Avaya CVLAN Server 9.1 for Linux

Installation and Administration Guide

Issue 1.1
October 2004

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- Mischief (troubling, but apparently innocuous, tampering)
- Harm (such as harmful tampering, data loss or alteration, regardless of motive or intent)

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Your responsibility for your company's telecommunications security

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- Installation documents
- System administration documents
- Security documents
- Hardware-/software-based security tools
- Shared information between you and your peers
- Telecommunications security experts

To prevent intrusions to your telecommunications equipment, you and your peers should carefully program and configure:

- Your Avaya-provided telecommunications systems and their interfaces
- Your Avaya-provided software applications, as well as their underlying hardware/software platforms and interfaces
- Any other equipment networked to your Avaya products.

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Acknowledgment

This document was written by the CRM Information Development group

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Avaya CVLAN Server 9.1 for Linux
Installation and Administration Guide

Contents

About this document

This installation and administrative guide describes the basic set of administrative tasks required for establishing communications between Avaya Communication Manager and CVLAN clients. This part of the document contains information about using this guide, and includes the following topics:

Intended audience

This document is intended for system administrators or service technicians who are familiar with administering Avaya Communication Manager and Linux.

Reason for reissue

This document, the *Avaya CVLAN Server 9.1 for Linux Installation and Administration Guide,* replaces the *Avaya CVLAN Server 9.0 for Linux Installation and Basic Administration Guide*.

- Issue 1.0 of the *Avaya CVLAN Server 9.1 for Linux Installation and Administration Guide* was the initial issue of the documentation for running CVLAN on the Red Hat Enterprise Linux ES operating system.
- Issue 1.1 of this document contains more explicit statements about the requirements for installing CVLAN Server 9.1 on Red Hat Enterprise Linux 3.0. That is, you must install Red Hat Enterprise Linux 3 ES (i386) Update 2, or a later update.

Organization of this document

This document is organized as follows:

- About this document is designed to provide you with general information about the document itself.
- Chapter 1: Overview of Avaya CVLAN Server 9.1 for Linux describes the hardware and software requirements for installing Avaya CVLAN Server 9.1 for Linux.
- Chapter 2: Installing and setting up Avaya CVLAN Server 9.1 for Linux describes how to install Avaya CVLAN Server 9.1 for Linux and how to administer a link on Avaya Communication Manager.
- Chapter 3: Administering Avaya CVLAN Server 9.1 for Linux describes the basic, initial tasks for administering CVLAN using the Web-based CVLAN Operations, Administration, and Maintenance interface.
- Appendix A: Avaya CVLAN Server 9.1 for Linux installed files lists the files that Avaya CVLAN Server 9.1 for Linux installs on your Linux PC.
- Appendix B: Setting up for remote access describes how to set up a Linux PC to provide remote access.
- Appendix D: Administering the Co-resident DLG on page 87 provides procedures for administering the Co-Resident DLG on Avaya Communication Manager.
- Glossary provides definitions of technical terms used in this document.

Conventions used in this document

The following conventions are used in this document.

Convention	Example	Usage
bold monospace	**`add station`**	Bold monospace indicates a literal entry. Type exactly as depicted.
bold italic monospaced term in angle brackets	***<username>***	Angle brackets enclosing Italics denote a term that you replace. Angle brackets are used as visual cues, you do not type them. Keep in mind that the number of terms in angle brackets does not have any significance. Descriptive terms are often used as an aid to comprehension. For example, you would replace the term <***link number***> by typing **`1`**.
plain monospace	`Password:`	Plain monospace denotes the command line interface (as opposed to the Graphical User Interface).
bold sans-serif	**Start**	Bold sans serif indicates a mouse selection.

Related documents

Use this section to locate additional information about implementing CVLAN.

- **Avaya Communication Manager documents**

  Administrator's Guide for Avaya™ Communication Manager, 555-233-506. Use this document as a general reference for Avaya Communication Manager. In most cases you will not need to consult this document to administer Avaya Communication Manager because the *Avaya CVLAN Server 9.1 for Linux Installation and Basic Administration Guide* includes this information.

- **API-related documents** for information about developing your application. These documents are included on the Avaya CVLAN Server 9.1 for Linux CD-ROM.

  - *Avaya Computer Telephony CVLAN Programmer's Reference* (CALLVISR.PDF)

    This document is intended for application designers and programmers who will be using the CVLAN API to develop and maintain CVLAN Client applications.

  - *Avaya Communication Manager, Release 2.0, ASAI Technical Reference* (ASAITECH.PDF)

    This document describes the messages that can be sent and received.

  - *Avaya Communication Manager, Release 2.0, ASAI Protocol Reference* (ASAIPROT.PDF)

    This document describes the format of messages.

Avaya product assistance and service Web sites

- For help with CVLAN, call the Avaya National Customer Care Center at: +1 800 344 9670
- For information about Avaya products and service, go to http://www.avaya.com .
- For product documentation for all Avaya products and related documentation, go to http://www.avaya.com/support .

CVLAN Server 9.1 for Linux features

CVLAN Server 9.1 for Linux provides the following features.

- SingleConnect

  With SingleConnect you can assign 1 to 16 links to one active switch connection.

- MultiConnect

  With MultiConnect you can assign 1 to 16 links to two or more active switch connections. MultiConnect can be used for:

  - load balancing
  - connecting to multiple Avaya Communication Manager platforms
  - failover and redundancy

- Switch connection
  - A CVLAN link is assigned a switch connection.
  - A switch connection can have one IP address to access a single Processor C-LAN or one or more IP addresses to access one or more TN799DP C-LAN Boards.
  - When a C-LAN failure occurs on the current active connection, the CVLAN Server will:
    - notify and drop all clients
    - automatically reconnect to Avaya Communication Manager using the next administered C-LAN connection

- Capacities
  - up to 16 Links per Server
  - up to 60 Clients
  - 32,000 ASAI Associations, shared over 16 Links

- Browser Based Administration and Maintenance
  - CVLAN Operations, Administration, and Maintenance is now browser based.
  - All major browsers were tested, such as Internet Explorer and Netscape.

- Licensing
  - CVLAN Server 9.1 for Linux uses Avaya Remote Feature Activation (RFA) to generate and update a license file.
  - Avaya Web License Manager (WebLM) is used to enforce the RFA License on the server hosting CVLAN.

- CVLAN Server 9.1 for Linux licensing is based on the number (quantity) of Proprietary Links and the number (quantity) of Active Switch Connections.
- A license is not required for installing and administering CVLAN, but you can not communicate with Avaya Communication Manager without a license.

Chapter 1: Overview of Avaya CVLAN Server 9.1 for Linux

Use Chapter 1 to familiarize yourself with Avaya CVLAN Server 9.1 for Linux (also referred to as the CVLAN Server or CVLAN) and the context of operations for the CVLAN Server. Chapter 1 includes the following topics:

What is CVLAN?

CVLAN is an application programming interface (API) that enables applications to communicate with Avaya Communication Manager -- that is, to send and receive ASAI Messages over shared ASAI links on TCP/IP. An application can use ASAI Messages to monitor and control resources on the Avaya Communication Manager server. Avaya CVLAN Server 9.1 for Linux is specific to the Linux operating system.

CVLAN consists of two components, a client and a server.

- The CVLAN Server provides LAN connectivity to remote workstations that require access to the CVLAN API.

Important:
Avaya CVLAN Server 9.1 for Linux, is designed exclusively for a Linux based PC. Although this server is functionally equivalent to the CVLAN Server that runs on the Multi-Application Platform for DEFINITY (MAPD), the two products are packaged differently and installed differently. For more information, see *DEFINITY Enterprise Communications Server CallVisor ASAI Applications Over MAPD*, 555-230-136.

- The CVLAN Client can be installed on a server or on a client workstation. It provides clients with access to Avaya Communication Manager via the CVLAN Server.

  Important:
  The Avaya CVLAN Server 9.1 for Linux CD-ROM does not include the CVLAN Client. The CVLAN Client software is available on the Web. For more information about the CVLAN Client software see The CVLAN Client on page 16.

The CVLAN Server

The CVLAN Server is software that manages ASAI message traffic between CVLAN Clients and Avaya Communication Manager. Avaya CVLAN Server 9.1 for Linux supports the following versions of the CVLAN Client:

- CVLAN Client Version 6.1.7
- CVLAN Client Version 8.2.5

The CVLAN Client

The CVLAN Client enables your applications to send and receive computer based telephony requests. The CVLAN Client provides the API (a set of function calls to send ASAI messages) that enables telephony based applications to use the resources provided by Avaya Communication Manager.

In addition to the API library, the CVLAN Client provides a protocol exerciser called the Integration Test Tool (ITT). ITT is designed to help test the ASAI library by exercising its function calls and, optionally, by comparing the expected results to the actual results for received messages.

Important:
The Avaya CVLAN Server 9.1 for Linux CD-ROM does not include the CVLAN Client software. See Getting the CVLAN Client software on page 17.

Getting the CVLAN Client software

From your browser, follow this procedure to get CVLAN Client software from the Avaya Web site.

1. Go to http://www.avaya.com .
2. From the top navigation bar, Select **Support > Software & Firmware Downloads**.
3. From the Software & Firmware downloads page, scroll down to Computer Telephony Integration (CTI), and select **CVLAN client**.
4. From the CVLAN Client page, click **Software Downloads**.
5. From the Software Downloads table select either of the following links:

   CVLAN client Version 6.1.7

   CVLAN client Version 8.2.5

The Avaya CVLAN Server 9.1 for Linux operating environment

The CVLAN operating environment includes the following components.

- A media server running Avaya Communication Manager, such as:
  - Avaya Media Server S8100
  - Avaya Media Server S8300
  - Avaya Media Server S8500
  - Avaya Media Server S8700

  Avaya Communication Manager is the telephony component of Avaya MultiVantage.
- A Red Hat Enterprise Linux PC (where the CVLAN Server is installed)
- A PC for running the CVLAN Client software. The CVLAN Client is supported on the following operating systems:
  - Windows
    - Windows NT (4.0 or later)
    - Windows 2000
    - Windows XP
    - Windows 2003
  - Unix
    - UnixWare
    - Solaris x86
    - Solaris Sparc
    - IBM Advanced Interactive Executive (AIX)

Note:

The **CVLAN Client** does not currently run on the Linux operating system.

Security

At a general level, security means ensuring the confidentiality, integrity, and availability of data. The CVLAN security implementation provides administrative security.

Administrative security

Administrative security is an encompassing term that includes system protection, (including passwords and authentication), the ability to stop and restart the system, and the ability to backup and restore the system.

System protection

Any user administered on a Linux system (except root) is allowed to administer CVLAN using the CVLAN OAM Web based interface.

CVLAN creates an internal account to be used by the CVLAN Server only.

- This account is locked by default, and the only way to access the account is by using **`su cvlan`** from root.
- This account should not be deleted or renamed, and its attributes should not be changed.

User accounts are authenticated at log on.

Restart capability

CVLAN provides the ability to stop the CVLAN Server and to restart it. For more information see "Restart CVLAN" in CVLAN OAM Help.

Backup and restoration of data

CVLAN provides a feature to backup the CVLAN database and a feature to restore the backed up database. See "Backup CVLAN Database" and "Restore CVLAN Configuration" in CVLAN OAM Help for more information.

Note:

CVLAN does not encrypt backup (.bck) files.

Security logs

CVLAN provides the following log files, which are not encrypted, for recording system events and activities:

- client access log
- system reset log
- command log

You can download these logs, which are located in the $LOGS directory, from the OAM interface.

Security Patches

Security vulnerabilities that affect Avaya products or underlying platforms will be posted on the Security Advisories page on the Avaya Support Web site. To access this Web site, go to http://support.avaya.com/security .

Chapter 2: Installing and setting up Avaya CVLAN Server 9.1 for Linux

This chapter describes how to install Avaya CVLAN Server 9.1 for Linux (also referred to as the CVLAN Server or CVLAN) and how to carry out the basic set of necessary administrative tasks to enable communications between the CVLAN Server and the server running Avaya Communication Manager. It includes the following topics.

Installation task list

Table 2-1: Installation task list describes the complete set of tasks for installing CVLAN and establishing connectivity between Avaya Communication Manager and CVLAN clients.

Table 2-1: Installation task list

	Task	Reference
1	**Administer the CTI link on Communication Manager**	See Administering a CTI link on Avaya Communication Manager on page 23. ● When you have completed this task, the status of the CTI link is "down." (See Step 4 of Procedure to administer a CTI Link -- Processor Ethernet connectivity on page 24, or see Step 4 of Procedure for administering a CTI link -- C-LAN connectivity on page 25.)
2	**Make sure you have the hardware and software**	See Prerequisites for Avaya CVLAN Server 9.1 for Linux on page 27.
3	**Make sure you are ready to start.**	See Before you start the installation procedures on page 29.
4	**Install required Red Hat Enterprise Linux components** .	See Installing the prerequisites on page 31. ● If you are setting up the CVLAN Server to allow Avaya Services to access the CVLAN Server for remote installation and maintenance, see Appendix B: Setting up for remote access on page 77.
5	**Download and install Java 2 SDK 1.4.2**.	See Installing the Java 2 SDK on page 37.
6	**Install and administer Tomcat 4.1.24.**	See Installing Tomcat 4 on page 39.
7	**Install CVLAN Server 9.1 for Linux**.	See Installing Avaya CVLAN Server 9.1 for Linux on a PC that has the required software on page 41. ● When you have completed this task, use SAT to verify that the status of the CTI link is "established." (See Checking the Service State of the CTI Link on page 26).
8	**Install the CVLAN Server license file**.	See Installing the CVLAN Server license file on page 42.
9	**Create a user account for CVLAN OAM access**.	See Creating a user account for OAM access on page 46.
10	**Administer the CVLAN Server's IP address**.	See Administering Avaya CVLAN Server 9.1 for Linux.
11	**Administer the switch connection**.	See Administering Avaya CVLAN Server 9.1 for Linux.
12	**Administer the CVLAN Server's link.**	See Administering Avaya CVLAN Server 9.1 for Linux.
13	**Run ASAI test**.	See Administering Avaya CVLAN Server 9.1 for Linux.
14	**Administer CVLAN Clients**.	See Administering Avaya CVLAN Server 9.1 for Linux.
15	**Check the status of the link**.	See Administering Avaya CVLAN Server 9.1 for Linux. ● When you have completed this task, use the Link Status and Control CVLAN OAM page to verify that the connection state is "Talking." (See Step 12 of Basic CVLAN administration procedure on page 61.

Administering Communication Manager

Before you install CVLAN Server 9.1 for Linux (on a dedicated Linux computer), you must administer a CTI link on Communication Manager. This section, which describes procedures that are carried out from the Communication Manager system access terminal (SAT), makes the following assumption.

- Communication Manager is running, and the Co-resident Definity LAN Gateway (DLG) has been administered. If you are aware that the Co-resident DLG has not been administered, see Appendix D: Administering the Co-resident DLG on page 87.

Administering a CTI link on Avaya Communication Manager

This section provides you with two representative scenarios for administering a CTI link on an Avaya Communication Manager server that relies on a Co-resident DLG for communicating with the CVLAN Server.

- Administering a CTI Link on configurations with Processor Ethernet connectivity on page 23
- Administering a CTI Link on configurations with C-LAN connectivity on page 25

Administering a CTI Link on configurations with Processor Ethernet connectivity

This section provides the procedure for administering a CTI link for Avaya Communication Manager on the following servers:

- Avaya S8100 Media Server
- Avaya S8300 Media Server

Note:

The following procedure assumes that the DLG has been administered. For more information, see Administering the Co-resident DLG service over Processor Ethernet on page 88.

Procedure to administer a CTI Link -- Processor Ethernet connectivity

Follow these steps from a Communication Manager system access terminal (SAT) to administer a CTI link (Link Type: ASAI-IP) for configurations that use the Processor Ethernet for IP connectivity. This procedure assumes you are running the appropriate level of software.

1. Type **change node-names ip** and follow Steps a and b on the IP Node Names screen.
   a. In the Name field, type ***<name of CVLAN Server>***
   b. In the IP Address field, type ***<IP address of CVLAN Server>***
2. Type **add cti-link <*link number*>** and follow Steps a through c on the CTI Link screen.
   a. In the Extension field, type ***<station extension>***
   b. In the Type field, type **ASAI-IP**
   c. In the Name field, type ***<name of CVLAN Server>***
3. Type **change ip-services**, and follow Steps a through e.
   a. Go to the DLG Administration page of the IP Services screen.
   b. In the CTI Link field, type ***<link number>***
   c. In the Enabled field, type **y**
   d. In the Client Name field, type ***<name of CVLAN Server>***
   e. In the Client Link field, type ***<link number of CVLAN Server>***
4. Type **status dlg cti-link**, and check the Service State on the DLG CTI Link Status screen.

   At this point the Service State field displays down because you have not installed the CVLAN Server.

- This completes the procedure for administering a CTI link. Continue with Prerequisites for Avaya CVLAN Server 9.1 for Linux .

Note:

When you have completed the CVLAN Server installation, you should check the Service State of the CTI link again. For more information see, Checking the Service State of the CTI Link on page 26.

Administering a CTI Link on configurations with C-LAN connectivity

This section provides the procedure for administering a CTI link for Avaya Communication Manager on the following servers:

- Avaya S8100 Media Server
- Avaya S8500 Media Server
- Avaya S8700 Media Server
- Avaya DEFINITY Server G3si
- Avaya DEFINITY Server G3csi

Note:

The following procedure assumes that a C-LAN board has been installed and that the Co-resident DLG has been administered. For more information, see Administering the Co-resident DLG service over C-LAN on page 89.

Procedure for administering a CTI link -- C-LAN connectivity

Follow these steps from a Communication Manager system access terminal (SAT) to administer a CTI Link (Link Type: ASAI-IP) for configurations that use the C-LAN board for IP connectivity. This procedure assumes you are running the appropriate level of software.

1. Type **change node-names ip** and follow Steps a and b on the IP Node Names screen.
   a. In the Name field, type ***<name of CVLAN Server>***
   b. In the IP Address field, type ***<IP address of CVLAN Server>***
2. Type **add cti-link *<link number>*** and follow Steps a through c on the CTI Link screen.
   a. In the Extension field, type ***<station extension>***
   b. In the Type field, type **ASAI-IP**
   c. In the Name field, type ***<name of CVLAN Server>***
3. Type **change IP services** and follow Steps a through e.
   a. Go to the DLG Administration page of the IP Services screen.
   b. In the CTI Link field, type ***<link number>***
   c. In the Enabled field, type **y**
   d. In the Client Name field, type ***<name of CVLAN Server>***
   e. In the Client Link field, type ***<link number of CVLAN Server>***

4. Type **status dlg cti-link**, and check the Service State on the DLG CTI Link Status screen.

   At this point the `Service State` field displays `down` because you have not installed the CVLAN Server.

- This completes the procedure for administering a CTI link. Continue with Prerequisites for Avaya CVLAN Server 9.1 for Linux .

  Note:

  When you have completed the CVLAN Server installation, you should check the Service State of the CTI link again. For more information see the next section, Checking the Service State of the CTI Link.

Checking the Service State of the CTI Link

After you have completed the CVLAN Server Installation, follow these steps from a Communication Manager system access terminal (SAT) to check the service state of the CTI Link.

- Type **status dlg cti-link**, and check the Service State on the DLG CTI Link Status screen.
  - The `Service State` field should display `established`, which indicates that the link has been successfully established .
  - If the `Service State` field displays `down`, and you have already installed the CVLAN as described in Installing Avaya CVLAN Server 9.1 for Linux on a PC that has the required software on page 41, verify the administration of the link on both Communication Manager and the CVLAN Server.

Prerequisites for Avaya CVLAN Server 9.1 for Linux

This section describes requirements and procedures for setting up and installing CVLAN Server 9.1 for Linux on a dedicated computer. Before you install the Avaya CVLAN Server 9.1 for Linux, make sure that you have the required hardware and software.

Hardware Requirements

The following table lists the minimum, basic hardware requirements for the computer that you designate as the CVLAN Server.

Table 2-2: Avaya CVLAN Server 9.1 for Linux -- hardware requirements

Component	Description
CPU	32-bit Pentium III 800 MHZ or higher
RAM	256 MB or higher
Network Interface Card (NIC)	For a standard installation, 2 NICs are recommended. • The network cards should be set up with static IP addresses. Dynamic Host Control Protocol (DHCP) is not supported. • The NICs can be configured as either 10Base T or 100Base T, full-duplex. **Note:** The link between the NIC and Communication Manager requires an Ethernet switch or a network hub. A crossover cable is not supported.
Drives	CD-ROM drive
Disk Space[1]	10 GB Hard Drive
Modem	Must be compatible with Red Hat Enterprise Linux

1. The disk space requirement is an approximation. The amount of disk space required also depends on other factors such as the number of users, types of activity performed, and number and/or size of the trace files. Additionally, this requirement includes space for the operating system, CVLAN dependencies, and Avaya CVLAN Server 9.1 for Linux.

Software requirements for installing CVLAN Server 9.1

Table 2-3: Avaya CVLAN Server 9.1 for Linux -- software requirements lists the components that are required for CVLAN. CVLAN Server 9.1 for Linux must be installed with the 32-bit version of Red Hat Enterprise Linux 3 ES (i386) Update 2, or later (CVLAN Server does not support 64-bit versions of Red Hat Enterprise Linux). It can not be installed with prior releases of Red Hat Enterprise Linux ES, Red Hat Enterprise Linux AS or Red Hat Enterprise Linux WS. For information about getting Red Hat Enterprise Linux 3 ES Update 2, see Appendix C: Downloading Red Enterprise Hat Linux ES on page 85.

Table 2-3: Avaya CVLAN Server 9.1 for Linux -- software requirements

Component	Description
Red Hat Enterprise Linux 3 ES (i386) Update 2, or later	Operating System 32-bit version of Red Hat is required for CVLAN
Red Hat LInux 9.0	
Additional required Red Hat Enterpirse Linux Operating System components	
mgetty-1.1.30-3	Software required for remote access.
ppp-2.4.1-14	
pdksh-5.2.14-21	Command line interpreter
postgresql-odbc-7.3.1	Database components
rh-postgresql-7.3.1	
rh-postgresql-docs-7.3.1	
rh-postgresql-jdbc-7.3.1	
rh-postgresql-pl-7.3.1	
rh-postgresql-python-7.3.1	
rh-postgresql-server-7.3.1	
glibc-devel-2.3.2-95.20	Software development tools
rpm-i pam-devel-0.75-54	
pam-0.75-54	
gdb-6.0post-0.20040223.17	
gcc-3.2.3-34	
ltrace-0.3.29-1	
Other required components	
Java 2 SDK (j2sdk-1_4_2_04-linux-i586.rpm)	Java Software Development Kit
Tomcat 4 (tomcat4-4.1.24)	Java servlet container

Before you start the installation procedures

Review this checklist before you carry out the installation procedures.

- Make sure you know the Linux root password. (See Logging in as root on page 29.)
- Make sure the X Window system is running. (See Running the X Window system on page 30.)
- Make sure have the Red Hat Enterprise Linux 3 ES (i386) Update 2 (or later) CD-ROM set, which was created from the download. See Appendix C: Downloading Red Enterprise Hat Linux ES on page 85.
- Make sure that your NICs are set up with static IP addresses.
- Make sure you have the CVLAN Server 9.1 for Linux CD-ROM.
- Make sure that GNOME (the graphical desktop included with Red Hat Linux) is running.

Logging in as root

To carry out many of the administrative procedures described in this chapter, you must be the root user (or superuser) of the system. This section describes two ways to become the root user.

To originally log in as root

If you are initially starting the Linux server running CVLAN you can login as root, as follows.

1. At the `login:` prompt type, **`root`**.

   The system issues the `Password:` prompt

2. Type the root password.

   The system issues the root prompt (`#:`)

To become root or the superuser

If you have already logged in with your user name, and you have the authority to become the superuser or root, follow this procedure.

1. Click the **Red Hat icon** (Main Menu) > **System Tools** >**Terminal** to get the command prompt.
2. At the command prompt, type **`su -`**
   To become root and work in the root shell you must type **`su`** followed by a space and the dash symbol).

   The system issues the `Password:` prompt
3. Type the root password.

Running the X Window system

Make sure you are logged into Linux, and you are running the X Window graphical environment (also called the X Window System). If you are logged in at the command prompt, and you are not running the X Window graphical environment, type **`startx`** to run the X Window System. You need to have the X Window system running to be able to carry out any of the installation tasks.

Installing the prerequisites

This procedure assumes that you installed Red Hat Enterprise Linux 3 ES (i386) Update 2 and accepted the **Package Installation Defaults** (as opposed to selecting the option to **Customize the set of packages**). For information about getting Red Hat Enterprise Linux ES (i386) Update 2, see Appendix C: Downloading Red Enterprise Hat Linux ES on page 85.

Follow this procedure to install the Red Hat Enterprise Linux packages required for CVLAN Server 9.1 for Linux.

1. Click the **Red Hat icon** (Main Menu) > **System Tools** >**Terminal** to get the command prompt.
2. Log in to the system as root. For more information see Logging in as root on page 29.
3. Use this checklist to help you install the Red Hat Enterprise Linux packages required for CVLAN. Type the commands in the first column to determine if the required components are already installed on your system. If a component is already installed you do not need to take any action. If Linux responds with a message that the package is not installed, use the information in the second column to install the package.

Verify if the component is installed	Install the component
`rpm -q mgetty`	`rpm -i mgetty-1.1.30-3.i386.rpm` (Red Hat Enterprise Linux ES CD-ROM 2, see Appendix B: Setting up for remote access **on page 77**).
`rpm -q ppp`	`rpm -i ppp-2.4.1-14.i386.rpm` (Red Hat Enterprise CD-ROM 2, see Appendix B: Setting up for remote access **on page 77**).
`rpm -q pdksh`	`rpm -i pdksh-5.2.14-21.i386.rpm` (Red Hat Enterprise Linux ES CD-ROM 2, see Installing the Korn shell **on page 33**).
`rpm -q postgresql-odbc-7.3.1`	`postgresql-odbc` (Linux desktop, see Installing the SQL Database on page 34).
`rpm -q rh-postgresql-7.3.1`	`rh-postgresql` (Linux desktop, see Installing the SQL Database on page 34).
`rpm -q rh-postgresql-docs-7.3.1`	`rh-postgresql-docs` (Linux desktop, see Installing the SQL Database on page 34).
`rpm -q rh-postgresql-jdbc-7.3.1`	`rh-postgresql-jdbc` (Linux desktop, see Installing the SQL Database on page 34).
`rpm -q rh-postgresql-pl-7.3.1`	`rh-postgresql-pl` (Linux desktop, see Installing the SQL Database on page 34).
`rpm -q rh-postgresql-python`	`rh-postgresql-python` (Linux desktop, see Installing the SQL Database on page 34).
`rpm -q rh-postgresql-server`	`rh-postgresql-server` (Linux desktop, see Installing the SQL Database on page 34).

Verify if the component is installed	Install the component
`rpm -q glibc-devel`	`rpm-i glibc-devel-2.3.2-95.20.i386.rpm` (Red Hat Red Hat Enterprise Linux ES CD-ROM 3, see Installing the Development Tools on page 35).
`rpm -q pam-devel`	`rpm-i pam-devel-0.75-54.i386.rpm` (Red Hat Enterprise Linux ES CD-ROM 3, see Installing the Development Tools **on page 35**).
`rpm -q pam`	`rpm -i pam-0.75-54.i386.rpm` (Red Hat Enterprise Linux ES CD-ROM 2, see Installing the Development Tools **on page 35**).
`rpm -q gdb`	`rpm -i gdb-6.0post-0.20040223.17.i386.rpm` (Red Hat Enterprise Linux ES CD-ROM 3, see Installing the Development Tools **on page 35**).
`rpm -q gcc`	`rpm -i gcc-3.2.3-34.i386.rpm` (Red Hat Enterprise CD-ROM 3, see Installing the Development Tools **on page 35**).
`rpm -q ltrace`	`rpm -i ltrace-0.3.29-1.i386.rpm` (Red Hat Enterprise CD-ROM 3, see Installing the Development Tools **on page 35**).

- This completes the procedure for Installing the Red Hat Enterprise Linux ES prerequisites. Continue with Installing the Korn shell on page 33.

Installing the Korn shell

The Korn shell is used by CVLAN scripts.

From the Linux desktop, follow this procedure to install the Korn shell.

1. Click the **Red Hat icon** (Main Menu) > **System Tools** > **Terminal** to get to the command prompt.
2. Insert the Red Hat Enterprise Linux Installation CD-ROM disk 2 in to the CD-ROM drive and type the following command to mount the file system:

   mount /mnt/cdrom/
3. Type the following command to change to the directory containing the RPM packages:

   cd /mnt/cdrom/RedHat/RPMS
4. Type the following command to install the Korn Shell (you must use the complete file name):

   rpm -i pdksh-5.2.14-21.i386.rpm
5. Type the following command to change out of the cdrom directory:

   cd
6. Type the following command to unmount the file system:

   umount/mnt/cdrom
7. Eject the CD-ROM from the drive.

- This completes the procedure to install the Korn shell. Continue with Installing the SQL Database on page 34.

Installing the SQL Database

The SQL Database is the database used by Avaya CVLAN Server 9.1 for Linux.

From the Linux desktop, follow this procedure to install the SQL Database.

1. Click the **Red Hat icon** (Main Menu) > **System Settings** > **Add/Remove Applications**.
2. From the **Package Group Selection**, select **SQL Database** and click **details**. From the Details list.
3. From the Optional Packages list, select the following:
   - **postgresql-odbc**
   - **rh-postgresql**
   - **rh-postgresql-docs**
   - **rh-postgresql-jdbc**
   - **rh-postgresql-pl**
   - **rh-postgresql-python**
   - **rh-postgresql-server**
4. Select **Development Tools.** Accept the default settings, and click **Next.**

- This completes the procedure to install the SQL Database server and the Development tools. Continue with Installing the Java 2 SDK on page 37.

Installing the Development Tools

The Development Tools are required by PAM (Pluggable Authentication Modules). From the Linux desktop, follow this procedure to install the Development Tools.

1. Click the **Red Hat icon** (Main Menu) > **System Tools** > **Terminal** to get to the command prompt.
2. Insert the Red Hat Enterprise Linux Installation CD-ROM disk 2 **i**n to the CD-ROM drive and type the following command to mount the file system:

   mount /mnt/cdrom/
3. Type the following command to change to the directory containing the RPM packages:

   cd /mnt/cdrom/RedHat/RPMS
4. Type the following command to install the first PAM component:

   rpm -i pam-0.75-54.i386.rpm
5. Type the following command to change out of the cdrom directory:

   cd
6. Type the following command to unmount the file system:

   umount/mnt/cdrom
7. Eject the CD-ROM from the drive.
8. Insert the Red Hat Enterprise Linux Installation CD-ROM disk 3 in to the CD-ROM drive and type the following command to mount the file system:

   mount /mnt/cdrom/
9. Type the following command to change to the directory containing the RPM packages:

   cd /mnt/cdrom/RedHat/RPMS
10. Type the following RPM commands to install the remaining Development Tools:

    rpm-i glibc-devel-2.3.2-95.20.i386.rpm

    rpm-i pam-devel-0.75-54.i386.rpm

    rpm -i gdb-6.0post-0.20040223.17.i386.rpm

    rpm -i gcc-3.2.3-34.i386.rpm

    rpm -i ltrace-0.3.29-1.i386.rpm

11. Type the following command to change out of the cdrom directory:

    cd

12. Type the following command to unmount the file system.

    umount/mnt/cdrom

13. Eject the CD-ROM from the drive.

- This completes the procedure to install the Development Tools. Continue with Installing the Java 2 SDK on page 37.

Installing the Java 2 SDK

Tomcat 4 requires that you use version 1.4 of the Java 2 SDK.

Follow this procedure to install the Java 2 SDK.

1. Create a directory called /root/j2sdk.
2. From your browser, go to http://java.sun.com .
3. From the java.sun.com home page, search on "j2se" .
4. From the search results page, look for links to either a downloads page or an archive page, for example http://java.sun.com/j2se/downloads.html.
5. When you locate the page that contains Java 2, Standard Edition, v1.4.2 (J2SE) follow the instructions for downloading the product. For example, click **Download J2SE SDK**.

   Your browser displays the License Agreement for Java(TM) 2 SDK, Standard Edition 1.4.2, Download.

   Note:

   The version number is subject to change. Keep in mind that you must correctly specify it when you edit the tomcat4.conf file (see Step 6a of Installing Tomcat 4 on page 39).
6. Once you have read the Terms and Conditions and have decided to accept them, select **ACCEPT**, and click **Continue**.
7. From the Download page for Java(TM) 2 SDK, Standard Edition 1.4.2_04, look for Linux Platform in the list of files.
8. Click **RPM in self-extracting file** (j2sdk-1_4_2_04-linux-i586-rpm.bin, 32.77 MB).
9. Your browser displays a dialog box for handling the file. Save the file to /root/j2sdk.
10. Type the following command change to the /root/j2sdk directory:

    ```
    cd /root/j2sdk
    ```
11. Type the following command to make the file executable:

    ```
    chmod 755 j2sdk-1_4_2_04-linux-i586-rpm.bin
    ```
12. Type the following command to execute the .bin file:

    ```
    ./j2sdk-1_4_2_04-linux-i586-rpm.bin
    ```
13. At the Java 2 SDK license prompt, select **yes**, and the self-extracting tool extracts the Java 2 SDK file system.

14. Type the following command install the Java 2 SDK:

    ```
    rpm -i j2sdk-1_4_2_04-linux-i586.rpm
    ```

- This completes the procedure to install the Java 2 SDK. Continue with Installing Tomcat 4 on page 39.

Installing Tomcat 4

The CVLAN Server and the CVLAN Web-based OAM use Tomcat 4.

Important:
You must install the Java 2 SDK before you install Tomcat 4.

Note:
This is a generic installation procedure that assumes you are installing Tomcat 4 in standard directories and having it run as root. It is beyond the scope of this guide to address any variation of this procedure. If you are working from a different set of assumptions, please refer to the documentation at the Apache Web site (http://jakarta.apache.org).

1. Click the **Red Hat icon** (Main Menu) > **System Tools** >**Terminal** to get the command prompt.
2. Log in to the system as root. For more information see Logging in as root on page 29.
3. Insert the Avaya CVLAN Server 9.1 for Linux CD-ROM in the PC's CD-ROM drive and type the following command to mount the file system:

   mount /mnt/cdrom/
4. Type the following command to change to the directory containing CVLAN Server 9.1 for Linux:

   cd /mnt/cdrom/RPMS
5. From the RPMS directory, type the following command to install Tomcat 4.

   rpm -i tomcat4-4.1.24-full.2jpp.noarch.rpm
6. Using vi or emacs, follow Steps a and b to edit the home and user environmental variables in the Tomcat 4 configuration file (/etc/tomcat4/tomcat4.conf).

   a. Edit the line for the Java home environmental variable by changing:

   #JAVA_HOME="/usr/JAVA/jdk"

   to:

   JAVA_HOME="/usr/java/j2sdk1.4.2_04"

Note:
Keep in mind that the version number in the JAVA_HOME= environmental variable must match the version number of the Java 2 SDK that you installed (see Step 5 of Installing the Java 2 SDK on page 37).

b. Edit the line for the Tomcat 4 user environmental variable by changing:

```
TOMCAT_USER="tomcat4"
```

to:

```
TOMCAT_USER="root"
```

Note:

Tomcat 4 will have added an entry in init.d so that Tomcat 4 can be started automatically.

7. Click the **Red Hat icon** (Main Menu) > **System Settings** > **Server Settings** > **Services**
8. Make sure the **Tomcat4**, checkbox is enabled so the service will automatically start on system startup.

- This completes the procedure to install Tomcat 4. Refer to Chapter 2, and continue with Installing Avaya CVLAN Server 9.1 for Linux on a PC that has the required software on page 41.

Installing Avaya CVLAN Server 9.1 for Linux on a PC that has the required software

If you are installing the CVLAN Server on a PC that has all the required components listed in Software requirements for installing CVLAN Server 9.1 on page 28, follow these steps to install the CVLAN Server software from the Avaya CVLAN Server 9.1 for Linux CD-ROM. Use this procedure to install CVLAN Server 9.1 with either:

- Red Hat Enterprise Linux 3 ES (i386) Update 2, or later.
- Red Linux Hat 9

1. Click the **Red Hat icon** (Main Menu) > **System Tools** >**Terminal** to get the command prompt.
2. Log in to the system as root. For more information see Logging in as root on page 29.
3. Insert the Avaya CVLAN Server 9.1 for Linux CD-ROM in the PC's CD-ROM drive, and type the following command to mount the file system:

   mount /mnt/cdrom/
4. Type the following command to change to the directory containing CVLAN Server 9.1 for Linux:

   cd /mnt/cdrom/RPMS
5. Type the following command to install CVLAN Server 9.1 for Linux:

   rpm -i cvlan*

   Wait for the package manager to install the software. The package installation is complete when the system displays this message:

   ```
   Reboot the system to start CVLAN.
   ```
6. Type the following command to change out of the cdrom directory:

   cd
7. Type the following command to unmount the file system.

   umount/mnt/cdrom
8. Eject the CD-ROM from the drive.
9. Type the following command to reboot the system:

   reboot

- You have completed the procedure for installing CVLAN Server 9.1 for Linux. Before you install the license as described in Installing the CVLAN Server license file, use Communication Manager SAT administration to check the Service State of the CTI link, as described in Checking the Service State of the CTI Link on page 26

Installing the CVLAN Server license file

The CVLAN Server license file is not included on the CVLAN Server for Linux CD-ROM. It is distributed separately in an email from Avaya. If you have not received a license file from Avaya, see If you do not have a license on page 45.

Important:
The WebLM Server and the CVLAN Server must be running on the same Linux PC.

Follow these steps to install the license file

1. Locate the email containing the CVLAN Server license file. Detach the license file from the email, and store it locally on a PC. The PC that the license file is stored on does not have to be same PC that the CVLAN Server is installed on.
2. Start your browser and type the appropriate URL based on this example:

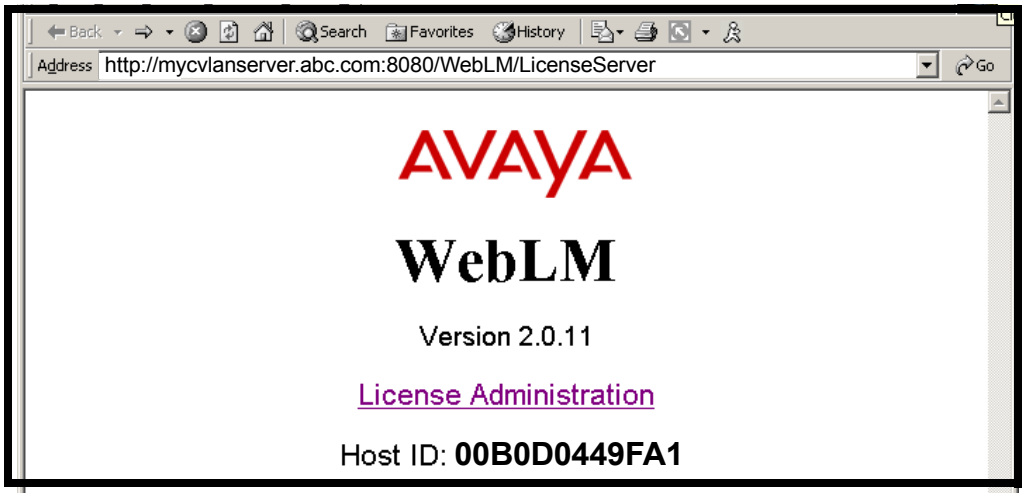
   `http://<cvlanhostname>:<port>/WebLM/LicenseServer`

   Substitute **`<cvlanhostname>`** and **`<port>`** with your CVLAN Server's host name (or IP address) and port number (the default port number is 8080), for example:
   `http://mycvlansrv.abc.com:8080/WebLM/LicenseServer`

   or

   `http://192.168.1.1:8080/WebLM/LicenseServer`

   Your browser displays the Avaya WebLM page, which contains a License Administration link and a Host ID, which is the MAC address of the NIC (in a dual NIC installation the Host ID is the MAC address of the first NIC WebLM reads).



3. Click **License Administration**.

   Your browser displays the WebLM Administrator Login page.

4. Accept the default User name (admin) and leave the Password blank, then click **Continue**.

   Your browser displays the Change Administrator Password page

   Note:

   WebLM issues the Change Administrator Password page the first time you log in to WebLM. If you get a new license, you do not have to change your password the next time you log in to WebLM.

5. Complete the Change Administrator Password page (leave the Old Password field blank the first time you set up your password), and click **Change Password**.

   Your browser displays the License Administration page,

6. Under **Install License File**, click **Browse** and locate the CVLAN Server license file. Once you have located the license file, click **Install**.

   WebLM uploads the license file from your PC to the WebLM server, and displays the following message "License File is installed successfully." If you do not receive this message see Troubleshooting the CVLAN license installation.

- This completes the CVLAN license installation, and you are ready to continue with the activity described in Administering a CTI link on Avaya Communication Manager.

Troubleshooting the CVLAN license installation

Use the information in this section to help you troubleshoot problems you might encounter during installation of the license. It covers the following topics:

- If you receive error messages from WebLM
- If you do not have a license

If you receive error messages from WebLM

If your browser displays the following messages contact your Avaya representative.

Message	Explanation
`License file is invalid or not created for this server. License file was NOT installed.`	The file is corrupt or the MAC address in the license file does not match the MAC address in the server.
`Attempting to install a license file that is currently installed. License file was NOT installed`	The license has already been activated.

If you do not have a license

If you discover that you have not received the CVLAN Server license file in an email from Avaya, contact your Avaya representative or Avaya Partner representative. To ensure that your request is processed as quickly as possible, be ready to provide the information listed in Required information for requesting a license file.

Note:

You must send a separate request for each license file.

Required information for requesting a license file

Required information	Description
Return email address	Avaya emails this license file to you. You must provide a secure email address where you want to receive the license file.
MAC Address of the NIC	For more information, see Identifying the MAC address.

Identifying the MAC address

If you have already installed CVLAN, use WebLM to identify the MAC address of the NIC by following Step 2 of Installing the CVLAN Server license file on page 42.

As an alternate method (if you have not installed CVLAN), you can use the Linux **`ifconfig`** command to identify the MAC address of the NIC on your PC.

1. Click the **Red Hat icon** (Main Menu) > **System Tools** > **Terminal** to get the command prompt.
2. At the prompt type the following command:

   `ifconfig`
3. Linux displays the current information about the network interface. For example:

   ```
   eth0  Link encap:Ethernet  HWaddr 00:B0:D0:44:9F:A1
   inet addr:10.10.10 Bcast:10.255.255.255  Mask:255.0.0.0
   ```

   In this example, the MAC address (which corresponds to the HWaddr) is `00B0D0449FA1` (when specifying a MAC address do not include colons).
4. Provide the MAC address to your service representative when you request a license.

Important:

If your server is configured multiple NICs, provide the MAC address of the first NIC. If your server is configured with a dual port NIC, provide the address of the first port.

If you need to replace a NIC

If your NIC changes after the initial installation you must contact Avaya CTI Tier III.

Creating a user account for OAM access

You can create a user account for accessing the Web-based CVLAN OAM interface from either the GUI or the command line.

Important:
Do not create a user named "cvlan."

From the GUI

1. Log in as root.
2. Click the **Red Hat icon** (Main Menu) > **System Settings** > **Users and Groups**.
3. From the Red Hat User Manager, add a user account by clicking **Add User** (alternatively you can select **File > Add User**).
4. From **Create New User** dialog box, complete the User Name, Password, and Confirm Password fields. Click **OK**.

From the Command Line

1. Log in as root.
2. Use the either the **adduser** command or the **useradd** command (both commands use the same arguments), and type:

   adduser -p <*password*> <*username*>

Upgrading CVLAN Server 9.0

The procedures in this section assume that you have a PC running Red Hat Linux 9.0 with CVLAN Server 9.0. Use this section to upgrade the CVLAN Server 9.0 to CVLAN Server 9.1. The following list summarizes, in order, the tasks required for upgrading the CVLAN Server.

Procedure for backing up the CVLAN database

Carry out this procedure using the CVLAN OAM interface (using your user account).

1. In the left pane of the CVLAN OAM browser, click **Backup**. CVLAN OAM creates a backup and displays the message "Backup successful."
2. From the Backup CVLAN Database Web page, click the **here** link to download the backup file (for example, db07042004.bck) and save it to a directory on another computer.

- This completes the procedure for backing up the CVLAN database. Continue with the procedure for shutting down the CVLAN Server.

Procedure for shutting down the CVLAN Server

To shut down the CVLAN Server, you must be logged in as root.

1. From the command prompt type:

   ServerOffline.sh

2. To verify that the CVLAN Server is shut down, type:

   ServerState.sh

   The system displays the following response, indicating the CVLAN Server is down:

   DOWN

- This completes the procedure to shut down the CVLAN Server. Continue with the Procedure for removing CVLAN Server 9.0.

Procedure for removing CVLAN Server 9.0

To remove the CVLAN Server, you must be logged in as root.

1. From the command prompt type:

   rpm -e cvlan

   The RedHat package manager removes the CVLAN Server software.

2. To verify that the software has been removed, type:

   rpm -q cvlan

- This completes the procedure to remove Avaya CVLAN Server software. Continue with Procedures for removing or disabling Tomcat3 on page 49.

Procedures for removing or disabling Tomcat3

You can either remove Tomcat3 or you can disable Tomcat3. Use the procedure that is appropriate for your system.

Removing Tomcat3

To remove Tomcat3, you must be logged in as root.

1. From the command prompt type:

   `rpm -e tomcat3`

   The RedHat package manager removes the CVLAN Server software.

2. To verify that the software has been removed, type:

   `rpm -q tomcat3`

- This completes the procedure for removing Tomcat3. Procedure for installing the Java 2 SDK on page 50.

Disabling Tomcat3

To disable Tomcat3, you must be logged in as root.

1. Click the **Red Hat** icon (Main Menu) **> System Settings > Server Settings > Services**.

   Red Hat displays the Service Configuration dialog.

2. Scroll down the list and click **Tomcat3** (so it is not selected).

3. Click **Action > Stop Service** at the top of the Configuration dialog.

4. Click **File > Save Changes**.

- This completes the procedure to disable Tomcat3. Continue with Procedure for installing the Java 2 SDK on page 50.

Procedure for installing the Java 2 SDK

Tomcat 4 requires that you use version 1.4 of the Java 2 SDK. If you do not install Tomcat 4, CVLAN Server 9.1 will not install.

To install the Java 2 SDK, you must be logged in as root.

1. Create a directory called /root/j2sdk .
2. From your browser, go to http://java.sun.com .
3. From the java.sun.com home page, search on "j2se" .
4. From the search results page, look for links to either a downloads page or an archive page, for example http://java.sun.com/j2se/downloads.html.
5. When you locate the page that contains Java 2, Standard Edition, v1.4.2 (J2SE) follow the instructions for downloading the product. For example, click **Download J2SE SDK**.

   Your browser displays the License Agreement for Java(TM) 2 SDK, Standard Edition 1.4.2, Download.

   Note:

   The version number is subject to change. Keep in mind that you must correctly specify it when you edit the tomcat4.conf file (see Step 6a of Procedure for installing Tomcat 4 on page 52).
6. Once you have read the Terms and Conditions and have decided to accept them, select **ACCEPT**, and click **Continue**.
7. From the Download page for Java(TM) 2 SDK, Standard Edition 1.4.2_04, look for Linux Platform in the list of files.
8. Click **RPM in self-extracting file** (j2sdk-1_4_2_04-linux-i586-rpm.bin, 32.77 MB).
9. Your browser displays a dialog box for handling the file. Save the file to /root/j2sdk.
10. Type the following command change to the /root/j2sdk directory:

    ```
    cd /root/j2sdk
    ```
11. Type the following command to make the file executable:

    ```
    chmod 755 j2sdk-1_4_2_04-linux-i586-rpm.bin
    ```
12. Type the following command to execute the .bin file.

    ```
    ./j2sdk-1_4_2_04-linux-i586-rpm.bin
    ```

13. At the Java 2 SDK license prompt, select **yes**, and the self-extracting tool extracts the Java 2 SDK file system.
14. Type the following command to install the Java 2 SDK:

    ```
    rpm -i j2sdk-1_4_2_04-linux-i586.rpm
    ```

- This completes the procedure to install the Java 2 SDK. Continue with Procedure for installing Tomcat 4 on page 52.

Procedure for installing Tomcat 4

The CVLAN Server and the CVLAN Web-based OAM use Tomcat 4.

Important:
You must install the Java 2 SDK before you install Tomcat 4.

Note:
This is a generic installation procedure that assumes you are installing Tomcat 4 in standard directories and having it run as root. It is beyond the scope of this guide to address any variation of this procedure. If you are working from a different set of assumptions, please refer to the documentation at the Apache Web site (http://jakarta.apache.org).

To install Tomcat 4, you must be logged in as root.

1. Click the **Red Hat icon** (Main Menu) > **System Tools** >**Terminal** to get the command prompt.
2. Insert the Avaya CVLAN Server 9.1 for Linux CD-ROM in the PC's CD-ROM drive and type the following command to mount the file system:

   `mount /mnt/cdrom/`
3. Type the following command to change to the directory containing CVLAN Server 9.1 for Linux:

   `cd /mnt/cdrom/RPMS`
4. From the RPMS directory, type the following command to install Tomcat 4.

   `rpm -i tomcat4-4.1.24-full.2jpp.noarch.rpm`
5. Using vi or emacs, follow Steps a and b to edit the home and user environmental variables in the Tomcat 4 configuration file (/etc/tomcat4/tomcat4.conf).
   a. Edit the line for the Java home environmental variable by changing:

      `#JAVA_HOME="/usr/JAVA/jdk"`

      to:

      `JAVA_HOME="/usr/java/j2sdk1.4.2_04"`

   Note:
   Keep in mind that the version number in the JAVA_HOME= environmental variable must match the version number of the Java 2 SDK that you installed (see Step 5 of Procedure for installing the Java 2 SDK on page 50).

b. Edit the line for the Tomcat user environmental variable by changing:

```
TOMCAT_USER="tomcat4"
```

to:

```
TOMCAT_USER="root"
```

Note:

Tomcat 4 will have added an entry in init.d so that Tomcat can be started automatically.

6. Click the **Red Hat icon** (Main Menu) > **System Settings** > **Server Settings** > **Services**
7. Make sure the **Tomcat4**, checkbox is enabled so the service will automatically start on system startup.

- This completes the procedure to install Tomcat 4. Continue with the Procedure for installing CVLAN Server 9.1 on page 54

Procedure for installing CVLAN Server 9.1

You must be logged in as root to install CVLAN Server 9.1.

1. Click the **Red Hat icon** (Main Menu) > **System Tools** >**Terminal** to get the command prompt.
2. Log in to the system as root. For more information see Logging in as root on page 29.
3. Insert the Avaya CVLAN Server 9.1 for Linux CD-ROM in the PC's CD-ROM drive, and type the following command to mount the file system:

   mount /mnt/cdrom/
4. Type the following command to change to the directory containing CVLAN Server 9.1 for Linux:

   cd /mnt/cdrom/RPMS
5. Type the following command to install CVLAN Server 9.1 for Linux:

   rpm -i cvlan*

   Wait for the package manager to install the software. The package installation is complete when the system displays this message:

   ```
   Reboot the system to start CVLAN.
   ```
6. Type the following command to change out of the cdrom directory

   cd
7. Type the following command to unmount the file system.

   umount/mnt/cdrom
8. Eject the CD-ROM from the drive.
9. Type the following command to reboot the system:

   reboot

- This completes the procedure for installing CVLAN Server 9.1 for Linux. Continue with Procedure for re-installing the CVLAN Server license file.

Procedure for re-installing the CVLAN Server license file

If you are upgrading CVLAN Server 9.0 to CVLAN Server 9.1, you can reuse your existing CVLAN license file. If you are not familiar with installing the CVLAN Server license file see, Installing the CVLAN Server license file on page 42.

1. Start your browser and type the appropriate URL based on this example:

   http://<*cvlanhostname*>:<*port*>/WebLM/LicenseServer

   Substitute **<*cvlanhostname*>** and **<*port*>** with your CVLAN Server's host name (or IP address) and port number (the default port number is 8080), for example:
   http://mycvlansrv.abc.com:8080/WebLM/LicenseServer

   or

   http://192.168.1.1:8080/WebLM/LicenseServer

   Your browser displays the Avaya WebLM Web page.

2. Click **License Administration**.
3. Your browser displays the WebLM Administrator Log in Web page.
4. Complete the WebLM Administrator Log in Web page, and click **Continue**.
5. Your browser displays the License Administration Web page.
6. Under **Install License File**, click **Browse** and locate the CVLAN Server license file. Once you have located the license file, click **Install**.
7. WebLM uploads the license file from your computer to the WebLM server, and displays the following message "License File is installed successfully."

- This completes the procedure for re-installing the CVLAN Server license file. Continue with Procedure for restoring the CVLAN database.

Procedure for restoring the CVLAN database

Carry out this procedure from the CVLAN OAM interface (using your user account).

1. Start your browser and type the appropriate URL based on this example:

   http://<*cvlanhostname*>:<*port*>/CVLAN/OAM

   Substitute **<*cvlanhostname*>** and **<*port*>** with your CVLAN Server's host name (or IP address) and port number (the default port number is 8080), for example: **http://mycvlansrv.abc.com:8080/WebLM/LicenseServer**

   or

   http://192.168.1.1:8080/CVLAN/OAM

   Your browser displays the CVLAN OAM Logon Web page.

2. Complete the Username and Password fields (based on the user account you created in Creating a user account for OAM access on page 46), and click **Login**.
3. In the left pane of the OAM browser, click **Restore**.
4. CVLAN OAM displays the Restore CVLAN Configuration Web page that asks you to "Please select the file that you would like to restore:"
5. Click **Browse** and go to the directory that you use for backing up the CVLAN database, and select the CVLAN database backup file (for example db07042004.bck). See Procedure for backing up the CVLAN database on page 48.
6. On the Restore CVLAN Configuration Web page, click **Restore**.

   CVLAN OAM displays the Restart CVLAN Web page.

7. From the left pane, click **Restart CVLAN**.

   The CVLAN Server Displays Restart CVLAN Web page, with a warning message.

8. Ignore the warning message, and click **Yes**.

   The CVLAN Server restarts and it restores all the database information for your system (switch name, links, clients, and so forth).

- This completes the procedure for Upgrading CVLAN Server 9.0 to 9.1. Your system is fully operational at this point.

Chapter 3: Administering Avaya CVLAN Server 9.1 for Linux

This chapter is primarily a quick reference for administering Avaya CVLAN Server 9.1 for Linux (also referred to as the CVLAN Server or CVLAN) using the Web-based Operations Administration and Maintenance (OAM) interface. It includes the following topics:

Commands and Web pages you will be using

This chapter relies on a basic subset of the CVLAN administrative commands and Web pages. Table 3-1: Quick reference to CVLAN OAM Web pages provides a quick reference for the CVLAN OAM Web pages that you will be using.

Table 3-1: Quick reference to CVLAN OAM Web pages

Web page	Function
Switch connections	Lets you create a **Connection Name**. A connection name can refer to: • one IP address or multiple IP addresses (up to 64) that are assigned to the C-LAN boards on the Avaya Media server. • one host name or multiple host names (up to 64) that are that are assigned to the C-LAN boards on the Avaya Media server. • a collection of host names and IP addresses that are assigned to the C-LAN boards on the Avaya Media server. The total of host names and IP addresses can not exceed 64. **Note:** The ability to use a connection name that refers to multiple connections requires a multiple connection license.
Ping Host	Lets you determine if the server running Avaya Communication Manager (switch) is online and communicating with the CVLAN Server.
Links	Lets you administer your links.
• Edit Link	Lets you edit settings for each link.
• Edit Clients	Lets you add CVLAN clients.
Link Status and Control	Lets you observe the status of links and enables you to take a link out of service, put a link into service, or disconnect a link. Additionally it lets you set the time interval for capturing information about message traffic.

Logging on to CVLAN OAM

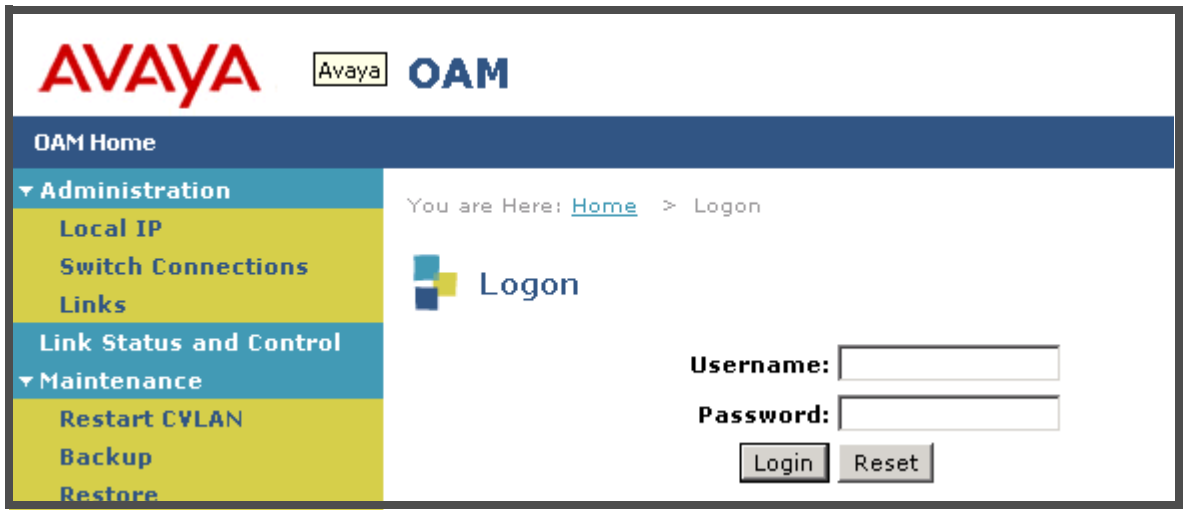
Follow this procedure to log on to the CVLAN Web based OAM interface.

1. Start your Web browser and type the following URL to start the CVLAN OAM interface:

   `http://<hostname>:<port>/CVLAN/OAM`

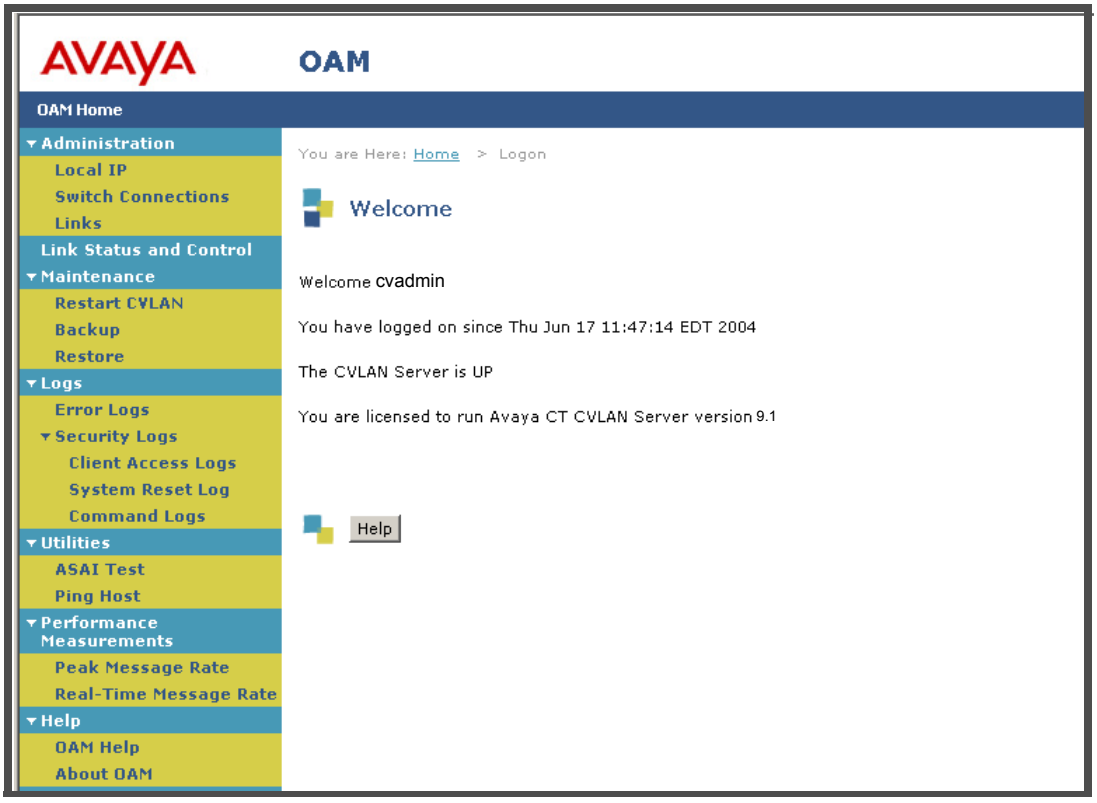
   - Substitute ***`hostname`*** with the host name of the Linux computer running the CVLAN Server.
   - Substitute ***`port`*** with the appropriate port number (the default port number is 8080).

   The OAM interface displays the Logon page.



2. Type your ***`username`*** and ***`password`*** and click **Login**. Recall that you can not log on to CVLAN OAM as root.

Your browser displays the Welcome page.



3. Review the status messages that are displayed on the Welcome page, and click **Help** for more information.

- This completes the log in procedure.

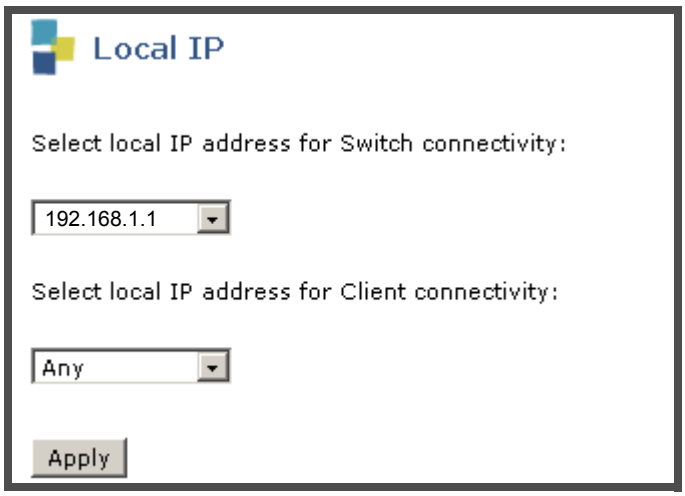
Basic CVLAN administration procedure

Follow this procedure to set up your CVLAN Server and enable your CVLAN Clients to communicate with Avaya Communication Manager.

- To ensure that you are viewing the most current state of an OAM Web page, you must either press **Shift** and click **Refresh**, or set up your browser to stop caching pages.

1. Log on to CVLAN OAM (see Logging on to CVLAN OAM on page 59).
2. In the left panel of the OAM Web page, click **Local IP**.

   Your browser displays the Local IP page.



3. Follow Steps a through c to complete the Local IP Web page.

   a. In the **Select local IP address for Switch connectivity**: text box, select the local IP address the CVLAN Server will use to connect to Communication Manager.

      - In a dual NIC configuration select the IP Address of the CVLAN Server NIC (eth1) that connects to the private, isolated LAN.
      - In a single NIC configuration use the IP Address of the only NIC on the server, or choose **Any**.

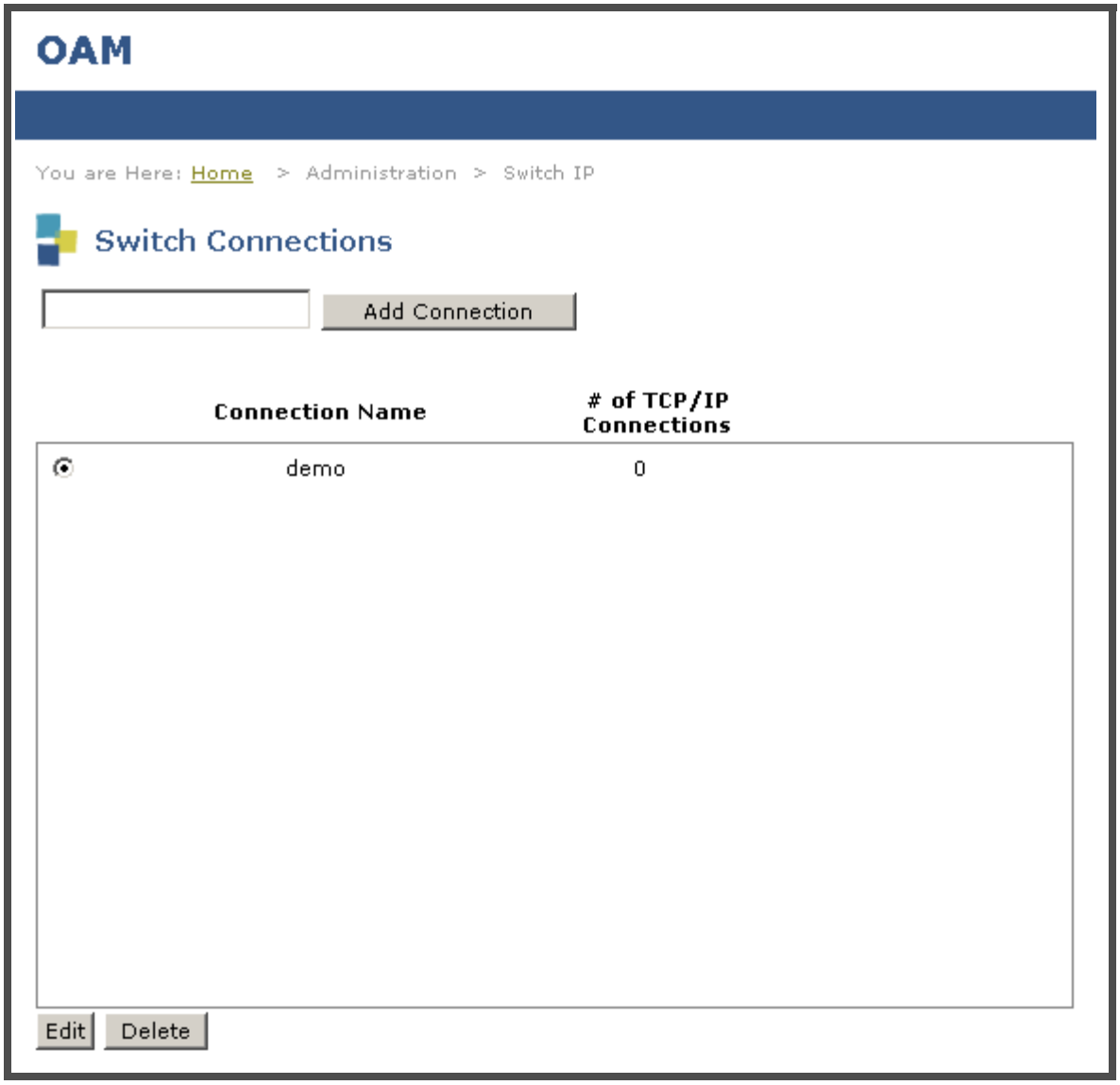
   b. In the **Select local IP address for Client connectivity** text box select the local IP address the CVLAN Client will use to connect to the CVLAN Server

      - In a Dual NIC configuration select the IP Address of the CVLAN Server NIC (eth0) that connects to the organizational LAN/WAN.
      - In a Single NIC configuration select the IP Address of the only NIC on the server, or choose **Any**.

   c. Click **Apply** to put your changes into effect.

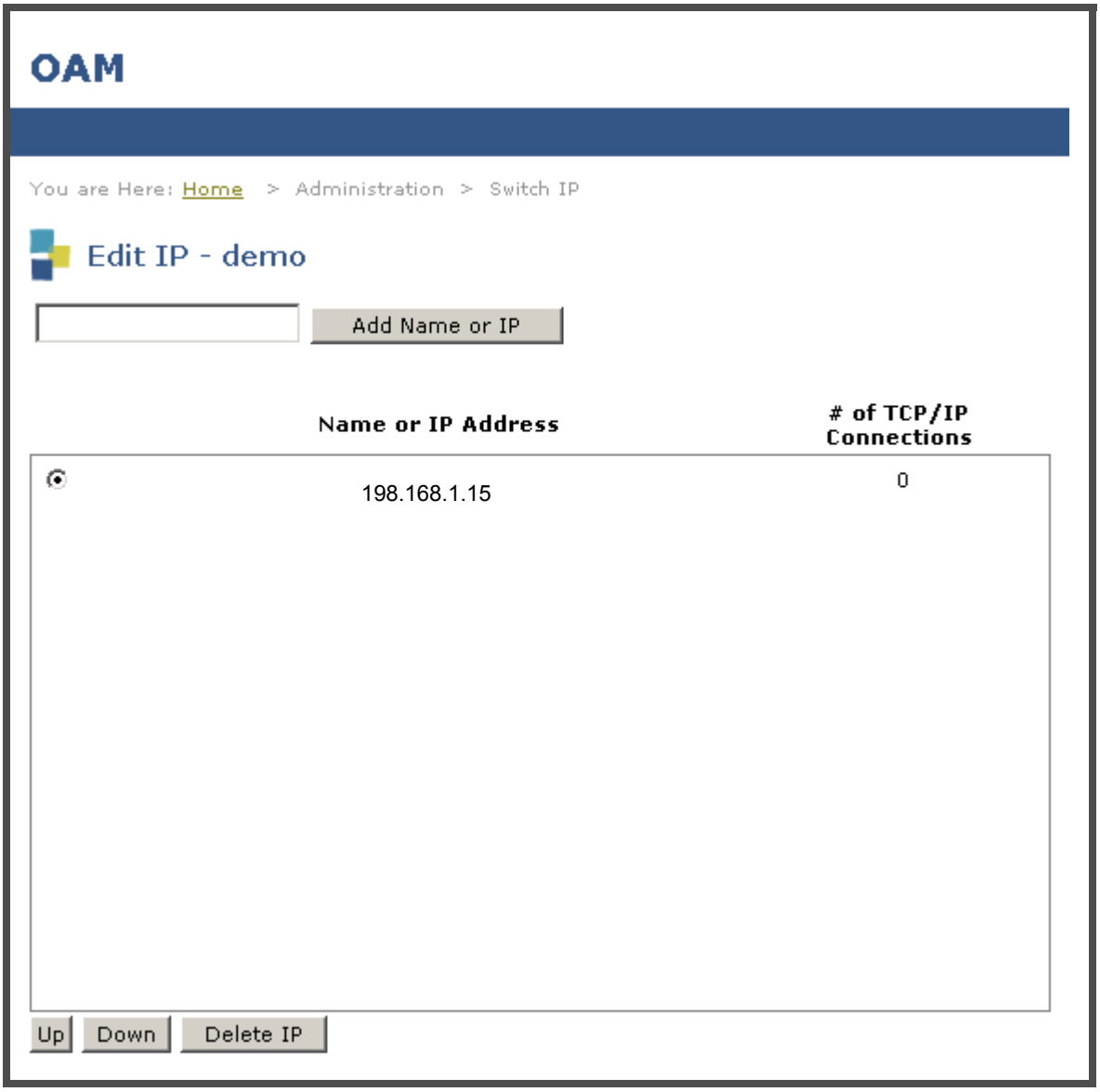
4. In the left panel of the OAM Web page, click **Switch Connections**.

   Your browser displays the Switch Connections page.



5. In the Add Connection text box, type a name you want to assign to the switch (for example, **demo**) and click **Add Connection**. (The name can be any name you want to use -- switch names allow alphanumeric characters and only one special character, the dash "-").

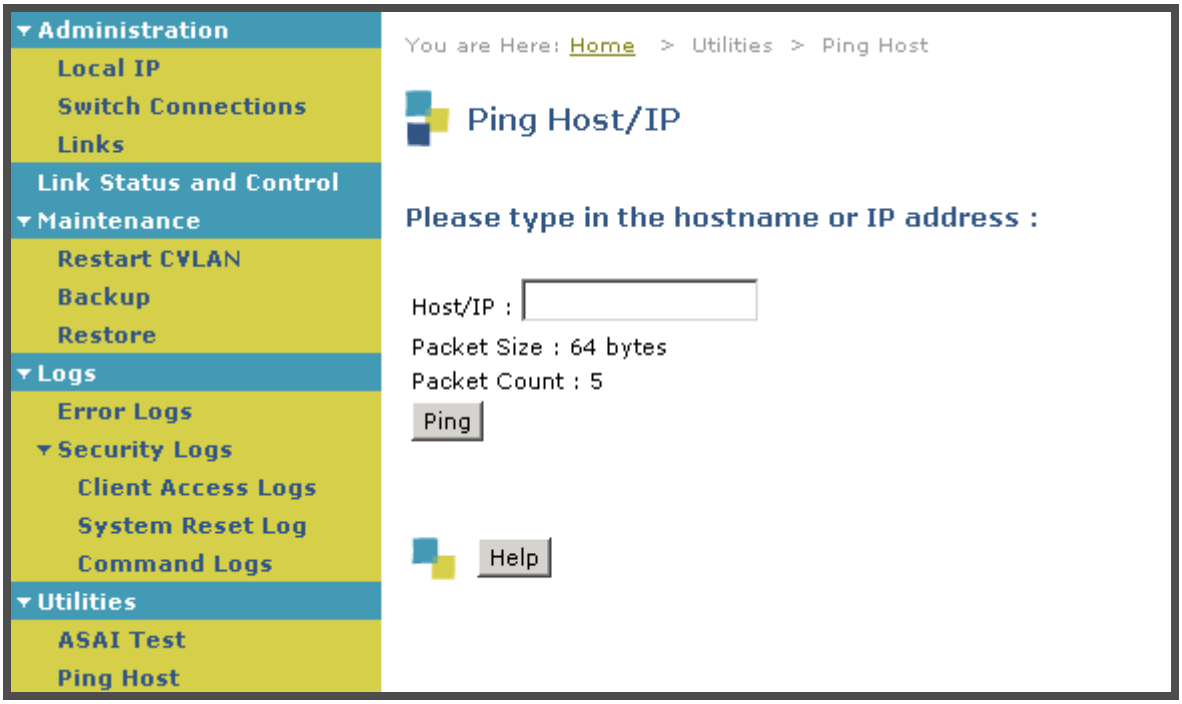
Your browser displays a new page with the title "Edit IP - demo" (the page title reflects the name of the connection that was just added).



6. At this point you can add an IP address (or addresses) of C-LAN boards that you want to associate with that particular connection name. Each IP address you add appears as the last member of the list of IP addresses. You can change the priority of the IP address by selecting the IP address and clicking **Up** (sets it to a higher priority) or **Down** (sets it to a lower priority).

7. In the left panel of the OAM web page, click **Ping Host**.

   Your browser displays the Ping Host/IP Page.

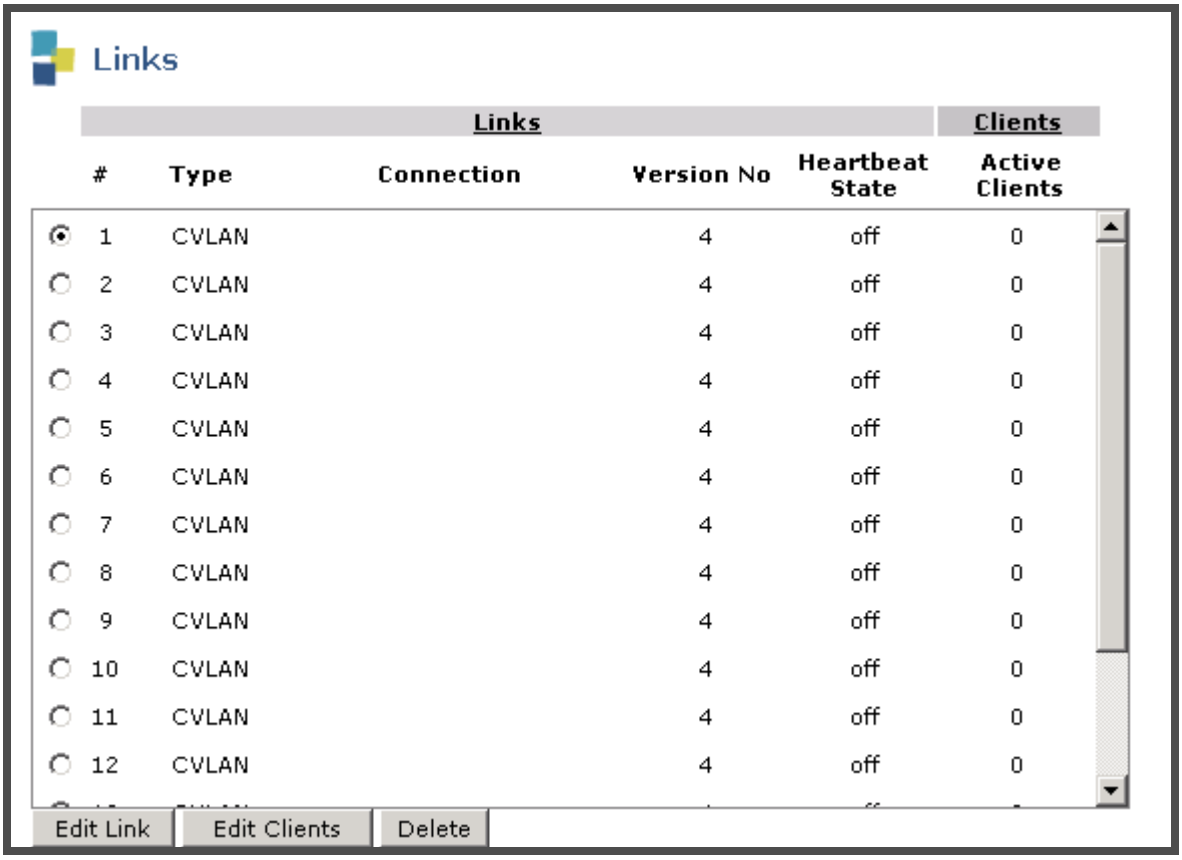


8. In the Host/IP list box, type the ***IP address of the C-LAN board*** and click **Ping**. If your browser displays a message that indicates a packet size and a packet count the ping is successful. For example.

   ```
   Packet Size : 64 bytes
   Packet Count : 5
   ```

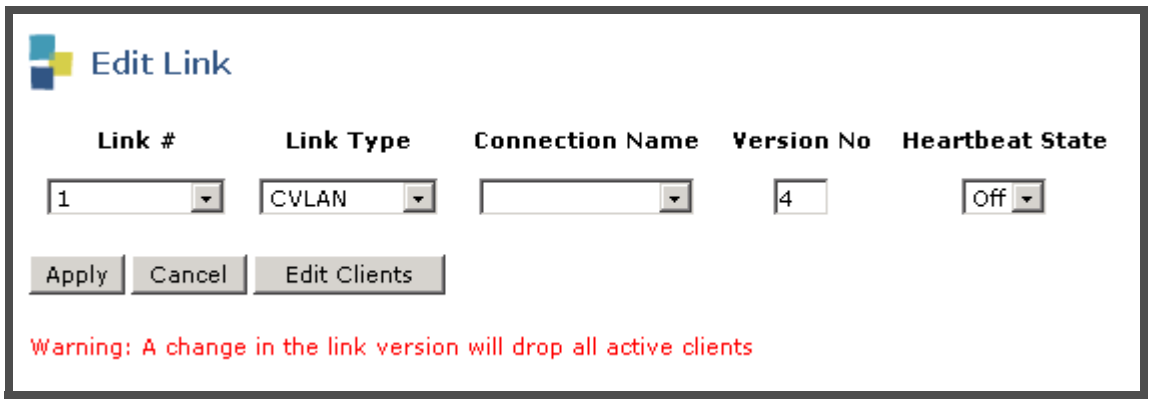
9. In the left panel of the OAM web page, click **Links**.

   Your browser displays the Links page.



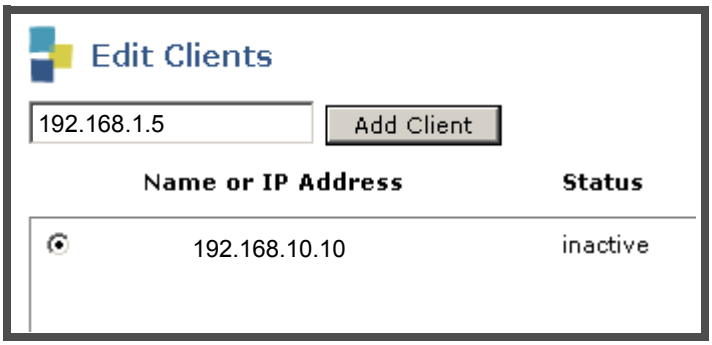
10. In the Links list select the link you just added, and click **Edit Link** to edit a client link.

Your browser displays the Edit Link page.



11. Follow Steps a through h to complete the Edit Link page.
    a. Link # -- Select the link number that corresponds to the signal number used by the application. The application signal number and the link number must match. For CVLAN Server 9.1, the terms link number and signal number are equivalent.
    b. Link Type -- Select **CVLAN** or **Proprietary**, based on your CVLAN license.
    c. Connection Name -- Select the name of the link you want to administer.
    d. Version -- Type the number that corresponds to the highest ASAI Link Version that your application requires. A rule of thumb is that applications using CVLAN 6.1.7 clients require ASAI version 3, and applications using CVLAN 8.2.5, or later, clients require ASAI version 4.
    e. Heartbeat State -- Choose the setting appropriate for your configuration. Select **On** to designate the CVLAN Server as the Heartbeat server. Select **Off** to designate the Avaya Communication Manager server as the heartbeat server.
    f. Click **Apply** to update the Edit Link fields for Link 1.
    g. Click **Edit Clients** to assign CVLAN clients to Link 1.

       Your browser displays the Edit Clients page.

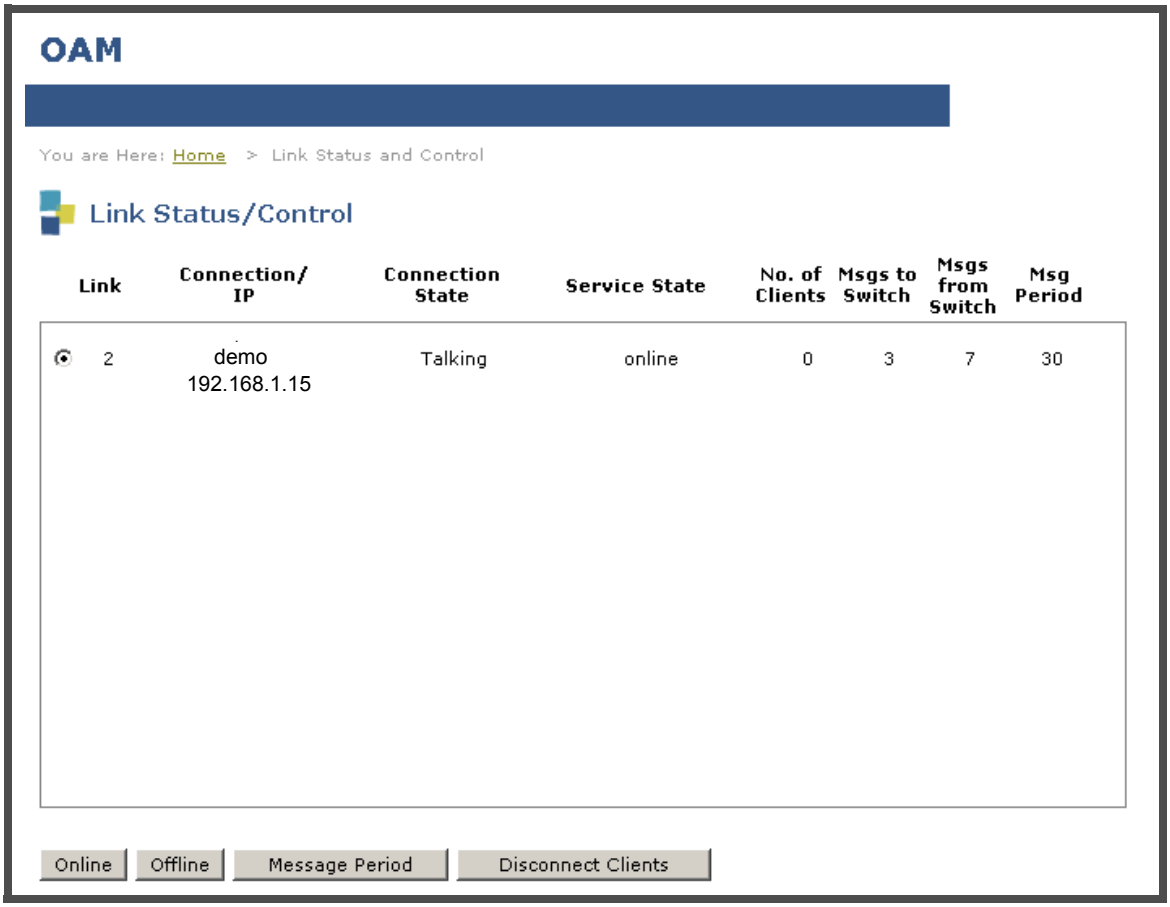


    h. In the Add Client text box, enter the ***IP Address of the client*** that you want to assign to the link you just administered, and then click **Add Client**. Repeat this

step for each client you want to add. The total number of client IP addresses and client names can not exceed 44.

12. In the left panel of the CVLAN web page, click **Link Status and Control**.

    Your browser displays the Link/Status Control page.



13. Review the status of the client link that you administered in Step 11. Here are a few guidelines to follow:
    - Make sure that the Link number, connection (name), and IP address are correct.
    - Verify that the Connection State is Talking for the link you just administered.
    - Verify that the Service State is online for the link you just administered.
    - Observe the message traffic for each client under No. of Clients, Msgs to Switch, and Msgs from Switch.
    - Notice that Msg Period (interval for counting messages) is set to 30 minutes, which is the default.

- This completes the initial, basic administration of the CVLAN Server. For more information about CVLAN OAM, click **Help** at the bottom of each OAM Web page.

Configuring Avaya CVLAN Server 9.1 for Linux

When you install Avaya CVLAN Server 9.1 for Linux, it relies on the default port for making servlet calls to and from the application server (Tomcat Web server). You can either use the default configuration or you can customize the configuration.

Using the default CVLAN configuration

The default configuration assumes that CVLAN is the only application (with an application server, such as Tomcat) on the Linux server. The default port assignment is 8080.

If you intend to use the default configuration with the 8080 port assignment, and you have followed the installation procedures described in this chapter, then no additional administration is required.

Guidelines for configuring TCP/IP

This section provides a few guidelines for setting up port numbers and determining the speed of the network. It includes the following topics.

Recommended NIC configurations

Although Avaya CVLAN Server 9.1 for Linux can work in a single NIC (Network Interface Card) configuration, it is recommended that you configure the Linux server with dual NICs according to these guidelines.

- Prohibit IP forwarding on the Linux server. That is, there should be no IP forwarding between the NIC used for Communication Manager and the NIC used for client access.
- Configure CVLAN Server NIC (eth1) to communicate with Communication Manager (via the Co-Resident DLG and the C-LAN). The network connection from eth1 to Communication Manager should be an isolated segment.

  Note:

  The link between the CVLAN Server NIC (eth1) and Communication Manager requires an Ethernet switch or a network hub. A crossover cable is not supported.
- Configure CVLAN Server NIC (eth0) to communicate with the client application.
- You can configure the NICs as either 10Base T or 100Base T, full-duplex.

Network latency requirements

The following list describes the network latency requirements for supporting CTI links over a LAN or WAN. These are TCP/IP links, connected via LAN or WAN, between the CVLAN Server, the DLG, and Avaya Communication Manager.

- Maximum average round trip time of 200 ms -- a maximum 200 millisecond (ms) average round trip packet delivery time as measured with ping over every one hour time period with no single spike exceeding five seconds.
- No unrecovered packet loss

Note:

Avaya Services will not troubleshoot a customer LAN/WAN.

General information about TCP/IP Ports used by Avaya CVLAN Server 9.1 for Linux

The CVLAN Server uses port 9999, and CVLAN is currently configured to work with the default port of 8080 for Tomcat and the specified port of 5431 for PostgreSQL. If these ports are in conflict with another product you are running, and you have decided to change these port numbers, please follow the procedures described in Changing the TCP/IP port for Tomcat and Changing the TCP/IP port for PostgreSQL.

Changing the TCP/IP port for Tomcat

CVLAN uses WebLM which runs on Tomcat and will fail to contact the license manager if the port for Tomcat has changed.

Follow these steps to reconfigure the TCP/IP port for Tomcat:

1. Click the **RedHat icon** (Main Menu) > **System Tools** > **Terminal** to get the command prompt.
2. Log in as root if necessary.
3. At the command prompt, type the following command:

   `cd /etc/profile.d`
4. Use vi or emacs to edit the `cvlan.sh` file.
5. Change the line that reads `WEBLM_SERVER_URL=http://localhost:8080/WebLM/LicenseServer` by changing the port number to the new port number. Save the file.
6. Restart the Linux server.

Changing the TCP/IP port for PostgreSQL

CVLAN uses PostgreSQL as its primary database and CVLAN Server will fail to connect to the database if the port has changed.

Follow these steps to reconfigure CVLAN:

1. Click the **RedHat icon** (Main Menu) > **System Tools** > **Terminal** to get the command prompt.
2. Log in as root if necessary.
3. At the command prompt, type the following command:

   `cd /usr/local/cvlan/config`
4. Use vi or emacs and edit the `postgreSQL.cfg` file.
5. Change the line that reads `port=5431` by changing the port number to the new port number. Save the file.
6. Restart the Linux server.

Removing Avaya CVLAN Server software and the CVLAN user account

Use this procedure to completely remove Avaya CVLAN Server software (either CVLAN Server 9.0 or CVLAN Server 9.1) from the Linux computer.

Note:

If you want to remove the CVLAN Server in the context of a CVLAN upgrade, see Procedure for removing CVLAN Server 9.0 on page 48

1. Click the **Red Hat icon** (Main Menu) > **System Tools** >**Terminal** to get the command prompt.
2. Log in to the system as root. For more information see Logging in as root on page 29.
3. To verify that the CVLAN software is on the computer, type:

   `rpm -q cvlan`

   Your browser displays a response similar to the following: `cvlan-9.1.0.0-30`
4. To remove the CVLAN software, type:

   `rpm -e cvlan`

   The RedHat package manager removes the CVLAN Server software.
5. Because CVLAN saves the logs directory and backs up the database when you remove the CVLAN Server, you must remove the following directories:
   /usr/local/cvlan
   /home/cvlan
6. Click the **Red Hat** icon (Main Menu) **> System Settings > Users and Groups**.

   Red Hat displays the Red Hat User Manager dialog.
7. From the list box, select **CVLAN**, and then click **Delete**.

- This completes the procedure to remove Avaya CVLAN Server software.

Operating system updates

Major updates to the operating system are typically certified within three months of the release and information is posted on the appropriate Web page on the Avaya Support Web site. Any information about operating system updates that affect CVLAN will be posted to the CVLAN for Linux Web page.

Follow this procedure to get to the CVLAN for Linux Web page.

1. From your browser, go to http://www.support.avaya.com .
2. From the Avaya Support page, select Technical Database > Contact Centers/CRM > Computer Telephony Integration > CVLAN for Linux.

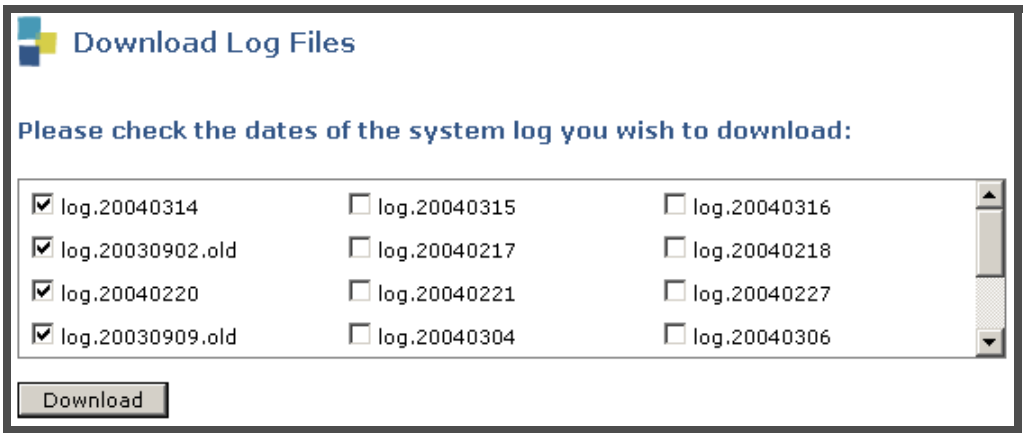
Accessing CVLAN Server error logs

Error logs contain up-to-date information about system activity and errors. Bear in mind that you can not view error logs from the Download Log Files Web page. You must download them to your computer, uncompress them, and use a text editor to view them.

Follow this procedure to access the CVLAN Server error logs.

1. Log on to the CVLAN OAM interface (see Logging on to CVLAN OAM on page 59).
2. In the left panel of the CVLAN OAM Web page, select **Error logs**.

   CVLAN OAM displays the Download Log Files Web page that allows you to select one or more error logs to download to your computer.



3. Select the checkbox next to the error logs you want to download, and click **Download** to download the error logs to your local computer.

   CVLAN OAM displays the Download Log Files page, with the instruction "Click here to download the log file."

4. Click the "here" link to download the log file.

   Your computer displays the File Download dialog box.

5. Select **Save**.

   Your computer displays the Save As dialog box with the default log file name (for example, `log17032004-102822.zip`) in the File name list box.

6. Use the Save in list box to browse to the appropriate directory for storing the error log, and click **Save** to save the file to that directory.

   The system stores the compressed error log file in the location you specified.

7. Change to the directory where you stored the log file. Uncompress the log file and use a text editor to view the error log.

- This completes the procedure to download CVLAN Server error log file.

Appendix A: Avaya CVLAN Server 9.1 for Linux installed files

This appendix lists the files that Avaya CVLAN Server 9.1 for Linux installs.

Avaya CVLAN Server 9.1 for Linux files

Table A-1 lists the CVLAN Server for Linux files and where they are installed.

Table A-1: CVLAN Server -- installed components

Directories	/usr/local/cvlan /usr/local/cvlan/bin /usr/local/cvlan/lib /usr/local/cvlan/archive /usr/local/cvlan/config /usr/local/cvlan/webapps /usr/local/cvlan/database /usr/local/cvlan/itt /usr/local/cvlan/logs
Libraries	/usr/lib/libasai.so /usr/lib/libACE.so.5.3.0
trace and debug utilities	/usr/local/cvlan/bin/LogUtility /usr/local/cvlan/bin/ServerCommandUtility /usr/local/cvlan/bin/esai_trace
CVLAN Server	/usr/local/cvlan/bin/cvlanserv /usr/local/cvlan/bin/perf
config	/usr/local/cvlan/config/postgreSQL.cfg

Table A-1: CVLAN Server -- installed components (continued)

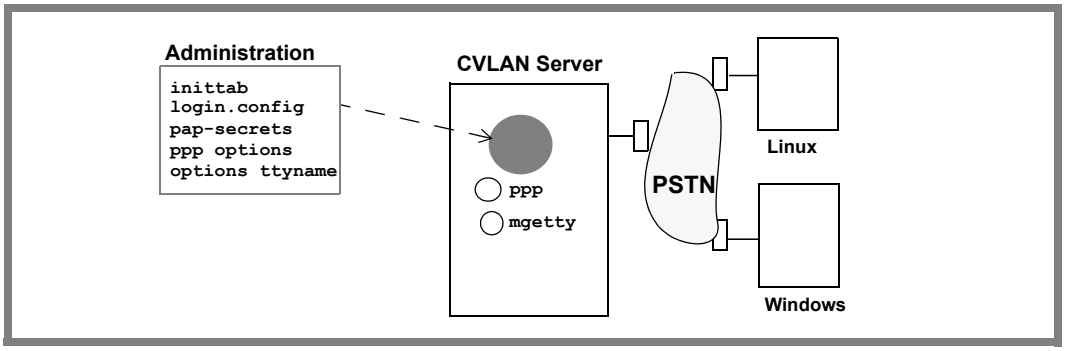
shell scripts	/usr/local/cvlan/bin/ASAITest.sh /usr/local/cvlan/bin/Restore.sh /usr/local/cvlan/bin/Backup.sh /usr/local/cvlan/bin/ServerOnline.sh /usr/local/cvlan/bin/ServerOffline.sh /usr/local/cvlan/bin/ServerMonitor.sh /usr/local/cvlan/bin/cvlan_start.sh /usr/local/cvlan/bin/ServerState.sh /usr/local/cvlan/bin/CVsh.inc /usr/local/cvlan/bin/GetDBProps.inc /usr/local/cvlan/bin/dbcreate.sh /usr/local/cvlan/bin/LocalIP.sh /usr/local/cvlan/bin/runLocalIP.sh /usr/local/cvlan/bin/CheckForDB.sh /usr/local/cvlan/bin/check_licensemanager /usr/local/cvlan/bin/cvlan_install_checker.sh /usr/local/cvlan/bin/ServerCron.sh /usr/bin/asai_test /usr/bin/asai_hb
webapps, OA&M and WebLM	/usr/local/cvlan/webapps/CVLAN.war /usr/local/cvlan/webapps/WebLM.war /etc/pam.d/checkuser /usr/local/cvlan/lib/libcheckuser.so /etc/profile.d/cvlan.sh
Itt	/usr/local/cvlan/itt/itt.tar
User documentation	/usr/local/cvlan/docs/readme.txt /usr/local/cvlan/docs/CVLS_IG.pdf /usr/local/cvlan/docs/CALLVISR.pdf /usr/local/cvlan/docs/ASAIPROT.pdf /usr/local/cvlan/docs/ASAITECH.pdf

Appendix B: Setting up for remote access

Avaya Services personnel require remote access to the Linux PC to install, administer, and maintain the CVLAN Server.

This appendix includes the following topics.

Remote access arrangement



Setting up the Linux PC for remote access

Setting up a Linux PC for remote access requires a modem and installing and two software components (**ppp** and **mgetty**). This appendix describes how to install **ppp** and **mgetty** and how to configure the PC after you have installed these two software components. This section includes the following topics.

Prerequisites

If you have a Linux PC with the default Red Hat Enterprise Linux software components already installed (see Installing the prerequisites on page 31), the only additional requirements are as follows

- Red Hat Enterprise compatible modem
- **ppp** -- Point-to-point-Protocol software
- **mgetty** -- a program that handles modem communications

Before You Begin

Use this checklist to make sure you are ready to start.

- You are logged in as root (see Logging in as root on page 29).
- The X Window system is running (see Running the X Window system on page 30)
- You are at the command prompt. If you are not, follow this step:
  - Click the **Red Hat icon** (Main Menu) > **System Tools** > **Terminal** to get to the command prompt.
- You have the complete Red Hat Enterprise Linux ES CD-ROM set on hand.

Installing the additional software components

From the command prompt, follow this procedure to install ppp and mgetty.

1. Insert the Red Hat Enterprise Linux Installation CD-ROM disk 2 in to the CD-ROM drive, and type the following command, to mount the file system:

   `mount /mnt/cdrom/`

2. Type the following command to change to the directory containing the RPM packages:

   `cd /mnt/cdrom/RedHat/RPMS`

3. Type the following command to install ppp.

   `rpm -i ppp-2.4.1.14.i386.rpm`

4. Type the following command to install mgetty.

   `rpm -i mgetty-1.1.30-3.i386.rpm`

- This completes the procedure to install ppp and mgetty. Continue with Configuring the Linux PC on page 80.

Configuring the Linux PC

Once you have the installed necessary software, carry out the tasks described in the following sections to configure the Linux PC.

- Editing the inittab file on page 80
- Editing the login.config file on page 80
- Editing the options.tty file on page 82
- Checking the PPP options file on page 81
- Editing the options.tty file on page 82

Note:

All of these procedures assume that you are using a text editor such as vi or emacs.

Editing the inittab file

Edit the `/etc/inittab` file, and add one line for each modem you plan to use. For example:

```
S0:2345:respawn:/sbin/mgetty -D ttyS0
```

`-D`	is the parameter for a data modem
`ttyS0`	is the device identifier (Varies according to your hardware. For example, `ttyS0` is associated with COM1 and `ttyS1` is associated with COM2)

Editing the login.config file

Edit the `/etc/mgetty+sendfax/login.config` file by uncommenting the AutoPPP line and editing it to include a reference to the options file (by specifying `file /etc/ppp/options`), as shown below:

```
/AutoPPP/ - a_ppp /usr/sbin/pppd file /etc/ppp/options
```

Editing the pap-secrets file

For PAP (Password Authentication Protocol) authentication, edit the `/etc/ppp/pap-secrets` file, so that it consists of one line containing the following characters (see Example of /etc/pap-secrets file):

```
* * "" *
```

Example of /etc/pap-secrets file

```
# Secrets for authentication using PAP
# client        server       secret      IP address
    *             *            ""              *
```

These settings enable any registered user to log in. (Alternatively, you could specify usernames, passwords and IP addresses.)

Checking the PPP options file

Check the `/etc/ppp/options` file and make sure the following options are specified.

```
lock
-detatch
modem
crtscts
proxyarp
asyncmap 0
```

PPP options

`lock`	Creates a lock file that has exclusive access to a specific device.
`-detach`	Prohibits the pppd process from forking and becoming a background process (this happens when a serial device is specified).
`modem`	Sets up the server to use modem control lines. The client waits for a signal from the modem before opening a serial device (default) behavior. You can change this handshake if necessary.
`crtscts`	Specifies hardware flow control.
`proxyarp`	Lets the client appear as if it is on the same LAN as its peers.
`asyncmap 0`	Prohibits the pppd process from setting up and using escape control sequences.

Editing the options.tty file

Edit the options file for the modem to include a <*serverIP*>:<*clientIP*> entry for each tty.

For example if your modem is connected to ttys0, edit `/etc/ppp/options.ttyS0` as follows (be sure to include the colon between the server IP address and the client IP address). The default <*serverIP*>:<*clientIP*> entry for each tty is:

Server IP	Client IP
192.168.25.10	192.168.25.20

Setting up the client to dial-in to the server

This section contains some basic tips for setting up the two most frequently used clients:

- Windows
- Linux

It also includes connection requirements, which apply to both.

Windows clients

From a Windows client, use Windows Dial-up Network Connections to establish a PPP connection to the CVLAN Server.

Linux clients

From a Linux client, use either the GNOME or KDE Dialer to establish a PPP connection to the CVLAN Server.

Connection Requirements

Verify the PPP connection requirements and administer accordingly, for example:

- You may need to administer a login and password for the client connection. By default, no login and password are administered on the CVLAN Server.
- You will need to administer an IP address for the client connection. The default Client IP address is 192.168.25.20.

Appendix C: Downloading Red Enterprise Hat Linux ES

CVLAN Server 9.1 requires the 32-bit version of Red Hat Enterprise Linux ES 3.0 Update 2, or later (Update 3 is currently available). This appendix provides you with basic information about downloading the appropriate version of Red Hat Enterprise Linux ES software, and includes the following topics.

Before you start

Keep in mind that the only way to get Red Hat Enterprise Linux ES 3.0, Update 2 (or later) is by downloading the software from the Red Hat Network. Follow these steps to download Update 2.

1. Locate the registration card that comes with the Red Hat Enterprise LInux ES 3.0 CD-ROM set, and follow the instructions under "Red Hat Subscription Information" to register.
2. When you have registered to use the Red Hat Network, continue with Downloading Red Hat and creating installation CD-ROMs on page 86.

Downloading Red Hat and creating installation CD-ROMs

This procedure assumes that you have registered to use the services available via the Red Hat Network.

Follow these procedures to download the software -- keep in mind that these procedures are based on Web pages that are subject to change.

1. Go to **https://rhn.redhat.com** .
2. From the Red Hat Network Sign In page, enter your Red Hat login and password, and click **Sign In**.
3. From the opening page, Your RHN, click the **Channels** tab.
4. Click **Easy ISOs** in the left pane of the Software Channels Overview page.
5. Click **All** in the left pane of the Easy ISOs page.
6. From the Channel Name list box, on the Easy ISOs page, click **Red Hat Enterprise Linux ES (v. 3 for x86)**
7. From the Red Hat Enterprise Linux ES (v. 3 for x86) page, follow these instructions:
   a. Scroll down the page to locate **Red Hat Enterprise Linux 3 ES (i386) Update 2** (or a later update, Update 2 is the minimum requirement).
   b. Click and download each ISO (**Binary Disc 1** and so on) in the list until you have downloaded all of the ISO files (an example of a downloaded ISO file name is rhel-3U2-es-disc1.iso).
8. Create your installation CD-ROMs by using a media creation tool, which enables you to create installation CD-ROMs from the ISOs.
9. When you boot Red Hat Enterprise Linux ES, Disk 1, run the Media Test to verify that your CD-ROMs are not defective.

Appendix D: Administering the Co-resident DLG

This appendix provides two procedures for administering the Co-resident DLG on an Avaya Media Server running Avaya Communication Manager:

- Administering the Co-resident DLG service over Processor Ethernet on page 88
- Administering the Co-resident DLG service over C-LAN on page 89

Administering the Co-resident DLG service over Processor Ethernet

This section provides the procedure for administering Avaya Communication Manager on the following media servers:

- Avaya S8100 Media Server
- Avaya S8300 Media Server

Procedure to administer the Co-resident DLG service over Processor Ethernet

Follow these steps from a Communication Manager system access terminal (SAT) to administer the Co-resident DLG configurations that rely on the Processor Ethernet for IP connectivity.

1. Type **`list configuration software-versions`** and verify that the appropriate version of software is running (R11.00.059 or later).
2. Type **`display system-parameters customer-options`**, and verify that the following settings are enabled (set to y) on the System Parameters Customer-Options screen.
   - `Co-Res DEFINITY LAN Gateway? y`
   - `Processor Ethernet?` field, is set to `y`

   Either
   - `ASAI Link Core Capabilities? y`

   or
   - `Computer Telephony Adjunct Links? y`
3. Type **`change ip-services`**, and follow Steps a through c to complete the IP Services screen.
   a. In the `Service Type` field, type **`DLG`**
   b. In the `Enabled` field, type **`y`**
   c. In the `Local Node` field, type **`procr`**
4. Type **`status DLG interface`**, and verify that the status is `listening`.

   If the service state field displays `down`, verify the administration of the link on both Communication Manager and the CVLAN Server.

- This completes the procedure to administer the Co-resident DLG service over Processor Ethernet.

Administering the Co-resident DLG service over C-LAN

This section applies to the following servers:

- Avaya S8100 Media Server
- Avaya S8500 Media Server
- Avaya S8700 Media Server
- Avaya DEFINITY Server G3si
- Avaya DEFINITY Server G3csi

Note:

This procedure assumes that a C-LAN board has been installed and that a data module has been administered for the particular C-LAN board that you plan to use for CTI. See *Administration for Network Connectivity for Avaya Communication Manager*, 555-233-504 for more information about administering Avaya Communication Manager.

Procedure to administer the Co-resident DLG service over C-LAN

Follow this procedure to administer the Co-resident DLG service on an Avaya Media Server configuration with a C-LAN.

1. Type **`list configuration software-versions`** and verify that the appropriate level of software is running (CM2.0.0, or later)
2. Type **`display system-parameters customer-options`**, and verify that the following settings are enabled (set to y) on the System Parameters Customer-Options screen.
   - `Co-Res DEFINITY LAN Gateway? y`

   Either

   - `ASAI Link Core Capabilities? y`

   or

   - `Computer Telephony Adjunct Links y`
3. Type **`change ip-services`**, and follow Steps a through c to complete the IP Services screen.
   a. In the `Service Type` field, type **`DLG`**
   b. In the `Enabled` field, type **`y`**
   c. In the `Local Node` field, type ***`<Name of C-LAN where DLG will be enabled>`***

4. Type **`status DLG interface`**, and verify that the status is `listening`.

   If the service state field displays `down`, verify the administration of the link on both Communication Manager and the CVLAN Server.

- This completes the procedure to administer the Co-resident DLG service over C-LAN.

Glossary

Administration
The process of setting up a system (the CVLAN Server, for example) so that it will function as desired. Administration is typically done by the system administrator or by remote services personnel.

API
Application Programming Interface. A set of functions and data items that allow a programmer to define an application to a particular interface.

Application
A process on a client computer that requests and receives ASAI services and capabilities through a program library or network service. The terms *application* and *adjunct* are sometimes used interchangeably. *See also* **ASAI Application**.

Adjunct Switch Application Interface (ASAI)
Adjunct Switch Application Interface (ASAI) can refer to either of the following.

- The Avaya recommendation for Computer Telephony Integration (CTI) based on the CCITT Q.932 protocol.
- An option in Avaya Communication Manager (Communication Manager) that enables the ASAI messaging interface. Commonly referred to as ASAI.

ASAI application
An application running on an ASAI client computer written to request service of a library that provides direct access to ASAI messages. *See also* **Application**.

Adjunct Services Application Interface (ASAI) link
An Ethernet interface configured to support ASAI.

Avaya Communication Manager
Also referred to as Communication Manager. An open, scalable, highly reliable and secure telephony application. Communication Manager provides user and system management functionality, intelligent call routing, application integration and extensibility, and enterprise communications networking.

Avaya media server A hardware component that can run Avaya Communication Manager. Examples include: Avaya S8100 Media Server, Avaya S8300 Media Server, Avaya S8500 Media Server, and Avaya S8700 Media Server. For more information see the *Overview for Avaya Communication Manager*, 555-233-767.

Avaya media gateway A hardware component that acts as a protocol server that provides a gateway for traditional and IP configurations. The Avaya media server controls the Avaya media gateway and Avaya Communication Manger runs on the Avaya Media Server. For more information see the *Overview for Avaya Communication Manager*, 555-233-767.

Browser See Web browser.

C-LAN Abbreviation for Control LAN. Refers to the circuit pack that handles the TCP/IP connection between the Avaya Media Server (S8100, S8500, and S8700) and the CVLAN Server.

Client At the most fundamental level, (in terms of client server architecture) the client is the application requesting a service and the server is the application providing the service. In most cases client refers to the CVLAN Client. When the context calls for a different usage of the term, it will be explained in context.

Client Name In terms of CVLAN OAM, the client name refers to a name assigned to a CVLAN Client. Client names resolve to IP addresses.

Configuration The combination of hardware and software that defines a computer or telecommunications system and also determines how it will operate.

Connection Name A connection name is a CVLAN based convention for a switch connection. A connection name can refer to the following.

- one IP address or multiple IP addresses (up to 64) that are assigned to the C-LAN boards on the Avaya Media server.
- one host name or multiple host names (up to 64) that are that are assigned to the C-LAN boards on the Avaya Media server.
- a collection of host names and IP addresses that are assigned to the C-LAN boards on the Avaya Media server. The total of host names and IP addresses can not exceed 64.

Bear in mind that the ability to use a connection name that refers to multiple connections requires a multiple connection license.

CVLAN Server The server based component of CVLAN that enables applications to communicate with Avaya Communication Manager. The CVLAN Server includes the Web based OAM interface. Also referred to as Avaya CVLAN Server 9.1 for Linux in this document.

Default An alternative value, attribute or option that is assumed by the system when none has been specified by the user.

Diagnostics Programs that run on Avaya Communication Manager to check for actual, as well as potential, faults and problems in the system. Diagnostics normally run automatically at pre-defined intervals.

Ethernet A local area network that connects computers, printers, workstations, terminals etc. within the same building. Ethernet operates over twisted wire and over coaxial cable at speeds up to 10 mbps. For LAN interconnections, Ethernet is a physical link and data link protocol.

Heartbeat A message sent from Communication Manager to the CVLAN Server at timed intervals to determine the status of a CTI link. (Note: the CVLAN Server can initiate the heartbeat to Communication manager.) The heartbeat or request must be acknowledged by a confirmation message. If three consecutive heartbeat requests go unconfirmed, the link is taken down.

GNOME GNOME (GNU Object Model Environment) is a graphical user interface for the Linux desktop.

Link *See* **Adjunct Switch Application Interface link.** Synonymous with ASAI Link. A CTI link. In the context of Avaya CVLAN Server for Linux, it refers to either a CVLAN (ASAI-IP) link or a Proprietary link (ADJ-IP).

Local Area Network (LAN) A networking arrangement designed for a limited geographical area. Generally, a LAN is limited in range to a maximum of 6.2 miles and provides high-speed carrier service with low error rates.

Login A unique code that identifies and authenticates a user to the system.

MAC Media Access Control. Data-link layer protocol that governs access to transmission media. Also refers to the unique address of a Network Interface Card (sometimes referred to as MAC address).

Operating System The set of programs that runs the hardware and interprets the software commands.

Operations, Administration, and Maintenance (OAM)	A state of system operation where the core processes of CVLAN Server are accessed, including system initialization, resource configuration, forms interface, entry into the maintenance subsystem, and file system access.
Ping	A program that is used to test and debug networks. It sends an ICMP Echo packet to a specified host and waits for a response. It reports on the success or failure of its operation as well as associated statistics that accompany the test.
Pluggable Authentication Module	Also referred to as PAM. An authentication process used by Red Hat.
Reboot	A system reboot clears major system problems (such as the corruption of program memory). It also runs automatically whenever the system is powered up.
Red Hat	Red Hat, Inc. A Linux provider.
RPM	RPM Package Manager (or RPM). The Red Hat system that enables you to install, remove, and manage Linux software. When you use the **`rpm`** command you invoke the system.
Server	An application (or process) that processes (acts on) requests from clients. It is an instantiation of a set of services that can be shared with multiple clients in a distributed environment.
Switch Connections	A convention that allows you to associate an IP address (or host name) with a name that you choose. Switch Connection also refers to the OAM Web page that lets you create a Connection Name. See also Connection Name on page 92.
TCP/IP Port	Transmission Control Protocol/Internet Protocol port. A numbered access "subaddress" for an IP address that usually indicates the service or application that is desired to engage in a communications session.
Technical Service Center	The Avaya Tier 3 services group who remotely maintains and diagnoses a CVLAN Server using a set of forms generated on a computer terminal.
Telnet	The TCP/IP protocol governing the exchange of character-oriented terminal data. Also, the process by which a person using one computer can sign on to a computer in another city, state, or country. With Telnet, a user can work from a PC as if it were a terminal attached to another machine by a hard-wired line.

Tomcat	A open-source implementation of Java Servlet and JavaServer Pages technologies. It is required for running the CVLAN Server. From the viewpoint of the CVLAN user (and OAM activities), it is transparent.
Web Browser	A program capable of reading HTTP and rendering in HTML. Red Hat Linux supports several browsers including Netscape, Mozilla and Galeon.
Web Client	An client that submits HTTP service requests to a server capable of processing HTTP requests. The server responds with an HTML message, which the web client understands.The CVLAN Web OAM is a web client that requests services from the Web server running on the Linux operating system.
Web License Manager	(Also referred to as WebLM) A Web application that hosts your Avaya CVLAN Server for Linux license.
Web Server	A server that is capable of processing HTTP requests from an Web client. (See also, Web client).

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