



**ATM Installation, Upgrades,
and Administration**
using Avaya Communication Manager

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Notice

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"Toll fraud" is the unauthorized use of your telecommunications system by an unauthorized party (for example, a person who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf). Be aware that there may be a risk of toll fraud associated with your system and that, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

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- Outside the United States, click the *Escalation Contacts* link that is located under the *Support Tools* heading. Then click the *International Services* link that includes telephone numbers for the international Centers of Excellence.

Providing Telecommunications Security

Telecommunications security (of voice, data, and/or video communications) is the prevention of any type of intrusion to (that is, either unauthorized or malicious access to or use of) your company's telecommunications equipment by some party.

Your company's "telecommunications equipment" includes both this Avaya product and any other voice/data/video equipment that could be accessed via this Avaya product (that is, "networked equipment").

An "outside party" is anyone who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf. Whereas, a "malicious party" is anyone (including someone who may be otherwise authorized) who accesses your telecommunications equipment with either malicious or mischievous intent.

Such intrusions may be either to/through synchronous (time-multiplexed and/or circuit-based), or asynchronous (character-, message-, or packet-based) equipment, or interfaces for reasons of:

- Utilization (of capabilities special to the accessed equipment)
- Theft (such as, of intellectual property, financial assets, or toll facility access)
- Eavesdropping (privacy invasions to humans)
- Mischief (troubling, but apparently innocuous, tampering)
- Harm (such as harmful tampering, data loss or alteration, regardless of motive or intent)

Be aware that there may be a risk of unauthorized intrusions associated with your system and/or its networked equipment. Also realize that, if such an intrusion should occur, it could result in a variety of losses to your company (including but not limited to, human/data privacy, intellectual property, material assets, financial resources, labor costs, and/or legal costs).

Responsibility for Your Company's Telecommunications Security

The final responsibility for securing both this system and its networked equipment rests with you - Avaya's customer system administrator, your telecommunications peers, and your managers. Base the fulfillment of your responsibility on acquired knowledge and resources from a variety of sources including but not limited to:

- 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

TCP/IP Facilities

Customers may experience differences in product performance, reliability and security depending upon network configurations/design and topologies, even when the product performs as warranted.

Standards Compliance

Avaya Inc. is not responsible for any radio or television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Avaya Inc. The correction of interference caused by such unauthorized modifications, substitution or attachment will be the responsibility of the user. Pursuant to Part 15 of the Federal Communications Commission (FCC) Rules, the user is cautioned that changes or modifications not expressly approved by Avaya Inc. could void the user's authority to operate this equipment.

Product Safety Standards

This product complies with and conforms to the following international Product Safety standards as applicable:

Safety of Information Technology Equipment, IEC 60950, 3rd Edition, or IEC 60950-1, 1st Edition, including all relevant national deviations as listed in Compliance with IEC for Electrical Equipment (IECEE) CB-96A.

Safety of Information Technology Equipment, CAN/CSA-C22.2 No. 60950-00 / UL 60950, 3rd Edition, or CAN/CSA-C22.2 No. 60950-1-03 / UL 60950-1.

Safety Requirements for Information Technology Equipment, AS/NZS 60950:2000.

One or more of the following Mexican national standards, as applicable: NOM 001 SCFI 1993, NOM SCFI 016 1993, NOM 019 SCFI 1998.

The equipment described in this document may contain Class 1 LASER Device(s). These devices comply with the following standards:

- EN 60825-1, Edition 1.1, 1998-01
- 21 CFR 1040.10 and CFR 1040.11.

The LASER devices used in Avaya equipment typically operate within the following parameters:

Typical Center Wavelength	Maximum Output Power
830 nm - 860 nm	-1.5 dBm
1270 nm - 1360 nm	-3.0 dBm
1540 nm - 1570 nm	5.0 dBm

Luokan 1 Laserlaite

Klass 1 Laser Apparat

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposures. Contact your Avaya representative for more laser product information.

Electromagnetic Compatibility (EMC) Standards

This product complies with and conforms to the following international EMC standards and all relevant national deviations:

Limits and Methods of Measurement of Radio Interference of Information Technology Equipment, CISPR 22:1997, EN55022:1998, and AS/NZS 3548.

Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement, CISPR 24:1997 and EN55024:1998, including:

- Electrostatic Discharge (ESD) IEC 61000-4-2
- Radiated Immunity IEC 61000-4-3
- Electrical Fast Transient IEC 61000-4-4
- Lightning Effects IEC 61000-4-5
- Conducted Immunity IEC 61000-4-6
- Mains Frequency Magnetic Field IEC 61000-4-8
- Voltage Dips and Variations IEC 61000-4-11

Power Line Emissions, IEC 61000-3-2: Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions.

Power Line Emissions, IEC 61000-3-3: Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems.

Federal Communications Commission Statement

Part 15:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Part 68: Answer-Supervision Signaling

Allowing this equipment to be operated in a manner that does not provide proper answer-supervision signaling is in violation of Part 68 rules. This equipment returns answer-supervision signals to the public switched network when:

- answered by the called station,
- answered by the attendant, or
- routed to a recorded announcement that can be administered by the customer premises equipment (CPE) user.

This equipment returns answer-supervision signals on all direct inward dialed (DID) calls forwarded back to the public switched telephone network. Permissible exceptions are:

- A call is unanswered.
- A busy tone is received.
- A reorder tone is received.

Avaya attests that this registered equipment is capable of providing users access to interstate providers of operator services through the use of access codes. Modification of this equipment by call aggregators to block access dialing codes is a violation of the Telephone Operator Consumers Act of 1990.

REN Number

For MCC1, SCC1, CMC1, G600, and G650 Media Gateways:

This equipment complies with Part 68 of the FCC rules. On either the rear or inside the front cover of this equipment is a label that contains, among other information, the FCC registration number, and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

For G350 and G700 Media Gateways:

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the rear of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. The digits represented by ## are the ringer equivalence number (REN) without a decimal point (for example, 03 is a REN of 0.3). If requested, this number must be provided to the telephone company.

For all media gateways:

The REN is used to determine the quantity of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in devices not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed 5.0. To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company.

REN is not required for some types of analog or digital facilities.

Means of Connection

Connection of this equipment to the telephone network is shown in the following tables.

For MCC1, SCC1, CMC1, G600, and G650 Media Gateways:

Manufacturer's Port Identifier	FIC Code	SOC/REN/A.S. Code	Network Jacks
Off premises station	OL13C	9.0F	RJ2GX, RJ21X, RJ11C
DID trunk	02RV2-T	0.0B	RJ2GX, RJ21X
CO trunk	02GS2	0.3A	RJ21X
	02LS2	0.3A	RJ21X
Tie trunk	TL31M	9.0F	RJ2GX
Basic Rate Interface	02IS5	6.0F, 6.0Y	RJ49C
1.544 digital interface	04DU9-BN	6.0F	RJ48C, RJ48M
	04DU9-IKN	6.0F	RJ48C, RJ48M
	04DU9-ISN	6.0F	RJ48C, RJ48M
120A4 channel service unit	04DU9-DN	6.0Y	RJ48C

For G350 and G700 Media Gateways:

Manufacturer's Port Identifier	FIC Code	SOC/REN/A.S. Code	Network Jacks
Ground Start CO trunk	02GS2	1.0A	RJ11C
DID trunk	02RV2-T	AS.0	RJ11C
Loop Start CO trunk	02LS2	0.5A	RJ11C
1.544 digital interface	04DU9-BN	6.0Y	RJ48C
	04DU9-DN	6.0Y	RJ48C
	04DU9-IKN	6.0Y	RJ48C
	04DU9-ISN	6.0Y	RJ48C
Basic Rate Interface	02IS5	6.0F	RJ49C

For all media gateways:

If the terminal equipment (for example, the media server or media gateway) causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, please contact the Technical Service Center at 1-800-242- 2121 or contact your local Avaya representative. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. It is recommended that repairs be performed by Avaya certified technicians.

The equipment cannot be used on public coin phone service provided by the telephone company. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

This equipment, if it uses a telephone receiver, is hearing aid compatible.

Canadian Department of Communications (DOC) Interference Information

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

Installation and Repairs

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Declarations of Conformity

United States FCC Part 68 Supplier's Declaration of Conformity (SDoC)

Avaya Inc. in the United States of America hereby certifies that the equipment described in this document and bearing a TIA TSB-168 label identification number complies with the FCC's Rules and Regulations 47 CFR Part 68, and the Administrative Council on Terminal Attachments (ACTA) adopted technical criteria.

Avaya further asserts that Avaya handset-equipped terminal equipment described in this document complies with Paragraph 68.316 of the FCC Rules and Regulations defining Hearing Aid Compatibility and is deemed compatible with hearing aids.

Copies of SDoCs signed by the Responsible Party in the U. S. can be obtained by contacting your local sales representative and are available on the following Web site: <http://www.avaya.com/support>.

All Avaya media servers and media gateways are compliant with FCC Part 68, but many have been registered with the FCC before the SDoC process was available. A list of all Avaya registered products may be found at: <http://www.part68.org> by conducting a search using "Avaya" as manufacturer.

European Union Declarations of Conformity



Avaya Inc. declares that the equipment specified in this document bearing the "CE" (*Conformité Européenne*) mark conforms to the European Union Radio and Telecommunications Terminal Equipment Directive (1999/5/EC), including the Electromagnetic Compatibility Directive (89/336/EEC) and Low Voltage Directive (73/23/EEC).

Copies of these Declarations of Conformity (DoCs) can be obtained by contacting your local sales representative and are available on the following Web site: <http://www.avaya.com/support>.

Japan

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case, the user may be required to take corrective actions.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

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For the most current versions of documentation, go to the Avaya support Web site: <http://www.avaya.com/support>.

Contents

About This Book.	9
Overview	9
Organization	10
Conventions used in this book	11
Systems and circuit packs	11
Typographic	12
Admonishments	13
Physical dimensions	13
How to get this book.	13
On the Web.	13
Non-Web	14
How to get help	14
Security.	15
Antistatic Protection.	15
Remove/Install circuit packs	15
How to comment on this book	15
Chapter 1: Preparing for Installation and Upgrades	17
Request Address Information.	17
Review Configuration and Equipment	18
Required Hardware	19
ATM interface circuit packs	19
Firmware monitor port.	20
Processor speed increased	21
Increased hardware vintage bits	22
Synchronization splitters	22
Fiber-optic cable distances	23
Server configurations	24
Determine ATM Switch Suitability	31
Constraint tests	34
Final notes	35
Known limits of commonly used ATM switches.	35
Schedule Installation or Upgrade.	36
Chapter 2: Installing ATM-CES	37
Equipment Installation	37
NAA1 Fiber Optic Circuit Pack (csi models only)	39
Unpack and Inspect	39
Installation Instructions	41

Chapter 3: Installing ATM-PNC	43
Installing Equipment.	43
Installing and Testing Network Synchronization	45
Connections without synchronization splitters	46
Connections needing synchronization splitters.	46
Splitter descriptions	47
Synchronization splitter connections	52
Verify the DS1 service	56
Installing and testing the splitter	58
Setting Up ATM Network Duplication.	63
Network duplication administration	66
Changing circuit packs on the standby PNC	69
Chapter 4: Upgrading to ATM-PNC	71
Preparation.	71
Upgrading the Communication Manager server with CSS to ATM-PNC	73
Administration screens	78
Chapter 5: Administering ATM-PNC and ATM-CES	83
Accessing Switches for administration	83
Acquiring ATM Addresses	84
Administering ATM Switch	86
Administering Communication Manager.	86
ATM Port Network Connectivity (ATM-PNC)	87
ATM Circuit Emulation Service (ATM-CES)	90
ATM-CES rules	91
Trunk groups	93
ATM-CES trunk board	93
ATM-CES administration procedure	94
ATM-CES administration screens	100
Changing the port-to-channel mapping	105
Commands for CES	106
Additional server administration	106
Locations	106
SVC cache	113
Gain/Loss adjustments	115
Final Checklist and Test.	118

Chapter 6: Troubleshooting.	121
Contact information	122
Avaya service organizations	122
Helplines	123
International customers	123
Serviceability.	124
Report congestion and CLP bit	126
Report SONET/SDH layer alarms	127
Report cell underruns and overruns	128
Report lost cells	129
Report internal performance problems.	129
Report control link details.	129
Circuit pack automatically resets.	132
Report system up time	132
Alarm reporting modified	133
Display VPI.VCI data	134
VPI.VCI assignments	134
Alarms and Errors	136
Troubleshooting ATM-CES	137
Inspecting LEDs	138
Troubleshooting interoperability	138
Physical connections	139
Administration	140
TN2305X/TN206X circuit pack	142
ATM signaling architecture	144
Unusual ATM trouble conditions	148
Incorrectly typed or omitted PN route or end system identifier (ATM switch)	148
Swapped routes, end system identifiers, or fiber between an IPSI-connected PN and a non-IPSI-connected PN	149
ATM-CES troubleshooting commands	149
Troubleshooting ATM-PNC	149
Inspecting LEDs	150
Troubleshooting synchronization (401A/402A/403A).	150
Troubleshooting interoperability	152
Physical connections	152
Administration	153
TN2305X/TN206X circuit pack	161
ATM signaling architecture	163

Contents

Unusual ATM trouble conditions	170
Incorrectly typed or omitted PN route or end system identifier (ATM switch)	170
Swapped routes, end system identifiers, or fiber between an IPSI-connected PN and an PN	171
Swapped routes, end system identifiers, or fiber between two PNs	171
Swapped routes, end system identifiers, or fiber between A- and B-side TN2305X/TN206Xs on PN	172
ATM-PNC troubleshooting	
commands	172
change/display atm pnc-pairs.	173
list measurements atm pnc-latency	174
Conserving ATM bandwidth	175
Alarming out-of-spec conditions	177
SVC latency commands	177
Administration	181
Constricted bandwidth administration screens	182
Appendix A: Baselining the Customer's Configuration	185
ATM Switch Administration	185
Interconnections.	185
S8700 Media Server Administration Worksheet	187
Appendix B: ATM Switch Feature Interactions	189
Location-related Interactions	189
Switch operability	190
Feature performance	191
Features Supported	196
Features Not Supported.	200
Delay Interactions	201
ATM Feature Interactions	211
Cross-product Compatibility	219
Index	221

About This Book

This book provides procedures for installing new ATM-PNC configurations and upgrading existing Avaya S8700 Media Server software. It specifically covers:

- Installing a new Avaya server that uses ATM-PNC
- Replacing the center stage switch (CSS), the central interface between the IPSI-connected PN and non-IPSI-connected PNs, with ATM-PNC

The information in this book is intended for use by

- Avaya and channel partner trained field installation and maintenance personnel
- Remote Technical Services (RTS) and Global Service Organization (GSO) personnel
- InterNetwork Systems (INS) engineers and technicians
- Sales and Design Support Center (SDSC) personnel
- Data Services Support Center (DSSC)
- Sales associates
- Avaya channel partners.

Overview

The Avaya Communication Manager ATM (asynchronous transfer mode) offer combines Avaya servers with an ATM switch platform that meets specific criteria. ATM offers *intraswitch* ATM solutions. This intraswitch solution is called the ATM port network connectivity, or ATM-PNC.

ATM-PNC provides an alternative to either the direct connect or center stage switch configurations for connecting the IPSI-connected port network to one or more non-IPSI-connected (expansion) port networks (PNs). ATM-PNC is available with three reliability options—standard, high, and critical. Customers must choose whether they want direct connect, CSS, or ATM-PNC. It is not possible to mix configurations.

ATM-CES lets the Avaya server emulate an ISDN-PRI trunk on an ATM facility. These virtual trunks can serve as integrated access, tandem, or tie trunks. ATM-CES emulates up to 8 ISDN spans on a single OC-3/STM-1 ATM interface.

ATM wide area network (ATM-WAN) extends the port network connectivity beyond a single ATM switch over large distances. This allows you to use either a private ATM network, public WAN or a combination of both. Several networked ATM devices can be used as effectively as a single ATM switch for inter-port network connectivity.

About This Book

The Avaya server supports two ATM switch types, the Avaya M770 Multifunction switch and the Lucent Packetstar PSAX-series switches, which are sold through Avaya's InterNetworking Systems (INS) channel, formerly know as DNS. Also, Avaya servers may work with non-Avaya ATM switches that meet ATM standards set by the European Union.

For more information on Avaya ATM switches, go to the Support Web site (<http://support/avaya.com>). In the search box in the upper right hand corner, type ATM and press Enter.

Organization

This book contains 6 chapters and 2 appendices:

- [Chapter 1: Preparing for Installation and Upgrades](#) describes the preparation necessary before an installation and upgrade, including
 - network design considerations, including SVCs generated and network impacts that can restrict ATM switch
 - interactions among various Avaya organizations to prepare the customer site for equipment, translations, and scheduling upgrades and new installations
 - calculating the suitability of various Avaya ATM switches.
- [Chapter 2: Installing ATM-CES](#) provides a procedure for
 - hardware installation: ATM circuit packs and the ATM switch.
 - cabling (I/O connector, fiber optic cables).
- [Chapter 3: Installing ATM-PNC](#) provides a procedure for
 - hardware installation: ATM circuit packs, T1 or E1 synchronization splitter, the ATM switch.
 - cabling (I/O connector, fiber optic cables)
 - ATM network duplication
- [Chapter 4: Upgrading to ATM-PNC](#) describes the preparation and various upgrade paths for the following upgrades:
 - center stage switch to Avaya Communication Manager on ATM-PNC
 - Release 6.3, Release 7, Release 8, Release 9, and Release 10 Avaya ATM-PNC to Avaya Communication Manager ATM-PNC.
- [Chapter 5: Administering ATM-PNC and ATM-CES](#) provides the step-by-step procedures for administering
 - ATM port network connectivity (ATM-PNC)
 - ATM circuit emulation service (ATM-CES)

- [Chapter 6: Troubleshooting](#) describes troubleshooting scenarios and offers suggestions for isolating, fixing, and clearing Avaya server alarms and errors for
 - Avaya server administration
 - ATM-related synchronization
 - ATM switch administration.
- [Appendix A: Baselineing the Customer's Configuration](#) provides a worksheet to log the translations and administration information for
 - Avaya server configurations
 - Lightwave interface units.
- [Appendix B: ATM Switch Feature Interactions](#) offers a quick-reference guide to the features supported and not supported and interactions among the Avaya server's features.

Conventions used in this book

Systems and circuit packs

- The word “system” is a general term encompassing all references to the Avaya server running Avaya Communication Manager software.
- Circuit pack codes (for example, TN780 or TN2182B) are shown with the *minimum acceptable* alphabetic suffix (like the “B” in the code TN2182B).
Generally, an alphabetic suffix higher than that shown is also acceptable. However, not every *vintage* of either the minimum suffix or a higher suffix code is necessarily acceptable. A suffix of “P” means that firmware can be downloaded to that circuit pack.
- The term “cabinet” generally refers to the MCC1 (multi-carrier) cabinet.
- UUCSS refers to a circuit pack address in cabinet-carrier-slot order.

Typographic

Other terms and conventions might help you use this book.

- Commands are printed in bold face as follows: **command**.

We show complete commands in this book, but you can usually type an abbreviated version of the command. For example, **list configuration station** can be typed as **list config sta**.

- Screen displays and names of fields are printed in constant width as follows: `screen display`.

A screen is any form displayed on your computer or terminal monitor.

- Variables are printed in italics as follows: *variable*.
- Keys and buttons are printed as follows: **KEY**.
- To move to a certain field, you can use the **TAB** key, arrows, or the **ENTER** key (the **enter** key may appear as the **return** key on your keyboard).
- If you use terminal emulation software, you need to determine what keys correspond to **ENTER**, **RETURN**, **CANCEL**, **HELP**, **NEXT PAGE**, etc.
- In this book we use the terms “telephone” and “voice terminal” to refer to phones.
- If you need help constructing a command or completing a field entry, remember to use **HELP**.
 - When you press **HELP** at any point on the command line, a list of available commands appears.
 - When you press **HELP** with your cursor in a field on a screen, a list of valid entries for that field appears.
- The status line or message line can be found near the bottom of your monitor display. This is where the system displays messages for you. Check the message line to see how the system responds to your input. Write down the message if you need to call our helpline.
- When a procedure requires you to press **ENTER** to save your changes, the screen you were working on clears and the cursor returns to the command prompt.

The message line shows “`command successfully completed`” to indicate that the system accepted your changes.

Admonishments

Admonishments in this book have the following meanings:



CAUTION:

Denotes possible harm to software, possible loss of data, or possible service interruptions.



WARNING:

Denotes possible harm to hardware or equipment.



DANGER:

Denotes possible harm or injury to your body.

Physical dimensions

- Physical dimensions in this book are in inches (in.) followed by metric centimeters (cm) in parentheses.
- Wire gauge measurements are in AWG followed by the cross-sectional area in millimeters squared (mm²) in parentheses.

How to get this book

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3. Type in the document number 555-233-124 and press Enter.
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How to get help

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If you are:

- Within the United States, click the **Escalation Contacts** link. Then click the appropriate link for the type of support you need.
- Outside the United States, click the **Escalation Contacts** link. Then click the **International Services** link, which includes telephone numbers for the international Centers of Excellence.

You can also access the following services in the USA. You might need to purchase an extended service agreement to use some of these services. Contact your Avaya representative for more information.

DEFINITY Helpline (for help with feature administration and system applications)	1 800 225 7585
Avaya National Customer Care Center Support Line (for help with maintenance and repair)	1 800 242 2121
Avaya Toll Fraud Intervention	1 800 643 2353
Avaya Corporate Security	1 877 993 8442

Security

To ensure the greatest security possible for customers, Avaya offers services that can reduce toll-fraud liabilities. Contact your Avaya Inc. representative for more security information.

Login security is an attribute of the Communication Manager. Existing passwords expire 24 hours after installation.

Antistatic Protection

 **CAUTION:**

When handling circuit packs or any components of a system, always wear an antistatic wrist ground strap. Connect the strap to an approved ground such as an unpainted metal surface on the system.

Remove/Install circuit packs

 **CAUTION:**

When the power is on:

- *The control circuit packs cannot be removed or installed.*
- *The port circuit packs can be removed or installed.*

How to comment on this book

Avaya always welcomes your feedback. Contact us through:

- e-mail: document@avaya.com
- fax: 1-303-538-1741
- Your Avaya representative

Mention this document name and number, *ATM Installation, Upgrades, and Administration using Avaya Communication Manager*, 555-233-124.

Your comments are of great value, and help us to improve our documentation.

Chapter 1: Preparing for Installation and Upgrades

This chapter contains information on preparing for the installation or upgrade to Avaya™ Communication Manager running on an Avaya S8700 Media Server ATM Port Network Connectivity (ATM-PNC) and ATM Circuit Emulation Server (ATM-CES).

Common activities to either install or upgrade new ATM-PNCs or ATM CESs include:

- [Request Address Information](#)
- [Review Configuration and Equipment](#)
- [Determine ATM Switch Suitability](#)
- [Schedule Installation or Upgrade](#)

Preparing for an ATM switch installation or upgrade involves coordinating the efforts among the following people and organizations:

- The customer
- The project manager
- Avaya Remote Technical Services (RTS) or Global Strategic Opportunities (GSO) Division
- ATM switch technician
- Avaya channel partner, if applicable

Request Address Information

The complete Avaya server translations require precutover administration, which, in turn, requires a customer address scheme, specifically the ATM addresses for the TN2305X/ TN2306X ATM interface circuit pack(s). The address of the PN is automatically read by the local ATM switch, using the address registration procedure defined in Integrated Local Management Interface (ILMI). If field technicians do not have the login permissions required to obtain the PN's ATM address(es) directly from the ATM switch(es), the customer or ATM switch installer must provide that information.

Required Hardware

[Table 1](#) lists the required equipment for standard, high, critical reliability, and ATM network duplication configurations.

Table 1: Min. required equipment for ATM-PNC configurations

Equipment	Reliability level		
	Standard	High	Critical/ATM Network Duplication
ATM switch	1	1	2
TN2305X/TN230XB ATM interface ¹ for each PN (see ATM interface circuit packs)	1	1	2
T1 or E1 synchronization splitter ² (see Synchronization splitters)	1	1	1
SC-connected fiber optic cable (see) ³	1	1	2
TN771 maintenance/test circuit pack ⁴			1

1. TN2305B (multimode fiber); TN2306B (single-mode fiber) for ATM-PNC. The B-suffix circuit pack is backward-compatible with, but does not replace the TN2305 or TN2306 circuit packs.

2. The number and uses of the synchronization splitter depend on the configuration and the source(s) from which primary and secondary synchronization is derived. You may need 1 sync splitter per ATM switch. DS1 synchronization requires either no sync splitter or up to a number twice the number of sites.

3. Existing fiber optic cable may require an ST-to-SC adapter, depending on the interface at the ATM switch. The TN2305X/TN2306X circuit pack requires an SC connector.

4. For network duplication; required for systems supporting PRI, BRI, or ASAI.

ATM interface circuit packs

- The TN2305B and TN2306B circuit packs do not replace the TN2305 and TN2306 circuit packs, respectively. Either circuit pack can be used in all platforms, but the TN2305B or TN2306B is required for ATM-PNC.
- You do not receive the TN2305B and TN2306B ATM interface circuit packs as automatic upgrades.

Preparing for Installation and Upgrades

The redesigned TN2305B/TN2306B ATM interface circuit packs have more capabilities and resources:

- [Firmware monitor port](#) on the backplane of the circuit packs
- [Processor speed increased](#) to 66 megahertz (MHz.)
- [Increased hardware vintage bits](#)

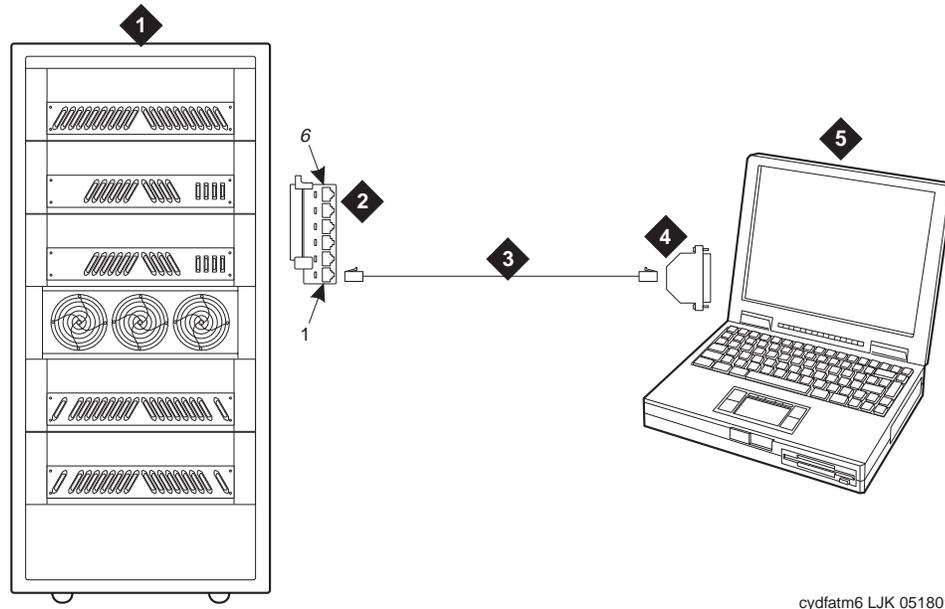
The increased functionality is available to both ATM-PNC and ATM-CES applications. However, both circuit packs can also function in systems designed and installed earlier than this release.

Firmware monitor port

[Figure 2](#) shows the location of the firmware monitor port on the backplane of the circuit pack. You can attach a monitor cable to the ATM expansion circuit pack without removing the circuit pack from its carrier.

Note:

The TN2305/2306 circuit packs also have a firmware monitor header located on the circuit pack. This header functions the same as the redesigned backplane connector ([Figure 2](#)), but requires busying out and unseating the circuit pack to attach the monitor cable.

Figure 2: TN2305B and TN2306B firmware monitor port
**Figure notes:**

- | | |
|--|--|
| 1. MCC1 Media Gateway | 3. D8W (8-wire) cable |
| 2. 258A 6-port Amphenol to RS-232 adapter
(Comcode 102605136) | 4. 355A RS-232 to 25-pin serial adapter
(Comcode 407590785) |
| | 5. Laptop computer |
-

Use [Figure 2](#) and the following procedure to access firmware monitor port *on the TN2305B or TN2306B circuit packs only*:

1. Connect the 258A 6-port Amphenol adapter to the port slot on the backplane corresponding to the TN2305B or TN2306B circuit pack.
2. Connect a D8W cable to port 1 of the 258A adapter.
3. Connect the other end of the D8W cable to the RS-232 side of the 355A adapter.
4. Connect the 25-pin serial connector on the 355A adapter to a serial port on the computer.
5. At the computer set the baud rate for the serial port to 38,400 (38.4K).

Processor speed increased

The circuit pack processor speed is 66 megahertz (MHz.)

Increased hardware vintage bits

The range of available hardware vintage bits is now 7, increasing the number of possible vintage values to 127.

Synchronization splitters

To test the synchronization splitters, you need the following equipment:

- Phoenix 1541C Test Set with accessory cord kit
- Phoenix 5575A T1 Test Set with cord kit or equivalent
- 700A DS1 CPE Loopback Jack¹ (comcode 10798867)
- 103A block
- 1541CC cable kit
- RJ45-to-Bantam test cable from the 1541CC cable kit
- System capacities

[Table 2](#) lists the maximum number of TN2305X/TN2306X circuit packs allowed in an Avaya server.

Table 2: Maximum number of TN2305X/TN2306X circuit packs

Platform	Maximum ATM circuit packs allowed	Description
S700-series Media Server	176	88 port networks (for CES) plus 88 port networks (for PNC)
SI or CSI	6	CES only (no PNC)

¹ See *Maintenance Procedures for Avaya Communication Manager 3.0, Media Gateways, and Servers*, Chapter 7, DS1 Loopback Test for more information.

Fiber-optic cable distances

The fiber-optic cable range is determined by the optical power budget and the fiber bandwidth. [Table 3](#) shows the TN2305X/TN2306X specifications.

Table 3: TN2305X/TN2306X fiber-optic specifications

Parameter	Fiber mode		Units
	Multimode	Single mode	
Output optical power max	-14	-8	dBm average
Output optical power min (BOL/ EOL)	-19/-20	-15	dBm average
Input optical power max	-14	-8	dBm average
Input optical power min	-30	-31/32.5/34	dBm average
Optical power budget	30-19=11	31-15=16	dBm
Typical range	4	20	Km
Typical wavelength	1310	1310	nm
Wavelength min/max	1261/1360	1261/1360	nm
Fiber width	62.5/125	62.5/125	um
Connector	Duplex SC	Duplex SC	
Loss per connector	0.2		dB
Fiber cable loss	1	0.5 max (0.33 typical)	dB/Km
Fiber bandwidth	500	10,000	MHz-Km
Reflections		28	dB
IEC 825/CDRH		Class 1 compliant	

Example

A multimode fiber using an optical power budget of 11 dB and a loss of 1 dB/Km with no connectors yields a distance of 11 Km, which is unrealistic. Using a fiber bandwidth of 500MHz-Km and using the ATM OC-3c symbol rate of 77.5 Mb/s (data rate 155 Mb/s) yields a distance of 6.4Km. In this case the distance is limited by the fiber bandwidth.

Server configurations

Supported ATM configurations are:

- S8700 Media Server series ATM single control network ([Figure 3: S8700-series ATM single control network](#) on page 25)
- S8700 Media Server series ATM duplicated control network ([Figure 4: S8700-series ATM duplicated control networks](#) on page 27)
- S8700 Media Server series ATM duplicated control and duplicated voice-bearer network ([Figure 5: S8700-series ATM duplicated control and duplicated voice-bearer networks](#) on page 29)

Figure 3: S8700-series ATM single control network

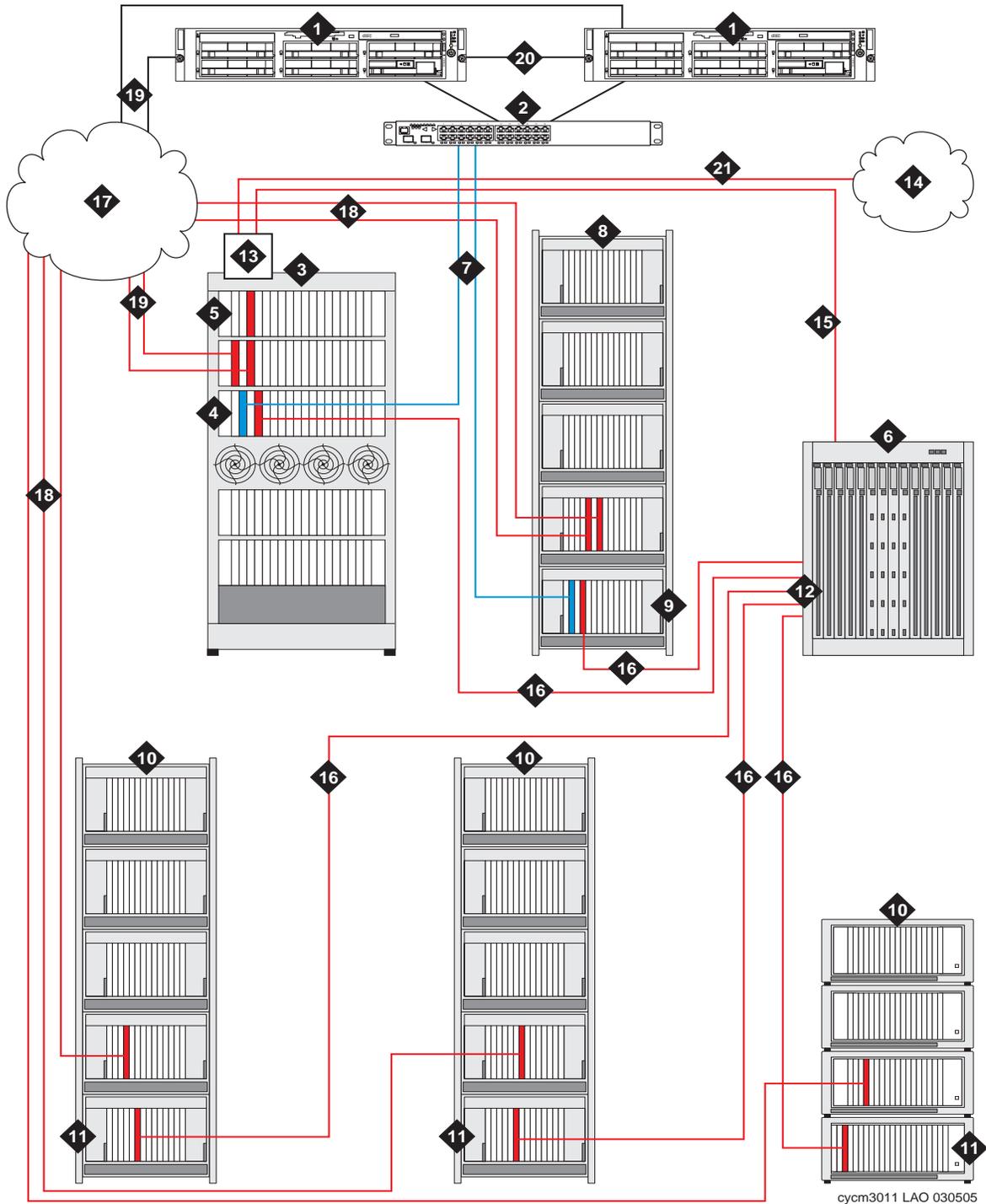
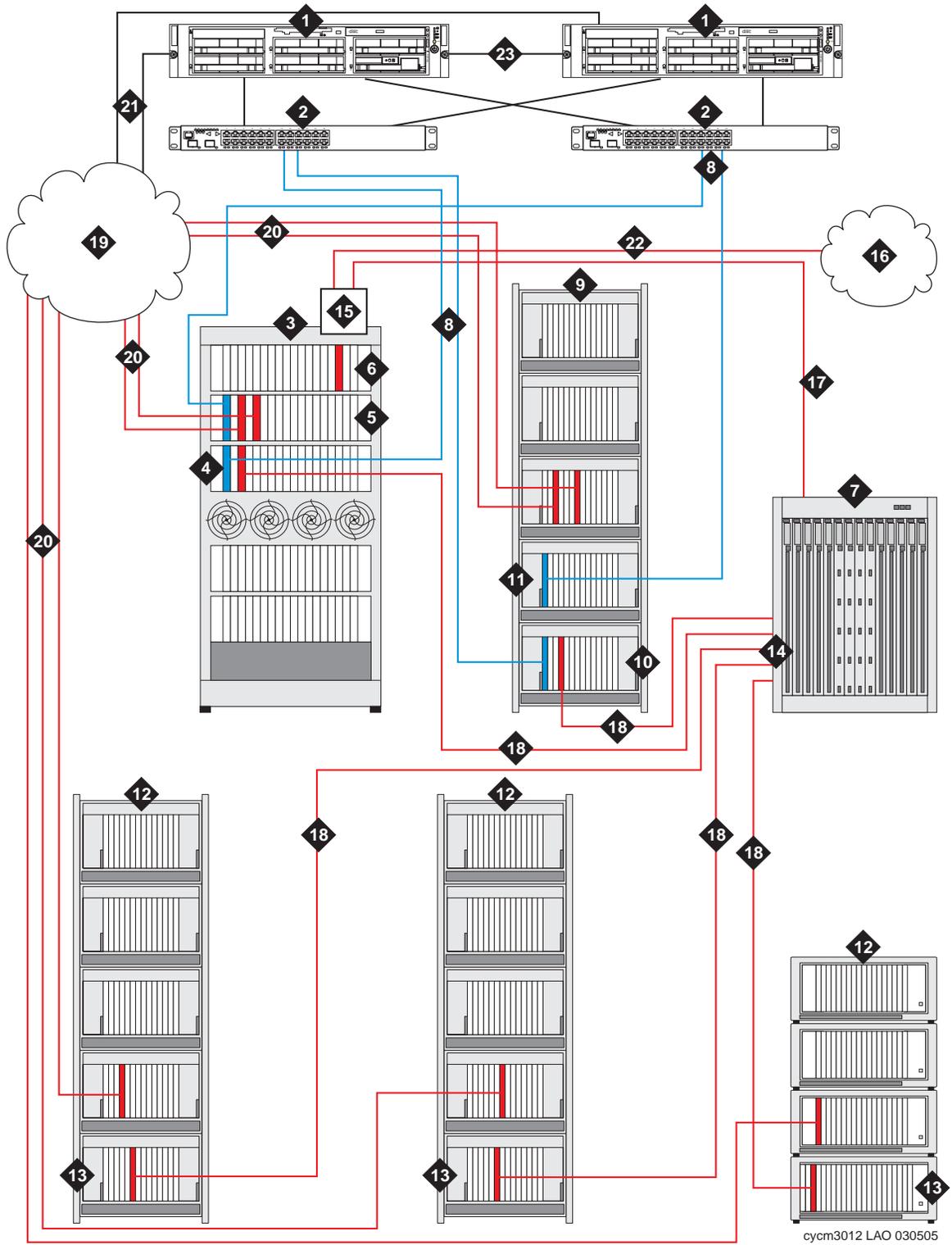


Figure notes: S8700-series ATM single control network

1. S8700/S8710 Media Server
 2. Ethernet Switch
 3. IPSI-connect PN (G650 Media Gateway stack, MCC1 Media Gateway [shown in figure], or SCC1 Media Gateway stack), consisting of at least two media gateways or carriers.
 4. PN control gateway or carrier, in the A position which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to server.
Note: For the G650 Media Gateway, the BP version of the TN2312 is required in order to provide environmental maintenance.
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
 5. TN464GP DS-1 circuit pack, for clock synchronization with a network resource
 6. ATM switch.
 7. IPSI-to-server control network connection via Ethernet switch
 8. IPSI-connect PN (G650 Media Gateway stack [shown in figure], MCC1 Media Gateway, or SCC1 Media Gateway stack).
 9. PN control gateway or carrier, in the A position which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to server.
Note: For the G650 Media Gateway, the BP version of the TN2312 is required in order to provide environmental maintenance.
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
 10. Fiber-connected PN (G650 Media Gateway stack [shown in figure], MCC1 Media Gateway, SCC1 Media Gateway stack [shown in figure])
 11. PN control gateway or carrier, in the A position, which contains:
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
Note: One TN2182 Tone Clock circuit pack must also be present per PN if the PN(s) consist of SCC1 or MCC1 Media Gateways. One maintenance-only TN2312BP IPSI circuit pack must be present per PN if the PN(s) consist of G650 Media Gateways.
 12. OC-3 connections to the ATM switch
 13. 401A/B sync splitter, attached to the back of the TN464GP DS1 circuit pack
 14. Public network (PSTN)
 15. Timing signal to ATM switch from sync splitter.
 16. Fiber connections from TN2305B/TN2306B to ATM switch.
 17. Customer LAN
 18. LAN connections of optional TN2302AP IP Media Interface or TN2602AP IP Media Resource 320 for IP-TDM voice processing, if any, and optional TN799DP C-LAN for control of IP endpoints. These circuit packs are optional for PNs in an ATM-connected network. However, the C-LAN circuit pack is required for downloads of firmware updates.
 19. LAN connections of media servers for remote administration
 20. Duplicated server links, including the link for translations transfer and the link for control data sharing
 21. DS1 connection from sync splitter.
-

Figure 4: S8700-series ATM duplicated control networks



Preparing for Installation and Upgrades

Figure notes: S8700-series ATM duplicated control networks

1. S8700/S8710 Media Server
 2. Ethernet Switch
 3. IPSI-connected PN (G650 Media Gateway stack, MCC1 Media Gateway [shown in figure], or SCC1 Media Gateway stack), consisting of at least two media gateways or carriers.
 4. PN control gateway or carrier, in the A position, which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to server.
Note: For the G650 Media Gateway, the BP version of the TN2312 is required in order to provide environmental maintenance.
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
 5. Duplicated control carrier, in the B position, which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to duplicated control network
 6. TN464GP DS-1 circuit pack, for clock synchronization with a network resource
 7. ATM switch.
 8. IPSI-to-server control network connection via Ethernet switch
 9. IPSI-connected PN (G650 Media Gateway stack [shown in figure], MCC1 Media Gateway, or SCC1 Media Gateway stack).
 10. PN control gateway or carrier, in the A position, which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to server.
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
 11. Duplicated control gateway, in the B position, which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to server.
 12. Fiber-connected PN (G650 Media Gateway stack [shown in figure], MCC1 Media Gateway, SCC1 Media Gateway stack [shown in figure]).
 13. PN control gateway or carrier, in the A position, which contains:
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
Note: One TN2182 Tone Clock circuit pack must also be present per PN if the PN(s) consist of SCC1 or MCC1 Media Gateways. One maintenance-only TN2312BP IPSI circuit pack must be present per PN if the PN(s) consist of G650 Media Gateways.
 14. OC-3 connections to the ATM switch
 15. 401A/B sync splitter, attached to the back of the TN464GP DS1 circuit pack
 16. Public network (PSTN)
 17. Timing signal to ATM switch from sync splitter.
 18. Fiber connections from TN2305B/TN2306B to ATM switch.
 19. Customer LAN
 20. LAN connections of optional TN2302AP IP Media Interface or TN2602AP IP Media Resource 320 for IP-TDM voice processing, if any, and optional TN799DP C-LAN for control of IP endpoints. These circuit packs are optional for PNs in an ATM-connected network. However, the C-LAN circuit pack is required for downloads of firmware updates.
 21. LAN connections of media servers for remote administration
 22. DS1 connection from sync splitter.
 23. Duplicated server links, including the link for translations transfer and the link for control data sharing
-

Figure 5: S8700-series ATM duplicated control and duplicated voice-bearer networks

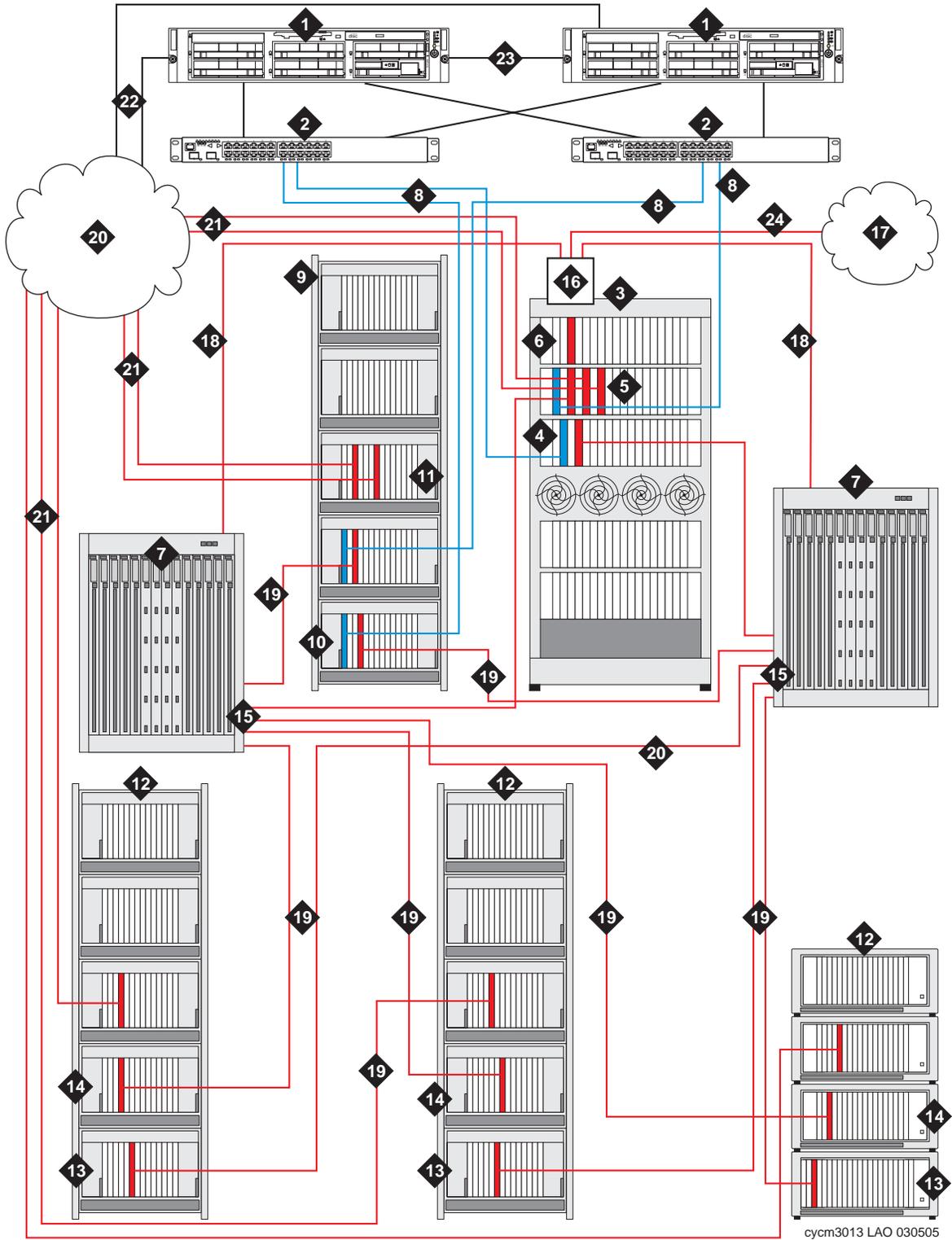


Figure notes: S8700-series ATM duplicated control and duplicated voice-bearer networks

1. S8700/S8710 Media Server
 2. Ethernet Switch
 3. IPSI-connect PN (G650 Media Gateway stack, MCC1 Media Gateway [shown in figure], or SCC1 Media Gateway stack), consisting of at least two media gateways or carriers.
 4. PN control gateway or carrier, in the A position, which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to server.
Note: For the G650 Media Gateway, the BP version of the TN2312 is required in order to provide environmental maintenance.
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
 5. Duplicated control carrier or gateway, in the B position, which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to duplicated control network
 - A TN2305B (for multimode fiber) or TN2306B (for single-mode fiber) ATM circuit pack for bearer and control network connections to the duplicated ATM switch.
Note: For the duplicated control and bearer network configurations, each location of a PN or a group of PNs must contain a TN771 Maintenance Test circuit pack.
 6. TN464GP DS-1 circuit pack, for clock synchronization with a network resource
 7. ATM switch. There are two ATM switches in this configuration.
 8. IPSI-to-server control network connection via Ethernet switch
 9. IPSI-connected PN (G650 Media Gateway stack [shown in figure], MCC1 Media Gateway, or SCC1 Media Gateway stack, consisting of at least two media gateways or carriers).
 10. PN control gateway or carrier, in the A position, which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to server.
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
 11. Duplicated control gateway or carrier, in the B position, which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to server.
 - A TN2305B or TN2306B ATM circuit pack for bearer and control network connections to the duplicated ATM switch.
 12. Fiber-connected PN (G650 Media Gateway stack [shown in figure], MCC1 Media Gateway, SCC1 Media Gateway stack [shown in figure]), consisting of at least two media gateways or carriers.
 13. PN control gateway or carrier, in the A position which contains:
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
 - One TN2182 Tone Clock circuit pack if the PN consists of SCC1 or MCC1 Media Gateways. One maintenance-only TN2312BP IPSI circuit pack if the PN consists of G650 Media Gateways.
 14. Duplicated control gateway or carrier, in the B position which contains:
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
 - One TN2182 Tone Clock circuit pack if the PN consists of SCC1 or MCC1 Media Gateways. One maintenance-only TN2312BP IPSI circuit pack if the PN consists of G650 Media Gateways.
 15. OC-3 connections to the ATM switch
 16. 401A/B sync splitter, attached to the back of the TN464GP DS1 circuit pack
 17. Public network (PSTN)
-

Determine ATM Switch Suitability

To fully support ATM-PNC and provide nonblocking ATM access between all port networks, ATM switches must support at least 400 point-to-multipoint switched virtual connection (SVC) roots or leaves per OC-3/STM-1 interface. Because different switches have different limits—some limit roots, some leaves, and some the total, we have developed the Meiners' Algorithm to determine whether a switch can support a proposed set of port networks. Note that there are separate versions of the algorithm for Avaya M770 Multifunction switches and for other ATM switches. These algorithms are available to Avaya personnel as calculators within two Microsoft® Excel spreadsheets. Personnel with Avaya intranet access may find either of these MS Excel files. Check periodically for updates.

The following directions only apply to the non-M770 version of the algorithm. (See the spreadsheets for further usage notes.) For best results, use the calculator for one ATM switch at a time. Use trial and error to set the values in the user-defined values section until the feasibility indicator reports **YES** or **PROBABLY**.

Note:

Use of this spreadsheet is no substitute for thinking. Please apply basic sanity checks to the outcome. ATM switches may have limitations that the calculator does not consider.

To use the calculator, type the network layout and resource limits for the ATM switch you are using. Refer to the following caveats as you input your information:

1. Not all ATM switches have limits on all of the values. If a limit does not apply, enter any very large number (1000000 is good).
2. Some ATM switches (for example, access concentrators) allow a limited ability to configure the limits. Other switches have fixed limits. If you do not know the limits, ask the ATM switch vendor.
3. If your ATM switch is handling non-Communication Manager traffic, enter the resource limits after subtracting the resources used by the non-Communication Manager traffic.
4. If you are using an ATM switch with different limits on different modules or ports (for example, an Avaya M770 Multifunction Switch):
 - a. compute the average limits per port to which a Communication Manager port network is attached.
 - b. select the port with the most restrictive limitations.
 - c. enter the system limit as these limits times the number of Communication Manager port networks attached to that ATM switch.

Note:

The more partitioned the limits are, the less accurate are the results of the spreadsheet.

Preparing for Installation and Upgrades

5. If you answer "yes" to transit traffic, the calculator may or may not be able to determine feasibility. If it cannot, the feasibility displays as **UNKNOWN**.

[Table 4](#) shows an example of a calculation.

Table 4: Sample calculation

Network Layout	
Customer	SV
ATM switch	M770
Total number of Communication Manager port networks:	20
Number of PNs directly attached to this ATM switch:	8
Number of trunks on this ATM switch (inter-ATM-switch connections)	1
Any transit traffic through this ATM switch (yes/no)	no
Aggregate peak phone calls rate per hour in all directly connected PNs	10000
Bidirectional aggregate trunk bandwidth in Mbps	155.52
Application bandwidth in kbps needed per port network	128
ATM Switch Resource Limits (see "Limits" sheet for help)	
Number of PP SVCs supported:	1000000
Number of PMP (roots) supported:	4096
Number of PMP parties (leaves) supported:	1000000
Number of PMP endpoints (roots+leaves) supported:	1000000
Total number of SVCs (PP+PMP) supported	1000000
Per-port SVC limit (normally based on VCI range)	1000000
Setups per second at <220 ms per setup	1000000
Feasibility	YES
Bandwidth limited	1960 calls

YES means that this application is okay under any load.

PROBABLY means that this application is okay under any reasonable loads. Check the constraint tests results to see what kind of loads might be a problem.

NO means that this application is not reasonable. See the Constraint Tests results to see what resource you are short of. See if you can increase this resource, or decrease the number of port networks.

UNKNOWN means that special engineering is required for this application because of the transit traffic. The special treatment is necessary because the feasibility depends on the volume of the transit traffic. Making any of the changes suggested for **NO** above might make it feasible regardless of the transit traffic.

BANDWIDTH LIMITED means that the aggregate trunk bandwidth is insufficient to support the theoretical maximum demand. Bandwidth-limited applications are not recommended unless you are certain that the requested call load will never exceed the available bandwidth. Make sure you are comfortable with the call limit for calls to nonlocal port networks (PNs).

Table 5: Constants

Timeslots per port network	500
Cache hit ratio	50%
EAL+PACL bandwidth	96

Table 6: Computed values

Number of nonlocal port networks	12
Effective number of port networks for PP	19
Effective number of port networks for PMP	16
Number of available timeslots	7920
Per-port SVCs (PP+PMP) needed	557
PP SVCs per PN	3
Total PP SVCs	57
PP cells per second required over trunks	13992
Aggregate cells per second available over trunks	353207
Bandwidth-limited maximum phone calls over trunks	1960
Timeslot-limited maximum phone calls over trunks	2000

Constraint tests

If your calculations do not yield a **YES**, this section provides the resources of which you are short. These tests check 9 ATM switch resource limitations against 6 different application scenarios. A 1 in the Test Results ([Table 8: Test results](#) on page 34) indicates a passed test; a 0 indicates a failed test. To achieve a **YES** feasibility, all 54 tests must pass. To achieve a **PROBABLY**, only 27 tests (indicated in **bold**) must pass.

Table 7: Application scenarios

Number of 2-party calls	1980	0	0	0	0	990
Number of 3-party calls	0	880	0	0	0	220
Number of 4-party calls	0	0	495	0	0	61
Number of 5-party calls	0	0	0	316	0	19
Number of 6-party calls	0	0	0	0	220	14

Table 8: Test results

Constraint 1: Timeslots	1	1	<i>1</i>	<i>1</i>	<i>1</i>	1
Constraint 2: PMP roots	1	1	<i>1</i>	<i>1</i>	<i>1</i>	1
Constraint 3: PP	1	1	<i>1</i>	<i>1</i>	<i>1</i>	1
Constraint 4: PMP leaves	1	1	<i>1</i>	<i>1</i>	<i>1</i>	1
Constraint 5: PMP endpoints	1	1	<i>1</i>	<i>1</i>	<i>1</i>	1
Constraint 6: Total SVCs	1	1	<i>1</i>	<i>1</i>	<i>1</i>	1
Constraint 7: Per-port SVCs	1	1	<i>1</i>	<i>1</i>	<i>1</i>	1
Constraint 8: Performance	1	1	<i>1</i>	<i>1</i>	<i>1</i>	1
Constraint 9: Trunk bandwidth	1	1	1	1	1	1

Final notes

The goal is to engineer the network so that in all reasonable applications, you always run out of port network time slots before running out of ATM switch resources. This is required to provide acceptable service to the customer.

These calculations factor in phone calls only. There is no specific accommodation for the ATM SVC cache, or for special features such as music, announcements, and group paging. The theory behind using 500 as the number of timeslots in a port network rather than the real number (484) is to allow for a normal amount of these special features. If you use multiple music on hold, group paging, and so forth, you may need special engineering.

This calculator determines that an application is **PROBABLY** feasible if it can handle reasonable activity mixes. The three columns in [Table 8](#) that have bold entries define what is meant by reasonable. These tests require that the switch be able to handle a complete suite of 2-party calls, a complete suite of 3-party calls, and a mixed suite that involves some calls of each type. For best results, your application should pass all the constraint tests.

Any ATM switch that processes transit traffic (that is, connections that do not either originate or terminate on any of the port networks directly attached to it) may require special engineering. This is possible if the number of trunks on the ATM switch is more than one. If this is the case, the calculator first attempts to determine if the application is feasible despite the transit traffic. If it is, it reports the feasibility as **YES** or **PROBABLY**. If not, it reports the feasibility as **UNKNOWN**, requiring special engineering.

Known limits of commonly used ATM switches

Use the limits shown in [Table 9](#) to do your own calculations. To make it easier as you use the calculator, we suggest that you

1. Select and copy the values from the table in the spreadsheet.
2. Select the values on the sample calculation.
3. Select **Edit > Paste Special** with the transpose option to paste the values into the calculator.

Note:

These limits are the best we could determine at one time. For each switch, the example shown is generally the best you can do, assuming you bought the maximum configuration and you administered it optimally (which are not necessarily the default settings). Consult the switch vendor for confirmation of current limits.

Preparing for Installation and Upgrades

A limit shown as 1000000 means that this ATM switch has no independently defined limit on this resource.

Table 9: Known limits of commonly used ATM switches

Switch	Number of PP SVCs supported	Number of PMP (roots) supported	Number of PMP parties (leaves) supported	Number of PMP endpoints (roots + leaves) supported	Total number of SVCs (PP+PMP) supported	Per-port SVC limit (normally based on VCI range)	Setups/s at <220 s/ setup
Avaya PacketStar PSAX 1250							
Release 5.0	1000000	1000000	1000000	1000	1000000	1000000	1000000
Release 5.1	1000000	1000000	1000000	4000	1000000	1000000	1000000
Release 6 (with recommended admin)	400	5000	6666	1000000	1000000	1000000	1000000
Avaya M770 Multifunction r2							
Dual Domain Modules 1&8	1000000	4096	1000000	1000000	1000000	1000000	1000000
Dual Domain Modules 2-7&9-14	1000000	2048	1000000	1000000	1000000	1000000	1000000
Single Domain	1000000	1024	1000000	1000000	1000000	1000000	1000000
Dual Domain	1000000	4096	1000000	1000000	1000000	1000000	1000000
Fore ASX1000							
Release 6 (with memory model 5)	2048	2048	16384	1000000	1000000	1000000	1000000

Schedule Installation or Upgrade

Schedule the installation or upgrade with the Avaya Remote Technical Services (RTS).

Chapter 2: Installing ATM-CES

This chapter describes the procedures for installing ATM Circuit Emulation Service (CES). The procedure is simple: install the server first, then install the ATM switch, and finally TN2305X/TN2306X interface circuit packs. ATM-CES is administered in [Chapter 5: Administering ATM-PNC and ATM-CES](#).

Note:

ATM-CES works only with TN2305X/TN2306X ATM interface circuit packs.

Equipment Installation

To prepare for a new ATM-CES installation, you need to install the server first. For instructions on installing the server, refer to the following installation books or online information:

- *Installing and Configuring an Avaya S8700 Series Media Server, 03-300145*
- *Installing the Avaya G650 Media Gateway, 03-300144*
- *Installation, Upgrades, and Additions for Avaya CMC1 Media Gateway*

Review the reliability configurations (refer to [Figure 3: S8700-series ATM single control network](#) on page 25 through [Figure 5: S8700-series ATM duplicated control and duplicated voice-bearer networks](#) on page 29).

The slot restrictions for a CES configuration are similar to ISDN-PRI circuit packs. ATM interface circuit packs can occupy any available slot in a port carrier.

Follow the steps in [Table 10](#) to ensure that

- the applicable equipment is installed correctly.
- the customer's configuration is properly recorded (use worksheet in [Appendix A: Baselining the Customer's Configuration](#)).

Table 10: General installation process

✓	Step	Action	Description
	11	Install Avaya server	Refer to the appropriate installation book for your platform See Server configurations on page 24 for connection schematics.
	22	Install ATM switch(es) or access concentrators	Refer to your ATM switch's quick reference guide.
	33	Install ATM interface circuit pack	Insert the TN2305X/TN2306X circuit pack(s) into the appropriate slot(s).
	4.	Route the fiber optic cables between the ATM switch and the IPSI-connected PN and non-IPSI-connected PNs.	<p>Follow the fiber pass-through procedure in the appropriate Avaya server installation book.</p> <p>⚠ WARNING: Be sure that the fiber optic cable is secured so that the door of the media gateway does not pinch or bend the cable.</p> <p>For csi platforms, see NAA1 Fiber Optic Circuit Pack (csi models only) on page 39 for a diagram of the NAA7 board that routes fiber optic cabling from the back of the switch to the front.</p>
	5.	Connect the fiber optic cables	<p>Connect the fiber optic cables to the ATM switch.</p> <p>Note: If the installation uses the customer's existing fiber, you may need an ST-to-SC adapter (1 included in Fiber Pass-Through Kit).</p>

Table 10: General installation process (continued)

✓	Step	Action	Description
	6.	Connect the fiber optic cables to the ATM interface circuit packs	<p>Connect fiber optic cable to the SC connector on the faceplate of each TN2305X/TN2306X circuit pack in the IPSI-connected PN and non-IPSI-connected PN.</p> <ul style="list-style-type: none"> • The TN2305X/TN2306X circuit pack interface requires SC connectors (see Note in Step 5). • Do not reuse existing fiber cabling with ST connectors at both the Avaya server and the ATM switch. This requires an ST-to-SC adapter at both ends. It is better to order the cable with the SC connectors at both ends.
	7.	Record configuration	Record Avaya server switch-to-ATM port (port locations for each ATM circuit pack) in Table 55 in Appendix A: Baselineing the Customer's Configuration .
	8.	Record fiber connections	Record the fiber optic cable runs on the lightwave interface (LIU) diagram (Figure 74 in Appendix A: Baselineing the Customer's Configuration).

2 of 2

NAA1 Fiber Optic Circuit Pack (csi models only)

The NAA1 board routes fiber optic connections from the rear of the cabinet through the front faceplate. The SC fiber connectors that go through the faceplate connect to the faceplate connectors on the TN2305X/TN2306X ATM circuit pack.

Unpack and Inspect

Use the following steps:

1. Verify that the equipment is received. See [Figure 6: NAA1 Fiber Optic Interface Kit Equipment](#) on page 40. Actual equipment may vary in appearance and may ship in separate packages.

2. See [Table 11: Parts List](#) on page 40 for a list of part Comcodes.

Figure 6: NAA1 Fiber Optic Interface Kit Equipment

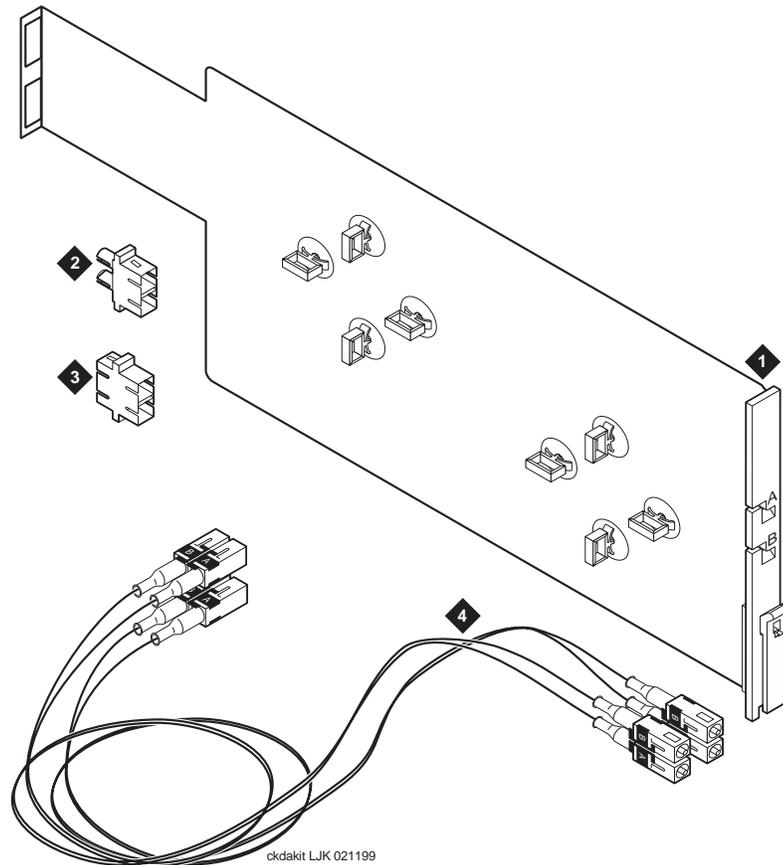


Figure notes:

- 1. NAA1 circuit pack
- 2. SC/ST connectors (2x)
- 3. SC/SC connectors (2x)
- 4. Fiber cables (2 orange multimode cables for use with the TN2305X circuit pack and 2 yellow single mode cables for use with the TN2306X circuit pack)

Table 11: Parts List

Quantity	Description	Comcode
1.	Fiber optic interface kit Kit includes: NAA1 circuit pack, 2 SC/SC connectors, 2 SC/ST connectors, and 4 cables (2 for single mode and 2 for multi-mode).	108424391

Installation Instructions

Complete these steps after the TN2305X/TN2306X circuit pack is installed.

1. Insert the connector into the top opening at the rear of the NAA1 circuit pack. See [Figure 7: NAA1 Circuit Pack with Cables Attached](#) on page 42.
2. Attach either the single mode (yellow) cable or multimode (orange) cable to the connector.
3. Route the cable through the slot A in the faceplate.
4. Determine how much of the cable is needed to reach the ATM circuit pack.
5. Wrap the excess cable as shown in [Figure 7: NAA1 Circuit Pack with Cables Attached](#) on page 42 and secure with the clips.
6. Repeat these steps for each circuit pack used.

Note:

In Step 1, use the bottom opening at the rear of the NAA1 circuit pack.

In Step 3, use slot B in the faceplate.

In Step 5, use the lower set of clips to secure the excess cable.

7. Insert the NAA1 circuit pack into slot 11 on the top row of the compact modular cabinet.

 **CAUTION:**

Do not attempt to put this circuit pack into any other slot as pin damage may occur.

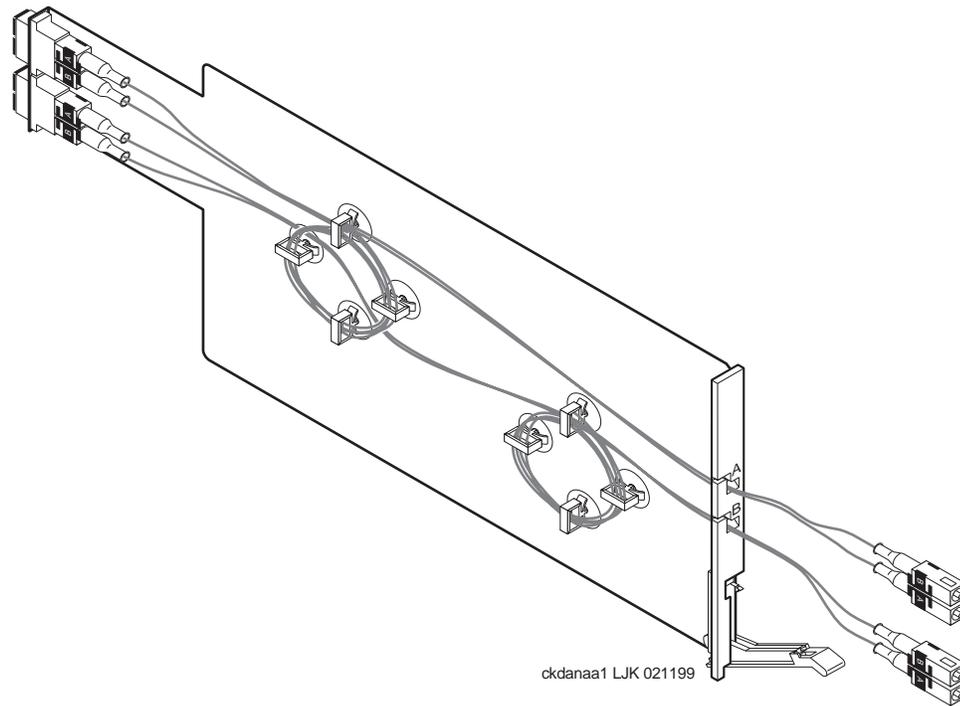
8. Route the cable(s) to the TN2305X/TN2306X circuit pack(s) and connect them.

Note:

The loop formed by the cable connecting the two circuit packs must have a minimum radius of 1 in. (2.54 cm). If not, adjust the cable or move the circuit pack(s) to another location.

9. Connect the other equipment into the connector(s) at the rear of the NAA1 circuit pack.

Figure 7: NAA1 Circuit Pack with Cables Attached



Chapter 3: Installing ATM-PNC

This chapter describes the procedures for installing ATM-PNC. The process includes

- [Installing Equipment](#)
- [Installing and Testing Network Synchronization](#)
- [Setting Up ATM Network Duplication](#)

Installing Equipment

If the ATM switch and interface circuit packs are already installed, then the actual upgrade to ATM-PNC is done administratively in [Chapter 5: Administering ATM-PNC and ATM-CES](#).

To prepare for a new ATM installation refer to the following:

- *Installing and Configuring an Avaya S8700 Series Media Server, 03-300145*
- *Installing the Avaya G650 Media Gateway, 03-300144*
- ATM configurations ([Figure 3: S8700-series ATM single control network](#) on page 25 through [Figure 5: S8700-series ATM duplicated control and duplicated voice-bearer networks](#) on page 29) and the synchronization sources (DS1, E1, or ATM network).

Slot restrictions for an ATM interface circuit packs are similar to expansion interface circuit packs. In an MCC1 expansion control carrier or an SCC1 expansion control cabinet in the carrier A position, ATM interface circuit packs used for ATM-PNC can occupy slot 1 (labeled EXPN INTFC). In a G650 Media Gateway in the carrier A position, the ATM interface circuit pack may occupy any slot except slot 1.

For bearer duplication with MCC1 and SCC1 Media Gateways, the second ATM circuit pack is inserted into slot 2 in a port carrier in the B position. With a G650 Media Gateway in the B position in a stack, the ATM circuit pack may be inserted in any slot.

Follow the steps in [Table 12](#) to ensure that

- the applicable equipment is installed correctly.
- the customer's configuration is properly recorded (use worksheet in [Appendix A: Baselineing the Customer's Configuration](#)).

Table 12: General installation process

✓	Step	Action	Description
	1.	Install Avaya server and media gateways/PNs	Refer to the appropriate installation book. See Server configurations on page 24 for connection schematics.
	2.	Install ATM switch(es) or access concentrators	Refer to your ATM switch's quick reference guide. To get a copy of the quick reference guide, go to the Avaya web site (http://www.avaya.com), click on Support, and then find the page for your Avaya ATM solution.
	3.	Check the distances from the ATM switch to the DS1 timing source	Use the information in Table 15: Maximum cable lengths on page 53 to determine the maximum cable run lengths for the configuration for more information.
	4.	Install ATM interface circuit pack	Insert the TN2305/TN2306 circuit pack(s) into the appropriate slot(s).
	5.	Route the fiber optic cables between the ATM switch and the PNs.	<p>Follow the fiber pass-through procedure in the appropriate installation book.</p> <p style="text-align: center;"> WARNING:</p> <p>Be sure that the fiber optic cable is secured so that the door of the Avaya server does not pinch or bend the cable.</p>
	6.	Connect the fiber optic cables	<p>Connect the fiber optic cables to the ATM switch.</p> <p>Note: If the installation uses the customer's existing fiber, you may need an ST-to-SC adapter (1 included in Fiber Pass-Through Kit).</p>

Table 12: General installation process (continued)

✓	Step	Action	Description
	7.	Connect the fiber optic cables to the ATM interface circuit packs	<p>Connect fiber optic cable to the SC connector on the faceplate of each TN2305/TN2306 circuit pack in the Avaya PN.</p> <ul style="list-style-type: none"> • The TN2305/TN2306 circuit pack interface requires SC connectors (see Note in Step 5). • Do not reuse existing fiber cabling with ST connectors at both the Avaya PN and the ATM switch. This requires an ST-to-SC adapter at both ends. It is better to order the cable with the SC connectors at both ends.
	8.	Record configuration	<p>Record Avaya PN-to-ATM port (port locations for each ATM circuit pack) in Table 55 (in Appendix A: Baselineing the Customer's Configuration).</p> <p>Note: Read the MAC addresses from the ATM switch (refer to your ATM switch's quick reference guide) and record them in Table 55.</p>
	9.	Record fiber connections	<p>Record the fiber optic cable runs on the lightwave interface (LIU) diagram (Figure 74) in Appendix A: Baselineing the Customer's Configuration.</p>
	10.	Install and test synchronization splitter, if required.	<p>Follow the procedures for installing and testing the synchronization splitter and the T1 or E1 timing source in Installing and Testing Network Synchronization on page 45.</p>

2 of 2

Installing and Testing Network Synchronization

ATM-PNC requires network synchronization for DS1 circuit packs not to slip relative to the LEC/IXC switches. The ATM switch serves as the sync reference source for the Avaya server. The ATM switch, in turn, derives primary and secondary sync. To accomplish this, the most common option is to use synchronization expanders (splitters).

Connections without synchronization splitters

In some configurations the ATM switches are traced to network clocks through their SONET/SDH interfaces, not requiring any synchronization splitters. However, the ATM switch could require a single splitter if only one of the sync sources is derived from the network.

The ATM switches may obtain their network synchronization as follows:

- The ATM switch gets its network timing reference from its SONET/SDH/SDIT interface to that network.
- Or if the customer wants to use a DS1 source for network synchronization that also happens to be an Avaya server switch trunk, then one sync splitter is necessary to send a copy of that DS1 signal to the ATM switch. The DS1 circuit pack is only an indirect timing reference for the Avaya server.

Connections needing synchronization splitters

If the ATM network does not provide a synchronization expander (splitter), then the ATM configurations may require one that takes a DS1 T1 or E1 signal and redirects it to the

- ATM switch(es), depending on configuration and duplication
- Avaya server through the DS1 circuit pack

This creates a single synchronization source.

Check the customer's configuration carefully so that you can

- Connect the hardware correctly during installation
- Properly administer the synchronization plan later ([Chapter 5: Administering ATM-PNC and ATM-CES](#))

This section covers the synchronization installation and test process.

- [Splitter descriptions](#)—Describes the splitter's inputs and outputs
- [Synchronization splitter connections](#)—Connection diagrams for timing connections ([Figure 12: Synchronization connections directly to timing source \(401A/402A/403A\)](#) on page 52)
- [Verify the DS1 service](#)—Checks for presence of the DS1 T1 or E1 timing source and the general health of the DS1 circuit pack.
- [Installing and testing the splitter](#) provides the following information
 - [Splitter port tests \(401A/402A only\)](#)
 - [Installing 401A, 402A, or 403A splitters](#)

Installing and testing the synchronization splitter involves interrupting the DS1 signal provided by the service provider. Even though the DS1 circuit pack should be down less than 5 minutes, before removing a working T1/E1 span, contact the service provider. Failure to notify the T1/E1 service provider may result in:

- *The service provider looping the T1/E1 span back to the subscriber.*
- *A span alarm being detected at the central office and the span being taken out of service, sending an AIS (blue Alarm) to the Avaya server. The synchronization signal is necessary for testing equipment and connections.*

Splitter descriptions

[Table 13](#) describes the 4 splitter models and their capabilities. The drawings show the splitters and their connection points. [Figure 11: Jumper settings \(401A/402A/403A\)](#) on page 51 shows a schematic of the 2 jumper sets and their connections for 401A, 402A, and 403A sync splitters.

Table 13: Synchronization splitter models and attributes

Table 14:

Model	T1/ E1	Impedan ce	Comcode	Drawing	Description/ Application
401A	T1	100 Ω	108508078	Figure 8	Limited ICSU capability
402A	E1	120 Ω	108508094	Figure 9	
403A	E1	75 Ω	108508102	Figure 10	

Figure 8: 401A synchronization splitter

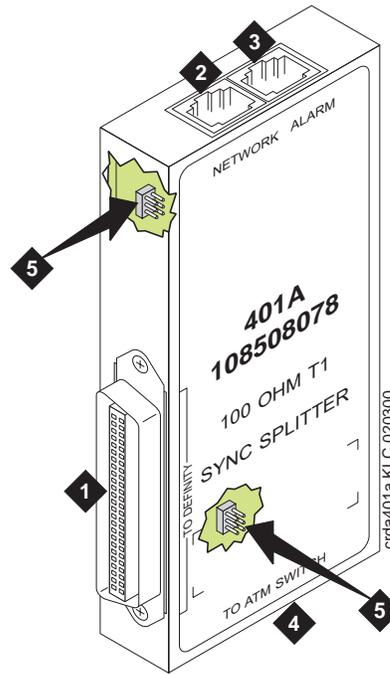


Figure notes:

1. Amphenol connector to DS1 circuit pack in IPSI-connected PN
2. Network timing connection
3. Timing alarm lead connection
4. Timing output ports (RJ45) to ATM switch¹
5. Jumpers and capacitors (inside case). See [Figure 11: Jumper settings \(401A/402A/403A\)](#) on page 51 for settings.

1. Ports J1 and J2 provide identical DS1 timing source signals to the ATM switches. The ATM switch can use two separate DS1 timing signals (one at a time from two separate spans).

Figure 9: 402A synchronization splitter

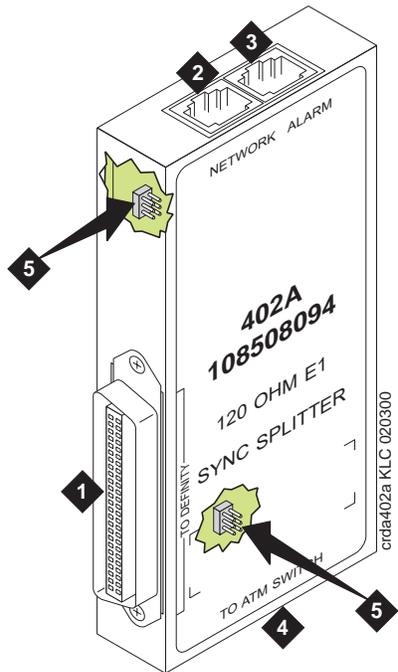


Figure notes:

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Amphenol connector to DS1 circuit pack in IPSI-connected PN 2. Network timing connection | <ol style="list-style-type: none"> 3. Timing alarm lead connection 4. Timing output ports (RJ45) to ATM switch¹ 5. Jumpers and capacitors (inside case). See Figure 11: Jumper settings (401A/402A/403A) on page 51 for settings. |
|--|---|
1. Ports J1 and J2 provide identical DS1 timing source signals to the ATM switches. The ATM switch can use two separate DS1 timing signals (one at a time from two separate spans).

Figure 10: 403A synchronization splitter

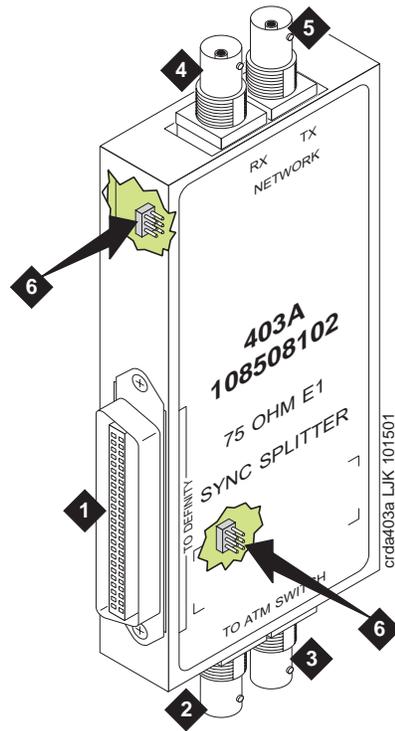


Figure notes:

1. Amphenol connector to DS1 circuit pack in IPSI-connected PN
2. Synchronization source (timing output ports) to ATM switch¹
3. Synchronization source (timing output ports) to ATM switch¹
4. Network receive connection, BNC connector
5. Network transmit connection, BNC connector
6. Jumpers and capacitors (inside case). See [Figure 11: Jumper settings \(401A/402A/403A\)](#) on page 51 for settings.

1. These are identical DS1 timing source signals to the ATM switches. The ATM switch can use two separate DS1 timing signals (one at a time from two separate spans).

Figure 11: Jumper settings (401A/402A/403A)

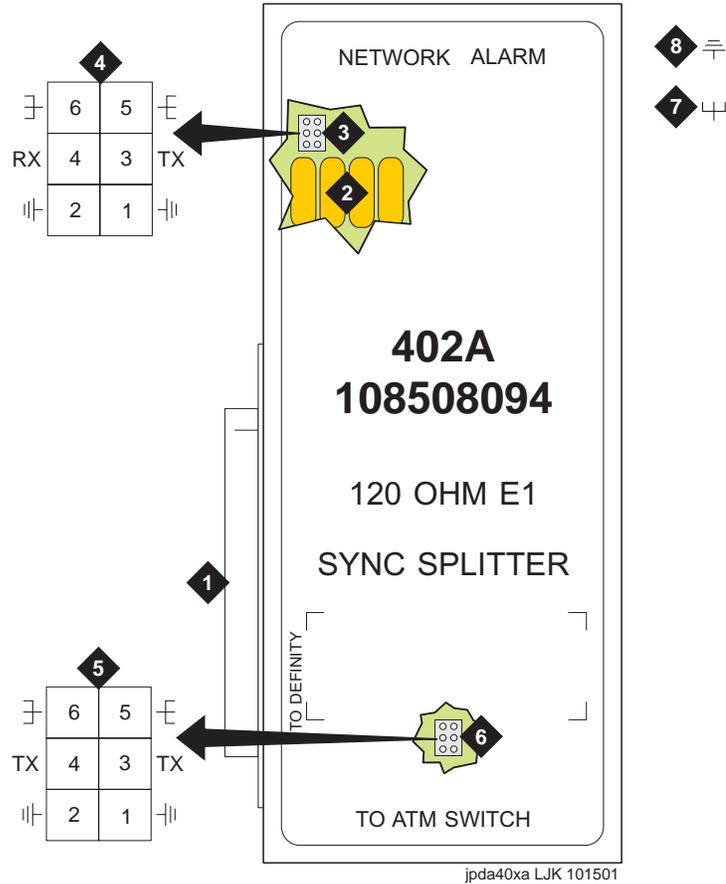


Figure notes:

1. Amphenol connection to DS1 circuit pack in IPSI-connected PN
2. Row of capacitors
3. Jumpers for incoming network connections
4. Incoming network transmit and receive connections
5. Jumper 1-2 = true ground
Jumper 5-6 = shield grounded
Jumper 3 = TX cable ground
Jumper 4 = RX cable ground
Default connections = 1-2, 3-5
6. True ground
7. Cable shield grounded
8. Jumper 1-2 = true ground
Jumper 5-6 = shield grounded
Jumper 3 = ATM switch A TX cable ground
Jumper 4 = ATM switch B TX cable ground
Default connections = 3-5, 4-6
9. Output jumpers
10. Timing output to ATM switch A
11. Timing output to ATM switch B

Synchronization splitter connections

The splitter connects to a timing source. [Figure 12: Synchronization connections directly to timing source \(401A/402A/403A\)](#) on page 52 shows the synchronization connections directly to the timing source (401A, 402A, 403A).

Figure 12: Synchronization connections directly to timing source (401A/402A/403A)

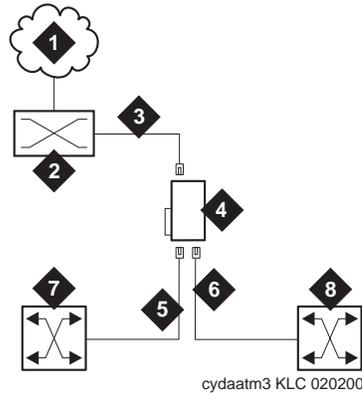


Figure notes:

- | | |
|--|---|
| 1. Public switched telephone network (PSTN) | 5. H600-383 quad cable from sync splitter to ATM switch A |
| 2. Main distribution frame (MDF) or smart jack | 6. H600-383 quad cable from sync splitter to duplicated ATM switch B (critical reliability/ATM network duplication) |
| 3. H600-383 quad cable | 7. Avaya ATM switch A |
| 4. 401A T1 (100 Ω) splitter, 402A E1 (120 Ω) splitter, or 403A E1 (75 Ω) splitter connected to DS1 circuit pack in IPSI-connected PN | 8. Avaya ATM switch B (critical reliability/ATM network duplication) |
-

Use the information in [Table 15](#) to determine the maximum cable run lengths for the configuration.

Table 15: Maximum cable lengths

Splitter	Used in	Cable	Maximum distance from splitter to ATM switch
401A T1 100 Ω	North America (USA and Canada)	H600-383 ¹ shielded twisted pair	1310 feet ² 393 meters
402A E1 120 Ω	See Table 16: Country-specific splitter applications on page 53	120-Ω shielded twisted pair	1000 feet ¹ 305 meters
403A E1 75 Ω	See Table 16: Country-specific splitter applications on page 53	75-Ω coaxial	1000 feet ² 305 meters

1. The loss allowed in the cable is 6 dB. Typical cables have losses of 0.6 dB/100 ft; hence, 1000 feet may be considered a typical distance. Distance varies if cables with different losses are used.

[Table 16](#) lists the splitter model(s) applicable to specific countries.

Table 16: Country-specific splitter applications

Country	Splitter model		
	401A T1 100 Ω	402A E1 120 Ω	403A E1 75 Ω
Argentina			Y
Australia		Y	
Austria		Y	Y
Bahrain		Y	Y
Belgium		Y	Y

1 of 3

Table 16: Country-specific splitter applications (continued)

Country	Splitter model		
	401A T1 100 Ω	402A E1 120 Ω	403A E1 75 Ω
Brazil			Y
Canada	Y		
China			Y
Columbia			Y
Denmark		Y	Y
Egypt		Y	Y
Finland		Y	Y
France		Y	Y
Germany		Y	Y
Hong Kong		Y	
India		Y	Y
Indonesia		Y	Y
Ireland		Y	Y
Italy		Y	Y
Japan ¹			
Korea		Y	Y
Luxembourg		Y	Y
Malaysia		Y	Y
Mexico			Y
Netherlands		Y	Y
New Zealand		Y	Y
Norway		Y	Y
Philippines		Y	Y

2 of 3

Table 16: Country-specific splitter applications (continued)

Country	Splitter model		
	401A T1 100 Ω	402A E1 120 Ω	403A E1 75 Ω
Poland		Y	Y
Portugal		Y	Y
Russia		Y	Y
Saudi Arabia		Y	Y
Singapore		Y	
South Africa		Y	Y
Spain		Y	Y
Sri Lanka		Y	Y
Sweden		Y	Y
Switzerland		Y	Y
Taiwan		Y	Y
Ukraine		Y	Y
UAE		Y	Y
UK		Y	Y
USA	Y		
Uzbekistan		Y	Y
Vietnam		Y	Y

3 of 3

1. Japan uses both 75- Ω and 120- Ω T1; 402A and 403A sync splitters will also work with T1s.

Verify the DS1 service

To verify the DS1 service, use the procedure in [Table 17](#). Have the ATM switch installer verify the synchronization source.

Table 17: T1 or E1 service verification procedure

✓	Step	Action	Command	Description
	1.	Check timing signal		Check that the GREEN STATUS 3 LED on the designated DS1 circuit pack is on steady.
	2.	Test the DS1 circuit pack	test board <i>UUCSS</i>	Test the designated DS1 board. If any one of Test 138 through 145 fails, follow the repair procedures listed in <i>Maintenance Alarms for Avaya Communication Manager 3.0, Media Gateways and Servers</i> , 03-300430.
	3.	Run error report	list measurements ds1 <i>UUCSS</i> summary	Verify that the report is free of errors. See Table 18: Interpretation of the list measurements report on page 57 to help interpret the report.
	4.	Identify active synchronization source	status synchronization	Verify that the designated DS1 circuit pack is the <i>active</i> sync source. Note: The DS1 circuit pack is not the sync source; it simply shows where the sync splitter is connected.

Table 18: Interpretation of the list measurements report

Displayed Field	Function	Indication
Test: cpe-loopback -jack	3-in-24 stress test pattern	The loopback jack test is active
Synchronized	= Y = N	<p>The DS1 circuit pack is synchronized to the looped 3-in-24 pattern and is counting the bit errors detected in the pattern until the test is ended.</p> <p>Retry the test:</p> <ol style="list-style-type: none"> 1. Stop the test (test ds1-loop UUCSS end cpe-loopback-jack-test). 2. Restart the test (test ds1-loop UUCSS cpe-loopback-jack-test-begin) 3. Repeat Steps 1 and 2 a maximum of 5 times, as necessary. <p>If the circuit pack never synchronizes, it is possibly due to intermittent connections or a broken wire in a receive or transmit wire pair.</p>
Bit Error Count	Cumulative detected errors	<p>0 indicates that there are no wiring problems. A count that sits at 65535 or continues to increment by several hundred to several thousand errors with each subsequent list measurements command indicates</p> <ul style="list-style-type: none"> ● Intermittent or corroded connections ● Severe crosstalk ● Impedance imbalances between the two conductors of the receive or the transmit pairs. <ol style="list-style-type: none"> 4. Replace wiring, if necessary. 5. Note whether the Extended Super Frame (ESF) error and performance counters summaries (errored seconds, bursty errored seconds, and so forth) also increment. Although these counters are not used with the loopback jack test, they do increment as errors occur.

Installing and testing the splitter

The splitter must be installed and tested before the upgrade and cutover. The purpose of testing the splitter is to

- Prove that there is enough signal level for the cable length to the ATM switch within the standard 6 dB allowable loss for 401A, 402A, and 403A (see [Table 15: Maximum cable lengths on page 53](#))
- Ensure that the DS1 circuit pack functions properly while receiving the DS1 signal level output from the splitter (Ports J1 and J2 unterminated).

[Table 19](#) shows the configurations of the test cable and ports on the sync splitter.

Table 19: Cable and port configurations for splitter tests

To test	Description
Port J1	Insert an opening plug into port J2
Port J2	Insert an opening plug into port J1
Maximum output of the splitter to the DS1 circuit pack	Insert an opening plug into both ports J1 and J2

Splitter port tests (401A/402A only)

Note:

The standard RJ45-to-Bantam test cable does not work with the 403A.

To test the **splitter** ports J1 or J2, use the procedures in [Table 20](#), using the RJ45 to Bantam Test cable from the 1541CC cable kit.

Table 20: Testing the splitter ports

✓	Step	Action	Command	Description
	1.	Terminate one or more ports		Plug the RJ45 (modular) end of the DS1 test cable into the jack (J1 or J2) you wish to test on the splitter.
	2.	Connect to DS1 circuit pack		Plug the Bantam Plug end (plug with the black band) of the DS1 test cable into the Equipment-In (EI) jack on the DS1 circuit pack faceplate.

1 of 2

Table 20: Testing the splitter ports (continued)

✓	Step	Action	Command	Description
	3.	Test DS1 circuit pack	test board <i>UUCSS</i>	Wait 30 seconds, then test the circuit pack. If any tests fail, wait 5 minutes and test the DS1 circuit pack again.
	4.	Replace splitter if necessary		If any test still fails, replace the splitter and retest.
	5.	Escalate if necessary		If the test still fails, escalate to Tier 3 Support .

2 of 2

Installing 401A, 402A, or 403A splitters

To install a 401A, 402A, or 403A sync splitter between the network and a DS1 circuit pack, follow the procedures listed in [Table 21](#).

Table 21: Splitter installation to DS1 (401A/402A/403A)

✓	Step	Action	Command	Description
	1.	Disable synchronization switch	disable synchronizat ion-switch	Prevent the system from switching synchronization sources.
	2.	Busyout DS1 circuit pack	busyout board <i>UUCSS</i>	Busyout the designated DS1 circuit pack.
	3.	Administer sync splitter	change DS1 <i>UUCSS</i>	Administer the sync splitter. For T1, set the <code>Near-end CSU Type:</code> field to integrated (see Figure 13: DS1 circuit pack—T1 on page 62). For E1, set the <code>E1 Sync-Splitter?</code> field to y (see Figure 14: DS1 circuit pack—E1 on page 62).
	4.	Remove cable from DS1 circuit pack		Remove the cable from the amphenol connector located on rear of the DS1 circuit pack.
	5.	Attach the splitter		Plug the splitter into the same connector just vacated by the cable.

1 of 3

Table 21: Splitter installation to DS1 (401A/402A/403A) (continued)

✓	Step	Action	Command	Description
	6.	Reconnect the cable		Plug the cable into the connector on the splitter.
	7.	Secure the splitter		Secure the splitter to the carrier using the large mounting strap removed from a fiber transceiver.
	8.	Check connection		Check that the Amphenol connection is secure.
	9.	Reseat DS1 circuit pack		Release the clip holding the DS1 circuit pack, pull out slightly, close clip.
	10.	Release DS1 circuit pack	release board <i>UUCSS</i>	Restore the designated DS1 circuit pack to service.
	11.	Test the splitter		<p>Use the procedure in Splitter port tests (401A/402A only) on page 58.</p> <ul style="list-style-type: none"> Before testing the splitter, insert a modular RJ45 plug into jack J1 and jack J2 (401A/402A only). <p>Note: Do not connect port J1 to port J2. Leave the other end of both cords free, because the modular RJ45 plug acts as an opening plug and removes the 100-Ω termination from J1 and J2 ports.</p> <p>The standard RJ45-to-Bantam test cable does not work with the 403A. You need a coax-to-Bantam cable or an adapter for the RJ45 connector.</p> <ul style="list-style-type: none"> After testing is complete, remove the opening plugs from J1 and J2.

Table 21: Splitter installation to DS1 (401A/402A/403A) (continued)

✓	Step	Action	Command	Description
	12.	Check the 7 DS1 LEDs		<p>After about 20 s, all the alarm LEDs on the DS1 go out and the status 3 LED is steady green.</p> <p>If this is the case, continue. If not, follow the DS1 span test procedures in the <i>Maintenance Alarms for Avaya Communication Manager 3.0, Media Gateways and Servers</i>, 03-300430.</p>
	13.	Test the circuit pack	test board UUCSS	<p>Verify that the DS1 circuit pack passes Tests 138 through 146 and 1227. If these tests pass and this is a new installation, continue.</p> <p>If any one of Test 138 through 146 fails, follow the repair procedures in <i>Maintenance Alarms for Avaya Communication Manager 3.0, Media Gateways and Servers</i>, 03-300430.</p> <p>After clearing all errors, retest the circuit pack.</p>
	14.	Run error report	list measurements ds1 summary UUCSS	<p>Wait 15 minutes. Check the error report and verify that the DS1 circuit pack is free of any</p> <p>To interpret the periodic list measurements report, refer to</p>

3 of 3

Figure 13: DS1 circuit pack—T1

```
add ds1 b10                                     Page 1 of 2
                                         DS1 CIRCUIT PACK
                                         Location: 01B10
                                         Bit Rate: 1.544
                                         Signaling Mode: isdn-pri
                                         Connect: line-side
                                         Name: xxxxxxxxxxxxxxxxxxxx
                                         Line Coding: b8zs
                                         Country Protocol: 1
                                         Protocol Version: a
                                         Interface Companding: mulaw
                                         Idle Code: 11111111
                                         DCP/Analog Bearer Capability: 3.1kHz
                                         CRC? n

                                         Slip Detection? n
                                         Near-end CSU Type: integrated
                                         Alarm When PRI

                                         Endpoint Detached? y
```

Figure 14: DS1 circuit pack—E1

```
add ds1 b10                                     Page 1 of 2
                                         DS1 CIRCUIT PACK
                                         Location: 01B10
                                         Bit Rate: 2.048
                                         Signaling Mode: isdn-pri
                                         Connect: line-side
                                         Name: xxxxxxxxxxxxxxxxxxxx
                                         Line Coding: hdb3
                                         Country Protocol: 2
                                         Protocol Version: a
                                         Interface Companding: alaw
                                         Idle Code: 11111111
                                         DCP/Analog Bearer Capability: 3.1kHz
                                         CRC? n

                                         Slip Detection? n
                                         Near-end CSU Type: other
                                         E1 Sync-Splitter? y Alarm When PRI Endpoint Detached? y
```

Setting Up ATM Network Duplication

ATM-PNC configurations can be supported with duplicated PN connectivity to other points on an ATM network, or ATM network duplication. These points can be on separate ATM switches or on the same ATM switch.

With respect to port network connectivity, there is no difference in performance between ATM network duplication and critical reliability. ATM network duplication configurations require

- Duplicate connectivity over ATM to all PNs
- Duplicate ATM interfaces in each PN
- Duplicate Tone-Clock boards in each PN.

An ATM network duplication configuration can be the result of

- A new installation
- An upgrade from a standard reliability system

The PN configuration for ATM network duplication is the same as for an PN equipped for ATM critical reliability ([Figure 15: PN configuration with ATM network duplication](#) on page 64).

Figure 15: PN configuration with ATM network duplication

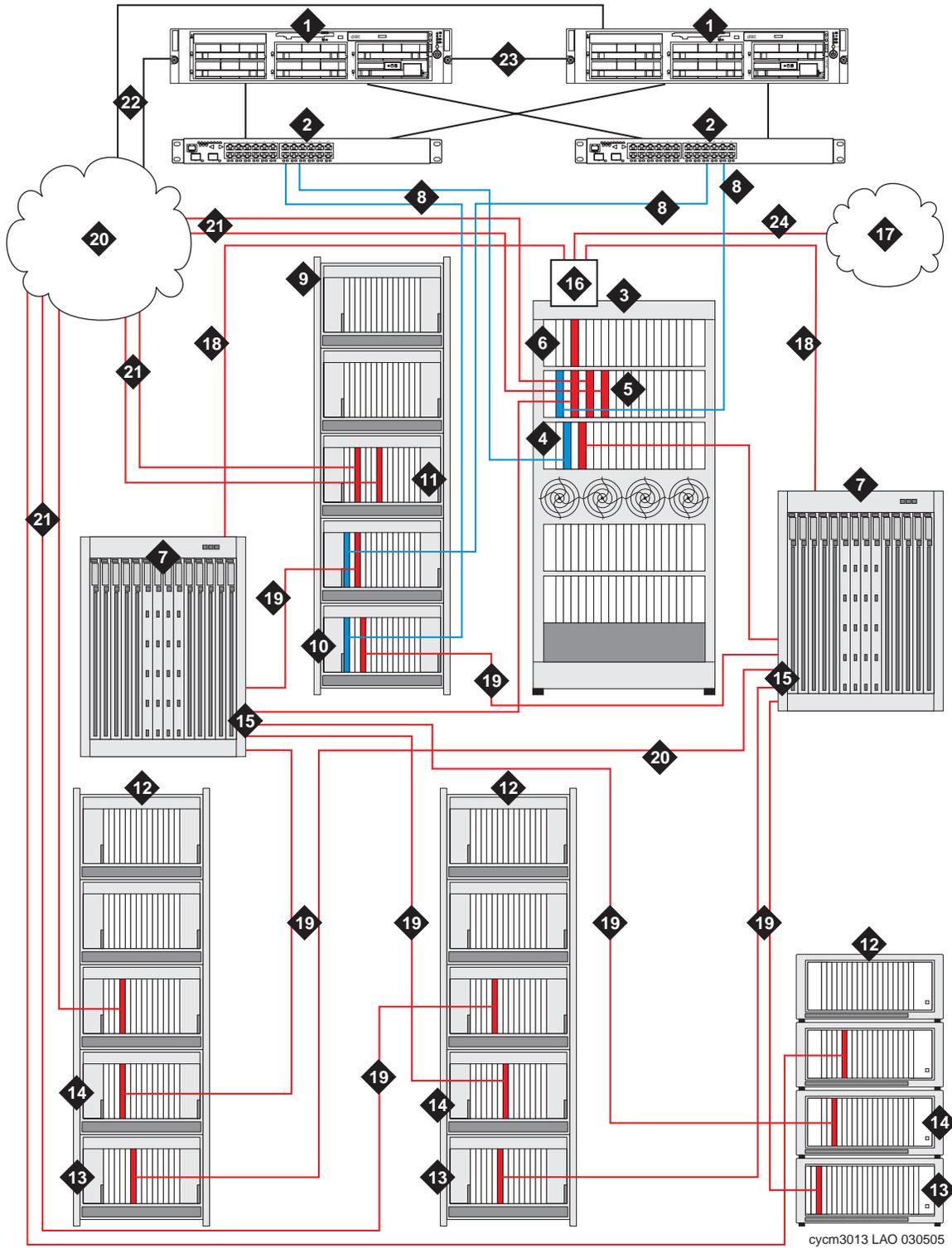


Figure notes: S8700-series ATM duplicated control and duplicated voice-bearer networks

1. S8700/S8710 Media Server
2. Ethernet Switch
3. IPSI-connect PN (G650 Media Gateway stack, MCC1 Media Gateway [shown in figure], or SCC1 Media Gateway stack), consisting of at least two media gateways or carriers.
4. PN control gateway or carrier, in the A position, which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to server.

Note: For the G650 Media Gateway, the BP version of the TN2312 is required in order to provide environmental maintenance.
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
5. Duplicated control carrier or gateway, in the B position, which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to duplicated control network
 - A TN2305B (for multimode fiber) or TN2306B (for single-mode fiber) ATM circuit pack for bearer and control network connections to the duplicated ATM switch.

Note: For the duplicated control and bearer network configurations, each location of a PN or a group of PNs must contain a TN771 Maintenance Test circuit pack.
6. TN464GP DS-1 circuit pack, for clock synchronization with a network resource
7. ATM switch. There are two ATM switches in this configuration.
8. IPSI-to-server control network connection via Ethernet switch
9. IPSI-connected PN (G650 Media Gateway stack [shown in figure], MCC1 Media Gateway, or SCC1 Media Gateway stack, consisting of at least two media gateways or carriers).
10. PN control gateway or carrier, in the A position, which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to server.
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
11. Duplicated control gateway or carrier, in the B position, which contains:
 - A TN2312AP/BP IPSI circuit pack for IP connection to server.
 - A TN2305B or TN2306B ATM circuit pack for bearer and control network connections to the duplicated ATM switch.
12. Fiber-connected PN (G650 Media Gateway stack [shown in figure], MCC1 Media Gateway, SCC1 Media Gateway stack [shown in figure]), consisting of at least two media gateways or carriers.
13. PN control gateway or carrier, in the A position which contains:
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
 - One TN2182 Tone Clock circuit pack if the PN consists of SCC1 or MCC1 Media Gateways. One maintenance-only TN2312BP IPSI circuit pack if the PN consists of G650 Media Gateways.
14. Duplicated control gateway or carrier, in the B position which contains:
 - A TN2305B or T2306B ATM circuit pack for bearer and control network connections to the ATM switch.
 - One TN2182 Tone Clock circuit pack if the PN consists of SCC1 or MCC1 Media Gateways. One maintenance-only TN2312BP IPSI circuit pack if the PN consists of G650 Media Gateways.
15. OC-3 connections to the ATM switch
16. 401A/B sync splitter, attached to the back of the TN464GP DS1 circuit pack
17. Public network (PSTN)

Figure notes: S8700-series ATM duplicated control and duplicated voice-bearer networks (continued)

18. Timing signal to ATM switch from sync splitter.
19. Fiber connections from TN2305B/TN2306B to ATM switch.
20. Customer LAN
21. LAN connections of optional TN2302AP IP Media Interface or TN2602AP IP Media Resource 320 for IP-TDM voice processing, if any, and optional TN799DP C-LAN for control of IP endpoints. These circuit packs are optional for PNs in an ATM-connected network. However, the C-LAN circuit pack is required for downloads of firmware updates.
22. LAN connections of media servers for remote administration
23. Duplicated server links, including the link for translations transfer and the link for control data sharing
24. DS1 connection from sync splitter.

2 of 2

Network duplication administration

The procedure to administer ATM network duplication ([Table 22](#)) assumes that customers with:

- High reliability (duplicated IPSIs) and who desire greater reliability *would* migrate to critical reliability configurations
- Critical reliability configurations *would not* migrate to ATM network duplication

Table 22: Network duplication administration procedure

✓	Step	Action	Command	Description
	1.	Check that feature is turned on	display system-parameters customer-options	Ensure that the PNC Duplication? field on the customer options screen is y (Figure 16: Optional feature—screen 5 on page 68). This field is controlled by the License File.
	2.	Add hardware		<ul style="list-style-type: none"> ● Insert a second TN2305/ TN2306 ATM Interface circuit pack in slot in the B-position port carrier in each PN or D-position carrier in PNs configured for 2 port networks. ● Add a TN2182 tone-clock circuit pack in the slot labeled Tone-Clock. Add it to the A-, B-, D- and E-position carriers in PNs configured for 2 port networks.
	3.	Add ATM B-PNC address	change atm-pnc number	Bring up the ATM PNC screen (<i>number</i> is the connection number assigned to each PNC being administered). Add in the B-PNC ATM address information in the right-hand column of the screen (Figure 17: ATM PNC on page 68).
	4.	Enable duplication	change system-parameters duplication	Change the Enable Operation of PNC Duplication? field on the Duplication-Related System Parameters screen to y (Figure 18: Duplication-related system parameters on page 69). Note: The Enable Operation of Spe Duplication? field must remain n .

Figure 16: Optional feature—screen 5

```
display system-parameters customer-options                                page 5 of x

                                OPTIONAL FEATURES

Multinational Locations?                               Station and Trunk MSP? n
Multiple Level Precedence and Preemption?              Station as Virtual Extension? n
Multiple Locations?                                     System Management Data Transfer? n

Personal Station Access (PSA)? y                       Tenant Partitioning? n
Posted Messages? n                                     Terminal Trans. Init. (TTI)? y
PNC Duplication? y                                    Time of Day Routing? y
Port Network Support? y                                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? y
Restrict Call Forward Off Net? y                       Wireless? n
Secondary Data Module? y
```

Figure 17: ATM PNC

```
                                ATM PNC

                                Connection Number: 12

                                A - PNC                                B - PNC

Location: 02A01                                         Location: 02B02
Name: 123456789012345                                  Name: 123456789012345

Address Format: E.164 ATM Private  Address Format: E.164 ATM Private

AFI: 45                                                 AFI: 45
E.164: 1234567890123456                                E.164: 1234567890123456
HO-DSP: 12345678                                       HO-DSP: 12345678
ESI: 123456789012                                       ESI: 123456789012

SEL: 12                                                 SEL: 13
```

Figure 18: Duplication-related system parameters

```
Page 1 of 1

DUPLICATION-RELATED SYSTEM PARAMETERS

Enable Operation of IPSI Duplication? y
Enable Operation of PNC Duplication? y
```

Changing circuit packs on the standby PNC

To partially or completely exchange circuit packs on an ATM network duplication switch without service interruption, follow this procedure:

1. **Type busyout pnc-standby** and press **Enter**
2. **Type busyout board UUCSS** and press **Enter**
3. Replace circuit packs on the standby PNC
4. **Type release board UUCSS** and press **Enter**
5. **Type release pnc-standby** and press **Enter**
6. **Type reset pnc interchange** and press **Enter**
7. Repeat steps 1-5 on the other side
8. **Type save translation** and press **Enter**

Chapter 4: Upgrading to ATM-PNC

This chapter describes the procedures for upgrading a server with a center stage switch (CSS) to Avaya Communication Manager using ATM-PNC.

Preparation

[Table 23](#) lists the items that must be completed and the equipment or materials available before starting the upgrade procedure.

Table 23: Pre-upgrade checklist

✓	Component	Description
	Cabinet	Installed and fiber-prepped (fiber pass-through with ST-to-SC adapters (if necessary)). Because of the terminating connectors, fiber-optic cabling from the CSS configuration is usually not re-usable.
	ATM switch(es)	ATM switch(es) <ul style="list-style-type: none">● Installed● Fiber connected● Modem connections work and phone numbers recorded
	Synchronization	Synchronization splitters in DS1 spans and cables are connected to ATM switch(es). Verify proper synchronization of ATM switches to both primary and secondary sources.
	Required circuit packs	All circuit packs required for the S8700 Media Server are installed and administered in the media gateways.
	License File	The License File must match the serial number(s) of the installed hardware, and the <code>Async.Transfer Mode (ATM) PNC</code> field must be n and underlined (changeable) meaning that the feature is enabled but turned off . See the Customer Options form (Figure 24: Optional features—page 3 on page 81).

1 of 2

Table 23: Pre-upgrade checklist (continued)

✓	Component	Description
	Translations on removable media	Have both the customer's translations on a compact flashcard and a fall-back copy (also on a compact flash card).
	ATM circuit packs	ATM interface circuit packs (TN2305X/TN2306X)
	Design	Customer's configuration (SDSC)
Critical reliability/network duplication only		
	Duplication	2 independent switches or 1 switch with duplicated switch fabrics and controls Independent fiber optic connections between the OC-3/STM-1 ATM interfaces and each duplicated fabric
	Power supply	No single power failure (other than the commercial AC source) able to cause <ul style="list-style-type: none"> ● both pairs of switch fabric and controls to simultaneously fail—no one power failure (excluding AC source) ● all interface circuits to fail simultaneously
	Back up power	Back up option (independent of commercial AC source) installed

Upgrading the Communication Manager server with CSS to ATM-PNC

This procedure includes all reliabilities and assumes that cabinet 1 is the IPSI-connected PN. When using the commands in this table, type the command and then press **Enter**.

Table 24: Upgrading CSS to ATM-PNC

✓ Step	Action	Command	Description	More information	Site-specific comments
1.	Upgrade the S8700-series Media Server		Refer to <i>Upgrading, Migrating, and Converting Media Servers and Gateways</i> , 03-300412, for complete procedures. In this upgrade you must install a new License File with Async.Transfer Mode (ATM) PNC enabled and turned off.		
2.	Check ATM-PNC availability	change system-parameters customer-options	Ensure that the Async.Transfer Mode (ATM) PNC field is n and underlined (changeable) meaning that the feature is enabled but turned off. Try changing this field to y, and you should get an error message indicating that you must remove all switch-node carriers before enabling ATM-PNC. Then cancel the command. If the form already shows y for this field, you should change it to n and do a reset system 2, as the License File is incorrect.	Figure 24: Optional features—page 3 on page 81	
3.	Disable scheduled maintenance	change system-parameters maintenance	Ensure that Scheduled Maintenance is disabled by entering a start time that begins after the upgrade will be completed.	Figure 19: Maintenance-related system parameters on page 78	
4.	Suppress alarms	almsuppress -t time (at the Linux command line)	Telnet to the Linux command line.		
5.	Backup all data		Use the Maintenance Web pages to back up data to either a flashcard or to a LAN backup server.		
6.	Check health	status pnc	Ensure proper switch functions. Resolve any alarms before proceeding.	Figure 20: Port network connectivity on page 79	
7.	Check synchronization source	status synchronization	Is the synchronization source healthy? If synchronization source is in an PN, move it to an IPSI-connected PN or remove this PN last.		
8.	Disable synchronization switching	disable synchronization-switch	Disable switching to secondary synchronization source.		

1 of 6

Upgrading to ATM-PNC

Table 24: Upgrading CSS to ATM-PNC (continued)

✓ Step	Action	Command	Description	More information	Site-specific comments
9.	Change synchronization source	change synchronization	Remove all DS1 timing references.	Figure 23: Synchronization plan on page 80	
10.	Determine active PNC	status pnc	Ensure that the A-PNC is active. If necessary use the reset pnc-interchange command to make the A-PNC active.		
11.	Busyout B-PNC (standby)	busyout pnc-standby	Busyout the standby (B) PNC before removing any physical connections.		
12.	Disable PNC duplication	change system-parameters duplication	Change the Enable Operation of PNC Duplication field to n.		
13.	List fiber links	list fiber-link	Displays numbered list of administered fiber links		
14.	Busyout fiber	busyout fiber-link <number>	<p>Busyout each fiber link associated with the center stage switch. Start with fiber associated with the last translated switch node (SN) and end with the PN fiber., if any, in the PN containing the center stage switch.</p> <p>Note: Service outage begins at this time.</p>		
15.	Remove fiber links	remove fiber-link <number>	<p>Remove the fiber link administration associated with the center stage switch.</p> <p>CAUTION:  Failure to remove fiber link administration before removing hardware causes unnecessary INADS alarms and errors that may be difficult to clear.</p>		
16.	List cabinets	list cabinet	Displays numbered list of administered cabinets		
17.	Remove circuit pack administration	change circuit-packs	Remove administration (blank out fields) for all EI, SNI, SNC, and DS1-CONV circuit packs in the center stage carriers.		
18.	Remove switch node and duplicate switch node administration	change cabinet <number>	Remove switch node and duplicate switch node carrier administration from all applicable cabinets/carriers (select not-used for the appropriate fields).	Figure 21: Cabinet on page 79	
19.	Save translations	save translation removable-media	Interim translation capture for potential fall-back		
20.	Power down all center stage carriers		Power down the center stage carrier by removing the plug(s) from the power unit at the edge.		

Table 24: Upgrading CSS to ATM-PNC (continued)

✓ Step	Action	Command	Description	More information	Site-specific comments
21.	Remove all CSS-related hardware		<p>Physically remove all EI, SNI, SNC, and DS1-CONV circuit packs (and metal cabling on back of cabinet) associated with the center stage switch.</p> <p>Note: On the back of the cabinets you must also remove the fiber-optic interfaces (“warts”) corresponding to the TN570 (Expansion Interface) circuit packs. If these interfaces remain connected to the new ATM interface circuit packs, ATM-PNC will not operate properly.</p> <p> DANGER: The metal hood on metallic cable connectors may be hot.</p>		
22.	Swap-out carrier(s)		<p>Physically replace the center stage carrier (1D) with a port carrier, which will house the new ATM-EI circuit pack.</p> <ul style="list-style-type: none"> ● Remove ribbon cables and bus terminators. ● Replace any vacant carriers with blank covers to ensure proper ventilation. <p>Note: All other former-SNI carriers (for example 1E, 2D, 2E, 3D, 3E, and so on) can either remain vacant or be replaced by port carriers.</p>		
23.	Enable ATM-PNC	change system-parameters customer-options	Change the Async.Transfer Mode (ATM) PNC field to y on the Customer Options form (Figure 19: Maintenance-related system parameters on page 78).		
24.	Effect ATM-PNC change	Either: <ul style="list-style-type: none"> ● log off and log back on ● newterm 	This effects the ATM-PNC change to the customer options.		
25.	Re-administer carriers	change cabinet <number>	Administer the new port carriers as port.		

Upgrading to ATM-PNC

Table 24: Upgrading CSS to ATM-PNC (continued)

✓ Step	Action	Command	Description	More information	Site-specific comments
26.	Insert ATM interface circuit packs		Insert TN2305X/TN2306X circuit packs into the new port carrier (1D) and in port carriers from which you have removed Expansion Interface (TN570) circuit packs. If the customer elected not to install a 1E port carrier, you will also need to install an ATM-EI circuit pack in carrier 1C. If there is not an available slot in 1C, you might need to move another 1C circuit pack to 1D to make room for the ATM-EI circuit pack.		
27.	Connect fiber-optic cabling		Physically connect fiber-optic cabling between the ATM circuit pack(s) and the ATM switch(es).		Y
28.	Power up carrier(s)		Power up the carrier(s) by replacing the plugs on the power supplies. Wait approximately 2 minutes for each ATM circuit pack to boot. If the fiber-optic cabling is properly connected and the MAC address button is firmly in place, all LEDs on the circuit pack should be dark. This indicates that the circuit pack has <ul style="list-style-type: none"> ● SONET framing with the ATM switch. ● completed ILMI registration and detected no errors. 		
29.	Administer ATM circuit packs	change circuit-packs	Add the TN2305X/TN2306X circuit pack administration to each new port network.		
30.	Administer ATM-PNC	add atm pnc n (n = the PN number for consistency)	Administer the following fields: Name: ATM switch port information. Location: UCCSS location ESI: MAC address from ATM switch E.164, HO-DSP, and SEL from ATM switch (refer to worksheets). Note: If the site does not use E.164, you will probably administer the ICD or DCC instead. Note: The administered address of ATM ports and the MAC address for the ATM circuit packs in PN cabinets must match exactly. Double check this administration before proceeding.		Record the ESI (MAC) address(es) of TN2305X/TN2306X circuit pack(s).
31.	Enable PNC duplication	change system-parameters duplication	Change the Enable Operation of PNC Duplication field to y.		
32.	Check links	list system-link	Ensure that the links are up. This can take several minutes.		

Table 24: Upgrading CSS to ATM-PNC (continued)

✓ Step	Action	Command	Description	More information	Site-specific comments
33.	Check health	status pnc	Is State of Health field functional for both PNCs? Resolve any alarms.	Figure 20: Port network connectivity on page 79	
34.	Change synchronization source	change synchronization atm	<p>Administer these fields:</p> <ul style="list-style-type: none"> ● Stratum - enter the Stratum clock number ● Primary - UCCSS address of the primary synchronization source ● Secondary - UCCSS address of the secondary synchronization source <p>Note: The primary and secondary addresses are for reference only. They do not affect the system behavior, but indicate the location of the synchronization splitters.</p>		
35.	Place test calls		<p>Make a few A-PNC inter-port network calls using every port network. Verify two-way talk paths for each call.</p> <p>Note: Having the links come up (Step 32) does not ensure that administration and addressing is correct; only test calls can verify proper administration.</p>		
36.	Perform PNC interchange (Critical reliability only)	reset pnc-interchange	Switches call processing to the B-PNC.		
37.	Place test calls (Critical reliability only)		<p>Make a few B-PNC inter-port network calls using every port network. Verify two-way talk paths for each call.</p> <p>Note: Having the links come up (Step 32) does not ensure that the server administration and addressing is correct; only test calls can verify proper administration.</p>		
38.	Perform PNC interchange (Critical reliability only)	reset pnc-interchange	<p>Switches call processing back to the A-PNC.</p> <p>Note: This step assumes that the A-PNC will be the active side for normal operation.</p>		

Upgrading to ATM-PNC

Table 24: Upgrading CSS to ATM-PNC (continued)

✓ Step	Action	Command	Description	More information	Site-specific comments
39.	Enable synchronization switching	enable synchronization-switch	Enable switching to secondary synchronization source.		
40.	Reinstate alarm origination and scheduled maintenance	change system-parameters maintenance	Ensure that the Scheduled Maintenance is enabled by entering the original start time prior to the upgrade.	Figure 19: Maintenance-related system parameters on page 78	
41.	Enable alarms	almsuppress -n (at the Linux command line)	Telnet to the Linux command line.		
42.	Save translations	save translation	Copy translations to the system disk (about 2 minutes).		
43.	Back up files	Backup Now (from Maintenance Web pages)	Back up translations to the compact flashcard or a backup Web site..		

6 of 6

Administration screens

Figure 19: Maintenance-related system parameters

```
change system-parameters maintenance                               Page 1 of 2
                                MAINTENANCE-RELATED SYSTEM PARAMETERS
OPERATIONS SUPPORT PARAMETERS
CPE Alarm Activation Level: none

SCHEDULED MAINTENANCE
                                Start Time: 01 : 00
                                Stop Time: 01 : 01
                                Save Translation: no
                                Update LSP and ESS Servers When Saving Translations:
                                Command Time-out <hours>:
                                Control Channel Interchange: daily
                                System Clocks/IPSI Interchange: daily
```

Figure 20: Port network connectivity

```

status pnc

                                PORT NETWORK CONNECTIVITY

                                Duplicated? no
                                Software Locked?
                                Standby Busied?

                                Standby Refreshed?
                                Interchange Disabled?

                                A-PNC                                B-PNC

                                Mode: active                        Mode:
State of Health:                                State of Health:
Inter PN Index:                                Inter PN Index:

Major Alarms: 0                                Major Alarms:
Minor Alarms: 0                                Minor Alarms:
Warning Alarms: 0                              Warning Alarms:

```

Figure 21: Cabinet

```

change cabinet 1                                Page 1 of 1

                                CABINET

CABINET DESCRIPTION
Cabinet: 1
Cabinet Layout: G650-rack-mount-stack
Cabinet Type: processor

Location: 1                                IP Network Region: 1

Rack:____ Room:____ Floor:____ Building:____

CARRIER DESCRIPTION
Carrier      Carrier Type      Number
C            port           PN 01
B            processor      PN 01
A            processor      PN 01
X            Fan
D            dup-sw-node     SN 01
E            switch-node     SN 01

Info: Right-click in a field to see valid entries or help text

```

Figure 22: ATM PNC

```

change atm pnc 1

                                ATM PNC

                                Connection Number: 1

                                A-PNC                                B-PNC

                                Location: 01B02                      Location: 01B02
                                Name:                                Name:

Address Format: ICD ATM                      Address Format: ICD ATM

                                AFI: 47                            AFI: 47
                                ICD: 0005                          ICD: 0005
                                HO-DSP: 80FFE1000000F2071B02      HO-DSP:
80FFE1000000F2071B02
                                ESI: 0000000000000              ESI: 0000000000000
                                SEL: 00                          SEL: 00
    
```

Figure 23: Synchronization plan

```

change synchronization atm                                Page 1 of 6

                                SYNCHRONIZATION PLAN
                                SYNCHRONIZATION SOURCE (circuit pack location)
                                Stratum: 4
                                Primary: ATM-SW              Secondary: ATM-SW
Location   Name           Slip           Location   Name           Slip
02A17 g3rs-1e20          n             03B20 r2v6-0318          n
03D20 r2v6-tg86-isdn    n             03E20 ds1-r2v5-20305    n
01C20 isdn-r2v5-1e13    y             02C20 r2v5-1e10 xxx    n
02D20 ISDN- G3i         n             04A17 ds-1 to s75 v2    n
04B16 N3-isdn-2c19      n             01C19 nod2-g3s-1b15     y
03B17 g3s-isdn-1c16     n             02B20 Spare              n
03D19 wdbnd #1 L2       n             01C17 spare              n
Note: DS1 and BRI TRUNK sources result in stratum 4, type II
synchronization
    
```

Figure 24: Optional features—page 3

change system-parameters customer-options	Page 3 of 10
OPTIONAL FEATURES	
Abbreviated Dialing Enhanced List? y	Audible Message Waiting? y
Access Security Gateway (ASG)? y	Authorization Codes? y
Analog Trunk Incoming Call ID? y	Backup Cluster Automatic Takeover? n
A/D Grp/Sys List Dialing Start at 01? y	CAS Branch? n
Answer Supervision by Call Classifier? y	CAS Main? y
ARS? y	Change COR by FAC? n
ARS/AAR Partitioning? y	Computer Telephony Adjunct Links? y
ARS/AAR Dialing without FAC? n	Cvg of Call Redirected Off-net? n
ASAI Link Core Capabilities? n	DCS (Basic)? y
ASAI Link Plus Capabilities? n	DCS Call Coverage? y
Async. Transfer Mode (ATM) PNC? n	DCS with Rerouting? n
Async. Transfer Mode (ATM) Trunking? y	
ATM WAN Spare Processor? n	Digital Loss Plan Modification? n
ATMS? y	DS1 MSP? n
Attendant Vectoring? n	DS1 Echo Cancellation? y
(Note: You must logoff & login to effect the permission changes.)	

Chapter 5: Administering ATM-PNC and ATM-CES

After the hardware is upgraded for ATM-PNC or ATM-CES, you must administer the ATM switch and Avaya™ Communication Manager to finish the process. Administration procedures are:

- [Accessing Switches for administration](#)
- [Acquiring ATM Addresses](#)
- [Administering ATM Switch](#)
- [Administering Communication Manager](#)

Accessing Switches for administration

To access the server and ATM switches for administration, you must have one of the following setups:

- Management terminal
- Laptop/PC with Avaya Site Administration (ASA)

The management terminal has been the traditional method for accessing servers; however, it is no longer being offered or supported. Field technicians can use laptops or Windows-based PCs to administer the switch.

Avaya Site Administration is a system management tool that runs on a personal computer or laptop. It is designed for a single user to administer and monitor servers and associated voice mail systems.

Although these methods of access present different interfaces, the command syntax is the same. Your interface and screen page numbers may differ.

Acquiring ATM Addresses

Equipment that interfaces with an ATM switch must have a unique 40-digit (20-byte) ATM address. These 40 characters are divided into sectors as [Table 25](#) shows:

Table 25: ATM addressing

Hex digit position	Length (hexadecimal)	Description
1-26	26	Network prefix that identifies a particular ATM switch in the network.
27-38	12	End system identifier (ESI) identifies each end-station connected through an ATM switch. ¹
39-40	2	Selector byte is always 0 for ATM

1. The ESI is usually the IEEE Media Access Control (MAC) address programmed into the end-station device during its manufacture. The MAC address on the TN2305X/TN2306X is located on the MAC address button on the circuit pack.

The address of the PN is automatically derived by the local ATM switch using the address registration procedure defined in the Integrated Local Management Interface (ILMI). The ATM switch uses its 13-byte network address plus the 6-byte ESI, or MAC address, and the 1-byte selector byte of the corresponding TN2305X or TN2306X board(s) in the PN to formulate the 20-byte ATM address(es).

ATM switches can use any of the address formats listed in [Table 26: ATM address formats](#) on page 85.

Note:

The beginning AFI and the last 2 sectors (ESI, and Selector) in [Table 26: ATM address formats](#) on page 85 are all the same length, making it easier to parse the ATM address, regardless of the format.

Table 26: ATM address formats

Format	Length (hex characters)	Description (high to low order)
Data Country Code (DCC)	2	Address Format Identifier (AFI) (39 for DCC)
	4	Data Country Code
	20	High-Order Domain Specific Part (HO-DSP)
	12	End System Identifier (ESI)
	2	Selector
International Code Designator (ICD)	2	Address Format Identifier (AFI) (47 for ICD)
	4	International Code Designator
	20	High-Order Domain Specific Part (HO-DSP)
	12	End System Identifier (ESI)
	2	Selector
ISDN E.164	2	Address Format Identifier (AFI) (45 for E.164)
	16	E.164 address
	8	High-Order Domain Specific Part (HO-DSP)
	12	End System Identifier (ESI)
	2	Selector

Administering ATM Switch

To administer the ATM switch, refer to your switch's quick reference guide. To get a copy of the guide, go to <http://support.avaya.com>) then find the page for your Avaya ATM solution.

Administering Communication Manager

Communication Manager on an S8700-series Media Server provides 2 kinds of ATM service:

- [ATM Port Network Connectivity \(ATM-PNC\)](#)
- [ATM Circuit Emulation Service \(ATM-CES\)](#)

[Table 27](#) outlines important concepts to observe when administering ATM.

Table 27: General ATM parameters

Concept	Description
PNC duplication	<p>If you are installing or upgrading a critical reliability system, the PNC duplication on the Customer Options screen must be turned on in the License File before the feature can be used. If it is enabled, you must further</p> <ul style="list-style-type: none">• Add pnc-a or pnc-b to command strings to clarify which carrier the ATM interface circuit pack is in• Specify the location of the ATM interface circuit pack serving as the duplicate <p>The ATM interface circuit pack in the A carrier must be in the same port network as the B carrier. If not, an alarm is issued. You need not administer ATM interface circuit packs serving as backups to each other with the same parameters.</p>
Fiber links	<p>You do not need to administer fiber links for ATM-PNC. Information on the ATM circuit pack screen identifies which packs are used for PNC (endpoint-1), and endpoint-2 is administered on the ATM switch.</p>

1 of 2

Table 27: General ATM parameters (continued)

Concept	Description
Remote switch administration	A remote switch connected with a permanent virtual circuit (PVC). The Avaya server recognizes the remote switch as a node with compatible circuit parameters at the other end of an emulated circuit. You can connect a remote switch to the Avaya server with one or more CES-emulated circuits. In such a case, the emulated circuits remain discrete.
Synchronization	PNC—All synchronization is derived from the ATM switch providing port connectivity. The ATM switch obtains synchronization from either a sync splitter attached to one or two DS1 cards or from the ATM network. CES—Synchronization is derived the same way it is in a non-ATM-PNC or ATM-PNC environment, whichever applies.

2 of 2

ATM Port Network Connectivity (ATM-PNC)

Each Avaya server port network must be translated in the server's screen with the full ATM address (The ATM switch prefix, plus the port network's ESI, plus a Selector of 0) that uniquely identifies it.

Use the procedure in [Table 28](#) to administer ATM-PNC:

Table 28: ATM-PNC administration

✓	Step	Action	Command	Description
	1.	Log onto the Avaya server		Use the <code>craft</code> login to log on to the Avaya server (and ignore any alarms at this time).
	2.	Check that feature is turned on	<code>display system-parameters customer-options</code>	Ensure that the Async. Transfer Mode <ATM> PNC? field on the customer options screen is y (Figure 27: Optional features—screen 3 on page 100). This field is controlled by the License File.
	3.	Administer ATM PNC		Use the ATM worksheet in Appendix A: Baselineing the Customer's Configuration to record the configuration.

1 of 3

Table 28: ATM-PNC administration (continued)

✓	Step	Action	Command	Description
	4.	Add new PNC	add atm pnc next	Add the next ATM-connected port network.
	5.	Set location address		Set the <code>Location:</code> field to the address of the ATM circuit pack (in 01C01 - cabinet, carrier, slot format).
	6.	Assign network name		Type a name in the <code>Name:</code> field to assign a unique, 15-character port network name.
	7.	Set the MAC address (Steps 10-13)		Set <code>Address format</code> to one of the following: E.164 ATM private, DCC, or ICD Note: If other ATM applications are installed ask the ATM system administrator to determine which address format to use. The system default is DCC.
	8.	Fill in information from worksheet		Set <code>HO DSP: xxxxxxxx</code> , fill in information from the ATM worksheet (Appendix A: Baselining the Customer's Configuration).
	9.	Enter the ESI address		Type in the ESI from the ATM worksheet (Appendix A: Baselining the Customer's Configuration) (MAC address) of the TN2305X/TN2306X in the PN. Note: The first 13 bytes auto set after initial entry. Just enter the MAC address from each column for each TN2305X/TN2306X circuit pack.
	10.	Set the Sel field		Set the <code>Sel:</code> field to 00 . Note: Steps 11-13 make up the 20-byte ATM address.

Table 28: ATM-PNC administration (continued)

✓	Step	Action	Command	Description
	11.	If duplicated PNC (critical reliability), enable PNC	change system-parameters duplication	Set Enable Operation of IPSI Duplication? field to y Set Enable Operation of PNC Duplication? field to y (Figure 29: Duplication related system parameters on page 101)
	12.	Repeat for all PNs		Repeat Steps 7-13 until all port networks are administered.
	13.	Check administration	list atm pnc	Verify that all ATM connections are administered.
	14.	Check links	list sys-link	Types EAL and PACL (all PNs) should display.
	15.	Administer the Avaya server synchronization	change synchronization atm	Synchronize all signals.
	16.	Set primary timing reference		Set <code>primary</code> : atm-sw or a 5-digit DS1 circuit pack location, where the DS1 circuit pack has a PSTN synchronization connection.
	17.	Set secondary timing reference		Set <code>secondary</code> : atm-sw . Press Enter to effect the changes.
	18.	Save translations	save translations	Save translations to system disk.

3 of 3

ATM Circuit Emulation Service (ATM-CES)

ATM Circuit Emulation Service (ATM-CES):

- Can be administered
 - as an ATM-CES direct connect
 - through an ATM network using PVCs

Both procedures are in [Table 32](#), under [ATM-CES administration procedure](#) on page 94.

- Uses ATM emulated circuits instead of physical T1/E1 tie-trunks out to the ATM network.
- Uses up to 8 signaling groups per TN2305X/TN2306X to create virtual trunking.
- Uses bearer (B) and signaling (D) channels, similar to ISDN facilities but does not support nonfacility associated signaling (NFAS).
- Uses channels inside each signaling group, which appear as if they were ports on the TN2305X/TN2306X circuit pack. Hereafter, these are referred to as ports.
- Uses constant bit-rate (CBR) signalling over permanent virtual connections (PVCs).
- Has a transparent Communication Manager feature set to other locations through narrowband QSIG (N-QSIG) or distributed communications system over ISDN-PRI (DCS+)

Note:

Because ATM trunks always appear as ISDN-emulated trunks, they do not support DCS, only DCS+.

ATM-CES rules

[Table 29](#) lists several guidelines for ATM-CES administration.

Table 29: ATM-CES administration rules

Rule	How to administer or confirm
Both ends of the emulated circuit must have the same number of channels	Type change signaling-group siggrpnr and press Enter ; go to screen 2
Both ends of the emulated circuit must have the same number of trunks.	Type change trunk-group trkgrpnr and press Enter ; go to screen 6.
Both ends of the emulated circuit must use the same channel numbers.	Type change signaling-group siggrpnr and press Enter ; go to screen 2. In the port-to-channel mapping, use the same channel numbers for both ends of the trunk.
Each end of the trunk may use different port numbers on the respective ATM circuit packs.	Type change trunk-group trkgrpnr and press Enter ; go to screen 6. The same port numbers on the circuit packs need not be used on the two ends of the emulated circuit.
The maximum number of emulated circuits (signaling groups) on a single TN2305 circuit pack is 8.	A circuit pack can have more than one signaling group and more than one D-channel. The D-channel from one emulated circuit cannot signal for the bearer channels of another emulated circuit (no NFAS for virtual circuits).
A minimum of 7 ports must be administered for each emulated circuit (signaling group).	Because this includes the D-channel, at least 6 B-channels and the D channel must be administered in a signaling group.
The D channel must be in a port between 009 and 032.	Type display signaling-group siggrpnr and press Enter ; go to screen 2 to verify. The D channel is automatically populated in channel 24 (T1) or in channel 16 (E1).

1 of 2

Table 29: ATM-CES administration rules (continued)

Rule	How to administer or confirm
The TN2305X/TN2306X circuit packs provide up to 248 ports for trunking.	A circuit pack has 256 ports, but ports 1 through 8 are reserved for future use. Of the 248 available ports, 8 are for D-channels, and 240 are for B-channels. See Table 30 and Table 31: Avaya server trunk capacities by model on page 92 for details about port and trunk group capacities for the TN2305X/TN2306X circuit pack and the Avaya server.
A trunk group may contain either ISDN trunks or ATM trunks, but not both	

2 of 2

Table 30: TN2305X/TN2306X CES trunk capacities

Bearer ports per signaling group (B channel)	Signaling groups per TN2305X/TN2306X (D-channel)	Total ports used ¹
T1: 23 E1: 30	8 8	192 248

1. The circuit pack provides 256 ports, but ports 1 through 8 are reserved for future use.

Table 31: Avaya server trunk capacities by model

Capacity	csi, si	S8700-series	S8500
Maximum trunks per trunk group	99	255	255
Maximum number of trunk groups	99	2000	2000
Maximum number of trunks in the system	400	4000	800

Trunk groups

At least one trunk group is typically created for each remote switch with these attributes (see [Figure 33: Trunk group—screen 1](#) on page 104):

- Group Type field is **isdn**
- Carrier medium field is **atm**
- Dial Access? field is always **n**
- TN2305X/TN2306X may have Trunk Access Codes (TAC), but these are for reporting purposes only and cannot be dialed.
- CDR records for ATM trunk calls are maintained.

Note:

Release 7 introduced 3-digit port numbers for administering a CES trunk, and some CMS releases cannot read the old 2-digit numbers. Release 10 and later of the CentreVu™ Call Management System (CMS) software can read both the 2- and 3-digit port numbers.

- A trunk group may include ports from more than one of the ATM circuit packs in the system. This enables *same module preference*, the feature that gives preference to outgoing trunks on the same port network as the originator.
- ATM trunk groups can only contain ports on ATM boards, and ports on ATM boards cannot be assigned to non-ATM trunk groups.

ATM-CES trunk board

When administered as a trunk board, the TN2305X/TN2306X can have up to 8 ATM signaling groups with up to 30 members per signaling group over an OC-3/STM-1 connection. Although the ATM board does not have physical ports, software makes the ATM board appear as if it does. Multiple TN2305X/TN2306X circuit packs in a port network could connect to different ATM switches.

Figure 25: Signaling groups and members for ATM trunking

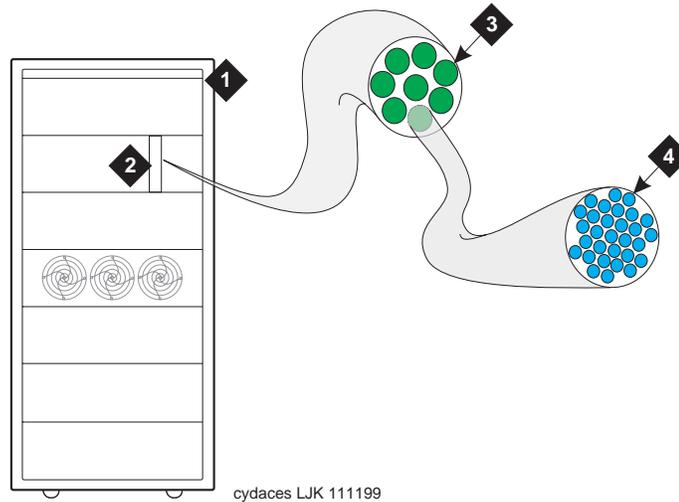


Figure notes:

- | | |
|--|---|
| 1. IPSI-connected PN | 4. Ports |
| 2. TN2305X/TN2306X circuit pack in any port | 24 maximum (T1), including D-channel |
| 3. Signaling groups (maximum 8) | 31 maximum (E1), including D-channel |

- Each of the 248 ports in the ATM trunk group are either B-channels or D-channels.
- Each B-channel has an associated maintenance object with a very simple maintenance strategy. This is done so that any of the virtual ports on a single ATM interface circuit pack can be members of different trunk groups. When a trunk group is busied out, only those ports in that trunk group are taken out of service. Because all ports associated with a single D-channel follow the same PVC, you cannot test them individually.

ATM-CES administration procedure

[Table 32](#) contains ATM-CES administration for

- ATM signaling groups
- ATM-CES direct-connect configurations (two CES circuit packs linked by fiber, with no intervening switches). Observe the note in step 16.

Note:

The screens shown in the following section may differ for DEFINITY Server CSI and SI and S8700-series and S8500 Media Servers.

Table 32: ATM-CES administration

✓	Step	Action	Description
	1.	Check the customer options	Type display system-parameters customer-options and press Enter . The Customer Options screen (Figure 26: Optional features—screen 1 on page 100) displays.
	2.		Upgrades only: Ensure that the G3 Version field is V13 . Go to screen 3.
	3.		Ensure that the Async. Transfer Mode (ATM) Trunking? field is y (Figure 27: Optional features—screen 3 on page 100). Go to screen 4.
	4.		Ensure that the ISDN-PRI field is y (Figure 28: Optional features—screen 4 on page 101).
	5.	Install the circuit packs	Install the TN2305X/TN2306X circuit pack and wait for it to initialize (about 4 minutes)
	6.	Connect the fiber optic cable	Attach the fiber optic cable to the circuit pack and to the ATM switch.
	7.	Look up ATM circuit pack locations	Type list configuration atm and press Enter . The name for this circuit pack appears as ATM Trunk.
	8.	Administer the circuit pack personality	Type add atm trunk-board UUCSS and press Enter . The ATM Trunk-Board screen (Figure 30: ATM trunk board on page 102) displays.
	9.	Type a name for the ATM board	Type the name of the ATM interface circuit pack (15 alphanumeric characters) in the Name field.

1 of 5

Table 32: ATM-CES administration (continued)

✓	Step	Action	Description
	10.	Set the synchronization	<p>Set the <code>Synchronization Capable</code> field to n (default).</p> <p>Note: Up to 44 boards may be designated synchronization capable on S8700-series Media Servers using ATM-PNC and 3 boards on the S8500, SI, or CSI Media Server. If you enter y in this field when the maximum number of boards has been designated, the system returns:</p> <pre>Maximum number of Synchronization Capable boards already administered</pre> <p>Note: If this ATM trunk circuit pack is a synchronization source, set the field to y. If you change the field to n when the circuit pack is administered as a synchronization source, the system returns:</p> <pre>Cannot remove synchronization source.</pre>
	11.	Administer the signaling group	<p>Type add signaling-group and press Enter. The Signaling Group screen (Figure 31: Signaling group on page 102) displays.</p> <p>Set the following fields (tabbing goes vertically)</p>
	12.	Set the group type	Set the <code>Group Type</code> field to atm .
	13.	Type port address	Type the <code>D-channel</code> (signaling channel) port address for this new signaling group in UUCSSppp screen at (3-digits required for port addresses). This address must match the slot and port number on an ATM-Interface circuit pack.
	14.	Type a name	Type a name in the <code>Name</code> field (15 alpha-numeric characters).
	15.	Set VPI	The <code>Virtual Path Identifier</code> (VPI) field is set to 0 and is not administrable.

Table 32: ATM-CES administration (continued)

✓	Step	Action	Description
	16.	Set VCI	<p>Set the <code>Virtual Channel Identifier (VCI)</code> field (32-1023). This number must be unique among signaling groups that share the same ATM circuit pack.</p> <p>Note: For a direct connection (two fiber-connected CES circuit packs), specify the same VCI at both ends of the emulated circuit. When the CES is connected to an ATM switch, the VCI specified here must match the VCI used for the PVC created on the ATM switch, which is typically provided by the ATM switch administrator.</p> <p>Note: The <code>Signaling Mode</code> field is set to <code>isdn-pri</code> and is not administrable.</p>
	17.	Set idle code	Set the <code>Idle Code</code> field (typically 11111111).
	18.	Set interface companding	Set the <code>Interface Companding</code> field (alaw or mulaw). Once administered, busyout the signaling group before changing.
	19.	Set country protocol	Set the <code>Country Protocol</code> field (Table 33: Country and protocol version supported (for Figure 31) on page 102).
	20.	Set protocol version	Set the <code>Protocol Version</code> field (Table 33: Country and protocol version supported (for Figure 31) on page 102).
	21.	Set circuit type	<p>Set the <code>Circuit Type</code> field (T1 or E1).</p> <p>Note: Both ends must be the same. It is preferable to set it to E1 even in the United States, Canada, or other T1 countries.</p>
	22.	Set connect	Set the <code>Connect</code> field to pbx . Once administered, busyout the signaling group before changing.
	23.	Set interface	Set the <code>Interface</code> field to user at one end of the emulated circuit and to network at the other end.
	24.	Set DCP/analog bearer capability	Set the <code>DCP/Analog Bearer Capability</code> field to 3.1 kHz .

3 of 5

Table 32: ATM-CES administration (continued)

✓	Step	Action	Description
	25.	Set internetworking message	Set internetworking message field to PROgress .
	26.	Verify channel settings	<p>Go to screen 2; Figure 32: Signaling group D-channel assignments—screen 2 on page 104 displays.</p> <p>Depending on the settings in step 18:</p> <ul style="list-style-type: none"> ● If <code>Circuit Type</code> field is set at T1, then channel 24 is populated. ● If <code>Circuit Type</code> field is set at E1, then channel 16 is populated. <p>Other details about D-channels:</p> <ul style="list-style-type: none"> ● All ports for one signaling group must be on the same ATM circuit pack (the same circuit pack that the D channel is on). ● The D-channel port is never assigned to a trunk group. Because they are all the same, the administrator does not need to type in the circuit pack location for each channel. ● No port can be assigned to more than one signaling group.
	27.	Type port numbers	<p>Add the port numbers (minimum of 6) from the port-to-channel mapping on signaling group screen 2.</p> <p>See Changing the port-to-channel mapping on page 105 if you need to change any administration.</p> <p>When finished, press Enter to save the administration.</p>
	28.	Administer the trunk group	<p>Type add trunk-group [trkgrpnbr / next] and press Enter.</p> <p>Figure 33: Trunk group—screen 1 on page 104 displays.</p>

Table 32: ATM-CES administration (continued)

✓	Step	Action	Description
	29.	Set final fields	Set the following fields (tabbing goes horizontally): <ul style="list-style-type: none"> ● Group Type: field to isdn. ● Note: A trunk group can contain either ISDN or ATM trunks, but not both. ● The CDR Reports field defaults to y. ● The Carrier Medium: field to ATM. ● The TAC: field to match customer's dial plan. ● The Dial Access? field defaults to n. ● The Service Type: field to tie.
	30.		Go to screen 6 and add the channel-to-port mapping (Figure 35: Optional features—screen 5 on page 109). You must have the same number of entries as port numbers in step 28. Press Enter to effect the changes.
	31.	Save translations	Type save translations and press Enter .

5 of 5

ATM-CES administration screens

Figure 26: Optional features—screen 1

```
display system-parameters customer-options                               Page 1 of x
                                OPTIONAL FEATURES

G3 Version: V13                                                         RFA System ID (SID): 123456789012
Location: 2                                                             RFA Module ID (MID): 123456
Platform: 2

                                USED
                                Platform Maximum Ports: 300 174
                                Maximum Stations: 300 174
                                Maximum XMOBILE Stations: 30 28
Maximum Off-PBX Telephones - EC500: 1200 0
Maximum Off-PBX Telephones - OPS: 1200 0
Maximum Off-PBX Telephones - SCCAN: 0 0

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

Figure 27: Optional features—screen 3

```
display system-parameters customer-options                               page 3 of x
                                OPTIONAL FEATURES

Abbreviated Dialing Enhanced List?                                     Audible Message Waiting?
Access Security Gateway (ASG)?                                         Authorization Codes?
Analog Trunk Incoming Call ID?                                         CAS Branch?
A/D Grp/Sys List Dialing Start at 01?                                  CAS Main?
Answer Supervision by Call Classifier?                                   Change COR by FAC?
ARS?                                                                     Computer Telephony Adjunct Links?
ARS/AAR Partitioning?                                                  Cvg Of Calls Redirected Off-net?
ARS/AAR Dialing without FAC?                                           DCS (Basic)?
ASAI Link Core Capabilities?                                           DCS Call Coverage?
ASAI Link Plus Capabilities?                                           DCS with Rerouting?
Async. Transfer Mode (ATM) PNC?
Async. Transfer Mode (ATM) Trunking?
ATM WAN Spare Processor?                                               Digital Loss Plan Modification?
ATMS?                                                                    DS1 MSP?
Attendant Vectoring?                                                  DS1 Echo Cancellation?
```

Figure 28: Optional features—screen 4

```

display system-parameters customer-options                               Page 4 of x
                                OPTIONAL FEATURES

Emergency Access to Attendant? y                                     IP Stations? y
  Enable 'dadmin' Login? y                                           Internet Protocol (IP) PNC? y
  Enhanced Conferencing? y                                           ISDN Feature Plus? y
    Enhanced EC500? y                                               ISDN Network Call Redirection? y
  Enterprise Wide Licensing? y                                       ISDN-BRI Trunks? y
    Extended Cvg/Fwd Admin? y                                       ISDN-PRI? y
  External Device Alarm Admin? y                                     Local Survivable Processor? y
    Extended Cvg/Fwd Admin? y                                       Malicious Call Trace? y
  External Device Alarm Admin? y   Mode Code for Centralized Voice Mail? y
Five Port Networks Max per MCC? y
  Flexible Billing? y                                               Multifrequency Signaling? y
  Forced Entry of Account Codes? y Multimedia Appl. Server Interface (MASI)? y
  Global Call Classification? y   Multimedia Call Handling (Basic)? y
    Hospitality (Basic)? y   Multimedia Call Handling (Enhanced)? y
  Hospitality (G3V3 Enhancements)? y
    IP Trunks? y

IP Attendant Consoles? y

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

```

Figure 29: Duplication related system parameters

```

display system-parameters duplication   Page 1 of 1   SPE B
                                DUPLICATION RELATED SYSTEM PARAMETERS

Enable Operation of IPSI Duplication? y

Enable Operation of PNC Duplication? y

```

Figure 30: ATM trunk board

```

ATM TRUNK-BOARD

Location: 2E08

Name: _____ Synchronization Capable: 1
    
```

Figure 31: Signaling group

```

add signaling-group                               Page 1 of 6
                                           SIGNALING GROUP

Group Number: 2                                Group Type: atm                                Name:
                                           Max number of NCA TSC: 0
                                           Max number of CA TSC: 0
                                           Trunk Group for NCA TSC:
D-Channel:
Trunk Group for Channel Selection:
Supplementary Service Protocol: a            Network Call Transfer? n

CIRCUIT PARAMETERS
Virtual Path Identifier: 0
Virtual Channel Identifier:

Signal Mode: isdn-pri                        Circuit Type: T1
Idle Code: 1111111                            Connect: pbx
Interface Companding: mulaw                    Interface: network
Country Protocol: 1
Protocol Version: a

DCP/Analog Bearer Capability: 3.1kHz
Interworking Message: PROGRESS
    
```

Table 33: Country and protocol version supported (for [Figure 31](#))

Value	Country	Protocol supported
1-a	United States, Canada	AT&T TR41449/41459 (tested with AT&T, Canadian, and MCI networks)
1-b	United States	Bellcore TR 1268; NIUF.302; ANSI T1.607

Table 33: Country and protocol version supported (for [Figure 31](#)) (continued)

Value	Country	Protocol supported
2	Australia	AUSTEL TSO14.1; Telecom Australia TPH 1856
3	Japan	NTT INIS-NET
4	Italy	ETS 300 102
5	Netherlands	ETS 300 102
6	Singapore	ETS 300 102
7	Mexico	ETS 300 102
8	Belgium	ETS 300 102
9	Saudi Arabia	ETS 300 102
10-a	United Kingdom	ETS 300 102 (for connection to DASS II/DPNSS through external converter)
10-b	United Kingdom	ETS 300 102 (Mercury) British Telecom ISDN 30
11	Spain	Telefonica ISDN Specification
12-a	France	VN4 (French National PRI)
12-b	France	ETS 300 102 modified according to P10-20, called Euronumeris
	Argentina	ETS 300 102
	Brazil	ETS 300 102
	China	ETS 300 102
	Germany	ETS 300 102
	Hong Kong	ETS 300 102
	South Korea	ETS 300 102
	New Zealand	ETS 300 102

2 of 2

Figure 32: Signaling group D-channel assignments—screen 2

```

add signaling-group next                                     Page 2 of 6
                                                    SIGNALING GROUP

Chan Port Chan Port
_1: ___ _17: ___
_2: ___ _18: ___
_3: ___ _19: ___
_4: ___ _20: ___
_5: ___ _21: ___
_6: ___ _22: ___
_7: ___ _23: ___
_8: ___ _24: Occ (T1 only)
_9: ___
_10: ___
_11: ___
_12: ___
_13: ___
_14: ___
_15: ___
_16: Occ (E1 only)
    
```

Figure 33: Trunk group—screen 1

```

add trunk-group                                           Page 1 of 10
                                                    TRUNK GROUP

Group Number: 1                Group Type: isdn                CDR Reports: y
  Group Name: OUTSIDE CALL          COR: 1                TN: 1                TAC:
  Direction: two-way              Outgoing Display? n        Carrier Medium: ATM
  Dial Access? n                  Busy Threshold: 99         Night Service:
Queue Length: 0
Service Type: tie                Auth Code? n                TestCall ITC: rest
                                Far End Test Line No:

TestCall BCC: 4
TRUNK PARAMETERS
  Codeset to Send Display: 6        Codeset to Send National IEs: 6
  Max Message Size to Send: 260    Charge Advice: none
  Supplementary Service Protocol: a  Digit Handling (in/out): enbloc/enbloc

  Trunk Hunt: cyclical              QSIG Value-Added Lucent? n
                                Digital Loss Group: 13
Calling Number - Delete:          Insert:                    Numbering Format:
  Bit Rate: 1200                  Synchronization: async    Duplex: full
Disconnect Supervision - In? y  Out? n
Answer Supervision Timeout: 0
    
```

Figure 34: Trunk group—screen 4

```

add trunk-group                                     Page 4 of 10
                                                    TRUNK GROUP
                                                    Administered Members (min/max): 0/0
GROUP MEMBER ASSIGNMENTS                          Total Administered Members: 0

      Port      Code Sfx Name      Night      Sig Grp
1:
2:
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

```

Changing the port-to-channel mapping

Use the following steps to change the port-to-channel mapping for emulated circuits:

1. Type **busyout atm signaling-group *siggrpnr*** and press **Enter** to busyout the signaling group.
2. Type **change trunk-group *trkgrpnr*** and press **Enter**.
Remove any port administration on screen 6.
3. Type **change signaling-group *siggrpnr***.
Modify the port-to-channel mapping.
4. Type **change trunk-group *trkgrpnr*** and press **Enter**.
Add the ports back in on screen 6, using new port numbers, if desired.
5. Type **release atm signaling-group *siggrpnr*** and press **Enter** to release the signaling group.
The display shows the command aborts, but the D-channel and B-channels come up.

Commands for CES

Administration commands that are useful in working with CES are listed in [Table 34](#).

Table 34: ATM administration commands

Command	Description
display circuit-packs <i>cabinet</i>	Displays the packs in the cabinet, identifying ATM Trunk as well as ATM PNC EI boards. ATM Interface boards have not been specified as CES or PNC yet.
display atm ports <i>eqloc</i>	Displays the 256 ports on the ATM board with the corresponding signaling and trunk group.
list configuration atm	Lists the ATM boards, identifying equipment location, board code, type, and vintage.
list configuration trunks	Lists boards identifying assigned ports. Although the ATM board is listed, the 256 ports are not.

Additional server administration

After administering the ATM-PNC or ATM-CES, you may need to do some further administration, specifically:

- [Locations](#)
- [SVC cache](#) (PNC only)
- [Gain/Loss adjustments](#) (PNC only).

Locations

ATM-PNC makes it easier for the Avaya server to have port networks in multiple time zones. To handle distances between the IPSI-connected PN or PNs and its non-IPSI-connected PNs, the system tracks one or more locations by assigning each cabinet a location number. All locations must be in the same country code.

If upgrading from a pre-Release 7, you may need to set the locations for your PNs. To administer locations, follow the procedure in [Table 35](#).

Note:

The screens and field description follow the table.

Table 35: Administer location procedure

✓	Step	Action	Description
	1.	Check the customer options	Type display system-parameters customer-options and press Enter . The Customer Options screen displays. Go to screen 3 (Figure 35: Optional features—screen 5 on page 109).
	2.		Ensure that the <code>Multiple locations</code> field is y . Note: The system is limited to a single location unless this field is y .
	3.	Change cabinet administration	Type change cabinet n (cabinet number) and press Enter . The Cabinet screen displays (Figure 36: Cabinet on page 110).
	4.	Administer cabinet location	Each cabinet in the switch and the port network(s) in that cabinet must be assigned a location number (default location number is 1). Change the <code>Location</code> field to the appropriate number and press Enter .
	5.	Administer location properties	Type change locations and press Enter . The Locations screen displays (Figure 37: Locations—screen 1 on page 111).
	6.	Set timezone offset	Ensure that the <code>Timezone Offset</code> field for Location 1 is set at 00:00 , indicating the local time. This serves as a system-wide, relative time reference.
	7.	Set Number Plan Area Code	The <code>Number Plan Area Code</code> field (for subnet trunking conversions between 10-digit North American Number Plan (NANP) and 7-digit (local) numbers). Leaving the field blank is the normal setting for a location <ul style="list-style-type: none"> ● outside the NANP. ● with no 7-digit local calling plan. These locations may have overlaid area codes requiring 10-digit dialing.

1 of 3

Table 35: Administer location procedure (continued)

✓	Step	Action	Description
	8.	Administer cabinet locations	<p>Administer all other locations as necessary. For example, if the IPSI-connected PN is in New York and a group of other PNs is in Los Angeles, then New York (location 1) is the reference and is administered with no time offset (see step 8). Los Angeles (location 2) is 3 hours earlier than New York time and is administered with a time offset of -03:00.</p> <p>Administer cabinet locations as they are added to the system. More than 1 cabinet can be in the same location.</p> <p>For location-related feature limitations and interactions see Table 57: Communication Manager server operations affected by location.</p> <p>When finished, press Enter to effect the changes.</p>
	9.	Administer Daylight-Savings Time rules	<p>Type change daylight-savings-rules and press Enter.</p> <p>The Daylight Savings Rules screen displays (Figure 38: Daylight savings rules screen on page 112).</p> <p>Administer as many rules as necessary for all of the administered locations.</p> <p>If you want to deny access for an individual login:</p> <ul style="list-style-type: none"> ● set the Additional Restrictions field for that login to y, and entering daylight-savings-rules in the Restricted Object List field. ● set the Administer Features field for that login to n. ● set the Display Admin. and Maint. Data field for that login to n.

Table 35: Administer location procedure (continued)

✓	Step	Action	Description
	10.	Verify date and time	Check the system date and time (set time). Ensure that the <code>Type</code> and <code>Daylight Savings Rule</code> fields are administered correctly (Figure 39: Date and time screen on page 113).
	11.	Administer ARS routing	Administer the <code>Location</code> field on the ARS analysis screen (change ars analysis 0 location all), observing the following conditions: <ul style="list-style-type: none"> • ARS customer option (display system-parameters customer-options) must be enabled. • The Multiple Locations customer option must be administered to a value other than all.

3 of 3

Figure 35: Optional features—screen 5

display system-parameters customer-options	page 5 of x
OPTIONAL FEATURES	
Multinational Locations?	Station and Trunk MSP? n
Multiple Level Precedence and Preemption?	Station as Virtual Extension? n
Multiple Locations?	System Management Data Transfer? n
Personal Station Access (PSA)? y	Tenant Partitioning? n
Posted Messages? n	Terminal Trans. Init. (TTI)? y
PNC Duplication? n	Time of Day Routing? y
Port Network Support? y	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? y
Restrict Call Forward Off Net? y	Wireless? n
Secondary Data Module? y	

Figure 36: Cabinet

```

add cabinet 1                                     Page 1 of 1
                                         CABINET
CABINET DESCRIPTION
      Cabinet: 1
      Cabinet Layout: five-carrier
      Cabinet Type: expansion-portnetwork
Number of Portnetworks: 1
Survivable Remote EPN? n
      Location: 1                                IP Network Region: 1
      Cabinet Holdover: A-carrier-only
      Room:          Floor:          Building:

CARRIER DESCRIPTION
Carrier      Carrier Type      Number      Duplicate

C           not-used          PN 01
B           port              PN 01
A           expansion-control PN 01
X           fan
D           not-used          SN 01
E           switch-node       SN 01      05ED
    
```

Note:

All cabinets default automatically to location 1.

Field description:

- Location Location number associated with the cabinet (range is 1-44, default 1).
- Field cannot be blank
 - Location is display-only if the Multiple locations field (**change system-parameters customer-options**) is not set to **y**.

Figure 37: Locations—screen 1

change locations		LOCATIONS						Page 1 of 1		
ARS Prefix 1 Required For 10-Digit NANP Calls? y										
Loc. No	Name	Timezone Offset	Rule	NPA	ARS FAC	Attd FAC	Loc. Parms.	Pre-fix	Proxy Rte.	Sel. Pat.
1.	Main	+ 00:00	1	312						
2.	Denver-01_____	- 01:00	1	303	_____	_____	_____	_____	_____	_____
3.	Lincroft-01_____	+ 01:00	1	953	_____	_____	_____	_____	_____	_____
xxx	_____	- __:__	__	__	_____	_____	_____	_____	_____	_____
xxx	_____	- __:__	__	__	_____	_____	_____	_____	_____	_____

Note:

Upgrades from a previous software version default to a single location (location 1) with the values shown in [Figure 37](#). The Number Plan Area Code is the home NPA from the dial plan screen of the earlier release.

Field descriptions:

ARS Prefix 1 Required For 10-Digit NANP Calls? This field is set to **y** if all 10-digit NANP calls (those marked as FNPA in the ARS analysis tables) must be preceded by a digit '1' (commonly called the toll prefix); otherwise, it is set to **n**.

Note:

Many areas in the United States have changed to 10-digit dialing for local calls, and administration for this field and the ARS analysis entries must reflect these changes.

Number This read-only field uniquely identifies a location. Valid values range from 1 to 44.

Name This 15-character field identifies the location but may be blank for any given location (default = y).

Timezone Offset This field specifies the time offset from the system standard time. Set a value in the ±, hour (0-23), and minute (0-59) areas, as these fields cannot be blank for an administered location.

Administering ATM-PNC and ATM-CES

Number	This field is the number assigned to the administered, customized rule (0 to 15) for this location. Each rule consists of the week, day, month, and time that daylight savings starts and stops. <ul style="list-style-type: none"> ● Rule 0 is no daylight savings time and is not alterable. ● Rule 1 defaults to the U.S. daylight savings time rule but may be altered or deleted.
Number Plan Area Code	This field is the numbering plan area code appropriate for this location (can be blank).

Figure 38: Daylight savings rules screen

change daylight-savings-rules						Page 1 of 2
DAYLIGHT SAVINGS RULES						
Rule	Change Day	Month	Date	Time	Increment	
0:	No Daylight Savings					
1:	Start: first Sunday	on or after	April	1	at 2 :0	1 :0
	Stop: first Sunday	on or after	October	25	at 2 :0	
2:	Start: first	on or after			at 0 :	0 :
	Stop: first	on or after			at 0 :	
3:	Start: first	on or after			at 0 :	0 :
	Stop: first	on or after			at 0 :	
4:	Start: first	on or after			at 0 :	0 :
	Stop: first	on or after			at 0 :	
5:	Start: first	on or after			at 0 :	0 :
	Stop: first	on or after			at 0 :	
6:	Start: first	on or after			at 0 :	0 :
	Stop: first	on or after			at 0 :	
7:	Start: first	on or after			at 0 :	0 :
	Stop: first	on or after			at 0 :	

Field descriptions:

Change Day	The day of the week, or date that the change takes effect.
Month	The month the change takes effect.
Date	The date on or after which the change takes place.
Time	2 fields that specify the hour (0-23) and minute (0-59) that the change takes effect (in 24-hour format)
Increment	2 fields specifying the number of hours (0-23) and minutes (0-59) the clock is moved ahead to begin daylight savings time (and moved back to return to standard time).

Note:

Some states (Arizona) or portions of states (Indiana) do not observe daylight savings time. Verify the daylight savings time status in all your locations.

Figure 39: Date and time screen

```

set time                                     Page 1 of 1

                                DATE AND TIME

                                DATE

                                Day of the Week: Sunday           Month: October
                                Day of the Month: 24                 Year: 1999

                                TIME

                                Hour: 8   Minute: 16   Second: 31   Type: Standard
                                Daylight Savings Time Rule: 0

WARNING: Changing the date or time will impact BCMS, CDR and MEASUREMENTS

```

Note:

When the system clock is upgraded from an earlier release, the daylight savings time rule on the **set time** screen defaults to **0** (no rule). While you can change the daylight savings time rule, the system clock is not adjusted automatically until the next transition of the rule.

Field descriptions:

Type	Daylight-savings = daylight savings time Standard = standard time
Daylight Savings Rule	The daylight savings time rule number (0 to 15). Rule 0 is no daylight savings time, and rule 1 defaults to U.S. daylight savings time rule.

SVC cache

Communication Manager ATM software maintains a cache of inter-port-network connections (SVCs), with the preference given to those SVCs with the longest setup times. All cached interconnections are aged to ensure that a large number of them are not kept during nearly idle periods.

You can administer the setup time thresholds, cache holding times, and total cache size, which can mitigate the effects of long interconnection setup delays.

Note:

Avaya strongly suggests you always leave the cache algorithm set to the default of **lan**, except in highly unusual conditions. Internal testing has uncovered virtually no situations in which the default setting is not best. Therefore, experimentation on this screen is strongly discouraged.

The **change atm svc-cache** command ([Figure 40](#)) is restricted to init, inads, and craft logins.

Figure 40: ATM SVC cache report

```
change atm svc-cache Page 1 of 1

                ATM SVC CACHE

Algorithm:                               Size: 410

                ALGORITHM PARAMETERS

For Latency   Hold Time
>= 50    ms   36    sec
>= 0     ms   12    sec
>=      ms           sec
```

Field descriptions:

Algorithm	<p>The name of the cache algorithm (default is lan). Possible values are none, lan, man, wan, and custom. Please read the Note above.</p> <p>When this field is changed to none, lan, man, or wan, the read-only For Latency and Hold Time field values change to the following (all other entries are blank):</p> <table> <thead> <tr> <th>Value</th> <th>For Latency (ms)</th> <th>Hold Time (ms)</th> </tr> </thead> <tbody> <tr> <td>none</td> <td>00</td> <td>012</td> </tr> <tr> <td>lan</td> <td>5036</td> <td>012</td> </tr> <tr> <td>man</td> <td>80080</td> <td>501608</td> </tr> <tr> <td>wan</td> <td>800200</td> <td>20036501600</td> </tr> </tbody> </table> <p>When this field is custom, none of the For Latency or Hold Time field values change, but the fields change from read-only to read/write. For example, if you want a slight variation of the wan algorithm, type wan first to set the above values, then type custom to change the individual parameters.</p>	Value	For Latency (ms)	Hold Time (ms)	none	00	012	lan	5036	012	man	80080	501608	wan	800200	20036501600
Value	For Latency (ms)	Hold Time (ms)														
none	00	012														
lan	5036	012														
man	80080	501608														
wan	800200	20036501600														
Size	The maximum number of entries simultaneously allowed in the cache (default = 410).															
For Latency	These fields (10) are read-only if the Algorithm field is none , lan , man , or wan , but are read/write if Algorithm is custom . Defaults: 36 for the 1st entry, 0 for the second, blank for the last 8 entries.															

Gain/Loss adjustments

Gain and loss are administrable. Calls between a digital (BRI or DCP) phone (6400 and 8400 series) and an analog trunk port require adjustments to the default gain/loss settings to prevent distortion. Use the procedure ([Table 36: Gain/loss adjustment procedure](#) on page 116) to administer digital phones in ATM configurations.

Note:

Use the following procedure *only* for Series 6400 or 8400 digital phones.

Table 36: Gain/loss adjustment procedure

✓	Step	Action	Description
	1.	Set or verify gain/loss administration	Type change location-parameters <#> , where # is the code for the country in which the server resides, and press Enter . The Location Parameters screen appears (Figure 41: Location parameters—screen 2 on page 117). Go to page 2.
	2.	Set digital loss plan	In the U.S.: Ensure that the 2 Party Loss Plan and Tone Loss Plan fields are 1 . If they are, exit this procedure. Outside the U.S.: If the 2 Party Loss Plan and Tone Loss Plan fields are anything other than 1, you must change the terminal parameters. Proceed to step 3.
	3.	Customize the digital phone series administration	Type change terminal-parameters # and press Enter . (# can be a number from 1 to 25.) Go to page 2. See the 6400-Type Terminal Parameters example (Figure 42: 6400-type terminal parameters on page 117) display (6400 used for this example). Change the Default Parameter Set field to 1 .
	4.	Change the settings	In the Primary Levels part of the screen, change the following fields to these settings: <ul style="list-style-type: none"> ● Voice Transmit (dB) = +2.5 ● Voice Receive (dB) = -2.0 <i>For 6400 and 8400 series phones only:</i> in the BUILT-IN SPEAKER LEVELS part of the screen, change the following fields to these settings: <ul style="list-style-type: none"> ● Voice Transmit (dB) = 0.0 ● Voice receive (dB) = 0.0 Press Enter .
	5.	If both series 6400 and 8400 digital phones are used	Repeat steps 3 and 4 for all of the applicable phone series. When finished, press Enter to effect the changes.

Figure 41: Location parameters—screen 2

```

change location-parameters N                                     Page 2 of 4

LOSS PLANS

      Inter-location Loss Group: 18

          2 Party Loss Plan: 1                                Customize? n

          Tone Loss Plan: 1                                  Customize? n

End-to-End total loss (dB) in a n-party conference:
3: 15  4: 21  5: 26  6: 29                                Customize? n
  
```

Figure 42: 6400-type terminal parameters

```

change terminal-parameters 2                                   Page 2 of 3

      6400/607A1/4600/2420-TYPE TERMINAL PARAMETERS

      Default Parameter Set: 1                                Customize Parameters? y

OPTIONS
      Display Mode:
      Handset Expander Enabled?
      Volume:

PRIMARY LEVELS
      Voice Transmit (dB): 2.5
      Voice Receive (dB): 2.5
      Voice Transmit (dB):
      Touch Tone Transmit (dB):
      Voice Receive (dB):
      Voice Sidetone (dB):
      Touch Tone Sidetone (dB):

BUILT-IN SPEAKER LEVELS
      Voice Transmit (dB):
      Voice Receive (dB):
      Touch Tone Sidetone (dB):

6402 BUILT-IN SPEAKER LEVELS
      Voice Receive (dB):
      Touch Tone Sidetone (dB):
  
```

Final Checklist and Test

After you complete all the administration, you might want to run through a final checklist and verify that everything is working. This section contains a final installation checklist and a procedure for testing the installation.

Use [Table 37](#) to make sure that the switch administration for both the ATM switch and Avaya server is complete. Use [Table 38: ATM-PNC installation test procedure](#) on page 119 and [Table 39: ATM-CES installation test procedure](#) on page 120 to test the ATM-PNC and ATM-CES installations, respectively.

Table 37: Final installation checklist

✓	Switch administration	What to check	How to check
	ATM	1. A VPI or VCI is administered for each CES PVC	Query ATM switch
		2. Class of service is Constant Bit Rate (CBR)	Query ATM switch
		3. Quality of Service (QoS) is Peak Cell Rate (PCR)	Query ATM switch
	Avaya server	4. ATM circuit packs inserted and translated	Query Avaya server (list configuration atm)
		5. Signaling group for each PVC	a. Signaling group identifier b. Circuit pack ID c. VPI/VCI d. VC type is PVC e. D-channel port number assigned properly f. Signaling type (CES) administered g. Minimum number of channels administered (total of 7, at least 1 must be a D channel) h. D- and B-channel-to-port mapping

Table 37: Final installation checklist (continued)

✓	Switch administration	What to check	How to check
		6. PVCs are up	Query Avaya server (status signaling-group <i>n</i>). If signaling group is in service, then PVCs are up.
	ATM-PNC	7. ATM circuit packs installed and translated	Query Avaya server
		8. ATM addresses are correct	Query Avaya server
		9. EALs are up	Query Avaya server (list system link)

2 of 2

Table 38: ATM-PNC installation test procedure

✓	What to check	How to check	How to fix
	1. Check SONET/SDH layer for status and alarms.	Query alarms and hardware logs	
	2. Check the LEDs on the ATM circuit packs	Refer to the maintenance book for descriptions of the LEDs, their flash rates, and the conditions indicated.	
	3. Ensure that Expansion Archangel Links (EAL) are established to the PNs	On the Avaya server access terminal, type list system link and press Enter .	<ul style="list-style-type: none"> ● If the EAL is not up, check the ATM address for that TN2305X/TN2306X port network (list atm pnc, then display atm pnc n). ● If the ATM address is incorrect, enter the correct ATM address (change atm pnc n) and retest.

1 of 2

Table 38: ATM-PNC installation test procedure (continued)

✓	What to check	How to check	How to fix
	4. Place test call to any PN remoted through the ATM network.	Dial an administered number on a remoted PN.	
	5. Verify synchronization	Query ATM switch to make sure it is in "locked" state	

2 of 2

Table 39: ATM-CES installation test procedure

✓	What to check	How to check	How to fix
	1. Check SONET/SDH layer for status and alarms.		
	2. Check the LEDs on the ATM circuit packs	Refer to the maintenance book for descriptions of the LEDs, their flash rates, and the conditions indicated.	
	3. Temporarily disable any call overflows through administration across each CES trunk group.	Place test call to any PN remoted through each signaling group. Make sure call completes and has a 2-way talk path.	
	4. Ensure CDR records properly, if enabled		
	5. Verify that ISDN features are working		

Chapter 6: Troubleshooting

This chapter provides the following troubleshooting information:

- [Contact information](#)—Lists Avaya service organizations and helplines for U.S. and international installations
- [Serviceability](#) details the enhanced command and reports for more easily isolating and diagnosing ATM network problems. New reports, data, and automatic circuit pack reset command to help you and service organizations maintain ATM-network applications.
- [Alarms and Errors](#)—Lists ATM maintenance objects and the platforms on which you can expect alarms and errors.
- [Troubleshooting ATM-PNC](#)—Provides tips for troubleshooting Avaya servers ATM-PNC interfacing with ATM switches.

Note:

Information on troubleshooting specific ATM switches is found in your ATM switch's quick reference guide.

Contact information

Avaya service organizations

[Table 40](#) lists initial contact information for Avaya’s service and support. In cases where there is trouble and the customer cannot tell where it resides, call the Technical Service Organization (TSO) or Global Strategic Opportunities Division (GSOD) first.

Table 40: Avaya service organizations—initial contact information

Organization	Contact information
Remote Technical Services (RTS)	<ul style="list-style-type: none"> ● Customers: 1-800-242-2121 ● Technicians: 1-800-248-1234 ● International: Call your local direct or indirect channel partner
NetCare® Professional Services (NPS)	<ul style="list-style-type: none"> ● 1-800-237-0016
Data networking technical support	<ul style="list-style-type: none"> ● Domestic: 1-800-237-0016 (press 0 at the prompt, then dial extension 73300) ● Outside the USA: 1-813-217-2425.

Helplines

[Table 41](#) lists various HelpLine organizations that handle postsale maintenance and general usage questions.

Table 41: Helpline information

Organization		US and Canada	
		Direct	Indirect
CES	DEFINITY Helpline	1-800-225-7585	1-800-225-7585
	Maintenance	1-800-242-2121 (TSC)	1-800-242-2121 (TSC)
INS	Helpline	1-800-237-1616	Call distributor or maintenance provider
	Maintenance	1-800-237-0016	
	Provisioning	NA	1-800-996-7053 (WestCon)
GSO	Maintenance	720-444-9990	720-444-9990

International customers

- International MNC customers contact the RCOE with any problems.
- All other international customers contact their Channel Partner with any problems.

Serviceability

Circuit-pack firmware changes and modified system software improve the ATM Port Network Connectivity (ATM-PNC) application on the TN2305B and TN2306B ATM interface circuit packs.

The Serviceability reports include

- Congestion and Cell-Loss Priority (CLP) bit monitoring
 - reports the status of the AAL-5 SVCs, the links across an ATM network
 - generates ATM-NTWK alarms and reports data to the Hardware Error Log.
- SONET-/SDH-layered alarms reported with the detection and clearing time prioritized (reported hierarchically):
 - Loss of Signal (LOS)
 - Loss of Pointer (LOP)
 - Alarm Indication Signal (MS-AIS and HP-AIS)
 - Remote Defect Identifier (MS-RDI and HP-RDI)
 - Loss of Frame (LOF)
 - HP-PSL
- Cell over/underruns and lost cells
 - are based on your traffic rate.
 - apply to the bearer channels (SVCs in ATM-PNC).
 - generate ATM-NTWK warning alarms (viewed with the display errors command).
- Internal performance report
 - shows queue overruns and buffer exhaustion problems.
 - generates no alarms but logs ATM-EI and ATM-TRK errors in the Hardware Error Log.
 - indicates whether the system is properly engineered.
- Automatic circuit pack reset after 30 minutes when
 - it is not an archangel.
 - it is not scanned by an archangel.
- Control link report (status sys-link)
 - requires craft (and higher) command permissions.
 - shows originating and terminating VPI.VCI links through an PN.
 - shows the time that the link came up or went down.

- System up time report (status atm board)
 - requires craft (and higher) command permissions.
 - shows the elapsed time since the last circuit pack insertion and boot.
 - compares the administered ATM address with the network address for mismatches.
 - shows last time UNI and ILMI went up and down.
- VPI.VCI data appears on the status station screen for
 - ATM-PNC configurations. The system parameters customer-options screen must have ATM-PNC enabled.
 - the originating station.
 - up to 10 connected ports.
 - the active PNC only (duplicated systems).
- Enhancements to the list trace station or list trace tac (trunk access code) command show
 - terminating VCI for setup connections between port networks.
 - End System Identifier (ESI) portion of the ATM address for successful setups.
 - a cause code for failed setups.
 - 8 new messages to describe the setup status (setup, fail, rele, add, rej, drop, save, and reuse).

Serviceability information that follows makes it easier for you and field technicians to isolate and diagnose problems. [Table 42](#) lists the diagnostic tool, the associated command, and when or how to use the information.

Table 42: ATM serviceability enhancements

Enhancement	Command	Use this to
Report congestion and CLP bit	None (ATM-NTWK warning alarms)	Assess the ATM network's performance.
Report SONET/SDH layer alarms	None	Isolate defects in the media transmission layer through alarm indication signals (AIS).
Report cell underruns and overruns	None (ATM-NTWK warning alarms)	Compare the ATM network's performance with the your required quality of service.
Report lost cells	None (ATM-NTWK warning alarms)	Assess the ATM network's performance.

1 of 2

Table 42: ATM serviceability enhancements (continued)

Enhancement	Command	Use this to
Report internal performance problems	display errors (ATM-EI and ATM-TRK errors, not reported as alarms)	Determine whether these conditions exist: <ul style="list-style-type: none"> ● queue overruns ● buffers or resources exhausted
Report control link details	status sys-link	Show status data for a specified system link.
Circuit pack automatically resets	None	Automatically reset an ATM circuit pack after 30 minutes in specific conditions.
Report system up time	status atm board	Determine when the circuit pack was last inserted or when a link went up or down.
Alarm reporting modified	None (ATM-EI and ATM-TRK alarms remapped as ATM-NTWK)	Assess the ATM network's performance.
Display VPI.VCI data	status station	Diagnose network problems without onsite personnel.
VPI.VCI assignments	list trace	Track successful and failed call setups.

2 of 2

Report congestion and CLP bit

Each ATM Interface tracks the number of received cells having the congestion indicator or the Cell-Loss Priority (CLP) bit set (marked). The total number of both types of cells either

- generates ATM-NTWK warning alarms when the number of marked cells received by the circuit pack (totaled across all SVCs) exceeds 100.
- retires ATM-NTWK warning alarms when the circuit pack receives less than 90 marked cells within the previous 15 minutes.

Note:

Only AAL-5 SVCs are monitored for CLP or congestion markings.

Report SONET/SDH layer alarms

SONET/SDH layer alarms are reported with priority (hierarchically). These include:

- Loss of Signal (LOS)
- Loss of Pointer (LOP)
- Alarm Indication Signal (MS-AIS and HP-AIS)
- Remote Defect Identifier (MS-RDI and HP-RDI)
- Loss of Frame (LOF)
- HP-PSL

The switch masks downstream defects within one transmission network layer. For example, if a defect is detected within the media transmission network layer, the downstream notification occurs through AIS in that layer and does not occur in a client layer also (for example, the path network layer).

Each reported alarm shows the time it was detected and the time it was cleared. Only the highest level alarm reports, as defined in the hierarchy ([Table 43](#)), where a

- + indicates that the defect contributes as an AND to the Boolean expression for the failure
- – indicates that the defect contributes as an AND NOT (NAND).
- no entry means that the defect is not considered when evaluating that failure.

Table 43: Synchronous Transmission Fault Condition: Contributing Synchronous Defects

	Defect							
	LOS	LOF	MJS-AIS	MS-RDI	HP-AIS	LOP	HP-PSL	HP-RDI
LOS	+							
LOF	–	+						
MJS-AIS	–	–	+					
MS-RDI	–	–	–	+				
HP-AIS	–	–	–		+			
LOP	–					+		

Table 43: Synchronous Transmission Fault Condition: Contributing Synchronous Defects (continued)

	Defect							
	LOS	LOF	MJS-AIS	MS-RDI	HP-AIS	LOP	HP-PSL	HP-RDI
HP-PSL		-	-		-	-	+	
HP-RDI		-	-		-	-	-	+

2 of 2

Report cell underruns and overruns

The system monitors each bearer channel (SVCs in ATM-PNC) for cell underruns and overruns. These errors are aggregated and appear as ATM-NTWK warning alarms.

In general, SVCs are set up for a certain traffic rate. For example, constant bit rate (CBR) for voice is about 173 cells/second.

- If traffic is less than this rate, cell underruns are possible.
- If traffic is higher than this rate, cell overruns are possible.

If the network and traffic parameters are well-engineered/designed, you should not experience cell underruns or overruns. In case of either, use [Table 44](#) to help troubleshoot the cause(s).

Table 44: Troubleshooting ATM cell underruns/overruns

Condition	Likely cause	Description	Action
Underrun	Network/switch jitter	In periods of high jitter, the network delays cell delivery.	Determine the cause of the network/switch jitter. You could have to contact your ATM service provider.
Overrun	Network/switch jitter resolved	When the jitter stops, delayed cells are delivered quickly.	Determine the cause of the network/switch jitter or the source of the extra network traffic.

Report lost cells

The system monitors each bearer channel (SVCs in ATM-PNC) for lost cells, which are totalled in 15-minute intervals and reported as ATM-NTWK warning alarms.

Report internal performance problems

The circuit pack reports internal performance problems including

- queue overruns
- exhausted buffers or other resources

Using an Error Type and Aux Data value to indicate the resource that experienced a performance problem, these ATM-EI (ATM-PNC applications) errors are reported in the Hardware Error Log but do not alarm. This helps service personnel or administrators understand when the Avaya server has been engineered properly for the ATM Solution

To interpret the Error Type and Aux Data fields in the Hardware Error Log, look up the use of these maintenance objects:

- ATM-EI (Expansion Interface Circuit Pack)

Report control link details

The status sys-link command shows ATM-link data for each link that goes to an PN and thereby traverses through an ATM switch, including the

- time that link last came up and last went down.
- originating and the terminating VPI.VCI data.

[Figure 43](#) shows that the link encountered a fault and recovered by switching to a different inter-switch-node fiber.

Figure 43: Status sys-link screen, page 1

```

status sys-link 2a0101                                     Page 1 of 2  SPE A

    Location: 02A0101      Type/Chan: EAL      Alarms: none
    Current Path: present  State: up           Time Up: 03/12/2001 10:48
    Faulted Path: present  Last Fault: 03/12/2001 10:50

                                Faulted Hardware Path

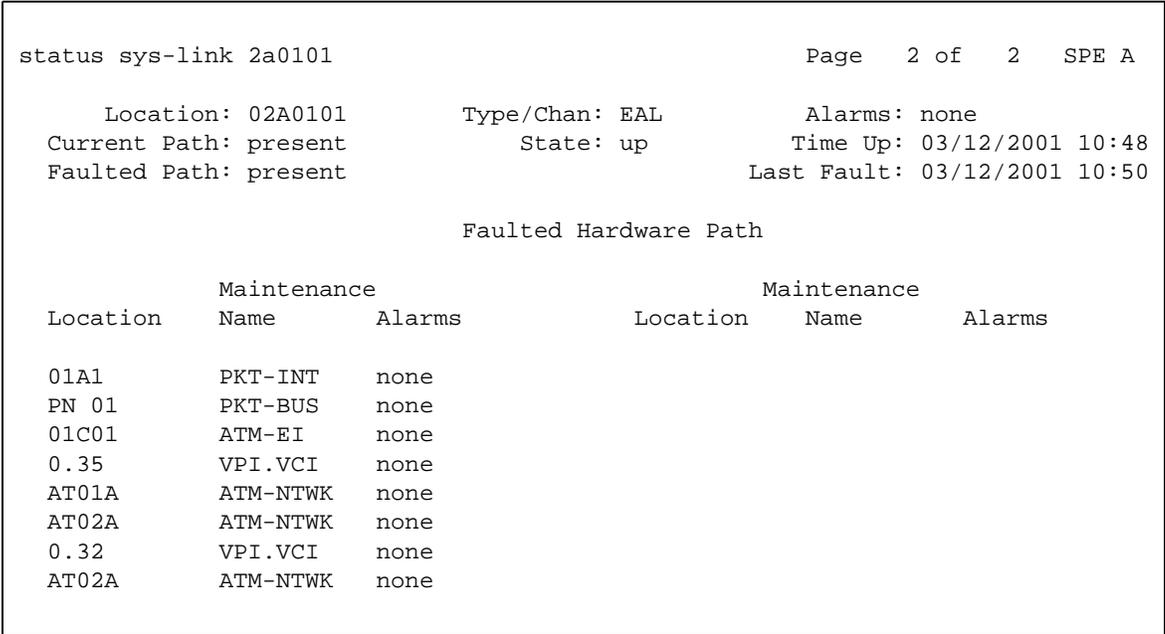
Location      Maintenance      Maintenance
Name          Alarms           Location      Name          Alarms

01A1         PKT-INT          none
PN 01        PKT-BUS          none
01C01       ATM-EI           none
0.32        VPI.VCI          none
AT01A       ATM-NTWK         none
AT02A       ATM-NTWK         none
0.32        VPI.VCI          none
AT02A       ATM-NTWK         none
    
```

Both the originating and terminating VPI.VCI links are 0.32.

Scroll to the next page of the report, and you see the old VPI.VCI path for the faulted link ([Figure 44](#)).

Figure 44: Status sys-link screen, page 2



Use these information resources to interpret the status sys-link report:

- [Figure 43](#) and [Figure 44](#)
- [Figure 45](#)

The ATM network encountered a fault at 10:48 and recovered 2 minutes later using a different VPI.VCI link ([Figure 45](#)).

Figure 45: Troubleshooting schematic (status sys-link)

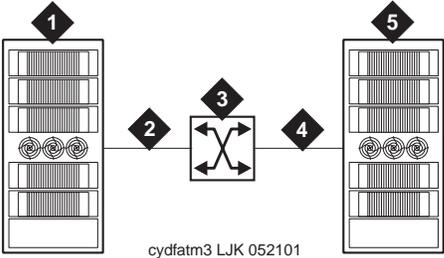


Figure notes:

- 1. IPSI-connected PN
- 2. VPI.VCI = 0.35
- 3. ATM network
- 4. VPI.VCI = 0.32
- 5. PN

Troubleshooting

Additionally, use the following information when interpreting this report:

- If the VPI.VCI information is not available for an ATM segment of the link, n/a appears.
- If an SVC is down at the point that you enter the status sys-link command, the VPI.VCI data indicates when the SVC was up.
- A "-d" (down) follows the VPI.VCI value (for example, 0.1234-d).

Circuit pack automatically resets

The circuit pack automatically resets after 30 minutes if

- it is not an archangel.
- it is not scanned by an archangel.

Report system up time

By using the status atm board command technicians can get a report listing the time elapsed since the

- circuit pack was last inserted.
- UNI link and ILMI link last went up and down.
- value of the sysUpTime variable for both the circuit pack and the corresponding network end of the ILMI link.

[Figure 46](#) shows the command output.

Figure 46: Status atm board screen

```
status atm board 02A01                               Page 1 of 1     SPE A

      Location: 02A01      Personality: ATM-EI

ATM Address: 1234567890123456789012345678901234567890 Mismatch: No
Last Board Insertion: mm/dd/yyyy hh:mm
Board sysUpTime: 1234567890      Network sysUpTime: 1234567890
UNI   State: up Last Down: mm/dd/yyyy hh:mm Last Up: mm/dd/yyyy hh:mm
ILMI  State: up Last Down: mm/dd/yyyy hh:mm Last Up: mm/dd/yyyy hh:mm
```

Note:

Only circuit packs administered as ATM-EI or ATM-TRK personalities appear the Location, Last Board Insertion date and time, and Board sysUpTime fields. All other fields are turned off.

Alarm reporting modified

The ATM-related maintenance objects report conditions

- on the ATM circuit pack
- in the ATM network

and do not always reflect hardware conditions within your Avaya server. In order to fairly assess the ATM network's performance, we recommend that you examine the

- Hardware Error Log (display errors) for ATM-NTWK errors, indicating ATM network faults (See the ATM-NTWK (ATM Network) maintenance object.)
and the
- Red LED on the TN2305A/B or TN2306A/B circuit pack's faceplate, visually indicating network faults.

[Table 45](#) shows the Cause Code (Error Types) that are now reported against the ATM-NTWK maintenance object:

Table 45: A few samples of the network errors reported by ATM-NTWK

Cause Code/ Error Type	Aux Data	Description
769		AAL5 or LAPD excessive
770		ATM UCH
771		VPI.VCI unknown
1281	16	Loss of Signal (LOS)
1281	17	Loss of Frame (LOF)
1281	18	Alarm Indication Signal (MS-AIS)
1281	19	Remote Defect Identifier (MS-RDI)
1281	20	Loss of Pointer (LOP)
1281	21	HP-PSL
1281	22	Alarm Indication Signal (HP-AIS)

Note:

These alarms still contribute to the parameters that determine PNC interchanges. For a complete list of possible network errors reported by ATM-NTWK, see the applicable maintenance documentation for your switch.

Display VPI.VCI data

For ATM-PNC configurations, an additional page to the status station screen appears and contains information about

- the VPI.VCI for the originating station.
- up to 10 connected port(s).
- the VPI.VCI associated with the connected port(s).

Use this command to get a snapshot of the VPI.VCI data for a specific station. These data enable you to diagnose their network(s) without onsite service personnel or Avaya technical support.

Command interactions

Also consider the following interactions when issuing or interpreting the status station command.

- For connected ports that are located in the same port network as the originating station, the VPI.VCI value of n/a appears.
- If VPI.VCI value has -d (down) added at the end (for example, 0.1234-d), this means that the SVC is down.
- This page appears only if ATM-PNC is enabled on the system parameters customer-options screen.
- For PNC Duplication, only the active VPI.VCI is shown.
- VPI.VCI data are not shown for:
 - status trunk
 - status access-endpoint
 - status attendant
 - status bri-port
 - status data-module

VPI.VCI assignments

The list trace command includes the terminating VCI number for setup connections between port networks. The command syntax for the qualifiers to this command are:

- list trace station xxxxx/a where xxxxx is the station number, and /a means that you are requesting ATM-specific data.
- list trace tac xxx/a where xxx is the trunk access code number, and /a means that you are requesting ATM-specific data.

Example

[Figure 47](#) shows VPI.VCI data for a successful 2-party call setup.

Figure 47: List trace screen (list trace station)

```
list trace station 52501/a                               Page 1 of 1   SPE B
                                                         LIST TRACE
time          data
15:12:07     Calling party station    57405 cid 0x20
15:12:09     dial 52501
15:12:09     ring station 52501 cid 0x20
15:12:09     ATM setup PN01-0081 to PN03-0045
15:12:09     ATM setup PN03-0046 to PN01-0082
15:12:11     active station 52501 cid 0x20
15:12:22     idle station 57405 cid 0x20
```

- If the setup is successful, the assigned VPI.VCI appears along with the Port Network (PN) number portion of the ATM address.
- If the setup fails, the cause code associated with the failure appears.

These events are not included in the list trace command:

- Parties dropped from the SVC by the network after a successful add party are neither detected nor reported.
- SVCs released or saved in the cache after the phone call is terminated are not traced. This applies to SVCs in existence when a call is hung up, and to SVCs that belonged to a discarded call when it is merged into another call.
- Events on SVCs not actually assigned to the call. This primarily includes SVCs supporting announcements, music and automatic wake-up. These SVCs are considered system resources and do not belong to any one call.
- Many events are not traced unless new firmware exists on both the originating and terminating ATM-EI boards. Some events only require new firmware on the originating or terminating board.
- Only events on the active PNC are reported. Events on the standby PNC, if any, are ignored.

Alarms and Errors

Depending on the ATM-PNC application and the Avaya server you have, [Table 46](#) describes the ATM maintenance objects and the platforms on which you can expect alarms and errors to occur. For specific maintenance information refer to one of the following books:

- *Maintenance Alarms for Avaya Communication Manager Media Gateways and Servers* (03-300190)
- *Maintenance Commands for Avaya Communication Manager Media Gateways and Servers* (03-300191)
- *Maintenance Procedures for Avaya Communication Manager Media Gateways and Servers* (03-300192)

Table 46: ATM maintenance objects descriptions

Maintenance object	Description	PNC	CES	Avaya server			
				S8700	S8500	SI	CSI
ATM-BCH	Monitors the bearer channels containing digitized voice and data		X	X	X	X	X
ATM-DCH	Monitors the signaling channel containing control messages		X	X	X	X	X
ATM-EI	ATM Expansion Interface provides port network connectivity between the PN(s).	X		X			
ATM-INTF	ATM Interface provides basic maintenance (test and reset) for ATM circuit packs that have not been administered as ATM Expansion Interface (ATM-EI) or ATM trunk (ATM-TRK).	X	X	X	X	X	X
ATM-NTWK	Indicates problems with the network, primarily signaling, including the ATM switch(es).	X		X			
ATM-SGRP	Monitors ATM signaling groups.		X	X	X	X	X

1 of 2

Table 46: ATM maintenance objects descriptions (continued)

Maintenance object	Description	PNC	CES	Avaya server			
				S8700	S8500	SI	CSI
ATM-SYNC	Monitors the common reference frequency among the Communication Manager server, the ATM switch(es), central offices (CO), and customer premise equipment (CPE)	X		X			
ATM-TRK	Monitors the ATM circuit pack when administered for trunking.		X	X	X	X	X
EXP-PN	Is responsible for overall maintenance of a PN	X		X			
SYS-LINK	Monitors system links		X	X	X	X	X

2 of 2

Troubleshooting ATM-CES

[Table 47](#) provides a first-level method for troubleshooting an installation.

Table 47: ATM-CES installation troubleshooting checklist

Problem	Solution
On System Parameters Maintenance screen Is Bus Bridge field set to enabled ? (csi) Is Packet Bus field set to activated ? (S8700, si) Are EI circuit packs TN570Bs or later?	Set to correct field Set to correct field Verify/replace EI circuit packs
All COR, COS, UDP, FRLs, AAR, and ARS support proper routing	Verify they are all set correctly

Troubleshooting

The following list provides tips for further ATM-CES troubleshooting:

- [Inspecting LEDs](#)—Describes the possible LED states on the
 - TN2305X/TN206X ATM interface circuit packs
 - ATM switch
- [Troubleshooting interoperability](#)—Provides guidelines for troubleshooting
 - [Physical connections](#)
 - [Administration](#)
 - [TN2305X/TN206X circuit pack](#)
 - [ATM signaling architecture](#)
- [Unusual ATM trouble conditions](#)—Describes difficult-to-diagnose failure modes in the Communication Manager server and ATM switch combinations.
- [ATM-CES troubleshooting commands](#)—Describes specific troubleshooting commands.

Inspecting LEDs

To get a high-level status of the system, observe the LEDs on the TN2305X/TN206X ATM interface circuit packs and the ATM switch. For information on interpreting the LEDs on the ATM switch, refer to your switch's quick reference guide. For information on interpreting the LEDs on the TN2305X/TN206X circuit packs, refer to the following books:

- *Maintenance Alarms for Avaya Communication Manager Media Gateways and Servers* (03-300190)
- *Maintenance Commands for Avaya Communication Manager Media Gateways and Servers* (03-300191)
- *Maintenance Procedures for Avaya Communication Manager Media Gateways and Servers* (03-300192)

Troubleshooting interoperability

This section covers the following ATM interoperability topics:

- [Physical connections](#)—Checks for correct ATM installation and configuration
- [Administration](#)—Checks for correct Communication Manager and ATM switch administration
- [TN2305X/TN206X circuit pack](#)—Checks LED status, circuit pack insertion, and demand tests
- [ATM signaling architecture](#)—Checks the interoperability between the Communication Manager server and the ATM switch

Because Avaya offers a variety of ATM switches, this discussion suggests general rather than specific diagnostics.

Physical connections

Has the ATM switch been installed and configured correctly?

Diagnostics

- Is the ATM switch powered up?
- If you are administering the ATM switch through a locally attached console, is there a local console terminal connected to the console port on the ATM switch processor circuit pack with the correctly pinned RS232 serial cable?
- If you are administering the ATM switch through telnet over the Ethernet, is there an Ethernet drop plugged into the Ethernet port on the ATM switch processor board? (Note that a few ATM switch commands may only be permitted over the local console terminal.)
- Has the ATM switch been booted using either a reset button or by turning the power off then on again?
- Did the ATM switch go through a normal power up sequence, including testing all of the LEDs?
- Are any ATM switch FAULT LEDs lit?
- Are the remaining ATM switch LEDs in a normal state?
- Can you log into the ATM switch console using the diagnostic account from the local console terminal or through telnet? If so, check the system status
 - a. If the customer is providing an Ethernet connection to the ATM switch, does the `Ethernet IP address` field have the customer-provided Internet address?

Note:

You might not be able to administer the ATM switch through a telnet connection over the Ethernet, but if you are able to, make sure the Ethernet address is correct.

- b. If the customer is providing an Ethernet connection to the ATM switch, does the `Ethernet IP mask` field have the customer-provided mask (typically something like `255.255.255.0`, although other values are valid)?
- c. If the customer is providing an Ethernet connection to the ATM switch, does the **IP default router** field have the customer-provided Internet address?
- d. If the customer is providing an Ethernet connection to the ATM switch and intends to upload to or download from a TFTP server, does the **TFTP server** field have the customer-provided Internet address?
- e. Does the **ATM address** field have the correct network prefix (the first 13 bytes)?
- f. On the ATM switch, is the PVC administered correctly?

Administration

Is ATM-CES administered correctly?

D-channel problems - If the D-channel does not come up following CES administration, use the following steps to troubleshoot the cause.

Table 48: Troubleshooting CES

✓	Step	Action	Description
	1.	Verify PVC is correctly administered	Check VPI/VCI (change signaling-group siggrpnbr , screen 2)
	2.	Check channel number	Check that both ends of the emulated circuit have the same number of channels (change signaling-group siggrpnbr , screen 2).
	3.	Check trunks	Both ends of the emulated circuit have the same number of trunks (change trunk-group trkgrpnbr , screen 6). Note: A trunk group can contain either ISDN or ATM trunks but not both.
	4.	Check channels	Both ends of the emulated circuit use the same channel numbers (change signaling-group siggrpnbr , screen 2). Use the same channel numbers for the port to channel mapping (page 2) for the other end. See Changing the port-to-channel mapping on page 105 for more information.
	5.	Check maximum number of emulated circuits	The maximum number of emulated circuits (signaling groups) on a single ATM circuit pack is 8. <ul style="list-style-type: none"> Each circuit pack can have more than one signaling group and more than one D-channel The D-channel from one emulated circuit cannot signal for the bearer channels of another emulated circuit (no Nonfacility Associated Signaling for virtual circuits).

1 of 2

Table 48: Troubleshooting CES (continued)

✓	Step	Action	Description
	6.	Check minimum ports for emulated circuit	A minimum of 7 ports must be administered for each emulated circuit as follows: <ul style="list-style-type: none"> • at least 6 bearer (B) channels • one signaling (D) channel (required)
	7.	Check D-channel administration	The D-channel is administered in a port numbered 009–032 (display signaling-group siggrpnbr , screen 2). <p>Note: The D-channel is automatically populated in channel 24 (T1) and channel 16 (E1) and this must match on both ends.</p>
	8.	Check trunk limits	Avaya server trunk limits must not be exceeded (see Table 49)

2 of 2

Table 49: Avaya server trunk capacities by model

Capacity	csi, si	S8500	S8700
Maximum trunks per trunk group	99	255	255
Maximum number of trunk groups	99	2000	2000
Maximum number of trunks in the system	400	800	8000

Note:

Port numbers on each end of the emulated circuit do not have to match.

Is the ATM switch administered correctly?

To verify that a specific Avaya ATM switch was administered correctly, refer to the appropriate reference guide.

TN2305X/TN206X circuit pack

Did the TN2305X/TN206X come up correctly?

1. Review the LED conditions for the TN2305X/TN206X (refer to the appropriate maintenance book for LED indications):
 - Do the TN2305X/TN206X LEDs indicate a normal operational state (any of the following):
 - Active in the PN
 - Standby in the PN
 - Archangel mode in the PN
 - CES in any PN
2. If after circuit pack insertion or a demand reset:
 - Do the TN2305X/TN206X LEDs indicate that it is booting?
 - Do the TN2305X/TN206X LEDs indicate it is downloading its DSPs?
 - Do the TN2305X/TN206X LEDs indicate that circuit pack is not completely inserted?
 - Do the TN2305X/TN206X LEDs indicate a maintenance alarm?
3. If the TN2305X/TN206X is inserted and shows a vintage number, type **test board UUCSS** and press **Enter**; [Figure 48](#) displays.

Figure 48: Screen output for test board *number*

```

test board 1b11
Page 1

TEST RESULTS

Port      Maintenance Name  Alt. Name  Test No.  Result      Error Code
-----
01B11    ATM-TRK           598        PASS
01B11    ATM-TRK           1293       PASS      888
01B11    ATM-TRK           1259       PASS
01B11009 ATM-BCH           001/006    255       PASS
01B11009 ATM-BCH           001/006    256       PASS
01B11009 ATM-BCH           001/006    257       PASS
01B11010 ATM-BCH           001/001    255       PASS
01B11010 ATM-BCH           001/001    257       PASS
01B11011 ATM-BCH           001/002    255       PASS
01B11011 ATM-BCH           001/002    256       PASS
01B11011 ATM-BCH           001/002    257       PASS
01B11012 ATM-BCH           001/003    255       PASS
01B11012 ATM-BCH           001/003    256       PASS
01B11012 ATM-BCH           001/003    257       PASS
01B11013 ATM-BCH           001/004    255       PASS
01B11013 ATM-BCH           001/004    256       PASS
01B11013 ATM-BCH           001/004    257       PASS
01B11014 ATM-BCH           001/005    255       PASS
01B11014 ATM-BCH           001/005    256       PASS
01B11014 ATM-BCH           001/005    257       PASS
01B11200 ATM-BCH           001/007    255       PASS
01B11200 ATM-BCH           001/007    256       PASS
01B11200 ATM-BCH           001/007    257       PASS
01B11015 ATM-DCH           643        PASS
1        ATM-SGRP          636        PASS
1        ATM-SGRP          1291
1        ATM-SGRP          647
    
```

- The `Result` field should show `PASS` for each test number. If any of the tests fail, refer to the ATM-TRK maintenance object in one of the following books:
 - *Maintenance Alarms for Avaya Communication Manager Media Gateways and Servers* (03-300190)
 - *Maintenance Commands for Avaya Communication Manager Media Gateways and Servers* (03-300191)
 - *Maintenance Procedures for Avaya Communication Manager Media Gateways and Servers* (03-300192)

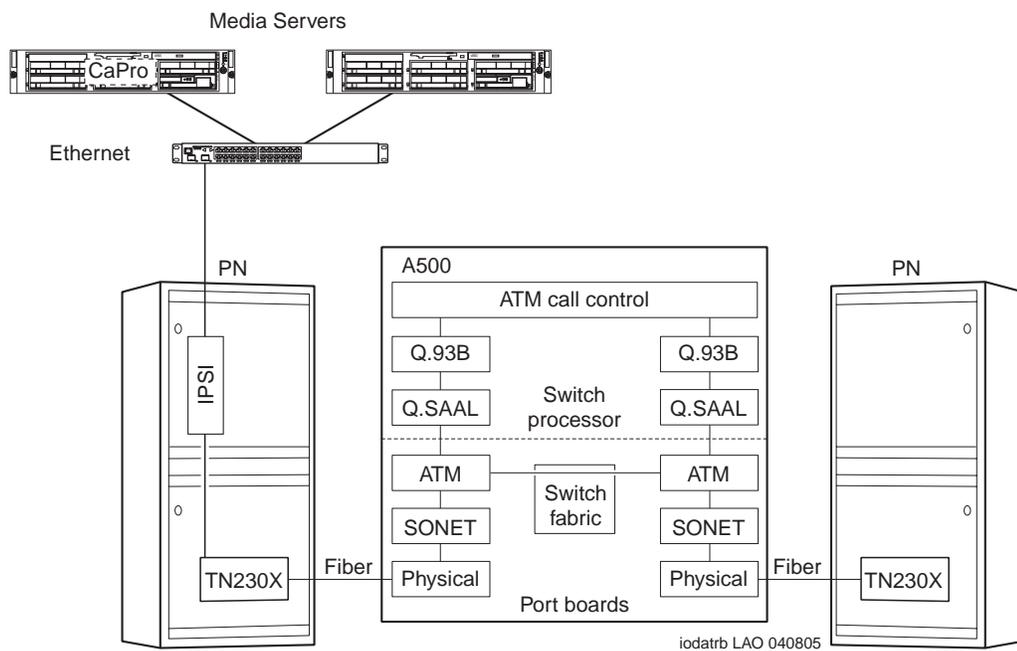
Possible causes

1. The TN2305X/TN206X circuit pack is in a slot different from the Communication Manager administration.
2. The TN2305X/TN206X was not completely inserted.

ATM signaling architecture

Troubleshooting interoperability between the Avaya server and the ATM switch involves understanding the architecture of ATM signaling ([Figure 49](#)). An Avaya Cajun A500 network switch is used to show this concept.

Figure 49: ATM signaling architecture



The following list shows the ATM-stack layers discussed in this section:

- [Physical layer](#)
- [SONET/SDH layer](#)
- [Call processing \(CaPro\) Layer](#)

Physical layer

Is there an optical signal between the TN2305X/TN206X and the ATM switch?

1. Identify the OC-3/STM-1 ports on the ATM switch that have port networks attached.
 - Be aware that customers may use other ports on the ATM switch for applications unrelated to their Communication Manager servers (LAN traffic or multimedia applications, for examples).
 - These other applications may manifest themselves in the output of the troubleshooting commands you run on the ATM switch. Avaya server port networks must be identified by their ATM switch port numbers.

Note:

The following examples show Avaya server port networks connected to ATM switch ports A1.1 and A1.2.

2. Does the TN2305X/TN206X's YELLOW LED flash 100 ms on and 100 ms off, indicating a loss of signal on the fiber? Recall that the TN2305X/TN206X detects continuity problems with either the transmit (bottom) or the receive (top) fibers.

If the fiber shows a loss of signal, refer to the "Fiber Fault Isolation Procedure" in *Maintenance Procedures for Avaya Communication Manager Media Gateways and Servers* (03-300192).
3. Is the ATM switch port's LED indicating a loss of signal on the fiber? Note that the ATM switch may detect continuity problems only with the receive fiber; the state of the transmit fiber might not be detected.
4. Refer to your ATM switch's quick reference guide for troubleshooting commands.

Possible causes -

Check the following list for possible causes.

- The fiber is disconnected from the ATM switch and/or the TN2305X/TN206X circuit pack.
- The transmit and receive fibers are swapped at the ATM switch or the TN2305X/TN206X circuit pack (but not both).
- There is a break in the fiber.
 - The TN2305X/TN206X is not transmitting a carrier (not inserted, not powered, or not administered). See the ATM-TRK maintenance object in one of the following books:
- *Maintenance Alarms for Avaya Communication Manager Media Gateways and Servers* (03-300190)
- *Maintenance Commands for Avaya Communication Manager Media Gateways and Servers* (03-300191)
- *Maintenance Procedures for Avaya Communication Manager Media Gateways and Servers* (03-300192)

Troubleshooting

- Hardware safety interlocks on optical transceivers may cut transmitter power if no carrier is received, so lack of a receive carrier could indicate a transmitter problem at the same end.
- The ATM switch does not recognize that a port circuit pack is in the slot. You may need to re-administer the ATM switch port boards. Refer to your ATM switch's quick reference guide for further information.

Recommended Action

1. Plug in, swap, repair, or replace the fiber as necessary.
2. Verify that the port circuit pack is completely inserted.

SONET/SDH layer

Are SONET/SDH frames reaching the ATM switch?

Is the ATM switch port's LED indicating no cell traffic?

- Check the transmit and receive cell count fields. Each field's values should be increasing if the TN2305X/TN206X is actively sending and receiving cells to and from the ATM switch.
- Check for SONET/SDH layer alarms, LOP, LOF, LOS, and so on.
- If neither field is increasing, the ATM switch port may be down. Verify that the admin status is up.
- If the receive cell count is increasing but the transmit cell count is not increasing, this may be because the port was administered with no UNI signaling. Ensure that signaling is UNI3.1.
- Although the error counters may not be zero, they should not be large either compared with the receive and transmit cell counters. If the counters are large and increasing, check the fiber integrity. Make sure the fiber pairs are securely plugged into both the TN2305X/TN206X circuit pack and the ATM switch.
- If the fiber has been pulled and reinserted as part of fault diagnosis, the nonzero loss of signal error counter may be correct.

Call processing (CaPro) Layer

Are control channels being established from the IPSI-connected PN to the other PNs?

Diagnostics

- Do you get a dial tone on a set on the port network in question?
 - Can you ring a set on the PN dialing from the IPSI-connected PN and vice-versa?
1. Type **list sys-link** and press **Enter**. [Figure 50](#) shows the screen output.

Troubleshooting

- These virtual circuits may persist beyond the duration of a phone call. The Avaya Call Processing software saves virtual circuits for a few seconds after the end stations have hung up in case the VC can be used again for another call between the same two port networks.
- There may be other CBR virtual circuits between ATM switch ports that are not associated with port networks. A common CBR application is Circuit Emulation, in which T-1, T-3, and so forth circuits are carried over ATM.

Unusual ATM trouble conditions

A few failure modes in the Avaya server/ATM switch combinations are particularly difficult to diagnose. One example might be that you cannot make a completely successful call even though most indications from the Avaya server and the ATM switch look good.

This section documents some hints and clues that may help diagnose the following failure modes:

- [Incorrectly typed or omitted PN route or end system identifier \(ATM switch\)](#)
- [Swapped routes, end system identifiers, or fiber between an IPSI-connected PN and an PN](#)

Incorrectly typed or omitted PN route or end system identifier (ATM switch)

Symptoms

Talk paths are one-way, from one PN to another PN: you can hear tones from the originating PN end station to the other PN end station but not vice versa. Because the signaling channels are bidirectional virtual circuits (VCs) established between PNs, these can be routed correctly and come up just fine. Talk paths are two unidirectional virtual circuits, so a single call has one VC from the originating PN to the receiving PN (which is routed correctly) and one VC from the receiving PN to the originating PN (which cannot be routed).

Diagnostics

1. At the ATM switch, check the ATM addresses.
2. Look for a cause code 3 (No route to destination).

Action

1. Correct the ATM address translations in the ATM switch.

Swapped routes, end system identifiers, or fiber between an IPSI-connected PN and a non-IPSI-connected PN

Symptoms

- An incorrectly connected PN TN2305X/TN206X circuit pack is not completely inserted.
- Dial tone is present on end stations on correctly connected PNs, but no dial tone is present on the affected PN end stations.
- Calls cannot be made between PNs because talk paths cannot be routed correctly.

Diagnostics

1. Check to see if the ATM switch shows VBR control channels from the ATM switch port intended for the incorrectly connected PN (but actually connected logically or physically to the other PNs) that should not exist.

Action

1. Correct the ATM addresses (or swap fibers) on the ATM switch between the incorrectly connected PNs.

ATM-CES troubleshooting commands

If ATM-CES is enabled (**change system-parameters customer-options**), 2 commands become available:

- **change/display signaling-group *siggrpnbr*** lets you determine the number of channels and lets you know their slot location.
- **change trunk-group *trkgrpnbr*** lets you determine the number of trunks.

Troubleshooting ATM-PNC

This section describes the process for troubleshooting the ATM-PNC interface with the ATM switch.

- [Inspecting LEDs](#)—Describes the possible LED states on the
 - TN2305X/TN206X ATM interface circuit packs
 - ATM switch
- [Troubleshooting interoperability](#)—Provides guidelines for troubleshooting

Troubleshooting

- [Physical connections](#)
- [Administration](#)
- [TN2305X/TN206X circuit pack](#)
- [ATM signaling architecture](#)
- [Unusual ATM trouble conditions](#)—Describes difficult-to-diagnose failure modes in the Avaya server and ATM switch combinations.
- [ATM-PNC troubleshooting commands](#)—Describes the following specific troubleshooting commands:
 - [change/display atm pnc-pairs](#)
 - [list measurements atm pnc-latency](#)

Inspecting LEDs

To get a high-level status of the system, observe the LEDs on the TN2305X/TN206X ATM interface circuit packs and the ATM switch. For information on interpreting the LEDs on the ATM switch, refer to your switch's quick reference guide. For information on interpreting the LEDs on the TN2305X/TN206X circuit packs, refer to the following book:

- *Maintenance Alarms for Avaya Communication Manager Media Gateways and Servers* (03-300190)

Troubleshooting synchronization (401A/402A/403A)

To troubleshoot 401A/402A/403A synchronization problems, follow the procedures in [Table 50](#).

Table 50: Troubleshooting 401A/402A/403A synchronization

✓	Step	Action	Description
	1.	Check all connections	If the LEDs on the DS1 circuit pack indicate an error condition, or any of the tests associated with testing the DS1 circuit pack fails, recheck all cables, connectors, and the splitter connection to the back of the DS1 circuit pack.
	2.	Test the circuit pack	Test the circuit pack (test board UUCSS). If the tests pass, go to step 13 (release). If a test fails, continue with step 3.

1 of 3

Table 50: Troubleshooting 401A/402A/403A synchronization (continued)

✓	Step	Action	Description
	3.	Reseat circuit pack	Reseat the DS1 circuit pack.
	4.	Retest the circuit pack	Repeat the test (test board UUCSS). If Tests 138 through 145 pass, go to step 13 (release). If any test fails, go to step 5.
	5.	Busyout the DS1 circuit pack	To suppress alarms on the DS1 circuit pack, type busyout board UUCSS and press Enter .
	6.	Remove splitter	Remove the splitter from the DS1 circuit pack.
	7.	Connect cable directly on DS1 circuit pack	Reconnect the cable directly to the back of the DS1 circuit pack (without the splitter) and reseat the DS1 circuit pack. After approximately 30 seconds the DS1 Status LEDs should extinguish, leaving only the green Status 3 LED on steady.
	8.	Test the circuit pack	Test the circuit pack (test board UUCSS) and verify that the DS1 circuit pack passes Tests 138 through 145. If any one of Test 138 through 145 fails, follow the repair procedures listed in <i>Maintenance Procedures for Avaya Communication Manager Media Gateways and Servers</i> (03-300192).
	9.	Replace splitter	If the tests pass, replace the splitter onto the back of the DS1 circuit pack.
	10.	Reseat the circuit pack	Reseat the DS1 circuit pack and check the Amphenol connectors, making sure they are seated properly.
	11.	Test the circuit pack	Test the circuit pack (test board UUCSS) and verify that the DS1 circuit pack passes Tests 138 through 145. If any one of Test 138 through 145 fails, follow the repair procedures listed in <i>Maintenance Procedures for Avaya Communication Manager Media Gateways and Servers</i> (03-300192), or replace the splitter.
	12.	Escalate if necessary	If the DS1 circuit pack tests OK, go to step 13. If step 11 still fails, escalate to Tier 3 or replace the splitter.

Table 50: Troubleshooting 401A/402A/403A synchronization (continued)

✓	Step	Action	Description
	13.	Release the circuit pack	Release the DS1 circuit pack (release board UUCSS).
	14.	Verify active synchronization source	Verify that the designated DS1 circuit pack is now the <i>active</i> sync source (status synchronization).

3 of 3

Troubleshooting interoperability

This section covers the following ATM interoperability topics:

- [Physical connections](#)—Checks for correct ATM installation and configuration
- [Administration](#)—Checks for correct Communication Manager and ATM switch administration
- [TN2305X/TN206X circuit pack](#)—Checks LED status, circuit pack insertion, and demand tests
- [ATM signaling architecture](#)—Checks the interoperability between the Communication Manager server and the ATM switch

Because Avaya offers a variety of ATM switches, this discussion suggests general rather than specific diagnostics.

Physical connections

Has the ATM switch been installed and configured correctly?

Diagnostics

- Is the ATM switch powered up?
- If you are administering the ATM switch through a locally attached console, is there a local console terminal connected to the console port on the ATM switch processor circuit pack with the correctly pinned RS232 serial cable?
- If you are administering the ATM switch through telnet over the Ethernet, is there an Ethernet drop plugged into the Ethernet port on the ATM switch processor board? (Note that a few ATM switch commands are only permitted over the local console terminal.)
- Has the ATM switch been booted using either a reset button or by turning the power off then on again?

- Did the ATM switch go through a normal power up sequence, including testing all of the LEDs?
- Are any ATM switch FAULT LEDs lit?
- Are the remaining ATM switch LEDs in a normal state?
- Can you log into the ATM switch console using the diagnostic account from the local console terminal or through telnet? If so, check the system status
 - a. If the customer is providing an Ethernet connection to the ATM switch, does the `Ethernet IP address` field have the customer-provided Internet address?

Note:

You might not be able to administer the ATM switch through a telnet connection over the Ethernet, but if you are able to, make sure the Ethernet address is correct.

- b. If the customer is providing an Ethernet connection to the ATM switch, does the `Ethernet IP mask` field have the customer-provided mask (typically something like `255.255.255.0`, although other values are valid)?
- c. If the customer is providing an Ethernet connection to the ATM switch, does the **IP default router** field have the customer-provided Internet address?
- d. If the customer is providing an Ethernet connection to the ATM switch and intends to upload to or download from a TFTP server, does the **TFTP server** field have the customer-provided Internet address?
- e. Does the **ATM address** field have the correct network prefix (the first 13 bytes)?

Administration

Administration must be correct for both the Avaya server and ATM switches.

Avaya server administration

ATM-PNC - Is ATM-PNC administered correctly?

1. Type **list atm pnc** and press **Enter**. The cabinet, carrier and slot positions of each administered TN2305X/TN206X circuit pack display is as shown in [Figure 51](#). Ensure that each circuit pack's physical location matches the display.

Figure 51: Screen output for list atm pnc command

```
list atm pnc                                     Page 1 SPE A
ATM PNC
PNC          A-PNC          B-PNC
Connection # LOC          LOC
1            01B02
2            02A01
```

Alternatively, type **list configuration UUC** and press **Enter** (noncontrol cabinets) to confirm the PN circuit pack locations and correct insertion.

2. Type **status pnc** and press **Enter**. This display tells you which TN2305X/TN206X circuit pack is active in a duplicated system and how many alarms (if any) of each severity level have been logged for the circuit pack. [Figure 52](#) shows the output from this command.

Figure 52: Screen output for status pnc command

```
status pnc
PORT NETWORK CONNECTIVITY
Duplicated? no
Software Locked?
Standby Busied?
Standby Refreshed?
Interchange Disabled?
A-PNC          B-PNC
Mode: active   Mode:
State of Health: functional State of Health:
Inter PN Index: 00.00.00   Inter PN Index:
Major Alarms: 0           Major Alarms:
Minor Alarms: 0           Minor Alarms:
Warning Alarms: 0         Warning Alarms:
```

3. Type either **list configuration UUC** (for the carrier in which the ATM interface circuit packs reside) or **display circuit-packs cabinet** (noncontrol cabinet) and press **Enter**. This command tells you in more detail what boards are in which slots in each cabinet and carrier. Verify that the TN2305X/TN206Xs are physically located in the slots indicated on the display. [Figure 53: Screen output for display circuit-packs 1](#) on page 155 shows the output for the **display circuit-packs 1** command; [Figure 54: Screen output for circuit-packs 2](#) on page 156 shows the output for the **display circuit-packs 2** command.

Figure 53: Screen output for display circuit-packs 1

```
display circuit-packs 1

                                CIRCUIT PACKS

      Cabinet: 1                      Carrier: A
Cabinet Layout: five-carrier        Carrier Type: processor

                                CIRCUIT PACKS

      Cabinet: 1                      Carrier: B
Cabinet Layout: five-carrier        Carrier Type: port

Slot Code  Sfx  Name                      Slot Code  Sfx  Name
00:                                               11: TN464  C   DS1 INTERFACE
01:                                               12: TN464  F   DS1 INTERFACE
02: TN2305          ATM PNC EI           13: TN767  F   DS1 INTERFACE
03:                                               14: TN767  C   DS1 INTERFACE
04: TN754  C   DIGITAL LINE             15: TN760  D   TIE TRUNK
05: TN746  B   ANALOG LINE              16: TN760  D   TIE TRUNK
06: TN753          DID TRUNK              17:
07: TN771  D   MAINTENANCE/TEST         18:
08: TN747  B   CO TRUNK                  19:
09: TN556  B   BRI LINE                  20:
10: TN767  C   DS1 INTERFACE

'#' indicates circuit pack conflict.
```

Figure 54: Screen output for circuit-packs 2

```

display circuit-packs 2
                                CIRCUIT PACKS

      Cabinet: 2                      Carrier: A
Cabinet Layout: single-carrier-stack  Carrier Type: expansion-control

Slot Code  Sfx  Name                               Slot Code  Sfx  Name
01: TN2305      ATM PNC EI                          11: TN746  B   ANALOG LINE
02:                                     12:
03:                                     13:
04: TN2305      ATM TRUNK                             14:
05:                                     15:
06:                                     16:
07:                                     17: TN754  C   DIGITAL LINE
08:
09: TN767  E    DS1 INTERFACE
10: TN754  B    DIGITAL LINE

'#' indicates circuit pack conflict.

```

4. Type **display atm pnc connection** and press **Enter**.

This display tells you the ATM addresses that have been administered for each TN2305X/ TN206X. Verify that each ATM address (the concatenation of the 5 displayed hexadecimal fields) is correct and match those in the ATM switch. [Figure 55](#) shows the output for the **display atm pnc 1** command; [Figure 56](#) shows the output for the **display atm pnc 2** command.

Figure 55: Screen output for display atm pnc 1

```

display atm pnc 1
                                     ATM PNC
                                     Connection Number: 1

Location: 01B02
Name:

Address Format: ICD ATM

AFI: 47
ICD: 0005
HO-DSP: 80FFE1000000F2071B02
ESI: 000000000000
SEL: 00
    
```

Figure 56: Screen output for display atm pnc 2

```

display atm pnc 2
                                     ATM PNC
                                     Connection Number: 2

Location: 02A01
Name:

Address Format: ICD ATM

AFI: 47
ICD: 0005
HO-DSP: 80FFE1000000F2072A01
ESI: 000000000000
SEL: 00
    
```

Administered with end system identifiers

If the port networks are addressed using end system identifiers, the display looks like [Figure 57](#) (pnc 1) and [Figure 58](#) (pnc 2).

Figure 57: Screen output for display atm pnc 1 with end system identifiers

```
display atm pnc 1

                                ATM PNC

                                Connection Number: 1

    A - PNC
    Location: 01B02
    Name:

Address Format: E.164 ATM Private

    AFI: 45
    E.164: 0001013035381053
    HO-DSP: 00000000
    ESI: 000000000011
    SEL: 00
```

Figure 58: Screen output for display atm pnc 2 with end system identifiers

```
display atm pnc 2

                                ATM PNC

                                Connection Number: 2

    A - PNC

    Location: 02A01
    Name:

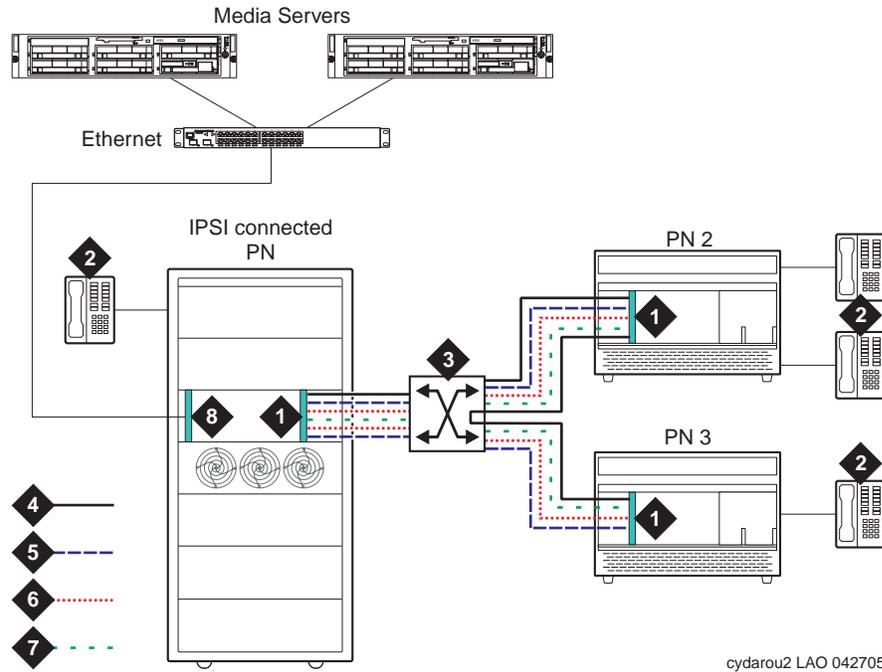
Address Format: E.164 ATM Private

    AFI: 45
    E.164: 0001013035381053
    HO-DSP: 00000000
    ESI: 000000000012
    SEL: 00
```

ATM signaling links

Figure 59 shows the signaling links in an ATM-PNC configuration.

Figure 59: ATM signaling links



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Figure notes:

- | | |
|--|-----------------------------------|
| 1. ATM interface | 5. PNC ATM control link (PACL) |
| 2. Telephones | 6. Expansion archangel link (EAL) |
| 3. ATM switch | 7. ATM signaling |
| 4. Constant bit rate switched virtual connection (CBR-SVC) | 8. IPSI circuit pack |

Signaling sequences - Use the information in [Table 51](#) to help determine trouble with ATM signaling. Abbreviations used in this table correspond to those in [Figure 59: ATM signaling links](#) on page 159.

Table 51: ATM signaling sequences

	Signaling between the IPSI-connected PN and the PN	Call between PN2 and PN 3
1.	TN2305X/TN206X circuit pack in the IPSI-connected PN establishes a variable bit-rate switched virtual connection (VBR-SVC) for Communication Manager signaling through the ATM switch to each PN.	Station goes off hook in PN2. CCMS messages sent over the already established EAL to call processing in Communication Manager.
2.	TN2305X/TN206X circuit pack in the IPSI-connected PN establishes EAL and PACL links with each PN within the above VBR-SVC.	Call Processing sends a message over the PACL to the TN2305X/TN206X circuit pack in PN2 to establish a connection to the TN2305X/TN206X circuit pack in PN3.
3.	Links come up	TN2305X/TN206X circuit pack in PN2 sends an ATM signaling message to the ATM switch to establish a CBR-SVC link to the TN2305X/TN206X circuit pack in PN3.
4.		Call processing on the server sends CCMS messages through the IPSI-connected PN to the station in PN2 over the already-established EAL.
5.		Repeat steps 2 through 4 for the PN3 to PN2 connection.

ATM switch administration

Is the ATM switch administered correctly?

To verify that a specific Avaya ATM switch was administered correctly, refer to the appropriate reference guide for the network switch.

TN2305X/TN206X circuit pack

Did the TN2305X/TN206X come up correctly?

1. Review the LED conditions for the TN2305X/TN206X (refer to the maintenance book for LED indications):
 - Do the TN2305X/TN206X LEDs indicate a normal operational state (any of the following):
 - Active in the PN
 - Standby in the PN
 - Archangel mode in the PN
2. If after circuit pack insertion or a demand reset:
 - Do the TN2305X/TN206X LEDs indicate that it is booting?
 - Do the TN2305X/TN206X LEDs indicate it is downloading its DSPs?
 - Do the TN2305X/TN206X LEDs indicate that circuit pack is not completely inserted?
 - Do the TN2305X/TN206X LEDs indicate a maintenance alarm?
3. Type **list configuration carrier *UUCC*** and press **Enter**. See [Figure 60](#) (1b) and [Figure 61](#) (2a).

Figure 60: List configuration carrier 1b screen

```
list configuration carrier 1b
```

SYSTEM CONFIGURATION						
Board Number	Board Type	Code	Vintage	Assigned Ports		
				u=unassigned	t=tti	p=psa
01B02	ATM PNC EI	TN2305	HW02 FW007			
01B04	DIGITAL LINE	TN754C	000002	u	u	u
01B05	ANALOG LINE	TN746B	000010	u	u	u
				u	u	06
				u	u	u
01B06	DID TRUNK	TN753	000021	u	u	u
01B07	MAINTENANCE/TEST	TN771D	000006	u	02	03
01B08	CO TRUNK	TN747B	000018	u	u	u
01B09	BRI LINE	TN556B	000003	u	u	u
				u	u	u
				u	u	u
01B10	DS1 INTERFACE	TN767C	000003	u	u	u
				u	u	u
				u	u	u
				u	u	u

Figure 61: List configuration carrier 2a screen

```
list configuration carrier 2a

                                SYSTEM CONFIGURATION

Board                               Assigned Ports
Number  Board Type                Code    Vintage  u=unassigned t=tti p=psa

02A01   ATM PNC EI                 TN2305  HW02 FW007
02A09   DS1 INTERFACE                TN767E  000004   u u u u u u u u
                                u u u u u u u u
                                u u u u u u u u
02A10   DIGITAL LINE                TN754B  000016   u u u u u u u u
02A11   ANALOG LINE                  TN746B  000010   01 u u u u u u u
                                u u u u u u u u
02A17   DIGITAL LINE                TN754C  000002   u u u u u u u u
```

- Make sure the TN2305X/TN206X circuit pack is shown in the correct slot (check the Board Number field).
- Fields should have values as indicated below:

Field	Value
Board Type	ATM PNC EI
Vintage	The TN2305X/TN206X vintage is split between the hardware and firmware vintages. the hardware vintage matches the label on the latch, and the firmware number indicates the firmware vintage. If Vintage is no board, then either the circuit pack is in the incorrect slot or the circuit pack was not completely inserted. Reinsert circuit pack into correct slot.

4. If the TN2305X/TN206X is inserted and shows a vintage number, type **test board UUCSS** and press **Enter**; [Figure 62](#) displays.

Figure 62: Screen output for test board UUCSS

```

test board 1b02

                                TEST RESULTS

Port      Maintenance Name  Alt. Name  Test No.  Result      Error Code
-----
01B02     ATM-EI                316        PASS
01B02     ATM-EI                598        PASS
01B02     ATM-EI                1293       PASS      888
01B02     ATM-EI                241        PASS
01B02     ATM-EI                304        PASS
01B02     ATM-EI                1259       PASS
    
```

- The `Result` field should show `PASS` for each test number. If any of the tests fail, refer to the ATM-EI maintenance objects in *Maintenance Alarms for Avaya Communication Manager Media Gateways and Servers* (03-300190).

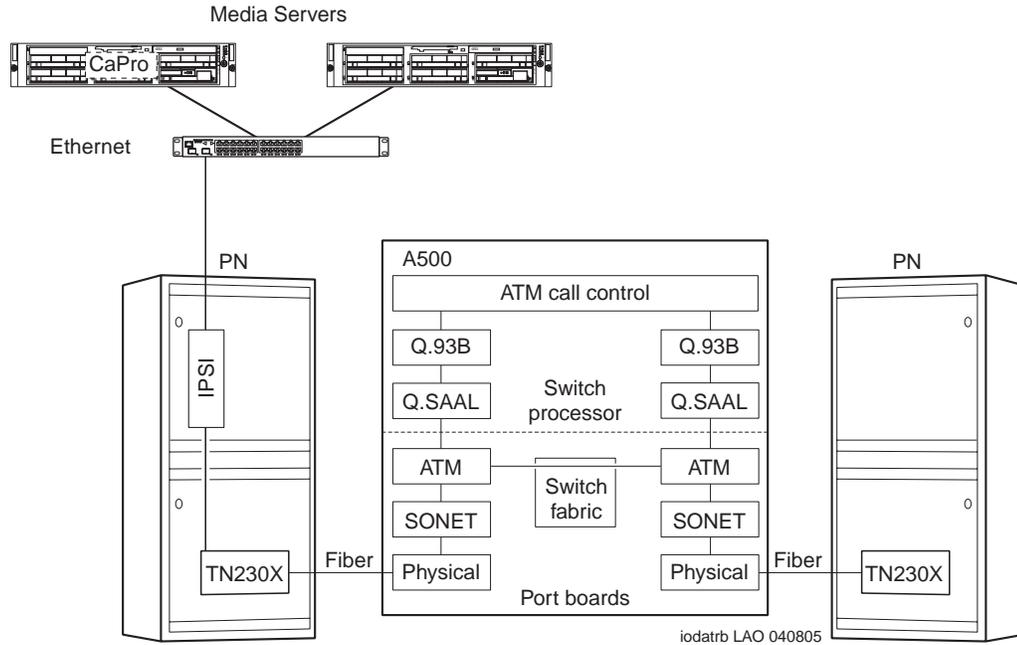
Possible causes

1. The TN2305X/TN206X circuit pack is in a slot different from the Communication Manager administration.
2. The TN2305X/TN206X was not completely inserted.

ATM signaling architecture

Troubleshooting interoperability between the Avaya server and the ATM switch involves understanding the architecture of ATM signaling ([Figure 63](#)). An Avaya Cajun A500 switch is used to show this concept.

Figure 63: ATM signaling architecture



The following list shows the ATM-stack layers discussed in this section:

- [Physical layer](#)
- [SONET/SDH layer](#)
- [Q.SAAL \(data link\) layer](#)
- [ATM call control](#)
- [Call processing \(CaPro\) Layer](#)

Physical layer

Is there an optical signal between the TN2305X/TN206X and the ATM switch?

1. Identify the OC-3/STM-1 ports on the ATM switch that have Communication Manager port networks attached.
 - Be aware that customers may use other ports on the ATM switch for applications unrelated to Communication Manager (LAN traffic or multimedia applications, for examples).
 - These other applications may manifest themselves in the output of the troubleshooting commands you run on the ATM switch. Communication Manager port networks must be identified by their ATM switch port numbers.

The following examples show Communication Manager port networks connected to ATM switch ports A1.1 and A1.2.

1. Does the TN2305X/TN206X's YELLOW LED flash 100 ms on and 100 ms off, indicating a loss of signal on the fiber? Recall that the TN2305X/TN206X detects continuity problems with either the transmit (bottom) or the receive (top) fibers.

If the fiber shows a loss of signal, refer to the "Fiber Fault Isolation Procedure" in *Maintenance Procedures for Avaya Communication Manager Media Gateways and Servers* (03-300192).

2. Is the ATM switch port's LED indicating a loss of signal on the fiber? Note that the ATM switch may detect continuity problems only with the receive fiber; the state of the transmit fiber might not be detected.
3. Refer to your ATM switch's quick reference guide for troubleshooting commands.

Possible causes -

Check the following list for possible causes.

- The fiber is disconnected from the ATM switch and/or the TN2305X/TN206X circuit pack.
- The transmit and receive fibers are swapped at the ATM switch or the TN2305X/TN206X circuit pack (but not both).
- There is a break in the fiber.
- The TN2305X/TN206X is not transmitting a carrier (not inserted, not powered, or not administered). See the ATM-EI or ATM-TRK maintenance objects in *Maintenance Alarms for Avaya Communication Manager Media Gateways and Servers* (03-300190).
- Hardware safety interlocks on optical transceivers may cut transmitter power if no carrier is received, so lack of a receive carrier could indicate a transmitter problem at the same end.
- The ATM switch does not recognize that a port circuit pack is in the slot. You may need to re-administer the ATM switch port boards. Refer to your ATM switch's quick reference guide for further information.

Recommended Action

1. Plug in, swap, repair, or replace the fiber as necessary.
2. Verify that the port circuit pack is completely inserted.

SONET/SDH layer

Are SONET/SDH frames reaching the ATM switch?

Is the ATM switch port's LED indicating no cell traffic?

- Check the transmit and receive cell count fields. Each field's values should be increasing if the TN2305X/TN206X is actively sending and receiving cells to and from the ATM switch.
- Check for SONET/SDH layer alarms, LOP, LUF, and so on.

Troubleshooting

- If neither field is increasing, the ATM switch port may be down. Verify that the admin status is up.
- If the receive cell count is increasing but the transmit cell count is not increasing, this may be because the port was administered with no UNI signaling. Ensure that signaling is UNI3.1.
- Although the error counters may not be zero, they should not be large either compared with the receive and transmit cell counters. If the counters are large and increasing, check the fiber integrity. Make sure the fiber pairs are securely plugged into both the TN2305X/TN206X circuit pack and the ATM switch.
- If the fiber has been pulled and reinserted as part of fault diagnosis, the nonzero loss of signal error counter may be correct.

Q.SAAL (data link) layer

Are ATM signaling messages reaching the ATM switch Call Control?

Note:

If the TN2305X/TN206X circuit pack is not connected to the ATM switch at the Q.SAAL protocol layer, then no report is displayed.

1. If the port of interest is not configured for UNI signaling, then the port was administered for no UNI signaling. Verify that signaling is UNI3.1.
2. If the port of interest was administered for UNI3.0 signaling, verify that signaling is UNI3.1.
3. Check to see if the TN2305X/TN206X circuit pack is actively sending and receiving Q.SAAL Protocol Data Units with the ATM switch.

Q.93B (network) layer

Are connection requests being received by ATM switch call control?

Note:

If there is no connection between the TN2305X/TN206X circuit pack and the ATM switch at the Q.93B protocol layer, then no report displays.

1. Check the port of interest. If it is not configured for UNI signaling, then the port was administered for no UNI signaling. Verify that signaling is UNI3.1
2. The connect, setup, and release message counters should be a nonzero number if the ATM switch is handling Q.93B protocol layer messages sent by the server and a PN. They may not increase during troubleshooting unless calls are being made because the server initially sets up control connections to the IPSI-connected PN and then sets up talk path connections as needed.
3. Check to see if connections are being rejected. The error may be on the IPSI-connected PN port even though the non-IPSI-connected PN port is the one misbehaving and vice versa.
4. Type **display errors** and press **Enter**.

- Set the **Error List** field to **errors** and **Category** field to **PNC** on the input screen ([Figure 64](#)) and press **Enter** to display any cause codes (see [Table 52](#)) returned from the ATM network to a TN2305X/TN206X circuit pack on the IPSI-connected PN (and to a TN2305X/TN206X circuit pack on a non-IPSI-connected PN). This is successful only if the links between the IPSI-connected PN and the non-IPSI-connected PN remain up so that the message from the non-IPSI-connected PN is logged.

See the ATM-EI maintenance object in *Maintenance Alarms for Avaya Communication Manager Media Gateways and Servers* (03-300190).

Figure 64: Error report

```

display errors                                     Page 1 of 1  SPE A
                                         ERROR REPORT

The following options control which errors will be displayed.
ERROR TYPES

Error Type:                                     Error List: errors

REPORT PERIOD

Interval: a      From:  /  /  :  To:  /  /  :

EQUIPMENT TYPE ( Choose only one, if any, of the following )

Cabinet:
Port Network:
Board Number:
Port:
Category: pnc
Extension:
Trunk ( group/member ):  /
  
```

[Figure 65](#) shows the screen output for the **display errors** command.

Figure 65: Hardware error report—screen 9

```

display errors
Page 9 SPE A
HARDWARE ERROR REPORT
Port      Mtce      Alt      Err      Aux      First      Last      Err Err  Rt/ Al Ac
          Name     Name     Type     Data     Occur     Occur     Cnt Rt  Hr  St
AT01A    ATM-NTWK      41      1      11/12/16:59 12/09/15:10 14  0  0  n  n
AT01A    ATM-NTWK      31      0      11/13/18:27 11/20/20:02 5   0  0  n  n
AT02A    ATM-NTWK      0       0      11/13/18:45 11/13/18:45 1   0  0  n  n
AT02A    ATM-NTWK      31      0      11/15/14:40 11/15/14:41 2   120 0  n  n
AT01B    ATM-NTWK      31      0      11/16/17:39 11/16/17:39 1   0  0  n  n
AT01A    ATM-NTWK      3       1      11/16/18:19 11/26/13:13 12  0  0  n  n
    
```

In this example the errors that have **ATM-NTWK** for **Name** field and **1** for **Aux Data** field indicate an error returned to the TN2305X/TN206X circuit pack from the ATM network. In this case, the **Err Type** field shows the cause code returned by the ATM network (see [Table 52: Observed Cause Codes](#)). In the earlier example, two cause codes (41 and 3) are reported from the ATM network. For more information about these cause codes and repair information see the ATM-NTWK (ATM Network Error) maintenance object.

Table 52: Observed Cause Codes

Cause Code	Definition	Observed Cause
3	No route to destination	The ATM addresses administered in the ATM switch or in Communication Manager (display atm pnc) are incorrect.
31	Normal, unspecified	This is a normal return.
41	Temporary failure	This “try again later” cause code has been observed when the source of the problem is on another port (for example, a routing problem on another port that displays cause code 3).
47	Resources unavailable, unspecified	Communication Manager call volume is too high for the available resources in the ATM network.
63	Service or option unavailable, unspecified	Communication Manager call volume is too high for the available resources in the ATM network.

ATM call control

Are ATM signaling connections being setup to ATM switch Call Control?

The UBR virtual circuits between the PN ports and ATM switch ports are ATM signaling channels between the port network and the ATM switch. They are used to request connection setups and releases to other end points such as another port network. These are established by each TN2305X/TN206X when it comes up, independent of Avaya Call Processing on Avaya servers.

Other UBR virtual circuits may exist between ATM switch ports that are not associated with Communication Manager port networks and may be signaling channels for other applications (for example, data network traffic).

Call processing (CaPro) Layer

Are control channels being established from the IPSI-connected PN to the non-IPSI-connected PN?

Diagnostics -

- Do you get a dial tone on a set on the port network in question?
- Can you ring a set on the non-IPSI-connected PN dialing from the IPSI-connected PN and vice-versa?

Are talk paths being established between port networks?

Diagnostics -

- Can you talk both ways on a set on one port network dialed from another port network and vice versa?
 - The CBR (Constant Bit Rate) virtual circuits (VCs) between the ATM switch PN ports are used for talk paths between port networks (IPSI-connected PN to non-IPSI-connected PN, PN to IPSI-connected PN, or non-IPSI-connected PN to non-IPSI-connected PN).
 - They are established when calls are first setup between port networks. Each virtual circuit represents one party of a complete multiparty talk path.
 - These virtual circuits may persist beyond the duration of a phone call. The Communication Manager Call Processing software saves virtual circuits for a few seconds after the end stations have hung up in case the VC can be used again for another call between the same two port networks. Also, check 3-way conference calling across 3 port networks.
 - There may be other CBR virtual circuits between ATM switch ports that are not associated with Communication Manager port networks. A common CBR application is Circuit Emulation, in which T-1, T-3, and so forth circuits are carried over ATM.

Unusual ATM trouble conditions

A few failure modes in the Avaya server/ATM switch combinations are particularly difficult to diagnose. One example might be that you cannot make a completely successful call even though most indications from Avaya server and the ATM switch look good.

This section documents some hints and clues that may help diagnose the following failure modes:

- [Incorrectly typed or omitted PN route or end system identifier \(ATM switch\)](#)
- [Swapped routes, end system identifiers, or fiber between an IPSI-connected PN and an PN](#)
- [Swapped routes, end system identifiers, or fiber between A- and B-side TN2305X/TN206Xs on PN](#)
- [Swapped routes, end system identifiers, or fiber between two PNs](#)

Incorrectly typed or omitted PN route or end system identifier (ATM switch)

Symptoms

Talk paths are one-way, from the IPSI-connected PN to the non-IPSI-connected PN: you can hear tones from the IPSI-connected PN end station to the non-IPSI-connected PN end station but not vice versa. Because the signaling channels are bidirectional virtual circuits (VCs) established from the IPSI-connected PN to the non-IPSI-connected PN, these can be routed correctly and come up just fine. Talk paths are two unidirectional virtual circuits, so a single call has one VC from the IPSI-connected PN to the non-IPSI-connected PN (which is routed correctly) and one VC from the non-IPSI-connected PN to the IPSI-connected PN (which cannot be routed).

Diagnostics

1. At the ATM switch, check the ATM addresses.
2. Look for a cause code 3 (No route to destination).

Action

1. Correct the ATM address translations in the ATM switch.

Swapped routes, end system identifiers, or fiber between an IPSI-connected PN and an PN

Symptoms

- An incorrectly connected PN TN2305X/TN206X circuit pack is not completely inserted.
- Dial tone is present on end stations on the IPSI-connected PN and on correctly connected PNs, but no dial tone is present on the affected non-IPSI PN end stations.
- Calls cannot be made between the IPSI-connected PN and the correctly connected non-IPSI PNs because talk paths cannot be routed correctly.

Diagnostics

1. Check to see if the ATM switch shows VBR control channels from the ATM switch port intended for the incorrectly connected non-IPSI PN (but actually connected logically or physically to the IPSI-connected PN) that should not exist.

Action

1. Correct the ATM addresses (or swap fibers) on the ATM switch between the incorrectly connected IPSI-connected PN and non-IPSI PN.

Swapped routes, end system identifiers, or fiber between two PNs

Symptoms

- All TN2305X/TN206X circuit packs are completely inserted.
- The IPSI-connected PN cold starts both incorrectly connected non-IPSI PNs as usual.
- Both non-IPSI PNs log many `WRONG BOARD INSERTED` errors (**list configuration all** or **display circuit-packs carrier**), providing the non-IPSI PNs actually do have different circuit packs configured in the same slots.
- Some end stations may work if they are connected to the correct circuit pack in the same slot on both PNs. Otherwise, end stations on the IPSI-connected PN have dial tone, while end stations on the non-IPSI PNs do not.
- All ATM switch diagnostic commands look good.

Diagnostics

1. Check log for `WRONG BOARD INSERTED` errors (**list configuration all** or **display circuit-packs carrier**).

Action

1. Correct the ATM addresses (or swap fibers) on the ATM switch between the incorrectly connected PNs.

Swapped routes, end system identifiers, or fiber between A- and B-side TN2305X/TN206Xs on PN

Symptoms

- The server establishes links to what it thinks is the active TN2305X/TN206X circuit pack on the non-IPSI-connected PN.
- As normal, it reboots this TN2305X/TN206X circuit pack, and when complete, it resets the non-IPSI-connected PN. When this happens, the active (instead of the standby) TN2305X/TN206X circuit pack reboots, dropping the links.
- To recover, the server re-establishes links to what it thinks is the active TN2305X/TN206X circuit pack and the cycle repeats indefinitely.

Diagnostics

1. Type **status pnc** and press **Enter**. The screen shows both the A-side and B-side `State of Health` field as `partially functional`.

Action

1. Correct the ATM addresses (or swap fibers) on the ATM switch between the A and B side of the PN.

ATM-PNC troubleshooting commands

Wide-area networks (WAN), especially those constructed as an internet using public network facilities, may take inter-PN connectivity to the edge of acceptable performance. The switch may experience delays, blockages, or connection losses because of circumstances beyond the control of switch management. Variations in performance may be expected during periods of high traffic.

If ATM-PNC is enabled, 2 commands are available:

- **change/display atm pnc-pairs** lets you get inter-port-network measurements for up to 10 ordered pairs of port networks
- **list measurements atm pnc-latency** reports data about ATM cell latency and connection times.

In both of these commands, you must supply the following information:

- the number of connections requested,
- the average connection setup time in milliseconds,
- the number of ATM network setup requests required, and
- the average setup time for the ATM connections.

Separate sets of measurements are available for the A and B sides in critical reliability systems.

change/display atm pnc-pairs

This command lets you select 10 pairs of port networks for which measurements can be reported. [Figure 66](#) shows the output for the command.

Figure 66: PNC measurements pairs screen (change/display atm pnc-pairs)

```
change atm pnc-pairs

                                PNC MEASUREMENTS PAIRS

Pair  Orig  Dest
      PN   PN
1     1     5
2     1     8
3     5     8
4     5     7
5     4     2
6     10    11
7     10    12
8     10     1
9     1     10
10    8     2
```

Field descriptions

Pair Identifies the port network pair number (read only).

Orig PN These entries identify the originating port network and

Dest PN the destination port network for the measured SVCs (values are between 1 and 44; default is blank).

list measurements atm pnc-latency

This command reads and displays the collected information regarding ATM cell latency and connection times. The command-line syntax is:

- **list measurements atm pnc-latency** [*last-hour, today-peak, yesterday-peak*] [*print / schedule*]

Note:

If a PN pair is changed during a 24-hour period, the peak value reported for the (new) pair is the highest latency measured after the change. If you type **list measurements atm pnc-latency** and press **Enter** while the PNC duplication feature is *disabled*, the output contains data for A-PNC *only*.

Measurements are displayed only for administered pnc-pairs. That is, if 5 pairs were administered on the ATM PNC Measurements Pairs screen, the **list measurements atm pnc-latency** output consists of 5 measurement entries. If the system time has been modified through the **set time** command during any measurement hour Y, that measurement hour is displayed as Y** instead of Y00, to indicate that the data for that hour may be invalid.

If an administered pnc-pair is changed, the next time measurements are gathered, the **today-peak** entry for the old pnc-pair is replaced with an entry for the new pair, and all counters are set to 0.

[Figure 67](#) shows the output for this command.

Figure 67: ATM-PNC latency measurements

```
list measurements atm pnc-latency last-hour

Switch Name: _____ Date: 7:23 pm SAT MAR 21, 1998

                        ATM PNC LATENCY MEASUREMENTS

-----A-PNC-----
Orig  Dest  PN  Connection  ATM  NW  Setup  Hour
PN    PN   Count    ms      Count  ms
1     5    2200     143     2055   153   1900
1     8    1219     78      1144   83    1900
5     8    2663     220     2386   245   1900
5     7    143      105     123    122   1900
4     2    7101     326     6845   338   1900
10    11    353      54      343    56    1900
10    12    3360     76      3326   77    1900
10    1     1570     71      1547   72    1900
1     10    1570     83      1547   84    1900
8     2     1100     62      1038   66    1900

-----B-PNC-----
PN  Connection  ATM  NW  Setup  Hour
Count    ms      Count  ms
```

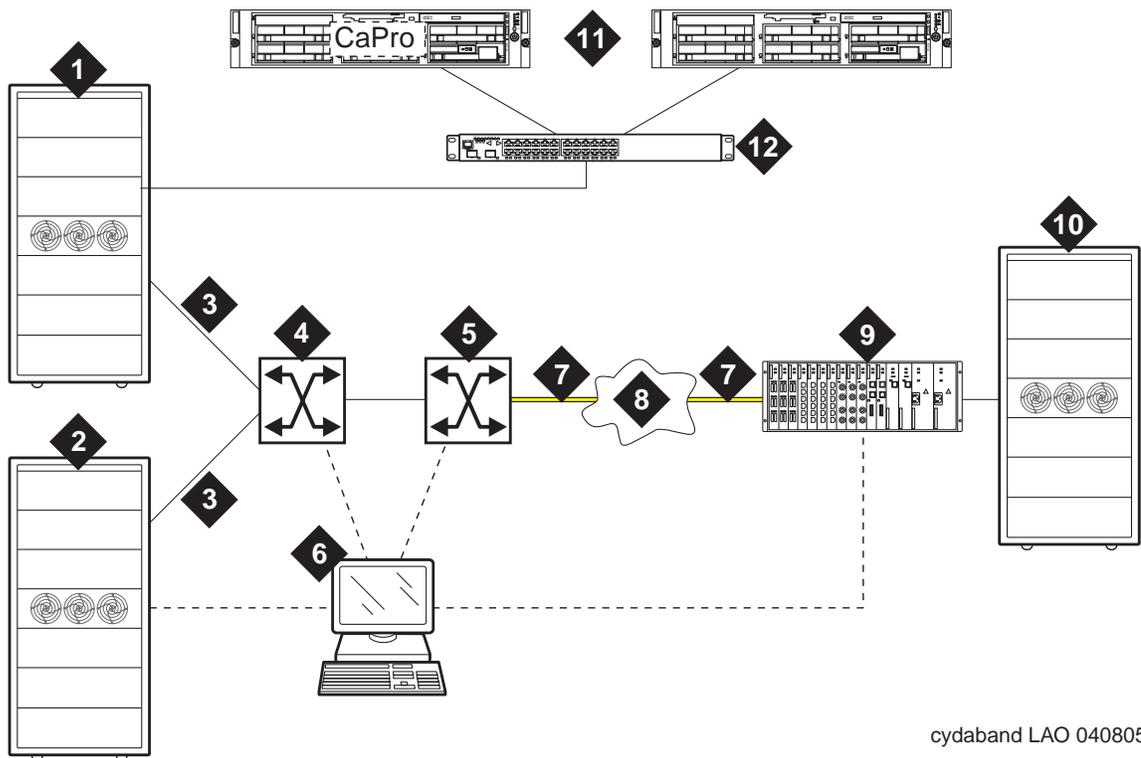
Field descriptions

Orig PN/Dest PN	Identifies the originating port network and the destination port network for the measured SVCs (default is blank).
PN Count	The number of setup attempts on the port network
Connection ms	The amount of time (in milliseconds) for the connection
ATM NW Count	The number of setup attempts on the ATM network
Setup ms	The amount of time (in milliseconds) to set up the connection.
Hour	The time of the data collection.

Conserving ATM bandwidth

Port Networks in an ATM-PNC configuration, when used with access concentrators or other ATM switches interfacing to bandwidth-constricted or congested facilities, can incur contention for bandwidth, resulting in failed call completions. [Figure 68](#) represents an ATM-PNC configuration in which Inverse Multiplexing for ATM (IMA) is used going into and coming out of the network cloud.

Figure 68: Bandwidth-constricted ATM network configuration



cydaband LAO 040805

Figure notes:

- | | |
|---------------------------|--|
| 1. IP-connected PN | 7. IMA connection |
| 2. PN | 8. ATM network |
| 3. OC-3/STM-1 connection | 9. Access concentrator |
| 4. ATM switch A | 10. PN |
| 5. ATM switch B | 11. S8700-series Media Server |
| 6. Server access terminal | 12. Ethernet switch/LAN connection to IP |

In this configuration connections from the Avaya server and the ATM backbone switch and to the ATM access concentrator are OC-3/STM-1 through the TN2305X/TN206X ATM interface circuit packs over fiber optic cable. When traffic exceeds the capacities of the IMA links, contention for access to the ATM network occurs. In such cases, SVC setups requested by the Avaya server can be denied by the ATM network and associated components, and calls are not completed.

In this section, a failed SVC setup means that the ATM network has actively rejected the request. A delayed SVC setup means that the SVC setup exceeded a time threshold, specified in milliseconds (ms).

Performance indicators of both failed and delayed SVC setups:

- The called party may hear ringing, take the receiver off-hook, and hear nothing. The called party may eventually receive a delayed call, but never receives a failed call.
- If the call was delayed, the calling party hears silence if one of the SVCs is not up or hears the called party if it is up.
- If the call is never completed, the caller eventually hangs up without knowing why the call was not completed.

Therefore, SVC failures that occur more often than normal are most often evidence of an ATM network that is out of specification.

The tools to manage the Avaya server and the ATM network are:

- [Alarming out-of-spec conditions](#)
- [SVC latency commands](#)
- [Administration](#) thresholds to either allow or deny completion of calls that require a new SVC over a path that recently experienced a high number of delayed or failed SVCs.

Alarming out-of-spec conditions

Out-of-spec conditions in the ATM network are reported against the ATM-NTWK maintenance object in the Alarm Report and the Hardware Error Report (**display errors**). Refer to the following book for an example of a Hardware Error Report with an ATM-NTWK alarm:

- *Maintenance Alarms for Avaya Communication Manager Media Gateways and Servers* (03-300190)

SVC latency commands

Two reports are available to help monitor the ATM network:

1. The ATM PNC Latency Histogram report (accessed through the **list measurements atm latency-histogram** command) shows:
 - Setup count
 - AddParty count
 - total
 - average latencies
 - histogram (21 different time bins ranging from 0-9 msec. to +10 sec.)

Syntax: **list measurements atm latency-histogram *current-hour* | *last-hour* | *today-total* | *yesterday-total* [*print* or *schedule*]**

The **list measurements atm latency-histogram** output is shown in [Figure 69](#).

2. The ATM PNC Delayed/Failed Setups report (accessed through the **list measurements atm setup-events**) shows:

- event date
- event time
- event type (delayed or failed)
- delay time (in ms)
- from/to PN connection numbers
- PNC connection (A-PNC or B-PNC)

Syntax: **list measurements atm setup-events** [*x*] or [*from-conn x*] [*to-conn x*] [*print* or *schedule*]

The command syntax allows you to list setup events for a particular connection number or for a range of connection numbers ([Table 53](#)).

Table 53: Constricted bandwidth administration procedure

Command	Description
list measurements atm setup-events	Lists up to 100 of the most recent setup events
list measurements atm setup-events from-conn 3	Lists all setup events from connection 3 to all other connections
list measurements atm setup-events from-conn 3 to-conn 4	Lists all setup events from connection 3 to connection 4
list measurements atm setup-events to-conn 4	Lists all setup events from all connections to connection 4
list measurements atm setup-events 4	Lists all setup events from or to connection 4

The report from the **list measurement atm setup-events** command looks like [Figure 70](#)

Figure 70: ATM-PNC delayed/failed setups report

```
list measurements atm setup-events
```

Page 1

Switch Name: Date: 2:33 pm TUE DEC 12, 1999

ATM PNC DELAYED/FAILED SETUPS

Date	Time	Event	Delay(msec)	From Conn	To Conn	PNC
12/12/1999	14:32:10	delayed	1765	3	7	A-PNC
12/12/1999	14:31:37	failed		3	7	A-PNC
12/12/1999	14:31:22	delayed	1809	7	8	A-PNC
12/12/1999	14:31:18	delayed	1672	12	6	B-PNC
12/12/1999	14:31:15	delayed	1023	3	7	B-PNC
12/12/1999	14:29:45	delayed	1005	1	3	B-PNC
12/12/1999	14:29:23	failed		3	1	A-PNC
12/12/1999	14:28:12	failed		6	2	A-PNC
12/12/1999	14:27:56	delayed	2088	6	7	A-PNC
12/12/1999	14:27:24	delayed	1308	6	8	B-PNC
12/12/1999	14:27:05	delayed	1011	6	2	A-PNC
12/12/1999	14:26:38	failed		11	4	B-PNC
12/12/1999	14:26:32	delayed	1246	3	7	A-PNC

Field descriptions:

Switch Name:	The value administered on the system-parameters features form.
Date	Time and date that the command was executed.
Date	System date when the event occurred (4-character).
Time:	System time when the event occurred
Event:	The type of event (delayed or failed)
Delay (msec):	The delay value is only displayed for delayed events. For failed events, this field is blank. Values range from 250 to 20,000
From Conn:	The originating connection number
To Conn:	The destination connection number
PNC:	A-PNC or B-PNC

Administration

Use the procedure in [Table 54](#) to administer ATM Constricted Bandwidth.

Table 54: Constricted bandwidth administration procedure

✓	Step	Action	Description
	3.	Turn feature on	Turn the feature on by changing the <code>Async . Transfer Mode (ATM)?</code> field on the customer options form (change system-parameters customer-options) to <code>y</code> (Figure 71). This requires a Avaya Services login.
	4.	Set thresholds	<p>Set the impairment thresholds in 4 fields on the ATM-Related System Parameters form (change system-parameters atm) shown in Figure 72:</p> <ul style="list-style-type: none"> ● Activation (%) ● Deactivation (%) ● Timeout (msec) ● Deny Calls Using Impaired Paths? <p>Press Enter to effect the changes.</p>
	5.	Set alarm options	<p>Alarms generated due to impaired paths are reported against the ATM-NTWK maintenance object. The default alarm level is WARNING, but may be administered as either MINOR or WARNING.</p> <ul style="list-style-type: none"> ● Use the set options and press Enter to change the <code>Off-board ATM Network Alarms</code> field on the Alarm Reporting Options form (Figure 73: Alarm reporting options—screen 1 on page 184).

Constricted bandwidth administration screens

Figure 71: Optional features—screen 2

```
change system-parameters customer-options                               Page 3 of 6
                                OPTIONAL FEATURES

Abbreviated Dialing Enhanced List? y                                CAS Branch? y
  Access Security Gateway (ASG)? y                                  CAS Main? y
  Analog Trunk Incoming Call ID? y                                Change COR by FAC? n
A/D Grp/Sys List Dialing Start at 01? y  Cvg Of Calls Redirected Off-net? y
Answer Supervision by Call Classifier? y                                DCS (Basic)? y
                                ARS? y                                DCS Call Coverage? y
                                ARS/AAR Partitioning? y                DCS with Rerouting? y
                                ARS/AAR Shortcut Dialing? n

                                Digital Loss Plan Modification? n
ASAI Proprietary Adjunct Links? y                                DS1 MSP? y
Async. Transfer Mode (ATM) PNC? y    Emergency Access to Attendant? y
Async. Transfer Mode (ATM) Trunking? y                                Extended Cvg/Fwd Admin? y
                                ATMS? y                                External Device Alarm Admin? y
                                Attendant Vectoring? n                Flexible Billing? y
                                Audible Message Waiting? y            Forced Entry of Account Codes? y
                                Authorization Codes? y                Global Call Classification? y

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

Figure 72: ATM-related system parameters

```
change system-parameters atm                                           Page 1
                                ATM-RELATED SYSTEM PARAMETERS

THRESHOLDS OF SETUP EVENTS TO DECLARE IMPAIRMENT

                                Activation (%): 4
                                Deactivation (%): 3
                                Timeout (msec): 1000

TREATMENT DURING IMPAIRED CONDITIONS

                                Deny Calls Using Impaired Paths? n
```

Field descriptions:

Activation (%)	This field specifies the percentage of setup events for a path to become impaired. That is, if the percentage of setup events for a given path meets or exceeds this administered value, then it becomes impaired (see example below). An alarm is raised against an ATM-IMP when one or more paths originating from that ATM-IMP become impaired. [Values 1 to 20, default is 4]
Deactivation (%)	This field specifies the percentage of setup events for a path to come out of the impaired state. That is, if the percentage of setup events for an impaired path meets or drops below this administered value, then it is no longer impaired (see example below). An alarm is retired when no more impaired paths are originating from that ATM-IMP. [Values 0 to 19, default is 3]
Timeout (msec)	The maximum number of milliseconds allowed for an SVC connection to be completed before being counted as delayed. [Values 250 to 20,000, default is 1000]
Deny Calls Using Impaired Paths?	This field specifies whether to deny calls that use connections over impaired paths. If the option is y , then calls that require a new SVC on an impaired path on the active PNC are not completed. If the option is n , then those calls are treated according to current administered parameters for ATM PNC. [Default is n]

Example:

If the value for Activation (%) is 5, then the value for Deactivation (%) can be 0, 1, 2, 3, or 4.

Figure 73: Alarm reporting options—screen 1

```

set options
ALARM REPORTING OPTIONS
Page 1 of 2

Major Minor

On-board Station Alarms: w w
Off-board Station Alarms: w w
On-board Trunk Alarms (Alarm Group 1): y Y
Off-board Trunk Alarms (Alarm Group 1): w w
On-board Trunk Alarms (Alarm Group 2): w w
Off-board Trunk Alarms (Alarm Group 2): w w
On-board Trunk Alarms (Alarm Group 3): w w
Off-board Trunk Alarms (Alarm Group 3): w w
On-board Trunk Alarms (Alarm Group 4): w w
Off-board Trunk Alarms (Alarm Group 4): w w
On-board Adjunct Link Alarms: w w
Off-board Adjunct Link Alarms: w w
Off-board MASI Link Alarms: w w
Off-board DS1 Alarms: w w
Off-board PI-LINK Alarms: w w
Off-board Alarms (Other): w w
Off-board ATM Network Alarms: w

```

Appendix A: Baselining the Customer's Configuration

Appendix A provides a worksheet for recording information about the customer's configuration. The kinds of information to baseline includes:

- [ATM Switch Administration](#)
- [Interconnections](#)
- [S8700 Media Server Administration Worksheet](#)

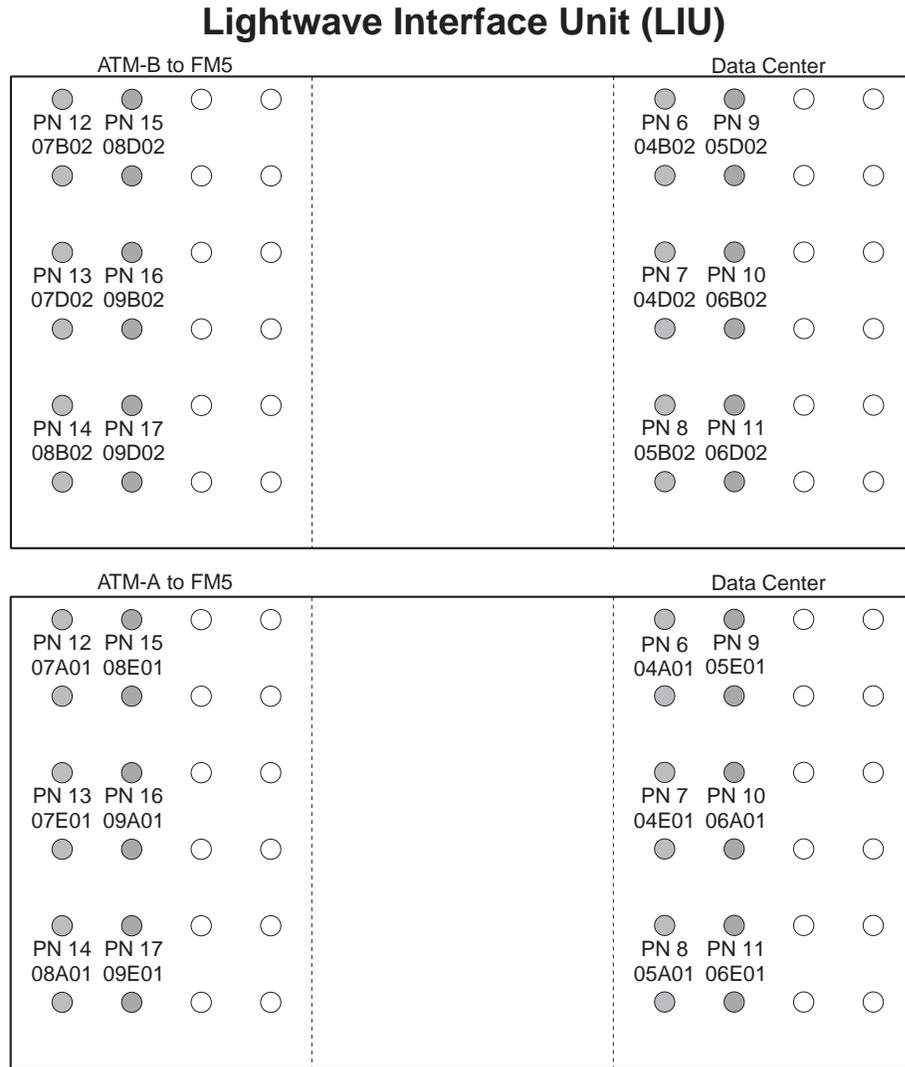
ATM Switch Administration

Refer to your Avaya ATM network switch's quick reference guide for more information.

Interconnections

Record the interconnection of fiber optic cabling on the LIU form ([Figure 74](#)). Record the S8700 Media Server port network number below the ATM switch port in [Table 55: Customer configuration worksheet for standard and high reliability systems](#) on page 187.

Figure 74: Sample lightwave interface unit (LIU)



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Appendix B: ATM Switch Feature Interactions

The interconnection of port networks across a wide area through multiple ATM switches may introduce delays in establishing some inter-port network connections. WAN interconnectivity can introduce some transmission delays.

The following topics are covered in this appendix.

- [Location-related Interactions](#)
- [Delay Interactions](#)
- [ATM Feature Interactions](#)
- [Cross-product Compatibility](#)

Location-related Interactions

Location-related problems happen in two areas:

- [Switch operability](#)
- [Feature performance](#)

Switch operability

The basic switch functions ([Table 56](#)) are affected by location within the ATM application.

Table 56: Switch operability interactions

Operation	Description
Station alerting	When a call is offered to a station, an inter-PN connection is initiated and the phone rings. This procedure applies to calls to stations, data modules, and attendant consoles. When the user answers, the station should be connected before the user says "hello."
Trunk seizure	Trunk seizure happens after an outgoing call is submitted to an outgoing trunk port, followed by address outpulsing. Seizure and address outpulsing do not require an established talk path to the trunk. If the talk path to or from the trunk is delayed for several seconds and the call was dialed instantly through abbreviated dialing, some initial call progress feedback might be missed and, perhaps, some information from the answering party. Connection setup times of as much as 1-2 s can be covered by seizure/outpulsing, but longer setup times require postponing seizure until the inter-PN connection is established.
Recorded announcements	When an announcement is connected, it requests playback as soon as possible. The switch delays playing back an announcement until at least one inter-port-network connection, if needed, is established. The barge-in announcements, which the caller joins in progress, do not require this delay.

Feature performance

S8700 Media Server switch features are affected by location ([Table 57](#)).

Table 57: Communication Manager server operations affected by location

Operation	Description	User interface	Performance
Time of Day	Administration of a time offset relative to the system clock permits the computation of local time for each port network. See Time of Day considerations for more information.	<ul style="list-style-type: none"> ● Time/date display and wakeup or do-not-disturb times displayed in local time. ● Attendant service from a local attendant on local time. ● User can dial local calls without supplying the area code (NANP only) or the country and/or city code (international), just as on a single-location switch. ● Each location can have its own local emergency processing center, and 911 calls typically routed via ARS are sent to the local dispatch for each caller's location. 	<p>These added locations help solve:</p> <ul style="list-style-type: none"> ● Different public network dial plans for different locations affecting <ul style="list-style-type: none"> - 911 calls - home or foreign number plan area (US only) - international dialing or country codes ● Different time zones on <ul style="list-style-type: none"> - user displays - CDR records - time-of-day routing

1 of 4

Table 57: Communication Manager server operations affected by location (continued)

Operation	Description	User interface	Performance
ARS Digit Analysis	ARS digit analysis (routing), digit conversion, and toll analysis can be administered with location-specific parameters in addition to “global” (ARS and public-network TAC calls).	If a location-specific entry and a global entry both match a dialed number equally well, then the location-specific entry takes precedence over the global entry, and a location-specific digit conversion takes precedence over a location-specific routing entry.	Multiple-location routing capacities = 4000 (Release 7 or later ACP software on Communication Manager) A set of local routing options also are required for each location for <ul style="list-style-type: none"> ● 911 ● other service numbers ● local operator access ● local calls in general.

2 of 4

Table 57: Communication Manager server operations affected by location (continued)

Operation	Description	User interface	Performance
ARS Digit Conversion	<ul style="list-style-type: none"> <li data-bbox="513 310 727 974">● Code Conversion When Foreign Number Plan Area (FNPA, 10-digit) or Home Number Plan Area (HNPA, 7-digit) numbers are converted, the home NPA used is determined from the originator's administered location. <li data-bbox="513 999 727 1352">● Call Redirection Uses the location and partition group of the forwarded or covered party, not those of the caller. 	To simplify the administration of AAR/ARS and its interaction with TOD routing and partition groups, partitioning should be separated from AAR and ARS analysis. In other words, AAR/ARS analysis entries could specify a routing index (from 1 to 2000), and a separate table could be used to specify the routing treatment for each of 8 partitions, for each routing index.	Maximum 600 conversion entries possible (Release 7r or later) Provides a fixed point of reference for digit analysis
Daylight Savings Time	Up to 15 starting and ending dates and times and the change increment (in hours and minutes) can be administered for different locations.	Each location must have a Daylight Savings Time rule administered.	Once administered, all locations change automatically to the proper time at the designated day and time.

3 of 4

Table 57: Communication Manager server operations affected by location (continued)

Operation	Description	User interface	Performance
Dial Plan	<p>Users on port networks located in different North American Number Plan Areas (NPA) expect to make local calls by dialing 7-digit numbers. Although the digits dialed by two different users may be the same, the actual intended destinations may be different.</p>		<p>Carefully consider AAR and ARS routing parameters in ATM configurations.</p>
System clock	<p>Time displays and stamps in all other locations automatically change according to the administered Daylight Savings Time rules.</p>	<p>Elapsed-time fields for features such as Call Detail Recording (CDR) are treated as they are now whenever the system clock is reset during the transition to and from daylight savings time. The system administrator may choose not to specify daylight savings time for the system clock, thereby avoiding the transitions. This may make time-of-day routing tables inaccurate. And, because the automatic daylight transition occurs early in the morning (at least by U.S. rules), only a few CDR records are affected.</p>	<p>With one administration change in Communication Manager, all remote locations display and timestamp in locally adjusted Daylight Savings Time.</p>

Time of Day considerations

[Table 58](#) shows the time-of-day impacts on users and administrators. In the Group column:

- User-visible means that times are visible and/or manipulated by the users.
- System management means that times are visible to, used by, and set by the system administrator or other switch management.

Table 58: Time of day impacts

Use	Group	Impact
User date and time	User-visible	The date and time displayed by the system should indicate the user's local time.
Automatic wakeup Announcements Do-Not-Disturb	User-visible	The user is able to specify and receive a wakeup call at the correct local time.
Call Detail Recording	System management	Times recorded may have to be matched against times reported by public network service providers (which may be dependent on the locations of trunk groups). Two kinds of changes: <ul style="list-style-type: none"> ● Automatic changes are set in software to occur at 2 AM, for example. ● Manual changes are still possible
Time-of-Day routing	System management	Times are derived from time-of-day considerations based on the location(s) of various outgoing trunks. For example, a time-of-day routing change may take place at 5:00 PM EST because calls entering the public network through a New York trunk group receive reduced rates. Another change may occur at 5:00 PM PST because trunks in Los Angeles now provide reduced rates. Some or all of these times may be subject to daylight savings time changes.

1 of 2

Table 58: Time of day impacts (continued)

Use	Group	Impact
Malicious Call Trace	System management	Recorded time may need to be converted to user-perceived time. Because this feature is invoked infrequently, manual conversion is acceptable.
AUDIX	User-visible	AUDIX maintains its own time (including daylight savings) and is unaffected by switch administration. Depending on the number of DCS links available, it is possible to provide a different AUDIX switch for each time zone (or each location), with the AUDIX clock set to match.

2 of 2

Features Supported

Release 7 and later software supports the ATM-CES trunking features listed in [Table 59](#) with noted feature interactions. Other features are not listed because they have nothing to do with trunking.

Table 59: Release 7 and later ATM-CES trunking features supported

Feature	Description
Abbreviated Dialing	Has the digits before cut-through put in the SETUP message. Tones after the cut-through (used by voice response systems) are generated directly by the ATM board.
Alternate Facility Restriction Levels	Works the same for ATM trunks as for any other trunk.
Attendant Serial Calling	Works the same as for other trunks.
Automatic Alternate Routing (AAR)	Selects a routing pattern, which in turn may select an ATM trunk.
Authorization Codes	Can override the FRL on incoming ATM calls or block access to ATM trunks.

1 of 4

Table 59: Release 7 and later ATM-CES trunking features supported (continued)

Feature	Description
Automatic Route Selection	Selects a routing pattern, which in turn may select an ATM trunk.
CallVisor Adjunct/Switch Applications Interface (ASAI)	Carries messages (customer account number, for example) in facilities information elements in Q.931 messages. ¹
Call Detail Recording	Applies to trunk groups, not to individual trunk members (same CDR format used for ISDN-PRI trunks)
CDR Account Code Dialing Forced Entry of Account Codes	Works with ARS, but not with TAC (ATM trunk groups <i>do not</i> support TAC).
Class of Restriction (COR)	Is used for miscellaneous trunk restrictions: CORs assigned to individual stations control access to ATM trunks through the routing table FRL.
Clock/Synchronization	Derives synchronization source from T1 or E1 span connected to the ATM switch(es).
Data Call Setup Data Hot Line Data Privacy Data Restriction	Sets the QoS parameters appropriately for data calls.
DCS Over ISDN-PRI D-Channel (DCS+)	Is supported
End-to-End Signaling	Send DTMF digits for rotary phones <i>after</i> the call is connected.
Extended Trunk Access (ETA)	Routes a call to a trunk
Facility Restriction Levels (FRLs)	Control access to ATM trunks like any other trunk. See also Traveling Class Marks (TCM).
Facility Associated Signaling (NFAS)	Is supported
Nonfacility Associated Signaling (NFAS)	Is not supported (see NFAS in the list of unsupported features).
Generalized Route Selection (GRS)	Includes Bearer Capability Class (BCC), Information Transfer Capability (ITC), and others. These parameters are checked on the routing pattern, and are used to select an appropriate trunk group. These parameters may help choose the appropriate QoS.

2 of 4

Table 59: Release 7 and later ATM-CES trunking features supported (continued)

Feature	Description
Inbound Call Management (ICM)	See CallVisor ASAI.
Inter-PBX Attendant Calls	Does not require a special kind of trunk, unlike Centralized Attendant Service (CAS).
Look Ahead Interflow	Places look ahead interflow information element in the SETUP message, requiring a private network connection.
Malicious Call Trace (MCT)	Shows calling party identification and port number. MCT cannot be activated on a specific ATM trunk port, as can be done on ISDN ports.
Multiple Listed Directory Numbers	Work with CO, DID, FX, ISDN-PRI, and ATM trunks.
Network Access—Private	Works same as any other tie trunk
Network Access—Public	Works same as an ISDN-PRI trunk to the public network
Night Service	Is supported for all night service modes, including the ability to administer an individual night service button to an ATM group. It is <i>not</i> possible to have a night service extension assigned to an individual trunk group member (for other than CES).
QSIG Global Networking	Is supported
Remote Access (with Security Measures)	Uses remote access features for incoming calls on ATM trunks, including barrier codes and authorization codes.
Remote Call Coverage	Is supported to an endpoint over ATM, with the limitation that the ATM trunk cannot be selected by a TAC.
Restriction—Fully Restricted Service	Restricts stations to certain ATM trunks
Restriction—Toll	Uses the ARS toll table for ATM trunking
Restriction—Voice Terminal, Inward	Restricts stations to receive ATM private network calls but not ATM public network calls.
Restriction—Voice Terminal, Outward	Restricts stations to originate ATM private network calls but not ATM public network calls.

Table 59: Release 7 and later ATM-CES trunking features supported (continued)

Feature	Description
Restriction—Voice Terminal, Public	Restricts stations to receive ATM private network calls but not ATM public network calls.
Ringback Queuing	Queues Callbacks for any ATM trunk not used for DCS (same as ISDN-PRI restriction).
Subnet Trunking	Supports subnet trunking over ATM with normal digit manipulation.
Synchronization	See Clock Synchronization
System Measurements	Includes ATM-related measurements
System Status Report	Monitors trunk group traffic
Timed Reminder and Attendant Timers	Routes an incoming ATM call to the attendant if it is unanswered for a specified time period.
Transfer—Outgoing Trunk to Outgoing Trunk (with Security Measures)	Allows a station user to connect an ATM trunk to another trunk (ATM or not).
Traveling Class Marks (TCM)	Work as with ISDN-PRI.
Trunk Identification By Attendant	Are identifiable by group and member.
Wideband Switching	Is supported in ATM trunks and in ATM-PNC but in limited numbers.

4 of 4

1. The adjunct requests that these messages be sent along with the call when it routes over the trunk.

Features Not Supported

None of the features listed below are supported by ATM CES trunks.

- Abandoned Call Search
- Access Endpoint
- Administered Connections
- Advice of Charge (AOC)
- Answer Detection
- Attendant Control of Trunk Group Access
- Attendant Direct Trunk Group Selection
- Automatic Circuit Assurance (ACA).
- Automatic Transmission Measurement System (ATMS)
- Busy Verification of Trunks
- Call-by-Call Service Selection
- Centralized Attendant Service (CAS)
- Data-Only Off-Premises Extensions
- DCS Attendant Control of Trunk Group Access
- DCS Attendant Direct Trunk Group Selection
- DCS Automatic Circuit Assurance (ACA)
- DCS Busy Verification of Terminals and Trunks
- DCS Trunk Group Busy/Warning Indication
- Digital Multiplexed Interface Plan
- Direct Inward and Outward Dialing (DIOD)—International
- Direct Outward Dialing (DOD)
- DS1 Trunk Service
- E1 Trunk Service
- Enhanced ICSU
- Enhanced DCS (EDCS)
- Facility Busy Indication
- Facility Test Calls (with Security Measures)
- Flexible Billing

- Integrated Services Digital Network (ISDN)—Primary Rate Interface
- Loudspeaker Paging Access and Loudspeaker Paging Access—Deluxe
- Nonfacility Associated Signaling (NFAS)
- Off-Premises Station
- Personal Central Office Line (PCOL)
- Power Failure Transfer
- R2-MFC Signaling
- Recorded Announcement
- Recorded Telephone Dictation Access
- Restriction—Miscellaneous Trunk
- Trunk Flash
- Trunk Group Busy/Warning Indication

Delay Interactions

Delays in ATM cell delivery affects the ATM-PNC or ATM-CES features and functionality listed in [Table 60](#).

Additionally, WAN-PNC configurations (more than one ATM switch) require additional delay considerations:

1. Setting up an SVC through the PNC can be delayed by as much as 7 s, similar to an ISDN trunk.
2. An SVC request can fail, and this failure may not be received for several seconds.
3. Paths through the PNC are not free (however, tariffing of these resources is highly variable).

Table 60: ATM delay interactions

Feature	Description
POTS (plain old telephone service)	Lets in normal point-to-point calls the terminating side does not ring until an SVC is established through the WAN.
AAR (Automatic Alternate Routing) ARS (Automatic Route Selection)	Route calls based on the preferred (normally the least expensive) route available at the time the call is placed.

1 of 10

Table 60: ATM delay interactions (continued)

Feature	Description
AAR and ARS Overlap Sending	Determines that if the call is to be routed to another switch over a trunk with ISDN overlap sending, the system seizes the outgoing ISDN trunk and starts sending digits while the Communication Manager server continues to collect (receive) the remaining incoming digits.
AAR and ARS Partitioning	Manages geographically dispersed PNs.
Agent Call Handling	Allows you to administer functions that Automatic Call Distribution (ACD) agents use to answer and process ACD calls. Automatic answering (zip tone) calls are also affected by SVC setup delays and failures.
Alternate Operations Support System Alarm Number (OSSA)	Allows you to establish a second number for the switch to call when an alarmable event occurs. This feature is affected by SVC setup delays and failures.
Answer Detection	Detects when the called party answers a call for call-detail recording. If the customer provisions Answer Supervision by Time-out, then calls are affected by SVC setup delays and failures.
Attendant Auto-Manual Splitting	Allows the attendant to announce a call or consult privately with the called party without being heard by the calling party on the call. This feature is affected by SVC setup delays and failures.
Attendant Backup Alerting	Allows other system users to pick up attendant calls when the attendant is unable to do so. This feature provides both audible and visual alerting to backup stations when the attendant queue reaches its queue warning level. When the queue drops below the queue warning level, alerting stops. This feature is affected by SVC setup delays and failures for the calls that are picked up by other system users.
Attendant Direct Trunk Group Selection	Allows the attendant to access an idle outgoing trunk. This feature is affected by SVC setup delays and failures if trunk is on another PN.
Attendant Intrusion	Allows an attendant to intrude on an existing call to offer a new call or message to the intruded party. This feature is affected by SVC setup delays and failures.

Table 60: ATM delay interactions (continued)

Feature	Description
Attendant Override of Diversion Features	Allows an attendant to bypass call-diversion features invoked by and associated with a dialed extension. This feature is affected by SVC setup delays and failures.
Attendant Recall	Allows voice-terminal users on a 2-party call or on an attendant conference call held on the console to recall the attendant for assistance. This feature is affected by SVC setup delays and failures.
Attendant Serial Calling	Enables the attendant to transfer trunk calls that return to the same attendant after the called party hangs up. This feature is affected by SVC setup delays and failures.
Audio Information Exchange (AUDIX) Interface	Is affected by SVC setup delays and failures.
Auto Start and Don't Split	Allows the attendant to initiate a call by pressing any key on the keypad without having to first press Start. No effect.
Automatic Call Distribution (ACD)	Allows incoming calls to connect automatically to specific splits. This feature is affected by SVC setup delays and failures.
Automatic Callback (ACB)	Allows internal users who placed a call to a busy or unanswered internal voice terminal to be called back automatically when the called voice terminal becomes available. This feature is affected by SVC setup delays and failures.
Automatic Incoming Call Display	Allows the system to provide information about an incoming call when the called party is active on a call. This feature is affected by SVC setup delays and failures.
Automatic Transmission Measurement System (ATMS)	Measures transmission performance for voice and data trunk facilities. This is affected by ATM-WAN problems.
Automatic Wakeup	Allows attendants, front desk users, and guests to place an automatic wakeup call to a certain extension at a later time. This feature is affected by SVC setup delays and failures.

3 of 10

Table 60: ATM delay interactions (continued)

Feature	Description
Bridged Call Appearance	Allows single-line and multi-appearance voice-terminal users to have an appearance of another user's primary extension number. This feature is affected by SVC setup delays and failures.
Busy Verification of Terminals and Trunks	Allows attendants and specified multi-appearance voice-terminal users to make test calls to trunks, voice terminals, and hunt DDC and UCD groups. This feature is affected by SVC setup delays and failures.
Call Coverage	Provides automatic redirection of calls to alternate answering positions in a Call Coverage path. This feature is affected by SVC setup delays and failures.
Call Detail Recording (CDR)	Collects detailed information about all incoming and outgoing calls on specified trunk groups and, if you use intraswitch CDR, about calls between designated extensions on the switch. No effect.
Call Forwarding	Allows users to redirect calls to designated destinations. The feature is affected by SVC setup delays and failures.
Call Park	Allows users to put a call on hold and then retrieve the call from any other voice terminal within the system. This feature is affected by SVC setup delays and failures.
Call Pickup	Allows a voice-terminal user to answer calls that alert other extension numbers within the user's specified call pickup group. This feature is affected by SVC setup delays and failures.
Call Prompting	Uses specialized vector commands to process incoming calls based on information collected from the caller or from an ISDN-PRI message. This feature is affected by SVC setup delays and failures.
Call Vectoring	Processes incoming and internal calls according to a programmed set of commands. This feature is affected by SVC setup delays and failures.
Call Waiting Termination	Notifies a user with a single-line telephone who is active on one call that a second call is waiting. This feature is affected by SVC setup delays and failures.
Centralized Attendant Service (CAS)	Allows attendants in a private network of switching systems to be concentrated at a central or main location. Attendant answer times are affected by delays and failures.

Table 60: ATM delay interactions (continued)

Feature	Description
Code Calling Access	Allows attendants, voice-terminal users, and tie-trunk users to page with coded chime signals. This feature is affected by SVC setup delays and failures.
Conference Attendant	Allows the attendant to set up a conference call for as many as 6 conferees, including the attendant. This feature is affected by SVC setup delays and failures.
Conference Terminal	Allows multi-appearance voice-terminal users to make 6-party conference calls without attendant assistance. This feature is affected by SVC setup delays and failures.
Consult	Allows a covering user, after answering a coverage call, to call the principal (called party) for private consultation. This feature is affected by SVC setup delays and failures.
DCS Alphanumeric Display for Terminals	<p>Allows calls to or from alphanumeric-display terminals to have transparency for call-related data. No impact for all of DCS features.</p> <ul style="list-style-type: none"> ● DCS Attendant Control of Trunk Group Access ● DCS Attendant Direct Trunk Group Selection ● DCS Attendant Display ● DCS Automatic Callback ● DCS Automatic Circuit Assurance ● DCS Busy Verification of Terminals and Trunks ● DCS Call Coverage ● DCS Call Forwarding ● DCS Call Waiting ● DCS Distinctive Ringing ● DCS Leave Word Calling ● DCS Multiappearance Conference/Transfer ● DCS Over ISDN-PRI D-channel ● DCS Trunk Group Busy/Warning Indication

5 of 10

Table 60: ATM delay interactions (continued)

Feature	Description
Do Not Disturb	Allows guests, attendants, and authorized front-desk voice-terminal users (those with console permission) to request that no calls, other than priority calls, terminate at a particular extension until a specified time. Affected by Time-of-Day issues.
Emergency Access to the Attendant	Alerts an attendant if a station remains off-hook for more than the administered period of time. This feature is affected by SVC setup delays and failures.
Expert Agent Selection	Routes incoming Automatic Call Distribution (ACD) calls to the agent best qualified to handle the call. This feature is affected by SVC setup delays and failures.
Facility Test Calls	Allows you to test specific trunks, DTMF receivers, time slots, and system tones from a phone. This feature is affected by SVC setup delays and failures.
Generalized Route Selection	Provides voice and data call-routing capabilities. This may be used for routing to PNs when knowledge of the WAN behavior is available.
Go to Cover	Allows users who call another internal extension to send the call directly to coverage. This feature is affected by SVC setup delays and failures.
Group Paging -	Allows a user to make announcements to groups of stations. This feature is affected by SVC setup delays and failures.
Hot Line Service	Allows single-line voice terminal users, by simply lifting the handset, to automatically place a call to a preassigned destination (extension, public or private network telephone number, or feature access code). This feature is affected by SVC setup delays and failures.
Hunt Groups	Handle multiple calls simultaneously to a single phone number. This feature is affected by SVC setup delays and failures.
Inbound Call Management	Allows you to integrate features of a Communication Manager server with host-application processing and routing, and automate delivery of caller information to agents' displays. This feature is affected by SVC setup delays and failures.

Table 60: ATM delay interactions (continued)

Feature	Description
Intercept Treatment	Provides an intercept tone or a recorded announcement or routes the call to an attendant for assistance when calls cannot be completed or when use of a feature is denied. This feature is affected by SVC setup delays and failures.
Intercom Automatic	Provides a talking path between two voice-terminal users. This feature is affected by SVC setup delays and failures.
Intercom Dial	Allows multiappearance voice-terminal users to gain rapid access to other voice-terminal users within an administered group. This feature is affected by SVC setup delays and failures.
Internal Automatic Answer	Provides convenient hands-free answering of internal calls to some voice-terminal users on most multifunction stations with a speakerphone or a headphone. This feature is affected by SVC setup delays and failures.
Inter-PBX Attendant Service (IAS)	Allows attendants for multiple branches to be concentrated at a main location. Incoming trunk calls to the branch, as well as attendant-seeking voice-terminal calls, route over tie trunks to the main location. This feature may be affected by SVC setup delays and failures.
Intraflow and Interflow	Allows you to redirect ACD calls from one split to another split when the splits are not vector-controlled. This feature is affected by SVC setup delays and failures.
Look-Ahead Routing	Provides an efficient way to use trunking facilities. This feature is affected by SVC setup delays and failures.
Loudspeaker Paging Access	Loudspeaker Paging Access provides attendants and voice-terminal users dial access to voice-paging equipment. This feature is affected by SVC setup delays and failures.
Malicious Call Trace	Allows you to trace malicious calls. No effect.
Manual Message Waiting	Enables multi-appearance voice-terminal users to press a designated button on their own terminals and light the Manual Message Waiting button lamp at another multi-appearance voice terminal. No effect.
Manual Originating Line Service	Connects single-line voice-terminal users to the attendant automatically when a user lifts the handset. This feature is affected by SVC setup delays and failures.

7 of 10

Table 60: ATM delay interactions (continued)

Feature	Description
Messaging Server Interface	Messaging Server (MS) interface provides MS-based features to the system. This feature is affected by SVC setup delays and failures.
Multimedia Call Handling (MMCH)	Allows you to administer a non-BRI voice terminal and a multimedia endpoint as a multimedia complex. This feature is affected by SVC setup delays and failures.
Multiple Call Handling (MCH)	Allows agents to receive an ACD call while other types of calls are alerting, active, or on hold. This feature is affected by SVC setup delays and failures.
Music-on-Hold Access	Automatically provides music, silence, or tone to a caller. This feature is affected by SVC setup delays and failures.
Night Service	Same as other hunt group and trunk features.
PC Interface	Is part of the PC/PBX connection, the PC/PBX platforms, and PC/ISDN platform product family. None of these features are affected.
Property Management System Interface	Provides a communications link between the switch and a customer-owned PMS. Interface to PMS system is affected by SVC setup delays and failures.
Public Network Call Priority	Provides call retention, forced disconnect, intrusion, mode-of-release control, and rering to switches on public networks. No effect.
QSIG	Provides compliance to the ISO ISDN private-networking specifications. Similar effect as DCS <ul style="list-style-type: none"> ● QSIG Call Forwarding (Diversion) ● QSIG Call Transfer ● QSIG Name and Number Identification ● QSIG Path Replacement (ANF-PR) ● QSIG Transit Counter (ANF-TC)
Recall Signaling	Allows the user of an analog station to place a call on hold, use the voice terminal for other call purposes, and then return to the original call. This feature is affected by SVC setup delays and failures.
Recorded Announcement	Provides an announcement to callers under a variety of circumstances. This feature is affected by SVC setup delays and failures.

Table 60: ATM delay interactions (continued)

Feature	Description
Recorded Telephone Dictation Access	Permits voice-terminal users, including Remote Access and incoming tie-trunk users, to access dictation equipment. No effect if user waits for signal.
Redirection on No Answer	Redirects a ringing ACD split or skill call or Direct Agent Call after an administered number of rings. It will have an effect if WAN-PNC delays ringing.
Ringback Queuing	Places outgoing calls in an ordered queue (first-in, first-out) when all trunks are busy. The voice-terminal user is automatically called back when a trunk becomes available. This feature is affected by SVC setup delays and failures.
Send All Calls	Allows users to temporarily direct all incoming calls to coverage regardless of the assigned call-coverage redirection criteria. The forwarded phone is affected by delays.
Service Observing	Allows a specified user, such as a supervisor, to observe or monitor another user's calls. No effect.
Station Hunting	Routes calls made to a busy station down a chain of stations until one is found that is not active. This feature is affected by SVC setup delays and failures.
Temporary Bridged Appearance	Allows multi-appearance voice terminal users in a terminating extension group (TEG) or personal central office line (PCOL) group to bridge onto an existing group call. This feature is affected by SVC setup delays and failures.
Terminating Extension Group	Allows an incoming call to ring as many as 4 voice terminals at one time. This feature is affected by SVC setup delays and failures.
Time of Day Routing	Provides the most economical routing of ARS and AAR calls. This feature is affected by different time zones.
Transfer	Allows voice-terminal users to transfer trunk or internal calls to other voice terminals or trunks without attendant assistance. This feature is affected by SVC setup delays and failures.
Transfer Outgoing Trunk to Outgoing Trunk	Permits a controlling party (such as a station user or attendant) to initiate two or more outgoing trunk calls and then connect the trunks. This feature is affected by SVC setup delays and failures.

9 of 10

Table 60: ATM delay interactions (continued)

Feature	Description
Trunk-to-Trunk Transfer	Allows the attendant or voice-terminal user to connect an incoming trunk call to an outgoing trunk. This feature is affected by SVC setup delays and failures.
Uniform Dial Plan	Provides a common 4- or 5-digit dial plan (specified in the Dial Plan Record) that can be shared among a group of switches. No effect.
VDN in a Coverage Path	Enhances Call Coverage and Call Vectoring to allow you to assign Vector Directory Numbers (VDNs) as the last point in coverage paths. This feature is affected by SVC setup delays and failures.
VDN of Origin Announcement	Provides agents with a short message about a caller's city of origin or requested service based on the VDN used to process the call. This feature is affected by SVC setup delays and failures.
Visually Impaired Attendant Service	Allows a visually impaired attendant to listen to voiced information about each button in Inspect mode. This feature is affected by SVC setup delays and failures.
Voice Response Integration	Integrates Call Vectoring with the capabilities of voice response units (VRUs) such as the CONVERSANT Voice Information System (CVIS). This feature is affected by SVC setup delays and failures.
Whisper Page	Allows station users to make and receive barge-in announcements to and from other station users without anyone else on the calls being aware of the announcements. This feature is affected by SVC setup delays and failures.
Wideband Switching	Provides the ability to dedicate 2 or more ISDN-PRI B-channels or DS0 endpoints for applications that require large bandwidth. This feature is affected by SVC setup delays and failures.
World-Class Tone Detection	Allows Communication Manager media server to identify and handle different types of call-progress tones. Affected by delays and failures if the call needs to go to another PN for the tone detector.
World-Class Tone Generation	Allows you to define call-progress tones. Affected by delays and failures if the call needs to go to another PN for the tone generator.

ATM Feature Interactions

The following sections summarize the effects of ATM-WAN PNC on various features because of:

1. Location assignments in a widely distributed switch
2. Cell delivery delays and race conditions that occur on the ATM-WAN.

The features affected by these conditions are listed in [Table 61](#).

Table 61: Release 7 or later ATM feature interactions

Feature	Affected by		Description	Remedy
	Location	Race Condition		
Music on Hold	X		Long holding times between widely separated PNs (single music source extended to the PNs while caller is on hold).	Administer a separate music source for each location.
Tenant Partitioning Attendant Selection	X		Attendant services based on time of day at the administered location	Specify an attendant group for the partition (optional; overrides the location-based administration)
AAR/ARS Partioning	X ¹		Partitioning is applied in a partition routing table as the result of digit analysis.	AAR/ARS partitioning separated from digit analysis to: <ul style="list-style-type: none"> ● simplify AAR/ARS administration ● permit ARS caller-location analysis

1 of 8

Table 61: Release 7 or later ATM feature interactions (continued)

Feature	Affected by		Description	Remedy
	Location	Race Condition		
Attendant Group Features Centralized Attendant Service	X		When a CAS attendant extends a call out over public facilities through TAC or ARS access, digit analysis is based on the location of the RLT trunk. That is, CAS attendants must dial as if they were on the served switch in the same location as the RLT trunk.	Combine switches in different locations to provide direct access to a single attendant group Centralized attendant service is acquired from another switch through an RLT trunk
AUDIX	X	X	If a call goes to AUDIX, and the assigned AUDIX is far across the WAN, a race condition can exist between alerting with answer by AUDIX, and establishment of an inter-port-network connection through the ATM WAN. If the WAN loses, the AUDIX announcement could be clipped or lost.	Avoid this problem by providing local AUDIX systems, each located near its subscriber. If the switch spans multiple time zones, a separate AUDIX for each time zone is also desirable to provide the correct timestamps for recorded messages.

Table 61: Release 7 or later ATM feature interactions (continued)

Feature	Affected by		Description	Remedy
	Location	Race Condition		
Automatic Call Distribution (ACD)	X		ATM WAN PNC permits the administration of a single ACD group with agents scattered across the country. Depending on the service provided by the WAN, this can lead to relatively long interconnection delays if, for example, an ACD customer calls in on a New York trunk and is routed to an agent on a port network located in Los Angeles.	Ensure that the ATM network used can meet interconnection delay requirements. This may require the use of local ATM switches interconnected through dedicated long-haul facilities. The switch cannot guarantee, in the worst case, that a talk path is available when the agent is alerted to the call and begins speaking. This remedy is necessary if a switch is to support ACD groups with access points in remote locations.
Automatic Route Selection (ARS)	X		The multilocation feature provides the ability to perform ARS digit conversion and routing analysis based on location. That is, the switch can support local public network dialing plans as appropriate for users in each location.	Convert this capability to ARS and apply it to UDP or AAR calls.

Table 61: Release 7 or later ATM feature interactions (continued)

Feature	Affected by		Description	Remedy
	Location	Race Condition		
Call Coverage	X		When a call is sent to remote coverage, digit analysis and routing are based on the location, tenant number, and partition group of the covered user, not on those of the calling user. When the attendant is specified as a coverage point, the attendant group selected is based on the location (or tenant partition) of the covered user.	
Call Forwarding	X		When call forwarding is activated and a call is actually forwarded, the forward-to digits are analyzed, and the call is routed, according to the location, tenant partition, and partition group assigned to the forwarded endpoint, not according to the caller's properties and permissions.	

Table 61: Release 7 or later ATM feature interactions (continued)

Feature	Affected by		Description	Remedy
	Location	Race Condition		
CAMA trunks	X		Enhanced 911 (E911) service over CAMA trunks (MF signalling through a TN744D or TN2182B port) uses an algorithm that searches for a touch-tone receiver within a single location before searching elsewhere. This ensures that an E911 call uses a tone generator within the same location as the trunk and should not negatively impact E911 service on a WAN PNC configuration.	Engineer the service circuits and port networks within a location as if they were a stand-alone switch, which reduces reliance on service circuits located on distant port networks and minimizes long-haul ATM connections just for services like touchtone collection.
Dial Plan	X		The ATM-WAN PNC switch's dial plan has a common extension numbering and common feature access codes. Take care in planning to: <ul style="list-style-type: none"> • Combine existing switches • Add DID trunks and number ranges in different locations. 	Administer multiple NANP home area codes (one per location) when using subnet trunking. See AAR and ARS changes.
Hospitality Automatic Wakeup	X		When guests and attendants enter or check wakeup times, all times are reported in that location's timezone and daylight savings time plan.	Time-zone and daylight savings time administration
Interexchange Carrier (IXC) access	X		You can administer IXC access codes across all locations in a WAN PNC.	

Table 61: Release 7 or later ATM feature interactions (continued)

Feature	Affected by		Description	Remedy
	Location	Race Condition		
International	X		Restricted to a single country code	No provision has been made for location-based selection of companding modes, call progress tones, loss plans, or other options.
Paging	X		Switch capacity is 9 individual zones and a tenth (global) zone	
Modem Pooling	X		Delayed connections to and through a modem pool can lead to failed modem training sequences.	Modern modems are more than twice as fast as the fastest modems supported by a modem pool.
Multimedia			The multimedia feature builds a conference using MMIs and VCs in a single port network to minimize the number of timeslots. This means that long-haul connections carry H.320 encoded digital data.	Send all data conferencing connections to the one ESM (24 connections per ESM) the switch supports.
Music on Hold	X		Placing music on hold to all port networks requires extending a music timeslot to any PN that needs it, resulting in long-haul music links between PNs if endpoints in different locations are on hold.	Use tenant partitioning to segregate music sources to individual locations.

Table 61: Release 7 or later ATM feature interactions (continued)

Feature	Affected by		Description	Remedy
	Location	Race Condition		
Network access (public)	X		ARS permits location-based digit analysis and manipulation, including support for local dialling plans, local central office access, and the WAN PNC equivalent of tail-end hopoff (routing a call to the best central office access point through the ATM WAN).	
Network access (private)				
Network (SDN)	X		WAN PNC supports SDN access.	Replace the SDN with a WAN PNC switch.
Personal CO line			You can administer a personal CO line in a different city than the user.	
Recorded Announcement	X	X	Announcement playback may be delayed during inter-PN connection setup to ensure that the complete announcement can be heard.	
Remote modules			Multilocation feature supports any type of remote PN (including DS-1)	
Tenant Partitioning	X		WAN PNC tenant partitioning can provide local music-on-hold sources and/or local attendants. XREF to Music on Hold above.	

7 of 8

Table 61: Release 7 or later ATM feature interactions (continued)

Feature	Affected by		Description	Remedy
	Location	Race Condition		
Ten-Digit to Seven-Digit Conversion	X		Supports 10-to-7 digit conversion by providing location-dependent routing and location-dependent home-NPA definition.	
Time-of-Day Routing	X		The system clock, which determines time-of-day routing transitions, permits administration of a daylight savings time rule, if desired.	System clock (if administered), changes automatically according to the specified rule, and time-of-day changes follow the system clock.
Uniform Dial Plan	X			Uniform Dial Plan in a network of switches makes it easier to merge those switches into a single WAN PNC switch.
Voice Terminal Display - Date/Time Display	X		Some phones maintain an internal time that is not synchronized with the switch, and must be set by the user.	Base correct date and time display on the user's location if location is administered.
World Class Routing (Multinational Call Routing/AAR-ARS)	X		Location-dependent digit analysis and conversion for ARS	

8 of 8

1. If a customer does not use AAR/ARS partitioning (or time-of-day routing), then the partition-routing table is not used at all, and route patterns are administered directly in AAR/ARS analysis entries.

Cross-product Compatibility

Observe the following cross-product compatibility issues:

Table 62: Cross-product compatibility with Communication Manager Media Server ATM

Product	Description
AUDIX	For the caller to hear the complete AUDIX greeting message, the connection between the caller and AUDIX must be available immediately after AUDIX answers a call.
Conversant	Similar to the considerations for AUDIX, there must be an available talk path between the caller and the Conversant so that the caller hears prompts from the Conversant.

Index

Numerical

258A adapter	21
355A adapter	21
401A T1	48
402A E1	49
403A E1	50

A

administration	
access terminals	
Avaya Site Administration (ASA)	83
accessing switches	83
acquiring ATM addresses	84
ATM switch.	86
ATM-CES	90
ATM-CES procedure	94
ATM-CES rules	91
ATM-CES trunk capacities	92
ATM-PNC	87
Communication Manager	86
gain/loss adjustments	115
locations	106
port-to-channel mapping	105
SVC cache	113
trunk capacities by model	92
trunk groups	93
administration screens	78
Asynchronous Transfer Mode (ATM)	
attaching firmware monitor cable.	20
cell underruns/overruns	128
Cell-Loss Priority (CLP)	126
fiber-optic distances.	23
jitter	128
layer alarms	127
link data	129
VPI.VCI	
data interactions.	134
traces between port networks	134
ATM addresses	17
ATM circuit emulation service.	9
ATM connections	18
ATM maintenance objects	136
ATM network duplication	63
administration	66
ATM port network connectivity	9, 17
ATM switch suitability	31

ATM switches	
list of	10
ATM wide-area network.	9
ATM-CES	9
ATM-PNC	9, 17
slot restrictions	43
upgrading CSS	
critical reliability	73
network duplication.	73
ATM-WAN	9
Avaya service organizations.	122
Global Services Organization Division	17
Remote Technical Services	17
Avaya support Web site.	14

C

cables	
1541CC cable kit	58
1541CC test kit	58
fiber optic	38, 44
H600-383	52
maximum run lengths	
401A T1	53
402A E1	53
403A E1	53
RJ45 to Bantam	58
RJ450-to-Bantam test cable	22
RJ45-to-Bantam test cable.	58, 60
ST-to-SC adapter	38, 44
Caution, meaning of	13
Cell-Loss Priority (CLP)	126
center stage switch	9
connections	
needing synchronization splitters	46
without synchronization splitters	46
conserving ATM bandwidth	175
conventions used in this book	
Caution	13
Danger	13
Warning	13
CSS	9

D

Danger, meaning of.	13
daylight-savings time rules	108
DS1 synchronization splitter (3-way)	46

Index

H

hardware

401A T1 synchronization splitter	53
402A E1 splitter	52
402A E1 synchronization splitter	52 , 53
403A E1 synchronization splitter	53
TN2305	19 , 22 , 37
TN2306	19 , 37
TN771	19
helplines	123

I

installation

ATM-CES	37
Integrated Local Management Interface (ILMI)	17

L

LEDs

DS1 circuit pack	150
location administration	106

M

maintenance objects	136
ATM-NTWK	126 , 128 , 129 , 133
Meiners' Algorithm	31

N

NAA1 fiber optic circuit pack	39
network synchronization	45

R

reliability

ATM network duplication	63
reliability configurations, parts required for	19
Remote Technical Services.	36

S

SONET/SDH layer alarms	127
SVC cache administration	113
switch suitability	
known switch limits	35
switched virtual connection	31
synchronization	
network	45
synchronization connections	
directly to timing source	52

synchronization splitters.	46
401A T1	47 , 48 , 52
402A E1	47 , 49 , 52
403A E1	47 , 50 , 52
E1	19
for specific countries.	53
jumper settings	
401A T1	51
402A E1	51
403A E1	51
T1	19
testing	58
system capacities.	22

T

test equipment

103A block	22
15411C cable kit	22
700A DS1 CPE loopback jack	22
Phoenix 1541C Test Set	22
Phoenix 5575A T1 Test Set	22

TN2305B (ATM)

attaching firmware monitor cable	20
automatic reset	132

TN2306B (ATM)

attaching firmware monitor cable	20
automatic reset	132

troubleshooting

401A T1 synchronization.	150
402A E1 synchronization.	150
403A E1 synchronization.	150
Alarms and Errors	136
ATM CES commands	149
ATM-PNC.	138 , 149
ATM-PNC commands	172
inspecting LEDs.	138 , 150
interoperability	138 , 152
TN2305.	142 , 161
TN2306.	142 , 161
unusual ATM problems	148 , 170

V

voice terminals, see phones

W

Warning, meaning of	13
-------------------------------	--------------------