Installation and User's Guide



iSD200-PCD™

Personal Content Director

Part Number: 050143, Revision A, January 2001

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Web Speed for e-Business

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Caution—Alteon WebSystems products are designed to work with single-phase power systems having a grounded neutral conductor. To reduce the risk of electric shock, do not plug Alteon WebSystems products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

Caution—Not all power cords have the same ratings. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Alteon WebSystems product.

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Preface

This *Installation and User's Guide* describes how to install, configure, and maintain the iSD200-PCD Personal Content Director. The iSD200-PCD is a Global Server Load-Balancing appliance that directs clients to the quickest-responding Web site in a geographically distributed domain. The iSD200-PCD is another in the series of Integrated Service Director (iSD) products that leverage the content-aware switching features of Alteon WebSystems switches.

Who Should Use This Book

The *iSD200-PCD Installation and User's Guide* is intended for network installers and system administrators who configure and maintain data networks. It assumes that you are familiar with Ethernet concepts, IP addressing, network masks, and SNMP.

How This Book Is Organized

Chapter 1, "Introduction," provides a system overview, lists the iSD200-PCD features, and describes the basic operational concepts.

Chapter 2, "Installing the iSD200-PCD Hardware," describes how to mount the iSD200-PCD, connect network cables, and attach power.

Chapter 3, "The Command Line Interface," describes how to connect to the iSD200-PCD and use the Command-Line Interface.

Chapter 4, "First-Time Configuration," provides setup procedures for basic iSD200-PCD configuration.

Chapter 5, "Menu Basics," provides an overview of the menu system, including a menu map, global commands, and menu shortcuts.

Chapter 6, "The Information Menu," shows how to view iSD200-PCD configuration parameters.

Chapter 7, "The Statistics Menu," shows how to view iSD200-PCD performance statistics.

Chapter 8, "The Configuration Menu," shows how to configure iSD200-PCD administrative layer parameters and PCD layer parameters.

Chapter 9, "The Operations Menu," provides a menu for enabling/disabling the network interface port and a menu for restarting/renewing IBP connections.

Chapter 10, "The Boot Options Menu," describes how to select software images, how to set the active code block, how to download new software images, and how to reset the software to factory defaults.

Chapter 11, "The Maintenance Menu," provides menus for displaying routing status, setting the service state for local domains, performing DNS cache control, and administering the ARP table.

Appendix A, "Glossary," provides definitions for terms used throughout this manual.

Appendix B, "Frequently Asked Questions (FAQ)," presents a list of Frequently Asked Questions (FAQ) about the iSD200-PCD.

Appendix C, "iSD200-PCD/Switch Compatibility," presents the Alteon switch features that are compatible with the iSD200-PCD with work-around instructions as needed.

Appendix D, "Troubleshooting," provides troubleshooting procedures for the iSD200-PCD.

Appendix E, "Specifications," describes the hardware and performance characteristics of the iSD200-PCD.

Appendix F, "iSD200-PCD Sample Configuration," describes a sample topology and iSD200-PCD configuration.

Typographic Conventions

The following table describes the typographic styles used in this book.

Table 1 Typographic Conventions

Typeface or Symbol	Meaning	Example
`AaBbCc123`	This type is used for names of commands, files, and directories used within the text.	View the `readme.txt` file.
	It also depicts on-screen computer output and prompts.	`Main#`
`AaBbCc123`	This bold type appears in command examples. It shows text that must be typed in exactly as shown.	`Main# sys`
<AaBbCc123>	This italicized type appears in command examples as a parameter placeholder. Replace the indicated text with the appropriate real name or value when using the command. Do not type the brackets.	To establish a Telnet session, enter: `host# telnet` *<IP address>*
	This also shows book titles, special terms, or words to be emphasized.	Read your *User's Guide* thoroughly.
[ ]	Command items shown inside brackets are optional and can be used or excluded as the situation demands. Do not type the brackets.	`host# ls [-a]`

Contacting Alteon WebSystems

Use the following information to access Alteon WebSystems' support and sales.

- URL for Alteon WebSystems Online:

  `http://www.alteonwebsystems.com`

  This website includes product information, software updates, release notes, and white papers. The website also includes access to Alteon WebSystems Customer Support for accounts under warranty or covered by a maintenance contract.

- E-mail access:

  `support@alteonwebsystems.com`

  E-mail access to Alteon WebSystems Customer Support is available for accounts under warranty or covered by a maintenance contract.

- Telephone access to Alteon WebSystems Customer Support:

  1-888-Alteon0 (or 1-888-258-3660)
  1-408-360-5695

  Telephone access to Alteon WebSystems Customer Support is available to accounts that are under warranty or covered by a maintenance contract. Normal business hours are 8 a.m. to 6 p.m. Pacific Standard Time.

- Telephone access to Alteon WebSystems Sales:

  1-888-Alteon2 (or 1-888-258-3662), and press 2 for Sales
  1-408-360-5600, and press 2 for Sales

  Telephone access is available for information regarding product sales and upgrades.

CHAPTER 1

Introduction

The iSD200-PCD is a Global Server Load-Balancing (GSLB) appliance that directs client requests to the quickest-responding site in a geographically-distributed domain. The process, called *site-selection*, continuously evaluates the relevant network paths, ensuring that clients get the best available "Web experience" while traffic is load-balanced across the domain.

Features

The iSD200-PCD has the following features:

- Leverages the content-aware switching features of Alteon WebSystems switches
- Easily scaled to match increases in traffic volume
- Supports the Alteon WebSystems WebOS Command Line Interface (CLI) conventions
- Provides semi-automated setup utility for basic configuration
- Supports SNMP-based network management
- Uses MD-5 authentication for PCD-to-PCD communications
- Supports S-records (serial port) or TFTP for downloading software images
- Stores multiple application images and configurations
- Maintains full list of layer-1 through layer-4 statistics
- Provides dedicated processing with the iSD purpose-built hardware platform
- Comes with a 10/100/1000 copper or Gigabit fiber ACEnic network interface
- Includes various site-selection modes, a client network cache, authoritative DNS, and remote server health checking

Physical Description

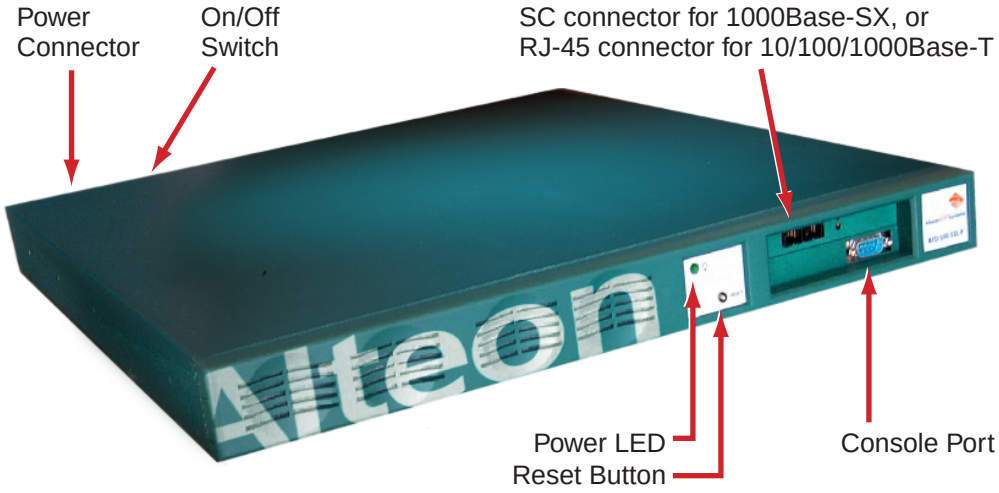


Figure 1 Physical Layout of the iSD200-PCD

Front Panel

- Network uplink port
  - Model iSD200-PCD-C2A—one 10/100/1000Base-T port for copper (RJ-45 connector) Ethernet/Fast Ethernet/Gigabit Ethernet at half or full duplex
  - Model iSD200-PCD-F2A—one 1000Base-SX port for fiber-optic (SC connector) Gigabit Ethernet
- Status LEDs for uplink port
- Power LED
- Console port for serial communications
- Reset button
- Air vents

Rear Panel

- Power on/off switch
- A/C power connector

Operational Overview

The iSD200-PCD is a Global Server Load-Balancing (GSLB) appliance that directs clients to the quickest-responding site in a geographically-distributed domain. For the initial client request to a domain, iSD200-PCDs test the response of each site before assigning the connection. The process, called *site-selection*, continuously evaluates the relevant network paths, ensuring that clients get the best available "Web experience" while traffic is load-balanced across the domain.

The iSD200-PCD is a standalone unit that is collocated with Web server equipment at each site. You can deploy iSD200-PCDs alone or in clusters behind a load-balancing device. Load-balanced iSD200-PCDs allow for non-disruptive maintenance, fault tolerance, and scalability.

No centralized device is required to orchestrate site-selection. Instead, each iSD200-PCD is equally capable of servicing the initial client request and coordinating the processes that determine the best performing network path between a domain server and the client.

iSD200-PCDs provide several modes of site-selection and performance-tuning features, such as a client network cache to speed site-selection for repeat visitors or to maintain session persistence. The iSD200-PCD can also function concurrently as an authoritative Domain Name Server (DNS), using iSD200-PCD resources to intelligently direct client requests to the appropriate Web site. Server health-check probing is another option that allows iSD200-PCDs to factor in the availability of servers for site-selection.

The iSD200-PCD platform is based on the Alteon WebSystems Integrated Service Director (iSD) model, which provides seamless, scalable processing extensions to Alteon WebSystems' high-performance Web switches. Alteon WebSystems iSD products are purpose-built appliances that perform compute-intensive tasks that would otherwise slow down Web switch performance.

iSD200-PCD Network Topology

Figure 2 shows a simplified iSD200-PCD network topology. The Web sites *wwwla.myco.com* and *wwwny.myco.com* are mirror content hosts serving separate geographic regions for *www.myco.com*. The authoritative DNS has been configured to resolve client requests to www.myco.com to the switch Virtual IP (VIP) address that represents the load-balanced iSD200-PCDs at either site. The iSD200-PCD that receives the initial client request synchronizes the site-selection process through a separate TCP connection with the other site. At the conclusion of site-selection, the client is redirected to the site with the fastest response time to the client. See "Site-Selection Proximity Methods" on page 19 for additional site-selection details.

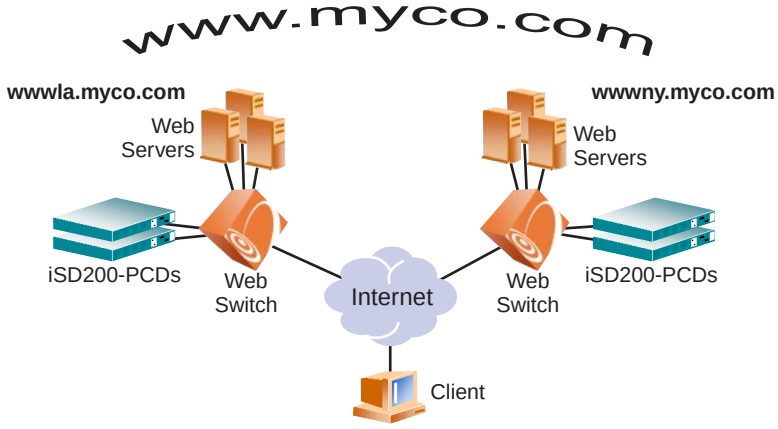


Figure 2 Network Topology for Site-selection

Site-Selection Terms and Concepts

To capitalize on the iSD200-PCD's strengths, a domain must be made up of mirror content hosts at geographically-distributed sites. This topology is called a *global domain* and the mirror content hosts are called *local domains*. Each local domain must be registered in DNS with a unique URL and the authoritative DNS must be configured to resolve client requests to any local domain iSD200-PCD, either directly or through a VIP.

To participate in site-selection, an iSD200-PCD must be configured as a *member* of that local domain. The iSD200-PCD that receives the initial client request is the *synchronizing PCD* for that session**.** The synchronizing PCD orchestrates site-selection, which requires all of the member iSD200-PCDs to respond simultaneously to the client. This response *race* tests the network paths between client and local domain and the quickest responding iSD200-PCD *wins* the session for its site. Host server health and load can also be factored into the race.

iSD200-PCDs constantly communicate with each other over a TCP/IP connection. iSD200-PCDs use IBP, a Alteon WebSystems proprietary protocol, to transmit time synchronization messages, http redirect packets and other information required for site-selection.

Site-Selection Proximity Methods

The site-selection modes, called *proximity methods*, are *Footrace*, *Double Redirect*, *Refresh*, and *DNS Round-Robin*. The first three determine the client connection assignment after running an http redirect race between each local domain and the client. The DNS Round-Robin method uses round-robin selection to equalize domain traffic across distributed sites instead of client proximity to the site. DNS Round-Robin does not require an iSD200-PCD at each local domain.

The proximity methods are described below:

Footrace

1. The synchronizing PCD responds to the initial client request by sending an http redirect packet to a member iSD200-PCD at each site, including itself.
2. Each iSD200-PCD changes the domain portion of the packet to the URL of the site it represents. Then it sends the packet to the client at the precise time specified by the synchronizing PCD.
3. The client integrates the first redirect packet it receives (which traveled the fastest path) into the TCP stream and finishes the session with the site of the iSD200-PCD that sent the packet. The client treats the packets from the other iSD200-PCDs as TCP duplicate packets.

NOTE – The Footrace and Double Redirect site-selection methods are only effective in networks that do not use source IP filtering.

Double Redirect

1. The synchronizing PCD responds to the initial client request by sending an http redirect packet to a member iSD200-PCD at each site, including itself.
2. Each iSD200-PCD inserts its administrator-selected *local domain alias* into the domain portion of the packet. Then each iSD200-PCD sends the packet to the client at the precise time specified by the synchronizing PCD.
3. The client integrates the first redirect packet it receives (which traveled the fastest path) into the TCP stream and responds by sending an http get request to the synchronizing PCD. The client treats the packets from the other iSD200-PCDs as TCP duplicate packets.
4. The synchronizing PCD then redirects the client to the server IP address or VIP at the site that matches the local domain alias in the packet. The client finishes the session with that site.

Refresh

1. The synchronizing PCD responds to the initial client request by returning an html page to the client that has link requests for the member iSD200-PCDs at each site.
2. The client requests the images from the member iSD200-PCDs and each iSD200-PCD begins timing the Round Trip Time (RTT) of messages between itself and the client. The images are around 8000 bytes, they are transparent, and do not show in the client's browser.
3. The iSD200-PCDs send the RTTs to the synchronizing PCD.
4. Upon receiving RTT data from at least one iSD200-PCD, the synchronizing PCD completes the original client connection with an html meta refresh tag.
5. The client issues a new request to the synchronizing PCD.
6. The synchronizing PCD returns an http redirect to the client that contains the URL of the local domain with the best RTT. The client completes the session with that local domain. The results of the race are shared with the other iSD200-PCDs and cached for use until an administrator-selected timeout period expires (see "Client Network Cache" on page 21).

DNS Round-Robin

When a client request arrives, the synchronizing PCD directs the client to one of the sites in the domain, based on a weighted or non-weighted round-robin algorithm.

- For weighted round-robin, a numerical weight is configured for each local domain. For example, if there are three local domains, the first could have a weight of three, the second a weight of four, and the third a weight of five. Accordingly, the synchronizing PCD would assign the first three connections to the site of the first local domain, the next four connections to the site of the second local domain and the next five connections to the site of the third local domain. The pattern would be repeated for every 12 connections.
- For non-weighted round-robin, the synchronizing PCD assigns each connection to the next local domain in an ordered loop.

Performance Tuning Features

iSD200-PCDs provide several means of tuning site-selection performance. They include the Client Network Cache, Server Health Check Probing, and a DNS function. These features are described below.

Client Network Cache

The Client Network Cache (CNC) is a configurable feature for the Double Redirect and Refresh proximity methods. The CNC is unavailable for Footrace or DNS.

A CNC is a table of client networks derived from clients that have visited the domain. Associated with each CNC entry, is the IP address of the local domain that won the session (the RTT is also stored if the Refresh method was selected). Each CNC entry also contains a datestamp, which allows iSD200-PCDs to delete CNC entries that are older than an administrator-specified limit.

Each iSD200-PCD maintains a duplicate CNC that is continuously updated. Administrators can also enter static entries for "well-known" networks.

When a synchronizing PCD receives the initial client request, it checks its CNC and does the following:

- If a relevant CNC entry is found, the synchronizing PCD assigns the client connection to the associated local domain. The rest of the site-selection process is averted.
- If no relevant CNC entry is found, the synchronizing PCD initiates site-selection. At the completion of site-selection, each iSD200-PCD updates its own CNC with the new client network/response data.

The advantage of the CNC is that it allows repeat visitors, and clients from the same network to avoid the initial connection latency that is inherent with site-selection. Using the client network address instead of the client's address as the organizing parameter improves the CNC efficiency and leverages the effect of client visits to the domain.

Server Health Check Probing

Server health check probing measures the health of selected servers in a global domain at regular intervals. iSD200-PCDs measure server health by requesting a test page from the selected server and timing the response. Response times are multiplied by a configurable weighting factor, which is used to shape the distribution of connections across the global domain.

Servers that do not return the test page before the next health check probe is issued are excluded from site-selection until the next time the server responds to a server health check probe.

Authoritative DNS

The iSD200-PCD will act as the authoritative DNS for the configured global and local domains when requested. When a DNS request arrives, the iSD200-PCD queries the CNC for relevant entries. If a relevant CNC entry is found, the iSD200-PCD resolves the DNS request to the associated local domain server IP address. If a relevant CNC entry is not found, the iSD200-PCD resolves the DNS request to itself and, in its capacity as synchronizing PCD, initiates site-selection.

CHAPTER 2

Installing the iSD200-PCD Hardware

This chapter describes the physical installation of the iSD200-PCD, including step-by-step directions for mounting the iSD200-PCD to a rack or on a table and installing network interface cabling.

The iSD200-PCD is shipped with the following items:

- A/C power cord
- Console cable
- Two mounting brackets for rack mounting
- Six Phillips screws for rack installation
- Four rubber feet for tabletop placement
- The iSD200-PCD Installation and User's Guide

Installation involves the following tasks:

- Unpacking the iSD200-PCD
- Mounting the iSD200-PCD
- Connecting network interface cables
- Connecting the power cord and plugging it into a power outlet
- Powering on the device

System Requirements

The iSD200-PCD is intended for installation with network equipment in data centers or similar surroundings that meet the environmental, hardware, and power requirements listed in Appendix E. Adjacent subnet devices must have network interfaces that are compatible with the iSD200-PCD port specifications also listed in Appendix E. The iSD200-PCD is a standalone unit that can be installed with or without a Server Load-Balancing device such as an Alteon WebSystems switch.

Preparing for Installation

Before installing the iSD200-PCD...

1. **Remove the unit from the shipping box.**
2. **Turn the power switch to the OFF (O) position.**
3. **Choose a suitable location to install the unit.**



CAUTION—Observe the following precautions when selecting a site and installing the iSD200-PCD:

Make sure the device is properly grounded electrically and power connections are safe, particularly when using power strips.

Avoid overloading your electrical supply circuits. Electrical ratings are printed on the nameplates of all your equipment. Be sure that your supply circuits and wiring can support the rated power draw of whatever equipment is used.

The ambient temperature of an operating iSD200-PCD must not exceed 40°C. When installing the device in a closed or multi-unit rack assembly, please consider that the operating ambient temperature of the equipment may be higher than the ambient temperature of the room. Take appropriate steps to ensure that the device does not overheat.

For proper air circulation, the vents on the front, back, and sides of the device should not be blocked or obstructed by cables, panels, rack frames, or other materials.

Do not place or rack-mount the device in any way that would exceed the maximum weight-bearing capacity of the surface or rack or cause potentially hazardous uneven mechanical loading.

Mounting the iSD200-PCD

Always observe the precautions outlined in the manuals for this and all other equipment you are installing.

Determine whether the unit will be mounted into an equipment rack or placed free-standing on a shelf or tabletop. The following sections detail each type of installation.

Rack-Mounting the Unit

NOTE – Do not use the included rubber feet for a rack installation.

1. **As shown in Figure 3, connect the two mounting brackets to the iSD200-PCD using the supplied screws.**

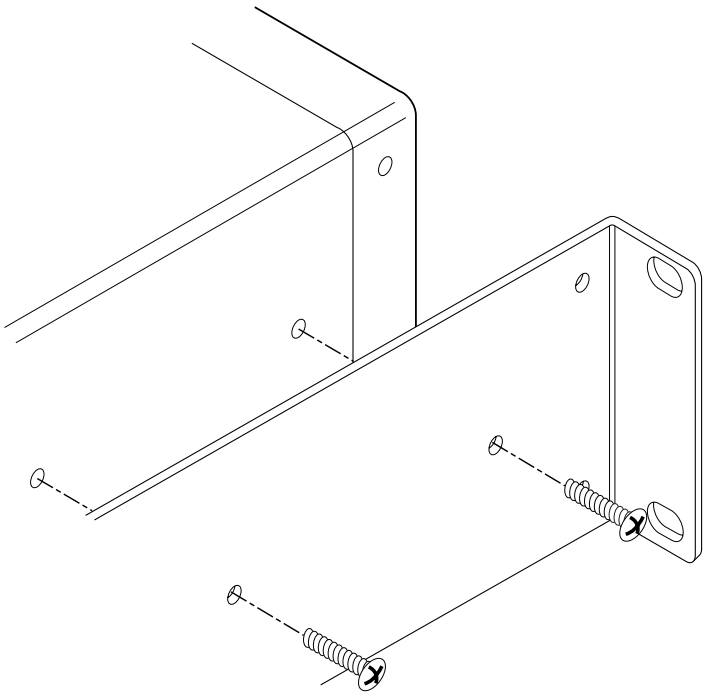


Figure 3 Position Mounting Brackets for Rack Mount

2. **Mount the iSD200-PCD, as shown in Figure 4, using the appropriate screws for your rack-mount system.**

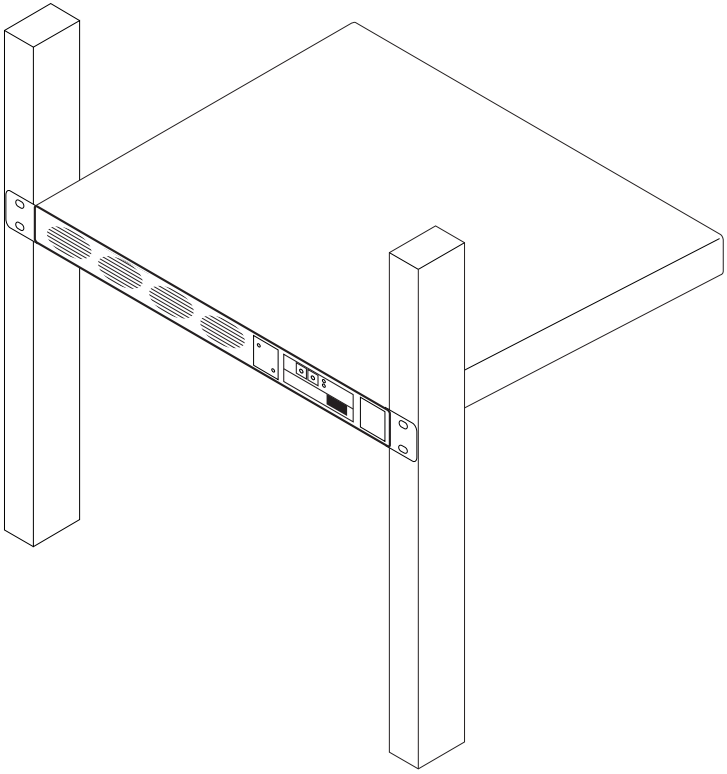


Figure 4 Rack-Mounted iSD200-PCD

Table-Mounting the Unit

1. **Attach the four rubber feet and screws to the bottom of the iSD200-PCD.**
2. **Place the switch on a level tabletop or equipment shelf.**

Connecting Network Cables

As described in the following sections, the type and method of cabling depends on your particular model of iSD200-PCD.

- Model iSD200-PCD-C2A has one 10/100/1000Base-T port for copper Ethernet, Fast Ethernet, or Gigabit Ethernet.
- Model iSD200-PCD-F2A has one 1000Base-SX port for fiber-optic Gigabit Ethernet.

10/100/1000Base-T Port (Model iSD200-PCD-C2A)

Model iSD200-PCD-C2A uses an RJ-45 copper connector for 10/100/1000 Mbps Ethernet. This port is auto-negotiating and supports half- and full-duplex operation. UTP Category 5 cables are required. Use a straight-through cable when connecting the iSD200-PCD to a Web switch, hub, or router.

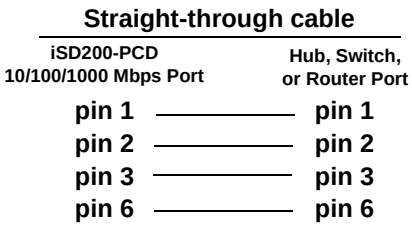


Figure 5 Pin assignments for 10/100/1000 Mbps port cables

Table 2 describes the states of the uplink LEDs.

Table 2 iSD200-PCD-C2A Uplink Port LEDs

LED	State	Description
Data	Blinking Off	Data is detected on the port. No data is detected on the port.
10	On Off	Good 10 Mbps Ethernet link established. No 10 Mbps link established (possible link at different speed, possible bad cable, bad connector, or configuration mismatch).
100	On Off	Good 100 Mbps Fast Ethernet link established. No 100 Mbps link established (possible link at different speed, possible bad cable, bad connector, or configuration mismatch).
1000	On Off	Good 1000 Mbps Gigabit Ethernet link established. No 1000 Mbps link established (possible link at different speed, possible bad cable, bad connector, or configuration mismatch).

1000Base-SX Port (Model iSD200-PCD-F2A)

Model iSD200-PCD-F2A uses an SC fiber-optic connector for 1000 Mbps (Gigabit Ethernet). The figure below illustrates an SC-type connector:

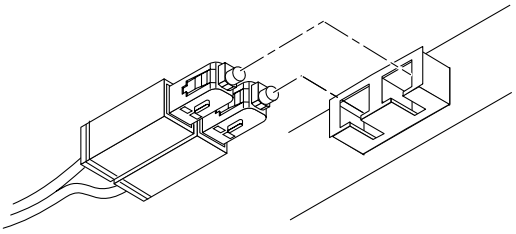


Figure 6 Fiber Optic Connector for the iSD200-PCD-F2A

The 1000Base-SX port is designed to operate with multi-mode fiber-optic cables. Table 3 lists the cable characteristics for this port.

Table 3 1000Base-SX Link Characteristics

Description	62.5 Micron	50 Micron
	Shortwave (850 nm multimode fiber)	
Operating Range	2-260 meters	2-550 meters (in compliance with IEEE 802.3z)

Table 4 describes the states of the uplink LEDs.

Table 4 iSD200-PCD-F2A Uplink Port LEDs

LED	State	Description
Data	Blinking Off	Data is detected on the port. No data is detected on the port.
Link	On Off Blinking	Good link established. No link established (possible bad cable or bad connector). Port has been disabled by software.

The Console Port

The iSD200-PCD console port can be used for downloading software (see `srec` on page 138) or for configuring a unit with unspecified uplink port parameters (see "Opening a Console Connection" on page 32 before going on to "Starting Setup" on page 36).

Once the uplink port parameters have been configured, you can administer the iSD200-PCD using a Telnet connection to the uplink port (see "Opening a Telnet Connection" on page 34).

Power

Connecting the Power Cord

1. **Verify that the iSD200-PCD power switch (on back of the unit) is in the OFF (O) position.**
2. **Connect the power cord to the A/C power connector on the back of the unit.**
3. **Plug the cord into a properly fused outlet.**

Turning Power On/Off

Power is off when the power switch (on back of the unit) is in the O position.

To turn power on, move the power switch to the | position. The power LED lights up to indicate that the iSD200-PCD is on and receiving proper power.

CHAPTER 3

The Command Line Interface

This chapter explains how to use the iSD200-PCD Command Line Interface (CLI). The CLI and menu system allow you to configure the iSD200-PCD and display status using a local terminal or remote Telnet session.

Connecting to the iSD200-PCD

You can access the CLI in several ways:

- Using a console connection at the console port
- Using a Telnet connection over the network

Each method is detailed in the following sections.

NOTE – The iSD200-PCD is shipped without an IP address and with the network interface port disabled. For these reasons, you must open a serial connection at the console port for initial configuration of the iSD200-PCD.

Opening a Console Connection

Requirements

To open a console connection with the iSD200-PCD, the following is required:

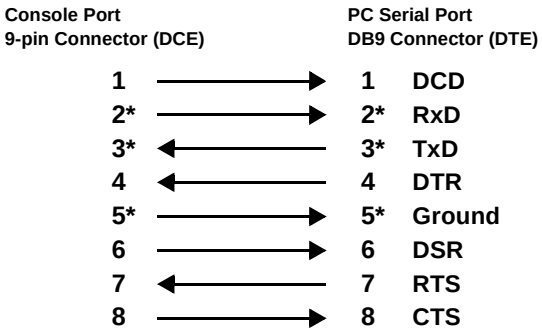
- An ASCII terminal or a PC running ASCII terminal emulation software set as follows:

Table 5 Console Configuration Parameters

Parameter	Value
Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

- A serial cable

  In most cases where a PC running ASCII terminal emulation software is used, a straight-through DB-9 to DB-9 cable is required with the pin assignments shown in Figure 7. The end that connects to the console port requires a DB9 male connector.



* Required connections.

Figure 7 DB9-to-DB9 Pin Assignments

Console Connection Procedure

1. **Connect the serial cable between the iSD200-PCD console port and the terminal port.**
2. **Apply power to the ASCII terminal or PC and, if necessary, launch the terminal emulation program at your PC.**
3. **Set the parameters at your ASCII terminal or PC according to Table 5.**

4. **Apply power to the iSD200-PCD. The following will be displayed:**

```
Alteon WebSystems, Inc.                    0004004C
hd:boot

Boot Loader Version 0.2.0.0

Interrupt Boot? 0 (N)
text: 363204.....................................................
data: 141963.....................................................
bss:  1267640....................................................


Copyright (c) 2000 Alteon WebSystems, Inc.
      All Rights Reserved
      Personal Content Director

Version: 2.2.1.7

1024MB RAM
Interface 1: Alteon Ace Gigabit NIC EA=00:60:cf:20:60:3c
Initializing Httpd
Created Http Conns

XML-RPC: XML parser initialized (Version: 1.0.1.8)
XML-RPC: XCS/PCD:1.1.1.0
Booting complete Ram Size: 1024
 Max conns: 65536
te 17:50:59 Sun Nov 26, 2000:
  Version 2.2.1.7 from FLASH image1, active config block.

Starting Default Httpd on 8080
Init Tcp on Stack 0: Params.. Bind.. Listen..Done

Enter password:
```

Figure 8 iSD200-PCD Boot Messages

NOTE – The software versions, active config block, and MAC address displayed at your console may differ from the screen presentation in Figure 8.

---

5. **Enter `admin` (the administrator password) at the `Enter password` prompt. The administrator password gives you read and write access to all iSD200-PCD parameters.**

   If the iSD200-PCD has not been configured, go to Chapter 4, "First Time Configuration," and begin the iSD200-PCD configuration process.

Opening a Telnet Connection

A Telnet connection offers the convenience of accessing the iSD200-PCD from any workstation connected to the network. Telnet access offers the same options as the console port for user and administrator access.

To configure the iSD200-PCD for Telnet access, your Telnet device must be on the same network as the iSD200-PCD and the iSD200-PCD must have a complete administrative layer configuration (see the introductory paragraphs in Chapter 4, "First-Time Configuration," for an explanation of administrative layer parameters).

Running Telnet

Once you have configured the iSD200-PCD IP parameters, you can access the CLI using a Telnet session. To open a Telnet session with the iSD200-PCD, run the Telnet program on your workstation and issue the Telnet command, followed by the PCD IP address:

```
telnet <IP-address>
```

Then enter **admin** (the administrator password) at the `Enter password` prompt.

Command-Line History and Editing

For a description of global commands, shortcuts, and command-line editing functions, see Chapter 5, "Menu Basics."

Idle Timeout

By default, the iSD200-PCD will disconnect your console or Telnet session after 5 minutes of inactivity. This function is controlled by the idle timeout parameter, which can be set from 1 to 60 minutes. For information on changing this parameter, see Chapter 8, "The Configuration Menu."

CHAPTER 4

First-Time Configuration

This chapter describes how to use the Setup utility for configuring your iSD200-PCD. This utility prompts you to enter all the necessary information for basic configuration. This chapter also explains how to change system passwords.

Using the Setup Utility

Whenever you log in as the system administrator under the factory default configuration, you are asked whether you wish to run the Setup utility. Setup can also be activated manually from the command-line interface any time after login.

Information Needed for Setup

Setup requests the following information:

- Date and time
- Port and IP configuration
  - Speed, duplex, flow control, and negotiation mode
  - IP address and subnet mask
  - Default gateway
- Domain configuration
  - Global domain alias and URL
  - Local domain alias and URL
  - Member IP addresses

Starting Setup

NOTE – The Setup utility is available only when you log in as a system administrator.

1. **Connect to the iSD200-PCD console.**

   After connecting, the login prompt will appear:

```
Enter Password:
```

2. **Enter `admin` as the default administrator password.**

   The Main Menu will appear:

```
[Main Menu]
        info  - Information Menu
        stats - Statistics Menu
        cfg   - Configuration Menu
        oper  - Operations Menu
        boot  - Boot Options Menu
        maint - Maintenance Menu
        save  - Save updated config to FLASH [global command]
        exit  - Exit  [global command, always available]
```

3. **Enter `/cfg/setup` at the `Main#` prompt to begin the Setup utility.**

Stopping Setup

To restart or abort the Setup utility, you must cycle through the program to the last two questions:

```
Would you like to run from the top again? [y/n]
```

Enter **y** to restart the Setup utility at the beginning. If you enter **n**, the utility will prompt you to save your entries:

```
Save the changes to flash? [y/n]
```

Configuring the Administrative-Layer Parameters

There are two layers of configuration: administrative and PCD. The administrative-layer refers to the basic system configuration, port and IP parameters that make it possible to access an iSD200-PCD from a network.

Administrative parameter settings are unique for each iSD200-PCD and must be set initially through a console connection.

Basic System Configuration

Setup begins with a short introduction followed by the System Time configuration prompt

1. **Enter the present year at the prompt:**

```
"Set Up" will walk you through the configuration of
  System Date and Time, Port Speed/Mode, IP interfaces, etc....
------------------------------------------------------------------

System Date:
Enter year [2001]:
```

Enter the last two digits of the year as a number from 00 to 99; 00 is considered 2000. To keep the current year, press <Enter>.

2. **Enter the present month at the prompt:**

```
System Date:
Enter month [1]:
```

Enter the month as a number from 1 to 12. To keep the current month, press <Enter>.

3. **Enter today's date at the prompt:**

```
Enter day [24]:
```

Enter the date as a number from 1 to 31. To keep the current day, press <Enter>.

The system displays the date and time settings:

```
System clock set to 13:56:52 Wed Jan 24, 2001.
```

4. **Enter the hour of the current system time at the prompt:**

```
System Time:
Enter hour in 24-hour format [13]:
```

Enter the hour as a number from 00 to 23. To keep the current hour, press <Enter>.

5. **Enter the minute of the current time at the prompt:**

```
Enter minutes [56]:
```

Enter the minute as a number from 00 to 59. To keep the current minute, press <Enter>.

6. **Enter the seconds of the current time at the prompt:**

```
Enter seconds [52]:
```

Enter the seconds as a number from 00 to 59. To keep the current second, press <Enter>.

The system displays the date and time settings:

```
System clock set to 13:56:52 Tues Aug 15, 2000.
```

Port Configuration

The network interface port can be configured for 10, 100 or 1000 MHz operation. Some of the following steps will not apply to your application, depending on the speed you select.

1. **Configure the Ethernet/Fast Ethernet port speed.**

```
Fast Link Configuration:
Port Speed:
Current Port 1 speed setting:   10/100
Enter new speed ["10"/"100"/"any"]:
```

Enter the port speed from the options available, or enter **any** to have the iSD200-PCD auto-sense the port speed. To keep the current setting, press <Enter>.

2. **Configure the Ethernet/Fast Ethernet port duplex mode.**

```
Port Mode:
Current port 1 mode setting:
Enter new speed ["full"/"half"/"any"]
```

Enter **full** for full-duplex, **half** for half-duplex, or **any** to have the iSD200-PCD auto-negotiate. To keep the current setting, press <Enter>.

3. **Configure Ethernet/Fast Ethernet port for auto-negotiation mode.**

```
Port Auto Negotiation (Fast):
Current Port 1 autonegotiation:
Enter new value ["on"/"off"]:
```

Enter **on** to enable auto-negotiation, **off** to disable it, or press <Enter> to keep the current setting.

4. **Configure the Gigabit Ethernet port flow parameters.**

```
Gig Link Configuration:
Port Flow Control:
Current Port 1 flow control setting:
Enter new value ["rx"/"tx"/"both"/"none"]:
```

Enter **rx** to enable receive flow control, **tx** for transmit flow control, **both** to enable both, or **none** to turn flow control off for the port. To keep the current setting, press <Enter>.

5. **Configure Gigabit Ethernet port auto-negotiation mode.**

```
Port Auto Negotiation (Gig):
Current Port 1 autonegotiation:
Enter new value ["on"/"off"]:
```

Enter **on** to enable port auto-negotiation, **off** to disable it, or press <Enter> to keep the current setting.

IP Configuration

The IP Configuration determines the network access to this iSD200-PCD.

1. **Select the IP interface, or skip interface configuration at the prompt:**

```
IP Config:

IP interfaces:
Enter interface number: (1)
```

To skip IP interface configuration, press <Enter> without typing an interface number.

2. **Enter the IP address in dotted-decimal notation:**

```
Current IP address:     0.0.0.0
Enter new IP address:
```

To keep the current setting, press <Enter>.

3. **Enter the IP subnet mask in dotted-decimal notation:**

```
Current subnet mask:            0.0.0.0
Enter new subnet mask:
```

To keep the current setting, press <Enter>.

4. **Enter the IP address for the default gateway:**

```
IP default gateways:
Current IP address:     0.0.0.0
Enter new IP address:
```

Enter the IP address in dotted-decimal notation, or press <Enter> without specifying an address to accept the current setting.

Configuring the PCD-Layer Parameters

The PCD-layer refers to the parameters that make it possible for an iSD200-PCD to participate in site-selection. PCD-layer parameter settings must be identical for each iSD200-PCD in the network. This is because every iSD200-PCD in the network must know its own parameters and the parameters of every other iSD200-PCD to be able to function as the synchronizing PCD for initial client requests.

To skip PCD-layer configuration, press <Enter> without typing a global domain alias.

Global Domain Setup

1. **Enter a Global Domain alias at the prompt:**

```
Global Domain Configuration:
Configure Global Domain #1
Enter global domain alias:
```

The global domain alias may be any combination of alphanumeric characters; no spaces are allowed. You should keep the global domain alias short to reduce typing.

2. **Enter the Global Domain URL:**

```
Enter global domain URL:
```

Enter the DNS-registered URL associated with the global domain. The setup program will prefix your entry with "http://" if you omit it.

3. **Enter the Proximity Method:**

```
Enter proximity method (footrace|double_redirect|refresh|
dns_round_robin) (optional):
```

Enter one of the four Proximity Methods. The default method is **footrace**.

4. **Enter a four-digit number for the authentication PIN:**

```
Enter authentication PIN (optional):
```

The PIN enables authentication of communications between iSD200-PCDs. The default value is **0000**, which disables authentication.

5. **Enter the time limit (in milliseconds) for iSD200-PCDs to respond to the synchronizing iSD200-PCD:**

```
Enter threshold delay in ms (optional):
```

This parameter is applicable only when using either the footrace or double-redirect proximity methods. It specifies the maximum time allowed for iSD200-PCDs to respond to a synchronizing iSD200-PCD. Any iSD200-PCD that exceeds this response time will not be allowed to participate in the site-selection process. The default threshold delay is 0.

6. **Enter the IBP Renewal Time (in minutes):**

```
Enter ibp renewal time in min (optional):
```

The IBP Renewal Time sets the minimum time between refreshing IBP connections between iSD200-PCDs. The default IBP Renewal Time is 0.

Local Domain Setup

After you create a global domain, setup of local domains for that global domain begins.

To skip local domain configuration, press <Enter> without typing a local domain alias.

1. **Enter a Local Domain alias at the prompt:**

```
Configure Local Domains for Global <domain alias>
Configure Local Domain #1
Enter local domain alias:
```

The local domain alias may be any combination of alphanumeric characters; no spaces are allowed. You should keep the local domain alias short to reduce typing.

2. **Enter the Local Domain URL:**

```
Enter local domain URL:
```

Enter the DNS-registered URL for the Web site represented by the local domain. The setup program will prefix your entry with "`http://`" if you omit it.

3. **Enter the IBP IP address and port number:**

```
Enter IBP IP[:port] (optional):
```

This is the IP address and port dedicated to communications between iSD200-PCDs. If the configuration includes a load-balancing switch, enter the virtual IP address of the iSD200-PCD. If the configuration does not include a load-balancing switch, enter the iSD200-PCD's IP address.

4. **Enter the virtual IP address and port number (optional):**

```
Enter virtual ip[:port] (optional):
```

You must enter the Virtual IP address if the iSD200-PCD is part of a load-balanced configuration. Ordinarily, this will be the same IP address you entered in step 3. If the iSD200-PCD is not part of a load-balanced configuration, enter **`0.0.0.0`**.

5. **Enter a weight factor for this local domain if using the DNS method:**

```
Enter dns weight (0-100) (optional):
```

This entry is significant only if you are using the DNS Round-Robin to distribute client connections. It specifies the number of successive client requests that will be handled by this local domain. For example, if you enter 4, then this local domain will receive four consecutive requests before the iSD200-PCD directs a client request to another local domain.

6. **Enter a delay period (in milliseconds) that will extend the response time for this local domain during site selection:**

```
Enter delay (ms) (optional):
```

Specifying a delay will handicap this local domain as it competes for site-selection when using either the footrace, double redirect, or refresh proximity method. You can use this parameter to reduce traffic to a busy site.

7. **Enter the IP address and port number of the server for which you want to perform a health check:**

```
Enter health check ip[:port] (optional):
```

The iSD200-PCD will periodically query the server, verifying that it is accessible and determining how busy it is.

8. **Enter the name of the page (normally an HTML file) that the iSD200-PCD will attempt to retrieve as part of the health check:**

```
Enter the health check test page (optional):
```

The iSD200-PCD will concatenate the server's IP address and (optionally) the port with the page you specify, creating a URL of the format `http://`*<IP-address:port>*`/`*<test-page>*.

9. **Specify how often (in seconds) the iSD200-PCD should conduct the health check:**

```
Enter health check freq (sec) (optional):
```

10. **Enter a weight factor for the health check:**

```
Enter health check weight (0-10000%) (optional):
```

The iSD200-PCD will multiply the server's response time (obtained during the health check) by the value you specify, ranging from zero to 10,000 percent. The result introduces additional delay when synchronizing iSD200-PCDs for site selection, making it less likely for a busy iSD200-PCD to be selected.

11. **Specify whether you want to enable or disable the remote server health check (optional):**

```
Enter remote server probe (enable|disable) (optional)
```

You can instruct this iSD200-PCD to conduct the health check on a server in the local domain you are configuring.

Member Setup

Each member has one parameter, which must be configured for a iSD200-PCD to represent a local domain.

1. **Enter the iSD200-PCD IP address in dotted-decimal format:**

```
Configure Members for Local <domain alias>
Enter PCD IP for member #1:
```

Member 1 setup is complete once you have entered the PCD IP address. At this point you are prompted to enter more members. If you decline, you are prompted to configure more local domains. If you decline, you are prompted to configure more global domains. If you decline, you are prompted to configure the Client Network Cache.

Client Network Cache Configuration

1. **Enter the network mask.**

```
Enter netmask:
```

2. **Enter the maximum time (in minutes) for which an individual entry in the Client Network Cache is valid.**

```
Enter timeout (min):
```

The first time a iSD200-PCD determines the optimal network path and redirects a client to the associated local domain, the iSD200-PCD creates an entry in the Client Network Cache containing the following information:

- The client's network IP address
- The client's network mask
- The alias of the local domain to which the client was directed
- The time the client request was received plus the specified timeout value

For each subsequent client request, the iSD200-PCD will query the Client Network Cache to determine if a previous request originated from the same network. If so, the iSD200-PCD directs the client to the same local domain without testing the various network paths, provided that the time limit for that entry has not expired. If the iSD200-PCD does not find a valid entry, it uses the selected proximity method to determine the optimal network path.

3. **Optionally, you can create one or more entries in the cache. The program will prompt you to enter the necessary the information:**

```
Enter a static entry in cache?(y/n)
Enter network ip:
Enter network mask:
Enter local domain alias:
```

The local domain alias specifies the domain to which you want to direct a client whose request originates from the specified network. After you create a cache entry, the program will prompt you to create another. Enter **y** to continue. If you enter **n** to end the function, the program will display a message that Client Network Cache Configuration is complete.

4. **Terminate the setup or run it again from the beginning:**

```
Would you like to run from the top again? [y/n]
```

If you enter **y**, the setup program restarts from the beginning (step 1 of Setup Part 1: Basic System Configuration) without offering you the opportunity to save your entries.

If you respond **n**, the program prompts you to save the configuration to flash memory.

5. **Save the settings:**

```
Save the changes to flash? [y/n]
```

Whether you save the configuration or not, Setup is done.

NOTE – To prevent the changes you have just made from being lost at the next reboot, you must save the configuration to flash. You can do this at the end of Setup or by entering the Global Command `save` prior to reboot.

After initial configuration is complete, you should change the default passwords as shown in the following section.

Setting Passwords

It is recommended that you change the user and administrator passwords after initial configuration and as regularly as required under your network security policies.

To change both the user password and the administrator password, you must log in using the administrator password. Passwords cannot be modified from the user command mode.

NOTE – If you forget your administrator password, call your technical support representative.

Changing the Default Administrator Password

The administrator has complete access to all menus, information, and configuration commands, including the ability to change both the user and administrator passwords.

The default password for the administrator account is `admin`. To change the default password, follow this procedure:

1. **Connect to the iSD200-PCD and log in using the `admin` password.**
2. **From the Main Menu, use the following command to access the Configuration Menu:**

```
Main# cfg
```

The Configuration Menu is displayed.

```
[Configuration Menu]
        sys   - System-wide parameter menu
        port  - Port configuration menu
        ip    - IP configuration menu
        snmp  - SNMP menu
        setup - Step by step configuration set up
        syslg - Syslog menu
        dump  - Dump current configuration to script file
        ptcfg - Backup current configuration to tftp server
        gtcfg - Restore current configuration from tftp server
        pcd   - PCD Configuration Menu
```

3. **From the Configuration Menu, use the following command to select the System Menu:**

```
>> Configuration# sys
```

The System Menu is displayed.

```
[System Menu]
        date  - Set system date
        time  - Set system time
        usrpw - Set user password
        admpw - Set administrator password
        l4apw - Set L4 administrator password
        tnet  - Enable/disable Telnet access
        bannr - Set login banner
        mnet  - Set management network
        mmask - Set management netmask
        cur   - Display current system-wide parameters
```

4. **Select the administrator password by entering `admpw` at the `System#` prompt.**

```
System# admpw
```

5. **Enter the current administrator password at the prompt:**

```
Changing ADMINISTRATOR password; validation required...
Enter current administrator password:
```

6. **Enter the new administrator password at the prompt:**

```
Enter new administrator password:
```

7. **Enter the new administrator password, again, at the prompt:**

```
Re-enter new administrator password:
```

8. **Save your change by entering the following command:**

```
System# save
```

Changing the Default User Password

The user login has limited control of the iSD200-PCD. Through a user account, you can view iSD200-PCD information and statistics, but you cannot change configuration data.

The default password for the user account is `user`. This password cannot be changed from the user account. Only the administrator has the ability to change passwords, as shown in the following procedure.

1. **Connect to the iSD200-PCD and log in using the `admin` password.**
2. **From the Main Menu, use the following command to access the Configuration Menu:**

```
Main# cfg
```

3. **From the Configuration Menu, use the following command to select the System Menu:**

```
>> Configuration# sys
```

4. **Select the user password by entering `usrpw` at the `System#` prompt.**

```
System# usrpw
```

5. **Enter the current administrator password at the prompt.**

   Only the administrator can change the user password. Entering the administrator password confirms your authority.

```
Changing USER password; validation required...
Enter current administrator password:
```

6. **Enter the new user password at the prompt:**

```
Enter new user password:
```

7. **Enter the new user password, again, at the prompt:**

```
Re-enter new user password:
```

8. **Save your changes:**

```
System# save
```

Changing the Default Layer 4 Administrator Password

The Layer 4 administrator has limited control of the iSD200-PCD. Through a Layer 4 administrator account, you can view all iSD200-PCD information and statistics, but can configure changes only on the Server Load Balancing menus.

The default password for the Layer 4 administrator account is `L4admin`. To change the default password, follow this procedure:

1. **Connect to the iSD200-PCD and log in using the administrator account.**

   To change any iSD200-PCD password, you must log in using the administrator password. Passwords cannot be modified from the Layer 4 administrator account or the user account.

2. **From the Main Menu, use the following command to access the System Menu:**

```
Main# /cfg/sys
```

3. **Select the Layer 4 administrator password:**

```
System# l4apw
```

4. **Enter the current *administrator* password (not the Layer 4 administrator password) at the prompt:**

```
Changing L4 ADMINISTRATOR password; validation required...
Enter current administrator password:
```

NOTE – If you forget your administrator password, call your Alteon WebSystems support representative.

---

5. **Enter the new Layer 4 administrator password at the prompt:**

```
Enter new L4 administrator password:
```

6. **Enter the new administrator password, again, at the prompt:**

```
Re-enter new L4 administrator password:
```

7. **Save your change by entering the following command:**

```
System# save
```

CHAPTER 5

Menu Basics

This chapter explains how to use the command-line interface to configure the iSD200-PCD and to display iSD200-PCD status and statistics. The Main Menu appears after a successful connection and login. Figure 9 shows the Main Menu for the administrator login.

```
[Main Menu]
        info  - Information Menu
        stats - Statistics Menu
        cfg   - Configuration Menu
        oper  - Operations Command Menu
        boot  - Boot Options Menu
        maint - Maintenance Menu
        save  - Save updated config to FLASH [global command]
        exit  - Exit [global command, always available]
```

Figure 9 The Administrator Main Menu

Menu Summary

- **Information Menu**

  Provides sub-menus and commands for displaying current status information about the iSD200-PCD.

- **Statistics Menu**

  Provides sub-menus for displaying iSD200-PCD performance statistics. Included are Port, IF, IP, ICMP, TCP, UDP, SNMP, Routing, ARP, ACEnic, and PCD statistics.

- **Configuration Menu**

  Provides sub-menus for configuring the iSD200-PCD.

- **Operations Menu**

  Provides a sub-menu for enabling or disabling port operation and another sub-menu for renewing or restarting IBP connections.

- **Boot Options Menu**

  Provides options for downloading and selecting software images for operating the iSD200-PCD. You can also reset the iSD200-PCD from this menu.

- **Maintenance Menu**

  Provides a sub-menu for setting the iSD200-PCD service state and other sub-menus for administering the DNS cache, the ARP table, and the Route table.

Menu Map

Figure 10 illustrates the administrator menu hierarchy.

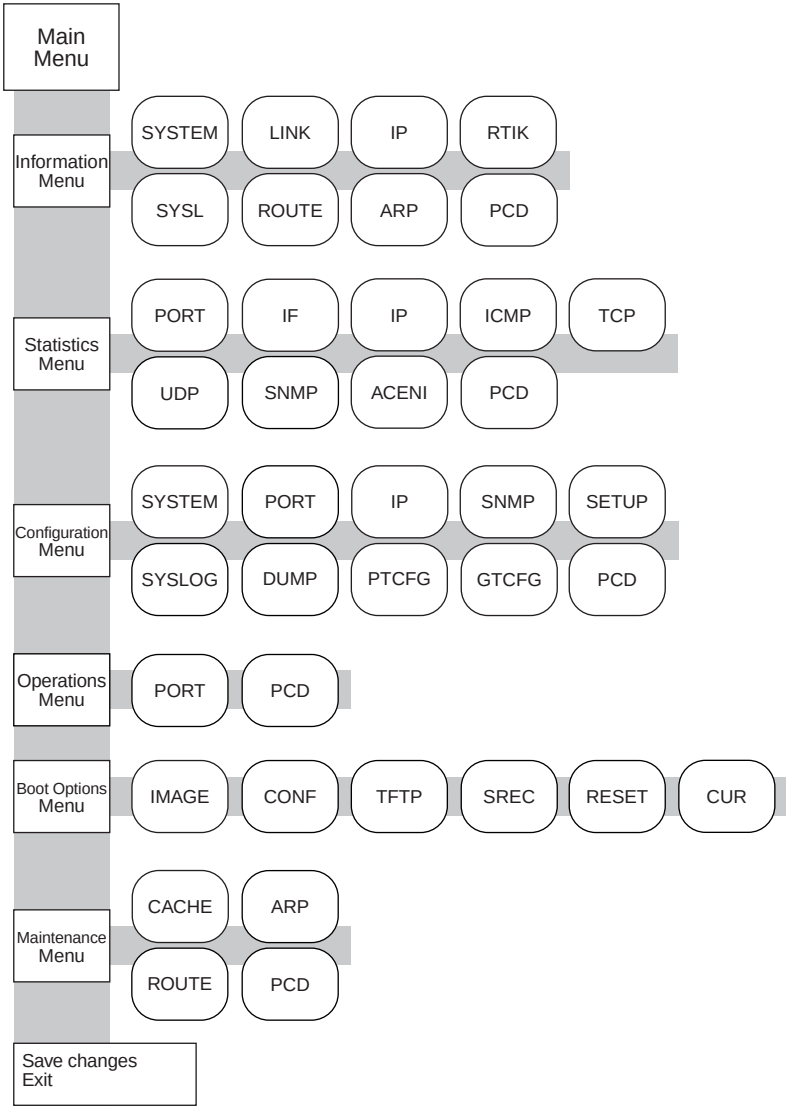


Figure 10 Administrator Menu Hierarchy

Global Commands

Global commands are recognized throughout the menu hierarchy. They are useful for obtaining online help, navigating through menus, and for saving configuration changes. To view the list of global commands, type **?** at any CLI prompt.

Table 6 Global Commands

Command	Action
? <*command*>	Displays the command usage syntax for the specified command. Displays the Global Commands and the menu navigation characters, when the command is not specified.
.	Displays the current menu.
..	Goes up one level in the menu structure.
/	Separates multiple commands that are placed (stacked) on the same line. If placed at the beginning of a command, the command execution starts at the Main Menu.
exit	Exit the CLI and log out.
help	Displays the Global Commands and the menu navigation characters.
history	Displays a numbered list of the last 10 previously entered commands.
nslookup	Resolves IP addresses for URLs and URLs for IP addresses
ping	Verifies station-to-station connectivity across the network. The format is: **ping** <*address*> where <*address*> is the host name or IP address (in dotted-decimal format) of the device. The DNS parameters must be configured for specifying host names (see "Domain Name System Configuration" on page 115).
popd	Restores the last saved menu path. Up to eight paths can be stacked.
print	Displays the current menu.
pushd	Saves the current menu path and optionally jumps to a new path.
pwd	Prints he current path in the menu structure.
quit	Exit the CLI and log out.
save	Saves configuration changes to FLASH memory.
traceroute	Performs traceroute.
up	Goes up one level in the menu structure.
uptime	Displays the elapsed time since the most recent reboot.

Command-Line History and Editing

The command-line history and editing feature allows you to retrieve and modify previously entered command with just a few keystrokes. Table 7 describes the history and editing options available at any CLI command prompt.

Table 7 Command-Line History and Editing Options

Option	Description
`history`	Displays a numbered list of the last 10 previously entered commands.
`!!`	Repeats the last entered command.
`!`*n*	Repeats the *n*th command shown on the history list.
<Ctrl-p>	(Also the up arrow key.) Recalls the *previous* command from the history list. This can be used multiple times to work backward through the last 10 commands. The recalled command can be entered as is, or edited using the options below.
<Ctrl-n>	(Also the down arrow key.) Recalls the next command from the history list. This can be used multiple times to work forward through the last 10 commands. The recalled command can be entered as is, or edited using the options below.
<Ctrl-a>	Moves the cursor to the *beginning* of command line.
<Ctrl-e>	Moves cursor to the *end* of the command line.
<Ctrl-b>	(Also the left arrow key.) Moves the cursor *back* one position to the left.
<Ctrl-f>	(Also the right arrow key.) Moves the cursor *forward* one position to the right.
<Backspace>	(Also the Delete key.) Erases one character to the left of the cursor position.
<Ctrl-d>	*Deletes* one character at the cursor position.
<Ctrl-k>	Kills (erases) all characters from the cursor position to the end of the command line.
<Ctrl-l>	Redraws the screen.
<Ctrl-u>	Clears the entire line.
Other keys	Inserts new characters at the cursor position.

Command-Line Interface Shortcuts

Command Stacking

As a shortcut, you can type multiple commands, separated by forward slashes (**/**), on a single line. You can connect as many commands as required to access the menu option that you want. For example, the keyboard shortcut to access Global Domain Configuration Menu from the `Main#` prompt is:

```
>> Main# /cfg/pcd/globa
```

Command Abbreviation

Most commands can be abbreviated by entering the first characters that distinguish the command from the others in the same menu or sub-menu. For example, the command shown above could also be entered as follows:

```
>> Main# /c/pc/g
```

Tab Completion

If you type the first letter of a command at any menu prompt and press <Tab>, the CLI will display all commands or options in that menu that begin with the letter you entered. Entering additional letters will further refine the list of commands or options displayed. If only one command fits the input text when <Tab> is pressed, that command will be supplied on the command line, waiting to be entered. If the <Tab> key is pressed without any input on the command line, the currently active menu will be displayed.

CHAPTER 6

The Information Menu

This chapter describes the Information Menu and how to use the CLI to view iSD200-PCD configuration parameters.

/info
Information Menu

```
[Information Menu]
        sys   - Show system information
        link  - Show link status
        ip    - Show IP information
        rtik  - Display RTIK Information
        sysl  - Syslog control
        route - IP routing information menu
        arp   - ARP information menu
        pcd   - PCD Information Menu
```

Table 8 describes the Information Menu options.

Table 8 Information Menu Options (/info)

Command Syntax and Usage
sys Displays system information. For details, see "System Information" on page 59.
link Displays configuration information about each port. For details, see "Link Status Information" on page 59.
ip Displays IP information. For details, see "IP Information" on page 60.

Table 8 Information Menu Options (/info) (Continued)

Command Syntax and Usage
`rtik` Provides a kernel-level view of iSD200-PCD software operation. RTIK information is reserved for authorized support personnel. For details, see "Display RTIK Information" on page 61.
`sysl` Displays or changes the syslog configuration information. For details, see "Syslog Information" on page 62.
`route` Displays the IP Routing Menu. Using the options of this menu, the system displays the following for each configured or learned route: ■ Route destination IP address, subnet mask, and gateway address ■ Type of route ■ Tag indicating origin of route ■ Metric for RIP tagged routes, specifying the number of hops to the destination (1-15 hops, or 16 for infinite hops) ■ The IP interface that the route uses For details, see "IP Routing Information" on page 63.
`arp` Displays the Address Resolution Protocol (ARP) Information Menu. For details, see "ARP Information" on page 64.
`pcd` Displays the PCD Information Menu. For details, see "The PCD Information Menu" on page 65.

/info/sys
System Information

```
System Information at 16:16:28 Mon Dec 4, 2000

2011
sysName:       Phox
sysLocation:   Alteon Atlanta

MAC address 00:60:cf:20:6a:41    IP (If 2) address: 192.168.160.60
Software Version 2.2.1.7

Welcome to the iSD200-PCD world
```

System information includes:

- System date and time
- Host name
- System name and location
- MAC address of the network interface
- IP address of network interface
- Software version
- Login banner, if configured

/info/link
Link Status Information

```
------------------------------------------------------------------
Port   Speed    Duplex     Flow Ctrl      Link
----   -----   --------  --TX-----RX--   ------
  1    10/100     any     yes    yes      down
```

Use this command to display link status information about each port, including:

- Port number
- Port speed (10, 100, 10/100, or 1000)
- Duplex mode (half, full, or auto)
- Flow control for transmit and receive (no, yes, or auto)
- Link status (up or down)

/info/ip
IP Information

```
Interface information:
  1: 192.168.160.60,  255.255.255.0,  192.168.160.255
Default gateway information:
  1: 192.168.150.50

Current RIP settings:
  1: PASSIVE-OFF

Current DNS settings:
  0.0.0.0, none
```

IP information includes:

- IP interface information: Interface number, IP address, subnet mask, and broadcast address.
- Default gateway information: Metric for selecting which configured gateway to use, gateway number, IP address, and health status.
- RIP1 information: Enable status, update period, and active modes
- DNS information: primary and secondary DNS IP address, and default domain name.

/info/rtik
Display RTIK Information

```
[RTIK Menu]
        cpu   - Show CPU usage
        frame - Show frame usage
        proc  - Show process table
        stack - Display stack for specific process
        syste - Show system information (cpu speed, memory, etc...)
        timer - Show timer usage
```

Using the commands listed in Table 9, you can obtain Real-Time Internet Kernel (RTIK) information, which provides a kernel-level view of iSD200-PCD software operation. RTIK information is reserved for authorized support personnel.

Table 9 Real-Time Internet Kernel Information Menu Options (/info/rtik)

Command Syntax and Usage
cpu Displays peak and current CPU usage in percent.
frame Displays internal Ethernet frame usage.
proc Displays status for each active RTIK process.
stack Displays the stack entries for the specified RTIK process. Use the **proc** command to view the active rtik process names.
syste Displays the software version, cpu identity, and memory usage.
timer Displays the status for the system timers.

/info/sysl
Syslog Information

The **sysl** command displays or changes the syslog configuration information. With no arguments, the host, facility, level and console mode settings are displayed along with the current syslog buffer contents. All syslog messages are transmitted to UDP port 520 of the syslog host. If there is no syslog information to display, the CLI returns "Empty List."

The format of the syslog command is as follows:

/info/sysl [<*IP address*>] [<*fac*>**.**<*lvl*>] [**console=**<**on**|**off**>] [**flush**]

syslog command parameters are described in Table 10.

Table 10 Syslog Command Parameters (/info/sysl)

Command Syntax and Usage
<*IP address*> Optional: Specifies the IP address for the syslog host.
<*fac*>**.**<*lvl*> Optional: <*fac*> specifies the facility (i.e., the type of device generating the message). The default facility is 10. <*lvl*> specifies the level (i.e., which messages are generated). The default level is 6.
console=on|**off** Optional: **on** turns on the display of syslog messages at the host console; **off** turns off the display of syslog messages at the host console.
flush Optional: Flushes the console syslog buffer.

/info/route
IP Routing Information

```
[IP Routing Menu]
      find    - Show a single route by destination IP address
      gw      - Show routes to a single gateway
      type    - Show routes of a single type
      tag     - Show routes of a single tag
      if      - Show routes on a single interface
      dump    - Show all routes
```

The IP interface that the route uses. Using the commands listed in Table 11, you can display all or a portion of the IP routes currently held in the iSD200-PCD.

Table 11 Route Information Menu Options (/info/route)

Command Syntax and Usage
find *<IP address (e.g., 192.4.17.101)>* Displays a single route by destination IP address.
gw *<default gateway address (e.g., 192.4.17.44)>* Displays routes to a single gateway.
type direct|indirect Displays routes of a single type: ■ direct: Packets will be delivered to a destination host or subnet attached to the iSD200-PCD. ■ indirect: The next hop to the host or subnet destination will be forwarded through a router at the gateway address.
tag addr|static|rip Displays routes of a single tag indicating origin of route: ■ addr: The address belongs to the iSD200-PCD's IP interfaces. ■ static: The address is a static route that has been configured on the iSD200-PCD. ■ rip: The address was learned by the Routing Information Protocol (RIP).
if *<interface number (1-256)>* Displays routes on a single interface.
dump Displays all routes configured in the iSD200-PCD. For more information, see "Show All IP Route Information" on page 64.

/info/route/dump

Show All IP Route Information

```
>> IP Routing# dump
    Destination      Mask         Gateway       Type    Tag    Mc If
  ------------- ------------- --------------- -------- ------ -- --
  192.168.170.0 255.255.255.0 192.168.170.70  direct   addr      1
        0.0.0.0       0.0.0.0 192.168.170.100 indirect static    1
```

/info/arp

ARP Information

```
[Address Resolution Protocol Menu]
      find    - Show a single ARP entry by IP address
      addr    - Show ARP address list
      port    - Show ARP entries on a single port
```

You can display all or part of the ARP entries currently held in the iSD200-PCD, according to one of the parameters listed on the menu.

Table 12 ARP Resolution Menu Options (/info/arp)

Command Syntax and Usage
find Displays a single ARP entry data per the specified IP address.
addr Displays the entire ARP address list. See "ARP Address List Information" on page 65.
port Displays ARP entries per the specified port.

/info/arp/addr
ARP Address List Information

```
>> Address Resolution Protocol# addr
    IP address        IP mask        MAC address    VLAN Flags
  -------------- -------------- ----------------- ---- -----
  205.178.18.66   255.255.255.255 00:70:cf:03:20:04        P
  205.178.50.1    255.255.255.255 00:70:cf:03:20:06    1
  205.178.18.64   255.255.255.255 00:70:cf:03:20:05    1
```

/info/pcd
The PCD Information Menu

```
[PCD Information menu]
        globa - Show global domains for this PCD
        local - Show local domains for a specific global domain
        membr - Show members for local domain(s) on this PCD
        ibp   - Show IBP connections for local domain(s)
        virtu - Show virtual address for local domain(s) on this PCD
        sstat - Set service state for local domain
        cache - Display current client cache entries
        techs - Show all statistics, errors, and configuration info
```

The iSD200-PCD Information Menu presents options for viewing the configuration of iSD200-PCD(s) in your network. Table 13 describes the PCD Information Menu options.

Table 13 PCD Command Syntax and Usage (/info/pcd)

Command Syntax and Usage
globa [<*global domain alias*>] Displays all global domain configurations (or the configuration information for the global domain you specify). For details, see "Global Domain Information Display" on page 67.
local [<*local domain alias*>] Displays all local domain configurations (or the configuration information for the local domain you specify). For details, see "Local Domain Information Display" on page 68.

Table 13 PCD Command Syntax and Usage (/info/pcd) (Continued)

Command Syntax and Usage
membr [<*local domain alias*> <*PCD IP*>] Displays all member configurations (or the configuration information for the local domain and PCD IP address you specify). For details, see "Member Information Display" on page 69.
ibp [<*global domain alias*> [<*local domain alias*>]] Displays the status of all incoming IBP connections (or the status of incoming IBP connection associated with the global domain alias or local domain alias you specify). For details, see "Interbox Protocol (IBP) Information Display" on page 70.
virtu [<*local domain alias (e.g., local1a)*>] Displays all Virtual IP addresses (or the Virtual IP address for the local domain you specify. For details, see "Virtual Address Information Display" on page 72.
sstat Displays the service status for all local domains. The service states are: ■ Out of Service (Automatic) ■ Out of Service (Manual) ■ In Service An iSD200-PCD will set an iSD200-PCD to Out of Service if it does not respond to IBP messages or if it does not respond to health check probes. Administrators can manually set the service status of a iSD200-PCD using the `/maint/pcd/sstat` command.
cache Displays the attributes (client network, netmask, global domain alias, local domain alias, distance, and expire time) of all learned and static entries in the CNC (distance and expire time do not apply to static entries).
techs Dumps all of the iSD200-PCD Information displays (i.e., global domain, local domain, member, service state list, and pcd errors and statistics) to the screen, pausing after each display to allow you to quit or continue.

/info/pcd/globa

Global Domain Information Display

```
Global Domain Alias            : Delaware
  Global Domain URL            : www.BlueHen.com
  Client Listen IP             : 287.40.20.10:80
  Proximity Method             : Double_Redirect
  Authentication PIN           : 0000
  Participation Threshold (ms) : 0
  IBP Renewal Time (min)       : 30
```

Table 14 describes the global domain information.

Table 14 Global Domain Parameters (/info/pcd/globa)

Parameter	Description
Global Domain Alias	The user-defined name associated with a global domain.
Global Domain URL	The DNS-registered URL represented by the global domain.
Client Listen IP	The Client Listen IP address and port for the iSD200-PCD that you are connected to. An address of 0.0.0.0 means the Client Listen IP:Port has not been configured.
Proximity Method	The method the iSD200-PCD uses to determine the closest (fastest responding) local domain to the client. The methods are Footrace, Double Redirect, Refresh, and DNS round-robin.
Authentication PIN	The value used by iSD200-PCDs to authenticate IBP communications. A receiving iSD200-PCD will ignore a transmission if the PIN in the IBP message does not match the configured PIN. The PIN is disabled if the displayed value is 0000.
Participation Threshold	The Round Trip Time (RTT) threshold between a synchronizing PCD and other iSD200-PCDs in a global domain. Any iSD200-PCD that takes more than the Threshold-Delay time to respond to a synchronizing PCD is removed from the site-selection process for that connection.
IBP Renewal Time	Displays the IBP Renewal Time in minutes for the specified local domain. This parameter determines how long a iSD200-PCD waits before opening a new IBP connection with another iSD200-PCD and closing the old one.

/info/pcd/local

Local Domain Information Display

```
Local Domain Alias           : LocalOne
  Global Domain Alias        : GlobalOne
  Local Domain URL           : http://www.test1.com
  Server IP                  : 0.0.0.0
  IBP IP                     : 2.3.4.5:10000
  Virtual IP                 : 0.0.0.0:80
  DNS Weight                 : 1
  Delay (ms)                 : 0
  Health Check IP            : 0.0.0.0:80
  Health Check Test Page     :
  Health Check Freq (sec)    : 0
  Health Check Result Weight : 0%
  Health Check Remote Enable : Disable
```

Table 15 describes the local domain information.

Table 15 Local Domain Parameters (/info/pcd/local)

Parameter	Description
`Local Domain Alias`	The user-defined name associated with a local domain.
`Global Domain Alias`	The user-defined name of the global domain with which this local domain is associated.
`Local Domain URL`	The URL of the local domain.
`IBP IP`	The IP address and TCP port used to communicate with this local domain via IBP.
`Virtual IP`	The VIP address and TCP port configured at the switch to represent load-balanced iSD200-PCDs. Required only if a VIP is present.
`DNS Weight`	Sets the DNS Round-Robin weight value for the local domain.
`Delay`	(Optional) The time in milliseconds that the iSD200-PCD is delayed in responding to the client during the site-selection process. Delay is used to shape load distribution among local domains.
`Health Check IP`	The IP address that represents server(s) at a local domain. The address could be a VIP at the switch or a server IP address at a non-load-balanced site.

Table 15 Local Domain Parameters (/info/pcd/local) (Continued)

Parameter	Description
`Health Check Test Page`	The resource path of the server test page. The iSD200-PCD requests the page from the server and uses the response time to determine the health of the server. If the PCD does not receive a response, it places the server out of service.
`Health Check Freq (sec)`	The interval in milliseconds between health check probes.
`Health Check Result Weight`	A value from 0% to 10000% that is multiplied by the response time to delay the response of the local domain to the client during site-selection. The weight is used to shape load distribution among local domains according to the availability of servers at that site.
`Health Check Remote Enable`	The remote server probe status (`enable` or `disable`) for the iSD200-PCD. If enabled, the iSD200-PCD can probe remote servers. If disabled, the iSD200-PCD probes servers only at the iSD200-PCD's Web site.

/info/pcd/membr

Member Information Display

```
Local Domain ID          : local1
  PCD IP                 : 192.168.160.60
  Client Listen IP       : 192.168.160.60:80
```

Table 16 describes the Member Information.

Table 16 Member Parameters (/info/pcd/membr)

Parameter	Description
`PCD IP`	The IP address of the iSD200-PCD used for administrative Telnet connections.
`Client Listen IP`	The IP address and TCP port that the client connects to for site-selection. Administrators typically enter the PCD IP for the address and retain the default TCP port which is 80. When iSD200-PCDs are load-balanced by a switch, the switch VIP is associated with the Client Listen IP:Port. If 0.0.0.0:80 is displayed, the Client Listen IP:Port has not been configured.

/info/pcd/ibp

Interbox Protocol (IBP) Information Display

```
>> Main# /info/pcd/ibp
****** Incoming IBP Connections ******
Remote Host : 192.168.160.2:1038
Conn State : UP
Local Domain : listen
Global Domain : GlobalOne

Remote Host : 192.168.150.2:1033
Conn State : UP
Local Domain : listen
Global Domain : GlobalTwo

Remote Host : 192.168.150.2:1032
Conn State : UP
Local Domain : listen
Global Domain : GlobalOne

Remote Host : 192.168.160.2:1036
Conn State : UP
Local Domain : listen
Global Domain : GlobalTwo

>> Main# /info/pcd/ibp GlobalOne
****** Outgoing IBP Connections ******

Global Domain Alias : GlobalOne
Local Domain Alias : Georgia2
IBP IP : 192.168.160.2:10000
Conn State : UP

Global Domain Alias : GlobalOne
Local Domain Alias : Germany2
IBP IP : 192.168.150.2:10000
Conn State : UP
```

When entered without additional parameters, this command displays information about the incoming IBP connections. When entered with a global domain alias specified (or with both a global domain alias and a local domain alias), this command displays information about the outgoing IBP connections.

Table 17 describes the IBP information.

Table 17 IBP Parameters (/info/pcd/ibp)

Parameter	Description
`Remote Host`	The IBP IP:Port for a remote host.
`Conn State`	The connection status between the IBP IP:Port. ■ `NO CONN` — A connection has not yet been attempted to this local domain. If you specify your own local domain, the `NO CONN` status appears. ■ `DOWN` — The connection that once was is no longer. ■ `QUEUED` — The connection is down and queued up to try again (attempted every 10 seconds). ■ `TRYING` — The connection was just unqueued and is being attempted again. ■ `IDENTIFYING` — The connection is up but the local domain that initiated the connection has not yet identified itself. ■ `UP` — The connection is up. ■ `CLOSING` — The iSD200-PCD(s) are in the process of shutting down this connection.
`Local Domain` or `Local Domain Alias`	The alias of the local domain associated with this IBP connection.
`Global Domain` or `Global Domain Alias`	The alias of the global domain associated with this IBP connection.
`IBP IP`	The IBP IP:port for the local domain. Administrators typically enter the PCD IP for the address and retain the default TCP port, which is 10000.

/info/pcd/virtu

Virtual Address Information Display

```
Local Domain Alias      : local1c
  Virtual IP            : 0.0.0.0:80
```

Table 18 describes the Virtual Address Information.

Table 18 Virtual Address Parameters (/info/pcd/virtu)

Parameter	Description
`Local Domain Alias`	The local domain alias.
`Virtual IP:Port`	The VIP configured at the switch. A VIP is required to represent iSD200-PCDs in a load-balancing cluster. The iSD200-PCD enters the VIP as the source address when it builds a TCP response to the client. If 0.0.0.0:80 appears, the VIP has not been configured at the iSD200-PCD. This would be the case if there is no switch in front of the iSD200-PCD, in which case, client connections to the iSD200-PCD use the Client Listen IP:Port.

CHAPTER 7

The Statistics Menu

This chapter discusses using the Command Line Interface (CLI) to show iSD200-PCD statistics[1].

/stats
Statistics Menu

```
[Statistics Menu]
        port  - Statistics Menu for one port
        if    - IP interface ("if") statistics
        ip    - IP statistics
        icmp  - ICMP statistics
        tcp   - TCP statistics
        udp   - UDP statistics
        snmp  - SNMP statistics
        aceni - Alteon NIC Stats Menu
        pcd   - PCD statistics
```

Table 19 describes the Statistics Menu options.

Table 19 Statistics Menu Options (/stats)

Command Syntax and Usage
port Displays the Port Statistics Menu for the specified port. Use this command to display traffic statistics on a port-by-port basis. Traffic statistics are included in SNMP Management Information Base (MIB) objects. For details, see "Port Statistics Menu" on page 74.
if *<interface number (1-256)>* Displays IP interface statistics for the management processors. To view an example of what is displayed on-screen, see "Interface Statistics" on page 77.

1. Except for the "PCD Statistics" on page 98, parameter names and descriptions are taken from *SNMP, SNMPv2, SNMPv3, and RMON 1 and 2*, Third Edition, by William Stallings, and published in 1999 by Addison Wesley.

Table 19 Statistics Menu Options (/stats) (Continued)

Command Syntax and Usage
ip Displays IP statistics. See "IP Statistics" on page 77 for sample output.
ICMP Display ICMP statistics. See "ICMP Statistics" on page 79 for sample output.
TCP Displays TCP statistics. See "TCP Statistics" on page 81 for sample output.
UDP Displays UDP statistics. See "UDP Statistics" on page 82 for sample output.
SNMP Displays SNMP statistics. See "SNMP Statistics" on page 82 for sample output.
aceni Displays the Alteon WebSystems Network Interface Card (ACEnic) statistics. For details, see "ACENIC Statistics" on page 85.
pcd Displays PCD Statistics Menu. For details, see "PCD Statistics" on page 98.

/stats/port
Port Statistics Menu

Displays Ethernet "dot3" and Interface "if" (data link) statistics for the iSD200-PCD port.

```
[Port Statistics 1 Menu]
      ether   - Ethernet ("dot3") statistics
      if      - Interface ("if") statistics
```

Table 20 Port Statistics Menu Options (/stats/port)

Command Syntax and Usage
ether Displays the port's Ethernet ("dot3") statistics.
if Displays the port's interface statistics.

Table 21describes the Ethernet statistics.

Table 21 Ethernet Statistics

Statistic	Description
dot3StatsAlignmentErrors	The number of received frames not having an integral number of octets.
dot3StatsFCSErrors	The number of received frames that did not pass the FCS check.
dot3StatsSingleCollisionFrames	The number of successfully transmitted frames that experience exactly one collision before transmission.
dot3StatsMultipleCollisionFrames	The number of successfully transmitted frames that experience more than one collision before transmission.
dot3StatsSQETestErrors	The number of SQE test errors.
dot3StatsDeferred-Transmissions	The number of frames for which the first transmission attempt is delayed because the medium is busy.
dot3StatsLateCollisions	The number of times a collision is detected later than 512-bit times into the transmission.
dot3StatsExcessiveCollisions	The number of frames for which transmission fails due to excessive collisions.
dot3StatsInternalMacTransmitErrors	The number of frames for which transmission fails due to internal MAC transmit error.
dot3StatsCarrierSenseErrors	The number of times that the carrier sense condition was lost or not asserted when attempting to transmit a frame.
dot3StatsFrameTooLongs	The number of received frames that exceed maximum permitted frame size.
dot3StatsInternalMacReceiveErrors	The number of frames for which reception failed due to internal MAC transmit error.

Table 22 describes the Port Interface statistics.

Table 22 Port Interface Statistics

Statistic	Description
`ifInOctets`	The number of octets received on the interface, including framing characters.
`ifInUcastPkts`	The number of subnetwork-unicast packets delivered to a higher-layer protocol.
`ifInNUcastPkts`	The number of nonunicast packets delivered to a higher-layer protocol.
`ifInDiscards`	The number of inbound packets discarded, even though no errors had been detected, to prevent their being delivered to a higher-layer protocol (e.g., buffer overflow).
`ifInErrors`	The number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol.
`ifInUnknownProtos`	The number of inbound packets that were discarded because of an unknown or unsupported protocol.
`ifOutOctets`	The number of octets transmitted on the interface, including framing characters.
`ifOutUcastPkts`	The number of packets that higher level protocols requested be transmitted to a network-unicast address. Included are packets that were discarded or were otherwise not sent.
`ifOutNUcastPkts`	The number of packets that higher level protocols requested be transmitted to a non-unicast address. Included are packets that were discarded or were otherwise not sent.
`ifOutDiscards`	The number of outbound packets discarded even though no errors had been detected to prevent their being transmitted (e.g., buffer overflow).
`ifOutErrors`	The number of outbound packets that could not be transmitted because of errors.
`ifStateChanges`	Not implemented; always zero.

/stats/if
Interface Statistics

```
IP interface 1 statistics:
ifInOctets:       2435148747   ifInUcastPkts:        1000174
ifInNUCastPkts:      2365278   ifInDiscards:               0
ifInErrors:                0   ifInUnknownProtos:         27
ifOutOctets:               0   ifOutUcastPkts:             0
ifOutNUcastPkts:           0   ifOutDiscards:              0
ifOutErrors:               0   ifStateChanges              0
```

These are the same statistics returned for the `/stats/port/if` command. See Table 20 on page 74 for definitions.

/stats/ip
IP Statistics

```
IP statistics:
ipInReceives:         3115873   ipInHdrErrors:              1
ipInAddrErrors:         35447   ipForwDatagrams:            0
ipInUnknownProtos:     500504   ipInDiscards:               0
ipInDelivers:         2334166   ipOutRequests:        1010542
ipOutDiscards:              4   ipOutNoRoutes:              4
ipReasmReqds:               0   ipReasmOKs:                 0
ipReasmFails:               0   ipFragOKs:                  0
ipFragFails:                0   ipFragCreates:              0
ipRoutingDiscards:          0   ipDefaultTTL:             255
```

Table 23 describes the IP protocol statistics.

Table 23 IP Protocol Statistics (/stats/ip)

Statistic	Description
`ipInReceives`	Number of input datagrams received from interfaces, including those received in error.
`ipInHdrErrors`	Number of input datagrams discarded due to errors in the IP header.
`ipInAddrErrors`	Number of input datagrams discarded because the IP address in the destination field was not valid to be received at this entity.

Table 23 IP Protocol Statistics (/stats/ip) (Continued)

Statistic	Description
ipForwDatagrams	Number of input datagrams for which this entity was not the final IP destination. The entity tries to forward these datagrams.
ipInUnknownProtos	Number of locally addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.
ipInDiscards	Number of input IP datagrams for which no problems were encountered to prevent their continued processing but were discarded (e.g., for lack of buffer space).
ipInDelivers	Number of input datagrams successfully delivered to IP user protocols.
ipOutRequests	Number of IP datagrams that local IP user protocols supplied to IP in requests for transmission.
ipOutDiscards	Number of output IP datagrams that were discarded even though no problems were encountered that would prevent continued processing.
ipOutNoRoutes	Number of IP datagrams that were discarded because no route could be found.
ipReasmReqds	Number of received IP fragments that required reassembly at this entity.
ipReasmOKs	Number of received IP datagrams that were successfully reassembled.
ipReasmFails	Number of failures detected by the IP reassembly algorithm.
ipFragOKs	Number of IP datagrams that were successfully fragmented at this entity.
ipFragFails	Number of IP datagrams that were discarded because the don't-fragment flag was set.
ipFragCreates	Number of IP datagram fragments that were generated at this entity.
ipRoutingDiscards	Number of routing entries discarded even though valid.
ipDefaultTTL	Default value inserted into Time-To-Live (TTL) field of IP header of datagrams originated at this entity.

/stats/icmp
ICMP Statistics

```
ICMP statistics:
icmpInMsgs:              245802   icmpInErrors:               1393
icmpInDestUnreachs:          41   icmpInTimeExcds:               0
icmpInParmProbs:              0   icmpInSrcQuenchs:              0
icmpInRedirects:              0   icmpInEchos:                  18
icmpInEchoReps:          244350   icmpInTimestamps:              0
icmpInTimestampReps:          0   icmpInAddrMasks:               0
icmpInAddrMaskReps:           0   icmpOutMsgs:              253810
icmpOutErrors:                0   icmpOutDestUnreachs:          15
icmpOutTimeExcds:             0   icmpOutParmProbs:              0
icmpOutSrcQuenchs:            0   icmpOutRedirects:              0
icmpOutEchos:            253777   icmpOutEchoReps:              18
icmpOutTimestamps:            0   icmpOutTimestampReps:          0
icmpOutAddrMasks:             0   icmpOutAddrMaskReps:           0
```

Table 24 describes the ICMP Protocol Statistics.

Table 24 ICMP Protocol Statistics (/stats/icmp)

Statistic	Description
icmpInMsgs	The number of icmp messages received.
icmpInErrors	The number of icmp messages received by the client that contained errors (and so were not responded to).
icmpInDestUnreachs	The number of messages that were not delivered by the client because the destination was unreachable.
icmpInTimeExcds	The number of messages that were discarded because the TTL field was exceeded.
icmpInParmProbs	The number of messages with IP header errors received by the client.
icmpInSrcQuenchs	The number of messages discarded by the client because of buffer overflow.
icmpInRedirects	The number of redirect messages received.
icmpInEchos	The number of echo messages (pings) received.
icmpInEchoReps	The number of echo reply messages (pings) answered.
icmpInTimestamps	The number of time stamp messages (which samples network delay) received.

Table 24 ICMP Protocol Statistics (/stats/icmp) (Continued)

Statistic	Description
icmpInTimestampReps	The number of time stamp reply messages answered.
icmpInAddrMasks	Number of ICMP Address Mask Request messages received.
icmpInAddrMaskReps	The number of address mask requests received by the client.
icmpOutMsgs	The number of icmp messages sent.
icmpOutErrors	The number of icmp messages received by the host that contained errors.
icmpOutDestUnreachs	The number of messages that were not delivered by the host because the destination was unreachable.
icmpOutTimeExcds	The number of messages that were discarded by the host because the ttl field was exceeded.
icmpOutParmProbs	The number of messages with IP header errors received by the host.
icmpOutSrcQuenchs	The number of messages discarded by the host because of buffer overflow.
icmpOutRedirects	The number of redirect messages sent.
icmpOutEchos	The number of echo messages sent.
icmpOutEchoReps	The number of echo reply messages sent.
icmpOutTimestamps	The number of time stamp messages sent.
icmpOutTimestampReps	The number of time stamp reply messages sent.
icmpOutAddrMasks	The number address mask requests (to determine the subnet mask associated with the local IP network) received.
icmpOutAddrMaskReps	The number of address mask requests received by the host.

/stats/tcp
TCP Statistics

```
TCP statistics:
tcpRtoAlgorithm:         4   tcpRtoMin:               0
tcpRtoMax:          240000   tcpMaxConn:            512
tcpActiveOpens:     252214   tcpPassiveOpens:         7
tcpAttemptFails:       528   tcpEstabResets:          4
tcpInSegs:          756401   tcpOutSegs:         756655
tcpRetransSegs:          0   tcpInErrs:               0
tcpOutRsts:            417
```

Table 25 describes the TCP Protocol Statistics.

Table 25 TCP Protocol Statistics (/stats/tcp)

Statistic	Description
tcpRtoAlgorithm	Retransmission time (other (1); constant (2); MIL-STD-1778 (3); Jacobson's algorithm (4).
tcpRtoMin	Minimum value for the retransmission timer.
tcpRtoMax	Maximum value for the retransmission timer.
tcpMaxConn	Limit on the number of TCP connections the entity can support.
tcpActiveOpens	Number of active opens this entity has supported.
tcpPassiveOpens	Number of passive opens this entity has supported.
tcpAttemptFails	Number of failed connection attempts that has occurred at this entity.
tcpEstabResets	Number of resets that has occurred at this entity.
tcpInSegs	Number of segments received, including those received in error.
tcpOutSegs	Number of segments sent, excluding those containing only retransmitted octets.
tcpRetransSegs	Number of retransmitted segments.
tcpInErrs	Number of segments received in error.
tcpOutRsts	Number of TCP segments sent containing the RST flag.

/stats/udp
UDP Statistics

```
UDP statistics:
udpInDatagrams:        54   udpOutDatagrams:        43
udpInErrors:            0   udpNoPorts:        1578077
```

Table 26 describes the UDP Protocol Statistics.

Table 26 UDP Protocol Statistics (/stats/udp)

Statistic	Description
udpInDatagrams	Number UDP datagrams delivered to UDP users.
udpInErrors	Number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.
udpOutDatagrams	Number of UDP datagrams sent from this entity.
udpNoPorts	Number of received UDP datagrams for which there was no application at the destination port.

/stats/snmp
SNMP Statistics

```
SNMP statistics:
snmpInPkts:                 54   snmpInBadVersions:              0
snmpInBadC'tyNames:          0   snmpInBadC'tyUses:              0
snmpInASNParseErrs:          0   snmpEnableAuthTraps:            0
snmpOutPkts:                54   snmpInBadTypes:                 0
snmpInTooBigs:               0   snmpInNoSuchNames:              0
snmpInBadValues:             0   snmpInReadOnlys:                0
snmpInGenErrs:               0   snmpInTotalReqVars:           105
snmpInTotalSetVars:          0   snmpInGetRequests:              2
snmpInGetNexts:             52   snmpInSetRequests:              0
snmpInGetResponses:          0   snmpInTraps:                    0
snmpOutTooBigs:              0   snmpOutNoSuchNames:             2
snmpOutBadValues:            0   snmpOutReadOnlys:               0
snmpOutGenErrs:              0   snmpOutGetRequests:             0
snmpOutGetNexts:             0   snmpOutSetRequests:             0
snmpOutGetResponses:        54   snmpOutTraps:                   0
```

Table 27 describes the SNMP Protocol Statistics.

Table 27 SNMP Protocol Statistics (/stats/snmp)

Statistic	Description
snmpInPkts	Number of messages delivered to the SNMP entity from the transport service.
snmpInBadVersions	Number of SNMP messages delivered to the SNMP entity for an unsupported SNMP version.
snmpInBadC'tyNames	Number of SNMP messages delivered to the SNMP entity that used an SNMP community name not known to the entity.
snmpInBadC'tyUses	Number of SNMP messages delivered to the SNMP entity that represented an SNMP operation not allowed by the SNMP community named in the message.
snmpInASNParseErrs	Number of ASN.1 or BER errors encountered when decoding received SNMP messages.
snmpEnableAuthenTraps	Authentication-failure traps enabled (1) or disabled (2).
snmpOutPkts	Number of SNMP messages passed from the SNMP entity to the transport service.
snmpInBadTypes	Number of bad values in received SNMP messages.
snmpInTooBigs	Number of SNMP PDUs delivered to the SNMP entity for which the value of the error-status field is TooBig.
snmpInNoSuchNames	Number of SNMP PDUs delivered to the SNMP entity for which the value of the error-status field is NoSuchName.
snmpInBadValues	Number of SNMP PDUs delivered to the SNMP entity for which the value of the error-status field is BadValue.
snmpInReadOnlys	Number of SNMP PDUs delivered to the SNMP entity for which the value of the error-status field is ReadOnly.
snmpInGenErrs	Number of SNMP PDUs delivered to the SNMP entity for which the value of the error-status field is GenErr.
snmpInTotalReqVars	Number of MIB objects retrieved successfully by the SNMP entity as the result of receiving valid SNMP Get-Request and Get-Next PDUs.
snmpInTotalSetVars	Number of MIB objects retrieved successfully by the SNMP entity as the result of receiving valid SNMP Set-Request PDUs.
snmpInGetRequests	Number of SNMP Get-Request PDUs accepted and processed by the SNMP entity.

Table 27 SNMP Protocol Statistics (/stats/snmp) (Continued)

Statistic	Description
snmpInGetNexts	Number of SNMP Get-Next PDUs accepted and processed by the SNMP entity.
snmpInSetRequests	Number of SNMP Set-Request PDUs accepted and processed by the SNMP entity.
snmpInGetResponses	Number of SNMP Get-Response PDUs accepted and processed by the SNMP entity.
snmpInTraps	Number of SNMP Trap PDUs accepted and processed by the SNMP entity.
snmpOutTooBigs	Number of SNMP PDUs generated by the SNMP entity for which the value of the error-status field is TooBig.
snmpOutNoSuchNames	Number of SNMP PDUs generated by the SNMP entity for which the value of the error-status field is NoSuchName.
snmpOutBadValues	Number of SNMP PDUs generated by the SNMP entity for which the value of the error-status field is BadValue.
snmpOutReadOnlys	Number of SNMP PDUs generated by the SNMP entity for which the value of the error-status field is ReadOnly.
snmpOutGenErrs	Number of SNMP PDUs generated by the SNMP entity for which the value of the error-status field is GenErr.
snmpOutGetRequests	Number of SNMP Get-Request PDUs generated by the SNMP entity.
snmpOutGetNexts	Number of SNMP GetNext PDUs generated by the SNMP entity.
snmpOutSetRequests	Number of SNMP Set-Request PDUs generated by the SNMP entity.
snmpOutGetResponses	Number of SNMP Get-Response PDUs generated by the SNMP entity.
snmpOutTraps	Number of SNMP Trap PDUs generated by the SNMP entity.

/stats/aceni
ACENIC Statistics

```
[Alteon NIC Stats Menu]
        bd    - BD Coalescing Statistics
        clear - Reset ALL NIC Counters
        cmds  - Host to NIC Command Statistics
        dma   - DMA Attentions
        event - NIC Events Statistics
        inter - Host Interrupt Statistics
        resou - Ring/Misc Resources
        ring  - NIC Ring Manipulation Statistics
        rxmac - MAC Receive Statistics
        txmac - MAC Transmit Statistics
```

This menu option enables you to display the Alteon WebSystems Network Interface Card (ACEnic) statistics.

Table 28 ACEnic Statistics Menu Options (/stats/aceni)

Command Syntax and Usage
bd Displays the buffer descriptor coalescing statistics. For details, see "Buffer Coalescing Statistics" on page 86.
clear Resets all network interface card counters.
cmds Displays IP statistics. See "Host Command Statistics" on page 87.
dma Displays the host command statistics. See "DMA Statistics" on page 89.
event Displays the NIC event statistics. See "NIC Event Statistics" on page 90.
inter Displays host interrupt statistics. See "Host Interrupt Statistics" on page 91.
resou Displays the ring and miscellaneous resource statistics. See "Ring/Misc Resource Statistics" on page 91.

Table 28 ACEnic Statistics Menu Options (/stats/aceni) (Continued)

Command Syntax and Usage
ring Displays the NIC ring statistics. For details, see "NIC Ring Statistics" on page 93.
rxmac Displays MAC receive statistics. For details, see "MAC Receive Statistics" on page 94.
txmac Displays MAC transmit statistics. For details, see "MAC Transmit Statistics" on page 97.

/stats/aceni/bd

Buffer Coalescing Statistics

```
Buffer Descriptor statistics for port 1:
nicEventThresholdHit:                    0
nicSendThresholdHit:                     0
nicRecvThresholdHit:                     0
```

Table 29 describes the Buffer Descriptor Coalescing Statistics.

Table 29 Buffer Descriptor (BD) Coalescing Statistics (/stats/aceni/bd)

Statistic	Description
nicEventThresholdHit	Number of times EventMaxCoalesce BD Threshold hit.
nicSendThreshholdHit	Number of times either BD_FLAG_COAL_NOW or Send Max Coalesce BD Threshold hit.When these two conditions meet, the firmware sends updated consumer index to the host.
nicRecvThreshholdHit	Number of times Recv Max Coalesce BD Threshold hit. When this happens, the firmware updates the Receive Return Producer Index in the host.

/stats/aceni/cmds

Host Command Statistics

```
Host command statistics for port 1:
nicCmdsHostState:                          0
nicCmdsFdrFiltering:                       0
nicCmdsSetRecvProdIndex:                   0
nicCmdsUpdateGencommStats:                 0
nicCmdsResetJumboRing:                     0
nicCmdsAddMCastAddr:                       0
nicCmdsDelMCastAddr:                       0
nicCmdsSetPromiscMode:                     0
nicCmdsLinkNegotiate:                      0
nicCmdsSetMACAddr:                         0
nicCmdsClearProfile:                       0
nicCmdsSetMulticastMode:                   0
nicCmdsClearStats:                         0
nicCmdsSetRecvJumboProdIndex:              0
nicCmdsSetRecvMiniProdIndex:               0
nicCmdsRefreshStats:                       0
nicCmdsUnknown:                            0
```

Table 30 describes Host Command Statistics.

Table 30 Host Command Statistics (/stats/aceni/cmds)

Statistic	Description
nicCmdsFDRFiltering	Number of TG_CMD_FDR_FILTERING commands received.
nicCmdsSetRecvProdIndex	Number of TG_CMD_SET_RECV_PRODUCER_INDEX commands received.
nicCmdsUpdateGencommStats	Number of TG_CMD_UPDATE_GENCOM_STATS commands received.
nicCmdsResetJumboRing	Number of TG_CMD_RESET_JUMBO_RING commands received.
nicCmdsAddMCastAddr	Number of TG_CMD_ADD_MULTICAST_ADDR commands received.
nicCmdsDelMCastAddr	Number of TG_CMD_DEL_MULTICAST_ADDR commands received.
nicCmdsSetPromiscMode	Number of TG_CMD_SET_PROMISCUOUS_MODE commands received.
nicCmdsLinkNegotiate	Number of TG_CMD_LINK_NEGOTIATION commands received.

Table 30 Host Command Statistics (/stats/aceni/cmds) (Continued)

Statistic	Description
`nicCmdsSetMACAddr`	Number of TG_CMD_SET_MAC_ADDR commands received.
`nicCmdsClearProfile`	Number of TG_CMD_CLEAR_PROFILE commands received.
`nicCmdsSetMulticast-Mode`	Number of TG_CMD_SET_MULTICAST_MODE commands received.
`nicCmdsClearStats`	Number of TG_CMD_CLEAR_STATS commands received.
`nicCmdsSetRecvJumbo-ProdIndex`	Number of TG_CMD_SET_RECV_JUMBO_PRODUCER_INDEX commands received.
`nicCmdsSetRecvMini-ProdIndex`	Number of TG_CMD_SET_RECV_MINI_PRODUCER_INDEX commands received.
`nicCmdsRefreshStats`	Number of TG_CMD_REFRESH_STATS commands received.
`nicCmdsUnknown`	Number of unknown or illegal commands received.

/stats/aceni/dma

DMA Statistics

```
DMA statistics for port 1:
nicDmaRdOverrun:                    0
nicDmaRdUnderrun:                   0
nicDmaWrOverrun:                    0
nicDmaWrUnderrun:                   0
nicDmaWrMasterAborts:               0
nicDmaRdMasterAborts:               0
```

Table 31 describes the DMA Statistics.

Table 31 DMA Statistics (/stats/aceni/dma)

Statistic	Description
nicDmaRdOverrun	Number of times DMA read overrun error occurred. This DMA error and following DMA errors are detected and reported by hardware. This error indicates that DMA FIFO data is overwritten by new data from DMA read. If this counter is non-zero it indicates a serious error.
nicDmaRdUnderrun	Number of times DMA read underrun error occurred. This error indicates that DMA read engine is trying to read from an empty DMA FIFO. If this counter is non-zero it indicates a serious error.
nicDmaWrOverrun	Number of times DMA write overrun error occurred. This error indicates that DMA FIFO data is overwritten by the new data from DMA write. If this counter is non-zero it indicates a serious error.
nicDmaWrUnderrun	Number of times DMA write underrun error occurred. This error indicates that DMA write is ring to retrieve data from an empty DMA FIFO. If this counter is non-zero it indicates a serious error.
nicDmaRdMasterAborts	Number of times DMA read Master Abort error occurred. Possible cause is hardware failure or a bad address given to the NIC by the host driver.
nicDmaWrMasterAborts	Number of times DMA write master Abort error occurred. Possible cause is hardware failure or a bad address given to the NIC by the host driver.

/stats/aceni/event

NIC Event Statistics

```
Event statistics for port 1:
nicEventsNICFirmwareOperational:                0
nicEventsStatsUpdated:                          0
nicEventsLinkStateChanged:                      5
nicEventsError:                                 0
nicEventsMCastListUpdated:                      0
nicEventsResetJumboRing:                        0
```

Table 32 describes the NIC Event Statistics.

Table 32 NIC Event Statistics (/stats/aceni/event)

Statistic	Description
`nicEventsNICFirmware-Operational`	Number of TG_EVENT_FIRMWARE_OPERATIONAL events generated.
`nicEventsStatsUpdated`	Number of TG_EVENT_STATS_UPDATED events generated.
`nicEventsLinkState-Changed`	Number of TG_EVENT_LINK_STATE_CHANGED events generated.
`nicEventsError`	Number of TG_EVENT_ERROR events generated.
`nicEventsMCastListUp-dated`	Number of TG_EVENT_MULTICAST_LIST_UPDATED events generated.
`nicEventsResetJumboR-ing`	Number of TG_EVENT_RESET_JUMBO_RING commands received.

/stats/aceni/inter

Host Interrupt Statistics

```
Interrupt statistics for port 1:
nicInterrupts:                          0
nicAvoidedInterrupts:                   0
```

Table 33 Host Interrupt Statistics (/stats/aceni/inter)

Statistic	Description
nicInterrupts	Number of interrupts generated by the NIC.
nicAvoidedInterrupts	Number of interrupts avoided by the NIC.

/stats/aceni/resou

Ring/Misc Resource Statistics

```
Miscellaneous resource statistics for port 1:
nicDmaWriteRingFull:                                0
nicDmaReadRingFull:                                 0
nicEventRingFull:                                   0
nicEventProducerRingFull:                           0
nicTxMacDescrRingFull:                              0
nicOutOfTxBufSpaceFrameRetry:                       0
nicNoMoreWrDMADescriptors:                          0
nicNoMoreRxBDs:                                     0
nicNoSpaceInReturnRing:                             0
nicSendBDs:                                         0
nicRecvBDs:                                         0
nicJumboRecvBDs:                                    0
nicMiniRecvBDs:                                     0
nicTotalRecvBDs:                                    0
nicTotalSendBDs:                                    0
nicJumboSpillOver:                                  0
nicSbusHangCleared:                                 0
nicEnqEventDelayed:                                 0
```

Table 34 describes the Ring/Misc Resource Statistics.

Table 34 Ring/Misc Resource Statistics (/stats/aceni/resou)

Statistic	Description
nicDmaWriteRingFull	Number of times DMA write ring was full. The NIC firmware was unable to queue the data being sent from the NIC to the host in the DMA write ring. This indicates data moving to the host is slower than write requests generated by the NIC, typically due to a slow PCI bus/bridge chip.
nicDmaReadRingFull	Number of times DMA read ring was full. The NIC firmware was unable to queue the data being sent from the host to the NIC in the DMA read ring. This indicates data moving to NIC is slower than read requests generated by the NIC, typically due to a slow PCI bus/ bridge chip but sometimes due to a very large burst of data from the host.
nicEventRingFull	Number of times NIC Event ring was full. This indicates events are being generated faster than they are processed.
nicEventProducerRing-Full	Number of times the DMA write ring was full trying to place either the DMA event or event producer to host. This indicates events are generated faster than they can be processed.
nicTxMacDescrRingFull	Number of times MAC TX Descriptor ring was full. Possible cause is not enough TX buffer space.
nicOutOfTxBufSpace-FrameRetry	Number of times TX buffer space was full. Possible cause is not enough TX buffer space.
nicNoMoreWrDMADescrip-tors	Number of times NIC ran out of DMA write Descriptors. This indicates the DMA can not keep up with write requests. This is accompanied by a nicDmaWriteRingFull.
nicNoMoreRxBDs	Number of times NIC ran out of the Recv Buffer Descriptors. This indicates that the host is not replenishing empty receive BDs quickly enough.
nicNoSpaceInReturnRing	Number of times NIC could not place a buffer descriptor in the return ring because it was full. Possible cause is the host is too slow in processing packets.
nicSendBDs	Number of Send Buffer Descriptors current being handled in the NIC (host based send rings only).
nicRecvBDs	Number of Standard Receive Buffer Descriptors available to the NIC.
nicJumboRecvBDs	Number of Jumbo Receive Buffer Descriptors available to the NIC.

Table 34 Ring/Misc Resource Statistics (/stats/aceni/resou) (Continued)

Statistic	Description
nicMiniRecvBDs	Number of Mini Receive Buffer Descriptors available to the NIC (valid in Tigon 2 only).
nicTotalRecvBDs	Number of Receive Buffer Descriptors available to the NIC.
nicTotalSendBDs	Obsolete.
nicJumboSpillOver	Number of times a Jumbo frame was split into multiple standard BDs.
nicSbusHangCleared	Number of times an SBus DMA bug was worked around.
nicEnqEventDelayed	Number of times posting an event was delayed.

/stats/aceni/ring

NIC Ring Statistics

```
Ring statistics for port 1:
nicRingSetSendProdIndex:                    0
nicRingSetSendConsIndex:                    0
nicRingSetRecvReturnProdIndex:              0
```

Table 35 describes the NIC Ring Manipulation Statistics.

Table 35 NIC Ring Statistics (/stats/aceni/ring)

Statistic	Description
nicRingSetSendProdIndex	Number of times the NIC has seen updates to the Send Producer Index.
nicRingSetSendConsIndex	Number of times the send consumer index was updated.
nicRingSetRecvReturnProdIndex	Number of times the recv return producer index was updated.

/stats/aceni/rxmac

MAC Receive Statistics

```
MAC receive statistics for port 1:
nicMacRxLateColls:                              0
nicMacRxLinkLostDuringPkt:                      0
nicMacRxPhyDecodeErr:                           0
nicMacRxMacAbort:                               0
nicMacRxTruncNoResources:                       0
nicMacRxDropUla:                                0
nicMacRxDropMcast:                              0
nicMacRxFlowControl:                            0
nicMacRxDropSpace:                              0
nicMacRxColls:                                  0
nicMacRxTotalAttns:                             0
nicMacRxLinkAttns:                              0
nicMacRxSyncAttns:                              0
nicMacRxConfigAttns:                            0
nicMacReset:                                    0
nicMacRxBufDescrAttns:                          0
nicMacRxBufAttns:                               0
nicMacRxZeroFrameCleanup:                       0
nicMacRxOneFrameCleanup:                        0
nicMacRxMultipleFrameCleanup:                   0
nicMacRxTimerCleanup:                           0
nicMacRxDmaCleanup:                             0
```

Table 36 describes the MAC Receive Statistics.

Table 36 MAC Receive Statistics (/stats/aceni/rxmac)

Statistic	Description
`nicMacRxLateColls`	Packets dropped due to late collisions. This error does not happen at Gigabit speed as the NIC operates in full duplex mode.
`nicMacRxLinkLostDur-ingPkt`	Packets dropped because of loss of link. Possible causes are cable disconnected, broken cable, NIC hardware failure, or the link partner hardware failure.
`nicMacRxPhyDecodeError`	Packets dropped because of PHY decode errors. Possible cause is hardware failure that generates too much noise such that the PHY can not recognize the signal. Another possible cause is hardware failure.

Table 36 MAC Receive Statistics (/stats/aceni/rxmac) (Continued)

Statistic	Description
nicMacRxMacAbort	Packets aborted by MAC because of remote errors. Possible causes are receiving a packet smaller than minimal size (64 bytes), a PHY decode error (see above), a collision was detected during receipt, or an error occurred during gigabit half duplex frame extension.
nicMacTruncNoResources	Number of times a frame was dropped due to lack of NIC internal resources (e.g. memory space or MAC descriptors). This is usually because the bus is too slow. Increase RX buffer ratio, live with it, or invoke flow control.
nicMacRxDropUla	Unicast Packets dropped; this is caused by a nonmatching unicast address. This happens regularly on full duplex repeaters or during switch flooding.
nicMacRxDropMcast	Multicast Packets dropped; destination address in the received packet doesn't match the Multicast address list. This is normal for multicast packets for groups not set up by the host.
nicMacRxFlowControl	Number of Flow Control packets received.
nicMacRxDropSpace	Packets dropped because of lack of space. This is usually because the bus is too slow. Increase RX buffer ratio, live with it, or invoke flow control.
nicMaxRxColls	Number of packets dropped because of collisions. This is caused by two nodes sending messages simultaneously. This error does not happen at Gigabit speeds as the NIC is operating in full duplex mode.
nicMacRxTotalAttentions	Number of Mac Rx Attentions, e.g. Receive Descriptor Attention, Receive Buffer Attention, Flow Control XON Sent, Flow Control XOFF Sent, and FIFO overrun.
nicMacRxLinkAttentions	Number of link state change Attentions, e.g. Auto-Negotiation changed, Link State Error, and Link Ready Changed.
nicMacRxSyncAttentions	Number of Sync lost Attentions.
nicMacRxConfigAttentions	Number of Link Config Attentions. Possible causes are the link partner changing its link configuration. Under normal situation, this attention does not indicate hardware failure, only when this number is greater than the number of times link partner configuration changed.
nicMacReset	Number of times MAC was reset. This is caused by link lost and trying to re-establish the link.
nicMacRxBufDescrAttns	Obsolete.

Table 36 MAC Receive Statistics (/stats/aceni/rxmac) (Continued)

Statistic	Description
`nicMacRxBufAttns`	Number of Receive Buffer Descriptor Attentions. This attention is triggered by received buffer descriptor reaches a predefined threshold. This happens when the receive buffer fills either due to a slow host or a bad frame that has to be manually removed by the firmware.
`nicMacRxZeroFrame-Cleanup`	Number of times Received Buffer got cleaned up when the Receive Buffer is full and the frame received count is 0. This indicates the data in the receive buffer is all garbage. This could happen if the remote part kept sending errored frames.
`nicMacRxOneFrame-Cleanup`	Number of times Received Buffer got cleaned up when the Receive Buffer is full and the frame received count is 1. This could happen if the remote part kept sending errored frames.
`nicMacRxMultipleFrame-Cleanup`	Number of times Received Buffer got cleaned up when the Receive Buffer is full and the frame received count is more than one. This could happen if the remote part kept sending errored frames.
`nicMacRxTimerCleanup`	Number of times setting up a timer to wait for Receive Buffer space to be freed up when the Receive Buffer is full. This could happen if the remote part kept sending errored frames.
`nicMacRxDmaCleanup`	Number of times DMA Buffer got cleaned up when the Receive Buffer is full. This could happen if the remote part kept sending errored frames.

/stats/aceni/txmac

MAC Transmit Statistics

```
MAC transmit statistics for port 1:
nicMacTxCollisionHistogram:
        nicMacTxCollision[1]:                           0
        nicMacTxCollision[2]:                           0
        nicMacTxCollision[3]:                           0
        nicMacTxCollision[4]:                           0
        nicMacTxCollision[5]:                           0
        nicMacTxCollision[6]:                           0
        nicMacTxCollision[7]:                           0
        nicMacTxCollision[8]:                           0
        nicMacTxCollision[9]:                           0
        nicMacTxCollision[10]:                          0
        nicMacTxCollision[11]:                          0
        nicMacTxCollision[12]:                          0
        nicMacTxCollision[13]:                          0
        nicMacTxCollision[14]:                          0
        nicMacTxCollision[15]:                          0
        nicMacTxTotalAttns:                             0
```

Table 37 describes the MAC Transmit Statistics.

Table 37 MAC Transmit Statistics (/stats/aceni/txmac)

Statistic	Description
`nicMacTxCollision[1-15]`	Tx collision histogram.
`nicMacTxTotalAttentions`	Number of Tx Attentions.
`nicProfile[32]`	NIC profiling is not enabled, ignore MAC Transmit Statistics.

/stats/pcd
PCD Statistics

```
[PCD Statistics Menu]
        error - Client and IBP errors
        stats - Client and IBP statistics
        ibp   - IBP errors and statistics
        cache - Client Network Cache statistics
        all   - Client and IBP errors and statistics
        clear - Clear PCD statistics
```

The PCD Statistics Menu has options for displaying connection statistics and errors that are generated by client messages and IBP messages. Table 38 describes the PCD statistics options.

Table 38 PCD Statistics Menu Options (/stats/pcd)

Command Syntax and Usage
error Displays client errors and IBP errors. For details, see "Client and IBP Errors" on page 99.
stats Displays client statistics and IBP statistics. For details, see "Client and IBP Statistics" on page 101.
ibp Displays IBP errors and statistics.
cache Displays the following statistics: ■ Client cache hits ■ Client cache hits on expired entries ■ Client cache hits while local domain out of service ■ Client cache misses
all Displays all errors and statistics.
clear Resets iSD200-PCD statistics counters to zero.

/stats/pcd/error

Client and IBP Errors

```
No conns                    : 0   No frames                    : 0
Token Errors                : 0   No fdups                     : 0
Redir time missed           : 0   No timer                    : 0
Delay too big               : 0   IBP no conns                : 0
IBP conn down               : 0   IBP TCP errors              : 0
IBP token errors            : 0   IBP delay threshold exceeded : 0
IBP tx dropped              : 0   IBP TCP high water          : 0
IBP TCP errs w/conn UP      : 0   IBP TCP errs w/conn !UP      : 0
IBP RTT dropped             : 0   IBP Redirects Dropped       : 0
IBP Unknown Vector          : 0   IBP Unknown Message         : 0
IBP Bad Magic Number        : 0   IBP Bad Magic Version       : 0
IBP No Local Domain         : 0   IBP Bad MD5                 : 0
IBP Msg Start Not Align     : 0   IBP Msg Length Not Align    : 0
```

Table 39 describes the Client and IBP Errors.

Table 39 Client and IBP Errors (/stats/pcd/error)

Statistic	Descriptions
`No conns`	Out of resources; no client connection objects.
`No frames`	Out of resources; no frame buffers.
`Token Errors`	Errors while parsing client requests.
`No fdups`	Out of resources; no frame buffer duplicates.
`Redir time missed`	A redirect command was not issued on time.
`No timer`	Out of resources; no callback timers available.
`Delay too big`	Time to send redirect is mathematically too large.
`IBP no conns`	Out of resources; no IBP connection objects.
`IBP conn down`	Could not send IBP data because connection was down.
`IBP TCP errors`	Total number of TCP errors on IBP connections.
`IBP max delay exceeded`	IBP connection delay greater than threshold.
`IBP token errors`	Errors parsing IBP messages.
`IBP tx dropped`	IBP tx data (redirects) dropped for lack of resources or connection.
`IBP TCP high water`	IBP TCP High water mark exceeded.

Table 39 Client and IBP Errors (/stats/pcd/error) (Continued)

Statistic	Descriptions
IBP TCP errs w/conn UP	IBP TCP errors while connection is up.
IBP TCP errs w/conn !UP	IBP TCP errors while connection is down.
IBP RTT dropped	Round-trip-time messages dropped for lack of resources or connections.
IBP Redirects Dropped	Redirects dropped while receiving due to lack of frames.
IBP Unknown Vector	Unknown vector type in IBP data.
IBP Unknown Message	Unknown message type in IBP data.
IBP Bad Magic Number	Bad magic number in IBP data header.
IBP Bad Magic Version	Bad magic version in IBP data header.
IBP No Local Domain	IBP received redirect from unknown local domain.
IBP Bad MD5	Unable to authenticate IBP connection.
IBP Msg Start Not Align	Incoming IBP message not aligned.
IBP Msg Length Not Align	Length of IBP message not aligned.

/stats/pcd/stats

Client and IBP Statistics

```
Active conns              : 0           Active conns hwm          : 0
IBP active conns          : 0           Client rx complete        : 0
Name matches              : 0           Name misses               : 0
Client redir sched        : 0           Redirects Sent            : 0
Requests while OOS        : 0           IBP Redirect Complete     : 0
IBP rx complete           : 0           IBP tx complete           : 0
IBP Redirect Messages     : 0           IBP Timestamp Messages    : 0
IBP Identity Messages     : 0           IBP Proximity Messages    : 0
IBP Redirect Vectors      : 0           IBP Timer Requests        : 0
IBP Timer Responses       : 0           IBP Identity Vectors      : 0
Footrace Initiated        : 0           Double Redirect Initiated: 0
Double Redirect Completed: 0            Refresh Initiated         : 0
Refresh Completed         : 0           Clnt cache hit            : 0
Clnt cache hit - expired : 0            Clnt cache hit - OOS      : 0
Clnt cache miss           : 0
```

Table 40 describes the Client/IBP Statistics.

Table 40 Client/IBP Statistics (/stats/pcd/stats)

Statistic	Description
`Active conns`	Active client connections.
`Active conns hwm`	Highest number of active client connections experienced.
`IBP active conns`	Active IBP connections.
`Client rx complete`	Client requests accepted.
`Name matches`	Name recognized in client request.
`Name misses`	Name not recognized in client request.
`Client redir sched`	Redirects scheduled for later transmission.
`Redirects Sent`	Redirects transmitted.
`Requests while oss`	Requests received while our local domain is out of service.
`IBP Redirect Complete`	IBP redirects received.
`IBP rx complete`	IPB messages received.
`IBP tx complete`	IBP messages transmitted.
`IBP Redirect Messages`	IBP redirect messages received.

Table 40 Client/IBP Statistics (/stats/pcd/stats) (Continued)

Statistic	Description
IBP Timestamp Messages	IBP timestamp messages received.
IBP Identity Messages	IBP identity messages received.
IBP Proximity Messages	IBP proximity messages received.
IBP Redirect Vectors	IBP redirect vectors received.
IBP Timer Requests	IBP timer request vectors received.
IBP Timer Responses	IBP timer time response vectors received.
IBP Identity Vectors	IBP identity vectors received.
Footrace Initiated	Number of times the footrace proximity method was initiated.
Double Redirect Initiated	Number of times the double-redirect proximity method was initiated.
Double Redirect Completed	Number of times the double-redirect proximity method was completed.
Refresh Initiated	Number of times the refresh proximity method was initiated.
Refresh Completed	Number of times the refresh proximity method was completed.
Clnt cache hit	Client network cache hits.
Clnt cache hit - expired	Client network cache hits but entry expired.
Clnt cache hit - OOS	Client network cache hits but local domain out of service.
Clnt cache miss	Client not found in cache.

CHAPTER 8

The Configuration Menu

This chapter describes the Configuration Menu, which allows you to access configuration parameters for the iSD200-PCD. In addition, the Configuration Menu provides a command to write the current configuration in script form to a file (`/cfg/dump`) and also provides commands to save (`/cfg/ptcfg`) or restore (`/cfg/gtcfg`) the current configuration to a tftp server.

There are two layers of configuration: administrative and PCD. The administrative-layer refers to the parameters in `/cfg/sys`, `/cfg/port`, `/cfg/ip`, and `/cfg/syslog` that make it possible to access an iSD200-PCD from a network. The PCD-layer refers to the parameters in `/cfg/pcd` that make it possible for an iSD200-PCD to participate in site-selection.

Administrative parameter settings are unique for each iSD200-PCD and must be set, initially, through a console connection. PCD parameter settings are identical for each iSD200-PCD in the network, because the role of *Synchronizing PCD* that each iSD200-PCD plays on a periodic basis, requires each iSD200-PCD to know its own parameter settings and the parameter settings of every other iSD200-PCD.

/cfg
Configuration Menu

```
[Configuration Menu]
        sys   - System-wide parameter menu
        port  - Port configuration menu
        ip    - IP configuration menu
        snmp  - SNMP menu
        setup - Step by step configuration set up
        syslg - Syslog menu
        dump  - Dump current configuration to script file
        ptcfg - Backup current configuration to tftp server
        gtcfg - Restore current configuration from tftp server
        pcd   - PCD Configuration Menu
```

Table 41 describes the Configuration Menu options.

Table 41 Configuration Menu Options (/cfg)

Command Syntax and Usage
sys Displays the System Configuration Menu. For details, see "System Configuration" on page 106.
port Displays the Port Configuration Menu. For details, see "Port Configuration" on page 108.
ip Displays the IP Configuration Menu. For details, see "IP Configuration" on page 111.
snmp Displays the SNMP Configuration Menu. For details, see "SNMP Configuration" on page 116.
setup Step-by-step configuration set-up of the switch. For details, see "Setup" on page 118.
syslg Displays the Syslog Menu. For details, see "System Log" on page 118.
dump Dumps current configuration to a script file. For details, see "Dump" on page 119.

Table 41 Configuration Menu Options (/cfg) (Continued)

Command Syntax and Usage
ptcfg [<*host name or IP address*> <*filename on host*>] Backs up current configuration to TFTP server. For details, see "Saving the Active Configuration" on page 120.
gtcfg [<*host name or IP address*> <*filename on host*>] Restores current configuration from TFTP server. For details, see "Loading the Active Configuration" on page 120.
pcd Displays the PCD Configuration Menu. For details, see "PCD Configuration" on page 121.

Applying and Saving Changes

The changes you make are applied as you enter them. However, the changes must be saved with the `save` command or they will be lost the next time you boot the iSD200-PCD. You can also back up the current configuration to the tftp server and restore a configuration from the tftp server (see the `/cfg/ptcfg` and `/cfg/gtcfg` command descriptions in subsequent sections).

/cfg/sys
System Configuration

```
[System Menu]
        date  - Set system date
        time  - Set system time
        usrpw - Set user password
        admpw - Set administrator password
        l4apw - Set L4 administrator password
        tnet  - Enable/disable Telnet access
        bannr - Set login banner
        mnet  - Set management network
        mmask - Set management netmask
        cur   - Display current system-wide parameters
```

Enter a System Menu option at the CLI and the command will prompt for the required information.

Table 42 System Configuration Menu Options (/cfg/sys)

Command Syntax and Usage
date Configures the system date. The command will prompt you for the year, month, and day.
time Configures the system time using a 24-hour clock format. The command will prompt you for the hour, minute, and seconds.
usrpw Configures the user password; the maximum length is 15 characters. The user can only view iSD200-PCD information and statistics.
admpw Configures the administrator password; the maximum length is 15 characters. The administrator can view all iSD200-PCD information and statistics and change any parameters.
14apw Configures the L4apw password; the maximum length is 15 characters. The L4 administrator can view all iSD200-PCD information and statistics and change the operations and maintenance parameters.

Table 42 System Configuration Menu Options (/cfg/sys) (Continued)

Command Syntax and Usage
tnet disable|enable Enables or disables Telnet access to CLI sessions. The command is accessible only from the local console.
bannr *<string>* Configures a login banner of up to 80 characters. When a user or administrator logs into the switch, the login banner is displayed; it is also displayed as part of the output from the `/info/sys` command.
mnet *<IP subnet>* Sets the network subnet address for remote access through a Telnet, SNMP, RIP, or the NMS connection. A range of IP addresses is produced when used with `mmask` (below). Specify an IP address in dotted-decimal notation.
mmask *<IP subnet mask>* This IP subnet mask is used with mnet to set a range of source IP addresses that are allowed access to switch management functions. Specify the IP subnet mask in dotted-decimal notation.
cur Displays the current system parameters.

/cfg/port
Port Configuration

```
[Port 1 Menu]
        fast  - Fast phy menu
        gig   - Gig phy menu
        dis   - Disable port
        ena   - Enable port
        cur   - Display current port configuration
```

The Port Menu enables you to configure the iSD200-PCD port speed. The port is either 10/100/1000BaseT copper or 1000BaseSX fiber.

Table 43 Port Configuration Menu Options (/cfg/port)

Command Syntax and Usage
fast If the uplink port supports Fast Ethernet, this option displays the Fast Ethernet Physical Link menu. For details, see "Fast Port Configuration" on page 109.
gig Displays the Gigabit Ethernet Physical Link menu. For details, see "Gigabit Port Configuration" on page 110.
dis Disables the port.
ena Enables the port.
cur Displays current port parameters.

/cfg/port/fast

Fast Port Configuration

```
[Fast Link Menu]
      speed   - Set link speed
      mode    - Set full or half duplex mode
      auto    - Control autonegotiation
      cur     - Display current link configuration
```

Use this menu to select Fast Ethernet Physical Link options, as described in Table 44.

Table 44 Port Link Configuration Menu Options (/cfg/port/fast)

Command Syntax and Usage
speed 10|100|any Sets the link speed; the choices are: ■ "Any," for automatic detection (default) ■ 10 Mbps ■ 100 Mbps
mode full|half|any Sets the operating mode; the choices include: ■ Any, for autonegotiation (default) ■ Full-duplex ■ Half-duplex
auto on|off Enable or disable auto-negotiation for the port.
cur Displays current port parameters.

/cfg/port/gig
Gigabit Port Configuration

```
[Gigabit Link Menu]
        fctl  - Set flow control
        auto  - Control autonegotiation
        cur   - Display current gig link configuration
```

Use this menu to select Gigabit Ethernet Physical Link options, as described in Table 45.

Table 45 Port Link Configuration Menu Options (/cfg/port/gig)

Command Syntax and Usage
fctl rx|tx| both|none Sets the flow control; the choices include: ■ Autonegotiation (default) ■ Receive flow control ■ Transmit flow control ■ Both receive and transmit flow control ■ No flow control
auto on|off Enable or disable auto-negotiation for the port.
cur Displays current port parameters.

/cfg/ip
IP Configuration

```
[IP Menu]
        if    - Interface menu
        gw    - Default gateway menu
        route - Static route menu
        rip1  - Routing Information Protocol menu
        dns   - Domain Name System menu
        host  - Set hostname
        log   - Set IP address of syslog host
        rearp - Set re-ARP period in minutes
        cur   - Display current IP configuration
```

Table 46 describes the IP Configuration Menu options.

Table 46 IP Configuration Menu Options (/cfg/ip)

Command Syntax and Usage
if Displays the IP Interface Menu. For details, see "IP Interface Configuration" on page 112.
gw Displays the IP Default Gateway Menu. For details, see "Default IP Gateway Configuration" on page 113.
route Displays the IP Static Route Menu. For details, see "IP Static Route Configuration" on page 113.
rip1 Displays the Routing Interface Protocol Menu. For details, see "Routing Information Protocol Configuration" on page 114.
dns Displays the IP Domain Name System Menu. For details, see "Domain Name System Configuration" on page 115.
host [<*hostname*>] Displays the current host name and prompts you to enter a new one (up to 15 characters). The host name appears in the CLI prompt and in the **/info/sys** display.

Table 46 IP Configuration Menu Options (/cfg/ip) (Continued)

Command Syntax and Usage
log *<address>* Sets the IP address, in dotted-decimal notation, of the syslog host. For details, see "Syslog Host Configuration" on page 116.
rearp *<minutes>* Sets the re-ARP period in minutes (2-120). The iSD200-PCD periodically sends Address Resolution Protocol (ARP) requests to refresh its address database. The `/cfg/rearp` command sets the interval between ARP refresh requests. The CLI displays the current interval (in minutes) and prompts you to enter a new one.
cur Displays the current IP configuration.

/cfg/ip/if
IP Interface Configuration

```
[IP Interface 1 Menu]
        addr  - Set IP address
        mask  - Set subnet mask
        mtu   - Set MTU
        cur   - Display current interface configuration
```

Use this menu to select IP interface options, as described in the Table 47.

Table 47 IP Interface Menu Options (/cfg/ip/if)

Command Syntax and Usage
addr *<IP address>* Configures the IP address of the iSD200-PCD using dotted-decimal notation.
mask *<IP subnet mask>* Configures the subnet mask for the iSD200-PCD using dotted-decimal notation.
mtu *<mtu>* Specifies the size of the maximum transfer unit (MTU). The default is 1514.
cur Displays the current interface settings.

/cfg/ip/gw

Default IP Gateway Configuration

```
[Default gateway 1 Menu]
    addr    - Set IP address
    cur     - Display current default gateway configuration
```

Table 48 describes the Default Gateway Menu options.

Table 48 Default Gateway Options (/cfg/ip/gw)

Command Syntax and Usage
addr *<IP address>* Configures the IP address of the default gateway using dotted-decimal notation.
cur Displays the current gateway settings.

/cfg/ip/route

IP Static Route Configuration

```
[IP Static Route Menu]
      add     - Add static route
      rem     - Remove static route
      cur     - Display current static routes
```

Table 49 IP Static Route Menu (/cfg/ip/route)

Command Syntax and Usage
add *<IP address> <IP mask> <gateway>* Adds a static route. You will be prompted to enter a destination IP address, destination subnet mask, and gateway address. Specify all addresses using dotted-decimal notation.
rem *<IP address>* Removes a static route. Specify the destination address of the route you want to remove using dotted-decimal notation.
cur Displays the current IP static routes.

/cfg/ip/rip1

Routing Information Protocol Configuration

```
[Routing Information Protocol Menu]
        rip    - RIP control for a specific interface
        on     - Globally turn RIP ON
        off    - Globally turn RIP OFF
        cur    - Display current RIP configuration
```

The RIP1 Menu is used for configuring Routing Information Protocol version 1 parameters.

NOTE – Do not configure RIP1 parameters if your routing equipment uses RIP version 2.

Table 50 describes the Routing Information Protocol Menu options.

Table 50 Routing Information Protocol Menu (/cfg/ip/rip1)

Command Syntax and Usage
rip <*interface*> **active**|**passive**|**off** Enable RIP control for a specific interface.
on Globally turns RIP ON.
off Globally turns RIP OFF.
cur Displays the current RIP configuration.

/cfg/ip/dns

Domain Name System Configuration

```
[Domain Name System Menu]
        prima - Set IP address of primary DNS server
        secon - Set IP address of secondary DNS server
        dname - Set default domain name
        add   - Add Authoritative entry
        cache - Control DNS cache
        cur   - Display current DNS configuration
```

The Domain Name System (DNS) Menu is used for defining the DNS servers on your local network, for configuring cache control, and for setting the default domain name served by the iSD200-PCD. DNS parameters must be configured prior to using host name parameters with the `ping`, `traceroute`, and `tftp` commands.

Table 51 Domain Name Service Menu Options (/cfg/ip/dns)

Command Syntax and Usage
prima *<IP address>* You will be prompted to set the IP address for your primary DNS server. Specify the IP address using dotted-decimal notation.
secon *<IP address>* You will be prompted to set the IP address for your secondary DNS server. If the primary DNS server fails, the iSD200-PCD will use the secondary DNS server for outbound TCP/IP connections. Specify the IP address using dotted-decimal notation.
dname *<domain>* Sets the default domain name used by the iSD200-PCD (e.g., mycompany.com). If you do not enter the domain name argument, the domain name will be blank.
add [*<domain>* *<IP address>*] Adds a new authoritative domain name and IP address to the DNS table.
cache [**flush**] Lists the client network cache entries. If you enter the optional argument flush, the command also removes all entries from the cache. Local and global domains put authoritative entries in the DNS cache. The entries are removed when a global or local domain is deleted.
cur Displays the current Domain Name System settings.

/cfg/ip/log
Syslog Host Configuration

The Syslog Host command allows you to set the IP address of the syslog host. The CLI displays the current IP address and prompts you to enter a new one.

Each syslog message has a criticality level associated with it, included in text form as a prefix to the log message. One of eight different prefixes is used, depending on the condition:

- EMERG: indicates the system is unusable
- ALERT: indicates action should be taken immediately
- CRIT: indicates critical conditions
- ERR: indicates error conditions or errored operations
- WARNING: indicates warning conditions
- NOTICE: indicates a normal but significant condition
- INFO: indicates an information message
- DEBUG: indicates a debut-level message

/cfg/snmp
SNMP Configuration

```
[SNMP Menu]
      name    - Set SNMP "sysName"
      locn    - Set SNMP "sysLocation"
      cont    - Set SNMP "sysContact"
      rcomm   - Set SNMP read community string
      trap1   - Set first SNMP trap host address
      trap2   - Set second SNMP trap host address
      t1comm  - Set community string for first trap host
      t2comm  - Set community string for second trap host
      linkt   - Enable/disable SNMP link up/down trap
      cur     - Display current SNMP configuration
```

The iSD200-PCD support for SNMP-based network management is presently limited to the system, IP, and interface portions of MIB II (RFC 1213), GETs only.

Table 52 describes the SNMP Configuration Menu options.

Table 52 SNMP Configuration Menu Options (/cfg/snmp))

Command Syntax and Usage
name [<*name*>] Configures the name for the system. The name can have a maximum of 64 characters.
locn [<*location*>] Configures the name of the system location. The system location can have a maximum of 64 characters.
cont [<*contact*>] Configures the name of the system contact. The system contact can have a maximum of 64 characters.
rcomm [< *community*>] Configures the SNMP read community string. The read community string controls SNMP "get" access to the switch. It can have a maximum of 32 characters.
trap1 [< *IP address*>] Configures the IP address of the first SNMP trap host using dotted-decimal notation. The SNMP trap host is the device that receives SNMP trap messages from the switch.
trap2 [< *IP address*>] Configures the IP address of the second SNMP trap host using dotted-decimal notation.
t1com [<*community*>] Configures the community string for the first trap host. A maximum of 32 characters is allowed.
t2com [<*community*>] Configures the community string for the second trap host. A maximum of 32 characters is allowed.
linkt [<**d**|**e**>] Enables or disables the sending of SNMP link up and link down traps.
cur Displays the current SNMP information.

/cfg/setup
Setup

The `setup` command invokes the setup utility, which steps you through the process of configuring the administrative layer parameters (system date and time, port speed and flow control, IP address, and network addresses) and the PCD-layer parameters (global domains, local domains and members).

For a complete description of how to use Setup, see Chapter 4, "First-Time Configuration."

/cfg/syslg
System Log

```
[Syslog Menu]
        clear - Clear syslog log file
        con   - Enable/disable syslog messages to console
        fac   - Set syslog facility
        host  - Set IP address of syslog host
        levl  - Set syslog level
        log   - Show syslog log file
        cur   - Show current syslog configuration
```

The Syslog Menu options allow you to configure and control the Syslog messages. Table 53 describes the Syslog Menu options.

Table 53 System Log Menu Options (/cfg/syslg))

Command Syntax and Usage
clear Clears all entries from the syslog file.
con [e|d] Enable/disables the display of syslog messages to the console.
fac *<number>* Sets the syslog facility (i.e., the type of device generating the messages). Acceptable values are 0-65535, with 10 being the default.

Table 53 System Log Menu Options (/cfg/syslg)) (Continued)

Command Syntax and Usage
host *<IP address>* Sets the IP address of the syslog host using dotted-decimal notation. All syslog messages are transmitted to UDP port 520 of the syslog host.
levl *<number>* Sets the syslog level. Valid entries are: 0 LOG_EMERG System unusable 1 LOG_ALERT Action must be taken immediately 2 LOG_CRIT Critical condition 3 LOG_ERR Error condition 4 LOG_WARN Warning condition 5 LOG_NOTICE Normal but significant condition 6 LOG_INFO Informational 7 LOG_DEBUG Debug The default level is 6.
log Displays all syslog file contents. If there are no syslog messages, "Empty List" is displayed.
cur Displays the current syslog configuration (i.e., Host IP address, Facility, Level, and Console status).

/cfg/dump
Dump

The dump command displays the current configuration in the form of a script. The screen display can be captured, edited, and placed in a configuration script file.

The configuration script file can be used to configure other iSD200-PCDs through a Telnet connection. Just open a Telnet connection for each iSD200-PCD and paste the PCD-layer commands from the script file at the CLI prompt.

/cfg/ptcfg
Saving the Active Configuration

The **ptcfg** command backs up the current configuration to the TFTP server. *Server* is the TFTP server IP address or host name, and *filename* is the name of the target script configuration file.

To start the switch configuration backup, at the Configuration# prompt, enter:

```
Configuration# ptcfg [<server> <filename>]
```

NOTE – If the TFTP server is running SunOS or the Solaris operating system, the specified `ptcfg` file must exist prior to executing the `ptcfg` command, and must be writable (set with proper permission, and not locked by any application). The contents of the specified file will be replaced with the current configuration data.

/cfg/gtcfg
Loading the Active Configuration

The `gtcfg` command restores the iSD200-PCD configuration stored at the TFTP server. *Server* is the TFTP server IP address or host name, and *filename* is the name of the target script configuration file. The file is loaded directly into the active configuration block.

To start the switch configuration restore, at the Configuration# prompt, enter:

```
Configuration# gtcfg [<server> <filename>]
```

/cfg/pcd
PCD Configuration

```
[PCD Configuration Menu]
        globa - Global Domains Menu
        local - Local Domains Menu
        membr - Members Menu
        cache - Client Cache Menu
        nms   - NMS Menu
        cur   - Display current parameters
```

For site-selection to occur, there must be:

- a *global domain* configured for each group of mirror sites (see "Global Domain Configuration" on page 123).
- a *local domain* configured for each site in the global domain (see "Local Domain Configuration" on page 125).
- a *member* configured for each local domain (see "Member Configuration" on page 128).

Each iSD200-PCD must have its own PCD-layer parameters stored in its memory, as well as the PCD-layer parameters of every other iSD200-PCD. This can be accomplished by entering all PCD-layer parameters at one iSD200-PCD, then using the `/cfg/dump` command to propagate the parameters to the other iSD200-PCDs in the network (see "Dump" on page 119).

NOTE – If you use the `/cfg/dump` command to propagate parameters to load-balanced iSD200-PCDs, you must subsequently modify each unit's VIP setting.

Duplicate PCD-layer configurations at each iSD200-PCD allow any iSD200-PCD that receives a client request to act as the *synchronizing PCD* for that connection. The synchronizing PCD sends redirect data to the other iSD200-PCDs and synchronizes their responses to the client. This allows the iSD200-PCDs to operate as a system without centralized device to coordinate them.

Table 54 describes the PCD Configuration Menu options.

Table 54 PCD Configuration Menu Options (/cfg/pcd)

Command Syntax and Usage
globa Displays options for configuring global domains. For details, see "Global Domain Configuration" on page 123.
local Displays options for configuring local domains. For details, see "Local Domain Configuration" on page 125.
membr Displays options for configuring iSD200-PCDs as members of a local domain. For details, see "Member Configuration" on page 128.
cache Displays options for configuring cache parameters. For details, see "Cache Configuration" on page 129.
nms Displays options for configuring nms parameters. For details, see "NMS Configuration" on page 131.
cur [**global**|**local**|**member**|**cache**] Allows you to display parameters for each component in the category you select. With no argument, the CLI defaults to member. If there is no information to report for the selected category, "Empty list" is displayed.

/cfg/pcd/globa
Global Domain Configuration

```
[Global Configuration Menu]
        add   - Add global domain
        proxi - Set proximity method for a global domain
        authe - Set PIN for global domain
        parti - Set participation threshold for global domain
        renew - Set IBP connection renewal time for global domain
        rem   - Remove global domain
        cur   - Display current global domain parameters
        hiwat - Set tcp high water mark for this global domain's
                IBP connections
```

The Global Domain Configuration Menu provides options for configuring global domains.A global domain must be defined before local domains and members can be added to it.

Table 55 Global Domain Options (/cfg/pcd/globa)

Command Syntax and Usage
add *<global domain alias> <global domain url>* [*<proximity method>*] [*<pin>*] [*<threshold delay>*] [*<ibp renewal time>*] Displays a sequence of prompts for configuring a global domain. They are: ■ Global Domain Alias — Enter an alias for the global domain. You can use any combination of alphanumeric characters, but it is recommended that you keep the alias short. ■ Global Domain URL — Enter the DNS-registered URL represented by the global domain. ■ Proximity Method — Optional; see `proxi`.). ■ Authentication PIN — Optional; see `authe`. ■ Participation Threshold — Optional; see `parti`. ■ IBP Renewal Time — Optional; see `renew`.
proxi *<global domain alias>* **footrace|double_redirect|refresh|dns_round_robin** Allows you to specify a proximity method for the global domain you specify.
authe *<global domain alias> <4-digit pin>* Allows you to select a global domain alias and specify a PIN that must be contained in all messages between iSD200-PCDs in the global domain. Originating iSD200-PCDs append the PIN to outgoing messages; receiving iSD200-PCDs accept messages that contain the specified PIN and ignore those that do not contain the specified PIN.

Table 55 Global Domain Options (/cfg/pcd/globa) (Continued)

Command Syntax and Usage
parti *<global domain alias> <threshold (ms)>* Allows you to select a global domain alias and specify a Participation Threshold (in milli-seconds). The intent is to exclude from the site-selection process a local domain that has an unacceptably long inter-box communications (IBP) round-trip-time (RTT) to the synchronizing PCD. This lets you keep the performance impact of site-selection within acceptable limits. Example: ■ Global domain #1 has three local domains (A, B, and C). ■ The RTT of 200 ms between A and C is too long. ■ The RTTs of 50 ms between A and B and 75 ms between B and C are acceptable. By setting the Participation Threshold to 100 ms, you can exclude C from site-selection when A is the synchronizing PCD. This will also exclude A from site-selection when C is the synchronizing PCD.
renew *<global domain alias> <min>* Allows you to set the interval for re-establishing IBP connections among iSD200-PCDs. Valid values are 0–1440.
rem *<global domain alias>* Allows you to select a global domain alias and remove it from the iSD200-PCD configuration. When you remove a global domain, you remove all the associated local domain and member parameters as well.
cur [**global**|**local**|**member**|**cache**] Allows you to display parameters for each component in the category you select. With no argument, the CLI defaults to global domain. If there is no information to report for the selected category, "Empty list" is displayed. The global domain information also includes the Client Listen IP, which identifies the iSD200-PCD you are connected to. If 0.0.0.0:80 is displayed, the iSD200-PCD is not a member of the specified global domain. See "Member Configuration" on page 128 for more information.
hiwat *<global domain ID> <byte count>* Allows you to set the high water mark for IBP messages. The high water mark determines the size in bytes of the IBP message buffer, beyond which http redirect messages (but not synchronization messages) are discarded. The byte count range is 0-65535. A value of zero disables the feature (i.e., no http redirect messages are discarded). The default value is 16384 bytes.

/cfg/pcd/local

Local Domain Configuration

```
[Local Domain Configuration Menu]
        add   - Add local domain
        url   - URL of the local domain
        srvr  - IP address of server that answers client request
        ibp   - Set IBP Listen address for local domain
        virtu - Set Local Virtual address for local domain
        dnswt - Set DNS weighting
        delay - Set Response Delay for local domain
        hcip  - Set health check IP address
        hctp  - Set health check test page
        hcfq  - Set health check frequency
        hcwt  - Set health check result weight
        hcr   - Set remote health check for this local domain
        rem   - Remove local domain
        cur   - Display current local domain parameters
```

The Local Domain Configuration Menu provides options for configuring local domain parameters. Local domains must be defined before members can be defined. The health check commands allow you to configure health check parameters for determining the availability of servers for additional client connections.

Health checking is accomplished by requesting a test page from a server and recording the response time. Each health check command includes the local domain alias, which identifies the local domain that represents the site of the server being probed.

Table 56 Local Domain Options (/cfg/pcd/local)

Command Syntax and Usage
add *<global domain alias> <local domain alias>* [*<local domain url>*] [*<server IP>*] [*<IBP IP>*[**:***<port>*]] [*<virtual IP>*[**:***<port>*]] [*<dns_weight>*] [*<delay ms>*] [*<hc IP>*[**:***<port>*]] [*<hc test page>*] [*<hc freq (sec)>*] [*<hc weight>*] [*<remote hc (***enable**|**disable***)>*] Displays a sequence of prompts for configuring a local domain. They are: ■ Global Domain Alias — Enter the alias of the global domain you are configuring. ■ Local Domain Alias — Enter an alias for the local domain name. You can use any combination of alphanumeric characters, but it is recommended that you keep the alias short. ■ Local Domain URL — Enter the DNS-registered Universal Resource Locator (URL) that clients use to connect to the Web host. ■ Server IP — Optional; see `srvr`. ■ IBP IP [:Port] — Optional; see `ibp`. ■ Virtual IP [:Port] — Optional; see `virtu` ■ DNS Weight (0-100)—Optional: see `dnswt` ■ Delay — Optional; see `delay`. ■ Health Check IP—Optional: see `hcip`. ■ Health Check Test Page—Optional: see `hctp`. ■ Health Check Probe Freq—Optional: see `hcfq`. ■ Health Check Probe Weight—Optional: see `hcwt`. ■ Health Check Remote Probe—Optional: see `hcr`.
srvr *<local domain alias> <server IP>* Allows you to specify the IP address (or VIP) of the server to which the client request will be directed. The entry is significant only if you select the DNS round-robin proximity method.
ibp *<local domain alias> <IBP IP*[**:***<port>*]*>* Allows you to set the IBP IP address and TCP port for a specified local domain. The address is used for Inter-box Protocol (IBP) communications between iSD200-PCDs. Use dotted-decimal notation to set the address. The port value defaults to 10000.
virtu *<local domain alias> <virtual IP*>[**:***<port>*] Allows you to select a local domain alias and specify the Virtual IP (VIP) address and TCP port that represents a load-balanced cluster of iSD200-PCDs. Use dotted-decimal notation to set the address. The port value defaults to 80. If your iSD200-PCD is not load-balanced by a switch, the VIP[:port] should be left as 0.0.0.0:80, the default IP address:port.

Table 56 Local Domain Options (/cfg/pcd/local) (Continued)

Command Syntax and Usage
dnswt *<local domain alias> <0-100>* Allows you to set the weighting factor for the DNS Round-Robin proximity method. The value determines the number of successive connections a site will get per round-robin cycle.
delay *<local domain alias> <ms>* Allows you to set the Response Delay time from the specified local domain to a client. Increase the value if you want to slow down responses to force connections onto other iSD200-PCDs in the global domain. Set the value to **0** to remove delay.
hcip *<local domain alias> <health check IP>*[**:***<port>*] Allows you to set the remote server IP address for server health check probes.
hctp *<local domain alias> <health check test page>* Allows you to set the resource path served by remote server(s). For the *health check test page*, enter the test page resource path (e.g., www.myco.com/test.html). The service defaults to http.
hcfq *<local domain alias> <health check freq (sec)>* Allows you to set the natively in seconds between server health check probes.
hcwt *<local domain alias> <health check result weight (0-10000%)>* Allows you to set the server probe weight for remote server health check probes. The weight is multiplied by the health check response time and that value is used to delay the response to the client during site-selection. You can use the weight to alter the availability of a site for additional client connections.
hcr *<local domain alias> <remote health check (***enable**|**disable***)>* Allows you to enable or disable remote server health check probes.
rem *<local domain alias>* Allows you to remove a local domain.
cur [**global**|**local**|**member**|**cache**] Allows you to display parameters for each component in the category you select. With no argument, the CLI defaults to local. If there is no information to report for the selected category, "Empty list" is displayed.

/cfg/pcd/membr
Member Configuration

```
[Member Configuration Menu]
        add   - Add member to local domain
        liste - Set PCD address for client connections
        rem   - Remove member from local domain
        cur   - Display current members
```

The Member Configuration Menu provides options for configuring member parameters. The member parameters of an iSD200-PCD must be configured before it can participate in the site-selection process for a local domain.

Table 57 Member Configuration Options (/cfg/pcd/membr)

Command Syntax and Usage
add *<local domain alias> <PCD IP>* [*<client listen IP>*[**:***<port>*]]
Displays a sequence of prompts for configuring a member. They are: ■ Local Domain Alias — Enter the alias of the local domain you are configuring. ■ PCD IP — Enter the IP address for the member you are configuring. This is the same address that you configured with the `/cfg/ip/if/addr` command. ■ Listen IP[:Port]— (Optional) Enter the Listen IP address and TCP port for the specified member. If you do not enter these parameters, the iSD200-PCD will default to the PCD IP address and TCP port 80.
liste *<local domain alias> <PCD IP> <client listen IP>*[**:***<port>*]
Allows you to change the Client Listen IP address and TCP port for the specified local domain and member. ■ Local Domain Alias — Enter the local domain alias for the member you are configuring. ■ PCD IP — Enter the IP address for the member you are configuring. This is the same address that you configured with the `/cfg/ip/if/addr` command. ■ Listen IP[:Port] — Enter the Listen IP address and TCP port for the specified member. If you do not enter the TCP port parameter, the CLI defaults to TCP port 80.
rem *<local domain alias> <PCD IP>*
Allows you to remove the member (specified by the PCD IP address) from the specified local domain.
cur [**global**|**local**|**member**|**cache**]
Allows you to display parameters for each component in the category you select. With no argument, the CLI defaults to member. If there is no information to report for the selected category, "Empty list" is displayed.

/cfg/pcd/cache
Cache Configuration

```
[Client Cache Configuration Menu]
        mask  - Set the default netmask for the client cache
        timeo - Set timeout for client network entries
        adden - Add a static entry to the client cache
        remen - Remove a static entry from the client cache
        cur   - Display current client cache settings
        dump  - Display current client cache entries
        clear - Clear client cache learned entries
```

The Client Cache Configuration Menu provides options for configuring the CNC parameters.

Table 58 Client Cache Configuration Options (/cfg/pcd/cache)

Command Syntax and Usage
mask *<netmask>* Allows you to set the default netmask, in dotted-decimal notation, for the client network cache. The default netmask derives a range of IP addresses when applied to the source IP address for a client request. In most cases a class C netmask is recommended.
timeo *<minutes>* Allows you to enter the timeout value in minutes. The shorter the timeout value, the fresher each cache entry will be. The timeout value does not apply to static entries.
adden *<network IP> <netmask> <local domain alias>* Allows you to enter a static client cache entry, in dotted-decimal notation, for a 'well-known' network. Static entries bypass the site-selection process as the means for identifying the fastest responding site to the client. Static entries remain in the client network cache until you remove them.
remen *<network IP> <netmask> <local domain alias>* Allows you to remove a static entry from the client network cache.
cur [**global**|**local**|**member**|**cache**] Allows you to display parameters for each component in the category you select. With no argument, the CLI defaults to cache. The cache parameters are Default netmask and Timeout. If there is no information to report for the selected category, "Empty list" is displayed.

Table 58 Client Cache Configuration Options (/cfg/pcd/cache) (Continued)

Command Syntax and Usage

dump
Displays the contents of the client network cache as in this example of a learned entry:
`Client Network : 192.168.100.32`
`Netmask : 192.168.100.100`
`Global Domain Alias : global1`
`Local Domain Alias : local1a`
`Distance (us) : 0`
`Expire Time (sec) : 0`
`Hit Count : 0`
The Distance parameter is the time in microseconds for the transmission between the client and the fastest responding local domain. The figure is recorded during site-selection. The Expire Time parameter is the number of seconds remaining before the entry times out and is removed from the client network cache. Static cache entries are identified by **STATIC** in place of the Distance parameter and the Expire Time parameter which do not apply to static entries. The Hit Count is the number of times a cache entry was used to direct a client to a local domain.

clear Clears the client cache of learned entries.

/cfg/pcd/nms

NMS Configuration

```
[NMS Menu]
        ckey  - Set PCD-NMS communications key
        comsi - Set IP:Port on which NMS Comms are received
        cur   - Show PCD-NMS Configuration Settings
```

The NMS Configuration Menu provides options for configuring the Network Management System (NMS) parameters. The NMS configuration specifies the parameter values that an NMS must provide to gain access to the iSD200-PCD. The NMS is a Java-based software application with a graphical user interface (UI) for remote configuration of PCD-layer parameters.

Table 59 NMS Configuration Options (/cfg/pcd/nms)

Command Syntax and Usage
ckey *<16digitkey1> <16digitkey2> <16digitkey3>* Allows you to set the PCD-NMS communications key. The key is a 48-digit number in three groups of 16 that a PCD-NMS must specify to change PCD-layer parameters at an iSD200-PCD.
comsi *<IP address>*:*<port>* Allows you to the set the IP address and TCP port that the PCD-NMS connects to.
cur Displays the PCD-NMS communications key for the specified IP address and TCP port.

CHAPTER 9

The Operations Menu

This chapter explains the Operations Menu, which allows you to change temporarily the operational status of various configured parameters.

/oper
Operations Menu

```
[Operations Menu]
      port   - Operational Port items menu
      pcd    - PCD Operational Menu
```

The commands of the Operations Menu enable you to alter operational characteristics without affecting configuration.

Table 60 Operations Menu Options (/oper)

Command Syntax and Usage
port Displays the Operational Port menu. For details, see "Operations-Level Port Options" on page 134.
pcd Displays options for restarting or renewing IBP connections. For details, see "Restarting IBP Connections" on page 135.

/oper/port
Operations-Level Port Options

```
[Operations Port 1 Menu]
        dis   - Disable port
        ena   - Enable port
        cur   - Display current port configuration
```

Operations-level port options are used for temporarily disabling or enabling Port 1, the only network interface port on the iSD200-PCD. The default operational status is `enabled`. When Port 1 is enabled, the port can open communication links with other ports. When Port 1 is disabled, the port cannot open communication links with other ports.

NOTE – Disabling Port 1 shuts down active links associated with it.

Table 61 Operations-Level Port Menu Options (/oper/port)

Command Syntax and Usage
dis Temporarily disables the port. The port returns to its configured operation mode after a reset.
ena Temporarily enables the port. The port returns to its configured operation mode after a reset.
cur Displays the current configuration for Port 1.

/oper/pcd
Restarting IBP Connections

```
[PCD Operational Menu]
        rst   - Restart IBP Connections
        ren   - Renew IBP Connections
```

Table 62 describes the PCD Operational Menu parameters. IBP connections must be renewed on a continuous basis to ensure an even distribution of IBP connections among iSD200-PCDs in a global domain. IBP connection renewal goes on automatically at a frequency set by the `/cfg/renew` command (see "`renew`" on page 124). The `rst` and `ren` commands allow you to restart or renew IBP connections manually.

Table 62 PCD Operations Menu Parameters (/oper/pcd)

Parameter
`rst` *<global domain alias>* Tears down all outgoing IBP connections per the specified global domain alias and then creates new connections.
`ren` *<global domain alias>* Creates new IBP connections per the specified global domain alias and then tears down the old connections.

CHAPTER 10

The Boot Options Menu

This chapter describes the Boot Options Menu, which provides options for:

- Selecting which PCD software image will be installed at the next reset
- Selecting an alternate PCD configuration block that will be applied at the next reset
- Downloading a new software image to the iSD200-PCD via TFTP or S-records.

/boot
Boot Menu

```
[Boot Options Menu]
     image - Select software image to use on next boot
     conf  - Select config block to use on next boot
     tftp  - Download new software image via TFTP
     srec  - Download new software image (S-records) via console port
     reset - Reset system
     cur   - Display current boot options
```

Table 63 describes the Boot Options Menu.

Table 63 Boot Menu Options (/boot)

Command Syntax and Usage
image [**image1**|**image2**] With no argument, displays the name of the software image that will be used for the next boot (`image1` or `image2`), and prompts you to select an alternative. With an argument, specifies the image that will be used for the next boot.
conf [**active**|**backup**|**factory**] With no argument, displays which set of configuration parameters are being used (active, backup, or factory), and prompts you to select an alternative. With an argument, specifies which configuration parameters to use.

Table 63 Boot Menu Options (/boot) (Continued)

Command Syntax and Usage
`tftp` [**`image1`**|**`image2`**|**`boot`**] With no argument, prompts you to select which software image (`image1`, `image2`, or `boot`) will be replaced by the software you are about to download via TFTP. With an argument, specifies the software image that will be replaced. In both cases, the CLI will prompt you to enter the host name or IP address of the TFTP server and the name of the software file. Note: Host names will be resolved only if DNS has been configured properly, as described in "Domain Name System Configuration" on page 115.
`srec` [**`image1`**|**`image2`**|**`boot`**] With no argument, prompts you to select which software image (`image1`, `image2`, or `boot`) will be replaced by the software you are about to download via the console port. With an argument, specifies the software image that will be replaced.
`reset` Reboots the iSD200-PCD. Rebooting takes place immediately without further prompting. Changes to the iSD200-PCD configuration that have not been saved will be lost.
`cur` Reports the current selections for the software image and configuration block that will be used to boot and for the configuration block that will be applied.

Updating the iSD200-PCD Software Image

The iSD200-PCD software image is the executable code running on the iSD200-PCD. A version of the image ships with your unit, and comes pre-installed. As new versions of the image are released, you can upgrade the software running on your unit.

The iSD200-PCD can store up to two different software images, called `image1` and `image2`, as well as boot software, called `boot`. When you download new software, you must specify which area of memory (`image1`, `image2`, or `boot`) you want to store it in.

For example, if your active image is currently loaded into `image1`, you would typically load the new software image into `image2`. This lets you test the new software and reload the original active image (stored in `image1`), if needed.

Selecting a Configuration Block

When you change PCD configuration parameters, you must save the changes so they can be used the next time the switch is reset. When you perform the `save` command, your configuration changes are placed in the *active* configuration block. The previous configuration is copied into the *backup* configuration block.

There is also a factory configuration block that holds the default configuration set by the factory. It may be helpful to reset the iSD200-PCD configuration to the factory default for various reasons. For example, when you move an iSD200-PCD to a new network location, you can use the factory default to purge the previous configuration before reconfiguring the unit.

CHAPTER 11

The Maintenance Menu

This chapter describes the Maintenance Menu, which displays the DNS Cache command and the ARP Cache, IP Route, and PCD Maintenance menus.

/maint
Maintenance Menu

```
[Maintenance Menu]
        cache - Control DNS cache
        arp   - ARP Cache Manipulation Menu
        route - IP Route Manipulation Menu
        pcd   - PCD Maintenance Menu
```

Table 64 describes the Maintenance Menu options.

Table 64 Maintenance Menu Options (/maint)

Command Syntax and Usage
cache [**flush**] Displays the DNS cache, grouped into the following categories: ■ A-records: Address records, which equate an IP address to the fully qualified domain name of a host. ■ PTR-records: Pointer records, which are used for reverse lookups. Given an IP address, you can find the fully qualified domain name of a host. ■ NS-records: NameServer records, which identify hosts that are name servers.
arp Displays the ARP Cache Manipulation Menu. See "ARP Cache Manipulation" on page 142.
route Displays the IP Route Manipulation Menu. See "IP Route Manipulation" on page 143.
pcd Displays the PCD Maintenance Menu. See "PCD Maintenance Menu" on page 144.

/maint/arp
ARP Cache Manipulation

```
[Address Resolution Protocol Menu]
        find  - Show a single ARP entry by IP address
        port  - Show ARP entries on a single port
        add   - Add a permanent ARP entry
        del   - Delete an ARP entry
        clear - Clear ARP cache
        addr  - Show ARP address list
```

The information provided by each menu option is briefly described in Table 65.

Table 65 Maintenance Menu Options (/maint/arp)

Command Syntax and Usage
find *<IP address (eg, 192.4.17.101)>* Prompts you to enter an IP address and then displays the iSD200-PCD ARP entry (IP address, MAC address, and Timeout) for the specified IP address.
port [*<port>*] Prompts you to enter a port number and then displays all iSD200-PCD ARP entries for the specified port.
add *<IP address>* *<interface #>* *<mac address>* Allows you to add an ARP entry to the iSD200-PCD ARP cache by specifying an IP address, interface number, and MAC address.
del *<IP address>* Prompts you to enter an IP address and then removes the associated ARP entry from the iSD200-PCD ARP cache.
clear Removes every entry in the iSD200-PCD ARP Cache.
addr Displays the iSD200-PCD ARP address list.

/maint/route
IP Route Manipulation

```
[IP Routing Menu]
        find  - Show a single route by destination IP address
        gw    - Show routes to a single gateway
        type  - Show routes of a single type
        tag   - Show routes of a single tag
        if    - Show routes on a single interface
        dump  - Show all routes
        clear - Clear route table
```

Table 66 describes the IP Route Manipulation Menu options.

Table 66 IP Route Manipulation Menu Options (/maint/route)

Command Syntax and Usage
find *<IP address (eg, 192.4.17.101)>* Shows a single route by destination IP address.
gw *<default gateway (eg, 192.4.17.101)>* Shows routes to a single gateway.
type direct|indirect Shows routes of a single type.
tag addr|static|rip Shows routes of a single tag.
if *<interface number (1-256)>* Shows routes on a single interface.
dump Shows all routes.
clear Clears all dynamic routes from the iSD200-PCD routing table.

/maint/pcd
PCD Maintenance Menu

```
[PCD Maintenance Menu]
        sstat - Set service state for local domain
        cur   - Display current setting
```

The following table describes the PCD Maintenance Menu options.

Command Syntax and Usage
sstat <*local domain alias*> <**is**|**oos**> Allows you to change the service state for a local domain. A local domain must be in service (`is`) to participate in site-selection. When a local domain is out of service (`oos`), it is excluded from site-selection, though IBP communications continue.
cur Displays the current service state for all configured local domains.

APPENDIX A

Glossary

Client Listen IP	The IP address and TCP port on a iSD200-PCD that processes client requests. The switch assigns client connections to this address and TCP port in a iSD200-PCD load-balancing configuration. The PCD IP address is typically used for the IP address and the TCP port defaults to 80.
Delay	The time in milliseconds that can be added to iSD200-PCD responses to clients. Delay allows administrators to slow the response time for a particular iSD200-PCD to force connections onto other local domains.
DIP (Destination IP Address)	The destination IP address of a packet.
Dport (Destination Port)	The destination port (application socket; for example, http-80/https-443/DNS-53).
Global Domain	The iSD200-PCD designation for a domain topology that is represented by two or more mirror content, geographically distributed Web sites.
Global Domain Alias	The administrator-defined name that identifies a global domain.
Global Domain URL	The DNS-registered URL of the domain represented by the global domain.
IBP	Interbox Protocol (IBP). The IBP carries synchronization messages, redirect packets, RTTs, and CNC data between iSD200-PCDs in a global domain.
PCD IP	The IP address of a iSD200-PCD. It also serves as a iSD200-PCD identifier when configuring the member parameters.
IBP IP	The IP address and TCP port that processes IBP messages between iSD200-PCDs. The PCD IP address is typically used for the IP address and the TCP port defaults to 10000.
Local Domain	The iSD200-PCD designation for a local site in a global domain.
Local Domain Alias	The user-defined alias that identifies a local domain.
Local Domain URL	The URL of the local site represented by the local domain.

Member	The designation for a iSD200-PCD that has been configured to represent a local domain.
NAT (Network Address Translation)	With regard to TCP/IP packets, NAT is the exchange of a SIP or DIP address of one resource for the SIP or DIP address of another resource. For example, a load balancer performs half NAT when it changes the incoming DIP address from its own VIP to the RIP of a server and leaves the SIP unchanged. In general, half NAT is when the DIP or SIP is changed from one address to another and full NAT is when both addresses are changed from one address to another.
Participation Threshold	The RTT time limit in milliseconds for IBP communications. If a iSD200-PCD does not respond to a synchronizing PCD within the Participation Threshold time, that iSD200-PCD is excluded from site-selection for that client request.
PIN	The authentication number for IBP connections.
Proto (Protocol)	The protocol of a frame. The proto can be any value represented by an eight-bit value in the IP header according to the IP specification (e.g., TCP, UDP, OSPF, ICMP, etc.).
Real Server Group	A group of real servers represented by a VIP or filter.
RIP (Real Server IP Address)	The IP address of a server in a Real Server Group.
RTT (Round Trip Time)	iSD200-PCDs record RTTs between themselves and clients during site-selection to determine which site has the fastest response to the client.
SIP (Source IP Address)	The source IP address of a packet.
SPort (Source Port)	The source port (application socket; for example, HTTP-80/HTTPS-443/DNS-53).
Synchronizing PCD	The iSD200-PCD that receives the initial client request and orchestrates the site-selection process for that client request. All iSD200-PCDs are expected to perform the synchronizing PCD role on a regular basis.
VIP (Virtual IP Address)	The IP address at the switch that represents servers in Real Server Group. A VIP is also used to represent a group of iSD200-PCDs for load-balancing.
Virtual Server Load Balancing (SLB)	A method of distributing client requests (load) evenly among servers in a Real Server Group. Client requests are initially forwarded to a VIP at the switch. This allows the switch to assign the connection to a real server, based on an algorithm for tracking load (e.g., round-robin or least connections). The switch makes the selection and NATs the incoming DIP from the switch VIP to the RIP of the selected real server. The outbound side of the connection is directly between the client and the real server.

APPENDIX B

Frequently Asked Questions (FAQ)

This appendix contains Frequently Asked Questions (FAQ) about configuring the iSD200-PCD.

- **Can a iSD200-PCD support more than one global domain?**

  Yes. You must configure a global domain for each domain that is hosted across geographically distributed Web sites. For example, if your network is hosting two domains at several mirror Web sites, you must configure two global domains. See "iSD200-PCD Sample Configuration" on page 161 for an example of multiple global domains.

- **How many global domains, local domains, and members can a iSD200-PCD support?**

  1024 for all three (see "Configuration Limits" on page 159). In practical terms, the upper limit on global domains depends on the load. But you can cluster as many iSD200-PCDs behind a load-balancing device as are required to meet traffic demands.

- **What's the point of giving a global domain or a local domain an alias?**

  Global domain and local domain URLs can be lengthy. A short alias (global domain alias or local domain alias) cuts down on typing and fits better in displays at the CLI.

- **Can an iSD200-PCD support more than one local domain?**

  Yes. A local domain is required for each local site in a global domain. The local domain represents the domain servers at the local sites.

- **Can more than one iSD200-PCD be a member of a local domain?**

  Yes. For example, each iSD200-PCD in a cluster behind a load-balancing device must be configured to be a member of the local domain.

- **How do iSD200-PCDs behind a load-balancer communicate with each other?**

  They use UDP connections.

APPENDIX C

iSD200-PCD/Switch Compatibility

This appendix lists the Alteon WebSystems switch features that are compatible with site-selection. Special considerations or workarounds are described, if they are required to configure a particular Web Switch feature.

NOTE – If you want to use a Web Switch feature with site-selection that is not listed here, contact your Alteon WebSystems support representative.

Table 67 iSD200-PCD/Web Switch Compatibility

Web Switch Feature	Special Considerations
Global Server Load-Balancing (GSLB)	To work with site-selection, turn off all Web Switch-based GSLB features except backup redirect.
VRRP with Sharing	No special considerations are required.
VRRP without Sharing	No special considerations are required.
PIP	No special considerations are required.
Port Mapping	Does not work with site-selection.
Dynamic NAT	No special considerations are required.
Static NAT	No special considerations are required.
IP Forwarding	No special considerations are required.
VLAN Tagging	No special considerations are required.
VMA	No special considerations are required.
BandwidthManagement	No special considerations are required.

APPENDIX D

Troubleshooting

This appendix lists probable causes and defines possible solutions for basic problems that may occur with the iSD200-PCD. It also describes diagnostic procedures that can help you detect and resolve operational anomalies.

iSD200-PCD Management Problems

Table 68 shows a matrix of iSD200-PCD management problems along with possible causes and corrective actions. If these troubleshooting measures do not work, contact your Alteon WebSystems support representative for help.

Table 68 iSD200-PCD Management Problems and Corrective Actions

Symptoms of Failure	Possible Causes	Corrective Action
Unit will not boot.	No power.	Verify power cabling and power switch operation.
Unit attempts to boot, but fails repeatedly.	Invalid code block image.	Interrupt the boot and choose a different image.
Cannot open console connection.	Cable failure Incorrect terminal setup	Verify cable continuity per "DB9-to-DB9 Pin Assignments" on page 32. Verify terminal setup per "Console Configuration Parameters" on page 32.
Cannot open a Telnet connection. Cannot `ping` an iSD200-PCD IP interface.	Cable failure Incorrect IP interface configuration Duplicate IP addresses in network	Verify cable continuity per "Pin assignments for 10/100/1000 Mbps port cables" on page 27. Verify IP interface configuration via console connection. Verify that the IP interfaces are enabled.

Diagnostics

After configuring global domains, local domains, and members (or after modifying the configuration), you should conduct the following diagnostic sequences to verify that all components are operating properly. Furthermore, you should repeat this exercise periodically to detect and correct problems that may occur during normal operations.

The following procedure assumes and accommodates a complex configuration of:

- Multiple global domains
- Multiple local domains within each global domain
- Multiple global domains associated with a single iSD200-PCD
- Multiple local domains associated with a single member.

This procedure also requires you to establish a Telnet connection to each PCD.

Inspect the IP Configuration

1. **Verify the IP configuration using the `/info/ip` command.**
2. **Verify the routing table using the `/info/route/dump` command. This will help determine if you need to add static routes or if incorrect routes were added.**
3. **Run the `/cfg/ip/gw` command to ensure that the default gateway is set to the IP address of the interface of the actual gateway and not to the interface on the PCD.**
4. **Verify connectivity at the IP level by using the global `ping` command (which you can enter at any prompt). Figure 11 on page 153 illustrates the command entry and application response for successful and unsuccessful attempts.**
5. **If the `ping` command is not successful, use the global command `traceroute` to identify the module that is causing the problem. Figure 12 on page 153 illustrates the command entry and application response for successful and unsuccessful attempts. Note: If two devices are separated by a firewall, ensure that the IBP port between the devices is open.**

Example of Successful Ping

```
>> PCD Info# ping
Enter hostname or IP address to ping: 192.168.100.194
[host 192.168.100.194, max tries 5, delay 1000 msec]
192.168.100.194: #1 ok, RTT 6 msec.
192.168.100.194: #2 ok, RTT 6 msec.
192.168.100.194: #3 ok, RTT 6 msec.
192.168.100.194: #4 ok, RTT 6 msec.
192.168.100.194: #5 ok, RTT 6 msec.
```

Example of Unsuccessful Ping

```
>> PCD Info# ping
Enter hostname or IP address to ping: 192.168.100.254
[host 192.168.100.254, max tries 5, delay 1000 msec]
192.168.100.254: #1 timed out.
192.168.100.254: #2 timed out.
192.168.100.254: #3 timed out.
192.168.100.254: #4 timed out.
192.168.100.254: #5 timed out.
```

Figure 11 Using the Ping command

Example of Successful Traceroute

```
>> PCD Info# traceroute
Enter hostname or IP address to trace route:  192.168.100.194
[host 192.168.100.194, max-hops 32, delay 2048 msec]
X
X192.168.90.128: #1
 192.168.90.1: #2
192.168.100.194: #3
```

Example of Unsuccessful Traceroute

```
>> PCD Info# traceroute
Enter hostname or IP address to trace route:  192.168.100.254
[host 192.168.100.254, max-hops 32, delay 2048 msec]
 192.168.90.128: #1
192.168.90.1: #2 X*X**XX**XX*X*X**XX*X**XX*X**No Response - Timeout
```

Figure 12 Using the Traceroute command

Inspect the Domain and Member Configurations

1. **Using the `/info/pcd/globa` command, verify that all iSD200-PCDs in the same global domain have identical settings for that domain.**
2. **Using the `/info/pcd/local` command, verify that all iSD200-PCDs in the same global domain have identical settings for the participating local domains.**
3. **Using the `/info/pcd/membr` command, verify that all iSD200-PCDs in the same global domain have identical settings for the participating members, and that all members are reported.**

NOTE – Domain names are case-sensitive. For example, the domain name "LosAngeles" is not identical to the domain name "Losangeles."

Inspect the IBP Connections

1. **Verify the incoming IBP connections using the `/info/pcd/ibp` command.**
2. **Verify the outgoing IBP connections for each global domain using the `/info/pcd/ibp` <*global-domain-alias*> command.**

Inspect the Service State and Cache of Local Domains

1. **Determine if local domains are in service using the `/info/pcd/sstat` command. Figure 13 on page 155 illustrates the command entry and application response.**
2. **Verify that the client network cache on each iSD200-PCD is identical, using the `/info/pcd/cache` command. Figure 14 on page 155 illustrates the command entry and application response for three different iSD200-PCDs. Although this example shows only one entry in each client network cache, actual deployed units will list one entry for all client requests originating from the same network address (plus static entries added during configuration).**

```
>> PCD Info# sstate
*** Service State List ****
Local Domain Alias : Germany
Service State    : In Service
Local Domain Alias : Islands
Service State    : In Service
Local Domain Alias : Georgia
Service State    : In Service
Local Domain Alias : Georgia2
Service State    : In Service
Local Domain Alias : Germany2
Service State    : Out Of Service (automatic)
```

Figure 13 Using the Service State (sstat) Command

```
Hawaii>> PCD Info# /info/pcd/cache
Client Network        : 192.168.100.0
  Netmask             : 255.255.255.0
  \ Alias : sp3
  Local Domain Alias  : Islands3
  Distance (us)       : 62
  Expire Time (sec)   : 102
  Hit Count           : 0

Atlanta >> PCD Info# /info/pcd/cache
Client Network        : 192.168.100.0
  Netmask             : 255.255.255.0
  Global Domain Alias : sp3
  Local Domain Alias  : Islands3
  Distance (us)       : 62
  Expire Time (sec)   : 105
  Hit Count           : 1

Berlin >> Client Cache Config# /info/pcd/cache
Client Network        : 192.168.100.0
  Netmask             : 255.255.255.0
  Global Domain Alias : sp3
  Local Domain Alias  : Islands3
  Distance (us)       : 62
  Expire Time (sec)   : 109
  Hit Count           : 0
```

Figure 14 Using the Cache Command

Getting Technical Support

Collecting Information Needed for Support

If you are unable to resolve problems, please collect the following information before contacting Alteon Technical Support:

- The output of the **`/cfg/dump`** command
- The output of the **`/info/ip`** command
- The output of the **`/info/route/dump`** command
- The output of the **`/info/pcd/techs`** command
- The output of the **`/info/pcd/ibp`** command
- The output of the **`/info/pcd/ibp`** <*global domain*> command for each global domain defined
- Detailed topology diagrams (if available)

Contacting Alteon WebSystems for Support

Use the following information to access Alteon WebSystems' support.

- URL for Alteon WebSystems Online:

  `http://www.alteonwebsystems.com`

  This Web site includes product information, software updates, release notes, and white papers. The Web site also includes access to Alteon WebSystems Customer Support for accounts under warranty or covered by a maintenance contract.

- E-mail access:

  `support@alteonwebsystems.com`

  E-mail access to Alteon WebSystems Customer Support is available for accounts under warranty or covered by a maintenance contract.

- Telephone access to Alteon WebSystems Customer Support:

  1-888-Alteon0 (or 1-888-258-3660)
  1-408-360-5695

  Telephone access to Alteon WebSystems Customer Support is available to accounts that are under warranty or covered by a maintenance contract. Normal business hours are 8 a.m. to 6 p.m. Pacific Standard Time.

APPENDIX E

Specifications

This appendix describes the specifications, standards, requirements, and certifications for the iSD200-PCD.

Physical Characteristics

Characteristic	Measurement
Height	44.45 mm (1.75 inches), 1U
Width	431.8 mm (17 inches)
Depth	457.2 mm (18 inches)
Weight	4.1 kg (9 pounds)
Processor	Intel Pentium III–Low Power–500MHz
SDRAM (ECC) memory	IGB
L2 Cache (Internal)	256KB ECC 64-bit wide
Compact Flash Disk	64 MB

Supported Standards

- Logical Link Control (IEEE 802.2)
- 10Base-T/100Base-TX (IEEE 802.3, 802.3u)
- 1000Base-SX (IEEE 802.3z)
- IP
- TFTP (RFC 783)

Port Specifications

Port	Connector	Media	Maximum Distance
10Base-T	RJ-45	Cat. 3, 4, or 5 UTP	100 meters (328 feet)
100/1000Base-T	RJ-45	Cat. 5 UTP	100 meters (328 feet)
1000Base-SX	SC full-duplex	Shortwave (850 nm): 62.5 micron multimode fiber 50 micron multimode fiber	 2 to 275 meters (6.5 to 902 feet) 2 to 550 meters (6.5 to 1804 feet)
Console (DCE)	Female DB-9	RS-232C (serial)	25 meters (80 feet)

Power Requirements

Specification		Measurement
AC Power	Power Supply	ATX150W AC
	Input Voltage	90-260VAC auto-switch 47-63Hz
DC Power	Power Supply	ATX150W DC-48
	Input Voltage	-42 to -56VDC (-48VDC nominal)

Configuration Limits

Parameter	Limit
Global Domains	1024
Local Domains	1024
Members (iSD200-PCD units)	1024

Performance Specifications

Parameter	Limit
Simultaneous TCP Connections	1000000
CNC Entries	1000000
Static CNC Entries	2048
New Users/Second	2000

Environmental Specifications

Condition	Operating Specification	Storage Specification
Temperature	0° to +45°C (32°F to 133°F)	-40°C to +70°C (-40°F to 158°F)
Relative humidity	5-95% @ 40° (5-95% @ 104°F)	0-95% @ 40°C (0-95% @ 104°F)
Altitude	up to 3,048 meters (10,000 feet)	up to 9,114 meters (30,000 feet)
Shock	15G, 11ms duration (half-sinus / 6-axis)	30G, 11ms duration (half-sinus / 6-axis)
Vibration	1G, +/- 0.15mm, 10-58Hz (sinus / 6-axis)	2G, +/- 0.3mm, 10-500 Hz (sinus / 6-axis)
Acoustic Noise	<50dB at 1m in front of the system at full load	

Certifications

Category	Compliance
Emissions (EMC)	FCC CFR 47, Part 15, Class A VCCI, Class A Industry Canada, Class A CE EN-55022, EN-55024, EN-61000-4-2, EN-61000-4-3, EN-61000-4-4, EN-61000-4-5, EN-61000-4-6, EN-61000-4-8, EN-61000-4-11 BSMI CNS 13438 Class A AS/NZS 3548 Class A
Safety	UL 1950 CSA 22.2 No. 950 IEC 60950, with all NCB Member Differences* EN 60950 IEC 60825-1

*NCB (National Certified Bodies) Member countries: Austria, Australia, Belgium, Canada, Switzerland, China, Czech Republic, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Hungary, Ireland, Israel, India, Italy, Japan, Republic of Korea, The Netherlands, Norway, Poland, Russia, Sweden, Singapore, Slovenia, Slovakia, United States of America, South Africa

APPENDIX F

iSD200-PCD Sample Configuration

This appendix presents a sample implementation of the iSD200-PCD. The topology (see Figure 17) includes multiple global domains, local domains and members. A dump of the configuration is also included to show you the exact parameter values that were used.

NOTE – This topology has been successfully deployed on the internet (with routable IP addresses) to prove basic site-selection concepts. The implementation has no usefulness beyond its capacity to demonstrate these concepts.

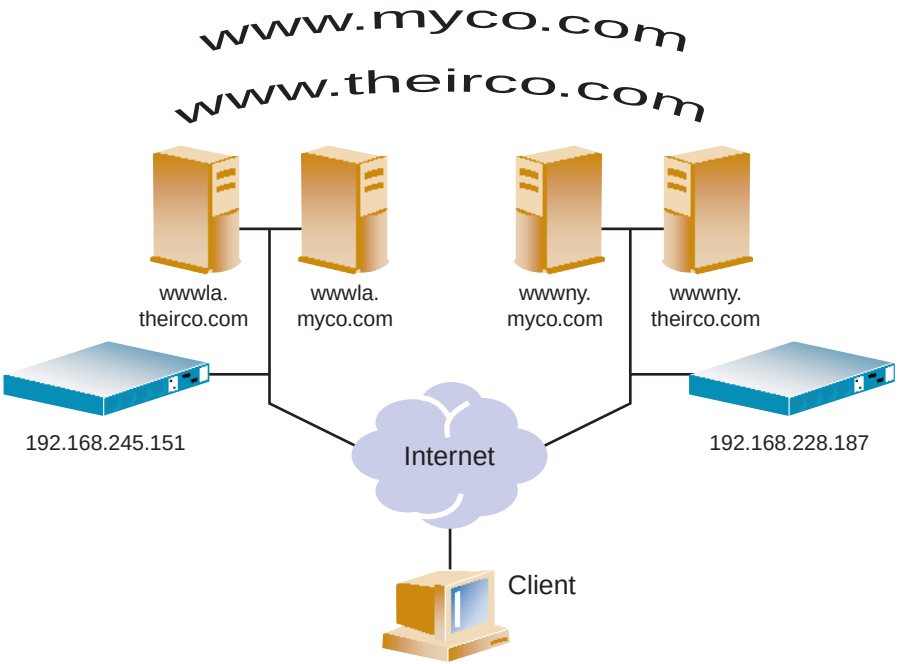


Figure 15 Sample Configuration Topology

Description

A small, fictitious internet service provider, isp.net, has one site in New York City and a second site in Los Angeles. Isp.net has set aside identical equipment configurations (two servers and an iSD200-PCD) at both locations to demonstrate site-selection for two of its customers, myco.com and theirco.com. Accordingly, isp.net has configured two global domains (one for each customer), four local domains (one for each server) and four members (one for each local domain) on the iSD200-PCD at both sites.

Isp.net has dedicated a server at each site to both customers. The content on the two myco.com servers is identical and the content on the two theirco.com servers is identical. Clients are redirected to the servers per the local domain URLs. These URLs have been registered with DNS.

Isp.net has reconfigured the authoritative Domain Name Servers for www.myco.com and www.theirco.com to resolve to the iSD200-PCD at each site on an alternating basis. This means that an initial client request to www.myco.com or www.theirco.com will be resolved to 192.168.245.151 or to 192.168.228.187, the IP addresses for the two iSD200-PCDs.

Configuration

Administrators at both sites configured the administrative-layer parameters through local terminal connections to the iSD200-PCD serial port. Then the Los Angeles administrator entered the PCD-layer parameters at his iSD200-PCD for both iSD200-PCDs. The configuration dump (see Figure 16 through Figure 21) shows the complete configuration, including administrative-layer parameters.

To prepare for configuring the iSD200-PCD in New York City, the administrator saved the dump to a text file and deleted the administrative-layer parameters. Next, the administrator opened a Telnet session with the New York City iSD200-PCD and pasted the file contents into the CLI.

As soon as both iSD200-PCDs had complete configurations, they began opening IBP connections between each other. Within seconds, the two iSD200-PCDs were synchronized and ready for site-selection.

Configuration Dump

The configuration dump for the Los Angeles iSD200-PCD is shown in Figure 16 through Figure 21 below. The dump has been divided into various categories to fit better on the page and to highlight different configuration parameters.

Figure 16 shows the administrative-layer parameters that were configured for the iSD200-PCD in Los Angeles. Administrative-layer parameters are unique for each iSD200-PCD and should not be copied to other iSD200-PCDs.

NOTE – Comments, which are preceded by the characters **/***, are generated by the `/cfg/dump` command and are ignored by the iSD200-PCD when pasted into the CLI.

```
/* 71461  START - DO NOT EDIT THIS LINE!
/* Configuration dump taken 14:55:03 Fri Dec 1, 2000
/* Version 2.2.1.3, Base MAC address 00:60:cf:20:68:12
/*
/cfg/ip/if 1
        mask 255.255.255.248
        addr 192.168.228.187
        mtu 1514
/cfg/ip/rip1/rip 1 off
/cfg/port 1
        dis
        fast
           speed any
           mode any
           auto on
/cfg/port 1
        gig
           fctl none
           auto on
/cfg/ip/host isp_net_la
/cfg/ip/rearp 10
/cfg/ip/log 0.0.0.0
/cfg/ip/route/add 0.0.0.0 0.0.0.0 192.168.228.185
/cfg/sys/bannr ""
/cfg/sys/mnet 0.0.0.0
/cfg/sys/mmask 0.0.0.0
/cfg/ip/dns/prima 192.168.183.72
/cfg/ip/dns/secon 0.0.0.0
/cfg/ip/dns/dname alteon.com
/cfg/ip/dns/all off
/cfg/sys/tnet e
```

Figure 16 Administrative-layer Parameters

Figure 17 shows the global domain parameters, the first of the PCD-layer parameters. Notice that the proximity methods, among other parameters, are different for the two global domains. This is an example of the flexibility you have when configuring PCD-layer parameters.

```
/* Application specific configuration BEGIN */

/* Global Domain Information */
/cfg/pcd/globa/add global1 www.myco.com
/cfg/pcd/globa/proximity-method global1 double_redirect
/cfg/pcd/globa/authentication-pin global1 5555
/cfg/pcd/globa/participation-threshold global1 0
/cfg/pcd/globa/renewal-time global1 30
/cfg/pcd/globa/hiwat global1 0
/cfg/pcd/globa/add global2 www.theirco.com
/cfg/pcd/globa/proximity-method global2 refresh
/cfg/pcd/globa/authentication-pin global2 5555
/cfg/pcd/globa/participation-threshold global2 0
/cfg/pcd/globa/renewal-time global2 30
/cfg/pcd/globa/hiwat global2 0
```

Figure 17 Global Domain Parameters

Figure 18 shows the local domain parameters. Notice that the `/cfg/pcd/local/virtu` parameters have not been set. This is because the iSD200-PCDs were not installed behind a load-balancing device, which obviates the need for a local VIP address.

```
/* Local Domain Information */
/cfg/pcd/local/add global1 NYmyco http://wwwny.myco.com
/cfg/pcd/local/ibp NYmyco 192.168.228.187:10000
/cfg/pcd/local/virtu NYmyco 0.0.0.0:80
/cfg/pcd/local/delay NYmyco 0
/cfg/pcd/local/hcip NYmyco 0.0.0.0:80
/cfg/pcd/local/hctp NYmyco
/cfg/pcd/local/hcfq NYmyco 0
/cfg/pcd/local/hcwt NYmyco 0
/cfg/pcd/local/hcr NYmyco disable
/maint/pcd/sstate NYmyco is
/cfg/pcd/local/add global1 LAmyco http://wwwla.myco.com
/cfg/pcd/local/ibp LAmyco 192.168.245.151:10000
/cfg/pcd/local/virtu LAmyco 0.0.0.0:80
/cfg/pcd/local/delay LAmyco 0
/cfg/pcd/local/hcip LAmyco 0.0.0.0:80
/cfg/pcd/local/hctp LAmyco
/cfg/pcd/local/hcfq LAmyco 0
/cfg/pcd/local/hcwt LAmyco 0
/cfg/pcd/local/hcr LAmyco disable
/maint/pcd/sstate LAmyco is
/cfg/pcd/local/add global2 NYtheirco http://wwwny.theirco.com
/cfg/pcd/local/ibp NYtheirco 192.168.228.187:10000
/cfg/pcd/local/virtu NYtheirco 0.0.0.0:80
/cfg/pcd/local/delay NYtheirco 0
/cfg/pcd/local/hcip NYtheirco 0.0.0.0:80
/cfg/pcd/local/hctp NYtheirco
/cfg/pcd/local/hcfq NYtheirco 0
/cfg/pcd/local/hcwt NYtheirco 0
/cfg/pcd/local/hcr NYtheirco disable
/maint/pcd/sstate NYtheirco is
/cfg/pcd/local/add global2 LAtheirco http://wwwla.theirco.com
/cfg/pcd/local/ibp LAtheirco 192.168.245.151:10000
/cfg/pcd/local/virtu LAtheirco 0.0.0.0:80
/cfg/pcd/local/delay LAtheirco 0
/cfg/pcd/local/hcip LAtheirco 0.0.0.0:80
/cfg/pcd/local/hctp LAtheirco
/cfg/pcd/local/hcfq LAtheirco 0
/cfg/pcd/local/hcwt LAtheirco 0
/cfg/pcd/local/hcr LAtheirco disable
/maint/pcd/sstate LAtheirco is
```

Figure 18 Local Domain Parameters

Figure 19 shows the member parameters. The `/cfg/pcd/membr/listen` parameter refers to the Listen IP[:Port].

```
/* Member Information */
/cfg/pcd/membr/add NYmyco 192.168.228.187
/cfg/pcd/membr/listen NYmyco 192.168.228.187 192.168.228.187:80
/cfg/pcd/membr/add NYtheirco 192.168.228.187
/cfg/pcd/membr/listen NYtheirco 192.168.228.187 192.168.228.187:80
/cfg/pcd/membr/add LAmyco 192.168.245.151
/cfg/pcd/membr/listen LAmyco 192.168.245.151 192.168.245.151:80
/cfg/pcd/membr/add LAtheirco 192.168.245.151
/cfg/pcd/membr/listen LAtheirco 192.168.245.151 192.168.245.151:80
```

Figure 19 Member Parameters

Figure 20 shows the CNC parameters. Notice that the `/cfg/pcd/cache/mask` refers to a class C network. This is the recommended network mask for most CNC configurations.

```
/* Client Network Cache Information */
/cfg/pcd/cache/mask 255.255.255.0
/cfg/pcd/cache/timeout 1
```

Figure 20 CNC Parameters

Figure 21 shows the PCD NMS parameters. The word `exit` must be included when you paste a dump file at the CLI to end the process which reads the input and stores the parameters.

```
/* Communication Keys */
/cfg/pcd/nms/ckey default default default
/cfg/pcd/nms/comsip 0.0.0.0:0

/* Application specific configuration END */

exit
/* 71461  END - DO NOT EDIT THIS LINE!
```

Figure 21 PCD NMS Parameters

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