Avaya Call Management System
Switch Connections, Administration, and Troubleshooting

Release 19.0
June 2019
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Chapter 1: Introduction

Purpose

This document describes how to connect and administer Avaya communication servers (switches) that are used with the Avaya CMS.

Intended audience

This document is intended for:

- Avaya support personnel
- Contact center administrators

This document assumes a minimum level of technical knowledge on the part of its readers. It assumes, for example, that a reader knows how to use the switch administration interfaces and how to connect switch hardware.

Document changes since last issue

The following changes have been made to this document since the last issue:

- Updated the Switch release and CMS compatibility table in the Switch and CMS release compatibility section.
- Removed references to NTS and Intuity AUDIX from the 'Sample Configurations' section.
- Removed references to Token Ring from the section 'Switch Connections with TCP/IP over a LAN'.
- Updated the text referring to NIC connections in the section 'Planning for TCP/IP switch links.'
- Updated diagrams in the section 'Two ethernet ports on CMS computer', 'Remote switch on the customer network', 'Two ethernet ports option' and 'Public Network'.
- Updated the release number to CMS R18.
Chapter 1: Introduction

March 2016
● Added support for 1 GBps network speed.

June 2017
● Added support for Dual IP address.

August 2018
● Added support for CM 8.0

Related Resources

Documentation

See the following documents.

Table 1: Related documents.

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Viewing Avaya Mentor Videos

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About this task

Videos are available on the Avaya Support website, listed under the video document type, and on the Avaya-run channel on YouTube.

Procedure

● To find videos on the Avaya support web site, go to https://support.avaya.com and perform one of the following actions:
  - In Search, type Avaya Mentor Videos to see a list of available videos.
  - In Search, type the product name. On the Search Results page, select Video in the Content Type column on the left.

● To find Avaya Mentor videos on YouTube, go to https://www.youtube.com/user/AvayaMentor and perform one of the following actions:
  - Enter a key word or key words in the Search Channel to search for a specific product or topic.
  - Scroll down Playlists, and click the name of a topic to see the list of available list of videos posted on the web site.

  Note: Videos are not available for all products..

________________________________________

Documentation Web Sites

All CMS documentation can be found at https://support.avaya.com. New issues of CMS documentation will be placed on this website when available.

Use the following websites to view related support documentation:

● Information about Avaya products and services.
  http://www.avaya.com

● Sun hardware documentation.
Support

Go to the Avaya Support website at [https://support.avaya.com](https://support.avaya.com) for the most up-to-date documentation, product notices and knowledge articles. You can also search for release notes, downloads, and resolution to issues. Use the online service request system to create a service request. Chat with live agents to get answers to questions, or request an agent to connect you to a support team if an issue requires additional expertise.
Different releases of CMS software are certified to interface with the following switch software releases.

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<th>CMS software release</th>
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Chapter 3: Connecting a TCP/IP switch link

This section explains how to connect the CMS computer to the switch using TCP/IP over a local area network (LAN).

This section includes the following topics:

- Overview on page 15
- Switch connections with TCP/IP over a LAN on page 19

Overview

The connection between the CMS computer and a switch allows the CMS software on the computer to receive, store, and format the Automatic Call Distribution (ACD) information it receives from one or more switches.

A switch technician should be on-site to make the connection from the CMS computer to the switch and, if necessary, to administer the switch for the ACD feature and CMS. The CMS software will not communicate with the switch if the ACD feature, CMS, or the switch hardware is not properly administered. See Administering a TCP/IP switch link on page 39 for more information.

This section includes the following topics:

- Local vs remote connections on page 16
- Multiple ACDs (switches) on page 16
- High availability option on page 16
- For the S8300 Server, you cannot have dedicated links to each CMS computer; if you want true duplication, you must use a different solution. on page 16
- Planning for TCP/IP switch links on page 16
Local vs remote connections

This section shows both local and remote connections between the switch and the CMS computer. For clarification, these connections are defined as follows:

- Local - The connections between the switch and the CMS computer use facilities local to the switch, such as a direct connection over a LAN.
- Remote - The connections between the switch and the CMS computer use wide area network (WAN).

Multiple ACDs (switches)

One CMS computer can collect data from up to eight different switches. From the CMS computer point of view, each switch represents one ACD. Each switch requires a link to the CMS computer.

High availability option

The High Availability option provides dual links between the switch and two separate CMS computers. If the customer has purchased the High Availability option, you must connect a link from one ethernet port on the switch to one CMS computer, and a second link from a different ethernet port on the switch to another CMS computer.

Note:
For the S8300 Server, you cannot have dedicated links to each CMS computer; if you want true duplication, you must use a different solution.

Planning for TCP/IP switch links

When setting up a switch link using TCP/IP over a LAN, planning information must be gathered before you begin. In particular, you must take into account if the LAN connection includes both a connection to CMS and Avaya Operational Analyst (OA). Some of the information needed includes:

- How is the connection being made from the CMS computer to the switch?
  - Private LAN, no connectivity to customer LAN (uses private LAN addresses).
    - Most robust and reliable, no dependency on customer’s network
    - A dedicated LAN port on the CMS computer provides the switch link
● The primary LAN port (the built-in ethernet port) is used for other connectivity (printers, terminals, Avaya CMS Supervisor and Avaya OA) using a different subnet from the switch link

● If desired, a second ethernet port can be used to provide additional isolation for the CMS link

● A dedicated LAN hub to connect the links

— Customer LAN with private segment.

● Uses a network switch or router to provide a private network or network segment

● Minimal dependency on customer’s network

● A dedicated LAN port on the CMS computer provides the switch link

● The primary LAN port (the built-in ethernet port) is used for other connectivity (printers, terminals, Avaya CMS Supervisor and Avaya OA) using a different subnet from the switch link

● Customer must provide equipment and administer network for private segment

● Customer LAN administrator must be present during setup

— Direct connect to Customer LAN, without private segment.

● Complete dependency on performance and reliability of customer’s LAN

● Allows remote location of endpoints when customer LAN connectivity is convenient

● Customer LAN administrator must be present during setup
Chapter 3: Connecting a TCP/IP switch link

- If the customer LAN is used, the following information is needed from the customer:
  - Customer network physical connectivity:
    - Location of network access point (hub, router, and so on)
    - Distance between the ethernet port on the switch and the network access point (328 ft, 100 m maximum)
    - Wiring to access point, existing or new, Category 5 minimum required.
  - Customer network administration:
    - IP address of switch ethernet ports, CMS computer and gateways
    - Node names of switch ethernet ports, CMS computer and gateways
    - Subnet masks for all LAN segments containing switch ethernet ports or adjuncts
    - Gateway IP address for all LAN segments containing switch ethernet ports, adjuncts, or routers
    - Are all endpoints (switch ethernet ports and adjuncts) on the same local LAN segment?
    - Network routes.

Network administration information needs to be mapped into specific administration fields.

- Sanity check of information obtained from customer:
  - If switch and adjuncts are on different LAN subnets (recommended), gateway IP addresses are different
  - If switch and adjuncts (CMS or Intuity) are on the same LAN subnet (not recommended):
    - Gateway IP address (if present) and subnet mask information is valid
    - All IP addresses contain the same subnet address

Without the above information, the technician may not be able to complete the installation. Installations that require the technicians to return because information was not available incur additional charges.
Switch connections with TCP/IP over a LAN

Any switch either the TN799DP C-LAN circuit pack or a processor ethernet port can interface to a CMS computer using a LAN. This connection can be made in the following ways:

- Connecting with a crossover cable
- Connecting with a LAN hub or a network switch (recommended configuration)
- Connecting over a customer LAN

This section includes the following topics:

- Connecting one or more ACDs using TCP/IP over a LAN on page 19
- Ethernet ports on the switch on page 19
- Ethernet ports on a CMS computer on page 20
- Data transfer speed on page 20
- Sample configurations on page 21
- Connecting with a crossover cable on page 30
- Connecting with a LAN hub or router on page 31
- Connecting over a customer LAN on page 33

Connecting one or more ACDs using TCP/IP over a LAN

Any switch equipped with a TN799DP C-LAN circuit pack or a processor ethernet port can interface to a CMS computer using a LAN. CMS computers are equipped with at least two ethernet ports for network connections. The connection to the switch must be dedicated to a second ethernet port which is provided on a PCI or SBus card in the CMS server. The primary built-in ethernet port can be used for printers, CMS Supervisor, and connections to Avaya OA. Avaya recommends that these two network connections be on different subnets.

Detailed parts lists and cabling diagrams are shown later in this document for each switch that supports a LAN connection.

Ethernet ports on the switch

The switch provides an ethernet port using either the TN799DP C-LAN circuit pack or the processor ethernet port. For connectivity purposes, it does not matter what ethernet port is used, but the correct port must be administered on the switch.
Chapter 3: Connecting a TCP/IP switch link

Ethernet ports on a CMS computer

CMS computers are equipped with at least two ethernet ports for network connections. The connection to the switch must be dedicated to a second ethernet port which is provided on a PCI or SBus card in the CMS server. The primary, built-in ethernet port can be used for printers, CMS Supervisor, and connections to Avaya OA. Avaya recommends that these two network connections be on different subnets.

⚠️ Important:
It is recommended that, if possible, the switch connection be isolated to a dedicated LAN port without any other network connections.

Data transfer speed

All TN799DP C-LAN circuit packs support 10 Mbps ethernet connections. The TN799DP and later supports 10 and 100 Mbps ethernet connections as long as all the connecting equipment supports that speed. If you use 10 Mbps hubs between the switch and the CMS, the speed of the connection will be 10 Mbps.

The processor ethernet port on the S8xxx servers support 10 Mbps and 100 Mbps, autosensing.

The TN799DP C-LAN circuit pack also uses the IP Media Processor adapter (Material ID 848525887) to provide an ethernet modular jack connection on the switch backplane. This adapter must be used to attain 100 Mbps connections.

The LAN speed of 1 Gbps is also supported to both processor ethernet and C-LAN.
Sample configurations

The CMS computer can connect to a switch in a number of ways using a LAN. This section shows some examples of how this can be done. Though several sample configurations are shown, there will be variations not shown here. All but the most basic configurations require planning by the customer and account team.

**Note:**
Please note that the IP addressing shown in these examples reflects a basic recommended scheme that can be used if the customer does not have their own addressing requirements.

This section includes the following topics:

- [Basic configuration](#) on page 22
- [Multiple ACDs (switches)](#) on page 23
- [Two ethernet ports on CMS computer](#) on page 24
- [Remote switch on the customer network](#) on page 25
- [Two ethernet ports option](#) on page 26
- [High availability option](#) on page 27
- [Public network](#) on page 29
Basic configuration

In the most basic configuration, you can create a LAN between a CMS computer to a switch using either a crossover cable or a dedicated hub. This setup provides isolation from the customer data network, keeping all switch-to-CMS messaging traffic on a dedicated private network. The CMS computer is directly connected to the switch, and neither is part of another network.

This configuration is adequate if there is no printer or CMS Supervisor traffic.
Multiple ACDs (switches)

A CMS computer can collect data from more than one switch. The following figure shows how several ACDs (local or remote) would connect to a CMS computer over a LAN. This example isolates the switch-to-CMS traffic from any other network traffic.
Two ethernet ports on CMS computer

If the CMS computer is using a LAN for both switch link traffic and connections to CMS Supervisor, Avaya OA, and other network applications, the CMS computer should be equipped with two ethernet ports. In this configuration, the primary ethernet port is used for all non-switch applications. The secondary ethernet port is dedicated for carrying switch link traffic. This link can be connected using either a LAN hub or a crossover cable. Each ethernet port must be administered on different networks, so switch-to-CMS traffic does not mix with other traffic.
Remote switch on the customer network

A remote switch can also be connected through the customer network, using a router and a network switch to isolate the switch link traffic from the Message Manager traffic and the other customer network traffic.
Two ethernet ports option

This configuration shows the best way to isolate the CMS links to the switch. This configuration uses two ethernet ports on the switch. A router must be used to send traffic from the customer network to the remote switch that connects to the CMS computer. For true link isolation, this is the best option available.
High availability option

The High Availability option uses dual links from one switch to different CMS computers. This option helps ensure that CMS data is not lost if one of the links loses connectivity or if one of the CMS computers goes down.

You can achieve the High Availability option by using separate IP addresses on separate C-LAN cards or Ethernet ports on the switch.

Duplicated Processor Ethernet switch port connections are supported, thus removing the need for C-LAN cards on the switch. The connection to the Processor Ethernet (PE) applies to High Availability, Survivable CMS and Dual Role CMS. These are all Avaya Professional Services offers.

To configure a solution using the PE interface and any of these offers, contact Avaya Professional Services.

The following figure shows a typical High Availability C-LAN configuration. Though not shown here, you can use a second Ethernet port on the CMS computers to isolate the printer, and CMS Supervisor traffic.

Note: For the S8300 Server, you cannot have dedicated links to each CMS computer. If you want true duplication, you must use a different solution.
Chapter 3: Connecting a TCP/IP switch link
Public network

In a public network where the customer is connected to the Internet, the default IP addressing cannot be used. You must administer IP addressing based on the customer requirements. For switch-to-CMS traffic, this setup is the least desirable way to set up a switch link because of potential message loss on a network that has too much traffic.
Connecting with a crossover cable

The direct LAN connection is the most basic method to connect the switch to the CMS computer.

Distance limits

The distance limit for a direct LAN connection is 328 feet (100 meters).

Cabling diagram - LAN via crossover cable

Cabling procedure

To connect the switch to a CMS computer using a crossover cable:

1. Do one of the following:
   - Attach an adapter (259A, 258B, or 356A) to the backplane connector of the TN799DP C-LAN circuit pack, then attach the plug end of the crossover cable to the adapter. Use jack #1 on the 258B or 356A adapters.
   - Connect the ethernet port of a TN799DP C-LAN circuit pack to a Category 5 connecting block using Category 5 cross-connect wiring, then attach the plug end of the crossover cable to the connecting block.

2. Connect one end of an RJ45 Category 5 modular cord to the receptacle end of the crossover cable.

3. Connect the other end of the modular cord to an ethernet port on the CMS computer.
Connecting with a LAN hub or router

The LAN hub or router connection is the recommended method to connect the switch to the CMS computer. The hub or router can be used to connect to more than one switch (multiple ACDs), and to connect to NTS units.

This section includes the following topics:

- Distance limits on page 31
- Cabling Diagram - LAN via hub or router on page 31
- Cabling procedure on page 32

Distance limits

The distance limit for a single hub or router LAN connection is 328 feet (100 meters) from the switch to the hub or router, and another 328 feet (100 meters) from the hub or router to the CMS computer. If the distance between the switch and the CMS computer is more than 328 feet (100 meters), you can daisy-chain up to four separate hubs or routers.

Cabling Diagram - LAN via hub or router

[Diagram showing the cabling setup with labels for each component and connections.]

- Switch (R7 or later)
- TN799 C-LAN Port
- Processor ethernet port
- IP Media Processor adapter (100 Mbps) or 259A adapter (10 Mbps)
- RJ45 Cat 5 modular cord
- Cat 5 cross-connect field
- Cat 5 connecting block
- OR
- Cat 5 wire
- RJ45 Cat 5 modular cord
- Hub or router
- AC power
- RJ45 Cat 5 modular cord
- Ethernet port
- CMS computer (R3V6 or later)
- OR
- Cat 5 25-pair cable
- RJ45 Cat 5 modular cord
- RJ45 Cat 5 modular cord

328 ft (100 m)
Cabling procedure

To connect the switch to a CMS computer using a LAN hub:

1. Do one of the following depending on your hardware configuration:
   - Attach an adapter (IP Media Processor or 259A) to the backplane connector of the TN799DP C-LAN circuit pack. Attach one end of an RJ45 Category 5 modular cord to the adapter.
   - Connect the ethernet port of a TN799DP C-LAN circuit pack to a Category 5 connecting block using Category 5 cross-connect wiring. Attach one end of an RJ45 Category 5 modular cord to the connecting block.
   - Attach one end of an RJ45 Category 5 modular cord to the processor ethernet port on the switch. On the S8100 Server, the processor ethernet port is found on the processor interface cable assembly of the TN2314 processor circuit pack.
   - Attach one end of an RJ45 Category 5 modular cord to either the EXT1 or EXT2 ethernet port on a G700 Media Gateway. A G700 Media Gateway can be controlled by either an S8300 Server or an S87xx Server.

2. Connect the other end of the modular cord to a port on the LAN hub or router.

3. Connect another RJ45 Category 5 modular cord to a different port on the LAN hub or router.

4. Connect the other end of the modular cord to an ethernet port on the CMS computer.

5. Connect and apply power to the LAN hub or router.
Connecting over a customer LAN

Using a customer network is another method to connect a switch to the CMS computer. This method is not recommended except in special cases. The LAN hub or router method should be used for most installations.

This section includes the following topics:

- **Distance limits** on page 33
- **The distance limit using a customer network must be locally engineered**, on page 33
- **Cabling diagram - customer LAN** on page 33
- **Cabling procedure** on page 34

Distance limits

The distance limit using a customer network must be locally engineered.

Cabling diagram - customer LAN
Chapter 3: Connecting a TCP/IP switch link

Cabling procedure

To connect the switch to a CMS computer using a customer LAN:

1. Do one of the following depending on your hardware configuration:
   - Attach an adapter (IP Media Processor or 259A) to the backplane connector of the TN799DP C-LAN circuit pack. Attach one end of an RJ45 Category 5 modular cord to the adapter.
   - Connect the ethernet port of a TN799DP C-LAN circuit pack to a Category 5 connecting block using Category 5 cross-connect wiring. Attach one end of an RJ45 Category 5 modular cord to the connecting block.
   - Attach one end of an RJ45 Category 5 modular cord to the processor ethernet port on the switch. On the S8100 Server, the processor ethernet port is found on the processor interface cable assembly of the TN2314 processor circuit pack.
   - Attach one end of an RJ45 Category 5 modular cord to either the EXT1 or EXT2 ethernet port on a G700 Media Gateway. A G700 Media Gateway can be controlled by either an S8300 Server or an S87xx Server.

2. Connect the other end of the modular cord to a port on the customer data network.

3. Connect from the customer data network to an ethernet port the CMS computer.
Chapter 4: Dual IP address

This section describes the Dual IP feature, which is available in Call Management System (CMS) R18.0.1 and later. You must install the Dual IP package to use the feature.

Overview

Using the Dual IP address feature, you can switch over to a secondary IP for an ESS/LSP survivable Communication Manager server when the connection to the primary Communication Manager server fails. Call Management System (CMS) remains connected to the ESS/LSP until the connection is lost, either through a manual link reset or other interventions.

Prior to CMS 18.0.1, the CMS server only allows a single host/IP connection to be administered per Automatic Call Distribution (ACD). To support survivability in distributed Communication Manager environments, CMS establishes connections with ESS/LSP nodes. Only one secondary IP/host address for one alternate connection is allowed per ACD.

To use the Dual IP feature, you must use the Processor Ethernet (PE) ports instead of the CLAN ports. Using CMS, you can arrange an alternate IP address to the survivable satellite ESS/LSP in addition to the primary link to the main Communication Manager server for each ACD. CMS establishes a link to either the primary Communication Manager or the secondary ESS by connecting to the primary IP address, and then to the secondary IP address when the primary IP address fails to register.

Functional specifications

The functional specifications of the Dual IP feature are as follows:

- After installing the Dual IP package, you can configure an optional secondary IP address in Call Management System (CMS) to connect to a survivable Communication Manager server. The secondary IP address can be a host name or an actual IP address and port number. Perform the configuration during the cmssvc setup, cmssvc swsetup, and cmsadm acd_create procedures, for each Automatic Call Distribution (ACD).

- If you do not install the Dual IP package, the administration options for the second IP address is not displayed. The option for one IP address for the link to Communication Manager is displayed.
When establishing a TCP/IP connection to Communication Manager, CMS tries to connect to the primary IP address five times, waiting 30 seconds between each attempt. If CMS is unable to connect, CMS tries the Survivable Communication Manager IP address, if assigned, two times, waiting 30 seconds between each attempt.

- If connection to the Survivable Communication Manager IP address also fails, CMS tries connecting to the primary IP address five times, waiting 30 seconds between each attempt until one of the connections starts functioning.
- If the main link fails at any time, the entire connection cycle is attempted again until a connection is established with the main Communication Manager or ESS/LSP.

After the TCP/IP connection is established with either the primary or Survivable Communication Manager, CMS requests for the pump-up data. Therefore, a delay occurs before CMS starts processing data, which is normal for link establishment.

- If the link is fully established through the secondary IP, an informational message is recorded in the CMS elog file.
- A new link indicator is used by the clients to show the alternative connection status.
- After Communication Manager fragmentation is resolved, when the primary Communication Manager gains control again and the ESS is not in control, the ESS eventually drops the link as it becomes inactive. When the link drops, CMS tries to re-establish the connection to the primary link.
  - If a customer switches back to the primary Communication Manager before the ESS is inactive, manually turn the data collection off and back on. CMS tries to re-establish the link through the primary link.

Feature implementation scenarios

The user scenario and the steps implemented by the feature to handle this user scenario are as follows:

1. The primary Communication Manager is inactive and the call processing is failed over to the secondary ESS.
   - Call Management System (CMS) detects the TCP/IP link problem to the main switch and tries to re-connect.
   - After five attempts to connect to the primary Communication Manager, CMS tries the secondary link and is able to establish the TCP/IP connection.
   - CMS pumps up from the secondary link and starts to receive call center traffic data.
2. When the primary Communication Manager is backed up and ESS releases control of all the resources, the ESS node drops the link.
Feature implementation scenarios

- CMS detects a problem with the TCP/IP link to the Survivable Communication Manager.
- CMS tries the primary link and is able to establish the TCP/IP connection.
- CMS pumps up from the primary link and starts to receive call center traffic data.

Scenarios that require manual intervention

Network failure to both the primary Communication Manager and secondary ESS.
- When Call Management System (CMS) attempts to establish connections to the primary and secondary IPs in a sequence, CMS might connect to the secondary ESS before the main CM network is available. Manual intervention might be required to correct the situation depending on the nature of the network outage and which Communication Manager (main or secondary) is operational.

Status message descriptions

The status bar of the Controller window and other Avaya CMS Supervisor windows display the following status messages:

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>^</td>
<td>The primary link is active.</td>
</tr>
<tr>
<td>v</td>
<td>TCP/IP connection to the primary link is inactive.</td>
</tr>
<tr>
<td>-</td>
<td>TCP/IP connection to the primary link is slow or not responding.</td>
</tr>
<tr>
<td>*</td>
<td>TCP/IP connection is connected to the Survivable Communication Manager.</td>
</tr>
</tbody>
</table>

Note:
When Call Management System (CMS) is connected to the Survivable Communication Manager for Automatic Call Distribution (ACD), the Connection field in the Connection Status window displays the message "Secondary".

Data collection exceptions

In R 18.0.1, the system sends the following data collection exceptions when the link is active:
- ACD %s: data collection started.
Chapter 4: Dual IP address

- ACD %s: data collection started - new translations.

When the primary Communication Manager starts collecting data, exceptions are generated. When the secondary Communication Manager starts collecting data, one of the following new exception is generated:

- ACD %s: data collection to the Survivable Communication Manager started.
- ACD %s: data collection to the Survivable Communication Manager started-new translations.

All exceptions are displayed on the following screens:

- Exception
- Real-time Exception Log and Exception
- Historical Reports
- Other Exceptions
- Data Collection
Chapter 5: Administering a TCP/IP switch link

This section provides the procedures to administer TCP/IP over a LAN.

This section includes the following topics:

- Administering the link at the CMS on page 39
- If the file already has this line, quit out of the file and make no changes. Administering the CMS and switch release options on page 40
- Administering data collection options on page 45
- Administering a TCP/IP connection on page 46

Administering the link at the CMS

In addition to the switch administration presented in this section, you must also set up the switch link on the CMS computer using the `swsetup` option of the `cmssvc` command. This procedure is documented in your CMS software installation document.

To set up the switch link:

1. Using the `cmssvc` command, turn off CMS.
2. Using the `cmssvc` command, access the `swsetup` option. When you access this option, you are queried for the following information:
   
   - Switch name
   - Switch model
   - Is Vectoring enabled on the switch (if authorized)?
   - Is Expert Agent Selection (EAS) enabled on the switch (if authorized)?
   - Does the Central Office have disconnect supervision?
   - Local and remote port

   The local and remote port assignments must be symmetrical between the switch and the CMS. The standard CMS provisioning procedure is to set the local and remote port assignments equal to the switch processor channel used for the link. For example, if you use processor channel 10, set the local and remote port to 10.
Chapter 5: Administering a TCP/IP switch link

- Transport method used to connect to the switch (TCP/IP). For TCP/IP, the IP address or hostname, and TCP port (the default is 5001).

If the CMS computer has two ethernet ports, it is possible that the system might attempt to route packets from one interface to another. To prevent this, edit the `/etc/rc2.d/S98cms_ndd` file and add the following line to the end of the file:

```
ndd -set /dev/ip ip_forwarding 0
```

If the file already has this line, quit out of the file and make no changes.

Administering the CMS and switch release options

This section contains release option administration that must be done before you administer the switch to CMS computer link. The following administration must be done:

- [Verifying the software version](#) on page 41
- [Verifying the call center release](#) on page 42
- [Setting the reporting adjunct release](#) on page 43
Verifying the software version

Use the System Parameters Customer Options form to verify the software version. If the software version is not correct, apply a new license file that has the correct version.

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>G3 Version</td>
<td>Enter the appropriate software release of the switch. If you set this field to an earlier release number, you will not have access to the latest features. Apply a new license file that has the correct version. The G3 Version must be set to V8 or later to use the High Availability option.</td>
</tr>
</tbody>
</table>
Verifying the call center release

Use the first Call Center Optional Features page of the System Parameters Customer Options form to set the Call Center Release. If the release number is not correct, apply a new license file that has the correct version.

```plaintext
display system-parameters customer-options

CALL CENTER OPTIONAL FEATURES

Call Center Release: 7.0

ACD? y Reason Codes? y
BCMS (Basic)? y Service Level Maximizer? n
BCMS/VuStats Service Level? y Service Observing (Basic)? y
BSR Local Treatment for IP & ISDN? y Service Observing (Remote/By FAC)? y
Business Advocate? n Service Observing (VDNs)? y
Call Work Codes? y Timed ACW? y
DTMF Feedback Signals For VRU? y Vectoring (Basic)? y
Dynamic Advocate? n Vectoring (Prompting)? y
Expert Agent Selection (EAS)? y Vectoring (G3V4 Enhanced)? y
EAS-PHD? y Vectoring (3.0 Enhanced)? y
Forced ACD Calls? n Vectoring (ANI/II-Digits Routing)? y
Least Occupied Agent? y Vectoring (G3V4 Advanced Routing)? y
Lookahead Interflow (LAI)? y Vectoring (CINFO)? y
Multiple Call Handling (On Request)? y Vectoring (Best Service Routing)? y
Multiple Call Handling (Forced)? y Vectoring (Holidays)? y
PASTE (Display PBX Data on Phone)? y Vectoring (Variables)? y

(NOTE: You must logoff & login to effect the permission changes.)
```

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call Center Release</td>
<td>Enter a Call Center Release number that matches the set of Call Center features you want to use. If you set this field to something other than your current Call Center load, you will not have access to the latest Call Center features. Apply a new license file that has the correct version.</td>
</tr>
</tbody>
</table>
### Setting the reporting adjunct release

Use the following page of the System Parameters Features form to set the Reporting Adjunct Release. Depending on the switch software release, this field will be found on different pages.

<table>
<thead>
<tr>
<th>change system-parameters features</th>
<th>Page 12 of 19</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEATURE-RELATED SYSTEM PARAMETERS</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>AGENT AND CALL SELECTION</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>MIA Across Splits or Skills? n</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>ACW Agents Considered Idle? n</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>AUX Agents Considered Idle (MIA)? n</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>AUX Agent Remains in LOA Queue? n</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>Service Level Supervisor Call Selection Override? n</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>Auto Reserve Agents: none</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>Block Hang-up by Logged-in Auto-Answer Agents? y</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>CALL MANAGEMENT SYSTEM</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>REPORTING ADJUNCT RELEASE</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>(determines protocol used by appl link)</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>CMS (appl mis): R18.1</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>AAPC/IQ (appl ccr): 5.2.6+</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>BCMS/VuStats LoginIDs? y</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>BCMS/VuStats Measurement Interval: half-hour</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>BCMS/VuStats Abandon Call Timer (seconds):</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>Validate BCMS/VuStats Login IDs? y</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>Clear VuStats Shift Data: at-midnight</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>Remove Inactive BCMS/VuStats Agents? n</td>
<td>Page 12 of 19</td>
</tr>
<tr>
<td>Field</td>
<td>Definition</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Reporting Adjunct</td>
<td>The field that determines the protocol used by the appl link.</td>
</tr>
<tr>
<td>Release</td>
<td>The CMS (appl mis) and IQ (appl ccr) parameters determine the Switch Protocol Interpreter (SPI) language protocol used for the CMS (mis) and Avaya IQ (ccr) links. You must administer the mis and ccr links on the Processor Channel Assignment screen.</td>
</tr>
<tr>
<td></td>
<td>You can assign maximum two links of each type of parameter. For example, you can assign two mis links and two ccr links. If you activate Special Application SA9090, you can administer three to four links as application type mis.</td>
</tr>
<tr>
<td></td>
<td>● If you administer three links as appl type mis, you can administer only one Avaya IQ interface ccr link.</td>
</tr>
<tr>
<td></td>
<td>● If you administer all four links as appl type mis, you cannot administer the ccr links because the total number of mis and ccr links is four.</td>
</tr>
<tr>
<td>CMS (appl mis)</td>
<td>The option to select the release of Call Management System (CMS) to which you are connecting.</td>
</tr>
<tr>
<td></td>
<td>The options are:</td>
</tr>
<tr>
<td></td>
<td>● <strong>R16.1/R16.x/R17.0:</strong> These releases apply to R16.1, R16.2, R16.3, or R17.0.</td>
</tr>
<tr>
<td></td>
<td>● <strong>R18:</strong> This release applies to CMS R18.0.x.</td>
</tr>
<tr>
<td></td>
<td>● <strong>R18.1:</strong> This release applies to CMS R18.1.x.</td>
</tr>
<tr>
<td></td>
<td>Connection to the second CMS using mis2 link is optional. You can leave the field blank to indicate that CMS is not connected to the system. This option is the default.</td>
</tr>
<tr>
<td>IQ (appl ccr)</td>
<td>The option to select a release of Avaya IQ.</td>
</tr>
<tr>
<td></td>
<td>The options are:</td>
</tr>
<tr>
<td></td>
<td>● <strong>5.1/5.2:</strong> Apply to 5.1.x, 5.2.0, 5.2.1, 5.2.2, 5.2.3, 5.2.4, and 5.2.5.</td>
</tr>
<tr>
<td></td>
<td>● <strong>5.2.6+:</strong> Applies to 5.2.6 and 5.3.x.</td>
</tr>
<tr>
<td></td>
<td>You must administer <strong>Expert Agent Selection (EAS)</strong> and <strong>Universal Call ID (UCID)</strong> before establishing a connection with Avaya IQ.</td>
</tr>
<tr>
<td></td>
<td>Connection to the second Avaya IQ using ccr2 link is optional. You can leave the field blank to indicate that Avaya IQ is not connected to the system. This option is the default.</td>
</tr>
</tbody>
</table>
Administering data collection options

In addition to administering the switch link described in this document, you must also administer and understand the following data collection options:

- Enable CMS measuring for hunt groups, trunk groups, and VDNs
- Assign measured extensions and multiple splits or skills
- Measured trunks versus unmeasured facilities
- Interactions with CMS measurements and IP trunk groups

For more details about these data collection options, see “Forms and fields used to enable CMS measurements” in *Administering Avaya Aura™ Call Center Features.*
Administering a TCP/IP connection

The administration for a TCP/IP connection over a LAN is different if you are using a C-LAN circuit pack or if you are using a processor ethernet port as described in Ethernet ports on the switch on page 19.

This section includes the following topics:

- Administering a C-LAN connection on page 46
- Administering a processor ethernet port connection on page 57
- Administering a Survivable Backup CMS on page 63

Administering a C-LAN connection

Use the procedures in this section to administer a TCP/IP connection to a C-LAN circuit pack. This section contains examples of the administration forms with detailed explanations for the required fields. Use the forms in the order shown.

<table>
<thead>
<tr>
<th>Form</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>change system-parameter maintenance</td>
<td>Adding a second packet interface</td>
</tr>
<tr>
<td>add data-module</td>
<td>Adding an ethernet data module</td>
</tr>
<tr>
<td>change node-names ip</td>
<td>Adding node names and IP addresses</td>
</tr>
<tr>
<td>change ip-interfaces</td>
<td>Adding a C-LAN IP interface</td>
</tr>
<tr>
<td>change communication-interface processor-channels</td>
<td>Adding the processor interface channels</td>
</tr>
<tr>
<td>add ip-route</td>
<td>Adding IP routes (if needed)</td>
</tr>
</tbody>
</table>

Note: If the customer has purchased the High Availability option, you must administer a link from one ethernet port on the switch to one CMS computer, and a second link from a different ethernet port on the switch to another CMS computer.
This section includes the following topics:

- **Adding a second packet interface** on page 47
- **Adding node names and IP addresses** on page 49
- **Adding a C-LAN IP interface** on page 51
- **Adding an ethernet data module** on page 53
- **Adding the processor interface channels** on page 54
- **Adding IP routing** on page 55

**Adding a second packet interface**

Use the Maintenance-Related System Parameters form to add a second packet interface.

```
change system-parameter maintenance

MAINTENANCE-RELATED SYSTEM PARAMETERS

MINIMUM MAINTENANCE THRESHOLDS ( Before Notification )
  TTRs: 4        CPTRs: 1        Call Classifier Ports: 0
  MMI: 0          VC: 0

TERMINATING TRUNK TRANSMISSION TEST ( Extension )
  Test Type 100:  
  Test Type 102:  
  Test Type 105:  

ISDN MAINTENANCE
  ISDN-PRI Test Call Extension: 30999     ISDN-BRI Service SPID:

DS1 MAINTENANCE
  DS0 Loop-Around Test Call Extension:

SPE OPTIONAL BOARDS
  Packet Intf1? y     Packet Intf2? y
  Bus Bridge: 01A03   Inter-Board Link Timeslots Pt0: 6  Pt1: 1  Pt2: 1
```
### Field Definition

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packet Intf2</td>
<td>Enter <code>y</code> to add a second packet interface.</td>
</tr>
<tr>
<td>Bus Bridge</td>
<td>Enter the equipment location of the C-LAN circuit pack that does the bus bridge functionality when the packet bus is activated. This must be administered for the C-LAN to work.</td>
</tr>
<tr>
<td>Inter-Board Link Timeslots - The total number of timeslots allocated cannot greater than 11.</td>
<td></td>
</tr>
<tr>
<td>Inter-Board Link Timeslot Pt0</td>
<td>Enter the number of timeslots (1-9) used by this port. Port 0 carries the bulk of messaging traffic between the switch and the CMS. The default of 6 should be adequate, but can be increased if needed to improve traffic flow.</td>
</tr>
<tr>
<td>Inter-Board Link Timeslot Pt1</td>
<td>Enter the number of timeslots (1-3) used by this port. Port 1 is a low traffic port and should always be set to 1.</td>
</tr>
<tr>
<td>Inter-Board Link Timeslot Pt2</td>
<td>Enter the number of timeslots (1-3) used by this port. Port 2 is a low traffic port and should always be set to 1.</td>
</tr>
</tbody>
</table>
## Adding node names and IP addresses

Use the Node Names form to assign the name and IP address of the CMS computer and any switches that are networked with the CMS computer. With the High Availability option, you will assign two switch node names and two CMS computer node names.

<table>
<thead>
<tr>
<th>Name</th>
<th>IP Address</th>
<th>Name</th>
<th>IP Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>3net</td>
<td>192.168.3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>cmshost</td>
<td>192.168.1</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>cmshost2</td>
<td>192.168.3</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>default</td>
<td>0</td>
<td>.0</td>
<td>.0</td>
</tr>
<tr>
<td>gateway</td>
<td>192.168.1</td>
<td>.211</td>
<td></td>
</tr>
<tr>
<td>gateway2</td>
<td>192.168.4</td>
<td>.211</td>
<td></td>
</tr>
<tr>
<td>switchhost</td>
<td>192.168.1</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td>switchhost2</td>
<td>192.168.4</td>
<td>.10</td>
<td></td>
</tr>
</tbody>
</table>

... ... ... ...

(8 of 8 administered node-names were displayed)

Use 'list node-names' command to see all the administered node-names
Use 'change node-names ip xxx' to change a node-name 'xxx' or add a node-name
## Field Definition

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
</table>
| **Name** | Enter the host name of the CMS computer, any switches that are networked with the CMS computer, and any gateway hosts used in the network. The node names can be entered in any order. The names are displayed in alphabetical order the next time the form is displayed. The default node name entry is display-only and is not used for this application. For consistency, use the CMS computer host name as defined during the CMS Setup procedure. See your CMS software installation document for more information. These names are also used in the IP interfaces, data module, IP routing, and other forms. If you change the node name in this form, it is automatically updated on the other forms.  

**Note:**  
Do not use special characters in the node name. Special characters are not allowed in the `/etc/hosts` file on the CMS computer. |
| **IP Address** | Enter the IP address of the CMS computer, the switches, and any required gateways.  

⚠️ **CAUTION:**  
Plan out the network before you assign any IP addresses. Any future changes that require a change to IP addresses will cause a service disruption. |
Adding a C-LAN IP interface

Use the IP Interfaces form to assign a C-LAN circuit pack as an IP interface. With the High Availability option, you will assign two separate C-LAN IP interfaces.

⚠️ CAUTION:
If the IP interface is already administered, do not change the administration. Changing the administration could cause failure with IP telephones and other adjunct links.

```
change ip-interface proc

IP INTERFACES

Type: PROCR

Enable Interface? y
Allow H.323 Endpoints? y
Allow H.248 Gateways? y
Network Region: 1
Gatekeeper Priority: 5

IPV4 PARAMETERS

Node Name: procr
IP Address: 10.133.68.220
Subnet Mask: /24
```

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enabled</td>
<td>Enter <code>y</code> to enable the C-LAN IP interface. After initial administration, you must disable the interface before you make any changes.</td>
</tr>
<tr>
<td>Type</td>
<td>Enter <strong>C-LAN</strong>.</td>
</tr>
<tr>
<td>Slot</td>
<td>Enter the equipment location of the C-LAN circuit pack.</td>
</tr>
<tr>
<td>Code/Sfx</td>
<td>This is a display-only field that shows the designation number of the circuit pack installed in the specified slot.</td>
</tr>
<tr>
<td>Node Name</td>
<td>Enter the switch node name assigned on the Node Names form. In this example, enter <code>switchhost</code>. The same node name cannot be assigned to two different IP interfaces.</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>Identifies which portion of an IP address is a network address and which is a host identifier. Use the default entry, or check with the LAN administrator on site if connecting through the customer LAN.</td>
</tr>
<tr>
<td>Field</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Gateway Address</td>
<td>Enter the address of a network node that will serve as the default gateway for the IP interface. If the application goes to points off the subnet, the gateway address of the router is required. If the switch and CMS computer are on the same subnet, a gateway is not required. If using ethernet only, and a gateway address is administered, no IP routes are required.</td>
</tr>
<tr>
<td>Net Rgn</td>
<td>For a C-LAN IP interface, use 1.</td>
</tr>
<tr>
<td>VLAN</td>
<td>Enter y if this is on a virtual LAN or n for a standard LAN.</td>
</tr>
<tr>
<td>Number of CLAN Sockets Before Warning</td>
<td>Enter the number of CLAN sockets available before the system issues a warning.</td>
</tr>
<tr>
<td>Auto</td>
<td>Enter y for auto-negotiation or n for manual speed and duplex settings.</td>
</tr>
<tr>
<td>Speed</td>
<td>Enter either 10Mbps or 100Mbps.</td>
</tr>
<tr>
<td>Duplex</td>
<td>Enter either full or half.</td>
</tr>
</tbody>
</table>
Adding an ethernet data module

Use the Data Module form to assign the Ethernet port of the C-LAN circuit pack.

```
add data-module 2000
DATA MODULE

Data Extension: 2000 Name: ethernet data module
    Type: ethernet
    Port: 01A0317
    Link: 8

Network uses 1’s for Broadcast Address? y
```

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Extension</td>
<td>Enter an unassigned extension number.</td>
</tr>
<tr>
<td>Type</td>
<td>Enter <strong>ethernet</strong>.</td>
</tr>
<tr>
<td>Port</td>
<td>Enter the equipment location of the C-LAN circuit pack (TN799DP). For the ethernet link, always use circuit 17 (for example, 01A0317).</td>
</tr>
<tr>
<td>Link</td>
<td>Enter a TCP/IP link number (1-25 for csi/si, 1-33 for r). This entry is also used on the Processor Channel form.</td>
</tr>
<tr>
<td>Name</td>
<td>Enter a name for the data module. This name will display when you list the assigned data modules.</td>
</tr>
<tr>
<td>Network uses 1’s for Broadcast Address</td>
<td>This sets the host portion of the IP address to 0s or 1s. The default is yes (all 1s). Use the default if the private network contains only Avaya switches and adjuncts. Enter n only if the network includes non-Avaya switches that use the 0s method of forming broadcast addresses.</td>
</tr>
</tbody>
</table>
Adding the processor interface channels

Use the Processor Channel form to assign the processor channel attributes. With the High Availability option, you will assign two separate processor channels.

<table>
<thead>
<tr>
<th>Proc Chan</th>
<th>Enable</th>
<th>Appl.</th>
<th>Mode</th>
<th>Interface</th>
<th>Destination</th>
<th>Session</th>
<th>Mach</th>
<th>Local/Remote ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>y</td>
<td>mis</td>
<td>s</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>y</td>
<td>mis</td>
<td>s</td>
<td>5001</td>
<td>cmshost2</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>n</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>n</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Field Definition

- **Proc Chan**: Select a processor channel for this link. The standard CMS provisioning procedure is to use channel 1.
- **Enable**: Enter `y`.
- **Appl**: Enter `mis`.
- **Gtwy To**: Leave blank for the local CMS-to-switch link.
- **Mode**: Enter `s` for server.
- **Interface Link**: Enter the TCP/IP link number used on the ethernet data module form.
- **Interface Chan**: Enter the TCP channel number (5000-64500). The default for CMS is 5001 and is defined during CMS setup. See your CMS software installation document for more information.
- **Destination Node**: Enter the node name of the CMS computer as assigned on the Node Names form. In these examples, `cmshost` is used.
- **Destination Port**: Use the default of 0.
Adding IP routing

Use the IP Routing form to set up the IP routes from the switch to the CMS computer. This is required when:

- The switch and the CMS computer are on different subnets, or
- When a Gateway Address is not administered for the C-LAN IP interface.

The following example shows an IP route. This route shows how you get from a gateway (for example, a router) to a network.

```
add ip-route 1

Route Number: 1
Destination Node: 3net
Network Bits: 24  Subnet Mask: 255.255.0 .0
   Gateway: gateway2
   Board: 01C02
   Metric: 0
   Route Type: Network
```

### Field Definition

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session Local/Session Remote</td>
<td>The local and remote port assignments must be symmetrical between the switch and the CMS. The standard CMS provisioning procedure is to set the local and remote port assignments equal to the switch processor channel used for this link. For example, if you use processor channel 10, set the local and remote port to 10.</td>
</tr>
<tr>
<td>Mach ID</td>
<td>Not used for CMS.</td>
</tr>
</tbody>
</table>

**Example IP Route:**

- **Route Number:** 1
- **Destination Node:** 3net
- **Network Bits:** 24, **Subnet Mask:** 255.255.0.0
- **Gateway:** gateway2
- **Board:** 01C02
- **Metric:** 0
- **Route Type:** Network

If you are going through a router, you must set up IP route 1 from the switch to the router and set up IP route 2 from the switch to the CMS computer. The example above shows a simple IP route.
### Chapter 5: Administering a TCP/IP switch link

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gateway</td>
<td>Enter the node name of the gateway by which the destination node is reached for this route. This is either the local C-LAN port of the first intermediate node between the C-LAN port and the final destination. For example, if there were one or more routers between the C-LAN port and the final destination node (the CMS computer), the gateway would be the node name of the first router.</td>
</tr>
<tr>
<td>C-LAN Board</td>
<td>Enter the equipment location of the C-LAN circuit pack that provides this route. It is possible to have more than one C-LAN circuit pack, but most configurations will only have one C-LAN.</td>
</tr>
<tr>
<td>Metric</td>
<td>Specifies the complexity of this IP route. Enter 0 if there are no intermediate nodes between the C-LAN port and the ethernet port on the CMS computer. A metric value of 1 is used only on a switch that has more than one C-LAN circuit pack installed. See <em>Administration for Network Connectivity</em> for more information about using this field.</td>
</tr>
</tbody>
</table>
Administering a processor ethernet port connection

Use the procedures in this section to administer a TCP/IP connection over a LAN when connected to a processor ethernet port. If the processor ethernet port is not enabled, you must apply a new license file to the switch.

```
display system-parameters customer-options

OPTIONAL FEATURES

Multinational Locations? n  Station and Trunk MSP? n
Multiple Level Precedence & Preemption? n  Station as Virtual Extension? n
Multiple Locations? n  
Personal Station Access (PSA)? n  Tenant Partitioning? n
Posted Messages? y  Terminal Trans. Init. (TTI)? n
PNC Duplication? n  Time of Day Routing? n
Port Network Support? n  Uniform Dialing Plan? y
Processor and System MSP? n  Usage Allocation Enhancements? y
Private Networking? y  TN2501 VAL Maximum Capacity? y

Processor Ethernet? y

Remote Office? n  Wideband Switching? n
Restrict Call Forward Off Net? y  Wireless? n
Secondary Data Module? y

(NOTE: You must logoff & login to effect the permission changes.)
```

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor Ethernet</td>
<td>Verify that the processor ethernet port is enabled.</td>
</tr>
</tbody>
</table>
Displaying the processor ethernet port

Use the IP Interfaces form to display the IP address to the processor ethernet port. Use this form to verify that the IP interface has been administered.

⚠️ **CAUTION:**
In most cases, the IP interface is already administered. Do not change the administration. Changing the administration could cause failure with IP telephones and other adjunct links.

```
display ip-interface procr

IP INTERFACES

    Type: PROCR

    Node Name: procr
    IP Address: 192.9  .22 .245
    Subnet Mask: 255.255.255.0

    Enable Ethernet Port? y
    Network Region: 1
```
Adding node names and IP addresses

Use the Node Names form to assign the name and IP address of the CMS computer and any gateways that are networked with the CMS computer. With the High Availability option, you will assign two CMS computer node names.

<table>
<thead>
<tr>
<th>Name</th>
<th>IP Address</th>
<th>Name</th>
<th>IP Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>3net</td>
<td>192.168.3 .0</td>
<td>. . .</td>
<td></td>
</tr>
<tr>
<td>cmshost</td>
<td>192.168.1 .90</td>
<td>. . .</td>
<td></td>
</tr>
<tr>
<td>cmshost2</td>
<td>192.168.3 .90</td>
<td>. . .</td>
<td></td>
</tr>
<tr>
<td>default</td>
<td>0 .0 .0 .0</td>
<td>. . .</td>
<td></td>
</tr>
<tr>
<td>gateway</td>
<td>192.168.1 .211</td>
<td>. . .</td>
<td></td>
</tr>
<tr>
<td>gateway2</td>
<td>192.168.4 .211</td>
<td>. . .</td>
<td></td>
</tr>
</tbody>
</table>

(8 of 8 administered node-names were displayed)

Use 'list node-names' command to see all the administered node-names
Use 'change node-names ip xxx' to change a node-name 'xxx' or add a node-name
### Chapter 5: Administering a TCP/IP switch link

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Enter the host name of the CMS computer and any gateway hosts used in the network. The processor ethernet port can be displayed on this form, but cannot be changed. The node names can be entered in any order. The names are displayed in alphabetical order the next time the form is displayed. The default node name entry is display-only and is not used for this application. For consistency, use the CMS computer host name as defined during the CMS Setup procedure. See your CMS software installation document for more information. These names are also used in the IP interfaces, data module, IP routing, and other forms. If you change the node name in this form, it is automatically updated on the other forms. <strong>Note:</strong> Do not use special characters in the node name. Special characters are not allowed in the <code>/etc/hosts</code> file on the CMS computer.</td>
</tr>
<tr>
<td>IP Address</td>
<td>Enter the IP address of the CMS computer and any required gateways. <strong>CAUTION:</strong> Plan out the network before you assign any IP addresses. Any future changes that require a change to IP addresses will cause a service disruption.</td>
</tr>
</tbody>
</table>
Adding the processor interface channels

Use the Processor Channel form to assign the processor channel attributes. With the High Availability option, you will assign two separate processor channels.

<table>
<thead>
<tr>
<th>Proc Chan</th>
<th>Enable</th>
<th>Appl</th>
<th>Gtwy To</th>
<th>Mode</th>
<th>Interface Link</th>
<th>Interface Chan</th>
<th>Destination Node</th>
<th>Destination Port</th>
<th>Local/Remote ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: y</td>
<td>n</td>
<td>mis</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
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<td>0</td>
</tr>
<tr>
<td>14: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16: n</td>
<td>n</td>
<td>n</td>
<td>s</td>
<td>p</td>
<td>5001</td>
<td>5001</td>
<td>cmshost</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Field Definition**

- **Proc Chan**: Select a processor channel for this link.
- **Enable**: Enter `y`.
- **Appl**: Enter `mis`.
- **Gtwy To**: Leave blank for the local CMS-to-switch link.
- **Mode**: Enter `s` for server.
- **Interface Link**: Enter `p` for the processor ethernet port.
- **Interface Chan**: Enter the TCP channel number (5000-64500). The default for CMS is 5001 and is defined during CMS setup. See your CMS software installation document for more information.
- **Destination Node**: Enter the node name of the CMS computer as assigned on the Node Names form. In these examples, `cmshost` is used.
- **Destination Port**: Use the default of 0.
### Session Local/Session Remote

The local and remote port assignments must be symmetrical between the switch and the CMS. The standard CMS provisioning procedure is to set the local and remote port assignments equal to the switch processor channel used for this link. For example, if you use processor channel 10, set the local and remote port to 10.

### Mach ID

Not used for CMS.
Administering a Survivable Backup CMS

Use the Survivable Processor form to associate a survivable backup CMS for either:

- a CLAN port on a specific ESS server,
- or a processor ethernet port on a specific ESS or LSP server

The Survivable Processor form is administered on the main server. The translations are sent to the ESS server or LSP during a file sync. After the file sync, the information on Page 2 is used by the LSP or the ESS server to connect to the CMS.

**Note:**
For more information about the Survivable CMS offer, contact Avaya Professional Services.

On Page 1 of the form, everything but the Network Region is prepopulated based on what was already administered on the Node Name form and the System Parameters ESS form.

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Region</td>
<td>Enter the network region in which the LSP or ESS server resides.</td>
</tr>
</tbody>
</table>
Use Page 2 of the Survivable Processor form to administer the CMS that is connected to a CLAN or processor ethernet interface.

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proc Chan</td>
<td>Displays the processor channel for this link.</td>
</tr>
<tr>
<td>Enable</td>
<td>Enter one of the following values in this field:</td>
</tr>
<tr>
<td></td>
<td>● Enter n if this processor channel is disabled on the LSP or the ESS server.</td>
</tr>
<tr>
<td></td>
<td>● Enter i (inherit) if this link is to be inherited by the LSP or ESS server.</td>
</tr>
<tr>
<td></td>
<td>Generally, you would use the inherit option in the following cases:</td>
</tr>
<tr>
<td></td>
<td>~ The main server connects to the adjuncts using a CLAN and you want the ESS server to use the same connectivity.</td>
</tr>
<tr>
<td></td>
<td>~ The main server connects to the adjuncts using the main server’s PE interface and you want the LSP or ESS server to connect to the adjunct using it’s PE interface.</td>
</tr>
<tr>
<td></td>
<td>● Enter an o (override) to override the processor channel information sent in the file sync from the main server. The override option causes the near-end (server’s end of the link) address of the link to change to a p when the translations are sent from the main server to the LSP or the ESS server. Generally, you would want the override option when an adjunct connects to the main server using a CLAN and you want the adjunct to connect to the LSP or the ESS server’s processor ethernet interface. When you enter an o in the enable field, you can enter the processor channel information for the LSP or the ESS server in the remaining fields.</td>
</tr>
<tr>
<td>Appl</td>
<td>Displays mis.</td>
</tr>
</tbody>
</table>
### Administering a TCP/IP connection

<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode</td>
<td>Enter <code>s</code> for server.</td>
</tr>
<tr>
<td>Interface Link</td>
<td>Enter <code>p</code> in this field when the physical link is the processor ethernet</td>
</tr>
<tr>
<td></td>
<td>interface on an LSP or ESS. Enter the CLAN link number when the physical</td>
</tr>
<tr>
<td></td>
<td>link is a CLAN on an ESS.</td>
</tr>
<tr>
<td>Interface Chan</td>
<td>Enter the TCP channel number (5000-64500). The default for CMS is 5001</td>
</tr>
<tr>
<td></td>
<td>and is defined during CMS setup. See your CMS software installation</td>
</tr>
<tr>
<td></td>
<td>document for more information.</td>
</tr>
<tr>
<td>Destination Node</td>
<td>Enter the node name of the CMS computer as assigned on the Node Names form.</td>
</tr>
<tr>
<td></td>
<td>In these examples, <code>cmshost</code> is used.</td>
</tr>
<tr>
<td>Destination Port</td>
<td>Use the default of 0.</td>
</tr>
<tr>
<td>Session Local/Session</td>
<td>The local and remote port assignments must be symmetrical between the</td>
</tr>
<tr>
<td>Remote</td>
<td>switch and the CMS. The standard CMS provisioning procedure is to set the</td>
</tr>
<tr>
<td></td>
<td>local and remote port assignments equal to the switch processor channel</td>
</tr>
<tr>
<td></td>
<td>used for this link. For example, if you use processor channel 10, set the</td>
</tr>
<tr>
<td></td>
<td>local and remote port to 10.</td>
</tr>
</tbody>
</table>
Chapter 6: Administering and configuring the secondary IP address

When you configure Call Management System (CMS), you must administer a secondary IP address on an existing Automatic Call Distribution (ACD) or a new ACD.

Use the following commands to administer the connections between CMS and Communication Manager:

- `cmssvc: 5) setup`: To set up the initial system configuration, add all ACDs to the system, and configure the maximum number of entities to ACDs.
  
  **Note:**
  Running this command is mandatory to install a dual IP package.

- `cmssvc: 7) swsetup`: To change the existing switch information on CMS.

- `cmsadm: 1) acd_create`: To add a new ACD to CMS.

For information about how to use these commands, see *Avaya CMS Software Installation, Maintenance, and Troubleshooting for Linux*.

---

Secondary connection configuration

After you administer the primary connection, you can change the default port number. The default port number specifies the port number assigned to the primary connection.

The system does not prompt the session layer, virtual local ports, and virtual remote ports for the Survivable Communication Manager. The secondary connection uses the values that are set for the primary connection. For example:

Does this switch have a secondary host name or IP address? (y/n): (default: y) y
Enter secondary switch host name or IP Address: 1.2.3.5
Enter secondary switch TCP port number (5001-5999): (default: 5004) 5004

---

Secondary connection configuration display

The `cmssvc swinfo` menu selection displays the secondary connection if you have administered the secondary connection. For example:

Switch administration for acd 1:Switch name: denvercm6
Switch model: Communication Mgr 6.x
Chapter 6: Administering and configuring the secondary IP address

Vectoring: y
Expert Agent Selection: y
Central office disconnect supervision: y
Local port: 1
Remote port: 1
Link: TCP/IP 1.2.3.4 5004
Secondary Link: TCP/IP 1.2.3.5 5004
Chapter 7: Troubleshooting TCP/IP switch connections

TCP/IP link troubleshooting can be done at the switch and at the CMS computer. This section describes tests you can run from either system.

The information in this section includes:

- Switch administration on page 69
- Switch tests on page 70
- CMS computer tests on page 72

Switch administration

Check all switch administration. See the following sections:

- Administering a TCP/IP switch link on page 39
- Verifying the software version on page 41
- Setting the reporting adjunct release on page 43.

When selecting the CMS adjunct release, make sure that the features you want to use are compatible with the Communication Manager and Call Center Release. For example, if you want to use features specific to Communication Manager 8.0, the Reporting Adjunct Release on the switch should be set to R18.1, the ACD on the CMS must be administered as Communication Manager 8.0, and the CMS installed must be r18.1yy.y.
Switch tests

Using the system administration terminal on the switch, you can use the following commands to test the TCP/IP link:

```
ping ip-address X.X.X.X board CCs [packet-length YYYY repeat ZZZ]
```

(where \(X.X.X.X\) is the IP address of the CMS computer, \(CCs\) is the equipment location of the C-LAN circuit pack, \(YYYY\) is the size of the test packet, and \(ZZZ\) is the number of times the test will be repeated)

The packet length and repeat options are available with R8 or later. This command sends a test message to the specified IP address to request a remote echo. The results will be either pass or fail, and will show how long the test took to complete. The packet length defaults to 64 bytes, with a maximum of 1500 bytes.

```
ping node-name XXXX board CCs [packet-length YYYY repeat ZZZ]
```

(where \(XXXX\) is the node name of the CMS computer, \(CCs\) is the equipment location of the C-LAN circuit pack, \(YYYY\) is the size of the test packet, and \(ZZZ\) is the number of times the test will be repeated)

The packet length and repeat options are available with R8 or later. This command sends a test message to the specified node name to request a remote echo. The results will be either pass or fail, and will show how long the test took to complete. The packet length defaults to 64 bytes, with a maximum of 1500 bytes.

```
netstat ip-route
```

This command displays the destination IP address, gateway IP address, C-LAN circuit pack used for the route, and the interface for the route.

```
status processor-channels X
```

(where \(X\) is the processor channel used for the TCP/IP link)

This command displays the current status of the processor channel used for the TCP/IP link, and the last time and reason that the channel went down.

```
status link X
```

(where \(X\) is the TCP/IP link number)

This command displays the status for the TCP/IP link. Page 1 of the test shows whether the link is connected and is in service. Page 3 of the test shows whether the link is up or down. If the link is not up, there is a problem in translations or connectivity.

```
status data-module XXXX
```

(where \(XXXX\) is the extension number of the ethernet data module)

This command displays the status for the ethernet data module. This shows which port is connected and if the port is in service.
status sys-link CCsc

(where CCsc is the cabinet, carrier, slot, and circuit of the system link in question)

This command displays the status data for a specific system link. Each system link can be listed using the list sys-link command. The status includes the type and operational state of the link, the associated processor channel (if any), active alarms and path status, and a list of all hardware components that make up the link path.

status packet

This command displays the packet interface status.

trace-route [ip-address X.X.X.X] [node-name nodename] board CCs

(where X.X.X.X is the IP address of the CMS computer, nodename is the node name of the CMS computer, and CCs is the cabinet, carrier, and slot number of the C-LAN circuit pack)

This command works for R8 or later using the TN799B C-LAN circuit pack. This command displays the hops traversed from source to destination, along with the IP addresses of the hop points and final destination, and the observed round-trip delay from the source to each hop point. If no reply is received from a hop point, the IP address is blank.

list measurements clan ethernet CCsc

(where CCsc is the cabinet, carrier, slot, and circuit number of the ethernet port on the C-LAN circuit pack)

This command works for R8 or later. This command displays Cyclic Redundancy Check and collision counts for the past 24 hours in 15-minute intervals. N/A is displayed if the data cannot be retrieved for any interval.

Additional references

See the switch maintenance documents for more details on these test commands.
CMS computer tests

Using the system console on the CMS computer, you can use the following commands to test the TCP/IP link. More information about the UNIX commands can be found by printing out the manual pages (man command).

**netstat**
This command displays general network status information.

**ping X.X.X.X**
(where X.X.X.X is the IP address of the switch)
This command sends a test message to the specified IP address to request a remote echo. The results will be either alive or no answer.

**ping XXX**
(where XXX is the node name of the switch)
This command sends a test message to the specified node name to request a remote echo. The results will be alive, no answer, or unknown host.

**traceroute X.X.X.X**
(where X.X.X.X is the IP address of the switch)
This command traces the route that an IP packet follows from the CMS computer to the switch. There are more options to the command other than the IP address. Check the manual page for traceroute for more options.

**snoop**
This command allows you to capture and inspect network packets.

**spray hostname**
(where hostname is the name of the switch)
This command sends a stream of packets to a selected host, and reports how many were received and the transfer rate.

**Maintenance > Connection Status** (from CMS Main Menu)
This CMS command displays status information for the switch links.

```
/usr/sbin/ndd /dev/tcp tcp_smallest_anon_port
tcp_largest_anon_port
```
This command allows you to display the possible range of talk ports randomly assigned by the CMS when communicating with the switch. These ports are called ephemeral ports.

You should also check the /etc/hosts and /etc/defaultrouter files to verify that the IP addresses and host names are accurate.
# Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td><strong>Automatic Call Distribution (ACD)</strong></td>
<td>A switch feature. ACD is software that channels high-volume incoming call</td>
</tr>
<tr>
<td></td>
<td>traffic to agent groups (splits or skills).</td>
</tr>
<tr>
<td></td>
<td>Also an agent state where the extension is engaged in an ACD call, with</td>
</tr>
<tr>
<td></td>
<td>the agent either talking to the caller or the call waiting on hold.</td>
</tr>
<tr>
<td><strong>CMS</strong></td>
<td>Call Management System (CMS). A software product used by business customers</td>
</tr>
<tr>
<td></td>
<td>that have an Avaya telecommunications switch and receive a large volume</td>
</tr>
<tr>
<td></td>
<td>of telephone calls that are processed through the Automatic Call</td>
</tr>
<tr>
<td></td>
<td>Distribution (ACD) feature of the switch.</td>
</tr>
<tr>
<td><strong>Split</strong></td>
<td>A group of extensions that receive special-purpose calls in an efficient,</td>
</tr>
<tr>
<td></td>
<td>cost-effective manner. Normally, calls to a split arrive over one or a few</td>
</tr>
<tr>
<td></td>
<td>trunk groups.</td>
</tr>
<tr>
<td><strong>Switch</strong></td>
<td>A private switch system providing voice-only or voice and data communications services (including access to public and private networks) for a group of terminals within a customer premises.</td>
</tr>
<tr>
<td><strong>TSC</strong></td>
<td>Technical Service Center. The Avaya organization that provides technical support for Avaya products.</td>
</tr>
<tr>
<td><strong>Transmission Control Protocol/Internet Protocol (TCP/IP)</strong></td>
<td>A communications protocol that provides interworking between dissimilar systems. It is the de facto standard for UNIX systems.</td>
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