# DEFINITY®
# Enterprise Communications Server
Release 9
Getting Started with the Avaya R300
Remote Office Communicator

555-233-769
Comcode 700169808
Issue 2
August 2001

**Printed in U.S.A.**

**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.

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**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

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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.

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**Acknowledgment**
This document was prepared by Product Documentation Development, Avaya, Denver, CO.

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# About this document

## Overview

This document describes the Avaya R300 Remote Office Communicator. This system is based on Lucent-Ascend's MAX 3000 and provides an effective way to maintain remote digital (DCP) and analog phones and trunks from a DEFINITY Enterprise Communication Server (ECS). This book covers Releases 1.0 and 1.1 of this product.

## Conventions used in this document

The following terms and conventions will help you use this book with your Avaya R300 system.

- To "move" to a certain field, you can use the TAB key, arrows, or the RETURN key.
- A "screen" is a screen form displayed on the terminal monitor.
- In this book we use the terms "phone" and "voice terminal" to refer to telephones.
- If you use terminal emulation software, you need to determine which keys correspond to ENTER, RETURN, CANCEL, HELP, NEXT PAGE, etc.
- Commands are printed in bold face as follows: **command**.
- Keys and buttons are printed as follows: KEY.
- Screen displays are printed in constant width as follows: `screen display`.
- Variables are printed in italics as follows: *variable*.
- We show complete commands in this book, but you can always use a truncated version of the command. For example, **list configuration station** can be entered as **list config sta**.

- We show commands and screens from the newest DEFINITY system and refer to the most current books. Please substitute the appropriate commands for your system and refer to the manuals you have available.
- If you need help constructing a command or completing a field entry, remember to use HELP.
- When you press HELP at any point on the command line, a list of available commands appears.
- When you press HELP with your cursor in a field on a screen, a list of valid entries for that field appears.
- The status line or message line can be found near the bottom of your monitor display. This is where the system displays messages for you. Check the message line to see how the system responds to your input. Write down the message if you need to call our helpline.
- When a procedure requires you to press ENTER to save your changes, the screen you were working on clears and the cursor returns to the command prompt. The message line shows `"command successfully completed"` to indicate that the system accepted your changes.

**NOTE:**
Draws attention to information that you must heed.

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

**WARNING:**
*Denotes possible harm to hardware or equipment.*

**SECURITY ALERT:**
*Indicates when system administration may leave your system open to toll fraud.*

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To access the latest version:

1. Access the Avaya web site at www.avaya.com.
2. Click **Get Support.**
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4. Click **Recent Documents**.
5. Scroll down to find the recent release of DEFINITY and click the link.
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## On-line documentation

You can obtain related technical documentation and R300 software from:

http//support.avaya.com/comsys/definity/r300

For related sales support documentation, go to:

http://associate2.avaya.com/sales_market/definity/r300.htm.

## How to get help

If you need additional help, the following services are available. You may need to purchase an extended service agreement to use some of these services. See your Avaya representative for more information.

| | |
|---|---|
| ■ DEFINITY Helpline (for help with feature administration and system applications) | +1-800-225-7585 |
| ■ Avaya Technical Service Center Support Line – US and Canada (for help with maintenance and repair) | +1-800-242-2121 |
| ■ Avaya Toll Fraud Intervention | +1-800-643-2353 |
| ■ Avaya Corporate Security | +1-800-822-9009 |
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# US Federal Communications Commission Statement

## FCC Part 68 Information

This equipment complies with Part 68 of the FCC rules. The Certification number of the Interface assembly and associated circuit pack is: AV1USA-43029-CN-T.

The REN for this equipment is 0.5A.

If requested, this information must be provided to the telephone company.

## Means of connection:

| *Mfr's Port I.D.* | *FIC* | *SOC/REN/A.S. Code* | *USOC* |
|---|---|---|---|
| *Loop-start central office (LSCO) trunk* | *02LS2* | *0.5A* | *8 pin mod. jack (see below)* |

## LSCO (02LS2) interface jacks

The R300 Interconnect unit has two 8-pin modular jacks for connection to two-wire analog loop-start central office lines of the R300 product. Pins 4 and 5 of the jacks are ring and tip, respectively. All other pins are not connected. Either an 8-conductor modular plug, or a 6-conductor RJ11 plug can be used to connect the R300 Interconnect unit. Pins 3 and 4 of a 6-conductor RJ11 plug line up with pins 4 and 5 of an 8-pin modular jack. See Figure 1.

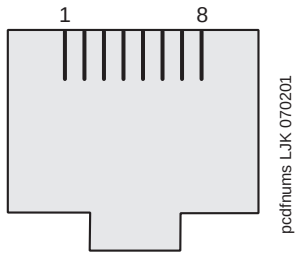



**Figure 1. 8-pin Modular jack**

**Table 1. Pin Connections for 8-pin Modular jack and 6 or 8-Conductor Modular Plugs**

| Interconnect Unit | From Network Connection Point | |
|---|---|---|
| **8-pin modular jack** | **8-conductor modular plug** | **6-conductor modular plug** |
| 1 | 1 | |
| 2 | 2 | 1 |
| 3 | 3 | 2 |
| 4 Ring | 4 Ring | 3 Ring |
| 5 Tip | 5 Tip | 4 Tip |
| 6 | 6 | 5 |
| 7 | 7 | 6 |
| 8 | 8 | |

This equipment is equipped with a FCC compliant jack and is designed to be connected to the telephone network or premises wiring using a compatible modular cord that is Part 68 compliant. See Installation Instructions for details.

The REN is used to determine the quantity of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. Typically, the sum of RENs should not exceed five (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.

If this equipment (Avaya R300 Remote Office) 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 isn't 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 to its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice so you can make the necessary modifications to maintain uninterrupted service.

If trouble is experienced with the Avaya R300 Remote Office, for repair or warranty information, please contact the Avaya 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.

This unit is to be repaired by authorized personnel only. There are no user serviceable parts.

Connection to party line service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information.)

## Part 68 Answer supervision signaling

Allowing this equipment to be operated in such a manner as to not provide for proper answer supervision is a violation of Part 68 of the FCC's rules.

Proper answer supervision is when:

a. This equipment returns answer supervision to the PSTN when DID calls are:
   - Answered by the called station
   - Answered by the attendant
   - Routed to a recorded announcement that can be administered by the CPE user.
   - Routed to a dial prompt

b. This equipment returns answer supervision on all DID calls forwarded to the PSTN. Permissible exceptions are:
   - A call is unanswered
   - A busy tone is received
   - A reorder tone is received.

This 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.

# Overview of the Avaya R300

# 1

## The DEFINITY system and Avaya R300

The Avaya R300 Remote Office Communicator supports the complete communication needs of a small office of 24 LAN data clients or digital and analog voice terminals. The Avaya R300 also supports IP routing through its integrated WAN interfaces (T1, E1, BRI, and serial V.35) to the DEFINITY system.

The DEFINITY system manages all call processing, call routing, and billing. The Avaya R300 Remote Office Communicator provides local access trunks (digital and analog), and the DEFINITY system manages these as IP signaling groups.

Based on Lucent-Ascend's MAX 3000, the Avaya R300 provides you with an effective way to connect Digital Communications Protocol (DCP) phones, analog phones, Fax machines, paging systems, and trunks at a remote site to a DEFINITY Enterprise Communication Server (ECS). The Avaya R300 provides full DEFINITY functionality and features to the remote site either through a WAN or LAN using the IP protocol.

Because the Avaya R300 is based on Lucent-Ascend's MAX 3000, you may see references to Lucent-Ascend's MAX documentation. You can find documentation of Lucent-Ascend's MAX 3000 on the DEFINITY Systems Library CD shipped with the Avaya R300.


**Figure 2. Avaya R300 Remote Office Communicator and Interconnect module**

# DEFINITY Remote Office overview

## DEFINITY Network

The “main” DEFINITY cabinet may be a G3, DEFINITY One, or an Avaya IP-600. The DEFINITY cabinet may either be a PPN (Processor Port Network) or an EPN (Expansion Port Network). The DEFINITY software must contain Release 9 or newer release software.

The Avaya R300 remote office requires two hardware boards in the DEFINITY system: the C-LAN (TN799C) and the IP Media Processor (TN2302AP). The C-LAN board conveys signaling and control streams over to remote station endpoints and to remote trunks that are supported on the Avaya R300. The IP Media Processor card serves as the voice bearer gateway and audio conference bridge for transporting TDM-based traffic from the DEFINITY backplane (supporting traditional line and trunk cards) out to the IP-based wide area network and on toward the Remote Office.The C-LAN and the IP Media Processor must be in the same network region (as DEFINITY defines an IP networking region). Figure 3 below shows the network topology for a DEFINITY ECS main system with two subtending remote office configurations.

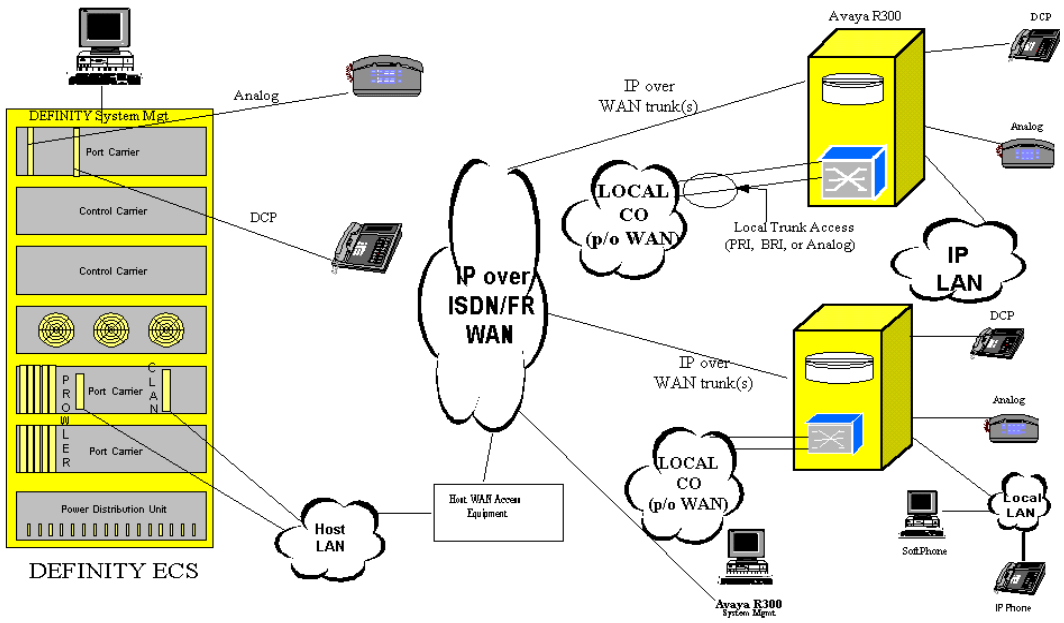



**Figure 3. DEFINITY Remote Office Network Topology**

The network connection to the C-LAN card is a 10 BaseT (half-duplex) Ethernet connection. The network connection to the IP Media Processor is a 10/100 BaseT (full-duplex) Ethernet connection. The Ethernet output from these two cards connects to the host LAN, which is a subnetwork consisting of data switches and/or hubs and interior routers.

Host WAN access equipment directs the control and bearer IP traffic streams from the host LAN network to the WAN. Host WAN access equipment typically would consist of the following components:

- A router to serve as the IP gateway from the enterprise premises out to the IP-based WAN.
- An access concentrator to multiplex the LAN and TDM-based enterprise traffic streams into an aggregated stream to present to the wide area network.
- A Virtual Private Network (VPN) service for providing enhanced security, particularly for data services (optional).
- A Frame Relay Access Device (FRAD) to wrap the traffic into a frame format suitable for transport over an enterprise network based upon frame relay PVC service (optional).

This WAN access equipment may be one or more separate products, and you can get them from varied vendors. However, the industry trend is for increased consolidation of this equipment.

The central wide area network services (shown as a cloud in the center of Figure 3 on page 3) can be an enterprise network, a PSTN switched network or a combination of the two. The technologies of the WAN may be a variety of services including frame relay, ATM, ISDN or digital T-carrier. In all cases, this DEFINITY Remote Office application will provide both the signaling and voice bearer traffic in IP -based protocol frames that are transported over the underlying physical frame formats.

## The Avaya R300 network

At the far side of the WAN is the Avaya R300. You can have multiple Avaya R300 devices subtending a main DEFINITY system via the WAN.

The Avaya R300 supports:

- Up to 24 DCP digital two-wire sets: 6400-series, 8400-series, or 9031DCP Transtalk model (wireless base station).
- Two analog phones (6200-series or 2500-series) or analog fax machines, or one of these and a paging system.
- Local switching between the analog and DCP phones out through local central office trunks. These local trunks (local to the remote site) may be either digital through T1/E1/BRI WAN access trunks or, in North America, through 600 ohm analog trunks.

In addition to the voice telephony features that it provides for your remote office, the Avaya R300 provides integration of data and a conversion of voice and data applications, all in one product.

Specifically, the Avaya R300 provides:

- WAN access via E1, T1, BRI (BRI-S/T 4-wire), and serial WAN.
- An Ethernet 10/100BaseT interface to provide IP routed connectivity to the local LAN in the Remote Office. (This interface is a dual-routed port.)
- An IP router that is capable of supporting both interior and exterior gateway routing protocols (RIP V2 and OSPF).
- A Voice over IP (VoIP) gateway to convert TDM-based audio streams (from DCP and analog phone sets or incoming digital and analog trunks) into IP-based streams for transport to/from the main DEFINITY site, or other IP-connected DEFINITY remote sites and/or IP phones and IP softphones.
- Support for CODECs including G.711 (A-law and μ-law), and G.729. See ‘‘Network region design’’ on page 39 for more details.

This digital WAN interface is based on three product models:

- MX30-2T1-DRM which contains two T1 interfaces (available in North American and Japanese models).
- MX30-2E1-DRM which contains two E1 interfaces.
- MX30-6ST-DRM which contains six BRI 4-wire S/T interfaces.

**NOTE:**
The T1/E1 WAN interfaces are capable of supporting robbed bit service, ISDN Primary Rate service (both in full T1/E1 and FT1/FE1 modes), and frame relay service. The North American T1 interface is capable of supporting up to twenty-three 64 Kbps channels for PRI and twenty-four channels for robbed bit signaling. The International E1 interface is capable of supporting up to thirty 64 Kbps bearer channels.

**NOTE:**
The ISDN Basic Rate interface is capable of supporting two 64 Kbps channels.

## Ordering Information

- Avaya R300 North America 2-T1 Model: Pec code 63650.
- Avaya R300 Japan 2-T1 Model: Pec code 63657.
- Avaya R300 Global 2-E1 Model: Pec code 63651.
- Avaya R300 Global 6-BRI ST Model: Pec code 63653.

All models include:

- Avaya R300 Interconnect module
- R300 Interconnect cable (Y-cable)
- 50-pin connector gender changer
- Serial RS232 cable
- AC power cord (varies with country)
- 120 ohm to 75 ohm conversion kit (E1 model only)

## DEFINITY call processing for the Avaya R300 stations & trunks

The main DEFINITY switch manages the trunk facilities within the Avaya R300. The Avaya R300 operates as:

- a line-side gateway to represent the 24 digital and 2 analog stations to DEFINITY as IP phones.

  It translates the TDM-based digital and analog telephone stations and presents them to DEFINITY as if they were “native” H.323 IP phones. Note that for the Avaya R300, the DEFINITY system maintains lamp displays and button control exactly in accordance with existing DEFINITY CCMS messages. The DEFINITY system sends these messages over TCP/IP connections to the Avaya R300.

- a trunk-side gateway to represent the PSTN wide area network (WAN) digital (T1, E1, or BRI depending on the product model) and analog services to DEFINITY as IP trunks.

The DEFINITY switch manages the trunks through H.323 protocol instructions via the C-LAN module. DEFINITY call processing sends H.323 signaling messages to establish, release, and send information over to the PSTN network. This is a virtual interface in that the DEFINITY system manages these resources as if they were B-channels on a DEFINITY DS1 interface card. To identify these virtual trunks to the DEFINITY system, administer the signaling group form and the trunk group form.

The actual direct control of these virtual trunks is provided by the R300. The R300 conducts that state machine instantiations for:

- T1 Robbed Bit signaling
- T1 ISDN PRI signaling
- E1 ISDN PRI signaling
- E1 R2 and R2MFC signaling
- BRI ISDN signaling

For outbound calls, the R300 terminates the H.323 IP signaling messages that come from the DEFINITY system and re-generates the communication signaling message out toward the PSTN network per the appropriate signaling facility on the given PSTN network trunk. For inbound calls, the R300 terminates the incoming signaling message from the PSTN and re-generates the signaling message as an H.323 uplink IP signaling message to the DEFINITY system.

The R300 "pools" all of the available channels (for example from both T1 interfaces) and assigns channels starting with channel one of the first physical WAN interface. It continues to use channels sequentially through that first WAN interface link. When these are fully utilized, and if the R300 administration has set up a second trunk interface, the R300 will continue to assign channels until there are no further channels. At that point, the R300 will deny call attempts from both the DEFINITY switch on the "IP side" and from the public network on the "PSTN side".

The R300 is responsible for communicating normal error and call clearing messages across the respective signaling channel for the given PSTN interface such that the DEFINITY system is the "virtual" manager of that interface. The PSTN network has no knowledge that there is a PBX on the other side of the gateway. The DEFINITY switch has no precise knowledge of the PSTN network on the other side of the gateway.

The DEFINITY system will employ the shuffling feature to directly bind an IP endpoint (such as an R300 station) over to an IP trunk channel if the dial plan requires that both parties are to be engaged in a point-to-point call. Refer to the description of "Shuffling" and "Call Routing" for a full description of how this operation works.

Note that in the "Hop-on/Hop-off Gateway operation" description that the DEFINITY system is treating the connection to the trunk gateway as a virtual "tie trunk" to extend the capabilities of the main DEFINITY system over to the remote R300.

In effect, the Avaya R300 operates as a virtual “EPN” to the DEFINITY switch. Figure 4 shows how DEFINITY call processing views the resources within the Remote Office.

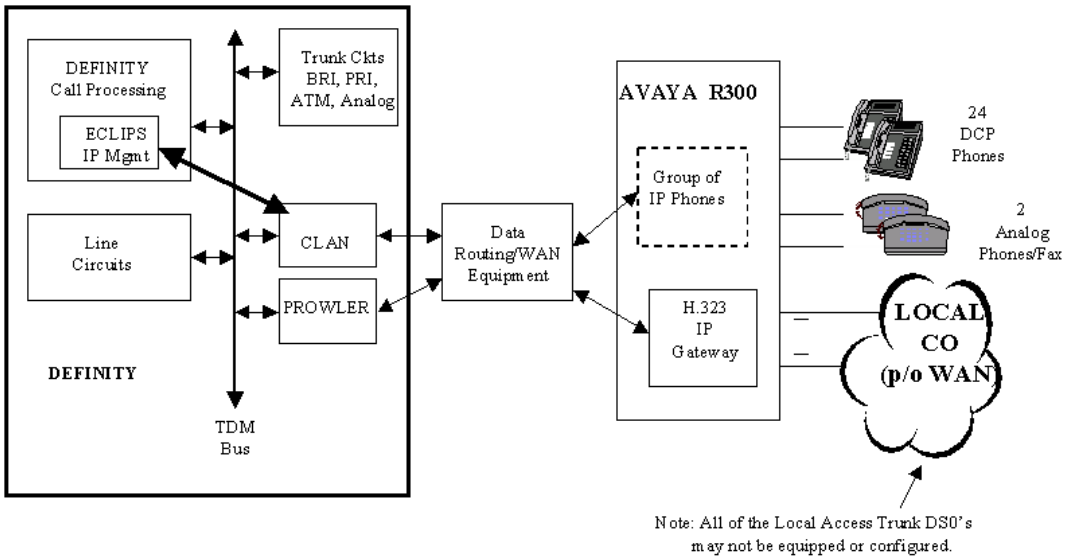



**Figure 4. DEFINITY Call Processing for Remote Stations and Trunks**

## Signal flow from the DEFINITY system to the remote office

During call processing, signaling messages travel from the Switch Processor Element (SPE), across the internal DEFINITY backplane bus, and to the C-LAN module. The C-LAN board wraps the signaling information in IP packets and sends them out to a local Ethernet switch subnet. Host-side WAN router equipment would forward these IP packets across the WAN over to the Avaya R300. The Router Engine in the Avaya R300 directs these wrapped signaling packets across the API to the Remote Angel (on the Combo Blade).

For a digital phone supported at the main DEFINITY system site, the bearer information travels from the digital line card onto the DEFINITY TDM backplane bus and then over to the IP Media Processor. The Media Processor performs the TDM to IP gateway conversion per the H.323V2 protocol.

The IP based bearer stream travels across the WAN to the Avaya R300. The Avaya R300 receives the IP stream and routes it to its internal VoIP gateway, where the IP Voice stream is converted back to TDM and passed to the Combo Blade. Then the Combo Blade transforms this into an I-channel of the DCP communication channel and sends it to the DCP digital station.

Figure 5 depicts the detailed signal stream flow of the control messages, voice bearer channels, and the system management flows between the main DEFINITY site and the Avaya R300.

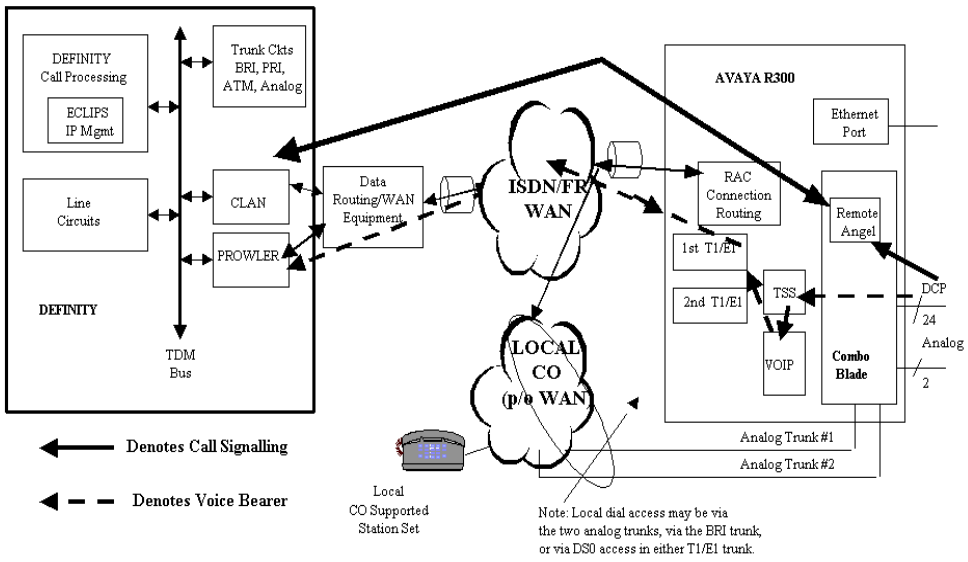



**Figure 5. Avaya R300 Serving as the WAN Access Concentrator**

## Avaya R300 connection topologies

You can connect the Avaya R300 to a WAN using two principle topologies:

- Direct connection from its WAN ports (T1/E1, BRI, analog trunk) to the WAN service provider
- Connection through your existing equipment that serves as the principle WAN service access point.

### Avaya R300 serving as the WAN access concentrator

The illustration in Figure 5 on page 8 depicts the topology which could be more commonly used in deployments of newly configured Remote Offices. This topology has the Avaya R300 serving as the principle point of WAN access via its WAN ports. The Avaya R300 has either T1, E1, or BRI ports and also has two analog trunk ports. The configuration of available port types will depend on the model of the Avaya R300 unit (2-T1 or 2-E1 or 6 BRI) and the configuration of network resources (i.e. what you actually subscribe to from your WAN service provider). You can configure T1 or E1 trunks in a fractional mode. You can also connect the Avaya R300's Ethernet port to a subtending local LAN, provided that the bandwidth capacity and QoS performance is sufficient.

### Avaya R300 subtending existing WAN access equipment

When the Avaya R300 is in this topology, you can configure it in one of two ways:

- Connect it via its Ethernet port over to the local IP LAN (see Figure 6 on page 10)
- Connect it via its Serial WAN port (V.35) over to the Serial input of a WAN router (see Figure 7 on page 10)

The Avaya R300 allows DEFINITY call routing to use local access trunks. You may directly connect these local access trunks to a WAN service provider network, or you can set the T1/E1 WAN trunks to subtend a drop-and-insert T1/E1 connection on the existing WAN access equipment.

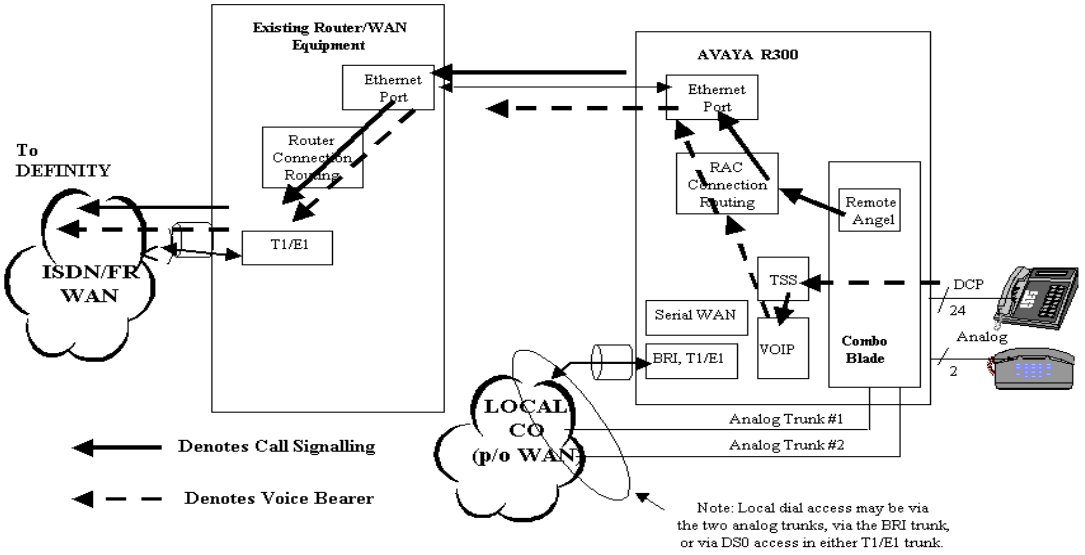



**Figure 6. Avaya R300 Co-existing with WAN Access Concentrator**

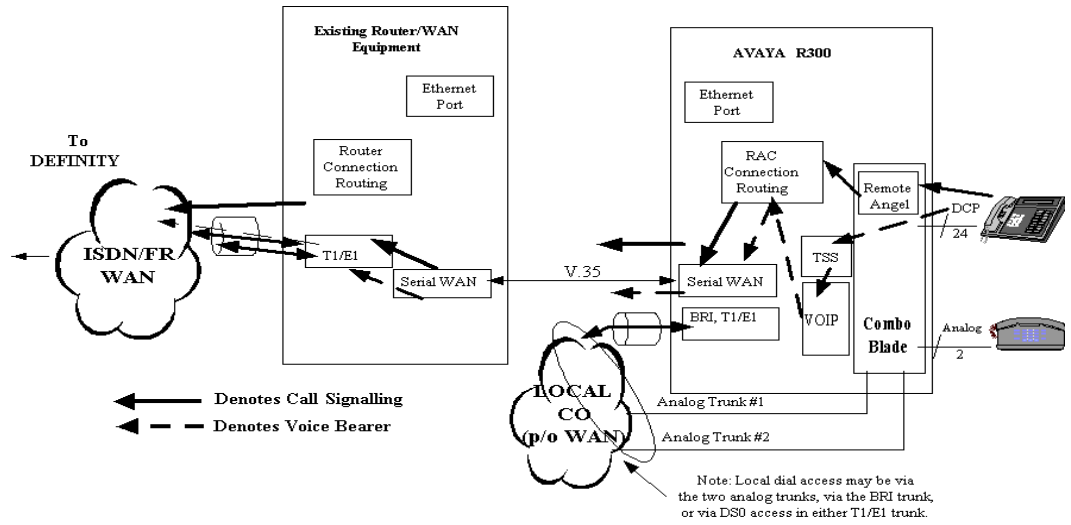



**Figure 7. Avaya R300 Subtending to Existing WAN Access Concentrator (Serial WAN Connected to Router)**

# Avaya R300 as an IP network-region “hop-on/hop-off” point

In addition to the common application of the Avaya R300 as a remote office for a set of DCP and analog stations, you can deploy it in support of a remote PSTN trunk gateway. This will allow you to connect, with a shuffled IP connection, DEFINITY managed IP endpoints (such as IP phones, IP softphones, or other endpoints from another Avaya R300) to the IP trunk or signaling group whose virtual trunk members represent one of the PSTN channels (i.e. The two analog trunks, or the digital trunks (T1, E1, or BRI)).

This can provide great cost-savings if, for example, your DEFINITY headquarters switch is located in one city, and the R300 and IP phones are in another city. IP calls will not have to connect back to the IP Media Processor board (at the main DEFINITY site) and incur added WAN toll charges. Instead, the Avaya R300 allows the IP Media Processor to shuffle the calls back to a local PSTN gateway, thereby simplifying the toll charges.

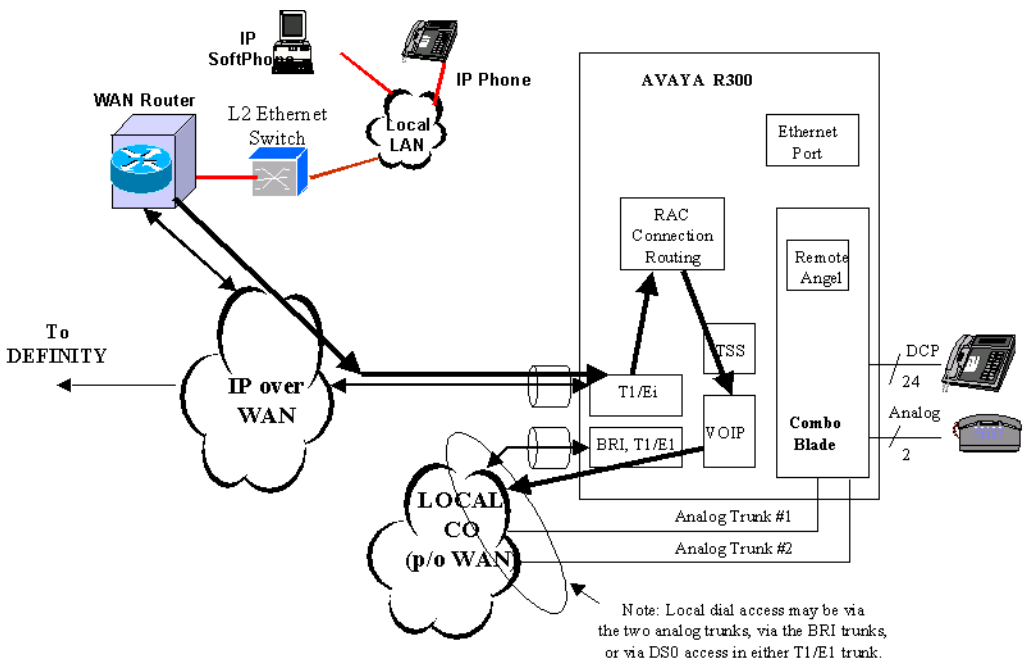



**Figure 8. Avaya R300 as an IP network-region “hop-on/hop-off” point**

## Avaya R300 with local LAN supported IP Softphones and telephones

The Avaya R300 Ethernet interface can connect to your LAN with both native IP-based data clients and native IP-based voice clients. PC resident IP Softphones (IP voice client application) and the Model 46xx IP telephones are available.

The IP-based voice and data clients will be connected in a subnet (See Figure 9 below). This subnet is provided by point-to-point serial Ethernet connections to a Layer 2 Ethernet switch. The uplink of this subnet is connected to the Ethernet port on the Avaya R300. It is important that voice-over-IP clients be connected to switched Ethernet hubs rather than to shared Ethernet hubs, so that all of the uni-cast Ethernet bandwidth from an individual voice or data client does not necessarily impact the LAN access of a second LAN client.

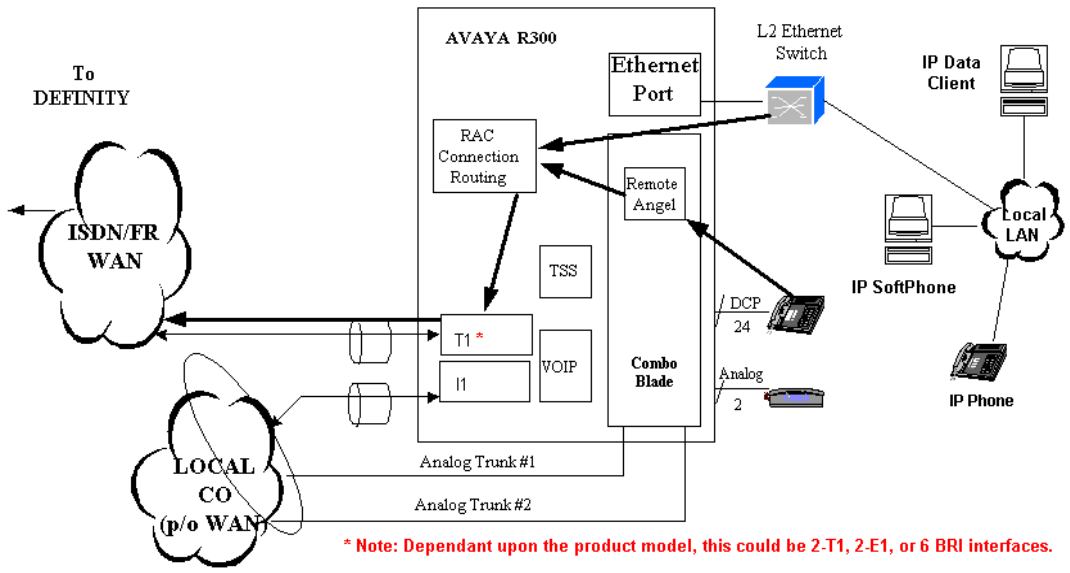



**Figure 9. Interface Between the Avaya R300 and IP-based Data and Voice Clients**

# Emergency transfer to the Remote Office

The Avaya R300 emergency transfer feature provides some limited telephone service in the case of disaster. The R300 supports two, 600 ohm analog loop-start trunks that contain relay contacts. These contacts operate during a disaster to directly cut-through (hardware connection) the tip and ring pair of R300 analog station #1 and connect it to the tip and ring pair of R300 analog trunk #1. Similarly, in this emergency mode, the tip and ring pair for analog station #2 is connected over to the tip and ring pair of R300 analog trunk #2.

As long as the customer has subscribed to active central office service for these two analog trunks, in this disaster recovery scenario they will have “central office dial tone” when they go off-hook and can enjoy incoming and outgoing calls per the service agreements for those two analog trunk lines. See Figure 10.

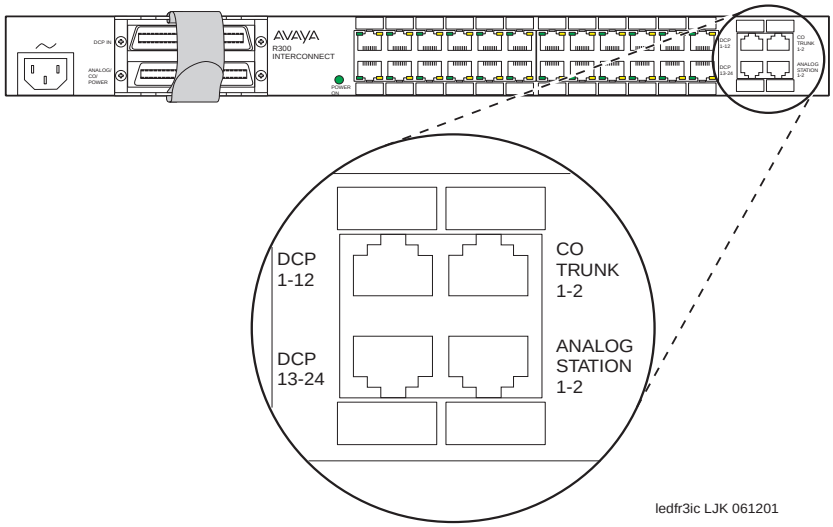



**Figure 10. Analog Station and Trunk Ports for Emergency Transfer**

**NOTE:**
DCP stations do not operate in this failure mode.

The emergency transfer relays operate in the following circumstances:

- Loss of power on the Avaya R300's Combo Blade
- Loss of H.323 registration message communication with the main DEFINITY switch.
  - — This may be due to a failure of the host switch.
  - — This may be due to a failure in the interconnecting IP network at either the host switch or the remote office.
  - — This may be due to a failure in the WAN service links.

The emergency transfer will initiate within 60 seconds of loss of connectivity.

## Avaya R300 with basic rate interface (BRI) support

New with Release 1.1, the product model MX30-6ST-DRM supports 6 Basic Rate Interface (BRI) ISDN WAN ports. With BRI, there are two 64 Kbps circuit switched B-channels, and one out-of-band D-channel which is used to carry call-processing information. This allows you to use this product model in network areas that offer significant cost savings for PSTN service.

Figure 11 illustrates that the R300 can use the BRI WAN interfaces for IP switched service connectivity over a BRI enterprise or public switched network. Alternatively, the BRI WAN interfaces may be used for the PSTN access trunks.

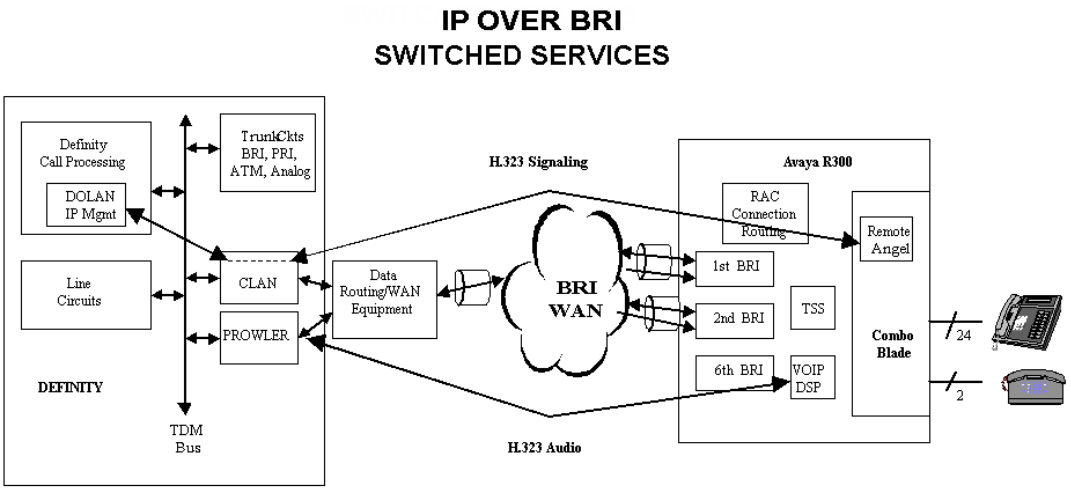



**Figure 11. IP Over BRI Switched Services**

Figure 12 illustrates how the Avaya R300 BRI-ST model can connect up to either an enterprise PBX or to a public network service provider. This application diagram shows the use of a terminating resistor (TR) adaptor, the 440A4, which is optional. When the T-interface requires this resistance unit to balance the cable plant between the receiver and the transmitter, then the TR adapter must be used. It may be built into a network termination (NT1) module. In this case, the user can configure the value of resistance with one of three options:

- 50 ohms for distances up to 250 feet (76 meters)
- 100 ohms for distances from 250 feet to 1800 feet (548 meters)
- High impedance for distances greater than 1800 feet

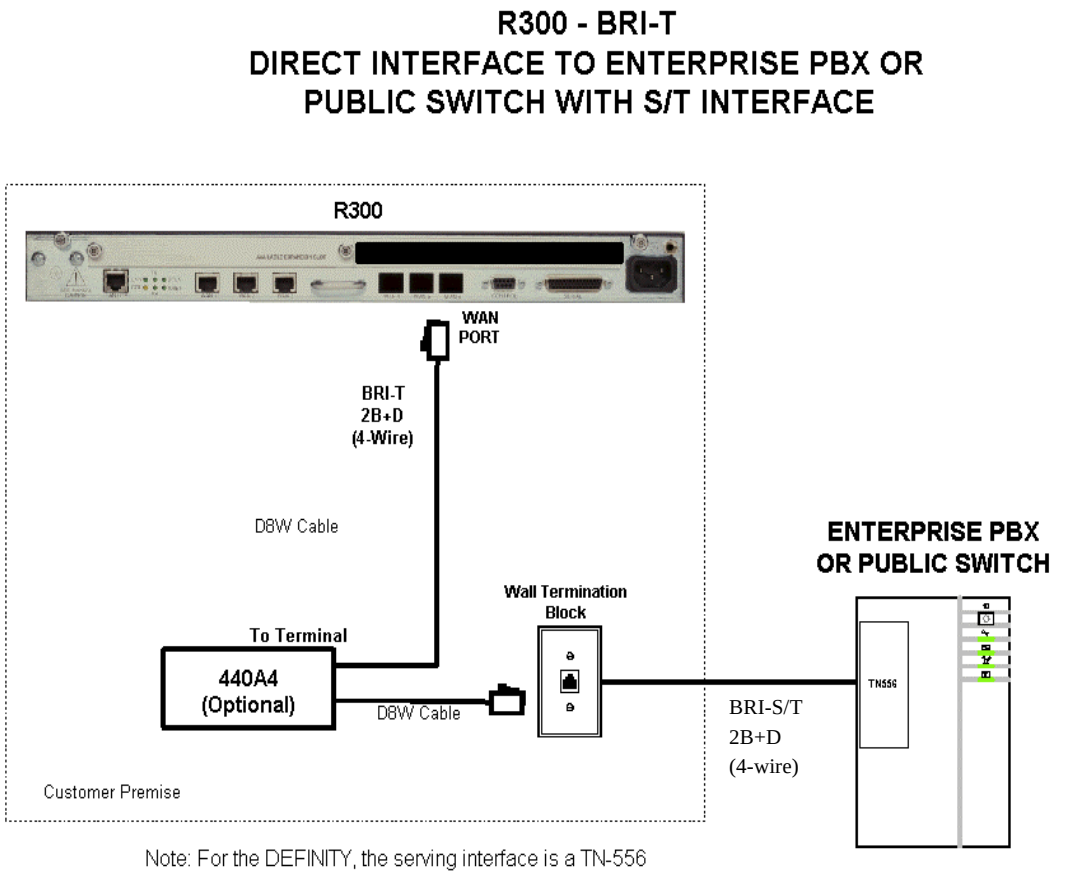



**Figure 12. BRI-T Direct Interface to Enterprise PBX or Public Switch with S/T interface**

The International Standard Organization's ISO 8877 specifies the 8-pin connector (plug and jack) and the assignment of pins for the ISDN physical interface at the "S" and "T" reference points (also specified in ITU-T I.430). Table 2 contains the T-interface contact assignments. In common terminology, the 8-pin connector is an "RJ-45" connector.

**Table 2. T-Interface Contact Assignments for Plugs and Jacks**

| Contact No. | TE | NT | Polarity |
|---|---|---|---|
| 1 | Not Used | Not Used | + |
| 2 | Not Used | Not Used | - |
| 3 | Transmit | Receive | + |
| 4 | Receive | Transmit | + |
| 5 | Receive | Transmit | - |
| 6 | Transmit | Receive | - |
| 7 | Power Sink 2 | Power Source 2 | - |
| 8 | Power Sink 2 | Power Source 2 | + |

NT: This refers to "network" and is used to describe the actions of the network service provider as it relates to the transmit and receive actions for supporting the BRI interface.

TE: This refers to "terminal equipment" and is used to describe the actions of the end system equipment as it relates to the transmit and receive actions for supporting the BRI interface.

For transmit and receive pairs, the contact designated "+" is the conductor of the pair for which the framing pulse should be relatively positive. It is not necessary to distinguish the individual conductors of transmit and receive circuit pairs in interface cables or extension cords in point-to-point interconnections. However, the polarity of individual conductors of the transmit and receive circuit must be common to all terminals in a multipoint arrangement. This means that the framing pulse will be relatively positive on the same conductor for all terminals (including test equipment) in a multipoint arrangement.

Figure 13 illustrates an environment in which the R300 has its S/T interface connected through a network termination device to convert the 4-wire S/T interface into a 2-wire U interface. Since the ISDN BRI standards efforts spanned several years, there were several "generations" of terminal equipment (and NT1's). In the United States there is an older version of ISDN offered as "Custom ISDN". This is served off of 5ESS switches and requires an NT1 device that supports an older physical layer encoding that requires an AMI data format. Subsequently in the United States a newer service definition (National ISDN-1 and National ISDN-2) were introduced. These require NT1 units that support the 2B1Q data encoding format.

Furthermore, the NT1 units must be powered by either a stand-alone power supply or some form of power transformer with wire cable translator to provide Power Source 2 powering of –40 volts and a ground potential on the fourth pair (pins 7 and 8). As one example, Figure 13 shows a 400B2 Adapter. This adaptor gets power from a AC to DC power transformer. It connects directly via a standard 8-wire modular cable to the input jack on the NT1 unit. The output of the NT1 device is connected directly via a second 8-wire modular cable to the BRI WAN port on the R300.

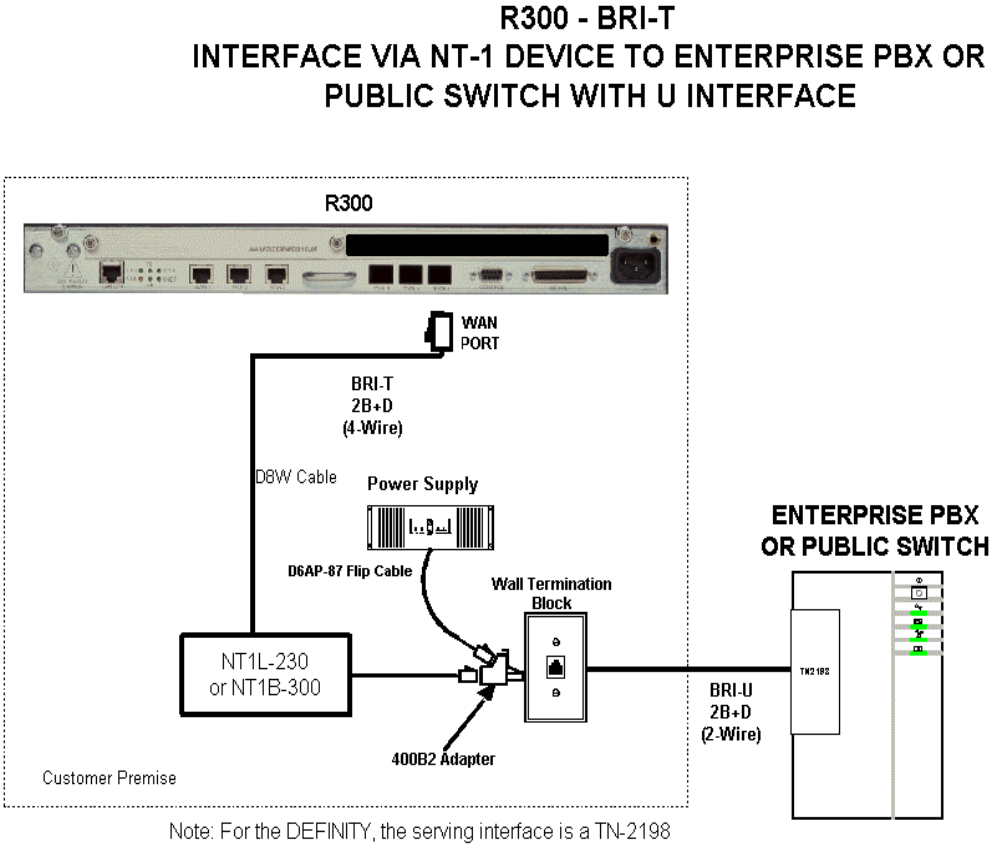



**Figure 13. BRI-T Interface Via NT-1 Device to Enterprise PBX or Public Switch with U Interface**

### BRI Interface: Hints in Placing an order for ISDN Service

Before you contact your ISDN service provider, whether it's the telephone company or PBX administration, obtain answers to the following questions:

- What is the vendor and model of the switching equipment?

  This would be the manufacturer of the central-office switch (examples would be Lucent Technologies 5ESS, Northern Telecom, Siemens). If you are interfacing to a PBX, you need to know which switch type that it conforms to.

- What is the type of ISDN service that you will receive?

  In North America, this would be a choice between some form of custom ISDN or National ISDN service. In other countries in the EMEA and CALA and APAC regions, the specification would be for the country type. Some services will offer the choice of point-to-point or multi-point at the physical layer.

When you are ordering ISDN service, record the directory numbers (PSTN DN's) and the service profile identifiers (SPIDs) that the ISDN service provider assigns. Normally, the provider will assign two directory numbers and the appropriate SPIDs.

The administration of these parameters is discussed in Chapter 5, ''Avaya R300 Administration''.

## Avaya R300 BOOTP Relay and DHCP

### BOOTP Relay via the R300

The R300 supports the feature of BOOTP Relay. This allows an IP client (data or voice) located on the local Ethernet of the R300 to send a request to a DCHP server connected to the system IP network in front of the R300. The R300 will relay the information across itself to or from the IP network. Figure 14 shows an illustration of this.

The operation of BOOTP proceeds as follows. Local clients (voice or data) send a DHCPDISCOVER message and the R300 will forward these messages across the IP WAN interface toward a DHCP server.

The network based DHCP server responds with a DHCPOFFER message which the R300 forwards back to the local client. See Figure 14 for a graphical depiction.

In this application, clients may be an IP Softphone, an IP Telephone, or an IP-based data client (such as a PC).

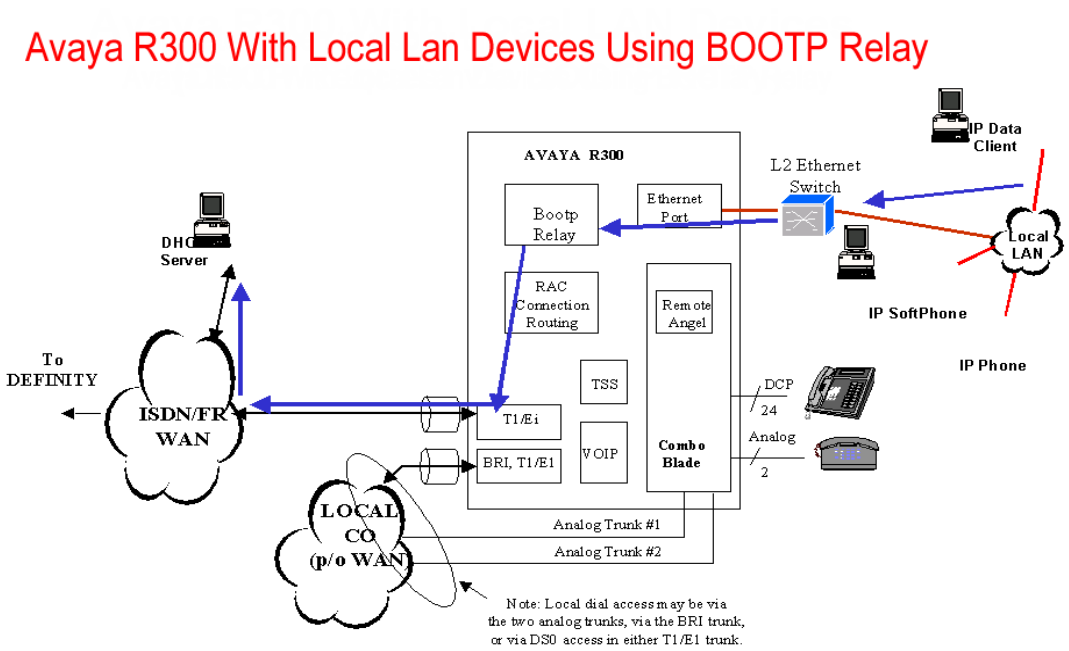



**Figure 14. Avaya R300 With Local LAN Devices Using BOOTP Relay**

## DHCP for IP client support

**NOTE:**

The standard DHCPOFFER protocol message will assign an IP address in the method described in this section. This works fine for standard data clients, such as PCs. The Avaya IP phone, however, also requires that the following supplementary information can be provided:

- A CLAN IP address.
- A CLAN TCP port number.
- The address of the TFTP server and its file directory path (optional).

The support of exchanging this additional information as part of the DCHPOFFER protocol message is not available in the initial release of R300 Release 1.1 software. As soon as this feature code is tested, it will be made available on the Avaya R300 support website at http://support.avaya.com/comsys/definity/r300.

DHCP is a method of assigning IP addresses to end points on a dynamic (as-needed) basis as opposed to a static basis. The operation of the DHCP feature is covered in IETF specification RFC 2131. This feature allows for better management of IP addresses by an enterprise. If a customer wishes to have their IP clients operate with dynamic IP address assignment they can administer the R300 to act in the role of a DHCP server. In the administration (see Chapter 5) they would enable the DHCP Spoofing feature. R300 operation with this feature enabled is described in Figure 15 and in the following text.

The R300 offers the following IP address assignment:

- Three unique IP addresses, which may be mapped to three unique Ethernet MAC addresses.
- Two 20-address pools of contiguous IP addresses.

The R300 shall respond to an incoming DHCPDISCOVER message by looking first to see if there is a match with one of three 'reserved' IP addresses. If it makes a match, it shall offer that reserved address in the DHCPOFFER message. If there is not a match, the R300 shall offer an address from its pool of 40 addresses (two pools of twenty) in a sequential fashion as the R300 traverses its pool. Note that administration commands in the R300 are used to load these DHCP server-supplied IP addresses.

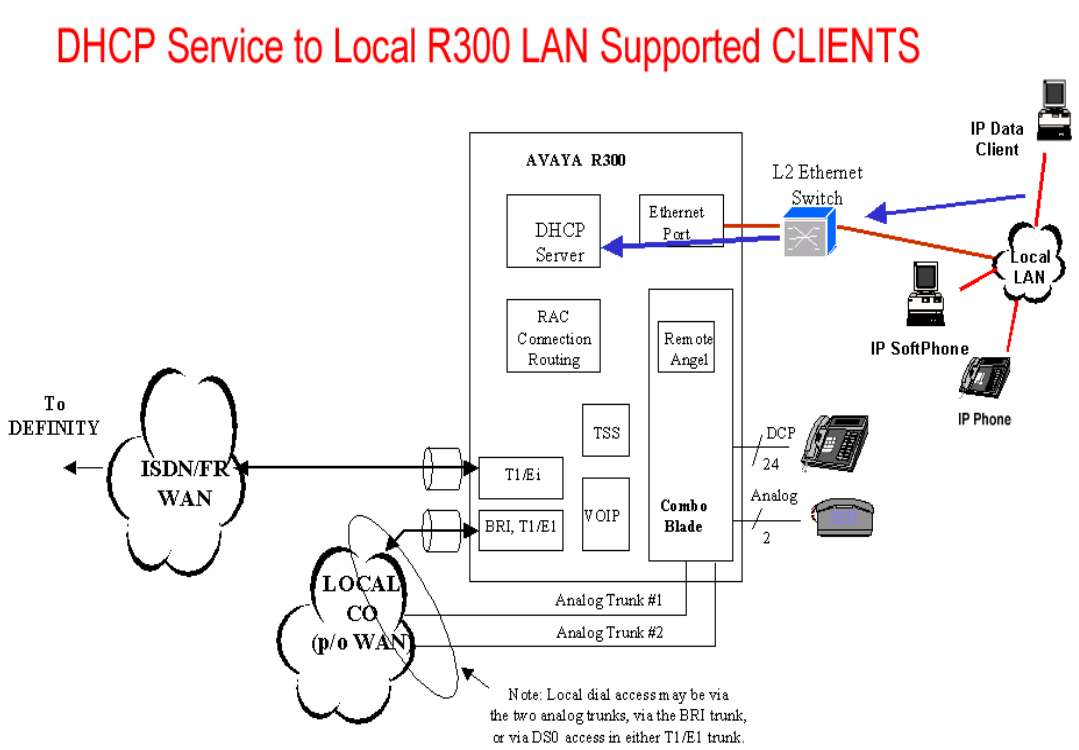



**Figure 15. DHCP Service to Local R300 LAN Supported Clients**

As a further application of the DHCP server feature, Figure 16 illustrates the environment wherein other external IP equipment could make access through a routed IP network to access the DHCP server feature in the R300.

In this diagram, an IP client in a work-at-home-office, could send its DHCPDISCOVER message out via its WAN router (provided that the router supports BOOTP relay) and this message could be routed into the DHCP server on the R300. At this point in operation, the R300 would look first for a direct match with one the “three” reserved IP addresses. If there is not a match, the R300 would then offer an address from its pool of 40 addresses in a sequential fashion.

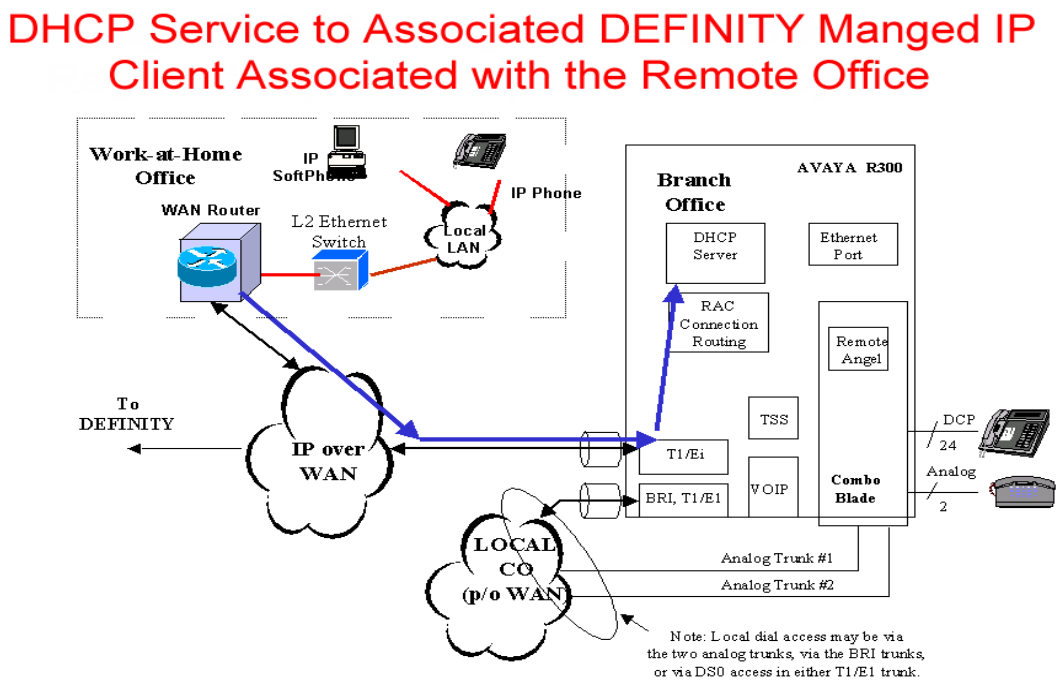



**Figure 16. DHCP Service to Associated DEFINITY Managed IP Client Associated with this Remote Office**

## System management for the Remote Office

The system management of the Remote Office consists of two functional subsystems:

- DEFINITY main switch
- Avaya R300 voice/data switch

## Administration of the DEFINITY system and the Avaya R300

You administer the DEFINITY system via a SAT interface and/or via the Avaya Site Administration or DEFINITY Network Administration (DNA) tools.

The Lucent-Ascend MAX 3000 Command Line Interface manages the administration of the Avaya R300. Within the Avaya R300, the TAOS operating system supports a menu-driven administration system. This system provides for the full administration of the Avaya R300 Combo Blade's voice features. Figure 17 shows the current tools available for configuration management on the Avaya R300.

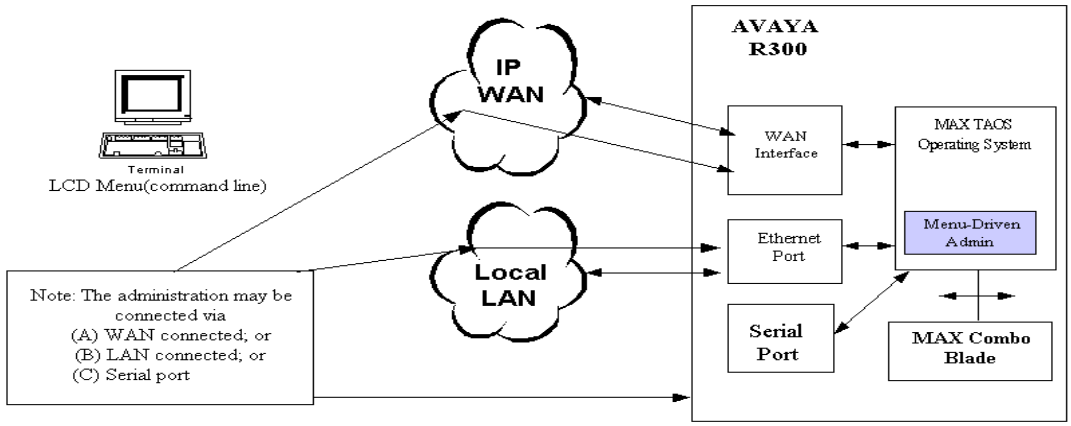



**Figure 17. Avaya R300 Administration System**

## Fault management of the DEFINITY system and the Avaya R300

You can manage the DEFINITY system for fault and performance via a SAT interface and/or via the DEFINITY Network Management (DNM) system. The DEFINITY Network Management (DNM) product as well as Lucent-Ascend's NAVIS Network Management product operate on the HP OpenView network management application platform. In fact, they both concurrently can run together under a common platform. The NAVIS Access manager was specifically developed to support the Lucent-Ascend Max product family (including the MAX 3000, upon which the Avaya R300 is based).

The Avaya R300 is interoperable at the SNMP packet level with both HP Openview and University of California-Davis (UCD) network management applications.

The NAVIS Access network management tool or any generic SNMP manager with an MIB compiler tool set provides the Avaya R300 with fault management and performance management. As long as your network connection supports IP-based communication, these network management systems can communicate with the Avaya R300. The SNMP management tools may communicate with the Avaya R300 via a WAN-based IP network, a local LAN, or with a directly connected serial communications port. See Figure 18.

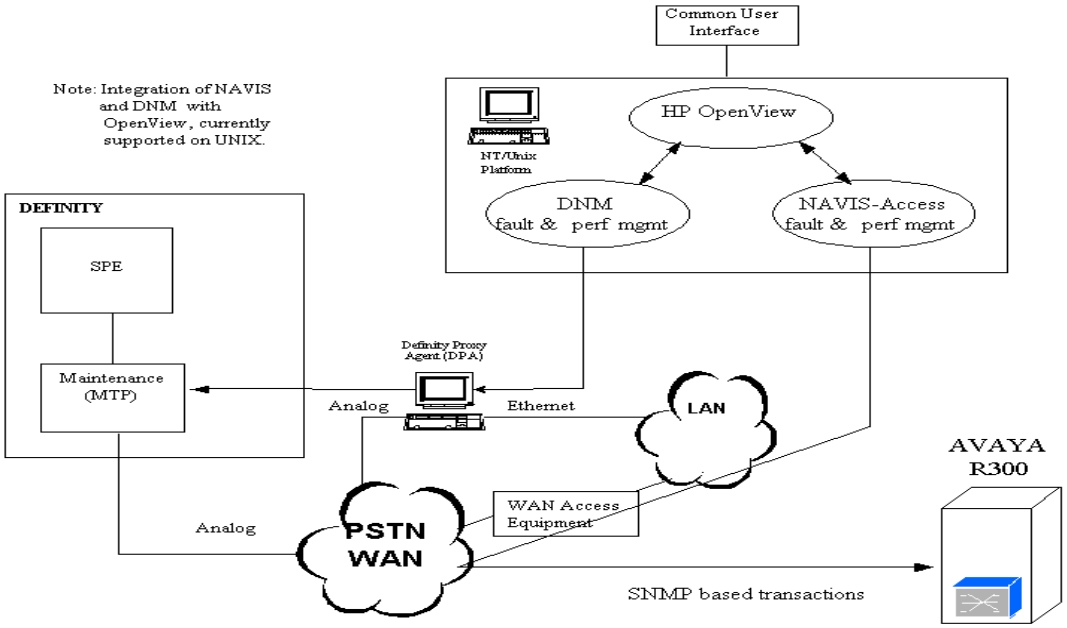



**Figure 18. Avaya R300 Fault & Performance Management**

## What's new with Release 1.1

The Avaya R300 Release 1.1 contains the following new features and enhancements:

- Two analog, 600 ohm loop start trunks which are managed as a separate IP signaling group.
- A separate R300 product model (MX30-6ST-DRM) which supports a BRI-ST WAN interface.
- The introduction of a larger capacity DSP card (DSP30) which supports 30 VoIP channels.
- An administrable loss plan for VoIP station and trunk calls.
- Support for a secondary gatekeeper (CLAN).
- The ability to provide re-order tone to stations and/or provide signaling to the DEFINITY system or the network that the DSP resources are not available to complete the call request.
- Support of DHCP and BOOTP Relay.
- Support of T.38 fax (fax over IP).
- SNMP MIP enhancements and HP Openview interoperability.

As more information about the R300 features becomes available, this document will be updated on the customer support website (see ''How to get this book on the web'' on page ix ).

# Avaya R300 Specifications and Network Design

# 2

## What is the Avaya R300?

The Avaya R300 Remote Office Communicator is a small, rack-mountable unit that features two expansion slots. The left slot, as you look at the back of the unit, houses a DSP blade (for Voice over IP option). Another slot houses the new Combo Blade which supports 24 two-wire Digital DCP stations, two analog stations, and two analog (600 ohm) loop start trunks. A single DEFINITY switch can support multiple Avaya R300 units as described in Table 3.

**Table 3. Number of Avaya R300 units supported on DEFINITY platforms**

| DEFINITY Platform | Max # of Avaya R300 units supported |
|---|---|
| G3r | 250 |
| G3si | 80 |
| G3csi | 80 |
| DEFINITY ONE | 16 |
| IP600 | 16 |

The Avaya R300 and DEFINITY IP Solutions endpoints use common DEFINITY call processing resources. This means that the number of endpoints connected to the Avaya R300 units and the number of IP Solutions endpoints supported by the main DEFINITY system are included in the total number of IP endpoints allowed by the system's capacity.

The Avaya R300 is a cost-effective method for providing the full range of DEFINITY functionality to a remote site. End users at the remote site will have the same capabilities as users "directly connected" to the DEFINITY switch at the main site. The Avaya R300 also provides voice and data convergence since voice and data can share the same WAN link between the DEFINITY system and the remote office.

A single DEFINITY switch can support multiple signaling groups as described in Table 4.

**Table 4. Number of signaling groups supported on DEFINITY platforms**

| DEFINITY Platform | Max # of signaling groups supported |
|---|---|
| G3r | 416 |
| G3si | 110 |
| G3csi | 110 |
| DEFINITY ONE | 46 |
| IP600 | 46 |

The digital trunks (2 T1 trunks for R300 T1 model, 2 E1 trunks for R300 E1 model, or 6 BRI trunks for R300 BRI model) are managed by a single DEFINITY signaling group. The analog trunks (2 for any given R300 model) are managed by a second DEFINITY signaling group. A customer is not required to use these local trunk interfaces, but if these are administered, there would be a maximum of two signaling groups per R300.

With the application of hop-on/hop-off gateway (see Figure 8 on page 11), it is possible for a station user on the DEFINITY system or a DEFINITY managed IP phone to dial a trunk access code to select routing out via the trunk gateway on the R300 and access the PSTN via its local access trunks. The call that is directed out to the R300's local access trunk would be utilizing an IP signaling group and virtual trunk group member to effect that call scenario.

## Requirements and constraints for setting up the Avaya R300

The following sections describe requirements and constraints that may affect the setup of the Avaya R300 Remote Office Communicator.

## DEFINITY system requirements

The main DEFINITY system may be a DEFINITY G3r, G3si, G3csi, DEFINITY ONE, or an IP600. It must use DEFINITY Release 9 (R9) or a newer release software. The remote office option must be enabled on the System-Parameters Customer-Options screen. The DEFINITY cabinet housing the connection to the Avaya R300 may be either a PPN (Processor Port Network) or an EPN (Expansion Port Network).

To administer analog or digital stations and analog or digital trunks on the Avaya R300, you must subscribe to the appropriate Right to Use (RTU) software.

## Number of ports and Avaya R300 units

For a list of the maximum number of station and trunk ports, TN799C C-LAN boards, TN2302AP Media Processors supported, as well as the maximum number of Network Regions that can be administered, please see the *DEFINITY Enterprise Communications Server: System Description* for your software release

The number of TN2302AP IP Media Processors required to support your remote offices is based on the volume of traffic offered by the active calls on the Avaya R300 units. The assumption is that one third of the traffic is carried over the link between the Avaya R300 and the DEFINITY switch, but the traffic is also based on the percent of shuffled calls. For more information about shuffling, see ‘‘Shuffling’’ on page 41.

## Number of terminals and trunks supported by the Avaya R300

An individual Avaya R300 supports 26 stations (24 DCP and two analog). For countries which use 600-ohm impedances, the Avaya R300 also supports two 600-ohm loop-start CO analog trunks. These two analog trunks support the feature of emergency transfer. See ‘‘Emergency transfer to the Remote Office’’ on page 13.

The following are the maximum number of DS0 trunks available:

- 24 DS0 trunks available per T1 interface with robbed bit signaling (the Avaya R300 supports a two-T1 model) or 23 with ISDN PRI T1.
- 30 DS0 trunks per E1 (European Standard) trunk (the Avaya R300 supports a two-E1 model)
- 2 DS0 trunks in another product model available per BRI trunk (the Avaya R300 supports a six-BRI model).

The total number of DS0 trunks in a given configuration is determined by the number of each type of trunk.

## Types of terminals supported by the Avaya R300

The Avaya R300 can support DCP and analog phones directly and can support IP Telephones and IP Softphones through its networking component. DCP and analog phones (and other analog devices) can be connected directly through the Avaya R300 using the Interconnect unit. IP phones must be linked through a data switch or external routing device from the Avaya R300's Ethernet port.

The following tables describe the DCP and analog phones supported by the Avaya R300.

**Table 5. Supported telephones**

**2-wire DCP phones**
(support for I1 channel only)

64xx Series:

- 6402 (non-display)
- 6402D (display)
- 6408+ (non-display with speakerphone)
- 6408D+ (display with speakerphone)
- 6416D+ (display with speakerphone)
- 6416D+M (display, with analog module)
- 6424D+ (display with speakerphone)
- 6424D+M (display with analog module)

84xx Series:

- 8403 (non-display with one-way speakerphone)
- 8405B (non-display with one-way speakerphone)
- 8405D+ (display with two-way speakerphone)
- 8410 (non-display with two-way speakerphone)
- 8410D (display with two-way speakerphone)
- 8411D (display with analog and asynchronous connectors)
- 8434DX (display with two-way speakerphone)

90xx Series:

- 9031DCP (supports transtalk wireless base station)

Callmaster Series:

- Callmaster IV
- Callmaster V
- Callmaster VI

**Analog phones**

- 6210
- 6218
- 6220

model 2500 sets
(Post 1985 with electric ringers)

**NOTE:**
To set an 8411D phone to use the I1 channel, on the keypad of the phone type SHIFT - MUTE - 4 - 2

**NOTE:**
The 6416D+M, and the 6424D+M phone requires a model 100A Analog Interface Module in the base of the phone set. The dip switches for these phones must be set as follows:

- Left switch to “1”
- Right switch to “phone”

The majority of the DCP phones (see exceptions below) receive phantom power through the tip and ring (pins 4&5). This power is supplied by an electronic battery feed circuit on the Avaya R300’s Combo Blade.

-48 volts DC is supplied to the Combo Blade via the 50-pin female connector on the Y-cable (see ‘‘50-pin female connector on Y-cable’’ on page 33 for details)

The following phones do not receive phantom power in the manner detailed above:

- 8411D phone:

  All of the power comes through pins 7&8. This is aux-power, which may be supplied by either a separate local 1151A power supply, or by the Avaya R300 Interconnect.

- 6416 D+M phone:

  The power for the DCP part of the set comes via phantom power over pins 4&5 (as above)

  However, the power for the 100A aux-module comes through pins 7&8 to drive the analog port. This port will not function without power to these pins.

- 6424 D+M phone:

  Power is supplied in exactly the same manner as for the 6416 D+M.

## Supported Fax Terminals

For all releases, group 3 fax terminals may be connected to one of the two analog station ports. The Avaya R300, with release 1.1 or newer software, supports T.38 service as an interoperable feature. This allows a direct IP connection from the Avaya R300 to the TN2302AP IP Media Processor. Support of T.38 service requires that the feature be operationally certified on the main DEFINITY system (see ‘‘Fax support’’ on page 46).

## Power and physical attributes - Avaya R300

Table 6 describes the dimensions and power attributes of the Avaya R300 unit.

**Table 6. Avaya R300 attributes**

| Attribute | Value |
|---|---|
| Input Power Voltage | 100 VAC-240 VAC Universal Input |
| Input Power Frequency | 50/60 Hz |
| Input Power | 135 W maximum |
| Fuse | 5A/250 V (not user-accessible) |
| Current | 1.125 A maximum |
| Weight | 17 lbs (7.7 kg) |
| Height | 1.72" (4.37 cm) |
| Width | 17.62" (44.76 cm) [19”(46.55 cm) rack mount] |
| Depth | 16" (40.64 cm) |
| Max Heat Loss | 460 BTU/hour |

## Avaya R300 Interconnect module

One Avaya R300 Interconnect module is included with each Avaya R300. This provides an effective way to interconnect stations and trunks with the Avaya R300. Each Interconnect module supports 24 DCP stations, two analog stations, and two analog CO trunk interfaces. You do not need to use all of these connections for every installation, and the Avaya R300 only supports the analog CO trunks in countries which support 600 ohm loop-start service.

The Interconnect module also supplies power to the Avaya R300’s Combo Blade to power the DCP stations. Specifically, the Interconnect module provides 30W of -48VDC which is used to provide the native “phantom” power for each DCP station (pins 4&5). If the Interconnect module is not used, the installation must provide “phantom” power for each DCP station some other way (for example, 110-interconnect punch down wall-field using an Avaya 1145 or equivalent -48VDC power source).

The Avaya R300 Interconnect module provides auxiliary power to pins 7 and 8 for the 24 DCP connections so that a customer can use most auxiliary equipment without need or concern for local power. This allows customers to use auxiliary equipment such as adjunct speakerphones, headsets, and additional displays with auxiliary power already available. Specifically, each DCP connection has a current limited auxiliary power of 6 Watts (-48VDC). The yellow LED associated with the DCP modular jack will light, indicating a warning condition, if more than 6 Watts of auxiliary power is drawn (symptomatic of a short).

### Power and physical attributes - Avaya R300 Interconnect module

Table 7 describes the dimensions and power attributes of the Interconnect Module.

**Table 7. Avaya R300 Interconnect module attributes**

| Attribute | Value |
|---|---|
| Input Power Voltage | 100 VAC-240 VAC Universal Input |
| Input Power Frequency | 50/60 Hz |
| Input Power | 192 W maximum |
| Fuse | Power supply is fused for protection (not accessible). Auto-protect for overcurrent, overvoltage on output, over temperature |
| Current | 4 A maximum |
| Weight | 2 lbs (0.9kg) |
| Height | 1.72" (4.37 cm) |
| Width | 17.62" (44.76 cm) [19”(46.55 cm) rack mount] |
| Depth | 8" (20 cm) |
| Max Heat Loss | 284 BTU/hour at full load |

## Cabling

The following cabling is provided with the Avaya R300:

- A power cord (appropriate for country of installation)
- A DB9-DB9 serial cable
- A 15-ft. (x-m) Y-cable (Comcode #84522991)
  - — 64/68-pin connector on one end
  - — DCP (male) amphenol connector on one leg of Y
  - — analog (female) amphenol connector on other leg of Y

  **NOTE:**
  While the cable that comes with the Avaya R300 is fifteen feet long, you can add additional length to the cable. Additional length should not allow the distance between the Avaya R300 and the phone to exceed 1000 feet.

  **NOTE:**
  Off-premise DCP or analog phones may be used if a current protection device is used in series.
- A serial cable to connect external modem (optional). The control port uses a standard DB-9 female connector that conforms to the EIA RS-232 standard for serial interfaces.

The following cabling is provided with the Avaya R300 Interconnect module:

- A power cord (appropriate for country of installation)

Additionally, you will need CAT 3 or equivalent cables to connect analog and DCP stations to the R300 Interconnect unit. Also, all network (Ethernet) cable going to the Avaya R300 should be CAT 5 to provide the best voice quality possible.

For more information about cabling with the Avaya R300, see *MAX 3000 Hardware Installation Guide, Appendix D, Cables and Connectors.*

This provides a full description (including connector pin-out) for:

- RS-232 Control port.
- Ethernet LAN port.
- T1/PRI WAN interfaces (including cross-over cables).
- E1/PRI WAN interfaces (including cross-over cables).
- Serial WAN (V.35) port.

As a reminder, the document *MAX 3000 Hardware Installation Guide* is shipped in paper form and on the DEFINITY CD, with each R300 product. This may also be accessed with on-line documentation as described in ‘‘On-line documentation’’ on page ix.

## Wall field cabling

If you prefer to deploy the Avaya R300 with your existing wall field cabling, you can connect the Combo Blade Y-cable to a conventional wall field panel. The Avaya R300 Combo Blade must be powered with the Y-cable or the Avaya R300 will not function. The Y-cable has 50-pin, male and female connectors, which allows you to use standard, Telcom 50-pin cables to extend the reach of the Y-cable to the wall field location. The analog power plug has a gender changer, which makes the Y-cable compatible with existing 110-volt hardware.

### 50-pin male connector on Y-cable

The 50-pin male connector on the Y-cable provides a standard cut-down configuration for the 24, two-wire sets. For example:

- DCP-Tip 1 is connected to pin 26
- DCP-Ring 1 is connected to pin 1
- DCP-Tip 2 is connected to pin 27
- DCP-Ring 2 is connected to pin 2

This configuration pattern would continue for up to 24 DCP sets. The auxiliary power for the DCP sets is delivered on pins 7 & 8 of each set. Pin 7 is -48Vdc lead and pin 8 is ground (+48Vdc) lead.

The maximum power level for each DCP set is 6 watts or a 120-watt maximum of 48Vdc. The voltage range for operation must be greater than 42.5Vdc and less than 56.5Vdc. The current limit for each DCP set is 170Ma.

### 50-pin female connector on Y-cable

The 50-pin female connector on the Y-cable provides the communication interconnection for the two analog stations and two analog loop start trunks, and provides the source of -48 volts to the Combo Blade (for phantom power of DCP sets).

When using analog sets, make the following pin connections:

1. Analog line-Tip 1 is connected to pin 26
2. Analog line-Ring 1 is connected to pin 1
3. Analog line-Tip 2 is connected to pin 30
4. Analog line-Ring 2 is connected to pin 5
5. Analog trunk-Tip 1 is connected to pin 42
6. Analog trunk-Ring 1 is connected to pin 17
7. Analog trunk-Tip 2 is connected to pin 46
8. Analog trunk-Ring 2 is connected to pin 21

The analog and power female connector on the Y-cable supplies 30 watts of -48Vdc to the Combo Blade (25 watts under load condition). The battery (-48Vdc) is connected to pins 9 & 13 while the ground (+48Vdc) is supplied on pins 34 & 38. You should provide both pairs of signals to maintain an appropriate impedance for the source to the -48 volts.

The voltage range for operation must be greater than 42.5Vdc and less than 56.5Vdc. The current must be limited to 750mA.

**NOTE:**
Power units must have safety and emission approvals appropriate for the country of installation. The power applied to the Combo Blade may require FCC part 68 registration or other country required registration.

**NOTE:**
Power supplied to the Avaya R300 Combo Blade must meet the following standards:

- Power Required: 48Vdc at 150W with a minimum of 42.5Vdc and a maximum of 56.5Vdc.
- Current Limit: Phantom Power 750mA total for the entire board.
- Current Limit: Auxiliary Power 170mA per DCP set.
- Line and Load Regulation: plus or minus 2%.
- Minimum Load: 0 Watts must regulate at no load.
- Protection: Overvoltage, Overcurrent.

## Bandwidth engineering considerations

The bandwidth available for communication between the main DEFINITY ECS host and the Avaya R300 is dependent on several factors. The following gives a high level overview of the items for consideration. The remote office has three principle forms of traffic back to the host site (See Figure 19):

- Voice bearer traffic (carried on IP streams, over WAN network channels)
- H.323V2 call signaling or registration traffic (carried on IP streams, over WAN network channels) and tunneled maintenance
- IP routed data network traffic (carried on PPP streams, over WAN network channels)

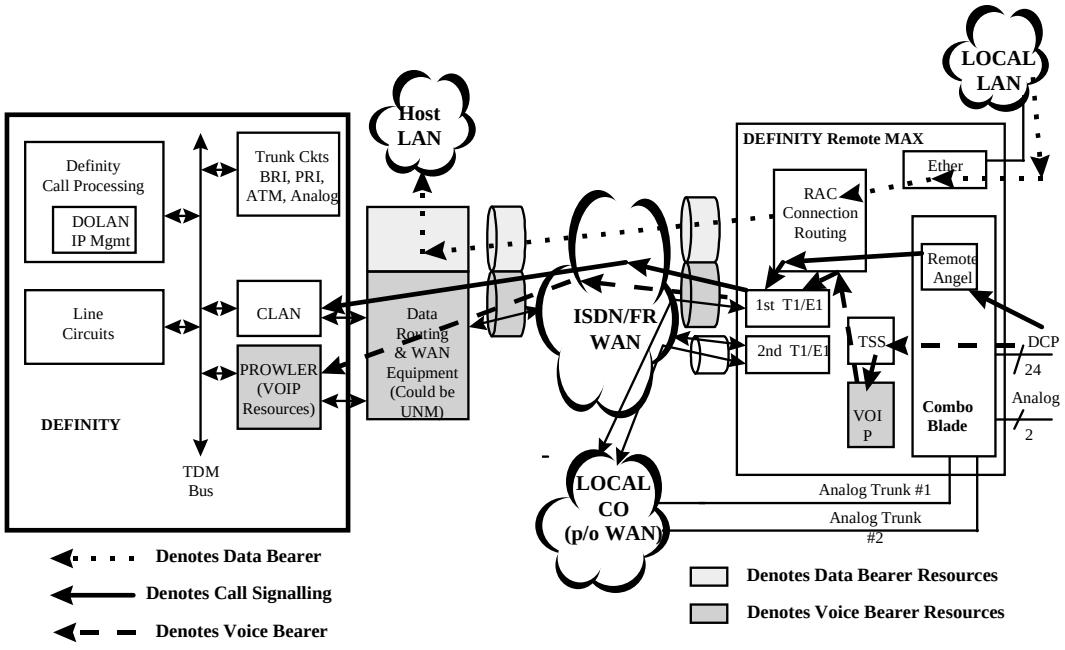



**Figure 19. Bandwidth engineering for the Avaya R300**

## Five network components

The bandwidth traffic engineering depends on several components of the distributed network:

- IP Media Processors
- Host-side WAN or LAN access and routing equipment
- WAN Network Services Subscription
- Avaya R300 WAN Access Trunks
- Multi-Voice DSP Resources in the Avaya R300

### IP Media Processor

In the DEFINITY system, the IP Media Processor (TN2302AP) supports audio conferencing and bearer conversion (from TDM based traffic to IP based traffic). To provide bearer conversion, this circuit pack supports voice processing algorithms that are housed in a DSP farm. This DSP farm currently is designed to support 32 channels of G.729 (compressed 8 Kbps encoding) and/or G.723 (compressed 5.3 Kbps) or 64 channels of G.711 (64 Kbps encoding) for voice bearer traffic. Although the TN2302AP supports G.723, this encoding scheme is not applicable to the Avaya R300. To scale to various switch processing needs, multiple IP Media Processors can be supplied in a switch configuration.

The DEFINITY system's call processing supervises the choice of CODECs used for voice. To conserve on bandwidth for WAN network services, use the G.729 CODEC.

### Host-side WAN access and routing equipment

The WAN access equipment (access concentrator and router) support a variety of network interfaces and a certain capacity. For example, there may be multiple T1 or E1 interfaces available. With each physical interface, individual "pipes" may be used (these are most commonly DS0-based (64Kbps)). These pipes may use bonding to aggregate multiple DS0 components into a larger pipe.

For the WAN access equipment, there must be a negotiated service agreement between the customer and the enterprise or public network provider.

**NOTE:**
IP- based streams must always traverse some kind of physical channel.

### WAN network services subscription

The supporting network is arranged or subscribed in terms of a negotiated network service between you and your service provider. This service is a function of the:

- service type such as fractional T1 or E1, full T1 or E1, frame relay, etc.
- number of network interfaces (for example, multiple T1 or E1)

Network requirements for any DEFINITY IP solutions customer is found in the *DEFINITY IP Solutions Voice Quality Network Requirements* or on the web at www.avaya.com.

### Remote office WAN access trunks

The Avaya R300 offers a variety of WAN interfaces. The North American model offers two T1 interfaces. The Global models offer two E1 interfaces or six BRI interfaces. These interfaces are referred to as “digital trunks.” You can use them for network control or bearer communication to the host switch site, or local access trunks (to the local network central office).

Since the traffic within T1 or E1 trunks is actually a group of individually switched DS0 (64Kbps) pipes, you can direct traffic within these T1 or E1 facilities to two or more destinations. Therefore, both local trunk access traffic and traffic destined for the main switch host site may use a given Avaya R300 WAN trunk facility, depending on the facility configuration administered with the service provider.

With Release 1.1 on the Avaya R300, you have access to two analog loop-start trunks to provide additional bandwidth (two DS0's). You can use this added bandwidth for standard operational PSTN trunk bandwidth.

The Global 6-BRI S/T model offers six basic rate interface (BRI) ISDN ports.

### Multi-Voice DSP resources in the Avaya R300

In the Avaya R300, the bearer conversion (from TDM based traffic to IP based traffic) is performed in a Multi-Voice DSP module. The DSP-16 module supports 16 channels of TDM voice to IP voice conversion. Available with Release 1.1 software, the DSP-30 module supports 30 channels of TDM voice to IP voice conversion.

The Connection Management software module in the Avaya R300 determines if both parties are connected via local ports (either local access trunks or DCP or analog station sets) on the Avaya R300 unit. If both parties are local, the switch connection will be offered over a TDM based connection with that Avaya R300. Otherwise, a VoIP conversion channel is utilized for each party that is connected.

## Engineering bandwidth for the five networking components

You must engineer the five networking components appropriately. Use the following equation as a guide:

- Total Bandwidth = Aggregate voice bandwidth + Aggregate data bandwidth

where:

- Aggregate Voice Bandwidth = Aggregate Voice Bearer bandwidth + Aggregate signaling bandwidth associated with these voice applications
- Aggregate data bandwidth is that bandwidth devoted for IP traffic between host and remote sites.

Aggregate voice bearer bandwidth is a function of the call traffic model. Combine the amount of equipped stations (DCP and analog) with the amount of equipped local access trunks, and calculate the amount of average traffic that is networked back to the DEFINITY system host site. A typical configuration could have as many as half of the calls networked back to the DEFINITY switch. In this example, you would multiply the number of endpoints by the CODEC used, to determine needed bandwidth.

The bandwidth for call signaling and registration traffic is estimated to be two DS0's in size for a full deployment of 24 digital stations, 2 analog stations, and a full complement of trunk group members.

## Voice over IP bandwidth requirements

To help you properly estimate the bandwidth necessary for your IP network to transport signals to the main DEFINITY system, the following section explains the bandwidth used with various CODEC selections.

The signaling information between the Avaya R300 and the C-LAN board consists of H.323 compatible messages, which are exchanged over TCP/IP control links. The control links for the analog and digital phones are permanently established for the length of time that a phone is registered. There are two additional control links, one that is a shared signaling connection for the analog trunks, and one that is a shared signaling connection for the digital trunks. With rough estimation, an active signaling channel consumes about 3 Kbps bandwidth.

Calculating the amount of bandwidth that voice encoded over IP requires is a little more complex. The R300 offers a choice of CODECs from the G.711 and G.729 family at the point of call registration. The DEFINITY system will select a particular CODEC at the point of call establishment.

Not including overhead, the CODEC bandwidth required for each call is as follows:

- For G.711: 64 Kbps
- For G.729: 8 Kbps

The packet “size” is sometimes expressed in units of time (in milliseconds). The following formula yields the packet size, expressed in bits:

- For G.711: (64 Kbits/sec) x (msec/packet) = number of bits of payload per packet
- For G.729: (8 Kbits/sec) x (msec/packet) = number of bits of payload per packet

These formulas can be applied to various packet sizes (expressed in ms) to obtain the number of bits of payload per packet for various packet sizes.

**Table 8. The Number of Bits of Payload per Packet for Various Packet Sizes**

| Packet “size” | Number of bits of payload/packet (G.711) | Number of bits of payload/packet (G.729) |
|---|---|---|
| 10 ms | 640 | 80 |
| 20 ms | 1280 | 160 |
| 30 ms | 1920 | 240 |

**NOTE:**
The number of bits of payload per packet depends on the packet size, but is independent of the sizes of the individual frames contained in that packet. For example, a packet size of 60 ms could be referring to six 10 ms frames per packet, or three 20 ms frames per packet, or two 30 ms frames per packet, etc.

Next we consider overhead due to packet headers. Each packet includes a 464-bit header (regardless of CODEC and packet size) in addition to its payload.

The header is comprised of the following on a typical LAN based stream:

- Ethernet header: 14 Bytes
- IP header: 20 Bytes
- UDP header: 8 Bytes
- RTP header: 12 Bytes
- Ethernet tail: 4 Bytes
- **Total: 58 Bytes (464 bits)**

So, the following is an expression for the overall one-way bandwidth (assuming no silence suppression):

- BW = (BW, no overhead) x [(464 + bits payload per packet) / bits payload per packet]

Plugging the number of bits of payload per packet (determined earlier) into this formula yields the following values for one-way bandwidth (including overhead):

**Table 9. Values for One-way Bandwidth (including Overhead) Per Packet Size**

| Packet size | Bandwidth required (Kbps) for G.711 | Bandwidth required (Kbps) for G.729 |
|---|---|---|
| 10 ms | 110.4 | 54.4 |
| 20 ms | 87.2 | 31.2 |
| 30 ms | 79.5 | 23.5 |
| 60 ms | 71.7 | 15.7 |

## Network region design

The Avaya R300 can receive data from a T1, E1 or BRI line (depending on the model) and pass information through PSTN trunks, through drop/insert trunks (on the T1 model, only), and through the Ethernet to a LAN/WAN.

The switch administrator can assign the Avaya R300 to a network region in the same manner as other DEFINITY IP resources (such as the TN2302AP IP media Processor). The DEFINITY system permits the administrator to specify one set of CODECs to be used for connecting endpoints within a region and to specify a different set to be used for connecting endpoints in the region to endpoints in another region. Separate Avaya R300 units within a single office, or in multiple offices that are in close proximity through an IP network, may be assigned the same network region in order to share the same type of interconnectivity. Endpoints in different regions may be assigned with limited or no interconnectivity.

The use of network regions can insure that intra-region office connections use a high-quality CODEC with low delay while inter-region office connections use a low-bandwidth CODEC to conserve network resources. However, it is reasonable to configure multiple Avaya R300 endpoints into the same region if they share sufficient network interconnectivity.

The Avaya R300 supports the following IP audio CODECs:

- G.729
- G.729 Annex A
- G.729 Annex B
- G.729 Annex A/Annex B
- G.711 A-law 64k
- G.711 A-law 56k
- G.711 μ-law 64k
- G.711 μ-law 56k

The Avaya R300 always advertises CODECs to the DEFINITY switch at registration time in the order shown above. The order of the CODECs that the Avaya R300 advertises to the DEFINITY system at registration time is more important in determining which CODEC is selected for a call than the order of the CODECs in the CODEC set on the DEFINITY switch. The DEFINITY system will always attempt to utilize a CODEC at or near the top of an endpoint's capability set, even if that CODEC is low in the CODEC set.

For example, suppose a CODEC set on the DEFINITY system consists of G.711 μ-law 64K, followed by G.729, and G.723.1. The DEFINITY system would select G.729 for the CODEC on a call involving an Avaya R300 endpoint since G.729 is at the top of the Avaya R300's capability set. In fact, the only way to force the DEFINITY system to select one of the other CODECs over G.729 is to have a CODEC set that does not include G.729 at all.

G.729 is at the top of the Avaya R300's capability set because it is a low bit-rate CODEC. Since most Avaya R300s will be across the WAN from their host DEFINITY system, it is desirable to use a low bit rate CODEC like G.729 (8k), as opposed to G.711 (64k) to conserve WAN bandwidth. To determine which CODEC will be used on a call by call basis, you will need to administer the DEFINITY system ip-codec-set, ip-network-region, and Inter Network Region Management (ip-network-region, page 2) forms.

When administering the DEFINITY switch, the administrator would place the Media Processor boards in network region 1, and place both the Avaya R300s in network region 2. The administrator would then create two CODEC sets. One of the CODEC sets (CODEC set 1) would contain G.729. The other CODEC set (CODEC set 2) would contain only G.711. The administrator would then specify that CODEC set 1 was to be used between network regions 1 and 2, and CODEC set 2 was to be used within network region 2.

If you do not identify network regions for the Avaya R300 endpoints, the switch will use the default network region for the C-LAN board that the Avaya R300 has registered to. The network region assigned to the Avaya R300 determines which C-LAN board calls will route through. The proper use of network regions will improve the quality of service to the Avaya R300 and the stations supported by the unit.

The stations supported by an Avaya R300 share the network region assigned to it.

You can also use network regions to define administrative considerations, in particular, Quality of Service (QoS) definitions. If different QoS values are used in different parts of the network, those parts should be defined as different regions. Use region-based CODEC selection algorithms and region-based interconnectivity rules when interconnecting IP-based endpoints.

# Shuffling

Shuffling refers to an IP endpoint's ability to redirect its IP audio stream in the middle of a call. DEFINITY systems support shuffling, whereas most endpoints made by other companies are not capable of this feature. Shuffling reduces the resources required to switch audio calls, and eliminates the need to involve the Media Processor directly in an IP networked call.

For two IP endpoints' (softphone, IP phones, R300 stations) audio connections to be shuffled, both endpoints must be capable of handling the shuffling feature. This shuffling feature is based on the implementation of some optional procedures in H.245 for the "double-connect" stations and for some optional procedures in H.225 Fast Start for the "single connect" stations. The R300 has implemented the "single-connect" protocol. The DEFINITY system is made aware of the ability of endpoints to support shuffling by both the exchange of RAS procedures at registration time and through the DEFINITY system administration.

Prior to Release 9, all audio streams were set up between an endpoint and a Media Processor board on the DEFINITY system. If one IP endpoint called another, the IP audio was routed to an IP Media Processor board, converted to TDM audio, routed back to a Media Processor board, converted back to IP audio, and finally routed to the other IP endpoint.

This IP-TDM-IP model made things easier for the IP endpoints, but had drawbacks. First, the call between two IP endpoints used resources on the Media Processor board and DEFINITY backplane, even though the audio was simply looping back out to the IP network. Second, the audio quality suffered due to the unnecessary conversion from IP audio to TDM audio and back again to IP audio. Finally, the distance of the IP routed call was longer, causing increased network delays. For these reasons, it is preferable to set up the IP audio connection directly between two IP endpoints. For this to happen, however, the DEFINITY processor must have R9 or newer software and both IP endpoints must be capable of shuffling.

With shuffling enabled, the IP Media Processor actually establishes an H.323 audio connection temporarily to endpoint A and establishes a second connection to endpoint B, by opening logical channels to these endpoints. The channels are opened with a "null capability exchange" permission. When both channels are opened, the IP Media Processor closes the two channels and the H.323 signaling instructs the two endpoints to "shuffle" the call off the IP Media processor, and move it to the second IP endpoint.

The audio shuffling procedure may cause a disruption in the audio media exchange for a duration of approximately 200 milliseconds. The disruption may be longer for inter-network region call, or a call traversing multiple DEFINITY switches (PPN or EPN).

To implement shuffling on the Avaya R300, administer the DEFINITY system to shuffle all Avaya R300 stations and signaling groups. Specifically, enable the Direct IP-IP Audio Connections option on the following DEFINITY administration screens:

- Globally, on the Feature-Related System Parameters screen.
- On the IP Network Region screen that corresponds with the Avaya R300's network region.

- For each station on the Station screen (page 2).
- On the Signaling Group screen (only if using trunks on the Avaya R300).

## C-LAN resources on the DEFINITY system

Each physically connected station that is administered as “TTI” or “named” on the Avaya R300 unit will require one active TCP/IP control link. Each trunk (digital or analog) will have a TCP/IP control link established for the duration of an active call. A control link will consume one socket in the C-LAN board, which has up to 442 sockets available for use.

The DEFINITY system needs a number of C-LAN circuit packs greater than or equal to the total socket usage divided by 442 and then rounded up.

## Call connection examples

The DEFINITY system manages all calls from the Avaya R300 as IP network based calls. How each call is routed and what resources it uses depends upon what connection parties are involved, and whether the shuffling feature is enabled or disabled on the DEFINITY system host.

If the shuffling feature is disabled, or if one of the connected parties is a TDM based station or trunk, then the connection must transit through the R300’s VoIP conversion (DSP card), and travel across the IP network to the IP media processor card.

If the shuffling feature is enabled and the call involves two IP-based connections (IP softphone, IP phone, or station or trunk connected directly to the Avaya R300), then this call will be made without involving any connection to the IP media processor after the exchange of call progress tones and initial call establishment. In this situation, the DEFINITY system treats the call as if it were VoIP (connected as an IP-based call), provided that the Avaya R300 presents the call as VoIP. The Avaya R300 has an internal TDM-bus. If the R300’s connection management recognizes both parties are locally supported on the same Avaya R300 unit, it will direct the connection over the R300’s TDM backplane. This minimizes the delay on the call, and frees a DSP conversion channel.

The following are examples of call scenarios. They each contain a summary of the path by which the call would be established within the Avaya R300.

a. DCP or analog station #1 connected to the Avaya R300 calls DCP or analog station #2 connected to the same R300.

   — This call would route over the TDM bus within the Avaya R300. It would not use VoIP conversion with the DSP 16 or DSP 30 card.

b. DCP or analog station #1 connected to the Avaya R300 calls DCP or analog station #3 connected to another Avaya R300.

   — This call would route over the VoIP engine on the DSP 16 or DSP 30 card, which would convert it to voice over IP, then it would travel over the IP network to the second R300. This is known as a DEFINITY IP shuffled call.

c. DCP or analog station #1 connected to the Avaya R300 calls an IP phone.

   — This call would route over the VoIP engine on the DSP 16 or DSP 30 card, which would convert it to voice over IP, then it would travel over the IP network to the second R300. This is known as a DEFINITY IP shuffled call.

d. DCP or analog station #1 connected to the Avaya R300 calls DCP station #103 connected to the main DEFINITY switch.

   — This call would be routed over the DSP 16 or DSP 30 card which would convert it to voice over IP, then it would travel over the IP network to the IP media processor module on the DEFINITY system. The IP Media Processor module converts the call from IP-based to TDM-based. The call switches to the TDM bus, continues to the DCP line card and finally connects to the DCP station.

e. DCP or analog station #1 connected to the Avaya R300 makes a local trunk call (either digital (T1, E1, or BRI) or analog trunk) out to the local PSTN network.

   — This call would route over the TDM bus within the Avaya R300. It would not use VoIP conversion with the DSP 16 or DSP 30 card.

f. DCP or analog station #1 connected to the Avaya R300 makes a call via Dial access code to a trunk directly supported on the main DEFINITY switch.

   — This call would be routed over the DSP 16 or DSP 30 card which would convert it to voice over IP, then it would travel over the IP network to the IP media processor module on the DEFINITY system. The IP Media Processor module converts the call from IP-based to TDM-based. The call switches to the TDM bus, and continues to the trunk card.

## VoIP Exhaustion

There may be situations during which the call conversion resources of the DSP 16 or DSP 30 card cannot support the number of calls being made from the Avaya R300. This is known as “VoIP exhaustion”. The following scenarios will help to explain how these calls are denied:

a. VoIP exhaustion upon R300 station originated call request.

   — When a local R300 station (analog or DCP) goes off-hook and attempts to originate a call, if the R300 detects that there are no available VoIP DSP conversion channels, it shall issue re-order tone toward the R300 in accordance with the re-order tones listed in the following table.

**Table 10. Re-order Tone Definitions for Avaya R300 Supported Countries**

| Country | Cadence | Fequency(ies) | Level | Duration | Footnotes |
|---|---|---|---|---|---|
| Global | Repeat | 480Hz +620Hz | -24dBm | 250ms on, 250ms off | 1 |
| Argentina | Repeat | 425Hz | -11dBm | 250ms on, 250ms off | |
| Australia | Repeat | 425Hz | -11dBm | 400ms on, 400ms off | |
| Belgium | Repeat | 425Hz | -4dBm | 200ms on, 200ms off | 2 |
| China | Repeat | 440Hz | -11dBm | 700ms on, 700ms off | 1 |
| Costa Rica | Repeat | 425Hz | -11dBm | 250ms on, 250ms off | 6 |
| Finland | Repeat | 425Hz | -8dBm | 250ms on, 250ms off | 5 |
| France | Repeat | 440Hz | -11dBm | 200ms on, 200ms off | |
| Germany | Repeat | 425Hz | -4dBm | 250ms on, 250ms off | |
| Hong Kong | Repeat | 480Hz | -13dBm | 250ms on, 250ms off | |
| Italy | Repeat | 425Hz | -4dBm | 200ms on, 200ms off | 2 |
| Japan | Repeat | 404Hz | -16dBm | 500ms on, 500ms off | 3 |
| Korea | Repeat | 480Hz +620Hz | -24dBm | 250ms on, 250ms off | 1 |
| Mexico | Repeat | 425Hz | -4dBm | 200ms on, 200ms off | 2 |
| Netherlands | Repeat | Repeat | -4dBm | 200ms on, 200ms off | 2 |
| New Zealand | Repeat | 400Hz +425Hz | 0dBm | 250ms on, 250ms off | |
| Singapore | Repeat | 425Hz | -11dBm | 500ms on, 250ms off | |
| Spain | Repeat | 425Hz | -4dBm | 200ms on, 200ms off | |
| Sweden | Repeat | 425Hz | -45dBm | 250ms on, 750ms off | |
| Switzerland | Repeat | 425Hz | -4dBm | 250ms on, 250ms off | 4 |
| UK | Repeat | 404Hz | -16dBm | 400ms on, 350ms off | |
| USA | Repeat | 480Hz +620Hz | -24dBm | 250ms on, 250ms off | 1 |

Footnotes:

1. Same re-order tone as USA
2. Same re-order tone as Belgium
3. Same tone as busy tone
4. Same re-order tone as Germany
5. Estimated
6. Estimated
7. For those countries not listed, the ‘GLOBAL’ settings apply.

b. VoIP exhaustion upon an incoming call request on an R300 analog trunk.

   — When an incoming voice call activation occurs on one of the analog trunks on the R300 and there are insufficient VoIP conversion channels to process the call, the R300's analog trunk stat machine enters an ignore state. It stays in that state until the incoming analog trunk has quit ringing, and then the R300 returns to an idle state.

c. VoIP exhaustion upon an incoming call request on an R300 ISDN trunk.

   — When an incoming voice call setup message is received on one of the digital message based signaling trunks (T1, E1, or BRI) and there are insufficient VoIP conversion channels to process the call, the R300's ISDN trunk state machine will return a "disconnect" message with an associated Cause IE value of "47". This will in turn cause the PSTN network switch to provide re-order tone to the calling party.

d. VoIP exhaustion upon an incoming call request on an R300 robbed bit trunk.

   — When an incoming voice call activation occurs on one of the digital robbed-bit trunks on the R300 and there are insufficient VoIP conversion channels to process the call, the R300's trunk state machine enters an ignore state. It stays in that state until the incoming trunk has quit ringing and then the R300 returns to an idle state.

e. VoIP exhaustion upon a DEFINITY system originated outgoing call toward the R300.

   — If the DEFINITY system sends an H.323 setup message to the R300 for either a call directed toward a station on the R300 or a call directed toward the PSTN trunk gateway on the R300, and insufficient resources exist to process the call, the R300 shall return a "disconnect" or "release complete" message, along with a Cause IE value of "47". This will in turn cause the DEFINITY switch to provide re-order tone to the calling party.

## Loudspeaker paging support

The Avaya R300 supports the use of an auxiliary loudspeaker paging system for the remote office. You may connect a paging system directly into one of the analog station ports on the R300 Interconnect module.

To access or test the paging system, you would originate a call at the DEFINITY system directed toward the analog station port on the Avaya R300. This call would activate a loudspeaker paging announcement in the remote office. You do not need to do any special administration of the analog station line on the Avaya R300 to enable this application.The analog station would be administered in "named" mode. This port will display as a registered endpoint in the host DEFINITY system after registration.

## Fax support

You may connect a facsimile machine into one of the analog station ports on the Avaya R300 Interconnect module. Alternatively, you can connect the facsimile machine to the built-in analog port on a DCP station (such as the 8411D). If you use this alternative method, however, the individual station port cannot handle voice calls during simultaneous fax operation.

There are two forms of fax support in the Avaya R300:

- Fax support over pure circuit-switched connections (group 3 fax)
- Fax support over IP connections (T.38 fax)

All releases of the Avaya R300 support a group 3 fax operation (ITU-T standard T.4), provided that the entire pathway from the Avaya R300 analog port to the network connected facsimile machine contains only circuit-switched connections.

As explained in the ‘‘Call connection examples’’ on page 42, all calls involving two parties on the R300 are considered "IP Shuffled" from the perspective of the DEFINITY system call management programs. However the R300 does have the ability to constrain the calls between two local endpoints (in this application it would be an analog station and an local access trunk) to be switched over the TDM backplane of the R300. If the DEFINITY switch is set up with a TAC code or some other ARS dial code prefix to specify that the call be directed out toward the R300 local access trunk, this call connection will be preserved in a true circuit switching mode out to the PSTN network. The call will then traverse over the PSTN network and reach its destination G3 fax client.

In Release 1.1, the feature of T.38 fax is offered on the R300 (listed as option (b) above). This fax operation would require the R300 to route the call through its DSP card to be converted to a FAX over IP format, wherein it would be routed across the IP network to the destination client. If the destination client is served off the host DEFINITY, the call would be processed through the IP Media Processor module where it would be transformed back into the TDM domain and routed to a analog station.

This support of T.38 on DEFINITY will be forthcoming in a future DEFINITY system release (post-R9.5). When this feature is operationally certified, this second form of fax support will be available across any network managed by a DEFINITY system.

## 911 Emergency Assistance calls

The Avaya R300 serves to transparently extend the DEFINITY system’s capabilities to a remote location. In effect, the endpoints connected to the Avaya R300 function as if they were directly connected to the DEFINITY system. They share the same dial plan and have access to the full complement of functionality provided by the DEFINITY system. While feature and access-transparency are fundamental attributes of this solution, they have the potential to interfere with accurate delivery of 911 calls.

In the absence of an Avaya R300 E911 strategy, 911 emergency assistance calls from Avaya R300 endpoints could be improperly routed to the Public Safety Answering Point (PSAP) designated to receive emergency calls from the location of the main DEFINITY. These calls should be routed to the PSAP assigned to the Avaya R300 location. The E911 strategy for the Avaya R300 ensures that emergency assistance calls are routed to the appropriate PSAP. The Avaya R300 E911 strategy must account for two basic requirements:

- 911 calls originated from stations connected to an Avaya R300 must be selectively routed to the PSAP servicing the Avaya R300 location, and not to the PSAP servicing the controlling DEFINITY system.
- Avaya R300 - 911 calls must be accompanied by correct Automatic Numbering Identification (ANI) or caller ID information.

The Avaya R300 911 strategy takes advantage of the ability to associate a location designation with each Avaya R300 unit. Each DEFINITY system has the capacity to support up to 44 locations. Accordingly, each DEFINITY system provides the ability to accurately route 911 emergency access request calls to these locations. It is possible to support more than 44 Avaya R300 units using this strategy if multiple units are associated to a single location. In cases where one DEFINITY system needs to support more than 44 Avaya R300 units and these units do not map to 44 locations, this strategy must be augmented.

If a maximum of 44 locations is insufficient to accommodate a complex remote office configuration, accurate 911 call routing can be achieved using ARS Partitioning in conjunction with locations. This allows up to eight different routing options per location. Although the DEFINITY administration to accomplish this is fairly complex, this strategy provides sufficient routing alternatives to support the maximum number (250) of Avaya R300 units that can be maintained by a single DEFINITY system.

## Possible remote office configuration

The following diagram illustrates a plausible DEFINITY remote office configuration with two Avaya R300 units connected via a LAN or T1 interface to a central controlling DEFINITY system. One Avaya R300 is located in Holmdel, New Jersey and the other is located in Denver, Colorado. The controlling DEFINITY system is located in Chicago, Illinois. Consider the following diagram as a portion of a remote office configuration that exceeds 44 locations, and therefore requires the use of ARS Partitioning to support accurate delivery of 911 calls.

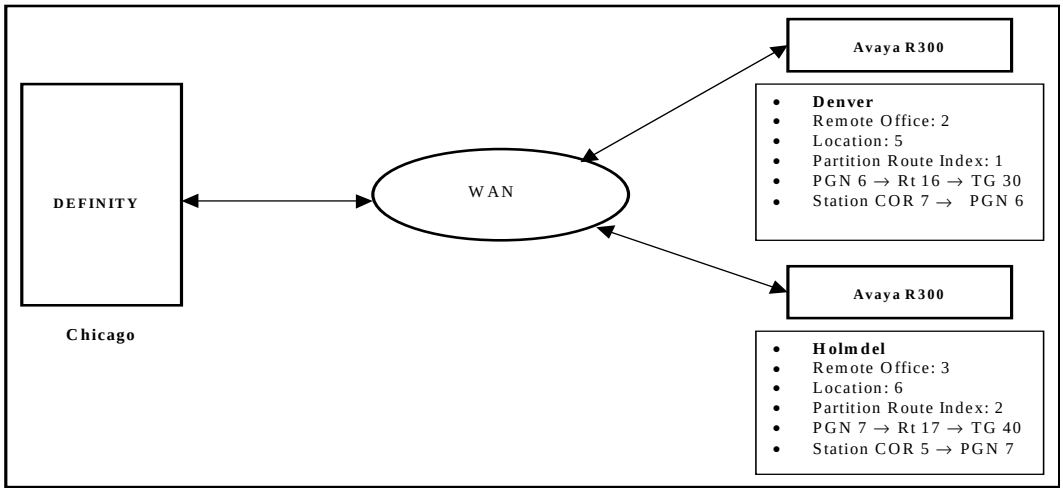



**Figure 20. Remote office configuration for 911 strategy**

## Remote office 911 calling scenario

The following scenario applies to a remote office configuration that exceeds 44 locations, and therefore requires the use of ARS Partitioning to support accurate delivery of 911 calls.

1. An individual in Denver dials 911 from a station connected to remote office 2 in Denver, Colorado.
2. The digit string “911” is transmitted from the Avaya R300 to the DEFINITY system located in Chicago.
3. The DEFINITY system determines that the emergency call has originated from remote office 2, which is associated with Location 5. The COR assigned to the station used to place the call is 7 and the Partition Group Number (PGN) specified for COR 7 is 6.
4. ARS digit analysis of the string “911” for Location 5 indicates that the call should be routed based on criteria specified in Route Index 1, as administered in the Partition Routing Table.
5. Since the PGN assigned to the originating COR is 6, this indicates that the route pattern assigned to Route Index 1 - PGN 6 should be used to route this call. In this case the route pattern is 16.
6. Trunk Group 30 is the first, and only, preference in the list of trunk groups supported by Route Pattern 16. This trunk group is assigned to remote office 2.
7. The DEFINITY system sets up the call to be transmitted on a trunk interface connected to the Denver Avaya R300 and terminate to the correct PSAP in Denver.

## DEFINITY system administration required to support the Avaya R300 E911 strategy

The following sections provide an overview of the DEFINITY system administration that is required to implement this strategy. This section does not provide a comprehensive overview of all of the administration that must be performed to support the remote office capability, but is focused on those parameters that are required to support a 911 strategy for the remote office capability.

### System parameters customer options

To view the System-Parameters Customer-Options page:

1. Type **display system-parameters customer-options** and press RETURN

   Go to page 2 and look for the following:

```
                                                    Page 2  of  X
                     OPTIONAL FEATURES

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

   Go to page 3 and look for the following:

```
                                                  Page   3 of 8

                     OPTIONAL FEATURES

   Emergency Access to Attendant?                          ISDN-BRI Trunks?
          Extended Cvg/Fwd Admin?                                ISDN-PRI?
     External Device Alarm Admin?                       Malicious Call Trace?
                 Flexible Billing?     Mode Code for Centralized Voice Mail?
   Forced Entry of Account Codes?                         Mode Code Interface?
      Global Call Classification?                   Multifrequency Signaling?
              Hospitality (Basic)? Multimedia Appl. Server Interface (MASI)?
 Hospitality (G3V3 Enhancements)?         Multimedia Call Handling (Basic)?
                   H.323 Trunks?       Multimedia Call Handling(Enhanced)?
                                                    Multiple Locations? Y
                    IP Stations?           Personal Station Access (PSA?)?
               ISDN Feature Plus?
   ISDN Network Call Redirection?
```

Go to page 4 and look for the following:

```
                                                  Page 4 of 8

                     OPTIONAL FEATURES

             PNC Duplication?              Tenant Partitioning?
                                       Terminal Trans.Init.(TTI)?
     Processor and System MSP?               Time of Day Routing?
           Private Networking?             Uniform Dialing Plan?
                                  Usage Allocation Enhancements?
                 Remote Office? Y
Restrict Call Forward Off Net?               Wideband Switching?
        Secondary Data Module?                         Wireless?
        Station and Trunk MSP?
 Station as Virtual Extension?
  Survivable Remote Processor?
```

2. Check that each of these things has been enabled (set as “Y” on the above screens):

- ARS
- ARS Partitioning
- Multiple Locations
- Remote Office

## Multiple locations

The Multiple Locations capability, once restricted to the G3R platform, has now been extended to all DEFINITY platforms.

To administer Multiple Locations:

1. Type **change locations** and press RETURN

   The following location form parameters must be administered to support the Avaya R300 E911 strategy

```
change locations                                              Page 1 of 3
                                  LOCATIONS

                    ARS Prefix 1 Required for 10-Digit NANP Calls? _

 Number   Name                     Timezone   Daylight-Savings        Number Plan
                                   Offset     Rule                    Area Code

    1     Chicago-main_______      _ 00:00    _1                      312
    2     Denver-R01_________      + 01:00    _1                      303
    3     Holmdel-R02________      - 01:00    _1                      953
    4     ___________________      _ __:__    __                      ___
    5     ___________________      _ __:__    __                      ___
    6     ___________________      _ __:__    __                      ___
    7     ___________________      _ __:__    __                      ___
    8     ___________________      _ __:__    __                      ___
    9     ___________________      _ __:__    __                      ___
   10     ___________________      _ __:__    __                      ___
   11     ___________________      _ __:__    __                      ___
   12     ___________________      _ __:__    __                      ___
   13     ___________________      _ __:__    __                      ___
   14     ___________________      _ __:__    __                      ___
```

2. In the Name field, enter an alpha-numeric description of the location. For our example we have chosen Chicago-main, Denver-R01, and Holmdel-R02
3. In the Timezone Offset field, enter the offset, in hours and minutes, associated with the location relative to the main DEFINITY system location. For our example Chicago is the main site, so it has a 00:00 offset. Denver has a +01:00 offset, and Holmdel a -01:00 offset.
4. In the U.S., if the region associated with the location supports daylight savings time, a rule should be defined. Daylight savings rules are defined using the **change timezone** command. For our example, all of the regions support daylight savings time.
5. In the Number Plan Area Code field enter the area code assigned to the region associated with the location. For our example Chicago is 312, Denver is 303, and Holmdel is 953.

## Remote office

The purpose of the remote office command is to assign parameters specific to a particular Avaya R300 unit.

To administer the remote office parameters:

1. Type **change remote-office <remote office number>** and press RETURN.

```
change remote-office 1                                        Page 1 of 1
REMOTE OFFICE   1
             Node Name:
       Network Region:
              Location:
             Site Data:
```

2. Administer the fields as follows:
   - The Node Name field should reflect the name as assigned the Avaya R300 in the IP Node Names form. To administer node names, type **change node-names ip <alphanumeric wild card>**.
   - In the Network Region field, enter the number of the network region associated with the remote office. To administer network regions, type **change ip-network-region <region number>**. If a network region is not assigned to the remote office, the audio and QoS parameters associated with the C-LAN (TN799) that processes the connection will be used.

- In the location field, enter the number assigned to the location of the remote office. If no location is assigned, the field defaults to 1. For our example, the following locations would be assigned:
  - Chicago: 1
  - Denver: 5
  - Holmdel: 6
- In the site data field, enter an alpha-numeric identifier, such as the address of the remote office.

### Class of restriction

For the purpose of ensuring that 911 calls are transmitted to the correct Public Safety Answering Point (PSAP), the Class Of Restriction (COR) associates a partition group number to a remote office station. For our example, we will change cor 7 for Denver and cor 5 for Holmdel.

To administer class of restriction:

1. Type **change cor <cor number>** and press RETURN.

```
change cor 10                                                Page 1 of 4
                      CLASS OF RESTRICTION

               COR Number: 10
          COR Description: supervisor

                      FRL: 0                                       APLT? y
  Can Be Service Observed? n                 Calling Party Restriction: none
Can Be A Service Observer? y                  Called Party Restriction: none
 Partition Group number: 1                Forced Entry of Account Codes? n
         Priority Queuing? n                        Direct Agent Calling? y
     Restriction Override: none                Facility Access Trunk Test? n
     Restricted Call List? n                         Can Change Coverage? n
   Unrestricted Call List? ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
           Access to MCT? y                     Fully Restricted Service? n
     Category For MFC ANI: 7                    Hear VDN of Origin Annc.? n
         Send ANI for MFE? n_                    Add/Remove Agent Skills? y
            MF ANI Prefix: ______               Automatic Charge Display? n
Hear System Music on Hold? y      PASTE(Display PBX Data on telephone)? n
                             Can Be Picked Up By Directed Call Pickup? n
                                        Can Use Directed Call Pickup? n
 Group Controlled Restriction: inactive
```

**NOTE:**
If time-of-day partitioning is turned on, the **partition group number** field will not appear on this screen. For information on administration of time-of-day partitioning, see the *DEFINITY ECS Administrator's Guide.*

2. Associate the partition group number to a remote office:
   - Assign a number from 1 to 8. The DEFINITY system will use this number to correlate a route pattern and a trunk group for 911 calls originated from this station. For our example we would use the following partition group numbers:
     — Denver: 6
     — Holmdel: 7

## Route pattern

The route pattern form associates trunking and call handling preferences to routing criteria. For our example, the following route patterns would be assigned to the Avaya R300 locations:

— Denver: 16

— Holmdel: 17

To administer a route pattern:

1. Type **add** or **change route pattern <route pattern number>** and press RETURN.

```
change route-pattern 16                                          Page 1 of X
                              Pattern Number: 1_

   Grp. FRL NPA Pfx Hop Toll No. Del Inserted                            IXC
    No.          Mrk Lmt List Digits  Digits
1: _30   _  ___  _  __  __   __    ____________________________________ user
2: ___   _  ___  _  __  __   __    ____________________________________ user
3: ___   _  ___  _  __  __   __    ____________________________________ user
4: ___   _  ___  _  __  __   __    ____________________________________ user
5: ___   _  ___  _  __  __   __    ____________________________________ user
6: ___   _  ___  _  __  __   __    ____________________________________ user

     BCC VALUE  TSC CA-TSC   ITC  BCIE Service/Feature BAND  No.  Numbering LAR

   0 1 2 3 4 W Request Dgts    Format      Subaddress

 1: y y y y y n  y none_____ both ept  outwats-bnd____ ___ _    _________  none
 2: y y y y y n  y           rest     ________________     _    _________  next
 3: y y y y y n  y           rest     ________________     _    _________  rehu
 4: y y y y y n  y           rest     ________________     _    _________  none
 5: y y y y y n  y           rest     ________________     _    _________  none
 6: y y y y y n  y           rest     ________________     _    _________  none
```

2. Administer the **GRP. NO.** field. Assign the number of a trunk group associated with the remote office.

   For our example trunk group 30 will be assigned to Denver, and 40 will be assigned to Holmdel.

## ARS digit analysis table

The ARS digit analysis table establishes parameters that will be used to route calls based on the dialed digits.

To administer ARS analysis:

1. Type **change ars analysis <digit string> location <location number>** and press RETURN.

```
change ars analysis 911 location 5                              Page X of X

                          ARS DIGIT ANALYSIS TABLE
                                  Location:  _5      Percent Full:  ___

     Dialed          Total    Route    Call   Node  ANI
     String         Min Max  Pattern   Type   Num   Reqd
_911_____________   _3  _3    ___p1    emer  ___    n
____________________ __  __   _____    ____  ___     n
____________________ __  __   _____    ____  ___     n
____________________ __  __   _____    ____  ___     n
____________________ __  __   _____    ____  ___     n
____________________ __  __   _____    ____  ___     n
____________________ __  __   _____    ____  ___     n
____________________ __  __   _____    ____  ___     n
____________________ __  __   _____    ____  ___     n
____________________ __  __   _____    ____  ___     n
```

2. Administer the fields as follows:

   - Location: This is the number of the location associated with the remote office. You would not administer this field, but rather you would type the number on the command line to indicate that you will be making changes to the ARS table for this location. For our example we will use:
     - Chicago: **1**
     - Denver: **5**
     - Holmdel: **6**
   - Dialed String: Enter **911**
   - Total Min: Enter **3**
   - Total Max: Enter **3**
   - Route Pattern: Enter the number assigned to the partition route table index, prefaced by a p. For our example we would use **p1** for Denver, and **p2** for Holmdel.
   - Call Type: Enter **emer**.
   - ANI Reqd: Enter **n**.

## Partition routing table

The partition route table allows up to eight different routing options for a given dial string. For our example we will specify the following route indices:

— Denver: 1

— Holmdel: 2

To administer the partition route table:

1. Type **change partition-route-table index <index number>** and press RETURN.

```
change partition-route-table index 1                          Page 1 of X
                          Partition Routing Table

                             Routing Patterns
Route
Index        PGN 1   PGN 2   PGN 3   PGN 4   PGN 5   PGN 6   PGN 7   PGN 8
1            ____    ____    ____    ____    ____    __16    ____    ____
2            ____    ____    ____    ____    ____    ____    __17    ____
3            ____    ____    ____    ____    ____    ____    ____    ____
4            ____    ____    ____    ____    ____    ____    ____    ____
5            ____    ____    ____    ____    ____    ____    ____    ____
6            ____    ____    ____    ____    ____    ____    ____    ____
7            ____    ____    ____    ____    ____    ____    ____    ____
8            ____    ____    ____    ____    ____    ____    ____    ____
9            ____    ____    ____    ____    ____    ____    ____    ____
10           ____    ____    ____    ____    ____    ____    ____    ____
11           ____    ____    ____    ____    ____    ____    ____    ____
12           ____    ____    ____    ____    ____    ____    ____    ____
13           ____    ____    ____    ____    ____    ____    ____    ____
14           ____    ____    ____    ____    ____    ____    ____    ____
15           ____    ____    ____    ____    ____    ____    ____    ____
```

2. Administer the following fields:

   - PGN X: Enter the route pattern number assigned on the ARS digit analysis screen. For our example, the following route patterns would be used:

     — Denver: 16 under PGN 6 for index 1.

     — Holmdel: 17 under PGN 7 for index 2.

# Avaya R300 Installation and Upgrade

# 3

## Installing the Avaya R300

The Avaya R300, a part of the Remote Office Solutions, allows you to support all the functionality available on your DEFINITY system from a remote location. The Avaya R300 is a combination switch and power supply that, along with an R300 Interconnect, connects your remote office to the main DEFINITY through a Wide Area Network (WAN) connection.

### General instructions

- Follow all caution and warning labels and instructions marked on the equipment or included in these installation instructions.
- Installation and maintenance of the R300 Communicator and Interconnect units must be performed by service personnel. There are no user serviceable parts inside either the Communicator or Interconnect units.
- The maximum recommended operating ambient temperature for this equipment is 40°C (104°F). Allow sufficient air circulation or space between units when installing this product in a closed rack assembly. To ensure reliable operation and prevent overheating, the ventilation openings in the units must not be blocked or covered.
- If the equipment is to be mounted in a rack or cabinet that is not securely fastened in place, consideration must be given to avoid hazards due to uneven loading (overbalancing).
- For products installed in Nordic countries (except Central Office equipment), a type B plug or permanent connection must be used for connections to the main power supply.
- All intra-building communication wiring associated with the R300 system must be 26 AWG (0.13mm2) or larger.

## AC power and ground

**WARNING:**
*This equipment must only be installed and maintained by service personnel.*

**CAUTION:**
*Proper AC power and ground wiring is critical for proper and safe operation of this product and must be verified by trained service personnel. Any problems associated with this wiring must be corrected by a qualified electrician. Protective earthing The AC power circuit must be dedicated to the system and must not be shared with other equipment and must not be controlled by a wall switch. The AC receptacle should not be located under the MDF.*

**CAUTION:**
*The AC power circuit must be dedicated to the system and must not be shared with other equipment and must not be controlled by a wall switch. The AC receptacle should not be located under the MDF.*

**CAUTION:**
*System grounding must comply with the general rules for grounding contained in Article 250 of the National Electrical Code (NEC), National Fire Protection Agency (NFPA) 70, or the applicable electric code in the country containing the equipment.*

**CAUTION:**
*The R300 Communicator and Interconnect units contain auto-ranging power supplies (100 – 240 Vac, 50 – 60 Hz) and require 3 amps maximum current a piece. The AC power source can be 1 phase of 120 Vac with neutral (100 Vac for Japan) with a 15 amp circuit breaker, or 1 phase of 220 or 240 Vac (200 Vac for Japan) with a 10 amp circuit breaker. A single, dedicated AC branch can service both the R300 Communicator and Interconnect units. These units require a three-wire AC cord having either a NEMA 5-15P plug or an IEC 320 plug.*

**CAUTION:**
*To remove AC power from either the Communicator or Interconnect units, pull the AC power cord from the AC appliance coupler on the rear of the unit. Even when AC power is removed from the Communicator unit, the Communicator may still be receiving –48Vdc from the Interconnect unit. To remove all power from the Communicator, either the Interconnect unit AC power cord or the interconnection cable between the Communicator and the Interconnect unit must be disconnected.*

**CAUTION:**
*The Avaya R300 Unit does not support "Hot Plug-in". The power cord must be disconnected when inserting or removing either the Combo Blade or the DSP card.*

## Equipment and information you will need

The main DEFINITY system requires the following:

- Release 9 or later software.
- A TN799C Control-LAN (C-LAN) circuit pack in a DEFINITY system to enable firmware download to the DS1 and the TN2302AP IP Media Processor modules (You can use a TN799B in the DEFINITY system as long as you have at least one TN799C C-LAN circuit pack to enable this feature).
- A TN2302AP IP Media Processor circuit pack.
- A Router or an access concentrator to serve as IP gateway.
- An IP address for the C-LAN circuit pack.
- An IP address for the IP Media Processor.
- A WAN Router (with Network Services).

The remote site requires the following:

- An Avaya R300 (and associated cables).
- An R300 Interconnect module (and associated cables).
- A Mounting rack (optional).
- A terminal or a PC for administration on the Avaya R300, that includes:
  - Terminal communications software (such as Microsoft HyperTerminal).
  - Optionally, a telnet session from an IP terminal.
  - TFTP server software (required only for R300 firmware upgrades).
  - FTP server software.
  - A directory for file storage.
- An IP Network Tap (valid IP address and subnet mask which is customer supplied).
- A U.S. Robotics 9.6 K modem or its equivalent for remote maintenance.

**NOTE:**
You will need a second modem, if you have a second Avaya R300 unit in case one of the modem links fails. If you have more than two, you may telnet from Avaya R300 units without modems to those with modems, or you will need modems for each Avaya R300 unit.

## Tools you will need

- #2 cross (Phillips) screwdriver for the Avaya R300
- #2 cross (Phillips) screwdriver for the R300 Interconnect module
- #2 Standard blade screwdriver for the DSP16 or DSP30 card

# Installation process

The following steps describe the process for installing the hardware into a rack:

- Unpack and inspect equipment.
- Mount the Avaya R300.
- Mount the R300 Interconnect module.
- Connect the Avaya R300 and Interconnect module.
- Connect DCP and analog phones, Ethernet, T1 lines, to the Avaya R300 and R300 Interconnect module.
- Administer the DEFINITY system (Chapter 4).
- Administer the Avaya R300 (Chapter 5).

## Unpack and inspect equipment

Check the order and the packing lists to confirm that the following equipment is present. If any equipment is missing, report this to your Avaya representative.

The Avaya R300 package contains:

- A power cord (ensure the cord is correct for the country of installation).
- A DB9-DB9 serial cable.
- A 15-ft (x-m) Y cable (Comcode #84522991).
- A 25-to-9 pin adapter.
- Mounting brackets (For optional rack mounting).
- An Avaya R300 with
  - combo blade - preinstalled and preconfigured for the Avaya R300.
  - DSP30 or DSP16 card - preinstalled and preconfigured for the Avaya R300.
- *A MAX 3000 Installation and Basic Configuration Guide* book.
- The *Getting Started with the Avaya R300 Remote Office* book (this book).
- An Avaya DEFINITY Release 9 documentation CD.

The Avaya R300 Interconnect module comes with:

- A power cord (ensure the cord is correct for the country of installation).
- Mounting brackets (preinstalled).
- The Avaya R300 Interconnect module.
- Rubber Feet (packed in plastic).

## Ground wrist strap

You should use a wrist strap connected to a ground when removing or installing the Combo Blade or the DSP card.

The Avaya R300 does not support “hot plug-in”, so you must disconnect the power cord before you remove or insert any circuit cards. Once you have removed the power cord, the Avaya R300 will no longer be grounded. Therefore, if you connect the wrist strap to the Avaya R300 it would not provide electrostatic discharge (ESD) protection.

A better option is to connect the wrist strap to some other telecommunication or data-communication equipment that provides a building ground.

## Off-premises circuit protection

All off-premises (out-of-building) trunks require protection from hazardous voltages and currents. This includes both over-voltage (lightning, power induction, and so forth) and sneak current protection. Sneak current protectors must be either UL listed / CSA certified, or must comply with local safety standards.

Sneak current protectors must have a maximum rating of 350mA, and a minimum voltage rating of 600V. The following devices protect the system from over-voltages:

- Analog trunks use the 507B or SCP-110 sneak current protectors. The local phone company normally provides over-voltage protection.
- T1 / E1 / DS1 circuits require isolation from exposed facilities. You must provide a CSU (T1), LIU (E1), or other agency-approved equipment that provides this insulation external to the T1 / E1 / DS1 circuit pack.
- The DCP voice terminals and analog voice terminals used with the R300 system are restricted to on-premise use only, and do not require sneak current protection.

**NOTE:**
You may use off-premise DCP or analog phones if you use an external current protection device in series.

## Sneak fuse panel installation

You must have sneak current protection between the incoming RJ21X or RJ2GX network interface and the system for both trunk and off-premises circuit packs.

Use the model 507B sneak current fuse panel or 110-SCP-9 sneak current protectors. The panel contains two 25-pair connectors, fuse removal tool, and fifty 220029 Sneak Fuses (and two spares).

## Sneak fuse panel ordering information

**Table 11. Sneak Fuse Panel Ordering Information**

| Description | Comcode |
|---|---|
| 157B Connecting Block | 403613003 |
| SCP-110 Protector | 406948976 |
| 507B Sneak Current Fuse Panel | 107435091 |
| 220029 Sneak Current Fuse | 407216316 |

**NOTE:**
The 507B includes 52 sneak fuses and 2 cables and you can order it using PEC code 63210. you can use the SCP-110 protectors with 110-type hardware and on the 507B Sneak Fuse Panel. You can order the SCP-110 Protectors separately and install them on the 157B connecting block. Each block requires fifty protectors.

Install the 507B near the network interface or main distribution frame (MDF) with locally-obtained #12 three-quarter-inch screws (or equivalent).

## Mount the Avaya R300

Refer to the *MAX 3000 Hardware Installation Guide*, Chapter 2: “Setting Up and Testing the MAX Hardware,” for information on mounting the Avaya R300 in a 19" rack.

**CAUTION:**
*Do not plug-in the Avaya R300’s power cord until you have made all other connections.*

## Mount the R300 Interconnect module

**NOTE:**
If you are not using a mounting rack, place the R300 Interconnect module on top of the Avaya R300 with the backs aligned. Attach the rubber feet to the R300 Interconnect Module.

If mounting in the same rack as the Avaya R300, mount the Interconnect module above the Avaya R300 with the backs aligned (see Figure 21).

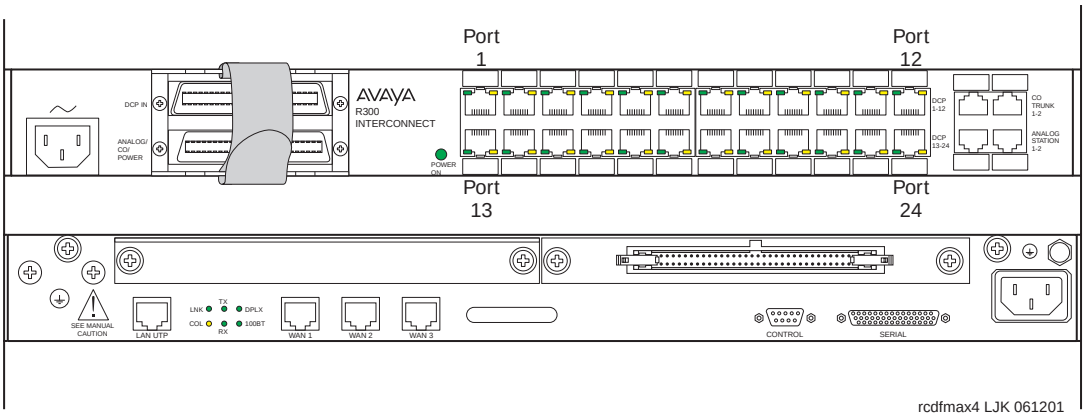



**Figure 21. Avaya R300 Interconnect module and Avaya R300 mounted in rack**

1. Attach the mounting brackets to the unit using the screws provided.
2. Secure the unit to the rack, leaving about 2 in. (5 cm) of space between the unit and the Avaya R300.

## The Interconnect unit wall-mount:

To wall-mount the Avaya R300 Interconnect unit, proceed as follows:

1. Secure a ¾ inch (2 cm.) thick sheet of 24” (61 cm.) x 4” (10 cm.) plywood to the wall using screws. At least one side of the plywood should be secured to a framing timber (i.e., 2 x 4) in the wall. The installer provides the plywood and the hardware.
2. Secure the interconnect unit to the plywood using the screws included with the interconnect unit.

## Connect the Avaya R300 and R300 Interconnect module

On the Avaya R300:

1. Make sure the two connector tabs (ears) point away from the connection (at 45 degree angle).
2. Grab the 64-pin-connector end of the cable (part 700013642) so the “key” located on the connector is pointing up.
3. Align the key with its corresponding slot located on the Combo Blade (LAM2) connector.
4. Gently apply force to the connector until the two tabs are locked in place (see Figure 22).

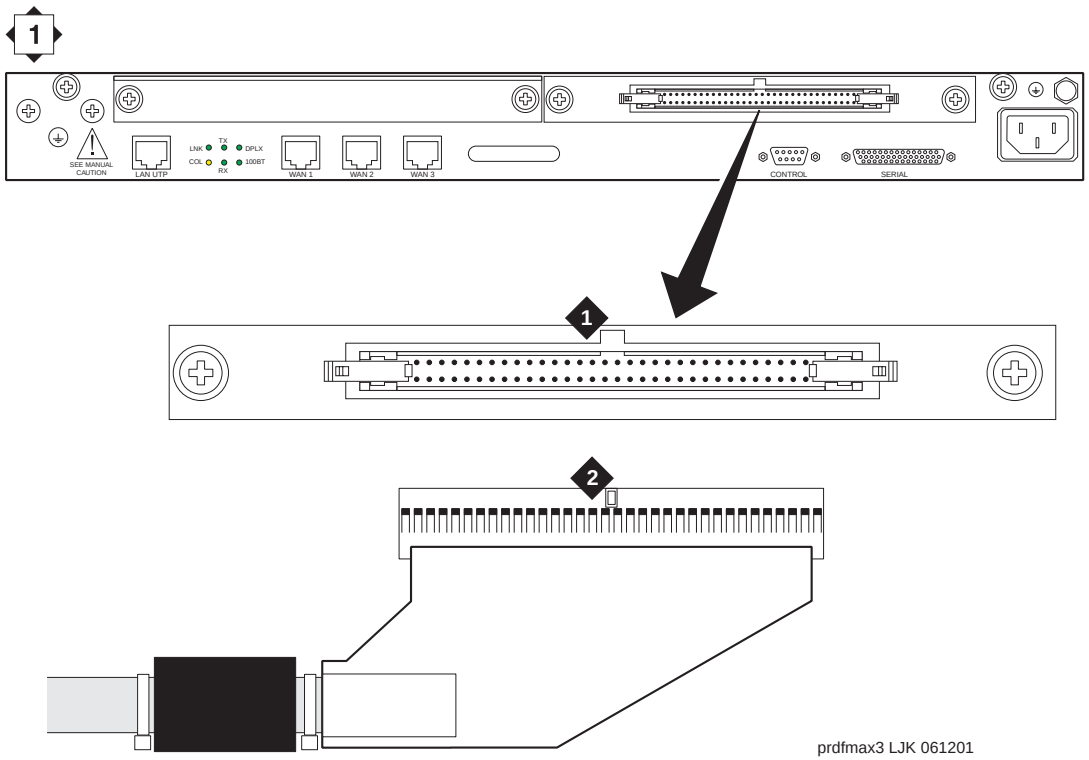



**Figure Notes**

1. Slot on LAM2 Connector
2. Key

**Figure 22. 64-Pin-Connector Cable with Key and Slot Aligned**

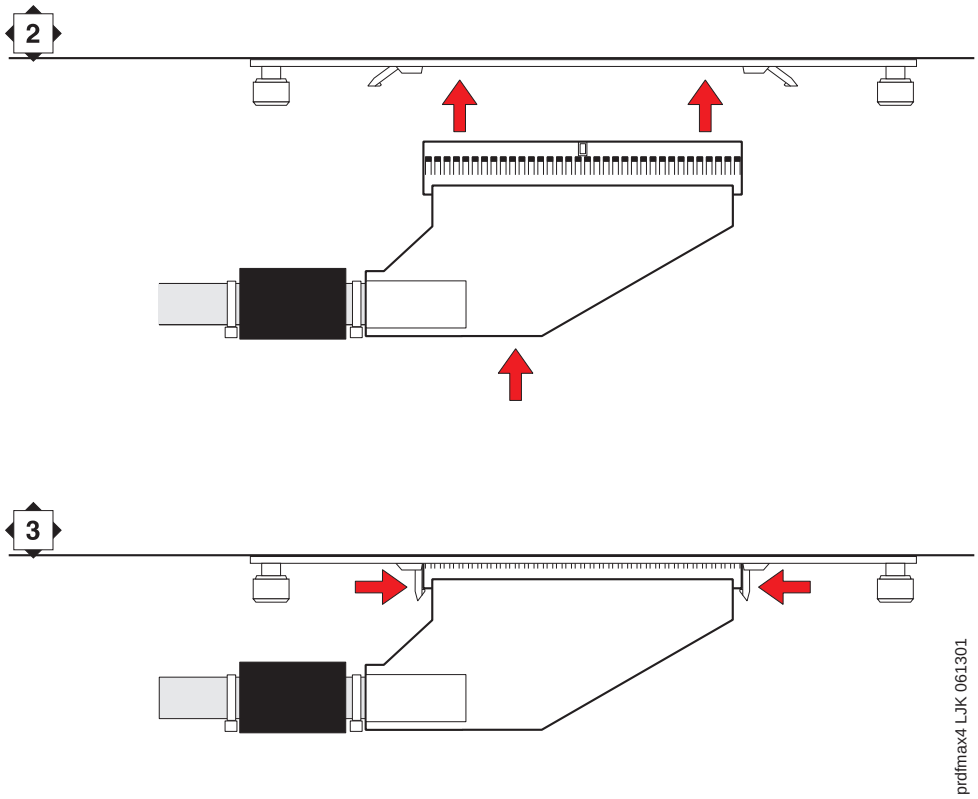



**Figure 23. Securing the 64-Pin-Connector Cable with the Connector Tabs (Ears)**

**CAUTION:**
*Do not force the connector into place if it is not aligned properly. If you force the connector, you can bend the pins.*

5. Secure the cable in place with the connector tabs (see Figure 23).
6. Plug in one end of the power plug.

**CAUTION:**
*Do not plug into any electrical outlet until everything is connected.*

On the Avaya R300 interconnect module:

1. Loosen the Velcro security strap over the socket and plug.
2. Plug in the DCP (male) Amphenol connector into the top socket.
3. Plug in the analog (female) Amphenol connector into the bottom plug.
4. Tighten the Velcro strap and lock it in place.
5. Plug in one end of the power plug.

**⚠ CAUTION:**
*Do not plug into wall outlet until everything is connected.*

## Connect DCP and analog phones, Ethernet, and T1 lines

Refer to Figure 24 for port and connection descriptions for the Avaya R300 and R300 Interconnect module and Figure 25 for connection diagram for the Avaya R300 and R300 Interconnect module.

1. Plug in the Ethernet connection (modular 8 wire telecommunications cable, D8W, or equivalent).
2. Plug in the T1, E1, or BRI connection(s).
3. Plug in the PC to the 9-pin DCE port with straight through serial cable.
4. Plug in DCP phones with D8W connector (up to 24, 6400 or 8400-series digital phones).
5. Plug in analog phones or CO trunks with D8W connector (up to 2 analog devices and up to 2 analog trunks).
6. Plug in the Interconnect module power cord to power the unit up.
7. Plug in the Avaya R300 power cord to power the unit up.
8. Familiarize yourself with Avaya R300 front-panel lights listed in Table 12 on page 69.
9. Familiarize yourself with Avaya R300 back-panel lights listed in Table 13 on page 70.
10. Observe LEDs on the front of the Avaya R300 to make sure everything is working properly (see Figure 26 on page 68).

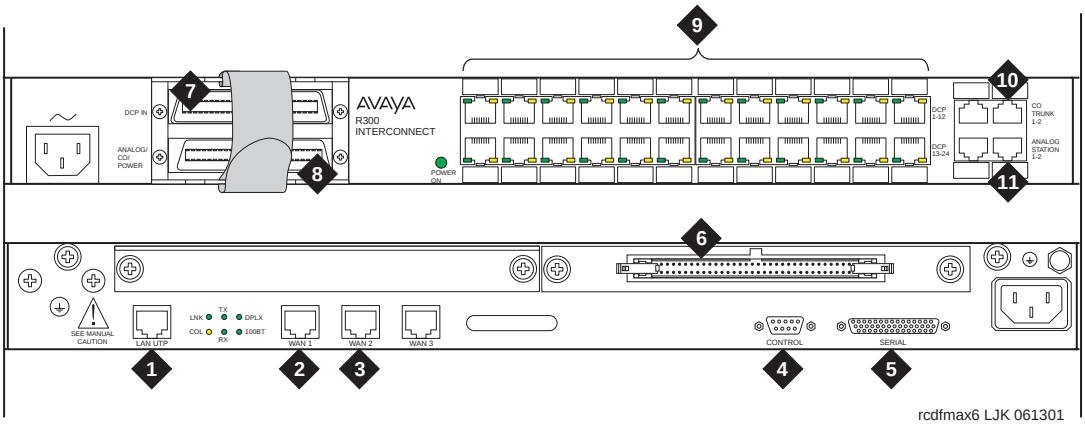



**Figure Notes**

1. Ethernet port
2. T1/E1 port (data)
3. T1/E1 port (PSTN)
4. 9-pin control port for administering the Avaya R300 from a PC
5. DB44 port for serial WAN
6. Combo blade (LAM2) with Y-cable connector
7. DCP connector (male)
8. Analog connector (female)
9. DCP phone connectors
10. CO trunk ports
11. Analog Station ports

**Figure 24. Port and connections for the Avaya R300 and Interconnect module**

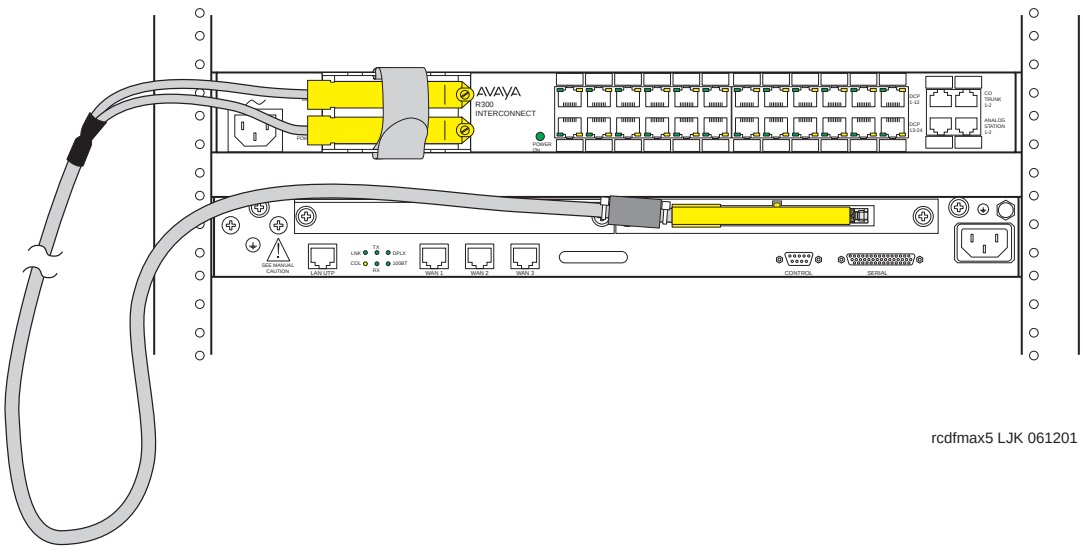



**Figure 25. Connection Diagram for the Avaya R300 and R300 Interconnect Module**

## Avaya R300 front-panel lights

Figure 26 illustrates the Avaya R300 front-panel lights, and Table 12 is the key for interpreting these lights.

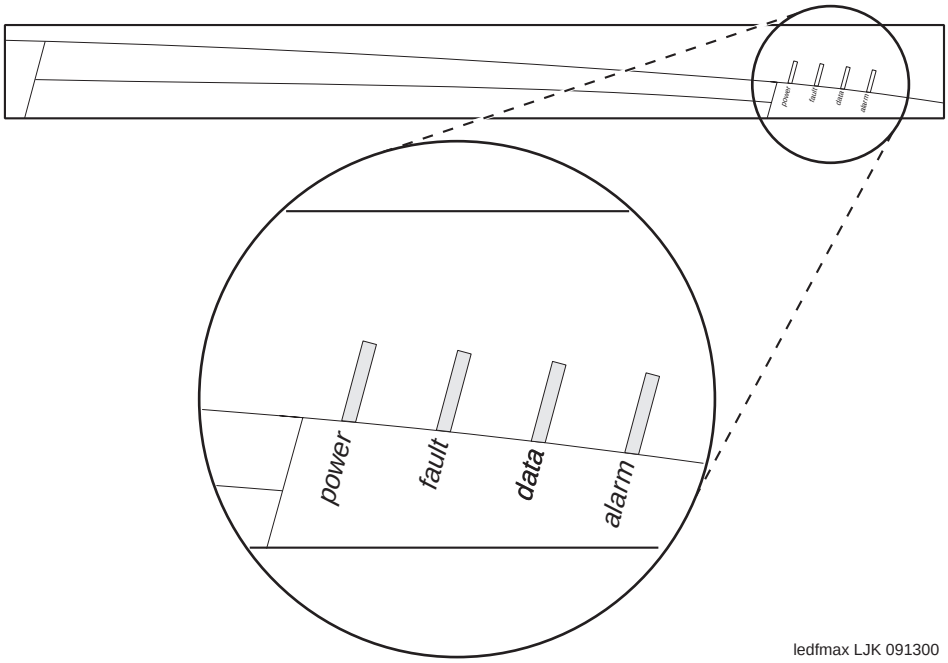



**Figure 26. Avaya R300 Front-Panel Lights**

**Table 12. Avaya R300 Front-Panel Light description**

| Light | Description |
|---|---|
| Power | Green when the Avaya R300 power is on. |
| Fault | Yellow in one of two cases. Either a hardware self-test is in progress or there is a hardware failure.<br><br>When a hardware self-test is in progress, the light is on. If any type of hardware failure occurs, the light flashes. If the failure is isolated to an expansion card, the Avaya R300 may continue functioning without the expansion card. |
| Data | Green at power-up and thereafter when packets are detected on the Ethernet interface.80 |
| Alarm | Amber at power-up. Thereafter, on indicates a low-power detection (Avaya R300 sends an SNMP trap), WAN alarm, or trunk out-of service (for example, during line loopback diagnostics). WAN alarms include Loss of Sync, Red Alarm, Yellow Alarm, and All Ones (or AIS). |

# Avaya R300 back-panel lights

Table 13 is the key for interpreting the back-panel lights, as shown in Figure 27 on page 70. From these lights you can determine the state of the R300's Ethernet connection.

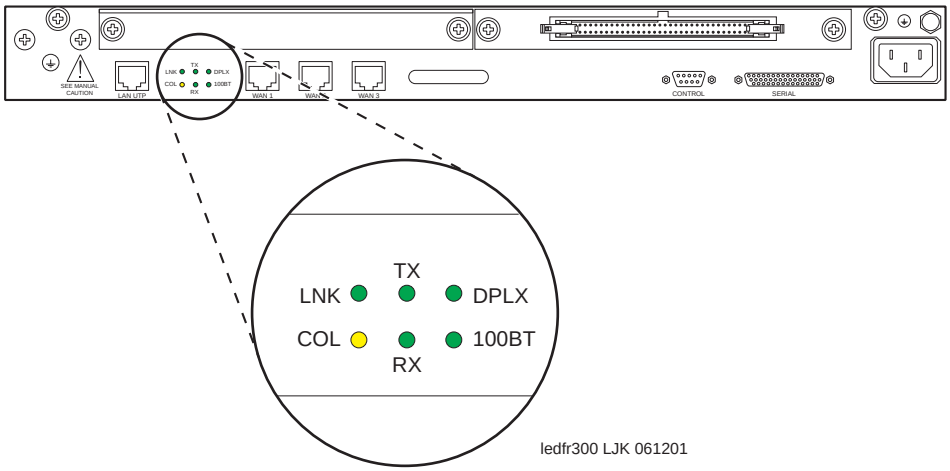



**Figure 27. Avaya R300 back-panel lights**

**Table 13. Avaya R300 back-panel light description**

| Light | Description |
|---|---|
| LNK | During 10 Mbps operation, indicates Link Valid status. During 100 Mbps operation, indicates scrambler lock and receipt of valid Idle codes. The light is green when on. |
| TX | Indicates transmitter is active. The light is green when on. |
| DPLX | Indicates that the port is in Full Duplex Mode. The light is green when on. When the light is off, the port is in Half Duplex Mode. |
| 100BT | Indicates that 100 Mbps operation is selected for the UTP port. the light is green when on. |
| RX | Indicates that the receiver is active. The light is green when on. |
| COL | Indicates a collision. The light is amber when on. |

## Modem connection

If maintaining the Avaya R300 remotely, you must install a U.S. Robotics 9.6 Kbps modem or the equivalent.

**NOTE:**
The U.S. Robotics 9.6 Kbps modem available from Avaya comes preconfigured for the Avaya R300. Configure other modems using the process described in the next section.

1. Connect the RS232 port of the modem to the 9-pin port.
2. Connect an analog phone line to the left most analog-line port on the modem as shown in Figure 28.
3. Make sure that the modem's DIP switches are set as shown in Figure 28 and Table 14 on page 72.
4. Plug the modem into an AC power outlet.
5. Turn on the modem using the switch located on the front of the modem.

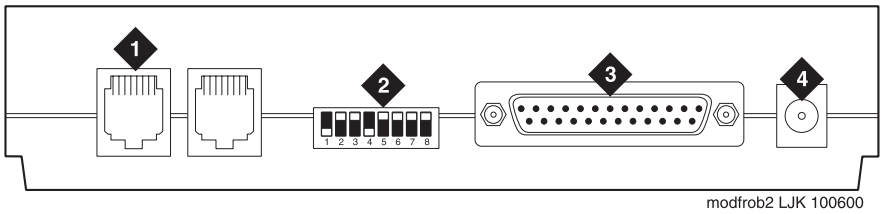



**Figure Notes**

1. Connect analog line here.
2. Set the DIP switches as Table 14 describes them.
3. Connect MODEM connector here.
4. Connect power connector here.

**Figure 28. External modem connections for U.S. Robotics modem**

**Table 14. U.S. Robotics Modem dip switch settings for 9.6K modem**

| Dip Switch | Setting | Description |
|---|---|---|
| 1 | UP<br>**DOWN** | Data Terminal Ready normal<br>Data Terminal Ready override |
| 2 | **UP**<br>DOWN | Verbal result codes<br>Numeric result codes |
| 3 | **UP**<br>DOWN | Suppress result codes<br>Display result codes |
| 4 | UP<br>**DOWN** | Echo offline commands<br>No echo, offline commands |
| 5 | **UP**<br>DOWN | Auto answer on first ring or higher if specified in NVRAM<br>Auto answer off |
| 6 | **UP**<br>DOWN | Carrier detect normal<br>Carrier detect override |
| 7 | **UP**<br>DOWN | Load NVRAM defaults<br>Load factory defaults |
| 8 | **UP**<br>DOWN | Dumb mode<br>Smart mode |

## External modem configuration

On a PC using a modem communication program such as MS HyperTerm, configure external modems that are not pre-configured U.S. Robotics 9.6K modems. Proceed as follows:

1. Connect the maintenance modem to the PC's serial port.
2. Set the Hyperterminal profile or other communication program to the following settings:
   - — VT100 Emulation
   - — 9600bps
   - — 8 Data Bits
   - — 1 Stop Bit
   - — No Parity
   - — No Flow Control

3. Set the modem DIP switches to the following:
   - Switch 1 - DOWN
   - Switch 2 - UP
   - Switch 3 - DOWN
   - Switch 4 - UP
   - Switch 5 - UP
   - Switch 6 - UP
   - Switch 7 - UP
   - Switch 8 - DOWN
4. Enter the following commands, pressing ENTER after each:
   - at&f
   - at&b1
   - at&d
   - at&h2
   - at&i2
   - at&w
5. Disconnect the modem from the PC.
6. Connect the modem to the Avaya R300 and reset the dip switches as described in Table 14 on page 72.

## Avaya R300 software upgrade

Information on upgrading an Avaya R300 is available at http://support.avaya.com/comsys/definity/r300.

The MAX 3000 upgrade instructions are the same as the Avaya R300 upgrade instructions.

To upgrade the Avaya R300, you need one of the following:

- Trivial File Transfer Protocol (TFTP) server software. TFTP server software is available at http://support.avaya.com/telset/ipphone/4600/sd/4742.jhtml or other websites but is not supplied with the Avaya R300
- Telnet capabilities or a connection via a PC com-port or modem to the “control” port on the back of the Avaya R300.

### Upload the Avaya R300 software update

When you update the software on the Avaya R300, the system makes a copy of the current image as a backup then loads the new software image.

Upload the software update from the diagnostics mode of the Avaya R300.

1. From the diagnostics window, type **`tloadcode`** ***`server filename`*** where ***`server`*** is the IP address or the DNS name of the TFTP server and ***`filename`*** is the name of the software update.
2. Press ENTER.
3. Type **`reset`** at the prompt to reset the Avaya R300 after the software update is complete.

## The DSP16 vs. the DSP30

Every Avaya R300 Unit uses a Digital signaling Processing (DSP) card. This can be either a DSP16 card or a higher capacity card the DSP30. The Avaya R300 can use a DSP30 if it has R1.1 software. This sections details the steps you will need to complete to update the DSP 16 card to the DSP 30 card.

**WARNING:**
*Only trained service personnel should open the Avaya R300 Unit for any purpose.*

**CAUTION:**
*When installing any component, be sure to follow proper procedures (such as using a grounding mat and a wrist strap) to prevent build-up of static electricity.*

### Tools you will need

- #2 cross (Phillips) screwdriver
- #2 standard screwdriver

### Update the Avaya R300 DSP card to the DSP30

**NOTE:**
Customers or Avaya Personnel working remotely can perform steps 1 through 3 before the arrival of the service technician.

Complete the following steps:

1. Download the R1.1 software for the Avaya R300 Unit from http://support.avaya.com/comsys/definity/r300.
2. Update the Avaya R300 Unit software to R1.1.

3. Change the DEFINITY signaling group translations as required by the R1.1 software load.
4. Attach an anti-static wrist strap.
5. Unpack the DSP30's box.
6. Power down the Avaya R300.
7. Remove the DSP16.
8. Insert the DSP30 (into the left-most card slot on the Avaya R300).
9. Place the DSP16 into the DSP30's anti-static bag.
10. Power-up the Avaya R300.
11. Repack the shipping box with the DSP16.
12. Return the DSP16 to Avaya.

**NOTE:**
While it is not necessary to remove the Avaya R300 Interconnect cable (Y-cable) before removal or insertion of the DSP card, it may be advantageous to do so to provide more working room.

# The Avaya R300 unit 75-ohm vs. 120-ohm configuration

## Check the Avaya R300 E1 unit for 75-ohm vs. 120-ohm configuration

The Avaya R300 E1 ships from the factory in a 120-ohm configuration. You can check the configuration by typing the debug command "bt -s" which returns
"DXS-120E 3.8dB E1 B8ZS/HDB3 FAS R2" for the 120-ohm unit, and
"DXS-75E 3.8dB E1 B8ZS/HDB3 FAS R2" for the 75-ohm unit.

## Convert from the 75-ohm to the 120-ohm configuration

You can remove jumpers to change the impedance from 75 to 120-Ohms.

**WARNING:**
*Only trained service personnel should open the Avaya R300 Unit's case for any purpose.*

**CAUTION:**
*When installing any component, be sure to follow proper procedures (such as using a grounding mat and a wrist strap) to prevent build-up of static electricity.*

To change the Avaya R300 Unit's E1-terminal impedance to 120-Ohms, proceed as follows:

1. Make sure the Avaya R300 Unit is off and the power cord is unplugged.
2. Remove the chassis cover to expose the mother board.
3. Remove the RJ-BNC adapters if they are installed.
4. Remove the jumpers on each of the following four headers:
   - P34
   - P35
   - P36
   - P37

   These headers are also marked with a 75 E1 notation.
5. Remove the jumper on header P16. This header is marked with an OPT1 notation.
6. Replace the Avaya R300 Unit's chassis cover.

# DEFINITY Administration for the Avaya R300

# 4

The DEFINITY system must be configured to recognize the Avaya R300. Use the following instructions to help you configure and administer the Avaya R300.

**NOTE:**
Whenever you make substantial changes to the DEFINITY system, such as entering new stations and trunks, it is a good idea to **save translations** both before and after.

# Administer customer options

## Instructions

Verify that the following fields are administered on the Feature Related System Parameters Customer Options screen. An Avaya representative must administer these fields.

1. Type **display system-parameters customer-options** and press ENTER to display the screen.

```
display system-parameters customer-options          Page 1 of 9
                        Optional Features
       G3 Version: V9                       Maximum Ports: 300
          Location: 1             Maximum XMOBILE Stations: 0

IP PORT CAPACITIES
                             Maximum Administered IP Trunks: 50
                 Maximum Concurrently Registered IP Stations: 100
                   Maximum Administered Remote Office Trunks: 10
     Maximum Concurrently Registered Remote Office Stations: 10



   Maximum Number of DS1 1 Boards with Echo Cancellation:0



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

**Screen 1. Optional Features screen (page 1)**

2. Verify that the following fields are enabled:
   - G3 Version:**V9** or greater
   - Maximum Administered Remote Office Trunks: Total number of trunk group members for all Avaya R300 units supported by this DEFINITY system (a single B-channel of a T1, E1 or BRI is a trunk group member).
   - Maximum Concurrently Administered Remote Office Stations: Total number of stations for all Avaya R300 units supported by this DEFINITY system

3. Go to page 3 of this screen.

```
display system-parameters customer-options              Page 3 of 9
                     Optional Features

  Emergency Access to Attendant: y                 ISDN-BRI Trunks? n
         Extended Cvg/Fwd Admin? y                          ISDN-PRI? y
    External Device Alarm Admin? y               MaliciousCall Trace? n
      Flexible Billing? n      Mode Code for Centralized Voice Mail? n
  Forced Entry of Account Codes? n
     Global Call Classification? n          Multifrequency Signaling? y
Hospitality (Basic)? y          Multimedia Appl Server Interf(MASI)? y
Hospitality (G3V3 Enhancements)? n
                    H.323 Trunks? y  Multimed Call Handl (Enhanced)? y
                                                  Multiple Locations? n
                     IP Stations? y   Personal Station Access (PSA)? y
               ISDN Feature Plus? n
  ISDN Network Call Redirection? n

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

**Screen 2. Optional Features screen (page 3)**

4. Verify that the following fields are enabled:
   - H.323 Trunks: **y** (yes)
   - ISDN-PRI Trunks: **y** (yes)
5. Go to page 4 of this screen.

```
display system-parameters customer-options              Page 4 of 9
                       Optional Features

              PNC Duplication? n        Tenant Partitioning? n
                                 Terminal Trans. Init. (TTI)? y
     Processor and System NSP? n        Time of Day Routing? n
           Private Networking? y          Uniform Dial Plan? n
                              Usage Allocation Enhancements? n
                 Remote Office? y
Restrict Call Forward Off Net? y         Wideband Switching? n
        Secondary Data Module? y                    Wireless? n
        Station and Trunk NSP? n
 Station as Wirtual Extension? n




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

**Screen 3. Optional Features screen (page 4)**

6. Verify that the Remote Office field is enabled.

7. Go to page 8 of this screen.

```
display system-parameters customer-options                Page 9 of 9
             Maximum IP Registrations by Product ID

Product ID  Rel  Limit   Product ID Rel  Limit    Product ID Rel Limit
IP_Agent    ___: 50      __________ ___  0____    __________ ___ _____
IP_Phone    ___: 20      __________ ___  0____    __________ ___ _____
IP_ROMax    ___: 30      __________ ___  0____    __________ ___ _____
IP_Soft     ___: 50      __________ ___  0____    __________ ___ _____
Ascend Mul  ___: 5____   __________ ___  0____    __________ ___ 0____
__________  ___: 0____   __________ ___  0____    __________ ___ 0____
__________  ___: 0____   __________ ___  0____    __________ ___ 0____
__________  ___: 0____   __________ ___  0____    __________ ___ 0____
__________  ___: 0____   __________ ___  0____    __________ ___ 0____
__________  ___: 0____   __________ ___  0____    __________ ___ 0____


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

**Screen 4. Maximum IP Registrations by Product ID**

8. Verify that the following fields are enabled:
   - Product ID: **IP_ROMax**
   - Limit: Total number of remote office stations for **IP_ROMax**.

**NOTE:**
The specification of "Ascend Mul" is not required for this screen in DEFINITY Release 9.5 or newer.

## Direct IP-IP Audio and IP Hairpinning

```
change system-parameters features                              Page 10 of 10
                        FEATURE-RELATED SYSTEM PARAMETERS

AUTOMATIC EXCLUSION PARAMETERS

                      Automatic Exclusion by COS? n

                             Recall Rotary Digit: 2
          Duration of Call Timer Display (seconds): 3
WIRELESS PARAMETERS
  Radio Controllers with Download Server Permission (enter board location)
  1: _____ 2: _____ 3: _____ 4: _____ 5: _____

IP PARAMETERS
                  Direct IP-IP Audio Connections? y
                            IP Audio Hairpinning? y
```

**Screen 5. Direct IP-IP Audio and IP Hairpinning**

- This form (system-parameters features) lets us enable/disable these features for the whole system.
- If these are disabled, no station will be able to use these features.
- Direct IP-IP Audio Connections should be set to ‘y’ to enable shuffling.
- If these features are disabled on ip-network-region form, no endpoint in that region will be able to use these features.

# Administer IP Boards

Log into the system using a customer login with super-user permission.

**NOTE:**
The following information is required prior to performing the DEFINITY administration:

- The IP Address of the Avaya R300
- Security Codes (passwords) for each Remote Office station.

## Instructions

### Administer circuit packs

Verify that the system is administered to provide C-LAN and IP Media Processor support.

1. Type **display change circuit-packs** and press ENTER to display the Circuit Packs screen.

```
display change circuit-packs                          Page 3 of 5
                        Circuit Packs
    Cabinet: 1                      Carrier: C
Cabinet Layout: five-carrier     Carrier Type: port

Slot Code   SF Mode Name                Slot Code SF Mode Name
 00: TN748   D      Tone Detector         11 TN754 C      Digital Line
 01: TN767   B      DS1 Interface         12 TN754 C      Digital Line
 02: TN746   B      Analog Line           13
 03: TN2302  _      IP Media Processor    14
 04: ______  _                            15
 05: ______  _                            16
 06: ______  _                            17
 07: ______  _                            18
 08: TN799   C                            19
 09: ______  _                            20
 10: ______  _
```

**Screen 6. Circuit Packs**

2. Confirm the administration of the C-LAN (TN799) and IP Media Processor (TN2302). Verify these board codes are specified in the list of circuit packs supported by the system.

**NOTE:**
If administration was not performed on these circuit packs, refer to the Administration for Network Connectivity document for instructions.

### Administer IP Addresses and Interfaces

1. Type **change node-names IP** and press ENTER to display the IP Node Names screen.

```
change node-names ip                                          Page 1 of 1
                              IP NODE NAMES

  Name                   IP Address            Name
default               0  .0  .0  .0       ____________________  ___.___.___.___
remote office 6       134.23.107.22       ____________________  ___.___.___.___
____________________  ___.___.___.___     ____________________  ___.___.___.___
____________________  ___.___.___.___     ____________________  ___.___.___.___
____________________  ___.___.___.___     ____________________  ___.___.___.___
____________________  ___.___.___.___     ____________________  ___.___.___.___
____________________  ___.___.___.___     ____________________  ___.___.___.___
____________________  ___.___.___.___     ____________________  ___.___.___.___
____________________  ___.___.___.___     ____________________  ___.___.___.___
____________________  ___.___.___.___     ____________________  ___.___.___.___
```

**Screen 7. IP Node Names**

2. Complete the following fields:
   - Name: Assign a unique name to the Avaya R300.
   - IP Address: Type the IP address associated with the Avaya R300.
3. Press ENTER to effect the changes.
4. Type **change ip-interfaces** and press ENTER to display the IP Interfaces screen.

```
change ip-interfaces                                          Page 1 of 1
                           IP INTERFACES

Enable Type  Slot  Code   SFx Node Name     Sub Mask       Gate Add       Net
Eth Pt                                                                   Rgn
    Y   C-LAN 01C07 TN799    B   clan1      255.255.255.0  192.11.128.254  1
_______ _____  ____  ______ ___ _______ _________________ _____________  ____
_______ _____  ____  ______ ___ _______ _________________ _____________  ____
_______ _____  ____  ______ ___ _______ _________________ _____________  ____
```

**Screen 8. IP Interfaces**

5. Verify that the C-LAN and IP Media Processor resources are allocated and assigned to Net Rgn (Network Regions) field as appropriate for support of Avaya R300 units.
6. In the Enable Eth Pt field, type **y** (yes) to enable interfaces.
7. Press ENTER to effect the changes.

### Administer Ethernet data module

1. If you have a C-LAN, you need to add an Ethernet data module on the Data Module screen. Otherwise, go to the CODEC Administration procedures.
2. Type **add data-module next** and press ENTER to display the Data Module screen.

```
add data-module next                                  Page 1 of X
                        DATA MODULE

    Data Extension: 2377       Name: ethernet on link 2
              Type: ethernet
              Port: 01c0817
              Link: 2

Network uses 1's for broadcast addresses?: y
```

**Screen 9. Data Module**

3. Complete the following fields:
   - Type: Type **Ethernet**.
   - Port: Type **17**.
   - Link: The link must be in the range **1 – 33** for G3r, or **1 – 25** for G3si and G3csi, and not previously assigned on this switch.

# Administer CODECs

The IP CODEC Set screen is used to establish an audio CODEC preference list, to associate silence suppression, and to assign frame and packet size attributes to each CODEC. You can specify up to 7 sets of different CODECs. By default, all the sets have one CODEC G.711 (μ-law) with no silence suppression and packet size 20ms in DEFINITY Release 9.5.

## Instructions

1. Type **change ip-codec-set <number>** and press ENTER to display the screen.

```
change ip-codec-set 1                                          Page 1 of 1
                          IP CODEC Set

    CODEC Set:

     Audio          Silence          Frames        Packet
     CODEC      Suppression          Per Pkt       Size(ms)
 1:  G.711MU            n                3            30
 2.  G.729              n                3            30
```

**Screen 10. IP CODEC Set**

2. Administer a list of audio CODECs, in preference order, that are supported by the Avaya R300.
3. Press ENTER to effect the changes.

   For more information about CODECs used in the Avaya R300, see‘‘Network region design’’ on page 39.

# Administer network regions

Use these procedures to set up network regions, CODEC-sets for a region, QoS values, and Shuffling.

## Instructions

1. Type **change ip-network-region <number>** and press ENTER to display the IP Network Regions screen.

```
change ip-network-region 1                                    Page 1 of 1
                          IP Network Region

                 Region: 1
                   Name: Main

        Audio Parameters
               CODEC Set: 1

          UDP Port Range
                    Min:2048
                    Max:65535

       DiffServPHB Value:0        Direct IP-IP Audio Connections? y
                                                IP Audio Hairpinning? n
        802.1p/Q Enabled? y
         802.1p Priority: 0
             802.1Q VLAN: 0
```

**Screen 11. IP Network Region**

2. On the IP Network Region screen, complete the following fields:
   - Name: Assign a unique name to the network region.
   - CODEC Set: Assign the CODEC set for the Avaya R300 associated with this Network Region.
   - Direct IP-IP Audio Connection: Type **y** (yes) to allow shuffling between Avaya R300 endpoints
3. Assign QoS values as appropriate.
   - UDP Port Range Min: Type **2048**.
   - UDP Port Range Max: Type **65535**.
   - DiffServPHB Value: Assign the per hop behavior to agree with the differentiated services setting in the network. The value “0” is the default.
   - 802.1p/Q Enabled?: Type y if you wish to use 802.1p or 802.1Q on the Ether connection of the TN2302 IP Media Processor.

   In the R300, the ranges of 1900 to 2055 are used in fixed assignments for UDP ports for audio connections.

**Table 15. Fixed ranges of UDP ports per port type**

| Port Type | UDP Ports Used |
|---|---|
| analog trunks | 1900-1903 |
| analog stations | 1904-1907 |
| DCP stations | 1908-1955 |
| PRI trunks | 1956-2055 (2115) |
| BRI trunks | 1956-1967 (1979) |

4. If C-LAN and IP Media Processing resources are shared between regions, go to page 2, which is the Inter Network Region Connection Management screen. Otherwise, go to the Multiple Location administration steps.

**NOTE:**
Sharing of resources between or among network regions is allowed *only* if you make an entry specifying the CODEC set to be used.

```
change IP-network-region 1                                  Page   2 of 2
          Inter Network Region Connection Management

Region                    (Group of 32)
          1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2
001-032   1 _ _ 2_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
033-064   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
065-096   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
097-128   _ _ 5_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
129-160   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
161-192   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
193-224   6_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
225-256   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
257-288   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
289-320   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
321-352   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
353-384   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```

**Screen 12. IP Network Region screen (page 2)**

5. Specify CODEC sets for your shared network regions as done in the example above. In the example, network region 1 will share resources with the following other network regions, using the specified CODEC sets:
   - network region 1 using CODEC set 1.
   - network region 4 using CODEC set 2.
   - network region 99 using CODEC set 5.
   - network region 193 using CODEC set 6.

# Administer multiple locations

The Locations screen allows you to assign time zone and daylight saving rule parameters by location. Since Avaya R300 units will most likely be remotely located from the DEFINITY switch, establish location parameters for each Avaya R300 region.

## Instructions

1. Type **change locations** and press ENTER.

```
change locations                                              Page 1 of 3
                                  LOCATIONS

                    ARS Prefix 1 Required for 10-Digit NANP Calls? _

 Number   Name                    Timezone   Daylight-Savings        Number Plan
                                  Offset     Rule                    Area Code

    1     Chicago-Avaya R300__    _ 00:00    _1                      312
    2     Denver-R01_________     + 01:00    _1                      303
    3     Holmdel-R02________     - 01:00    _1                      953
    4     ___________________     _ __:__    __                      ___
    5     ___________________     _ __:__    __                      ___
    6     ___________________     _ __:__    __                      ___
    7     ___________________     _ __:__    __                      ___
    8     ___________________     _ __:__    __                      ___
```

**Screen 13. Locations screen**

2. On the Locations screen, complete the following fields:
   - Name: Assign a name for this location, for example, Chicago- Avaya R300
   - Timezone Offset: Enter the time difference in hours and minutes from the DEFINITY system.
   - Daylight-Savings Rule: Assign the daylight-savings rule that applies to this location.

     TIP: Use display daylight-savings rules to see what rules are established for this system.
   - Number Plan Area Code: Type the appropriate area code for the location.
3. Press ENTER to effect the changes.

# Administer Remote office

Perform Remote Office administration on the DEFINITY system before registering the Avaya R300 endpoints. This administration includes administering the Remote Office and Remote Office stations.

## Instructions

### Remote Office

1. Type **add remote-office <number>** and press ENTER to display the Remote Office screen.

```
add remote-office 6                                          Page 1 of 1
                            REMOTE OFFICE 6

     Node Name:  Remote Office 6
Network Region:  22
      Location:  1
     Site Data:  Contact: Joe Smith
                 Phone: xxx-yyy-zzz
                 _____________________________
```

**Screen 14. Remote Office**

2. Complete the following fields:
   - Node Name: Assign a node name to the Avaya R300. This names must correspond to the node name used on the IP Node Names screen.
   - Network Region: Assign the number of a previously administered Network Region for the Avaya R300. If a Network Region is not assigned, use the region associated with the C-LAN.
   - Location: Assign the number of a previously administered Location for the Avaya R300 on the Locations screen. If a location is not specified, this field defaults to 1.
   - Site Data: Provide relevant location and site data.
3. Press ENTER to effect the changes.

4. Type **status remote-office n** and press ENTER to verify the addition of the Avaya R300.

```
status remote-office 6                                          Page 1 of 1
                              REMOTE OFFICE 6

             Node Name:  Remote Office 6             IP Address: 134.23 .107.22
       Network Region:  22
             Location:  1

Trunk Signaling Groups: *5 *6

   Stations Registered: 4131  4102  4103  4104  4105  4108
                        4109  tti   4111  4118  4119  4120
                        4121  4124  4112  4113  4116  4123
                        4115  4122  4117  4110  4114  4106
                        4101  4107

* Signaling group is currently registered
```

**Screen 15. Status Remote Office**

The following fields represent the administration of the Remote Office:

- Node Name
- IP Address
- Network Region
- Location

The **Trunk Signaling Groups** lists the active signaling groups. In this example 5 is the analog signaling group and 6 is the digital signaling group.

The **Stations Registered** field lists those stations that are either registered in “TTI” mode or registered in named mode.

## Remote Office Stations

1. Type **add station <extension number>** and press ENTER to display the Station screen.

```
add station 4101                                          Page 1 of 4
                              STATION

Extension: 1014                              Lock Messages? n         BCC: 0
     Type: 8410D                             Security Code: 1234567    TN: 1
     Port: x                                 Coverage Path 1: ___     COR: 1
     Name: Remote main                       Coverage Path 2: ___     COS: 1
                                              Map-to Station:
                                             Hunt-to-Station: ____

STATION OPTIONS
              Loss Group: _                  Personalized Ringing Pattern:
             Data Module? n                            Message Lamp Ext: 6001
            Speakerphone: 2-way                      Mute button enabled? y
        Display Language? English
                                                       Media Complex Ext:
                                                            IP Softphone? n
                                                     Remote Office Phone? y
```

**Screen 16. Station**

2. Complete the following fields:
   - Type: Assign the set type associated with the terminal.
   - Port: Type **x**.
   - Security Code: Assign a security code/password that is used to validate Avaya R300 registration using this extension.
   - Remote Office Phone: Type **y** (yes).

3. Press ENTER to save your changes and go to page 2 of the Station screen.

```
change station 4101                                    Page   2 of   4
                              STATION
FEATURE OPTIONS
             LWC Reception: spe     Auto Select Any Idle Appearance? n
            LWC Activation? y                Coverage Msg Retrieval? y
    LWC Log External Calls? n                          Auto Answer:
              CDR Privacy? n                      Data Restriction? n
     Redirect Notification? y            Idle Appearance Preference? n
   Per Button Ring Control? n
     Bridged Call Alerting? n              Restrict Last Appearance? y
    Active Station Ringing: single
          H.320 Conversion? y   Per Station CPN - Send Calling Number?
         Service Link Mode: as-needed
         Multimedia Mode: enhanced
                                          Display Client Redirection? n
                AUDIX Name:              Select Last Used Appearance? n
     Messaging Server Name:                Coverage After Forwarding?
                                    Direct IP-IP Audio Connections? y
                                              IP Audio Hairpinning?
```

**Screen 17. Station (Page 2)**

4. On page 2 of the Station screen, type **y** in the Direct IP-IP Audio Connections field to enable station shuffling.

**NOTE:**
Refer to Chapter 5 in this guide for information on administering the Avaya R300.

## Set up a signaling group and digital trunk group

**NOTE:**
Important: You will only need to administer an H.323 signaling group or trunk group between the Avaya R300 and the DEFINITY system if the trunks to your central office are terminated *at the R300*. If you are using the Avaya R300 solely for DCP and/or analog station connectivity, then you will not need an H.323 trunk or signaling group between the R300 and the DEFINITY system.

Each Avaya R300 has its own listening port and signaling group for the digital trunks (T1, E1 or BRI). Set up a new signaling group and trunk group administered for H.323 signaling.

## Instructions

### Setting up a signaling group

Set up the signaling group for remote office:

1. Type **add signaling-group <signaling group number or next>** and press ENTER to display the Signaling Group screen.

```
add signaling-group 6                                          Page 1 of 5
                              SIGNALING GROUP

Group Number  6              Group Type:  H.323
                           Remote Office?  y     Max Number of NCA TSC: 0
                                                  Max number of CA TSC: 0
                                              Trunk Group for NCA TSC:
     Trunk Group for Channel Selection: 6
        Supplementary Service Protocol: a         Network Call Transfer? n


  Near-end Node Name:  clan                   Far-end Node Name: remote office 6
Near-end Listen Port:  5005             Far-end Listen Port:1720

        LRQ Required? n           Calls Share IP Signaling Connection?  y
        RRQ Required? y
                                      Bypass If IP Threshold Exceeded?  n
                                       Direct IP-IP Audio Connections?  y
                                                 IP Audio Hairpinning?  n
                                     Interworking Message: PROGress
```

**Screen 18. Signaling Group**

2. On the signaling group screen, complete the following fields:
   - Group Type: type **H.323**.
   - Remote Office: type **y**.
   - Trunk Group for Channel Selection: type trunk group number.
   - Near-end Node Name: assign the node name assigned to the C-LAN that supports this Avaya R300.
   - Far-end Node Name: type the node name assigned to the remote office.
   - Near-end Listen Port: type a port number in the 5000-9999 range.
   - Far-end Listen Port: type **1720**. This is the dedicated TCP port in the Avaya R300

- Calls share IP Signaling Connection: Type **y** for R300 Release 1.1 or newer, otherwise type **n**.
- Direct IP-IP audio connections: Type **y** to enable IP call shuffling.

**NOTE:**
The far-end port must be 1720. The near-end port must be unique; it must be different from the far-end port.

3. Press ENTER to save your changes.

## Setting up a digital trunk group

You can modify an existing trunk group or add a new one.

1. Type **add trunk group <trunk group number or next>** and press ENTER.

```
add trunk-group 6                                              Page 1 of 22
                              TRUNK GROUP
Group Number: 6                 Group Type: isdn          CDR Reports: y
  Group Name: ro6-digital             COR: 1        TN: 1        TAC: 6
   Direction: two-way       Outgoing Display? n         Carrier Medium: IP
 Dial Access? y               Busy Threshold: 255        Night Service:
Queue Length: 0
Service Type:tie                  Auth Code? n            TestCall ITC: unre
                        Far End Test Line No:
TestCall BCC: 4
TRUNK PARAMETERS
        Codeset to Send Display: 0   Codeset to Send National IEs:6
       Max Message Size to Send: 260 Charge Advice: none
 Supplementary Service Protocol: a   Digital Handling (in/out): enbloc/enbloc

          Trunk Hunt: cyclical

                                                  Digital Loss Group: 6
Calling Number - Delete:      Insert:                  Number Format:
              Bit Rate: 1200      Synchronization: async       Duplex: full
Disconnect Supervision - In? y  Out? n
Answer Supervision Timeout: 0
```

**Screen 19. Trunk Group**

2. On the Trunk Group screen, complete the following fields:
   - Group Type: Type **isdn.**
   - Carrier Medium: Type **IP.**
   - Service Type: Type **tie.**
   - Codeset to Send Display: Type **0.**

     The default is 6, and this should be changed to 0 to support interoperability with non-DEFINITY systems.

3. Go to the group member assignments screen to associate the trunk group with the signaling group.

```
add trunk-group 6                                              Page 6 of 22
                          TRUNK GROUP
                                      Administered Members    (min/max): 1/2
GROUP MEMBER ASSIGNMENTS                    Total Administered Members: 2

     Port       Code 5Fx Name    Night           Sig Grp
1:IP               ro6-digital co 1               6
2:IP               ro6-digital co 2               6
3:
4:
5:
6:
7:
8:
9:
10:
```

**Screen 20. Group Member Assignments**

4. On the Group Member Assignments screen, complete the following fields to add trunk group members:
   - Port: Type **IP**.
   - Sig Grp: Assign the number of the signaling group that provides the signaling channel for this trunk group.

   **NOTE:**
   On the Avaya R300 there is a maximum of 23 trunk group members for each T1 interface, 30 trunk group members for each E1 interface, and 2 trunk group members for each BRI interface. All six BRI interfaces may be deployed and are represented by this one signaling group.

5. Type **change signaling-group <number of signaling group>** and press ENTER to return to the signaling group screen. See Screen 18.
6. In the Trunk Group for Channel Selection field, type the number of the trunk group that should be associated with this signaling channel.
7. Press ENTER to save your changes.

# Set up a signaling group and an analog trunk group

Each Avaya R300 that uses one or both of its central office loop-start analog trunks has a listen port, a signaling group, and a trunk group that are unique to those analog trunks, and separate from the listen port, signaling group, and trunk group used by the T1 or E1 digital trunk. Set up a new signaling group and trunk group administered for H.323 signaling.

## Instructions

### Setting up a signaling group

Set up the signaling group for remote office:

1. Type **add signaling-group <signaling group number or next>** and press ENTER to display the Signaling Group screen.

```
add signaling-group 5                                          Page 1 of 5
                              SIGNALING GROUP

Group Number  5              Group Type:  H.323
                          Remote Office?  y     Max Number of NCA TSC: 0
                                                 Max number of CA TSC: 0
                                             Trunk Group for NCA TSC:
     Trunk Group for Channel Selection: 5
        Supplementary Service Protocol: a         Network Call Transfer? n


  Near-end Node Name:  clan                   Far-end Node Name: remote office 6
Near-end Listen Port:  5005             Far-end Listen Port:1721

        LRQ Required? n           Calls Share IP Signaling Connection?  y
        RRQ Required? y
                                      Bypass If IP Threshold Exceeded?  n
                                       Direct IP-IP Audio Connections?  y
                                                 IP Audio Hairpinning?  n
                                     Interworking Message: PROGress
```

**Screen 21. Signaling Group**

2. On the signaling group screen, complete the following fields:
   - Group Type: type **H.323**.
   - Remote Office: type **y**.
   - Trunk Group for Channel Selection: type trunk group number.
   - Near-end Node Name: assign the node name assigned to the C-LAN that supports this Avaya R300.
   - Far-end Node Name: type the node name assigned to the remote office.

- Near-end Listen Port: type a port number in the 5000-9999 range.
- Far-end Listen Port: type **1721**. This is the dedicated TCP port in the Avaya R300
- Calls share IP Signaling Connection: Type **y**.
- Direct IP-IP audio connections: Type **y** to enable IP call shuffling, otherwise type **n**.

**NOTE:**
The far-end port must be 1721. The near-end port must be unique; it must be different from the far-end port.

3. Press ENTER to save your changes.

### Setting up an analog trunk group

You can modify an existing trunk group or add a new one.

1. Type **add trunk group <trunk group number or next>** and press ENTER.

```
add trunk-group 5                                              Page 1 of 22
                            TRUNK GROUP
Group Number: 5                 Group Type: isdn          CDR Reports: y
  Group Name: ro6-analog              COR: 1        TN: 1        TAC: #05
   Direction: two-way        Outgoing Display? n         Carrier Medium: IP
 Dial Access? y                Busy Threshold: 255        Night Service:
Queue Length: 0
Service Type:tie                  Auth Code? n            TestCall ITC: unre
                        Far End Test Line No:
TestCall BCC: 4
TRUNK PARAMETERS
        Codeset to Send Display: 0   Codeset to Send National IEs:6
       Max Message Size to Send: 260 Charge Advice: none
 Supplementary Service Protocol: a   Digital Handling (in/out): enbloc/enbloc

          Trunk Hunt: cyclical

                                                  Digital Loss Group: 6
Calling Number - Delete:      Insert:                 Number Format:
             Bit Rate: 1200      Synchronization: async       Duplex: full
Disconnect Supervision - In? y  Out? n
Answer Supervision Timeout: 0
```

**Screen 22. Trunk Group**

2. On the Trunk Group screen, complete the following fields:
   - Group Type: Type **isdn.**
   - Carrier Medium: Type **IP.**
   - Service Type: Type **tie.**
   - Codeset to Send Display: Type **0.**

     The default is 6, and this should be changed to 0 to support interoperability with non-DEFINITY systems.
   - Digital Loss Group: Type **6**. The default is 13, the loss group used for H.323 trunks. Because this is an H.323 signaling group, the DEFINITY system cannot tell that this ultimately terminates in an analog trunk. Loss group 6 is the correct loss group for analog trunks.
3. Go to the Group Member Assignments screen to associate the trunk group with the signaling group.

```
add trunk-group 5                                              Page 6 of 22
                          TRUNK GROUP
                                        Administered Members    (min/max): 1/2
GROUP MEMBER ASSIGNMENTS                      Total Administered Members: 2

     Port       Code 5Fx Name    Night           Sig Grp
1:IP                ro6-analog co 1                5
2:IP                ro6-analog co 2                5
3:
4:
5:
6:
7:
8:
9:
10:
```

**Screen 23. Group Member Assignments**

4. On the Group Member Assignments screen, complete the following fields to add trunk group members:
   - Port: Type **IP**.
   - Sig Grp: Assign the number of the signaling group that provides the signaling channel for this trunk group. There are two trunks which may be designated in this group.
5. Type **change signaling-group <number of signaling group>** and press ENTER to return to the signaling group screen. See Screen 21.
6. In the Trunk Group for Channel Selection field, type the number of the trunk group that should be associated with this signaling channel.
7. Press ENTER to save your changes.

# Administer loss plan

To administer a loss plan, see Appendix A, ‘‘Loss Plan Settings’’.

# Add phones to remote office location

When administering an IP telephones, the extensions you add must match your dial plan.

## Instructions

### R300 phones

1. Type **add station *nnnn***, where *nnnn* is the extension you are adding to display the Station screen.

   **NOTE:**
   To set the 8411D to use the I1 channel press **shift mute 42** on the keypad of the phone.

   **NOTE:**
   The 6416D+M and the 6424D+M require a model 100A analog interface module in the base of the phone set. Set the left dip switch to “1”.

```
add station 4101                                          Page 1 of X
                                    STATION

Extension: 4101                        Lock Messages? n         BCC: 0
     Type: 8410D                       Security Code: 1234567    TN: 1
     Port: x                           Coverage Path 1: ___     COR: 1
     Name: Remote main                 Coverage Path 2: ___     COS: 1
                                        Map-to Station:
                                       Hunt-to-Station: ____

STATION OPTIONS
              Loss Group: _            Personalized Ringing Pattern:
             Data Module? n                       Message Lamp Ext: 4101
            Speakerphone: 2-way                 Mute button enabled? y
        Display Language? English
                                                  Media Complex Ext:
                                                       IP Softphone? n
                                                 Remote Office Phone? y
```

**Screen 24. Station**

2. On the Station screen, complete the following fields:
   - Type: Type in the model of the phone you are adding, either analog or digital.
   - Port: Type **x**.
   - Name: Identify the phone for your records.
   - Security Code: Match the password set up on the Avaya R300 administration.
   - Remote Office Phone: Type **y (**yes).
3. Go to page 2 of the Station screen.

```
change station 4101                                    Page   2 of   4
                              STATION
FEATURE OPTIONS
             LWC Reception: spe     Auto Select Any Idle Appearance? n
            LWC Activation? y                Coverage Msg Retrieval? y
    LWC Log External Calls? n                          Auto Answer:
              CDR Privacy? n                     Data Restriction? n
     Redirect Notification? y            Idle Appearance Preference? n
   Per Button Ring Control? n
     Bridged Call Alerting? n              Restrict Last Appearance? y
    Active Station Ringing: single
          H.320 Conversion? y   Per Station CPN - Send Calling Number?
         Service Link Mode: as-needed
           Multimedia Mode: enhanced
                                        Display Client Redirection? n
               AUDIX Name:             Select Last Used Appearance? n
    Messaging Server Name:               Coverage After Forwarding?
                                  Direct IP-IP Audio Connections? y
                                            IP Audio Hairpinning?
```

**Screen 25. Station (page 2)**

4. In the Direct IP-IP Audio Connections field (second page), type **y** (yes).
5. Press ENTER to save your changes.

   You can set up a telnet session on your remote office administration program to verify that the phone is registered.

## IP Softphone: Roadwarrior & Telecommuter

1. Type **add station** and press ENTER to display the Station screen.

```
add station 6001                                          Page 1 of X
                                    STATION

Extension: 6001                      Lock Messages? n          BCC: 0
     Type: 8410D                     Security Code: 1234567     TN: 1
     Port: x                         Coverage Path 1: ___      COR: 1
     Name: Remote main               Coverage Path 2: ___      COS: 1
                                      Map-to Station:
                                     Hunt-to-Station: ____

STATION OPTIONS
             Loss Group: _           Personalized Ringing Pattern:
            Data Module? n                     Message Lamp Ext: 6001
          Speakerphone: 2-way                Mute button enabled? y
       Display Language? English
                                              Media Complex Ext: 6002
                                                   IP Softphone? y
                                             Remote Office Phone? n
```

**Screen 26. Station (page 1)**

2. On the Station screen, complete the following fields:
   - Type: Type in the model of the phone you are adding, either analog or digital.
   - Port: Type **x**.
   - Name: Identify the phone for your records.
   - Security Code: Match the password set up on the Avaya R300 administration.
   - IP Softphone: Type **y** (yes).
   - Media Complex Ext: Type the H.323 extension.
   - Remote Office Phone: Type n (no).

3. Go to page 2 of the Station screen.

```
change station 6001                                    Page   2 of   4
                              STATION
FEATURE OPTIONS
             LWC Reception: spe     Auto Select Any Idle Appearance? n
            LWC Activation? y                Coverage Msg Retrieval? y
    LWC Log External Calls? n                          Auto Answer:
              CDR Privacy? n                      Data Restriction? n
     Redirect Notification? y            Idle Appearance Preference? n
   Per Button Ring Control? n
     Bridged Call Alerting? n              Restrict Last Appearance? y
    Active Station Ringing: single
          H.320 Conversion? y   Per Station CPN - Send Calling Number?
         Service Link Mode: as-needed
         Multimedia Mode: enhanced
                                          Display Client Redirection? n
                AUDIX Name:              Select Last Used Appearance? n
     Messaging Server Name:                Coverage After Forwarding?
                                     Direct IP-IP Audio Connections? y
                                                 IP Audio Hairpinning?
```

**Screen 27. Station (page 2)**

4. On page 2 of the Station screen, complete the following fields:
   - Multimedia Mode: Type **enhanced**.
   - Direct IP-IP Audio Connection: Type **y** (yes).

# Avaya R300 Administration

# 5

The Avaya R300 user interface is a menu-driven interface accessed through a VT100 terminal or VT100 emulation software running on a PC or workstation. Refer to the *MAX 3000 Installation and Basic Configuration Guide*, Chapter 3: "MAX User Interfaces," for information on:

- Setting up your PC or workstation to work with the Avaya R300
- Using the VT100 interface
- Using the command line interface.

Use the control serial port to administer an IP address and a default Gateway on the Avaya R300. You can do the remaining configuration in a telnet session to the Avaya R300.

## The Avaya R300 interface

The interface for the Avaya R300 is through a VT100 interface. The menus are text-based and are displayed in the left side of the window. The interface consists of the Main Edit Menu and eight status windows. The Main Edit Menu is located on the left side of the screen, and the right side of the screen contains status windows for the Avaya R300. The system sets the status windows to a default. You can manually change them using the up arrow key to display the system menu.

## Main Editing Window

The Main Edit Menu appears as follows:

```
 |-------- MAX EDIT ------------| |--------------------| |--------------------|
 |Main Edit Menu                | |10-100 1234567890   | |30-000 Line Stat    |
 | 00-000 System                | | L1/RA nnnnnnnnnn   | | 123456789012 A     |
 | 10-000 Net/T1                | |   12345678901234   | | --- ..........-    |
 | 20-000 Empty                 | |   nnnnnnnnnnnnnn   | | ..............-    |
 | 30-000 Empty                 | |--------------------| |--------------------|
 | 40-000 Ethernet              | |10-200 1234567890   | |00-200 15:10:34     |
 |>50-000 Enter Date            | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
 | 60-000 Serial WAN            | |   12345678901234   | | Ethernet up        |
 |                              | |   @@@@@@@@@@@@@@   | |                    |
 |                              | |--------------------| |--------------------|
 |                              | |40-300 WAN Stats    | |40-400 Ether Stat   |
 |                              | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
 |                              | | Tx Pkt:        511 | | Tx Pkt:      10056 |
 |                              | |    CRC:          0v| |    Col:       3530 |
 |                              | |--------------------| |--------------------|
 |                              | |00-100 Sys Option   | |40-100 Sessions     |
 |                              | |>Security Prof: 1  ^| |>  1 Active         |
 |                              | | SW +8.0-148a0e0+   | |   0 Answer         |
 |                              | | S/N: 9320027      v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
 Press Tab to move to another window --- thick border indicates active window.
```

## Virtual Slot Description

The numbers in the Main Edit Menu correspondent to "virtual slots". This is a way that the Lucent-Ascend product differentiates portions of the hardware into descriptions that suggest that each portion is actually on a real physical circuit pack. In fact, there is only a large motherboard and two expansion slot boards (the DSP card and the Combo Blade card). The slot description is as follows:

- Slot 0 (menu 00-000) This is the main system slot.
- Slot 1 (menu 10-000) This is the T1 or E1 or BRI slot. The physical built-in ports for both T1 (E1) network configuration parameters are provided at this menu level. For the BRI model, all six physical WAN ports are provided.
- Slot 2 (menu 20-000) This is the expansion slot that houses the DSP16 or DSP30 card.
- Slot 3 (menu 30-000) This is the expansion slot that houses the Combo Blade card. The parameters for the 24 DCP station interfaces, the 2 analog station interfaces and the 2 analog loop-start trunks are provided at this menu level.
- Slot 4 (menu 40-000) This is Ethernet slot. The Ethernet menu contains the submenus and profiles related to the local network, routing, bridging and WAN connections.
- Slot 5 (menu 50-000) This is the Ether Data slot. This is used for the HDLC channels for data modems.

- Slot 6 (menu 60-000) This is for the serial WAN slot. This is contains the menu related to the serial WAN V.35 connection.
- Slot 7 (menu 70-000) This is for the on-board (Motherboard) data modems. These are not existent on the standard manufactured R300. This slot will typically display "Not Available" at this menu setting.

## Status Windows

The default status window setup uses the items in Table 16 in the appropriate status window:.

**Table 16. Default Status Window Items**

| Screen Name | Purpose |
|---|---|
| Status 1 - 10-100 | First WAN interface status |
| Status 2 - 30-000 | Combo Blade station and trunk status |
| Status 3 - 10-200 | Second WAN interface status |
| Status 4 - 00-200 | System events (last 31 tasks completed) |
| Status 5 - 40-300 | WAN receive and transmit status |
| Status 6 - 40-400 | Ethernet receive and transmit status |
| Status 7 - 00-100 | System options |
| Status 8 - 40-100 | Ethernet sessions |

If you want to change the default information, changes are made in the System Config menu at the bottom. For example, to change the default information for the Status 2 (Combo Blade) window, you would proceed as follows:

1. From the Main Edit Menu, select System>Sys Config>Status
2. Type 30-000 on Status 2.
3. Press 2 to save your changes.
4. Press the left arrow key or ESC key twice to return to the Main Edit Menu.

Reset the system to implement the default status window setup.

You can find additional information on the status windows in *Max Reference, Chapter 1, Status-Window Reference.*

The status indicator panes are listed from left to right starting at the top:

- Line 1 Status - This shows the status of each channel on the first T1/E1/BRI line remoted through the Avaya R300 unit. L1 indicates this is line one. The information following the slash indicate the status of the line (YA=Yellow Alarm, RA=Red Alarm, LA=Line Active).
- 30-000 Line Stat - This shows the status of the lines on the Combo Blade.
  - The top row of symbols represent the first 12 DCP lines, and the bottom row of symbols represent DCP lines 13-24.
  - The two symbols under the **A** represent the 2 analog lines.
  - When a line has a **.** (dot), it is not registered with the DEFINITY system.
  - When a line has a **-** (dash), it is registered, but not active on a call.
  - When a line has a ***** (star), it is active on a call.
- Line 2 Status - This shows the status of each port on the second T1/E1/BRI line remoted through the Avaya R300 unit. Status indicators are the same for both lines.
- Message Log - This shows messages generated by the system.
- WAN Stats - This shows the status of the WAN connection and the number of packets transferred through the WAN.
- Ethernet Status - This shows the status of the ethernet connection, the number of packets transferred through the ethernet connection, and collisions.
- System Options - This shows the system options for the Avaya R300 including the software version and security profile. You can scroll through this pane to view all system options set.
- Sessions - This shows active sessions on the Avaya R300 unit.

To move between status indicator panes, press Tab until the pane has a think double line around it. Use the arrow keys to scroll up and down in a pane to display all information.

# The Avaya R300 IP address

Assign an IP address to the Avaya R300 using a dumb terminal, workstation, or PC connected by a serial connection. Refer to the *MAX 3000 Installation and Basic Configuration Guide*, Chapter 3: "MAX User Interfaces," for instructions on configuring your PC or workstation.

**NOTE:**
You must complete this step, at minimum, for Telnet administration to work.

To assign an IP address, set the IP Adrs field in the Ether Options profile, which is located in Ethernet > Mod Config > Ether Options. Proceed as follows:

1. From the Main Edit Menu, select Ethernet > Mod Config > Ether Options.

   The following list of parameters appears. (The settings shown are examples only.)

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|40-100 Mod Config             | |10-100 1234567890   | |30-000 Line Stat    |
| Ether options...             | | L1/RA nnnnnnnnnn   | |  123456789012  A   |
| >IP Adrs=111.1.111.11/24     | |   12345678901234   | |  ---.......... -   |
|  2nd Adrs=0.0.0.0/0          | |   nnnnnnnnnnnnnn   | |   ............ -   |
|  RIP=Off                     | |--------------------| |--------------------|
|  2nd RIP=Off                 | |10-200 1234567890   | |00-200 15:10:34     |
|  RIP2 Use Multicast=No       | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|  Ignore Def Rt=Yes           | |   12345678901234   | | Ethernet up        |
|  Proxy Mode=Off              | |   @@@@@@@@@@@@@@   | |                    |
|  Filter=0                    | |--------------------| |--------------------|
|  IPX Frame=None              | |40-300 WAN Stats    | |40-400 Ether Stat   |
|  IPX Enet#=N/A               | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|  IPX Pool#=N/A               | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|  IPX SAP Filter=N/A          | |    CRC:          0v| |    Col:       3530 |
|  Handle IPX Type20=N/A       | |--------------------| |--------------------|
|                              | |00-100 Sys Option   | |40-100 Sessions     |
|                              | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027      v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

2. Complete the IP Adrs field with the IP address and (optional) subnet mask of the Avaya R300. A slash (/) separates the address and the mask. For example, 198.5.248.40/24 indicates that 24 bits (for example, 255.255.255.0) of the IP address are interpreted as network bits.

3. Press the left arrow or ESC key to exit the Ether Options profile.

   A confirmation menu appears.

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|EXIT?                         | |10-100 1234567890   | |30-000 Line Stat    |
|>0=ESC (Don't exit)           | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
| 1=Exit and discard           | |   12345678901234   | |   ---..........-   |
| 2=Exit and accept            | |   nnnnnnnnnnnnnn   | |   ............-   |
|                              | |--------------------| |--------------------|
|                              | |10-200 1234567890   | |00-200 15:10:34     |
|                              | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|                              | |   12345678901234   | | Ethernet up        |
|                              | |   @@@@@@@@@@@@@@   | |                    |
|                              | |--------------------| |--------------------|
|                              | |40-300 WAN Stat     | |40-400 Ether Stat   |
|                              | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|                              | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|                              | |    CRC:          0v| |    Col:       3530 |
|                              | |--------------------| |--------------------|
|                              | |00-100 Sys Option   | |40-100 Sessions     |
|                              | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027      v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

4. Press 2 to save your changes.
5. Press the left arrow or ESC key twice to return to the Main Edit Menu.

## The Avaya R300 gateway

To assign a default gateway to the Avaya R300 proceed as follows:

1. From the Main Edit Menu, select Ethernet > Static Rtes.

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|E40-000 Ethernet              | |10-100 1234567890   | |30-000 Line Stat    |
| Static Rtes                  | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
| >Name:Default                | |   12345678901234   | |   ---..........-   |
|  Active=Yes                  | |   nnnnnnnnnnnnnn   | |   ............-   |
|  Dest=0.0.0.0/0              | |--------------------| |--------------------|
|  Gateway=111.11.11.11        | |10-200 1234567890   | |00-200 15:10:34     |
|  Metric=1                    | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|  Preference=100              | |   12345678901234   | | Ethernet up        |
|  Private=Yes                 | |   @@@@@@@@@@@@@@   | |                    |
|  Ospf-Cost=1                 | |--------------------| |--------------------|
|  LSA type=ExternalType1      | |40-300 WAN Stat     | |40-400 Ether Stat   |
|  NSSA-ASE1=N/A               | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|  ASE-tag=c0000000            | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|  Third-party=No              | |    CRC:          0v| |   Col:       3530  |
|                              | |--------------------| |--------------------|
|                              | |00-100 Sys Option   | |40-100 Sessions     |
|                              | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027      v| |                    |
 Press Ctrl-n to move cursor to the next menu item. Press return to select it.
 Press Tab to move to another window --- thick border indicates active window.
```

2. Type the IP address of the gateway in the Gateway field. Set this to the default gateway for your subnet.
3. Press the left arrow or ESC key to exit the Static Rtes profile.

   A confirmation menu appears.
4. Press 2 to save your changes.
5. Press the left arrow or ESC key twice to return to the Main Edit Menu.

Refer to the *MAX 3000 Installation and Basic Configuration Guide*, Chapter 4: "Preparing to Configure the MAX," for information on

- Securing the Avaya R300 from unauthorized configuration changes
- Setting Avaya R300 system options

## IP assignment confirmation

**NOTE:**
You should first enter the Avaya R300's "terminal Server" mode by typing CNTRL -D E. Then invoke the ping command toward a host PC or router on your own subnet. This will cause all of the host devices on your subnet to update their address resolution protocol (ARP) tables.

After assigning an IP address, ping the gateway machine from the Avaya R300 to verify the Avaya R300 network connection.

1. Ping from the terminal server window on the Avaya R300.
2. Type **ping** ***nnn.nnn.nnn.nnn*** and press ENTER where nnn.nnn.nnn.nnn is the IP address of the gateway machine.

Ping the Avaya R300 from another system to make sure the IP assignment is correct.

1. Ping from a DOS or UNIX prompt.
2. Type **ping** ***nnn.nnn.nnn.nnn*** and press ENTER where nnn.nnn.nnn.nnn is the IP address of the Avaya R300.

## Avaya R300 system information

Do the remaining configuration and administration either by using the serial connection to the Avaya R300 or by opening a telnet session to the Avaya R300.

System information for the Avaya R300 identifies it to the rest of the network and provides the date and time to the phones connected through the Avaya R300.

To assign system information to the Avaya R300, proceed as follows:

**NOTE:**
You must move the ">" scroll arrow downward to show more parameters in the system configuration (Sys Config) list.

1. From the Main Edit Menu, select System > Sys Config.
2. In the System> Sys Config menu, complete these fields:
   - Name: (Give the Avaya R300 a unique name of no more than sixteen characters. In general, use the same name for the Avaya R300 as the DNS name assigned to it. The name is case-sensitive.)
   - Location: (This can be the physical address of the Avaya R300, or it can be a location on a rack.)
   - Contact: (This is generally the system administrator for the Avaya R300.)
   - Max Dialout Time: (This field should be set to 225.)
   - Analog Encoding: (This field should be set to a-law or μ-law.)

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|00-100 Sys Config             | |10-100 1234567890   | |30-000 Line Stat    |
|>Name=                      ^ | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
| Location=                    | |   12345678901234   | |   ---.............-   |
| Contact=                     | |   nnnnnnnnnnnnn    | |   ..............-   |
| Date=07/19/2000              | |--------------------| |--------------------|
| Time=16:21:23                | |10-200 1234567890   | |00-200 15:10:34     |
| Term Rate=9600               | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
| Console=Standard             | |    12345678901234  | | Ethernet up        |
| Console Security=None        | |    @@@@@@@@@@@@@@  | |                    |
| Remote Mgmt=Yes              | |--------------------| |--------------------|
| Max Dialout Time=20          | |40-300 WAN Stat     | |40-400 Ether Stat   |
| Parallel Dial=5              | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
| Single Answer=Yes            | | Tx Pkt:        511 | | Tx Pkt:      10056 |
| Sub-Adr=None                 | |    CRC:          0v| |    Col:       3530 |
| Serial=0                     | |--------------------| |--------------------|
|  LAN=0                       | |00-100 Sys Option   | |40-100 Sessions     |
|  DM=0                        | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027      v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

3. Check the Date and Time fields and correct them, as needed.
4. Press the left arrow or ESC key to exit the Sys Config profile.

   A confirmation menu appears.
5. Press 2 to save your changes.
6. Press the left Arrow or ESC key twice to return to the Main Edit Menu.

# Avaya R300 T1 line (PSTN) configuration

To configure the T1 slot, you must set the parameters that specify the lines' connection to the Central Office switch.

For the T1 slot configuration, you open the Factory profile to the slot's Line 1 profile, and specify signaling mode, framing type, encoding, channel service unit (CSU) usage, cable length, line attenuation, and channel usage. If you are using inband signaling, you need to configure incoming call routing. If you want to use dynamic IP addressing, you need to configure the address pool characteristics.

## Specify and configure signaling mode

To specify the signaling mode, open the Net/T1 > Line Config > Factory profile > Line 1 profile for the line.

Set the Sig Mode parameter to specify the type of signaling to be used on the T1 line: ISDN, ISDN_NFAS, or Inband.

To configure the signaling mode you selected, do the following:

- If you selected ISDN_NFAS as the signaling mode, set the NFAS ID Num field to specify a number from 0 to 31 for each NFAS line. You must set this field to a unique number. The default is 1 for line 1 and 2 for line 2.
- If you selected Inband as the signaling mode, set the Rob Ctl field to specify the robbed-bit call-control mechanism.
- If you selected ISDN as the signaling mode:
  - set the Switch Type field to specify the type of WAN switch used at the t1 interface line's service provider point of presence. The choices are AT&T, NTI for Northern Telecom, NI-2 for National ISDN2, and Japan for the Japanese mode.
  - set the ISDN TE/NT Mode field to specify TE (terminal equipment).

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|10-1** isdn-pri               | |10-100 1234567890   | |30-000 Line Stat    |
| Line 1...                ^ | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
| >Sig Mode=ISDN               | |   12345678901234   | |   ---..........-   |
|  NFAS ID num=N/A             | |   nnnnnnnnnnnnnn   | |   ............-   |
|  Rob Ctl=N/A                 | |--------------------| |--------------------|
|  Switch Type=AT&T            | |10-200 1234567890   | |00-200 15:10:34     |
|  ISDN TN/NT mode=TE          | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|  Framing Mode=ESF            | |    12345678901234  | | Ethernet up        |
|  Front End=CSU               | |    @@@@@@@@@@@@@@  | |                    |
|  Encoding=B8ZS               | |--------------------| |--------------------|
|  FDL=None                    | |40-300 WAN Stat     | |40-400 Ether Stat   |
|  Length=N/A                  | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|  Buildout=0 dB               | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|  Clock Source=Yes            | |    CRC:          0v| |    Col:       3530 |
|  Collect DNIS/ANI=N/A        | |--------------------| |--------------------|
|  InterDigit Timeout=N/A      | |00-100 Sys Option   | |40-100 Sessions     |
|  Pbx Type=N/A            v | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027     v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|10-1** isdn-pri               | |10-100 1234567890   | |30-000 Line Stat    |
| Line 1...                ^ | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
|  Pbx Type=N/A                | |   12345678901234   | |   ---..........-   |
|  Delete Digits=N/A           | |   nnnnnnnnnnnnnn   | |   ............-   |
|  Add Number=N/A              | |--------------------| |--------------------|
|  Call-by-Call=N/A            | |10-200 1234567890   | |00-200 15:10:34     |
|  T1 PRI:PRI # Type=N/A       | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|  T1 PRI:NumPlanID =N/A       | |    12345678901234  | | Ethernet up        |
|  Ans #=N/A                   | |    @@@@@@@@@@@@@@  | |                    |
|  Ans Service=N/A             | |--------------------| |--------------------|
|  Input Sample Count=N/A      | |40-300 WAN Stat     | |40-400 Ether Stat   |
|  Send Disc=0                 | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|  Net2Net Incoming Calls...   | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|  Net2Net ChanGroup ID...     | |    CRC:          0v| |    Col:       3530 |
|  Ch 1=Switched               | |--------------------| |--------------------|
|  Ch 1 #=                     | |00-100 Sys Option   | |40-100 Sessions     |
|  Ch 1 Slot=0             v | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027     v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

## Specify the other required parameters

In addition to setting signaling mode, you must perform the following steps for the profile:

1. Set the Framing Mode field to D4 or ESF to specify the type of framing the line uses.
2. Set the Front End field to CSU to enable the internal CSU. Disable the internal CSU by setting Front End to DSX.
3. Set the Encoding field to None (identical to AMI, but without density enforcement), AMI, or B8ZS to specify the encoding used on this line.

4. Set the FDL field to N/A (appropriate for Framing Mode=D4), None, AT&T, ANSI, or Sprint to specify the Facility Data Link (FDL) used on the line.
5. Set the Length parameter as appropriate for your site. If you are using the internal CSU, keep it at the default value.
6. Set the Buildout field to specify proper line attenuation. Obtain this information from your service provider. The default is 0dB.
7. Set the Clock Source field to “yes” if you wish to have the T1 line as the master clock source for synchronous connections, otherwise set this to “no”.
8. If you cannot accept the default channel usage of `switched` for every channel on the line, set the Ch *N* field to Switched (the default), Nailed (dedicated), or Unused (not in service).
9. Use the Collect DNIS/ANI parameter to enable the Avaya R300 to collect the Automatic Number Identifier (ANI) and the Dialed Number Identification String (DNIS) signals. From the Main Edit Menu, select Net/T1>Line Config>10-1**>Line 1 Menu to use the Collect DNIS/ANI parameter.

   **NOTE:**
   These signals support ANI authentication of Avaya R300 users and single-stage dialing. DNIS and ANI can be collected for three network signal types:

   - DTMF tones in T1 inband
   - MF tones in E1 R2
   - D channel messages in T1/E1 PRI or BRI

   **NOTE:**
   To process DNIS and ANI signals, the telephone switch connected to the Avaya R300 must support DNIS and ANI pass-through signaling

10. You may configure each of the 24 channels to one of the following uses:

    — Switched (default) -

    Supports switched connections. This can be robbed-bit or a B-channel depending on the signaling mode.

    — Nailed -

    A clear-channel 64 Kbps circuit.

    — D channel -

    The channel that conveys signaling information for ISDN. Assigned automatically when you select ISDN signaling mode.

    — NFAS-Prime

    Primary D channel for two T1 lines that support NFAS signaling. You would use this as the D channel for both lines, unless it became unavailable.

— NFAS-Second

Secondary D channel for two T1 lines that support NFAS signaling. You would use this as the secondary (backup) D channel.

— Unused

Unavailable for use. For example, in fractional T1 usage set the channels that are unavailable to “unused”.

## Save the line profile for WAN interfaces

A T1, E1, or BRI WAN configuration has many parameters. Because they are so numerous, you may find it helpful to save them into a profile, and give the profile a symbolic name.

To save a profile:

1. From the Main Edit Menu, select T1>Net/T1>Line Config
2. Enter the “Save File” mode by typing CNTRL-D S. You will be prompted to store in one of four places:

   10-1** factory

   - 10-101
   - 10-102
   - 10-103
   - 10-104

   The presence of “**” indicates the active profile.
3. Complete the task by typing ENTER.

To provide a name for this profile:

4. Type ENTER to select one of the four profiles.
5. Select the Name field and type in the name.

To load this profile to make it active:

6. Enter “Load File” mode by typing CNTRL-D L. The display will now show a double asterisk to indicate that this is the active profile.

**NOTE:**
Lines 1 and 2 for T1 or E1 interfaces are both saved into one of the four WAN interface profile files.

# The Avaya R300 T1 line (IP routed over T1) configuration

## Specify and configure signaling mode and channel usage

The following example is for an In-band signaling trunk. If the user wishes to set this up over an ISDN trunk, he can do the administration by setting the "Sig Mode" parameter to select "ISDN".

To configure one of the T1 interfaces so that the all of the traffic destined to be IP-routed back to the host DEFINITY uses that path:

1. Open the Net/T1>Line Confg>Factory Profile>Line 1:

**NOTE:**
Instead of "Factory Profile", you could enter one of the other four profiles as described in the last section (Save the Line Profile for WAN Interfaces). If you wish to select the second T1 interface, you would enter "Line 2".

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|10-1** T1-Non Channel         | |10-100 1234567890   | |30-000 Line Stat    |
| Line 1...                  ^ | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
| >Sig Mode=Inband             | |   12345678901234   | |   ---.........-    |
|  NFAS ID num=N/A             | |   nnnnnnnnnnnnnn   | |   .............-   |
|  Rob Ctl=Wink-Start          | |--------------------| |--------------------|
|  Switch Type=N/A             | |10-200 1234567890   | |00-200 15:10:34     |
|  ISDN TN/NT mode=N/A         | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|  Framing Mode=ESF            | |    12345678901234  | | Ethernet up        |
|  Front End=DSX               | |    @@@@@@@@@@@@@@  | |                    |
|  Encoding=B8ZS               | |--------------------| |--------------------|
|  FDL=None                    | |40-300 WAN Stat     | |40-400 Ether Stat   |
|  Length=1-133                | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|  Buildout=N/A                | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|  Clock Source=Yes            | |    CRC:          0v| |    Col:       3530 |
|  Collect DNIS/ANI=No         | |--------------------| |--------------------|
|  InterDigit Timeout=N/A      | |00-100 Sys Option   | |40-100 Sessions     |
|  Pbx Type=N/A              v | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027     v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|10-1** T1-Non Channel         | |10-100 1234567890   | |30-000 Line Stat    |
| Line 1...                  ^ | | L1/RA nnnnnnnnn    | |   123456789012 A   |
|  Pbx Type=N/A                | |   12345678901234   | |   ---..........-   |
| >Delete Digits=N/A           | |   nnnnnnnnnnnnn    | |   ............-   |
|  Add Number=N/A              | |--------------------| |--------------------|
|  Call-by-Call=N/A            | |10-200 1234567890   | |00-200 15:10:34     |
|  T1 PRI:PRI # Type=Unknown   | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|  T1 PRI:NumPlanID =ISDN      | |    12345678901234  | | Ethernet up        |
|  Ans #=N/A                   | |    @@@@@@@@@@@@@@  | |                    |
|  Ans Service=N/A             | |--------------------| |--------------------|
|  Input Sample Count=N/A      | |40-300 WAN Stat     | |40-400 Ether Stat   |
|  Send Disc=0                 | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|  Net2Net Incoming Calls...   | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|  Net2Net ChanGroup ID...     | |    CRC:          0v| |    Col:       3530 |
|  Ch 1=Nailed                 | |--------------------| |--------------------|
|  Ch 1 #=N/A                  | |00-100 Sys Option   | |40-100 Sessions     |
|  Ch 1 Slot=N/A             v | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027      v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

2. Set the Sig Mode parameter to specify the type of signaling to be "Inband".
3. Set the Clock Source parameter to "Yes".
4. Set the Channel 1 to be set to "nailed". Repeat for as many channels as are to be used over this T1 interface for the "nailed transmission pipe".

## Specify the IP-routed connection

1. Open the administration path to Ethernet>Connections:

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|40-101 remote office 6        | |10-100 1234567890   | |30-000 Line Stat    |
|>Station=remote office 6    ^ | | L1/LA -----------  | |   123456789012 A T |
| Active=Yes                   | |   12345678901234   | |   ---...........- - |
| Encaps=PPP                   | |   -------------s   | |   ............- - |
| PRI * Type=National          | |--------------------| |--------------------|
| NumPlanID =ISDN              | |10-200 1234567890   | |00-200 15:10:34     |
| Dial #=N/A                   | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
| Calling #=                   | |   12345678901234   | | Call Terminated    |
| Called #=                    | |   @@@@@@@@@@@@@@   | |                    |
| Route IP=Yes                 | |--------------------| |--------------------|
| Route IPX=N/A                | |40-300 WAN Stat     | |40-400 Ether Stat   |
| Framed Only=No               | |>Rx Pkt:       3976^| |>Rx Pkt:     364473 |
| Bridge=N/A                   | | Tx Pkt:       5251 | | Tx Pkt:      88966 |
| Dial Brdcast=N/A             | |    CRC:          0v| |    Col:          0 |
| Shared Prof=No               | |--------------------| |--------------------|
| Encaps options...            | |00-100 Sys Option   | |40-100 Sessions     |
| IP options...              v | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 10341016     v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|40-101 remote office 6        | |10-100 1234567890   | |30-000 Line Stat    |
| IP options...              ^| | L1/LA -----------  | |   123456789012 A T |
|>Ipx options...               | |   12345678901234   | |   ---...........- - |
| Session options...           | |   -------------s   | |   ............- - |
| OSPF options...              | |--------------------| |--------------------|
| Telco options...             | |10-200 1234567890   | |00-200 15:10:34     |
| Accounting...                | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
| Interface Options...         | |   12345678901234   | | Call Terminated    |
|                              | |   @@@@@@@@@@@@@@   | |                    |
|                              | |--------------------| |--------------------|
|                              | |40-300 WAN Stat     | |40-400 Ether Stat   |
|                              | |>Rx Pkt:       3976^| |>Rx Pkt:     364473 |
|                              | | Tx Pkt:       5251 | | Tx Pkt:      88966 |
|                              | |    CRC:          0v| |    Col:          0 |
|                              | |--------------------| |--------------------|
|                              | |00-100 Sys Option   | |40-100 Sessions     |
|                              | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 10341016     v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

2. Set the Station parameter to its functional name.

**NOTE:**
This will be used as the "destination" name in the IP sessions status window (40-100) in the eighth status window.

3. Set the Active parameter to "yes" to enable this static IP routed path.
4. Set the Encaps parameter to "PPP" to enable the Point-to-Point WAN protocol to be used to convey the IP routed voice/data stream.

## Specify the telco dial options

1. Go to the Telco options subprofile by opening ethernet>connections>Telco Options:

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|40-101 remote office 6        | |10-100 1234567890   | |30-000 Line Stat    |
| Telco options...             | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
|  AnsOrig=N/A               ^| |   12345678901234   | |   ---...........-  |
| >Callback=N/A                | |   nnnnnnnnnnnnn    | |   ............-   |
|  Exp Callback=N/A            | |--------------------| |--------------------|
|  Callback Delay=N/A          | |10-200 1234567890   | |00-200 15:10:34     |
|  Call Type=Nailed            | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|  Group=1                     | |    12345678901234  | | Ethernet up        |
|  FT1 Caller=N/A              | |    @@@@@@@@@@@@@@  | |                    |
|  Data Svc=64K                | |--------------------| |--------------------|
|  Force 56=No                 | |40-300 WAN Stat     | |40-400 Ether Stat   |
|  Bill *=                     | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|  Call-by-Call=0              | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|  Transit #=                  | |    CRC:          0v| |    Col:       3530 |
|  Dialout OK=No               | |--------------------| |--------------------|
|  NAS Port Type=Any           | |00-100 Sys Option   | |40-100 Sessions     |
|                            v | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027      v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

2. Set the Call type parameter to be "nailed".
3. Set the Data Svc parameter to be "64K". This allows the non-channelized T1 pipe to be built with channels that are 64 Kbps in size.

## Specify the IP options

1. Go to the IP Options (for routing over a WAN interface) subprofile by opening ethernet>connections>Ip options:

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|40-101 remote office 6        | |10-100 1234567890   | |30-000 Line Stat    |
| IP options...                | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
|  LAN Adrs=135.9.76.118/32  ^ | |   12345678901234   | |   ---.........-    |
| >WAN Alias=0.0.0.0           | |   nnnnnnnnnnnnn    | |   ............-    |
|  IF Adrs=0.0.0.0/0           | |--------------------| |--------------------|
|  Preference=60               | |10-200 1234567890   | |00-200 15:10:34     |
|  Metric=1                    | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|  DownPreference=120          | |    12345678901234  | | Ethernet up        |
|  DownMetric=7                | |    @@@@@@@@@@@@@@  | |                    |
|  Private=No                  | |--------------------| |--------------------|
|  SourceIP Check=No           | |40-300 WAN Stat     | |40-400 Ether Stat   |
|  RIP=Off                     | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|  Pool=0                      | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|  Multicast Client=No         | |    CRC:          0v| |    Col:       3530 |
|  Multicast Rate Limit=100    | |--------------------| |--------------------|
|  Multicast Grp Leave Delay=0 | |00-100 Sys Option   | |40-100 Sessions     |
|  Client Pri DNS=0.0.0.0    v | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027      v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.

|-------- MAX EDIT ------------| |--------------------| |--------------------|
|40-101 remote office 6        | |10-100 1234567890   | |30-000 Line Stat    |
| IP options...                | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
|  Client Pri DNS=0.0.0.0    ^ | |   12345678901234   | |   ---.........-    |
| >Client Sec DNS=0.0.0.0      | |   nnnnnnnnnnnnn    | |   ............-    |
|  Client Assign DNS=No        | |--------------------| |--------------------|
|  Client Pri WINS=0.0.0.0     | |10-200 1234567890   | |00-200 15:10:34     |
|  Client Sec WINS=0.0.0.0     | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|  Client Assign WINS=Yes      | |    12345678901234  | | Ethernet up        |
|  Client Gateway=0.0.0.0      | |    @@@@@@@@@@@@@@  | |                    |
|  TOS Enabled=Yes             | |--------------------| |--------------------|
|  Precedence=000              | |40-300 WAN Stat     | |40-400 Ether Stat   |
|  TOS=Normal                  | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|  Apply To=Both               | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|  TOS Filter=0                | |    CRC:          0v| |    Col:       3530 |
|  Virtual Router=N/A          | |--------------------| |--------------------|
|                              | |00-100 Sys Option   | |40-100 Sessions     |
|                              | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027      v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

2. Set the LAN Adrs parameter to the dotted decimal number of the router/gateway device that is at the other end of this T1 routed IP-based network.

## Specify the encap options

1. Go to the Encap Options (for routing over a WAN interface) subprofile by opening ethernet>connections>Encap options:

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|40-101 remote office 6        | |10-100 1234567890   | |30-000 Line Stat    |
| Encaps options...            | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
| >Send Auth=PAP             ^ | |   12345678901234   | |   ---.............-   |
|  Bi-dir Auth=N/A             | |   nnnnnnnnnnnnnn   | |   ..............-   |
|  Send Name=rem-off X         | |--------------------| |--------------------|
|  Send PW=****                | |10-200 1234567890   | |00-200 15:10:34     |
|  Recv Name=N/A               | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|  Recv PW=****                | |    12345678901234  | | Ethernet up        |
|  MRU=1524                    | |    @@@@@@@@@@@@@@  | |                    |
|  MTU=1524                    | |--------------------| |--------------------|
|  LQM=No                      | |40-300 WAN Stat     | |40-400 Ether Stat   |
|  LQM Min=600                 | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|  LQM Max=600                 | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|  Link Comp=Stac              | |    CRC:          0v| |    Col:       3530 |
|  VJ Comp=Yes                 | |--------------------| |--------------------|
|  CBCP Mode=N/A               | |00-100 Sys Option   | |40-100 Sessions     |
|  CBCP Trunk Group=N/A      v | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027     v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.

|-------- MAX EDIT ------------| |--------------------| |--------------------|
|40-101 remote office 6        | |10-100 1234567890   | |30-000 Line Stat    |
| Encaps options...            | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
|  CBCP Trunk Group=N/A      ^ | |   12345678901234   | |   ---.............-   |
|  IPX Header Compression=N/A  | |   nnnnnnnnnnnnnn   | |   ..............-   |
|  Split Code.User=N/A         | |--------------------| |--------------------|
|  InterfaceType=HDLC-LIKE     | |10-200 1234567890   | |00-200 15:10:34     |
|                              | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|                              | |    12345678901234  | | Ethernet up        |
|                              | |    @@@@@@@@@@@@@@  | |                    |
|                              | |--------------------| |--------------------|
|                              | |40-300 WAN Stat     | |40-400 Ether Stat   |
|                              | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|                              | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|                              | |    CRC:          0v| |    Col:       3530 |
|                              | |--------------------| |--------------------|
|                              | |00-100 Sys Option   | |40-100 Sessions     |
|                              | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027     v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

2. Set the Send Auth parameter to the desired type of sending authorization protocol: PAP, CHAP, PAP-Token, Cache-Token, MS-Chap, or None. This sets up the authorization protocol to be associated with the setting up of a PPP (point-to-point protocol) exchange.

**NOTE:**
You have the ability to set up both a receive name/password and a send name/password for this authorization exchange.

3. Set the sender name as appropriate (rem-off X in this example).
4. Set the sender password. This must match the password that the peer WAN router will be using to receive the authorization handshake.
5. Set the receiver password. This must match the password the peer WAN router will be using to transmit authorization handshake.

### Use the iproute show command to view routing tables

As a final step, you should enter the terminal server mode by entering "cntrl D E". Then execute the traceroute command to perform traceroutes back to the CLAN and the Media Processor to confirm that the correct routed gateway is being used.

You may also use the terminal server command "iproute show" to get a display of the routed destinations, and enable you to add an delete IP routes.

```
** Ascend Pipeline Terminal Server **

ascend% iproute show

Destination        Gateway         IF       Flg   Pref Met     Use     Age
0.0.0.0/0          135.9.76.118    wan9     SGP     60   1   38632  362485
127.0.0.0/8        -               bh0      CP       0   0       0  362485
127.0.0.1/32       -               local    CP       0   0       0  362485
127.0.0.2/32       -               rj0      CP       0   0       0  362485
135.9.75.0/24      -               ie0      C        0   0   55072  362485
135.9.75.116/32    -               local    CP       0   0   17232  362485
135.9.76.118/32    135.9.76.118    wan9     rT      60   1       0  362473
135.9.76.118/32    135.9.76.118    wan9     *S     120   7       1  362485
224.0.0.0/4        -               mcast    CP       0   0       0  362485
224.0.0.1/32       -               local    CP       0   0       0  362485
224.0.0.2/32       -               local    CP       0   0       0  362485
224.0.0.9/32       -               local    CP       0   0       0  362485
255.255.255.255/32 -               ie0      CP       0   0    5178  362485
```

See the Chapter 5 "Managing IP Routes and Sessions" in the Lucent-Ascend MAX 3000 Administration Guide" for more details. You can find documentation of Lucent-Ascend's MAX 3000 on the DEFINITY Systems Library CD shipped with the Avaya R300.

## The Avaya R300 combo blade card configuration

Configure the Combo Blade card in order to register DCP and Analog lines for use with your Avaya R300. The steps to register an Analog and a DCP line are the same.

## Configure DCP lines

Configure DCP lines by doing the following:

1. From the Main Edit Menu, select DEFINITY Combo Blade > Mod Config > DCP Line *X*.
2. In the DEFINITY Combo Blade > Mod Config > DCP Line *X* menu, complete the following fields:
   - Registration Mode: (TTI or Named or Disabled)

     In TTI mode, the Avaya R300 follows DEFINITY rules for operator access codes and TTI access codes. In Named mode, registration occurs at the switch even if a phone is not plugged into the interconnect unit. Administer unavailable phones as DISABLED to conserve resources on the switch.
   - Extension Number: If registration mode is named, enter the extension number. Otherwise this will remain N/A.
   - Extension Password: If registration mode is Named, enter the extension password (This must match the security code in the display station form on the DEFINITY system). Otherwise this will remain N/A.

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|30-100 Mod Config             | |10-100 1234567890   | |30-000 Line Stat    |
| DCP Line 1...                | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
| >Registration Mode:=Named    | |   12345678901234   | |   ---..........-   |
|  Exctension Number=3601      | |   nnnnnnnnnnnnnn   | |   ............-   |
|  Extension Password=****     | |--------------------| |--------------------|
|                              | |10-200 1234567890   | |00-200 15:10:34     |
|                              | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|                              | |   12345678901234   | | Ethernet up        |
|                              | |   @@@@@@@@@@@@@@   | |                    |
|                              | |--------------------| |--------------------|
|                              | |40-300 WAN Stat     | |40-400 Ether Stat   |
|                              | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|                              | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|                              | |    CRC:          0v| |    Col:       3530 |
|                              | |--------------------| |--------------------|
|                              | |00-100 Sys Option   | |40-100 Sessions     |
|                              | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027      v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

3. Press the left arrow or ESC key to exit the DCP Line *X* profile.

   A confirmation menu appears.
4. Press 2 to save your changes.
5. Press the left arrow or ESC key twice to return to the Main Edit Menu.

## Configure analog lines

Administer the following common analog information.

1. From the Main Edit Menu, select DEFINITY Combo Blade > Mod Config.
2. Select Analog Common.

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|30-100 Mod Config             | |10-100 1234567890   | |30-000 Line Stat    |
| Analog Common                | | L1/LA -----------  | |   123456789012 A T |
|>Country Code=USA             | |   12345678901234   | |   ---..........- - |
| Balance Network=R            | |   -------------s   | |   ............- - |
| Codec Gain=Low               | |--------------------| |--------------------|
| Ringer Freq=By Country       | |10-200 1234567890   | |00-200 15:10:34     |
| Ringing Pattern=USA          | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
| Recall Window Min=10         | |   12345678901234   | | Call Terminated    |
| Recall Window Max=50         | |   @@@@@@@@@@@@@@   | |                    |
| Forward Disconnect Timer=20  | |--------------------| |--------------------|
|                              | |40-300 WAN Stat     | |40-400 Ether Stat   |
|                              | |>Rx Pkt:       3976^| |>Rx Pkt:     364473 |
|                              | | Tx Pkt:       5251 | | Tx Pkt:      88966 |
|                              | |    CRC:          0v| |    Col:          0 |
|                              | |--------------------| |--------------------|
|                              | |00-100 Sys Option   | |40-100 Sessions     |
|                              | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 10341016     v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

3. Complete the following fields:
   - Country Code: Select the appropriate country code.

     This controls the parameters used for processing analog signals on the attached analog stations.
   - Balance Network: Select R - (Not currently used in R300).
   - CODEC Gain: Select Low - (Not currently used in R300).
   - Ringer Freq: Select By Country.

     This will use the default ringer frequency for the country code you have chosen. You would select this in most circumstances, unless you are using non-native phones.

     If the phone on this analog line has a ringer frequency that differs from the default for your country code, select the appropriate ringer frequency: 20 Hz, 25 Hz or 50 Hz.
   - Ringing pattern: Select the appropriate ringing pattern for your country.

     This controls the set of ring cadences the analog phone connected to the analog line will use.
   - Recall Window Min: Select a time interval in units of 10ms.

     Disconnects (caused, for example, by momentarily depressing the switch hook on the analog phone) of less than this time interval will not be a “flash” signal to the DEFINITY system.

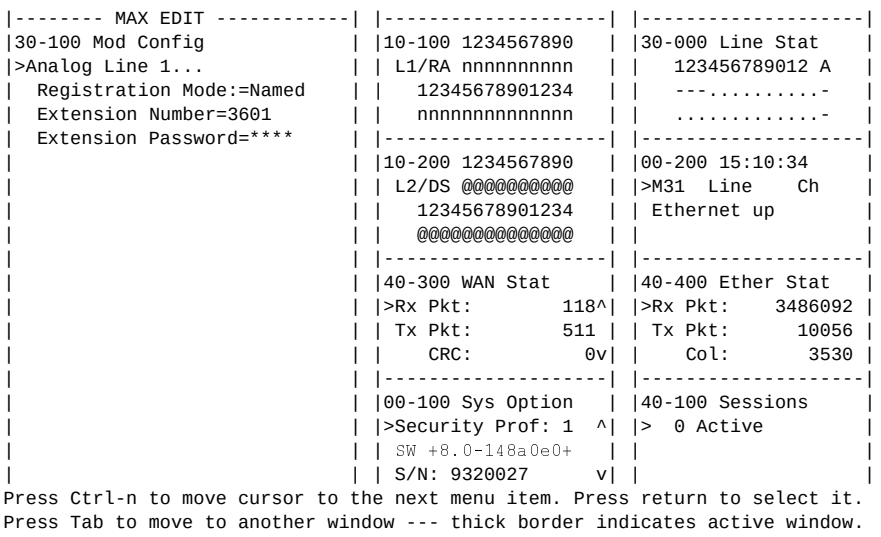
- Recall Window Max: Select a time interval in units of 10ms.

  Disconnects (caused, for example, by momentarily depressing the switch hook on the analog phone) of more than this time interval will not be a “flash” signal to the DEFINITY system.

- Forward Disconnect Time: Select a time interval in units of 25ms.

  Disconnects (caused, for example, by momentarily depressing the switch hook on the analog phone) of less than this time interval, will not be a “hang up” signal to the DEFINITY system. Also, a disconnect originated by the DEFINITY system will be at least this long.

4. Press the left arrow or ESC key to exit the Analog Common profile and return to the Mod Config menu.
5. Begin by configuring the first analog line; Select Analog Line 1 from the Mod Config menu.




6. Complete the following fields:

   - Registration Mode: Select TTI, Named or Disabled.

     In TTI Mode, the Avaya R300 follows DEFINITY rules for operator access codes and TTI access codes. In Named Mode, registration occurs at the switch even if a phone is not plugged into the interconnect unit. Administer unavailable phones as DISABLED to conserve resources on the switch.

   - Extension Number: If registration mode is named, enter the extension number. Otherwise this will remain N/A.

   - Extension Password: If registration mode is Named, enter the extension password (This must match the security code in the display station form on the DEFINITY system). Otherwise this will remain N/A.

     (If in TTI or Disabled mode, Extension Password is marked N/A.)

7. Press the left arrow or ESC key to exit the Analog Line 1 profile.
8. Select Analog Line 2 and repeat the process for the second analog line port.
9. Press the left arrow or ESC key to exit the Analog Line 2 profile.

   A confirmation menu appears.
10. Press 2 to save your changes.
11. Press the left arrow or ESC key twice to return to the Main Edit Menu.

## Configure central office loop-start analog trunks

1. From the Main Edit Menu, select DEFINITY Combo Blade>Mod Config> Trunk Common.

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|30-100 Mod Config             | |10-100 1234567890   | |30-000 Line Stat    |
| Trunk Common                 | | L1/RA nnnnnnnnn    | |   123456789012 A   |
| >Country Code=USA            | |   12345678901234   | |   ---.........-    |
|  Balance Network=RC          | |   nnnnnnnnnnnnn    | |   ............-    |
|  Codec Gain=High             | |--------------------| |--------------------|
|                              | |10-200 1234567890   | |00-200 15:10:34     |
|                              | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|                              | |   12345678901234   | | Ethernet up        |
|                              | |   @@@@@@@@@@@@@    | |                    |
|                              | |--------------------| |--------------------|
|                              | |40-300 WAN Stat     | |40-400 Ether Stat   |
|                              | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|                              | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|                              | |    CRC:          0v| |    Col:       3530 |
|                              | |--------------------| |--------------------|
|                              | |00-100 Sys Option   | |40-100 Sessions     |
|                              | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027      v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

3. Complete the following fields:
   - Country Code: Select USA (this is the only country currently supported).
   - Balance Network: Select R or RC.

     Select R balance if the distance between the Avaya R300 Unit and the nearest Public Switched Telephone Network (PSTN) office or repeater is less than 3000 feet.

     You can use either R or RC balance if that distance is between 3000 and 4000 feet. The VoIP echo canceler takes the greatest amount of time to converge (settle) in this range.

     Select RC balance when the distance between the Avaya R300 unit and the PSTN office or repeater is greater than 4000 feet but less than 5 miles.

- Codec Gain: Select High or Low

  Set the codec gain to high to induce 0dB of gain in the codec for the analog trunk.

  Set the codec gain to low to induce -2 dB of gain in the codec for the analog trunk.

  As a standard mode of operation, use the high setting. Only if you are experiencing unusual levels of echo, change the value to low. The low setting may cause the amplitude of the audio call to sound too soft (lower level of sound) for some users.

4. Press the left arrow or ESC key to exit the Trunk Common profile.
5. Configure the first analog trunk by selecting trunk 1.

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|30-100 Mod Config             | |10-100 1234567890   | |30-000 Line Stat    |
|>Trunk 1...                   | | L1/RA nnnnnnnnnn   | |   123456789012 A T |
|  Enabled=Yes                 | |   12345678901234   | |   ---...........- - |
|  Destination Number=3532     | |   nnnnnnnnnnnnnn   | |   ..............- - |
|  Dialing=DTMF                | |--------------------| |--------------------|
|  Connect Timer=10            | |10-200 1234567890   | |00-200 15:10:34     |
|                              | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|                              | |   12345678901234   | | Call Terminated    |
|                              | |   @@@@@@@@@@@@@@   | |                    |
|                              | |--------------------| |--------------------|
|                              | |40-300 WAN Stat     | |40-400 Ether Stat   |
|                              | |>Rx Pkt:       3976^| |>Rx Pkt:     357090 |
|                              | | Tx Pkt:       5251 | | Tx Pkt:      84048 |
|                              | |    CRC:          0v| |    Col:          0 |
|                              | |--------------------| |--------------------|
|                              | |00-100 Sys Option   | |40-100 Sessions     |
|                              | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 10341016     v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

7. Complete the following fields.

   - Enabled: Set this field to Yes if the analog trunk port is connected (for example to a Central Office trunk), otherwise set it to No to disable the port.
   - Destination Number: Set this to the number of the phone to which all incoming calls on this trunk should be forwarded. The default is 0 for operator. This can be any number 24 digits long or less.

     The Avaya R300 will direct any incoming call on this analog trunk to this number as if it had been dialed from one of the Avaya R300 DCP or analog stations. If you are using the analog trunks for FAX transmissions through a FAX machine attached to one of the Avaya R300 analog line ports, you probably will want to administer the FAX machine's number here.
   - Dialing: If the analog trunk is tone-dialed, then set this to DTMF. If it is pulse-dialed, set it to Pulse. DTMF is the default.

- Connect Timer: Set this in units of seconds (the default is 10). This is the number of seconds which the Avaya R300 will wait after dialing an outgoing analog trunk before assuming the call has been answered. Use this when the central office does not provide Line Side Answer Supervision. If the central office does not implement this feature, the DEFINITY system will assume the call has been answered after this timer expires, and marks this point as when the call began.

8. Press the left arrow or ESC key to exit the Trunk 1 profile.
9. Select Trunk 2 and repeat the process for the second analog trunk port.
10. Press the left arrow or ESC key to exit the Trunk 2 profile.

    A confirmation message appears.
11. Press 2 to save your changes.
12. Press the left arrow or ESC key twice to return to the Main Edit Menu.

## Avaya R300 DNS information

Configuring Domain Name Server (DNS) information is optional, but it is a good idea. DNS information allows a user to use symbolic names for servers, etc. from the diagnostic prompt and terminal server prompt. The DNS information is the name of the computer network domain of which the Avaya R300 is a member (for example dr.avaya.com).The DNS information is also a primary and secondary DNS IP address, and optionally a primary and secondary Windows Internet Name Service (WINS) IP address.

If you don’t configure DNS information, an R300 unit still has full functionality. In this case you would make reference to the IP endpoints by dotted decimal nomenclature (for example 216.25.242.138).

Contact your IS department if you are unsure of the values to administer here.

1. From the Main Edit Menu, select Ethernet > Mod Config > DNS.

   **NOTE:**
   You cannot see the DNS menu from the Ethernet > Mod Config menu until you press the down arrow. Scroll until you reach the DNS menu item.

2. In the Ethernet > Mod Config > DNS menu, complete the following fields:
   - Domain Name: (This is the name of the domain in which the Avaya R300 is located.)
   - Pri DNS: (This is the IP address of the primary DNS server.)
   - Sec DNS: (This is the IP address of the secondary DNS server.)

- Pri WINS (optional): (This is the IP address of the primary WINS server.)
- Sec WINS (optional): (This is the IP address of the secondary WINS server.)

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|40-100 Mod Config             | |10-100 1234567890   | |30-000 Line Stat    |
| DNS...                       | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
| >Domain Name=yourcompany.com | |   12345678901234   | |   ---...........-  |
|  Sec Domain Name=            | |   nnnnnnnnnnnnnn   | |   ..............-  |
|  Pri DNS=111.11.11.1         | |--------------------| |--------------------|
|  Sec DNS=111.11.12.2         | |10-200 1234567890   | |00-200 15:10:34     |
|  DNS Qry Type=UDP            | | L2/DS @@@@@@@@@@   | |>M31  Line   Ch     |
|  Allow As Client DNS=Yes     | |   12345678901234   | | Ethernet up        |
|  Pri WINS=111.11.110.1       | |   @@@@@@@@@@@@@@   | |                    |
|  Sec WINS=111.11.110.4       | |--------------------| |--------------------|
|  List Attempt=No             | |40-300 WAN Stat     | |40-400 Ether Stat   |
|  List Size=N/A               | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|  Client Pri DNS=0.0.0.0      | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|  Client Sec DNS=0.0.0.0      | |    CRC:          0v| |    Col:       3530 |
|  Enable Local DNS Table=No   | |--------------------| |--------------------|
|  Loc.DNS Tab Auto Update=N/A | |00-100 Sys Option   | |40-100 Sessions     |
|  Loc.DNS Name#1=N/A          | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027      v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

3. Press the left arrow or ESC key to exit the DNS profile.

   A confirmation menu appears.

4. Press 2 to save your changes.
5. Press the left arrow or ESC key twice to return to the Main Edit Menu.

## Avaya R300 VoIP information

To configure the Voice over IP (VoIP) information in the Ethernet profile on the Avaya R300, proceed as follows (You do not need to configure the VoIP card):

1. From the Main Edit Menu, select Ethernet > Mod Config > VOIP Options.

2. In the Ethernet > Mod Config > VOIP Options menu, complete the following fields:

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|40-E00 Mod Config             | |10-100 1234567890   | |30-000 Line Stat    |
| VOIP Options               ^ | | L1/RA nnnnnnnnnn   | |   123456789012 A   |
| >GK IP Adrs=123.45.67.89     | |   12345678901234   | |   ---..........-   |
|  2nd GK IP=135.9.76.104      | |   nnnnnnnnnnnnnn   | |   ............-   |
|  Keepalive Timer=120         | |--------------------| |--------------------|
|  Reg Retries=5               | |10-200 1234567890   | |00-200 15:10:34     |
|  Reg Retry Timer=5           | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|  Pri GK Retries=1            | |   12345678901234   | | PRI GK Registered  |
|  VPN Mode=Yes                | |   @@@@@@@@@@@@@@   | |                    |
|  Frames/Packet=4             | |--------------------| |--------------------|
|  Silence Detect/CNG=No       | |40-300 WAN Stat     | |40-400 Ether Stat   |
|  Silence Thresh (dB inc)=N/A | |>Rx Pkt:        118^| |>Rx Pkt:    3486092 |
|  Enable Adaptive Jtr Buf=Yes | | Tx Pkt:        511 | | Tx Pkt:      10056 |
|  Max Jtr Buf Size=3          | |    CRC:          0v| |    Col:       3530 |
|  Initial Jtr Buf Size=1      | |--------------------| |--------------------|
|  TOS Enabled=No              | |00-100 Sys Option   | |40-100 Sessions     |
|  Precedence=N/A            v | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 9320027     v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

- GK IP Adrs: Enter the IP address of the C-LAN board which is the gatekeeper on the DEFINITY system.
- 2nd GK IP (With Release 1.1 or newer): Enter the IP address of a secondary C-LAN board. This will be a back-up gatekeeper in the DEFINITY system.
- VPN Mode: Set this to Yes.
- Frames/Packet: Enter the number of audio frames sent per packet. Match your audio frame information on the Avaya R300 with the same information on the DEFINITY system.

  For Release 1.1 or newer, the R300 uses 10mSec voice frame samples for all CODECS.

  In Release 1.0, the R300 uses 5mSec audio frames for G.711 CODEC sampling and 10mSec audio frames for G.729 CODEC sampling.
- Enable Adaptive Jtr Buf: Set this to Yes.
- Max Jtr Buf: Set the maximum range for the jitter buffer.
- Initial Jtr Buf Size: Set the minimum range for the jitter buffer.
- DTMF Tone Passing: Set this to Out of Band.

- Single Dial Enable: Set this to Yes.

  Setting this value to Yes enables the Avaya R300 to extract the Dialed Number Identification Service (DNIS) string from a single dialed entry.

  Setting this value to No disables DNIS string collection, requiring users to dial the Avaya R300, first, wait for a dial tone from the MultiVoice Gateway, then dial the called phone number. This value defaults to No. Changes to this value become effective with the next VoIP call.

  Single stage dialing works with the Avaya R300 under the following conditions:

  — You are using T1 inband trunks, and the switch can relay DTMF signals to the MultiVoice Gateway.

  — You are using T1 PRI trunks.

  — You enabled collection of DNIS on the Avaya R300.

- Near End Cut Through: Set to No.
- True Connect Enable: Set to Yes or No.

  Setting this to Yes will delay transmission of the answer signal to the PSTN until the call is answered by the host DEFINITY system (via IP trunk signaling). This avoids incurring PSTN charges if the called party is busy.

  Setting this to No disables this feature. The Avaya R300 will transmit the answer signal immediately.

  Set this parameter to Yes when implementing single stage dialing.

  **NOTE:**
  Never enable True Connect when using two-stage dialing. Only enable True Connect when the entire gateway is used for single stage dialing.

4. Press the left arrow or ESC key to exit the VOIP profile.

   A confirmation menu appears.

5. Press 2 to save your changes.
6. Press the
7. or ESC key twice to return to the Main Edit Menu.

## Administerable loss/gain feature for VoIP station and trunk call

In Release 1.1, there is a feature that supports the ability to administer two parameters in the WAN line configuration. The support of this feature is not available on the initial release of the the R300 Release 1.1 software. As soon as this feature has been tested on a network interoperability basis, it will be made available on the Avaya R300 support website at http://support.avaya.com/comsys/definity/r300.

From the Main Edit Menu, select Net/T1>Line Config>Line 1:

- Input Pad = 0 dB.
- Output Pad = 0 dB.

These parameters determine the amount of loss/gain that the R300 will insert into the incoming or outgoing pathways of PSTN trunk calls or with the IP networked calls to/from the DCP and analog stations on the R300. This feature may be used in combination with the existing DEFINITY Loss plan tables (see Appendix A) to provide suitable loss plan adminstration for the customers network. In general, this feature will enhance the ease of customer operation of engineering their networks.

## Profile saving and restoration

You can save your profiles to use as backups for your Avaya R300 unit, or you can use the saved profiles to configure additional Avaya R300 units.

Profiles are plain text files so you can edit them with any text editor and then restore them to the Avaya R300.

**CAUTION:**
*If you use save and restore to configure multiple Avaya R300 units, make certain that you change the IP address on the Avaya R300 unit to match the IP address in the saved profile before you restore that profile. If your restore does not update the configuration of the Avaya R300 correctly, ensure that the IP address in the saved profile and the IP address on the Avaya R300 are the same.*

You must enter all save and restore commands listed below from the diagnostic window of the Avaya R300. For more information on the diagnostic window and how to access it, see *‘‘Diagnostics Mode’’ on page 143*.

## Save a profile with TFTP

Saving a profile with TFTP requires a TFTP server set up. Save from the diagnostic prompt on the Avaya R300.

For more information about the diagnostic prompt, see *''Diagnostics Mode'' on page 143*.

1. At the diagnostic prompt, type **tsave *server filename*** where *server* is the name or IP address of the TFTP server and *filename* is the name of the profile you want to save.
2. Press ENTER to save the profile as a flat text file for editing later.

## Restore a profile with TFTP

Restoring a profile with TFTP requires a TFTP server setup. Restore from the diagnostic prompt on the Avaya R300 where you want to upload the profile.

For more information about the diagnostic prompt, see *''Diagnostics Mode'' on page 143*.

1. At the diagnostic prompt, type **trestore *server filename*** where *server* is the name or IP address of the TFTP server and *filename* is the name of the profile you want to restore.
2. Press ENTER to save the profile as a flat text file that you can edit later.

**CAUTION:**
*The updates to the Avaya R300 profile configurations take place as the restore happens. Ensure that the IP address assigned to the Avaya R300 matches the IP address assigned in the configuration file for the configuration to complete properly.*

## Save a profile with Save Cfg

The Save Cfg command enables you to save the Avaya R300 configuration to a file. It does not save Security profiles or passwords.

**NOTE:**
Using the Save Cfg command to save the configuration and then restoring it from the saved file clears all passwords.

You must enter all save and restore commands from the diagnostic window of the Avaya R300. For more information on the diagnostic window and how to access it, see *''Diagnostics Mode'' on page 143*.

To save your configuration, proceed as follows:

1. Verify that the Download permission is enabled in the active Security profile.
2. Verify that the Term Rate parameter in the System profile is set to 9600.

3. Verify that the terminal-emulation program has a disk-capture feature, that it has an autotype feature, and that its data rate is set to 9600 bps or lower.
4. Connect the backup device to the Avaya R300 unit's control port.
5. Turn on the autotype function on your emulator, and start the save process by pressing any key on the emulator.
6. Highlight Save Cfg and press ENTER.
7. Verify that configuration data is being echoed to the terminal-emulation screen and that the captured data is being written to a file on the disk.
8. The save process is complete when the message
   `"Download complete--type any key to return to menu"`
   appears on the emulator's display. The backup file is an ASCII file.
9. Turn off the autotype feature.

## Restore a profile with Restore Cfg

The Restore Cfg command restores an Avaya R300 configuration that was saved with the Save Cfg parameter, or transfers the profiles to another Avaya R300. Because the Save Cfg command does not save passwords, the Restore Cfg command does not restore them.

You must enter all save and restore commands from the diagnostic window of the Avaya R300. For more information on the diagnostic window and how to access it, see *''Diagnostics Mode'' on page 143*.

Follow these instructions to restore your configuration from backup, proceed as follows:

1. Verify that the Upload and Edit Security permissions are enabled in the active Security profile.
2. Verify that the Term Rate parameter in the System profile is set to 9600.
3. Verify that your terminal-emulation program has a disk-capture feature and an autotype feature, and that its data rate is set to 9600 bps.
4. Connect the backup device to the Avaya R300 unit's control port.
5. Highlight Restore Cfg and press ENTER.
6. When the
   `"Waiting for upload data"`
   prompt appears, turn on the autotype function on your emulator and supply the filename of the saved Avaya R300 data.
7. Verify that the configuration data is going to your terminal-emulation screen and is being restored to the target Avaya R300.
8. The restore process is complete when the message
   "`Upload complete--type any key to return to menu`"
   appears on your emulator's display.

### Avaya R300 software upgrade

A software upgrade may be available for your Avaya R300. For detailed instructions and to download software, go online to http://support.avaya.com/comsys/definity/r300. Click on Software Downloads, and then Avaya R300 Remote Office Communicator Software Upgrades.

Before going online, you may want to determine what hardware model you have, and what your current software version is. See below.

### How to tell what hardware model you have

Look at the bottom of the R300. The serial number label shows the model number:

**Table 17. Hardware Model Number and Type**

| Model Number | Type |
|---|---|
| MX30-2T1-DRM | T1 |
| MX30-2E1-DRM | E1 |
| MX30-6ST-DRM | BRI-S/T |

### How to tell what software version you have today

If you telnet into the R300 and look in the “00-100 Sys Option” status box, you will see a “SW” followed by a number. For instance, the c-load 5 version number looks like “+8.0-114.0c5+”.

## Avaya R300 reset

You need to reset the Avaya R300 unit if you upload a new system software configuration (not a new Avaya R300 profile configuration). You can reset the Avaya R300 unit in one of the following ways:

- Choose System >Sys Diag > Sys Reset from the VT100 menu interface.
- Type **`reset`** at the diagnostic prompt.
- Power cycle the unit by pulling the plug out of the outlet and then plugging it back into the outlet.

**NOTE:**
Power cycling is not the preferred method of shutting down the Avaya R300. When you reset the Avaya R300 unit using one of the other methods, the peer-to-peer communication protocol suites involved with signaling and audio transport between the R300 and the host DEFINITY switch perform a systematic removal of call connections.

# Maintaining and Troubleshooting the Avaya R300

# 6

## Troubleshooting

The following sections help you troubleshoot your Avaya R300. It provides assistance for the following symptoms:

## There is no IP connectivity between the Avaya R300 and the DEFINITY IP Resource

If the Avaya R300 cannot “ping” to a DEFINITY IP resource board (C-LAN or IP Media Processor), do the following:

- Verify the physical connection from the Avaya R300 and DEFINITY IP resource board to network.
- Attempt to ping, via a dotted decimal IP address(xxx.xxx.xxx.xxx), another host on the subnet to which the R300 is connected. The routed gateway would be a good choice. This will force the host clients and routed gateway to update their address resolution protocol (ARP) tables.
- Attempt to ping the Avaya R300 from another system on the LAN. If there is no response from the Avaya R300, check that the IP address, subnet mask, and Default Gateway are correctly administered on the Avaya R300.
- Attempt to ping the DEFINITY system C-LAN and IP media processor from another system on the LAN. If there is no response from these boards, verify that each of their IP address, subnet mask, and Default Gateway are correctly administered on the DEFINITY system.
- Attempt to verify network connectivity using systems not directly associated with the Avaya R300 or the DEFINITY switch (for example, Personal Computers). The network could be at fault. Ping from a system on the Avaya R300's LAN to a system on the DEFINITY IP resource's LAN. If this does not work, you a have network problem. The traceroute tool (“traceroute <Destination IP address>” from the Avaya R300 terminal server prompt) can help you pinpoint the source of the network failure.

## The IP endpoint is not registered with the DEFINITY system

If the endpoint you are testing is not registered with the DEFINITY switch, do the following:

- Verify that endpoint you are testing is in TTI or named mode, and not in disabled mode by checking DEFINITY Combo Blade> Mod Config> DCP Line (x)> Registration Mode on the Avaya R300.
- If endpoint being tested is in TTI mode, refer to ‘‘The TTI endpoint is not registered with the DEFINITY system’’.
- If endpoint being tested is in named mode, refer to ‘‘The named endpoint is not registered with the DEFINITY system’’.
- Verify that the Avaya R300’s IP address is correct in the Node Names screen (“change node-names ip” from SAT), and that the remote office is using the correct node names (“change remote-office x” from SAT).

## The TTI endpoint is not registered with the DEFINITY system

If the TTI endpoint you are testing is not registered with the DEFINITY switch, do the following:

- Verify that registration attempts are being made. Enter the diagnostic prompt, and type “roRAS rasdebug.” Every 30 seconds you should see messages printing out indicating that registration attempts are being made. If you do not see these messages, registration attempts are not being made. One possible source of this problem would be if the endpoint being tested is a digital (DCP) phone, and the phone is not communicating successfully with the combo blade. Try a different phone. If still unsuccessful, reset the Avaya R300.
- Verify that TTI is enabled on the DEFINITY switch. TTI is enabled on page 2 of the Change System-Parameters Features screen.

## The named endpoint is not registered with the DEFINITY system

If the Named endpoint being tested is not registered with the DEFINITY switch, do the following:

- Verify that registration attempts are being made. Enter the diagnostic prompt, and type “roRAS rasdebug.” Every 30 seconds you should see messages printing out indicating that registration attempts are being made. If you do not see these messages, registration attempts are not being made. Try a different phone. If still unsuccessful, reset the Avaya R300.
- Verify that the extension number and password administered on the Avaya R300 match the extension number and security code administered on the DEFINITY switch.
- Analyzing the “roRAS rasdebug” messages at the diagnostic prompt. You should see registration attempts every 30 seconds. Be sure to type “roRAS rasdebug” again when finished troubleshooting. This will turn off the debug prints to not “clutter” the diagnostic prompt.

  **NOTE:**
  The endpoint numbers shown in registration attempts are computed as follows:

  — Analog Trunks: Port number - 1 (range is 0 to 1)

  — Analog Lines: Port number + 1 (range is 2 to 3)

  — DCP Lines: Port number + 3 (range is 4 to 27)

The following example shows a registration attempt that has timed out for DCP port 1 (endpoint 4). This would have been caused by a bad IP connection from the Avaya R300 to the DEFINITY C-LAN, or a problem internal to the DEFINITY switch or the C-LAN. Three time-out messages printed because the Avaya R300 retries the registration three times.

- h323ReceivedRegRequest endpoint 4
- allocSignalingPort: allocated port 7018
- RAS Address for endpoint 4 = 870996df
- h323GRQTimeout for endpoint 4
- RAS Address for endpoint 4 = 870996df
- h323GRQTimeout for endpoint 4
- RAS Address for endpoint 4 = 870996df

The next example shows a registration attempt for DCP port 1 (endpoint 4) that was Gatekeeper Rejected. This would happen if the extension number associated with DCP port 1 on the Avaya R300 was not an administered station on the DEFINITY switch.

- h323ReceivedRegRequest endpoint 4
- allocSignalingPort: allocated port 7038
- RAS Address for endpoint 4 = 870996df
- Received data on connection 4
- Received Gate Reject
- freeSignalingPort: freed port 7038

This last example depicts a registration attempt for DCP port 1 (endpoint 4) that was Register Rejected. This would happen if any of the following were true.

- The IP address for the Avaya R300 on the Node Names screen on the DEFINITY switch is incorrect.
- The extension number associated with DCP port 1 on the Avaya R300 is correctly administered on the DEFINITY switch, but the security code for the station on the DEFINITY switch does not match the password for the station on the Avaya R300.
- Another Avaya R300 station, IP telephone, or IP softphone is registered with that extension number. If you type **status station** at the DEFINITY switch, and the "Service State" field is anything other than "No hardware assigned," then another endpoint already registered this extension number. The other endpoint must unregister before the Avaya R300 will be able to register using this extension number.
  - h323ReceivedRegRequest endpoint 4
  - allocSignalingPort: allocated port 7004
  - RAS Address for endpoint 4 = 870996df
  - Received data on connection 4

— Received Gate Confirm

— Address for registration is c00b8280:6b7

— Received a token of 35 bytes

— Received data on connection 4

— Received Register Reject

— freeSignalingPort: freed port 7004

## The phones are not receiving power

If the DCP phones connected through the Avaya R300 are not receiving power, do the following:

- Verify the phones are supported by the Avaya R300. For valid phone types, see Table 5 on page 28.
- Verify that the phones are properly plugged into the Avaya R300 Interconnect. (Hit the “Test” button.)
- Verify that the R300 Interconnect unit’s power cord is plugged into the outlet and that the outlet is live.
- Verify the -48 volt power source works properly.
- Verify that both plugs from the Y-cable (DCP and analog/power) are correctly plugged into the R300 Interconnect unit.
- Verify the Y-cable is correctly plugged into the Combo Blade Card on the Avaya R300 unit.

## The phones are not receiving audio

If the phones connected through the Avaya R300 are not receiving an audio signal, do the following:

- Verify the phones are getting power by pressing the TEST button (DCP phones only). The LED next to the Test button should light. If the LED does not light then the phone is not getting power; You should refer to ‘‘The phones are not receiving power’’ on page 139 for a solution.
- Verify IP connectivity between the Avaya R300 and the DEFINITY Gatekeeper (C-LAN). Go to terminal server mode (Ctrl-d then e). Type “ping <C-LAN IP address>”. If this fails, refer to ‘‘There is no IP connectivity between the Avaya R300 and the DEFINITY IP Resource’’ on page 136.
- Verify IP connectivity between the Avaya R300 and the DEFINITY Media Processor. Go to terminal server mode (Ctrl-d then e). Type “ping <Media Processor IP Address>.” If this fails, refer to ‘‘There is no IP connectivity between the Avaya R300 and the DEFINITY IP Resource’’ on page 136.

- Verify that the endpoints are registered with the DEFINITY switch. Check status screen 30-000 for the Combo Blade. The endpoint that being tested should have a dash '-' (if phone is on-hook) or a star '*' (if phone is off-hook) displayed on this status screen. If it does not, refer ''The IP endpoint is not registered with the DEFINITY system'' on page 136.
- Verify that the Avaya R300 is opening the audio channel to the DEFINITY switch. Check status screen 30-000 for the Combo Blade. The endpoint being tested should have a '*****' displayed on this status screen when the phone goes off-hook. If this is not the case, attempt the same procedure with a different phone. If you still do not have success, reboot the Avaya R300. Rebooting should only be attempted if your phone is registered with the DEFINITY switch, and a dash '**-**' is displayed when the phone is on-hook.

## The voice quality is poor

If the voice quality on the phones connected to the Avaya R300 is poor, or below standard, review the following:

- Verify that Direct IP-IP Audio Connection is set to **yes** for the station, for the station's signaling group, for its network region, and for the system.

  Check the following screens:

  — Station, page 2

  — Feature-Related System Parameters, page 10

  — Signaling Group, page 1

  — IP Network Region, page 1

  If the field is set to **no** in any of these locations, then the quality of voice over an IP connection may be poor.
- Verify that any hubs between the phone and the Avaya R300 are switched, not shared, in the uplink direction.
- Verify the wiring between the phone and the Avaya R300 is CAT 5.
- Verify that the Avaya R300 and the switched hub connected to the TN2302 IP Media Processor are set to 100mbit operation.

## The stations repeatedly register and unregister

If the phones connected through the Avaya R300 register and unregister repeatedly (see Line Stat in the next screen), do the following:

- Verify that the R300 LCD Menu System>Sys Config>Name is not blank. If it is not blank, the R300 will attempt to register the digital trunks' signaling group.
- On the DEFINITY switch, check the signaling group for the R300. Verify that the Near-end Listen Port is not set to 1720 on the signaling group screen. The C-LAN uses port 1720 to listen for new connections in H.323. If the Near-end Listen Port is 1720, change it to some other value in the TCP port range 5000 to 9999.

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|40-000 Ethernet               | |10-100 1234567890   | |30-000 Line Stat    |
| 40-100 Connections           | | L1/LA ----------   | | 123456789012 A     |
| 40-200 Names / passwords     | |   12345678901234   | | r..u.......u r     |
| 40-300 Bridge Adrs           | |   -----oooooooos   | | ..r..r.r.... .     |
| 40-400 Static Rtes           | |--------------------| |--------------------|
| 40-500 Filters               | |10-200 1234567890   | |00-200 11:43:42     |
| 40-600 Firewalls             | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
| 40-700 Frame Relay           | |   12345678901234   | | PRI GK Registered  |
| 40-800 X.25                  | |   @@@@@@@@@@@@@@   | |                    |
| 40-900 Answer                | |--------------------| |--------------------|
| 40-A00 SNMP Traps            | |40-300 WAN Stat     | |40-400 Ether Stat   |
| 40-B00 SNMPv3 USM Users      | |>Rx Pkt:          0^| |>Rx Pkt:      44741 |
| 40-C00 IPX Routes            | | Tx Pkt:          0 | | Tx Pkt:      44864 |
| 40-D00 IPX SAP Filters       | |    CRC:          0v| |    Col:          0 |
| 40-E00 Virtual Routers       | |--------------------| |--------------------|
|>40-F00 Mod Config            | |00-100 Sys Option   | |40-100 Sessions     |
|                              | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 10341015     v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

## The digital trunk interface only allows one call to be established

If the user can make one successful call, and upon completion of a second call, the first call disconnects, then do the following:

- Verify that the R300 is operating with Release 1.1 or newer software. (see also ''Avaya R300 software upgrade'' on page 134)

  **NOTE:**
  You can view the R300 Status Window: 00-100 Sys Option>sw = +8.0-148xxx+ (see above screen), to see that the R300 has software Release 1.1.

- Look at the DEFNITY system IP signaling group form. Verify that the Calls Share IP Signaling Connection parameter is set to Yes.

# Alarms and MIBs

## Avaya R300 native MIBs

For information about the Alarms and MIBs native to the Avaya R300 machine, refer to *Lucent-Ascend's Max Administration Guide, Chapter 9, SNMP Traps to Monitor Performance*. You can find documentation of Lucent-Ascend's MAX 3000 on the DEFINITY Systems Library CD shipped with the Avaya R300.

## Combo Blade MIBs

The use of Simple Network Management Protocol (SNMP) is popular because it provides a tool for multivendor, interoperable network management. Network Management, Performance Management, and Security Management are achieved on the Avaya R300 through an Avaya R300 SNMP agent that accesses a slot card's Management Information Base (MIB). The main MIB, called ascend.mib can be downloaded at http://support.avaya.com. Click on "online-services" and find the R300 software for downloading as well as the Avaya SNMP MIB files.

This approach was adopted in defining the Combo Blade MIB since the Combo Blade resides in an Avaya R300 slot. It is called the combobladeGroup in ascend.mib with an object identifier (OID) of 36, giving it a full OID 1.3.6.1.529.36, or iso.org.dod.internet.private.enterprise.ascend.combobladeGroup. This MIB is used primarily for Fault, Configuration, and Performance Management.

Some of the SNMP traps sent from the Combo Blade are:

- Enabled or disabled state of emergency transfer
- Presence or absence of -48 D.C. volts
- Connection state of the Telcom connector

The remaining MIBs are performance statistics and can be accessed with queries through an SNMP manager.

### SNMP MIB

Chapter 6 of the *MAX 3000 Administration guide, "SNMP and Syslog configuration"* describes how to configure the R300 for SNMP. This addresses access security issues, lists the supported MIBs, and shows where to find the most up-to-date versions.

To reach the SNMP options form on the Avaya R300, select:

- Ethernet>Mod Config>SNMP options from the Main Edit Menu.

```
|-------- MAX EDIT ------------| |--------------------| |--------------------|
|40-E00 Mod Config             | |10-100 1234567890   | |30-000 Line Stat    |
| SNMP options...              | | L1/DF ----------   | | 123456789012 A T   |
| >Read Comm=public            | |   12345678901234   | | ............ . .   |
|  R/W Comm Enable=Yes         | |   -----ooooooos    | | ............ . .   |
|  R/W Comm=write              | |--------------------| |--------------------|
|  Security=No                 | |10-200 1234567890   | |00-200 15:10:45     |
|  RD Mgr1=135.9.76.101        | | L2/DS @@@@@@@@@@   | |>M31  Line    Ch    |
|  RD Mgr2=0.0.0.0             | |   12345678901234   | | SEC GK Unregister+ |
|  RD Mgr3=0.0.0.0             | |   @@@@@@@@@@@@@@   | |                    |
|  RD Mgr4=0.0.0.0             | |--------------------| |--------------------|
|  RD Mgr5=0.0.0.0             | |40-300 WAN Stat     | |40-400 Ether Stat   |
|  WR Mgr1=135.9.76.101        | |>Rx Pkt:      31756^| |>Rx Pkt:      60091 |
|  WR Mgr2=0.0.0.0             | | Tx Pkt:      25672 | | Tx Pkt:      62749 |
|  WR Mgr3=0.0.0.0             | |    CRC:          0v| |    Col:          0 |
|  WR Mgr4=0.0.0.0             | |--------------------| |--------------------|
|  WR Mgr5=0.0.0.0             | |00-100 Sys Option   | |40-100 Sessions     |
|  Queue Depth=0               | |>Security Prof: 1  ^| |>  0 Active         |
|                              | | SW +8.0-148a0e0+   | |                    |
|                              | | S/N: 10470701     v| |                    |
Press Ctrl-n to move cursor to the next menu item. Press return to select it.
Press Tab to move to another window --- thick border indicates active window.
```

## Diagnostics Mode

To access the diagnostic mode, you must set the Field Service privilege to Yes in the active Security profile. (If you have any questions about how to activate Security profiles, see the *MAX Security Supplement.*)

Use one of the following two methods to access diagnostic mode:

- From the Avaya R300 VT100 interface, display the DO menu by pressing Ctrl-D. Then press D or select `D=Diagnostics`.
- From the Avaya R300 VT100 interface, type the following key sequence in rapid succession:

  **Esc [ Esc =**

  Press the Escape key, followed by the Left Bracket key, then the Escape key again, followed by the Equals key. You must press all four keys within one second for the MAX to recognize the escape sequence.

To display an abbreviated list of the most commonly used commands in diagnostic mode, enter a question mark:

MAX>**?**

To display a complete listing, append **ascend** to the question mark:

MAX>**? ascend**

To exit diagnostic mode, type **quit** and press Enter.

For a list of commands available from the DO menu and a description of those commands, see *MAX Reference, Chapter 2, DO Menu Commands.*

Because most diagnostic commands are designed to give a developer information about specific aspects of MAX functionality, you might find it helpful to use commands in combination to troubleshoot different problems.

For example, when troubleshooting modem related issues, you might want to use ModemDrvState, ModemDiag, and MDialout (if modem dial-out is supported on your MAX) to get all modem related information for your calls.

Using several commands simultaneously not only gives you a clearer picture of what is happening, but also shows you a chronology of the events.

The MAX provides system diagnostic commands which appear in the System > Sys Diag menu:

```
System
  Sys Diag
    Restore Cfg
    Save Cfg
    Use MIF
    Sys Reset
    Term Serv
    Upd Rem Cfg
```

To enter a command, highlight the command in the Sys Diag menu and press Enter.

**NOTE:**
To use these commands, the operator must have sufficient permissions in the active Security profile.

## Terminal Server mode

Use the terminal server to ping or telnet to another Avaya R300 unit. You can access the terminal server mode in either of two ways:

- From the Avaya R300 diagnostics window, type `term serv.`
- From the MAX VT100 interface, display the DO menu by pressing Ctrl-D. Then press E or select `E=terminal server`.

When you access the terminal-server mode of the Avaya R300, the system displays the terminal server command-line prompt (by default, `ascend%`). For information about the terminal server commands, enter a question mark at the prompt.

For a list of commands available in the terminal server mode and a description of those commands, see *MAX Reference, Chapter 3, Terminal Server Commands.* For more details about the terminal server interface, see the *Network Configuration Guide* for your MAX.

Type `quit` to exit the terminal server mode.

## External maintenance modem

The external maintenance modem can be used either by Avaya support, or by the customer to dial into the Avaya R300 unit to troubleshoot problems.

Installation of the external maintenance modem and the required modem settings is covered in Chapter 3, ‘‘Avaya R300 Installation and Upgrade’’.

# Loss Plan Settings

# A

This appendix lists the loss plan settings for the following country codes:

| Settings | Country codes |
|---|---|
| Australia settings | 2 |
| Belgium settings | 8, 11, 18 |
| Dutch settings | 5 |
| France settings | 12 |
| German settings | 13, 25 |
| Italy settings | 4, 23 |
| Japan settings | 3 |
| Nordic settings | 24 |
| United Kingdom (UK) settings | 10 |
| United States (US) settings | 1, 6, 7, 9, 14-17, 19-22 |

## Australia settings

```
                        2 PARTY LOSS PLAN
          Digital Loss Plan: 2                          Customize? n
                                          TO
            1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
      1:    0   1   1   0   0   0   0   0   1   1   2   2   2   2   2  -2   1
      2:    0   1   1   0   0   0   0   0   1   1   2   2   2   2   2  -2   1
      3:    0   1   1   0   0   0   0   0   1   1   2   2   2   2   2  -2   1
      4:    0   1   1   0   0   2   2   2   1   1   2   2   2   2   2   0   1
      5:    0   1   1   0   0   2   2   2   1   1   2   2   2   2   2   0   1
      6:    0   1   1   2   2  11  11  11   3   3   4   4   4   4   4   3   4
F     7:    0   1   1   2   2  11  11  11   3   3   4   4   4   4   4   3   4
R     8:    0   1   1   2   2  11  11  11   3   3   4   4   4   4   4   3   4
O     9:    1   1   1   1   1   3   3   3   0   0   0   0   0   0   0   3   1
M    10:    1   1   1   1   1   3   3   3   0   0   0   0   0   0   0   3   1
     11:    1   2   2   1   1   3   3   3   0   0   1   1   1   1   1   3   2
     12:    1   2   2   1   1   3   3   3   0   0   1   1   1   1   1   3   2
     13:    1   2   2   1   1   3   3   3   0   0   1   1   1   1   1   3   2
     14:    1   2   2   1   1   3   3   3   0   0   1   1   1   1   1   3   2
     15:    1   2   2   1   1   3   3   3   0   0   1   1   1   1   1   3   2
     16:   -3  -2  -2  -1  -1   3   3   3   3   3   3   3   3   3   3   3   3
     17:    0   1   1   0   0   3   3   3   1   1   2   2   2   2   2   3   3
```

**Screen 28. Default loss plan settings for country code 2**

```
                        2 PARTY LOSS PLAN
          Digital Loss Plan: 2                          Customize? y
                                          TO
            1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
      1:    0   1   1   0   6   0   0   0   1   1   2   2   2   7   2  -2   1
      2:    0   1   1   0   6   0   0   0   1   1   2   2   2   7   2  -2   1
      3:    0   1   1   0   6   0   0   0   1   1   2   2   2   7   2  -2   1
      4:    0   1   1   0   6   2   2   2   1   1   2   2   2   7   2   0   1
      5:   -3  -3  -3  -3   1  -3  -3  -3  -3  -3  -3  -3  -3   2  -3  -3  -3
      6:    0   1   1   2   6  11  11  11   3   3   4   4   4   9   4   3   4
F     7:    0   1   1   2   6  11  11  11   3   3   4   4   4   9   4   3   4
R     8:    0   1   1   2   6  11  11  11   3   3   4   4   4   9   4   3   4
O     9:    1   1   1   1   6   3   3   3   0   0   0   0   0   5   0   3   1
M    10:    1   1   1   1   6   3   3   3   0   0   0   0   0   5   0   3   1
     11:    1   2   2   1   7   3   3   3   0   0   1   1   1   6   1   3   2
     12:    1   2   2   1   7   3   3   3   0   0   1   1   1   6   1   3   2
     13:    1   2   2   1   7   3   3   3   0   0   1   1   1   6   1   3   2
     14:   -3  -3  -3  -3   2  -2  -2  -2  -3  -3  -3  -3  -3   1  -3  -2  -3
     15:    1   2   2   1   7   3   3   3   0   0   1   1   1   6   1   3   2
     16:   -3  -2  -2  -1   3   3   3   3   3   3   3   3   3   8   3   3   3
     17:    0   1   1   0   6   3   3   3   1   1   2   2   2   7   2   3   3
```

**Screen 29. Customized loss plan settings for country code 2**

- These instructions apply when you use country code 2 in the Digital Loss Plan field of the System-Parameters Country-Options screen (page 2).
- The loss plan does not apply to shuffled calls.
- Turn on shuffling (IP direct) for all R300 facilities.
- The 1st plan represents the default Australian loss plan.
- The 2nd plan represents the customized Australian loss plan for the R300 if you are using US terminal-parameter levels, defined on the Terminal Parameters screen.

  If the terminal parameters are set for Australia, no loss plan modifications are necessary. If you use the US terminal-parameters, you must customize the loss plan as shown above and make the following administration changes. There are 2 modified loss groups (5 and 14). When administering an R300 station, use loss group 5 instead of the default (1 or 2). When administering an R300 digital CO (T1) trunk group, use loss group 14 instead of the default (13).

Here is the legend.

| Loss Group | Port Type |
|---|---|
| 1 | DEFINITY ECS Analog Line |
| 2 | DEFINITY ECS Digital Station |
| 6 | DEFINITY ECS Analog CO |
| 11 | DEFINITY ECS Digital CO |
| 5 | R300 Digital Station and Analog Line |
| 14 | R300 Digital CO |

## Belgium settings

```
                        2 PARTY LOSS PLAN
        Digital Loss Plan: 8                          Customize? n
                                          TO
          1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
    1:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
    2:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
    3:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
    4:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
    5:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
    6:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
F   7:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
R   8:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
O   9:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
M  10:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
   11:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
   12:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
   13:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
   14:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
   15:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
   16:    3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3
   17:    3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3
```

**Screen 30. Default loss plan settings for country codes 8, 11, and 18**

```
                        2 PARTY LOSS PLAN
        Digital Loss Plan: 8                          Customize? y
                                          TO
          1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
    1:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
    2:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
    3:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
    4:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
    5:   -3  -3  -3  -3   0  -3  -3  -3  -3  -3  -3  -3  -3   0  -3  -2  -3
    6:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
F   7:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
R   8:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
O   9:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
M  10:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
   11:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
   12:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
   13:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
   14:   -3  -3  -3  -3   0  -3  -3  -3  -3  -3  -3  -3  -3   0  -3  -2  -2
   15:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
   16:    3   3   3   3   8   3   3   3   3   3   3   3   3   8   3   3   3
   17:    3   3   3   3   8   3   3   3   3   3   3   3   3   8   3   3   3
```

**Screen 31. Customized loss plan settings for country codes 8, 11, and 18**

- These instructions apply when you use country codes 8, 11 or 18 2 in the Digital Loss Plan field of the System-Parameters Country-Options screen (page 2).
- The loss plan does not apply to shuffled calls.
- Turn on shuffling (IP direct) for all R300 facilities.
- The 1st plan represents the default Belgian loss plan.
- The 2nd plan represents the customized Belgian loss plan for the R300 if you are using US terminal-parameter levels, defined on the Terminal Parameters screen.

  If the terminal parameters are set for Belgium, no loss plan modifications are necessary. If you use the US terminal-parameters, you must customize the loss plan as shown above, and make the following administration changes. There are 2 modified loss groups (5 and 14). When administering an R300 station, use loss group 5 instead of the default (1 or 2). When administering an R300 digital CO (T1) trunk group, use loss group 14 instead of the default (13).

Here is the legend.

| Loss Group | Port Type |
|---|---|
| 1 | DEFINITY ECS Analog Line |
| 2 | DEFINITY ECS Digital Station |
| 6 | DEFINITY ECS Analog CO |
| 11 | DEFINITY ECS Digital CO |
| 5 | R300 Digital Station and Analog Line |
| 14 | R300 Digital CO |

## Dutch settings

```
                        2 PARTY LOSS PLAN
          Digital Loss Plan: 5                          Customize? n
                                          TO
           1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
     1:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
     2:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
     3:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
     4:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
     5:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
     6:    0   0   0   0   0   8   8   8   0   0   8   8   8   8   8   3   3
F    7:    0   0   0   0   0   8   8   8   0   0   8   8   8   8   8   3   3
R    8:    0   0   0   0   0   8   8   8   0   0   8   8   8   8   8   3   3
O    9:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
M   10:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
    11:    0   0   0   0   0   1   1   1   0   0   0   0   0   0   0   3   3
    12:    0   0   0   0   0   1   1   1   0   0   0   0   0   0   0   3   3
    13:    0   0   0   0   0   1   1   1   0   0   0   0   0   0   0   3   3
    14:    0   0   0   0   0   1   1   1   0   0   0   0   0   0   0   3   3
    15:    0   0   0   0   0   1   1   1   0   0   0   0   0   0   0   3   3
    16:    3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3
    17:    3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3
```

**Screen 32. Default loss plan settings for country code 5**

```
                        2 PARTY LOSS PLAN
          Digital Loss Plan: 5                          Customize? y
                                          TO
           1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
     1:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
     2:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
     3:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
     4:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
     5:   -3  -3  -3  -3   0  -3  -3  -3  -3  -3  -3  -3  -3   0  -3  -2  -2
     6:    0   0   0   0   5   8   8   8   0   0   8   8   8  13   8   3   3
F    7:    0   0   0   0   5   8   8   8   0   0   8   8   8  13   8   3   3
R    8:    0   0   0   0   5   8   8   8   0   0   8   8   8  13   8   3   3
O    9:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
M   10:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
    11:    0   0   0   0   5   1   1   1   0   0   0   0   0   5   0   3   3
    12:    0   0   0   0   5   1   1   1   0   0   0   0   0   5   0   3   3
    13:    0   0   0   0   5   1   1   1   0   0   0   0   0   5   0   3   3
    14:   -3  -3  -3  -3   0  -3  -3  -3  -3  -3  -3  -3  -3   0  -3  -2  -2
    15:    0   0   0   0   5   1   1   1   0   0   0   0   0   5   0   3   3
    16:    3   3   3   3   8   3   3   3   3   3   3   3   3   8   3   3   3
    17:    3   3   3   3   8   3   3   3   3   3   3   3   3   8   3   3   3
```

**Screen 33. Customized loss plan settings for country code 5**

- These instructions apply when you use country code 5 in the Digital Loss Plan field of the System-Parameters Country-Options screen (page 2).
- The loss plan does not apply to shuffled calls.
- Turn on shuffling (IP direct) for all R300 facilities.
- The 1st plan represents the default Dutch loss plan.
- The 2nd plan represents the customized Dutch loss plan for the R300 if you are using US terminal-parameter levels, defined on the Terminal Parameters screen.

  If the terminal parameters are set for the Netherlands, no loss plan modifications are necessary. If you use the US terminal-parameters, you must customize the loss plan as shown above, and make the following administration changes. There are 2 modified loss groups (5 and 14). When administering an R300 station use loss group 5 instead of the default (1 or 2). When administering an R300 digital CO (T1) trunk group, use loss group 14 instead of the default (13).

Here is the legend.

| Loss Group | Port Type |
|---|---|
| 1 | DEFINITY ECS Analog Line |
| 2 | DEFINITY ECS Digital Station |
| 6 | DEFINITY ECS Analog CO |
| 11 | DEFINITY ECS Digital CO |
| 5 | R300 Digital Station and Analog Line |
| 14 | R300 Digital CO |

## France settings

```
                          2 PARTY LOSS PLAN
          Digital Loss Plan: 12                          Customize? n
                                                TO
            1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
      1:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
      2:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
      3:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
      4:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
      5:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
      6:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
  F   7:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
  R   8:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
  O   9:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
  M  10:   -3  -3  -3  -3  -3  -3  -3  -3  -3   0  -3  -3  -3  -3  -3   3   3
     11:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
     12:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
     13:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
     14:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
     15:    0   0   0   0   0   0   0   0   0   3   0   0   0   0   0   3   3
     16:    3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3
     17:    3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3
```

**Screen 34. Default loss plan settings for country code 12**

```
                          2 PARTY LOSS
PLAN
          Digital Loss Plan: 12                          Customize? y
                                                TO
            1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
      1:    0   0   0   0   5   0   0   0   0   3   0   0   0   5   0   3   3
      2:    0   0   0   0   5   0   0   0   0   3   0   0   0   5   0   3   3
      3:    0   0   0   0   5   0   0   0   0   3   0   0   0   5   0   3   3
      4:    0   0   0   0   5   0   0   0   0   3   0   0   0   5   0   3   3
      5:   -3  -3  -3  -3   0  -3  -3  -3  -3  -2  -3  -3  -3   0  -3  -2  -2
      6:    0   0   0   0   5   0   0   0   0   3   0   0   0   5   0   3   3
  F   7:    0   0   0   0   5   0   0   0   0   3   0   0   0   5   0   3   3
  R   8:    0   0   0   0   5   0   0   0   0   3   0   0   0   5   0   3   3
  O   9:    0   0   0   0   5   0   0   0   0   3   0   0   0   5   0   3   3
  M  10:   -3  -3  -3  -3   2  -3  -3  -3  -3   0  -3  -3  -3   2  -3   3   3
     11:    0   0   0   0   5   0   0   0   0   3   0   0   0   5   0   3   3
     12:    0   0   0   0   5   0   0   0   0   3   0   0   0   5   0   3   3
     13:    0   0   0   0   5   0   0   0   0   3   0   0   0   5   0   3   3
     14:   -3  -3  -3  -3   0  -3  -3  -3  -3  -2  -3  -3  -3   0  -3  -2  -2
     15:    0   0   0   0   5   0   0   0   0   3   0   0   0   5   0   3   3
     16:    3   3   3   3   8   3   3   3   3   3   3   3   3   8   3   3   3
     17:    3   3   3   3   8   3   3   3   3   3   3   3   3   8   3   3   3
```

**Screen 35. Customized loss plan settings for country code 12**

- These instructions apply when you use country code 12 in the Digital Loss Plan field of the System-Parameters Country-Options screen (page 2).
- The loss plan does not apply to shuffled calls.
- Turn on shuffling (IP direct) for all R300 facilities.
- The 1st plan represents the default French loss plan.
- The 2nd plan represents the customized French loss plan for the R300 if you are using US terminal-parameter levels, defined on the Terminal Parameters screen.

  If the terminal parameters are set for France, no loss plan modifications are necessary. If you use the US terminal-parameters, you must customize the loss plan as shown above, and make the following administration changes. There are 2 modified loss groups (5 and 14). When administering an R300 station, use loss group 5 instead of the default (1 or 2). When administering an R300 digital CO (T1) trunk group, use loss group 14 instead of the default (13).

Here is the legend.

| Loss Group | Port Type |
|---|---|
| 1 | DEFINITY ECS Analog Line |
| 2 | DEFINITY ECS Digital Station |
| 6 | DEFINITY ECS Analog CO |
| 11 | DEFINITY ECS Digital CO |
| 5 | R300 Digital Station and Analog Line |
| 14 | R300 Digital CO |

## German settings

```
                        2 PARTY LOSS PLAN
          Digital Loss Plan: 13                          Customize? n
                                                TO
            1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
      1:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
      2:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
      3:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
      4:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
      5:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
      6:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
F     7:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
R     8:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
O     9:   -3  -3  -3  -3  -3  -3  -3  -3   2   2  -3  -3  -3  -3  -3   3   3
M    10:   -3  -3  -3  -3  -3  -3  -3  -3   2   2  -3  -3  -3  -3  -3   3   3
     11:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
     12:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
     13:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
     14:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
     15:    0   0   0   0   0   0   0   0   4   4   0   0   0   0   0   3   3
     16:    3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3
     17:    3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3
```

**Screen 36. Default loss plan settings for country codes 13 and 25**

```
                        2 PARTY LOSS PLAN
          Digital Loss Plan: 13                          Customize? y
                                                TO
            1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
      1:    0   0   0   0   5   0   0   0   4   4   0   0   0   5   0   3   3
      2:    0   0   0   0   5   0   0   0   4   4   0   0   0   5   0   3   3
      3:    0   0   0   0   5   0   0   0   4   4   0   0   0   5   0   3   3
      4:    0   0   0   0   5   0   0   0   4   4   0   0   0   5   0   3   3
      5:   -3  -3  -3  -3   0  -3  -3  -3  -1  -1  -3  -3  -3   0  -3  -2  -2
      6:    0   0   0   0   5   0   0   0   4   4   0   0   0   5   0   3   3
F     7:    0   0   0   0   5   0   0   0   4   4   0   0   0   5   0   3   3
R     8:    0   0   0   0   5   0   0   0   4   4   0   0   0   5   0   3   3
O     9:   -3  -3  -3  -3   2  -3  -3  -3   2   2  -3  -3  -3   2  -3   3   3
M    10:   -3  -3  -3  -3   2  -3  -3  -3   2   2  -3  -3  -3   2  -3   3   3
     11:    0   0   0   0   5   0   0   0   4   4   0   0   0   5   0   3   3
     12:    0   0   0   0   5   0   0   0   4   4   0   0   0   5   0   3   3
     13:    0   0   0   0   5   0   0   0   4   4   0   0   0   5   0   3   3
     14:   -3  -3  -3  -3   0  -3  -3  -3  -1  -1  -3  -3  -3   0  -3  -2  -2
     15:    0   0   0   0   5   0   0   0   4   4   0   0   0   5   0   3   3
     16:    3   3   3   3   8   3   3   3   3   3   3   3   3   8   3   3   3
     17:    3   3   3   3   8   3   3   3   3   3   3   3   3   8   3   3   3
```

**Screen 37. Customized loss plan settings for country codes 13 and 25**

- These instructions apply when you use country code 13 or 25 in the Digital Loss Plan field of the System-Parameters Country-Options screen (page 2).
- The loss plan does not apply to shuffled calls.
- Turn on shuffling (IP direct) for all R300 facilities.
- The 1st plan represents the default German loss plan.
- The 2nd plan represents the customized German loss plan for the R300 if you are using US terminal-parameter levels, defined on the Terminal Parameters screen.

  If the terminal parameters are set for Germany, no loss plan modifications are necessary. If you use the US terminal-parameters, you must customize the loss plan as shown above, and make the following administration changes. There are 2 modified loss groups (5 and 14). When administering an R300 station, use loss group 5 instead of the default (1 or 2). When administering an R300 digital CO (T1) trunk group, use loss group 14 instead of the default (13).

Here is the legend.

| Loss Group | Port Type |
|---|---|
| 1 | DEFINITY ECS Analog Line |
| 2 | DEFINITY ECS Digital Station |
| 6 | DEFINITY ECS Analog CO |
| 11 | DEFINITY ECS Digital CO |
| 5 | R300 Digital Station and Analog Line |
| 14 | R300 Digital CO |

## Italy settings

```
                        2 PARTY LOSS PLAN
        Digital Loss Plan: 4                              Customize? n
                                          TO
          1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
     1:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
     2:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
     3:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
     4:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
     5:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
     6:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
F    7:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
R    8:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
O    9:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
M   10:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
    11:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
    12:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
    13:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
    14:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
    15:   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
    16:   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3
    17:   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3
```

**Screen 38. Default loss plan settings for country codes 4 and 23**

```
                        2 PARTY LOSS PLAN
        Digital Loss Plan: 4                              Customize? y
                                          TO
          1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
     1:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
     2:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
     3:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
     4:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
     5:  -3  -3  -3  -3   0  -3  -3  -3  -3  -3  -3  -3  -3   0  -3  -2  -3
     6:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
F    7:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
R    8:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
O    9:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
M   10:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
    11:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
    12:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
    13:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
    14:  -3  -3  -3  -3   0  -3  -3  -3  -3  -3  -3  -3  -3   0  -3  -2  -2
    15:   0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
    16:   3   3   3   3   8   3   3   3   3   3   3   3   3   8   3   3   3
    17:   3   3   3   3   8   3   3   3   3   3   3   3   3   8   3   3   3
```

**Screen 39. Customized loss plan settings for country codes 4 and 23**

- These instructions apply when you use country code 4 or 23 in the Digital Loss Plan field of the System-Parameters Country-Options screen (page 2).
- The loss plan does not apply to shuffled calls.
- Turn on shuffling (IP direct) for all R300 facilities.
- The 1st plan represents the default Italian loss plan.
- The 2nd plan represents the customized Italian loss plan for the R300 if you are using US terminal-parameter levels, defined on the Terminal Parameters screen.

  If the terminal parameters are set for Italy, change them to US, use the customized loss plan above, and make the following administration changes. There are 2 modified loss groups (5 and 14). When administering an R300 station, use loss group 5 instead of the default (1 or 2). When administering an R300 digital CO (T1) trunk group, use loss group 14 instead of the default (13).

Here is the legend.

| Loss Group | Port Type |
|---|---|
| 1 | DEFINITY ECS Analog Line |
| 2 | DEFINITY ECS Digital Station |
| 6 | DEFINITY ECS Analog CO |
| 11 | DEFINITY ECS Digital CO |
| 5 | R300 Digital Station and Analog Line |
| 14 | R300 Digital CO |

# Japan settings

2 PARTY LOSS PLAN

Digital Loss Plan: 3 Customize? n

TO

| FROM | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | -3 | 0 | 0 | 3 | 3 |
| 2: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 3: | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 4: | 0 | 0 | -3 | 0 | 0 | 3 | 3 | 3 | 2 | 5 | 0 | 0 | 0 | 0 | 2 | 3 | 3 |
| 5: | 0 | 0 | -3 | 0 | 0 | 3 | 3 | 3 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 6: | 0 | 0 | -3 | 3 | 3 | 6 | 8 | 6 | 5 | 7 | 5 | 3 | 3 | 3 | 5 | 3 | 3 |
| F 7: | 0 | 0 | -3 | 3 | 3 | 8 | 8 | 6 | 5 | 9 | 5 | 3 | 3 | 3 | 5 | 3 | 3 |
| R 8: | 0 | 0 | -3 | 3 | 3 | 6 | 6 | 6 | 3 | 7 | 3 | 3 | 0 | 0 | 3 | 3 | 3 |
| O 9: | 0 | 0 | -3 | 2 | 2 | 5 | 5 | 3 | 0 | 4 | 2 | -3 | -3 | -3 | 0 | 3 | 3 |
| M 10: | 5 | 8 | -3 | 5 | 5 | 7 | 9 | 7 | 4 | 4 | 3 | -3 | 0 | -3 | 3 | 3 | 3 |
| 11: | 0 | 0 | -3 | 0 | 0 | 5 | 5 | 3 | 2 | 3 | 0 | 0 | 0 | -3 | 0 | 3 | 3 |
| 12: | 6 | 6 | 3 | 6 | 6 | 9 | 9 | 9 | 3 | 3 | 6 | 0 | 0 | 0 | 6 | 3 | 3 |
| 13: | 5 | 6 | 0 | 5 | 5 | 6 | 6 | 3 | 3 | 8 | 6 | 0 | 0 | 0 | 6 | 3 | 3 |
| 14: | 6 | 6 | 0 | 6 | 6 | 9 | 9 | 6 | 3 | 3 | 3 | 0 | 0 | 0 | 6 | 3 | 3 |
| 15: | 0 | 0 | -3 | 2 | 0 | 5 | 5 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 16: | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 17: | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

**Screen 40. Default loss plan settings for country code 3**

2 PARTY LOSS PLAN

Digital Loss Plan: 3 Customize? y

TO

| FROM | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | -3 | 5 | 0 | 3 | 3 |
| 2: | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 5 | 0 | 3 | 3 |
| 3: | 3 | 6 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 5 | 0 | 3 | 3 |
| 4: | 0 | 0 | -3 | 0 | 5 | 3 | 3 | 3 | 2 | 5 | 0 | 0 | 0 | 5 | 2 | 3 | 3 |
| 5: | -3 | -3 | -3 | -3 | 0 | -3 | -3 | -3 | -3 | 3 | -3 | -3 | -3 | 0 | -3 | -2 | -2 |
| 6: | 0 | 0 | -3 | 3 | 5 | 6 | 8 | 6 | 5 | 7 | 5 | 3 | 3 | 10 | 5 | 3 | 3 |
| F 7: | 0 | 0 | -3 | 3 | 5 | 8 | 8 | 6 | 5 | 9 | 5 | 3 | 3 | 5 | 5 | 3 | 3 |
| R 8: | 0 | 0 | -3 | 3 | 5 | 6 | 6 | 6 | 3 | 7 | 3 | 3 | 0 | 8 | 3 | 3 | 3 |
| O 9: | 0 | 0 | -3 | 2 | 5 | 5 | 5 | 3 | 0 | 4 | 2 | -3 | -3 | 7 | 0 | 3 | 3 |
| M 10: | 5 | 8 | -3 | 5 | 13 | 7 | 9 | 7 | 4 | 4 | 3 | -3 | 0 | 8 | 3 | 3 | 3 |
| 11: | 0 | 0 | -3 | 0 | 5 | 5 | 5 | 3 | 2 | 3 | 0 | 0 | 0 | 5 | 0 | 3 | 3 |
| 12: | 6 | 6 | 3 | 6 | 11 | 9 | 9 | 9 | 3 | 3 | 6 | 0 | 0 | 11 | 6 | 3 | 3 |
| 13: | 5 | 6 | 0 | 5 | 11 | 6 | 6 | 3 | 3 | 8 | 6 | 0 | 0 | 11 | 6 | 3 | 3 |
| 14: | -3 | -3 | -3 | -3 | 0 | 0 | 0 | -2 | -3 | -2 | -3 | -3 | -3 | 0 | -3 | -2 | -2 |
| 15: | 0 | 0 | -3 | 2 | 5 | 5 | 5 | 3 | 0 | 3 | 0 | 0 | 0 | 5 | 0 | 3 | 3 |
| 16: | 3 | 3 | 3 | 3 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 8 | 3 | 3 | 3 |
| 17: | 3 | 3 | 3 | 3 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 8 | 3 | 3 | 3 |

**Screen 41. Customized loss plan settings for country code 3**

- These instructions apply when you use country code 3 in the Digital Loss Plan field of the System-Parameters Country-Options screen (page 2).
- The loss plan does not apply to shuffled calls.
- Turn on shuffling (IP direct) for all R300 facilities.
- The 1st plan represents the default Japan loss plan.
- The 2nd plan represents the customized loss plan to be used with the R300. There are 2 modified loss groups (5 and 14). When administering an R300 station, use loss group 5 instead of the default (1 or 2). When administering an R300 digital CO (T1) trunk group, use loss group 14 instead of the default (13).

Here is the legend.

| Loss Group | Port Type |
|---|---|
| 1 | DEFINITY ECS Analog Line |
| 2 | DEFINITY ECS Digital Station |
| 6 | DEFINITY ECS Analog CO |
| 11 | DEFINITY ECS Digital CO |
| 5 | R300 Digital Station and Analog Line |
| 14 | R300 Digital CO |

## Nordic settings

2 PARTY LOSS PLAN

Digital Loss Plan: 24 Customize? n

| FROM \ TO | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 2: | 0 | 0 | 0 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 3: | 0 | 0 | 0 | -2 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 4: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 3 | 3 |
| 5: | 0 | 2 | 2 | 0 | 0 | 2 | 4 | 2 | 2 | 2 | 7 | 2 | 2 | 4 | 2 | 3 | 3 |
| 6: | 0 | 0 | -3 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| F 7: | 3 | 3 | 0 | 0 | 0 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| R 8: | 0 | 0 | -3 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| O 9: | 0 | 0 | 0 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| M 10: | 0 | 0 | 0 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 11: | 0 | 0 | 0 | -2 | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 12: | 0 | 0 | 0 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 13: | 0 | 0 | 0 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 14: | 0 | 0 | 0 | -2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 15: | 0 | 0 | 0 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 16: | 3 | 3 | 3 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 17: | 3 | 3 | 3 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

**Screen 42. Default loss plan settings for country code 24**

2 PARTY LOSS PLAN

Digital Loss Plan: 24 Customize? y

| FROM \ TO | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 2: | 0 | 0 | 0 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 3: | 0 | 0 | 0 | -2 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 4: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 5 | 5 |
| 5: | 0 | 2 | 2 | 0 | 0 | 2 | 4 | 2 | 2 | 2 | 7 | 2 | 2 | 4 | 2 | 7 | 12 |
| 6: | 0 | 0 | -3 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| F 7: | 3 | 3 | 0 | 0 | 0 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 5 |
| R 8: | 0 | 0 | -3 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| O 9: | 0 | 0 | 0 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| M 10: | 0 | 0 | 0 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 11: | 0 | 0 | 0 | -2 | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 12: | 0 | 0 | 0 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 13: | 0 | 0 | 0 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 14: | 0 | 0 | 0 | -2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 15: | 0 | 0 | 0 | -2 | -2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 16: | -3 | -3 | -3 | -3 | -3 | -3 | -2 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | 0 | 0 |
| 17: | -3 | -3 | -3 | -3 | -1 | -3 | -2 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | 0 | 0 |

**Screen 43. Customized loss plan settings for country code 24**

- These instructions apply when you use country code 24 in the Digital Loss Plan field of the System-Parameters Country-Options screen (page 2).
- The loss plan does not apply to shuffled calls.
- Turn on shuffling (IP direct) for all R300 facilities.
- The 1st plan represents the default Nordic loss plan.
- The 2nd plan represents the customized Nordic loss plan for the R300 if you are using US terminal-parameter levels, defined on the Terminal Parameters screen.

  If the terminal parameters are set for Nordic countries, no loss plan modifications are necessary. If you use the US terminal-parameters, you must customize the loss plan as shown above, and make the following administration changes. There are 2 modified loss groups (16 and 17). When administering an R300 station use loss group 16 instead of the default (1 or 2). When administering an R300 digital CO (T1) trunk group use loss group 17 instead of the default (13).

Here is the legend.

| Loss Group | Port Type |
|---|---|
| 1 | DEFINITY ECS Analog Line |
| 2 | DEFINITY ECS Digital Station |
| 6 | DEFINITY ECS Analog CO |
| 11 | DEFINITY ECS Digital CO |
| 16 | R300 Digital Station and Analog Line |
| 17 | R300 Digital CO |

## United Kingdom (UK) settings

```
                        2 PARTY LOSS PLAN
          Digital Loss Plan: 10                          Customize? n
                                                TO
            1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
      1:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
      2:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
      3:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
      4:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
      5:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
      6:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
F     7:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
R     8:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
O     9:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
M    10:    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   3   3
     11:    6   6   6   6   6   0   0   0   0   0   0   0   0   0   0   3   3
     12:    6   6   6   6   6   0   0   0   0   0   0   0   0   0   0   3   3
     13:    6   6   6   6   6   0   0   0   0   0   0   0   0   0   0   3   3
     14:    6   6   6   6   6   0   0   0   0   0   0   0   0   0   0   3   3
     15:    6   6   6   6   6   0   0   0   0   0   0   0   0   0   0   3   3
     16:    3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3
     17:    3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3   3
```

**Screen 44. Default loss plan settings for country code 10**

```
                        2 PARTY LOSS PLAN
          Digital Loss Plan: 10                          Customize? y
                                                TO
            1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17
      1:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
      2:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
      3:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
      4:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
      5:   -3  -3  -3  -3   0  -3  -3  -3  -3  -3  -3  -3  -3   0  -3  -2  -2
      6:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
F     7:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
R     8:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
O     9:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
M    10:    0   0   0   0   5   0   0   0   0   0   0   0   0   5   0   3   3
     11:    6   6   6   6  11   0   0   0   0   0   0   0   0   5   0   3   3
     12:    6   6   6   6  11   0   0   0   0   0   0   0   0   5   0   3   3
     13:    6   6   6   6  11   0   0   0   0   0   0   0   0   5   0   3   3
     14:    1   1   1   1   6  -3  -3  -3  -3  -3  -3  -3  -3   0  -3  -2  -2
     15:    6   6   6   6  11   0   0   0   0   0   0   0   0   5   0   3   3
     16:    3   3   3   3   8   3   3   3   3   3   3   3   3   8   3   3   3
     17:    3   3   3   3   8   3   3   3   3   3   3   3   3   8   3   3   3
```

**Screen 45. Customized loss plan settings for country code 10**

- These instructions apply when you use country code 10 in the Digital Loss Plan field of the System-Parameters Country-Options screen (page 2).
- The loss plan does not apply to shuffled calls.
- Turn on shuffling (IP direct) for all R300 facilities.
- The 1st plan represents the default UK loss plan.
- The 2nd plan represents the customized UK loss plan for the R300 if you are using US terminal-parameter levels, defined on the Terminal Parameters screen.

  If the terminal parameters are set for the UK, no loss plan modifications are necessary. If you use the US terminal-parameters, you must customize the loss plan as shown above, and make the following administration changes.

  There are 2 modified loss groups (5 and 14). When administering an R300 station use loss group 5 instead of the default (1 or 2). When administering an R300 digital CO (T1) trunk group use loss group 14 instead of the default (13).

Here is the legend.

| **Loss Group** | **Port Type** |
|---|---|
| 1 | DEFINITY ECS Analog Line |
| 2 | DEFINITY ECS Digital Station |
| 6 | DEFINITY ECS Analog CO |
| 11 | DEFINITY ECS Digital CO |
| 5 | R300 Digital Station and Analog Line |
| 14 | R300 Digital CO |

## United States (US) settings

2 PARTY LOSS PLAN

Digital Loss Plan: 1 Customize? n

| | | TO | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| | 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| | 2: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| | 3: | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| | 4: | 0 | 0 | -3 | 0 | 0 | 3 | 3 | 3 | 2 | 3 | 0 | 0 | 0 | 0 | 2 | 3 | 3 |
| | 5: | 0 | 0 | -3 | 0 | 0 | 3 | 3 | 3 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| | 6: | 0 | 0 | -3 | 3 | 3 | 6 | 8 | 6 | 5 | 5 | 5 | 3 | 3 | 3 | 5 | 3 | 3 |
| F | 7: | 0 | 0 | -3 | 3 | 3 | 8 | 8 | 6 | 5 | 5 | 5 | 3 | 3 | 3 | 5 | 3 | 3 |
| R | 8: | 0 | 0 | -3 | 3 | 3 | 6 | 6 | 6 | 3 | 5 | 3 | 3 | 0 | 0 | 3 | 3 | 3 |
| O | 9: | 0 | 0 | -3 | 2 | 2 | 5 | 5 | 3 | 0 | 0 | 2 | -3 | -3 | -3 | 0 | 3 | 3 |
| M | 10: | 3 | 3 | 0 | 3 | 3 | 5 | 5 | 5 | 0 | 0 | 3 | -3 | -3 | -3 | 3 | 3 | 3 |
| | 11: | 0 | 0 | -3 | 0 | 0 | 5 | 5 | 3 | 2 | 3 | 0 | 0 | 0 | -3 | 0 | 3 | 3 |
| | 12: | 6 | 6 | 3 | 6 | 6 | 9 | 9 | 9 | 3 | 3 | 6 | 0 | 0 | 0 | 6 | 3 | 3 |
| | 13: | 6 | 6 | 0 | 6 | 6 | 9 | 9 | 6 | 3 | 3 | 6 | 0 | 0 | 0 | 6 | 3 | 3 |
| | 14: | 6 | 6 | 0 | 6 | 6 | 9 | 9 | 6 | 3 | 3 | 3 | 0 | 0 | 0 | 6 | 3 | 3 |
| | 15: | 0 | 0 | -3 | 2 | 0 | 5 | 5 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| | 16: | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | 17: | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

**Screen 46. Default loss plan settings for country codes 1, 6, 7, 9, 14-17, 19-22**

2 PARTY LOSS PLAN

Digital Loss Plan: 1 Customize? y

| | | TO | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| | 1: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| | 2: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| | 3: | 3 | 6 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 11 | 5 |
| | 4: | 0 | 0 | -3 | 0 | 0 | 3 | 5 | 3 | 2 | 3 | 0 | 0 | 0 | 0 | 2 | 5 | 5 |
| | 5: | 0 | 0 | -3 | 0 | 0 | 3 | 5 | 3 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| | 6: | 0 | 0 | -3 | 3 | 3 | 6 | 8 | 6 | 5 | 5 | 5 | 3 | 3 | 3 | 5 | 5 | 10 |
| F | 7: | -3 | -3 | -3 | -3 | -3 | -2 | 0 | -2 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | 2 |
| R | 8: | 0 | 0 | -3 | 3 | 3 | 6 | 8 | 6 | 3 | 5 | 3 | 3 | 0 | 0 | 3 | 5 | 8 |
| O | 9: | 0 | 0 | -3 | 2 | 2 | 5 | 7 | 3 | 0 | 0 | 2 | -3 | -3 | -3 | 0 | 5 | 7 |
| M | 10: | 3 | 3 | 0 | 3 | 3 | 5 | 7 | 5 | 0 | 0 | 3 | -3 | -3 | -3 | 3 | 8 | 8 |
| | 11: | 0 | 0 | -3 | 0 | 0 | 5 | 7 | 3 | 2 | 3 | 0 | 0 | 0 | -3 | 0 | 5 | 5 |
| | 12: | 6 | 6 | 3 | 6 | 6 | 9 | 11 | 9 | 3 | 3 | 6 | 0 | 0 | 0 | 6 | 11 | 11 |
| | 13: | 6 | 6 | 0 | 6 | 6 | 9 | 11 | 6 | 3 | 3 | 6 | 0 | 0 | 0 | 6 | 11 | 11 |
| | 14: | 6 | 6 | 0 | 6 | 6 | 9 | 11 | 6 | 3 | 3 | 3 | 0 | 0 | 0 | 6 | 11 | 8 |
| | 15: | 0 | 0 | -3 | 2 | 0 | 5 | 7 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| | 16: | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 | -2 | -3 | -3 | -3 | -3 | -3 | 0 | 0 |
| | 17: | -3 | -3 | -3 | -3 | -3 | 0 | 2 | -2 | -3 | -2 | -3 | -3 | -3 | -3 | -3 | 0 | 0 |

**Screen 47. Customized loss plan settings for country codes 1, 6, 7, 9, 14-17, 19-22**

- These instructions apply when you use country code 1, 6, 7, 9, 14-17, or 19-22 in the Digital Loss Plan field of the System-Parameters Country-Options screen (page 2).
- The loss plan does not apply to shuffled calls.
- Turn on shuffling (IP direct) for all R300 facilities.
- The 1st plan represents the default US loss plan.
- The 2nd plan represents the customized loss plan to be used with the R300. There are 3 modified loss groups (16, 7, and 17). When administering an R300 station use loss group 16 instead of the default (1 or 2). When administering an R300 analog CO trunk group, use loss group 7 instead of the default (13). When administering an R300 digital CO (T1) trunk group, use loss group 17 instead of the default (13).

Here is the legend.

| Loss Group | Port Type |
|---|---|
| 1 | DEFINITY ECS Analog Line |
| 2 | DEFINITY ECS Digital Station |
| 6 | DEFINITY ECS Analog CO |
| 11 | DEFINITY ECS Digital CO |
| 16 | R300 Digital Station and Analog Line |
| 7 | R300 Analog CO |
| 17 | R300 Digital CO |

# Glossary and abbreviations

## Numerics

**3DES**
Triple data encryption standard. A method of applying DES three times in succession using 2 or 3 different keys. See data encryption standard (DES).

**802.1p**
Protocol specification for the Ethernet MAC layer for the prioritization of traffic over the Ethernet. Supports up to eight levels of priority.

## A

**address resolution protocol**
Provides dynamic resolution of mapping an IP address to a MAC layer address.

**adjunct**
A processor that does one or more tasks for another processor and that is optional in the configuration of the other processor. Intuity AUDIX and CentreVu CMS are considered adjuncts to the DEFINITY ECS.

**angel**
The processor in each DEFINITY port board that supports the board and the ports is called an angel processor.

**ARP**
See address resolution protocol.

**ASCII**
American Standard Code for Information Interchange. The standard code for representing characters in digital form. Each character is represented by an 8-bit code (including parity bit).

**asynchronous data transmission**
A method of transmitting data in which each character is preceded by a start bit and followed by a stop bit, thus permitting data characters to be transmitted at irregular intervals. This type transmission is advantageous when transmission is not regular (characters typed at a keyboard). Also called asynchronous transmission.

**asynchronous transfer mode (ATM)**
A connection-oriented, digital service optimized for fiber-optic lines at speeds up to 622.08 mbps. ATM networks set up a virtual circuit (virtual connection) between the transmitter and the receiver before sending any data. Data is then sent in a continuous stream of fixed-length, 58-byte cells, each of which contains a 48-byte payload and a 5-byte header. The header contains the virtual circuit number that identifies the pre-negotiated path through the network.

**ATM**
See asynchronous transfer mode (ATM).

**Audio Information Exchange (AUDIX)**
A fully integrated voice-mail system. Can be used with a variety of communications systems to provide call-history data, such as subscriber identification and reason for redirection.

**auxiliary trunk**
A trunk used to connect auxiliary equipment, such as radio-paging equipment, to a communications system.

# B

**B8ZS**
See bipolar 8 zero substitution (B8ZS).

**basic rate interface (BRI)**
The basic rate interface has a capacity of 144 kbps, divided into 2 B-channels and one D-channel. The B-channels are 64 kbps and can carry voice or data services. The D-channel is 16 kbps and is a signaling channel that manages the communication sessions.

**bandwidth**
The amount of data that a given channel can transmit in a given period of time, measured in bits per second (not bytes per second) on digital networks or in Hertz (cycles per second) on analog networks.

**baud**
A unit of transmission rate equal to the number of signal events per second. See also bit rate.

**bearer channel**
A channel over which user information is carried. The voice traffic on a DS0 circuit is said to be bearer traffic.

**BER**
Bit error rate.

**BGP**
See border gateway protocol.

**bipolar 8 zero substitution (B8ZS)**
B8ZS line coding substitutes a mix of 1s and 0s for every group of eight consecutive 0s in a stream of AMI-encoded data (see line coding). The encoded string contains consecutive ones with the same polarity. These intentional, bipolar violations of the AMI coding scheme let the receiving end identify, decode, and restore the long zero strings in the original message. B8ZS line coding does not corrupt digital data, so it is commonly used with T-1 lines.

**bit (binary digit)**
One unit of information in binary notation, having two possible values: 0 or 1.

**bit rate**
The speed at which bits are transmitted, usually expressed in bits per second. Also called data rate.

**bit-oriented signaling**
A form of control channel carried over a T1 or E1.

**BOOTP**
An internet protocol that provides network configuration to devices that may not have network configuration data stored locally.

**border gateway protocol**
An external gateway protocol for communications between routers in different autonomous systems. See IETF RFC 1267.

**BOS**
See bit-oriented signaling.

**bps**
Bits per second.

**BRI**
See basic rate interface (BRI).

**bridge**
A device that connects two or more packet-switched networks and directs packets sent from one to the other. See router.

**bus bridge**
A connection between the TDM bus and the packet bus built into the C-LAN circuit pack for use with DEFINITY ECS R7csi. Bus bridge connectivity is not used with any other DEFINITY switch model.

**byte**
A sequence of (usually eight) bits processed together.

# C

**C-LAN**
Control LAN interface. This is a static router module that allows the DEFINITY system to keep a map of IP connectivity for IP-based endpoints and adjuncts. C-LAN provides one TCP socket for each endpoint in the R300 to support the transport of signaling information.

**CA-TSC**
Call-associated temporary signaling connection.

**call detail recording (CDR)**
A feature that uses software and hardware to record call data. (Same as station message detail recording — SMDR).

**call detail recording utility (CDRU)**
Software that collects, stores, optionally filters, and outputs call-detail records.

**call management system (CMS)**
An application, running on an adjunct processor, that collects information from an ACD unit. CMS enables customers to monitor and manage telemarketing centers by generating reports on the status of agents, splits, trunks, trunk groups, vectors, and VDNs, and enables customers to partially administer the ACD feature for a communications system.

**call redirection**
See restricted facilities.

**called party number IE**
The ISDN information element containing the digits sent to the called party.

**CCITT**
Comitte Consultatif International Telephonique et Telegraphique. Now called *International Telecommunications Union* (ITU).

**CCMS**
See control-channel message set.

**CDR**
See call detail recording (CDR). (Same as SMDR and CMDR).

**CDRP**
Call detail record poller.

**CDRU**
Call detail record unit.

**central office (CO)**
Typically where the local end-office switch is housed. Also, the head-end of the local wire or the fiber loop.

**challenge handshake authorization protocol**
A protocol that identifies and authorizes clients communicating over PPP.

**channel**
A communication path linking two points for transmitting voice and data. Also:
1. In wideband, all of the time slots (contiguous or noncontiguous) necessary to support a call.
Example: an H0-channel uses six 64-kbps time slots.
2. A DS0 on a T1 or E1 facility not specifically associated with a logical circuit-switched call; analogous to a single trunk.

**CHAP**
See challenge handshake authorization protocol.

**cherub**
A little angel, level 1/level 2 framing device for supporting DSL service to digital telephones.

**circuit**
1. An arrangement of electrical elements through which electric current flows.
2. A channel or transmission path between two or more points.

**circuit pack**
A card on which electrical circuits are printed, and IC chips and electrical components are installed. A circuit pack is installed in a switch carrier.

**circuit-switched network**
A network that sets up and maintains a connection for the exclusive use of two or more communicating parties for the duration of their call. The familiar, voice telephone network is circuit-switched. See packet switching.

**class of restriction (COR)**
A feature that allows up to 64 classes of call-origination and call-termination restrictions for voice terminals, voice-terminal groups, data modules, and trunk groups.

**class of service (COS)**
A feature that uses a number to specify if voice-terminal users can activate the Automatic Callback, Call Forwarding All Calls, Data Privacy, or Priority Calling features.

**clear-channel facility**
A digital circuit that requires no in-channel framing or control bits. The whole bandwidth is thus available for data transmission.

**client**
An application that runs on one processor while drawing on data or other resources that are on a server located elsewhere. See dial-plan table.

**CMDR**
Centralized message detail recording. (Same as CDR and SMDR).

**CMS**
See call management system (CMS).

**CO**
See central office (CO).

**control-channel message set**
Communicates control information between the SPE and the port board angel.

**COR**
See class of restriction (COR).

**COS**
See class of service (COS).

**CP**
Circuit pack.

**CSU**
Channel service unit.

**cyclic redundancy checking (CRC)**
A method for detecting read, transmit, and write errors in data. At the transmission end, the system treats a block of data as a single binary number, divides it by some specified binary number, and appends the remainder (called the CRC character) to the data. At the receiving end, the system recalculates the remainder and compares the result to the CRC character. If the two agree, there are no errors.

# D

**D-channel backup**
Type of backup used with Non-Facility Associated Signaling (NFAS). A primary D-channel provides signaling for an NFAS D-channel group (two or more PRI facilities). A second D-channel, on a separate PRI facility of the NFAS D-channel group, is designated as backup for the D-channel. Failure of the primary D-channel causes automatic transfer of call-control signaling to the backup D-channel. The backup becomes the primary D-channel. When the failed channel returns to service, it becomes the backup D-channel.

**data channel**
A communications path between two points used to transmit digital signals.

**data-communications equipment (DCE)**
The equipment (usually a modem, data module, or packet assembler/disassembler) on the network side of a communications link that makes the binary serial data from the source or transmitter compatible with the communications channel.

**datagram**
In packet switching, a packet that carries information sufficient for routing from the originating data terminal equipment (DTE) without the necessity of establishing a connection between the DTEs and the network. Connectionless, unreliable.

**data encryption standard (DES)**
DES is the U.S. encryption standard for non-classified documents. This standard uses a 64-bit key encryption. Only the sender and the receiver know the key for encrypting the data.

**data link**
The configuration of physical facilities enabling end terminals to communicate directly with each other.

**data path**
The end-to-end connection used for a data communications link. A data path is the combination of all elements of an interprocessor communication in a DCS.

**data port**
A point of access to a computer that uses trunks or lines for transmitting or receiving data.

**data service unit (DSU)**
A device that transmits digital data on transmission facilities.

**data terminal equipment (DTE)**
Equipment consisting of the endpoints in a connection over a data circuit. In a connection between a data terminal and host, the terminal, the host, and their associated modems or data modules make up the DTE.

**DCE**
See data-communications equipment (DCE).

**DCP**
See digital communications protocol (DCP).

**DCS**
Distributed communications system.

**DES**
See data encryption standard (DES).

**DHCP**
See dynamic host configuration protocol (DHCP).

**dial-plan table**
A data structure that defines how a switch or server interprets dialed digits and routes calls. The dial-plan table performs two tasks. First, it identifies a dial plan rule that applies to the kind of input it has received. Then it applies the rule and translates the dialed input into a corresponding extension or public-network telephone number.

**DID**
Direct inward dialing trunk.

**Diff Serv**
See differentiated services.

**differentiated services**
A set of protocol procedures for marking frames using the TOS field of the IP header to differentiate services and give priority of some over others.

**digital communications protocol (DCP)**
A proprietary protocol used to transmit both digitized voice and digitized data over the same communications link. A DCP link is made up of two 64-kbps information (I-) channels and one 8-kbps signaling (S-) channel. The DCP protocol supports 2 information-bearing channels, and thus two telephones/data modules.

**digital signal level 0 (DS0)**
A single 64-kbps voice channel. A DS0 is a single 64-kbps channel in a T1 or E1 facility and consists of eight bits in a T1 or E1 frame every 125 microseconds.

**digital signal level 1 (DS1)**
A single 1.544-Mbps (United States) or 2.048-Mbps (outside the United States) digital signal carried on a T1 transmission facility. A DS1 converter complex consists of a pair, one at each end, of DS1 converter circuit packs and the associated T1/E1 facilities.

**DIOD**
Direct inward and outward dialing trunk.

**directory number**
This is the PSTN number the service provider assigns to a customer. This number supplies a means of identification for this unique customer as a call is routed through the voice network.

**DNS**
See domain name server (DNS).

**domain**
An addressable location on a network, such as a group of computers, single computer, or subdirectory. See domain name server (DNS).

**domain name server (DNS)**
An Internet computer that maintains a database of domain names.

Provides a mapping of alphanumeric names to IP addresses; for example, xxx.xxx.xxx.xxx --> www.avaya.com.

**DSU**
Data service unit.

**DTE**
Data-terminal equipment.

**DTMF**
See dual tone multi-frequency.

**dual tone multi-frequency**
A generic term for Touch Tone.

**dynamic host configuration protocol (DHCP)**
This is a TCP/IP protocol that enables a client to obtain a temporary IP address from a central server. See IETF RFC 2131.

# E

**E-1**
A digital transmission link with a capacity of 2.048 Mbps (2,048,000 bits per second). The European equivalent of the T-1. It can support 30 multiplexed 64-Kbps voice and data channels plus separate 64-Kbps channels for signaling and framing (synchronization). Also spelled **E1**.

**EIA**
See Electronics Industries Association (EIA).

**EIA-232**
A physical interface specified by the EIA. EIA-232 transmits and receives asynchronous data at speeds of up to 38.4 kbps over cable distances of up to 50 feet. EIA-232 replaces RS-232 protocol in some DEFINITY applications.

**electronic tandem network (ETN)**
A tandem tie-trunk network that has automatic call-routing capabilities based on the number dialed and the most preferred route available. Each switch in the network is assigned a unique private network office code (RNX), and each voice terminal is assigned a unique extension.

**enbloc**
Signaling in which address digits are transmitted in one or more blocks, with each block containing address information sufficient to enable switches to carry out progressive routing. Used in SS7, ISDN, and H.323.

**end point**
A phone call is between two phones. Each phone is an end point (You may also refer to the end point as a client).

**Electronics Industries Association (EIA)**
A trade association of the electronics industry that establishes electrical and functional standards.

**ethernet**
A local area network (LAN) that works over short distances on twisted-pairs or coaxial cables at speeds up to 10 mbps or 100 mbps. See also ATM.

**ethernet source address**
A 48-bit physical address of the NIC; also called the media access control (MAC) address.

**ETN**
See electronic tandem network (ETN).

**ETSI**
European telecom standards institute.

## F

**facility**
A telecommunications transmission pathway and associated equipment.

**facility-associated signaling (FAS)**
Signaling for which a D-channel carries signaling only for those channels on the same physical interface.

**FAS**
See facility-associated signaling (FAS).

**FE1**
See fractional E1 interface.

**fractional E1 interface**
An interface that is NxDS0 in size, where N is less than 30.

**fractional T1 interface**
An interface that is NxDS0 in size, where N is less than 23.

**framing**
The data-formatting conventions that allow a receiver to synchronize with the transmitting end of a circuit. For example, T-1 frames contain an 8-bit sample from each of the 24 channels on the interface (192 bits total) plus a framing bit (for a total of 193 bits). Each framing bit marks the end of a timed sample the input at the transmission end.

**FRL**
Facilities restriction level.

**FT1**
See fractional T1 interface.

**FX**
Foreign exchange.

# G

**gateway**
(1) protocol converter (2) a node between network segments.

# H

**H.320**
The most common standard for videoconferencing over ISDN BRI circuits. H.320-compatible systems can communicate with each other even when they rely on dissimilar hardware and software.

**H.323**
A specification that sets standards for multimedia communications between LANs and telephony networks, such as ISDN.

**HDB3**
See high density bipolar 3-bit substitution (HDB3).

**high density bipolar 3-bit substitution (HDB3)**
HDB3 line coding is similar to bipolar 8 zero substitution (B8ZS) in some ways. It replaces every 4 consecutive zero in a stream of AMI-encoded data (see line coding) with either of two sequences. If there has been an even number of 1s since the last substitution, it substitutes the pattern **1 0 0** ***BipolarViolation***, where ***BipolarViolation*** is a 3-volt pulse (a **1**) of the same polarity as the preceding 3-volt pulse. If there has been an odd number of 1s since the last substitution, HDB3 coding substitutes the pattern **0 0 0** ***BipolarViolation*** for the 4-zero string. This system does not corrupt binary data, and is commonly used with E-1 lines.

**host**
A server.

**host access equipment**
Customer IP data equipment that serves on premises access to wide area networks (WANs). This equipment usually includes a router.

**host name**
See server.

# I

**IANA**
Internet Assigned Number Authority.

**ICMP**
See internet control message protocol (ICMP).

**IETF**
Internet Engineering Task Force.

**IGMP**
Internet group management protocol.

**INADS**
Initialization and administration system

**inband signaling**
A type of signaling in which a line uses 8 Kbps of each 64 Kbps channel for WAN synchronization. The remaining 56 Kbps of each channel handles the transmission of user data. Another term for inband signaling is robbed bit signaling.

**information element (IE)**
The data fields in ISDN messages.

**International Standards Organization (ISO)**
A body that defines and/or adopts protocols widely used in the computer and telecommunications industries.

**International Telecommunications Union (ITU)**
Formerly known as International Telegraph and Telephone Consultative Committee (CCITT), ITU is an international organization that sets universal standards for data communications, including ISDN. ITU members are from telecommunications companies and organizations around the world.

**internet**
The decentralized network of networks that grew from ARPAnet and supported by TCP/IP.

**internet control message protocol (ICMP)**
This protocol communicates error messages and conditions between two IP entities.See IETF RFC 792.

**IP**
Internet protocol. See IETF RFC 791.

**IP (internet protocol) address**
A 32-bit number that uniquely identifies endpoints on the Internet, commonly specified in the form ***n1.n2.n3.n4*** where each $n_n$ is a decimal number between **0** and **255**. Part of the IP address represents the address of a local network's gateway to the Internet and part represents the host-machine address within that local network. The available bits are apportioned to the network address or local address using a system of classes. The Class A addresses used by the largest organizations on the Internet reserve the first 8 bits for the network portion of the address and remaining 24 for the host machine. Class B addresses, the most common class, assign 16 bits to the network and 16 to the host machine. The Class C addresses used by small networks reserve the first 24 bits for the network and the remaining 8 bits for the host.

**IPsec**
IP security. See IETF RFC 2401

**ISDN**
Integrated Services Digital Network, a digital, voice and data service. ISDN comes in two forms, primary rate interface (PRI) and basic rate interface (BRI). PRI service has a capacity of 1.544 mbps, divided into 23 or 30 B-channels (23 on a North American T-1 connection, 30 on a European E-1) and 1 D-channel, each with a capacity of 64 kbps. BRI service has a capacity of 144 kbps, divided into 2 B-channels at 64 kbps each and 1 D-channel at 16 kbps.

**ISDN trunk**
A trunk administered for use with ISDN-PRI. Also called ISDN facility.

# L

**LAN**
See local area network.

**LAP-D**
See link-access procedure on the D-channel (LAPD).

**line coding**
Line coding is the data format that lets either end of a communications channel correctly interpret messages from the other. Line coding systems specify the voltage levels and patterns that represent binary digits (1s and 0s), based on the requirements of the transmission network. The AT&T network has two: it demands that the net voltage on the line equal 0 volts DC and it demands a minimum open system interconnect (OSI) model. The T-carrier system meets the first requirement by using a bipolar line-coding scheme called Alternate Mark Inversion (AMI). It meets the second with one of several supplementary coding schemes, including ZCS, bipolar 8 zero substitution (B8ZS), and high density bipolar 3-bit substitution (HDB3).

**link**
A transmitter-receiver channel that connects two systems.

**link-access procedure on the D-channel (LAPD)**
A link-layer protocol on the ISDN-BRI and ISDN-PRI data-link layer (level 2). LAPD provides data transfer between two devices, and error and flow control on multiple logical links. LAPD is used for signaling and low-speed packet data (X.25 and mode 3) on the signaling (D-) channel and for mode-3 data communications on a bearer (B-) channel.

**local area network**
A short-range data communication network providing high-speed carrier service with low error rates. Generally, a LAN is limited in range to a maximum of 6.2 miles. Ethernet and Token-Ring are common LAN architectures. See wide area network, ethernet.

**looparound testing**
Checking an interface by sending a signal through the output, across a medium (the loop), and back through the input. Internal looparound tests run against the internal circuitry of the card. External looparound tests check the connectors at the edge of the card using a fiber or wire loop. PRI, Ethernet, and ATM cards are tested this way.

# M

**MAC**
See media access control (MAC).

**main**
The DEFINITY switch is called the main portion of the system. See also remote.

**main-satellite-tributary**
A private network configuration that can either stand alone or access an ETN. A main switch provides interconnection, via tie trunks, with one or more subtending switches, called satellites; all attendant positions for the main/satellite configuration; and access to and from the public network. To a user outside the complex, a main/satellite configuration appears as one switch, with one listed directory number (LDN). A tributary switch is connected to the main switch via tie trunks, but has its own attendant positions and LDN.

**management information base (MIB)**
A virtual database used by the simple network management protocol (SNMP).It is a group of managed elements that contain a description of the fault and performance management event counters and threshold counters for a subsystem module.

**MAX**
Multiband access exchange.

**MAX 3000**
An pre-existing remote access concentrator product created by Luscent-Ascend. Voice capabilities were added through software redesign and the addition of the Combo Blade to create the DEFINITY R300 Remote Office product.

**MDR**
Message detail record.

**mean opinion score (MOS)**
A measure of voice transmission quality. MOS is a rating in scale from 1 to 5, where 5 is the best score. Toll quality is an MOS = 4. An MOS greater than 4 is considered an enhancement to toll quality.

**media access control (MAC)**
A sublayer of the OSI Data Link layer, provides an interface with the network layer.

**media access control (MAC) address**
An address programmed into the network interface card (NIC) that uniquely identifies it.

**MIB**
See management information base (MIB).

**MOS**
See mean opinion score (MOS).

**multicasting**
A transmission method that promotes efficient bandwidth utilization on a multimedia data network when several parties are transmitting and receiving simultaneously. Normally, each party sends a separate video stream to each of the other parties and receives a separate video stream from each in return (this is called unicasting). Multicasting substitutes a single broadcast transmission (addressed to all parties) for the separate transmissions addressed to each. Each party then continues to receive multiple data streams while sending only one. For best results, multicast messages should be restricted to one or more subnet.

# N

**national number**
The full dialed number minus the country code. The national number is composed of office code plus subscriber code. In North America, this means area code plus seven digits. For example, 303-538-1234 is a national number.

**NCA/TSC**
Noncall-associated/temporary-signaling connection.

**network**
A collection of computer-like devices (“nodes”) that are connected by, and can communicate across, a common transmission medium.

**network adapter**
The interface between a node and the network; has a unique physical address.

**network interface card (NIC)**
A circuit board that can be fitted to a personal computer (PC) to allow the PC to communicate with other machines on a network. Also called a network adapter.

**NFAS**
See nonfacility-associated signaling (NFAS).

**NIC**
See network interface card (NIC).

**node**
1. A point on a network that provides an interface to a communications device.

2. A switch or adjunct in an Avaya DCS network.

**nonfacility-associated signaling (NFAS)**
A method that allows multiple T1 and/or E1 facilities to share a single D-channel to form an ISDN-PRI. If D-channel backup is not used, one facility is configured with a D-channel, and the other facilities that share the D-channel are configured without D-channels. If D-channel backup is used, two facilities are configured to have D-channels (one D-channel on each facility), and the other facilities that share the D-channels are configured without D-channels.

# O

**off-hook**
When the handset is picked up, the phone is said to be off-hook.

**on-hook**
When the handset is in its cradle and the line is in a state of disconnect, the phone is considered on-hook.

**open system interconnect (OSI) model**
An International Standards Organization (ISO) interoperability specification. OSI defines standard services that compliant communications networks and equipment must provide, rather than specific implementations. It divides network operations into 7 steps, called layers, and arranges them hierarchically, in a protocol stack. The rules (protocols) in each layer of the stack specify a service that other parts of a communications system can always get, as long as they make their requests in a standard way. This approach leaves designers free to implement the internal details of the service in whatever way seems best to them. The OSI layers are **1 Physical** (transmission medium), **2 Datalink** (link-level signaling and error control), **3 Network** (computer-to-computer signaling, routing, etc.), **4 Transport** (delivery, end-to-end error control, and flow control), **5 Session** (dialog management), **6 Presentation** (data-format compatibility), and **7 Application** (file-transfer services, virtual terminals, etc.).

**OSI**
See open system interconnect (OSI) model.

**OSPF**
Open shortest path first protocol. See IETF RFC 1247.

**overlap dialing**
When SS7, ISDN, or H.323 setup messages are sent and received with partial or absent called party number information. The complete called party information is sent in later signaling messages.

# P

**packet**
A group of bits (including a message element, which is the data, and a control information element (IE), which is the header) used in packet switching and transmitted as a discrete unit. In each packet, the message element and control IE are arranged in a specified format.

**packet bus**
A wide-bandwidth bus that transmits packets.

**packet switching**
A data-transmission technique whereby user information is segmented and routed in discrete data envelopes called packets, each with its own appended control information, for routing, sequencing, and error checking. The packets can travel to their destinations by varying routes. For data transmissions, a packet switched network can make more efficient use of available bandwidth than a circuit-switched network, because it does not dedicate a channel for the duration of a call. Instead, packets are queued and sent on a standby basis, as channel capacity becomes available. The Internet is a good example of a packet-switching network.

**PBX**
Private Branch Exchange: a customer-owned telephone switch that connects a company's internal telephone network with the local telephone service provider's central office. Avaya's DEFINITY ECS system is a good example.

**point-to-point protocol**
A TCP/IP implementation tailored for use over telephone lines. It supports router-to-router and host-to-network connections over both synchronous and asynchronous circuits. PPP replaces SLIP, the older Serial Line Interface Protocol.

**Port**
(1) Interface between an application and the TCP/IP network. A port is a predefined internal address (port number) that serves as a pathway from the application to the Transport layer (or from T to A). (2) circuit-pack port.

**PPP**
See point-to-point protocol.

**PRI**
Primary rate interface. See ISDN.

**primary rate interface (PRI)**
See ISDN.

**private network**
A network used exclusively for the telecommunications needs of a particular customer.

**private network office code (RNX)**
The first three digits of a 7-digit private network number.

**protocol**
A set of conventions or rules governing the format and timing of message exchanges to control data movement and correction of errors.

**prowler**
The conventional name of the (TN2302) IP media processor board. This is the media gateway module that provides conversion between IP-based information streams and TDM-based streams.

**PSA**
Personal station access.

**PSDN**
Packet-switch public data network.

**PSTN**
See public switched telephone network (PSTN).

**PSN**
Packet-switched network.

**public switched telephone network (PSTN)**
The worldwide voice telephone system. This is the ordinary telephone network the Qwest, Ameritech, and other operating companies provide.

# Q

**QoS**
See quality of service (QoS).

**QPPCN**
Quality Protection Plan Change Notice.

**QSIG**
A set of open standards for Enterprise Networking. QSIG is a protocol defining message exchanges (signaling) at the "Q" reference point between two switches.

**quality of service (QoS)**
These are various methods of controlling the flow of data in a network to improve data delivery time from end-to-end.

# R

**RARP**
Reverse address resolution protocol. See IETF RFC 903.

**RAS**
Registration/admission/status is an H.323v2 procedure for a station to identify itself and register with a gatekeeper.

**remote**
The DEFINITY Remote MAX is called the remote portion of the system. See also main.

**remote trunks**
Any trunk connected to the DEFINITY remote MAX is considered a remote trunk.

**restricted facilities**
PRI spans that use ZCS line coding, the opposite of unrestricted facilities.

**RFC**
Request for comment.

**RIP**
See routing information protocol (RIP).

**RIP-V2**
Routing information protocol version 2. See IETF RFC 2453.

**robbed bit signaling**
A type of signaling in which 8 kbps of each 64 kbps channel is used for WAN synchronization and signaling. The signaling information may be communicated as a bit reversal pattern or in-band tones (R2-MFC). This technique is also known as inband signaling.

**router**
An interface between different networks. A router supports network management, including load balancing, route optimization, prioritization of calls, and troubleshooting. Therefore, it is more capable than a bridge.

**routing information protocol (RIP)**
A simple interior gateway routing protocol.

**routing plan**
Routing plans direct outgoing voice-interworking and interserver calls to the first available PRI trunk group in a list. This arrangement lets you allow for trunk groups that are busy, out of service, or out of bandwidth. Each routing plan is identified by a routing-plan number in the range **1-32**.

**RPN**
Routing-plan number.

**RRQ**
Registration request. This is an H.225 RAS message.

**RTP**
Real-time protocol.

# S

**socket**
A TCP/IP interface that facilitates a two-way link between two systems on a connectionless network. A socket is defined by two addresses: the IP address of the host computer, and the TCP port of the application running on the host.

**server**
Any system that maintains and administers files that are used by independent, client applications.

**shuffling**
Redirecting a voice stream between IP endpoints from one address to another without re-establishing the call through a main DEFINITY cabinet hardware module. For example, an IP-based call that comes to an IP-phone connected to a DEFINITY system must first connect to the prowler because it needs translation from IP-based to TDM-based information stream. Once the call is established, however, the prowler may no longer be needed. It will therefore shuffle the call to the IP network, taking itself out of the loop.

**signaling**
The control information that a network uses to set up and maintain connections. On-hook and off-hook are, for instance, the familiar voice-telephone signals that tell the central office that you have picked up the telephone handset or hung up at the end of a call.

In-channel signaling reserves part of the available data -communication bandwidth for control information (see restricted facilities). Out-of-channel signaling schemes use a separate channel for signals, so that data transmissions can use all of the bandwidth available to them (see clear-channel facility).

**simple network management protocol (SNMP)**
An International Standards Organization (ISO) protocol that sets standards for communications between network components and network management stations. SNMP handles network resources using the information contained in a management information base (MIB), a virtual database resident on the various parts of the network. SNMP supports security, configuration, performance, fault management, and accounting management. SNMP is part of the ISO open system interconnect (OSI) model specification.

**SMDR**
Station message detail recording. (Same as call detail recording — CDR).

**SNMP**
See simple network management protocol (SNMP).

**SPE**
Switch processing element.

**SPID**
A service profile identifier. A SPID is a number that the telephone service provider uses at the central office switch to identify services on the ISDN subscriber line. The encoding of the SPID is derived from the directory number.

**subnet**
A network within a larger network. Subdividing a network into subnets improves the efficiency of routing and makes the best use of the limited number of addresses available with any given addressing scheme. Subnetworks are defined by using part of the host-machine portion of the IP (internet protocol) address as an additional layer of network information. Routers can then distinguish between a networking part that is significant for internet/intranet routing and a host-machine part, which is significant only within the local subnet.

**subnet mask**
A bit pattern that lets a network administrator define subnets using the host-machine portion of the IP (internet protocol) address. The subnet mask has binary ones in positions corresponding to the network and subnet parts of the address and zeros in the remaining, host-address positions. During IP-address resolution, zero fields in the mask hide corresponding host-address fields in the address, causing the router to ignore them. The router resolves only the networking part of the address, leaving the host part for the local subnet to resolve. This increases speed and makes multicasting more efficient. Subnet masks are usually written in the decimal notation used for IP addresses.

# T

**T-1**
A 4-wire (2 twisted pair), digital communications link with a capacity of 1.544 Mbps (1,544,000 bits per second). A T-1 provides 24 separate 64-Kbps channels. These can support up to 23 concurrent voice and data channels (B-channels) plus a separate channel (D-channel) for signaling and framing (synchronization) in a primary rate facility. T-1 is the standard for data communications in North America and Japan. Also spelled **T1**. See E-1.

**T-carrier**
A hierarchy of digital voice- and data-transmission systems used in North America and based on multiples of the capacity of the Table  line.

**tandem switch**
A switch within an electronic tandem network (ETN) that provides the logic to determine the best route for a network call, possibly modifies the digits outpulsed, and allows or denies certain calls to certain users.

**tandem-through**
The switched connection of an incoming trunk to an outgoing trunk without human intervention.

**tandem tie-trunk network (TTTN)**
A private network that interconnects several customer switching systems.

**TCP**
Transmission control protocol — transport layer; connection oriented, reliable. See IETF RFC 793.

**TCP/IP**
Transmission control protocol/internet protocol. A standard that lets different computer hardware and different operating systems (such as PCs, Apple computers, UNIX workstations, and mainframes) communicate with each other over a network. TCP/IP is the most complete, most widely accepted network protocol currently available.

**TDM**
See time-division multiplexing.

**terminal translation initialization (TTI)**
The administration of a station on the DEFINITY switch at the station itself, utilizing feature access codes. With this feature a station can be moved from one location to another without the need for re-entering the station translations.

**tie trunk**
A telecommunications channel that directly connects two private switching systems.

**time-division multiplexing**
A way of interleaving digitized voice, video, and/or data so that several calls can be sent concurrently over the same spread of frequencies. TDM systems distribute the available bandwidth across a series of time slots and divide each input stream into a set of samples. They then assign successive time slots to the first sample in each input stream. They repeat the process until all time slots have been assigned or all inputs sent. At the far end, the receiver de-multiplexes the transmission and reconstructs the original sequence of samples. Time-division multiplexing is typically used on circuit-switched networks.

**time slot**
64 kbps of digital information structured as eight bits every 125 microseconds. In the switch, a time slot refers to either a DS0 on a T1 or E1 facility or a 64-kbps unit on the TDM bus or fiber connection between port networks.

**TOS**
See type of service (TOS).

**trunk**
A communication line linking two switches (public-network or PBX).

**trunk group**
A collection of trunks that all terminate at the same public switch or PBX.

**TSS**
Time space switch.

**TTI**
See terminal translation initialization (TTI).

**type of service (TOS)**
A field in the header of the IP protocol frame.

# U

**UDP**
1. User datagram protocol — transport layer; connectionless, unreliable, fast. See IETF RFC 768.

2. Uniform Dial Plan.

**UNP**
Uniform numbering plan

**unrestricted data**
Data that has to travel over an unrestricted facilities, because it can be corrupted by zero code suppression (ZCS) line coding. Digital data is unrestricted data.

**unrestricted facilities**
PRI spans that use non-ZCS line coding, such as B8ZS or HDB3, end-to-end. See zero code suppression (ZCS).

# V

**virtual private network (VPN)**
A VPN is virtual because it appears as a private network to the organization subscribing to it. VPNs require sophisticated encryption and decryption in order to remain secure while using the public internet.

**voice over IP (VoIP)**
A set of protocol procedures for managing the transmission of voice information with IP protocol as its native transport layer. In the DEFINITY system this entails encoding of the voice information into a G.xxx -series codec, wrapping it in the real time protocol (RTP) and sending it over a UDP socket per H.323 defined procedures.

**VoIP**
See voice over IP (VoIP).

**VPN**
See virtual private network (VPN).

# W

**WAN**
See wide area network.

**well-known address**
The default network address for a given type of network component, as specified by a communications protocol or standards body. For example, the ATM Forum defines well-known addresses for LAN-emulation servers and LAN-emulation configuration servers.

**well-known port**
port numbers that are assigned to specific applications by IANA. For example, 21 for FTP, 23 for Telnet, 110 for pop3.

**wide area network**
A data network that connects local area networks (LANs) using common-carrier telephone lines, bridges, and routers.

**wideband**
A circuit-switched call at a data rate greater than 64 kbps. A circuit-switched call on a single T1 or E1 facility with a bandwidth between 128 and 1536 (T1) or 1984 (E1) kbps in multiples of 64 kbps. H0, H11, H12, and N x DS0 calls are wideband.

# Z

**ZCS**
See zero code suppression (ZCS).

**zero code suppression (ZCS)**
ZCS line coding substitutes a 1 for the second least-significant bit of every all-zero byte in AMI-encoded data (see line coding). ZCS encoding has no effect on voice communications, but it corrupts digital data (see restricted facilities).

# Index

## I



## L



## M



## N



## O



## P



## R

## S



## T



## U



## V



## Z