
Cyclades-TS User Guide

Version 1.3.7 Revision 4

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Preface

Purpose

The purpose of this guide is to provide instruction for users to independently install, configure, and maintain the Cyclades-TS. This manual should be read in the order written, with exceptions given in the text. *Whether or not you are a UNIX user, we strongly recommend that you follow the steps given in this manual.*

Audience and User Levels

This guide is intended for the user who is responsible for the deployment and day-to-day operation and maintenance of the Cyclades-TS. It assumes that the reader understands networking basics and is familiar with the terms and concepts used in Local and Wide Area Networking. UNIX and Linux users will find the configuration process very familiar. It is not necessary to be a UNIX expert, however, to get the Cyclades-TS up and running. There are two audiences or user levels for this manual:

New Users

These are users new to Linux and/or UNIX with a primarily PC/Microsoft background. You might want to brush up on such things as common Linux/UNIX commands and how to use the vi editor prior to attempting installation and configuration. This essential background information appears in [Appendix A - New User Background Information](#). It is recommended that New Users configure the Cyclades-TS using a Web browser, however, New Users can also configure the Cyclades-TS with vi, the Wizard or the Command Line Interface (CLI).

Power Users

These are UNIX/Linux experts who will use this manual mostly for reference. Power Users can choose between configuring the Cyclades-TS via Web browser, vi, Wizard, or CLI.

Each configuration task will be separated into a section (a clickable link on the PDF file) for each user type. Users then can skip to the appropriate level that matches their expertise and comfort level.

Preface

How to use this Guide

This guide is organized into the following sections:

- [Chapter 1 - Introduction and Overview](#) contains an explanation of the product and its default CAS setup. It also includes safety guidelines to be followed.
- [Chapter 2 - Installation, Configuration, and Usage](#) explains how the Cyclades-TS should be connected and what each cable is used for. It describes the basic configuration process to get the Cyclades-TS up and running for its most common uses.
- [Chapter 3 - Additional Features](#) is dedicated to users wanting to explore all available features of the Cyclades-TS. It provides configuration instructions for syslog, data buffers, authentication, filters, DHCP, NTP, SNMP, clustering, and sniffing.
- [Chapter 4 - Server Management](#) explains how to manage the Cyclades-TS through your browser or via the Command Line Interface. It also instructs the user on sending warning messages.
- [Appendix A - New User Background Information](#) contains information for those who are new to Linux/UNIX.
- [Appendix B - Cabling, Hardware, and Electrical Specifications](#) has detailed information and pinout diagrams for cables used with the Cyclades-TS.
- [Appendix C - The pslave Configuration File](#) contains example files for the various configurations as well as the master file.
- [Appendix D - Linux-PAM](#) enables the local system administrator to choose how to authenticate users.
- [Appendix E - Software Upgrades and Troubleshooting](#) includes solutions and test procedures for typical problems.
- [Appendix F - Certificate for HTTP Security](#) provides configuration information that will enable you to obtain a Signed Digital Certificate.
- [Appendix G - Web User Management](#) covers default and optional configuration, and the addition/deletion of users, groups, and access limits.
- [Appendix H - Connect to Serial Ports from Web](#) enables this process, based on how the serial port is configured.

Preface

- [Appendix I - Power Management](#) instructs on using your Cyclades-TS with various IPDUs.
- [Appendix J - Examples for Configuration Testing](#) provides examples for testing the Cyclades-TS after configuration.
- [Appendix K - Billing Feature](#) explains how the Cyclades TS110/100 can also be simply used as an intermediate buffer to collect serial data (like billing tickets from a PABX), making them available for a posterior file transfer.
- [Appendix L - Wiz Application Parameters](#) contains all basic and custom wizard parameters.
- [Appendix M - Copyrights](#) lists details about applications that were incorporated into the product.
- The [Glossary](#) provides definitions for commonly-used terms in this manual.

Additional Documentation and Help

There are other Cyclades documents that contain background information about Console Port Management and the Cyclades product line. These are:

- Cyclades' *Console Management in the Data Center*
- Cyclades' *Product Catalog*

For the most updated version of Cyclades' documentation, use the following Web address:

<http://www.cyclades.com/support/downloads.php>

Technical Support Centers

To reach Cyclades' Technical Support Centers, go to the following:

http://www.cyclades.com/support/technical_support.php

Preface

Conventions and Symbols

This section explains the significance of each of the various fonts, formatting, and icons that appear throughout this guide.

Fonts

This guide uses a regular text font for most of the body text and `Courier` for data that you would input, such as a command line instruction, or data that you would receive back, such as an error message. An example of this would be:

```
telnet 200.200.200.1 7001
```

Hypertext Links

References to another section of this manual are hypertext links that are underlined (and are also blue in the PDF version of the manual). When you click on them in the PDF version of the manual, you will be taken to that section.

Glossary Entries

Terms that can be found in the glossary are underlined and slightly larger than the rest of the text. These terms have a hypertext link to the glossary.

Quick Steps

Step-by-step instructions for installing and configuring the Cyclades-TS are numbered with a summarized description of the step for quick reference. Underneath the quick step is a more detailed description. Steps are numbered 1, 2, 3, etc. Additionally, if there are sub-steps to a step, they are indicated as Step A, B, C, and are nested within the Step 1, 2, 3, etc. For example:

Step 1: Modify files.

You will modify four Linux files to let the Cyclades-TS know about its local environment.

Step A: Modify `pslave.conf`.

Open the file `pslave.conf` and add the following lines . . .

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Parameter Syntax

This manual uses standard Linux command syntaxes and conventions for the parameters described within it.

Brackets and Hyphens (dashes)

The brackets ([]) indicate that the parameter inside them is optional, meaning that the command will be accepted if the parameter is not defined. When the text inside the brackets starts with a dash (-) and/or indicates a list of characters, the parameter can be one of the letters listed within the brackets.

Example:

```
iptables [-ADC] chain rule-specification [options]
```

Ellipses

Ellipses (...) indicate that the latest parameter can be repeated as many times as needed. Usually this is used to describe a list of subjects.

Example:

```
ls [OPTION]... [FILE]...
```

Pipes

The pipe (|) indicates that one of the words separated by this character should be used in the command.

Example:

```
netstat {--statistics|-s} [--tcp|-t] [--udp|-u] [--raw|-w]
```

When a configuration parameter is defined, the Linux command syntax conventions will be also used, with a difference.

Greater-than and Less-than signs

When the text is encapsulated with the “<>” characters, the meaning of the text will be considered, not the literal text. When the text is not encapsulated, the literal text will be considered.

Preface

Spacing and Separators

The list of users in the following example must be separated by semicolons (;); the outlets should be separated by commas (,) to indicate a list or with dashes (-) to indicate range; there should not be any spaces between the values.

sXX.pmusers: The user access list. For example: `jane:1,2;john:3,4`. The format of this field is:

```
[<username>:<outlet list>][;<username>:<outlet list>...]
```

where <outlet list>'s format is:

```
[<outlet number>|<outlet start>-<outlet end>][,<outlet number>|<outlet start>-<outlet end>]...
```


Preface

Note Box Icons

Note boxes contain instructional or cautionary information that the reader especially needs to bear in mind. There are five levels of note box icons:



Tip. An informational tip or tool that explains and/or expedites the use of the Cyclades-TS.



Important! An important tip that should be read. Review all of these notes for critical information.



Warning! A very important type of tip or warning. Do not ignore this information.



DANGER! Indicates a direct danger which, if not avoided, may result in personal injury or damage to the system.



Security Issue. Indicates security-related information where it is relevant.

Preface

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Introduction and Overview

Introducing Cyclades

Cyclades is a data center fault management company that enables remote management of servers, network equipment and automation devices. Its products help data center managers at enterprise, telecommunication and Internet companies to maximize network and server availability. This results in decreased maintenance costs, increased efficiency and productivity, along with greater control, freedom and peace of mind. Cyclades' advantage is providing scalable products leveraging Linux technology for flexibility and ease of customization.

The Cyclades-TS

The Cyclades-TS is line of Console Access and Terminal Servers that allow both local and dial-in access for in-band and out-of-band network management. They run an embedded version of the Linux operating system. Configuration of the equipment is done by editing a few plain-text files, and then updating the versions of the files on the Cyclades-TS. The files can be edited using the vi editor provided or on another computer with the environment and text editor of your choice. The default "box profile" of the Cyclades-TS is that of a Console Access Server.

You can access the Cyclades-TS via three methods:

- A console directly connected to the Cyclades-TS
- Telnet/ssh over a network
- A browser

And configure it with any of the following four options:

- vi
- Wizard
- Browser
- Command Line Interface (CLI) - only for certain configuration parameters

Introduction and Overview

With the Cyclades-TS set up as a Console Access Server, you can access a server connected to the Cyclades-TS through the server's serial console port from a workstation on the LAN or WAN. There is no authentication by default, but the system can be configured for authentication to be performed by a Radius server, a TacacsPlus server, or even by a local database. Either telnet or ssh (a secure shell session) can be used. See [Appendix A - New User Background Information](#) for more information about ssh. The instructions in [Chapter 2 - Installation, Configuration, and Usage](#) will set up a fully-functional, default CAS environment. More options can be added after the initial setup, as illustrated in [Chapter 3 - Additional Features](#).

What's in the box

There are several models of the Cyclades-TS with differing numbers of serial ports. Cyclades will ship either Cable Package #1 or #2 with the product according to current availability.

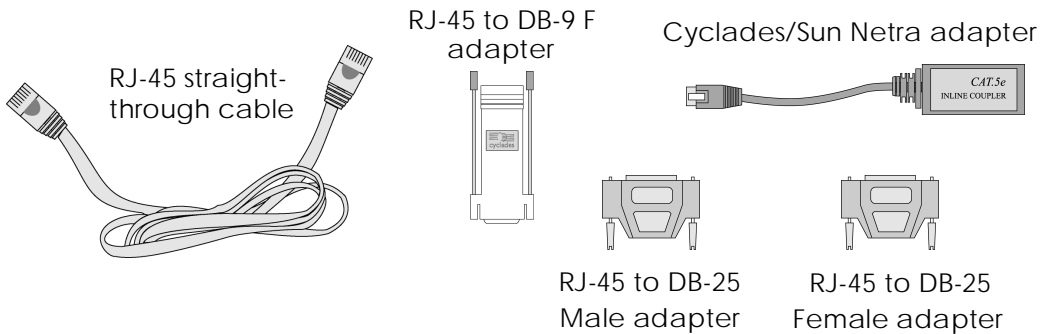


Figure 1: Cable Package #1

Introduction and Overview

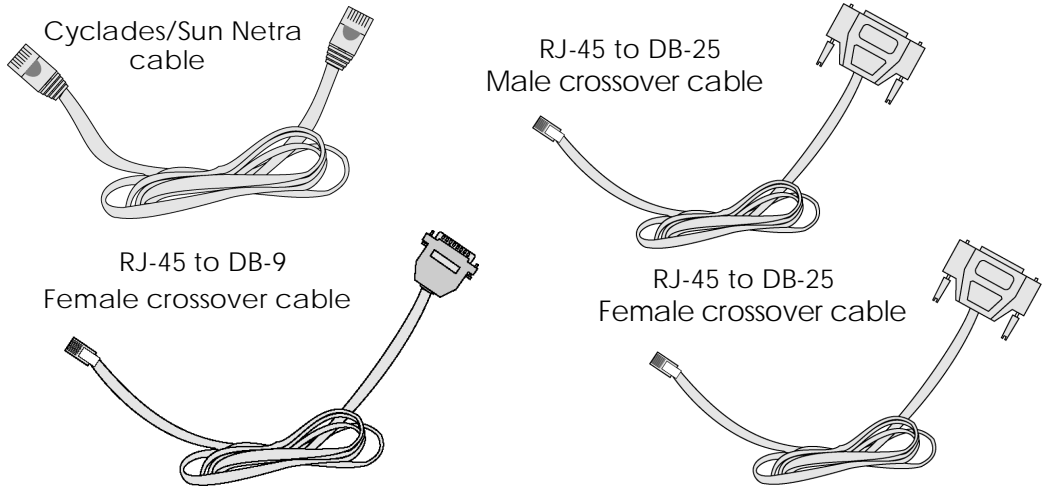


Figure 2: Cable Package #2

The following figures show the main units and accessories included in each package.

Introduction and Overview

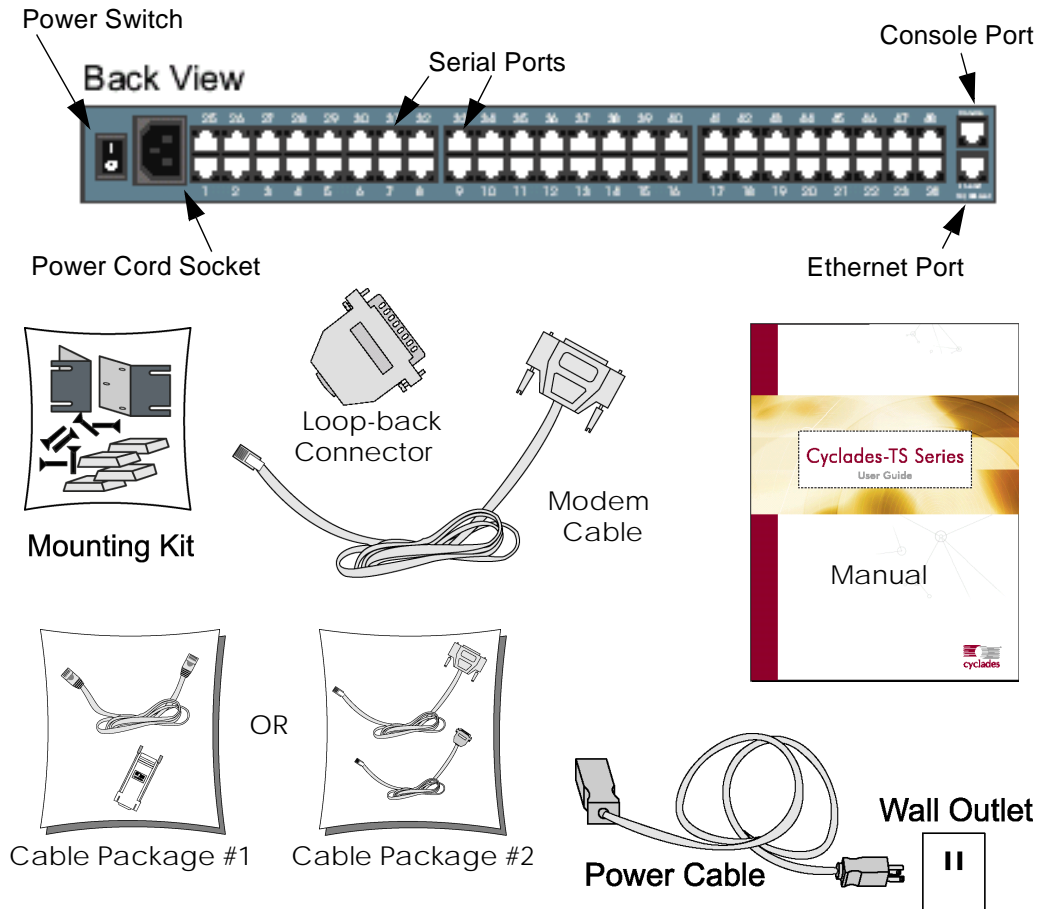


Figure 3: The Cyclades-TS3000 and cables

Introduction and Overview

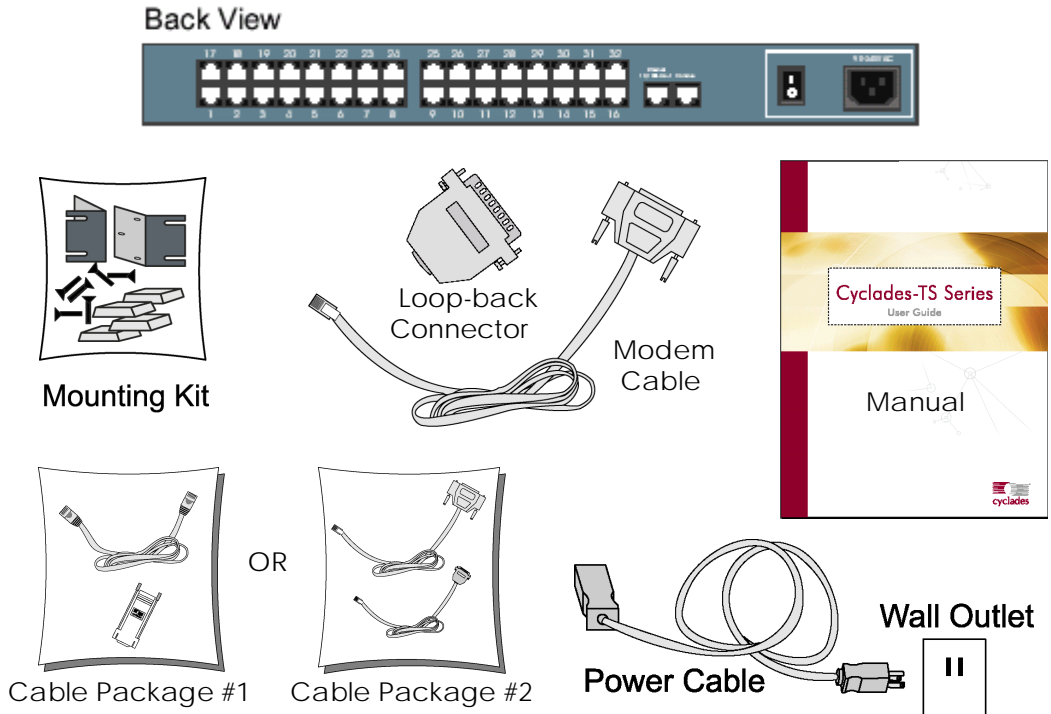


Figure 4: The Cyclades-TS2000 and cables

Introduction and Overview

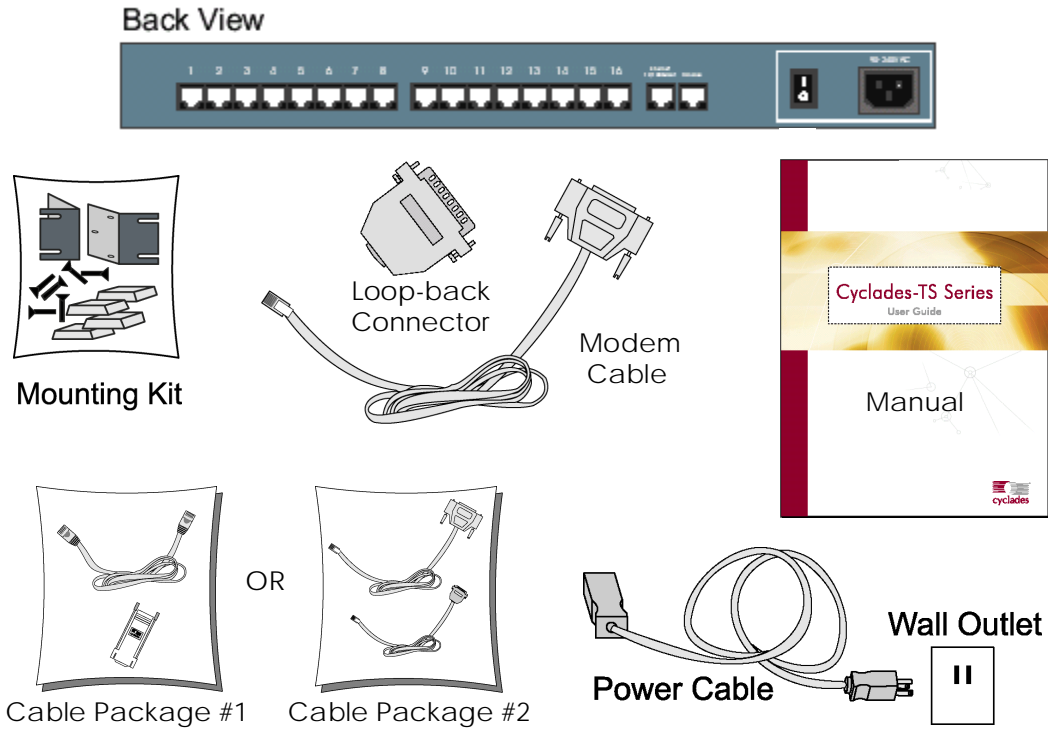


Figure 5: The Cyclades-TS1000 and cables

Introduction and Overview

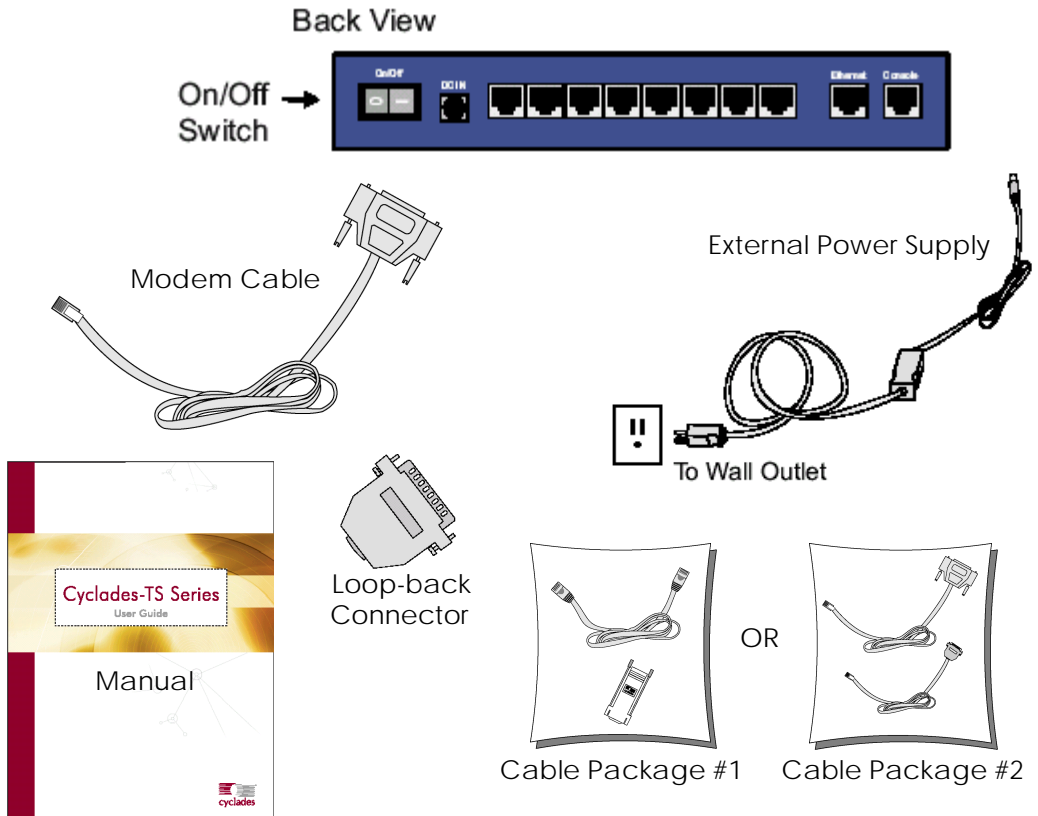


Figure 6: The Cyclades-TS800 and cables

Introduction and Overview

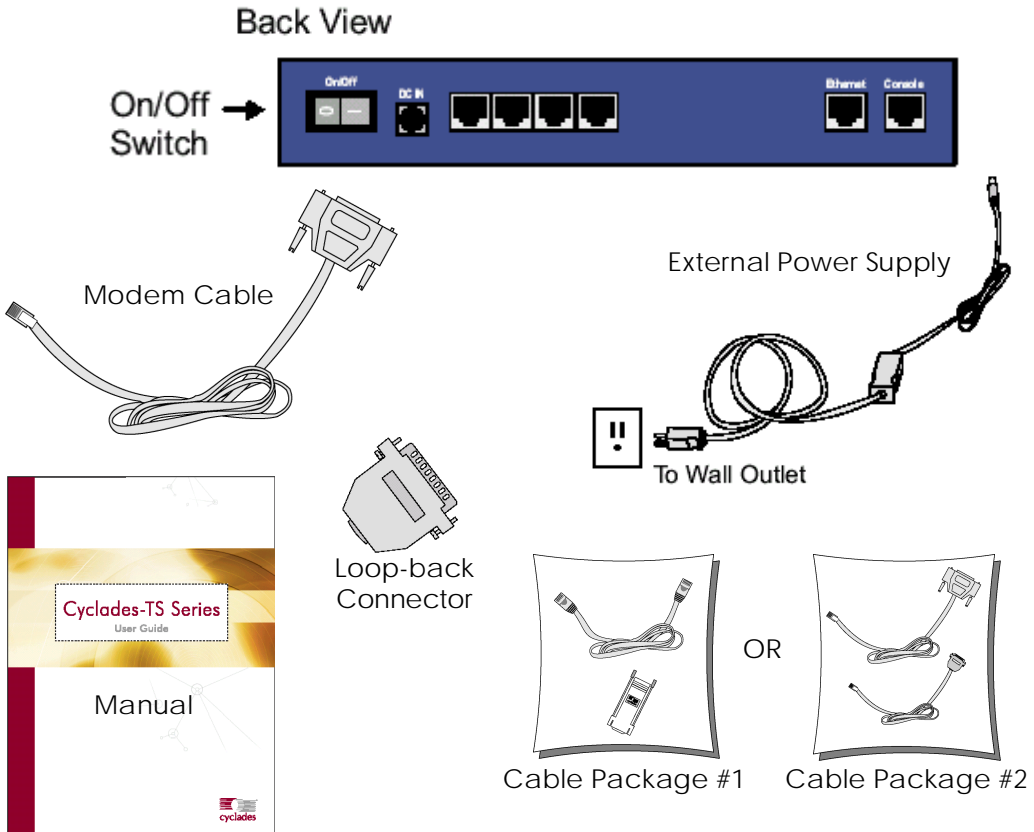


Figure 7: The Cyclades-TS400 and cables

Introduction and Overview

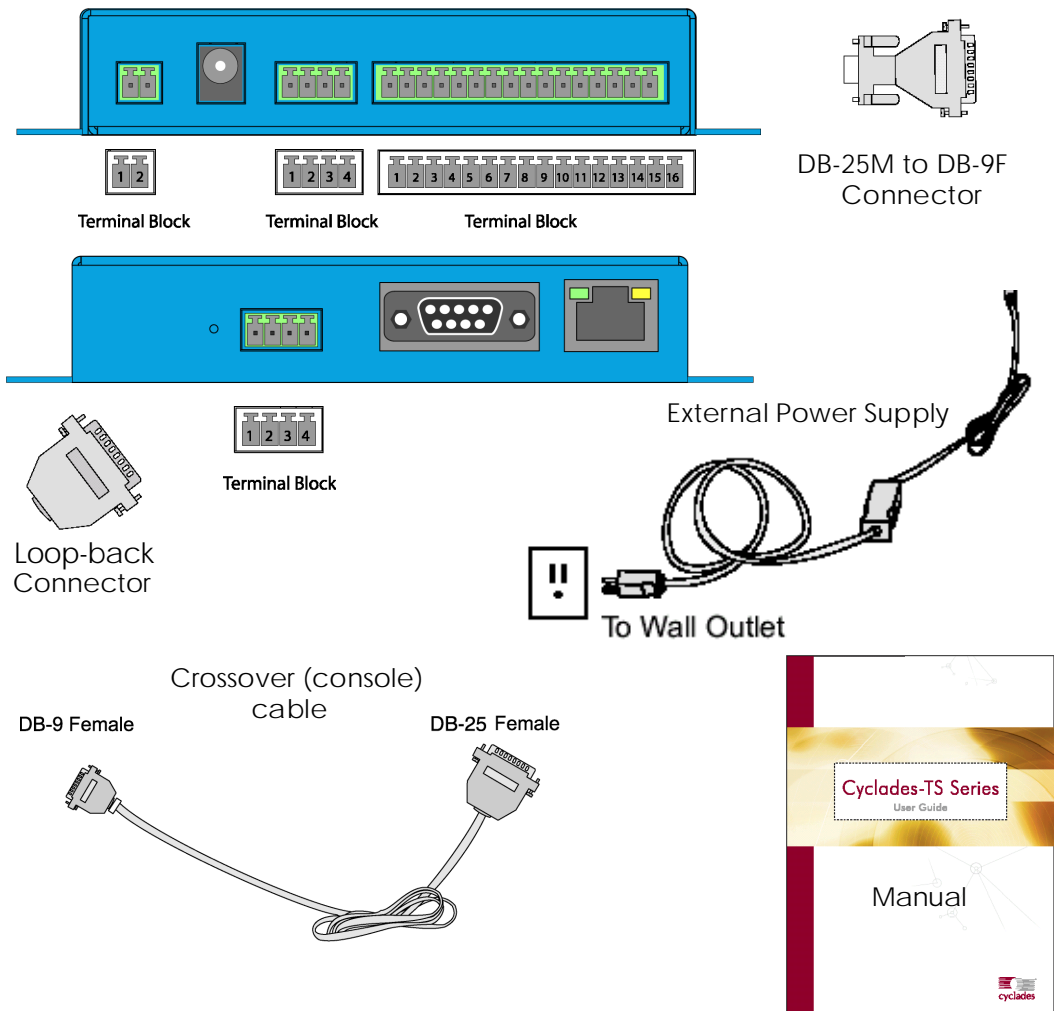


Figure 8: The Cyclades-TS110 and cables

Introduction and Overview

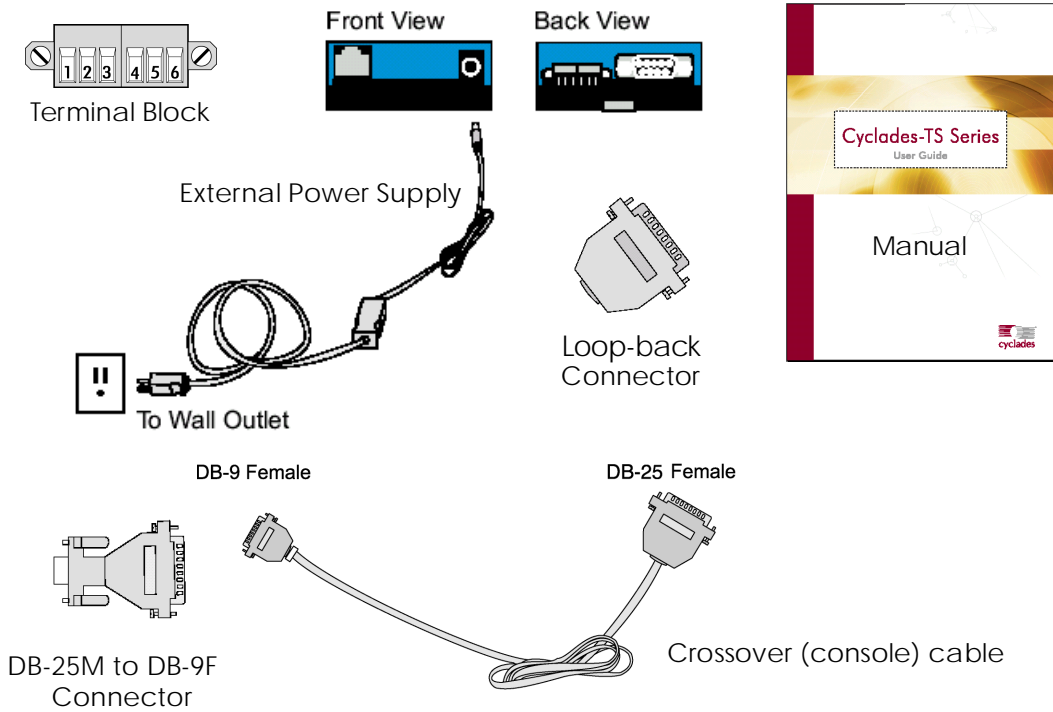


Figure 9: The Cyclades-TS100 and cables

Introduction and Overview

Powering the TS110/100

There are three ways to supply power to the TS110/100:

1. **External AC Desktop Power Supply: Universal AC Input (100-240VAC) / 5VDC Output.**
This power supply is shipped with the standard TS110/100 unit (AC input)
2. **External DC Supply.** Three DC input options are available:
 - 12VDC nominal input (9-18 VDC)
 - 24VDC nominal input (18-36 VDC)
 - 48VDC nominal input (36-72 VDC)
3. **P.O.E. (Power Over Ethernet)**
The power is supplied through the Ethernet cable. When this option is selected, the TS110/100 unit has to be connected to the LAN through a special hub or switch that provides DC voltage over the LAN cable. Besides these special hubs and switches, there are power injector devices available in the market which allow the users to keep using the regular hubs and switches. There are two P.O.E. standards in terms of P.O.E. feature detection circuitry. The P.O.E. supplier unit (hub, switch or power injector) can detect if the attached device supports P.O.E. One standard (old) uses capacitive load process and the second standard (new) uses resistive load process. TS110/100 supports both standards.

Power Supply Installation

External Desktop AC Power Supply

Step 1: Connect one end of the power cable to the TS110/100 power jack (5VDC in).

Step 2: Connect the power supply end of the power cable to a standard wall outlet.

External DC Supply

Connect the two DC supply wires to the terminal block, marked as PW- and PW+. The positive voltage should be connected to PW+ and the return to PW-. If it is a -48VDC supply, the -48V signal should be connected to PW- and the return signal to PW+.

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Notes:

- There is a label on the TS110/100 unit showing the nominal DC input voltage.
- The external desktop AC Power Supply (Universal AC input / 5VDC output) is not shipped with the TS110/100 as a standard accessory.
- If the 5VDC input power jack is used, it will bypass the DC input from the terminal block.
- There is a protection on the terminal block's DC input. If the (PW+) and (PW-) signals are inverted, the TS110/100 just won't work. It does not cause any damage to the unit.

P.O.E. (Power Over Ethernet)

No special setup is required. Just connect the Ethernet cable coming from the hub or switch that has support for P.O.E. or to the power injector device.



- Notes: If the 5VDC input power jack is used, it will bypass the P.O.E. feature.
- The external desktop AC Power Supply (Universal AC input / 5VDC output) is not shipped with the TS110/100 as standard accessory.

Introduction and Overview

Safety Instructions

Read all the following safety guidelines to protect yourself and your Cyclades-TS.



DANGER! Do not operate your Cyclades-TS with the cover removed.



DANGER! In order to avoid shorting out your Cyclades-TS when disconnecting the network cable, first unplug the cable from the equipment and then from the network jack. When reconnecting a network cable to the equipment, first plug the cable into the network jack, and then into the equipment.



DANGER! To help prevent electric shock, plug the Cyclades-TS into a properly grounded power source. The cable is equipped with a three-prong plug to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from the cable. If you have to use an extension cable, use a three-wire cable with properly grounded plugs. For the TS110/100, LES400, and 800, the grounded power cable constraint does not apply, as these products have an external power supply, and one power cable instead of two.



Important! To help protect the Cyclades-TS from electrical power fluctuations, use a surge suppressor, line conditioner, or uninterruptible power supply.



Important! Be sure that nothing rests on the cables of the Cyclades-TS and that they are not located where they can be stepped on or tripped over.

Introduction and Overview



Important! Do not spill food or liquids on the Cyclades-TS. If it gets wet, contact Cyclades.



DANGER! Do not push any objects through the openings of the Cyclades-TS. Doing so can cause fire or electric shock by shorting out interior components.



Important! Keep your Cyclades-TS away from heat sources and do not block cooling vents.



Important! The AlterPath Console Server product (DC version) is only intended to be installed in restricted access areas (Dedicated Equipment Rooms, Equipment Closets or the like) in accordance with Articles 110-18, 110-26 and 110-27 of the National Electrical Code, ANSI/NFPA 701, 1999 Edition.

Use 18 AWG or 0.75 mm² or above cable to connect the DC configured unit to the Centralized D.C. Power Systems.

Install the required double-pole, single-throw, DC rated UL Listed circuit breaker between the power source and the AlterPath Console Server DC version. Minimum Breaker Rating: 2A. Required conductor size: 18 AWG.

Introduction and Overview

Working inside the Cyclades-TS

Do not attempt to service the Cyclades-TS yourself, except when following instructions from Cyclades Technical Support personnel. In the latter case, first take the following precautions:

- Turn the Cyclades-TS off.
- Ground yourself by touching an unpainted metal surface on the back of the equipment before touching anything inside it.

Replacing the Battery

A coin-cell battery maintains date and time information. The TS110/100 does not have the battery, so the date and time must be kept up-to-date by ntpclient.



WARNING: There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.



WARNUNG: Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

FCC Warning Statement

The Cyclades-TS has been tested and found to comply with the limits for Class A digital devices, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Installation & Service Manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user is required to correct the problem at his or her own expense.

Introduction and Overview

Notice about FCC compliance for the Cyclades-TS1000 and the Cyclades-TS2000

In order to comply with FCC standards the Cyclades-TS require the use of a shielded CAT 5 cable for the Ethernet interface. Notice that this cable is not supplied with either of the products and must be provided by the customer.

Canadian DOC Notice

The *Cyclades-TS* does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le Cyclades-TS n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Aviso de Precaución S-Mark Argentina

Por favor de leer todos los avisos de precaución como medida preventiva para el operador y el Cyclades-TS.



¡Peligro! No hacer funcionar el Cyclades-TS con la tapa abierta.



¡Peligro! Para prevenir un corto circuito en el Cyclades-TS al desconectarlo de la red, primero desconectar el cable del equipo y luego el cable que conecta a la red. Para conectar el equipo a la red, primero conectar el cable a la red y luego al equipo.

Introduction and Overview



¡Peligro! Asegurarse que el equipo este conectado a tierra, para prevenir un shock eléctrico. El cable eléctrico del equipo viene con tres clavijas para conectar asegurar conexión a tierra. No use adaptadores o quite la clavija de tierra. Si se tiene que utilizar una extensión, utilice una que tenga tres cables con clavija para conexión a tierra.



¡Importante! Para proteger al Cyclades-TS de fluctuaciones en corriente eléctrica, utilice una fuente eléctrica de respaldo.



¡Importante! Asegurarse de que nada descansa sobre los cables del Cyclades-TS, y que los cables no obstruyan el paso.



¡Importante! Asegurarse de no dejar caer alimentos o bebidas en el Cyclades-TS. Si esto ocurre, avise a Cyclades Corporation.



¡Peligro! No empuje ningún tipo de objeto en los compartimientos del Cyclades-TS. Hacer esto podría ocasionar un incendio o causar un corto circuito dentro del equipo.

Introduction and Overview



¡Importante! Mantenga el Cyclades-TS fuera del alcance de calentadores, y asegurarse de no tapar la ventilación del equipo.



¡Importante! El Cyclades-TS con alimentación de corriente directa (CD) solo debe ser instalado en áreas con restricción y de acuerdo a los artículos 110-18, 110-26, y 110-27 del National Electrical Code, ANSI/NFPA 701, Edición 1999.

Para conectar la corriente directa (CD) al sistema, utilice cable de 0.75 mm (18 AWG).

Instalar el interruptor corriente directa (CD) aprobado por UL entre la fuente de alimentación y el Cyclades-TS. El límite mínimo del interruptor deberá ser 2 amperes, con conductor de 0.75 mm (18 AWG).

Trabajar dentro del AlterPath Console Server

No intente dar servicio al Cyclades-TS, solo que este bajo la dirección de Soporte Técnico de Cyclades. Si este es el caso, tome las siguientes precauciones:

Apague el Cyclades-TS. Asegurase que este tocando tierra antes de tocar cualquier otra cosa, que puede ser al tocar la parte trasera del equipo.

Introduction and Overview

Batería



¡Peligro! Una batería nueva puede explotar, si no esta instalada correctamente. Reemplace la batería cuando sea necesario solo con el mismo tipo recomendado por el fabricante de la batería. Deshacerse de la batería de acuerdo a las instrucciones del fabricante de la batería.

Introduction and Overview

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Chapter 2 - Installation, Configuration, Usage

Introduction

This chapter will allow you to install and configure the Cyclades-TS as the default CAS configuration. *Please read the entire chapter before beginning.* A basic installation and configuration should take a half hour at the most, either done manually or with the Wizard.

The Cyclades-TS operating system is embedded Linux. If you are fairly new to Linux, you will want to brush up prior to proceeding with this chapter with the essential background information presented in [Appendix A - New User Background Information](#). *Even if you are a UNIX user and find the tools and files familiar, do not configure this product as you would a regular Linux server.*

The chapter is divided into the following sections:

- [System Requirements](#)
- [Default Configuration Parameters](#)
- [Pre-Install Checklist](#)
- [Task List](#)
- [The Wizard](#)
- [Quick Start](#)
- [The Installation and Configuration Process](#)

System Requirements

Cyclades recommends either of the following specifications for configuration of the Cyclades-TS:

- A workstation with a console serial port, or
- A workstation with Ethernet and TCP/IP topology

Chapter 2 - Installation, Configuration, Usage

The following table shows the different hardware required for various configuration methods:

Table 1: Hardware vs. Configuration Methods

Hardware	Configuration Method
Console, Console Cable (constructed from RJ-45 straight-through cable + adapter)	vi, Wizard, or CLI
Workstation, Hub, Ethernet Cables	vi, Wizard, CLI, or browser

If you will be using vi, the files that need to be changed are discussed in [Configuration using Telnet](#) in this chapter. If you will be using the Wizard, basic Wizard access can be found under [Configuration Wizard - Basic Wizard](#) in [Chapter 3 - Additional Features](#) and specifics of this method are discussed under the appropriate option title in the same chapter. If you choose the browser method, the [Quick Start](#) in this chapter shows the screen flow and input values needed for this configuration mode. If you choose the CLI (Command Line Interface) method, this allows you to configure certain parameters for a specified serial port or some network-related parameters. Specifics of this method are discussed under the appropriate option title in [Chapter 3 - Additional Features](#).

Default Configuration Parameters

- DHCP enabled (if there is no DHCP Server, IP for Ethernet is 192.168.160.10 with a Net-mask of 255.255.255.0)
- CAS configuration
- socket_server in all ports (access method is telnet)
- 9600 bps, 8N1
- No Authentication

Chapter 2 - Installation, Configuration, Usage

Pre-Install Checklist

There are several things you will need to confirm prior to installing and configuring the Cyclades-TS:

Root Access

You will need Root Access on your local UNIX machine in order to use the serial port.

*HyperTerminal,
Kermit, or Minicom*

If you are using a PC, you will need to ensure that HyperTerminal is set up on your Windows operating system. If you have a UNIX operating system, you will be using Kermit or Minicom.

*IP Address of:
PC or terminal,
Cyclades-TS,
NameServer, and
Gateway*

You will need to locate the IP address of your PC or workstation, the Cyclades-TS, and the machine that resolves names on your network. Your Network Administrator can supply you with these. If there is outside access to the LAN that the Cyclades-TS will be connected with, you will need the gateway IP address as well.

Network Access

You will need to have a NIC card installed in your PC to provide an Ethernet port, and have network access.

Chapter 2 - Installation, Configuration, Usage

Task List

There are eight key tasks that you will need to perform to install and configure the Cyclades-TS:

[Task 1: Connect the Cyclades-TS to the Network and other Devices.](#)

[Task 2: Configure the COM Port Connection and Log In.](#)

[Task 3: Modify the System Files.](#)

[Task 4: Edit the pslave.conf file.](#)

[Task 5: Activate the changes.](#)

[Task 6: Test the configuration.](#)

[Task 7: Save the changes.](#)

[Task 8: Reboot the Cyclades-TS](#)

The Wizard

The eight key tasks can also be done through a wizard in the 1.3.4 plus versions of the Cyclades-TS.

Basic Wizard

The Basic Wizard will configure the following parameters:

- Hostname
- DHCP enabled/disabled
- System IP (if DHCP is disabled)
- Netmask (if DHCP is disabled)
- Default Gateway
- DNS Server
- Domain

Chapter 2 - Installation, Configuration, Usage

Basic Wizard access is covered in the Quick Start in this chapter and also in [Configuration Wizard - Basic Wizard](#) in [Chapter 3 - Additional Features](#).

Custom Wizard

Further configuration of the Cyclades-TS can be done through one of several customized wizards. These procedures are explained under their respective topic heading in [Chapter 3 - Additional Features](#). There are custom wizards for the following optional configurations:

- [Access Method](#)
- [Generating Alarms](#)
- [Authentication](#)
- [Data Buffering](#)
- [Help](#)
- Power Management (see [Appendix I - Power Management](#))
- [Serial Settings](#)
- [Session Sniffing](#)
- [Syslog](#)
- [Terminal Appearance](#)
- [TS Setup Wizard](#) (These are additional configuration parameters applied only to the TS profile.)



Important! If you are installing and configuring the Cyclades-TS110/100, there are special requirements and instructions. Be sure to read [Special Configuration for the Cyclades-TS110/100](#) at the end of this chapter.

Chapter 2 - Installation, Configuration, Usage

Quick Start

This Quick Start gives you all the necessary information to quickly configure and start using the Cyclades-TS as a Console Access Server (CAS). The complete version of this process is listed later in this chapter under [The Installation and Configuration Process](#). New Users may wish to follow the latter instruction set, as this Quick Start does not contain a lot of assumed knowledge.

You can configure the Cyclades-TS by any one of four methods:

- Console
- Browser
- Telnet
- CLI (Command Line Interface)

If you have a serial port that you can use as a console port, use the Console method. If you have access to telnet, you can use this method, while [New Users](#) may prefer the Browser method for its user-friendliness.



Important! Take care when changing the IP address of the Cyclades-TS. Confirm the address you are changing it to. (You may want to write it down.)

Configuration using a Console

Step 1: Connect the console cable.

Connect the console cable (created from the RJ-45 straight-through cable and the appropriate console adapter) to the port labeled “Console” on the Cyclades-TS with the RJ-45 connector end, and to your PC’s available COM port with the serial port end.

Chapter 2 - Installation, Configuration, Usage

Step 2: Power on the Cyclades-TS.

After the Cyclades-TS finishes booting, you will see a login prompt on the console screen.

Step 3: Enter *root* as login name and *tslinux* as password.

Step 4: Type *wiz* and press Enter.

A configuration wizard screen will appear in your Hyperterminal session, asking you a series of questions.

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or
- 3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

Press ENTER to continue...

You will want to configure the following settings:

- Hostname
- DHCP enabled/disabled
- System IP (if DHCP is disabled)
- Domain Name
- Primary DNS Server

Chapter 2 - Installation, Configuration, Usage

- Gateway IP
- Network Mask (if DHCP is disabled)

After you input the requested parameters you will receive a confirmation screen:

Current configuration:

Hostname : CAS

DHCP : enabled

Domain name : cyclades.com

Primary DNS Server : 197.168.160.200

Gateway IP : 192.168.160.1

If the parameters are correct, “y” should be typed; otherwise, type “n” and then “c” when asked to change the parameters or quit the program. After the parameters are confirmed, the next question will be whether to save the configuration to flash. Select “y” to make the new configuration permanent in non-volatile memory.

After you confirm and save the basic parameters, you will be presented with the shell prompt. From there, either select to continue configuration using the vi editor or use the browser or CLI method (if appropriate).

The Cyclades-TS is now configured as a CAS with its new IP address, with no authentication, and accepting telnet to the serial ports. You can telnet the CAS IP + serial port 1 with the following command:

```
telnet <IP assigned by DHCP Server or by you> 7001
```



Note. Serial port 1 is configured as 9600, 8N1 by default. The server connected to this serial port has to have the same configuration for its serial port.

To explore the Cyclades-TS features, either continue configuration using the vi editor from the console or use a browser from a workstation and point to the Cyclades-TS.

Chapter 2 - Installation, Configuration, Usage

Configuration using a Web browser

The Cyclades-TS box comes with DHCP client enabled. If you have a DHCP Server installed on your LAN, you can skip Step 2 below. If not, the DHCP request will fail and an IP address pre-configured on the Console server's Ethernet interface (192.168.160.10) will be used instead. To access the box using your browser:

Step 1: Connect Hub to workstation and TS.

Your workstation and your TS must be on the same physical LAN. Connect one RJ-45 cable from the Ethernet port of the TS to a spare port from a hub, and another cable from another spare port of that same hub to the workstation used to manage the servers.

Step 2: If you do not have a DHCP Server in your LAN, add a route pointing to the TS IP.

From the workstation, issue a command to add a route pointing to the network IP address of the TS (192.168.160.0) accessed through the workstation's Ethernet interface.

For Linux, the command would be:

```
route add -net 192.168.160.0/24 gw <IP address assigned to the workstation's Ethernet interface>
```

Example: if the workstation has IP address 200.246.93.150 the command would be:

```
route add -net 192.168.160.0/24 gw 200.246.93.150
```

For Windows, the command would be:

```
route add 192.168.160.0 mask 255.255.255.0 <IP address assigned to the workstation's Ethernet interface>
```

Example: if the workstation has IP address 200.246.93.150 the command would be:

```
route add 192.168.160.0 mask 255.255.255.0 200.246.93.150
```

Step 3: Point your browser to the IP address assigned by the DHCP Server (or to 192.168.160.10 if there is no DHCP Server in your LAN).

The login page shown in the following figure will appear.

Chapter 2 - Installation, Configuration, Usage

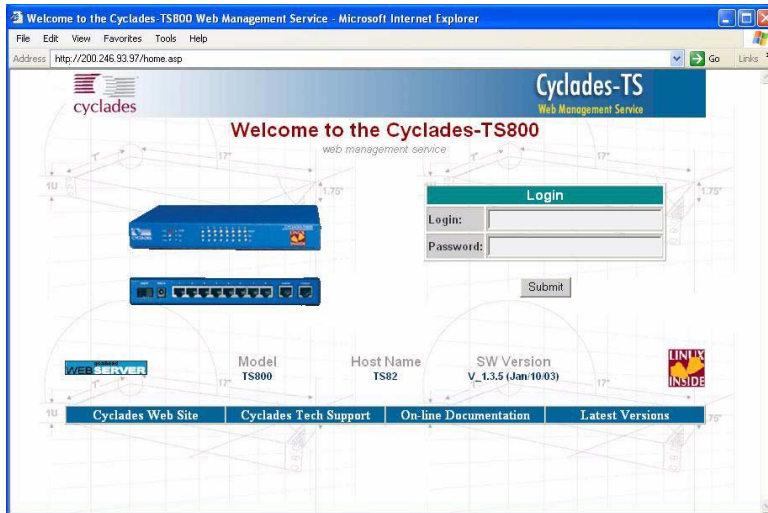


Figure 10: Login page of Web Configuration Manager

Step 4: Enter *root* as login name and *tslinux* as password.

Step 5: Click the Submit button.

This will take you to the Configuration & Administration Menu page, shown in the following figure:

Chapter 2 - Installation, Configuration, Usage

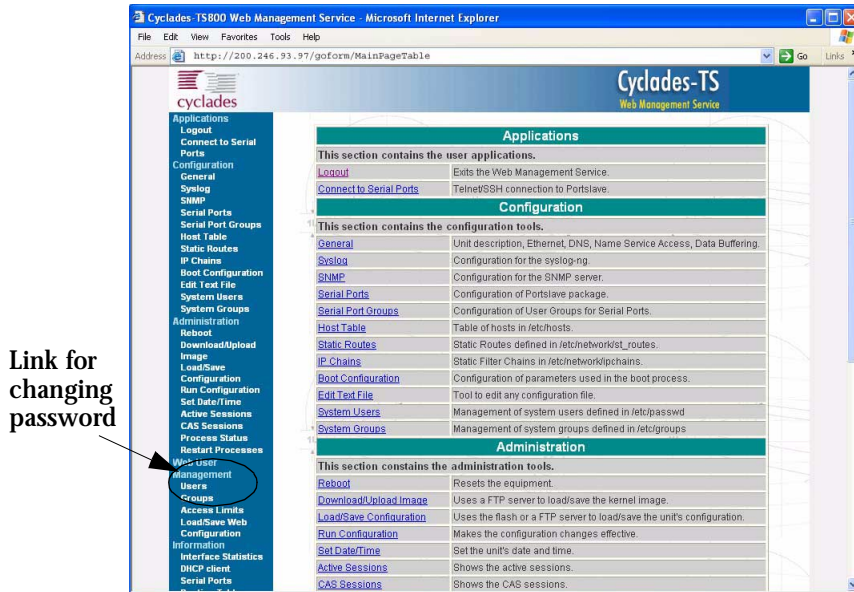


Figure 11: Configuration & Administration Menu page

This page gives a brief description of all menu options. A menu of links is provided along the left side of the page. A summary of what each link leads to is shown on [Table 3: Configuration Section](#) through [Table 6: Information Section](#).



Security Issue. Change the password of the Web root user as soon as possible. The user database for the Web Configuration Manager is different than the system user database, so the root password can be different. See [Changing the Root Password](#) in [Appendix G - Web User Management](#).

Step 6: Click on the General link.

Chapter 2 - Installation, Configuration, Usage

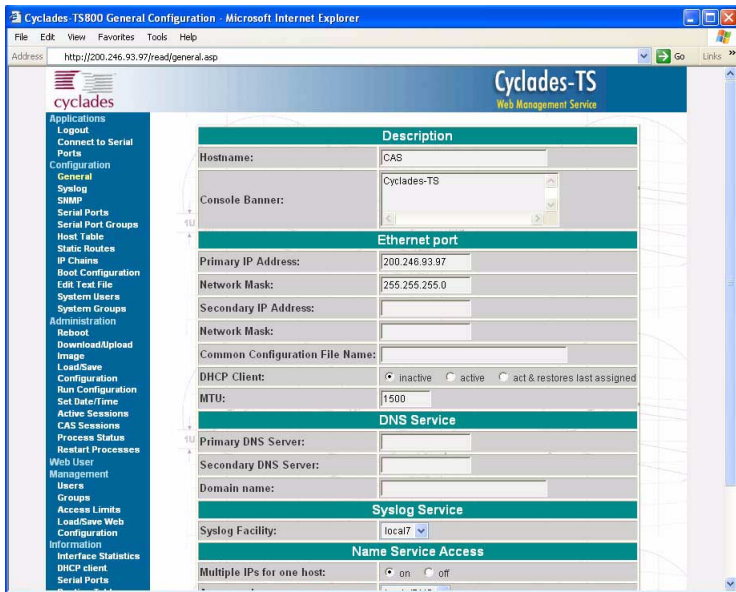


Figure 12: General page

Step 7: Configure parameters presented in the fields.

Step 8: Click on the Submit button.

Step 9: Make the changes effective.

Click on the Administration > Run Configuration link, check the Serial Ports/Ethernet/Static Routes box and click on the Activate Configuration button. If you disabled DHCP and changed your Ethernet IP, you will lose your connection. You will need to use your browser to connect to the new IP.

Step 10: Click on the Save Configuration to Flash button.

The configuration was saved in flash. The new configuration will be valid and running. The Cyclades-TS is now configured as a CAS with its assigned (by DHCP Server or you) IP address, with no authentication, and accepting telnet to the serial ports. You can telnet the CAS IP + serial port 1 with the following command:

```
telnet <IP assigned> 7001
```

Chapter 2 - Installation, Configuration, Usage



Note. Serial port 1 is configured as 9600, 8N1 by default. The server connected to this serial port has to have the same configuration for its serial port.

To explore the Cyclades-TS features, either continue configuration using your browser, use the vi editor from the console, or use CLI, if appropriate.

A description of each of the links on the five sections of the Configuration and Administration menu page is provided on the following five tables:

Table 2: Applications Section

Link Name	Description of Page Contents
<i>Logout</i>	Exits the Web Management Service
<i>Connect to Serial Ports</i>	Telnet/SSH connection to Portslave

Chapter 2 - Installation, Configuration, Usage

Table 3: Configuration Section

Link Name	Description of Page Contents
<i>Configuration</i>	This section contains the configuration tools
<i>General</i>	Unit Description, Ethernet, DNS, Name Service Access, Data Buffering
<i>Syslog</i>	Configuration for the syslog-ng
<i>SNMP</i>	Configuration for the SNMP server
<i>Serial Ports</i>	Configuration of Portslave package
<i>Serial Port Groups</i>	Configuration of User Groups for Serial Ports
<i>Host Table</i>	Table of hosts in /etc/hosts
<i>Static Routes</i>	Static routes defined in /etc/network/st_routes
<i>IP Chains</i>	Shows IP Chains entries
<i>Boot Configuration</i>	Configuration of parameters used in the boot process
<i>Edit Text File</i>	Tool to edit a configuration file
<i>System Users</i>	Management of system users defined in /etc/password
<i>System Groups</i>	Management of system groups defined in /etc/groups

Chapter 2 - Installation, Configuration, Usage

Table 4: Administration Section

Link Name	Description of Page Contents
<i>Reboot</i>	Resets the equipment
<i>Download/ Upload Image</i>	Uses an FTP server to load/save a kernel image
<i>Load/Save Configuration</i>	Uses flash memory or an FTP server to load or save the TS's configuration
<i>Run Configuration</i>	Makes the configuration changes effective
<i>Set Date/Time</i>	Set the TS's date and time
<i>Active Sessions</i>	Shows the active sessions
<i>Process Status</i>	Shows the running processes and allows the administrator to kill them
<i>Restart Processes</i>	Allows the administrator to start or stop some specific processes
<i>PCMCIA</i>	Allows the administrator to insert and eject PCMCIA cards

Table 5: Web User Management Section

Link Name	Description of Page Contents
<i>Users</i>	List of users allowed to access the Web server
<i>Groups</i>	List of possible access groups
<i>Access Limits</i>	List of access limits for specific URLs
<i>Load/Save Configuration</i>	Load/Save Configuration in /etc/websum.conf

Chapter 2 - Installation, Configuration, Usage

Table 6: Information Section

Link Name	Description of Page Contents
<i>Interface Statistics</i>	Shows statistics for all active interfaces
<i>DHCP client</i>	Shows host information from DHCP
<i>Serial Ports</i>	Shows the status of all serial ports
<i>Routing Table</i>	Shows the routing table and allows the administrator to add or delete routes
<i>ARP Cache</i>	Shows the ARP cache
<i>IP Statistics</i>	Shows IP protocol statistics
<i>ICMP Statistics</i>	Shows ICMP protocol statistics
<i>TCP Statistics</i>	Shows TCP protocol statistics
<i>UDP Statistics</i>	Shows UDP protocol statistics
<i>RAM Disk Usage</i>	Shows the TS File System status
<i>System Information</i>	Shows information about the kernel, time, CPU, and memory

Chapter 2 - Installation, Configuration, Usage

Configuration using Telnet

The Cyclades-TS box comes with DHCP client enabled. If you have a DHCP Server installed on your LAN, you can skip Step 2 below. If not, the DHCP request will fail and an IP address pre-configured on the Console server's Ethernet interface (192.168.160.10) will be used instead. To access the box using telnet:

Step 1: Connect Hub to workstation and TS.

Your workstation and your TS must be on the same physical LAN. Connect one RJ-45 cable from the Ethernet port of the TS to a spare port from a hub, and another cable from another spare port of that same hub to the workstation used to manage the servers.

Step 2: If you do not have a DHCP Server in your LAN, add a route pointing to the TS IP.

From the workstation issue a command to add a route pointing to the network IP address of the TS (192.168.160.0) accessed through the workstation's Ethernet interface.

For Linux, the command would be:

```
route add -net 192.168.160.0/24 gw <IP address assigned to the workstation's Ethernet interface>
```

Example: if the workstation has IP address 200.246.93.150 the command would be:

```
route add -net 192.168.160.0/24 gw 200.246.93.150
```

For Windows, the command would be:

```
route add 192.168.160.0 mask 255.255.255.0 <IP address assigned to the workstation's Ethernet interface>
```

Example: if the workstation has IP address 200.246.93.150 the command would be:

```
route add 192.168.160.0 mask 255.255.255.0 200.246.93.150
```

Step 3: Telnet to <IP assigned by DHCP Server or 192.168.160.10 if there is no DHCP Server>.

Step 4: Enter *root* as login name and *tslinux* as password.

Chapter 2 - Installation, Configuration, Usage

Step 5: Type *wiz* and press Enter.

A Configuration Wizard screen will appear on your telnet screen, asking you a series of questions.

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER. Enter '#' if you want to deactivate that parameter or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or
- 3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

Press ENTER to continue...

After you input the requested parameters you will receive a confirmation screen:

Current configuration:

Hostname : CAS

DHCP: disabled

System IP : 192.168.160.10

Domain name : cyclades.com

Primary DNS Server : 197.168.160.200

Gateway : eth0

Network Mask : 255.255.255.0

Chapter 2 - Installation, Configuration, Usage

If the parameters are correct, “y” should be typed; otherwise, type “n” and then “c” when asked to change the parameters or quit the program. After the parameters are confirmed, the next question will be whether to save the configuration to flash. Select “y” to make the new configuration permanent in non-volatile memory.

At this point you may lose your connection when saving the changes, if you disabled DHCP and assigned an IP address. *Don't worry!* The new configuration will be valid. The Cyclades-TS is now configured as a CAS with its assigned (by DHCP or you) IP address, with no authentication, and accepting telnet to the serial ports. You can telnet the CAS IP + serial port 1 with the following command:

```
telnet <IP assigned> 7001
```



Note. Serial port 1 is configured as 9600, 8N1 by default. The server connected to this serial port has to have the same configuration for its serial port.

After you confirm the basic parameters, you will be presented with the shell prompt. From there, either select to continue configuration using the vi editor or continue using a browser. For additional configuration, see [Chapter 3 - Additional Features](#) in this guide.

Chapter 2 - Installation, Configuration, Usage

The Installation and Configuration Process

Task 1: Connect the Cyclades-TS to the Network and other Devices

Power Users

Connect a PC or terminal to the Cyclades-TS using the console cable. If you are using a PC, HyperTerminal can be used in the Windows operating system and Kermit or Minicom in the UNIX operating system. When the Cyclades-TS boots properly, a login banner will appear. Log in as *root* (default password is *tslinux*). A new password should be created as soon as possible. The terminal parameters should be set as follows:

- Serial Speed: 9600 bps
- Data Length: 8 bits
- Parity: None
- Stop Bits: 1 stop bit
- Flow Control: none
- ANSI emulation

You may now skip to [Task 4: Edit the pslave.conf file](#).



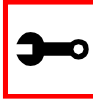
Important! Any configuration change must be saved in flash once validated. To save in **Flash** run `saveconf` (see [Task 7: Save the changes](#)). To validate/activate a configuration, run `signal_ras hup` (see [Task 5: Activate the changes](#)).



Note: If your terminal does not have ANSI emulation, select vt100; then, on the TS, log in as root and switch to vt100 by typing:

```
TERM=vt100;export TERM
```

Chapter 2 - Installation, Configuration, Usage



Tip. We strongly recommend to use 9600 bps console speed. In case you need to use another speed please check [Appendix E - Software Upgrades and Troubleshooting](#).



Important! Always complete ALL the steps for your chosen configuration before testing or switching to another configuration.

New Users

If you are using a PC, you will be using HyperTerminal to perform the initial configuration of the Cyclades-TS directly through your PC's COM port connected with the Cyclades-TS console port. HyperTerminal, which comes with Windows 95, 98, Me, NT, 2K, and XP is often located under Start > Program > Accessories. HyperTerminal emulates a dumb terminal when your PC connects to the serial port (console port) of the Cyclades-TS.

After the initial configuration through the HyperTerminal connection, you will be connecting your PC (or another terminal) to the Cyclades-TS via an Ethernet connection in order to manage the TS. The workstation used to access the TS through telnet or ssh uses a LAN connection.

These events can be summarized as follows:

- PC (Hyper terminal): COM port connects via serial cable to the TS's console port.
- PC (Ethernet): Ethernet port connects via hub to the TS's Ethernet port.
- Use the HyperTerminal to configure the box.
- Use the PC Ethernet to access the box as client (telnet/ssh).

Chapter 2 - Installation, Configuration, Usage

Step 1: Plug the power cable into the Cyclades-TS.

Insert the female end of the black power cable into the power socket on the Cyclades-TS and the three-prong end into a wall outlet.



DANGER! To help prevent electric shock, plug the Cyclades-TS into a properly grounded power source. The cable is equipped with a 3-prong plug to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from the cable. If you use an extension cable, use a 3-wire cable with properly grounded plugs. For the TS110/100, 400, and 800, the grounded power cable constraint does not apply, as these products have an external power supply, and one power cable instead of two.

Step 2: Connect the console cable.

You will be constructing a Console Cable out of the RJ-45 straight-through cable and the appropriate adapter provided in the product box. (There are four options: all adapters have an RJ-45 connector on one end, and either a DB25 or DB9 connector on the other end, male or female). Connect this cable to the port labeled “Console” on the Cyclades-TS with the RJ-45 connector end, and connect the adapter end to your PC’s available COM port. For more detailed information on cables, see [Appendix B - Cabling, Hardware, and Electrical Specifications](#).



Note: The modem cable is not necessary for a standard installation and configuration. Use it when the configuration is complete and you want to access the box remotely through a serial port.

Step 3: Connect Hub to PC and the Cyclades-TS.

Your workstation and TS must be on the same physical LAN. Connect one RJ-45 cable from the Ethernet port of the TS to the hub, and another from the hub to the workstation used to manage the servers.

Step 4: Install and launch HyperTerminal, Kermit or Minicom if not already installed.

You can obtain the latest update to HyperTerminal from:

<http://www.hilgraeve.com/hpte/download.html>

Chapter 2 - Installation, Configuration, Usage

Task 2: Configure the COM Port Connection and Log In

Step 1: Select available COM port.

In HyperTerminal (Start > Program > Accessories), select File > Properties, and click the Connect To tab. Select the available COM port number from the Connection dropdown.

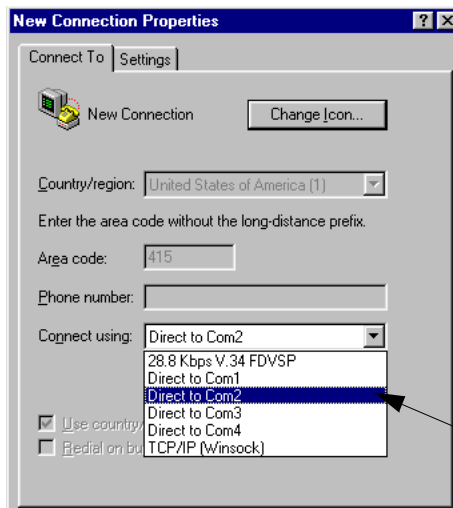


Figure 13: Choose a free COM port

Step 2: Configure COM port.

Click the Configure button (hidden by the dropdown menu in the above figure). Your PC, considered here to be a “dumb terminal,” should be configured to use 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control (as shown in the following figure).

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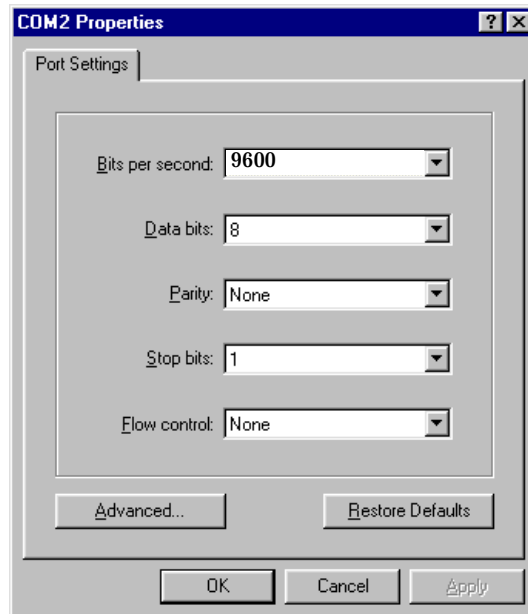


Figure 14: Port Settings

Step 3: Power on the Cyclades-TS.

Step 4: Click OK on the Properties window.

You will see the Cyclades-TS booting on your screen. After it finishes booting, you will see a login prompt.

Chapter 2 - Installation, Configuration, Usage

Task 3: Modify the System Files

When the Cyclades-TS finishes booting, a prompt will appear (a flashing underline cursor) in your HyperTerminal window. You will modify the following Linux files to let the Cyclades-TS know about its local environment:

```
/etc/hostname  
  
/etc/hosts  
  
/etc/resolv.conf  
  
/etc/network/st_routes  
  
/etc/inittab (Cyclades-TS110/100 only)
```



Important! If you have the Cyclades-TS110/100 you will be modifying an additional file: `/etc/inittab`. See [Configuring the Cyclades-TS110/100 for the first time](#) at the end of this chapter for instructions specific to this model.

The five Linux files must be modified to identify the TS and other devices it will be communicating with. The operating system provides the vi editor, which is described in [Appendix A - New User Background Information](#) for the uninitiated. The Cyclades-TS runs Linux, a UNIX-like operating system, and those not familiar with it will want to refer to Appendix A.

Step 1: Type *root* and press Enter.

Step 2: At the password prompt, type *tslinux*.

Press Enter.

Step 3: Modify `/etc/hostname`.

In HyperTerminal, type “vi `/etc/hostname`” (without the quotes) and press Enter. Arrow over the existing text in the file, type “r” (for replace) and type the first number of the model of your Cyclades-TS. (Or, you can replace the default naming convention with anything you’d like for your hostname.) When finished, press the Esc key, (to return to command mode), then type “:” (colon), and then “wq” and press Enter. This will save the file. (The only entry in this file should be the hostname of the Cyclades-TS.) An example is shown in the following figure. (The

Chapter 2 - Installation, Configuration, Usage

HyperTerminal screen is shown in this first example for clarity, however, for the other Linux files we will modify, only the command line text will be shown.)

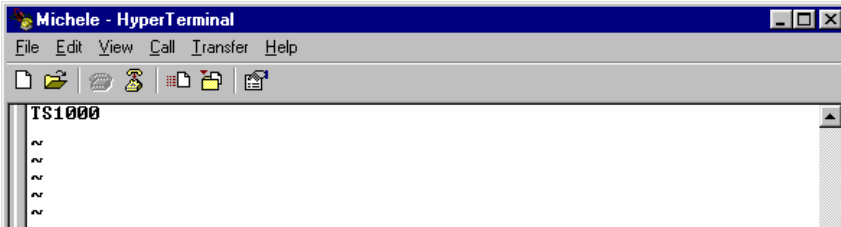


Figure 15: The `/etc/hostname` file with `hostname` typed in

Step 4: Modify `/etc/hosts`.

This file should contain the IP address for the Ethernet interface and the same hostname that you entered in the `/etc/hostname` file. It may also contain IP addresses and host names for other hosts in the network. Modify the file using the `vi` as you did in Step 1.

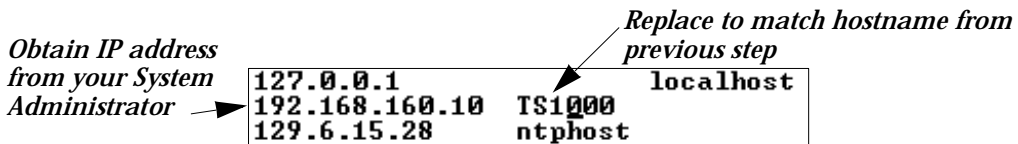


Figure 16: Contents of the `/etc/hosts` file

Step 5: Modify `/etc/resolv.conf`.

This file must contain the domain name and nameserver information for the network. Obtain the nameserver IP address from your Network Administrator. The default contents of this file are:

```
domain      mycompany.com
nameserver  200.200.200.2
```


Chapter 2 - Installation, Configuration, Usage

Step 6: Modify `/etc/network/st_routes`.

The fourth file defines static routes. In the console server example in [Figure 62: Console Access Server diagram](#) the router is a gateway router and thus its IP address is configured in this file to be the default gateway. Other static routes are also configured in this file. If you will be managing servers through a LAN, you don't need to alter this file. If you will be managing via Internet, you will be connecting through a router, and thus need to modify this file. You would get the IP address from your Network Administrator. The default contents of this file are:

```
route add default dev eth0
```

Step 7: Change password for root and new users.

The default `/etc/passwd` file has the user "root" with password "tslinux". You should change the password for user *root* as soon as possible. Before changing any password or adding new users you should also activate *shadow password*, if it is needed. The Cyclades-TS has support for shadow password, but it is not active by default. To activate shadow password follow the steps listed below:

Step A: Create an empty file called `/etc/shadow`.

```
# cd /etc
# touch shadow
```

Step B: Add a temporary user to the system. It will be removed later.

```
# adduser boo
```

Step C: Edit the file *shadow*.

For each user in `passwd` file, create a copy of the line that begins with "boo:" in the `shadow` file, then replace "boo" with the user name. The line beginning with "root" must be the first line in the file `/etc/shadow`.

Step D: Edit the *passwd* file.

Replace the password in all password fields with an "x". The root's line will look like this:

```
"root:x:0:0:root:/root:/bin/sh"
  ^
  ^ password field
```

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Tip. Using the vi editor, put the cursor in the first byte after “root:”, then type “ct:x” plus <ESC>.

Step E: Remove the temporary user boo.

```
# deluser boo
```

Step F: Change the password for all users and add the new ones needed.

```
# passwd <username>  
or  
# adduser <username>
```

Step G: Edit /etc/config_files and add a line with “/etc/shadow.”

Task 4: Edit the pslave.conf file

This is the main configuration file (/etc/portslave/pslave.conf) that contains most product parameters and defines the functionality of the Cyclades-TS. Only three parameters need to be modified or confirmed for a basic configuration:

- conf.eth_ip (if you disabled DHCP)
- all.authtype
- all.protocol



Tip. You can do a find for each of these parameters in vi, once you open this file by typing / <your string> to search the file downward for the string specified after the /.

A listing of the pslave.conf file with all possible parameters, as well as the files used to create other configurations from parameters in this file, is provided in [Appendix C - The pslave Configuration File](#). Additional, optional modifications made to this file will depend on the configuration desired.

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There are three basic types of parameters in this file:

- *conf.** parameters are global or apply to the Ethernet interface.
- *all.** parameters are used to set default parameters for all ports.
- *s#.** parameters change the default port parameters for individual ports.

An *all.** parameter can be overridden by a *s#.** parameter appearing later in the *pslave.conf* file (or vice-versa).



Power Users: To find out what to input for these three parameters so that you can configure what you need, go the appropriate appendix, where you will find a complete table with an explanation for each parameter. You can use the templates from that same Appendix (*pslave.conf.cas*, etc.) as reference.

confeth_ip

This is the IP address of the Ethernet interface. Use it if you don't have DHCP Server in your LAN. An example value would be:

200.200.200.1

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all.authtype This parameter controls the authentication required by the Cyclades-TS. The authentication required by the device to which the user is connecting is controlled separately. There are several authentication type options:

- *none* (no authentication)
- *local* (authentication is performed using the `/etc/passwd` file)
- *remote* (This is for a terminal profile only. The unit takes in a username but does not use it for authentication. Instead it passes it to the remote server where it is then used for authentication.)
- *radius* (authentication is performed using a Radius authentication server)
- *TacacsPlus* (authentication is performed using a TacacsPlus authentication server)
- *ldap* (authentication is performed against an ldap database using an ldap server. The IP address and other details of the ldap server are defined in the file `/etc/ldap.conf`)
- *local/radius* (authentication is performed locally first, switching to Radius if unsuccessful)
- *radius/local* (the opposite of the previous option)
- *local/TacacsPlus* (authentication is performed locally first, switching to TacacsPlus if unsuccessful)
- *TacacsPlus/local* (the opposite of the previous option)
- *RadiusDownLocal* (local authentication is tried only when the Radius server is down)
- *TacacsPlusDownLocal* (local authentication is tried only when the TacacsPlus server is down)

An example value would be:

```
radius
```

Chapter 2 - Installation, Configuration, Usage

- all.protocol* For the console server configuration, the possible protocols are:
- *socket_server* (when telnet is used)
 - *socket_ssh* (when ssh version one or two is used)
 - *raw_data* (to exchange data in transparent mode – similar to *socket_server* mode, but without telnet negotiation, breaks to serial ports, etc.)

An example value would be:

```
socket_server
```

The Authentication feature

See [Authentication](#) in [Chapter 3 - Additional Features](#).

Task 5: Activate the changes

Execute the following command in HyperTerminal to activate the changes:

```
signal_ras hup
```

Task 6: Test the configuration

Now you will want to make sure that the ports have been set up properly.

Step 1: Ping the TS from a DOS prompt.

Open a DOS window, type in the following, and then press Enter:

```
ping <IP assigned to the TS by DHCP or you>
```

An example would be:

```
ping 192.168.160.10
```

If you receive a reply, your TS connection is OK. If there is no reply see [Appendix E - Software Upgrades and Troubleshooting](#).

Step 2: Telnet to the server connected to the first port of the Cyclades-TS.

*(This will only work if you selected *socket_server* as your *all.protocol* parameter.)*

While still in the DOS window, type the following and then press Enter:

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```
telnet <IP assigned to the TS by DHCP or you> 7001
```

An example would be:

```
telnet 192.168.160.10 7001
```

If everything is configured correctly, a telnet session should open on the server connected to port 1. If not, check the configuration, follow the above steps again, and check [Appendix E - Software Upgrades and Troubleshooting](#).

Task 7: Save the changes

Execute the following command in HyperTerminal to save the configuration:

```
saveconf
```

Task 8: Reboot the Cyclades-TS

After rebooting, the initial configuration is complete.



Note: saveconf is equivalent to `tar -czf /proc/flash/script -T /etc/config_files` in standard Linux (saveconf must be used because tar on the TS does not support the z flag).



Note: restoreconf does the opposite of saveconf, copying the contents of the `/proc/flash/script` file to the corresponding files in the ramdisk. The files on the ramdisk are overwritten. Restoreconf is run automatically each time the Cyclades-TS is booted.

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Special Configuration for the Cyclades-TS110/100

TS110/100-specific background information

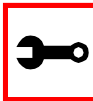
Since there are two configurable physical interfaces available in the TS110/100 (RS-232 and RS-485), these models require the configuration of the parameter described below.

all.media or*
s1.media

(*see note box
below)

For the TS110/100 only.

- rs232 (RS-232 interface and DB-9 connector),
- rs485_half_terminator (RS-485 interface, half duplex communication with two wires, DB-9 or Terminal Block. The TS110/100 terminates the network),
- rs422 (RS-485 interface, full duplex communication with four wires, DB-9 or Terminal Block. The TS110/100 terminates the network), or
- rs485_half (RS485 interface, half duplex communication with two wires, DB-9 or Terminal Block. The TS110/100 is in the middle of the network.)



Note: Note: all.* parameters are used to set default parameters for all ports and s#.* parameters change the default parameters for individual ports. As the TS110/100 has only one port, either s1* or all.* can be used interchangeably.

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DANGER! When reconfiguring the media from RS232 to RS485 (or RS485 to RS232), it is extremely important to remove the serial cable (DB9 connector) before issuing `signal_ras hup` or `signal_ras start` (to make valid the new configuration). Using wrong cable for that newly configured media may burn the serial interface.

When using Web or telnet/ssh session to reconfigure the media, follow these steps:

- 1) Remove the serial cable before the reconfiguration
- 2) Start the reconfiguration process
- 3) Save and submit the changes (e.g. `signal_ras hup`)
- 4) Insert the new serial cable compatible with the new media

When using console for the configuration, follow these steps:

- 1) Edit the proper configuration file
- 2) Quit editor, saving the changes
- 3) Run `saveconf`
- 4) Remove the serial cable
- 5) Power the unit off
- 6) Insert the new serial cable compatible with the new media
- 7) Power the unit back on

Configuring the Cyclades-TS110/100 for the first time

The Cyclades-TS110/100 does not have a dedicated console port. Therefore, after configuring the serial port, perform the following steps:

Chapter 2 - Installation, Configuration, Usage

Step 1: Edit the file /etc/inittab.

Comment the line that designates the console port (add a “#” to it):

```
# ttyS0::respawn:/sbin/getty -p ttyS0 ansi
```

Uncommenting the line starts the program `cy_buffering` (remove the '#' from the beginning):

```
::once:/sbin/cy_buffering
```

Step 2: Run saveconf.

The command `saveconf`, which reads the `/etc/config_files` file, should be run. The command `saveconf` copies all the files listed in the file `/etc/config_files` from the ramdisk to `/proc/flash/script`. The previous contents of the file `/proc/flash/script` will be lost.

Step 3: Reboot.

After rebooting the TS110/100, the initial configuration is complete.

Accessing the Serial Ports

There are four ways to access the serial ports, depending on the protocol you configured for that serial port (all.protocol being `socket_server` for telnet access, `socket_ssh` for ssh access, etc). For details on configuration to access using telnet or ssh please see Access Method, Configuration for CAS in Chapter 3.

Opening and closing a telnet session to a serial port

To open a telnet session to a serial port, issue the command:

```
telnet <CAS hostname> <TCP port number>
```

<CAS hostname> is the hostname configured in the workstation where the telnet client will run (through `/etc/hosts` or DNS table). It can also be just the IP address of the Cyclades-TS (Ethernet's interface) configured by the user or learned from DHCP.

Note: `saveconf` is equivalent to `tar -czf /proc/flash/script -T /etc/config_files` in standard Linux (`saveconf` must be used because `tar` on the Cyclades-TS does not support the `z` flag).

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Note: `restoreconf` does the opposite of `saveconf`, copying the contents of the `/proc/flash/` script file to the corresponding files in the ramdisk. The files on the ramdisk are overwritten. `Restoreconf` is run automatically each time the Cyclades-TS is booted.
<TCP port number> is the number associated to the serial port. From factory, 7001 corresponds to serial port 1, 7002 to serial port 2 and so forth.

To close the telnet session, just press the telnet hot key configured in telnet client application (usually it's "Ctrl J") and "q" to quit.

Opening and closing an SSH session to a serial port

To open a ssh session to a serial port, issue the command:

```
ssh -l <Username>:<Server> <CAS hostname>
```

<Username> is the user configured to access that serial port. It is present either in the local CAS database or in a Radius/Tacacs/LDAP/Kerberos, etc database.

<Server> can be just the TCP port number assigned for that serial port (7001, 7002, etc) or the alias for the server connected to that serial port.

<CAS hostname> is the hostname configured in the workstation where the ssh client will run (through `/etc/hosts` or DNS table). It can also be just the IP address of the Cyclades-TS (Ethernet's interface) configured by the user or learned from DHCP.

To exit the ssh session, press the hot key configured for that ssh client (usually ".~").

Accessing Serial Ports using "ts_menu"

To access the serial port (telnet or ssh) using `ts_menu`, login to the CAS unit and, after receiving the shell prompt, run `ts_menu`. The servers (aliases) or serial ports will be shown as option to start a connection (telnet/ssh). After typing `ts_menu`, you will see something similar to the following:

```
Serial Console Server Connection Menu for your Master Terminal
Server
```

```
1 ttyS1 2 ttyS2 3 ttyS3 4 ttyS4
5 ttyS5 6 ttyS6 7 ttyS7 8 ttyS8
```

Type 'q' to quit, a valid option[1-8], or anything else to refresh:

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How to close the session from `ts_menu` (from the console of your unit)

Step 1: Enter the escape character.

The escape character is shown when you first connect to the port.
In character/text Mode, the Escape character is `^]`

After entering the escape character, the following is shown:

```
Console escape. Commands are:
```

```
l go to line mode
c go to character mode
z suspend telnet
b send break
t toggle binary
e exit telnet
```

Step 2: Press “e” to exit from the session and return to the original menu.

Select the exit option and you will return to the shell prompt.

How to close the session from `ts_menu` (from a telnet session to your unit)

You have to be sure that a different escape character is used for exiting your telnet session; otherwise, if you were to exit from the session created through the `ts_menu`, you will close your entire telnet session to your unit. To do this, when you first telnet to your unit, use the “e” option. So for example, to set `Ctrl-?` as the escape character, type:

```
telnet -e ^? 192.168.160.10
```

To exit from the session created through the `ts_menu`, just follow Step 1 from above. To exit from the entire telnet session to your unit, type the escape character you had set.

Accessing Serial Ports using the Web Interface

From the Web, there's a “Connect to Serial Port” option that has to be selected. A serial port is chosen and a Java window will open on the user's screen. For a telnet session, just log in and provide the password (whenever necessary). For ssh, enter

```
<username>:<TCP port number or alias for the server>
```

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as login name and provide the password (whenever necessary). To exit the session, select “Disconnect” from the Java window. See the [Step-by-Step Process](#) section of [Appendix H - Connect to Serial Ports from Web](#) for more details.

Chapter 3 - Additional Features

Introduction

After the Configuration Wizard section in this chapter, each of the following sections is listed alphabetically and shows how to configure the option using vi, the custom Wizard (when available), browser, where appropriate, and the Command Line Interface (CLI), when available. This chapter contains the following sections:

- [Configuration Wizard - Basic Wizard](#)
- [Access Method](#)
- [Authentication](#)
- [CAS Port Pool](#)
- [Clustering](#)
- [CronD](#)
- [Data Buffering](#)
- [DHCP](#)
- [Filters](#)
- [Generating Alarms](#)
- [Help](#)
- [Modbus](#)
- [NTP](#)
- [Ports Configured as Terminal Servers](#)
- [Serial Settings](#)
- [Session Sniffing](#)
- [SNMP](#)
- [Syslog](#)
- [TCP Keepalive](#)

Chapter 3 - Additional Features

- [Terminal Appearance](#)
- [Time Zone](#)
- [TS110-only Analog and Digital Ports](#)

Configuration Wizard - Basic Wizard

The configuration wizard application is a quicker and easier way to configure the Cyclades-TS. It is recommended that you use this application if you are not familiar with the vi editor or if you just want to do a quick installation of the TS.

The command *wiz* gets you started with some basic configuration. After executing this command, you can continue the configuration of the TS using any browser or by editing system files with the vi editor. What follows are the basic parameters to get you quickly started. The files that will be eventually modified if you decide to save to flash at the end of this application are:

1. /etc/hostname
2. /etc/hosts
3. /etc/resolv.conf
4. /etc/network/st_routes
5. /etc/network/ifcfg_eth0
6. /etc/portslave/pslave.conf

Step 1: Enter the command *wiz*.

At the command prompt type “wiz” in your terminal to bring up the wizard. You will receive an initial instruction screen.

Chapter 3 - Additional Features

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or
- 3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

Press ENTER to continue...

Step 2: Press Enter to continue with the wizard.

You will see the current configurations and have the choice of setting them to default values, or not.

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

```
Hostname: CAS  
DHCP: enabled  
Domain name: #  
Primary DNS Server: #  
Gateway IP: eth0
```

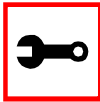
Set to defaults? (y/n) [n] :

Chapter 3 - Additional Features

Step 3: Press Enter or type *n* or *y*.

The default answer or value to any question is in the brackets. You can take one of three actions:

- Either just press the ENTER key to execute whatever is in between the brackets, or
- Type *n* to NOT reset the current configurations to the Cyclades defaults, or
- Type *y* to reset to Cyclades default configurations.



Tip. On most of the following configuration screens, the default or current value of the parameter is displayed inside brackets. Just press the ENTER key if you are satisfied with the value in the brackets. If not, enter the appropriate parameter and press ENTER.

If at any time after choosing whether to set your configurations to default or not, you want to exit the wizard or skip the rest of the configurations, press ESC. This will immediately display a summary of the current configurations for your verification before exiting the application. This will not work if you did not enter a valid choice for the parameter you are currently on.

For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

Step 4: Enter Hostname and then press the Enter key.

This is an alias for your TS that allows you to refer to the TS by this name rather than its IP address. Enter hostname after the prompt:

```
Hostname[ CAS ] :
```

Step 5: Type *y*, *n*, or press Enter to enable or disable DHCP client.

Type *y* or press Enter if there is a DHCP Server in your LAN, to have the Dynamic Host Configuration Protocol (DHCP) automatically assign an IP address for your TS. Type *n* to manually assign an IP address.

```
Do you want to use dhcp to automatically assign an IP for  
your system (y/n) [y]:
```


Chapter 3 - Additional Features



Note: Typing *y* omits Steps 6 and Step 10.

Step 6: If DHCP client is disabled, enter IP Address of your TS and then press the Enter key. If the DHCP client is enabled, skip this step. This question will only appear if DHCP client is disabled. This is the IP address of the TS within your network. See your network administrator to obtain a valid IP address for the TS.

```
IP of your system[]: 192.168.160.10
```

Step 7: Enter Domain name and then press Enter.

Domain name locates or identifies your organization within the Internet.

```
Domain name[#]: cyclades.com
```

Step 8: Enter IP address of Domain Name Server and press Enter.

At the prompt, enter the IP address of the server that resolves domain names. Your domain name is alphabetical so that it is easier to remember. Every time you see the domain name, it is actually being translated into an IP address by the domain name server. See your network administrator to obtain this IP address for the domain name server.

```
Domain Name Server[#]: 192.168.160.200
```

Step 9: Enter Gateway IP address and press Enter.

The Gateway is a node on a network that serves as an entrance point into another network. See your network administrator to find out your organization's gateway address.

```
Gateway IP[eth0]: 192.168.160.1
```

Step 10: If DHCP client is disabled, enter Netmask and press Enter.

If the DHCP client is enabled, skip this step. This question will appear only if DHCP client is disabled. The Netmask is a string of 0s and 1s that mask or screen out the host part of an IP address so that only the network part of the address remains.

```
Netmask[#]: 255.255.255.0
```

Chapter 3 - Additional Features

Step 11: Review configuration parameters.

You will now have the parameters you just configured displayed back to you. If you entered *y* in Step 5:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

```
Hostname: CAS  
DHCP: enabled  
Domain name: cyclades.com  
Primary DNS Server: 197.168.160.200  
Gateway IP: 192.168.160.1
```

Are all these parameters correct (Y)es or (N)o [N]:

If you entered *n* in Step 5:

Current configuration:

```
Hostname: CAS  
DHCP: disabled  
System IP: 192.168.160.10  
Domain name: cyclades.com  
Primary DNS Server: 192.168.160.200  
Gateway IP: 192.168.160.1  
Network Mask: 255.255.255.0
```

Are all these parameters correct (y/n) [y]:

Step 12: Type *y*, or *n*, or press Enter.

Type *y* if all parameters are correct. Type *n* or just press ENTER if not all the parameters are correct and you want to go back and redo them.

Step 13: If you typed *n* in Step 11, type *c* or *q*.

As directed by the prompt, type *c* to go back to very beginning of this application to change the parameters. Type *q* to exit.

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Step 14: If you typed *y* in Step 11, choose whether to activate your configurations.

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

You can now use the browser to finish your system configurations, but before that, please read below.

(Note: If you are NOT connected to this unit through a console, and you have just reconfigured the IP of this unit, activating the new configurations may cause you to lose connection. In that case, please reconnect to the unit by the new IP address, and manually issue a `saveconf` to save your configurations to flash.)

```
Do you want to activate your configurations now? (y/n) [y] :
```

Step 15: Choose whether to save to flash.

Flash is a type of memory that will maintain the information saved on it even after the Cyclades-TS is turned off. Once it is turned on again, the saved information can be recovered. If *y* is entered, the screen will display an explanation of what saving to flash means:

Flash refers to a type of memory that can be erased and reprogrammed in units of memory known as blocks rather than one byte at a time, thus making updating to memory easier.

If you choose to save to flash, your configurations thus far will still be in the memory of the TS even after you reboot it. If you don't save to flash and if you were to reboot the system, all your new configurations will be lost and you will have to reconfigure the Secure TS.

```
Do you want to save your configurations to flash? (y/n) [n]:
```

Step 16: Type '*y*' if you want to save to flash. Type '*n*' if you don't want to save to flash.

You can now continue TS configurations using the Web browser by typing in the IP address of the TS.

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Using the Wizard through your Browser

The Web interface supports wizards for serial ports configuration. The wizard is a useful tool that simplifies configuration of serial ports. The Web interface will access the following wizard files:

- /etc/portslave/pslave.wiz.cas (CAS)
- /etc/portslave/pslave.wiz.ts (TS)
- /etc/portslave/pslave.wiz.ras (Dial-in Access)
- /etc/portslave/pslave.wiz.auto (Automation)

The step-by-step process to configuring ports for a specific profile appear in the following sections, and the exact screen flow begins with [Figure 17: Configuration and Administration page](#).

To summarize the process, the wizard configuration is started by first selecting the desired port(s) on the Port Selection page ([Figure 18: Port Selection page](#)), clicking Submit, and then selecting either the CAS, TS, or RAS profile buttons on the subsequent Serial Port Configuration Page ([Figure 19: Serial Port Configuration page](#)). Change the appropriate parameters, and then click the Submit button on the Serial Port Configuration Page. For most applications, the parameters to be changed are:

For CAS:

- Port Speed
- First RADIUS/TacacsPlus Authentication Server
- First Accounting Server
- RADIUS/TacacsPlus secret
- Protocol (if the protocol is Socket SSH, Socket Telnet, or Socket Raw)
- Socket Port (keep the “Incremented” option on)

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For TS:

- Port Speed
- First RADIUS/TacacsPlus Authentication Server
- First Accounting Server
- RADIUS/TacacsPlus secret
- Protocol (if the protocol is Login, Rlogin, SSH, or Socket Client)
- Socket Port (write the TCP port for the protocol selected; keep the “incremented” option off)

For Dial-in access:

- First RADIUS/TacacsPlus Authentication Server
- First Accounting Server
- RADIUS/TacacsPlus secret
- Remote IP Address (keep the “Incremented” option on)

Access Method

Access method is how a user accesses a server connected to one of the serial ports on the Cyclades-TS (CAS profile) or how a user connected to one of the serial ports accesses a server in the network (TS profile or Dial-In profile).

Configuration for CAS

Parameters Involved and Passed Values

The parameters involved in configuring Access Method for CAS are as follows:

Chapter 3 - Additional Features

- all.ipno* This is the default IP address of the Cyclades-TS's serial ports. Any host can access a port using its IP address as long as a path to the address exists in the host's routing table. An example value would be 192.168.1.101+. The "+" indicates that the first port should be addressed as 192.168.1.101 and the following ports should have consecutive values.
- all.socket_port* In the CAS profile, this defines an alternative labeling system for the Cyclades-TS ports. An example value would be 7001+. The "+" after the numerical value causes the serial interfaces to be numbered consecutively. In this example, serial interface 1 is assigned the port value 7001, serial interface 2 is assigned the port value 7002, etc. One example on how this could be used is in the case of all.protocol or s<n>.protocol socket_ssh and the port value (7001, 7002, etc), if supplied by the ssh client like username:port value, the ssh client will be directly connected with the serial interface.
- all.protocol* The possible protocols are telnet, ssh1/ssh2 or raw data:
socket_server = telnet protocol,
socket_ssh = ssh1/ssh2 protocol,
raw_data = used to exchange data in transparent mode. Raw_data is similar to socket_server mode but without telnet negotiation breaks to serial ports.
An example value would be socket_server.
- all.users* Restricts access to ports by user name (only the users listed can access the port or, using the character "!", all but the users listed can access the port.) A single comma and spaces/tabs may be used between names. A comma may not appear between the "!" and the first user name. The users may be local, Radius or TacacsPlus. User groups (defined with the parameter conf.group) can be used in combination with user names in the parameter list. Notice that these are common users, not administrators. Example: all.users !joe, mark, user_group. In this example, the users joe, mark, and members of user_group cannot access the port.

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- all.poll_interval* Valid only for protocols `socket_server` and `raw_data`. When not set to zero, this parameter sets the wait for a TCP connection keep-alive timer. If no traffic passes through the Cyclades-TS for this period of time, the Cyclades-TS will send a line status message to the remote device to see if the connection is still up. If not configured, 1000 ms is assumed (the unit for this parameter is ms). If set to zero, line status messages will not be sent to the socket client.
- all.tx_interval* Valid for protocols `socket_server` and `raw_data`. Defines the delay (in milliseconds) before transmission to the Ethernet of data received through a serial port. If not configured, 100ms is assumed. If set to zero or a value above 1000, no buffering will take place.
- all.idletimeout* *Valid only for the CAS configuration* (protocols `socket_server`, `socket_ssh`, `raw_data`) and `modbus`. Specifies how long (in minutes) a connection can remain inactive before it is cut off. If set to zero (the default), the connection will not time out.
- conf.group* Used to group users to simplify configuration of the parameter `all.users` later on. This parameter can be used to define more than one group. The format is:
<group name>:<user1>{,<user2>[,<user3>]}
Example: `conf.group group_name: user1, user2`.
- s<n>.serverfarm* Alias name given to the server connected to the serial port. `Server_connected`.
Example: `s1.serverfarm Server_connected_serial1`.

vi Method

The parameters described above must be changed by directly editing the `/etc/portslave/plsave.conf` file.

Browser Method

To configure Access Method with your browser:

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server's IP address. For example:

```
http://10.0.0.0
```

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Step 2: Log in as root and type the Web root password configured by the Web server.
This will take you to the Configuration and Administration page.

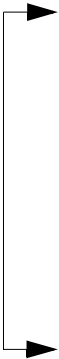


Figure 17: Configuration and Administration page

Step 3: Select the Serial Ports link.

Click on the Serial Ports link on the Link Panel to the left of the page or in the Configuration section of the page. This will take you to the Port Selection page.

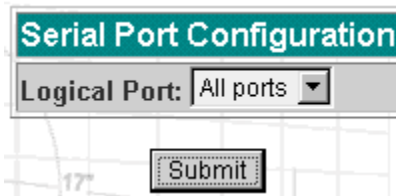


Figure 18: Port Selection page

Step 4: Select port(s).

On the Port Selection page, choose all ports or an individual port from the dropdown menu. This will take you to the Serial Port Configuration page.

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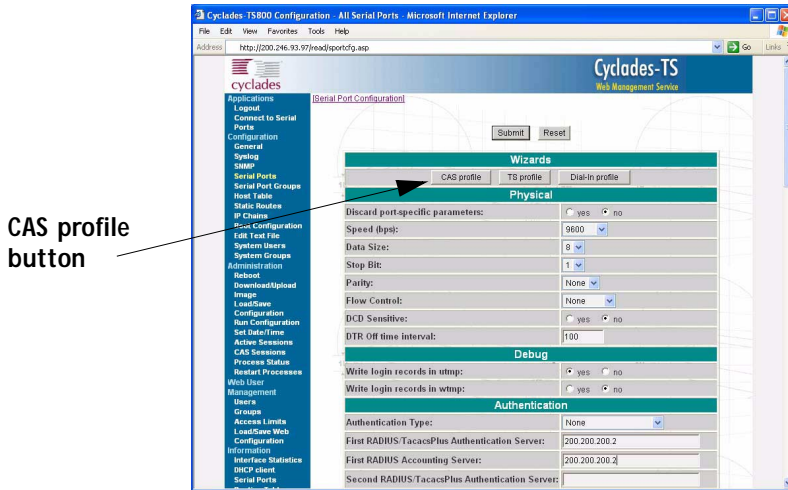


Figure 19: Serial Port Configuration page

Step 5: Click the CAS profile button.

Click the CAS profile button in the wizards section. The default CAS profile parameters are now loaded.

Step 6: Scroll down to the Profile section.

You can change the settings for *all.ipno*, *all.socket_port*, and *all.protocol* in this section.

Profile	
Protocol:	Socket Server <input type="checkbox"/> incremented
Remote IP Address:	192.168.1.101 <input type="checkbox"/> incremented
Socket Port:	7001 <input type="checkbox"/> incremented

Figure 20: Profile Section of Serial Port Configuration page

Step 7: Scroll to the Authentication Section.

You can configure the parameter *all.users* here under Access Restriction on Users.

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Step 8: Scroll to Console Access Server Section.

You can configure the following parameters here:

- all.sttyCmd
- all.poll_interval
- all.tx_interval
- all.idletimeout

Step 9: Configure s<n>.serverfarm.

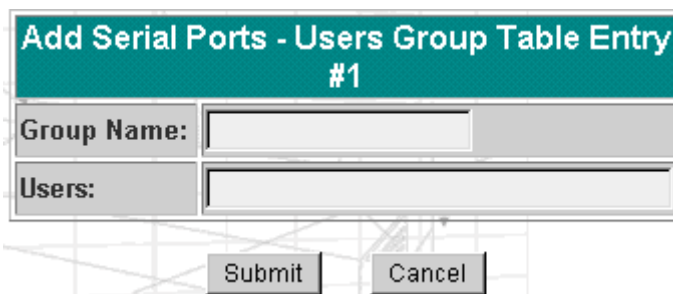
This parameter will not appear on the configuration page when “All ports” is selected. Scroll to the SSH section. Each port can be named after the server or device connected to it. This makes the process of associating what is connecting to which port easier.

Step 10: Click the Submit button.

This will take you back to the Port Selection page. At this point, the configuration file is written in the RAMdisk.

Step 11: Click on the Serial Port Groups link on the Link Panel.

Click the Add Group button that appears. A Serial Ports - Users Group Table Entry page appears.



Add Serial Ports - Users Group Table Entry #1	
Group Name:	<input type="text"/>
Users:	<input type="text"/>
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

Figure 21: Serial Ports - Users Group Table Entry page

Step 12: Configure conf.group.

Fill in the Group Name and Users fields to configure the group.

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Step 13: Click the Submit button.

At this point, the configuration file is written in the RAMdisk.

Step 14: Make the changes effective.

Click on the Administration > Run Configuration link, check the Serial Ports/Ethernet/Static Routes box and click on the Activate Configuration button.

Step 15: Save it in the flash.

Go to the link Administration > Load/Save Configuration and click the Save to Flash button.

Wizard Method

Step 1: Bring up the wizard.

At the command prompt, type the following to bring up the Access Method custom wizard:

```
wiz --ac cas
```

This will bring up Screen 1:

Screen 1:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER. Enter '#' if you want to deactivate that parameter or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or
- 3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within

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the brackets, it will continue to ask for a value.
In that case, you must enter a valid value or # if you
do not wish to configure the value.

Press ENTER to continue...

Screen 2:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

Current configuration:
(The ones with the '#' means it's not activated.)

```
all.ipno : #  
all.socket_port : 7001+  
all.protocol : socket_server  
all.users : #  
all.poll_interval : #  
all.tx_interval : #  
all.idletimeout : #  
conf.group : #
```

Set to defaults? (y/n) [n] :

Screen 3:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

ALL.IPNO - This is the default IP address of the system's
serial ports. If configured as 192.168.1.101+, the '+'
indicates that the first port should be addressed as
192.168.1.101 and the following ports should have
consecutive values. Any host can access a port using
its IP address as long as a path to the address exists

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in the host's routing table.

all.ipno[#] :

ALL.SOCKET_PORT - This defines an alternative labeling system for the system ports. The '+' after the numerical value causes the interfaces (or ports) to be numbered consecutively.

(e.g. interface 1 of your system is assigned port 7001, interface 2 has the value 7002, etc.)

all.socket_port[7001+] :

Screen 4:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
```

ALL.PROTOCOL - The possible protocols are telnet, ssh1/ssh2, raw data, or modbus.

(e.g. socket_server -telnet protocol, socket_ssh -ssh1/ssh2 protocol, raw_data -used to exchange data in transparent mode; similar to socket_server mode but without telnet negotiation breaks to serial ports modbus -an application layer messaging protocol for client/server communication widely used for industrial automation, etc.)

all.protocol[socket_server] :

ALL.MOVBUS_SMODE - Communication mode through the serial ports. This parameter is valid only if the protocol configured is modbus. If it is and this parameter is not configured, ASCII mode will be assumed.

(e.g. ascii -normal TX/RX mode, rtu -Remote Transmission mode where some time constraints are observed between characters while transmitting a frame)

all.modbus_smode[#] :

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ALL.USERS - Restricts access to ports by user name. Only the users listed can access the port, or using a '!', all but the users listed can access the port. A single comma and spaces/tabs may be used between names. A comma may NOT appear between the '!' and the first user name. The users may be local, Radius or TacacsPlus. User groups (defined with the parameter conf.group) can be used in combination with user names in the parameter list. Notice that these are common users, not administrators. (e.g. !joe, mark, grp1 -the users, Joe, Mark, and members of grp1, cannot access the port.)

```
all.users[#] :
```

Screen 5:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.POLL_INTERVAL - Valid for protocols socket_server and raw_data. When not set to 0, this parameter sets the wait for a TCP connection keep-alive timer. If no traffic passes through the system for this period of time, the system will send a line status message to the remote device to see if the connection is still up. If not configured, default is 1000ms. If set to 0, line status messages will not be sent to the socket client.

```
all.poll_interval[#] :
```

ALL.TX_INTERVAL - Valid for protocols socket_server and raw_data. This parameter defines the delay (in milliseconds) before transmission to the Ethernet of data received through a serial port. If not configured, 100ms is assumed. If set to 0 or a value above 1000, no buffering will take place.

```
all.tx_interval[#] :
```

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Screen 6:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.IDLETIMEOUT - This parameter specifies how long (in minutes) a connection can remain inactive before it is cut off. If set to 0 (the default), the connection will not time out.

```
all.idletimeout[#] :
```

CONF.GROUP - Used to combine users into a group. This simplifies the parameter, all.users. You can define more than one group. (e.g. groupName: user1, user2)

```
conf.group[#] :sales: john, jane
```

Would you like to create another group? (y/n) [n] :

Screen 7:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:
(The ones with the '#' means it's not activated.)

```
all.ipno : #  
all.socket_port : 7001+  
all.protocol : socket_server  
all.modbus_smode : #  
all.users : #  
all.poll_interval : #  
all.tx_interval : #  
all.idletimeout : #  
conf.group : #
```

Are these configuration(s) all correct? (y/n) [n]:

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If you type 'n':

Type 'c' to go back and CORRECT these parameters or 'q' to QUIT :

Typing 'c' repeats the application, typing 'q' exits the entire wiz application.

If you type 'y':

Discard previous port-specific parameters? (y/n) [n] :



Note: Answering yes to this question will discard only the parameter(s) which you are currently configuring if they were configured for a specific port in a previous session. For instance, if you are currently configuring parameter, all.x, and there was a specific port, s2.x, configured; then, answering yes to this question will discard s2.x.

Type 'c' to CONTINUE to set these parameters for specific ports or 'q' to QUIT :

Typing 'c' leads to Screen 8, typing 'q' leads to Screen 9.

Screen 8:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

You have 8 available ports on this system.

Type 'q' to quit, a valid port number[1-8], or anything else to refresh :

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Note: The number of available ports depends on the system you are on. Typing in a valid port number repeats this program except this time it's configuring for the port number you have chosen. For “wiz -ac cas,” an additional parameter is asked: serverfarm. Typing 'q' leads to Screen 9.

Screen 9:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

(Note: If you are NOT connected to this unit through a console, and you have just reconfigured the IP of this unit, activating the new configurations may cause you to lose connection. In that case, please reconnect to the unit by the new IP address, and manually issue a saveconf to save your configurations to flash.)

Do you want to activate your configurations now? (y/n) [y] :

Screen 10:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Flash refers to a type of memory that can be erased and reprogrammed in units of memory known as blocks rather than one byte at a time; thus, making updating to memory easier.

If you choose to save to flash, your configurations thus far will still be in the memory of the system even after you reboot it. If you don't save to flash and if you were to reboot the system, all your new configurations will be lost

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and you will have to reconfigure the system.

```
Do you want to save your configurations to flash? (y/n) [n] :
```

CLI Method

To configure certain parameters for a specific serial port:

Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be ttyS<serial port number> :

```
config configure line <serial port number> tty <string>
```

To configure the ipno:

```
config configure line <serial port number> ipno <string>
```

To configure the socket_port:

```
config configure line <serial port number> socket <number>
```

To configure the protocol. <string> is the type of protocol desired:

```
config configure line <serial port number> protocol <string>
```

To configure modbus_smode:

```
config configure line <serial port number> modbus <string>
```

To configure users:

```
config configure line <serial port number> users <string>
```

To configure the poll_interval:

```
config configure line <serial port number> pollinterval  
<number>
```

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To configure `tx_interval`:

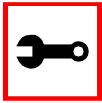
```
config configure line <serial port number> txinterval <number>
```

To configure `idletimeout`:

```
config configure line <serial port number> idletimeout <number>
```

To configure `conf.group`:

```
config configure conf group <string>
```



Tip. You can configure all the parameters for a serial port in one line.

```
config configure line <serial port number> tty <string>  
ipno <string> socket <number> protocol <string>  
modbus <string> users <string> pollinterval <number>  
txinterval <number> idletimeout <number>
```

Step 2: Activate and Save.

To activate your new configurations and save them to flash, type:

```
config write
```

(This is essentially typing *signal_ras hup* and *saveconf* from the normal terminal prompt.)

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Configuration for TS

Parameters and Passed Values

For TS configuration, you will need to configure the following parameters:

<i>all.host</i>	The IP address of the host to which the terminals will connect.
<i>all.protocol</i>	For the terminal server configuration, the possible protocols are login (which requests username and password), rlogin (receives username from the TS and requests a password), telnet, ssh, ssh2, or socket_client. If the protocol is configured as telnet or socket_client, the parameter socket_port needs to be configured.
<i>all.socket_port</i>	This parameter is valid only if all.protocol is configured as socket_client or telnet. The socket_port is the TCP port number of the application that will accept connections requested by this serial port.
<i>all.telnet_client_mode</i>	When the protocol is TELNET, this parameter configured as BINARY (1) causes an attempt to negotiate the TELNET BINARY option on both input and output with the Telnet server. So it puts the telnet client in binary mode. The acceptable values are "0" or "1", where "0" is text mode (default) and "1" is a binary mode.
<i>all.userauto</i> (<i>unique to TS</i>)	Username used when connected to a UNIX server from the user's serial terminal.

vi Method

The parameters described above must be changed by directly editing the /etc/portslave/pslave.conf file.

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Browser Method

Step 1: Follow the steps 1 to 4 in the section titled Configuration for CAS, [“Browser Method” on page 87](#).

Step 2: Click the TS Profile button in the Wizard section.
Configure the following parameters:

<i>Profile section:</i>	Protocol (telnet, ssh, rlogin or socket client) Socket port (23 for telnet, 22 for ssh, 513 for rlogin)
<i>Terminal Server section:</i>	Host (the name or the IP address of the host) Automatic User

Step 3: Click the Submit button.
At this point, the configuration file is written in the RAMdisk.

Step 4: Make changes effective.
Click on the Administration > Run Configuration link, check the Serial Ports/
Ethernet/Static Routes box and click on the Activate Configuration button.

Step 5: Save it in the flash.
Go to the link Administration > Load/Save Configuration and click the Save to Flash
button.

Wizard Method

Step 1: Bring up the wizard.
At the command prompt, type the following to bring up the Access Method custom
wizard:

```
wiz --ac ts
```

This will bring up Screen 1:

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Screen 1:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER. Enter '#' if you want to deactivate that parameter or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or
- 3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

Press ENTER to continue...

Screen 2:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.protocol : rlogin  
all.socket_port : 23  
all.telnet_client_mode : 0  
all.userauto : #
```

Set to defaults? (y/n) [n] :

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Screen 3:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

ALL.PROTOCOL - Users can access the servers through the serial port using ssh, ssh2, telnet, login, rlogin, or socket_client.
(e.g. login -requests username and password, rlogin - receives username from the system and requests a password, etc.)

```
all.protocol[rlogin] :
```

ALL.SOCKET_PORT - This defines the port(s) to be used by the protocols telnet and socket_client. For these two protocols a default value of 23 is used when no value is configured.

```
all.socket_port[23] :
```

Screen 4:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

ALL.TELNET_CLIENT_MODE - This parameter only applies if the current protocol configured is telnet. Configuring as binary (1) causes an attempt to negotiate the TELNET BINARY option on both input and output with the Telnet server. Thus, it puts the telnet client in binary mode. The default is 0 which represents text mode.

```
all.telnet_client_mode[0] :
```

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ALL.USERAUTO - Username used when connected to a Unix server from the user's serial terminal.

all.userauto[#] :



Note: all.host is configured under the wiz - - tso.

Screen 5:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.protocol : rlogin  
all.socket_port : 23  
all.telnet_client_mode : 0  
all.userauto : #
```

Are these configuration(s) all correct? (y/n) [n]:

If you type 'n'

Type 'c' to go back and CORRECT these parameters or 'q' to QUIT :

Typing 'c' repeats the application, typing 'q' exits the entire wiz application

If you type 'y'

Discard previous port-specific parameters? (y/n) [n] :

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Note: Answering yes to this question will discard only the parameter(s) which you are currently configuring if they were configured for a specific port in a previous session. For instance, if you are currently configuring parameter, `all.x`, and there was a specific port, `s2.x`, configured; then, answering yes to this question will discard `s2.x`.

Type 'c' to CONTINUE to set these parameters for specific ports or 'q' to QUIT :

Typing 'c' leads to Screen 6, typing 'q' leads to Screen 7.

Screen 6:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

You have 8 available ports on this system.

Type 'q' to quit, a valid port number[1-8], or anything else to refresh :



Note: The number of available ports depends on the system you are on. Typing in a valid port number repeats this program except this time it's configuring for the port number you have chosen. Typing 'q' leads to Screen 7.

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Screen 7:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

(Note: If you are NOT connected to this unit through a console, and you have just reconfigured the IP of this unit, activating the new configurations may cause you to lose connection. In that case, please reconnect to the unit by the new IP address, and manually issue a saveconf to save your configurations to flash.)

Do you want to activate your configurations now? (y/n) [y] :

Screen 8:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Flash refers to a type of memory that can be erased and reprogrammed in units of memory known as blocks rather than one byte at a time; thus, making updating to memory easier.

If you choose to save to flash, your configurations thus far will still be in the memory of the system even after you reboot it. If you don't save to flash and if you were to reboot the system, all your new configurations will be lost and you will have to reconfigure the system.

Do you want to save your configurations to flash? (y/n) [n] :

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CLI Method

To configure certain parameters for a specific serial port:

Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be ttyS<serial port number> :

```
config configure line <serial port number> tty <string>
```

To configure the protocol (<string> is the type of protocol desired):

```
config configure line <serial port number> protocol <string>
```

To configure the socket_port:

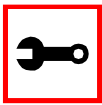
```
config configure line <serial port number> socket <number>
```

To configure the telnet_client_mode:

```
config configure line <serial port number> telnetclientmode  
<number>
```

To configure userauto:

```
config configure line <serial port number> userauto <string>
```



Tip. You can configure all the parameters for a serial port in one line.

```
config configure line <serial port number> tty <string>  
protocol <string> socket <number> telnetclientmode  
<number> userauto <string>
```

Step 2: Activate and Save.

To activate your new configurations and save them to flash, type:

```
config write
```

(This is essentially typing *signal_ras hup* and *saveconf* from the normal terminal prompt.)

Chapter 3 - Additional Features

Configuration for Dial-in Access

Parameters and Passed Values

The parameters that need to be configured are shown in the following list. *Note: The character “\” at the end of a line means that the string continues on the next line.*

- conf.pppd* Location of the ppp daemon with Radius. Default value:
 /usr/local/sbin/pppd.
- all.ipno* This is the default IP address of the Cyclades-TS's serial ports. Any host can access a port using its IP address as long as a path to the address exists in the host's routing table. An example value would be 192.168.1.101+. The “+” indicates that the first port should be addressed as 192.168.1.101 and the following ports should have consecutive values.
- all.initchat* Modem initialization string. Example value:
TIMEOUT 10 "" \d\ \dATZ \OK\r\n-ATZ-OK\r\n "" \ \ \ \ " ATMO OK\R\N "" \ \ \ \
TIMEOUT 3600 RING "" \ \ \ \
STATUS Incoming %p:I.HANDSHAKE "" ATA\
TIMEOUT 60 CONNECT@ "" \ \ \ \
STATUS Connected %p:I.HANDSHAKE
- all.autoppp* Options to auto-detect a ppp session. The cb-script parameter defines the file used for callback and enables negotiation with the callback server. Callback is available in combination with Radius Server authentication. When a registered user calls the Cyclades-TS, it will disconnect the user, then call the user back. The following three parameters must be configured in the Radius Server.
- attribute Service_type(6): Callback Framed;
 - attribute Framed_Protocol(7): PPP;
 - attribute Callback_Number(19): the dial number (example: 50903300).

Chapter 3 - Additional Features

Example value:

```
%j novj \  
proxyarp modem asyncmap 000A0000 \  
noipx noccp login auth require-pap refusechap\  
mtu %t mru %t \  
cb-script /etc/portslave/cb_script \  
plugin /usr/lib/libpsr.so
```

all.pppopt PPP options when user has already been authenticated.

Example value:

```
%i:%j novj \  
proxyarp modem asyncmap 000A0000 \  
noipx noccp mtu %t mru %t netmask%m \  
idle %I maxconnect %T \  
plugin /usr/lib/libpsr.so
```

all.protocol For the Dial-in configuration, the available protocols are PPP, SLIP and CSLIP.



Tip. Documentation about PPP options can be found on the Linux `pppd` man page.

vi Method

The parameters described above must be changed by directly editing the `/etc/portslave/pslave.conf` file.

Browser Method

For the serial ports you would have all the parameters described above but `conf.*`. To configure Access Method with your browser:

Step 1: Follow the steps 1 to 4 in the section titled Configuration for CAS, [“Browser Method” on page 87](#).

Step 2: Click the Dial in Profile button in the Wizard section.

Chapter 3 - Additional Features

Step 3: Scroll down to the Profile section.

You can change the settings for *all.ipno* and *all.protocol* in this section.

Step 4: Scroll to the modem Section.

You can configure the parameter *all.initchat* here.

Step 5: Scroll to the PPP Section.

You can configure the parameter *all.autoppp* and *all.pppopt* here.

Step 6: Click the Submit button.

At this point, the configuration file is written in the RAMdisk.

Step 7: Make the changes effective.

Click on the Administration > Run Configuration link, check the Serial Ports/Ethernet/Static Routes box and click on the Activate Configuration button.

Step 8: Save it in the flash.

Go to the link Administration > Load/Save Configuration and click the Save to Flash button.

Chapter 3 - Additional Features

CLI Method

To configure certain parameters for a specific serial port:

Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be `ttyS<serial port number>` :

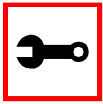
```
config configure line <serial port number> tty <string>
```

To configure the protocol. <string> is the type of protocol desired:

```
config configure line <serial port number> protocol <string>
```

To configure ipno:

```
config configure line <serial port number> ipno <string>
```



Tip. You can configure all the parameters for a serial port in one line.

```
config configure line <serial port number> tty <string>  
protocol <string> ipno <string>
```

Step 2: Activate and Save.

To activate your new configurations and save them to flash, type:

```
config write
```

(This is essentially typing *signal_ras hup* and *saveconf* from the normal terminal prompt.)

Chapter 3 - Additional Features

Authentication

Authentication is the process of identifying an individual, usually based on a username and password. In security systems, authentication is distinct from authorization, which is the process of giving individuals access to system objects based on their identity. Authentication merely ensures that the individual is who he or she claims to be, but says nothing about the access rights of the individual. With the Cyclades-TS, authentication can be performed locally, or with a remote Radius, Tacacs, or ldap database,.

Parameters Involved and Passed Values

The authentication feature utilizes the following parameters:

- all.authtype* Type of authentication used. There are several authentication type options:
- *none* (no authentication)
 - *local* (authentication is performed using the `/etc/passwd` file)
 - *remote* (This is for a terminal profile only. The unit takes in a username but does not use it for authentication. Instead it passes it to the remote server where it is then used for authentication.)
 - *radius* (authentication is performed using a Radius authentication server)
 - *TacacsPlus* (authentication is performed using a TacacsPlus authentication server)
 - *ldap* (authentication is performed against an ldap database using an ldap server. The IP address and other details of the ldap server are defined in the file `/etc/ldap.conf`)

Chapter 3 - Additional Features

- *local/radius* (authentication is performed locally first, switching to Radius if unsuccessful)
- *radius/local* (the opposite of the previous option)
- *local/TacacsPlus* (authentication is performed locally first, switching to TacacsPlus if unsuccessful)
- *TacacsPlus/local* (the opposite of the previous option)
- *RadiusDownLocal* (local authentication is tried only when the Radius server is down)
- *TacacsPlusDownLocal* (local authentication is tried only when the TacacsPlus server is down)

Note that this parameter controls the authentication required by the Cyclades-TS. The authentication required by the device to which the user is connecting is controlled separately.

all.authhost1
all.authhost2

This address indicates the location of the Radius/TacacsPlus authentication server and is only necessary if this option is chosen in the previous parameter. A second Radius/TacacsPlus authentication server can be configured with the parameter *all.authhost2*.

all.accthost1
all.accthost2

This address indicates the location of the Radius/TacacsPlus accounting server, which can be used to track how long users are connected after being authorized by the authentication server. Its use is optional. If this parameter is not used, accounting will not be performed. If the same server is used for authentication and accounting, both parameters must be filled with the same address. A second Radius/TacacsPlus accounting server can be configured with the parameter *all.accthost2*.

all.radtimeout

This is the timeout (in seconds) for a Radius authentication query to be answered.

all.radretries

Defines the number of times each Radius/ TacacsPlus server is tried before another is contacted. The first server (*authhost1*) is tried “*radretries*” times, and then the second (*authhost2*), if configured, is contacted “*radretries*” times. If the second also fails to respond, Radius/ TacacsPlus authentication fails.

Chapter 3 - Additional Features

all.secret This is the shared secret (password) necessary for communication between the Cyclades-TS and the Radius/TacacsPlus servers.

Configuration for CAS, TS, and Dial-in Access

vi Method

The parameters described above must be changed by directly editing the `/etc/portslave/pslave.conf` file.

Browser Method

To configure Authentication with your browser:

Step 1: Follow the steps 1 to 4 in the section titled Configuration for CAS, "[Browser Method](#)" on page 87.

Step 2: Scroll to the Authentication section.

Scroll down to the Authentication section and configure the parameters in this section.

Step 3: Click the Submit button.

At this point, the configuration file is written in the RAMdisk.

Step 4: Make changes effective.

Click on the Administration > Run Configuration link, check the Serial Ports/Ethernet/Static Routes box and click on the Activate Configuration button.

Step 5: Save it in the flash.

Go to the link Administration > Load/Save Configuration and click the Save to Flash button.

Wizard Method

Step 1: Bring up the wizard.

At the command prompt, type the following to bring up the Authentication custom wizard:

```
wiz --auth
```

Chapter 3 - Additional Features

Screen 1 will appear.

Screen 1:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER. Enter '#' if you want to deactivate that parameter or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or
- 3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

Press ENTER to continue...

Screen 2:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.authtype : none  
all.authhost1 : 192.168.160.3  
all.accthost1 : 192.168.160.3  
all.authhost2 : 192.168.160.4  
all.accthost2 : 192.168.160.4  
all.radtimeout : 3  
all.radretries : 5
```

Chapter 3 - Additional Features

```
all.secret : secret
```

```
Set to defaults? (y/n) [n] :
```

Screen 3:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.AUTHTYPE - This parameter controls the authentication required by the system. Users' access to the server through the serial port is granted through the check of username and password locally or remotely. (e.g. none, local, TacacsPlus (note the capital 'T' in TacacsPlus), radius, ldap, etc.

```
all.authtype[none] :
```



Note: If authtype is configured as *none*, *local*, or *ldap*, the application will skip immediately to the summary screen because the rest of the parameters pertain only if the system is configured to use a Radius or TacacsPlus server. Configurations for ldap are done in `/etc/ldap.conf`.

ALL.AUTHHOST1 - This IP address indicates where the Radius or TacacsPlus authentication server is located.

```
all.authhost1[200.200.200.2] :
```

Chapter 3 - Additional Features

Screen 4:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.ACCTHOST1 - This IP address indicates where the Radius or TacacsPlus accounting server is located. The accounting server can be used to track how long users are connected after being authorized by the authentication server.
all.accthost1[200.200.200.3] :

ALL.AUTHHOST2 - This IP address indicates where the SECOND Radius or TacacsPlus authentication server is located.

all.authhost2[200.200.200.2] :

Screen 5:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.ACCTHOST2 - This IP address indicates where the SECOND Radius or TacacsPlus accounting server is located.

all.accthost2[200.200.200.3] :

ALL.RADTIMEOUT- This is the timeout (in seconds) for a Radius or TacacsPlus authentication query to be answered.

all.radtimeout[3] :

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Screen 6:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.RADRETRIES - This defines the number of times each Radius or TacacsPlus server is tried before another is contacted.

```
all.radretries[5] :
```

ALL.SECRET - This is the shared secret necessary for communication between the system and the Radius or TacacsPlus servers.

```
all.secret[secret] :
```

Screen 7:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.authtype : none  
all.authhost1 : 200.200.200.2  
all.accthost1 : 200.200.200.3  
all.authhost2 : 200.200.200.2  
all.accthost2 : 200.200.200.3  
all.radtimeout : 3  
all.radretries : 5  
all.secret : rad-secret
```

```
Are these configuration(s) all correct? (y/n) [n] :
```

Chapter 3 - Additional Features

If you type 'n'

Type 'c' to go back and CORRECT these parameters or 'q' to QUIT :

Typing 'c' repeats application, typing 'q' exits the entire wiz application

If you type 'y'

Discard previous port-specific parameters? (y/n) [n] :



Note: Answering yes to this question will discard only the parameter(s) which you are currently configuring if they were configured for a specific port in a previous session. For instance, if you are currently configuring parameter, all.x, and there was a specific port, s2.x, configured; then, answering yes to this question will discard s2.x.

Type 'c' to CONTINUE to set these parameters for specific ports or 'q' to QUIT :

Typing 'c' leads to Screen 8, typing 'q' leads to Screen 9.

Screen 8:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****  
You have 8 available ports on this system.
```

Type 'q' to quit, a valid port number[1-8], or anything else to refresh :



Note: The number of available ports depends on the system you are on. Typing in a valid port number repeats this program except this time it's configuring for the port number you have chosen. Typing 'q' leads to Screen 9.

Chapter 3 - Additional Features

Screen 9:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

(Note: If you are NOT connected to this unit through a console, and you have just reconfigured the IP of this unit, activating the new configurations may cause you to lose connection. In that case, please reconnect to the unit by the new IP address, and manually issue a saveconf to save your configurations to flash.)

Do you want to activate your configurations now? (y/n) [y] :

Screen 10:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Flash refers to a type of memory that can be erased and reprogrammed in units of memory known as blocks rather than one byte at a time; thus, making updating to memory easier.

If you choose to save to flash, your configurations thus far will still be in the memory of the system even after you reboot it. If you don't save to flash and if you were to reboot the system, all your new configurations will be lost and you will have to reconfigure the system.

Do you want to save your configurations to flash? (y/n) [n] :

Chapter 3 - Additional Features

CLI Method

To configure certain parameters for a specific serial port.

Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be ttyS<serial port number> :

```
config configure line <serial port number> tty <string>
```

To configure authtype:

```
config configure line <serial port number> authtype <string>
```

To configure authhost1:

```
config configure line <serial port number> authhost1  
<string>
```

To configure accthost1:

```
config configure line <serial port number> accthost1  
<string>
```

To configure authhost2:

```
config configure line <serial port number> authhost2  
<string>
```

To configure accthost2:

```
config configure line <serial port number> accthost2  
<string>
```

To configure radtimeout:

```
config configure line <serial port number> timeout <number>
```

To configure radretries:

```
config configure line <serial port number> retries <number>
```

Chapter 3 - Additional Features

To configure secret:

```
config configure line <serial port number> secret <string>
```



Tip. You can configure all the parameters for a serial port in one line.

```
config configure line <serial port number> tty <string>  
authtype <string> authhost1 <string> accthost1 <string>  
authhost2 <string> accthost2 <string> timeout <number>  
retries <number> secret <string>
```

Step 2: Activate and Save.

To activate your new configurations and save them to flash, type:

```
config write
```

Chapter 3 - Additional Features

Access Control via Radius Attribute NAS-Port-id

This feature provides an additional way to control the access to serial ports other than the one based in usernames or groups. The authentication type must be Radius for this feature to function. The Radius server administrator must configure the user (in the radius server database) with one NAS-PORTId attribute for each serial port that the user is allowed to access.

In the example below the user alfred can access the serial ports ttyS11, ttyS13, and ttyS17:

```
alfred Auth-Type = Local, Password = 'alfred'  
  
    Service-Type = Framed-User,  
  
    Framed-Protocol = PPP,  
  
    NAS-Port-Id = 11,  
  
    NAS-Port-Id = 13,  
  
    NAS-Port-Id = 17
```

The pam_radius module will check whether the NAS-Port-Id matches one of those sent by the radius server. If the radius server does not send the NAS-Port-Id attribute, no check is performed.

No configuration is needed for the AlterPath Console Server or the Cyclades-TS. However, the authentication type must be “radius”. Authentications like radiusDownLocal, radius/local, etc. will not validate the NAS-port-Id if the user was locally authenticated.

Chapter 3 - Additional Features

CAS Port Pool

This feature is available for the ACS 2.1.3, TS 1.3.7. CAS Port Pooling allows you to access a free serial port from a pool in addition to the original feature where you could access a specific serial port. When you access a serial port through the pool the features sniff session and multiple sessions are not available. This feature is available for serial ports configured as CAS profile only.

You can define more than one pool of serial ports. Each serial port can only belong to ONE pool. The pool is uniquely identified by a four parameter scheme:

- protocol,
- pool_ipno,
- pool_serverfarm, and
- pool_socket_port

The three new parameters: pool_ipno, pool_serverfarm, and pool_socket_port have the same meaning as ipno, serverfarm, and socket_port respectively. Ports belonging to the same pool MUST be configured with the same value in these fields.

It is strongly recommended that you configure the same values in all parameters related to authentication for all serial ports belonging to a pool. Some of the authentication parameters are users, admin_users, and authtype.

You can access the serial ports from a pool with the same commands you use today to access a specific serial port. You just need to use pool_ipno, pool_serverfarm, or pool_socket_port instead ipno, serverfarm, or socket_port respectively in the ssh/telnet command.

When a connection request arrives using one of pool_ipno, pool_serverfarm, or pool_socket_port the ACS/TS will look for the first free serial port from the pool and that port will be assigned to connection. If there is no serial port free in the pool the connection is just dropped.

Chapter 3 - Additional Features

How to Configure it

Following is an example of serial port pool configuration:

```
#
# Serial port pool: pool-1
#

s1.tty ttyS1
s1.protocol socket_server
s1.socket_port 7001 // TCP port # for specific allocation
s1.pool_socket_port 3000 // TCP port # for the pool
s1.ipno 10.0.0.1 // IP address for specific allocation
s1.pool_ipno 10.1.0.1 // IP address for the pool
s1.serverfarm serial-1 // alias for specific allocation
s1.pool_serverfarm pool-1 // alias for the pool

s2.tty ttyS2
s2.protocol socket_server
s2.socket_port 7002 // TCP port # for specific allocation
s2.pool_socket_port 3000 // TCP port # for the pool
s2.ipno 10.0.0.2 // IP address for specific allocation
s2.pool_ipno 10.1.0.1 // IP address for the pool
s2.serverfarm serial-2 // alias for specific allocation
s2.pool_serverfarm pool-1 // alias for the pool

#
# Serial port pool: pool-2
#

s3.tty ttyS3
s3.protocol socket_ssh
s3.socket_port 7003 // TCP port # for specific allocation
s3.pool_socket_port 4000 // TCP port # for the pool
s3.ipno 10.0.0.3 // IP address for specific allocation
s3.pool_ipno 10.2.0.1 // IP address for the pool
s3.serverfarm serial-3 // alias for specific allocation
s3.pool_serverfarm pool-2 // alias for the pool

s4.tty ttyS4
s4.protocol socket_ssh
s4.socket_port 7004 // TCP port # for specific allocation
```

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```
s4.pool_socket_port 4000 // TCP port # for the pool
s4.ipno 10.0.0.4 // IP address for specific allocation
s4.pool_ipno 10.2.0.1 // IP address for the pool
s4.serverfarm serial-4 // alias for specific allocation
s4.pool_serverfarm pool-2 // alias for the pool
```

In the example above, there are two pools:

- *pool-1* (identified by Protocol `socket_server`, TCP port #3000, IP 10.1.0.1, and alias `pool-1`)
- *pool-2* (identified by Protocol `socket_ssh`, TCP port #4000, IP 10.2.0.1, and alias `pool-2`)

The serial ports `ttyS1` and `ttyS2` belong to the `pool-1`. The serial ports `ttyS3` and `ttyS4` belong to the `pool-2`.

You can access specifically serial port `ttyS1` by using TCP port 7001, IP address 10.0.0.1 or alias `serial-1`. If the `ttyS1` is being used by somebody else the connection will be dropped if the user is not a `admin_user`. Alternately, you can access `ttyS1` through `pool` (if it's free) using TCP port 3000, IP 10.1.0.1 or alias `pool-1`. If it is not free `ttyS2` will be automatically allocated. Additionally, if `ttyS2` is not free, the connection will be dropped.

Chapter 3 - Additional Features

Clustering

Clustering is available for the Cyclades-TS with firmware versions 1.3.0 and up (except for the TS110/100). It allows the stringing of Terminal Servers so that one Master Cyclades-TS can be used to access all Cyclades-TSs on a LAN. The Master Cyclades-TS can manage up to 1024 serial ports, so that the following can be clustered:

- 1 Master TS1000 + 31 Slave TS1000s, or
- 1 Master TS2000 + 15 Slave TS2000s, or
- 1 Master TS3000 + 9 slave TS3000s + 1 slave TS2000

An example with one Master TS2000 and two Slave TS1000s is shown in the following figure.

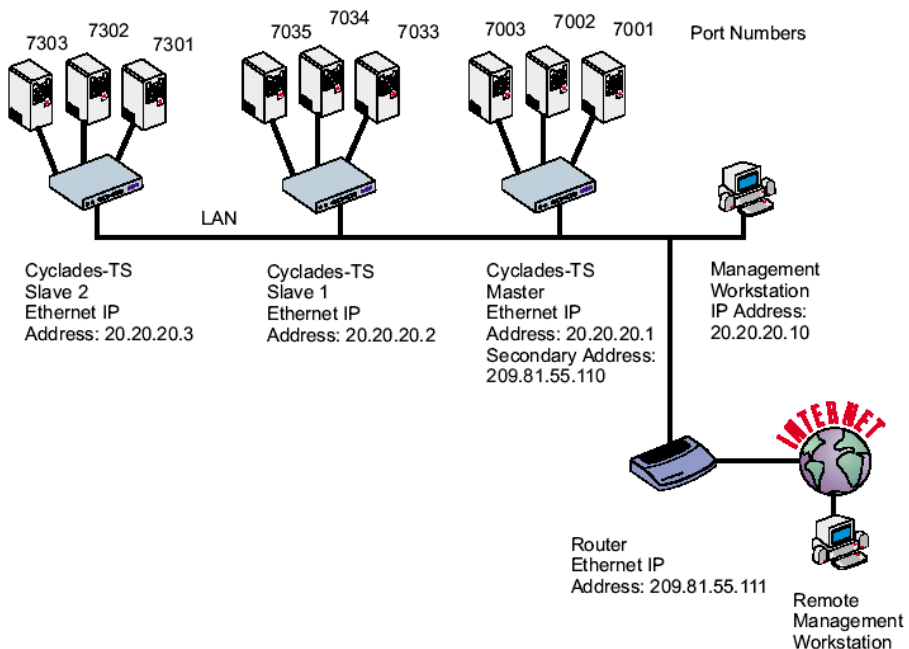


Figure 22: An example using the Clustering feature

Chapter 3 - Additional Features

Parameters Involved and Passed Values

The Master Cyclades-TS must contain references to the Slave ports. The configuration described earlier for Console Access Servers should be followed with the following exceptions for the Master and Slaves:

Table 7: Master Cyclades Configuration (where it differs from the CAS standard)

Parameter	Description	Value for this example
conf.eth_ip	Ethernet Interface IP address.	20.20.20.1
conf.eth_ip_alias	Secondary IP address for the Ethernet Interface (needed for clustering feature).	209.81.55.110
conf.eth_mask_alias	Mask for secondary IP address above.	255.255.255.0
all.socket_port	This value applies to both the local ports and ports on Slave Cyclades-TS.	7001+
all.protocol	Depends on the application.	Socket_ssh or socket_server
all.authtype	Depends on the application.	Radius or local or none
s33.tty	This parameter must be created in the Master TS file for every Slave port. Its format is: IP_of_Slave:[slave_socket_port] for non-Master ports. In this case, the slave_socket_port value is not necessary because s33.socket_port is automatically set to 7033 by all.socket_port above.	20.20.20.2:7033
s33.serverfarm	An alias for this port.	Server_on_slave1_serial_s1
s33.ipno	This parameter must be created in the Master TS file for every Slave port, unless configured using all.ipno.	0.0.0.0

Chapter 3 - Additional Features

Table 7: Master Cyclades Configuration (where it differs from the CAS standard)

Parameter	Description	Value for this example
s34.tty	See s33.tty.	20.20.20.2:7034
s34.serverfarm	An alias for this port.	Server_on_slave1_serial_s2
s34.ipno	See s33.ipno.	0.0.0.0
s35.tty	See s33.tty.	20.20.20.2:7035
s35.serverfarm	An alias for this port.	Server_on_slave1_serial_s3
s35.ipno	See s33.ipno.	0.0.0.0
etc. for s36-s64		
S65.tty	The format of this parameter is IP_of_Slave:[slave_socket_port] for non-Master ports. The value 7301 was chosen arbitrarily for this example.	20.20.20.3:7301
S65.serverfarm	An alias for this port.	Server_on_slave2_serial_s1
S65.ipno	See s33.ipno.	0.0.0.0
S66.tty	See s65.tty	20.20.20.3:7302
S66.serverfarm	An alias for this port.	Server_on_slave2_serial_s2
S66.ipno	See s33.ipno.	0.0.0.0
S67.tty	See s65.tty.	20.20.20.3:7303
S67.serverfarm	An alias for this port.	Server_on_slave2_serial_s3
S67.ipno	See s33.ipno.	0.0.0.0

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Table 7: Master Cyclades Configuration (where it differs from the CAS standard)

Parameter	Description	Value for this example
etc. for s68-s96		

The Slave Cyclades-TSs do not need to know they are being accessed through the Master Cyclades-TS. (You are creating virtual terminals: virtual serial ports.) Their port numbers, however, must agree with those assigned by the Master.

Table 8: Cyclades-TS configuration for Slave 1
(where it differs from the CAS standard)

Parameter	Value for this example
all.protocol	socket_server
all.authtype	none
conf.eth_ip	20.20.20.2
all.socket_port	7033+
all.authtype	none

Table 9: Cyclades-TS configuration for Slave 2
(where it differs from the CAS standard)

Parameter	Value for this example
all.protocol	socket_server
all.authtype	none
conf.eth_ip	20.20.20.3
all.authtype	none
all.socket_port	7301+

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To access ports from the remote management workstation, use telnet with the secondary IP address:

```
telnet 209.81.55.110 7001
```

to access the first port of the Master Cyclades-TS.

```
telnet 209.81.55.110 7033
```

to access the first port of Slave 1.

```
telnet 209.81.55.110 7065
```

to access the first port of Slave 2.

Ssh can also be used from the remote management workstation:

```
ssh -l <username>:Server_on_slave2_serial_s3 209.81.55.110
```

to access the third port of Slave 2, or

```
ssh -l <username>:7069 209.81.55.110
```

to access the fifth port of Slave 2.

Centralized Management - the Include File

The Cyclades-TS allows centralized management through the use of a Master pslave.conf file. Administrators should consider this approach to configure multiple Cyclades-TS. Using this feature, each unit has a simplified pslave.conf file where a Master include file is cited. This common configuration file contains information for all units, properly divided in separate sections, and would be stored on one central server. This file, in our example shown in [Figure 23: Example of Centralized Management](#), is /etc/portslave/TSccommon.conf. It must be downloaded to each Cyclades-TS.

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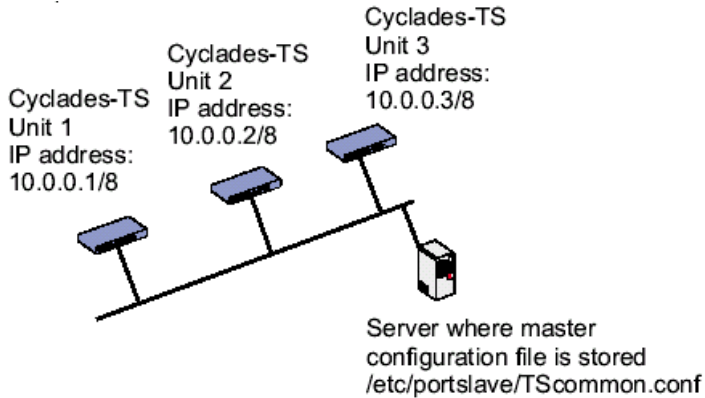


Figure 23: Example of Centralized Management

The abbreviated `pslave.conf` and `/etc/hostname` files in each unit, for the example are:

For the `/etc/hostname` file in *unit 1*:

```
unit1
```

For the `pslave.conf` file in *unit 1*:

```
conf.eth_ip 10.0.0.1
conf.eth_mask 255.0.0.0
conf.include /etc/portslave/TSccommon.conf
```

For the `/etc/hostname` file in *unit 2*:

```
unit2
```

For the `pslave.conf` file in *unit 2*:

```
conf.eth_ip 10.0.0.2
conf.eth_mask 255.0.0.0
conf.include /etc/portslave/TSccommon.conf
```

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For the `/etc/hostname` file in *unit 3*:

```
unit3
```

For the `pslave.conf` file in *unit 3*:

```
conf.eth_ip 10.0.0.3
conf.eth_mask 255.0.0.0
conf.include /etc/portslave/TScommon.conf
```

The common include file for the example is:

```
conf.host_config unit1
<parameters for unit1 following the rules for pslave.conf>
conf.host_config unit2
<parameters for unit2 following the rules for pslave.conf>
conf.host_config unit3
<parameters for unit3 following the rules for pslave.conf>
conf.host_config.end
```

When this file is included, *unit1* would read only the information between *conf.host_config unit1* and *conf.host_config unit2*. *Unit2* would use only the information between *conf.host_config unit2* and *conf.host_config unit3* and *unit3* would use information after *conf.host_config unit3* and before *conf.host_config.end*.

Steps for using Centralized Configuration

Step 1: Create and save the `/etc/portslave/pslave.conf` and `/etc/hostname` files in each Cyclades-TS.

Step 2: Execute the command `signal_ras hup` on each unit.

Chapter 3 - Additional Features

Step 3: Create, save, and download the common configuration.

Create and save the common configuration file on the server, then download it (probably using `scp`) to each unit. Make sure to put it in the directory set in the `pslave.conf` file (`/etc/portslave` in the example).

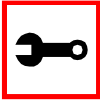
Step 4: Execute the command `signal_ras hup` on each unit again.

Step 5: Test each unit.

If everything works, add the line `/etc/portslave/TScommon.conf` to the `/etc/config_files` file.

Step 6: Save the file and close it.

Step 7: Execute the `saveconf` command.



Note: The included file `/etc/portslave/TScommon.conf` cannot contain another include file (i.e., the parameter `conf.include` must not be defined).

Also, `<max ports of TS> + N(+)` is done same way as serial port.

Chapter 3 - Additional Features

CronD

CronD is a service provided by the Cyclades-TS system that allows automatic, periodically-run custom-made scripts. It replaces the need for the same commands to be run manually.

Parameters Involved and Passed Values

The following parameters are created in the `/etc/crontab_files` file:

- status* Active or inactive. If this item is not active, the script will not be executed.
- user* The process will be run with the privileges of this user, who must be a valid local user.
- source* Pathname of the crontab file that specifies frequency of execution, the name of shell script, etc. It should be set using the traditional crontab file format.

Example:

The name of the shell script with the commands to be executed is `/etc/teste_cron.sh`. The name of the crontab file is `/etc/crontab_tst` and it contains one line:

```
0-59 * * * * /etc/test_cron.sh
```

Insert the follow line in the `/etc/crontab_files`:

```
active root /etc/crontab_tst
```

Result: CronD will execute the shell script `teste_cron.sh` with root privileges each minute.



Note: In `/etc/crontab`, you can only have one active entry per user. For instance, from the example above, you cannot add another active entry for root because it already has an entry. If you want to add more scripts, you can just add them to the source file (`/etc/crontab_tst`).

Chapter 3 - Additional Features

Configuration for CAS, TS, and Dial-in Access



Important! After creating the shell script and *crontab* file and modifying the *crontab_files* file, make sure the file named */etc/config_files* contains the names of all files that should be saved to flash. Run the command *saveconf* after this confirmation.

vi Method

The files Crontab and shell script are created and the file */etc/crontab_files* is modified as indicated.

To use cronD:

Step 1: Create the files for every process that it will execute:

Step 2: Create a line in the file */etc/crontab_files* for each process to be run.

Step 3: Update the system.

The next step is to update the system with the modified data. Make sure the file named */etc/config_files* contains the names of all files that should be saved to flash.

Step 4: Run *saveconf*.

The command *saveconf*, which reads the */etc/config_files* file, should then be run. *saveconf* copies all the files listed in the file */etc/config_files* from the ramdisk to */proc/flash/script*.

Step 5: Reboot the Cyclades-TS.

Browser Method

To configure CronD with your browser:

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server's IP address. For example:

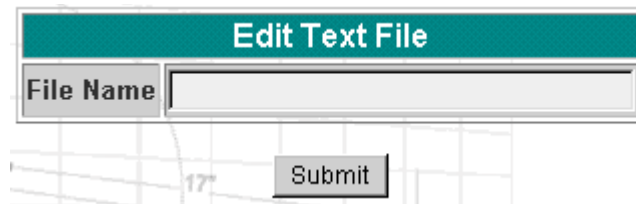
```
http://10.0.0.0
```


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Step 2: Log in as root and type the Web root password configured by the Web server.
This will take you to the Configuration and Administration page.

Step 3: Click on the Edit Text File link.

Click on this link on the Link Panel. You can then pull up the appropriate file and edit it.



The image shows a web interface for editing text files. At the top, there is a teal-colored header bar with the text "Edit Text File" in white. Below this header, there is a form area. On the left side of the form, there is a label "File Name" in a grey box. To the right of the label is a large, empty text input field. Below the input field, there is a "Submit" button in a grey box. The background of the form area is a light grey grid pattern.

Figure 24: Edit Text File page

Chapter 3 - Additional Features

Data Buffering

Introduction

Data buffering can be done in local files or in remote files through NFS. When using remote files, the limitation is imposed by the remote Server (disk/partition space) and the data is kept in linear (sequential) files in the remote Server. When using local files, the limitation is imposed by the size of the available ramdisk. You may wish to have data buffering done in file, syslog or both. For syslog, *all.syslog_buffering* and *conf.DB_facility* are the parameters to be dealt with, and *syslog-ng.conf* file should be set accordingly. (Please see [Syslog](#) for the *syslog-ng* configuration file.) For the file, *all.data_buffering* is the parameter to be dealt with.

Conf.nfs_data_buffering is a remote network file system where databuffering will be written, instead of using the default directory */var/run/DB*. When commented, it indicates local data buffering. The directory tree to which the file will be written must be NFS-mounted and the local path name is */mnt/DB_nfs*. The remote host must have NFS installed and the administrator must create, export, and allow reading/writing to this directory. The size of this file is not limited by the value of the parameter *s1.data_buffering*, though the value cannot be zero since a zero value turns off data buffering.

The *conf.nfs_data_buffering* parameter format is:

```
<server name or IP address>:<remote pathname>
```

If data buffering is turned on for port 1, for example, the data will be stored in the file *ttyS1.data* (or *<serverfarm1>.data* if *s1.serverfarm* was configured) in local directory */var/run/DB* or in remote path name and server indicated by the *conf.nfs_data_buffering*.

Ramdisks

Data buffering files are created in the directory */var/run/DB*. If the parameter *s<nn>.serverfarm* is configured for the port *<nn>*, this name will be used. For example, if the serverfarm is called *bunny*, the data buffering file will be named *bunny.data*.

The shell script */bin/build_DB_ramdisk* creates a 48 Mbyte ramdisk for the TS3000. Use this script as a model to create customized ramdisks for your environment. Any user-created scripts should be listed in the file */etc/user_scripts* because *rc.sysinit* executes all shell scripts found there. This avoids changing *rc.sysinit* itself.

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Linear vs. Circular Buffering

For local data buffering, this parameter allow users to buffer data in either a circular or linear fashion. Circular format (cir) is a revolving buffer file that is overwritten whenever the limit of the buffer size (set by `all.data_buffering`) is reached. In linear format (lin), data transmission between the remote device and the serial port ceases once the 4k bytes Rx buffer in the kernel is reached. Then if a session is established to the serial port, the data in the buffer is shown (`dont_show_DBmenu` must be 2), cleared, and data transmission is resumed. Linear buffering is impossible if flow control is set to none. Default is cir.

Parameters Involved and Passed Values

Data Buffering uses the following parameters:

all.data_buffering

A non zero value activates data buffering (local or remote, according to what was configured in the parameter `conf.nfs_data_buffering`). If local data buffering, a file is created on the Cyclades-TS; if remote, a file is created through NFS in a remote server. All data received from the port is captured in this file. If local data buffering, this parameter means the maximum file size (in bytes). If remote, this parameter is just a flag to activate (greater than zero) or deactivate data buffering. When local data buffering is used, each time the maximum is reached the oldest 10% of stored data is discarded, releasing space for new data (FIFO system) - circular file. When remote data

all.data_buffering (cont.)

buffering is used, there's no maximum file size other than the one imposed by the remote server - linear file. This file can be viewed using the normal UNIX tools (cat, vi, more, etc.). *Size is in bytes not kilobytes.*

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conf.nfs_data_buffering

This is the Remote Network File System where data captured from the serial port will be written instead of being written to the local directory */var/run/DB*. The directory tree to which the file will be written must be NFS-mounted, so the remote host must have NFS installed and the administrator must create, export and allow reading/writing to this directory. The size of this file is not limited by the value of the parameter *all.data_buffering*, though the value cannot be zero since a zero value turns off data buffering. The size of the file is dependent on the NFS server only (hard drive, partition size, etc.).

all.DB_mode

When configured as *cir* for circular format, the buffer is like a revolving file that is overwritten whenever the limit of the buffer size (as configured in *all.data_buffering* or *s<n>.data_buffering*) is reached. When configured as *lin* for linear format, once 4k bytes of the Rx buffer in the kernel is reached, a flow control stop (RTS off or XOFF—depending on how *all.flow* or *s<n>.flow* is set) is issued to prevent the serial port from receiving further data from the remote. Then when a session is established to the serial port, a flow control start (RTS on or XON) will be issued and data reception will then resume. If *all.flow* or *s<n>.flow* is set to *none*, linear buffering isn't possible. Default is *cir*.

all.syslog_buffering

When nonzero, the contents of the data buffer are sent to the *syslog-ng* every time a quantity of data equal to this parameter is collected. The *syslog* level for data buffering is hard coded to level 5 (notice) and facility is local plus *conf.DB_facility*. The file */etc/syslog-ng/syslog-ng.conf* should be set accordingly for the *syslog-ng* to take some action.

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all.syslog_sess

This parameter determines whether syslog is generated when a user is connected to the port or not. Originally, syslog is always generated whether the user is connected to the port or not. Now, users have the option to NOT have syslog generate messages when they connect to a port. This feature does not affect the local `data_buffering` file. When set to 0 (default), syslog is always generated. When set to 1, syslog is only generated when the user is NOT connected to the port sending the data. When the user does connect to the port that is sending data, syslog messages won't be generated.

all.dont_show_DBmenu

When zero, a menu with data buffering options is shown when a nonempty data buffering file is found. When 1, the data buffering menu is not shown. When 2, the data buffering menu is not shown but the data buffering file is shown if not empty. When 3, the data buffering menu is shown, but without the erase and show and erase options.

all.DB_timestamp

Records the time stamp in the data buffering file (1) or not (0). If it is configured as 1, the software will accumulate input characters until it receives a CR and LF from the serial port or the accumulated data reaches 256 characters. Either way, the accumulated data will be recorded in the data buffering file along with the current time. The parameter `all.data_buffering` has to be with a non-zero value for this parameter to be meaningful.

Configuration for CAS

vi Method

Files to be modified:

- `pslave.conf`
- `syslog-ng.conf`

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Browser Method

To configure Data Buffering with your browser:

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server's IP address. For example:

```
http://10.0.0.0
```

Step 2: Log in as root and type the Web root password configured by the Web server.

This will take you to the Configuration and Administration page.

Step 3: Select the Serial Ports link.

Click on the Serial Ports link on the Link Panel to the left of the page or in the Configuration section of the page. This will take you to the Port Selection page.

Step 4: Select port(s).

On the Port Selection page, choose all ports or an individual port to configure, from the dropdown menu. Click the Submit button. This will take you to the Serial Port Configuration page.

Step 5: Scroll down to the Data Buffering section.

You can change the settings in this section.

Data Buffering	
Maximum Buffer Size (0-disabled):	<input type="text" value="0"/>
Data Buffering Mode:	<input checked="" type="radio"/> CIR <input type="radio"/> LIN
Records the time stamp in the data buffering file:	<input type="radio"/> yes <input checked="" type="radio"/> no
Buffer size to send syslog (40 to 255, 0-disabled):	<input type="text" value="0"/>
Syslog Buffering at all times:	<input checked="" type="radio"/> yes <input type="radio"/> no
Data Buffering Menu:	<input type="text" value="Show Menu"/>
Alarm for Data Buffering:	<input type="radio"/> yes <input checked="" type="radio"/> no

Figure 25: Data Buffering section of the Serial Port Configuration page

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Step 6: Click the Submit button.

Step 7: Select the General link.

Click on the General link on the Link Panel to the left of the page.

Step 8: Scroll down to the Data Buffering section.

Choose whether NFS will be used or not, and choose the Data Buffering Facility level here.



Data Buffering	
Remote NFS path:	<input type="text"/>
Data Buffering Facility:	local7 ▾

Figure 26: Data Buffering section of the General page

Step 9: Click the Submit button.

Step 10: Make the changes effective.

Click on the Administration > Run Configuration link, check the Serial Ports/Ethernet/Static Routes box and click on the Activate Configuration button.

Step 11: Click on the link Administration > Load/Save Configuration.

Step 12: Click the Save Configuration to Flash button.

Wizard Method

Step 1: Bring up the wizard.

At the command prompt, type the following to bring up the Data Buffer custom wizard:

```
wiz --db
```

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Screen 1:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER. Enter '#' if you want to deactivate that parameter or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or
- 3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

Press ENTER to continue...

Screen 2:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
conf.nfs_data_buffering : #  
all.data_buffering : 0  
all.DB_mode : cir  
all.dont_show_DBmenu : 0  
all.DB_timestamp : 0  
all.syslog_buffering : 0  
all.syslog_sess : 0
```

Set to defaults? (y/n) [n] :

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Screen 3:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

CONF.NFS_DATA_BUFFERING - This parameter applies only if users choose to remotely buffer data. This is the remote directory name where data buffering will be written to instead of the default directory '/var/run'. If deactivated, data buffering will be done locally.

conf.nfs_data_buffering[#] :

ALL.DATA_BUFFERING - For local data buffering, this parameter represents the maximum file size in bytes allowed to be captured before it is discarded for new space. If remote this parameter is just a flag to either activate (any value greater than 0) or deactivate data buffering.

all.data_buffering[0] :

Screen 4:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.DB_MODE - For local data buffering, this parameter allow users to buffer data in either a circular or linear fashion. Circular format (cir) is a revolving buffer file that is overwritten whenever the limit of the buffer size (set by all.data_buffering) is reached. In linear format (lin), data transmission between the remote device and the serial port ceases once the 4k bytes Rx buffer in the kernel is reached. Then if a session is established to the serial port, the data in the buffer is shown (dont_show_DBmenu must be 2), cleared, and data transmission is resumed. Linear buffering is impossible if flow control is set to none. Default is cir.

all.DB_mode[cir] :

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ALL.DONT_SHOW_DBMENU - When 0, a menu with data buffering options is shown when a non-empty data buffering file is found. When 1, the data buffering menu is not shown. When 2, the data buffering menu is not shown but the data buffering file is shown if not empty. When 3, the data buffering menu is shown, but without the 'erase and show' and 'erase' options.

all.dont_show_DBmenu[0] :

Screen 5:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
ALL.DB_TIMESTAMP - Records the time stamp in the data buffering file (1) or not (0). In case it is configured as 1, the software will accumulate input characters until it receives a CR and LF from the serial port, or the accumulated data reaches 256 characters. Either way, the accumulated data will be recorded in the data buffering file along with the current time. The parameter, all.data_buffering, has to be nonzero in order for this parameter to work.
```

all.DB_timestamp[0] :

ALL.SYSLOG_BUFFERING - This parameter is another option to data buffering. Users can also have syslog perform this function along with data buffering into files. When nonzero, the contents of the data buffer are sent to the syslog-ng every time a quantity of data equal to this parameter is collected. The syslog level for data buffering is hard coded to level 5 (notice) and facility conf.DB_facility. The file /etc/syslog-ng/syslog-ng.conf should be set accordingly for the syslog-ng to take some action.

(Please see the 'Syslog-ng Configuration to use with

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Syslog Buffering Feature' section under Generating Alarms in Chapter 3 of the system's manual for the syslog-ng configuration file.)

```
all.syslog_buffering[0] :
```

Screen 6:

```
*****
***** C O N F I G U R A T I O N W I Z A R D *****
*****
ALL.SYSLOG_SESS - In order for this parameter to function,
make sure syslog buffering is activate. When set as 0,
syslog messages are always generated whether or not there
is a connection to the port that is sending data to your
unit. When set to 1, syslog messages are NOT generated when
there IS a connection to the port that is sending data. It
is only generated when there isn't a session to the port
that is sending data to your unit.
```

```
all.syslog_sess[0] :
```

Screen 7:

```
*****
***** C O N F I G U R A T I O N W I Z A R D *****
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
conf.nfs_data_buffering : #
all.data_buffering : 0
all.DB_mode : cir
all.dont_show_DBmenu : 0
all.DB_timestamp : 0
all.syslog_buffering : 0
all.syslog_sess : 0
```

Are these configuration(s) all correct? (y/n) [n] :

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If you type 'n'

Type 'c' to go back and CORRECT these parameters or 'q' to QUIT :

Typing 'c' repeats the application, typing 'q' exits the entire wiz application

If you type 'y'

Discard previous port-specific parameters? (y/n) [n] :



Note: Answering yes to this question will discard only the parameter(s) which you are currently configuring if they were configured for a specific port in a previous session. For instance, if you are currently configuring parameter, all.x, and there was a specific port, s2.x, configured; then, answering yes to this question will discard s2.x.

Type 'c' to CONTINUE to set these parameters for specific ports or 'q' to QUIT :

Typing 'c' leads to Screen 8, typing 'q' leads to Screen 9.

Screen 8:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****  
You have 8 available ports on this system.
```

Type 'q' to quit, a valid port number[1-8], or anything else to refresh :

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Note: The number of available ports depends on the system you are on. Typing in a valid port number repeats this program except this time it's configuring for the port number you have chosen. Typing 'q' leads to Screen 9.

Screen 9:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

(Note: If you are NOT connected to this unit through a console, and you have just reconfigured the IP of this unit, activating the new configurations may cause you to lose connection. In that case, please reconnect to the unit by the new IP address, and manually issue a saveconf to save your configurations to flash.)

Do you want to activate your configurations now? (y/n) [y] :

Screen 10:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Flash refers to a type of memory that can be erased and reprogrammed in units of memory known as blocks rather than one byte at a time; thus, making updating to memory easier.

If you choose to save to flash, your configurations thus far will still be in the memory of the system even after you reboot it. If you don't save to flash and if you were to reboot the system, all your new configurations will be lost and you will have to reconfigure the system.

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Do you want to save your configurations to flash? (y/n) [n] :

CLI Method

To configure certain parameters for a specific serial port.

Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be ttyS<serial port number> :

```
config configure line <serial port number> tty <string>
```

To configure nfs_data_buffering:

```
config configure conf nfsdb <string>
```

To configure data_buffering:

```
config configure line <serial port number> databuffering  
<number>
```

To configure DB_mode:

```
config configure line <serial port number> dbmode <string>
```

To configure dont_show_DBmenu:

```
config configure line <serial port number> dbmenu <number>
```

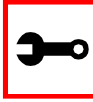
To configure DB_timestamp:

```
config configure line <serial port number> dbtimestamp  
<number>
```

To configure syslog_buffering:

```
config configure line <serial port number> syslogdb <number>
```

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Tip. You can configure all the parameters for a serial port in one line:

```
config configure line <serial port number> tty <string>
conf nfsdb <string> db <number> dbmode <string> dbmenu
<number> dbtimestamp <number> syslogdb <number>
```

Step 2: Activate and Save.

To activate your new configurations and save them to flash, type:

```
config write
```

(This is essentially typing *signal_ras hup* and *saveconf* from the normal terminal prompt.)

DHCP

The DHCP (Dynamic Host Configuration Protocol) Client is available for firmware versions 1.2.x and above. DHCP is a protocol that allows network administrators to assign IP addresses automatically to network devices. Without DHCP (or a similar protocol like BOOTP), each device would have to be manually configured. DHCP automatically sends a new IP address to a connected device when it is moved to another location on the network. DHCP uses the concept of a fixed time period during which the assigned IP address is valid for the device it was assigned for. This “lease” time can vary for each device. A short lease time can be used when there are more devices than available IP numbers. For more information, see RFC 2131.

Parameter Involved and Passed Values

The DHCP client on the Ethernet Interface can be configured in two different ways, depending on the action the Cyclades-TS should take in case the DHCP Server does not answer the IP address request:

1. No action is taken and no IP address is assigned to the Ethernet Interface (most common configuration):
 - Set the global parameter `conf.dhcp_client` to 1.

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- Comment all other parameters related to the Ethernet Interface (`conf.eth_ip`, etc.).
 - Add the necessary options to the file `/etc/network/dhcpd_cmd` (some options are described below).
2. The Cyclades-TS restores the last IP address previously provided in another boot and assigns this IP address to the Ethernet Interface. For the very first time the unit is powered ON, the IP address restored is 192.168.160.10 in case of failure in the DHCP. The unit goes out from the factory with DHCP enabled (`conf.dhcp_client 2`):
- Set the global parameter `conf.dhcp_client` to 2.
 - Comment all other parameters related to the Ethernet Interface (`conf.eth_ip`, etc.).
 - Add the following lines to the file `/etc/config_files`:

```
/etc/network/dhcpd_cmd
```

(from factory file already present in `/etc/config_files`)

```
/etc/dhcpd-eth0.save
```

(From the factory, the file is already present in `/etc/config_files`.)
- Add the option “-x” to the factory default content of the file `/etc/network/dhcpd_cmd`:

```
/sbin/dhcpd -l 3600 -x -c /sbin/handle_dhcp
```

From the factory, `/etc/network/dhcpd_cmd` already has such content.
- Add all other necessary options to the file `/etc/network/dhcpd_cmd` (some options are described below). In both cases if the IP address of the Cyclades-TS or the default gateway are changed, the Cyclades-TS will adjust the routing table accordingly.

Two files are related to DHCP:

`/bin/handle_dhcp`

The script which is run by the DHCP client each time an IP address negotiation takes place.

Chapter 3 - Additional Features

`/etc/network/dhccpd_cmd` Contains a command that activates the DHCP client (used by the `cy_ras` program). Its factory contents are:

```
/bin/dhccpd -c /bin/handle_dhcp
```

The options available that can be used on this command line are:

- D** This option forces `dhccpd` to set the domain name of the host to the domain name parameter sent by the DHCP Server. The default option is to NOT set the domain name of the host to the domain name parameter sent by the DHCP Server.
- H** This option forces `dhccpd` to set the host name of the host to the hostname parameter sent by the DHCP Server. The default option is to NOT set the host name of the host to the hostname parameter sent by the DHCP Server.
- R** This option prevents `dhccpd` from replacing the existing `/etc/resolv.conf` file.



Note. Do not modify the `-c /bin/handle_dhcp` option.

Configuration for CAS, TS, and Dial-in Access

vi Method

Steps 1 and 2 under Parameters and Passed Values should be followed. You'll need to edit `/etc/portslave/pslave.conf`, comment some lines, etc.

Browser Method

To configure DHCP via your Web browser:

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server's IP address. For example:

```
http://10.0.0.0
```

Chapter 3 - Additional Features

Step 2: Log in as root and type the Web root password configured by the Web server.
This will take you to the Configuration and Administration page.

Step 3: Click the General link on the Link Panel.
This takes you to the General page.

Step 4: Scroll down to the Ethernet port section.
You can choose the DHCP Client option in this section. Select the radio button and click the Submit button at the bottom of the page.

Ethernet port	
Primary IP Address:	<input type="text" value="200.246.93.97"/>
Network Mask:	<input type="text" value="255.255.255.0"/>
Secondary IP Address:	<input type="text"/>
Network Mask:	<input type="text"/>
Common Configuration File Name:	<input type="text"/>
DHCP Client:	<input checked="" type="radio"/> inactive <input type="radio"/> active <input type="radio"/> act & restores last assigned
MTU:	<input type="text" value="1500"/>

Figure 27: DHCP client section

Step 5: Make the changes effective.
Click on the Administration > Run Configuration link, check the Serial Ports/Ethernet/Static Routes box and click on the Activate Configuration button.

Step 6: Click on the link Administration > Load/Save Configuration.

Step 7: Click the Save Configuration to Flash button.
The configuration will be saved in flash.

Chapter 3 - Additional Features

Filters

This feature is only available for firmware versions 1.2.x and above.

Description

The Cyclades-TS uses the Linux utility *ipchains* to filter IP packets entering, leaving and passing through its interfaces.

An *ipchains* tutorial is beyond the scope of this manual. For more information on *ipchains*, see the *ipchains* man page (not included with the Cyclades-TS).

The syntax of the *ipchains* command is:

```
ipchains -command chain rule-specification [options]
```

```
ipchains -E old-chain-name new-chain-name
```

where:

chain is one of the following:

<i>input</i>	Filters for packets coming into the Cyclades-TS itself.
<i>output</i>	Filters for locally-generated packets.
<i>forward</i>	Filters for packets being routed through the Cyclades-TS.
<i>user_created_chain</i>	A previously defined (or in the process of being defined) chain created by the command “-N.”

command:

Only one command can be specified on the command line unless otherwise specified below. For all the long versions of the command and option names, you need to use only enough letters to ensure that *ipchains* can differentiate it from all other options.

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Configuration for CAS, TS, and Dial-in Access

Browser Method

To configure filters in IP chains via your Web browser:

Step 1: Point your browser to the Cyclades-TS.

In the address or location field of your browser type:

<Console Access Server's IP address>

Step 2: Log in as root and type the Web root password configured by the Web server.

This will take you to the Configuration and Administration page.

(See [“Configuration & Administration Menu page” on page 49](#))

Step 3: Click IPChains filter link.

Click on this link on the Link Panel. The following page will appear:

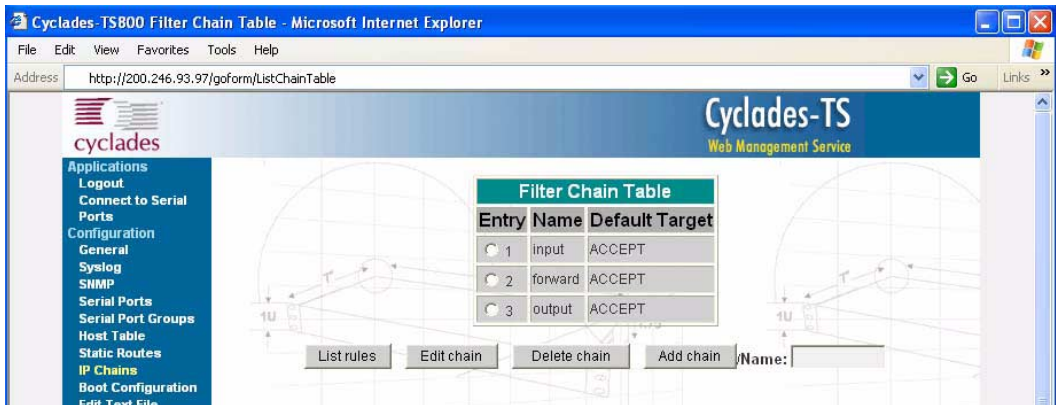


Figure 28: IP Chain filtering

Step 4: To create a new filter chain:

Type in the name of the filter chain in the Name box to the far right of the page, and then click the Add chain button. To enter the default target, click the appropriate Select button and then the Submit button. The new filter chain will be added to the Filter Chain Table.

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Step 5: To edit or delete a filter chain:

To change the default target or to delete the filter chain, click the radio button of the filter chain and then click the Edit chain button or the Delete chain button.

Step 6: To edit the rules of the filter chain:

Click the radio button of the filter chain and then click the List rules button. If the filter chain doesn't have rules, you need to add them. Skip to Step 9.

Step 7: To delete a rule:

Click the radio button of the rule and then click the Delete rule button.

Step 8: To edit a rule:

Click the radio button of the rule and then click the Edit rule button.

Chapter 3 - Additional Features

Generating Alarms

This feature helps the administrator to manage the servers. It filters the messages received by the serial port (the server's console) based on the contents of the messages. It then performs an action, such as sending an email or pager message. To configure this feature, you need to configure filters and actions in the `syslog-ng.conf` file. (You can read more about `syslog-ng` in the Syslog section.)

Port Slave Parameters Involved with Generating Alarms

- conf.DB_facility* This value (0-7) is the Local facility sent to the `syslog-ng` with data when `syslog_buffering` and/or alarm is active.
- all.alarm* When nonzero, all data received from the port is captured and sent to `syslog-ng` with INFO level and `LOCAL[0+conf.DB_facility]` facility.

Configuration for CAS, TS, and Dial-in Access

vi Method

Files to be modified:

- `pslave.conf`
- `syslog-ng.conf`

Browser Method

To configure PortSlave parameters involved with `syslog-ng` and the `syslog-ng` configuration file with your browser:

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server's IP address. For example:

```
http://10.0.0.0
```

Step 2: Log in as root and type the Web root password configured by the Web server.

This will take you to the Configuration and Administration page.

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Step 3: Select the General link.

Click on the General link on the Link Panel to the left of the page in the Configuration section. This will take you to the General page.

Step 4: Scroll down to the Data Buffering section.

You can change the Data Buffering Facility value (conf.DB_facility). Click the Submit button.

Step 5: Select the Serial Ports link.

Click on the Serial Ports link on the Link Panel to the left of the page in the Configuration section. This will take you to the Port Selection page.

Step 6: Select port(s).

On the Port Selection page, choose all ports or an individual port to configure from the dropdown menu. Click the Submit button. This will take you to the Serial Port Configuration page.

Step 7: Scroll down to the Data Buffering section.

You can change the “Alarm for Data Buffering” (.alarm) value. Click the Submit button.

Step 8: Select the Syslog link.

Click on the Syslog link on the Link Panel to the left of the page in the Configuration section. This will take you to the Edit the Syslog-ng Configuration File page.

Step 9: Make the changes effective.

Click on the Administration > Run Configuration link, check the Serial Ports/Ethernet/Static Routes box and click on the Activate Configuration button.

Step 10: Click on the link Administration > Load/Save Configuration.

Step 11: Click the Save Configuration to Flash button.

The configuration was saved in flash.

Chapter 3 - Additional Features

Wizard Method

The Alarm Generation custom wizard configures the ALL.ALARM parameter.

Step 1: Bring up the wizard.

At the command prompt, type the following to bring up the Alarm Generation custom wizard:

```
wiz --al
```

Screen 1 (below) will appear.

Screen 1:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

```
ALL.ALARM - When non zero, all data received from the port  
are captured and sent to syslog-ng with INFO level and  
LOCAL[0+conf.DB_facility] facility. The syslog-ng.conf  
file should be set accordingly, for the syslog-ng to take  
some action.
```

```
(Please see the 'Syslog-ng Configuration to use with Alarm  
Feature' section under Generating Alarms in Chapter 3 of  
the system's manual for the syslog-ng configuration file.)
```

```
all.alarm[0] :
```


Chapter 3 - Additional Features

Screen 2:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.alarm : 0
```

```
Set to defaults? (y/n) [n] :
```

Screen 3:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.ALARM - When non zero, all data received from the port are captured and sent to syslog-ng with DAEMON facility and ALERT level. The syslog-ng.conf file should be set accordingly, for the syslog-ng to take some action.

(Please see the 'Syslog-ng Configuration to use with Alarm Feature' section under Generating Alarms in Chapter 3 of the system's manual for the syslog-ng configuration file.)

```
all.alarm[0] :
```



Note: conf.DB_facility is configured under the syslog parameters (wiz - - sl).

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Screen 4:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.alarm : 0
```

```
Are these configuration(s) all correct? (y/n) [n] :
```

If you type 'n'

Type 'c' to go back and CORRECT these parameters or 'q' to QUIT :

Typing 'c' repeats the application, typing 'q' exits the entire wiz application

If you type 'y'

```
Discard previous port-specific parameters? (y/n) [n] :
```



Note: Answering yes to this question will discard only the parameter(s) which you are currently configuring if they were configured for a specific port in a previous session. For instance, if you are currently configuring parameter, all.x, and there was a specific port, s2.x, configured; then, answering yes to this question will discard s2.x.

Type 'c' to CONTINUE to set these parameters for specific ports or 'q' to QUIT :

Typing 'c' leads to Screen 5, typing 'q' leads to Screen 6.

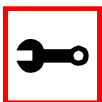
Chapter 3 - Additional Features

Screen 5:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

You have 8 available ports on this system.

Type 'q' to quit, a valid port number[1-8], or anything else to refresh :



Note: The number of available ports depends on the system you are on. Typing in a valid port number repeats this program except this time it's configuring for the port number you have chosen. Typing 'q' leads to Screen 6.

Screen 6:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

(Note: If you are NOT connected to this unit through a console, and you have just reconfigured the IP of this unit, activating the new configurations may cause you to lose connection. In that case, please reconnect to the unit by the new IP address, and manually issue a saveconf to save your configurations to flash.)

Do you want to activate your configurations now? (y/n) [y] :

Chapter 3 - Additional Features

Screen 7:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Flash refers to a type of memory that can be erased and reprogrammed in units of memory known as blocks rather than one byte at a time; thus, making updating to memory easier.

If you choose to save to flash, your configurations thus far will still be in the memory of the system even after you reboot it. If you don't save to flash and if you were to reboot the system, all your new configurations will be lost and you will have to reconfigure the system.

Do you want to save your configurations to flash? (y/n) [n] :

CLI Method

To configure certain parameters for a specific serial port:

Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be tty<serial port number> :

```
config configure line <serial port number> tty <string>
```

To configure conf.DB_facility:

```
config configure conf dbfacility <number>
```

To configure alarm:

```
config configure line <serial port number> alarm <number>
```



Tip. You can configure all the parameters for a serial port in one line.

```
config configure line <serial port number> tty <string>  
alarm <number>
```

Chapter 3 - Additional Features

Step 2: Activate and Save.

To activate your new configurations and save them to flash, type:

```
config write
```

(This is essentially typing *signal_ras hup* and *saveconf* from the normal terminal prompt.)

Syslog-ng Configuration to use with Alarm Feature

This configuration example is used for the alarm feature.

Step 1: Configure the pslave.conf file parameter.

In the pslave.conf file the parameters of the alarm feature are configured as:

```
all.alarm 1
conf.DB_facility 2
```

Step 2: Add lines to syslog-ng.conf.

The syslog-ng.conf file needs these lines:

```
# local syslog clients
source sysl { unix-stream("/dev/log"); };
# To filter ALARM message with the string "kernel panic" :
filter f_kpanic {facility(local2) and level(info) and
match("ALARM") and match("kernel panic"); };
# To filter ALARM message with the string "root login" :
filter f_root { facility(local2) and level(info) and
match("ALARM") and match("root login"); };
# To send e-mail to z@none.com (SMTP's IP address 10.0.0.2)
# from the e-mail address a@none.com with subject "ALARM".
# The message will carry the current date, the hostname
```

Chapter 3 - Additional Features

```
# of this unit and the message that was received from the
source.

destination d_maill {

    pipe("/dev/cyc_alarm"

        template("sendmail -t z@none.com -f a@none.com -s
\"ALARM\" -m \"${FULLDATE} $HOST $MSG\" -h 10.0.0.2"));

    };

# Example to send a pager to phone number 123 (Pager server
at 10.0.0.1) with message

# carrying the current date, the hostname of this TS and the
message that was received from the source :

destination d_pager {

    pipe("/dev/cyc_alarm"

        template("sendsms -d 123 -m \"${FULLDATE} $HOST $MSG\"
10.0.0.1"));

    };

# Example to send a Link Down trap to server at 10.0.0.1 with
message carrying the current

# date, the hostname of this unit and the message that
received from the source :

destination d_trap {

    pipe("/dev/cyc_alarm"

        template("snmptrap -v1 10.0.0.1 public \"\" \"\" 2 0 \"\" \"
.1.3.6.1.2.1.2.2.1.2.1 s \"${FULLDATE} $HOST $MSG\" ");

    };

# To send e-mail and snmptrap if message received from local
syslog client has the string "kernel panic" :
```

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```
log { source(sysl); filter(f_kpanic); destination(d_mail1);
destination(d_trap); };

# To send e-mail and pager if message received from local
syslog client has the string

# "root login":

log { source(sysl); filter(f_root); destination(d_mail1);
destination(d_pager); };
```

Alarm, Sendmail, Sendsms and Snmptrap

Alarm

This feature is available only for the Console Server Application. The TS sends messages using pager, e-mail, or snmptrap if the serial port receives messages with specific string. To configure this feature:

Step 1: Activate alarm in Portslave configuration file.

Parameter `all.alarm` - 0 inactive or `<> 0` active.

Step 2: Configure filters in the syslog-ng configuration file.

```
filter f_alarm { facility(local[0+conf.DB_facility]) and
level(info) and match("ALARM") and match("<your string>"); }
;
```

Example: to filter the ALARM message with the string "kernel panic" (conf.DB_facility is configured with value 1):

```
filter f_kpanic {facility(local1) and level(info) and
match("ALARM") and match ("kernel panic"); };
```

Example: to filter the ALARM message with the string "root login" :

```
filter f_root { facility(local1) and level(info) and
match("ALARM") and match("root login"); };
```

Step 3: Configure actions in the syslog-ng configuration file.

(See more details in syslog-ng examples.)

Example: alarm is active and if the serial port receives the string "kernel panic," one message will be sent to the pager.

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```
log (source(sysl); filter(f_kpanic); destination(d_pager);
};
```

To send e-mail:

```
destination d_mail { pipe("/dev/cyc_alarm" template("send-
mail <pars>"));};
```

To send a pager message:

```
destination d_pager {pipe("/dev/cyc_alarm" template("sendsms
<pars>"));};
```

To send snmptrap:

```
destination d_trap {pipe("/dev/cyc_alarm" template("snmptrap
<pars>")); };
```

Step 4: Connect filters and actions in the syslog-ng configuration file.

Example: alarm is active and if the serial port receives the string "kernel panic," one message will be sent to the pager.

```
log (source(sysl); filter(f_kpanic); destination(d_trap);
destination(d_pager); );
```

Sendmail

Sendmail sends a message to a SMTP server. It is not intended as a user interface routine; it is used only to send pre-formatted messages. Sendmail reads all parameters in the command line. If the SMTP server does not answer the SMTP protocol requests sent by sendmail, the message is dropped.

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Synopsis:

```
sendmail -t <name>[,<name>] [-c <name> [,<name>]] [-b <name>
[,<name>]] [-r <name>] -f <name> -s <text> -m <text> -h <SMTP
server> [-p <smtp-port>]
```

where:

<i>-t <name>[,<name>]</i>	“To:” Required. Multi-part allowed (multiple names are separated by commas). Names are expanded as explained below.
<i>[-c <name> [,<name>]]</i>	“Cc:” Optional. Multi-part allowed (multiple names are separated by commas).
<i>[-b <name> [,<name>]]</i>	“Bcc:” Optional. Multi-part allowed (multiple names are separated by commas).
<i>[-r <name>]</i>	“Reply-To:” Optional. Use the Reply-To: field to make sure the destination user can send a reply to a regular mailbox.
<i>-f <name></i>	“From:” Required.
<i>-s <text></i>	“Subject:” Required.
<i>-m <text></i>	“body” The message body.
<i>-h <SMTP server></i>	Required. IP address or name of the SMTP server.
<i>[-p <SMTP port></i>	Optional. The port number used in the connection with the server. Default: 25.
<i><name></i>	Any email address.
<i><text></i>	A text field. As this kind of field can contain blank spaces, please use the quotation marks to enclose the text.

For example, to send e-mail to z@none.com (SMTP's IP address 10.0.0.2) from the e-mail address a@none.com with subject “sendmail test.”

```
sendmail -t z@none.com -f a@none.com -s "sendmail test" -m "Send-
mail test. \n Is it OK???" -h 10.0.0.2
```

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Sendsms

The `sendsms` is the Linux command line client for the SMSLink project. It accepts command line parameters that define the message to be sent, and transmits them to the SMS server process running on the designated server. The `sendsms` was developed specifically for easy calling from shell scripts or similar situations.

Synopsis:

```
sendsms [-r] [-g] [-v] -d dest (-m message or -f msgfile)
[-u user] [-p port] server
```

where:

- r** Reporting. Additional info will be included in the message printed on stderr (namely, the device name used by the server to send the SMS out, and the message ID attributed to the SMS by the module's SIM card). If any of these items is missing or can't be parsed, a value of "???" will be returned.
- g** Turns debugging on. Will output the entire dialog with the server on stderr (and more).
- h** Displays a short help message and exits.
- v** Displays version information and exits.
- d dest** Required. The GSM network address (i.e. phone number) of the mobile phone the message is to be sent to. Supported format is: [int. prefix - country code] area code - phone number. The international prefix can be either "+" or "00" (or any other value supported by the GSM network provider the server is subscribed to). Some separation characters can be used to beautify the number, but they are purely cosmetic and will be stripped by the server. Those characters are [./-]. The pause character (',') is not supported. Regarding the international country code, don't forget that its necessity is to be considered respective to the SMS gateway location (the host this client program is connecting to), not the location where the client is run from.

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- d dest (cont.)* If there are any doubts, please contact the SMS server administrator for your network. Please always include the area code (even when sending to a destination in the same “area”, i.e., on the same network). The number without the area code, though syntactically correct and accepted by the network, may never get delivered.
- m message* Required (Use one and only one of “-m” or “-f”). The text of the message to be sent. Unless made up of a single word, it will have to be quoted for obvious reasons. Maximum length is 160 characters. A longer message will be truncated (you will be warned about it), but the message will still be sent. At the present time, only 7-bit ASCII is supported for the message text.
- f msgfile* Required (use one and only one of “-m” or “-f”). The name of a text file where the message to send is to be read from. This file can contain multiple lines of text (they will be concatenated), but its total length can't exceed 160 characters. A longer text will be truncated (you will be warned about it), but the message will still be sent. The special file '-' means that input will be read from stdin. At the present time, only 7-bit ASCII is supported for the message text.
- u user* Optional. The server module requires the user to identify her/himself for logging purposes. No authentication is performed on this information, however. If this parameter is omitted, sendsms will send the UNIX username of the current user. This parameter allows you to override this default behavior (might be useful in the case of automated sending).
- p port* Optional. Communication port on the target server. If provided here, this value will be used to connect to the server. If omitted, the client will query the local system for the port number associated with the “well known service” sms (as defined in /etc/services). If that doesn't return an answer, the compiled-in default value 6701 will be used.

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server

Required. The host name or IP address of the computer where the SMS gateway server process is running. By default, this server will be listening on TCP port 6701.

Upon success (when the server module reports that the message was successfully sent), `sendsms` returns 0. When a problem occurs, a non zero value is returned. Different return values indicate different problems. A return value of 1 indicates a general failure of the client program.

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Example to send a pager message to phone number 123 (Pager server at 10.0.0.1) with message:

```
sendsms -d 123 -m "Hi. This is a test message send from TS using  
sendsms" 10.0.0.1
```

Snmpttrap

`Snmpttrap` is an SNMP application that uses the TRAP-PDU Request to send information to a network manager. One or more fully qualified object identifiers can be given as arguments on the command line. A type and a value must accompany each object identifier. Each variable name is given in the format specified. If any of the required version 1 parameters—enterprise-oid, agent and uptime—are specified as empty, it defaults to “.1.3.6.1.4.1.3.1.1”, hostname, and host-uptime respectively.

Synopsis

```
snmptrap -v 1 [-Ci] [common arguments] enterprise-oid agent  
generic-trap specific-trap uptime [objectID type value]...
```

```
snmptrap -v [2c|3] [-Ci] [common arguments] uptime trap-oid  
[objectID type value]...
```

where:

-Ci Optional. It sends INFORM-PDU.

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<i>common arguments</i>	Required. They are: "-c <community name> <SNMP server IP address>"
<i>enterprise-oid</i>	Required, but it can be empty (").
<i>agent</i>	Required, but it can be empty ("). The agent name.
<i>generic-trap</i>	The generic trap number: 2 (link down), 3 (link up), 4 (authentication failure), ...
<i>specific-trap</i>	Required. The specific trap number.
<i>uptime</i>	Required.
<i>[objectID type value]</i>	Optional. objectID is the object oid. You want to inform its value to server.

If the network entity has an error processing the request packet, an error packet will be returned and a message will be shown, helping to pinpoint in what way the request was malformed. If there were other variables in the request, the request will be resent without the bad variable.

For example, to send a Link Down trap to server at 10.0.0.1 with interfaces.iftable.ifentry.ifde-scr:

```
snmptrap -v 1 10.0.0.1 public "" 2 0 "" .1.3.6.1.2.1.2.2.1.2.1 s  
"TS: serial port number 1 is down"
```

<i>-Ci</i>	Optional. It sends INFORM-PDU.
<i>common arguments</i>	Required. They are: SNMP server IP address and community.
<i>enterprise-oid</i>	Required, but it can be empty (").

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Help

Help Wizard Information

Synopsis: `wiz [--OPTIONS] [--port <port number>]`



Note: To directly configure a feature for a specific serial port, use the "- port <port number>" option after "wiz - [option]."



Note: Make sure there are two hyphens before any of the options listed on the following table.

Table 10: General Options for the Help Wizard

Option	Description
<i>ac</i> <cas or ts>	Configuration of access method parameters
<i>al</i>	Configuration of alarm parameter
<i>all</i> <cas or ts>	Configuration of all parameters
<i>auth</i>	Configuration of authentication parameters
<i>db</i>	Configuration of data buffering parameters
<i>help</i>	Print this help message
<i>pm</i>	Configuration of power management parameters.

Chapter 3 - Additional Features

Table 10: General Options for the Help Wizard

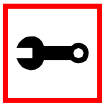
Option	Description
<i>sl</i>	Configuration of syslog parameters
<i>snf</i>	Configuration of sniffing parameters
<i>sset</i> < <i>cas</i> or <i>ts</i> >	Configuration of serial setting parameters
<i>tl</i>	Configuration of terminal login display parameters
<i>tso</i>	Configuration of other parameters specific to the TS profile

Step 1: Bring up the wizard.

At the command prompt, type the following to bring up the Help custom wizard (you can also type `wiz -h`):

```
wiz --help
```

Help Command Line Interface Information



Note: To enter into CLI mode, type `config` at the terminal prompt. You will then get a CLI prompt similar to `config@hostname>>`. Once in CLI mode, you eliminate the need to type `config` at the beginning of your CLI commands. To exit from this mode, type `exit` or `quit`.

Synopsis 1 - Configuration of Port Specific Parameters

```
config configure line [serial port number] [options]
```

or in CLI mode:

```
configure line [serial port number] [options]
```

The following table shows Help CLI Options and the actual parameter modified for Synopsis 1.

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Table 11: Help CLI Options - Synopsis 1

Option	Actual Parameter Modified
<i>accthost1</i> <string>	accthost1
<i>accthost2</i> <string>	accthost2
<i>adminusers</i> <string>	admin_users
<i>alarm</i> <number>	alarm
<i>authhost1</i> <string>	authhost1
<i>authhost2</i> <string>	authhost2
<i>authtype</i> <string>	authtype
<i>auto_input</i> <string>	auto_answer_input
<i>auto_output</i> <string>	auto_answer_output
<i>break</i> <string>	break_sequence
<i>datasize</i> <number>	datasize
<i>databuffering</i> <number>	data_buffering
<i>dbmenu</i> <number>	dont_show_DBmenu
<i>dbmode</i> <string>	DB_mode
<i>dbtimestamp</i> <number>	DB_timestamp
<i>dcd</i> <number>	dcd
<i>dtr_reset</i> <number>	DTR_reset
<i>escape</i> <string>	escape_char
<i>flow</i> <string>	flow
<i>host</i> <string>	host
<i>idletimeout</i> <number>	idletimeout

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Table 11: Help CLI Options - Synopsis 1

Option	Actual Parameter Modified
<i>ipno</i> <string>	ipno
<i>issue</i> <string>	issue
<i>lf</i> <number>	lf_suppress
<i>modbus</i> <string>	modbus_smode
<i>multipleless</i> <string>	multiple_sessions
<i>parity</i> <string>	parity
<i>pmkey</i> <string>	pmkey
<i>pmnumofoutlets</i> <number>	pmNumOfOutlets
<i>pmoutlet</i> <string>	pmoutlet
<i>pmtype</i> <string>	pmtype
<i>pmusers</i> <string>	pmusers
<i>pollinterval</i> <number>	poll_interval
<i>prompt</i> <string>	prompt
<i>protocol</i> <string>	protocol
<i>retries</i> <number>	timeout
<i>secret</i> <string>	secret
<i>sniffmode</i> <string>	sniff_mode
<i>socket</i> <number>	socket_port
<i>speed</i> <number>	speed
<i>stopbits</i> <number>	stopbits
<i>sttycmd</i> <string>	sttyCmd
<i>syslogdb</i> <number>	syslog_buffering

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Table 11: Help CLI Options - Synopsis 1

Option	Actual Parameter Modified
<i>syslogsess</i> <number>	syslog_sess
<i>telnetclientmode</i> <number>	telnet_client_mode
<i>term</i> <string>	term
<i>timeout</i> <number>	timeout
<i>tty</i> <string>	tty
<i>txinterval</i> <number>	tx_interval
<i>userauto</i> <string>	userauto
<i>users</i> <string>	users

(Refer to Appendix C for more info on the parameters.)

Synopsis 2 - Configuration of Network-related Parameters

```
config configure ether [options]
```

or in CLI mode:

```
configure ether [options]
```

Table 12: Help CLI Options - Synopsis 2

Option	Description	Actual Parameters Modified
<i>ip</i> <string>	Configuration of the IP of the Ethernet interface.	<i>conf.eth_ip</i>
<i>mask</i> <string>	Configuration of the mask for the Ethernet network.	<i>conf.eth_mask</i>
<i>mtu</i> <number>	Configuration of the Maximum Transmission Unit size.	<i>conf.eth_mtu</i>

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(Refer to Appendix C for more info on the parameters.)

Synopsis 3 - Configuration of other Conf. Parameters

```
config configure conf [options]
```

or in CLI mode:

```
configure conf [options]
```

Table 13: Help CLI Options - Synopsis 3

Option	Actual Parameter Modified
<i>dbfacility</i> <number>	conf.DB_facility
<i>facility</i> <number>	conf.facility
<i>group</i> <string>	conf.group
<i>locallogins</i> <number>	conf.locallogins
<i>nfsdb</i> <string>	conf.nfs_data_buffering

(Refer to Appendix C for more info on the parameters.)

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Note: To include spaces within the string you are configuring, encapsulate the string within single or double quotes. For instance, to configure `s2.sttyCmd -igncr -onlcr`, type (do not put a space after a comma):

```
config configure line 2 sttycmd "-igncr -onlcr"
```



Tip. You can specify the range or list of serial ports if you wish to configure the same parameters for several ports. For instance, to configure parameters for ports 2 through 4, you can type this command: `config configure line 2-4 [options]`. Or to configure parameters for just ports 4, 6, and 9, you can type:

```
config configure line 4,6,9 [options]
```

(Do not put a space after the commas when listing the serial ports.)

Requesting Help for the CLI

There are two methods for requesting help for the CLI:

- To obtain general help on the format of CLI, type `config help / more` at the terminal prompt.
- Help may be requested at any point in a command by entering a “?”. If nothing matches, the help list will be empty and you must backup until entering a “?” shows the available options.

For example:

- To find out possible commands that can come after `config`, type:

```
config ?
```

- To find out what parameters are configurable through CLI, type:

```
config configure line <serial port number> ?
```

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Modbus

MODBUS is an application layer messaging protocol for client/server communication which is widely used in the industrial automation. It is a confirmed service protocol and offers many services specified by function codes, like reading and writing registers on PLCs.

A protocol converter for the MODBUS protocol over the TCP/IP communication stack (Modbus/TCP) is implemented in the Cyclades-TS and converts Modbus/TCP ADUs from the Ethernet interface to plain MODBUS message frames over a serial RS-232 or RS-485 interface, and vice versa, supporting both serial modes (ASCII and RTU).

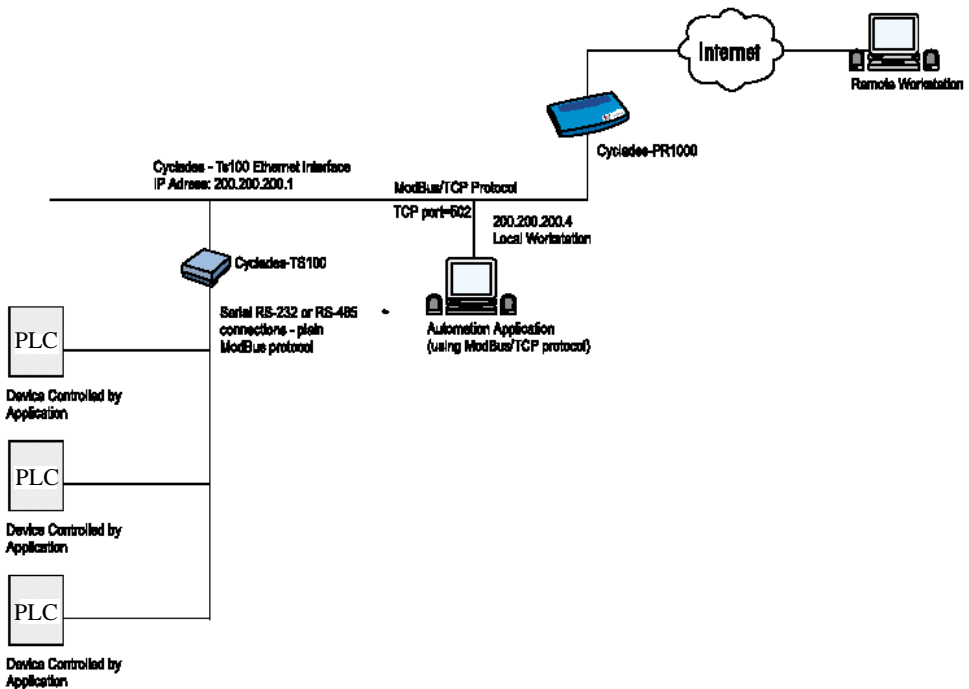


Figure 29: Modbus application

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In this example, the Automation Application running in the Workstation (local or remote) controls the PLCs connected to the serial port (RS-485) of the Cyclades-TS110/100 using MODBUS/TCP protocol. The connection is opened using the Cyclades-TS110/100 Ethernet IP address and TCP port = 502. The Cyclades-TS110/100 accepts the incoming connection and converts MODBUS/ TCP ADUs (packets) to plain MODBUS frames and sends them over the serial port. On the other hand, the MODBUS frames received from the serial port are converted to MODBUS/ TCP ADUs and sent through the TCP connection to the Automation Application.

The configuration described earlier for Console Access Servers (see Figure 1: Console Access Server diagram) should be followed with the following exceptions for this example:

Table 14: Modbus parameters

Parameter	Description	Value for this Example
<i>all.protocol</i>	For the console server profile, the possible protocols are <code>socket_server</code> (when telnet is used), <code>socket_ssh</code> (when ssh version one or two is used), <code>raw_data</code> (to exchange data in transparent mode – similar to <code>socket_server</code> mode, but without telnet negotiation, breaks to serial ports, etc.), or <i>modbus</i> (an application layer messaging protocol for client/server communication widely used for industrial automation).	modbus
<i>all.modbus_smode</i>	Communication mode through the serial ports. This parameter is meaningful only when modbus protocol is configured. The valid options are <code>ascii</code> (normal TX/RX mode) and <code>rtu</code> (some time constraints are observed between characters while transmitting a frame). If not configured, ASCII mode will be assumed.	ascii

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NTP

The `ntpclient` is a *Network Time Protocol* (RFC-1305) client for UNIX- and Linux-based computers. In order for the Cyclades-TS to work as a NTP client, the IP address of the NTP server must be set in the file `/etc/ntpclient.conf`.

The script shell `/bin/ntpclient.sh` reads the configuration file (`/etc/ntpclient.conf`) and build the line command to call `/bin/ntpclient` program.

Parameters Involved and Passed Values

The file `/etc/ntpclient.conf` has the value of two parameters:

<i>NTPSERVER</i>	The IP address of the NTP server.
<i>INTERVAL</i>	Check time every interval seconds (default 300).

The data and time will be update from the NPT server according to the parameter options. The `ntpclient` program has this syntax:

```
ntpclient [options]
```

Options:

<i>-c count</i>	Stop after count time measurements (default 0 means go forever).
<i>-d</i>	Print diagnostics.
<i>-h hostname</i>	NTP server host (mandatory).
<i>-i interval</i>	Check time every interval seconds.
<i>-l</i>	Attempt to lock local clock to server using <code>adjtimex(2)</code> .
<i>-p port</i>	Local NTP client UDP port.
<i>-r</i>	Replay analysis code based on stdin.
<i>-s</i>	Clock set (if count is not defined this sets count to 1).

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Configuration for CAS, TS, and Dial-in Access

vi Method

Files to be changed:

`/etc/ntpclient.conf`

Browser Method

To configure NTP with your browser:

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server's IP address. For example:

`http://10.0.0.0`

Step 2: Log in as root and type the Web root password configured by the Web server.

This will take you to the Configuration and Administration page.

Step 3: Click on the Edit Text File link.

Click on this link on the Link Panel or on the Configuration section of the Configuration and Administration page. (See [Figure 17: Configuration and Administration page](#). You can then pull up the appropriate file and edit it.

Step 4: in `/etc/mgetty/login.config` in `/etc/ppp/pap-secrets` Create the user for login in the Radius server.

If the login option was used, create the user either locally (by running `adduser`) or create the user in the Radius server for Radius authentication. When the login option is used, `/etc/pam.conf` may also need to be changed. (By default, `/etc/pam.conf` has the `ppp` and `login` services configured for local authentication. You will have to change them if you want Radius authentication. More information can be found in "Appendix D - Linux-PAM".)

Step 5: as `/etc/ppp/options.ttyS33` (the modem port)s in `/etc/ppp/options.ttyS33` Save `/etc/ppp/options.ttyS33` in flash.

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Ports Configured as Terminal Servers



Important! TS110/100 owners: please skip to the special section on the TS110/100 later in the installation chapter called [Configuring the Cyclades- TS110/100 for the first time](#), then perform “[Task 5: Activate the changes](#)” on [page 69](#) through listed in Chapter 2 - Installation and Configuration to finish the configuration. Make into links.

There are TS-specific parameters that are required to be configured when using the serial ports with the TS profile. The configuration of these TS-specific parameters are described in this section. Additional configuration for TS is described in Access Method and Serial Settings in Chapter 3, and in Appendix C – The pslave Configuration File.

TS Setup Wizard

The Wizard can be used to configure TS-specific parameters. (TSO stands for “TS Other”- other parameters specific to the TS profile):

Step 1: At the command line interface type the following:

```
wiz --tso
```

Screen 1:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER. Enter '#' if you want to deactivate that parameter or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or

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3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

Press ENTER to continue...

Screen 2:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.host : 192.168.160.8  
all.term : vt100  
conf.locallogins : 0
```

Set to defaults? (y/n) [n] :

Screen 3:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.HOST - The IP address of the host to which the terminals will connect.

```
all.host[192.168.160.8] :
```

ALL.TERM - This parameter defines the terminal type assumed when performing rlogin or telnet to other hosts.

```
all.term[vt100] :
```

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Screen 4:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
CONF.LOCALLOGINS - This parameter is only necessary when
authentication is being performed for a port. When set to
1, it is possible to log into the system directly by
placing a '!' before users' login name, then using their
normal password. This is useful if the Radius authentica-
tion server is down.

conf.locallogins[0] :
```

Screen 5:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
Current configuration:
(The ones with the '#' means it's not activated.)

all.host : 192.168.160.8
all.term : vt100
conf.locallogins : 0

Are these configuration(s) all correct? (y/n) [n] :
```

If you type 'n'

Type 'c' to go back and CORRECT these parameters
or 'q' to QUIT :

Typing 'c' repeats the application, typing 'q' exits the entire wiz application

If you type 'y'

Discard previous port-specific parameters? (y/n) [n] :

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Note: Answering yes to this question will discard only the parameter(s) which you are currently configuring if they were configured for a specific port in a previous session. For instance, if you are currently configuring parameter, `all.x`, and there was a specific port, `s2.x`, configured; then, answering yes to this question will discard `s2.x`.

Type 'c' to CONTINUE to set these parameters for specific ports or 'q' to QUIT :

Typing 'c' leads to Screen 6, typing 'q' leads to Screen 7.

Screen 6:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

You have 8 available ports on this system.

Type 'q' to quit, a valid port number[1-8], or anything else to refresh :



Tip. The number of available ports depends on the system you are on. Typing in a valid port number repeats this program except this time it's configuring for the port number you have chosen. Typing 'q' leads to Screen 7.

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Screen 7:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

(Note: If you are NOT connected to this unit through a console, and you have just reconfigured the IP of this unit, activating the new configurations may cause you to lose connection. In that case, please reconnect to the unit by the new IP address, and manually issue a saveconf to save your configurations to flash.)

Do you want to activate your configurations now? (y/n) [n]:

Screen 8:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Flash refers to a type of memory that can be erased and reprogrammed in units of memory known as blocks rather than one byte at a time; thus, making updating to memory easier.

If you choose to save to flash, your configurations thus far will still be in the memory of the system even after you reboot it. If you don't save to flash and if you were to reboot the system, all your new configurations will be lost and you will have to reconfigure the system.

Do you want to save your configurations to flash? (y/n) [n] :

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CLI Method

To configure certain parameters for a specific serial port:

Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be ttyS<serial port number> :

```
config configure line <serial port number> tty <string>
```

To configure host:

```
config configure line <serial port number> host <string>
```

To configure term:

```
config configure line <serial port number> term <string>
```

To configure conf.locallogins:

```
config configure conf locallogins <number>
```



Tip. You can configure all the parameters for a serial port in one line.

```
config configure line <serial port number> tty <string>  
host <string> term <string>locallogins <number>
```

Step 2: Activate and Save.

To activate your new configurations and save them to flash, type:

```
config write
```

(This is essentially typing *signal_ras hup* and *saveconf* from the normal terminal prompt.)

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Serial Settings

This feature controls the speed, data size, parity, and stop bits of all ports. It also sets the flow control to hardware, software, or none; the DCD signal; and tty settings after a socket connection to that serial port is established.

Parameters Involved and Passed Values

Terminal Settings involve the following parameters (the first four are physical parameters):

<i>all.speed</i>	The speed for all ports. Default value: <i>9600</i> .
<i>all.datasize</i>	The data size for all ports. Default value: <i>8</i> .
<i>all.stopbits</i>	The number of stop bits for all ports. Default value: <i>1</i> .
<i>all.parity</i>	The parity for all ports. Default value: <i>none</i> .
<i>all.flow</i>	This sets the flow control to hardware, software, or none. Default value: <i>none</i> .
<i>all.dcd</i>	DCD signal (sets the tty parameter CLOCAL). Valid values are 0 or 1. If <i>all.dcd=0</i> , a connection request will be accepted regardless of the DCD signal and the connection will not be closed if the DCD signal is set to DOWN. If <i>all.dcd=1</i> a connection request will be accepted only if the DCD signal is UP and the connection will be closed if the DCD signal is set to DOWN. Default value: <i>0</i> .

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all.sttyCmd (for CAS only) The TTY is programmed to work as configured and this user-specific configuration is applied over that serial port. Parameters must be separated by a space. The following example sets :

-igncr

This tells the terminal not to ignore the carriage-return on input,

-onlcr

Do not map newline character to a carriage return or newline character sequence on output,

opost

Post-process output,

-icrnl

Do not map carriage-return to a newline character on input.

```
all.sttyCmd -igncr -onlcr opost -icrnl
```

DTR_reset (for CAS only) This parameter specifies the behavior of the DTR signal in the serial port configured with buffering or sniff session. If set to zero the DTR signal will be ON if there is a connection to the serial port, otherwise OFF. If set from 1 to 99 the DTR signal will be always ON. A value greater or equal 100 specifies for how long (in milliseconds) the DTR signal will be turned off before it is turned back on again when a connection to the serial port is closed. Example value: 3.

Configuration for CAS

Browser Method

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server's IP address. For example:

```
http://10.0.0.0
```

Step 2: Log in as root and type the Web root password configured by the Web server.

This will take you to the Configuration and Administration page.

Step 3: Select the Serial Ports link.

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Click on the Serial Ports link on the Link Panel to the left of the page or in the Configuration section of the page. This will take you to the Port Selection page.

Step 4: Select port(s).

On the Port Selection page, choose all ports or an individual port to configure, from the dropdown menu. Click the Submit button. This will take you to the Serial Port Configuration page.

Step 5: Click the "CAS Profile" button.

Step 6: Scroll down to the Physical section.

You can change the settings for Speed, Data Size, Stop Bit, Parity, Flow Control, and DCD-sensitivity here.

Step 7: Click on the Submit button.

Step 8: Make the changes effective.

Click on the Administration > Run Configuration link, check the Serial Ports/Ethernet/Static Routes box and click on the Activate Configuration button.

Step 9: Click on the link Administration > Load/Save Configuration.

Step 10: Click the Save Configuration to Flash button.

The configuration was saved in flash.

Wizard Method

Step 1: Bring up the wizard.

At the command prompt, type the following to bring up the CAS Terminal Settings custom wizard:

```
wiz --sset cas
```

Screen 1 will appear.

Screen 1:

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```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER. Enter '#' if you want to deactivate that parameter or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or
- 3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

Press ENTER to continue...

Screen 2:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.speed : 9600
all.datasize : 8
all.stopbits : 1
```

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```
all.parity : none
all.flow : none
all.dcd : 0
all.DTR_reset : 100
all.sttyCmd : #
Set to defaults? (y/n) [n] :
```

Screen 3:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
ALL.SPEED - The data speed in bits per second (bps) of
all ports.

all.speed[9600] :

ALL.DATASIZE - The data size in bits per character of
all ports.

all.datasize[8] :
```

Screen 4:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****

ALL.STOPBITS - The number of stop bits for all ports.

all.stopbits[1] :
```

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ALL.PARITY - The parity for all ports.
(e.g. none, odd, even)

all.parity[none] :

Screen 5:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.FLOW - This sets the flow control to hardware,
software, or none. (e.g. hard, soft, none)

all.flow[none] :

ALL.DCD - DCD signal (sets the tty parameter CLOCAL).
Valid values are 0 or 1. In a socket session, if
all.dcd=0, a connection request (telnet or ssh) will be
accepted regardless of the DCD signal and the connection
will not be closed if the DCD signal is set to DOWN. In a
socket connection, if all.dcd=1 a connection request will
be accepted only if the DCD signal is UP and the connection
(telnet or ssh) will be closed if the DCD signal is set to
DOWN.

all.dcd[0] :

Screen 6:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.DTR_RESET - This parameter specifies the behavior of the
DTR signal in the serial port. If set to 0 the DTR signal

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will be ON if there is a connection to the serial port, otherwise it will be OFF. If set from 1 to 99 the DTR signal will be always ON. A value greater or equal to 100 specifies for how long (in milliseconds) the DTR signal will be turned off before it is turned back on again when a connection to the serial port is closed.

```
all.DTR_reset[100] :
```

ALL.STTYCMD - Tty settings after a socket connection to that serial port is established. The tty is programmed to work as a CAS profile and this user specific configuration is applied over that serial port. Parameters must be separated by space.(e.g. all.sttyCmd -igncr -onlcr opost -icrnl)-igncr tells the terminal not to ignore the carriage-return on input, -onlcr means do not map newline character to a carriage return/newline character sequence on output, opost represents post-process output, -icrnl means do not map carriage-return to a newline character on input.

```
all.sttyCmd[#] :
```

Screen 7:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
Current configuration:
(The ones with the '#' means it's not activated.)
```

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```
all.speed : 9600
all.datasize : 8
all.stopbits : 1
all.parity : none
all.flow : none
all.dcd : 0
all.DTR_reset : 100
all.sttyCmd : #
```

Are these configuration(s) all correct? (y/n) [n] :

If you type 'n'

Type 'c' to go back and CORRECT these parameters
or 'q' to QUIT :

Typing 'c' repeats the application, typing 'q' exits the entire wiz application

If you type 'y'

Discard previous port-specific parameters? (y/n) [n] :



Note: Answering yes to this question will discard only the parameter(s) which you are currently configuring if they were configured for a specific port in a previous session. For instance, if you are currently configuring parameter, all.x, and there was a specific port, s2.x, configured; then, answering yes to this question will discard s2.x.

Type 'c' to CONTINUE to set these parameters for
specific ports or 'q' to QUIT :

Typing 'c' leads to Screen 8, typing 'q' leads to Screen 9.

Screen 8:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
You have 8 available ports on this system.
```

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Type 'q' to quit, a valid port number[1-8], or anything else to refresh :



Note: The number of available ports depends on the system you are on. Typing in a valid port number repeats this program except this time it's configuring for the port number you have chosen. Typing 'q' leads to Screen 9.

Screen 9:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

(Note: If you are NOT connected to this unit through a console, and you have just reconfigured the IP of this unit, activating the new configurations may cause you to lose connection. In that case, please reconnect to the unit by the new IP address, and manually issue a saveconf to save your configurations to flash.)

Do you want to activate your configurations now? (y/n) [n]:

Screen 10:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

Flash refers to a type of memory that can be erased and

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reprogrammed in units of memory known as blocks rather than one byte at a time; thus, making updating to memory easier.

If you choose to save to flash, your configurations thus far will still be in the memory of the system even after you reboot it. If you don't save to flash and if you were to reboot the system, all your new configurations will be lost and you will have to reconfigure the system.

Do you want to save your configurations to flash? (y/n) [n] :

CLI Method

To configure line parameters for a specific serial port.

Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be ttyS<serial port number> :

```
config configure line <serial port number> tty <string>
```

To configure speed:

```
config configure line <serial port number> speed <number>
```

To configure datasize:

```
config configure line <serial port number> datasize <number>
```

To configure stopbits:

```
config configure line <serial port number> stopbits <number>
```

To configure parity:

```
config configure line <serial port number> parity <string>
```

To configure flow:

```
config configure line <serial port number> flow <string>
```

To configure dcd:

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```
config configure line <serial port number> dcd <number>
```

To configure DTR_reset:

```
config configure line <serial port number> dtr_reset  
<number>
```

To configure sttyCmd:

```
config configure line <serial port number> sttycmd <string>
```



Tip. You can configure all the parameters for a serial port in one line:

```
config configure line <serial port number> tty <string>  
speed <number> datasize <number> stopbits <number> par-  
ity <string> flow <string> dcd <number> dtr_reset <num-  
ber> sttycmd <string>
```

Step 2: Activate and Save.

To activate your new configurations and save them to flash, type:

```
config write
```

(This is essentially typing *signal_ras hup* and *saveconf* from the normal terminal prompt.)

Configuration for TS

Browser Method

See the browser method for the CAS, earlier in this section. The only difference for TS is that “TS Profile” button should be clicked in Step 5.

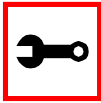
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Wizard Method

Step 1: Bring up the wizard.

At the command prompt, type the following to bring up the TS Terminal Settings custom wizard:

```
wiz --sset ts
```



Note: Screens 1- 5 are the same as those of the previous wizard for sset cas, thus, they are omitted here. The only difference between this feature and the CAS wizard is the parameter styCmd and DTR_reset. In the TS configuration, neither of these parameters is requested.

Screen 6:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.speed : 9600  
all.datasize : 8  
all.stopbits : 1  
all.parity : none  
all.flow : none  
all.dcd : 0
```

Are these configuration(s) all correct? (y/n) [n] :

If you type 'n':

Type 'c' to go back and CORRECT these parameters
or 'q' to QUIT :

Typing 'c' repeats the application, typing 'q' exits the entire wiz application.

If you type 'y':

Type 'c' to CONTINUE to set these parameters for specific
ports or 'q' to QUIT :

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Typing 'c' leads to Screen 7 typing 'q' leads to Screen 8.

Screen 7:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****  
You have 8 available ports on this system.
```

Type 'q' to quit, a valid port number[1-8], or anything else to refresh :



Note: The number of available ports depends on the system you are on. Typing in a valid port number repeats this program except this time it's configuring for the port number you have chosen. Typing 'q' leads to Screen 8.

Screen 8:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

(Note: If you are NOT connected to this unit through a console, and you have just reconfigured the IP of this unit, activating the new configurations may cause you to lose connection. In that case, please reconnect to the unit by the new IP address, and manually issue a saveconf to save your configurations to flash.)

Do you want to activate your configurations now? (y/n) [y] :

Screen 9:

```
*****
```

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```
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Flash refers to a type of memory that can be erased and reprogrammed in units of memory known as blocks rather than one byte at a time; thus, making updating to memory easier.

If you choose to save to flash, your configurations thus far will still be in the memory of the system even after you reboot it. If you don't save to flash and if you were to reboot the system, all your new configurations will be lost and you will have to reconfigure the system.

Do you want to save your configurations to flash? (y/n) [n] :

CLI Method

To configure line parameters for a specific serial port:

Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be ttyS<serial port number> :

```
config configure line <serial port number> tty <string>
```

To configure speed:

```
config configure line <serial port number> speed <number>
```

To configure datasize:

```
config configure line <serial port number> datasize <number>
```

To configure stopbits:

```
config configure line <serial port number> stopbits <number>
```

To configure parity:

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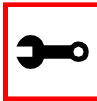
```
configure line <serial port number> parity <string>
```

To configure flow:

```
config configure line <serial port number> flow <string>
```

To configure dcd:

```
config configure line <serial port number> dcd <number>
```



Tip. You can configure all the parameters for a serial port in one line:

```
config configure line <serial port number> tty <string>  
speed <number> datasize <number> stopbits <number>  
parity <string> flow <string> dcd <number>
```

Step 2: Activate and Save.

To activate your new configurations and save them to flash, type:

```
config write
```

(This is essentially typing *signal_ras hup* and *saveconf* from the normal terminal prompt.)

Configuration for Dial-in Access

Browser Method

See the browser method for the CAS, earlier in this section. The only difference for Dial-in is that the “Dial-in Profile” button should be clicked in Step 5.

CLI Method

To configure line parameters for a specific serial port:

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Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be ttyS<serial port number> :

```
config configure line <serial port number> tty <string>
```

To configure speed:

```
config configure line <serial port number> speed <number>
```

To configure datasize:

```
config configure line <serial port number> datasize <number>
```

To configure stopbits:

```
config configure line <serial port number> stopbits <number>
```

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Session Sniffing

Versions 1.3.2 and earlier

The Cyclades-TS allows a maximum of two connections to each serial port, as follows:

- One common session: user can execute read and write commands to the tty port. Session can be established by a regular user or by an administrator.
- One sniffer session: user can execute only read commands, in order to monitor what is going on in the other (main) session. Session can only be established by an administrator, defined by the parameter `all.admin_users` or `sN.admin_users` in the file `pslave.conf` (exception: authentication none - anyone can open a sniffer).

The first connection always opens a common session. After the second connection has been established and the user is authenticated, the Cyclades-TS shows the following menu to the administrator user:

```
-----  
*  
* * * ttySN is being used by (<user_name>) !!!  
*  
1 - Assume the main session  
2 - Initiate a sniff session  
3 - Quit  
Enter your option:  
-----
```

If the second user is not an administrator, his connection is automatically refused. This description is valid for all of the available protocols (`socket_server`, `socket_ssh` or `raw_data`).

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Versions 1.3.3 and later

You can open more than one common and sniff session at the same port. For this purpose, the following configuration items are available in the file `pslave.conf`:

- `all.multiple_sessions`: If it is configured as *no*, only two users can connect to the same port simultaneously. If it is configured as *yes*, more than two simultaneous users can connect to the same serial port. A “Sniffer menu” will be presented to the user and they can choose either to open a sniff session; to open a read and/or write session; to cancel a connection; or to send a message to other users connected to the same serial port. If it is configured as “`RW_sessions`,” only read and/or write sessions will be opened, and the sniffer menu won’t be presented. If it is configured as “`sniff_session`” only, a sniff session will be opened, and the sniffer menu won’t be presented. Default value: *no*.
- `sN.multiple_sessions`: Valid only for port N. If it is not defined, it will assume the value of `all.multiple_sessions`.
- `all.escape_char`: Valid for all the serial ports; this parameter will be used to present the menus below to the user. Only characters from ‘`^a`’ to ‘`^z`’ (i.e., CTRL-A to CTRL-Z) will be accepted. The default value is ‘`^z`’ (CTRL-Z).
- `sN.escape_char`: Valid only for port N; this parameter will be used to present the menus below to the user. Only characters from ‘`^a`’ to ‘`^z`’ (i.e. CTRL-A to CTRL-Z) will be accepted. If it is not defined, it will assume the value of `all.escape_char`.

When multiple sessions are allowed for one port, the behavior of the Cyclades-TS will be as follows:

1. The first user to connect to the port will open a common session.
2. From the second connection on, only admin users will be allowed to connect to that port. The Cyclades-TS will send the following menu to these administrators (defined by the parameter `all.admin_users` or `sN.admin_users` in the file `pslave.conf`):

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```
*
* * * ttySN is being used by (<first_user_name>) !!!
*
1 - Initiate a regular session
2 - Initiate a sniff session
3 - Send messages to another user
4 - Kill session(s)
5 - Quit
Enter your option:
```

If the user selects *1 - Initiate a regular session*, s/he will share that serial port with the users that were previously connected. S/he will read everything that is received by the serial port, and will also be able to write to it.

If the user selects *2 - Initiate a sniff session*, s/he will start reading everything that is sent and/or received by the serial port, according to the parameter `all.sniff_mode` or `sN.sniff_mode` (that can be in, out or i/o).

When the user selects *3 - Send messages to another user*, the Cyclades-TS will send the user's messages to all the sessions, but not to the tty port. Everyone connected to that port will see all the "conversation" that's going on, as if they were physically in front of the console in the same room. These messages will be formatted as:

```
[Message from user/PID] <<message text goes here>> by the TS
```

To inform the Cyclades-TS that the message is to be sent to the serial port or not, the user will have to use the menu.

If the administrator chooses the option *4 - Kill session(s)*, the Cyclades-TS will show him/her a list of the pairs `PID/user_name`, and s/he will be able to select one session typing its PID, or "all" to kill all the sessions. If the administrator kills all the regular sessions, his session initiates as a regular session automatically.

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Option 5 - Quit will close the current session and the TCP connection.

Only for the administrator users:

Typing *all.escape_char* or *sN.escape_char* from the sniff session or “send message mode” will make the TS show the previous menu. The first regular sessions will not be allowed to return to the menu. If you kill all regular sessions using the option 4, your session initiates as a regular session automatically.

Parameters Involved and Passed Values

Sniffing involves the following parameters:

<i>all.admin_users</i>	This parameter determines which users can receive the sniff menu. When users want access per port to be controlled by administrators, this parameter is obligatory and <i>authype</i> must not be none. User groups (defined with the parameter <i>conf.group</i>) can be used in combination with user names in the parameter list. Example values: peter, john, user_group.
<i>all.sniff_mode</i>	This parameter determines what other users connected to the very same port (see parameter <i>admin_users</i> below) can see of the session of the first connected user (main session): <i>in</i> shows data written to the port, <i>out</i> shows data received from the port, and <i>i/o</i> shows both streams. The second and later sessions are called sniff sessions and this feature is activated whenever the protocol parameter is set to <i>socket_ssh</i> or <i>socket_server</i> . Example value: out.
<i>all.escape_char</i>	This parameter determines which character must be typed to make the session enter <i>menu mode</i> . The possible values are <CTRL-a> to <CTRL-z>. Represent the CTRL with carat: ^. This parameter is only valid when the port protocol is <i>socket_server</i> or <i>socket_ssh</i> . Default value is ^z.

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all.multiple_sessions If it is configured as *no*, only two users can connect to the same port simultaneously. If it is configured as *yes*, more than two simultaneous users can connect to the same serial port. A “Sniffer menu” will be presented to the user and they can choose either to open a sniff session; to open a read and/or write session; to cancel a connection; or to send a message to other users connected to the same serial port. If it is configured as “RW_sessions,” only read and/or write sessions will be opened, and the sniffer menu won’t be presented. If it is configured as “sniff_session” only, a sniff session will be opened, and the sniffer menu won’t be presented. Default value: no.

Configuration for CAS

vi Method

Only the file `/etc/portslave/pslave.conf` has to be changed.

Browser Method

To configure Session Sniffing with your browser:

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server’s IP address. For example:

```
http://10.0.0.0
```

Step 2: Log in as root and type the Web root password configured by the Web server.

This will take you to the Configuration and Administration page.

Step 3: Select the Serial Ports link.

Click on the Serial Ports link on the Link Panel to the left of the page or in the Configuration section of the page. This will take you to the Port Selection page.

Step 4: Select port(s).

On the Port Selection page, choose all ports or an individual port to configure, from the dropdown menu. Click the Submit button. This will take you to the Serial Port Configuration page.

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Step 5: Scroll down to the Sniff Session section.

You can configure the appropriate values here.

Sniff session	
Sniff Session Mode:	Output ▾
Administrative Users:	<input type="text"/>
Escape char from sniff mode:	<input type="text"/>
Allows multiple sniff sessions:	<input type="radio"/> yes <input checked="" type="radio"/> no

Figure 30: Sniff Session section of the Serial Port Configuration page

Step 6: Click on the Submit button.

Step 7: Make the changes effective.

Click on the [Administration > Run Configuration](#) link, check the [Serial Ports/Ethernet/Static Routes](#) box and click on the [Activate Configuration](#) button.

Step 8: Click on the link [Administration > Load/Save Configuration](#).

Step 9: Click the [Save Configuration to Flash](#) button.

The configuration was saved in flash.

Wizard Method

Step 1: Bring up the wizard.

At the command prompt, type the following to bring up the Sniffing custom wizard:

```
wiz --snf
```

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Screen 1:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER. Enter '#' if you want to deactivate that parameter or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or
- 3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

Press ENTER to continue...

Screen 2:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.admin_users : #
all.sniff_mode  : out
all.escape_char : ^z
all.multiple_sessions : no
```

Set to defaults? (y/n) [n] :

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Screen 3:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.ADMIN_USERS - This parameter determines which users can open a sniff session, which is where other users connected to the very same port can see everything that the first user is doing. The other users connected to the very same port can also cancel the first user's session (and take over). If the parameter, `all.multiple_sessions`, is configured as 'no', then only two users can connect to the same port simultaneously. If it is configured as 'yes', more simultaneous users can sniff the session or have read/write permissions.

(Please see details in Session Sniffing in Chapter 3 of the system's manual.)

```
all.admin_users[#] :
```

ALL.SNIFF_MODE - This parameter determines what other users connected to the very same port can see of the session of the first connected user (main session). The second session is called a sniff session and this feature is activated whenever the protocol is set to `socket_ssh` or `socket_server`.

(e.g. `in -shows` data written to the port, `out -shows` data received from the port, `i/o -shows` both streams.)

```
all.sniff_mode[out] :
```

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Screen 4:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.ESCAPE_CHAR - This parameter determines which character must be typed to make the session enter into "menu mode." The possible values are <CTRL-a> to <CTRL-z>, and this is only valid when the port protocol is socket_server or socket_ssh. Represent the CTRL character with '^'. Default value is ^z.

```
all.escape_char[^z] :
```

ALL.MULTIPLE_SESSIONS - Allows users to open multiple common and sniff sessions on the same port. The options are "yes," "no," "RW_session," or "sniff_session." Default is set to "no."

```
all.multiple_sessions[no] :
```

Screen 5:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:
(The ones with the '#' means it's not activated.)

```
all.admin_users : #  
all.sniff_mode : out  
all.escape_char : ^z  
all.multiple_sessions : no
```

```
Are these configuration(s) all correct? (y/n) [n] :
```

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If you type 'N'

Type 'c' to go back and CORRECT these parameters
or 'q' to QUIT :

Typing 'c' repeats the application, typing 'q' exits the entire wiz application

If you type 'Y'

Discard previous port-specific parameters? (y/n) [n] :



Note: Answering yes to this question will discard only the parameter(s) which you are currently configuring if they were configured for a specific port in a previous session. For instance, if you are currently configuring parameter, all.x, and there was a specific port, s2.x, configured; then, answering yes to this question will discard s2.x.

Type 'c' to CONTINUE to set these parameters for
specific ports or 'q' to QUIT :

Typing 'c' leads to Screen 6, typing 'q' leads to Screen 7.

Screen 6:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****  
You have 8 available ports on this system.
```

Type 'q' to quit, a valid port number[1-8], or anything
else to refresh :



NOTE: The number of available ports depends on the system you are on. Typing in a valid port number repeats this program except this time it's configuring for the port number you have chosen. Typing 'q' leads to Screen 7.

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Screen 7:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

(Note: If you are NOT connected to this unit through a console, and you have just reconfigured the IP of this unit, activating the new configurations may cause you to lose connection. In that case, please reconnect to the unit by the new IP address, and manually issue a saveconf to save your configurations to flash.)

Do you want to activate your configurations now? (y/n) [y] :

Screen 8:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Flash refers to a type of memory that can be erased and reprogrammed in units of memory known as blocks rather than one byte at a time; thus, making updating to memory easier.

If you choose to save to flash, your configurations thus far will still be in the memory of the system even after you reboot it. If you don't save to flash and if you were to reboot the system, all your new configurations will be lost and you will have to reconfigure the system.

Do you want to save your configurations to flash? (y/n) [n] :

Chapter 3 - Additional Features

CLI Method

To configure certain parameters for a specific serial port:

Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be ttyS<serial port number> :

```
config configure line <serial port number> tty <string>
```

To configure admin_users:

```
config configure line <serial port number> adminusers  
<string>
```

To configure sniff_mode:

```
config configure line <serial port number> sniffmode  
<string>
```

To configure escape_char:

```
config configure line <serial port number> escape <string>
```

To configure multiple_sessions:

```
config configure line <serial port number> multiplesess  
<string>
```



Tip. You can configure all the parameters for a serial port in one line.

```
config configure line <serial port number> tty <string>  
adminusers <string> sniffmode <string> escape <string>  
multiplesess <string>
```

Step 2: Activate and Save.

To activate your new configurations and save them to flash, type:

```
config write
```

Chapter 3 - Additional Features

SNMP

Short for Simple Network Management Protocol: a set of protocols for managing complex networks. The first versions of SNMP were developed in the early 80s. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters.

The TS uses the net-snmp package (<http://www.net-snmp.org>).



Important! Check the SNMP configuration before gathering information about ACS by SNMP. There are different types of attacks an unauthorized user can implement to retrieve sensitive information contained in the MIB. By default, the SNMP configuration in ACS cannot permit the public community to read SNMP information.

The net-snmp supports snmp version 1, 2 and 3. To use SNMP version 3 (username/password), perform the following steps:

Step 1: Create a file `/etc/snmp/snmpd.local.conf` with the following line:

```
createUser <username> MD5 <password> DES
```

Step 2: Include the following line in `/etc/snmp/snmpd.conf`, if the user has permission to read only:

```
rouser <username>
```

Step 3: Include the following line in `/etc/config_files`:

```
/etc/snmp/snmpd.local.conf
```

You can configure the `/etc/snmp/snmpd.conf` file as indicated later in this section.

1. Snmp version 1

- RFC1155 - SMI for the official MIB tree

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- RFC1213 - MIB-II
2. Snmp version 2
 - RFC2578 - Structure of Management Information Version 2 (SMIv2)
 - RFC2579 - Textual Conventions for SMIv2
 - RFC2580 - Conformance Statements for SMIv2
 3. Snmp version 3
 - RFC2570 - Introduction to Version 3 of the Internet-standard Network Management Framework
 - RFC2571 - An Architecture for Describing SNMP Management Frameworks
 - RFC2572 - Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
 - RFC2573 - SNMP Applications
 - RFC2574 - User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)
 - RFC2575 - View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)
 - RFC2576 - Coexistence between Version 1, Version 2, and Version 3 of the Internet-standard Network Management Framework
 4. Private UCD SNMP mib extensions (enterprises.2021)
 - Information about memory utilization (/proc/meminfo)
 - Information about system status (vmstat)
 - Information about net-snmp packet
 5. Private Cyclades Vendor MIB (enterprises.2925)
 - Cyclades TSxx Remote Management Object Tree (cyclades.4). This MIB permits you to get informations about the product, to read/write some configuration items and to do some administration commands. (For more details see the cyclades.mib file.)

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Configuration for CAS, TS, and Dial-in Access

vi Method

Files to be changed:

`/etc/snmp/snmpd.conf`

This file has information about configuring for SNMP.

Browser Method

To configure SNMP with your browser:

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server's IP address. For example:

`http://10.0.0.0`

Step 2: Log in as root and type the Web root password configured by the Web server.

This will take you to the Configuration and Administration page.

Step 3: Click on the SNMP link.

Select the SNMP link. The SNMP configuration file will appear in text mode.

Step 4: Edit the configuration file and click on the Submit button

Step 5: Make changes effective.

Click on the Administration > Run Configuration link. Check the SNMP box and click on the Activate Configuration button.

Step 6: Click on the Administration > Load/Save Configuration and click on the Save to Flash button.

This will save the file in the flash.

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Syslog

The syslog-ng daemon provides a modern treatment to system messages. Its basic function is to read and log messages to the system console, log files, other machines (remote syslog servers) and/or users as specified by its configuration file. In addition, syslog-ng is able to filter messages based on their content and to perform an action (e.g. to send an e-mail or pager message). In order to access these functions, the *syslog-ng.conf* file needs some specific configuration.

The configuration file (default: *syslog-ng.conf*) is read at startup and is reread after reception of a hangup (HUP) signal. When reloading the configuration file, all destination files are closed and reopened as appropriate. The syslog-ng reads from sources (files, TCP/UDP connections, syslogd clients), filters the messages and takes an action (writes in files, sends snmptrap, pager, e-mail or syslogs to remote servers).

There are five tasks required for configuring syslog-ng:

- Task 1: Define Global Options.
- Task 2: Define Sources.
- Task 3: Define Filters.
- Task 4: Define Actions (Destinations).
- Task 5: Connect all of the above.

The five tasks are explained in the following section [“Syslog-ng and its Configuration” on page 229](#).

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Port Slave Parameters Involved with syslog-ng

<i>conf.facility</i>	This value (0-7) is the Local facility sent to the syslog-ng from PortSlave.
<i>conf.DB_facility</i>	This value (0-7) is the Local facility sent to the syslog-ng with data when <code>syslog_buffering</code> and/or <code>alarm</code> is active. When nonzero, the contents of the data buffer are sent to the syslogng every time a quantity of data equal to this parameter is collected. The syslog level for data buffering is hard coded to level five (notice) and facility <code>local[0+ conf.DB_facility]</code> . The file <code>/etc/syslog-ng/syslog-ng.conf</code> should be set accordingly for the syslog-ng to take some action. Example value: 0.
<i>all.syslog_buffering</i>	When nonzero, the contents of the data buffer are sent to the syslog-ng every time a quantity of data equal to this parameter is collected. The syslog message is sent to syslog-ng with NOTICE level and <code>LOCAL[0+conf.DB_facility]</code> facility.

Configuration for CAS, TS, and Dial-in Access

vi Method

To change the PortSlave parameters: edit the `/etc/portslave/pslave.conf` file.

To change the syslog-ng configuration: edit the `/etc/syslog-ng/syslog-ng.conf` file.

Browser Method

To configure the PortSlave parameters, see the Data Buffering section. To configure syslog via your Web browser:

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server's IP address. For example:

```
http://10.0.0.0
```

Step 2: Log in as root and type the Web root password configured by the Web server.

This will take you to the Configuration and Administration page.

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Step 3: Click Syslog on the Configuration section.

Select the Syslog link. The following page will appear, giving information for configuring syslog:

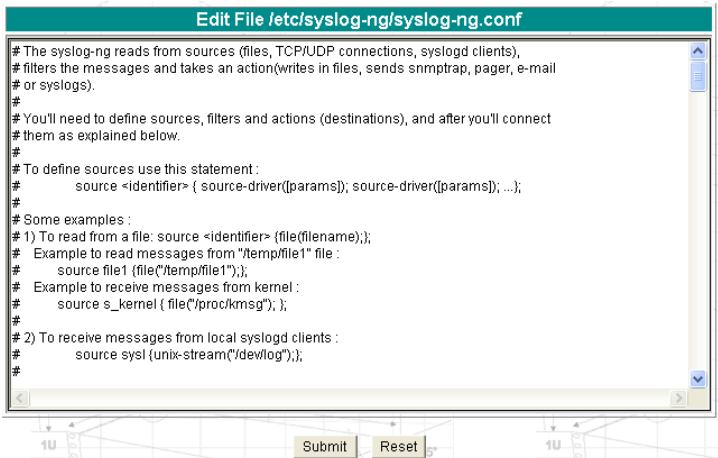


Figure 31: Syslog page 1

Step 4: Edit the configuration file and click on the Submit button

Step 5: Make changes effective.

Click on the Administration > Run Configuration link. Check the Syslog-ng box and click on the Activate Configuration button.

Step 6: Click on the Administration > Load/Save Configuration and click on the Save to Flash button.

This will save the file in the flash.

Wizard Method

Step 1: Bring up the wizard.

At the command prompt, type the following to bring up the PortSlave parameters involved with the Syslog custom wizard:

```
wiz --sl
```


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Screen 1 will appear.

Screen 1:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER. Enter '#' if you want to deactivate that parameter or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or
- 3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

Press ENTER to continue...

Screen 2:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
conf.facility : 7  
conf.DB_facility : 0
```

Set to defaults? (y/n) [n] :

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Screen 3:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

CONF.FACILITY - This value (0-7) is the Local facility sent to the syslog. The file /etc/syslog-ng/syslog-ng.conf contains a mapping between the facility number and the action.

(Please see the 'Syslog-ng Configuration to use with Syslog Buffering Feature' section under Generating Alarms in Chapter 3 the system's manual for the syslog-ng configuration file.)

```
conf.facility[7] :
```

CONF.DB_FACILITY - This value (0-7) is the Local facility sent to the syslog with the data when syslog_buffering is active. The file /etc/syslog-ng/syslog-ng.conf contains a mapping between the facility number and the action.

(Please see the 'Syslog-ng Configuration to use with Syslog Buffering Feature' section under Generating Alarms in Chapter 3 the system's manual for the syslog-ng configuration file.)

```
conf.DB_facility[0] :
```



Note: all.syslog_buffering is configured under the wiz - - db.

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Screen 4:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
conf.facility : 7  
conf.DB_facility : 0
```

Are these configuration(s) all correct? (y/n) [n] :

If you type 'n'

Type 'c' to go back and CORRECT these parameters
or 'q' to QUIT :

Typing 'c' repeats the application, typing 'q' exits the entire wiz application

If you type 'y' it leads to Screen 5.

Screen 5:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

(Note: If you are NOT connected to this unit through a console, and you have just reconfigured the IP of this unit, activating the new configurations may cause you to lose connection. In that case, please reconnect to the unit by the new IP address, and manually issue a saveconf to save your configurations to flash.)

Do you want to activate your configurations now? (y/n) [y] :

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Screen 6:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Flash refers to a type of memory that can be erased and reprogrammed in units of memory known as blocks rather than one byte at a time; thus, making updating to memory easier.

If you choose to save to flash, your configurations thus far will still be in the memory of the system even after you reboot it. If you don't save to flash and if you were to reboot the system, all your new configurations will be lost and you will have to reconfigure the system.

Do you want to save your configurations to flash? (y/n) [n] :

CLI Method

To configure certain parameters for a specific serial port:

Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be ttyS<serial port number> :

```
config configure line <serial port number> tty <string>
```

To configure conf.facility:

```
config configure conf facility <number>
```

To configure DB_facility:

```
config configure conf dbfacility <number>
```

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Tip. You can configure all the conf parameters in one line.

```
config configure conf facility <number> dbfacility  
<number>
```

Step 2: Activate and Save.

To activate your new configurations and save them to flash, type:

```
config write
```

(This is essentially typing *signal_ras hup* and *saveconf* from the normal terminal prompt.)

The Syslog Functions

This section shows the characteristics of the syslog-ng that is implemented for all members of the Cyclades-TS family. It is divided into three parts:

1. [Syslog-ng and its Configuration](#)
2. [Syslog-ng Configuration to use with Syslog Buffering Feature](#)
3. [Syslog-ng Configuration to use with Multiple Remote Syslog Servers](#)

Syslog-ng and its Configuration

The five tasks previously mentioned are detailed below.

Task 1: Specify Global Options.

You can specify several global options to syslog-ng in the options statement:

```
options { opt1(params); opt2(params); ... };
```

where *optn* can be any of the following:

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<i>time_reopen(n)</i>	The time to wait before a dead connection is reestablished.
<i>time_reap(n)</i>	The time to wait before an idle destination file is closed.
<i>sync_freq(n)</i>	The number of lines buffered before written to file. (The file is synced when this number of messages has been written to it.)
<i>mark_freq(n)</i>	The number of seconds between two MARKS lines.
<i>log_fifo_size(n)</i>	The number of lines fitting to the output queue.
<i>chain_hostname (yes/no) or long_hostname (yes/no)</i>	Enable/disable the chained hostname format.
<i>use_time_rcvd (yes/no)</i>	Use the time a message is received instead of the one specified in the message.
<i>use_dns (yes/no)</i>	Enable or disable DNS usage. syslog-ng blocks on DNS queries, so enabling DNS may lead to a Denial of Service attack.
<i>gc_idle_threshold(n)</i>	Sets the threshold value for the garbage collector, when syslog-ng is idle. GC phase starts when the number of allocated objects reach this number. Default: 100.
<i>gc_busy_threshold(n)</i>	Sets the threshold value for the garbage collector. When syslog-ng is busy, GC phase starts.
<i>create_dirs(yes/no)</i>	Enable the creation of new directories.
<i>owner(name)</i>	Set the owner of the created file to the one specified. Default: root.
<i>group(name)</i>	Set the group of the created file to the one specified. Default: root.
<i>perm(mask)</i>	Set the permission mask of the created file to the one specified. Default: 0600.

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Task 2: Define sources.

To define sources use this statement:

```
source <identifier> { source-driver([params]); source
driver([params]); ...};
```

where:

<i>identifier</i>	Has to uniquely identify this given source.
<i>source-driver</i>	Is a method of getting a given message.
<i>params</i>	Each source-driver may take parameters. Some of them are required, some of them are optional.

The following source-drivers are available:

<i>a) internal()</i>	Messages are generated internally in syslog-ng.
<i>b) unix-stream (filename [options])</i>	They open the given AF_UNIX socket, and start listening for messages. Options: owner(name), group(name), perm(mask) are equal global options
<i>and</i>	
<i>unix-dgram (filename [options])</i>	<i>keep-alive(yes/no)</i> - Selects whether to keep connections opened when syslog-ng is restarted. Can be used only with <i>unix_stream</i> . Default: yes <i>max-connections(n)</i> - Limits the number of simultaneously opened connections. Can be used only with <i>unix_stream</i> . Default: 10.

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- c) tcp([options])* These drivers let you receive messages from the network, and as the name of the drivers show, you can use both TCP and UDP.
- and* None of `tcp()` and `udp()` drivers require positional parameters. By default they bind to 0.0.0.0:514, which means that `syslog-ng` will listen on all available interfaces.
- udp([options])*
- Options:
- ip(<ip address>)* - The IP address to bind to. Default: 0.0.0.0.
 - port(<number>)* - UDP/TCP port used to listen messages. Default: 514.
 - max-connections(n)* - Limits the number of simultaneously opened connections. Default: 10.
- d) file(filename)* Opens the specified file and reads messages.
- e) pipe(filename)* Opens a named pipe with the specified name, and listens for messages. (You'll need to create the pipe using `mkfifo` command).

Some Examples of Defining Sources

1) To read from a file:

```
source <identifier> {file(filename)};
```

Example to read messages from "/temp/file1" file:

```
source file1 {file('/temp/file1')};
```

Example to receive messages from the kernel:

```
source s_kernel { file('/proc/kmsg'); };
```

2) To receive messages from local `syslogd` clients:

```
source sys1 {unix-stream('/dev/log')};
```

3) To receive messages from remote `syslogd` clients:

```
source s_udp { udp(ip(<cliente ip>) port(<udp port>))};
```

Example to listen to messages from all machines on UDP port 514:

```
source s_udp { udp(ip(0.0.0.0) port(514))};
```


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Example to listen to messages from one client (IP address=10.0.0.1) on UDP port 999:

```
source s_udp_10 { udp(ip(10.0.0.1) port(999)); };
```

Task 3: Define filters.

To define filters use this statement:

```
filter <identifier> { expression; };  
where:
```

- identifier* Has to uniquely identify this given filter.
- expression* Boolean expression using internal functions, which has to evaluate to true for the message to pass.

The following internal functions are available:

- a) *facility(<facility code>)* Selects messages based on their facility code.
- b) *level(<level code>)* or *priority(<level code>)* Selects messages based on their priority.
- c) *program(<string>)* Tries to match the <string> to the program name field of the log message.
- d) *host(<string>)* Tries to match the <string> to the hostname field of the log message.
- e) *match(<string>)* Tries to match the <string> to the message itself.

Some Examples of Defining Filters

1) To filter by facility:

```
filter f_facilty { facility(<facility name>); };
```

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Examples:

```
filter f_daemon { facility(daemon); };
filter f_kern { facility(kern); };
filter f_debug { not facility(auth, authpriv, news, mail); };
```

2) To filter by level:

```
filter f_level { level(<level name>);};
```

Examples:

```
filter f_messages { level(info .. warn)};
filter f_emergency { level(emerg); };
filter f_alert { level(alert); };
```

3) To filter by matching one string in the received message:

```
filter f_match { match('string'); };
```

Example to filter by matching the string “named”:

```
filter f_named { match('named'); };
```

4) To filter ALARM messages (note that the following three examples should be one line):

```
filter f_alarm { facility(local[0+<conf.DB_facility>]) and
level(info) and match('ALARM') and match('<your string>'); } ;
```

Example to filter ALARM message with the string “kernel panic”:

```
filter f_kpanic { facility(local[0+<conf.DB_facility>]) and
level(info) and match('ALARM') and match('kernel panic'); };
```

Example to filter ALARM message with the string “root login”:

```
filter f_root { facility(local[0+<conf.DB_facility>]) and
level(info) and match('ALARM') and match('root login'); };
```

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5) To eliminate sshd debug messages:

```
filter f_sshd_debug { not program('sshd') or not level(debug); };
```

6) To filter the syslog buffering:

```
filter f_syslog_buf { facility(local[0+<conf.DB_facility>]) and level(notice); };
```

Task 4: Define Actions.

To define actions use this statement (note that the statement should be one line):

```
destination <identifier> { destination-driver([params]);  
destination-driver([param]); ..};
```

where:

<i>identifier</i>	Has to uniquely identify this given destination.
<i>destination driver</i>	Is a method of outputting a given message.
<i>params</i>	Each destination-driver may take parameters. Some of them required, some of them are optional.

The following destination drivers are available:

a) file(filename [options])

This is one of the most important destination drivers in syslog-ng. It allows you to output log messages to the named file. The destination filename may include macros (by prefixing the macro name with a '\$' sign) which gets expanded when the message is written. Since the state of each created file must be tracked by syslog-ng, it consumes some memory for each file. If no new messages are written to a file within 60 seconds (controlled by the `time_reap` global option), it's closed, and its state is freed.

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Available macros in filename expansion:

HOST - The name of the source host where the message originated from.

FACILITY - The name of the facility the message is tagged as coming from.

PRIORITY or LEVEL - The priority of the message.

PROGRAM - The name of the program the message was sent by.

YEAR, MONTH, DAY, HOUR, MIN, SEC - The year, month, day, hour, min, sec of the message was sent.

TAG - Equals FACILITY/LEVEL.

FULLHOST - The name of the source host and the source-driver:

<source-driver>@<hostname>

MSG or MESSAGE - The message received.

FULLDATE - The date of the message was sent.

Available options:

log_fifo_size(number) - The number of entries in the output file.

sync_freq(number) - The file is synced when this number of messages has been written to it.

owner(name), group(name), perm(mask) - Equals global options.

template("string") - Syslog-ng writes the "string" in the file. You can use the MACROS in the string.

encrypt(yes/no) - Encrypts the resulting file.

compress(yes/no) - Compresses the resulting file using zlib.

b) *pipe(filename [options])*

This driver sends messages to a named pipe. Available options:

owner(name), group(name), perm(mask) - Equals global options.

template("string") - Syslog-ng writes the "string" in the file. You can use the MACROS in the string.

c) *unix-stream(filename) and unix-dgram(filename)*

This driver sends messages to a UNIX socket in either SOCKET_STREAM or SOCK_DGRAM mode.

d) *udp("<ip address>" port(number);) and tcp("<ip address>" port(number);)*

This driver sends messages to another host (ip address/port) using either UDP or TCP protocol.

e) *usertty(<username>)*

This driver writes messages to the terminal of a logged-in username.

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f) *program* (<program name and arguments>)

This driver fork()'s executes the given program with the arguments and sends messages down to the stdin of the child.

Some Examples of Defining Actions

1) To send e-mail:

```
destination <ident> { pipe(`/dev/cyc_alarm' template('sendmail
<pars>'))};
```

where *ident*: uniquely identifies this destination. Parameters:

<i>-t</i> <name>[,<name>]	To address
<i>[-c</i> <name>[,<name>]]	CC address
<i>[-b</i> <name>[,<name>]]	Bcc address
<i>[-r</i> <name>[,<name>]]	Reply-to address
<i>-f</i> <name>	From address
<i>-s</i> \ <i>"</i> <text> <i>"</i>	Subject
<i>-m</i> \ <i>"</i> <text message> <i>"</i>	Message
<i>-h</i> <IP address or name>	SMTP server
<i>[-p</i> <port>]	Port used. default:25

To mount the message, use this macro:

\$FULLDATE	The complete date when the message was sent.
\$FACILITY	The facility of the message.
\$PRIORITY or \$LEVEL	The priority of the message.
\$PROGRAM	The message was sent by this program (BUFFERING or SOCK).

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<code>\$HOST</code>	The name of the source host.
<code>\$FULLHOST</code>	The name of the source host and the source driver. Format: <source>@<hostname>
<code>\$MSG</code> or <code>\$MESSAGE</code>	The message received.

Example to send e-mail to `z@none.com` (SMTP's IP address 10.0.0.2) from the e-mail address `a@none.com` with subject "TS-ALARM". The message will carry the current date, the host-name of this TS and the message that was received from the source.

```
destination d_maill {
    pipe('/dev/cyc_alarm'
        template('sendmail -t z@none.com -f a@none.com -s \'TS-ALARM\' \
            -m \'$FULLDATE $HOST $MSG\' -h 10.0.0.2'));
};
```

2) To send to pager server (sms server):

```
destination <ident> {pipe('/dev/cyc_alarm' template('sendsms
<pars>'))};
```

where `ident`: uniquely identify this destination

`pars`: `-d <mobile phone number>`

`-m \'<message - max.size 160 characters>\'`

`-u <username to login on sms server>`

`-p <port sms - default : 6701>`

`<server IP address or name>`

Example to send a pager to phone number 123 (Pager server at 10.0.0.1) with message carrying the current date, the hostname of this TS and the message that was received from the source:

```
destination d_pager {
```

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```
pipe(`/dev/cyc_alarm`  
template(`sendsms -d 123 -m \'$FULLDATE $HOST $MSG\' 10.0.0.1`));  
};
```

3) To send snmptrap:

```
destination <ident> {pipe(`/dev/cyc_alarm` template(`snmptrap  
<pars>`)); };
```

where ident : uniquely identify this destination

pars : -v 1

<snmptrapd IP address>

public : community

\"\" : enterprise-oid

\"\" : agent/hostname

<trap number> : 2-Link Down, 3-Link Up, 4-Authentication Failure

0 : specific trap

\"\" : host-uptime

.1.3.6.1.2.1.2.2.1.2.1 : interfaces.iftable.ifentry.ifdescr.1

s : the type of the next field (it is a string)

\"<message - max. size 250 characters>\"

Example to send a Link Down trap to server at 10.0.0.1 with message carrying the current date, the hostname of this TS and the message that was received from the source:

```
destination d_trap {  
pipe("/dev/cyc_alarm"  
template("snmptrap -v1 10.0.0.1 public \"\" \"\" 2 0 \"\" \"  
.1.3.6.1.2.1.2.2.1.2.1 s \"'$FULLDATE $HOST $MSG' "));
```

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```
};
```

4) To write in file :

```
destination d_file { file(<filename>);};
```

Example send message to console :

```
destination d_console { file("/dev/ttyS0");};
```

Example to write a message in /var/log/messages file:

```
destination d_message { file("/var/log/messages"); };
```

5) To write messages to the session of a logged-in user:

```
destination d_user { usertty("<username>"); };
```

Example to send message to all sessions with root user logged:

```
destination d_userroot { usertty("root"); };
```

6) To send a message to a remote syslogd server:

```
destination d_udp { udp("<remote IP address>" port(514)); };
```

Example to send syslogs to syslogd located at 10.0.0.1 :

```
destination d_udp1 { udp("10.0.0.1" port(514)); };
```

Task 5: Connect all of the above.

To connect the sources, filters, and actions, use the following statement. (Actions would be any message coming from one of the listed sources. A match for each of the filters is sent to the listed destinations.)

```
log { source(S1); source(S2); ...  
filter(F1);filter(F2);...  
destination(D1); destination(D2);...  
};
```


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where :

<i>Sx</i>	Identifier of the sources defined before.
<i>Fx</i>	Identifier of the filters defined before.
<i>Dx</i>	Identifier of the actions/destinations defined before.

Examples:

1) To send all messages received from local syslog clients to console:

```
log { source(sysl); destination(d_console);};
```

2) To send only messages with level alert and received from local syslog clients to all logged root user:

```
log { source(sysl); filter(f_alert); destination(d_userroot);};
```

3) To write all messages with levels info, notice, or warning and received from syslog clients (local and remote) to /var/log/messages file:

```
log { source(sysl); source(s_udp); filter(f_messages); destination(d_messages);};
```

4) To send e-mail if message received from local syslog client has the string “kernel panic”:

```
log { source(sysl); filter(f_kpanic); destination(d_mail1);};
```

5) To send e-mail and pager if message received from local syslog client has the string “root login”:

```
log { source(sysl); filter(f_root); destination(d_mail1); destination(d_pager);};
```

6) To send messages with facility kernel and received from syslog clients (local and remote) to remote syslogd:

```
log { source(sysl); source(s_udp); filter(f_kern); destination(d_udp1);};
```

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Syslog-ng Configuration to use with Syslog Buffering Feature

This configuration example uses the syslog buffering feature, and sends messages to the remote syslogd (10.0.0.1).

Step 1: Configure pslave.conf parameters.

In the pslave.conf file the parameters of the syslog buffering feature are configured as:

```
conf.DB_facility 1
all.syslog_buffering 100
```

Step 2: Add lines to syslog-ng.conf.

Add the following lines by vi or browser to the file:

```
# local syslog clients
source src { unix-stream("/dev/log"); };
destination d_buffering { udp("10.0.0.1"); };
filter f_buffering { facility(local1) and level(notice); };
# send only syslog_buffering messages to remote server
log { source(src); filter(f_buffering); destination(d_buffering); };
```

Syslog-ng Configuration to use with Multiple Remote Syslog Servers

This configuration example is used with multiple remote syslog servers.

Step 1: Configure pslave.conf parameters.

In the pslave.conf file the facility parameter is configured as:

```
conf.facility 1
```

Step 2: Add lines to syslog-ng.conf.

The syslog-ng.conf file needs these lines:

```
# local syslog clients
source src { unix-stream("/dev/log"); };
```

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```
# remote server 1 - IP address 10.0.0.1 port default
destination d_udp1 { udp("10.0.0.1"); };

# remote server 2 - IP address 10.0.0.2 port 1999
destination d_udp2 { udp("10.0.0.2" port(1999));};

# filter messages from facility local1 and level info to warning
filter f_local1 { facility(local1) and level(info..warn);};

# filter messages from facility local 1 and level err to alert
filter f_critic { facility(local1) and level(err .. alert);};

# send info, notice and warning messages to remote server udp1
log { source(src); filter(f_local1); destination(d_udp1); };

# send error, critical and alert messages to remote server udp2
log { source(src); filter(f_critic); destination(d_udp2); };
```

TCP Keepalive

The objective of this feature is to allow the TS and ACS to recognize when the socket client (ssh or telnet) goes down without closing the connection properly. Currently, if this happens in a serial port the system administrator must close the connection manually or nobody else can access that port anymore.

How it works

The TCP engine of TS or ACS will send a tcp keepalive message (ACK) to the client. If the maximum retry number is reached without an answer from the client, the connection is closed.

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How to Configure it

The configuration is done in the file `/bin/init_proc_fs` using the linux proc filesystem.

```
#
# Enable TCP keepalive timer in ACS (six retries with ten seconds
of interval from each other).
#
# keepalive interval when the client is answering
echo 20 > /proc/sys/net/ipv4/tcp_keepalive_time
# keepalive interval when the client is not answering (ACS only).
echo 10 > /proc/sys/net/ipv4/tcp_keepalive_intvl
# number of retries
echo 6 > /proc/sys/net/ipv4/tcp_keepalive_probes

#
# Enable TCP keepalive timer in TS (six retries with twenty seconds
of interval from each other).
#
echo 20 > /proc/sys/net/ipv4/tcp_keepalive_time
echo 6 > /proc/sys/net/ipv4/tcp_keepalive_probes
```

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Terminal Appearance

You can change the format of the login prompt and banner that is issued when a connection is made to the system. Prompt and banner appearance can be port-specific as well.

Parameters Involved and Passed Values

Terminal Appearance involves the following parameters:

- | | |
|------------------------------|--|
| <i>all.prompt</i> | This text defines the format of the login prompt. Expansion characters can be used here. Example value: %h login: |
| <i>all.issue</i> | <p>This text determines the format of the login banner that is issued when a connection is made to the Cyclades-TS.</p> <p>\n represents a new line and \r represents a carriage return. Expansion characters can be used here.</p> <p><i>Value for this Example:</i></p> <pre>\r\n\
Welcome to terminal server %h port S%p \n\
\r\n</pre> |
| <i>all.If_suppress</i> | This activates line feed suppression. When configured as 0, line feed suppression will not be performed. When 1, extra line feed will be suppressed. |
| <i>all.auto_answer_input</i> | This parameter is used in conjunction with the next parameter, auto_answer_output. If configured and if there is no session established to the port, this parameter will constantly be compared and matched up to the string of bytes coming in remotely from the server. If a match is found, the string configured in auto_answer_output is sent back to the server. To represent the ESC character as part of this string, use the control character, ^[. |

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all.auto_answer_output This parameter is used in conjunction with the previous parameter, `auto_answer_input`. If configured, and if there is no session established to the port, this parameter is sent back to the server when there is a match between the incoming data and `auto_answer_input`. To represent the ESC character as part of this string, use the control character, `^[]`.

Configuration for CAS, TS, and Dial-in Access

Browser Method

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server's IP address. For example:

```
http://10.0.0.0
```

Step 2: Log in as root and type the Web root password configured by the Web server.

This will take you to the Configuration and Administration page.

Step 3: Select the Serial Ports link.

Click on the Serial Ports link on the Link Panel to the left of the page or in the Configuration section of the page. This will take you to the Port Selection page.

Step 4: Select port(s).

On the Port Selection page, choose all ports or an individual port to configure, from the dropdown menu. Click the Submit button. This will take you to the Serial Port Configuration page.

Step 5: Scroll down to the Terminal Server section.

You can change the settings for Banner Field (issue) and Login Prompt field here.

Step 6: Click on the Submit button.

Step 7: Make the changes effective.

Click on the Administration > Run Configuration link, check the Serial Ports/Ethernet/Static Routes box and click on the Activate Configuration button.

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Step 8: Click on the link Administration > Load/Save Configuration.

Step 9: Click the Save Configuration to Flash button.

The configuration was saved in flash.

Wizard Method

Step 1: Bring up the wizard.

At the command prompt, type the following to bring up the Terminal Appearance custom wizard:

```
wiz --tl
```

Screen 1 will appear.

Screen 1:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER. Enter '#' if you want to deactivate that parameter or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or
- 3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

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Press ENTER to continue...

Screen 2:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
Current configuration:
(The ones with the '#' means it's not activated.)

all.issue : \r\n>Welcome to terminal server %h port S%p \n\
\r\n\
all.prompt : %h login:
all.lf_suppress : 0
all.auto_answer_input : #
all.auto_answer_output : #

Set to defaults? (y/n) [n] :
```

Screen 3:

```
*****
***** C O N F I G U R A T I O N W I Z A R D *****
*****
ALL.ISSUE - This text determines the format of the login
banner that is issued when a connection is made to the
system. \n represents a new line and \r represents a
carriage return.

all.issue[\r\n>Welcome to terminal server %h port S%p \n\
\r\n] :

ALL.PROMPT - This text defines the format of the login
prompt.

all.prompt[%h login:] :
```


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Screen 4:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
ALL.LF_SUPPRESS - This activates line feed suppression.
When configured as 0, line feed suppression will not be
performed. When 1, extra line feed will be suppressed.
```

all.lf_suppress[0] :

ALL.AUTO_ANSWER_INPUT - This parameter is used in conjunction with the next parameter, auto_answer_output. Please refer to the manual for more info.

If configured and if there is no session established to the port, this parameter will constantly be compared and matched up to the string of bytes coming in remotely from the server. If a match is found, the string configured in auto_answer_output is sent back to the server. To represent the ESC character as part of this string, use the control character, ^[.

all.auto_answer_input[#] :

Screen 5:

```
*****
***** C O N F I G U R A T I O N   W I Z A R D *****
*****
```

ALL.AUTO_ANSWER_OUTPUT - This parameter is used in conjunction with the previous parameter, auto_answer_input. Please refer to the manual for more info.

If configured, and if there is no session established to the port, this parameter is sent back to the server when there is a match between the incoming data and auto_answer_input. To represent the ESC character as part of this string, use the control character, ^[.

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```
all.auto_answer_output[#] :
```

Screen 6:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.issue : \r\n>Welcome to terminal server %h port S%p \n\  
\r\n\  
all.prompt : %h login:  
all.lf_suppress : 0  
all.auto_answer_input : #  
all.auto_answer_output : #
```

Are these configuration(s) all correct? (y/n) [n] :

If you type 'N'

Type 'c' to go back and CORRECT these parameters
or 'q' to QUIT :

Typing 'c' repeats the application, typing 'q' exits the entire wiz application

If you type 'Y'

Discard previous port-specific parameters? (y/n) [n] :



Note: Answering yes to this question will discard only the parameter(s) which you are currently configuring if they were configured for a specific port in a previous session. For instance, if you are currently configuring parameter, all.x, and there was a specific port, s2.x, configured; then, answering yes to this question will discard s2.x.

Type 'c' to CONTINUE to set these parameters for
specific ports or 'q' to QUIT :

Typing 'c' leads to Screen 7, typing 'q' leads to Screen 8.

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Screen 7:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

You have 8 available ports on this system.

Type 'q' to quit, a valid port number[1-8], or anything else to refresh :

Screen 8:

```
*****  
***** C O N F I G U R A T I O N W I Z A R D *****  
*****
```

(Note: If you are NOT connected to this unit through a console, and you have just reconfigured the IP of this unit, activating the new configurations may cause you to lose connection. In that case, please reconnect to the unit by the new IP address, and manually issue a saveconf to save your configurations to flash.)

Do you want to activate your configurations now? (y/n) [y] :

Screen 9:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Flash refers to a type of memory that can be erased and reprogrammed in units of memory known as blocks rather than one byte at a time; thus, making updating to memory easier.

If you choose to save to flash, your configurations thus

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far will still be in the memory of the system even after you reboot it. If you don't save to flash and if you were to reboot the system, all your new configurations will be lost and you will have to reconfigure the system.

Do you want to save your configurations to flash? (y/n) [n] :

CLI Method

To configure certain parameters for a specific serial port:

Step 1: At the command prompt, type in the appropriate command to configure desired parameters.

To activate the serial port. <string> should be tty<serial port number> :

```
config configure line <serial port number> tty <string>
```

To configure issue:

```
config configure line <serial port number> issue <string>
```

To configure prompt:

```
config configure line <serial port number> prompt <string>
```

To configure lf_suppress:

```
config configure line <serial port number> lf <number>
```

To configure auto_answer_input:

```
config configure line <serial port number> auto_input  
<string>
```

To configure auto_answer_output:

```
config configure line <serial port number> auto_output  
<string>
```

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Tip. You can configure all the parameters for a serial port in one line.

```
config configure line <serial port number> tty <string>
issue <string> prompt <string> lf <number> auto_input
<string> auto_output <string>
```

Step 2: Activate and Save.

To activate your new configurations and save them to flash, type:

```
config write
```

(This is essentially typing *signal_ras hup* and *saveconf* from the normal terminal prompt.)

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Time Zone

The content of the file `/etc/TIMEZONE` can be in one of two formats. The first format is used when there is no daylight savings time in the local time zone:

```
std offset
```

The *std* string specifies the name of the time zone and must be three or more alphabetic characters. The offset string immediately follows *std* and specifies the time value to be added to the local time to get *Coordinated Universal Time* (UTC). The offset is positive if the local time zone is west of the Prime Meridian and negative if it is east. The hour must be between 0 and 24, and the minutes and seconds must be between 0 and 59.

The second format is used when there is daylight savings time:

```
std offset dst [offset],start[/time],end[/time]
```

There are no spaces in the specification. The initial *std* and *offset* specify the Standard Time zone, as described above. The *dst* string and *offset* specify the name and offset for the corresponding daylight savings time zone. If the *offset* is omitted, it defaults to one hour ahead of Standard Time.

The *start* field specifies when daylight savings time goes into effect and the *end* field specifies when the change is made back to Standard Time. These fields may have the following formats:

- Jn* This specifies the Julian day, with *n* being between 1 and 365. February 29 is never counted even in leap years.
- n* This specifies the Julian day, with *n* being between 1 and 365. February 29 is counted in leap years.
- Mm.w.d* This specifies day, *d* ($0 < d < 6$) of week *w* ($1 < w < 5$) of month *m* ($1 < m < 12$). Week 1 is the first week in which day *d* occurs and week 5 is the last week in which day *d* occurs. Day 0 is a Sunday.

The time fields specify when, in the local time currently in effect, the change to the other time occurs. If omitted, the default is 02:00:00.

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In the example below:

```
GST+7DST+6M4.1.0/14:30.M10.5.6/10
```

Daylight Savings Time starts on the first Sunday of April at 2:30 p.m. and it ends on the last Saturday of October at 10:00 a.m.

How to set Date and Time

The date command prints or sets the system date and time. Format of the command:

```
date [MMDDhhmm[[CC]YY]
^ ^ ^ ^ ^ ^
^ ^ ^ ^ ^ year
^ ^ ^ ^ century
^ ^ ^ minute
^ ^ hour
^ day
month
```

For example:

```
date 101014452002
```

produces:

```
Thu Oct 10 14:45:00 DST 2002
```

The DST is because it was specified in /etc/TIMEZONE.

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TS110-only Analog and Digital Ports

Digital Ports

The digital ports are dry contact inputs. They are controlled via `/dev/gpio`, which provides 8 bit status of the 8 digital ports. The LSB of the status byte is digital port 1. When `pin+` and `pin-` from the digital port are open (no contact between them), the port's bit on the status byte is 0. If `pin+` and `pin-` are closed, the port's bit on the status byte is 1.

Analog Ports

The analog ports are accessed via `/dev/adc1` and `/dev/adc2`. Each device controls a 15-bit Analog-to-Digital converter, which returns the digital value of the voltage between `pin+` and `pin-` on the analog port. The Analog-to-Digital converter reports full scales (`0x7FFF`), when `pin+` and `pin-` are open (no contact between them). If `pin+` and `pin-` are closed, the Analog-to-Digital converter reports zero (`0x0000`). When applying 10 K ohms over `pin+` and `pin-`, the Analog-to-Digital converter reports half scale (around `0x4000`).

Port Utility (/bin/pu)

Port Utility is the native application to access the digital and analog ports. Here are some commands:

a) For general help:

```
[TS110/]# pu -h
```

Usage:

```
pu -<r|[w data]> [-d device] [-p digital_port] -l -o -h
```

Options:

```
-r                read from device.
-w data          write data to device.
-d device        defines device to use.
-p digital_port  defines digital port [1-8] to use.
-l              list digital port status.
```


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-o *output in decimal format.*
-h for help.

b) Check digital ports. On this example, digital port 1, 2 and 3 are closed. The command returns the status byte for all digital ports.

```
[TS110]# pu -r -d /dev/gpio  
07
```

c) Check digital ports as previously, but now with -l option. This option lists all ports and their status. On this example, digital port 1, 2 and 3 are closed.

```
[TS110]# pu -r -d /dev/gpio -l  
Digital Port Stauts: 07  
    port 1 - closed  
    port 2 - closed  
    port 3 - closed  
    port 4 - open  
    port 5 - open  
    port 6 - open  
    port 7 - open  
    port 8 - open
```

d) It is also possible to check just one digital port at a time. For that, the port number must be passed along with the parameter -p. For verbal report, use option -l. On this example, digital port 3 is closed.

```
[TS110]# pu -r -d /dev/gpio -p 3 -l  
Digital Port Stauts:  
    port 3 - closed
```

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```
[TS110]# pu -r -d /dev/gpio -p 3
```

```
1
```

e) On the previous command, if port is open, the command return 0.

```
[TS110]# pu -r -d /dev/gpio -p 3
```

```
0
```

f) Analog Port 1 is open. Reading full scale.

```
[TS110]# pu -r -d /dev/adcl
```

```
7fff
```

Analog and Digital ports on the Web

The analog port values and the digital port status are also available via web browser on Information Section.

Sending Warning Messages

TS110 can respond to events or status change by sending warning messages to the console port or e-mail messages via sendmail. The `/etc/io_cron.src` file and its `/etc/io_cron.sh` shell file are cron files that can be included in the `/etc/crontab_files`, as described on the crond utility configuration section.

The `/etc/io_counter` file is automatically created by `/etc/io_cron.sh` when it runs by the first time. The `/etc/io_counter` file holds the countdown counters with the number of messages per event. These counters limit the number of warning messages issued per event. Whenever a counter reaches zero, no further message is generated for that event. Value -1 means no limit. To restart any counter, either change the counter value in the file or remove the file itself, which forces all counters to their default values when the file is created again.

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The `/etc/io_cron.sh` file has the counter default values that will be used to create the `/etc/io_counter` file. The counter default values, which can be modified by the user, are as follows:

```
ADC1=2 #Number of times Analog Port 1 warning will be sent
ADC2=2 #Number of times Analog Port 2 warning will be sent
DIG1=2 #Number of times Digital Port 1 warning will be sent
DIG2=2 #Number of times Digital Port 2 warning will be sent
DIG3=2 #Number of times Digital Port 3 warning will be sent
DIG4=2 #Number of times Digital Port 4 warning will be sent
DIG5=2 #Number of times Digital Port 5 warning will be sent
DIG6=2 #Number of times Digital Port 6 warning will be sent
DIG7=2 #Number of times Digital Port 7 warning will be sent
DIG8=2 #Number of times Digital Port 8 warning will be sent
```

The same `/etc/io_cron.sh` file also has the trigger values for each event and status. These values, which can be customized by the user, are as follows:

```
H_ADC1=65535 # Analog Port 1 A/D Converter high limit
L_ADC1=0     # Analog Port 1 A/D Converter low limit
H_ADC2=65535 # Analog Port 2 A/D Converter high limit
L_ADC2=0     # Analog Port 2 A/D Converter low limit
D1=0        # Digital Port 1 status (1-closed, 0-open)
D2=0        # Digital Port 2 status (1-closed, 0-open)
D3=0        # Digital Port 3 status (1-closed, 0-open)
D4=0        # Digital Port 4 status (1-closed, 0-open)
D5=0        # Digital Port 5 status (1-closed, 0-open)
D6=0        # Digital Port 6 status (1-closed, 0-open)
```

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```
D7=0          # Digital Port 7 status (1-closed, 0-open)
```

```
D8=0          # Digital Port 8 status (1-closed, 0-open)
```

Therefore, if at any time, digital port 5 changes status, becoming different to the initial one defined on D5, a warning message is sent out.

In order to save any change done on these files, do not forget to include the file names in `/etc/config_files` and run `saveconf`.

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Chapter 4 - Server Management

Introduction

Windows 2003 Server Management

Emergency Management Services (EMS) is a new feature in the Windows 2003 Server that allows out-of-band remote management and system recovery tasks. All Emergency Management Services output is accessible using a terminal emulator connected to the server serial port. Besides the normal character mode output sent to the serial console, Windows also sends xml tags. Those tags can be captured and processed by the ACS so that the administrator can automate the actions to be taken.

As the Administrator, you can manage the Emergency Management Services in the Windows Server 2003 from the Web interface. Instead of managing the server through the Special Administration Console (SAC), which is the console when connected directly to the Windows Server through telnet or ssh session, root users can interact with the SAC from the Web (via buttons or directly typing into the terminal window).

How it works

When users enter the page to manage their Windows Server, corresponding commands are sent to the server when the users click on the buttons. The server message or result (successful or not) is displayed. If a user is defined for a specific port (sX.users), then that port will be displayed in the Web interface only when that user logs in. Even if are a root user, you won't be able to see that port unless you are defined in all.admin_users.

The Web interface for Windows Server 2003 is done through the java applet. Each button on the java applet is created in a configuration file (winbuttonbar.conf). When users click on one of the buttons, commands are sent to the remote server. Users can either use the buttons or they can actually click on the terminal window and enter in the commands themselves. To change to other channels once they exist, users can type <Esc> <tab> <enter> in the terminal window. To change to Channel 0, type <Esc> <tab> <0> <enter>.

Windows sends xml tags in the following situations:

- During Windows installation, it sends <channel-switch> with the setup logs.
- During boot, it sends the <machine-info> information.
- When switching channels, it sends the <channel-switch> information.
- During system crash, it sends the <BP> to indicate BreakPoint.

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The <machine-info> tag is emitted once by Windows Server during its system boot sequence. This tag is also emitted as part of the <BP> tag. The following elements are included in <machine-info> tag:

<guid>	It is the GUID that uniquely identifies the server platform. Normally, this is an SMBIOS provided identification. If no such value is available, all 0's GUID string is used (see sample encoding below).
<name>	Is the system name.
<os-build-number>	Is a numeric string that identifies a successive Windows Build.
<os-product>	Is the name of the Windows Server 2003 product currently running on this server. It is one of the following: <ul style="list-style-type: none">• Windows Server 2003 Datacenter Edition• Windows Server 2003 Embedded• Windows Server 2003 Enterprise Edition• Windows Server 2003
<os-service-pack>	Is an alphanumeric string that identifies the most up-to-date service pack installed. If none installed, the string is None.
<os-version>	Is the numeric identification of the Windows version currently running.
<processor-architecture>	Is either x86 or IA64, designating the two processor architectures currently supported by Windows Server 2003.

A sample encoding of this tag follows:

```
<?xml>
<machine-info>
<name>NTHEAD-800I-1</name>
<guid>00000000-0000-0000-0000-000000000000</guid>
```


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```
<processor-architecture>x86</processor-architecture>
<os-version>5.2</os-version>
<os-build-number>3735</os-build-number>
<os-product>Windows Server 2003 Enterprise Edition</os-product>
<os-service-pack>None</os-service-pack>
</machine-info>
```

The console environment provided by the serial port is called Special Administration Console (SAC). In the SAC command line, each time we enter the “cmd” command we create a channel. A channel is the “Command Prompt” environment, where you can enter the Command Prompt commands (dir, cd, edit, del, copy, etc). We can switch back and forth between channel(s) and SAC by pressing Esc Tab keys. We can create up to 9 channels, i.e., up to 9 Command Prompt sessions. Whenever we switch channels, the <channel-switch> tag is sent. The following elements are included in the <channel-switch> tag:

<application-type> Is a hexadecimal GUID signifying the application or tool that is running on the Windows Server platform and communicating via this active channel. It is to be used to discern the different interaction modes. During the Windows GUI-mode Setup phase, the following GUIDs identify the specific types of data being emitted:

1. Debug Log (5ED3BAC7-A2F9-4E45-9875-B259EA3F291F)
2. Error Log (773D2759-19B8-4D6E-8045-26BF38402252)
3. Action Log (D37C67BA-89E7-44BA-AE5A-112C6806B0DD)

During nominal Windows Server operations, the following GUIDs can be expected:

1. SAC (63D02270-8AA4-11D5-BCCF-806D6172696F)
2. CMD (63D02271-8AA4-11D5-BCCF-00B0D014A2D0)

The above are constant GUIDs and should not be confused with those provided via the <guid> tag below.

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<description> Is the user-friendly name of the active channel. For the GUI-Mode Setup tool they are:

1. Debug Log (Setup tracing log)
2. Error Log (Setup errors log)
3. Action Log (Setup actions log)

For the Windows Server, they are:

1. SAC (Special Administration Console)
2. CMD (Command Prompt)

<guid> Is a hexadecimal GUID that identifies a specific instance of a channel. During a life-span of a Windows Server (between any two system boots), there is a total of 10 channels being allocated. Of those, one can be expected a GUID for each of the following channel types:

1. GUI-Mode Setup Debug Log
2. GUI-Mode Setup Error Log
3. GUI-Mode Setup Action Log
4. SAC

The remaining GUIDs are of the CMD channel type. For example, during Windows setup, there are 3 GUIDs assigned to Setup, 1 to SAC and the remaining 6 to CMD. However, during normal Windows operations, there is 1 GUID assigned to SAC and the remaining 9 to CMD.

These GUIDs are created anew for each instance of channels, and should not be confused with the constant GUIDs provided via the **<application-type>** tag above.

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- <name>** Is the system name of the active channel. For the GUI-mode Setup tool, they are the file names where the data is written:
1. Debug Log (setuplog.txt)
 2. Error Log (setuperr.log)
 3. Action Log (setupact.log)
- For Windows Server, they are:
1. SAC (SAC)
 2. CMD (Cmdnnnn), where nnnn indicates the corresponding channel number
- <type>** Is the type of data being emitted on the active channel. Currently, there are two types of data supported:
1. Raw for the 3 GUI-Mode Setup channels
 2. VT-UTF8 for the SAC and CMD channels

A sample encoding of the SAC channel tag follows:

```
<channel-switch>
<name>SAC</name>
<description>Special Administration Console</description>
<type>VT-UTF8</type>
<guid>laee4cc0-cff3-11d6-9a3d-806e6f6e6963</guid>
<application-type>63d02270-8aa4-11d5-bccf-806d6172696f</application-type>
</channel-switch>
```

A sample encoding of the CMD channel tag follows:

```
<channel-switch>
<name>Cmd0001</name>
<description>Command Prompt</description>
```

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```
<type>VT-UTF8</type>
<guid>970438d1-12bb-11d7-8a92-505054503030</guid>
<application-type>63d02271-8aa4-11d5-bccf-00b0d014a2d0</application-type>
</channel-switch>
```

A sample encoding of the GUI-Mode Setup Debug Log channel tag follows:

```
<channel-switch>
<name>setuplog.txt</name>
<description>Setup tracing log</description>
<type>Raw</type>
<guid>6f28e904-1298-11d7-b54e-806e6f6e6963</guid>
<application-type>5ed3bac7-a2f9-4e45-9875-b259ea3f291f</application-type>
</channel-switch>
```

The **<BP>** tag is emitted when the Windows Server system halts such that only elements of the kernel are the most recently operating logic.

<INSTANCE CLASSNAME=> Is the type of break point. Currently, there is only one type emitted, i.e. "Blue Screen" which indicates the system was halted prematurely. It is represented by the CLASSNAME="BLUESCREEN" value.

<machine-info> Is described above.

<PROPERTY NAME=> Provides additional details, such as error code of the abnormal condition that caused the break point.

A sample encoding of the Break Point tag follows:

```
<?xml>
<BP>
<INSTANCE CLASSNAME="BLUESCREEN">
```

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```
<PROPERTY NAME="STOPCODE" TYPE="string"><VALUE>"0xE2"</VALUE>
</PROPERTY>
<machine-info>
<name>NTHEAD-800I-1</name>
<guid>00000000-0000-0000-0000-000000000000</guid>
<processor-architecture>x86</processor-architecture>
<os-version>5.2</os-version>
<os-build-number>3735</os-build-number>
<os-product>Windows Server 2003 Enterprise Edition</os-product>
<os-service-pack>None</os-service-pack>
</machine-info>
</INSTANCE>
</BP>
```

How to Configure it

There is a new parameter in `/etc/portslave/pslave.conf` to monitor for xml data. For instance, for `ttyS1` we could configure:

```
s1.xml_monitor          1
```

When the `xml_monitor` is set, `cy_buffering` will search for xml packets coming from the serial port. When a complete xml packet is received, `cy_buffering` will send it to `syslog-ng`. In `syslog-ng.conf`, the following filters are available to filter the xml messages:

```
filter f_windows_bluescreen { facility(local[0+<conf.DB_facility>]) and level(info)
and
    match("XML_MONITOR") and match("BLUESCREEN"); } ;
filter f_windows_boot { facility(local[0+<conf.DB_facility>]) and level(info) and
    match("XML_MONITOR") and not match("BLUESCREEN") and
    match("machine-info"); } ;
```

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Once the desired message is filtered, we have to define which actions we would like to take. Syslog-ng will create macros that can give easy access for the administrators to access the xml information. If the administrator uses these macros, syslog-ng replaces the macros by the data received in the xml packet. For instance, the following table shows the macros that are available when filter `f_windows_bluescreen` is successful and the examples of values that can replace the macros:

Table 15: Windows 2003 Macros

Macro	Description	Value to replace macro
<code>\$<INSTANCE CLASSNAME=></code>	Reason for the break point. Currently there is only one type, BLUESCREEN.	BLUESCREEN
<code>\$<PROPERTY NAME=></code>	Additional details about break point.	STOPCODE
<code>\$<VALUE></code>	Additional details about break point.	0xE2
<code>\$<name></code>	Machine name	MY_WIN_SERVER
<code>\$<guid></code>	GUID that uniquely identifies this server. If no such value is available, all 0's GUID string is used.	4c4c4544-8e00-4410-8045-80c04f4c4c20
<code>\$<processor-architecture></code>	Processor architecture. It can be either x86 or IA64.	x86
<code>\$<os-version></code>	Windows version.	5.2
<code>\$<os-build-number></code>	Numeric string that identifies a successive Windows Build.	3763
<code>\$<os-product></code>	Which Windows Server product. It can be: Windows Server 2003 Datacenter Edition, Windows Server 2003 Embedded, Windows Server 2003 Enterprise Edition or Windows Server 2003.	Windows Server 2003

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Table 15: Windows 2003 Macros

Macro	Description	Value to replace macro
<code>\$<os-service-pack></code>	Alphanumeric string that identifies the most up-to-date service packet installed. If none installed, the string is None.	None
<code>\$<tty></code>	ACS serial port tty or serverfarm name.	S1.ttyS1

For the `f_windows_boot`, the following macros are available:

Table 16: `f_windows_boot` Macros

Macro	Description	Value to replace macro
<code>\$<name></code>	Machine name	MY_WIN_SERVER
<code>\$<guid></code>	GUID that uniquely identifies this server. If no such value is available, all 0's GUID string is used.	4c4c4544-8e00-4410-8045-80c04f4c4c20
<code>\$<processor-architecture></code>	Processor architecture. It can be either x86 or IA64.	x86
<code>\$<os-version></code>	Windows version.	5.2
<code>\$<os-build-number></code>	Numeric string that identifies a successive Windows Build.	3763
<code>\$<os-product></code>	Which Windows Server product. It can be: Windows Server 2003 Datacenter Edition, Windows Server 2003 Embedded, Windows Server 2003 Enterprise Edition or Windows Server 2003.	Windows Server 2003

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Table 16: f_windows_boot Macros

Macro	Description	Value to replace macro
<code><os-service-pack></code>	Alphanumeric string that identifies the most up-to-date service packet installed. If none installed, the string is None.	None
<code><tty</code>	ACS serial port tty or serverfarm name.	S2.server_connected_to_serial2

As an example on how we can use above macros, let's say we want the ACS to send an e-mail to the administrator whenever a crash happens. The e-mail should have the information about the reason of the crash, machine name and windows version information. So we just have to create the following entry in `syslog-ng.conf`:

```
destination win2003mail { pipe("/dev/cyc_alarm"
    template("sendmail -t administrator@cyclades.com -f acs -s \"\
    Server <name> crashed\" -m \"\
    Break Point: <INSTANCE CLASSNAME=> <PROPERTY NAME=> <VALUE>\
    Server: <name>\
    OS: <os-product>\
    Build: <os-build-number> Version: <os-version>\
    Service Pack: <os-service-pack>\
    Processor: <processor-architecture>\
    Server GUID: <guid>\
    ACS port: <tty>\
    \" -h mail.cyclades.com "));};
```

And the following entry will activate the `win2003mail` action when the `f_windows_bluescreen` filter is successful:

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```
source src { unix-stream("/dev/log"); };  
log { source(src); filter(f_windows_bluescreen); destination(win2003mail); };
```

Server Commands

The following are the different commands and their descriptions that can be sent to the server.

Table 17: Server Commands

Button Name	Command Set	Description
List Channels	ch	Channel management commands.
Close Channel	ch -ci <#>	Close a channel by its number.
Create a Channel	cmd	Create a Command Prompt channel.
Switch a Channel	ch -si <#>	Switch to another channel (from Channel 0).
Show Kernel Log	d	Dump the current kernel log.
Toggle T-list	f	Toggles the information output by the t-list command, which shows processes only, or shows processes and threads.
List IP Information	i	List all IP network numbers and their IP addresses.
Set IP Parameters	i <#> <ip> <subnet> <gateway>	Set network interface number, IP address, subnet and gateway.
Display Server ID	id	Display the computer identification information.
Kill a Process	k <pid>	Kill the given process.
Lower Priority of a Process	l <pid>	Lower the priority of a process to the lowest possible.

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Table 17: Server Commands

Button Name	Command Set	Description
Lock Channels	lock	Lock access to Command Prompt channels. You must provide valid logon credentials to unlock a channel.
Limit Memory Usage of a Process	m <pid> <MB-allow>	Limit the memory usage of a process to <MB-allow>.
Paging	p	Causes t-list command output to pause after displaying one full screen of information.
Raise Priority of a Process	r <pid>	Raise the priority of a process by one.
Show Time and Date	s	Display the current time and date (24 hour clock used).
Set Time and Date	mm/dd/yyyy hh:mm	Set the current time and date (24 hour clock used).
Show Task List	t	Tlist.
Crash Dump	crashdump	Crash the system. Crash dump must be enabled.
Restart	restart	Restart the system immediately.
Shutdown	shutdown	Shut down the system immediately.

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How it Works

Sample configuration in pslave.conf:

```
s1.tty ttyS1
```

```
s1.web_WinEMS 1
```

```
s1.users jen
```

```
s1.admin_users john
```

Step 1: Log into the web interface of your ACS/TS.

**Step 2: Go to the Navigation menu -> Applications section -> Windows EMS.
Start managing your server by pressing on actions desired.**

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Users and Passwords

A username and password are necessary to log in to the Cyclades-TS. The user *root* is pre-defined, with a password *tslinux*. A password should be configured as soon as possible to avoid unauthorized access. Type the command:

```
passwd
```

to create a password for the root user. To create a regular user (without root privileges), use the commands:

```
adduser user_name
```

```
passwd user_password
```

To log out, type “logout” at the command prompt.

How to show who is logged in and what they are doing

The command “w” displays information about the users currently on the machine, and their processes. It calls two commands: *w_ori* and *w_cas*. The *w_ori* is the new name of the original command “w” and the *w_cas* shows the CAS sessions information.

The header of *w_ori* shows, in this order: the current time, how long the system has been running, how many users are currently logged on (excluded the CAS users), and the system load averages for the past 1, 5, and 15 minutes.

The following entries are displayed for each user (excluded the CAS users): login name, the tty name, the remote host, login time, idle time, JCPU time (it is the time used by all processes attached to the tty), PCPU time (it is the time used by the current process, named in the “what” field), and the command line of their current process.

The header of *w_cas* shows how many CAS users are currently logged on. The following entries are displayed for each CAS user: login name, the tty name, the remote host and remote port, login time, the process ID and the command line of the current process.

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Linux File Structure

The Linux file system is organized hierarchically, with the base (or root) directory represented by the symbol “/”. All folders and files are nested within each other below this base directory. The directories located just below the base directory are:

- /home* Contains the work directories of system users.
- /bin* Contains applications and utilities used during system initialization.
- /dev* Contains files for devices and ports.
- /etc* Contains configuration files specific to the operating system.
- /lib* Contains shared libraries.
- /proc* Contains process information.
- /mnt* Contains information about mounted disks.
- /opt* Location where packages not supplied with the operating system are stored.
- /tmp* Location where temporary files are stored.
- /usr* Contains most of the operating system files.
- /var* Contains operating system data files.

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Basic File Manipulation Commands

The basic file manipulation commands allow the user to copy, delete, and move files and create and delete directories.

<i>cp file_name destination</i> a) cp text.txt /tmp b) cp /chap/robo.php ./excess.php	Copies the file indicated by <i>file_name</i> to the path indicated by <i>destination</i> . a) Copies the file text.txt in the current directory to the tmp directory. b) Copies the file robo.php in the chap directory to the current directory and renames the copy excess.php.
<i>rm file_name</i>	Removes the file indicated by <i>file_name</i> .
<i>mv file_name destination</i>	Moves the file indicated by <i>file_name</i> to the path indicated by <i>destination</i> .
<i>mkdir directory_name</i> a) mkdir spot b) mkdir /tmp/snuggles	Creates a directory named <i>directory_name</i> . a) creates the directory spot in the current directory. b) creates the directory snuggles in the directory tmp.
<i>rmdir directory_name</i>	Removes the directory indicated by <i>directory_name</i> .

Other commands allow the user to change directories and see the contents of a directory.

<i>pwd</i>	Supplies the name of the current directory. While logged in, the user is always “in” a directory. The default initial directory is the user's home directory: /home/<username>
<i>ls [options] directory_name</i>	Lists the files and directories within <i>directory_name</i> . Some useful options are <i>-l</i> for more detailed output and <i>-a</i> which shows hidden system files.
<i>cd directory_name</i>	Changes the directory to the one specified.
<i>cat file_name</i>	Prints the contents of <i>file_name</i> to the screen.

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Shortcuts:

- . (one dot) Represents the current directory.
- .. (two dots) Represents one directory above the current directory (i.e. one directory closer to the base directory).

The vi Editor

To edit a file using the vi editor, type:

```
vi file_name
```

Vi is a three-state line editor: it has a command mode, a line mode and an editing mode. If in doubt as to which mode you are in, press the <ESC> key which will bring you to the command mode.

Table 18: vi modes

Mode	What is done there	How to get there
Command mode	Navigation within the open file.	Press the <ESC> key.
Editing mode	Text editing.	See list of editing commands below.
Line mode	File saving, opening, etc. Exiting from vi.	From the command mode, type ":" (colon).

When you enter the vi program, you are automatically in command mode. To navigate to the part of the file you wish to edit, use the following keys:

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Table 19: vi navigation commands

<i>h</i>	Moves the cursor to the left (left arrow).
<i>j</i>	Moves the cursor to the next line (down arrow).
<i>k</i>	Moves the cursor to the previous line (up arrow).
<i>l</i>	Moves the cursor to the right (right arrow).

Having arrived at the location where text should be changed, use these commands to modify the text (note commands “i” and “o” will move you into edit mode and everything typed will be taken literally until you press the <ESC> key to return to the command mode).

Table 20: vi file modification commands

<i>i</i>	Inserts text before the cursor position (everything to the right of the cursor is shifted right).
<i>o</i>	Creates a new line below the current line and insert text (all lines are shifted down).
<i>dd</i>	Removes the entire current line.
<i>x</i>	Deletes the letter at the cursor position.

After you have finished modifying a file, enter line mode (by typing “:” from command mode) and use one of the following commands:

Table 21: vi line mode commands

<i>w</i>	Saves the file (w is for write).
<i>wq</i>	Saves and closes the file (q is for quit).
<i>q!</i>	Closes the file without saving.
<i>w file</i>	Saves the file with the name <file>.
<i>e file</i>	Opens the file named <file>.

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The Routing Table

The Cyclades-TS has a static routing table that can be seen using the commands:

```
route
```

or

```
netstat -rn
```

The file `/etc/network/st_routes` is the Cyclades-TS's method for configuring static routes. Routes should be added to the file (which is a script run when the Cyclades-TS is initialized) or at the prompt (for temporary routes) using the following syntax:

```
route [add|del] [-net|-host] target netmask nt_msk [gw gt_way]
interf
```

- [add/del]* One of these tags must be present. Routes can be either added or deleted.
- [-net/-host]* Net is for routes to a network and `-host` is for routes to a single host.
- target* Target is the IP address of the destination host or network.
- netmask* The tag *netmask* and *nt_mask* are necessary only when subnetting is used, otherwise, a mask appropriate to the target is assumed. *nt_msk* must be specified in dot notation.
- gw gt_way* Specifies a gateway, when applicable. *gt_way* is the IP address or hostname of the gateway.
- interf* The interface to use for this route. Must be specified if a gateway is not. When a gateway is specified, the operating system determines which interface is to be used.

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Secure Shell Session

Ssh is a command interface and protocol often used by network administrators to connect securely to a remote computer. Ssh replaces its non-secure counterpart rsh and rlogin. There are two versions of the protocol, ssh and ssh2. The Cyclades-TS offers both. The command to start an ssh client session from a UNIX workstation is:

```
ssh -t <user>@<hostname>
```

where

```
<user> = <username>:ttySnn or  
        <username>:socket_port or  
        <username>:ip_addr or  
        <username>:serverfarm
```

Note: “serverfarm” is a physical port alias. It can be configured in the file `pslave.conf`.
An example:

```
username:                cyclades  
TS1000 IP address:       192.168.160.1  
host name:               ts1000  
servername for port 1:  file_server
```

ttyS1 is addressed by IP 10.0.0.1 or socket port 7001. The various ways to access the server connected to the port are:

```
ssh -t cyclades:ttyS1@ts1000  
ssh -t cyclades:7001@ts1000  
ssh -t cyclades:10.0.0.1@ts1000  
ssh -t cyclades:file_server@ts1000
```

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```
ssh -t -l cyclades:10.0.0.1ts1000
```

```
ssh -t -l cyclades:7001 ts1000
```

For openssh clients, version 3.1p1 or later ssh2 is the default. In that case, the -1 flag is used for ssh1.

```
ssh -t cyclades:7001@ts1000
```

(openssh earlier than 3.1p1 - Cyclades-TS V_1.3.1 and earlier -> ssh1 will be used)

```
ssh -t -2 cyclades:7001@ts1000
```

(openssh earlier than 3.1p1 - Cyclades-TS V_1.3.1 and earlier -> ssh2 will be used)

```
ssh -t cyclades:7001@ts1000
```

(openssh 3.1p1 or later - Cyclades-TS V_1.3.2 or later/AlterPath Console Server version 2.1.0 or later -> ssh2 will be used)

```
ssh -t -l cyclades:7001@ts1000
```

(openssh 3.1p1 or later - Cyclades-TS V_1.3.2 or later ssh1 will be used)

To log in to a port that does not require authentication, the username is not necessary:

```
ssh -t -2 :ttyS1@ts1000
```

Note: In this case, the file sshd_config must be changed in the following way:

```
PermitRootLogin Yes
```

```
PermitEmptyPassword Yes
```

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The Session Channel Break Extension

This is a new feature for the AlterPath Console Server version 2.1.3 and Cyclades-TS version 1.3.7. The ACS/TS provides new way to send a break signal during a SSH version 2 terminal session. This method is defined by "Session Channel Break Extension : draft-ietf-secsh-break-00.txt." In previous ACS and TS versions there is one break length in milliseconds (break duration). Now the ACS and TS have a new parameter `<all/Sx>.break_interval`, which is used with `all.break_sequence (<all/Sxx>.break_sequence)`. (This improves the SSH-break Cyclades implementation).

The `ssh2-client` receives a command ("`<ssh escape char>B`") from the user and sends one "break request" to `ssh-server`. The `ssh-server` receives the "break request" and sends a break command to the serial port. The `ssh client` can send the break duration (break interval), so the user can configure this value by command line ("`-B <break interval in miliseconds>`") or by `ssh_config` file ("`breakinterval <break interval in miliseconds>`").

How it works in SSH Server (`all.protocol` is `socket_ssh`)

The serial driver accepts the parameter *break interval* in the break command. If the version is 2 (`ssh-2`), the server accepts and treats the "break request" sent by the client. The "break request" defines the break-length in milliseconds. The server sends a break command with the break-length to the serial driver to perform the break in the serial port. If the parameter `all.break_sequence` is configured and the server finds the sequence in the data received from client, the server sends a break command with `all.break_interval` to serial driver.

How it works in SSH Client

The SSH client has a new option "`-B <break_interval in miliseconds>`" and accepts `break_interval` in `ssh_config`. When the user types "`<ssh-escape>B`" (where `ssh-escape` is "`~`") the client sends a "break request" to `ssh-server`. When the ACS/TS calls the `ssh-client` automatically, it uses the parameter `all.break_interval` to calls the `ssh-2` client.

Configuring `sshd`'s client authentication using SSH Protocol version 1

Step 1: Only `RhostsAuthentication` yes in `sshd_config`.

In the linux host enable in the file `/etc/ssh/ssh_config` the parameters:

```
Host *
```

```
    RhostsAuthentication yes
```

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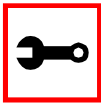
UsePrivilegedPort yes

- One of these:

```
hostname or ipaddress in /etc/hosts.equiv or  
/etc/ssh/shosts.equiv
```

```
hostname or ipaddress and username in ~/.rhosts or ~/.shosts  
and IgnoreRhosts no in sshd_config
```

- Client start-up command: `ssh -t <TS_ip or Serial_port_ip>` (if the ssh client is running under a session belonging to a username present both in the workstation's database and the TS's database).
- Client start-up command: `ssh -t -l <username> <TS_ip or Serial_port_ip>` (if the ssh client is running under a session belonging to a username present only in the workstation's database. In this case, the <username> indicated would have to be a username present in the TS's database).



Note: For security reasons, some ssh clients do not allow just this type of authentication. To access the serial port, the TS must be configured for local authentication. No root user should be used as username.

Step 2: Only RhostsRSAAuthentication yes in sshd_config.

- One of the RhostsAuthentication settings, described in Step 1.
- Client machine's host key (`/etc/ssh_host_key.pub`) copied into the `T/tmp/known_hosts` file. The client hostname plus the information inside this file must be appended in one single line inside the file `/etc/ssh/ssh_known_hosts` or `~/.ssh/known_hosts` and `IgnoreUserKnownHosts no` inside `sshd_config`. The following commands can be used for example:

```
echo `n `client_hostname ` >> /etc/ssh/ssh_known_hosts or ~/.ssh/  
known_hosts
```

```
cat /tmp/known_hosts >> /etc/ssh/ssh_known_hosts or ~/.ssh/  
known_hosts
```

- client start-up command: `ssh -t <TS_ip or Serial_port_ip>`

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Note: “client_hostname” should be the DNS name. To access the serial port, the TS must be configured for local authentication. No root user should be used as username.

Step 3: Only RSAAuthentication yes in sshd_config.

- Removal of the TS’s *.equiv, ~/.?hosts, and *known_hosts files.
- Client identity created by ssh-keygen and its public part (~/.ssh/identity.pub) copied into Secure TS’s ~/.ssh/authorized_keys.
- Client start-up command: ssh -t <TS_ip or Serial_port_ip>.

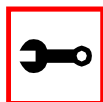
Step 4: Only PasswdAuthentication yes in sshd_config.

- Removal of the TS’s *.equiv, ~/.?hosts, *known_hosts, and *authorized_keys files.
- Client startup command: ssh -t -l <username> <TS_ip or Serial_port_ip> or ssh -t -l <username:alias><TS_ip>.

Configuring sshd's client authentication using SSH Protocol version 2

Only PasswdAuthentication yes in sshd_config DSA Authentication is the default. (Make sure the parameter PubkeyAuthentication is enabled.)

- Client DSA identity created by ssh-keygen -d and its public part (~/.ssh/id_dsa.pub) copied into the TS’s ~/.ssh/authorized_keys2 file.
- Password Authentication is performed if DSA key is not known to the TS. Client start-up command: ssh -2 -t <TS_ip or Serial_port_ip>.



Note: All files “~/*” or “~/.ssh/*” must be owned by the user and readable only by others. All files created or updated must have their full path and file name inside the file config_files and the command saveconf must be executed before rebooting the TS.

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Configuring the Session Channel Break Extension in SSH Server

Step 1: Configure the parameter `break_interval` in `pslave.conf`.

This can be done by the admin using the Web, `snmpset`, the Wizard or CLI.

Step 2: Configure the parameter `ssh_interval` in `ssh_config`.

This can be done using the `vi` editor.

The Process Table

The process table shows which processes are running. Type `ps -a` to see a table similar to that below.

Table 22: Process table

PID	UID	State	Command
1	root	S	/sbin/inetd
31	root	S	/sbin/sshd
32	root	S	/sbin/cy_ras
36	root	S	/sbin/cy_wdt_led wdt led
154	root	R	/ps -a

To restart the `cy_ras` process use its process ID or execute the command:

```
signal_ras hup
```

This executes the `ps` command, searches for the `cy_ras` process id, then sends the signal `hup` to the process, all in one step. Never kill `cy_ras` with the signals `-9` or `SIGKILL`.

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TS Menu Script

The `ts_menu` script can be used to avoid typing long telnet or ssh commands. It presents a short menu with the names of the servers connected to the serial ports of the Cyclades-TS. The server is selected by its corresponding number. `ts_menu` must be executed from a local session: via console, telnet, ssh, dumb terminal connected to a serial port, etc. Only ports configured for console access (protocols `socket_server` or `socket_ssh`) will be presented. To start having familiarity with this application, run `ts_menu - h`:

```
> ts_menu -h
```

```
USAGE: ts_menu options
```

```
-p : Display Ethernet Ip and Tcp port
```

```
-i : Display local Ip assigned to the serial port
```

```
-u <name> : Username to be used in ssh/telnet command
```

```
-U : Allows choosing of different usernames for different ports
```

```
-h : print this help message
```

```
> ts_menu
```

```
Master and Slaves Console Server Connection Menu
```

```
1 TSJen800
```

```
2 edson-r4.Cyclades.com
```

```
3 az84.Cycladess.com
```

```
4 64.186.190.85
```

```
5 az85.Cyclades.com
```

```
Type 'q' to quit, a valid option [1-5], or anything else to refresh:
```

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By selecting 1 in this example, the user will access the local serial ports on that Cyclades-TS. If the user selects 2 through 5, remote serial ports will be accessed. This is used when there is clustering (one Cyclades-TS master box and one or more Cyclades-TS slave boxes).

If the user selects 1, the following screen is displayed:

```
Serial Console Server Connection Menu for your Master Terminal
Server
```

```
1 ttyS1 2 ttyS2 3 s3serverfarm
```

```
Type 'q' to quit, 'b' to return to previous menu, a valid option[1-
3], or anything else to refresh:
```

Options 1 to 3 in this case are serial ports configured to work as a CAS profile. Serial port 3 is presented as an alias name (s3serverfarm). When no name is configured in pslave.conf, ttyS<N> is used instead. Once the serial port is selected, the username and password for that port (in case there is a per-user access to the port and -U is passed as parameter) will be presented, and access is granted.

To access remote serial ports, the presentation will follow a similar approach to the one used for local serial ports.

The ts_menu script has the following line options:

-p : Displays Ethernet IP Address and TCP port instead of server names.

```
Cyclades-TS: Serial Console Server Connection menu
```

```
1 209.81.55.79 7001 2 209.81.55.79 7002 3 209.81.55.79 7003
```

```
4 209.81.55.79 7004 5 209.81.55.79 7005 6 209.81.55.79 7006
```

```
Type 'q' to quit, a valid option [1-6], or anything else to refresh
:
```

-i : Displays Local IP assigned to the serial port instead of server names.

```
Cyclades-TS: Serial Console Server Connection menu
```

```
1 192.168.1.101 2 192.168.1.102 3 192.168.1.103 4 192.168.1.104
```

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5 192.168.1.105 6 192.168.1.106

Type 'q' to quit, a valid option [1-6], or anything else to refresh
:

-u <name> : Username to be used in the ssh/telnet command. The default username is that used to log onto the Cyclades-TS.

-h : Lists script options.

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Appendix B - Cabling, Hardware, & Electrical

General Hardware Specifications

The power requirements, environmental conditions and physical specifications of the Cyclades-TS are listed below.

Table 23: Cyclades-TS power requirements

Power Specifications						
	TS110/100	TS400	TS800	TS1000	TS2000	TS3000
Input Voltage Range	External Universal Input Desktop Power Supply, 100-240VAC auto-range input, 5VDC output (Internal power modules available for 12VDC, 24VDC, -48VDC and Power Over Ethernet)	External Universal Input Desktop Power Supply (100-240VAC auto-range input, 5VDC output)	External Universal Input Desktop Power Supply (100-240VAC auto-range input, 5VDC output)	Internal 100-240VAC autorange (-48VDC option available)	Internal 100-240VAC autorange (-48VDC option available)	Internal 100-240VAC autorange
Input Frequency Range	50/60H	50/60H	50/60H	50/60H	50/60H	50/60H
Power @120VAC	5 W max	5 W max	6 W max	22 W max	26 W max	11 W max
Power @220 VAC	6 W max	6 W max	8 W max	28 W max	37 W max	17 W max

Appendix B - Cabling, Hardware, & Electrical

Table 24: Cyclades-TS environmental conditions

Environmental Information						
	TS110/100	TS400	TS800	TS1000	TS2000	TS3000
Operating Temperature	50F to 122F (10°C to 50°C)	50F to 112F (10°C to 44°C)	50F to 112F (10°C to 44°C)	50F to 112F (10°C to 44°C)	50F to 112F (10°C to 44°C)	50F to 112F (10°C to 44°C)
Relative Humidity	10 - 90%, non-condensing	10 - 90%, non-condensing	10 - 90%, non-condensing	10 - 90%, non-condensing	10 - 90%, non-condensing	10 - 90%, non-condensing

Table 25: Cyclades-TS physical specifications

Physical Information							
	TS100	TS110	TS400	TS800	TS1000	TS2000	TS3000
External Dimensions	2.76 x 3.35 x 1.18 in.	3.4 x 4.8 x 1 in.	8.5 x 4.75 x 1 in.	8.5 x 4.75 x 1 in.	17 x 8.5 x 1.75 in.	17 x 8.5 x 1.75 in.	17 x 8.5 x 1.75 in.
Weight	0.3 lb.	0.8 lb.	1.5 lb.	1.6 lb.	6 lb.	6.2 lb.	8 lb.

Table 26: Cyclades-TS safety specifications

Safety Information						
	TS110/100	TS400	TS800	TS1000	TS2000	TS3000
Approvals	FCC and CE, Class A					

Appendix B - Cabling, Hardware, & Electrical

The following section has all the information you need to quickly and successfully purchase or build cables to the Cyclades-TS. It focuses on information related to the RS-232 interface, which applies not only to the Cyclades-TS but also to any RS-232 cabling. At the end of this chapter you will also find some information about the RS-485 interface, which is available for the Cyclades-TS110/100 models only.

The RS-232 Standard

RS-232C, EIA RS-232, or simply RS-232 refer to a standard defined by the Electronic Industries Association in 1969 for serial communication. More than 30 years later, more applications have been found for this standard than its creators could have imagined. Almost all electronic devices nowadays have serial communication ports.

RS-232 was defined to connect Data Terminal Equipment, (DTE, usually a computer or terminal) to Data Communication Equipment (DCE, usually a modem):

DTE > RS-232 > DCE > communication line > DCE > RS-232 > DTE

RS-232 is now mostly being used to connect DTE devices directly (without modems or communication lines in between). While that was not the original intention, it is possible with some wiring tricks. The relevant signals (or wires) in a RS-232 cable, from the standpoint of the computer (DTE), are:

<i>Receive Data (RxD) and Transmit Data (TxD)</i>	The actual data signals
<i>Signal Ground (Gnd)</i>	Electrical reference for both ends
<i>Data Terminal Ready (DTR)</i>	Indicates that the computer (DTE) is active
<i>Data Set Ready (DSR)</i>	Indicates that the modem (DCE) is active.
<i>Data Carrier Ready (DCD)</i>	Indicates that the connection over the communication line is active
<i>CTS (Clear to Send, an input)</i>	Flow control for data flowing from DTE to DCE
<i>RTS (Request to Send, an output)</i>	Flow control for data flowing from DCE to DTE

Appendix B - Cabling, Hardware, & Electrical

Not all signals are necessary for every application, so the RS-232 cable may not need all 7 wires. The RS-232 interface defines communication parameters such as parity, number of bits per character, number of stop-bits and the baud rate. Both sides must be configured with the same parameters. That is the first thing to verify if you think you have the correct cable and things still do not work. The most common configuration is 8N1 (8 bits of data per character, no parity bit included with the data, 1 stop-bit to indicate the end of a character). The baud rate in a RS-232 line translates directly into the data speed in bits per second (bps). Usual transmission speeds range between 9,600 bps and 19,200bps (used in most automation and console applications) to 115,200 bps (used by the fastest modems).

Cable Length

The original RS-232 specifications were defined to work at a maximum speed of 19,200 bps over distances up to 15 meters (or about 50 feet). That was 30 years ago. Today, RS-232 interfaces can drive signals faster and through longer cables.

As a general rule, consider:

- If the speed is lower than 38.4 kbps, you are safe with any cable up to 30 meters (100 feet)
- If the speed is 38.4 kbps or higher, cables should be shorter than 10 meters (30 feet)
- If your application is outside the above limits (high speed, long distances), you will need better quality (low impedance, low-capacitance) cables.

Successful RS-232 data transmission depends on many variables that are specific to each environment. The general rules above are empirical and have a lot of safety margins built-in.

Appendix B - Cabling, Hardware, & Electrical

Connectors

The connector traditionally used with RS-232 is the 25-pin D-shaped connector (DB-25). Most analog modems and most older computers and serial equipment use this connector. The RS-232 interface on DB-25 connector always uses the same standard pin assignment.

The 9-pin D-shaped connector (DB-9) saves some space and is also used for RS-232. Most new PC COM ports and serial equipment (specially when compact size is important) uses this connector. RS-232 interfaces on DB-9 connectors always use the same standard pin assignment.

The telephone-type modular RJ-45 plug and jack are very compact, inexpensive and compatible with the phone and Ethernet wiring systems present in most buildings and data centers. Most networking equipment and new servers use RJ-45 connectors for serial communication. Unfortunately there is no standard RS-232 pin assignment for RJ-45 connectors. Every equipment vendor has its own pin assignment.

Most connectors have two versions. The ones with pins are said to be “male” and the ones with holes are said to be “female.”

Table 27: Cables and their pin specifications

RS-232 Signal	Name/Function (Input/Output)	DB-25 pins (Standard)	DB-9 pins (Standard)	RJ-45 pins (Cyclades)
Chassis	Safety Ground	1	Shell	Shell
TxD	Transmit Data (O)	2	3	3
RxD	Receive Data (I)	3	2	6
DTR	Data Terminal Ready (O)	20	4	2
DSR	Data Set Ready (I)	6	6	8
DCD	Data Carrier Detect (I)	8	1	7
RTS	Request To Send (O)	4	7	1
CTS	Clear To Send (I)	5	8	5
Gnd	Signal Ground	7	5	4

Appendix B - Cabling, Hardware, & Electrical

Straight-Through vs. Crossover Cables

The RS-232 interface was originally intended to connect a DTE (computer, printer and other serial devices) to a DCE (modem) using a straight-through cable (all signals on one side connecting to the corresponding signals on the other side one-to-one). By using some “cabling tricks,” we can use RS-232 to connect two DTEs as is the case in most modern applications.

A crossover (a.k.a. null-modem) cable is used to connect two DTEs directly, without modems or communication lines in between. The data signals between the two sides are transmitted and received and there are many variations on how the other control signals are wired. A “complete” crossover cable would connect TxD with RxD, DTR with DCD/DSR, and RTS with CTS on both sides. A “simplified” crossover cable would cross TxD and RxD and locally short-circuit DTR with DCD/DSR and RTS with CTS.

Which cable should be used?

First, look up the proper cable for your application in the table below. Next, purchase standard off-the-shelf cables from a computer store or cable vendor. For custom cables, refer to the cable diagrams to build your own cables or order them from Cyclades or a cable vendor.

Table 28: Which cable to use

To Connect To	Use Cable
DCE DB-25 Female (standard) <ul style="list-style-type: none">• Analog Modems• ISDN Terminal Adapters	Cable 1: RJ-45 to DB-25 M straight-through (Custom). This custom cable can be ordered from Cyclades or other cable vendors. A sample is included with the product (“straight-through”).

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Table 28: Which cable to use

To Connect To	Use Cable
DTE RJ-45 Cyclades (custom) <ul style="list-style-type: none">All Cyclades Console Ports	Cable 2: RJ-45 to RJ-45 crossover (custom). A sample is included with the product (“straight-through”) This custom cable can be ordered from Cyclades or other cable vendors using the provided wiring diagram.
DTE DB-25 to DB-9 Cyclades (custom) <ul style="list-style-type: none">For the Cyclades-TS110/100	Cable 3: DB-9 Female to DB-25 Female crossover. This connects the Cyclades-TS110/100 (serial port) to terminals, printers and other DTE RS-232 devices.

Cable Diagrams

Before using the following cable diagrams refer to the tables above to select the correct cable for your application. Sometimes, crossover cables are wired slightly differently depending on the application. A “complete” crossover cable would connect the TxD with RxD, DTR with DCD/DSR, and RTS with CTS across both sides. A “simplified” crossover cable would cross TxD and RxD and locally short-circuit DTR with DCD/DSR and RTS with CTS.

Most of the diagrams in this document show the “complete” version of the crossover cables, with support for modem control signals and hardware flow control. Applications that do not require such features have just to configure NO hardware flow control and NO DCD detection on their side. Both ends should have the same configuration for better use of the complete version of the cables.

These cables appear in Cable Package #1 and/or Cable Package #2. You may or may not find them in your box depending on which package you received.

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Cable #1: Cyclades RJ-45 to DB-25 Male, straight-through

Application: This cable connects Cyclades products (serial ports) to modems and other DCE RS-232 devices. It is included in both Cable Package #1 and #2.

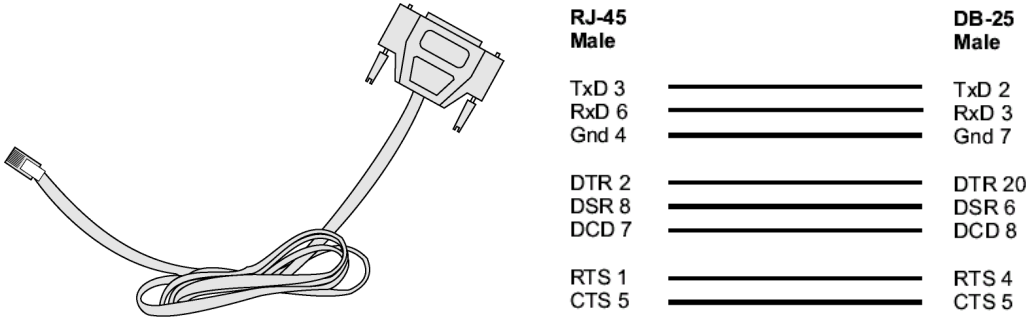


Figure 32: Cable 1 - Cyclades RJ-45 to DB-25 Male, straight-through

Cable #2: Cyclades RJ-45 to DB-25 Female/Male, crossover

This cable connects Cyclades products (serial ports) to console ports, terminals, printers and other DTE RS-232 devices. If you are using Cable Package #1, after connecting the appropriate adapter to the RJ-45 straight-through cable, you will essentially have the cable shown in this picture. If you are using Cable Package #2, no assembly is required. You will have the cable shown below.

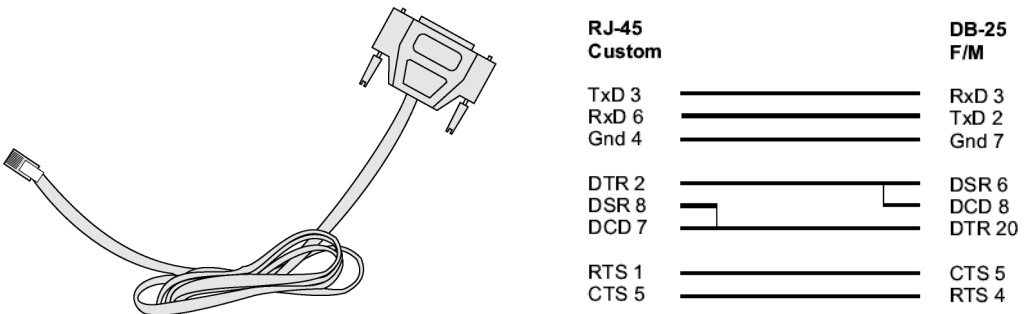


Figure 33: Cable 2 - Cyclades RJ-45 to DB-25 Female/Male, crossover

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Cable #3: Cyclades RJ-45 to DB-9 Female, crossover

This cable connects Cyclades products (serial ports) to console ports, terminals, printers and other DTE RS-232 devices. If you are using Cable Package #1, after connecting the appropriate adapter to the RJ-45 straight-through cable, you will essentially have the cable shown in this picture. If you are using Cable Package #2, no assembly is required. You will have the cable shown below.

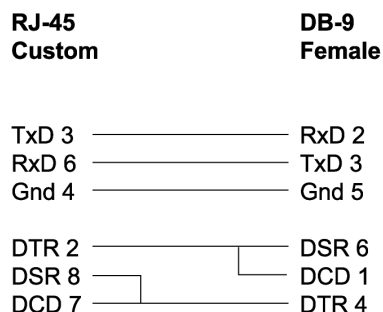
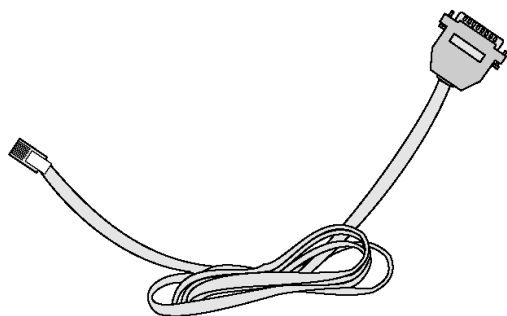


Figure 34: Cable 3 - Cyclades RJ-45 to DB-9 Female, crossover

Cable #4: Cyclades RJ-45 to Cyclades RJ-45, straight-through

This cable is the main cable that you will use. Along with one of the adapters provided (RJ-45 to DB-9 or RJ-45 to DB-25) you can create a crossover cable like the ones explained in Cable #2 or #3 for configuration or to connect to a server. This cable is only included in Cable Package. #1.

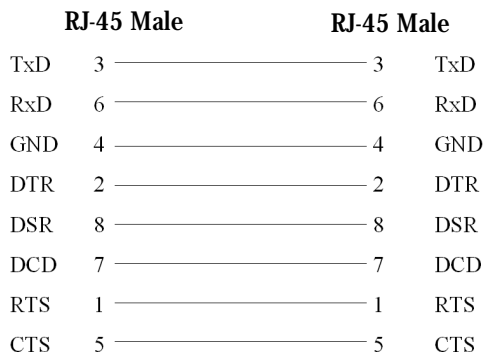
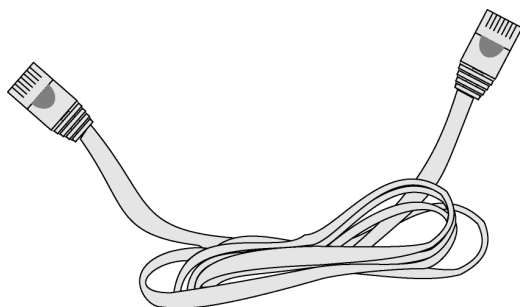


Figure 35: Cable 4 - Cyclades RJ-45 to Cyclades RJ-45, straight-through

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Cable #5: Cyclades/Sun Netra Cable

This Adapter attaches to a Cat 3 or Cat 5 network cable. It is usually used in console management applications to connect Cyclades products to a Sun Netra server or to a Cisco product. This cable is included in Cable Package #2.

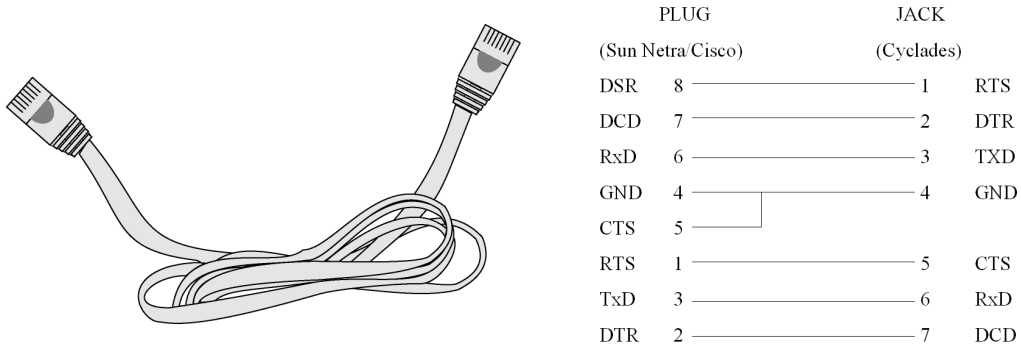


Figure 36: Cable 5 - Cyclades/Sun Netra Cable

Adapters

The following four adapters are included in the product box. A general diagram is provided below and then a detailed description is included for each adapter.

Loop-Back Connector for Hardware Test

The use of the following DB-25 connector is explained in the Troubleshooting chapter. It is included in both Cable Package #1 and #2.

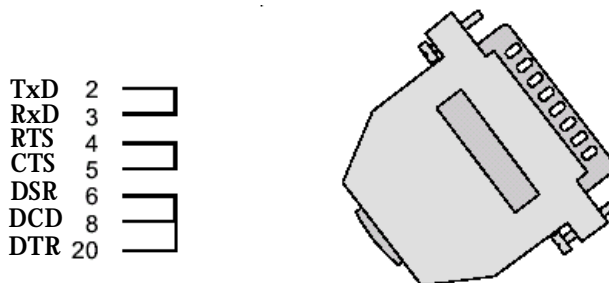


Figure 37: Loop-Back Connector

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Cyclades\Sun Netra Adapter

This Adapter attaches to a Cat 3 or Cat 5 network cable. It is usually used in console management applications to connect Cyclades products to a Sun Netra server or to a Cisco product. At one end of the adapter is the black CAT.5e Inline Coupler box with a female RJ-45 terminus, from which a 3-inch-long black Sun Netra-labeled cord extends, terminating in an RJ-45 male connector. This adapter is included in Cable Package #2.

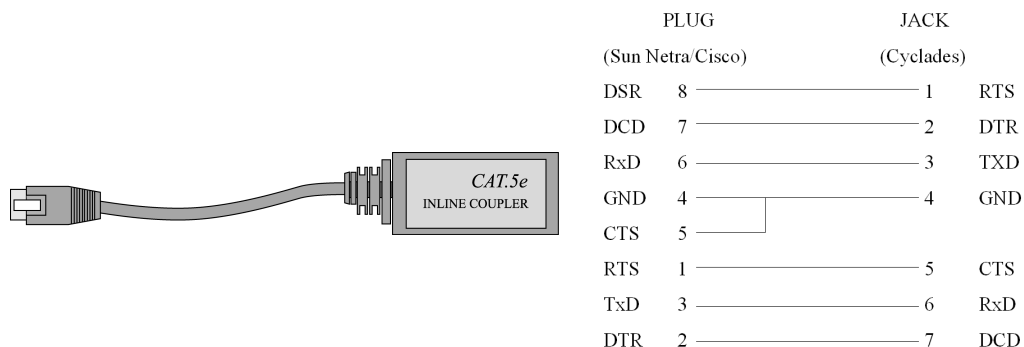


Figure 38: Cyclades\Sun Netra Adapter

RJ-45 Female to DB-25 Male Adapter

The following adapter may be necessary. It is included in Cable Package #1.

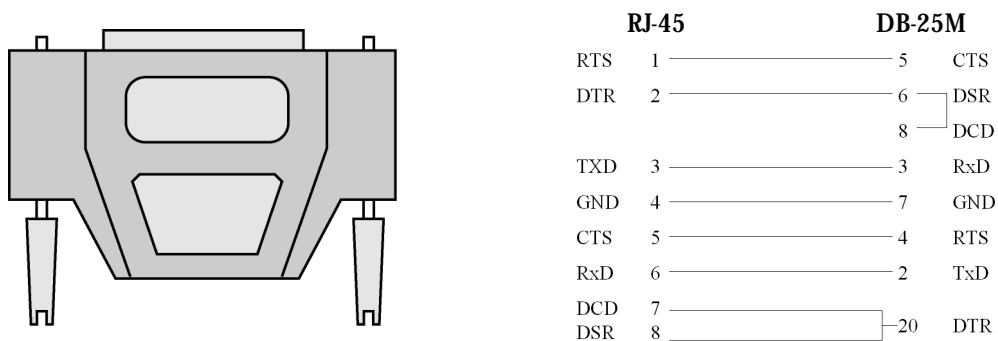


Figure 39: RJ-45 Female to DB-25 Male Adapter

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RJ-45 Female to DB-25 Female Adapter

The following adapter may be necessary. It is included in Cable Package #1.

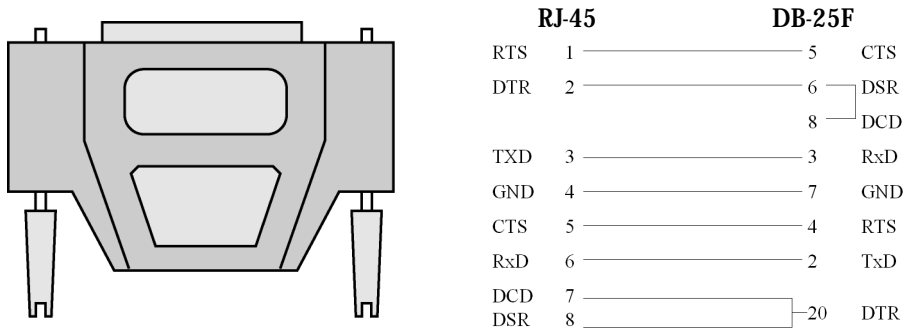


Figure 40: RJ-45 Female to DB-25 Female Adapter

RJ-45 Female to DB-9 Female Adapter

The following adapter may be necessary. This is included in Cable Package #1.

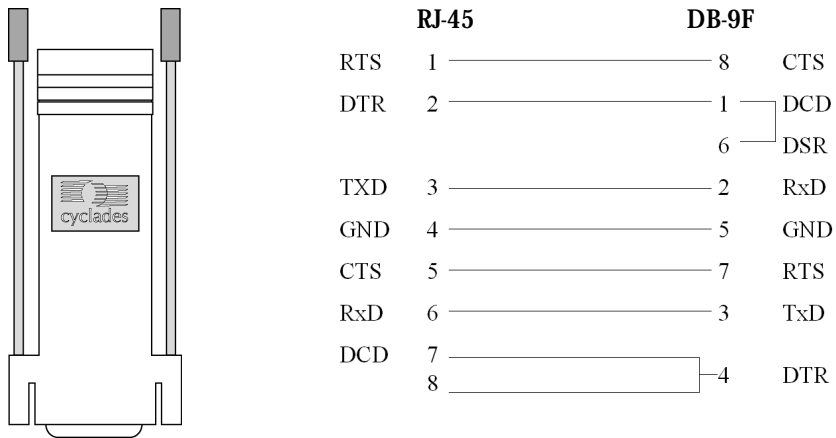


Figure 41: RJ-45 Female to DB-9 Female Adapter

Appendix B - Cabling, Hardware, & Electrical

TS110/100-only Cabling information

The RS-485 Standard

The RS-485 is another standard for serial communication and is available only in the TS110/100. Different from the RS-232, the RS-485 uses fewer wires - either two wires (one twisted pair) for half duplex communication or four wires (two twisted pairs) for full duplex communication. Another RS-485 characteristic is the “termination.” In a network that uses the RS-485 standard, the equipment is connected one to the other in a cascade arrangement. A “termination” is required from the last equipment to set the end of this network.

TS110/100 Connectors

Although the RS-485 can be provided in different kinds of connectors, the Secure Console Port Server SSH 1-Port uses a 9-pin D-shaped connector (DB-9) and a Terminal Block with the pin assignment described below.

Table 31: TS110/100 Connector pin assignment

RS-485 Signal	Name/Function	DB-9 pins	Terminal Block pins
Chassis	Safety Ground		1
TXD-	Transmit Data - (A)	7	2
TXD+	Transmit Data + (B)	3	3
RXD+	Receive Data + (B)	2	4
RXD-	Receive Data - (A)	8	5
Chassis	Safety Ground		6

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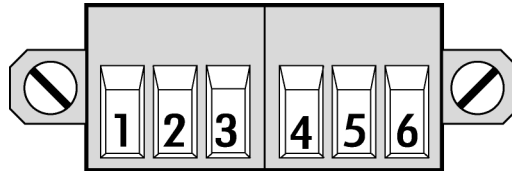


Figure 42: Terminal Block Pins

Notice that if the TS110/100 is configured to use RS-485, the RS-485 signals will be available in both DB-9 and Terminal Block. In this case, the DB-9 pins used in an RS-232 connection can be considered not connected.

Cable Diagrams

Cable #1: DB-9 Female to DB-9 Female, crossover half duplex

Application: It connects the TS110/100 (serial port) DTE RS-485 devices with half duplex communication.

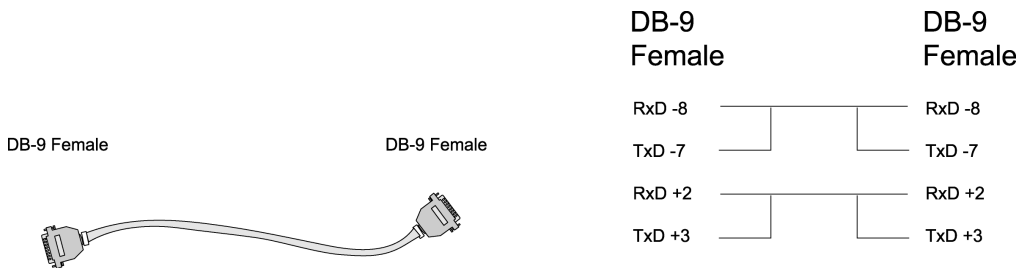


Figure 43: Cable 1 for the TS110/100 - DB-9 Female to DB-9 Female, crossover half duplex

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Cable #2: DB-9 Female to DB-9 Female, crossover full duplex

Application: It connects the TS110/100 (serial port) to DTE RS-485 devices with full duplex communication.

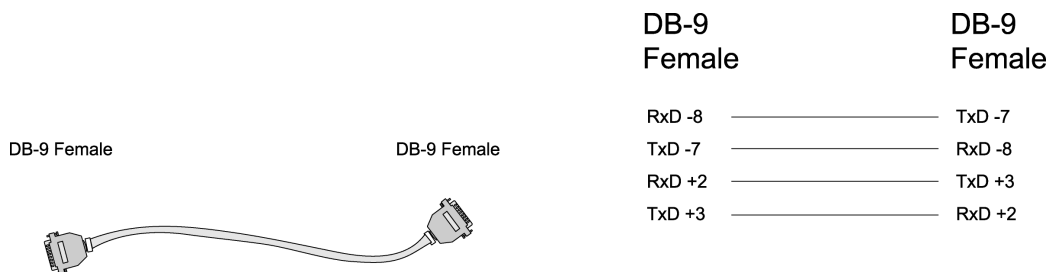


Figure 44: Cable 2 for the TS110/100 - DB-9 Female to DB-9 Female, crossover full duplex

Cable #3: Terminal Block to Terminal Block, crossover half duplex

Application: It connects the TS110/100 (serial port) to DTE RS-485 devices with half duplex communication.

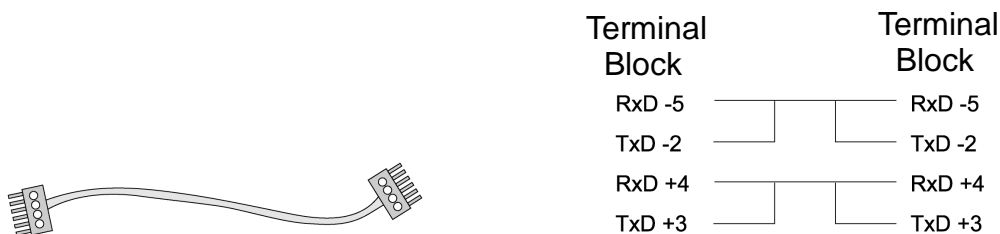


Figure 45: Cable 2 for the TS110/100 - Terminal Block to Terminal Block, crossover half duplex

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Cable #4: Terminal Block to Terminal Block, crossover full duplex

Application: It connects the TS110/100 (serial port) to DTE RS-485 devices with full duplex communication.

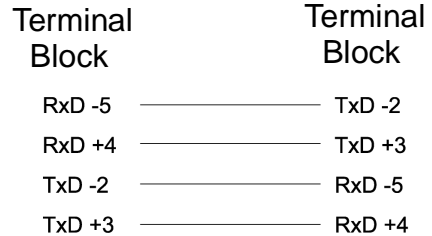


Figure 46: Cable 4 for the TS110/100 - Terminal Block to Terminal Block, crossover full duplex

Cable #5: DB-9 Female to DB-25 Female, crossover

This cable connects the TS110/100 to console ports, terminals, printers and other DTE RS-232 devices. You will essentially have the cable shown in this picture:

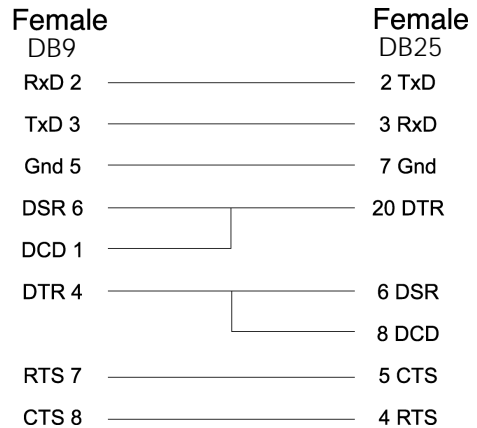
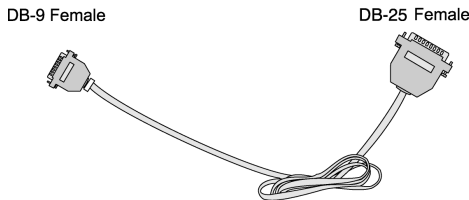


Figure 47: Cable 5 for the TS110/100 - DB-9 Female to DB-25 Female, crossover

Appendix C - The pslave Configuration File

Introduction

This chapter begins with a table containing parameters common to all profiles, followed by tables with parameters specific to a certain profile. You can find samples of the pslave configuration files (pslave.conf, .cas, .ts, and .ras) in the /etc/portslave directory in the TS box.

Configuration Parameters

CAS, TS, and Dial-in Common Parameters

The parameters on the following table are common to all three profiles:

Table 32: Parameters Common to CAS, TS, & Dial-in Access

Parameter	Description	Value for this Example
conf.eth_ip	Configured in Task 4: Edit the pslave.conf file in Chapter 2 - Installation, Configuration, and Usage . This is the IP address of the Ethernet interface. This parameter, along with the next two, is used by the cy_ras program to OVERWRITE the file /etc/network/ifcfg_eth0 as soon as the command “signal_ras hup” is executed. The file /etc/network/ifcfg_eth0 should not be edited by the user unless the cy_ras configuration is not going to be used.	200.200.200.1
conf.eth_mask	The mask for the Ethernet network.	255.255.255.0
conf.eth_mtu	The Maximum Transmission Unit size, which determines whether or not packets should be broken up.	1500

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Table 32: Parameters Common to CAS, TS, & Dial-in Access

Parameter	Description	Value for this Example
conf.lockdir	The lock directory, which is /var/lock for the Cyclades-TS. It should not be changed unless the user decides to customize the operating system.	/var/lock
all.speed	The speed for all ports.	9600
all.datasize	The data size for all ports.	8
all.stopbits	The number of stop bits for all ports.	1
all.parity	The parity for all ports.	none
all.authtype	Configured in Task 4: Edit the pslave.conf file in Chapter 2 - Installation, Configuration, and Usage .	radius
all.authhost1	This address indicates the location of the Radius/TacacsPlus authentication server and is only necessary if this option is chosen in the previous parameter. A second Radius/TacacsPlus authentication server can be configured with the parameter all.authhost2.	200.200.200.2
all.accthost1	This address indicates the location of the Radius/TacacsPlus accounting server, which can be used to track how long users are connected after being authorized by the authentication server. Its use is optional. If this parameter is not used, accounting will not be performed. If the same server is used for authentication and accounting, both parameters must be filled with the same address. A second Radius/TacacsPlus accounting server can be configured with the parameter all.accthost2.	200.200.200.2

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Table 32: Parameters Common to CAS, TS, & Dial-in Access

Parameter	Description	Value for this Example
all.authtype	<p>Type of authentication used. There are several authentication type options:</p> <ul style="list-style-type: none">• <i>none</i> (no authentication)• <i>local</i> (authentication is performed using the /etc/passwd file)• <i>remote</i> (This is for a terminal profile only. The unit takes in a username but does not use it for authentication. Instead it passes it to the remote server where it is then used for authentication.)• <i>radius</i> (authentication is performed using a Radius authentication server)• <i>TacacsPlus</i> (authentication is performed using a TacacsPlus authentication server)• <i>ldap</i> (authentication is performed against an ldap database using an ldap server. The IP address and other details of the ldap server are defined in the file /etc/ldap.conf)• <i>local/radius</i> (authentication is performed locally first, switching to Radius if unsuccessful)	local

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Table 32: Parameters Common to CAS, TS, & Dial-in Access

Parameter	Description	Value for this Example
	<ul style="list-style-type: none"> • <i>radius/local</i> (the opposite of the previous option) • <i>local/TacacsPlus</i> (authentication is performed locally first, switching to TacacsPlus if unsuccessful) • <i>TacacsPlus/local</i> (the opposite of the previous option) • <i>RadiusDownLocal</i> (local authentication is tried only when the Radius server is down) • <i>TacacsPlusDownLocal</i> (local authentication is tried only when the TacacsPlus server is down) <p>Note that this parameter controls the authentication required by the Cyclades-TS. The authentication required by the device to which the user is connecting is controlled separately.</p>	
<code>all.break_sequence</code>	This parameter is the string that is used to send a break to the TTY. It is only valid if TTY protocol is <code>socket_ssh</code> or <code>socket_server</code> .	<code>~break</code>
<code>all.break_interval</code>	This parameter defines the break duration in milliseconds. It is valid if TTY protocol is <code>socket_ssh</code> , <code>socket_server</code> or <code>ssh-2</code> (client).	
<code>all.radtimeout</code>	This is the timeout (in seconds) for a Radius/TacacsPlus authentication query to be answered. The first server (<code>authhost1</code>) is tried “ <code>radretries</code> ” times, and then the second (<code>authhost2</code>), if configured, is contacted “ <code>radretries</code> ” times. If the second also fails to respond, Radius/TacacsPlus authentication fails.	3

Appendix C - The pslave Configuration File

Table 32: Parameters Common to CAS, TS, & Dial-in Access

Parameter	Description	Value for this Example
all.radretries	Defines the number of times each Radius/TacacsPlus server is tried before another is contacted. The default, if not configured, is 5.	5
all.secret	This is the shared secret necessary for communication between the Cyclades-TS and the Radius/TacacsPlus servers.	secret
all.flow	This sets the flow control to hardware, software, or none.	hard
all.protocol	The default CAS setup was explained in Chapter 2, Task 4: Edit the pslave.conf file . The TS configuration settings are in Table 34, "TS Parameters," on page 326 . The Dial-in configuration settings are in Table 35, "Dial-in configuration Parameters," on page 328 . For Power Management, see the section "Appendix I - Power Management" on page 385 .	socket_server
s1.tty	The device name for the port is set to the value given in this parameter. If a device name is not provided for a port, it will not function.	ttyS1
web_WinEMS (new)	Defines whether or not management of Windows Emergency Management Service is allowed from the Web.	yes or 1, or no or 0
xml_monitor	A non-zero value activates XML monitoring. All XML data received from the port is captured and sent to syslog-ng with facility LOCAL<DB_facility> and priority INFO. The format of the message is "XML_MONITOR (ttySx) [data]". XML tags are sent by Windows Server 2003 Emergency Management Services during boot or crash. You can read more on XML_MONITOR in: /etc/syslog-ng/syslog-ng.conf	

Appendix C - The pslave Configuration File

Table 32: Parameters Common to CAS, TS, & Dial-in Access

Parameter	Description	Value for this Example
translation	Defines whether or not to perform translation of Fn-keys (e.g. F8 key) from one terminal type to VT-UTF8. Currently only translation from xterm to VT-UTF8 is supported.	xterm
pool	If a port is busy, you will be directed to the next pool group. If port 1 is busy, it goes to port 2. If port 2 is busy, it goes to port 3 and so on. You can pool together several serial ports into a pool group.	

CAS Parameters

You can configure additional CAS features with the parameters given on the following tables. (The `is` is used as an example in some parameters.)

In addition to the above parameters which are common to all local and remote access scenarios, you can also configure the following parameters for additional options. Many of the parameters are unique to CAS, but some also apply to TS and Dial-in port profiles. This is indicated in these instances.

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Table 33: Mostly CAS-specific Parameters

Parameter	Description	Value for this Example
conf.nfs_data_buffering	This is the Remote Network File System where data captured from the serial port will be written instead of being written to the local directory <i>/var/run/DB</i> . The directory tree to which the file will be written must be NFS-mounted, so the remote host must have NFS installed and the administrator must create, export and allow reading/writing to this directory. The size of this file is not limited by the value of the parameter <i>all.data_buffering</i> , though the value cannot be zero since a zero value turns off data buffering. The size of the file is dependent on the NFS server only (hard drive, partition size, etc.).	commented
conf.facility	This value (0-7) is the Local facility sent to the syslog. The file <i>/etc/syslog-ng/syslog-ng.conf</i> contains a mapping between the facility number and the action (see more in Syslog in Chapter 3 - Additional Features).	7
conf.DB_facility	This value (0-7) is the Local facility sent to the syslog with the data when <i>syslog_buffering</i> is active. The file <i>/etc/syslog-ng/syslog-ng.conf</i> contains a mapping between the facility number and the action (see more on Syslog in Chapter 3).	0
conf.group	Used to group users to simplify configuration of the parameter <i>all.users</i> later on. This parameter can be used to define more than one group.	group_name: user1, user2

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Table 33: Mostly CAS-specific Parameters

Parameter	Description	Value for this Example
all.DTR_reset	This parameter specifies the behavior of the DTR signal in the serial port. If set to zero the DTR signal will be ON if there is a connection to the serial port, otherwise OFF. If set from 1 to 99 the DTR signal will be always ON. A value greater or equal 100 specifies for how long (in milliseconds) the DTR signal will be turned off before it is turned back on again when a connection to the serial port is closed.	100
all.break_sequence	This parameter is the string that is used to send a break to the TTY. It is only valid if TTY protocol is socket_ssh or socket_server.	~break
all.break_interval	This parameter defines the break duration in milliseconds. It is valid if TTY protocol is socket_ssh,	socket_server or ssh-2 (client)
all.dcd	DCD signal (sets the tty parameter CLOCAL). Valid values are 0 or 1. If all.dcd=0, a connection request will be accepted regardless of the DCD signal and the connection will not be closed if the DCD signal is set to DOWN. If all.dcd=1 a connection request will be accepted only if the DCD signal is UP and the connection will be closed if the DCD signal is set to DOWN.	0
all.modbus_smode	Communication mode through the serial ports. This parameter is meaningful only when modbus protocol is configured. The valid options are ascii (normal TX/RX mode) and rtu (some time constraints are observed between characters while transmitting a frame). If not configured, ASCII mode will be assumed.	commented

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Table 33: Mostly CAS-specific Parameters

Parameter	Description	Value for this Example
all.issue	<p>This text determines the format of the login banner that is issued when a connection is made to the Cyclades-TS. \n represents a new line and \r represents a carriage return. Expansion characters can be used here.</p> <p><i>Value for this Example:</i></p> <pre>\r\n\ Welcome to terminal server %h port S%p \r\n\ </pre>	See Description column
all.prompt	<p>This text defines the format of the login prompt. Expansion characters can be used here.</p>	%h login:
all.lf_suppress	<p>This can be useful because telneting (from DOS) from some OS such as Windows 98 causes produces an extra line feed so two prompts appear whenever you press Enter. When set to 1, line feed suppression is active which will eliminate the extra prompt. When set to 0 (default), line feed suppression is not active.</p>	0
all.auto_answer_input	<p>This parameter works in conjunction with all.auto_answer_output. It allows you to configure a string that will be matched against all data coming in from the tty (remote server). If there is a match, the configured output string (auto_answer_output) will then be send back to the tty. This parameter works only when there is no session to the port. If uncomented and a string of bytes is set, matching occurs whenever there is not session established to the port. If this parameter is commented out, then no checking and matching occurs. (See more on the usage of this parameter in Terminal Appearance in Chapter 3.)</p>	commented

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Table 33: Mostly CAS-specific Parameters

Parameter	Description	Value for this Example
<code>all.auto_answer_output</code>	This parameter works in conjunction with <code>all.auto_answer_input</code> . It allows you to configure a string that is sent back to the remote server whenever the incoming data remote server matches with <code>all.auto_answer_input</code> . This parameter works only when there is no session to the port. If this parameter is commented, then nothing will be sent back to the remote server even if <code>all.auto_answer_input</code> is uncommented. If this parameter is uncommented and if <code>all.auto_answer_input</code> is also uncommented, then the string configured will be sent back to the remote server. (See more on the usage of this parameter in Terminal Appearance in Chapter 3.)	commented
<code>all.ipno</code>	This is the default IP address of the Cyclades-TS's serial ports. The "+" indicates that the first port should be addressed as 192.168.1.101 and the following ports should have consecutive values. Any host can access a port using its IP address as long as a path to the address exists in the host's routing table.	192.168.1.10 1+
<code>all.poll_interval</code>	Valid only for protocols <code>socket_server</code> and <code>raw_data</code> . When not set to zero, this parameter sets the wait for a TCP connection keep-alive timer. If no traffic passes through the Cyclades-TS for this period of time, the Cyclades-TS will send a line status message to the remote device to see if the connection is still up. If not configured, 1000 ms is assumed (the unit for this parameter is ms). If set to zero, line status messages will not be sent to the socket client.	0

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Table 33: Mostly CAS-specific Parameters

Parameter	Description	Value for this Example
all.socket_port	<p>In the CAS profile, this defines an alternative labeling system for the Cyclades-TS ports. The “+” after the numerical value causes the serial interfaces to be numbered consecutively. In this example, serial interface 1 is assigned the port value 7001, serial interface 2 is assigned the port value 7002, etc. One example on how this could be used is in the case of all.protocol</p> <p>or s<n>.protocol socket_ssh and the port value (7001, 7002, etc), if supplied by the ssh client like username:port value, the ssh client will be directly connected with the serial interface.</p> <p>For TS, this parameter is valid only all.protocol is configured as socket_cliente or telnet. It is the TCP port number of the application that will accept connection requested by this serial port.</p>	7001+

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Table 33: Mostly CAS-specific Parameters

Parameter	Description	Value for this Example
all.data_buffering	<p>A non zero value activates data buffering (local or remote, according to what was configured in the parameter <code>conf.nfs_data_buffering</code> see Data Buffering in Chapter 3). If local data buffering, a file is created on the Cyclades-TS; if remote, a file is created through NFS in a remote server. All data received from the port is captured in this file. If local data buffering, this parameter means the maximum file size (in bytes). If remote, this parameter is just a flag to activate (greater than zero) or deactivate data buffering. When local data buffering is used, each time the maximum is reached the oldest 10% of stored data is discarded, releasing space for new data (FIFO system) - circular file. When remote data buffering is used, there's no maximum file size other than the one imposed by the remote server - linear file. This file can be viewed using the normal Unix tools (<code>cat</code>, <code>vi</code>, <code>more</code>, etc.). <i>Size is in bytes not kilobytes</i>. See Data Buffering for details.</p>	0

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Table 33: Mostly CAS-specific Parameters

Parameter	Description	Value for this Example
all.DB_mode	When configured as cir for circular format, the buffer works like a revolving file at all times. The file is overwritten whenever the limit of the buffer size (as configured in all.data_buffering or s<n>.data_buffering) is reached. As for linear format (lin), once the limit of the kernel buffer size is reached (4k), a flow control stop (RTS off or XOFF-depending on how all.f low or s<n>.flow is set) is issued automatically to the remote device so that it will stop sending data to the serial port. Then, when a session is established to the serial port, the data in the buffer is shown to the user if not empty (dont_show_DBmenu parameter assumed to be 2), cleared, and a flow control start (RTS on or XON) is issued to resume data transmission. Once exiting the session, linear data buffering resumes. If all.flow or s<n>.flow is set to none, linear buffering is not possible as there is no way to stop reception through the serial line. Default is cir.	cir
all.DB_timestamp	Records the time stamp in the data buffering file (1) or not (0). If it is configured as 1, the software will accumulate input characters until it receives a CR and LF from the serial port or the accumulated data reaches 256 characters. Either way, the accumulated data will be recorded in the data buffering file along with the current time. The parameter all.data_buffering has to be with a non-zero value for this parameter to be meaningful.	0

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Table 33: Mostly CAS-specific Parameters

Parameter	Description	Value for this Example
all.syslog_buffering	When non zero, the contents of the data buffer are sent to the syslogng every time a quantity of data equal to this parameter is collected. The syslog level for data buffering is hard coded to level 5 (notice) and facility local[0+conf.DB_facility]. The file /etc/syslog-ng/syslog-ng.conf should be set accordingly for the syslog-ng to take some action. (See Syslog-ng Configuration to use with Syslog Buffering Feature.)	0
all.syslog_sess	Syslog_buffering must be activated for the following to work. When 0, syslog messages are always generated whether or not there is a session to the port sending data to the unit. When 1, syslog messages are NOT generated when there IS a session to the port sending data to the unit, but resumes generation of syslog messages when there ISN'T a session to the port.	0
all.dont_show_DBmenu	When zero, a menu with data buffering options is shown when a nonempty data buffering file is found. When 1, the data buffering menu is not shown. When 2, the data buffering menu is not shown but the data buffering file is shown if not empty. When 3, the data buffering menu is shown, but without the erase and show and erase options.	1
all.alarm	When non zero, all data received from the port are captured and sent to syslog-ng with level INFO and local[0+conf.DB_facility]facility. The syslogng.conf file should be set accordingly, for the syslog-ng to take some action (please see Generating Alarms in Chapter 3 - Additional Features for the syslog-ng configuration file).	0

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Table 33: Mostly CAS-specific Parameters

Parameter	Description	Value for this Example
<code>all.billing_records</code>	Billing file size configuration. A non-zero value defines the maximum number of billing records within a billing file. Zero stops billing recording. The billing files are located at <code>/var/run/DB</code> and are named <code>cycXXXXX-YYMMDD.hhmmss.txt</code> (e.g., <code>cycTS100-030122.153611.txt</code>).	60
<code>all.billing_timeout</code>	Billing timeout configuration. A non-zero value defines how long (minutes) a billing file should be waiting for records before close. After a file is closed, this file is available for transfer and a new one is opened. Zero means “no timeout” and so the file is only closed after “ <code>billing_records</code> ” are received.	60
<code>all.users</code>	Restricts access to ports by user name (only the users listed can access the port or, using the character “!”, all but the users listed can access the port.) In this example, the users <code>joe</code> , <code>mark</code> and members of <code>user_group</code> cannot access the port. A single comma and spaces/tabs may be used between names. A comma may not appear between the “!” and the first user name. The users may be local, Radius or TacacsPlus. User groups (defined with the parameter <code>conf.group</code>) can be used in combination with user names in the parameter list. Notice that these are common users, not administrators.	<code>! joe, mark, user_group</code>
<code>all.sniff_mode</code>	This parameter determines what other users connected to the very same port (see parameter <code>admin_users</code> below) can see of the session of the first connected user (main session): <code>in</code> shows data written to the port, <code>out</code> shows data received from the port, and <code>i/o</code> shows both streams. The second and later sessions are called sniff sessions and this feature is activated whenever the protocol parameter is set to <code>socket_ssh</code> or <code>socket_server</code> .	<code>out</code>

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Table 33: Mostly CAS-specific Parameters

Parameter	Description	Value for this Example
all.admin_users	This parameter determines which users can receive the sniff session menu. Then they have options to open a sniff session or cancel a previous session. When users want access per port to be controlled by administrators, this parameter is obligatory and auth-type must not be none. User groups (defined with the parameter conf.group) can be used in combination with user names in the parameter list.	peter, john, user_group
all.multiple_sessions	Allows users to open more than one common and sniff session on the same port. The options are “yes,” “no,” “RW_session,” or “sniff_session.” Default is set to “no.” Please see Session Sniffing in Chapter 3 for details.	no
all.escape_char	This parameter determines which character must be typed to make the session enter “menu mode”. The possible values are <CTRL-a> to <CTRL-z>. Represent the CTRL with '^'. This parameter is only valid when the port protocol is socket_server or socket_ssh. Default value is '^z'.	^z
all.tx_interval	Valid for protocols socket_server and raw_data. Defines the delay (in milliseconds) before transmission to the Ethernet of data received through a serial port. If not configured, 100ms is assumed. If set to zero or a value above 1000, no buffering will take place.	100
all.idletimeout	Specifies how long (in minutes) a connection can remain inactive before it is cut off. If it set to zero, the connection will not time out.	0

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Table 33: Mostly CAS-specific Parameters

Parameter	Description	Value for this Example
all.sttyCmd	<p>The TTY is programmed to work as configured and this user-specific configuration is applied over that serial port. Parameters must be separated by a space. The following example sets :</p> <p><i>-igncr</i> This tells the terminal not to ignore the carriage-return on input,</p> <p><i>-onlcr</i> Do not map newline character to a carriage return or newline character sequence on output,</p> <p><i>opost</i> Post-process output,</p> <p><i>-icrnl</i> Do not map carriage-return to a newline character on input.</p> <pre>all.sttyCmd -igncr -onlcr opost -icrnl</pre>	commented
s1.serverfarm	Alias name given to the server connected to the serial port. Server_connected.	serial1
s2.tty	See the s1.tty entry in the following table.	ttyS2
s8.tty	See the s1.tty entry in the following table.	ttyS8

TS Parameters

The following parameters are unique to a TS setup except where indicated.

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Table 34: TS Parameters

Parameter	Description	Value for this Example
conf.telnet	Location of the telnet utility	/usr/bin/telnet
conf.ssh	Location of the ssh utility.	/bin/ssh
conf.locallogins	This parameter is only necessary when authentication is being performed for a port. When set to one, it is possible to log in to the Cyclades-TS directly by placing a “!” before your login name, then using your normal password. This is useful if the Radius authentication server is down.	0
all.host	The IP address of the host to which the terminals will connect.	200.200.200.3
all.term	This parameter defines the terminal type assumed when performing rlogin or telnet to other hosts.	vt100
all.userauto	Username used when connected to a UNIX server from the user’s serial terminal.	
all.protocol (for TS)	For the terminal server configuration, the possible protocols are login (which requests username and password), rlogin (receives username from the TS and requests a password), telnet, ssh, ssh2, or socket_client. See all.socket_port definition if all.protocol is configured as socket_client.	rlogin
all.issue (CAS and TS)	See description in CAS section.	
all.prompt (CAS and TS)	See description in CAS section.	
all.socket_port	The socket_port is the TCP port number of the application that will accept connection requested by this serial port. That application usually is telnet (23).	

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Table 34: TS Parameters

Parameter	Description	Value for this Example
<code>all.telnet_client_mode</code>	When the protocol is TELNET, this parameter configured as BINARY (1) causes an attempt to negotiate the TELNET BINARY option on both input and output with the Telnet server. So it puts the telnet client in binary mode. The acceptable values are "0" or "1", where "0" is text mode (default) and "1" is a binary mode.	
<code>s16.tty (TS)</code>	See the <code>s1.tty</code> entry in the CAS section.	<code>ttyS16</code>

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Dial-in Access Parameters

The following parameters are unique to a Dial-in setup except where indicated.

Table 35: Dial-in configuration Parameters

Parameter	Description	Value for this Example
conf.pppd	Location of the ppp daemon with Radius.	/usr/local/sbin/ pppd
conf.facility (CAS and Dial-in)	See description in CAS section.	
all.ipno (CAS and Dial-in)	See description in CAS section.	
all.initchat	Modem initialization string.	TIMEOUT 10 "" \d\ \dATZ \ OK\r\n-ATZ-OK\r\n "" \ "" ATMO OK\R\N "" \ TIMEOUT 3600 RING "" \ STATUS Incoming %p:I.HANDSHAKE "" ATA\ TIMEOUT 60 CONNECT@ "" \ STATUS Connected %p:I.HANDSHAKE

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Table 35: Dial-in configuration Parameters

Parameter	Description	Value for this Example
all.autoppp	all.autoppp PPP options to auto-detect a ppp session. The cb-script parameter defines the file used for callback and enables negotiation with the callback server. Callback is available in combination with Radius Server authentication. When a registered user calls the TS, it will disconnect the user, then call the user back. The following three parameters must be configured in the Radius Server: attribute Service_type(6): Callback Framed; attribute Framed_Protocol(7): PPP; attribute Callback_Number(19): the dial number (example: 50903300).	%j novj \ proxyarp modem asyncmap 000A0000 \ noipx noccp login auth require-pap refusechap\ mtu %t mru %t \ cb-script /etc/portslave/cb_script \ plugin /usr/lib/libpsr.so
all.pppopt	all.pppopt PPP options when user has already been authenticated.	%i:%j novj \ proxyarp modem asyncmap 000A0000 \ noipx noccp mtu %t mru %t netmask%m \ idle %I maxconnect %T \ plugin /usr/lib/libpsr.so
all.protocol	For the Dial-in configuration, the available protocols are PPP, SLIP and CSLIP.	ppp
s32.tty	See the s1.tty entry in the CAS section.	ttyS32

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Appendix D - Linux-PAM

Introduction

Linux-PAM (Pluggable Authentication Modules for Linux) is a suite of shared libraries that enable the local system administrator to choose how applications authenticate users. In other words, without (rewriting and) recompiling a PAM-aware application, it is possible to switch between the authentication mechanism(s) it uses. Indeed, one may entirely upgrade the local authentication system without touching the applications themselves.

It is the purpose of the Linux-PAM project to separate the development of privilege-granting software from the development of secure and appropriate authentication schemes. This is accomplished by providing a library of functions that an application may use to request that a user be authenticated. This PAM library is configured locally with a system file, `/etc/pam.conf` (or a series of configuration files located in `/etc/pam.d/`) to authenticate a user request via the locally available authentication modules. The modules themselves will usually be located in the directory `/lib/security` and take the form of dynamically loadable object files.

The Linux-PAM authentication mechanism gives to the system administrator the freedom to stipulate which authentication scheme is to be used. S/he has the freedom to set the scheme for any/all PAM-aware applications on your Linux system. That is, s/he can authenticate from anything as generous as simple trust (`pam_permit`) to something as severe as a combination of a retinal scan, a voice print and a one-time password!

Linux-PAM deals with four separate types of (management) task. These are: authentication management, account management, session management, and password management. The association of the preferred management scheme with the behavior of an application is made with entries in the relevant Linux-PAM configuration file. The management functions are performed by modules specified in the configuration file.

Following is a figure that describes the overall organization of Linux-PAM:

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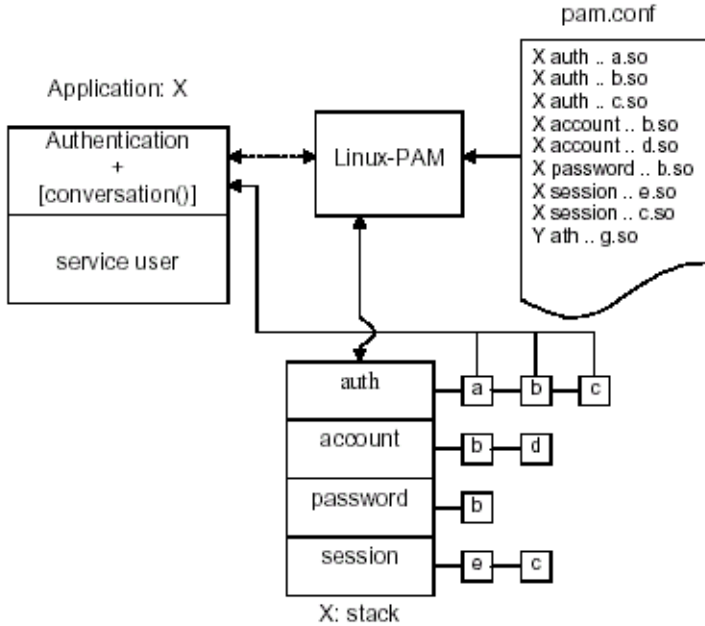


Figure 48: Data flow diagram of Linux-PAM

The left of the figure represents the application: Application X. Such an application interfaces with the Linux-PAM library and knows none of the specifics of its configured authentication method. The Linux-PAM library (in the center) consults the contents of the PAM configuration file and loads the modules that are appropriate for Application X. These modules fall into one of four management groups (lower center) and are stacked in the order they appear in the configuration file. These modules, when called by Linux-PAM, perform the various authentication tasks for the application. Textual information, required from or offered to the user can be exchanged through the use of the application-supplied conversation function.

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The Linux-PAM Configuration File

Linux-PAM is designed to provide the system administrator with a great deal of flexibility in configuring the privilege-granting applications of their system. The local configuration of those aspects of system security controlled by Linux-PAM is contained in one of two places: either the single system file `/etc/pam.conf` or the `/etc/pam.d/` directory. In this section we discuss the correct syntax of and generic options respected by entries to these files.

Configuration File Syntax

The reader should note that the Linux-PAM-specific tokens in this file are case-insensitive. The module paths, however, are case-sensitive since they indicate a file's name and reflect the case-dependence of typical Linux file systems. The case-sensitivity of the arguments to any given module is defined for each module in turn.

In addition to the lines described below, there are two special characters provided for the convenience of the system administrator:

- # Comments are preceded by this character and extend to the next end-of-line.
- \ This character extends the configuration lines.

A general configuration line of the `/etc/pam.conf` file has the following form:

```
Service-name module-type control-flag module-path arguments
```

The meaning of each of these tokens is explained below. The second (and more recently adopted) way of configuring Linux-PAM is via the contents of the `/etc/pam.d/` directory. After the meaning of the above tokens is explained, the method will be described.

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Service-name The name of the service associated with this entry. Frequently the service name is the conventional name of the given application. For example, 'ftpd', 'rlogind', 'su', etc. There is a special service-name, reserved for defining a default authentication mechanism. It has the name 'OTHER' and may be specified in either lower or upper case characters. Note, when there is a module specified for a named service, the 'OTHER' entries are ignored.

Module-type One of (currently) the four types of module. The four types are as follows:

Auth- This module type provides two aspects of authenticating the user. First, it establishes that the user is who they claim to be, by instructing the application to prompt the user for a password or other means of identification. Second, the module can grant group membership, independently of the /etc/groups, or other privileges through its credential-granting properties.

Account- This module performs non-authentication-based account management. It is typically used to restrict or permit access to a service based on the time of day, currently available system resources (maximum number of users) or perhaps the location of the applicant user—'root' login only on the console.

Session- Primarily, this module is associated with doing things that need to be done for the user before or after they can be given service. Such things include the logging of information concerning the opening or closing of some data exchange with a user, mounting directories, etc.

Password- This last module type is required for updating the authentication token associated with the user. Typically, there is one module for each 'challenge/response' based authentication (auth) module-type.

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Control-flag The control-flag is used to indicate how the PAM library will react to the success or failure of the module it is associated with. Since modules can be stacked (modules of the same type execute in series, one after another), the control-flags determine the relative importance of each module. The application is not made aware of the individual success or failure of modules listed in the `/etc/pam.conf` file. Instead, it receives a summary of success or fail responses from the Linux-PAM library. The order of execution of these modules is that of the entries in the `/etc/pam.conf` file: earlier entries are executed before later ones. The control-flag can be defined with one of two syntaxes. The simpler (and historical) syntax for the control-flag is a single keyword defined to indicate the severity of concern associated with the success or failure of a specific module. There are four such keywords: required, requisite, sufficient and optional.

The Linux-PAM library interprets these keywords in the following manner:

Required This indicates that the success of the module is required for the module-type facility to succeed. Failure of this module will not be apparent to the user until all of the remaining modules (of the same module-type) have been executed.

Requisite This is similar to *required*. However, in the case that such a module returns a failure, control is directly returned to the application. The return value is that associated with the first required or requisite module to fail. Note that this flag can be used to protect against the possibility of a user getting the opportunity to enter a password over an unsafe medium. It is conceivable that such behavior might inform an attacker of valid accounts on a system. This possibility should be weighed against the significant concerns of exposing a sensitive password in a hostile environment.

Sufficient The success of this module is deemed 'sufficient' to satisfy the Linux-PAM library that this moduletype has succeeded in its purpose. In the event that no previous required module has failed, no more 'stacked' modules of this type are invoked. (Note: in this case subsequent required modules are not invoked.) A failure of this module is not deemed as fatal to satisfying the application.

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Optional As its name suggests, this control-flag marks the module as not being critical to the success or failure of the user's application for service. In general, Linux-PAM ignores such a module when determining if the module stack will succeed or fail. However, in the absence of any definite successes or failures of previous or subsequent stacked modules this module will determine the nature of the response to the application. One example of this latter case is when the other modules return something like PAM_IGNORE.

Newest Syntax

The more elaborate (newer) syntax is much more specific and gives the administrator a great deal of control over how the user is authenticated. This form of the control flag is delimited with square brackets and consists of a series of value=action tokens:

```
[value1=action1 value2=action2 ...]
```

Here, value1 is one of the following return values: success; open_err; symbol_err; service_err; system_err; buf_err; perm_denied; auth_err; cred_insufficient; authinfo_unavail; user_unknown; maxtries; new_authtok_reqd; acct_expired; session_err; cred_unavail; cred_expired; cred_err; no_module_data; conv_err; authtok_err; authtok_recover_err; authtok_lock_busy; authtok_disable_aging; try_again; ignore; abort; authtok_expired; module_unknown; bad_item; and default. The last of these (default) can be used to set the action for those return values that are not explicitly defined.

The action can be a positive integer or one of the following tokens: ignore, ok, done, bad, die, and reset.

A positive integer When specified as the action, can be used to indicate that the next J modules of the current type will be skipped. In this way, the administrator can develop a moderately sophisticated stack of modules with a number of different paths of execution. Which path is taken can be determined by the reactions of individual modules.

Ignore When used with a stack of modules, the module's return status will not contribute to the return code the application obtains.

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<i>Bad</i>	This action indicates that the return code should be thought of as indicative of the module failing. If this module is the first in the stack to fail, its status value will be used for that of the whole stack.
<i>Die</i>	Equivalent to <i>bad</i> with the side effect of terminating the module stack and PAM immediately returning to the application.
<i>OK</i>	This tells PAM that the administrator thinks this return code should contribute directly to the return code of the full stack of modules. In other words, if the former state of the stack would lead to a return of PAM_SUCCESS, the module's return code will override this value. Note: if the former state of the stack holds some value that is indicative of a module failure, this 'OK' value will not be used to override that value.
<i>Done</i>	Equivalent to OK with the side-effect of terminating the module stack and PAM immediately returning to the application.
<i>Reset</i>	Clear all memory of the state of the module stack and start again with the next stacked module.

Module Path

Module Path is the path-name of the dynamically loadable object file—the pluggable module itself. If the first character of the module path is '/', it is assumed to be a complete path. If this is not the case, the given module path is appended to the default module path: /lib/security.

Currently, the Cyclades-TS has the following modules available:

<i>pam_access</i>	Provides logdaemon style login access control.
<i>pam_deny</i>	Deny access to all users.

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<i>pam_env</i>	This module allows the (un)setting of environment variables. The use of previously set environment variables as well as PAM_ITEMS such as PAM_RHOST is supported.
<i>pam_filter</i>	This module was written to offer a plug-in alternative to programs like <code>ttynoop</code> (XXX - need a reference). Since a filter that performs this function has not been written, it is currently only a toy. The single filter provided with the module simply transposes upper and lower case letters in the input and output streams. (This can be very annoying and is not kind to termcap-based editors.)
<i>pam_group</i>	This module provides group settings based on the user's name and the terminal they are requesting a given service from. It takes note of the time of day.
<i>pam_issue</i>	This module presents the issue file (<code>/etc/issue</code> by default) when prompting for a username.
<i>pam_lastlog</i>	This session module maintains the <code>/var/log/lastlog</code> file. It adds an open entry when called via the <code>pam_open_session()</code> function and completes it when <code>pam_close_session()</code> is called. This module can also display a line of information about the last login of the user. If an application already performs these tasks, it is not necessary to use this module.
<i>pam_limits</i>	This module, through the Linux-PAM open-session hook, sets limits on the system resources that can be obtained in a user session. Its actions are dictated more explicitly through the configuration file discussed in <code>/etc/security/pam_limits.conf</code> .
<i>pam_listfile</i>	The listfile module provides a way to deny or allow services based on an arbitrary file.
<i>pam_motd</i>	This module outputs the motd file (<code>/etc/motd</code> by default) upon successful login.
<i>pam_nologin</i>	Provides standard Unix <code>nologin</code> authentication.
<i>pam_permit</i>	This module should be used with extreme caution. Its action is to always permit access. It does nothing else.
<i>pam_radius</i>	Provides Radius server authentication and accounting.

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- pam_rootok* This module is for use in situations where the superuser wishes to gain access to a service without having to enter a password.
- pam_securetty* Provides standard UNIX *securetty* checking.
- pam_time* Running a well-regulated system occasionally involves restricting access to certain services in a selective manner. This module offers some time control for access to services offered by a system. Its actions are determined with a configuration file. This module can be configured to deny access to (individual) users based on their name, the time of day, the day of week, the service they are applying for and their terminal from which they are making their request.
- pam_tacplus* Provides TacacsPlus Server authentication, authorization (account management), and accounting (session management).
- pam_unix* This is the standard UNIX authentication module. It uses standard calls from the system's libraries to retrieve and set account information as well as authentication. Usually this is obtained from the *etc/passwd* and the */etc/shadow* file as well when shadow is enabled.
- pam_warn* This module is principally for logging information about a proposed authentication or application to update a password.
- pam_ldap* Pam_ldap looks for the ldap client configuration file "ldap.conf" in */etc/*. Here's an example of the ldap.conf file (partial):

```
# file name: ldap.conf

# This is the configuration file for the LDAP
nameservice

# switch library and the LDAP PAM module.

#

# Your LDAP server. Must be resolvable without using
LDAP.

host 127.0.0.1

# The distinguished name of the search base.
base dc=padl,dc=com
```

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Arguments

The arguments are a list of tokens that are passed to the module when it is invoked. They are much like arguments to a typical Linux shell command. Generally, valid arguments are optional and are specific to any given module. Invalid arguments are ignored by a module, however, when encountering an invalid argument, the module is required to write an error to `syslog(3)`.

The following are optional arguments which are likely to be understood by any module. Arguments (including these) are in general, optional.

<i>debug</i>	Use the <code>syslog(3)</code> call to log debugging information to the system log files.
<i>no_warn</i>	Instruct module to not give warning messages to the application.
<i>use_first_pass</i>	The module should not prompt the user for a password. Instead, it should obtain the previously typed password (from the preceding auth module), and use that. If that doesn't work, then the user will not be authenticated. (This option is intended for auth and password modules only).
<i>try_first_pass</i>	The module should attempt authentication with the previously typed password (from the preceding auth module). If that doesn't work, then the user is prompted for a password. (This option is intended for auth modules only).
<i>use_mapped_pass</i>	This argument is not currently supported by any of the modules in the Linux-PAM distribution because of possible consequences associated with U.S. encryption exporting restrictions.

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expose_account In general, the leakage of some information about user accounts is not a secure policy for modules to adopt. Sometimes information such as user names or home directories, or preferred shell, can be used to attack a user's account. In some circumstances, however, this sort of information is not deemed a threat: displaying a user's full name when asking them for a password in a secured environment could- also be called being 'friendly'. The *expose_account* argument is a standard module argument to encourage a module to be less discrete about account information as deemed appropriate by the local administrator. Any line in (one of) the configuration file(s), that is not formatted correctly will generally tend (erring on the side of caution) to make the authentication process fail. A corresponding error is written to the system log files with a call to `syslog(3)`.

Directory-based Configuration

It is possible to configure `libpam` via the contents of the `/etc/pam.d/` directory. This is more flexible than using the single configuration file. In this case, the directory is filled with files- each of which has a filename equal to a service-name (in lower-case)-the personal configuration file for the named service. The Cyclades-TS Linux-PAM was compiled to use both `/etc/pam.d/` and `/etc/pam.conf` in sequence. In this mode, entries in `/etc/pam.d/` override those of `/etc/pam.conf`.

The syntax of each file in `/etc/pam.d/` is similar to that of the `/etc/pam.conf` file and is made up of lines of the following form:

```
module-type control-flag module-path arguments
```

The only difference between the two is that the service-name is not present. The service-name is of course the name of the given configuration file. For example, `/etc/pam.d/login` contains the configuration for the `login` service.

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Default Policy

If a system is to be considered secure, it had better have a reasonably secure ‘OTHER’ entry. The following is a “severe” setting (which is not a bad place to start!):

```
#
# default; deny access
#
OTHER auth required pam_deny.so
OTHER account required pam_deny.so
OTHER password required pam_deny.so
OTHER session required pam_deny.so
```

While fundamentally a secure default, this is not very sympathetic to a misconfigured system. For example, such a system is vulnerable to locking everyone out should the rest of the file become badly written.

The module `pam_deny` not very sophisticated. For example, it logs no information when it is invoked, so unless the users of a system contact the administrator when failing to execute a service application, the administrator may not know for a long while that his system is misconfigured.

The addition of the following line before those in the above example would provide a suitable warning to the administrator.

```
#
# default; wake up! This application is not configured
#
OTHER auth required pam_warn.so
OTHER password required pam_warn.so
```

Having two “OTHER auth” lines is an example of stacking.

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On a system that uses the `/etc/pam.d/` configuration, the corresponding default setup would be achieved with the following file:

```
#
# default configuration: /etc/pam.d/other
#
auth required pam_warn.so
auth required pam_deny.so
account required pam_deny.so
password required pam_warn.so
password required pam_deny.so
session required pam_deny.so
```

On a less sensitive computer, the following selection of lines (in `/etc/pam.conf`) is likely to mimic the historically familiar Linux setup:

```
#
# default; standard UNIX access
#
OTHER auth required pam_unix_auth.so
OTHER account required pam_unix_acct.so
OTHER password required pam_unix_passwd.so
OTHER session required pam_unix_session.so
```

In general this will provide a starting place for most applications.

In addition to the normal applications: `login`, `su`, `sshd`, `passwd`, and `pppd`. Black Box also has made `portslave` a PAM-aware application. The `portslave` requires four services configured in `pam.conf`. They are `local`, `remote`, `radius`, and `taclplus`. The `portslave` PAM interface takes any parameter needed to perform the authentication in the serial ports from the file `pslave.conf`. The `pslave.conf` parameter `all.auththtype` determines which service(s) should be used.

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```
# -----#
# /etc/pam.conf                                     #
#                                                  #
# Last modified by Andrew G. Morgan <morgan@kernel.org> #
# -----#
# $Id: pam.conf,v 1.9 2003/06/12 20:34:13 regina Exp $
# -----#
# serv.module  ctrl      module [path]...[args..]      #
# nametype    flag                                #
# -----#

# WARNING. The services tacacs, s_tacacs, radius, s_radius, local, s_local,
#          and remote are used by the Cyclades applications portslave,
#          socket_server, socket_ssh, and raw_data and should not be changed
#          by the administrators unless he knows what he is doing.

#
# The PAM configuration file for the `kerberos' service
#
kerberosauthrequiredpam_krb5.so no_ccache
kerberos auth optional pam_auth_srv.so
kerberos accountrequiredpam_krb5.so no_ccache
kerberosessionrequiredpam_krb5.so no_ccache
#
#
# The PAM configuration file for the `kerberosdownlocal' service
# If Kerberos server is down, uses the local service
#
kerberosdownlocal auth requisite pam_securetty.so
kerberosdownlocal auth optionalpam_auth_srv.so
```


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```
kerberosdownlocal auth\  
    [ success=done new_authtok_reqd=done authinfo_unavail=ignore default=die ] \  
    pam_krb5.so no_ccache  
kerberosdownlocal auth requiredpam_unix2.so  
kerberosdownlocal account \  
    [ success=done new_authtok_reqd=done authinfo_unavail=ignore default=die ] \  
    pam_krb5.so no_ccache  
kerberosdownlocal account requiredpam_unix2.so  
kerberosdownlocal session \  
    [ success=done new_authtok_reqd=done authinfo_unavail=ignore default=die ] \  
    pam_krb5.so no_ccache  
kerberosdownlocal session requiredpam_unix2.so  
#  
# The PAM configuration file for the `ldap' service  
#  
ldapauth    sufficientpam_ldap.so  
ldapaccount required pam_ldap.so  
ldapsession required pam_ldap.so  
  
#  
# The PAM configuration file for the `ldapdownlocal' service  
# If LDAP server is down, uses the local service  
#  
ldapdownlocal auth\  
    [ success=done new_authtok_reqd=done authinfo_unavail=ignore default=die ] \  
    pam_ldap.so  
ldapdownlocal auth requiredpam_unix2.so  
ldapdownlocal account \  
    [ success=done new_authtok_reqd=done authinfo_unavail=ignore default=die ] \  
    pam_ldap.so
```

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```
ldapdownlocal account requiredpam_unix2.so
ldapdownlocal session \
    [ success=done new_authtok_reqd=done authinfo_unavail=ignore default=die ] \
    pam_ldap.so
ldapdownlocal session requiredpam_unix2.so

#
# The PAM configuration file for the `tacplus' service
#
tacplus auth    requisite pam_securetty.so
tacplus auth    required pam_tacplus.so encrypt
tacplus auth    optional pam_auth_srv.so
tacplus account required pam_tacplus.so encrypt service=ppp protocol=lcp
tacplus session required pam_tacplus.so encrypt service=ppp protocol=lcp

s_tacplus auth    requisite pam_securetty.so
s_tacplus auth    required pam_tacplus.so encrypt use_first_pass
s_tacplus account required pam_tacplus.so encrypt service=ppp protocol=lcp
s_tacplus session required pam_tacplus.so encrypt service=ppp protocol=lcp

#
# The PAM configuration file for the `radius' service
#
radius auth      requisite pam_securetty.so
radius auth      required pam_radius_auth.so
radius auth      optional pam_auth_srv.so
radius account   required pam_radius_auth.so
radius session   required pam_radius_auth.so

s_radius auth    requisite pam_securetty.so
```

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```
s_radius auth      required pam_radius_auth.so use_first_pass
s_radius account   required pam_radius_auth.so
s_radius session   required pam_radius_auth.so
```

```
#
```

```
# The PAM configuration file for the `local' service
```

```
#
```

```
local auth        requisite pam_securetty.so
local auth        required pam_unix2.so
local account      required pam_unix2.so
local password     required pam_unix2.so md5 use_authtok
local session      required pam_unix2.so
```

```
s_local auth      requisite pam_securetty.so
s_local auth      required pam_unix2.so use_first_pass
s_local account    required pam_unix2.so
s_local password   required pam_unix2.so md5 use_authtok
s_local session    required pam_unix2.so
```

```
#
```

```
# The PAM configuration file for the `remote' service
```

```
#
```

```
remoteauth        required pam_permit.so
remoteaccount      required pam_permit.so
remotepassword     required pam_permit.so
remotesession      required pam_permit.so
```

```
#
```

```
# The PAM configuration file for the `login' service
```

```
#
```

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```
loginauth      requisite pam_securetty.so
loginauth      required  pam_unix2.so
loginauth      optional  pam_group.so
loginaccount   requisite pam_time.so
loginaccount   required  pam_unix2.so
loginpassword  required  pam_unix2.so md5 use_authtok
loginsession   required  pam_unix2.so
login  session  required  pam_limits.so
```

```
#
# The PAM configuration file for the `xsh' service
```

```
#
sshdauth      required  pam_unix2.so
sshdauth      optional  pam_group.so
sshdaccount   requisite pam_time.so
sshdaccount   required  pam_unix2.so
sshdpassword  required  pam_unix2.so md5 use_authtok
sshdsession   required  pam_unix2.so
sshd  session  required  pam_limits.so
```

```
#
# The PAM configuration file for the `passwd' service
```

```
#
passwdpassword  required  pam_unix2.so md5
```

```
# The PAM configuration file for the `samba' service
```

```
#
smbaauth      required  pam_unix2.so
smbaaccount   required  pam_unix2.so
```

```
#
```

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```
# The PAM configuration file for the `su' service
#
suauth      required  pam_wheel.so
suauth      sufficient pam_rootok.so
suauth      required  pam_unix2.so
suaccount   required  pam_unix2.so
susession   required  pam_unix2.so

#
# Information for the PPPD process with the 'login' option.
#
ppp         auth      required  pam_nologin.so
ppp         auth      required  pam_unix2.so
ppp         account  required  pam_unix2.so
ppp         session  required  pam_unix2.so

#
# Information for the ippd process with the 'login' option: local authent.
#
ippd        auth      required  pam_nologin.so
ippd        auth      required  pam_unix2.so
ippd        account  required  pam_unix2.so
ippd        session  required  pam_unix2.so

# Information for the ippd process with the 'login' option: radius authent.
#ippd auth required  pam_radius_auth.so conf=/etc/raddb/server
#ippd auth optional  pam_auth_srv.so
#ippd account required  pam_radius_auth.so conf=/etc/raddb/server
#ippd session required  pam_radius_auth.so conf=/etc/raddb/server
```

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```
#
# The PAM configuration file for the `other' service
#
otherauth      required  pam_warn.so
otherauth      required  pam_deny.so
otheraccount   required  pam_deny.so
otherpassword  required  pam_warn.so
otherpassword  required  pam_deny.so
othersession  required  pam_deny.so
```

Reference

The Linux-PAM System Administrators' Guide
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Email: morgan@linux.kernel.org

Appendix E - Upgrades and Troubleshooting

Upgrades

Users should upgrade the Cyclades-TS whenever there is a bug fix or new features that they would like to have. Below are the six files added by Black Box to the standard Linux files in the `/proc/flash` directory when an upgrade is needed. They are:

- `boot_ori` - original boot code
- `boot_alt` - alternate boot code
- `syslog` - event logs (not used by Linux)
- `config` - configuration parameters, only the boot parameters are used by the boot code
- `zImage` - Linux kernel image
- `script` - file where all Cyclades-TS configuration information is stored

The Upgrade Process

To upgrade the Cyclades-TS, follow these steps:

Step 1: Log in to the TS as root.

Provide the root password if requested.

Step 2: Go to the `/proc/flash` directory using the following command:

```
cd /proc/flash
```

Step 3: FTP to the host where the new firmware is located.

Log in using your username and password. Go to the directory where the firmware is located. Select binary transfer and “get” the firmware file.



Note: The destination file name in the `/proc/flash` directory must be `zImage`.
Example (hostname = server; directory = `/tftpboot`; username= admin;
password = adminpw; firmware filename on that server = `zImage.134`).

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```
ftp
> open server
> user admin
> Password: adminpw
> cd /tftpboot
> bin
> get zImage.134 zImage
> quit
```



Note: Due to space limitations, the new zImage file may not be downloaded with a different name, then renamed. The TS searches for a file named zImage when booting and there is no room in flash for two zImage files.

Step 4: Run zImage.

To make sure the downloaded file is not corrupted or that the zImage saved in flash is OK the user should run:

```
md5sum -b /proc/flash/zImage
```

Step 5: Check text file information.

Now the user should check with the information present in the text file saved in the Black Box site (e.g. zImage.134.md5sum). If the numbers match, the downloaded file is not corrupted.

Step 6: Issue the command reboot.

```
reboot
```

Step 7: Confirm that the new Linux kernel has taken over.

After rebooting, the new Linux kernel will take over. This can be confirmed by typing

```
cat /proc/version
```

to see the Linux kernel version.

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Troubleshooting

Flash Memory Loss

If the contents of flash memory are lost after an upgrade, please follow the instructions below to restore your system:

Step 1: Turn the TS OFF, then back ON.

Step 2: Using the console, wait for the self test messages.

If you haven't got any, make sure you have the right settings. If you really get no boot message, press <s> right after powering ON and skip ALTERNATE boot code. That will make the boot run its ORIGINAL boot code.

Step 3: During the self test, press <Esc> after the Ethernet test.

Step 4: When the Watch Dog Timer prompt appears, press <Enter>.

Step 5: Choose the option Network Boot when asked.

Step 6: Enter the IP address of the Ethernet interface.

Step 7: Enter the IP address of the host where the new zImage file is located.

Step 8: Enter the file name of the zImage file on the host.

Step 9: Select the TFTP option instead of BOOTP.

The host must be running TFTP and the new zImage file must be located in the proper directory. e.g. /tftpboot for Linux.

Step 10: Accept the default MAC address by pressing <Enter>.

The Cyclades-TS should begin to boot off the network and the new image will be downloaded and begin running in RAM. At this point, follow the upgrade steps above (login, cd /proc/flash, ftp, and so forth) to save the new zImage file into flash again.

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Note: Possible causes for the loss of flash memory may include: downloaded wrong zImage file, downloaded as ASCII instead of binary; problems with flash memory.

If the Cyclades-TS booted properly, the interfaces can be verified using *ifconfig* and *ping*. If ping does not work, check the routing table using the command *route*. Of course, all this should be tried after checking that the cables are connected correctly.

The file */etc/config_files* contains a list of files acted upon by *saveconf* and *restoreconf*. If a file is missing, it will not be loaded onto the ramdisk on boot. The following table lists files that should be included in the */etc/config_files* file and which programs use each.

Table 36: Files to be included in */etc/config_file* and the program to use

File	Program
<i>/etc/securetty</i>	telnet, login, su
<i>/etc/issue</i>	getty
<i>/etc/getty_ttyS0</i>	login (via console)
<i>/etc/hostname</i>	tcp
<i>/etc/hosts</i>	tcp
<i>/etc/host.conf</i>	tcp
<i>/etc/nsswitch.conf</i>	dns
<i>/etc/resolv.conf</i>	dns
<i>/etc/config_files</i>	saveconf
<i>/etc/passwd</i>	login, passwd, adduser...
<i>/etc/group</i>	login, passwd, adduser...

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Table 36: Files to be included in `/etc/config_file` and the program to use

File	Program
<code>/etc/ssh/ssh_host_key.pub</code>	sshd
<code>/etc/ssh/sshd_config</code>	sshd
<code>/etc/ssh/ssh_config</code>	ssh client
<code>/etc/ssh/ssh_host_key</code>	sshd (ssh1)
<code>/etc/ssh/ssh_host_key.pub</code>	sshd (ssh1)
<code>/etc/ssh/ssh_host_dsa_key</code>	sshd (ssh2)
<code>/etc/ssh/ssh_host_dsa_key.pub</code>	sshd (ssh2)
<code>/etc/snmp/snmpd.conf</code>	snmpd
<code>/etc/portslave/plslave.conf</code>	cy_ras, portslave, TS configuration information
<code>/etc/network/ifcfg_eth0</code>	ifconfig eth0, cy_ras, rc.sysinit
<code>/etc/network/ifcfg*</code>	ifconfig, cy_ras, rc.sysinit
<code>/etc/network/ifcfg_lo ifconfig</code>	lo, cy_ras, rc.sysinit
<code>/var/run/radsession.id</code>	radinit, radius authentication process
<code>/home</code>	adduser, passwd
<code>/etc/network/st_routes</code>	ifconfig, cy_ras, rc.sysinit
<code>/etc/syslog-ng/syslog-ng.conf</code>	syslog-ng



Important! If any of the files listed in `/etc/config_files` is modified, the Cyclades-TS administrator must execute the command `saveconf` before rebooting the Cyclades-TS or the changes will be lost. If a file is created (or a filename altered), its name must be added to this file before executing `saveconf` and rebooting.

Appendix E - Upgrades and Troubleshooting



Important! Black Box Technical Support is always ready to help with any configuration problems. Before calling, execute the command

```
cat /proc/version
```

and note the Linux version and Cyclades-TS version written to the screen. This will speed the resolution of most problems.

Hardware Test

A hardware test called *tstest* is included with the Cyclades-TS firmware. It is a menu-driven program, run by typing *tstest* at the command prompt. The various options are described below. Note that the Cyclades-TS should not be tested while in use as the test will inactivate all ports. You should inactivate all processes that may use the serial ports: *inetd*, *sshd*, *cy_ras*, and *cy_buffering*. Following are the hardware test steps:

Step 1: *signal_ras* stop.

Step 2: Perform all hardware tests needed.

Step 3: *signal_ras* start.

Port Test

Either a cross cable or a loop-back connector is necessary for this test. Their pinout diagrams are supplied in [Appendix B - Cabling, Hardware, and Electrical Specifications](#). Connect the loop-back connector to the modem cable and then connect the modem cable to the port to be tested (or connect a cross cable between two ports to be tested). In the case of the 1-PortTS110/100, connect the DB-25 loop-back connector to the console cable using a DB-9 - DB-25 convertor. When *tstest* senses the presence of the cable or connector, the test will be run automatically and the result shown on the screen.

Each line of data corresponds to a port in test. The last four columns (DATA, CTS, DCD, and DSR) indicate errors. The values in these columns should be zero. Below is an example of the output screen.

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<- Packets ->			<- Errors ->					
From	To	Sent	Received	Passes	Data	CTS	DCD	DSR
2	<-> 2	35	35	35	0	0	0	0
4	<-> 5	35	35	35	0	0	0	0
5	<-> 4	35	35	35	0	0	0	0

When this test is run with a cable or connector without the DSR signal (see the pinout diagram for the cable or connector being used), errors will appear in the DSR column. This does not indicate a problem with the port. In the example above, tctest perceived that a loop-back connector was attached to port 2 and that a cross cable was used to connect ports 4 and 5.

Port Conversation

This test sends and receives data on the selected port. One way to run this test is to place a loop-back connector on the port to be tested and begin. Enter the number of the port and a baud rate (9600 is a typical value). Type some letters, and if the letters appear on the screen, the port is working. If the letters do not appear on the screen (which also occurs if the loop-back connector is removed), the port is not functioning correctly.

A second method that can be used to test the port is to connect it to a modem with a straight cable. Begin the test and type "at". The modem should respond with "OK", which will appear on the screen. Other commands can be sent to the modem or to any other serial device. Press Ctrl-Q to exit the terminal emulation test.

Test Signals Manually

This test confirms that signals are being sent and received on the selected port. Neither the loop-back connector nor the cross cable are necessary. Enter the number of the port to be tested and begin the test.

State	DTR	DCD	DSR	RTS	CTS
ON	X			X	
	↓			↓	
OFF		X	X		X

Figure 49: Initial test

Appendix E - Upgrades and Troubleshooting

First, type Ctrl-D to see the X in the DTR column move position, then type Ctrl-R to see the X in the RTS column change position. If each of the Xs moves in response to its command, the signals are being sent. Another method to test the signals is to use a loop-back connector. Enter the number of the port with the loopback connector and start the test. In this case, when Ctrl-D is typed, the Xs in the first three columns will move as shown below.

State	DTR	DCD	DSR	RTS	CTS
ON	X	X	X	X	
	↓	↓	↓		
OFF					X

Figure 50: Second screen, showing changed positions

This is because the test is receiving the DTR signal sent through the DCD and DSR pins. When Ctrl-R is typed, the Xs in the RTS and CTS columns should move together. If the Xs change position as described, the signals are being sent and received correctly.

Test Analog Ports (for theTS110 only)

This test consecutively reads the Analog-to-Digital converters on both analog ports and compares the variance between the current reading and the first reading (pattern). One way to run this test is to place a short-circuit connector on the ports. The reading should be at the bottom of the Analog-to-Digital scale. Another way is to place 10K ohms on the ports. The reading should be at half scale. A third way is to place no connector at all. The reading should be at full scale. Below is an example of the output screen, when using 10K ohms.

	<----- VALUE ----->			<----- ERRORS ----->	
ANALOG	Initial	Current	Correct	Passes	Data
1	3fff	3fff	7	7	0
2	3fff	3fff	7	7	0

Press <ESC> to stop the test.

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Test Digital Ports (for the TS110 only)

This test consecutively reads the digital ports and compares the variance between the current reading and the first reading (pattern). One way to run this test is to place a loop-back connector on the ports. The port reading on this condition should be 1. It means that pin+ and pin- have a closed loop. For the ports without loop-back, the reading should be 0. It means that pin+ and pin- have an open loop. Below is an example of the output screen. Digital ports 1, 2, 3, 4 and 5 have loop-back connectors. Digital ports 6, 7 and 8 have not.

```

                <----- VALUE ----->                <---- ERRORS ---->
DIGITAL Initial   Current   Correct   Passes           Data
-----
   1           1         1         10           10           0
   2           1         1         10           10           0
   3           1         1         10           10           0
   4           1         1         10           10           0
   5           1         1         10           10           0
   6           0         0         10           10           0
   7           0         0         10           10           0
   8           0         0         10           10           0

```

Press <ESC> to stop the test.

Single User Mode

The Cyclades-TS has a single user mode used when:

- The name or password of the user with root privileges is lost or forgotten,
- After an upgrade or downgrade which leaves the Cyclades-TS unstable,
- After a configuration change which leaves the Cyclades-TS inoperative or unstable.

Appendix E - Upgrades and Troubleshooting

Type the word “single” (with a blank space before the word) during boot using a console connection. This cannot be done using a telnet or other remote connection. The initial output of the boot process is shown below.

```
Entry Point = 0x00002120
loaded at: 00002120 0000D370
relocated to: 00300020 0030B270
board data at: 003052C8 0030537C
relocated to: 002FF120 002FF1D4
zimage at: 00008100 0006827E
relocated to: 00DB7000 00E1717E
initrd at: 0006827E 0024F814
relocated to: 00E18000 00FFF596
avail ram: 0030B270 00E18000
Linux/PPC load: root=/dev/ram
```

After printing “Linux/PPC load: root=/dev/ram,” the Cyclades-TS waits approximately 10 seconds for user input. This is where the user should type “<sp>single” (spacebar, then the word “single”). When the boot process is complete, the Linux prompt will appear on the console:

```
[root@(none) /]#
```

If the password or username was forgotten, execute the following commands:

```
passwd
saveconf
reboot
```


Appendix E - Upgrades and Troubleshooting

For configuration problems, you have two options:

Step 1: Edit the file(s) causing the problem with vi, then execute the commands:

```
saveconf  
  
reboot
```

Step 2: Reset the configuration by executing the commands:

```
echo 0 > /proc/flash/script  
  
reboot
```

If the problem is due to an upgrade/downgrade, a second downgrade/upgrade will be necessary to reverse the process. First, the network must be initialized in order to reach a ftp server. Execute the following script, replacing the parameters with values appropriate for your system. If your ftp server is on the same network as the TS, the gw and mask parameters are optional.

```
config_eth0 ip 200.200.200.1 mask 255.255.255.0 gw 200.200.200.5
```

At this point, the DNS configuration (in the file /etc/resolv.conf) should be checked. Then, download the kernel image using the ftp command.

Troubleshooting the Web Configuration Manager

What to do when the initial Web page does not appear

Try pinging, telnetting, or tracerouting to the Cyclades-TS to make sure it is reachable. If not, the problem is probably in the network or network configuration. Are the interfaces up? Are the IP addresses correct? Are filters configured which block the packets? If the Cyclades-TS is reachable, see if the /bin/webs process is running by executing the command ps. If it is not, type /bin/webs & to start it. If the /bin/webs process is not being initialized during boot, change the file /etc/inittab.

How to restore the Default Configuration of the Web Configuration Manager

This would be required only when the root password was lost or the configuration file /etc/websum.conf was damaged. From a console or telnet session, edit the file /etc/config_files. Find the reference to /etc/websum.conf and delete it. Save the modified /etc/config_files file. Execute the command saveconf. Reboot the system. Enter into the Web Con-

Appendix E - Upgrades and Troubleshooting

figuration Manager with the default username and password (root/tslinux). Edit the file `/etc/config_files` and insert the reference to `/etc/websum.conf`.

Recover access to the Cyclades-TS110/100 console port

There is no dedicated console port available in the Cyclades-TS110/100. As factory default the serial port is set to work as a console port to allow initial product configuration. After that, changes can still be made through the Ethernet port and a Telnet command. If for some reason this access is lost (usually misconfiguration), the product can only be configured if the steps bellow are followed.

Step 1: Power the Cyclades-TS110/100 off.

Step 2: Connect the Cyclades-TS110/100 to a terminal configured to work at 9600 bps, with 8 bits, no parity and 1 stop bit.

Step 3: Press and hold the ADM button and power on the Cyclades-TS110/100.

There's a small hole in the box containing an internal ADM button that can be reached by a thin, sharp object.

Step 4: Release the ADM button when the self test starts on the terminal's screen.

The Cyclades-TS110/100 be now in single user mode, the serial port will work as a console port and the product can de reconfigured. Notice that no previous configuration is lost. After finishing, save the configuration (saveconf), power the Cyclades-TS110/100 off, and reconnect the original device to the serial port.

Using a different speed for the Serial Console

The serial console is originally configured to work at 9600 bps. If you want to change that, it is necessary to change the configuration following the steps:

Step 1: Run bootconf. The user will be presented with the screen:

```
Current configuration
MAC address assigned to Ethernet [00:60:2e:00:16:b9]
IP address assigned to Ethernet interface [192.168.160.10]
Watchdog timer ((A)ctive or (I)nactive) [A]
Firmware boot from ((F)lash or (N)etwork) [F]
```

Appendix E - Upgrades and Troubleshooting

```
Boot type ((B)ootp,(T)ftp or Bot(H)) [T]
Boot File Name [zvmppctsbin]
Server's IP address [192.168.160.1]
Console speed [9600]
(P)erform or (S)kip Flash test [P]
(S)kip, (Q)uick or (F)ull RAM test [F]
Fast Ethernet ((A)uto Neg, (1)00 BtH, 100 Bt(F), 10 B(t)F, 10
Bt(H)) [A]
Fast Ethernet Maximum Interrupt Events [0]
```

Type <Enter> for all fields but the Console Speed. When presented the following line:

```
Do you confirm these changes in flash ( (Y)es, (N)o (Q)uit )
[N] :
```

Step 2: Enter Y and the changes will be saved in flash.

Step 3: Logout and login again to use the console at the new speed.

CPU LED

Normally the CPU status LED should blink consistently one second on, one second off. If this is not the case, an error has been detected during the boot. The blink pattern can be interpreted via the following table:

Table 37: CPU LED Code Interpretation

Event	CPU LED Morse code
Normal Operation	S (short, short, short . . .)
Flash Memory Error - Code	L (long, long, long . . .)
Flash Memory Error - Configuration	S, L

Appendix E - Upgrades and Troubleshooting

Table 37: CPU LED Code Interpretation

Event	CPU LED Morse code
Ethernet Error	S, S, L
No Interface Card Detected	S, S, S, L
Network Boot Error	S, S, S, S, L
Real-Time Clock Error	S, S, S, S, S, L



Note: The Ethernet error mentioned in the above table will occur automatically if the Fast Ethernet link is not connected to an external hub during the boot. If the Fast Ethernet is not being used or is connected later, this error can be ignored.

Appendix F - Certificate for HTTP Security

Introduction

The following configuration will enable you to obtaining a Signed Digital Certificate. A certificate for the HTTP security is created by a CA (Certificate Authority). Certificates are most commonly obtained through *generating public and private keys*, using a public key algorithm like RSA or X509. The keys can be generated by using a key generator software.

Procedure

Step 1: Enter OpenSSL command.

On a Linux computer, key generation can be done using the OpenSSL package, through the following command:

```
# openssl req -new -nodes -keyout private.key -out public.csr
```

If this command is used, the following information is required:

Table 38: Required information for the OpenSSL package

Parameter	Description
Country Name (2 letter code) [AU]:	The country code consisting of two letters.
State or Province Name (full name) [Some-State]:	Provide the full name (not the code) of the state.
Locality Name (e.g., city) []:	Enter the name of your city.
Organization Name (e.g., company) [Internet Widgits Ltd]:	Organization that you work for or want to obtain the certificate for.
Organizational Unit Name (e.g., section) []:	Department or section where you work.
Common Name (e.g., your name or your server's hostname) []:	Name of the machine where the certificate must be installed.

Appendix F - Certificate for HTTP Security

Table 38: Required information for the OpenSSL package

Parameter	Description
Email Address []:	Your email address or the administrator's email address.

The other requested information can be skipped.

The certificate signing request (CSR) generated by the command above contains some personal (or corporate) information and its public key.

Step 2: Submit CSR to the CA.

The next step is to submit the CSR and some personal data to the CA. This service can be requested by accessing the CA Web site and is not free. There is a list of CAs at the following URL

`pki-page.org`

The request will be analyzed by the CA, for policy approval and to be signed.

Step 3: Upon receipt, install certificate.

After the approval, the CA will send a certificate file to the origin, which we will call `Cert.cer`, for example purposes. The certificate is also stored on a directory server. The certificate must be installed in the GoAhead Web server, by following these instructions:

Step A: Open a Cyclades Terminal Server session and do the login.

Step B: Join the certificate with the private key into the file `/web/server.pem`.

```
#cat Cert.cer private.key > /web/server.pem
```

Step C: Copy the certificate to the file `/web/cert.pem`.

```
#cp Cert.cer /web/cert.pem
```

Step D: Include the files `/web/server.pem` and `/web/cert.pem` in `/etc/config_files`.

Appendix F - Certificate for HTTP Security

Step E: Save the configuration in flash.

```
#saveconf
```

Step F: The certification will be effective in the next reboot.

Appendix F - Certificate for HTTP Security

This page has been left intentionally blank.

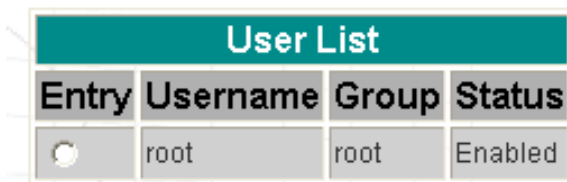
Appendix G - Web User Management

Introduction

In the Cyclades-TS Web server, the user database is completely separated from the system's (as defined in the `/etc/passwd` file), and the logic used for managing permissions is also different. The Web's user database is stored in the `/etc/websum.conf` file, and it has basically three lists: *users*, *user groups* and *access limits*.

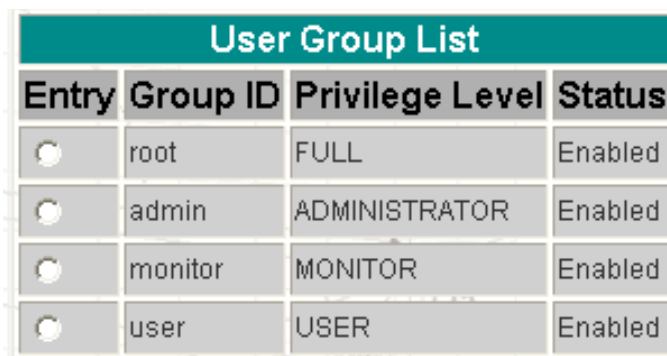
Default Configuration for Web User Management

The following three screen shots show the default configuration for User List, User Group List, and Access Limit List pages, respectively.



User List			
Entry	Username	Group	Status
<input type="radio"/>	root	root	Enabled

Figure 51: User List default page



User Group List			
Entry	Group ID	Privilege Level	Status
<input type="radio"/>	root	FULL	Enabled
<input type="radio"/>	admin	ADMINISTRATOR	Enabled
<input type="radio"/>	monitor	MONITOR	Enabled
<input type="radio"/>	user	USER	Enabled

Figure 52: User Group List default page

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Access Limit List				
Entry	URL	Privilege Level	Access Method	Secure
<input type="radio"/>	/	USER	FULL	No
<input type="radio"/>	/appl/	USER	COOKIE	No
<input type="radio"/>	/read/	MONITOR	COOKIE	No
<input type="radio"/>	/adm/	ADMINISTRATOR	COOKIE	No
<input type="radio"/>	/cfg/	FULL	COOKIE	No
<input type="radio"/>	/um/	FULL	COOKIE	No
<input type="radio"/>	/goform/	MONITOR	COOKIE	No
<input type="radio"/>	/goform/Login	USER	FULL	No
<input type="radio"/>	/goform/CheckLogin	USER	FULL	No
<input type="radio"/>	/goform/MainPageTable	USER	COOKIE	No
<input type="radio"/>	/goform/Logout	USER	COOKIE	No
<input type="radio"/>	/goform/appl/	USER	COOKIE	No
<input type="radio"/>	/goform/adm/	ADMINISTRATOR	COOKIE	No
<input type="radio"/>	/goform/cfg/	FULL	COOKIE	No
<input type="radio"/>	/goform/um/	FULL	COOKIE	No

Figure 53: Access Limit List default page

Appendix G - Web User Management

How Web User Management works

When a user logs in, the username and the password are encrypted and stored in the browser. Whenever a URL is requested, the User Manager will perform the following tasks:

Task 1: Check the URL in the Access Limit List

The Web server first scans for the full URL, and then it looks for the subdirectories, until reaching the root directory “/.” (In the URL `http://CAS/goform/cfg/IPTablesRulesHandle`, the access limits will be scanned in the following order: `/goform/cfg/IPTablesRulesHandle`, `/goform/cfg`, `/goform` and `/`.) When the URL matches an Access Limit, the following information will be available:

- Accessibility* When configured as FULL ACCESS, the URL can be accessed without any authentication; otherwise, the user can authenticate with BASIC, DIGEST or COOKIE authentication. The last type is recommended, because it allows the user to log out in the end of the session. The page will not be accessible when the accessibility is configured as NO ACCESS.
- Security* When set to be secure, the page will be accessed only through HTTPS, which will encrypt the pages through OpenSSL. If the browser is in unsecure mode, the protocol and the port will change to HTTPS.
- Privilege* This is the level of accessibility of the page. If the privilege is USER, any user will be able to access the page. If the privilege is FULL, only users with full access will be able to access the page. There are two levels between them: MONITOR and ADMINISTRATOR.

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Task 2: Read the Username and the Password

This is done when the page must be accessed through authentication. If the username matches an entry in the users list, the following information will be available:

<i>Enabled</i>	The username must be enabled to be authenticated.
<i>Encrypted password</i>	The password passed by the browser must match the one registered in the entry.
<i>Group</i>	Each username is linked to a user group.

Task 3: Look for the group retrieved in the user groups list

The user group entry will have the following information:

<i>Enabled</i>	The group must be enabled to grant access to the URL.
<i>Privilege</i>	The group can have four privileges: in increasing order, they are USER, MONITOR, ADMINISTRATOR and FULL. The group privilege will be compared with the URL privilege. If it is greater or equal, the URL can be accessed by the user; otherwise, access is denied.

Web User Management Configuration - Getting Started

The users, groups and access limits for Web User Management are configurable with your browser, though it is not recommended to change the groups and the access limits. In the default configuration:

- The access limits have privileges based on the functionality of the Web page.
- There are four different groups (root, monitor, admin and user), each one with a specific privilege.
- There is one root user (username is root and password is tslinux).

Appendix G - Web User Management

Changing the Root Password

The first thing to do after logging into a Web session the first time must be to change the root password. See Security Issue under [Figure 11: Configuration & Administration Menu page](#).

Step 1: Click on the link Web User Management > Users.

Step 2: Select the root user and click the Change Password button.

Step 3: Type the password twice and click the Submit button.

Step 4: Click on the link Web User Management > Load/Save Web Configuration.
The Login page will appear.

Step 5: Type the username *root* and the password that was configured, then click on the Login button.

Step 6: After the authentication, click on the Save Configuration button.

Step 7: Click on the link Administration > Load/Save Configuration.

Step 8: Click on the Save to Flash button.

Adding and Deleting Users

Adding a User

Step 1: Click on the link Web User Management > Users.

Step 2: Click on the Add User button.

Step 3: Configure the new user.

Type the username, the password (twice) and select a user group, depending on the access privilege desired. Leave the item Enabled checked.

Appendix G - Web User Management

Step 4: Click on the Submit button.

A confirmation message will appear.

Step 5: If there are more users to be added, repeat the steps 1 to 4.

Step 6: Click on the link Web User Management > Load/Save Web Configuration.

Step 7: Click on the Save Configuration button.

This will save the users added in the file `/etc/websum.conf`.

Step 8: Click on the link Administration > Load/Save Configuration.

Step 9: Click on the Save to Flash button.

Step 10: Test the user(s) added.

Log out the current user (Go to the link Application > Logout) and log in again, with the new user.

Deleting a User

The root user is delete-protected, and, because of that, it cannot be removed from the user list. The other users can be deleted.

Step 1: Click on the link Web User Management > Users.

Step 2: Select the user to be deleted and click on the Delete User button.

A confirmation message will appear.

Step 3: If there are more users to be deleted, repeat the steps 1 and 2.

Step 4: Click on the link Web User Management > Load/Save Web Configuration.

Step 5: Click on the Save Configuration button.

This will save the users added in the file `/etc/websum.conf`

Step 6: Click on the link Administration > Load/Save Configuration.

Step 7: Click on the Save to Flash button.

Appendix G - Web User Management

Adding and Deleting User Groups

The default configuration already comes with four user groups, and, for most of the cases, they will be enough. However, you have the option of editing the user groups.

Adding a group

Step 1: Click on the link **Web User Management > Groups**.

Step 2: Click on the **Add Group** button

Step 3: Configure the new group.

Type the group name and select the access privilege this group will have. Leave the **Enabled** item checked.

Step 4: Click on the **Submit** button.

A confirmation message will appear.

Step 5: If there are more groups to be added, repeat the steps 1 to 4.

Step 6: Click on the link **Web User Management > Load/Save Web Configuration**.

Step 7: Click on the **Save Configuration** button.

This will save the users added in the file `/etc/websum.conf`

Step 8: Click on the link **Administration > Load/Save Configuration**.

Step 9: Click on the **Save to Flash** button.

Deleting a group

Before deleting a group, make sure that there are no users using that group.

Step 1: Click on the link **Web User Management > Groups**.

Step 2: Select the group to be deleted and click on the **Delete Group** button.

A confirmation message will appear.

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Step 3: If there are more groups to be deleted, repeat the steps 1 and 2.

Step 4: Click on the link Web User Management > Load/Save Web Configuration.

Step 5: Click on the Save Configuration button.

This will save the users added in the file /etc/websum.conf

Step 6: Click on the link Administration > Load/Save Configuration.

Step 7: Click on the Save to Flash button.

Adding and Deleting Access Limits

The default configuration has the access limits set according to the functionality of the Web page.

- Pages or forms which causes the configuration to change will have FULL privilege (only high-privileged users will have access to it).
- Pages which change the status of the board without changing the configuration will have ADMINISTRATOR privilege;
- Pages with the system information will have MONITOR privilege.
- Only application pages will have USER privilege.

Changing access limits is not recommended, unless you need to create or change the web server pages; even so, the user should place the web pages in the subdirectories with the privilege desired. For example, a page with ADMINISTRATOR privilege should be placed in /adm.

Adding an Access Limit

Step 1: Click on the link Web User Management > Access Limits.

Step 2: Click on the Add Access Limit button.

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Step 3: Configure the new access limit.

Type the URL (or the subdirectory), and select the access privilege. If authentication is required to access the page, select **COOKIE ACCESS**; otherwise, select **FULL ACCESS**. If this page is confidential, check the **Secure** box.

Step 4: Click on the Submit button.

A confirmation message will appear.

Step 5: If there are more access limits to be added, repeat the steps 1 to 4.

Step 6: Click on the link [Web User Management > Load/Save Web Configuration](#).

Step 7: Click on the Save Configuration button.

This will save the users added in the file `/etc/websum.conf`.

Step 8: Click on the link [Administration > Load/Save Configuration](#).

Step 9: Click on the Save to Flash button.

Deleting an access limit

Step 1: Click on the link [Web User Management > Access Limits](#).

Step 2: Select the access limit to be deleted and click on the Delete Access Limit button.

A confirmation message will appear.

Step 3: If there are more access limits to be deleted, repeat the steps 1 and 2.

Step 4: Click on the link [Web User Management > Load/Save Web Configuration](#).

Step 5: Click on the Save Configuration button.

This will save the users added in the file `/etc/websum.conf`

Step 6: Click on the link [Administration > Load/Save Configuration](#).

Step 7: Click on the Save to Flash button.

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Appendix H - Connect to Serial Ports from Web

Introduction

Depending on how the serial port is configured, connecting to a serial port will either open up a telnet or ssh connection. A serial port configured as `socket_server` or `raw_data` will open up a telnet connection while `socket_ssh` will open up a ssh connection. Any Web user configured in the Web User Management section of the WMI will be able to use this application.

Tested Environment

Table 39: Windows XP + JREv1.4.0_01 or 02

Internet Explorer 6.0	Success
Netscape 6/6.2.3	Success
Netscape 7.0	Success
Mozilla 1.1	Success

Requirements: Java 2 Runtime Environment (JRE) SE v1.4.0_01 or v1.4.0_02 (which can be found at <http://java.sun.com/>) installed on your PC with your browser acknowledged to use it. You can first check if the browser you are using acknowledges the Java version by following the procedures given in the next sections.

Appendix H - Connect to Serial Ports from Web

On Windows

From Internet Explorer

Go to Tools → Internet Options → Advanced. Scroll down and look for a section on Java. There should be a checkbox that says "Use Java 2 v1.4.0" If there isn't, this could either mean your browser is not activated to use the Java plug-in that came with the JRE you have installed or it just means that you don't have any JRE installed, in which case please install and repeat the check.

If you have already installed JRE and you just want to activate your browser to use it, go to your system's Control Panel → Java Plug-in icon → Browser → check on the browser(s) you want to activate to use the Java Plug-in. Now repeat the check to see if your browser will now use the correct Java Plug-in.

From Netscape or Mozilla

Check to see if Java is enabled. Go to Edit → Preferences → Advanced → Check on Enable Java. To see what version of JRE Plug-in is used, go to Help → About Plug-ins. Scroll down to Java Plug-in section. Check if the Java Plug-in is the version you have installed.



Tip. When installing Netscape 7.0, it will ask if you want to install Sun Java. If you click on the box to install it, a version of JRE will be installed into your system; however, this does not mean that other browsers such as IE will recognize it. If you choose not to install Sun Java through Netscape but do it separately, Netscape 7.0 should automatically detect the JRE, and this can be checked by the instructions mentioned above.

Appendix H - Connect to Serial Ports from Web

Step-by-Step Process

Step 1: Point your browser to the Console Server.

In the address field of your browser type the Console Access Server's IP address. For example:

```
http://10.0.0.0
```

Step 2: Log in.

Log in with a user configured in the Web User Management section, and its password. This will take you to the Configuration and Administration page.

Step 3: Select the Connect to Serial Ports link.

Click on the Connect to Serial Ports link on the Link Panel to the left of the page in the Configuration section. This will take you to the Port Selection page. The ports will be listed by their server farm name if it were configured.



Figure 54: Serial Port Connection page

Step 4: Select port.

On the Port Selection page, choose a port to connect to from the dropdown menu and click the Connect button. This will open a new browser window that contains the applet connecting to the server chosen.

Appendix H - Connect to Serial Ports from Web

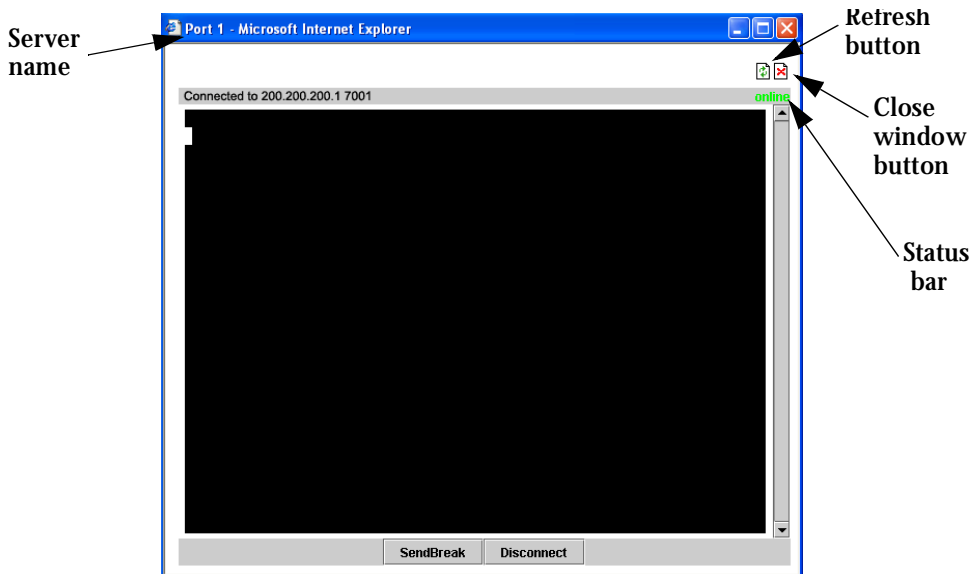


Figure 55: Port Connection page

At the upper right hand corner of the window, the left icon is a refresh button. Clicking on that button will reconnect to the server.



Figure 56: The Refresh button

The right icon closes the window. At the upper left corner, the server name is shown. In this case, the user didn't configure the serverfarm name, so "Port 1" appears.

Step 5: Log in.

If the port selected was configured as `socket_server` or `raw_data`, and depending on how it is configured to be authenticated, log in by typing into the terminal.

If the port selected was configured for a ssh connection, a Login window will pop

Appendix H - Connect to Serial Ports from Web

up. If you don't see it pop up, check your taskbar. Enter in the username and the username's password.

Enter in the username and the username's password if the servers were configured for authentication. If no authentication is configured, then just click Cancel.



Figure 57: SSH User Authentication Popup Window

Step 6: Enter command.

Click in the terminal window and start entering commands.

Step 7: To send a break to the terminal.

Click on the SendBreak button.

Step 8: Disconnect connection.

Click on the Disconnect button. Make sure the Status bar shows an Offline status. Closing the popup window will also disconnect you from the server.

Step 9: Reconnect to port.

Refresh the current page by clicking on the refresh icon at the upper right hand corner of the window.

Appendix H - Connect to Serial Ports from Web

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Appendix I - Power Management

Introduction

The AlterPath PM is a family of intelligent power strips (IPDU - Integrated Power Distribution Units), which is used for power management. Through a serial port, the administrator can use the AlterPath PM to control all the equipment connected to its outlets, using operations like On, Off, Cycle, Lock, and Unlock.

Using the AlterPath PM and the Cyclades-TS together, the administrator can have full control over his data center equipment. He can, for example, reboot the data center equipment when it crashes, without leaving his console session (telnet or ssh). To do that, he must simply press a configurable hotkey and select the appropriate option from the menu displayed in the session.

Configuration

This section covers only the software configuration for the Console Server when used in conjunction with the AlterPath PM. For hardware and cabling installation instructions for the AlterPath PM, Please refer to the AlterPath PM User Guide included in the product.

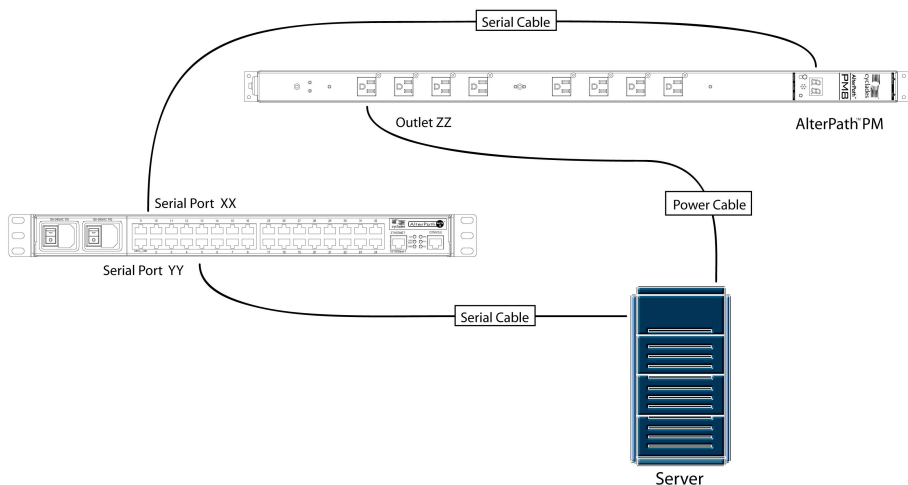


Figure 58: Configuration diagram

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[Figure 58: Configuration diagram](#) shows a typical setup for the AlterPath PM and the Cyclades-TS/AlterPath ACS. The AlterPath PM's serial console is connected to port YY of the Console Server, the server's serial console is connected to port YY of the Console Server, and the server's power plug is connected to power outlet ZZ on the AlterPath PM. These port denominations will be used in the descriptions below.

Port Slave Parameters Involved and Passed Values

There are two different types of parameters:

1. Parameters to the port XX where the AlterPath PM is connected:

- **sXX.protocol IPDU:** New protocol Integrated Power Distribution Unit. For example: ipdu.
- **sXX.pdtype:** The IPDU manufacturer. For example: cyclades.
- **sXX.pmusers:** The user access list. For example: jane:1,2;john:3,4. The format of this field is:
`[<username>:<outlet list>][;<username>:<outlet list>...]`

where <outlet list>'s format is:

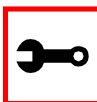
```
[<outlet number>|<outlet start>-<outlet end>][,<outlet number>|<outlet start>-<outlet end>]...
```

The list of users must be separated by semicolons (;); the outlets should be separated by commas (,) to indicate a list or with dashes (-) to indicate range; there should not be any spaces between the values.

- **sXX.pmNumOfOutlets:** the number of outlets of the AlterPath PM. Default: 8.
- ### 2. Parameters to the other ports where the servers are connected:
- **all.protocol:** Protocols for the CAS profile. For example: socket_server, socket_raw, socket_ssh.
 - **all.pmkey:** The hot-key that starts a power management session. Default: ^p (Ctrl-p).
 - **sYY.pmoutlet:** The outlet list where the server YY is plugged. The outlet is passed as a pair /PM_serial_port.outlet_number/. If the server has a dual power supply, the outlets are separated by space char. For example, one power supply is plugged in the second

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outlet of the IPDU connected in serial port 1. The other is plugged in the third outlet of the IPDU connected in serial port 5. The value is 1.2 5.3".



sXXpmusers notes: The ellipses in the field format for sXX.pusers means that you can add as many users as you need. The [] indicates that the parameter is optional, again indicating that you can configure more than one user. The separator is the semicolon, and spacing between the parameter and the variable matters in that a blank between names does not work.

e.g. jane:1,2; john:3,4 does not work
jane:1,2;john:3,4 works.

The users described in this parameter (sXX.pusers) are related to the users logged in a console session. These users will not be able to do power management from any other means, unless they are root users.

vi Method

The parameters described above must be changed by directly editing the */etc/portslave/plsave.conf* file.

Browser Method

To configure Power Management to control IPDUs through the Web interface:

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server's IP address. For example:

```
http://10.0.0.0
```

Appendix I - Power Management

- Step 2:** Log in as root and type the Web root password configured by the Web server.
This will take you to the Configuration and Administration page.
- Step 3:** Select the Serial Ports link.
Click on the Serial Ports link on the Link Panel to the left of the page or in the Configuration section of the page. This will take you to the Port Selection page.
- Step 4:** Select the serial port where the IPDU is connected.
After selecting the port, click the Connect button.
- Step 5:** Click the PM8 profile button in the Wizard Section.
This will automatically set the protocol to IPDU, the IPDU type to cyclades, and the number of outlets to 8.
- Step 6:** Scroll down to the IPDU Section.
Change the number of outlets and the user permissions in this section, if necessary.
- Step 7:** Click the Submit button.
If there are more IPDUs to be configured, repeat steps 4 to 7.
- Step 8:** Select the port whose server has the power supply plugged into one or more IPDU outlets.
After selecting the port, click the Submit button.
- Step 9:** Configure the port as a Console Access Server.
Read the Access Method section in Chapter 3 for details.
- Step 10:** Scroll down to the Power Management Section
Set the hotkey to access the power management menu and the outlet(s) the server is plugged into.
- Step 11:** Click on the Submit button.
- Step 12:** If there are more servers to be configured, repeat steps 8 to 11.

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Step 13: Make the changes effective.

Click on the Administration > Run Configuration link, check the Serial Ports/ Ethernet/Static Routes box and click on the Activate Configuration button.

Step 14: Click on the link Administration > Load/Save Configuration.

Step 15: Click the Save Configuration to Flash button.

The configuration was saved in flash.

Wizard Method

Step 1: Bring up the wizard.

At the command prompt, type the following to bring up the Power Management custom wizard:

```
wiz --pm
```

Screen 1 will appear.

Screen 1:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

INSTRUCTIONS for using the Wizard:

You can:

- 1) Enter the appropriate information for your system and press ENTER. Enter '#' if you want to deactivate that parameter or
- 2) Press ENTER if you are satisfied with the value within the brackets [] and want to go on to the next parameter or
- 3) Press ESC if you want to exit.

NOTE: For some parameters, if there is nothing within the brackets, it will continue to ask for a value. In that case, you must enter a valid value or # if you do not wish to configure the value.

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Press ENTER to continue...

Screen 2:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.protocol : ipdu  
all.pmtype : cyclades  
all.pusers : #  
all.pmoutlet : #  
all.pmkey : ^p  
all.pmNumOfOutlets : 8
```

Set to defaults ? (y/n) [n] :

Screen 3:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.PROTOCOL - The possible protocols are telnet (socket_server), ssh1/ssh2 (socket_ssh), raw data (raw_data), or integrated power distributed unit (ipdu).

```
all.protocol[ipdu] :
```

ALL.PMTYPE - Name of the IPDU manufacturer.

```
all.pmtype[cyclades] :
```

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Screen 4:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.PMUSERS - List of the outlets each user can access.
(e.g. Joe: 1-3; Jane: 4,5,6)

all.pmusers[#] :

ALL.PMOUTLET - The number of the outlet where the server
is plugged.

all.pmoutlet[#] :

Screen 5:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

ALL.PMKEY - The hot-key that identifies the power
management command.

all.pmkey[^p] :

ALL.PMNUMOFOUTLETS - The number of outlets you have on the
AlterPath PM.

all.pmNumOfOutlets[8] :

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Screen 6:

```
*****  
***** C O N F I G U R A T I O N   W I Z A R D *****  
*****
```

Current configuration:

(The ones with the '#' means it's not activated.)

```
all.protocol : ipdu  
all.pmtype  : cyclades  
all.pusers  : #  
all.pmoutlet : #  
all.pmkey   : ^p  
all.pmNumOfOutlets : 8
```

Are these configuration(s) all correct (y/n) [n] :

How to Access the AlterPath PM regular menu from the Console Session

Step 1: Open a console session.

Open a telnet or ssh session for the serial port.

Step 2: Access the IPDU regular menu.

This should be done, for example, when the server crashes and it necessary to change the power status. Type the preconfigured hot-key.

If the user does not have permission to access any outlet, the following message will appear, and you will return to the Console Session:

```
It was impossible to start a Power Management Session  
You can't access any Power Management functionality.  
Please contact your Console Server Administrator.
```


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If the user does not have permission to access the outlet(s) of this server, but can access another outlet, the following message will appear:
You cannot manage the outlet(s) of this server.
Please enter the outlet(s) (or 'h' for help):

The user should type the outlet(s) he wants to manage, before reaching the main menu. The main menu will appear only if the user has permission for this/these outlet(s). Typing 'h' will cause the session to show text explaining what to type, and 'l' will cause the PM session to be logged out, and the user to return to the Console Session. If the user has permission to access the outlet(s) of this server, these outlets will be managed by the PM session.

Step 3: Regular Menu.

This is the AlterPath PM regular menu:

```
-----  
Cyclades Corporation - Power Management Utility  
-----
```

```
1 - Exit      2 - On        3 - Off  
4 - Cycle    5 - Lock      6 - Unlock  
7 - Status   8 - Help      9 - Other
```

Please choose an option:

Table 40: AlterPath PM Regular Menu Options

Option	Description
Exit	Exits the Power Management Session.
On	Turns the outlet on.
Off	Turns the outlet off.
Cycle	Turns the outlet off and back on.
Lock	Locks the current status of the outlet.
Unlock	Unlocks the current status of the outlet.
Status	Shows the current status of the outlet.
Other	Allows user to control other outlets.

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Step 4: Check the status of the server's outlet or the outlet list.

Type '7' and wait for the answer. For example:

```
Please choose an option: 7
```

```
IPDU 1 Outlet 8:  
Outlet Status User  
8 OFF NONE
```

```
-----  
Cyclades Corporation - Power Management Utility  
-----
```

```
1 - Exit      2 - On      3 - Off  
4 - Cycle    5 - Lock    6 - Unlock  
7 - Status   8 - Help    9 - Other
```

```
Please choose an option:
```

Step 5: Reboot the server.

If the outlet(s) is/are locked, the user must unlock the outlet(s) first (option 6 - Unlock). The Cycle command turns the power off for some seconds and the turn it on again. Type '4' and wait for the answer. For example:

```
Please choose an option: 4
```

```
IPDU 1 Outlet 8:  
8: Outlet power cycled.
```

```
-----  
Cyclades Corporation - Power Management Utility  
-----
```

```
1 - Exit      2 - On      3 - Off  
4 - Cycle    5 - Lock    6 - Unlock  
7 - Status   8 - Help    9 - Other
```

```
Please choose an option:
```

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Step 6: Change the outlet list.

If the user needs to access another outlet(s) which can be managed by him, the option 9 - Other should be used. For example:

```
-----  
Cyclades Corporation - Power Management Utility  
-----
```

```
1 - Exit      2 - On       3 - Off  
4 - Cycle    5 - Lock     6 - Unlock  
7 - Status   8 - Help     9 - Other
```

```
Please choose an option: 9
```

```
Please enter the outlet(s) (or 'h' for help): 1.2
```

```
-----  
Cyclades Corporation - Power Management Utility  
-----
```

```
1 - Exit      2 - On       3 - Off  
4 - Cycle    5 - Lock     6 - Unlock  
7 - Status   8 - Help     9 - Other
```

```
Please choose an option:
```

From this point, all the commands will be related to the 2nd outlet of the IPDU in the port 1.

Step 7: Return to the Console Session.

The user can exit from the PM session and return to the Console Session in three ways:

1. Type the hot-key again, any time.
2. If the session is waiting for a menu option, type the option 1 - Exit.
3. If the session is waiting for the outlet, type 'l'.

When the user leaves the PM session, the following message will appear:

```
Exit from PM session
```

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Power Management for the Administrator

The administrator, who can log onto the Console server itself, must have total control over all the IPDU outlets. An additional menu, with more options than the regular menu, is provided for the administrator to manage any IPDU.

There are two commands which can be used to manage the IPDU. The first one (*pm*) deals with menu options, while the second one (*pmCommand*) deals with the commands as they are sent to the IPDU, and requires more knowledge about the AlterPath-PM commands.



Note: Only the root user can do power management by using *pm* or *pmCommand*.

pm command

There are two ways to use this command: menu interface or command line. The menu is reached by typing the following command, from the prompt:

```
pm <IPDU port>
```

For example:

```
[root@TSx000 /root]# pm 1
```

```
-----  
Cyclades Corporation - Power Management Utility  
-----
```

```
1 - Exit          2 - On           3 - Off  
4 - Cycle         5 - Lock        6 - Unlock  
7 - Status       8 - Help        9 - List  
10 - Current
```

Please choose an option:

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Table 41: AlterPath PM Administrator Menu Options

Option	Description
Exit	Exits the Power Management Session.
On	Turns the outlet on.
Off	Turns the outlet off.
Cycle	Turns the outlet off and back on.
Lock	Locks the current status of the outlet.
Unlock	Unlocks the current status of the outlet.
Status	Shows the current status of the outlet.
Help	Lists the AlterPath PM available commands.
List	Lists the users assigned for each outlet.
Current	Shows the current consumption of the AlterPath PM.

Some of these options require the outlet number (On, Off, Cycle, Lock, Unlock, Status), and others don't. In the first case, when the option is selected, the number of the outlet will be asked. The user can enter one or more outlets (separated by commas or dashes), or "all," to apply the option to all the outlets.

Following are examples of some things which can be done through this command.

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Turning the outlet off

Please choose an option: 3

Please enter the outlets (or 'help' for help): 4

4: Outlet turned off.

Cyclades Corporation - Power Management Utility

1 - Exit	2 - On	3 - Off
4 - Cycle	5 - Lock	6 - Unlock
7 - Status	8 - Help	9 - List
10 - Current		

Please choose an option:

Locking the outlets

When the outlet is locked, the previous status cannot be changed, until the outlet is unlocked. This means that if the outlet was on, it cannot be turned off and, if it was off, it cannot be turned on.

Please choose an option: 5

Please enter the outlets (or 'help' for help): 1-3

1: Outlet locked.
2: Outlet locked.
3: Outlet locked.

Cyclades Corporation - Power Management Utility

1 - Exit	2 - On	3 - Off
4 - Cycle	5 - Lock	6 - Unlock
7 - Status	8 - Help	9 - List
10 - Current		

Please choose an option:

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Retrieving the status of the outlets

```
Please choose an option: 7
```

```
Please enter the outlets (or 'help' for help): all
```

```
Outlet Status User
```

```
1 Locked OFF NONE
```

```
2 Locked OFF NONE
```

```
3 Locked OFF NONE
```

```
4 OFF NONE
```

```
5 OFF NONE
```

```
6 OFF NONE
```

```
7 OFF NONE
```

```
8 OFF NONE
```

```
-----  
Cyclades Corporation - Power Management Utility  
-----
```

```
1 - Exit          2 - On           3 - Off  
4 - Cycle        5 - Lock        6 - Unlock  
7 - Status       8 - Help        9 - List  
10 - Current
```

```
Please choose an option:
```

The second way to use the pm command is the command line. In this case, the syntax for the command is

```
pm <IPDU port> <option> [<outlet(s)>],
```

where:

<option> is the name of the option, as written in the menu.

<outlet(s)> is the number of the outlet(s) the option will be applied to, and is used only if the option requires the outlet.

In the examples above, the same result can be achieved by using the command line mode:

Appendix I - Power Management

Turning the outlet off

```
[root@TSx000 /root]# pm 1 Off 4
```

```
4: Outlet turned off.
```

```
[root@TSx000 /root]#
```

Locking the outlets

```
[root@TSx000 /root]# pm 1 Lock 1-3
```

```
1: Outlet locked.
```

```
2: Outlet locked.
```

```
3: Outlet locked.
```

```
[root@TSx000 /root]#
```

Retrieving the status of the outlets

```
[root@TSx000 /root]# pm 1 Status all
```

```
Outlet Status User
```

```
1 Locked OFF NONE
```

```
2 Locked OFF NONE
```

```
3 Locked OFF NONE
```

```
4 OFF NONE
```

```
5 OFF NONE
```

```
6 OFF NONE
```

```
7 OFF NONE
```

```
8 OFF NONE
```

```
[root@TSx000 /root]#
```

pmCommand command

Through `pmCommand` command, the administrator has access to other options beyond the menu options, because he will be accessing the IPDU itself. The administrator must have a good knowledge of the AlterPath PM command set to use it.

Appendix I - Power Management

There are two ways to use this command. If only the IPDU port is passed as an argument, it will appear in a prompt where the administrator can write the command. Otherwise, the arguments after the IPDU port will be considered the PM command.

Syntax:

```
pmCommand <IPDU port> [<command>]
```

For example:

```
[root@CAS root]# pmCommand 1
You're entering the "Power Management Prompt".
To go back to the Console Server's command line type: exitPm

[Cyclades - Power Management Prompt]#
```

The following are examples of some things which can be done through this command.

Listing the commands available for the AlterPath PM

```
[Cyclades - Power Management Prompt]# help

on <outlet><cr>           --Turn <outlet> ON
off <outlet><cr>         --Turn <outlet> OFF
cycle <outlet><cr>       --Turn <outlet> OFF and back ON
lock <outlet><cr>        --Lock the current status of <outlet>
unlock <outlet><cr>      --Unlock the current status of <outlet>
status <outlet><cr>      --Show the current status of <outlet>
list<cr>                --List users created and eventual outlets
                        assigned
exit<cr>                --Exit session
passwd <user><cr>        --Set a password for the specific user
help<cr>                --Show supported commands
current<cr>             --Show the instantaneous current consump
                        tion for the entire unit
adduser <username><cr>   --Add user to the DB (8 maximum users
                        allowed)
deluser <username><cr>   --Delete user from the DB
assign <outlet> <username><cr> --Assign <outlet> to a specific
                        user
name <outlet> <name><cr> --Name an outlet
[Cyclades - Power Management Prompt]#
```

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Cycling all the outlets

```
[Cyclades - Power Management Prompt]# cycle all
```

```
1: Outlet power cycled.  
2: Outlet power cycled.  
3: Outlet power cycled.  
4: Outlet power cycled.  
5: Outlet power cycled.  
6: Outlet power cycled.  
7: Outlet power cycled.  
8: Outlet power cycled.
```

```
[Cyclades - Power Management Prompt]#
```

Unlocking the outlets 1, 5 and 8

```
[Cyclades - Power Management Prompt]# unlock 1, 5, 8
```

```
1: Outlet unlocked.  
5: Outlet unlocked.  
8: Outlet unlocked.
```

```
[Cyclades - Power Management Prompt]#
```

Appendix I - Power Management

Power Management from a Browser

The Console Server Web server also supports power management. From a Web browser it is possible to check the status of all the IPDUs connected to the Console Server, as well as their outlets. If the user has Administration privileges, he can also perform the commands to turn on, turn off, cycle, lock and unlock the outlets.

Step 1: Point your browser to the Console Server.

In the address or location field of your browser type the Console Access Server's IP address. For example:

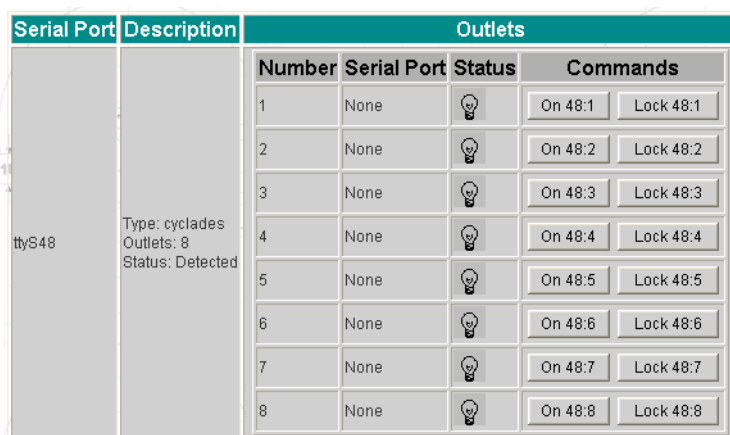
```
http://10.0.0.0
```

Step 2: Log in as root and type the Web root password configured by the Web server.

This will take you to the Configuration and Administration page.

Step 3: Select the Power Management link.

This link is in the Administration section. The following page will appear:



Serial Port	Description	Outlets			
		Number	Serial Port	Status	Commands
ttyS48	Type: cyclades Outlets: 8 Status: Detected	1	None		On 48:1 Lock 48:1
		2	None		On 48:2 Lock 48:2
		3	None		On 48:3 Lock 48:3
		4	None		On 48:4 Lock 48:4
		5	None		On 48:5 Lock 48:5
		6	None		On 48:6 Lock 48:6
		7	None		On 48:7 Lock 48:7
		8	None		On 48:8 Lock 48:8

Figure 59: Power Management page

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In the figure above, all the outlets are off (the light bulbs are off) and unlocked. For this status, there are two possible commands: turn it on and lock it.

The following steps are examples of what can be done in this page.

Step 4: Turn the outlet 1 on.

Click on the “On 48:1” button. The following page will appear:









Serial Port	Description	Outlets			
ttyS48	Type: cyclades Outlets: 8 Status: Detected	Number	Serial Port	Status	Commands
		1	None		<input type="button" value="Off 48:1"/> <input type="button" value="Cycle 48:1"/> <input type="button" value="Lock 48:1"/>
		2	None		<input type="button" value="On 48:2"/> <input type="button" value="Lock 48:2"/>
		3	None		<input type="button" value="On 48:3"/> <input type="button" value="Lock 48:3"/>
		4	None		<input type="button" value="On 48:4"/> <input type="button" value="Lock 48:4"/>
		5	None		<input type="button" value="On 48:5"/> <input type="button" value="Lock 48:5"/>
		6	None		<input type="button" value="On 48:6"/> <input type="button" value="Lock 48:6"/>
		7	None		<input type="button" value="On 48:7"/> <input type="button" value="Lock 48:7"/>
		8	None		<input type="button" value="On 48:8"/> <input type="button" value="Lock 48:8"/>

Figure 60: Power Management page after turning outlet 1 on

After this operation, the outlet 1 was turned on (the light bulb is on), and now the administrator can turn it off and cycle this outlet.

Step 5: Lock outlet 1.

Click on the “Lock 48:1” button. The following page will appear:

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Serial Port	Description	Outlets					
		Number	Serial Port	Status	Commands		
ttyS48	Type: cyclades Outlets: 8 Status: Detected	1	None		Off 48:1	Cycle 48:1	Unlock 48:1
		2	None		On 48:2	Lock 48:2	
		3	None		On 48:3	Lock 48:3	
		4	None		On 48:4	Lock 48:4	
		5	None		On 48:5	Lock 48:5	
		6	None		On 48:6	Lock 48:6	
		7	None		On 48:7	Lock 48:7	
		8	None		On 48:8	Lock 48:8	

Figure 61: Power Management page after locking outlet 1

The padlock indicates that outlet 1 was locked. From this point, nothing can change the outlet status, until the outlet is unlocked.

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This page has been left intentionally blank.

Appendix J - Examples for Config Testing

Introduction

The following three examples are just given to *test* a configuration. The steps should be followed *after* configuring the Cyclades-TS.

Console Access Server

With the Cyclades-TS set up as a CAS you can access a server connected to the Cyclades-TS through the server's serial console port from a workstation on the LAN or WAN. There is no authentication by default, but the system can be configured for authentication to be performed by a Radius server, a TacacsPlus server, or even by a local database. Either telnet or ssh can be used.

See [Appendix A - New User Background Information](#) for more information about ssh. The instructions in [Chapter 2 - Installation, Configuration, and Usage](#) will set up a fully-functional, default CAS environment. More options can be added after the initial setup, as illustrated in [Chapter 3 - Additional Features](#).

An example of a CAS environment is shown in [Figure 62: Console Access Server diagram](#). This configuration example has local authentication, an Ethernet interface provided by a router, and serially-connected workstations.

Appendix J - Examples for Config Testing

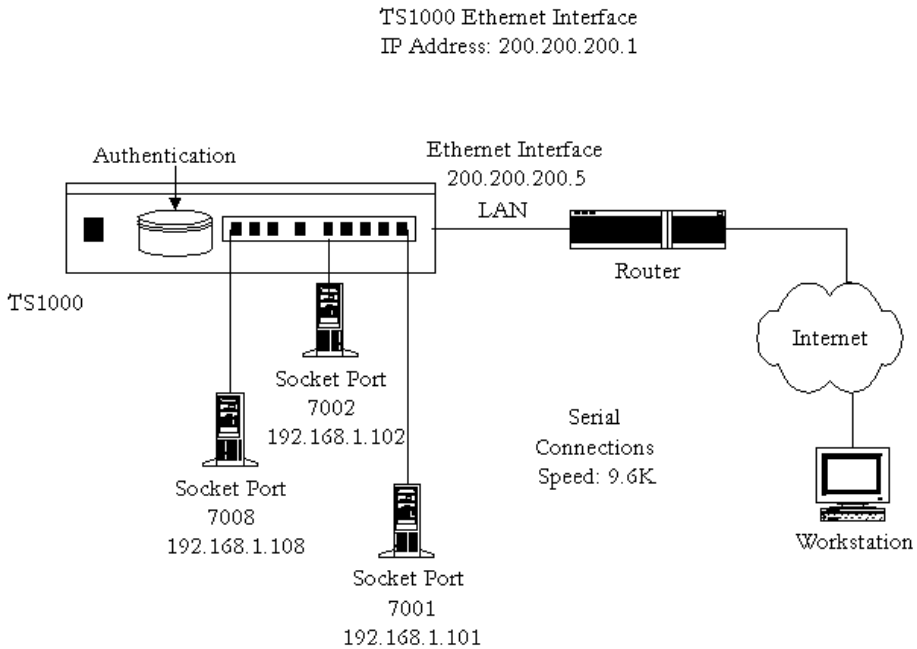


Figure 62: Console Access Server diagram

Appendix J - Examples for Config Testing

The following diagram, [Figure 63: CAS diagram with various authentication methods](#), shows additional scenarios for the Cyclades-TS: both remote and local authentication, data buffering, and remote access.

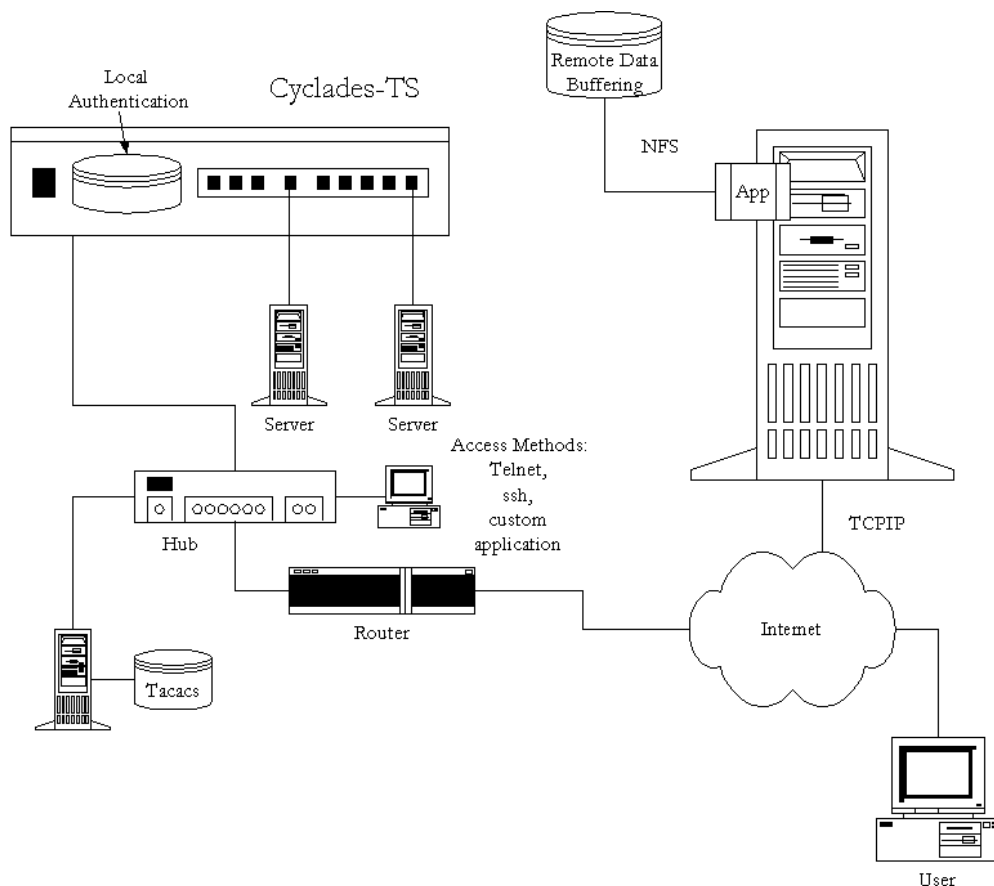


Figure 63: CAS diagram with various authentication methods

As shown in the above figure, our “CAS with local authentication” scenario has either telnet or ssh (a secure shell session) being used. After configuring the serial ports as described in [Chapter 3 - Additional Features](#) or in [Appendix C - The pslave Configuration File](#), the following step-by-step check list can be used to test the configuration.

Appendix J - Examples for Config Testing

Step 1: Create a new user.

Run the *adduser <username>* to create a new user in the local database. Create a password for this user by running *passwd <username>*.

Step 2: Confirm physical connection.

Make sure that the physical connection between the Cyclades-TS and the servers is correct. A cross cable (not the modem cable provided with the product) should be used. Please see [Appendix B - Cabling, Hardware, and Electrical Specifications](#) for pin-out diagrams.

Step 3: Confirm that server is set to same parameters as the TS.

The Cyclades-TS has been set for communication at 9600 bps, 8N1. The server must also be configured to communicate on the serial console port with the same parameters.

Step 4: Confirm routing.

Also make sure that the computer is configured to route console data to its serial console port (Console Redirection).

Step 5: Telnet to the server connected to port 1.

From a server on the LAN (not from the console), try to telnet to the server connected to the first port of the Cyclades-TS using the following command:

```
telnet 200.200.200.1 7001
```

For both telnet and ssh sessions, the servers can be reached by either:

1. Ethernet IP of the Cyclades-TS and assigned socket port.

or

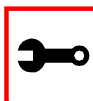
2. Individual IP assigned to each port.

If everything is configured correctly, a telnet session should open on the server connected to port 1. If not, check the configuration, follow the steps above again, and check the troubleshooting appendix.

Appendix J - Examples for Config Testing

Step 6: Activate the changes.

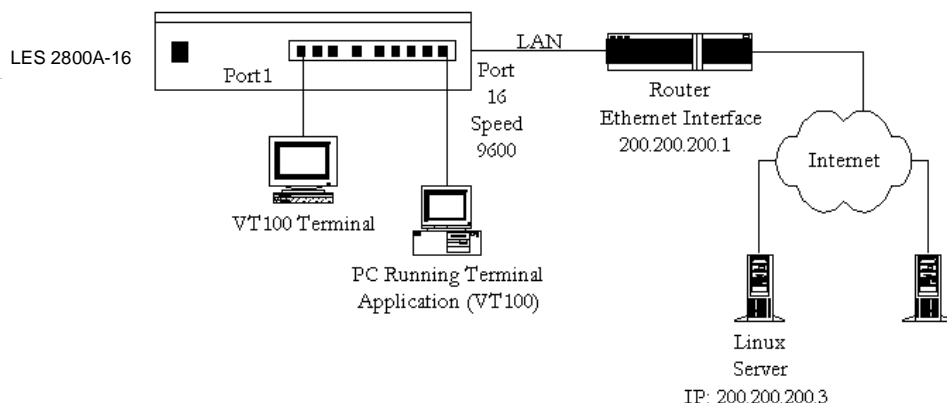
Now continue on to [Task 5: Activate the changes](#) through listed in [Chapter 2 - Installation, Configuration, and Usage](#).



Note: It is possible to access the serial ports from Microsoft stations using some off-the-shelf packages. Although Black Box is not liable for those packages, successful tests were done using at least one of them. From the application's viewpoint running on a Microsoft station, the remote serial port works like a regular COM port. All the I/O with the serial device attached to the Cyclades-TS is done through socket connections opened by these packages and a COM port is emulated to the application.

Terminal Server

The Cyclades-TS provides features for out-of-band management via the configuration of terminal ports. All ports can be configured as terminal ports. This allows a terminal user to access a server on the LAN.



The terminal can be either a dumb terminal or a terminal emulation program on a PC.

Appendix J - Examples for Config Testing

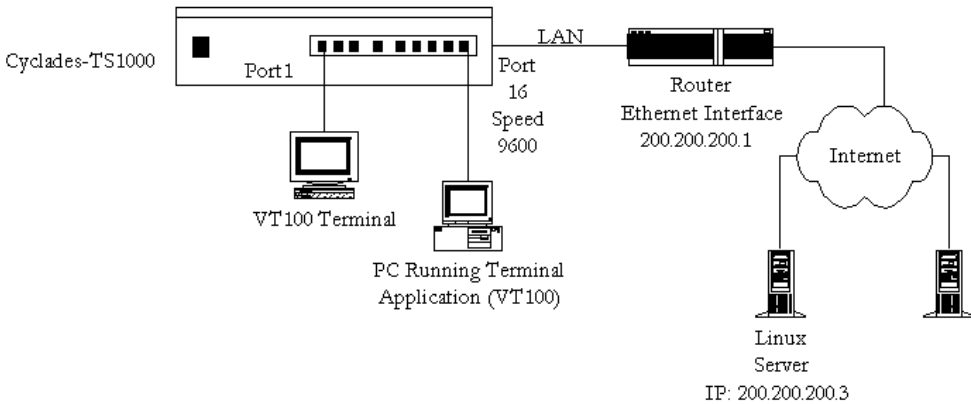


Figure 64: Terminal Server diagram

No authentication is used in the example shown above and rlogin is chosen as the protocol. After configuring the serial ports as described in [Chapter 3 - Additional Features](#) or in [Appendix C - The pslave Configuration File](#), the following step-by-step check list can be used to test the configuration.

Step 1: Create a new user.

Since authentication was set to none, the Cyclades-TS will not authenticate the user. However, the Linux Server receiving the connection will. Create a new user on the server called *test* and provide him with the password *test*.

Step 2: Confirm that the server is reachable.

From the console, ping 200.200.200.3 to make sure the server is reachable.

Step 3: Check physical connections.

Make sure that the physical connection between the Cyclades-TS and the terminals is correct. A cross cable (not the modem cable provided with the product) should be used. Please see the [Appendix B - Cabling, Hardware, and Electrical Specifications](#) for pin-out diagrams.

Step 4: Confirm that terminals are set to same parameters as the TS.

The Cyclades-TS has been set for communication at 9600 bps, 8N1. The terminals must also be configured with the same parameters.

Appendix J - Examples for Config Testing

Step 5: Log onto server with new username and password.

From a terminal connected to the Cyclades-TS, try to login to the server using the username and password configured in step one.

Step 6: Activate changes.

Now continue on to [Task 5: Activate the changes](#) through listed in [Chapter 2 - Installation, Configuration, and Usage](#).

Appendix J - Examples for Config Testing

Dial-in Access

The Cyclades-TS can be configured to accommodate out-of-band management. Ports can be configured on the Cyclades-TS to allow a modem user to access the LAN. Radius authentication is used in this example and ppp is chosen as the protocol on the serial (dial-up) lines. Cyclades recommends that a maximum of two ports be configured for this option.

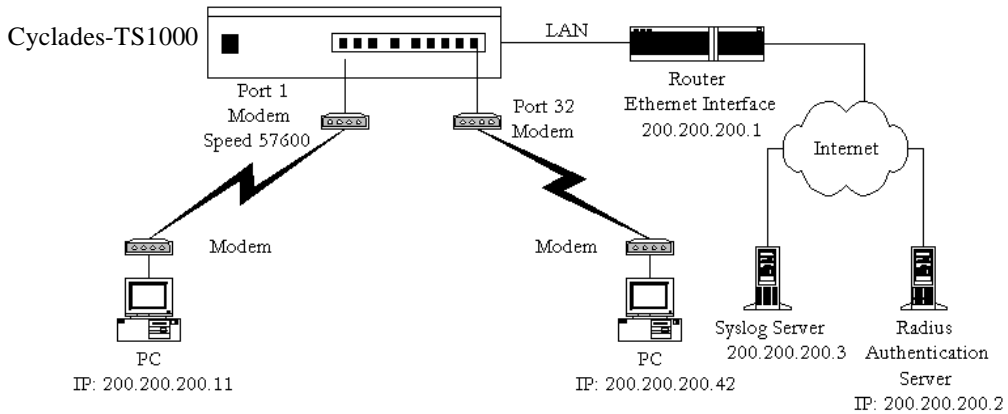


Figure 65: Ports configured for Dial-in Access

After configuring the serial ports as described in [Chapter 3 - Additional Features](#) or in [Appendix C - The pslave Configuration File](#), the following step-by-step check list can be used to test the configuration.

Step 1: Create a new user.

Since Radius authentication was chosen, create a new user on the Radius authentication server called *test* and provide them with the password *test*.

Appendix J - Examples for Config Testing

Step 2: Confirm that the Radius server is reachable.

From the console, ping 200.200.200.2 to make sure the Radius authentication server is reachable.

Step 3: Confirm physical connections.

Make sure that the physical connection between the Cyclades-TS and the modems is correct. The modem cable provided with the product should be used. Please see [Appendix B - Cabling, Hardware, and Electrical Specifications](#) for pinout diagrams.

Step 4: Confirm modem settings.

The Cyclades-TS has been set for communication at 57600 bps, 8N1. The modems should be programmed to operate at the same speed on the DTE interface.

Step 5: Confirm routing.

Also make sure that the computer is configured to route console data to the serial console port.

Step 6: Perform a test dial-in.

Try to dial in to the Cyclades-TS from a remote computer using the username and password configured in step one. The computer dialing in must be configured to receive its IP address from the remote access server (the Cyclades-TS in this case) and to use PAP authentication.

Step 7: Activate changes.

Now continue on to [Task 5: Activate the changes](#) through listed in [Chapter 2 - Installation, Configuration, and Usage](#).

Appendix J - Examples for Config Testing

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Appendix K - Billing Feature

Introduction

The Cyclades TS110/100 can also be simply used as an intermediate buffer to collect serial data (like billing tickets from a PABX), making them available for a posterior file transfer.

General Feature Description

The TS110/100 reads the serial port and saves information to Ramdisk files, limited to a maximum number of records per file or a maximum lifetime. After they are closed, these files are available for file transfer at /var/run/DB.

Configuration

The `plsave.conf` file has one more “protocol” and two new parameters shown on the Data Buffering section of the Web interface. They are:

<i>all.protocol</i>	billing
---------------------	---------

Data Buffering section:

<i>all.billing_records</i>	50
----------------------------	----

<i>all.billing_timeout</i>	60 (min)
----------------------------	----------

Appendix K - Billing Feature

How it works

Once the `cy_ras` program detects the protocol as “billing,” it starts the billing application. The billing application then opens the port (as configured in `pslave.conf`) and starts reading it. Records terminated by a “0Dh” (carriage return) and/or a “0Ah” (line feed) ASCII characters are expected to be received. The TS110/100 doesn’t change the termination method (DOS/UNIX), transferring the same sequence to the file. The name of the temporary file used to write these records is:

```
cycXXXXXX-YYMMDD.hhmmss.tmp
```

where:

- *XXXXXX* is the “hostname” or “serverfarm”
- *YYMMDD* is the year/month/day
- *hhmmss* is the hour:min:sec

XXXXXX is the “hostname” or “serverfarm”

YYMMDD is the year/month/day

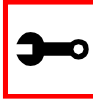
hhmmss is the hour:min:sec

This name helps the user archive and browse their directory as the file can be chronologically listed, not based on its creation or modification times, but based on when its contents were recorded. Also, whenever “hostname” is not significant, the user can use the “serverfarm” name (`s1.serverfarm` in `pslave.conf`) to match their actual plant (like PABX-trunk9). The temporary file described above is closed and renamed to `cycXXXXXX-YYMMDD.hhmmss.txt` and a new temporary file is opened when:

1. The maximum number of records specified by “`billing_records`” is reached;
2. The lifetime specified by “`billing_timeout`” finishes.

If no record is received within a file lifetime period, no file will be actually saved.

Appendix K - Billing Feature



Note: A zero-value for “billing_records” stops the application and a zero-value for “billing_timeout” means no timeout is desired and so the file will only be closed after “billing_records” are received.

Disk Space Issue

Finally, it is important to note that there is a protection against disk space problems. If you configure flow control to “hardware” for the serial port (*all.flow = hard* in the *pslave.conf* file), the application monitors the available disk space and if it is less than 100 Kb, the serial interface deactivates “RTS” signal on the RS-232. “RTS” is reactivated once the disk free space is greater than 120 Kb.

Appendix K - Billing Feature

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Appendix L - Wiz Application Parameters

Basic Parameters (wiz)

- Hostname
- System IP
- Domain Name
- DNS Server
- Gateway IP
- Network Mask

Access Method Parameters (wiz --ac <type>)

(CAS profile)

- Ipno
- Socket_port
- Protocol
- Modbus_smode
- Users
- Poll_interval
- Tx_interval
- Idletimeout
- Conf.group
- <sN>.serverfarm
- pool_ipno
- pool_socket_port

Appendix L - Wiz Application Parameters

- pool_serverfarm
- web_WinEMS
- translation

(TS profile)

- Protocol
- Socket_port
- Userauto
- Telnet_client_mode

Alarm Parameter (wiz --a)

- Alarm
- xml_monitor

Authentication Parameters (wiz --auth)

- Authtype
- Authhost1
- Accthost1
- Authhost2
- Accthost2
- Radtimeout

Appendix L - Wiz Application Parameters

- Radretries
- Secret

Data Buffering Parameters (wiz --db)

- Data_buffering
- Conf.nfs_data_buffering
- Syslog_buffering
- Dont_show_DBmenu
- DB_timestamp
- DB_mode
- Syslog_sess

Power Management Parameters (wiz --pm)

- pmkey
- pmNumOfOutlets
- pmoutlet
- pmtype
- pmusers

Appendix L - Wiz Application Parameters

Serial Settings Parameters (`wiz --sset <type>`)

(CAS profile)

- Speed
- Datasize
- Stopbits
- Parity
- Flow
- Dcd
- SttyCmd
- DTR_reset

(TS profile)

- Speed
- Datasize
- Stopbits
- Parity
- Flow
- Dcd

Appendix L - Wiz Application Parameters

Sniffing Parameters (wiz --snf)

- Admin_users
- Sniff_mode
- Escape_char
- Multiple_sessions

Syslog Parameters (wiz --sl)

- Conf.facility
- Conf.DB_facility

Terminal Appearance Parameters (wiz --tl)

- Issue
- Prompt
- Lf_suppress
- Auto_answer_input
- Auto_answer_output

Appendix L - Wiz Application Parameters

Terminal Server Profile Other Parameters (*wiz --tso*)

- Host
- Term
- Conf.locallogins

Appendix M - Copyrights

References

The Cyclades-TS is based in the HardHat Linux distribution, developed by Montavista Software for embedded systems. Additionally, several other applications were incorporated into the product, in accordance with the free software philosophy.

The list below contains the packets and applications used in the Cyclades-TS and a reference to their maintainers. The copyrights notices required in some packets are placed in the /COPYRIGHTS directory of the Cyclades-TS image.

Bootparamd

NetKit Bootparamd version 0.17

<ftp://ftp.uk.linux.org/pub/linux/Networking/netkit>

Busybox

BusyBox version 0.60.2

<ftp://ftp.lineo.com/pub/busybox/>

Cron

Paul Vixie's cron version 3.0.1.

paul@vix.com

DHCPD

PhysTech DHCP Client Daemon version 1.3.20.p10.

<http://www.phystech.com/download/dhcpd.html>

Flex

Flex version 2.5.4

vern@ee.lbl.gov

COPYRIGHT: This product includes software developed by the University of California, Berkeley and its contributors

Appendix M - Copyrights

GNU

The GNU project
<http://www.gnu.org>

HardHat Linux

MontaVista Software - HardHat version 1.2
<http://www.montavista.com>

IPChains

Netfilter IPChains version 1.3.9. Extracted from the HardHat Linux
<http://www.netfilter.org>

Linux Kernel

Linux Kernel version 2.2.17. Extracted from the HardHat Linux distribution
<http://www.kernel.org>

NTP

NTP client
<http://doolittle.faludi.com/ntpclient/>

OpenSSH

OpenSSH version 3.5p1
<http://www.openssh.org>
COPYRIGHT: This product includes software developed by the University of California, Berkeley and its contributors.

OpenSSL

OpenSSL Project version 0.9.6g
<http://www.openssl.org>
COPYRIGHT: This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (<http://www.openssl.org/>)
COPYRIGHT: This product includes cryptographic software written by Eric Young (ey@cryptsoft.com)

Appendix M - Copyrights

PAM

Linux PAM version 0.75

<http://www.kernel.org/pub/linux/libs/pam/>

Portslave

SourceForge Portslave project version 2000.12.25. (modified). Includes pppd version 2.4.1 and rlogin version 8.10

<http://sourceforge.net/projects/portslave/>

RSYNC

rsync version 2.5.5

<http://rsync.samba.org/rsync/>

Syslog-ng

Syslog new generation version 1.5.17

<http://www.balabit.hu/products/syslog-ng/>

Tinylogin

TinyLogin version 0.80

<ftp://ftp.lineo.com/pub/tinylogin/>

WEBS

GoAhead WEBS version 2.1 (modified)

<http://goahead.com/webserver/webserver.htm>

Copyright (c) 20xx GoAhead Software, Inc. All Rights Reserved

ZLIB

zlib version 1.1.4

<http://www.gzip.org/zlib/>

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Glossary

Authentication

Authentication is the process of identifying an individual, usually based on a username and password. In security systems, authentication is distinct from authorization, which is the process of giving individuals access to system objects based on their identity. Authentication merely ensures that the individual is who he or she claims to be, but says nothing about the access rights of the individual. (Source: www.webopedia.com)

Break Signal

A break signal is generated in an RS-232 serial line by keeping the line in zero for longer than a character time. Breaks at a serial console port are interpreted by Sun servers as a signal to suspend operation and switch to monitor mode.

Console Access Server (CAS)

A CAS has an Ethernet LAN connection and many RS-232 serial ports. It connects to the console ports of servers and networking equipment and allows convenient and secure access from a single location.

Console Port

Most of the equipment in a data center (servers, routers, switches, UPS, PBX, etc.) has a serial console port for out-of-band management purposes.

Cluster

A cluster is a group of one or more computers working as a group to execute a certain task. From the user standpoint, a cluster acts as a large computer system.

Flash

Flash refers to a type of memory that can be erased and reprogrammed in units of memory known as blocks rather than one byte at a time; thus, making updating to memory easier.

In-band network management

In a computer network, when the management data is accessed using the same network that carries the data, this is called “in-band management.”

Glossary

IP packet filtering

This is a set of facilities in network equipment that allows the filtering of data packets based on source/destination addresses, protocol, TCP port number and other parameters. Packet filtering is one of the main functions of a firewall.

KVM Switch (KVM)

Keyboard-Video-Mouse Switches connect to the KVM ports of many computers and allow the network manager to access them from a single KVM station.

Mainframe

Large, monolithic computer system.

MIBs

Management Information Bases. SNMP-compliant devices, called agents, store data about themselves in MIBs and return this data to the SNMP requesters.

Out-of-band network management

In a computer network, when the management data is accessed through a network that is independent of the network used to carry data, this is called “out-of-band network management.”

Off-line data buffering

This is a CAS feature that allows capture of console data even when there is no one connected to the port.

Profile

Usage setup of the Cyclades-TS: either as a Console Access Server (CAS), a Terminal Server, or a Remote Access Server.

RADIUS

Protocol between an authentication server and an access server to authenticate users trying to connect to the network.

Glossary

RISC

Reduced Instruction Set Computer. This describes a computer processor architecture that uses a reduced set of instructions (and achieves performance by executing those instructions very fast.) Most UNIX servers (Sun Sparc, HP, IBM RS6000, Compaq Alpha) were designed with a processor using a RISC architecture. The Intel[®] x86 architecture.

RS-232

A set of standards for serial communication between electronic equipment defined by the Electronic Industries Association in 1969. Today, RS-232 is still widely used for low-speed data communication.

Secure Shell (SSH)

SSH has the same functionality as Telnet (see definition below), but adds security by encrypting data before sending it through the network.

Server Farm

A collection of servers running in the same location (see Cluster).

SNMP

Short for Simple Network Management Protocol, a set of protocols for managing complex networks. The first versions of SNMP were developed in the early 80s. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters. (Source: Webopedia)

Telnet

Telnet is the standard set of protocols for terminal emulation between computers over a TCP/IP connection. It is a terminal emulation program for TCP/IP networks such as the Internet. The Telnet program runs on your computer and connects your PC to a server on the network. You can then enter commands through the Telnet program and they will be executed as if you were entering them directly on the server console. This enables you to control the server and communicate with other servers on the network. To start a Telnet session, you must log in to a server by entering a valid username and password. Telnet is a common way to remotely control Web servers. (from webopedia.com)

Glossary

Terminal Server

A terminal server has one Ethernet LAN port and many RS-232 serial ports. It is used to connect many terminals to the network. Because they have the same physical interfaces, terminal servers are sometimes used as console access servers.

TTY

The UNIX name for the COM (Microsoft) port.

U Rack height unit

A standard computer rack has an internal width of 17 inches. Rack space on a standard rack is measured in units of height (U). One U is 1.75 inches. A device that has a height of 3.5 inches takes 2U of rack space.

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