

**Lucent Technologies**  
Bell Labs Innovations



**DEFINITY<sup>®</sup>**

**Enterprise Communications Server**

Release 8.2

ATM Installation, Upgrades, and Administration

555-233-124  
Comcode 108678723  
Issue 1  
April 2000

## Notice

Every effort was made to ensure that the information in this book was complete and accurate at the time of printing. However, information is subject to change.

## Your Responsibility for Your System's Security

Toll fraud is the unauthorized use of your telecommunications system by an unauthorized party, for example, persons other than your company's employees, agents, subcontractors, or persons working on your company's behalf. Note that there may be a risk of toll fraud associated with your telecommunications system and, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

You and your system manager are responsible for the security of your system, such as programming and configuring your equipment to prevent unauthorized use. The system manager is also responsible for reading all installation, instruction, and system administration documents provided with this product in order to fully understand the features that can introduce risk of toll fraud and the steps that can be taken to reduce that risk. Lucent Technologies does not warrant that this product is immune from or will prevent unauthorized use of common-carrier telecommunication services or facilities accessed through or connected to it. Lucent Technologies will not be responsible for any charges that result from such unauthorized use.

## Lucent Technologies Fraud Intervention

If you *suspect that you are being victimized* by toll fraud and you need technical support or assistance, call Technical Service Center Toll Fraud Intervention Hotline at 1 800 643-2353 or contact your local Lucent representative.

## Federal Communications Commission Statement

**Part 15: Class A Statement.** 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 instructions, 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: Network Registration Number.** This equipment is registered with the FCC in accordance with Part 68 of the FCC Rules. It is identified by FCC registration number AS593M-13283-MF-E.

**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
- Routed to a recorded announcement that can be administered by the CPE user

This equipment returns answer-supervision signals on all 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

## Canadian Department of Communications (DOC)

### Interference Information

This digital apparatus does not exceed the Class A limits for radio noise emissions set out in the radio interference regulations of the Canadian Department of Communications.

Le Présent Appareil Numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A prescrites dans le reglement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

## Trademarks

See the preface of this document.

## Ordering Information

**Call:** Lucent Technologies BCS Publications Center  
Voice 1 800 457-1235 International Voice 317 322-6416  
Fax 1 800 457-1764 International Fax 317 322-6699

**Write:** Lucent Technologies BCS Publications Center  
2855 N. Franklin Road  
Indianapolis, IN 46219

**Order:** Document No. 555-233-124  
Comcode 108678723  
Issue 1, April 2000

For additional documents, refer to the section in "About This Document" entitled "Related Resources."

You can be placed on a standing order list for this and other documents you may need. Standing order will enable you to automatically receive updated versions of individual documents or document sets, billed to account information that you provide. For more information on standing orders, or to be put on a list to receive future issues of this document, contact the Lucent Technologies Publications Center.

## European Union Declaration of Conformity

The "CE" mark affixed to the DEFINITY® equipment described in this book indicates that the equipment conforms to the following European Union (EU) Directives:

- Electromagnetic Compatibility (89/336/EEC)
- Low Voltage (73/23/EEC)
- Telecommunications Terminal Equipment (TTE) i-CTR3 BRI and i-CTR4 PRI

For more information on standards compliance, contact your local distributor.

## Comments

To comment on this document, return the comment card at the front of the document.

## Acknowledgment

This document was prepared by Product Documentation Development, Lucent Technologies, Denver, CO.

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## About This Book

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This book provides procedures for installing ATM switches and upgrading existing DEFINITY® Enterprise Communications Servers to a Release 8.2 ATM-PNC or ATM-CES. It specifically covers

- Installing a new DEFINITY ECS that uses ATM-PNC
- Replacing the center stage switch (CSS), the central interface between the PPN and EPNs, with ATM-PNC
- Upgrading Release 6.3 and Release 7 DEFINITY ATM-PNC to Release 8.2 ATM-PNC
- Adding ATM-CES

The information in this book is intended for use by

- Lucent and channel partner trained field installation and maintenance personnel
- Technical Services Center (TSC) 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
- Lucent channel partners

## Overview

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The DEFINITY ATM (asynchronous transfer mode) combines portions of the DEFINITY platform with an ATM switch platform that meets specific criteria. DEFINITY ATM offers both intraswitch and interswitch ATM solutions. The intraswitch solution is called the ATM port network connectivity, or ATM-PNC, and the interswitch solution is called ATM circuit emulation service, or ATM-CES. ATM-PNC is only available on the R6.3r or later platform.

ATM-PNC provides an alternative to either the direct connect or center stage switch configurations for connecting the processor port network (PPN) to one or more expansion port networks (EPNs). ATM-PNC is available with four DEFINITY ECS reliability options—standard, high, ATM network duplication, and critical. Customers must choose whether they want direct connect, CSS, or ATM-PNC. It is not possible to mix configurations in the same R8r platform.

ATM-CES lets the DEFINITY ECS 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.

The DEFINITY ECS switch can connect through several ATM switch types, many of which are sold through Lucent's InterNetworking Systems (INS) channel, formerly know as DNS. Also, DEFINITY ECS switches are designed to work seamlessly with non-Lucent ATM switches that meet ATM standards set by the European Union.

For a current list of Lucent switches, go to the Infohub Web site (<http://infohub.mt.lucent.com/>) and select Product Index. Examples include the following equipment:

- Lucent Cajun M770 ATM switch
- Lucent PacketStar AC 60 or PSAX1250 access concentrators

## Organization

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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 Lucent organizations to prepare the customer site for equipment, translations, and scheduling upgrades and new installations
- calculating the suitability of various Lucent ATM switches
- [Chapter 2, “Installing a DEFINITY ECS 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 a DEFINITY ECS 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 Release 8 ATM-PNC
  - Release 6.3 and Release 7 DEFINITY ATM-PNC to Release 8 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 DEFINITY ECS alarms and errors for
  - DEFINITY ECS administration
  - ATM-related synchronization
  - ATM switch administration
- [Appendix A, “Baselining the Customer’s Configuration”](#) provides a worksheet to log the translations and administration information for
  - DEFINITY ECS
  - 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 DEFINITY ECS’s features.

## Conventions Used in This Book

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### Typographic

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- Information you type at the access terminal is shown in the following typeface: **list system-parameters maintenance**.
- Variables are shown in the following typeface: *number*.
- Field names and information displayed on the access terminal screen is shown in the following typeface: `login`.
- Keyboard keys are shown in the following typeface: Enter.

### Systems and circuit packs

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- The word “system” is a general term encompassing Release 8 and includes references to the DEFINITY Enterprise Communications Server models: Release 8r, Release 8si, Release 8csi, and Release 8c.
- DEFINITY Enterprise Communications Server is abbreviated as DEFINITY ECS.
- 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.
- The term “ASAI” is synonymous with the newer CallVisor ASAI.

### Admonishments

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Admonishments in this book have the following meanings:



**CAUTION:**

This sign is used to indicate possible harm to software, possible loss of data, or possible service interruptions.



**WARNING:**

This sign is used where there is possible harm to hardware or equipment.



**DANGER:**

This sign is used to indicate possible harm or injury to people.



## Physical dimensions

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- All physical dimensions in this book are in English units (feet [ft]) followed by metric (centimeter [cm]) in parenthesis.
- Wire gauge measurements are in AWG followed by the diameter in millimeters in parenthesis

## How to Comment on This Document

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Lucent Technologies welcomes your feedback. Your comments are of great value and help improve our documentation.

- Please fill out the reader comment card at the front of this manual and return it.
- If the reader comment card is missing, FAX your comments to 1-303-538-1741 or to your Lucent Technologies representative, and mention this document's name and number, DEFINITY Enterprise Communication Server Release 8 ATM Installation, Upgrade, and Administration, 555-233-124, Issue 1.
- Email your comments to **document@drmail.lucent.com**

## Resources

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### Related Books

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The following books are useful for system-related information:

- DEFINITY Enterprise Communications Server Release 8 Administration for Network Connectivity
- DEFINITY Enterprise Communications Server Release 8 System Description
- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8r
- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8si
- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8csi
- AT&T Network and Data Connectivity Reference
- DEFINITY Enterprise Communications Server Release 8 Installation and Test for Multicarrier Cabinets
- DEFINITY Enterprise Communications Server Release 8 Installation and Test for Single-Carrier Cabinets

- DEFINITY Enterprise Communications Server Release 8 Installation, Upgrades, and Additions for Compact Modular Cabinets
- DEFINITY Enterprise Communications Server Release 8 Administrator's Guide
- DEFINITY Enterprise Communications Server Release 8 Upgrades and Additions for R8si
- DEFINITY Enterprise Communications Server Release 8 Upgrades and Additions for R8r

## **How to Order Books**

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In addition to this book, other description, installation and test, maintenance, and administration books are available. A complete list of DEFINITY books can be found in the Business Communications System Publications Catalog.

This book and any other DEFINITY books can be ordered directly from the Lucent Technologies Business Communications System Publications Fulfillment Center at 1-317-322-6791 or toll free at 1-800-457-1235.

## **Other Resources**

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The following table lists Web sites containing more information on Lucent's ATM switch activities.

<b>Topic</b>	<b>Location</b>
Sales and marketing, design, administration, maintenance, provisioning, and upgrade (migration) activities	DEFINITY Solutions - ATM <a href="http://www.bcs.lucent.com/sales_market/definity/atm">http://www.bcs.lucent.com/sales_market/definity/atm</a>
General information on available Lucent ATM switches	Infohub <a href="http://infohub.mt.lucent.com/">http://infohub.mt.lucent.com/</a> (available to Lucent personnel only)
User manuals, installation guides, release notes, and help files	Cajun Tech Pubs <a href="http://pubs.lucenttctc.com/docs/">http://pubs.lucenttctc.com/docs/</a>

## Where To Call for Technical Support

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Use the telephone numbers in [Table 1](#) for the region in which the system is being installed.

**Table 1. Technical support contact numbers**

	Telephone Number
DEFINITY Helpline (feature administration and system applications)	1-800-225-7585
Lucent Technologies Toll Fraud Intervention	1-800-643-2353
Lucent Technologies National Customer Care Center (ATM customers)	1-800-242-2121
Lucent Technologies Corporate Security	1-800-822-9009
Streamlined Implementation (for missing equipment)	1-800-772-5409
USA/Canada Technical Service Center (ATM technicians)	1-800-248-1234
NetCare® Professional Services (NPS)	1-800-237-0016
International Technical Assistance (ITAC)	1-303-804-3777
Lucent Technologies Centers of Excellence	
Asia/Pacific Regional Support Center	65-872-8686
Western Europe/Middle East/South Africa	44-1252-77-4800
Central/Eastern Europe	361-345-4334
Central/Latin America Caribbean	1-303-804-3778
Australia	61-2-9352-9090
North America (INADS Database Administration)	1-800-248-1111

## Antistatic Protection

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### **WARNING:**

To minimize electrostatic discharge (ESD), always wear an authorized wrist ground strap when handling circuit packs or any components of a DEFINITY System. Connect the strap to an approved ground such as an unpainted metal surface on the DEFINITY ECS switch.

## Remove/Install Circuit Packs

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### **CAUTION:**

The control circuit packs with white labels cannot be removed or installed when the power is on. The port circuit packs with gray labels (older version circuit packs had purple labels) can be removed or installed when the power is on.

## Security

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To ensure the greatest security possible, Lucent Technologies offers services that can reduce toll fraud liabilities. Contact your Lucent Technologies representative for more security information.

Login security is an attribute of the DEFINITY ECS software. Advise customers that their existing passwords expire 24 hours after the upgrade. Also explain that the new passwords must conform to strict requirements.

System administrators must keep network addresses confidential. A PPN or any endpoint masquerading as a PPN on the ATM network can seize that EPN and control it if that EPN is not already connected to its proper PPN.

## Trademarks

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This document contains references to the following Lucent Technologies trademarked products:

- ACCUNET®
- AUDIX®
- Callmaster®
- CallVisor®
- CONVERSANT®
- DEFINITY®
- FORUM™

- MEGACOM®
- SYSTIMAX®
- TRANSTALK™

The following products are trademarked by their corresponding vendor:

- Audichron® is a registered trademark of Audichron Company
- LINX™ is a trademark of Illinois Tool Works, Inc.
- Windows95/98/NT is a trademark of Microsoft Corporation
- Music Mate® is a registered trademark of Harris Corporation
- PagePac® is a registered trademark of Harris Corporation, Dracon Division
- Shockwatch® is a registered trademark of Media Recovery, Incorporated
- Styrofoam® is a registered trademark of Styrofoam Corporation
- Tiltwatch® is a registered trademark of Media Recovery, Incorporated
- Zone Mate® is a registered trademark of Harris Corporation

## Standards Compliance

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The equipment in this document complies with:

- ITU-T (Formerly CCITT)
- ECMA
- ETSI
- IPNS
- DPNSS
- National ISDN-1
- National ISDN-2
- ISO-9000
- ANSI
- FCC Part 15 and Part 68
- EN55022
- EN50081
- EN50082
- UNI 3.1
- CISPR22
- Australia AS3548 (AS/NZ3548)

- Australia AS3260
- IEC 825
- IEC 950
- UL1459
- UL 1950
- CSA C222 Number 225
- TS001
- ILMI 3.1

## LASER Product

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The DEFINITY ECS switch may contain a Class 1 LASER device (IEC 825 1993) if single-mode fiber optic cable is connected to a remote expansion port network (EPN). The laser device operates within the following parameters:

Power output	Wavelength	Mode field diameter
-5 dBm	1310 nm	8.8 mm

### DANGER:

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Contact your Lucent Technologies representative for more information.

## Electromagnetic Compatibility Standards

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This product complies with and conforms to the following:

- Limits and Methods of Measurements of Radio Interference Characteristics of Information Technology Equipment, EN55022 (CISPR22), 1993
- EN50082-1, European Generic Immunity Standard
- FCC Part 15
- Australia AS3548

### NOTE:

The DEFINITY system conforms to Class A (industrial) equipment. Voice terminals meet Class B requirements.

- Electrostatic Discharge (ESD) IEC 1000-4-2
- Radiated radio frequency field IEC 1000-4-3
- Electrical Fast Transient IEC 1000-4-4
- Lightning effects IEC 1000-4-5
- Conducted radio frequency IEC 1000-4-6
- Mains frequency magnetic field IEC 1000-4-8
- Low frequency mains disturbance

The system conforms to the following:

- Electromagnetic Compatibility General Immunity Standard, part 1; Residential, Commercial, Light Industry, EN50082-1, CENELEC, 1991
- Issue 1 (1984) and Issue 2 (1992), Electrostatic Discharge Immunity Requirements (EN55024, Part 2) IEC 1000-4-2
- Radiated Radio Frequency Field Immunity Requirements IEC 1000-4-3
- Electrical Fast Transient/Burst Immunity Requirements IEC 1000-4-4

## **European Union Standards**

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Lucent Technologies Business Communications Systems declares that the DEFINITY equipment specified in this document bearing the "CE" mark conforms to the European Union Electromagnetic Compatibility Directives.

The "CE" (Conformité Européenne) mark indicates conformance to the European Union Electromagnetic Compatibility Directive (89/336/EEC) Low Voltage Directive (73/23/EEC) and Telecommunication Terminal Equipment (TTE) Directive (91/263/EEC) and with i-CTR3 Basic Rate Interface (BRI) and i-CTR4 Primary Rate Interface (PRI) as applicable.

The "CE" mark is applied to the following products:

- Global AC-powered Multicarrier Cabinet (MCC) with 25-Hz and 50-Hz ring generator
- DC-powered Multicarrier Cabinet (MCC) with 25-Hz ring generator
- AC-powered Enhanced Single-Carrier Cabinet (ESCC) with 25-Hz ring generator
- AC-powered Compact Single-Carrier Cabinet (CSCC) with 25-Hz ring generator
- AC-powered Compact Modular Cabinet (CMC) with 25-Hz and 50-Hz ring generator (for France)
- Enhanced DC Power System

# Federal Communications Commission Statement

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## Part 68: Statement

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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
- Routed to a recorded announcement that can be administered by the CPE user

This equipment returns answer-supervision signals on all domestic 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

Lucent Technologies 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.

This equipment complies with Part 68 of the FCC Rules. On the rear 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.

The REN is used to determine the quantity of devices which 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.

 **NOTE:**

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 table.

Manufacturer's Port Identifier	FIC Code	SOC/REN/ A.S. Code	Network Jacks
Off/On Premises Station	OL13C	9.0F	RJ2GX, RJ21X, RJ11C
DID trunk	02RV2-T	0.0B	RJ2GX, RJ21X
CO trunk	02GS2	0.3A	RJ21X
CO trunk	02LS2	3.0A	RJ21X
Tie trunk	TL31M	9.0F	RJ2GX
1.544 digital Interface	04DU9-B,C	6.0F	RJ48C, RJ48M
1.544 digital Interface	04DU9-BN,KN	6.0F	RJ48C, RJ48M
2.048 digital Interface	04DU9-BN,KN	6.0F	RJ48C, RJ48M
120A2 channel service unit	04DU9-DN	6.0F	RJ48C

If the terminal equipment (DEFINITY<sup>®</sup> System) 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. 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.

It is recommended that Lucent Technologies-certified technicians perform the repairs.

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.



# Preparing for Installation and Upgrades

# 1

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This chapter contains information on preparing for the installation or upgrade to Release 8 ATM Port Network Connectivity (ATM-PNC) and ATM Circuit Emulation Service (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 a DEFINITY ATM switch installation or upgrade involves coordinating the efforts among the following people and organizations:

- The customer
- The project manager
- NetCare® Professional Services (NPS)
- Lucent Technical Service Center (TSC) or Global Strategic Opportunities (GSO) Division
- ATM switch technician
- Lucent channel partner, if applicable

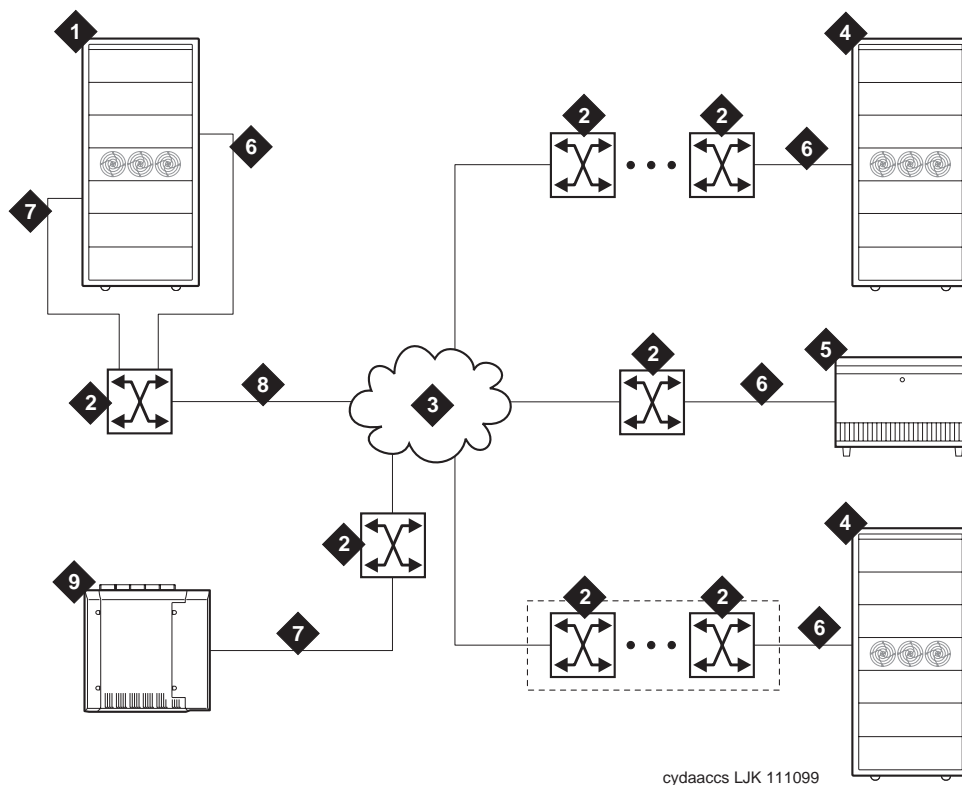
## **Request Address Information**

---

The complete DEFINITY ECS translations require precutover administration, which, in turn, requires a customer address scheme, specifically the ATM addresses for the TN2305/TN2306 ATM interface circuit pack(s). The address of the EPN 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 EPN's ATM address(es) directly from the ATM switch(es), the customer or ATM switch installer must provide that information.

## Review Configuration and Equipment

Figure 1-1 shows an example of the basic ATM connections for Release 8r and Release 8csi system using ATM-PNC and ATM-CES. For more detailed connection diagrams of the reliability options, refer to [“DEFINITY ECS configurations” on page 1-6](#).



### Figure Notes

- |                             |                            |
|-----------------------------|----------------------------|
| 1. DEFINITY ECS PPN-1 (r)   | 5. DEFINITY ECS EPN in SCC |
| 2. Lucent ATM switch        | 6. ATM-PNC                 |
| 3. ATM network (the cloud)  | 7. ATM-CES                 |
| 4. DEFINITY ECS EPN in MCC  | 8. ATM-PNC and ATM-CES     |
| 9. DEFINITY ECS PPN-2 (csi) |                            |

Figure 1-1. Example of an ATM-PNC and ATM-CES configuration

## Required Hardware

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

**Table 1-1. Minimum required equipment for Release 8 ATM-PNC configurations**

Equipment	Reliability level		
	Standard	High	Critical/ATM Network Duplication
ATM switch	1	1	2
TN2305/TN2306 ATM interface <sup>1</sup> for each PN	1	1 <sup>2</sup>	2
T1 or E1 synchronization splitter <sup>3</sup>	1	1	1
SC-connected fiber optic cable <sup>4</sup>	1	2 (PPN) 1 (each EPN)	2
TN771 maintenance/test circuit pack <sup>5</sup>			1

1. TN2305 (multimode fiber); TN2306 (single-mode fiber) for Release 8 ATM-PNC.
2. High reliability requires 2 ATM-EI circuit packs in the PPN and 1 ATM-EI in each EPN.
3. 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.
4. Existing fiber optic cable may require an ST-to-SC adapter, depending on the interface at the ATM switch. The TN2305/TN2306 circuit pack requires an SC connector (1 adapter is included in the Fiber Pass-Through Kit).
5. For network duplication; required for systems supporting PRI, BRI, or ASAI.

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 Jack<sup>1</sup> (comcode 10798867)
- 103A block
- 1541CC cable kit

1. See DEFINITY ECS Release 8 Maintenance for R8r, Chapter 6, DS1 Loopback Test for more information.

**1** Preparing for Installation and Upgrades  
*Review Configuration and Equipment*

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- RJ45-to-Bantam test cable from the 1541CC cable kit
- System capacities

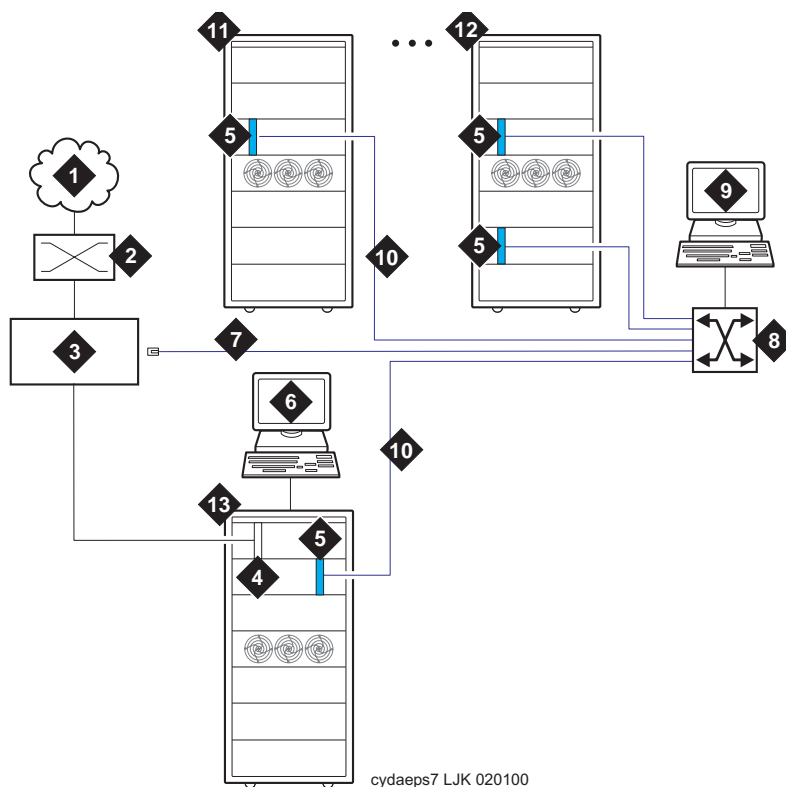
[Table 1-2](#) lists the maximum number of TN2305/TN2306 circuit packs allowed in a DEFINITY ECS.

**Table 1-2. Maximum number of ATM interface TN2305/TN2306 circuit packs**

<b>Platform</b>	<b>Maximum ATM circuit packs allowed</b>	<b>Description</b>
r	176	2 x 44 port networks (CES) plus 2 in each PN (PNC)
si, csi, c	6	CES only (no PNC)

## DEFINITY ECS configurations

Figure 1-2, Figure 1-3, and Figure 1-4 show the ATM-PNC connections for standard, high, and critical reliability, respectively.



### Figure Notes

- |   |  |
|---|--|
| 1. Public switched telephone network (PSTN)   | 8. Lucent ATM switch (more than one ATM switch in an ATM-WAN configuration.) |
| 2. Main distribution frame (MDF) or smart jack  | 9. ATM switch access terminal  |
| 3. Synchronization splitter.  | 10. Fiber optic cables from ATM OC-3/STM-1 interfaces                        |
| 4. DS1 circuit pack (TN464F)  | 11. DEFINITY ECS EPN   |
| 5. TN2305/TN2306 circuit packs  | 12. Split cabinet EPN  |
| 6. DEFINITY ECS access terminal   | 13. DEFINITY ECS PPN   |
| 7. Timing signal from synchronization splitter through an H600-383 cable to Lucent ATM switch |  |

Figure 1-2. ATM-PNC connections for standard reliability







## Determine ATM Switch Suitability

---

To fully support DEFINITY 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 in a proposed switch. This algorithm is available to Lucent engineers as a calculator within a Microsoft Excel spreadsheet. You may access the MS Excel file at <http://info.dr.lucent.com/~meiners/atm.html> . Check periodically for updates.

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-DEFINITY traffic, enter the resource limits after subtracting the resources used by the non-DEFINITY traffic.
4. If you are using an ATM switch with different limits on different modules or ports (for example, Lucent Cajun M770):
  - a. compute the average limits per port to which a DEFINITY 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 DEFINITY port networks attached to that ATM switch.

### ⇒ NOTE:

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

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**.

[Figure 1-3](#) shows an example of a calculation.

**Table 1-3. Sample calculation**

<b>Network Layout</b>	
Customer	<b>SV</b>
ATM switch	<b>AC120</b>
Total number of DEFINITY port networks:	<b>25</b>
Number of PNs directly attached directly to this ATM switch:	<b>12</b>
Is the DEFINITY PPN directly attached to this ATM switch (yes/no)	<b>yes</b>
Number of trunks on this ATM switch (inter-ATM-switch connections)	<b>1</b>
Any transit traffic through this ATM switch (yes/no)	<b>no</b>
Aggregate peak phone calls rate per hour in all directly connected PNs	<b>10000</b>
Bidirectional aggregate trunk bandwidth in Mbps	<b>155.52</b>
Application bandwidth in kbps needed per port network	<b>128</b>
<b>ATM Switch Resource Limits</b> (see "Limits" sheet for help)	
Number of PP SVCs supported:	<b>1000</b>
Number of PMP (roots) supported:	<b>6250</b>
Number of PMP parties (leaves) supported:	<b>8334</b>
Number of PMP endpoints (roots+leaves) supported:	<b>1000000</b>
Total number of SVCs (PP+PMP) supported	<b>1000000</b>
Per-port SVC limit (normally based on VCI range)	<b>1000000</b>
Setups per second at <220 ms per setup	<b>1000000</b>
<b>Feasibility</b>	<b>PROBABLY</b>
<b>Bandwidth limited</b>	<b>2032 calls</b>

**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.

**YES** means that this application is okay under any load.

**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.

**Table 1-4. Constants**

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

**Table 1-5. Computed values**

Number of nonlocal port networks	13
Effective number of port networks for PP	24
Effective number of port networks for PMP	24
Number of available timeslots	10064
Per-port SVCs (PP+PMP) needed	572
PP SVCs perPN	3
Total PP SVCs	72
PP cells per second required over trunks	15158
Aggregate cells per second available over trunks	366792
Bandwidth-limited maximum phone calls over trunks	2032
Timeslot-limited maximum phone calls over trunks	3000

## Constraint tests

If your calculations do not yield a **YES**, this section provides the resources of which you are short. These tests check 7 ATM switch resource limitations against 6 different application scenarios. A 1 in the Test Results ([Table 1-7](#)) indicates a passed test; a 0 indicates a failed test. To achieve a **YES** feasibility, all 42 tests must pass. To achieve a **PROBABLY**, only 21 tests (indicated in **bold**) must pass.

1 Preparing for Installation and Upgrades  
Determine ATM Switch Suitability

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Table 1-6. Application scenarios

Number of 2-party calls	2516	0	0	0	0	1258
Number of 3-party calls	0	1118	0	0	0	279
Number of 4-party calls	0	0	629	0	0	78
Number of 5-party calls	0	0	0	402	0	25
Number of 6-party calls	0	0	0	0	279	18

Table 1-7. Test results

Constraint 1: Timeslots	1	1	1	1	1	1
Constraint 2: PMP roots	1	1	1	1	1	1
Constraint 3: PP	1	1	1	1	1	1
Constraint 4: PMP leaves	1	1	1	1	0	1
Constraint 5: PMP endpoints	1	1	1	1	1	1
Constraint 6: Total SVCs	1	1	1	1	1	1
Constraint 7: Per-port SVCs	1	1	1	1	1	1
Constraint 8: Performance	1	1	1	1	1	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 DEFINITY 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 1-7](#) 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 1-8](#) 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 for DEFINITY (which are not necessarily the default settings). Consult the switch vendor for confirmation of current limits.

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

**Table 1-8. 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
<b>Lucent PSAX1250</b>							
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)	1000	6250	8334	1000000	1000000	1000000	1000000
<b>Lucent M770 r2</b>							
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
<b>Fore ASX1000</b>							
Release 6 (with memory model 5)	2048	2048	16384	1000000	1000000	1000000	1000000

## Schedule Installation or Upgrade

Schedule the installation or upgrade with the Lucent Technologies Technical Support Organization (TSO) and NetCare® Professional Services (NPS). See ["Where To Call for Technical Support" on page -xi.](#)



# Installing a DEFINITY ECS ATM-CES

# 2

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This chapter describes the procedures for installing a new DEFINITY ECS Release 8 ATM-CES. The procedure is simple in that you install the DEFINITY ECS, then install the ATM switch and the TN2305/TN2306 interface circuit packs. Making it an ATM-CES is done administratively (refer to [Chapter 5, "Administering ATM-PNC and ATM-CES"](#)).



**NOTE:**

ATM-CES works only with TN2305/TN2306 ATM interface circuit packs.

## Equipment Installation

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

- DEFINITY Enterprise Communications Server Release 8 Installation and Test for Multicarrier Cabinets
- DEFINITY Enterprise Communications Server Release 8 Installation and Test for Single-Carrier Cabinets
- DEFINITY Enterprise Communications Server Release 8 Installation, Upgrades, and Additions for Compact Modular Cabinets

Review the reliability configurations for DEFINITY Release 8 ATM (refer to [Figure 1-2](#) through [Figure 1-4](#)).

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

Follow the steps in [Table 2-1](#) 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 2-1. General installation process**

√	Step	Action	Description
	1.	Install DEFINITY ECS	Refer to the appropriate installation book for your platform  See <a href="#">"DEFINITY ECS configurations" on page 1-6</a> for connection schematics.
	2.	Install ATM switch(es) or access concentrators	Refer to your ATM switch's quick reference guide.
	3.	Install ATM interface circuit pack	Insert the TN2305/TN2306 circuit pack(s) into the appropriate slot(s).
	4.	Route the fiber optic cables between the ATM switch and the DEFINITY PPN and EPNs.	<p>Follow the fiber pass-through procedure in the appropriate DEFINITY ECS installation book.</p> <p><b>⚠ WARNING:</b> <i>Be sure that the fiber optic cable is secured so that the door of the DEFINITY ECS switch does not pinch or bend the cable.</i></p> <p>For csi platform, see <a href="#">Figure 2-1</a> 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><b>⇒ NOTE:</b> 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>
	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 TN2305/TN2306 circuit pack in the DEFINITY PPN and EPN.</p> <ul style="list-style-type: none"> <li>■ The TN2305/TN2306 circuit pack interface requires SC connectors (see Note in Step 5).</li> <li>■ Do not reuse existing fiber cabling with ST connectors at both the DEFINITY ECS 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.</li> </ul>

*Continued on next page*

Table 2-1. General installation process

√	Step	Action	Description
	7.	Record configuration	Record DEFINITY ECS switch-to-ATM port (port locations for each ATM circuit pack) in <a href="#">Table A-1</a> in <a href="#">Appendix A, "Baselining the Customer's Configuration"</a> .
	8.	Record fiber connections	Record the fiber optic cable runs on the lightwave interface (LIU) diagram ( <a href="#">Figure A-1</a> in <a href="#">Appendix A, "Baselining the Customer's Configuration"</a> ).

## NAA7 Board (csi/c models only)

The NAA7 board routes fiber optic connections from the rear of the cabinet through the front faceplate as shown in [Figure 2-1](#). The SC fiber connectors that go through the faceplate connect to the faceplate connectors on the TN2305/TN2306 ATM circuit pack.

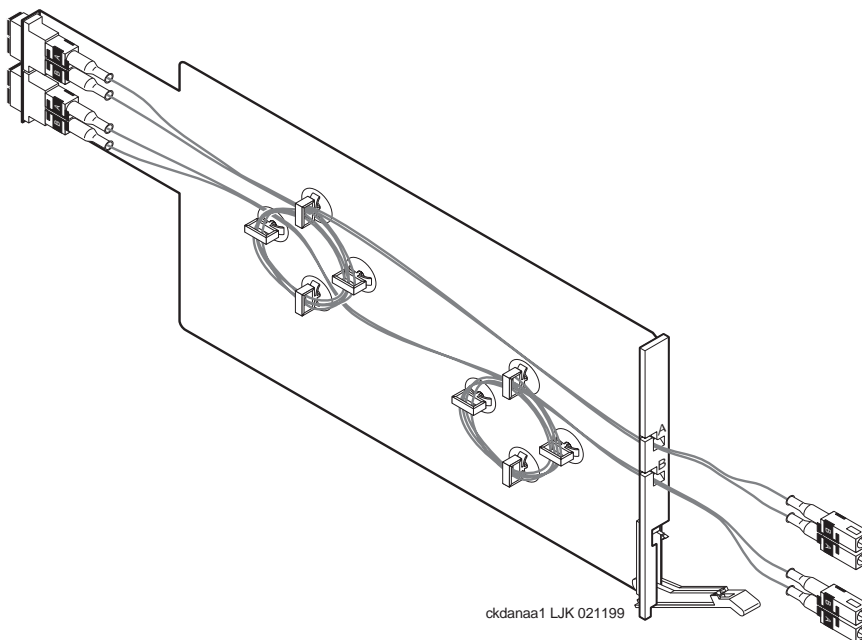


Figure 2-1. NAA7 board (csi and c models only)

**2** Installing a DEFINITY ECS ATM-CES  
NAA7 Board (*csi/c models only*)

2-4

# Installing a DEFINITY ECS ATM-PNC

# 3

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This chapter describes the procedures for installing a new DEFINITY ECS Release 8 ATM system. The process includes

- [Equipment Installation](#)
- [Synchronization Installation and Testing](#)
- [ATM Network Duplication](#)

## Equipment Installation

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 DEFINITY ECS ATM installation refer to the following books:

- DEFINITY Enterprise Communications Server Release 8 Installation and Test for Multicarrier Cabinets
- DEFINITY Enterprise Communications Server Release 8 Installation and Test for Single-Carrier Cabinets

Review the reliability configurations for DEFINITY Release 8 ATM (refer to [Figure 1-2](#) through [Figure 1-4](#)) and determine the synchronization sources (DS1, E1, or ATM network).



Slot restrictions for an ATM interface circuit packs are similar to expansion interface circuit packs:

- PPN: ATM interface circuit packs used for ATM-PNC must occupy the slots labeled EXPANSION INTERFACE.
- EPNs: ATM interface circuit packs used for ATM-PNC can occupy slot 1 (and 2 if duplicated) on carrier A, and slot 2 (and 3 if duplicated) on carrier B

Follow the steps in [Table 3-1](#) 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 3-1. General installation process**

√	Step	Action	Description
	1.	Install DEFINITY ECS switch	Refer to the appropriate installation book See <a href="#">"DEFINITY ECS configurations" on page 1-6</a> for connection schematics.
	2.	Install ATM switch(es) or access concentrators	Refer to your ATM switch's quick reference guide.
	3.	Check the distances from the ATM switch to the DS1 timing source	Use the information in <a href="#">Table 3-3</a> 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 DEFINITY PPN and EPNs.	Follow the fiber pass-through procedure in the appropriate installation book.   <b>WARNING:</b> Be sure that the fiber optic cable is secured so that the door of the DEFINITY ECS switch does not pinch or bend the cable.
	6.	Connect the fiber optic cables	Connect the fiber optic cables to the ATM switch.   <b>NOTE:</b> If the installation uses the customer's existing fiber, you may need an ST-to-SC adapter (1 included in Fiber Pass-Through Kit).

*Continued on next page*

Table 3-1. General installation process

√	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 DEFINITY PPN and EPN.</p> <ul style="list-style-type: none"> <li>■ The TN2305/TN2306 circuit pack interface requires SC connectors (see Note in Step 5).</li> <li>■ Do not reuse existing fiber cabling with ST connectors at both the DEFINITY switch 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.</li> </ul>
	8.	Record configuration	<p>Record DEFINITY ECS switch-to-ATM port (port locations for each ATM circuit pack) in <a href="#">Table A-1</a> (in <a href="#">Appendix A, "Baselining the Customer's Configuration"</a>).</p> <p><b>⇒ NOTE:</b> Read the MAC addresses from the ATM switch (refer to your ATM switch's quick reference guide) and record them in <a href="#">Table A-1</a>.</p>
	9.	Record fiber connections	<p>Record the fiber optic cable runs on the lightwave interface (LIU) diagram (<a href="#">Figure A-1</a>) in <a href="#">Appendix A, "Baselining the Customer's Configuration"</a>.</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 <a href="#">"Synchronization Installation and Testing" on page 3-3</a>.</p>

## Synchronization Installation and Testing

A DEFINITY 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 DEFINITY. 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 a DEFINITY ECS 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 DEFINITY ECS switch.

## 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
- DEFINITY ECS 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 through a DSU/CSU ([Figure 3-6](#)) and an ICSU ([Figure 3-7](#))
- [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 \(401A/401A only\)](#)
  - [Installing a 400A T1 splitter](#)
  - [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:

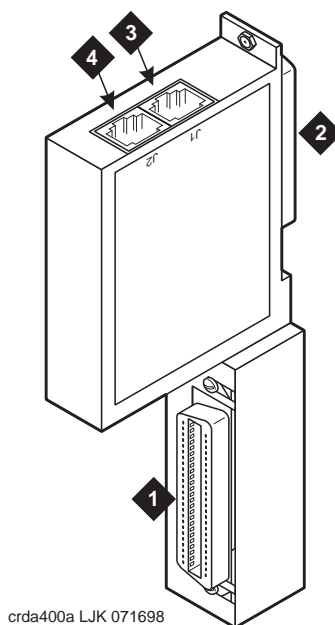
- The service provider looping the T1/E1 span back to the subscriber.
- A span alarm being detected at the central office and the span being taken out of service, sending an AIS (blue Alarm) to the DEFINITY ECS. The synchronization signal is necessary for testing equipment and connections.

## Splitter descriptions

[Table 3-2](#) describes the 4 splitter models and their capabilities. The drawings show the splitters and their connection points. [Figure 3-5](#) shows a schematic of the 2 jumper sets and their connections for 401A, 402A, and 403A sync splitters.

Table 3-2. Synchronization splitter models and attributes

Model	T1/E1	Impedance	Comcode	Drawing	Description/Application
400A	T1	100 $\Omega$	108217795	<a href="#">Figure 3-1</a>	No ICSU capability
401A	T1	100 $\Omega$	108508078	<a href="#">Figure 3-2</a>	Limited ICSU capability
402A	E1	120 $\Omega$	108508094	<a href="#">Figure 3-3</a>	
403A	E1	75 $\Omega$	108508102	<a href="#">Figure 3-4</a>	



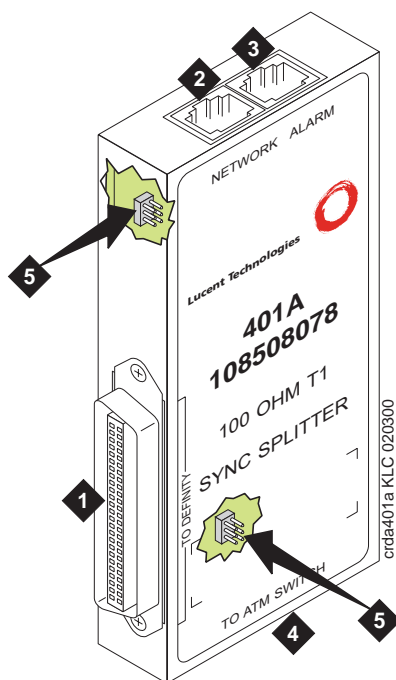
**Figure Notes:**

- |  |   |
|--|---|
| 1. From network interface              | 3. Timing output port (J1) to the ATM switch <sup>1</sup> |
| 2. Amphenol connection to DEFINITY ECS | 4. Timing output port (J2) to the ATM switch <sup>1</sup> |

- 
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).

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**Figure 3-1. 400A synchronization splitter**

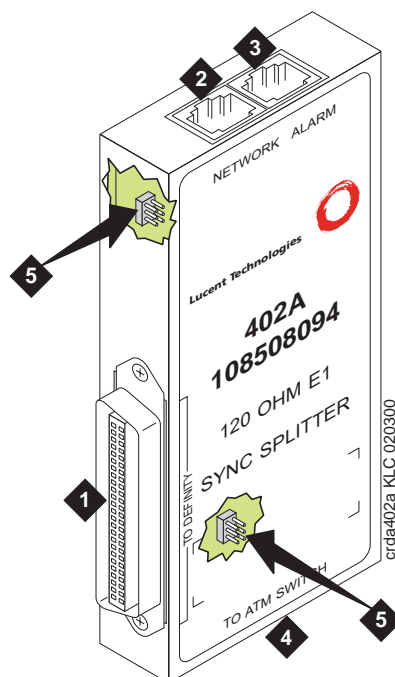


**Figure Notes:**

1. Amphenol connector to DEFINITY ECS
2. Network timing connection
3. Timing alarm lead connection
4. Timing output ports (RJ45) to ATM switch<sup>1</sup>
5. Jumpers and capacitors (inside case). See [Figure 3-5](#) 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 3-2. 401A synchronization splitter**

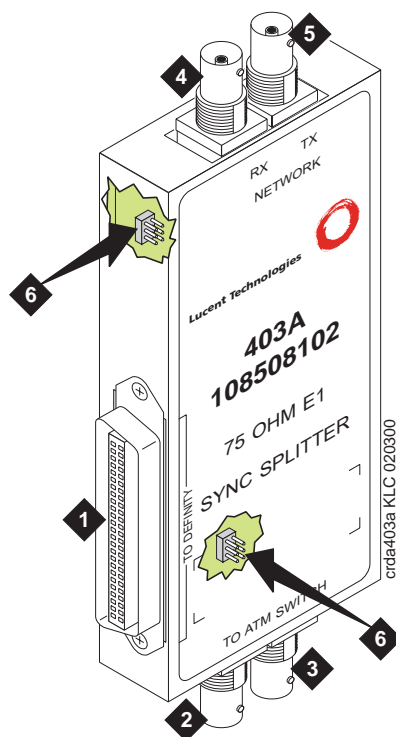


**Figure Notes:**

- |  |  |
|--|--|
| <p>1. Amphenol connector to DEFINITY ECS</p> <p>2. Network timing connection</p> | <p>3. Timing alarm lead connection</p> <p>4. Timing output ports (RJ45) to ATM switch<sup>1</sup></p> <p>5. Jumpers and capacitors (inside case). See <a href="#">Figure 3-5</a> for settings.</p> |
|--|--|

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 3-3. 402A synchronization splitter**

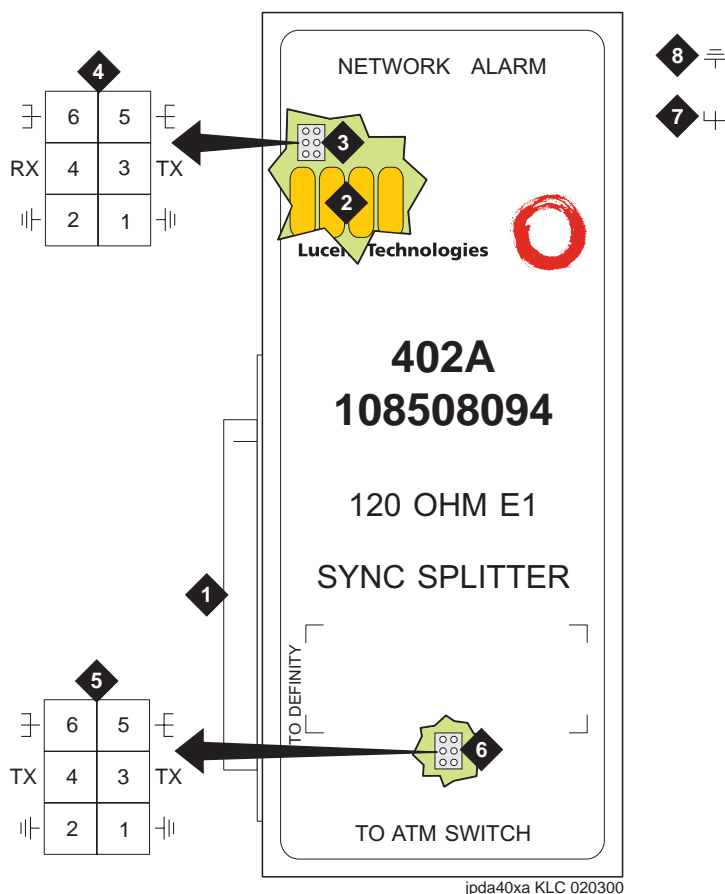


### Figure Notes:

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. Amphenol connector to DEFINITY ECS</li> <li>2. Synchronization source (timing output ports) to ATM switch<sup>1</sup></li> <li>3. Synchronization source (timing output ports) to ATM switch<sup>1</sup></li> </ol> | <ol style="list-style-type: none"> <li>4. Network receive connection, BNC connector</li> <li>5. Network transmit connection, BNC connector</li> <li>6. Jumpers and capacitors (inside case). See <a href="#">Figure 3-5</a> for settings.</li> </ol> |
|---|--|

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 3-4. 403A synchronization splitter



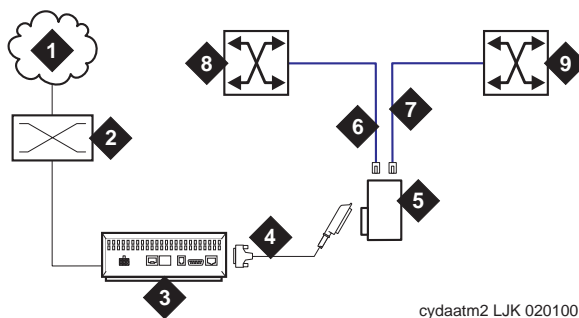
**Figure Notes:**

1. Amphenol connection to DEFINITY ECS switch
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

**Figure 3-5. Jumper settings (401A/402A/403A)**

## Synchronization splitter connections

The splitter connects to a timing source. [Figure 3-6](#) shows the synchronization connections through a DSU/CSU (400A), and [Figure 3-7](#) shows the synchronization connections through an ICSU (400A). [Figure 3-8](#) shows the synchronization connections directly to the timing source (401A, 402A, 403A).

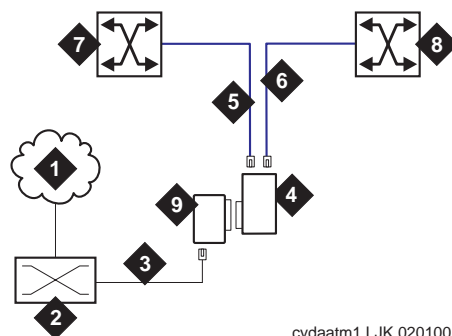


### Figure Notes:

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. Public Switched Telephone Network (PSTN)</li> <li>2. Main distribution frame (MDF) or smart jack.</li> <li>3. Channel service unit (CSU)</li> <li>4. H600-307-GR2 cable</li> <li>5. 400A T1 (100 Ω) splitter connects to the DEFINITY ECS</li> </ol> | <ol style="list-style-type: none"> <li>6. H600-383 quad cable from sync splitter to ATM switch A</li> <li>7. H600-383 quad cable from sync splitter to ATM switch B (critical reliability/ATM network duplication)</li> <li>8. Lucent ATM switch A</li> <li>9. Lucent ATM switch B (critical reliability/ATM network duplication)</li> </ol> |
|--|--|

**Figure 3-6. Synchronization connections through an external DSU/CSU (400A)**

Use the information in [Table 3-3](#) to determine the maximum cable run lengths for the configuration.



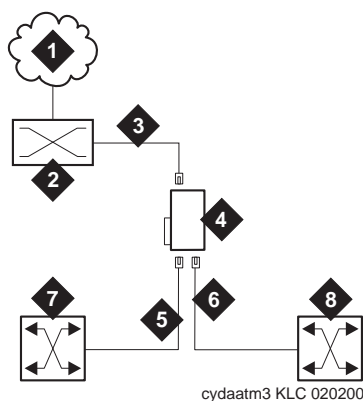
cydaatm1 LJK 020100

**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) |
| 3. H600-383 quad cable                                | 7. Lucent ATM switch A  |
| 4. 400A T1 (100 Ω) splitter connected to DEFINITY ECS | 8. Lucent ATM switch B (critical reliability/ATM network duplication)                       |
|   | 9. ICSU   |

**Figure 3-7. Synchronization connections through an ICSU (400A)**





**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. Lucent ATM switch A  |
| 4. 401A T1 (100 $\Omega$ ) splitter, 402A E1 (120 $\Omega$ ) splitter, or 403A E1 (75 $\Omega$ ) splitter connected to DEFINITY ECS | 8. Lucent ATM switch B (critical reliability/ATM network duplication)   |

**Figure 3-8. Synchronization connections directly to timing source (401A/402A/403A)**

Use the information in [Table 3-3](#) to determine the maximum cable run lengths for the configuration.

**Table 3-3. Maximum cable lengths**

Splitter	Used in	Cable	Maximum distance from splitter to ATM switch
<b>400A</b> T1 100 Ω	North America (USA and Canada)	H600-383 <sup>1</sup> shielded twisted pair	250 feet 76 meters
<b>401A</b> T1 100 Ω	North America (USA and Canada)	H600-383 <sup>1</sup> shielded twisted pair	1310 feet <sup>2</sup> 393 meters
<b>402A</b> E1 120 Ω	See <a href="#">Table 3-4</a>	120-Ω shielded twisted pair	1000 feet <sup>2</sup> 305 meters
<b>403A</b> E1 75 Ω	See <a href="#">Table 3-4</a>	75-Ω coaxial	1000 feet <sup>2</sup> 305 meters

1. Must have RJ45 connectors on each end.
2. 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 3-4](#) lists the splitter model(s) applicable to specific countries.

**Table 3-4. Country-specific splitter applications**

Country	Splitter model		
	400A/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
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 <sup>1</sup>			
Korea		Y	Y
Luxembourg		Y	Y
Malaysia		Y	Y
Mexico			Y
Netherlands		Y	Y
New Zealand		Y	Y
Norway		Y	Y

*Continued on next page*

**Table 3-4. Country-specific splitter applications —  
Continued**

Country	Splitter model		
	400A/401A T1 100 Ω	402A E1 120 Ω	403A E1 75 Ω
Philippines		Y	Y
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

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 3-5](#). Have the ATM switch installer verify the synchronization source.

**Table 3-5. 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 UUCSS	Test the designated DS1 board.  If any one of Test 138 through 145 fails, follow the repair procedures listed in DEFINITY ECS Maintenance for R8r.
	3.	Run error report	list measurements ds1 UUCSS summary	Verify that the report is free of errors.  See <a href="#">Table 3-6</a> to help interpret the report.
	4.	Identify active synchronization source	status synchronization	Verify that the designated DS1 circuit pack is the active sync source.  <b>Note:</b> The DS1 circuit pack is not the sync source; it simply shows where the sync splitter is connected.

Table 3-6. 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
Synchronize d	= Y	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.
	= N	<p>Retry the test:</p> <ol style="list-style-type: none"> <li>1. Stop the test (<b>test ds1-loop UUCSS end cpe-loopback-jack-test</b>).</li> <li>2. Restart the test (<b>test ds1-loop UUCSS cpe-loopback-jack-test-begin</b>).</li> <li>3. Repeat Steps 1 and 2 a maximum of 5 times, as necessary.</li> </ol> <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.</p> <p>A count that sits at 65535 or continues to increment by several hundred to several thousand errors with each subsequent <b>list measurements</b> command indicates</p> <ul style="list-style-type: none"> <li>■ Intermittent or corroded connections</li> <li>■ Severe crosstalk</li> <li>■ Impedance imbalances between the two conductors of the receive or the transmit pairs.</li> </ul> <ol style="list-style-type: none"> <li>1. Replace wiring, if necessary.</li> <li>2. 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.</li> </ol>

## 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:
  - up to 130 ft. (39.65 m) for 400A
  - within the standard 6 dB allowable loss for 401A, 402A, and 403A (see [Table 3-3](#))
- Ensure that the DS1 circuit pack functions properly while receiving the DS1 signal level output from the splitter (Ports J1 and J2 unterminated).

[Table 3-7](#) shows the configurations of the test cable and ports on the sync splitter.

**Table 3-7. 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/401A 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 3-8](#), using the RJ45 to Bantam Test cable from the 1541CC cable kit.

Table 3-8. 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.
	3.	Test DS1 circuit pack	test board UUCSS	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.

## Installing a 400A T1 splitter



### NOTE:

Make sure you are connected to the network before connecting to the DEFINITY ECS.

Once the sync splitter passes the DS1 span tests, it can be installed and tested in place. The 400A sync splitter can be either

- [Connected through an ICSU](#)
- [Connected through a DSU/CSU.](#)



### NOTE:

If using a TN464F/TN767E v18 or earlier, you must reseat the circuit pack each time the splitter is plugged on.



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**Connected through an ICSU.** Use the procedures in [Table 3-9](#) to install the splitter between an ICSU and a DS1 circuit pack.

**Table 3-9. Installing the splitter through an ICSU**

√	Step	Action	Command	Description
	1.	Disable synchronization switch	disable synchronization -switch	Prevent the system from switching synchronization sources.
	2.	Busyout DS1 circuit pack	busyout board UUCSS	Busyout the designated DS1 circuit pack.
	3.	Remove cable from DS1 circuit pack		Remove the existing H600-307 cable from the backplane slot corresponding to the designated DS1 circuit pack.
	4.	Remove ICSU		Remove the ICSU from the designated DS1 circuit pack's amphenol connector. Re-use the existing cable attached to the ICSU.
	5.	Attach splitter		Plug the splitter into the same connector just vacated by the ICSU.
	6.	Attach ICSU		Plug the ICSU into the connector on the splitter.
	7.	Reconnect cable		Connect the H600-307 cable to the amphenol connector on the ICSU.
	8.	Check connections		Check that all Amphenol connections are good.
	9.	Secure splitter		Secure the splitter to the carrier using the 4C retainer from the ICSU.
	10.	Secure ICSU		Secure the ICSU to the splitter with a long cable tie.
	11.	Terminate the splitter ports J1 and J2		Insert a modular RJ45 plug in both ports J1 and J2. Do not connect port J1 to port J2, but leave the other end of both cords free. The modular RJ45 plug acts as an opening plug and removes the 100-Ω termination from port J1 and J2 on the splitter.
	12.	Check DS1 Status 3 LED		After about 20 seconds the LEDs on the DS1 circuit pack should go out, leaving only the GREEN STATUS 3 LED on.
	13.	Test the DS1 circuit pack	test board UUCSS	Test the circuit pack. If any one of Tests 138 - 145 fails, follow the repair procedures listed in DEFINITY ECS Maintenance for R8r
	14.	Clear the error events counters	clear measurements ds1 esf-error-events UUCSS	Clear the error events counter.

*Continued on next page*

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Table 3-9. Installing the splitter through an ICSU — Continued

√	Step	Action	Command	Description
	15.	Run report	list measurements ds1 summary UUCSS	Wait 15 minutes before entering the command. If the DS1 circuit pack is not error-free, refer to <a href="#">“Troubleshooting synchronization (400A only)” on page 6-17.</a>
	16.	Replace connections		After testing is complete, remove the modular RJ45 opening plugs from port J1 and J2 of the splitter, and reconnect the cables to the port(s).
	17.	Test the ICSU		Depending on the ICSU model, go to the appropriate section: <ul style="list-style-type: none"> <li>■ Testing the 120A ICSU (<a href="#">Table 3-10</a>)</li> <li>■ Testing the 120A 2 ICSU (<a href="#">Table 3-11</a>)</li> </ul>

Test the 120A ICSU with either a 700A DS1 CPE loopback jack or a 103A block. Use the procedure in [Table 3-10](#) to test a splitter connected through an ICSU.

Table 3-10. The 120A ICSU test procedure

√	Step	Action	Command	Description
	1.	Connect 103A block if necessary		If the 700A DS1 CPE Loopback Jack is not installed or if the ICSU is not a 120A: <ul style="list-style-type: none"> <li>■ Connect a 103A block at the Smart Jack end of the H600-383 cable.</li> <li>■ On the 103A block, strap pin1 to pin 3 and pin 2 to pin 4, which provides a loopback to the ICSU.<sup>1</sup></li> </ul>
	2.	Test the DS1 circuit pack	test board UUCSS	Test the DS1 circuit pack. If any one of Tests 138 through 145 fails, follow the repair procedures listed in DEFINITY ECS Maintenance for R8r
	3.	Clear the error events counters	clear measurements ds1 esf-error-events UUCSS	Clear the error events counters.
	4.	Run report	list measurements ds1 summary UUCSS	Wait 15 minutes before entering the command. To interpret the results, refer to <a href="#">Table 3-6.</a> If the DS1 circuit pack is not error-free, refer to <a href="#">“Troubleshooting synchronization (400A only)” on page 6-17.</a>
	5.	Remove the 103A block		Remove the 103A block from Step 1.

Table 3-10. The 120A ICSU test procedure — *Continued*

√	Step	Action	Command	Description
	6.	Reconnect the cable		Connect the H600-383 cable to the smart jack or dumb block.

1. For more information about Smart Jack CPE Testing, see DEFINITY ECS Release 8 Maintenance for R8r, Chapter 6, “DS1 CPE Loopback Jack Installation and Operations Instructions.”

Use the procedures in [Table 3-11](#) to test the 120A ICSU with the 700A DS1 CPE loopback jack.

**Table 3-11. Testing the 120A 2 ICSU**

√	Step	Action	Command	Description
	1.	Busyout the DS1 circuit pack	busyout board UUCSS	Busyout the DS1 circuit pack.
	2.	Start the CPE loopback test	test ds1-loop UUCSS cpe-loopback- jack-test-begin	Start the CPE loopback test. <ul style="list-style-type: none"> <li>■ If the test passes, the splitter is functioning properly; go to Step 3.</li> <li>■ If the test fails, follow the procedures in <a href="#">“Troubleshooting synchronization (400A only)” on page 6-17.</a></li> </ul>
	3.	Terminate the test	test ds1-loop UUCSS end-loopback/ span-test	Terminate the test .
	4.	Release the DS1 circuit pack	release board UUCSS	Release the DS1 circuit pack .
	5.	Reassign synchronization	change synchronization	Reassign sync to the designated DS1 circuit pack .

**Connected through a DSU/CSU.** Before connecting any of the timing hardware, ensure that the DSU/CSU is configured to report loss of signal alarms.

If using a 316X CSU connected to a T1 facility and used as the DEFINITY synchronization source, verify or change the 316X settings (options) to ensure that it sends an AIS blue alarm to the DEFINITY ECS DS1 circuit pack or to the ATM switch whenever a network LOS (loss of signal) occurs. Upon receiving a LOS, the DEFINITY ECS or ATM switch transfers to its backup synchronization source.

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To configure the 316X CSU to send an AIS blue alarm, use the procedures in [Table 3-12](#).

**Table 3-12.** Configuring the 316X CSU to send AIS blue alarm

√	Step	Action	Description
	1.	Configure CSU	At the 316X CSU press the double-up arrow
	2.	Go through the readout steps	Press the button under "Cnfig."
	3.	Continue	Press the button under "Activ."
	4.	Continue	Press the button under "Edit."
	5.	Continue	Press the right arrow until "GEN" displays.
	6.	Continue	Press the button under "GEN."
	7.	Continue	Press F1 ("Next") until "Gen Yellow Alarm" displays. (This option defaults as enabled.)
	8.	Continue	Press the button under "Disabled."
	9.	Continue	Press the double-up arrow.  Save Option displays when "Enabled" changes to "Disabled."
	10.	Save settings	Press the button under the word "Yes" at the "Save Options Yes or No" prompt. Otherwise press F1 twice.
	11.	Save options	Press the button under "Activ" when asked where to save the options.  Command Complete displays.
	12.	Return to default screen	The CSU times out to its default ESF CSU Operational screen or set it there by pressing the double-up arrow once and then pressing F1 twice.
	13.	Install the splitter	Go to <a href="#">Table 3-13</a> to install the splitter.

**⇒ NOTE:**

All four faceplate status LEDs on the DS1 circuit pack are dark (not lit) when using an external CSU or DSU/CSU. The STATUS LEDs on the DS1 circuit pack are only functional with a 120A ICSU.

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To install a 400A sync splitter between a CSU or DSU/CSU and a DS1 circuit pack, follow the procedures listed in [Table 3-13](#).

Table 3-13. Splitter installation to DS1

√	Step	Action	Command	Description
	1.	Disable synchronization switch	disable synchronization -switch	Prevent the system from switching synchronization sources.
	2.	Busyout DS1 circuit pack	busyout board UUCSS	Busyout the designated DS1 circuit pack.
	3.	Remove cable from DS1 circuit pack		Remove the H600-307 cable from the amphenol connector located on rear of the DS1 circuit pack.
	4.	Attach the splitter		Plug the splitter into the same connector just vacated by the H600-307 cable.
	5.	Reconnect the cable		Plug the H600-307 cable into the connector on the splitter.
	6.	Secure the splitter		Secure the splitter to the carrier using the large mounting strap removed from a fiber transceiver.
	7.	Check connections		Check that all Amphenol connections are secure.
	8.	Release DS1 circuit pack	release board UUCSS	Restore the designated DS1 circuit pack to service.
	9.	Test the splitter		<p>Use the procedure in <a href="#">“Splitter port tests (401A/401A only)”</a> on page 3-19.</p> <ul style="list-style-type: none"> <li>■ Before testing the splitter, insert a modular RJ45 plug into jack J1 and jack J2.</li> </ul> <p><b>NOTE:</b></p> <p>Do not connect port J1 to port J2. Leave the other end of both cords free, because the modular RJ45 plug acts as a opening plug and removes the 100-Ω termination from J1 and J2 ports.</p> <ul style="list-style-type: none"> <li>■ After testing is complete, remove the opening plugs from J1 and J2.</li> </ul>
	10.	Check DSU/CSU LEDs		<p>After about 20 s, all the alarm LEDs on the 316X CSU or DSU/CSU should go out.</p> <p>If this is the case, perform steps 11 through 12. Otherwise, go to step 13.</p>

Continued on next page

Table 3-13. Splitter installation to DS1 — *Continued*

√	Step	Action	Command	Description
	11.	Check for CSU alarms		Verify that no alarms are against the CSU (the OK, SIG, SIG LEDs are lit).
	12.	Test the circuit pack	test board UUCSS	Verify that the DS1 circuit pack passes Tests 138 through 145. If these tests pass and this is a new installation, go to Step 14.  If any one of Test 138 through 145 fails, follow the repair procedures listed in DEFINITY ECS Maintenance for R8r.  After clearing all errors, retest the circuit pack.
	13.	Run error report	list measurements ds1 summary UUCSS	Wait 15 minutes. Check the error report and verify that the DS1 circuit pack is free of any errors.  To interpret the periodic list measurements report.
	14.	DTE and RLB loopback tests (new installations)		Perform both DTE and RLB loopback test at the 316X CSU or DSU/CSU to verify that the DS1 board can successfully transmit and receive a DS1 signal through the splitter to the 316X and back to the DS1 board.  Go to the <a href="#">“DTE loopback procedure” on page 3-27</a> and <a href="#">“RLB loopback procedure” on page 3-28</a>

**DTE loopback procedure.** To start the Data Terminal Equipment (DTE) loopback at the 316X CSU or DSU/CSU, use the procedures in [Table 3-14](#).

Table 3-14. DTE loopback testing for the 316X DSU/CSU

√	Step	Action	Command	Description
	1.	Begin the loopback test		Press the double-up arrow button.
	2.	Go through the readout steps		Press the button under “Test.”
	3.	Continue		Press the button under “Lpbk.”

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Table 3-14. DTE loopback testing for the 316X DSU/CSU — *Continued*

√	Step	Action	Command	Description
	4.	Continue		Press the button under "DLB." Test Started displays. The 316X is now in DTE loopback.
	5.	Test the circuit pack	test board UUCSS	At the DEFINITY management terminal. If any one of Test 138 through 145 fails, follow the repair procedures listed in DEFINITY ECS Maintenance for R8r.
	6.	Run error report	list measurements ds1 summary UUCSS	Wait 15 minutes and verify that the DS1 circuit pack is free of any errors. Use <a href="#">Table 3-6</a> to interpret the periodic list measurements report.
	7.	Terminate the DTE loopback test		Press the double-up arrow button.
	8.	Go through the readout steps		Press the button under "test."
	9.	Continue		Press the button under "lpbk."
	10.	Continue		Press the button under "abort."
	11.	Continue		Press the button under "all."
	12.	Continue test procedure		If all tests pass, and the splitter, cabling, and 316X CSU or DSU/CSU are working properly, go to the <a href="#">"RLB loopback procedure" on page 3-28</a> .

**RLB loopback procedure** . To start the RLB loopback testing at the 316X CSU or DSU/CSU, use the procedures in [Table 3-15](#).

Table 3-15. RLB loopback testing for the 316X DSU/CSU

√	Step	Action	Command	Description
	1.	Start the test.		Press the double-up arrow button.
	2.	Go through the readout steps		Press the button under "Test."
	3.	Continue		Press the button under "Lpbk."

*Continued on next page*



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Table 3-15. RLB loopback testing for the 316X DSU/CSU — Continued

√	Step	Action	Command	Description
	4.	Continue		Press the button under "RLB."  Test Started displays. The 316X is now in RLB loopback.
	5.	Test the circuit pack	test board UUCSS	If any one of Test 138 through 145 fails, follow the repair procedures listed in DEFINITY ECS Maintenance for R8r.
	6.	Run error report	list measurements ds1 summary UUCSS	Wait 15 minute, then verify that the DS1 circuit pack is free of any errors.  Use <a href="#">Table 3-6</a> to interpret the periodic list measurements report.
	7.	Terminate the RLB loopback test		Press the double-up arrow button.
	8.	Go through the readout steps		Press the button under "test."
	9.	Continue		Press the button under "lpbk."
	10.	Continue		Press the button under "abort."
	11.	Continue		Press the button under "all."  If all tests pass, and the splitter, cabling, and 316X CSU or DSU/CSU are working properly.
	12.	Return DSU/CSU to service		Press the double-up arrow.
	13.	Go through the readout steps		Press the right-arrow button until "Cntrl" displays.
	14.	Continue		Press the button under "Cntrl."
	15.	Continue		Press the button under "LED."
	16.	Continue		Press the button under the word PRT1, PRT2, PRT3 or PRT4 as required.
	17.	Verify that the DSU/CSU is in normal operating mode.		Press the double-up arrow once, then press the F1 button twice. ESF CSU OPERATIONAL displays.

## 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 3-16](#).

**Table 3-16. Splitter installation to DS1 (401A/402A/403A)**

√	Step	Action	Command	Description
	1.	Disable synchronization switch	disable synchronization -switch	Prevent the system from switching synchronization sources.
	2.	Busyout DS1 circuit pack	busyout board UUCSS	Busyout the designated DS1 circuit pack.
	3.	Administer sync splitter	change DS1 UUCSS	Administer the sync splitter. For T1, set the Near-end CSU Type: field to <b>integrated</b> (see <a href="#">Screen 3-1</a> ). For E1, set the E1 Sync-Splitter? field to <b>y</b> (see <a href="#">Screen 3-2</a> ).
	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.
	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 UUCSS	Restore the designated DS1 circuit pack to service.

*Continued on next page*

Table 3-16. Splitter installation to DS1 — *Continued*(401A/402A/403A)

√	Step	Action	Command	Description
	11.	Test the splitter		<p>Use the procedure in <a href="#">“Splitter port tests (401A/401A only)”</a> on page 3-19.</p> <ul style="list-style-type: none"> <li>Before testing the splitter, insert a modular RJ45 plug into jack J1 and jack J2 (401A/402A only).</li> </ul> <p><b>⇒ NOTE:</b></p> <p>Do not connect port J1 to port J2. Leave the other end of both cords free, because the modular RJ45 plug acts as a 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"> <li>After testing is complete, remove the opening plugs from J1 and J2.</li> </ul>
	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 DEFINITY ECS Maintenance for R8r.</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 DEFINITY ECS Maintenance for R8r.</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>

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

Slip Detection? n                            Near-end CSU Type: integrated
Alarm When PRI Endpoint Detached? y
```

**Screen 3-1. DS1 circuit pack—T1**

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

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

**Screen 3-2. DS1 circuit pack—E1**

## ATM Network Duplication

ATM-PNC configurations without duplicated SPEs can be supported with duplicated EPN connectivity to other points on an ATM network, or ATM network duplication. These points can be on separate ATM switches, the same ATM switch, or directly connected to an ATM-WAN.

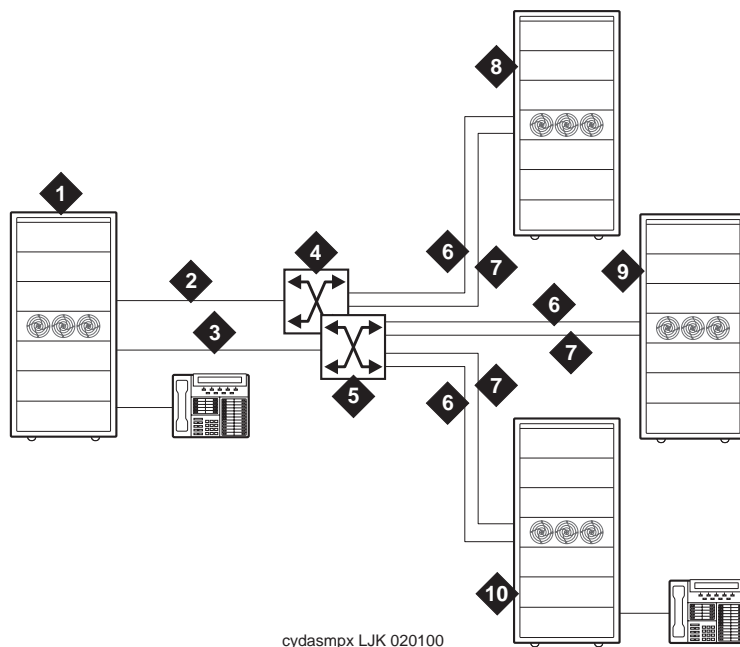
With respect to port network connectivity, there is no difference in performance between ATM network duplication and critical reliability. ATM network duplication configurations require

- A simplex SPE complex in the PPN
- Duplicate connectivity over ATM to all PNs
- Duplicate ATM interfaces in each EPN
- Duplicate Tone-Clock boards in each EPN.

An ATM network duplication configuration can be the result of

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

The EPN configuration for ATM network duplication is the same as for an EPN equipped for ATM critical reliability ([Figure 3-9](#)).



### Figure Notes

1. DEFINITY ECS PPN1
2. Fiber connecting ATM-EI A to ATM switch A
3. Fiber connecting ATM-EI B to ATM switch B
4. Lucent ATM switch A
5. Lucent ATM switch B
6. Fiber connecting ATM switch A to EPNs
7. Fiber connecting ATM switch B to EPNs
8. DEFINITY ECS EPN1
9. DEFINITY ECS PPN2
10. DEFINITY ECS EPN2

Figure 3-9. EPN configuration with ATM network duplication

## Network duplication administration

The procedure to administer ATM network duplication ([Table 3-17](#)) assumes that customers with:

- High reliability (duplex SPE complexes) and who desire greater reliability would migrate to critical reliability configurations
- Critical reliability configurations would not migrate to ATM network duplication

**NOTE:**

The screens follow the table and reflect what displays on an R8r platform using a SAT. Your screen interface and page numbers may differ.

Table 3-17. Network duplication administration procedure

√	Step	Action	Command	Description
	1.	Turn feature on	change system-parameters customer-options	Change the PNC Duplication? field on the customer options screen to <b>y</b> ( <a href="#">Screen 3-3</a> ). This requires a Lucent Services login.
	2.	Add hardware		<ul style="list-style-type: none"> <li>■ Insert a second TN2305/TN2306 ATM Interface circuit pack in slot in the B-position port carrier in each EPN or D-position carrier in EPNs configured for 2 port networks.</li> <li>■ Add a TN2182 tone-clock circuit pack in the slot labeled Tone-Clock.               <ul style="list-style-type: none"> <li>— For a standard reliability system, add it to the A-position carrier and either the B- or D-position carrier in EPNs configured for 2 port networks.</li> <li>— For a duplicated system, add it to the A-, B-, D- and E-position carriers in EPNs configured for 2 port networks.</li> </ul> </li> </ul>
	3.	Add ATM B-PNC address	change atm-pnc number	Bring up the ATM PNC screen (number 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 ( <a href="#">Screen 3-4</a> ).
	4.	Enable duplication	change system-parameters duplication	Change the Enable Operation of PNC Duplication? field on the Duplication-Related System Parameters screen to <b>y</b> ( <a href="#">Screen 3-5</a> ).

**NOTE:**

The Enable Operation of Spe Duplication? field must remain **n**.

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

Hospitality (Basic)? y	<b>PNC Duplication? y</b>
Hospitality (G3V3 Enhancements)? y	
H.323 Trunks? n	Processor and System MSP? y
IP Stations? n	Private Networking? y
ISDN Feature Plus? y	Restrict Call Forward Off Net? y
ISDN-BRI Trunks? y	Secondary Data Module? y
ISDN-PRI? y	Station and Trunk MSP? y
Malicious Call Trace? y	
Mode Code for Centralized Voice Mail? n	Tenant Partitioning? y
Mode Code Interface? y	Terminal Trans. Init. (TTI)? y
Multifrequency Signaling? y	Time of Day Routing? y
Multimedia Appl. Server Interface (MASI)? y	Uniform Dialing Plan? y
Multimedia Call Handling (Basic)? y	Usage Allocation Enhancements? y
Multimedia Call Handling (Enhanced)? y	
Multiple Locations? y	Wideband Switching? y
Personal Station Access (PSA)? y	Wireless? y

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

Screen 3-3. Optional feature—screen 3

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

Screen 3-4. ATM PNC

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DUPLICATION-RELATED SYSTEM PARAMETERS

Enable Operation of SPE Duplication? n

**Enable Operation of PNC Duplication? y**

Screen 3-5. Duplication-related system parameters



## 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 **reset pnc interchange** and press Enter
6. Repeat steps 1-5 on the other (active) side
7. Type **save translation** and press Enter

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*ATM Network Duplication*

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# Upgrading to ATM-PNC

# 4

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This chapter describes the procedures for upgrading a DEFINITY ECS with and without ATM-PNC to a Release 8r ATM-PNC. ATM-PNC features are only available in Release 6.3r or later systems. For information on installing a DEFINITY ECS, refer to DEFINITY Enterprise Communications Server Release 8 Upgrades and Additions for R8r.

## Upgrade paths

The main DEFINITY ECS upgrade paths are

- Upgrading [CSS to R8r ATM-PNC](#)
- Upgrading [R6.3r ATM-PNC to R8r ATM-PNC](#)
- Upgrading [R7r ATM-PNC to R8r ATM-PNC](#) .

## Preparation

[Table 4-1](#) lists the installation items that must be completed and the equipment or materials available before starting the upgrade procedure. We assume that in DEFINITY ECS Release 6.3r or later with ATM-PNC that the ATM switch and interface circuit packs are installed and administered.

**Table 4-1. Installation checklist for DEFINITY ECS with ATM installed**

√	Component	Description
	Cabinet	Installed and fiber-prepped (fiber pass-through)
	Timing (if needed)	T1 or E1 synchronization splitter installed and stable timing source present
	ATM switches	<ul style="list-style-type: none"> <li>■ ATM switches installed and fiber connected</li> </ul>
	ATM interfaces	<ul style="list-style-type: none"> <li>■ All ATM interface circuit packs (TN2305/TN2306) installed and able to receive and pass on synchronization</li> </ul>
	Required circuit packs	<ul style="list-style-type: none"> <li>■ All circuit packs required for DEFINITY ECS Release 8 are installed and administered.</li> </ul>
<b>Critical reliability/network duplication only</b>		
	Duplication	<ul style="list-style-type: none"> <li>■ 2 independent switches or 1 switch with duplicated switch fabrics and controls.</li> <li>■ Independent fiber optic connections between the OC-3/STM-1 ATM interfaces and each duplicated switch fabric</li> </ul>
	Power supply	<p>No one power failure (other than the commercial AC source) able to cause</p> <ul style="list-style-type: none"> <li>■ both pairs of switch fabric and controls to simultaneously fail—no one power failure (excluding AC source)</li> <li>■ all interface circuits to fail simultaneously</li> </ul>
	Back up power	<ul style="list-style-type: none"> <li>■ Back up option (independent of commercial AC source) installed</li> </ul>

[Table 4-2](#) lists and describes the equipment and materials required for an ATM upgrade.

Table 4-2. Equipment and materials checklist

√	Item	Description
	Translation removable media	<ul style="list-style-type: none"><li>■ Customer's translation removable media<sup>1</sup></li><li>■ Customer's fall-back translation removable media<sup>2</sup></li></ul>
	Replacement circuit packs	DEFINITY ATM interface circuit packs (TN2305/TN2306)
	Cables & adaptors	Fiber optic cabling and ST-to-SC adaptors (if necessary)
	Design	Customer's configuration (SDSC)

1. The removable media is optical disk when upgrading to Release 8; it is tape when upgrading to Release 7.
2. After upgrading the DEFINITY ECS to Release 8, use the spare formatted optical disk for the fall-back removable media. Do NOT use an off-the-shelf optical disk.

## CSS to R8r ATM-PNC

This section describes the procedures for upgrading a DEFINITY ECS with center stage switch (CSS) and no previous ATM administration to a Release 8 ATM-PNC. You need separate ATM interface circuit packs (TN2305/TN2306) for each use.

### ⇒ NOTE:

You can also update a DEFINITY ECS with direct connect to ATM-PNC. Follow the procedures in [Table 4-3](#) and [Table 4-4](#), but skip the steps involving removing switch nodes and switch node interfaces.

The basic upgrade process is to

- Upgrade DEFINITY ECS to Release 8r (refer to upgrade book)
- Make sure all equipment is on site before the installation

### ⇒ NOTE:

Make sure the ATM switch works before proceeding.

- Remove the current PNC and fiber links first from the standby carrier then the active carrier on a PPN, if a duplicated system
- Remove the PNC and fiber links from the EPNs
- Administer ATM switch on DEFINITY ECS
- Power down the cabinets, then remove TDM buses

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CSS to R8r ATM-PNC

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- Replace the switch node carriers in the PPNs and EPNs
- Rerterminate the TDM buses and power up the cabinets
- Install, administer, and cable the ATM interface circuit packs

The following tables have the step-by-step procedures. For critical reliability and ATM network duplication, perform the steps in [Table 4-3](#). For standard and high reliability, perform the steps in [Table 4-4](#). In using the commands in the upgrade tables, type the command and then press Enter.

Table 4-3. Upgrading DEFINITY ECS CSS to Release 8r ATM-PNC — Critical Reliability/ATM network duplication

Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
1.	Upgrade DEFINITY ECS to R8		Refer to appropriate upgrade book				
2.	Log on to DEFINITY ECS		Log on to the DEFINITY ECS				
3.	Suppress alarms	change system-parameters maintenance	Ensure that the Alarm Origination to OSS Numbers field is <b>neither</b>			<a href="#">Screen 4-1</a>	
4.	Save translations	save translations removable-media	Save current translations to current removable media and remove when finished (label).	varies			
5.	Load new removable media		Label and load duplicate fall-back removable media				
6.	Make duplicate removable media	save translations removable-media	Save translations to fall-back removable media	varies			
7.	Check health	status pnc	<ul style="list-style-type: none"> <li>■ Determine if alarms (bad components, fibers) might impact upgrade.</li> <li>■ Determine which is the active and standby PNC (Mode field is <b>active</b>).</li> <li>■ Determine whether to perform a PNC interchange.</li> </ul>			<a href="#">Screen 4-2</a> <a href="#">Table 4-7</a>	
8.	Check sync	status sync	Is sync source healthy? If sync source is in EPN, move to PPN or remove this EPN last				
9.	Busyout standby PNC	busyout pnc-standby	Busyout the standby (B) PNC before removing any physical connections.				
10.	Disable PNC duplication	change system-parameters duplication	Change the Enable Operation of PNC Duplication field to <b>n</b> .				
11.	List fiber link	list fiber-link	Displays numbered list of administered fiber links				

Continued on next page




Table 4-3. Upgrading DEFINITY ECS CSS to Release 8r ATM-PNC — Critical Reliability/ATM network duplication

Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
12.	Busyout fiber	busyout fiber-link n	Busyout each numbered, B-PNC fiber link listed in step 10. Start with fiber associated with the last translated switch node (SN) and end with the PPN fiber.				
13.	Remove B-PNC fiber links	change fiber-link n	Remove numbered, B-PNC fiber links listed in step 10.  <b>CAUTION:</b> Failure to remove fiber link administration before removing hardware causes unnecessary INADS alarms and errors that may be difficult to clear.				
14.	Remove B-PNC hardware		<b>DANGER:</b> The metal hood on metallic cable connectors may be hot.  Physically remove all EI, SNI, SNC, and DS1-CONV circuit packs (and metal cabling on back of cabinet) associated with the B-PNC fiber links just removed. Set aside reusable fiber.  <b>NOTE:</b> For direct connect remove EI only.				
15.	Remove circuit pack translations	change circuit-packs	Remove translations (blank out fields) for all circuit packs removed in step 13.				
16.	List cabinets	list cabinet	Displays numbered list of administered cabinets.				

Continued on next page



Table 4-3. Upgrading DEFINITY ECS CSS to Release 8r ATM-PNC – Critical Reliability/ATM network duplication

Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
17.	Remove switch node administration	change cabinet n	Remove B-PNC SN carriers from all cabinets.			<a href="#">Screen 4-3</a>	
18.	Check status	status pnc	A-PNC should be healthy				
19.	Remove PNC duplication	change system-parameters customer-options	Change the <code>PNC Duplication?</code> field on screen 3 to <b>n</b> .   <b>NOTE:</b> This command requires init login level. Access Security Gateway (ASG) feature challenges this login.			<a href="#">Screen 4-7</a>	
20.	Go to next procedure		Go to step 8 in <a href="#">Table 4-4</a> then return to step 21 to complete upgrade.				
21.	Administer B-PNC duplication	change system-parameters customer-options	Change the <code>PNC Duplication?</code> field on screen 2 to <b>y</b> .   <b>NOTE:</b> This command requires init login level. Access Security Gateway (ASG) feature challenges this login.			<a href="#">Screen 4-7</a>	
22.	Administer port connectivity for B-PNC	add atm pnc n (number or next)	Administer the following fields: Name: ATM switch port information. ESI: MAC address from ATM switch E.164, HO-DSP, and SEL from ATM switch (refer to worksheets).   <b>NOTE:</b> The administered address of ATM ports and the ATM circuit packs in PN cabinets must match.		Y		

Continued on next page

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CSS to R8r ATM-PNC

Table 4-3. Upgrading DEFINITY ECS CSS to Release 8r ATM-PNC — Critical Reliability/ATM network duplication

Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
23.	Enable PNC duplication	change system-parameters duplication	Change the Enable Operation of PNC Duplication field to y.				
24.	Check administration	list system-link	Ensure that the links are up.			<a href="#">Screen 4-8</a>	
25.	Check health	status pnc	Is State of Health field functional for both PNCs? Any alarms?			<a href="#">Screen 4-2</a>	
26.	Save translations	save translation	Copy upgraded translations to the system disk, which takes about 2 minutes				
27.	Back up disk	backup disk	Back up all changed files to the removable media. This takes about 15 minutes.				
28.	Log off DEFINITY ECS		Log off the DEFINITY ECS ATM				

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Table 4-4. Upgrading DEFINITY ECS CSS without ATM to Release 8r ATM-PNC — Standard and High Reliability

÷	Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
	1.	Upgrade DEFINITY ECS to R8		Refer to appropriate upgrade book				
	2.	Log on to DEFINITY switch		Log on to the DEFINITY ECS switch				
	3.	Suppress alarms	change system-parameters maintenance	Ensure that the Alarm Origination to OSS Numbers field is neither			<a href="#">Screen 4-1</a>	
	4.	Save translations	save translations removable-media	Save current translations to current removable media and remove when finished (label).	varies			
	5.	Load new removable media		Label and load duplicate fail-back removable media				
	6.	Make duplicate removable media	save translations removable-media	Save translations to fail-back removable media	varies			
	7.	Check health	status pnc	Determine if alarms (bad components, fibers) might impact upgrade			<a href="#">Screen 4-2</a>	
	8.	Check sync	status sync	Is sync source healthy? If sync source is in EPN, move to PPN or remove this EPN last				
	9.	List fiber link	list fiber	Displays numbered list of administered fiber links				
	10.	Busyout fiber	busyout fiber-link n	Busyout each numbered, A-PNC fiber link listed in step 8. Start with fiber associated with the last translated switch node and end with the PPN fiber.				
	11.	Remove fiber links	change fiber-link n	Remove numbered, A-PNC fiber links listed in step 8.				

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Table 4-4. Upgrading DEFINITY ECS CSS without ATM to Release 8r ATM-PNC — Standard and High Reliability — Continued


Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
12.	Remove hardware		Physically remove all A-PNC Ei, SNI, SNC, and DS1-CONV circuit packs (and metal cabling on back of cabinet) associated with the fiber links just removed. Set aside reusable fiber.  <b>⚠ DANGER:</b> The metal hood on metallic cable connectors may be hot.				
13.	Remove circuit pack translations	change circuit-packs	Remove translations (blank out fields) for all circuit packs removed in step 11.				
14.	List cabinets	list cabinet	Displays numbered list of administered cabinets. Begin with EPNs. See step 9.				
15.	Remove switch node administration	change cabinet n	Remove SN carriers from all cabinets.			<a href="#">Screen 4-3</a>	
16.	Disable sync switch	disable synchronization-switch	Prevents system from switching to secondary sync source				
17.	Change sync source	change synchronization	Remove all DS1 timing references.			<a href="#">Screen 4-5</a>	
18.	Save translations	save translations removable-media	Save this portion of the upgrade to the fail-back removable media.				
19.	Administer ATM switch on DEFINITY	change system-parameters customer-options	Set Async. Transfer Mode (ATM) PNC? field to y.			<a href="#">Screen 4-6</a>	
20.	Insert ATM interface circuit packs	Insert TN2305/TN2306 circuit packs and administer					
21.	Connect fiber to ATM circuit packs		Physically connect or reterminate fiber to all ATM circuit packs		Y		

Continued on next page

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CSS to R8r ATM-PNC

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Table 4-4. Upgrading DEFINITY ECS without ATM to Release 8r ATM-PNC — Standard and High Reliability — Continued

Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
22.	Administer port network connectivity	add atm pnc n (number of next)	Administer the following fields for A-PNC:  Name: ATM switch port information. ESI: MAC address from ATM switches E.164, HO-DSP, and SEL from ATM switches (refer to worksheets).   <b>NOTE:</b> The administered address of ATM ports and the ATM circuit packs in PN cabinets must match.		Y	Refer to <a href="#">Appendix A, "Baselining the Customer's Configuration"</a>	
23.	Check administration	list sys-link	Ensure that PACLs (all PNs) and EALs (all EPNs) are up.			<a href="#">Screen 4-8</a>	
24.	Check health	status pnc	Is State of Health field functional? Any alarms?			<a href="#">Screen 4-2</a>	
25.	If critical reliability, return to previous procedure		If critical reliability, return to step 21 in <a href="#">Table 4-3</a>				
26.	Save translations	save translation	Copy upgraded translations to the system disk, which takes about 2 minutes				
27.	Administer synchronization source	change synchronization	Remove all DS1 timing references.			<a href="#">Screen 4-5</a>  <a href="#">"Installing and testing the splitter" on page 3-19</a>	
28.	Save translations	save translations removable-media	Save this portion of the upgrade to the fail-back removable media.				
29.	Log off DEFINITY	logoff	Log off before powering down				

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Table 4-4. Upgrading DEFINITY ECS CSS without ATM to Release 8r ATM-PNC — Standard and High Reliability — Continued

Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
30.	Power down cabinets		Power down all cabinets containing SN circuit packs.				
31.	Remove TDM busses		Remove TDM busses from SN carriers				
32.	Remove switch node carriers		Physically remove the SN carriers from PPN and EPNs as required				
33.	Reterminate TDM busses		Reterminate TDM busses as required				
34.	Power up		Power up those PPNs and EPNs powered down in step 19				
35.	Log on to DEFINITY ECS		Log on as init (required for steps 26 and 30).  <b>NOTE:</b> Access Security Gateway feature challenges this log in.				
36.	Administer replacement carriers	change cabinet n	Add any replacement carriers as needed		Y		
37.	Save translations	save translation	Copy upgraded translations to the system disk, which takes about 2 minutes				
38.	Back up disk	backup disk	Back up all changed files to the removable media. This takes about 15 minutes.				
39.	Log off DEFINITY ECS ATM		Log off the DEFINITY ECS ATM				

## R6.3r ATM-PNC to R8r ATM-PNC

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This section describes the procedures for upgrading a DEFINITY ECS ATM-PNC from Release 6.3r to Release 8r.

The basic process is to

- Upgrade DEFINITY ECS to Release 7r (refer to the upgrade book)
- Make sure all equipment is on site before the installation
- Remove the old TN2238 ATM interface circuit packs
- Install the new TN2305/TN2306 ATM interface circuit packs
- Connect the fiber cables to the circuit packs
- Upgrade to Release 8r software

To upgrade ATM-PNC from Release 6.3r to Release 8r, you must first upgrade Release 6.3r software to Release 7r software.

To upgrade ATM-PNC from Release 7r to Release 8r, you must install the TN2305/TN2306 circuit packs before upgrading Release 7r to Release 8r software.

### NOTE:

Although Release 7r software recognizes the old TN2238 circuit pack, Release 8r software does not.

### NOTE:

Upgrading DEFINITY ECS Release 7r to Release 8r requires replacing the tape drive with an optical drive.

The following tables have the step-by-step procedures. For critical reliability/ATM network duplication, perform the steps in [Table 4-5](#), and for standard and high reliability perform the steps in [Table 4-6](#). In using the commands in the upgrade tables, type the command and then press Enter.

The critical reliability procedure is call-preserving if the steps are completed in order and the standby port network is addressed first followed by the active port network. This process assumes that the ATM switch is not changing.

### CAUTION:

You must replace the TN2238 circuit pack with the TN2305/TN2306 circuit pack before upgrading the software to Release 8r.

If for some reason the ATM switch is changing also, it simplifies the cutover significantly if the new ATM switch inherits the ATM address from its predecessor.

## R7r ATM-PNC to R8r ATM-PNC

---

### CAUTION:

To upgrade ATM-PNC from Release 7r to Release 8r, you must have the TN2305/TN2306 circuit packs installed.

Upgrading ATM-PNC from Release 7r to Release 8r does not require any additional hardware. The basic process is to upgrade the DEFINITY ECS to Release 8r first, then upgrade the ATM-PNC. See [Chapter 5, "Administering ATM-PNC and ATM-CES"](#) for information on upgrading through administration.

### NOTE:

Upgrading DEFINITY ECS Release 7r to Release 8r requires replacing the tape drive with an optical drive.

If for some reason the ATM switch is changing also, it simplifies the cutover significantly if the new ATM switch inherits the ATM address from its predecessor.



4 Upgrading to ATM-PNC  
R7r ATM-PNC to R8r ATM-PNC


Table 4-5. Upgrading ATM-PNC from Release 6.3r to Release 8r — Critical reliability/ATM network duplication

÷	Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
	1.	Upgrade DEFINITY ECS to R7r		Refer to DEFINITY Enterprise Communications Server Release 7 Upgrades and Additions for R7r  <b>CAUTION:</b> You must upgrade to R7r first.				
	2.	Log on to DEFINITY switch		Log on to the DEFINITY ECS switch				
	3.	Suppress alarms	change system-parameters maintenance	Ensure that the Alarm Origination to OSS Numbers field is neither.			<a href="#">Screen 4-1</a>	
	4.	Save translations	save translations tape	Save current translations to exiting tape and remove when finished (label).	varies			
	5.	Load another tape		Label and load duplicate fall-back removable media				
	6.	Make duplicate removable media	save translations tape	Save translations to fall-back removable media	varies			
	7.	Check health	status pnc	<ul style="list-style-type: none"> <li>■ Determine if alarms (bad components, fibers) might impact upgrade.</li> <li>■ Determine which is the active and standby PNC (Mode field is active).</li> <li>■ Determine whether to perform a pnc interchange.</li> </ul>			<a href="#">Screen 4-2</a> <a href="#">Table 4-7</a>	
	8.	Busyout standby PNC	busyout pnc-standby	Busyout the standby PNC before removing any physical connections.				
	9.	List all atm connections	list atm pnc b-pnc	Displays numbered list of all administered ATM B-PNC connections				

Continued on next page

4 Upgrading to ATM-PNC  
R7r ATM-PNC to R8r ATM-PNC

Table 4-5. Upgrading ATM-PNC from Release 6.3r to Release 8r — Critical reliability/ATM network duplication — Continued

Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
10.	Busyout connection	busyout atm pnc b-pnc n (connection number)	Busyout all connections listed in step 8, beginning with B-PNC EPNs.				
11.	Remove old ATM circuit packs		Remove old, B-PNC TN2238 circuit packs.  <b>NOTE:</b>  First, carefully remove the fiber connections to the ATM circuit packs.				
12.	Insert ATM circuit packs		Insert B-PNC TN2305/TN2306 circuit packs.				
13.	Connect fiber to B-PNC ATM circuit packs		Physically connect (reterminate) fiber to all B-PNC ATM circuit packs				
14.	Administer ILM/ESI information	change atm pnc n (connection number)	Change the new ESI (board) address in the ESI field for each B-PNC ATM circuit pack.  Query the ATM switch. Read the address information from the terminal screen and duplicate in the DEFINITY ECS switch administration or on the worksheet.		Y	<a href="#">Screen 4-2 Appendix A, "Baselining the Customer's Configuration"</a>	
15.	Verify circuit pack insertion	list configuration atm	Ensure that all new B-PNC ATM circuit packs are listed in the report.				
16.	Release atm connection	release atm pnc b-pnc n	Release all of the atm connections that were busyout in step 9.				
17.	Release the standby PNC	release pnc-standby	Release the standby PNC before making any physical connections.				
18.	Check link administration	list sys-link	Ensure that the PACLs (all PNs) and EALs (all EPNs) are up.			<a href="#">Screen 4-8</a>	

Continued on next page

4 Upgrading to ATM-PNC  
R7r ATM-PNC to R8r ATM-PNC

Table 4-5. Upgrading ATM-PNC from Release 6.3r to Release 8r — Critical reliability/ATM network duplication — Continued

÷	Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
	19.	Check health	status pnc	Is State of Health field for both A- and B-PNCs functional? Any alarms? Does standby refreshed? field say <b>yes</b> ?			<a href="#">Screen 4-2</a>	
	20.	PNC interchange	reset pnc-interchange	Perform PNC interchange to make the B-PNC active				
	21.	Check interchange	status pnc	Ensure that B-PNC is active and A-PNC is standby.				
	22.	Busyout standby PNC	busyout pnc-standby	Make the A-side the standby before removing any physical connections.				
	23.	Repeat steps 8 through 19		Repeat steps 8 through 19 (check health) but use a-pnc rather than b-pnc.				
	24.	Proceed to step 6 in <a href="#">Table 4-6</a> .						

4 Upgrading to ATM-PNC  
R7r ATM-PNC to R8r ATM-PNC

Table 4-6. Upgrading ATM-PNC from Release 6.3r to Release 8r — Standard and High Reliability

÷	Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
	1.	Upgrade DEFINITY ECS to R7r		Refer to DEFINITY Enterprise Communications Server Release 7 Upgrades and Additions for R7r  <b>CAUTION:</b> You must upgrade to R7r first.				
	2.	Log on to DEFINITY switch		Log on to the DEFINITY ECS switch				
	3.	Suppress alarms	change system-parameters maintenance	Ensure that the Alarm Origination to OSS Numbers field is neither			<a href="#">Screen 4-1</a>	
	4.	Save translations	save translations tape	Save current translations to removable media and remove when finished (label).	varies			
	5.	Load another tape		Label and load duplicate fall-back removable media				
	6.	Make duplicate removable media	save translations tape	Save translations to fall-back removable media	varies			
	7.	Check health	status pnc	Determine if alarms (bad components, fibers) might impact upgrade			<a href="#">Screen 4-2</a>	
	8.	List all atm connections	list atm pnc a-pnc	Displays numbered list of all administered ATM A-PNC connections				
	9.	Busyout connection	busyout atm pnc n (connection number)	Busyout all connections listed in step 8, beginning with A-PNC EPNs.				

*Continued on next page*

4 Upgrading to ATM-PNC  
R7r ATM-PNC to R8r ATM-PNC

Table 4-6. Upgrading ATM-PNC from Release 6.3r to Release 8r — Standard and High Reliability — Continued

Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
10.	Remove old ATM circuit packs		Remove old, A-PNC TN2238 circuit packs.  <b>NOTE:</b> Carefully remove the fiber connections to the ATM circuit packs.				
11.	Insert ATM circuit packs		Insert A-PNC TN2305/TN2306 circuit packs.				
12.	Connect fiber to A-PNC ATM circuit packs		Physically connect (reterminate) fiber to all A-PNC ATM circuit packs				
13.	Administer A-PNC ATM circuit packs	change atm pnc n (cabinet number)	Administer A-PNC ATM circuit pack		Y		
14.	Administer ILM/ESI information	change atm pnc n (connection number)	Change the new ESI (board) address in the ESI field for each B-PNC ATM circuit pack.  Query the ATM switch. Read the address information from the ATM terminal screen and duplicate in the DEFINITY ECS switch administration.		Y	<a href="#">Screen 4-4</a>	
15.	Verify circuit pack insertion	list configuration atm	Ensure that all new A-PNC ATM circuit packs are listed in the report.				
16.	Release atm connection	release atm pnc n	Release all of the atm connections that were busied out in step 10.				

Continued on next page

4 Upgrading to ATM-PNC  
R7r ATM-PNC to R8r ATM-PNC

Table 4-6. Upgrading ATM-PNC from Release 6.3r to Release 8r — Standard and High Reliability — Continued

Step	Action	Command	Description	Time	Record data	More info	Site-specific comments
17.	Check link administration	list sys-link	Ensure that PACLs (all PNs) and EALs (all EPNs) are up			<a href="#">Screen 4-8</a>	
18.	Check health	status pnc	Is State of Health field for A-PNCs functional? Any alarms? Does standby refreshed? field say <b>yes</b> ?			<a href="#">Screen 4-2</a>	
19.	Upgrade DEFINITY ECS to R8r		Refer to DEFINITY Enterprise Communications Server Release 8 Upgrades and Additions for R8r				

## Screens and Tables

```

change system-parameters maintenance                               Page 1 of 2   SPE B
                                MAINTENANCE-RELATED SYSTEM PARAMETERS
OPERATIONS SUPPORT PARAMETERS
    Product Identification: 1501137003
    First OSS Telephone Number:                               Abbrev Alarm Report? y
    Second OSS Telephone Number:                             Abbrev Alarm Report? n
Alarm Origination to OSS Numbers: neither
    Cleared Alarm Notification? n                               Suspension Threshold: 5
    Restart Notification? n
    Test Remote Access Port? n
    CPE Alarm Activation Level: none
    Customer Access to INADS Port? n
    Repeat Dial Interval (mins): 7
SCHEDULED MAINTENANCE
    Start Time: 01 : 00                                       Stop Time: 01 : 01
    Daily Maintenance: daily                                   Save Translation: no
    Control Channel Interchange: daily                       System Clocks Interchange: daily
    SPE Interchange: daily
    
```

Screen 4-1. Maintenance-related system parameters

```

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:
    
```

Screen 4-2. Port network connectivity

Table 4-7. PNC interchange

A-PNC status	B-PNC status	Description
Active	Standby	Go to the next step
Standby	Active	<ol style="list-style-type: none"> <li>1. Do a PNC interchange (<b>reset pnc-interchange</b>)</li> <li>2. Verify the interchange (<b>status pnc</b>): <ul style="list-style-type: none"> <li>■ A-PNC is active</li> <li>■ B-PNC is standby</li> </ul> </li> </ol>

```

change cabinet 1
                                     Page 1 of 1  SPE B
                                     CABINET
CABINET DESCRIPTION
  Cabinet: 1
  Cabinet Layout: five-carrier
  Cabinet Type: processor
  Number of Portnetworks: 1
    Room:
    Floor:
    Building:
CARRIER DESCRIPTION
Carrier      Carrier Type      Number      Duplicate
C           port              PN 01
B           processor      PN 01
A           processor      PN 01
X           Fan
D           dup-sw-node    SN 01      01E
E           switch-node    SN 01      01D
    
```

Screen 4-3. Cabinet

```

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: 0000000000000000                 ESI: 0000000000000000
SEL: 00                                 SEL: 00
    
```

Screen 4-4. ATM PNC Download from [www.Somanuals.com](http://www.Somanuals.com). All Manuals Search And Download.



change synchronization Page 1 of 6 SPE A

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

### Screen 4-5. Synchronization plan

change system-parameters customer-options Page 2 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	DEFINITY Network Admin? y
ASAI Proprietary Adjunct Links? y	Digital Loss Plan Modification? n
<b>Async. Transfer Mode (ATM) PNC? y</b>	DS1 MSP? y
<b>Async. Transfer Mode (ATM) Trunking? y</b>	Emergency Access to Attendant? y
ATMS? y	Extended Cvg/Fwd Admin? y
Attendant Vectoring? n	External Device Alarm Admin? y
Audible Message Waiting? y	Flexible Billing? y
Authorization Codes? y	Forced Entry of Account Codes? y
	Global Call Classification? y

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

### Screen 4-6. Optional features—screen 2

4 Upgrading to ATM-PNC  
 Screens and Tables

4-24

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

Hospitality (Basic)? y	<b>PNC Duplication? y</b>
Hospitality (G3V3 Enhancements)? y	
H.323 Trunks? n	Processor and System MSP? y
IP Stations? n	Private Networking? y
ISDN Feature Plus? y	Restrict Call Forward Off Net? y
ISDN-BRI Trunks? y	Secondary Data Module? y
ISDN-PRI? y	Station and Trunk MSP? y
Malicious Call Trace? y	
Mode Code for Centralized Voice Mail? n	Tenant Partitioning? y
Mode Code Interface? y	Terminal Trans. Init. (TTI)? y
Multifrequency Signaling? y	Time of Day Routing? y
Multimedia Appl. Server Interface (MASI)? y	Uniform Dialing Plan? y
Multimedia Call Handling (Basic)? y	Usage Allocation Enhancements? y
Multimedia Call Handling (Enhanced)? y	
Multiple Locations? y	Wideband Switching? y
Personal Station Access (PSA)? y	Wireless? y

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

Screen 4-7. Optional features—screen 3

list sys-link Page 1

SYSTEM LINKS INFORMATION

Location	Link Type/ Channel	State	Current Path	Faulted Path	Last Fault Recorded
02A0101	EAL	up	present	none	
02B0201	EAL	up	present	none	
01B0202	PACL	up	present	none	
01C0302	PACL	up	present	none	
02A0102	PACL	up	present	none	
02B0202	PACL	up	present	none	

Screen 4-8. System links information

## Administering ATM-PNC and ATM-CES

# 5

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After the hardware is upgraded to Release 8 ATM-PNC or ATM-CES, you must administer the ATM switch and the DEFINITY ECS to complete the process. Administration procedures are as follows:

- [Accessing Switches for Administration](#)
- [Acquiring ATM Addresses](#)
- [Administering ATM Switch](#)
- [Administering DEFINITY ECS](#)

### Accessing Switches for Administration

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

- SAT—System Administration Terminal
- DSA—DEFINITY Site Administration
- DNA—DEFINITY Network Administration

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

DSA is a software-only system management tool that runs on personal computer using Microsoft Windows 95/98/NT 4.0. It is designed for a single user to administer and monitor DEFINITY switches and voice mail systems. The software is available on laptops.

DEFINITY Network Administration (DNA) is a software-only system management tool based on client-server architecture. It gives multiple administrators the ability to administer a network of DEFINITY switches and INTUITY Voice Mail systems simultaneously from different machines.

Although the 3 methods of access present different interfaces, the command syntax is the same. The screens shown in this section are as they look on a Release 8r platform through a SAT. 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 (see Figure 3-1). These 40 characters are divided into sectors as [Table 5-1](#) shows:

Table 5-1. 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. <sup>1</sup>
39-40	2	Selector byte is always 0 for DEFINITY 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 TN2305/TN2306 is located on the MAC address button on the circuit pack (see Figure 5-1).

In Release 7 or later, the address of the EPN 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 TN2305 or TN2306 board(s) in the EPN to formulate the 20-byte ATM address(es).

ATM switches can use any of the address formats listed in [Table 5-2](#).

### NOTE:

The beginning AFI and the last 2 sectors (ESI, and Selector) in [Table 5-2](#) are all the same length, making it easier to parse the ATM address, regardless of the format.

Table 5-2. 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

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To administer the ATM switch, refer to your switch's quick reference guide.

## Administering DEFINITY ECS

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The DEFINITY ECS switch software provides 2 kinds of ATM service:

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

[Table 5-3](#) outlines important concepts to observe when administering ATM.

Table 5-3. General DEFINITY ECS ATM parameters



Concept	Description
PNC duplication	<p>If you are installing or upgrading a critical reliability system, you must enable the PNC duplication on the system-parameters customer-options screen (init password required) before the feature can be used. If it is enabled, you must further</p> <ul style="list-style-type: none"><li>■ Add <b>pnc-a</b> or <b>pnc-b</b> to command strings to clarify which carrier the ATM interface circuit pack is in</li><li>■ Specify the location of the ATM interface circuit pack serving as the duplicate</li></ul> <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>
Remote switch administration	<p>A remote switch connected with a permanent virtual circuit (PVC). The DEFINITY system recognizes the remote switch as a node with compatible circuit parameters at the other end of an emulated circuit.</p> <p>You can connect a remote switch to the DEFINITY with one or more CES-emulated circuits. In such a case, the emulated circuits remain discrete.</p>
Synchronization	<p>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.</p> <p>CES—Synchronization is derived the same way it is in a non-ATM-PNC or ATM-PNC environment, whichever applies.</p>

## ATM Port Network Connectivity (ATM-PNC)

Each DEFINITY port network must be translated in the PPN'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 5-4](#) to administer ATM-PNC:

**Table 5-4. ATM-PNC administration**

√	Step	Action	Command	Description
	1.	Log on DEFINITY ECS switch		Use the <code>init</code> login to log on to the DEFINITY switch.
				 <b>NOTE:</b> An <code>init</code> login is required to change customer options and will be challenged by Access Security Gateway (ASG). Contact your regional CSA (customer software administrator) to perform this function.
	2.	Turn on ATM-PNC	<code>change system-parameters customer-options</code>	The Customer Options screen ( <a href="#">Screen 5-2</a> ) displays.
	3.	Set the mode to yes		Set <code>Async.Transfer Mode (ATM) PNC?</code> field to <b>y</b> .
	4.	If duplicated PNC (critical reliability), set PNC duplication		Set the <code>PNC Duplication?</code> field to <b>y</b>
	5.	Log off the DEFINITY ECS		Log off the DEFINITY system administration terminal.
	6.	Log onto the DEFINITY ECS		Use the <code>craft</code> login to log on to the DEFINITY switch (ignore any alarms at this time).
				 <b>NOTE:</b> The <code>init</code> login is no longer required.
	7.	Administer ATM PNC		Use the ATM worksheet in <a href="#">Appendix A, "Baselining the Customer's Configuration"</a> to record the configuration.
	8.	Add new PNC	<code>add pnc next</code>	Add the next PNC.
	9.	Set location address		Set the <code>Location:</code> field to the address of the ATM circuit pack (in <b>01C01</b> - cabinet, carrier, slot format).
	10.	Assign network name		Type a name in the <code>Name:</code> field to assign a unique, 15-character port network name.

*Continued on next page*

Table 5-4. ATM-PNC administration — Continued

√ Step	Action	Command	Description
11.	Set the MAC address (Steps 10-13)		Set <code>Address format</code> to one of the following: E.164 ATM private, DCC, or ICD  <b>⇒ NOTE:</b> If other ATM applications are installed ask the ATM system administrator to determine which address format to use. The system default is DCC.
12.	Fill in information from worksheet		Set <code>HO DSP: xxxxxxxx</code> , fill in information from the ATM worksheet ( <a href="#">Appendix A, "Baselining the Customer's Configuration"</a> ).
13.	Enter the ESI address		Type in the ESI from the ATM worksheet ( <a href="#">Appendix A, "Baselining the Customer's Configuration"</a> ) (MAC address) of the TN2305/TN2306 in the EPN.  <b>⇒ NOTE:</b> The first 13 bytes auto set after initial entry. Just enter the MAC address from each column for each TN2305/TN2306 circuit pack.
14.	Set the Sel field		Set the Sel: field to <b>00</b> .  <b>⇒ NOTE:</b> Steps 11-13 make up the 20-byte ATM address.
15.	If duplicated PNC (critical reliability), enable PNC	<code>change system-parameters duplication</code>	Set <code>Enable Operation of SPE Duplication?</code> field to <b>y</b> Set <code>Enable Operation of PNC Duplication?</code> field to <b>y</b> ( <a href="#">Screen 5-4</a> )
16.	Repeat for all PNs		Repeat Steps 7-13 until all port networks are administered.
17.	Check administration	<code>list atm pnc</code>	Verify that all ATM connections are administered.
18.	Check links	<code>list sys-link</code>	Types EAL (EPN) and PACL (all PNs) should display.
19.	Administer the DEFINITY ECS synchronization	<code>change synchronization</code>	Synchronize all signals.
20.	Set primary timing reference		Set <code>primary: atm-sw</code> .
21.	Set secondary timing reference		Set <code>secondary: atm-sw</code> . Press Enter to effect the changes.
22.	Save translations	<code>save translations</code>	Save translations to system disk.



## 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 5-8](#), under [“ATM-CES administration procedure” on page 5-12](#).

- Uses ATM emulated circuits instead of physical T1/E1 tie-trunks out to the ATM network.
- Uses up to 8 signaling groups per TN2305/TN2306 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 TN2305/TN2306 circuit pack. Hereafter, these are referred to as ports.
- Uses constant bit-rate (CBR) signalling over permanent virtual connections (PVCs).
- Has a transparent DEFINITY 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 5-5](#) lists several guidelines for ATM-CES administration.

Table 5-5. ATM-CES administration rules

Rule	How to administer or confirm
Both ends of the emulated circuit must have the same number of channels	Type <b>change signaling-group siggrpnr</b> and press Enter; go to screen 2
Both ends of the emulated circuit must have the same number of trunks.	Type <b>change trunk-group trkgrpnr</b> and press Enter; go to screen 6.
Both ends of the emulated circuit must use the same channel numbers.	Type <b>change signaling-group siggrpnr</b> 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 <b>change trunk-group trkgrpnr</b> 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.

*Continued on next page*

Table 5-5. ATM-CES administration rules — *Continued*

Rule	How to administer or confirm
The D channel must be in a port between 009 and 032.	Type <b>display signaling-group siggrpnr</b> and press Enter; go to screen 2 to verify.  The D channel is automatically populated in channel 24 (T1) or in channel 16 (E1).
The TN2305/TN2306 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 <a href="#">Table 5-6</a> and <a href="#">Table 5-7</a> for details about port and trunk group capacities for the TN2305/TN2306 circuit pack and the DEFINITY ECS switch.
A trunk group may contain either ISDN trunks or ATM trunks, but not both	

Table 5-6. TN2305/TN2306 CES trunk capacities

Bearer ports per signaling group (B channel)	Signaling groups per TN2305/TN2306 (D-channel)	Total ports used <sup>1</sup>
<b>T1:</b> 23	8	192
<b>E1:</b> 30	8	248

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

Table 5-7. DEFINITY ECS trunk capacities by model

Capacity	c, csi, si	r
Maximum trunks per trunk group	99	255
Maximum number of trunk groups	99	666
Maximum number of trunks in the system	400	4000

## Trunk groups

At least one trunk group is typically created for each remote switch with these attributes (see [Screen 5-8](#)):

- Group Type field is **isdn**
- Carrier medium field is **atm**
- Dial Access? field is always **n**
- TN2305/TN2306 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:

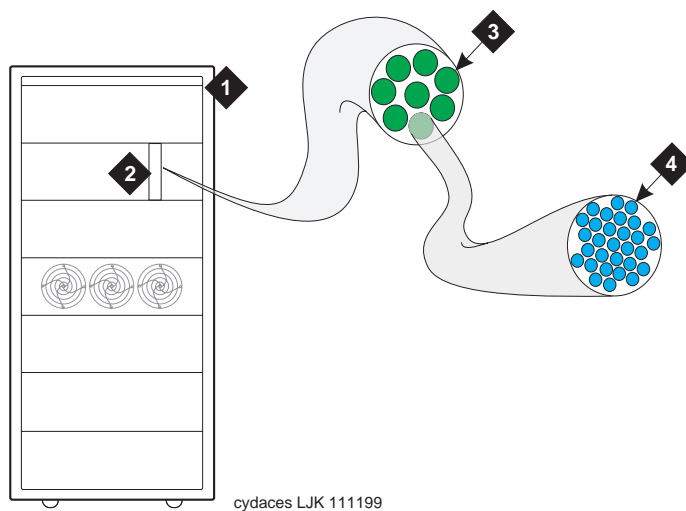
Release 7 introduced 3-digit port numbers for administering a CES trunk, and CMS cannot read the old 2-digit numbers. Release 8 CMS software can read both the 2- and 3-digit port numbers.

- 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 TN2305/TN2306 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. This concept is depicted in [Figure 3-1](#). Multiple TN2305/TN2306 circuit packs in a port network could connect to different ATM switches.



### Figure Notes

1. DEFINITY ECS PPN or EPN
2. TN2305/TN2306 circuit pack in any port
3. Signaling groups (maximum 8)
4. Ports  
24 maximum (T1), including D-channel  
31 maximum (E1), including D-channel

Figure 5-1. DEFINITY signaling groups and members for ATM trunking

- 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 5-8](#) 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 are for a Release 8r platform. The screen numbers may differ for Release 8c, Release 8csi, and Release 8si platforms.

Table 5-8. ATM-CES administration

√	Step	Action	Description
	1.	Set the software version	Type <b>change system-parameters customer-options</b> and press Enter. (init login required)  The Customer Options screen ( <a href="#">Screen 5-2</a> ) displays.
	2.	Set the version field	Upgrades only: Set the G3 <code>Version</code> field to <b>V8</b> .  Go to screen 2
	3.	Turn on ATM trunking	Set the <code>Async. Transfer Mode (ATM) Trunking?</code> field to <b>y</b> ( <a href="#">Screen 5-2</a> ).  Go to screen 3.
	4.	Administer as ISDN-PRI	Set the <code>ISDN-PRI</code> field to <b>y</b> ( <a href="#">Screen 5-3</a> ).  Press Enter to save the changes.
	5.	Log off/on	Log in as craft
	6.	Install the circuit packs	Install the TN2305/TN2306 circuit pack and wait for it to initialize (about 4 minutes )
	7.	Connect the fiber optic cable	Attach the fiber optic cable to the circuit pack and to the ATM switch.
	8.	Look up ATM circuit pack locations	Type <b>list configuration atm</b> and press Enter. The name for this circuit pack appears as ATM INTERFACE (or ATM INTF).
	9.	Administer the circuit pack personality	Type <b>add atm trunk-board UUCSS</b> and press Enter. The ATM Trunk-Board screen ( <a href="#">Screen 5-5</a> ) displays.
	10.	Type a name for the ATM board	Type the name of the ATM interface circuit pack (15 alphanumeric characters) in the <code>Name</code> field.




*Continued on next page*

Table 5-8. ATM-CES administration — *Continued*

√	Step	Action	Description
	11.	Set the synchronization	<p>Set the <code>Synchronization Capable</code> field to <b>n</b> (default).</p> <p> <b>NOTE:</b> Up to 44 boards may be designated synchronization capable on R8r and 3 boards on R8si, R8csi, R8c. If you enter <b>y</b> in this field when the maximum number of boards has been designated, the system returns:</p> <p style="padding-left: 40px;">Maximum number of Synchronization Capable boards already administered</p> <p> <b>NOTE:</b> If this ATM trunk circuit pack is a synchronization source, set the field to <b>y</b>. If you change the field to <b>n</b> when the circuit pack is administered as a synchronization source, the system returns:</p> <p style="padding-left: 40px;">Cannot remove synchronization source.</p>
	12.	Administer the signaling group	<p>Type <b>add signaling-group</b> and press Enter. The Signaling Group screen (<a href="#">Screen 3-3</a>) displays.</p> <p>Set the following fields (tabbing goes vertically)</p>
	13.	Set the group type	Set the <code>Group Type</code> field to <b>atm</b> .
	14.	Type port address	Type the <code>D-channel</code> (signaling channel) port address for this new signaling group in <b>UUCSSppp</b> screen at (3-digits required for port addresses). This address must match the slot and port number on an ATM-Interface circuit pack.
	15.	Type a name	Type a name in the <code>Name</code> field (15 alpha-numeric characters).
	16.	Set VPI	The <code>Virtual Path Identifier (VPI)</code> field is set to 0 and is not administrable.

*Continued on next page*

Table 5-8. ATM-CES administration — *Continued*

√	Step	Action	Description
	17.	Set VCI	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.   <b>NOTE:</b> 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.   <b>NOTE:</b> The <code>Signaling Mode</code> field is set to <code>isdn-pri</code> and is not administrable.
	18.	Set idle code	Set the <code>Idle Code</code> field (typically 11111111).
	19.	Set interface companding	Set the <code>Interface Companding</code> field ( <b>alaw</b> or <b>mulaw</b> ). Once administered, busyout the signaling group before changing.
	20.	Set country protocol	Set the <code>Country Protocol</code> field ( <a href="#">Table 5-9</a> ).
	21.	Set protocol version	Set the <code>Protocol Version</code> field ( <a href="#">Table 5-9</a> ).
	22.	Set circuit type	Set the <code>Circuit Type</code> field ( <b>T1</b> or <b>E1</b> ).   <b>NOTE:</b> Both ends must be the same. It is preferable to set it to E1 even in the United States, Canada, or other T1 countries.
	23.	Set connect	Set the <code>Connect</code> field to <b>pbx</b> . Once administered, busyout the signaling group before changing.
	24.	Set interface	Set the <code>Interface</code> field to <b>user</b> at one end of the emulated circuit and to <b>network</b> at the other end.
	25.	Set DCP/analog bearer capability	Set the <code>DCP/Analog Bearer Capability</code> field to <b>3.1 kHz</b> .
	26.	Set internetworking message	Set <code>internetworking message</code> field to <b>PROGress</b> .

*Continued on next page*




Table 5-8. ATM-CES administration — *Continued*

√	Step	Action	Description
	27.	Verify channel settings	<p>Go to screen 2; <a href="#">Screen 5-7</a> displays.</p> <p>Depending on the settings in step 18:</p> <ul style="list-style-type: none"><li>■ If <code>Circuit Type</code> field is set at T1, then channel 24 is populated.</li><li>■ If <code>Circuit Type</code> field is set at E1, then channel 16 is populated.</li></ul> <p>Other details about D-channels:</p> <ul style="list-style-type: none"><li>■ All ports for one signaling group must be on the same ATM circuit pack (the same circuit pack that the D channel is on).</li><li>■ 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.</li><li>■ No port can be assigned to more than one signaling group.</li></ul>
	28.	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 <a href="#">"Changing the port-to-channel mapping" on page 5-22</a> if you need to change any administration.</p> <p>When finished, press Enter to save the administration.</p>
	29.	Administer the trunk group	<p>Type <b>add trunk-group <i>trkgrpnbr</i></b> and press Enter.</p> <p><a href="#">Screen 3-5</a> displays.</p>

*Continued on next page*

Table 5-8. ATM-CES administration — *Continued*

√	Step	Action	Description
	30.	Set final fields	<p>Set the following fields (tabbing goes horizontally):</p> <ul style="list-style-type: none"><li>■ Group Type: field to <b>isdn</b>.</li></ul> <p> <b>NOTE:</b> A trunk group can contain either ISDN or ATM trunks, but not both.</p> <ul style="list-style-type: none"><li>■ The CDR Reports field defaults to <b>y</b>.</li><li>■ The Carrier Medium: field to <b>ATM</b>.</li><li>■ The TAC: field to match customer's dial plan.</li><li>■ The Dial Access? field defaults to <b>n</b>.</li><li>■ The Service Type: field to <b>tie</b>.</li></ul> <p>Go to screen 6 and add the channel-to-port mapping (<a href="#">Screen 5-10</a>). You must have the same number of entries as port numbers in step 28.</p> <p>Press Enter to save the changes.</p>
	31.	Save translations	Type <b>save translation</b> and press Enter.

## ATM-CES administration screens



### NOTE:

The screens shown in this section are as they look on a Release 8r platform through a SAT. Your interface and screen page numbers may differ.

```
change system-parameters customer-options                               Page 1 of 6
                                OPTIONAL FEATURES

                                G3 Version: V8
                                Location: 1
                                Maximum Ports: 300
                                Maximum XMOBILE Stations: 0
                                Maximum H.323 Trunks: 0
                                Maximum H.323 Stations: 0
                                Maximum IP SoftPhones: 0
```

### Screen 5-1. Optional features—screen 1

```
change system-parameters customer-options                               Page 2 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                                       DEFINITY Network Admin? y
                                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.)

### Screen 5-2. Optional features—screen 2

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

    Hospitality (Basic)? y                                           PNC Duplication? y
    Hospitality (G3V3 Enhancements)? y
    H.323 Trunks? n                                               Processor and System MSP? y
    IP Stations? n                                               Private Networking? y
    ISDN Feature Plus? y Restrict Call Forward Off Net? y
    ISDN-BRI Trunks? y                                           Secondary Data Module? y
    ISDN-PRI? y                                                 Station and Trunk MSP? y
    Malicious Call Trace? y
    Mode Code for Centralized Voice Mail? n                       Tenant Partitioning? y
    Mode Code Interface? y Terminal Trans. Init. (TTI)? y
    Multifrequency Signaling? y Time of Day Routing? y
    Multimedia Appl. Server Interface (MASI)? y Uniform Dialing Plan? y
    Multimedia Call Handling (Basic)? y Usage Allocation Enhancements? y
    Multimedia Call Handling (Enhanced)? y
    Multiple Locations? y                                         Wideband Switching? y
    Personal Station Access (PSA)? y                               Wireless? y

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

### Screen 5-3. Optional features—screen 3

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

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

### Screen 5-4. Duplication related system parameters

```
                                ATM TRUNK-BOARD

    Location: 2E08

    Name: _____ Synchronization Capable: 1
```

### Screen 5-5. ATM trunk board

```

add signaling-group                               Page 1 of 6
                SIGNALING GROUP

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

CIRCUIT PARAMETERS
Virtual Path Identifier: 0
Virtual Channel Identifier:

                Signaling Mode: isdn-pri        Circuit Type: T1
                Idle Code: 11111111           Connect: pbx
Interface Companding: mulaw
Country Protocol: 1
Protocol Version: a

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

## Screen 5-6. Signaling group

Table 5-9. Country and protocol version supported (for [Screen 5-6](#))

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
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)

*Continued on next page*

Table 5-9. Country and protocol version supported (for [Screen 5-6](#))

Value	Country	Protocol supported
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

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)

Screen 5-7. Signaling group D-channel assignments—screen 2

5 Administering ATM-PNC and ATM-CES  
 Administering DEFINITY ECS

5-21

```

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
    
```

Screen 5-8. Trunk group—screen 1

```

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:
    
```

Screen 5-9. Trunk group—screen 4

## 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.

## DEFINITY commands for CES

Administration commands that are useful in working with CES are listed in [Table 5-10](#).

Table 5-10. ATM administration commands

Command	Description
<b>display circuit-packs <i>cabinet</i></b>	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.
<b>display atm ports <i>eqloc</i></b>	Displays the 256 ports on the ATM board with the corresponding signaling and trunk group.
<b>list configuration atm</b>	Lists the ATM boards, identifying equipment location, board code, type, and vintage.
<b>list configuration trunks</b>	Lists boards identifying assigned ports. Although the ATM board is listed, the 256 ports are not.



## Additional DEFINITY ECS 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

---


The DEFINITY ATM-PNC makes it easier for the DEFINITY ECS to have port networks in multiple time zones. To handle distances between the PPN and its EPNs, 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 EPNs. To administer locations, follow the procedure in [Table 5-11](#).

**NOTE:**

The screens and field description follow the table.

**Table 5-11. Administer location procedure**

√	Step	Action	Description
	1.	Activate the feature	Type <b>change system-parameters customer-options</b> and press Enter. (Init password required.) The Customer Options screen displays. Go to screen 3 ( <a href="#">Screen 5-10</a> ).
	2.	Set multiple locations	Change the value in the <code>Multiple locations</code> field to <b>y</b> and press Enter.   <b>NOTE:</b> The system is limited to a single location unless this field is changed.
	3.	Verify feature activation	Type <b>display system-parameters customer-options</b> and press Enter. The Customer Options screen displays ( <a href="#">Screen 5-10</a> ). Go to screen 2 and verify that the <code>Multiple locations</code> field is set to <b>y</b> .
	4.	Change cabinet administration	Type <b>change cabinet n</b> (cabinet number) and press Enter. The Cabinet screen displays ( <a href="#">Screen 5-11</a> ).

*Continued on next page*

Table 5-11. Administer location procedure — *Continued*

√	Step	Action	Description
	5.	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.
	6.	Administer location properties	Type <b>change locations</b> and press Enter. The Locations screen displays ( <a href="#">Screen 5-12</a> ).
	7.	Set timezone offset	Ensure that the <code>Timezone Offset</code> field for Location 1 is set at <b>00:00</b> , indicating the local time. This serves as a system-wide, relative time reference.
	8.	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"> <li>■ outside the NANP.</li> <li>■ with no 7-digit local calling plan. These locations may have overlaid area codes requiring 10-digit dialing.</li> </ul>
	9.	Administer cabinet locations	Administer all other locations as necessary.  For example, if the PPN is in New York and a group of EPNs 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.  Administer cabinet locations as they are added to the system. More than 1 cabinet can be in the same location.  For location-related feature limitations and interactions see <a href="#">Table 5-11</a> .  When finished, press Enter to effect the changes.

*Continued on next page*

Table 5-11. Administer location procedure — *Continued*

√	Step	Action	Description
	10.	Administer Daylight-Savings Time rules	<p>Type <b>change daylight-savings-rules</b> and press Enter.</p> <p>The Daylight Savings Rules screen displays (<a href="#">Screen 5-13</a>).</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"> <li>■ set the <code>Additional Restrictions</code> field for that login to <b>y</b>, and entering <b>daylight-savings-rules</b> in the <code>Restricted Object List</code> field.</li> <li>■ set the <code>Administer Features</code> field for that login to <b>n</b>.</li> <li>■ set the <code>Display Admin. and Maint. Data</code> field for that login to <b>n</b>.</li> </ul>
	11.	Verify date and time	<p>Check the system date and time (set time).</p> <p>Ensure that the <code>Type</code> and <code>Daylight Savings Rule</code> fields are administered correctly (<a href="#">Screen 5-14</a>).</p>
	12.	Administer ARS routing	<p>Administer the <code>Location</code> field on the ARS analysis screen (<b>change ars analysis 0 location all</b>), observing the following conditions:</p> <ul style="list-style-type: none"> <li>■ ARS customer option (<b>change system-parameters customer-options</b>) must be enabled (init password required).</li> <li>■ the Multiple Locations customer option must be administered to a value other than <b>all</b>.</li> </ul>

change system-parameters customer-options Page 3 of 6

OPTIONAL FEATURES

Hospitality (Basic)? y	PNC Duplication? y
Hospitality (G3V3 Enhancements)? y	
H.323 Trunks? n	Processor and System MSP? y
IP Stations? n	Private Networking? y
ISDN Feature Plus? y	Restrict Call Forward Off Net? y
ISDN-BRI Trunks? y	Secondary Data Module? y
ISDN-PRI? y	Station and Trunk MSP? y
Malicious Call Trace? y	
Mode Code for Centralized Voice Mail? n	Tenant Partitioning? y
Mode Code Interface? y	Terminal Trans. Init. (TTI)? y
Multifrequency Signaling? y	Time of Day Routing? y
Multimedia Appl. Server Interface (MASI)? y	Uniform Dialing Plan? y
Multimedia Call Handling (Basic)? y	Usage Allocation Enhancements? y
Multimedia Call Handling (Enhanced)? y	
<b>Multiple Locations? y</b>	Wideband Switching? y
Personal Station Access (PSA)? y	Wireless? y

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

Screen 5-10. Optional features—screen 3

change cabinet 1 Page 1 of 1

CABINET

CABINET DESCRIPTION

Cabinet: 1  
 Cabinet Layout: five-carrier  
 Cabinet Type: processor  
 Number of Portnetworks: 1

**Location: 1**

Room: Floor: Building:

CARRIER DESCRIPTION

Carrier	Carrier Type	Number
C	not-used	PN 01
B	not-used	PN 01
A	processor	PN 01
X	fan	
D	not-used	PN 01
E	not-used	PN 01

Screen 5-11. Cabinet



**NOTE:**

With Release 7.1 or later software, all cabinets are automatically assigned 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**.

change locations Page 1 of 3

LOCATIONS

ARS Prefix 1 Required For 10-Digit NANP Calls? y

Number	Name	Timezone Offset	Daylight-Savings Rule	Number Plan Area Code
1	Main	+ 00:00	0	
2		:		
3		:		
4		:		
5		:		
6		:		
7		:		
8		:		
9		:		
10		:		
11		:		
12		:		
13		:		
14		:		

Screen 5-12. Locations—screen 1

**NOTE:**  
 Upgrades from a previous software version default to a single location (location 1) with the values shown in [Screen 5-12](#). The Number Plan Area Code is the home NPA from the dial plan screen of the earlier release.

**Field description:**

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.

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*Administering DEFINITY ECS*

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- 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.
- 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.
- 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).

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
	Stop: first Sunday	on or after	October	25	at 2 :0
2:	Start: first	on or after			at 0 :
	Stop: first	on or after			at 0 :
3:	Start: first	on or after			at 0 :
	Stop: first	on or after			at 0 :
4:	Start: first	on or after			at 0 :
	Stop: first	on or after			at 0 :
5:	Start: first	on or after			at 0 :
	Stop: first	on or after			at 0 :
6:	Start: first	on or after			at 0 :
	Stop: first	on or after			at 0 :
7:	Start: first	on or after			at 0 :
	Stop: first	on or after			at 0 :

**Screen 5-13. Daylight savings rules screen**

**Field description:**

- 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)

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Administering DEFINITY ECS

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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.

set time

Page 1 of 1

DATE AND TIME

DATE

Day of the Week: Sunday  
Day of the Month: 24

Month: October  
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

**Screen 5-14. Date and time screen**



**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 description:**

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

---

DEFINITY 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.

The **change atm svc-cache** command ([Screen 5-15](#)) is restricted to init, inads, and craft logins.

```
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
>= ms	sec
>= ms	sec
>= ms	sec
>= ms	sec
>= ms	sec
>= ms	sec
>= ms	sec
>= ms	sec

Screen 5-15. ATM SVC cache report



**Field description:**

**Algorithm** The name of the cache algorithm (default is **lan**). Possible values are **none**, **lan**, **man**, **wan**, and **custom**.

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):

Value	For Latency (ms)	Hold Time (ms)
<b>none</b>	0	0
<b>lan</b>	50	36
	0	12
<b>man</b>	800	80
	50	16
	0	8
<b>wan</b>	800	200
	200	36
	50	16
	0	0

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.

**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 5-12](#)) to administer digital phones on ATM-PNC DEFINITY ECSs.

**⇒ NOTE:**

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

Table 5-12. Gain/loss adjustment procedure

√	Step	Action	Description
	1.	Set or verify gain/loss administration	Type <b>change system-parameters country-options</b> and press Enter.  The System Parameters Country-Options screen displays <a href="#">(Table 5-16)</a> .
	2.	Set digital loss plan	Domestic: Ensure that the <code>Digital Loss Plan</code> field is <b>1</b> . If it is, exit this procedure.  International: If the <code>Digital Loss Plan</code> field is anything other than <b>1</b> , you must change the terminal parameters. Proceed to step 3.
	3.	Customize the digital phone series administration	Type <b>change terminal-parameters <i>termtyp</i></b> and press Enter. ( <i>termtyp</i> can be <b>603/302B1</b> , <b>6400</b> or <b>8400</b> .)  See the 6400-Type Terminal Parameters example <a href="#">(Table 5-17)</a> display ( <b>6400</b> used for this example).  Change the <code>Default Parameter Set</code> field to <b>1</b> .
	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"> <li>■ <code>Voice Transmit (dB)</code> = <b>+2.5</b></li> <li>■ <code>Voice Receive (dB)</code> = <b>-2.0</b></li> </ul> For 6400 and 8400 series phones only: in the BUILT-IN SPEAKER LEVELS part of the screen, change the following fields to these settings:  <ul style="list-style-type: none"> <li>■ <code>Voice Transmit (dB)</code> = <b>0.0</b></li> <li>■ <code>Voice receive (dB)</code> = <b>0.0</b></li> </ul> 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 connected to this switch, using <b>603/302B1</b> , <b>6400</b> or <b>8400</b> at the end of the command string. When finished, press Enter to effect the changes.

change system-parameters country-options Page 1 of 21

SYSTEM PARAMETERS COUNTRY-OPTIONS

Companding Mode: Mu-Law Base Tone Generator Set: 1  
440Hz PBX-dial Tone? n 440Hz Secondary-dial Tone? n

**Digital Loss Plan: 1**

Analog Ringing Cadence: 1 Set Layer 1 timer T1 to 30 seconds? n

Analog Line Transmission: 1

64/84xx Display Character Set? roman

TONE DETECTOR PARAMETERS

Tone Detection Mode: 6

Interdigit Pause: short

Screen 5-16. System parameters country-options—screen 1

change terminal-parameters 6400 Page 1 of 1 SPE A

6400-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):

Voice Sidetone (dB):

Touch Tone Transmit (dB):

Touch Tone Sidetone (dB):

Voice Receive (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):

Screen 5-17. 6400-type terminal parameters

## 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 5-13](#) to make sure that the switch administration for both the ATM and DEFINITY ECS switches is complete. Use [Table 5-14](#) and [Table 5-15](#) to test the ATM-PNC and ATM-CES installations, respectively.

Table 5-13. Final installation checklist

✓ Switch administration	What to check	How to check
ATM	<ol style="list-style-type: none"> <li>1. A VPI or VCI is administered for each CES PVC</li> <li>2. Class of service is Constant Bit Rate (CBR)</li> <li>3. Quality of Service (QoS) is Peak Cell Rate (PCR)</li> </ol>	<p>Query ATM switch</p> <p>Query ATM switch</p> <p>Query ATM switch</p>
DEFINITY ECS switch	<ol style="list-style-type: none"> <li>1. ATM circuit packs inserted and translated</li> <li>2. Signaling group for each PVC                             <ol style="list-style-type: none"> <li>a. Signaling group identifier</li> <li>b. Circuit pack ID</li> <li>c. VPI/VCI</li> <li>d. VC type is PVC</li> <li>e. D-channel port number assigned properly</li> <li>f. Signaling type (CES) administered</li> <li>g. Minimum number of channels administered (total of 7, at least 1 must be a D channel)</li> <li>h. D- and B-channel-to-port mapping</li> </ol> </li> <li>3. PVCs are up</li> </ol>	<p>Query DEFINITY ECS (list configuration atm)</p> <p>Query DEFINITY ECS (status signaling group)</p> <p>Query DEFINITY ECS (status signaling-group n). If signaling group is in service, then PVCs are up.</p>
ATM-PNC	<ol style="list-style-type: none"> <li>1. ATM circuit packs installed and translated</li> </ol>	<p>Query DEFINITY ECS</p>

Table 5-13. Final installation checklist — *Continued*

√	Switch administration	What to check	How to check
		2. ATM addresses are correct	Query DEFINITY ECS
		3. EALs are up	Query DEFINITY ECS (list system link)

Table 5-14. 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 EPNs	On the DEFINITY ECS access terminal, type <b>list system link</b> and press Enter.	<ul style="list-style-type: none"> <li>■ If the EAL is not up, check the ATM address for that TN2305/TN2306 port network (<b>list atm-pnc</b>, then <b>display atm-pnc n</b>).</li> <li>■ If the ATM address is incorrect, enter the correct ATM address (<b>change atm-pnc n</b>) and retest.</li> </ul>
	4. Place test call to any EPN remoted through the ATM network.	Dial an administered number on a remoted EPN.	
	5. Verify synchronization	Query ATM switch to make sure it is in "locked" state	

**Table 5-15. 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 EPN 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		

# Troubleshooting

# 6

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This chapter provides the following troubleshooting information:

- [Contact information](#)—Lists Lucent service organizations and helplines for U.S. and international installations
- [Alarms and errors](#)—Lists ATM maintenance objects and the platforms on which you can expect alarms and errors.
- [Troubleshooting ATM-CES](#)—Provides tips for troubleshooting DEFINITY ECS ATM-CES interfacing with ATM switches.
- [Troubleshooting ATM-PNC](#)—Provides tips for troubleshooting DEFINITY ECS 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

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### Lucent service organizations

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[Table 6-1](#) lists initial contact information for Lucent Technologies' 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 6-1. Lucent service organizations—initial contact information**

Organization	Contact information
Technical Service Organization (TSO)	<ul style="list-style-type: none"> <li>■ <b>Customers:</b> 1-800-242-2121</li> <li>■ <b>Technicians:</b> 1-800-248-1234</li> <li>■ <b>International:</b> Call your local direct or indirect channel partner</li> <li>■ <a href="http://www.bcs.lucent.com/tech_info/tso">http://www.bcs.lucent.com/tech_info/tso</a></li> </ul>
NetCare® Professional Services (NPS)	<ul style="list-style-type: none"> <li>■ 1-800-237-0016</li> <li>■ <a href="http://www.netcaredata.com">http://www.netcaredata.com</a></li> </ul>
Data networking technical support	<ul style="list-style-type: none"> <li>■ <a href="http://www.lucent.com/dns">http://www.lucent.com/dns</a></li> <li>■ <b>Domestic:</b> 1-800-237-0016 (press 0 at the prompt, then dial extension 73300)</li> <li>■ <b>Outside the USA:</b> 1-813-217-2425.</li> </ul>
Lucent ATM switches Services & Solution Delivery support	<ul style="list-style-type: none"> <li>■ <a href="http://infohub.mt.lucent.com/">http://infohub.mt.lucent.com/</a> (choose Product Index)</li> <li>or</li> <li>■ <a href="http://ndsspl.lc.lucent.com/netcareservicesrd/documents/ssplans/">http://ndsspl.lc.lucent.com/netcareservicesrd/documents/ssplans/</a></li> </ul>
DEFINITY ECS switch Services & Solution Delivery support	<ul style="list-style-type: none"> <li>■ <a href="http://www.bcs.lucent.com/solution/support_plans/#DEFINITY">http://www.bcs.lucent.com/solution/support_plans/#DEFINITY</a></li> </ul>
Global Strategic Opportunities (GSO) Division	<ul style="list-style-type: none"> <li>■ <a href="http://www-nsod.tsc.bcs.lucent.com">http://www-nsod.tsc.bcs.lucent.com</a></li> </ul>



## Helplines

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[Table 6-2](#) lists various HelpLine organizations that handle postsale maintenance and general usage questions.

Table 6-2. Helpline information

Organization		US and Canada	
		Direct	Indirect
BCS Enterprise	DEFINITY Helpline	1-800-225-7585	1-800-225-7585
	Maintenance	1-800-242-2121 (TSC)	1-800-242-2121 (TSC)
INS Enterprise	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

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

## Alarms and errors

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Depending on the ATM-PNC or ATM-CES application and the DEFINITY ECS switch platform, [Table 6-3](#) 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:

- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8r
- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8si
- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8csi

Table 6-3. ATM maintenance objects descriptions

Maintenance object	Description	PNC	CES	DEFINITY ECS platform		
				r	si	csi/c
ATM-BCH	Monitors the bearer channels containing digitized voice and data		X	X	X	X
ATM-DCH	Monitors the signaling channel containing control messages		X	X	X	X
ATM-EI	ATM Expansion Interface provides port network connectivity between the PPN and the EPN(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
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
ATM-SYNC	Monitors the common reference frequency among the DEFINITY ECS, 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
EXP-PN	Is responsible for overall maintenance of an EPN	X		X		
SYS-LINK	Monitors system links		X	X	X	X

## Troubleshooting ATM-CES

[Table 6-4](#) provides a first-level method for troubleshooting an installation.

**Table 6-4. ATM-CES installation troubleshooting checklist**

Problem	Solution
Is DEFINITY ECS software Release 7 or later?	Verify that software is Release 7 or later
On System Parameters Maintenance screen	Set to correct field
Is <code>Bus Bridge</code> field set to enabled? (csi)	Set to correct field
Is <code>Packet Bus</code> field set to activated? (r,si)	Verify/replace EI circuit packs
Are EI circuit packs TN570Bs or later?	
All COR, COS, UDP, FRLs, AAR, and ARS support proper routing	Verify they are all set correctly

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

- [Inspecting LEDs](#)—Describes the possible LED states on the
  - TN2305/TN2306 ATM interface circuit packs
  - ATM switch
- [Troubleshooting interoperability](#)—Provides guidelines for troubleshooting
  - [Physical connections](#)
  - [Administration](#)
  - [TN2305/TN2306 circuit pack](#)
  - [ATM signaling architecture](#)
- [Unusual ATM trouble conditions](#)—Describes difficult-to-diagnose failure modes in the DEFINITY ECS and ATM switch combinations.
- [DEFINITY ECS ATM-CES troubleshooting commands](#)—Describes specific troubleshooting commands.

## Inspecting LEDs

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To get a high-level status of the system, observe the LEDs on the TN2305/TN2306 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 TN2305/TN2306 circuit packs, refer to the following books:

- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8r
- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8si
- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8csi

## Troubleshooting interoperability

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This section covers the following ATM interoperability topics:

- [Physical connections](#)—Checks for correct ATM installation and configuration
- [Administration](#)—Checks for correct DEFINITY ECS and ATM switch administration
- [TN2305/TN2306 circuit pack](#)—Checks LED status, circuit pack insertion, and demand tests
- [ATM signaling architecture](#)—Checks the interoperability between the DEFINITY ECS switch and the ATM switch

Because Lucent 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 th ATM switch, is the PVC administered correctly?

## Administration

## Is DEFINITY ECS 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 6-5. Troubleshooting CES

√	Step	Action	Description
	1.	Verify PVC is correctly administered	Check VPI/VCI ( <b>change signaling-group siggrpnr</b> , screen 2)
	2.	Check channel number	Check that both ends of the emulated circuit have the same number of channels ( <b>change signaling-group siggrpnr</b> , screen 2).
	3.	Check trunks	Both ends of the emulated circuit have the same number of trunks ( <b>change trunk-group trkgrpnr</b> , screen 6).
			 <b>NOTE:</b> 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 ( <b>change signaling-group siggrpnr</b> , screen 2). Use the same channel numbers for the port to channel mapping (page 2) for the other end. See <a href="#">“Changing the port-to-channel mapping” on page 5-22</a> 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"> <li>■ Each circuit pack can have more than one signaling group and more than one D-channel</li> <li>■ The D-channel from one emulated circuit cannot signal for the bearer channels of another emulated circuit (no Nonfacility Associated Signaling for virtual circuits).</li> </ul>
	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"> <li>■ at least 6 bearer (B) channels</li> <li>■ one signaling (D) channel (required)</li> </ul>

*Continued on next page*

Table 6-5. Troubleshooting CES — *Continued*


√	Step	Action	Description
	7.	Check D-channel administration	The D-channel is administered in a port numbered 009–032 ( <b>display signaling-group siggrpnbr</b> , screen 2).
			 <b>NOTE:</b> The D-channel is automatically populated in channel 24 (T1) and channel 16 (E1) and this must match on both ends.
	8.	Check trunk limits	DEFINITY trunk limits must not be exceeded (see <a href="#">Table 6-6</a> )

Table 6-6. DEFINITY ECS trunk capacities by model

Capacity	c, csi, si	r
Maximum trunks per trunk group	99	255
Maximum number of trunk groups	99	666
Maximum number of trunks in the system	400	4000

 **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 Lucent ATM switch was administered correctly, refer to the appropriate reference guide.

**TN2305/TN2306 circuit pack**

**Did the TN2305/TN2306 come up correctly?**

- Review the LED conditions for the TN2305/TN2306 (refer to the appropriate maintenance book for LED indications):
  - Do the TN2305/TN2306 LEDs indicate a normal operational state (any of the following):
    - Active in the PPN
    - Standby in the PPN
    - Archangel mode in the EPN

- Standby in the EPN
  - CES in any PN
2. If after circuit pack insertion or a demand reset:
    - Do the TN2305/TN2306 LEDs indicate that it is booting?
    - Do the TN2305/TN2306 LEDs indicate it is downloading its DSPs?
    - Do the TN2305/TN2306 LEDs indicate that circuit pack is not completely inserted?
    - Do the TN2305/TN2306 LEDs indicate a maintenance alarm?
  3. If the TN2305/TN2306 is inserted and shows a vintage number, type **test board UUCSS** and press Enter; [Screen 6-1](#) displays.

```

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

```

### Screen 6-1. Screen output for test board *number*

- 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:
  - DEFINITY Enterprise Communications Server Release 8 Maintenance for R8r



- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8si
- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8csi

### Possible causes

1. The TN2305/TN2306 circuit pack is in a slot different from the DEFINITY administration.
2. The TN2305/TN2306 was not completely inserted.

## ATM signaling architecture

Troubleshooting interoperability between the DEFINITY ECS switch and the ATM switch involves understanding the architecture of ATM signaling ([Figure 6-1](#)). A Lucent Cajun A500 is used to show this concept.

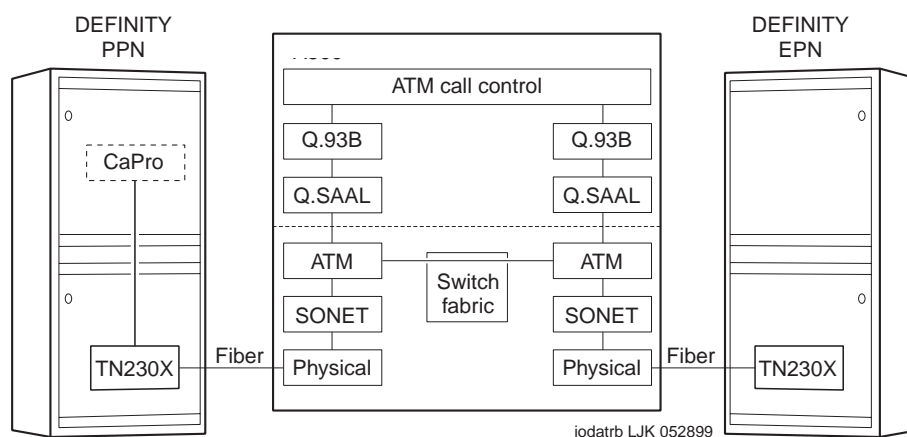


Figure 6-1. ATM signaling architecture

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 TN2305/TN2306 and the ATM switch?

1. Identify the OC-3/STM-1 ports on the ATM switch that have DEFINITY port networks attached.

- Be aware that customers may use other ports on the ATM switch for applications unrelated to DEFINITY (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. DEFINITY port networks must be identified by their ATM switch port numbers.

**NOTE:**

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

2. Does the TN2305/TN2306's YELLOW LED flash 100 ms on and 100 ms off, indicating a loss of signal on the fiber? Recall that the TN2305/TN2306 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 DEFINITY ECS Maintenance for R8r.

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 TN2305/TN2306 circuit pack.
- The transmit and receive fibers are swapped at the ATM switch or the TN2305/TN2306 circuit pack (but not both).
- There is a break in the fiber.
  - The TN2305/TN2306 is not transmitting a carrier (not inserted, not powered, or not administered). See the ATM-TRK maintenance object in one of the following books:
    - DEFINITY Enterprise Communications Server Release 8 Maintenance for R8r
    - DEFINITY Enterprise Communications Server Release 8 Maintenance for R8si
    - DEFINITY Enterprise Communications Server Release 8 Maintenance for R8csi
- 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 TN2305/TN2306 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 TN2305/TN2306 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 PPN to the EPN?**

#### **Diagnostics.**

- Do you get a dial tone on a set on the port network in question?
- Can you ring a set on the EPN dialing from the PPN and vice-versa?

1. Type **list sys-link** and press Enter. [Screen 6-2](#) shows the screen output.

```
list sys-link
```

SYSTEM LINKS INFORMATION

Location	Link Type/ Channel	State	Current Path	Faulted Path	Last Fault Recorded
02A0101	EAL	up	present	present	12/06/1997 16:20
01B0202	PACL	up	present	present	12/06/1997 16:17
02A0102	PACL	up	present	present	12/06/1997 16:20

**Screen 6-2. System links information**

Ensure that the fields have the values indicated below.

Link Type/ Channel	One PACL to each TN2305/TN2306 in either a PPN or an EPN, and one EAL to each TN2305/TN2306 in an EPN.
State	up

2. On the ATM switch console, look at the switch circuit.

The VBRnrt (Variable Bit Rate) virtual circuits between the ATM switch PPN and EPN ports are used for signaling between the PPN and each EPN.

- These are established once when initialized under control of DEFINITY Call Processing. They represent the ATM Control Link (ACL) and Expansion Archangel Link (EAL).
- VBRnrt virtual circuits are also used for ISDN channels between DEFINITY port networks.
- Other VBRnrt virtual circuits may exist between ATM switch ports that are not associated with DEFINITY port networks. A common use of VBRnrt circuits is multimedia and video-conferencing systems.

### 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 ATM switch PPN port and ATM switch EPN port are used for talk paths between port networks (PPN to EPN, EPN to PPN, or EPN to EPN).
  - 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 DEFINITY 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 DEFINITY 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 DEFINITY ECS/ATM switch combination are particularly difficult to diagnose. One example might be that you cannot make a completely successful call even though most indications from DEFINITY ECS 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 EPN route or end system identifier \(ATM switch\)](#)
- [Swapped routes, end system identifiers, or fiber between a PPN and an EPN](#)

### **Incorrectly typed or omitted EPN route or end system identifier (ATM switch)**

#### **Symptoms**

Talk paths are one-way, from the PPN to the EPN: you can hear tones from the PPN end station to the EPN end station but not vice versa. Because the signaling channels are bidirectional virtual circuits (VCs) established from the PPN to the EPN, 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 PPN to the EPN (which is routed correctly) and one VC from the EPN to the PPN (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 a PPN and an EPN

### Symptoms

- An incorrectly connected EPN TN2305/TN2306 circuit pack is not completely inserted.
- Dial tone is present on end stations on the PPN and on correctly connected EPNs, but no dial tone is present on the affected EPN end stations.
- Calls cannot be made between the PPN and the correctly connected EPNs 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 EPN (but actually connected logically or physically to the PPN) that should not exist.

### Action

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

## DEFINITY ECS ATM-CES troubleshooting commands

---

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

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

## Troubleshooting ATM-PNC

---

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

- [Inspecting LEDs](#)—Describes the possible LED states on the
  - TN2305/TN2306 ATM interface circuit packs
  - ATM switch
- [Troubleshooting synchronization \(400A only\)](#)—
  - [Connected through an ICSU](#)
  - [Connected through a DSU/CSU](#)

- [Troubleshooting interoperability](#)—Provides guidelines for troubleshooting
  - [Physical connections](#)
  - [Administration](#)
  - [TN2305/TN2306 circuit pack](#)
  - [ATM signaling architecture](#)
- [Unusual ATM trouble conditions](#)—Describes difficult-to-diagnose failure modes in the DEFINITY ECS and ATM switch combinations.
- [DEFINITY ECS 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 TN2305/TN2306 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 TN2305/TN2306 circuit packs, refer to the following book:

- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8r

## Troubleshooting synchronization (400A only)

---

### Connected through an ICSU

To troubleshoot 400A synchronization problems in systems where the synchronization signal connects through an ICSU, follow the procedures in [Table 6-7](#).

**Table 6-7. Troubleshooting 400A synchronization (through an ICSU)**

√	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 ( <b>test board UUCSS</b> ).  If the tests pass, go to step 14 (release). If a test fails, continue with step 3.

Table 6-7. Troubleshooting 400A synchronization (through an ICSU) — *Continued*

√	Step	Action	Description
	3.	Reseat circuit pack	Reseat the DS1 circuit pack.
	4.	Retest the circuit pack	Repeat the test ( <b>test board UUCSS</b> ). If Tests 138 through 145 pass, go to step 14 (release). If any test fails, go to step 5.
	5.	Busyout the DS1 circuit pack	To suppress alarms on the DS1 circuit pack, type <b>busyout board UUCSS</b> and press Enter.
	6.	Remove ICSU	Remove the ICSU module from the splitter.
	7.	Remove splitter	Remove the splitter from the DS1 circuit pack.
	8.	Put ICSU directly on DS1 circuit pack	Reconnect the ICSU module 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.
	9.	Test the circuit pack	Test the circuit pack ( <b>test board UUCSS</b> ) 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 DEFINITY ECS Maintenance for R8r.
	10.	Replace splitter	If the tests pass, replace the splitter onto the back of the DS1 circuit pack.
	11.	Reseat the circuit pack	Reseat the DS1 circuit pack and check the Amphenol connectors, making sure they are seated properly.
	12.	Test the circuit pack	Test the circuit pack ( <b>test board UUCSS</b> ) 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 DEFINITY ECS Maintenance for R8r or replace the splitter.
	13.	Escalate if necessary	If the ICSU tests OK, go to step 14.  If step 12 still fails, escalate to Tier 3 or replace the splitter.
	14.	Release the circuit pack	Release the DS1 circuit pack ( <b>release board UUCSS</b> ).
	15.	Verify active synchronization source	Verify that the designated DS1 circuit pack is now the active sync source ( <b>status synchronization</b> ).



## Connected through a DSU/CSU

To troubleshoot synchronization problems in systems where the synchronization signal connects through a Data Service Unit (DSU) or Channel Service Unit (CSU), follow the procedures in [Table 6-8](#).

Use this table if the

- DTE or RLB loopback tests fail
- CSU or DSU/CSU does not return to normal service

**Table 6-8. Troubleshooting 400A T1 synchronization (through a DSU/CSU)**

√	Step	Action	Description
	1.	If DSU/CSU does not go back to normal operation	Verify that the current line compensation settings on the DS1 circuit pack ( <b>change board</b> ) match the DTE equalization settings of the CSU or DSU/CSU for the length of cable:
	2.	Go through readout steps	On the 316X CSU or DSU/CSU, press the double-up arrow.
	3.	Continue	Press the button under the "Config" readout
	4.	Continue	Press the button under the "Activ." readout
	5.	Continue	Press the button under the "Edit." readout
	6.	Continue	Press the button under the "DTE." readout
	7.	Continue	Press the button under the "Next" readout until "Equalization" displays. The top line of the display shows the current settings.
	8.	Verify settings	If these settings do not agree with the DS1 administration (step 1), enter the correct settings and retest.  If the test still fails, continue.
	9.	Increase equalization settings	Increase the equalization settings on the CSU or DSU/CSU by one value.
	10.	Go through readout steps	Press the right-arrow button until "Value" displays. For example, if 0 through 133 displays, go to 133 through 266, and so on.
	11.	Continue	Press the double-up arrow.
	12.	Continue	Press the button under the "Yes" readout when asked to save options.
	13.	Continue	Press the button under the "Active" readout when asked where to save the options.  "Command Complete" displays.
	14.	Retest	Retest

Table 6-8. Troubleshooting 400A T1 synchronization (through a DSU/CSU) — Continued

√	Step	Action	Description
	15.	If the 316X CSU or DSU/CSU fails the DTE or RLB loopback tests	Remove the H600-307 DS1 cable from the splitter and the splitter from the DS1 circuit pack
	16.	Remove splitter	Remove the splitter from the DS1 circuit pack
	17.	Reconnect the cable	Reconnect the H600-307 cable directly to the DS1 circuit pack  After about 30 s, all the alarm LEDs on the 316X DSU/CSU should go out.  If the alarm LEDs on the 316X CSU or DSU/CSU do not go out, go to step 19.
	18.	Test circuit pack	Test the DS1 circuit pack ( <b>test board UUCSS</b> ).  If any one of Test 138 through 145 fails, follow the repair procedures listed in DEFINITY ECS Maintenance for R8r.
	19.	Check for errors	Wait 15 minutes and check that the <b>list measurements ds1 summary UUCSS</b> report is free of any errors. Use <a href="#">Table 3-6</a> to help interpret the report.
	20.	Replace the splitter	If the alarm LEDs on the 316X are not lit, replace the splitter. If the splitter has already been replaced, escalate to Tier 3.
	21.	Test the DS1 circuit pack	If the alarm LEDs on the 316X extinguish with the new splitter installed, perform a <b>test board UUCSS</b> and press Enter 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 DEFINITY ECS Maintenance for R8r.
	22.	Check error report	Wait 15 minutes and perform a <b>list measurements ds1 summary UUCSS</b> and verify that the DS1 circuit pack is free of errors. Use <a href="#">Table 3-6</a> to help interpret the report.
	23.	Release circuit pack	If there are no errors in step 22, release the DS1 circuit pack ( <b>release board UUCSS</b> ).
	24.	If the alarm LEDs on the 316X fail to go out	Reseat the DS1 circuit pack.
	25.	Escalate if necessary	If step 24 still fails, escalate to Tier 3

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

To troubleshoot 401A/402A/403A synchronization problems, follow the procedures in [Table 6-9](#).

**Table 6-9. 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 ( <b>test board UUCSS</b> ).  If the tests pass, go to step 13 (release). If a test fails, continue with step 3.
	3.	Reseat circuit pack	Reseat the DS1 circuit pack.
	4.	Retest the circuit pack	Repeat the test ( <b>test board UUCSS</b> ).  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 <b>busyout board UUCSS</b> 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 ( <b>test board UUCSS</b> ) 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 DEFINITY ECS Maintenance for R8r.
	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 ( <b>test board UUCSS</b> ) 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 DEFINITY ECS Maintenance for R8r or replace the splitter.

Table 6-9. Troubleshooting 401A/402A/403A synchronization — *Continued*

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

## Troubleshooting interoperability

This section covers the following ATM interoperability topics:

- [Physical connections](#)—Checks for correct ATM installation and configuration
- [Administration](#)—Checks for correct DEFINITY ECS and ATM switch administration
- [TN2305/TN2306 circuit pack](#)—Checks LED status, circuit pack insertion, and demand tests
- [ATM signaling architecture](#)—Checks the interoperability between the DEFINITY ECS switch and the ATM switch

Because Lucent 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 DEFINITY ECS and ATM switches.

### DEFINITY ECS switch administration

ATM-PNC. Is DEFINITY ECS ATM-PNC administered correctly?

1. Type **list atm pnc** and press Enter. The cabinet, carrier and slot positions of each administered TN2305/TN2306 circuit pack display is as shown in [Figure 6-3](#). Ensure that each circuit pack's physical location matches the display.

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

### Screen 6-3. Screen output for list atm pnc command

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

2. Type **status pnc** and press Enter. This display tells you which TN2305/TN2306 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. [Screen 6-4](#) shows the output from this 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:
```

### Screen 6-4. Screen output for status pnc command

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 TN2305/TN2306s are physically located in the slots indicated on the display. [Screen 6-5](#) shows the output for the **display circuit-packs 1** command; [Screen 6-6](#) shows the output for the **display circuit-packs 2** command.

```
display circuit-packs 1
```

```
CIRCUIT PACKS
```

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

```
*** PROCESSOR BOARDS NOT ADMINISTERABLE IN THIS SCREEN ***
```

```
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.
```

### Screen 6-5. Screen output for display circuit-packs 1

```
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.
```

### Screen 6-6. Screen output for circuit-packs 2

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

This display tells you the ATM addresses that have been administered for each TN2305/TN2306. Verify that each ATM address (the concatenation of the 5 displayed hexadecimal fields) is correct and match those in the ATM switch. [Screen 6-7](#) shows the output for the `display atm pnc 1` command; [Screen 6-8](#) shows the output for the `display atm pnc 2` command.

```
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
```

**Screen 6-7. Screen output for display atm pnc 1**

```
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
```

**Screen 6-8. Screen output for display atm pnc 2**

### Administered with end system identifiers

If the port networks are addressed using end system identifiers, the display looks like [Screen 6-9](#) (pnc 1) and [Screen 6-10](#) (pnc 2).



```
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: 0000000000011
      SEL: 00
```

**Screen 6-9.** Screen output for display atm pnc 1 with end system identifiers

```
display atm pnc 2

                               ATM PNC

                               Connection Number: 2

      A - PNC
Location: 02A01
      Name:

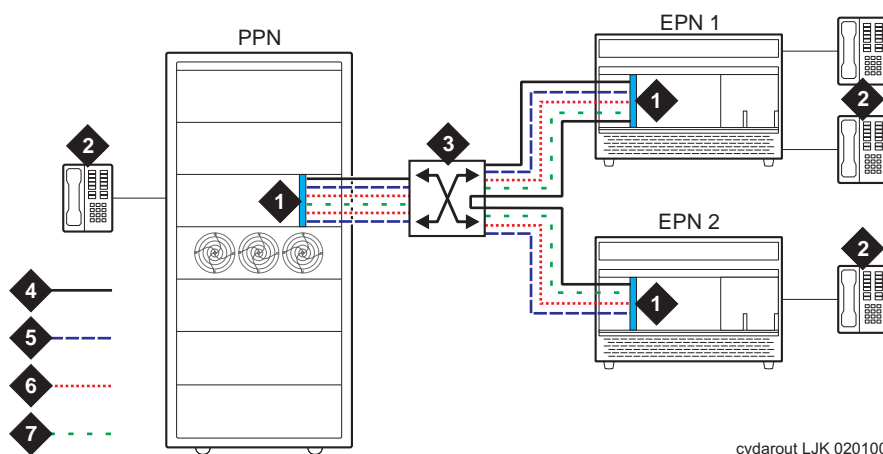
Address Format: E.164 ATM Private

      AFI: 45
      E.164: 0001013035381053
      HO-DSP: 00000000
      ESI: 0000000000012
      SEL: 00
```

**Screen 6-10.** Screen output for display atm pnc 2 with end system identifiers

## ATM signaling links

[Figure 6-2](#) shows the signaling links in an ATM-PNC configuration.



### Figure Notes

- |  |                                   |
|--|-----------------------------------|
| 1. DEFINITY ECS switch PPN/EPN                             | 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) |                                   |

Figure 6-2. ATM signaling links

**Signaling sequences.** Use the information in [Table 6-10](#) to help determine trouble with ATM signaling. Abbreviations used in this table correspond to those in [Figure 6-2](#).

**Table 6-10. ATM signaling sequences**

	Signaling between the PPN and the EPN	Call between EPN2 and EPN 3
1.	TN2305/TN2306 circuit pack in the PPN establishes a variable bit-rate switched virtual connection (VBR-SVC) for DEFINITY ECS signaling through the ATM switch to each EPN.	Station goes off hook in EPN2. CCMS messages sent over the already established EAL to call processing in the PPN.
2.	TN2305/TN2306 circuit pack in the PPN establishes EAL and PACL links with each EPN within the above VBR-SVC.	Call Processing sends a message over the PACL to the TN2305/TN2306 circuit pack in EPN2 to establish a connection to the TN2305/TN2306 circuit pack in EPN3.
3.	Links come up	TN2305/TN2306 circuit pack in EPN2 sends an ATM signaling message to the ATM switch to establish a CBR-SVC link to the TN2305/TN2306 circuit pack in EPN3.
4.		Call processing in the PPN sends CCMS messages to the station in EPN2 over the already-established EAL.
5.		Repeat steps 2 through 4 for the EPN3 to EPN2 connection.

## ATM switch administration

### Is the ATM switch administered correctly?

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

## TN2305/TN2306 circuit pack

### Did the TN2305/TN2306 come up correctly?

1. Review the LED conditions for the TN2305/TN2306 (refer to the maintenance book for LED indications):
  - Do the TN2305/TN2306 LEDs indicate a normal operational state (any of the following):
    - Active in the PPN
    - Standby in the PPN
    - Archangel mode in the EPN
    - Standby in the EPN
2. If after circuit pack insertion or a demand reset:
  - Do the TN2305/TN2306 LEDs indicate that it is booting?
  - Do the TN2305/TN2306 LEDs indicate it is downloading its DSPs?
  - Do the TN2305/TN2306 LEDs indicate that circuit pack is not completely inserted?
  - Do the TN2305/TN2306 LEDs indicate a maintenance alarm?
3. Type **list configuration carrier UUC** and press Enter. See [Screen 6-11](#) (1b) and [Screen 6-12](#) (2a).

```
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	u	u	u	u	u	u	u
01B05	ANALOG LINE	TN746B	000010	u	u	u	u	u	06	u	u	u	u
01B06	DID TRUNK	TN753	000021	u	u	u	u	u	u	u	u	u	u
01B07	MAINTENANCE/TEST	TN771D	000006	u	02	03	04						
01B08	CO TRUNK	TN747B	000018	u	u	u	u	u	u	u	u	u	u
01B09	BRI LINE	TN556B	000003	u	u	u	u	u	u	u	u	u	u
01B10	DS1 INTERFACE	TN767C	000003	u	u	u	u	u	u	u	u	u	u

Screen 6-11. List configuration carrier 1b 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 u
02A17   DIGITAL LINE                 TN754C  000002    u u u u u u u u
```

**Screen 6-12. List configuration carrier 2a screen**

- Make sure the TN2305/TN2306 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 TN2305/TN2306 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 TN2305/TN2306 is inserted and shows a vintage number, type **test board UUCSS** and press Enter; [Screen 6-13](#) displays.

```
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
```

**Screen 6-13. Screen output for test board UUCSS**

- The `Result` field should show `PASS` for each test number. If any of the tests fail, refer to the ATM-EI maintenance objects in DEFINITY ECS Maintenance for R8r.

### Possible causes

1. The TN2305/TN2306 circuit pack is in a slot different from the DEFINITY administration.
2. The TN2305/TN2306 was not completely inserted.

## ATM signaling architecture

Troubleshooting interoperability between the DEFINITY ECS switch and the ATM switch involves understanding the architecture of ATM signaling ([Figure 6-3](#)). A Lucent Cajun A500 is used to show this concept.

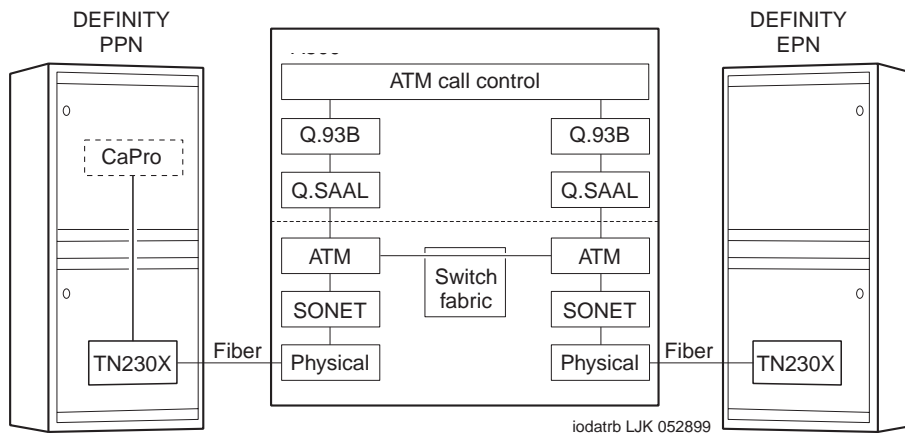


Figure 6-3. ATM signaling architecture

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 TN2305/TN2306 and the ATM switch?

1. Identify the OC-3/STM-1 ports on the ATM switch that have DEFINITY port networks attached.
  - Be aware that customers may use other ports on the ATM switch for applications unrelated to DEFINITY (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. DEFINITY port networks must be identified by their ATM switch port numbers.



#### NOTE:

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

1. Does the TN2305/TN2306's YELLOW LED flash 100 ms on and 100 ms off, indicating a loss of signal on the fiber? Recall that the TN2305/TN2306 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 DEFINITY ECS Maintenance for R8r.

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 TN2305/TN2306 circuit pack.
- The transmit and receive fibers are swapped at the ATM switch or the TN2305/TN2306 circuit pack (but not both).
- There is a break in the fiber.
- The TN2305/TN2306 is not transmitting a carrier (not inserted, not powered, or not administered). See the ATM-EI or ATM-TRK maintenance objects in DEFINITY ECS Maintenance for R8r.
- 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 TN2305/TN2306 is actively sending and receiving cells to and from the ATM switch.
- Check for SONET/SDH layer alarms, LOP, LUF, 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 TN2305/TN2306 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 TN2305/TN2306 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 TN2305/TN2306 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 TN2305/TN2306 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 PPN and EPN. They may not increase during troubleshooting unless calls are being made because the PPN initially sets up control connections to the PPN and then sets up talk path connections as needed.
3. Check to see if connections are being rejected. The error may be on the PPN port even though the EPN port is the one misbehaving and vice versa.
4. Type **display errors** and press Enter.
5. Set the `Error List` field to **errors** and `Category` field to **PNC** on the input screen ([Screen 6-14](#)) and press Enter to display any cause codes (see [Table 6-11](#)) returned from the ATM network to a TN2305/TN2306 circuit pack on the PPN (and to a TN2305/TN2306 circuit pack on an EPN). This is successful only if the links between the PPN and the EPN remain up so that the message from the EPN is logged.

See the ATM-EI maintenance object in one of the following books:

- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8r

```

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 ):  /
    
```

Screen 6-14. Error report

[Screen 6-15](#) shows the screen output for the **display errors** command.

```

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
    
```

Screen 6-15. Hardware error report—screen 9

In this example the errors that have ATM-NTWK for Name field and 1 for Aux Data field indicate an error returned to the TN2305/TN2306 circuit pack from the ATM network. In this case, the Err Type field shows the cause code returned by the ATM network (see [Table 6-11](#)). 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 6-11. Observed Cause Codes

Cause Code	Definition	Observed Cause
3	No route to destination	The ATM addresses administered in the ATM switch or in DEFINITY ( <b>display atm pnc</b> ) 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	DEFINITY call volume is too high for the available resources in the ATM network.
63	Service or option unavailable, unspecified	DEFINITY 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 ATM switch PPN port and ATM switch port and between the EPN port and ATM switch port 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 TN2305/TN2306 when it comes up, independent of DEFINITY Call Processing.

Other UBR virtual circuits may exist between ATM switch ports that are not associated with DEFINITY 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 PPN to the EPN?

#### Diagnostics.

- Do you get a dial tone on a set on the port network in question?
- Can you ring a set on the EPN dialing from the PPN 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 ATM switch PPN port and ATM switch EPN port are used for talk paths between port networks (PPN to EPN, EPN to PPN, or EPN to EPN).
  - 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 DEFINITY 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 DEFINITY 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 DEFINITY ECS/ATM switch combination are particularly difficult to diagnose. One example might be that you cannot make a completely successful call even though most indications from DEFINITY ECS 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 EPN route or end system identifier \(ATM switch\)](#)
- [Swapped routes, end system identifiers, or fiber between a PPN and an EPN](#)
- [Swapped routes, end system identifiers, or fiber between A- and B-side TN2305/TN2306s on EPN](#)
- [Swapped routes, end system identifiers, or fiber between two EPNs](#)

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

### Symptoms

Talk paths are one-way, from the PPN to the EPN: you can hear tones from the PPN end station to the EPN end station but not vice versa. Because the signaling channels are bidirectional virtual circuits (VCs) established from the PPN to the EPN, 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 PPN to the EPN (which is routed correctly) and one VC from the EPN to the PPN (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 a PPN and an EPN

### Symptoms

- An incorrectly connected EPN TN2305/TN2306 circuit pack is not completely inserted.
- Dial tone is present on end stations on the PPN and on correctly connected EPNs, but no dial tone is present on the affected EPN end stations.
- Calls cannot be made between the PPN and the correctly connected EPNs 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 EPN (but actually connected logically or physically to the PPN) that should not exist.

### Action

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

## Swapped routes, end system identifiers, or fiber between two EPNs

### Symptoms

- All TN2305/TN2306 circuit packs are completely inserted.
- The PPN cold starts both incorrectly connected EPNs as usual.
- Both EPNs log many `WRONG BOARD INSERTED` errors (**list configuration all** or **display circuit-packs carrier**), providing the EPNs 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 EPNs. Otherwise, end stations on the PPN have dial tone, while end stations on the EPNs 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 EPNs.

## Swapped routes, end system identifiers, or fiber between A- and B-side TN2305/TN2306s on EPN

### Symptoms

- The PPN establishes links to what it thinks is the active TN2305/TN2306 circuit pack on the EPN.
- As normal, it reboots this TN2305/TN2306 circuit pack, and when complete, it resets the EPN. When this happens, the active (instead of the standby) TN2305/TN2306 circuit pack reboots, dropping the links.
- To recover, the PPN re-establishes links to what it thinks is the active TN2305/TN2306 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 EPN.

## DEFINITY ECS 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 (**change system-parameters customer-options**), 2 commands become 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. [Screen 6-16](#) shows the output for the command.

```
change atm pnc-pairs
```

```
PNC MEASUREMENTS PAIRS
```

Pair	Orig	Dest
	PN	PN
1	<u>1</u>	<u>5</u>
2	<u>1</u>	<u>8</u>
3	<u>5</u>	<u>8</u>
4	<u>5</u>	<u>7</u>
5	<u>4</u>	<u>2</u>
6	<u>10</u>	<u>11</u>
7	<u>10</u>	<u>12</u>
8	<u>10</u>	<u>1</u>
9	<u>1</u>	<u>10</u>

Screen 6-16. PNC measurements pairs screen (change/display atm pnc-pairs)

## Field descriptions

Pair	Identifies the port network pair number (read only).
Orig PN	These entries identify the originating port network and the destination port network for the measured SVCs (values are between 1 and 44; default is blank).
Dest PN	

## 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.

[Screen 6-17](#) shows the output for this command.

```
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
```

Screen 6-17. ATM-PNC latency measurements

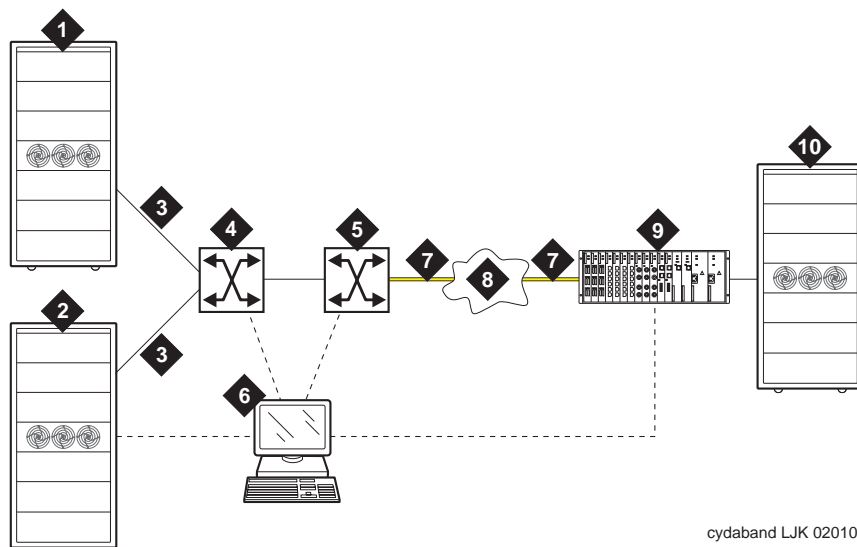
### Field descriptions

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 a DEFINITY ATM-PNC configuration, when used with the Lucent access concentrators or other ATM switches interfacing to bandwidth-constricted or congested facilities, can incur contention for bandwidth, resulting in failed call completions. [Figure 6-4](#) represents a DEFINITY

ATM-PNC configuration in which Inverse Multiplexing for ATM (IMA) is used going into and coming out of the network cloud.



cydaband LJK 020100

### Figure Notes

- |  |                                 |
|--|---------------------------------|
| 1. DEFINITY ECS PPN                          | 6. DEFINITY ECS access terminal |
| 2. DEFINITY ECS Expansion Port Network (EPN) | 7. IMA connection               |
| 3. OC-3/STM-1 connection                     | 8. ATM network                  |
| 4. ATM switch A                              | 9. Access concentrator          |
| 5. ATM switch B                              | 10. DEFINITY ECS EPN            |

Figure 6-4. Bandwidth-constricted ATM network configuration

In this configuration connections from the DEFINITY ECS switch and the ATM backbone switch and to the ATM access concentrator are OC-3/STM-1 through the TN2305/TN2306 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 DEFINITY 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 DEFINITY ECS switch 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 one of the following books for an example of a Hardware Error Report with an ATM-NTWK alarm:

- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8r
- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8si
- DEFINITY Enterprise Communications Server Release 8 Maintenance for R8csi

## 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 [Screen 6-18](#).

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

					Page 1	SPE A
Switch Name:				Date: 10:27 am TUE OCT 25, 1999		
				ATM PNC LATENCY HISTOGRAM		
Setup Count:	770	Average Latency (msec):	53	Failure Count:	3	
AddParty Count:	538	Average Latency (msec):	92	Failure Count:	1	
Total Count:	1308	Average Latency (msec):	71	Failure Count:	4	

Range (msec)	Setup	AddParty	Total	Range (sec)	Setup	AddParty	Total
0-9	0	0	0	1-1.9	1	0	1
10-19	200	2	202	2-2.9	0	0	0
20-49	400	3	403	3-3.9	0	0	0
50-99	100	1	101	4-4.9	6	1	7
100-149	50	6	56	5-5.9	0	0	0
150-199	10	0	10	6-6.9	0	0	0
200-249	3	0	3	7-7.9	0	0	0
250-299	0	0	0	8-8.9	0	0	0
300-399	0	0	0	9-9.9	0	0	0
400-499	0	0	0	10 +	0	0	0
500-999	0	0	0				

Screen 6-18. ATM-PNC latency histogram report

**Field descriptions:**

Setup Count :	The number of SVCs setup during the time period indicated. Values: 0 - 9999999
AddParty Count :	The number of ADDPARTY requests processed. Values: 0 - 9999999
Total Count :	The total number of SETUP and ADDPARTY requests. Values: 0 - 9999999
Average Latency :	Average latency in milliseconds for SVC type described during the time period indicated. Values: 0 - 8000
Failure Count :	The number of SVCs of the type described that could not be established by the ATM network during the time period. This does not include delayed SVCs; that is, the delay exceeded the threshold set for <code>Timeout (msec)</code> on the ATM-Related System Parameters form. Values: 0 - 9999. The number "9999" displays if the value is greater than 9999.
(msec) Count :	The number of delayed SVCs that fell within the time range (milliseconds) during the time period indicated. Values: 0 - 9999999
(sec) Count :	The number of delayed SVCs that fell within the time range (seconds) during the time period indicated. Values: 0 - 9999999

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 6-12](#)).

**Table 6-12. Constricted bandwidth administration procedure**

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

The report from the **list measurement atm setup-events** command looks like [Screen 6-19](#)

```
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    1765         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    1005         3          1        A-PNC
12/12/1999 14:28:12  failed    1005         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    1011        11         4        B-PNC
12/12/1999 14:26:32  delayed   1246         3          7        A-PNC
```

**Screen 6-19. ATM-PNC delayed/failed setups report**

**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 6-13](#) to administer ATM Constricted Bandwidth.

**Table 6-13. Constricted bandwidth administration procedure**

√	Step	Action	Description
	1.	Turn feature on	Turn the feature on by changing the <code>Async Transfer Mode (ATM)?</code> field on the customer options form ( <b>change system-parameters customer-options</b> ) to <code>y</code> ( <a href="#">Screen 6-20</a> ). This requires a Lucent Services login.
	2.	Set thresholds	Set the impairment thresholds in 4 fields on the ATM-Related System Parameters form ( <b>change system-parameters atm</b> ) shown in <a href="#">Screen 6-21</a> : <ul style="list-style-type: none"> <li>■ Activation (%)</li> <li>■ Deactivation (%)</li> <li>■ Timeout (msec)</li> <li>■ Deny Calls Using Impaired Paths?</li> </ul> Press Enter to effect the changes.

*Continued on next page*

Table 6-13. Constricted bandwidth administration procedure — *Continued*

√	Step	Action	Description
	3.	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"> <li>■ Use the <b>set options</b> and press Enter to change the Off-board ATM Network Alarms field on the Alarm Reporting Options form (<a href="#">Screen 6-22</a>).</li> </ul>

### Constricted bandwidth administration screens

Page 2 of 6

change system-parameters customer-options

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

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

### Screen 6-20. Optional features—screen 2



```
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
```

## Screen 6-21. ATM-related system parameters

### 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 <b>y</b> , then calls that require a new SVC on an impaired path on the active PNC are not completed. If the option is <b>n</b> , 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.

set options

Page 1 of 2

ALARM REPORTING OPTIONS

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
<b>Off-board ATM Network Alarms:</b>	<b>w</b>	<b>w</b>

Screen 6-22. Alarm reporting options—screen 1

## 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](#)
- [DEFINITY ECS Administration Worksheet](#)

### **ATM Switch Administration**

---

Refer to your Lucent ATM switch's quick reference guide.

## Interconnections

Record the interconnection of fiber optic cabling on the LIU form ([Figure A-1](#)). Record the DEFINITY port network number below the ATM switch port in [Table A-1](#).

### Lightwave Interface Unit (LIU)

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Figure A-1. Sample lightwave interface unit (LIU)

## DEFINITY ECS Administration Worksheet

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Use the sample worksheet in this section to baseline the customer's ATM configuration for standard and high reliability systems (see [Table A-1](#)). Make copies as needed.



**NOTE:**

Be sure to leave this worksheet or a copy of it on site.





**A** Baselining the Customer's Configuration  
*DEFINITY ECS Administration Worksheet*

*A-6*



# ATM Switch Feature Interactions

# B

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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](#)
- [Features Supported](#)
- [Features Not Supported](#)
- [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 B-1](#)) are affected by location within the ATM application.

**Table B-1. Switch operability interactions**

<b>Operation</b>	<b>Description</b>
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	<p>Trunk seizure happens after an outgoing call is submitted to an outgoing trunk port, followed by address outputting. Seizure and address outputting 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.</p> <p>Connection setup times of as much as 1-2 s can be covered by seizure/outputting, but longer setup times require postponing seizure until the inter-PN connection is established.</p>
Recorded announcements	<p>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.</p> <p>The barge-in announcements, which the caller joins in progress, do not require this delay.</p>

## Feature performance

DEFINITY ECS switch features are affected by location ([Table B-2](#)).

**Table B-2. DEFINITY 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 " <a href="#">Time of Day considerations</a> " for more information.	<ul style="list-style-type: none"> <li>■ Time/date display and wakeup or do-not-disturb times displayed in local time.</li> <li>■ Attendant service from a local attendant on local time.</li> <li>■ 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.</li> <li>■ 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.</li> </ul>	<p>These added locations help solve:</p> <ul style="list-style-type: none"> <li>■ Different public network dial plans for different locations affecting                             <ul style="list-style-type: none"> <li>— 911 calls</li> <li>— home or foreign number plan area (US only)</li> <li>— international dialing or country codes</li> </ul> </li> <li>■ Different time zones on                             <ul style="list-style-type: none"> <li>— user displays</li> <li>— CDR records</li> <li>— time-of-day routing</li> </ul> </li> </ul>
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.	<p>Multiple-location routing capacities = 4000 (Release 7r or later)</p> <p>A set of local routing options also are required for each location for</p> <ul style="list-style-type: none"> <li>■ 911</li> <li>■ other service numbers</li> <li>■ local operator access</li> <li>■ local calls in general.</li> </ul>

*Continued on next page*

**Table B-2. DEFINITY operations affected by location — Continued**

Operation	Description	User interface	Performance
ARS Digit Conversion	<ul style="list-style-type: none"> <li>■ 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> <li>■ Call Redirection                      Uses the location and partition group of the forwarded or covered party, not those of the caller.</li> </ul>	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.

*Continued on next page*

**Table B-2. DEFINITY operations affected by location — Continued**

Operation	Description	User interface	Performance
Dial Plan	Users on port networks located in different North American Number Plan Areas (NPAs) 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.		Carefully consider AAR and ARS routing parameters in ATM configurations.
System clock	Time displays and stamps in all other locations automatically change according to the administered Daylight Savings Time rules.	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.	With one administration change at the PPN, all remote locations display and timestamp in locally adjusted Daylight Savings Time.

## Time of Day considerations

[Table B-3](#) 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 B-3. 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"> <li>■ Automatic changes are set in software to occur at 2 AM, for example.</li> <li>■ Manual changes are still possible</li> </ul>
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.
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.

## Features Supported

Release 7 and later supports the ATM-CES trunking features listed in [Table B-4](#) with noted feature interactions. Other features are not listed because they have nothing to do with trunking.

**Table B-4. 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.
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. <sup>1</sup>
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 do not 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 after the call is connected.
Extended Trunk Access (ETA)	Routes a call to a trunk

*Continued on next page*

Table B-4. Release 7 and later ATM-CES trunking features supported — *Continued*

Feature	Description
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 by DEFINITY ATM.
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.
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 not 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

*Continued on next page*



Table B-4. Release 7 and later ATM-CES trunking features supported — *Continued*

Feature	Description
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.
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.

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

## **Features Not Supported**

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None of the features listed below are supported in DEFINITY ECS ATM CES trunks in Release 7 or later.

- 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 B-5](#).

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 B-5.** 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.
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 DEFINITY ECS continues to collect (receive) the remaining incoming digits.

*Continued on next page*

**Table B-5. ATM delay interactions — Continued**

Feature	Description
AAR and ARS Partitioning	Manages geographically dispersed EPNs.
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 EPN.
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.
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.

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Table B-5. ATM delay interactions — *Continued*

Feature	Description
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.
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.

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Table B-5. ATM delay interactions — *Continued*

Feature	Description
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.
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.

*Continued on next page*

Table B-5. ATM delay interactions — *Continued*

Feature	Description
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"> <li>■ DCS Attendant Control of Trunk Group Access</li> <li>■ DCS Attendant Direct Trunk Group Selection</li> <li>■ DCS Attendant Display</li> <li>■ DCS Automatic Callback</li> <li>■ DCS Automatic Circuit Assurance</li> <li>■ DCS Busy Verification of Terminals and Trunks</li> <li>■ DCS Call Coverage</li> <li>■ DCS Call Forwarding</li> <li>■ DCS Call Waiting</li> <li>■ DCS Distinctive Ringing</li> <li>■ DCS Leave Word Calling</li> <li>■ DCS Multiappearance Conference/Transfer</li> <li>■ DCS Over ISDN-PRI D-channel</li> <li>■ DCS Trunk Group Busy/Warning Indication</li> </ul>
Do Not Disturb	<p>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.</p>
Emergency Access to the Attendant	<p>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.</p>
Expert Agent Selection	<p>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.</p>
Facility Test Calls	<p>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.</p>
Generalized Route Selection	<p>Provides voice and data call-routing capabilities. This may be used for routing to EPNs when knowledge of the WAN behavior is available.</p>
Go to Cover	<p>Allows users who call another internal extension to send the call directly to coverage. This feature is affected by SVC setup delays and failures.</p>

*Continued on next page*

Table B-5. ATM delay interactions — *Continued*

Feature	Description
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 DEFINITY features 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.
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.

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Table B-5. ATM delay interactions — *Continued*

Feature	Description
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.
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"> <li>■ QSIG Call Forwarding (Diversion)</li> <li>■ QSIG Call Transfer</li> <li>■ QSIG Name and Number Identification</li> <li>■ QSIG Path Replacement (ANF-PR)</li> <li>■ QSIG Transit Counter (ANF-TC)</li> </ul>
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.

*Continued on next page*

**Table B-5.** 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.
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.

*Continued on next page*

Table B-5. ATM delay interactions — *Continued*

Feature	Description
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 Lucent Technologies 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 DEFINITY ECS to identify and handle different types of call-progress tones. Affected by delays and failures if the call needs to go to another EPN 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 EPN 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 B-6](#).

Table B-6. 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 Partitioning	X <sup>1</sup>		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"> <li>■ simplify AAR/ARS administration</li> <li>■ permit ARS caller-location analysis</li> </ul>
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.

*Continued on next page*

**B** ATM Switch Feature Interactions  
ATM Feature Interactions

B-21

**Table B-6.** 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.
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.	

*Continued on next page*

Table B-6. 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"> <li>■ Combine existing switches</li> <li>■ Add DID trunks and number ranges in different locations.</li> </ul>	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.	
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.

*Continued on next page*

Table B-6. Release 7 or later ATM feature interactions — *Continued*

Feature	Affected by		Description	Remedy
	Location	Race Condition		
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.
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 EPN (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.	
Ten-Digit to Seven-Digit Conversion	X		Supports 10-to-7 digit conversion by providing location-dependent routing and location-dependent home-NPA definition.	

**Table B-6. Release 7 or later ATM feature interactions — Continued**

Feature	Affected by		Description	Remedy
	Location	Race Condition		
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	

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 B-7. Cross-product compatibility with DEFINITY ATM**

Lucent Product	Description
<b>AUDIX</b>	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.
<b>Conversant</b>	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.



# Glossary and Abbreviations

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## Numerics

### 800 service

A service in the United States that allows incoming calls from certain areas to an assigned number for a flat-rate charge based on usage

---

### AAR

Automatic Alternate Routing—digit analysis performed in support of the private network numbering plan(s).

### AC

Access Concentrator

### ACD

Automatic Call Distribution

### AFI

Address Format Identifier

### AIS

Alarm Indication (or Inhibit) Signal—inserted when a network element receives a “bad” signal, and forwarded downstream to tell the receivers what happened.

### ARS

Automatic Route Selection—digit analysis performed in support of the public network numbering plan(s)

### ATM

Asynchronous Transfer Mode

### ATM network duplication

ATM network duplication is an ATM-PNC configuration that allows DEFINITY ECS's without duplicated SPEs to be supported with duplicated EPN connectivity to other points on an ATM network. These points can be on separate ATM switches, the same ATM switch, or directly connected to an ATM-WAN. There is no difference in performance between ATM network duplication and critical reliability.

---

## C

### CBR

Constant bit rate—Digital information, such as video and digitized voice, that is represented by a continuous stream of bits. CBR traffic requires guaranteed throughput rates and service levels.

### CES

Circuit Emulation Service—a connection over an ATM PVC-based network that provides end-to-end service, sometimes called virtual trunking. Conforms to CES ATM Forum VTOA-78 Interoperability Specifications (CES-IS).

### CDV

Cell delay variation, which measures the allowable variance in delay between one cell and the next, expressed in fractions of a second. When emulating a circuit, CDV measurements allow the network to determine if cells are arriving too fast or too slow.

### CMC

Compact Modular Cabinet

### CSCC

Compact Single Carrier Cabinet

### CSS

Center Stage Switch—the central interface between the processor port network (PPN) and the expansion port networks (EPN).

### CSU

Channel service unit

---

## D

### DCS

Distributed Communication System

### DS1

Digital Signal, Level 1—The 1.544 Mbps digital signal format defined for operation in the international digital hierarchy.

### DSU

Data service unit

### DTE

Data terminal equipment

---

## E

### EI

Expansion interface

### EPN

Expansion port network

## ESCC

Enhanced single-carrier cabinet

## ESI

End System Identifier

---

# E

## FNPA

Foreign Number Plan Area—in the North American Numbering Plan, any area code other than the caller's own area code. An FNPA ARS call specifies a 10-digit address (optionally preceded by a '1' toll prefix), the first three digits of which specify the area code, or number plan area. In some locations (typically where area codes are overlaid), it is necessary to dial the NPA even for a local call.

---

# H

## HNPA

Home Number Plan Area—in the North American Numbering Plan, the caller's own area code. An HNPA ARS call is usually a 7-digit call (perhaps preceded by a '1' toll prefix) for which the local area code is implied. In some locations, HNPAs are overlaid (2 or more used in the same location), requiring 10-digit dialing; in effect, there is no HNPA for such locations.

## HO-DSP

High-Order Domain Specific Part

---

# I

## ICSU

Integrated Channel Service Unit

## ILMI

Integrated Layer Management Interface

## INS

Lucent's Data Network Systems

## ISDN

Integrated Services Digital Network

---

# L

## LAN

Local area network

## LAPD

Link Access Protocol D-channel

## LIU

Lightwave Interface Unit

## LOS

Loss of signal

---

## M

### MAC

Media Access Control

### MCC

Multicarrier cabinet

### MDF

Main distribution frame

### Meiners' algorithm

The Meiners' algorithm is a method to determine whether a switch can support a proposed set of port networks in a proposed switch. This algorithm is available to Lucent engineers as a calculator within a Microsoft Excel spreadsheet, accessible at <http://info.dr.lucent.com/~meiners/atm.html>.

---

## N

### NANP

North American Numbering Plan—the numbering plan used in the U.S., Canada, and the Caribbean, in which a number consists of a 3-digit area code plus a 7-digit "local" number (itself divided into a 3-digit office code and a 4-digit number).

### NPA

Number Plan Area—the area identified by the area code of the North American Numbering Plan.

---

## O

### OC-3

SONET (Synchronous Optical Network) optical carrier level 3 (155.52 Mbit/s).

---

## P

### PCR

Peak cell rate

## PN

Port network

## PNC

Port Network Connectivity—an alternative to either the direct-connect or center stage switch configurations for connecting the processor port network (PPN) to one or more expansion port networks (EPNs).

## PPN

Processor port network

## PRI

ISDN primary rate interface

## PSTN

Public switched telephone network

## PVC

Permanent Virtual Circuit—a virtual circuit that provides the equivalent of a dedicated private line service over a packet switching network between two DTEs (the path between users is fixed). A PVC uses a fixed logical channel to maintain a permanent association between the DTEs. Once a PVC is defined, it requires no set-up operation before data is sent and no disconnect operation after data is sent. ATM-CES uses PVCs as the basis for the permanent connections, sometimes called virtual trunking.

---

## Q

### QoS

Quality of Service

---

## R

### RDI

Remote defect indication

---

## S

### SDH

Synchronous Digital Hierarchy—Used outside the United States, it's an ITU standard for transmission in synchronous optical networks.

### SONET

Synchronous Optical NETWORK—a family of optical transmission channels for speeds from about 45 Mbps to 2.4 Gbps and higher.

### STM-1

Similar to OC-3 but used outside the United States.

### Subnet Trunking

A feature permitting the manipulation of digits on outgoing AAR and ARS calls, based on the selected routing preference.

### SVC

Switched Virtual Connection—a virtual link established through an ATM network; the basic building block of port network interconnectivity. Two SVCs, one in each direction, are required for a bi-directional talk path between two port networks in ATM-PNC configurations.

---

## T

### TAC

Trunk access code

### TDM

Time-division multiplexing

### TTR

Touch-tone receiver

---

## U

### UID

Call redirection

---

## V

### VC

Virtual circuit

### VCI

Virtual channel identifier—a unique, numeric tag (16-bit field in cell header) that identifies every virtual channel across an ATM network

### VDN

Vector directory number

### Virtual Path Identifier (VPI)

The 8-bit field in the cell header that indicates the virtual path over which a cell is routed.

---

## W

### WAN

Wide-area network

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