AVAYA

communication

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

DEFINITY Enterprise Communication Server Release 9
Getting Started with the Avaya R300 Remote Office Communicator

Issue 1
November 2000

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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 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.

> **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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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

- Avaya Centers of Excellence

  — Asia/Pacific +65-872-8686

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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: AV1XXX-XXXXX-CN-E (not available as of this printing).

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
C.O. Trunk	02LS2	0.5A	RJ61X

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 it's 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.

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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.

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1 Overview of the Avaya R300 Remote Office Communicator
DEFINITY and the Avaya R300 1

Overview of the Avaya R300 Remote Office Communicator

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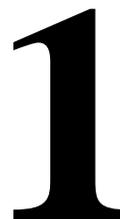
DEFINITY and the Avaya R300

The Avaya R300 provides an integral solution to support the complete communication needs of a small office (24 clients or less) for LAN data clients and digital/analog voice terminals. The Avaya R300 supports IP routing through its integrated WAN interfaces (T1, E1, BRI, and serial) to the R9 or newer DEFINITY.

From a control perspective, all call processing, call routing, and billing are managed in the DEFINITY control cabinet. The Avaya R300 operates similarly to a DEFINITY EPN. The Avaya R300 Remote Office Communicator provides local access trunks (digital and analog), and the DEFINITY manages these as IP signaling groups.

This remote application, based on Lucent-Ascend's MAX 3000, provides you with an effective way to maintain remote DCP and analog phones and trunks from 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.

Since the Avaya R300 Remote Office Communicator is based on Lucent-Ascend's MAX 3000, you may see references to Lucent-Ascend's MAX documentation. That documentation can be found on the DEFINITY documentation CD shipped with the Avaya R300.

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DEFINITY Remote Office overview

DEFINITY Network

The "main" DEFINITY cabinet may be a G3R, a G3SI, G3CSI, 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 a Release 9 or newer release software.

Two DEFINITY hardware boards are used to support the Remote Office; the C-LAN (TN799C) and the IP Media Processor (TN2302AP). The C-LAN board is used to convey signaling/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 1 below shows the network topology for a DEFINITY ECS main system with two subtending remote office configurations.
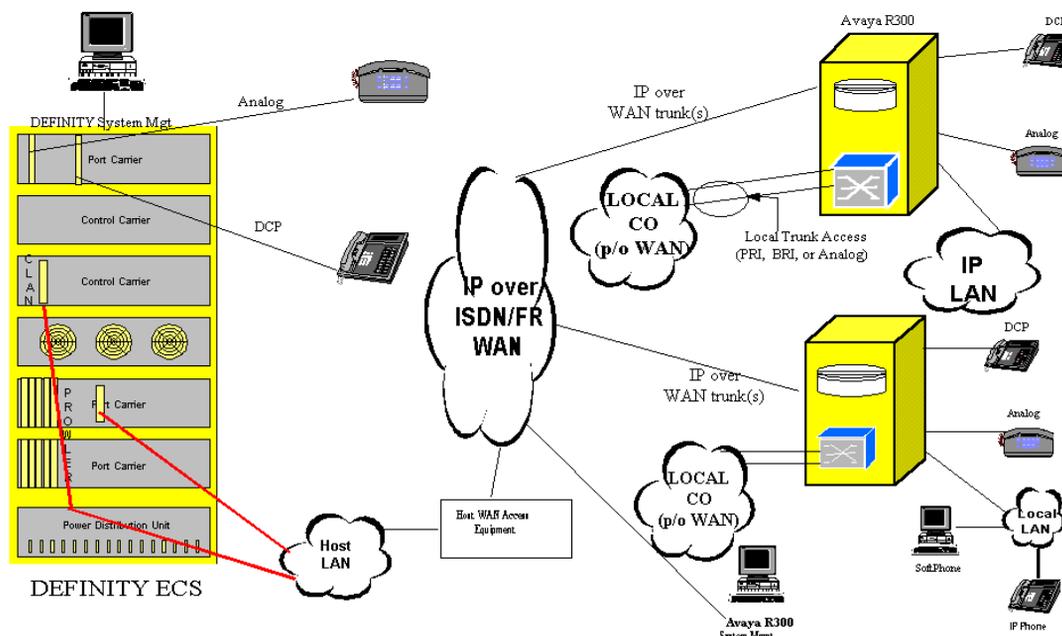
Figure 1.   DEFINITY Remote Office Network Topology

The "network" connection to the C-LAN card is a 10 BaseT and 100 BaseT Ethernet connection. The "network" connection to the IP Media Processor is a 10/100 BaseT Ethernet connection. This Ethernet output of these two cards is connected to the host LAN which is a subnetwork consisting of data switches and/or hubs and interior routers.

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From the host LAN network, the control and bearer IP traffic streams are directed via Host WAN Access equipment to the WAN. This WAN access equipment typically would consist of the following components:

- Router to serve as the IP gateway from the enterprise premises out to the IP-based WAN.

- Access Concentrator to multiplex the LAN and TDM-based enterprise traffic streams into an aggregated stream to present to the wide area network.

- Optionally a VPN service for providing enhanced security, particularly for data services.

- Optionally 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.

This WAN access equipment may be provided by one or more physically separate products, and these products may be provided by different vendors. 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 1 on page 2) 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.

Avaya R300 network

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

The Avaya R300 provides the following features:

- Support for up to 24 DCP digital two-wire sets: 6400-series, 8400-series, or 9031DCP Transtalk model (wireless base station).

- Support for two analog stations to which analog phones (6200-series or 2500-series) or analog fax machines may be connected.

- Support for local switching between the analog and DCP station sets 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 voice telephony features, the Avaya R300 provides the remote site the opportunity to integrate data and provides a conversion of voice and data applications in the same product.

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Specifically, the Avaya R300 provides:

- WAN access via E1, T1, BRI (BRI-S/T 4-wire or BRI-U 2-wire), and serial WAN.

- 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 U-law), G.729, and G.723

This digital WAN interface is based on four product models:

- MX30-2T1-AC which contains two T1 interfaces (available in North American and Japanese models).

- MX30-2E1-AC which contains two E1 interfaces.

- MX30-6ST-AC which contains six BRI 4-wire S/T interfaces.

- MX30-6BU-AC which contains six BRI 2-wire U 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 signalling. 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.

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DEFINITY call processing for the Avaya R300 stations & trunks   5

DEFINITY call processing for the Avaya R300 stations & trunks

The trunk facilities within the Avaya R300 are under the management of the main DEFINITY switch. The Avaya R300 operates as a:

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

- ■ Trunk-side gateway to represent the PSTN wide area network digital and analog services to DEFINITY as IP trunks.

The Avaya R300 operates as a "line side" gateway to translate the TDM-based digital and analog telephone stations and present them to DEFINITY as if they were "native" H.323 IP phones. It should be noted that the DEFINITY maintenance and administration of the lamp displays and button control are maintained exactly in accordance with existing DEFINITY CCMS messages. These "custom" DEFINITY messages are tunneled over the TCP/IP connections to the Avaya R300.

The Avaya R300 operates as an IP trunk gateway for the management of digital trunks (T1/E1, BRI) and the analog trunks. Each element of the PSTN trunks can be mapped to be represented to DEFINITY as an IP Signalling group member. This allows all of the DEFINITY application features such as ARS and Multi-Location Routing to be employed.

In effect, the Avaya R300 operates as a "virtual" EPN to DEFINITY. Figure 2 shows how DEFINITY call processing views the resources within the Remote Office.
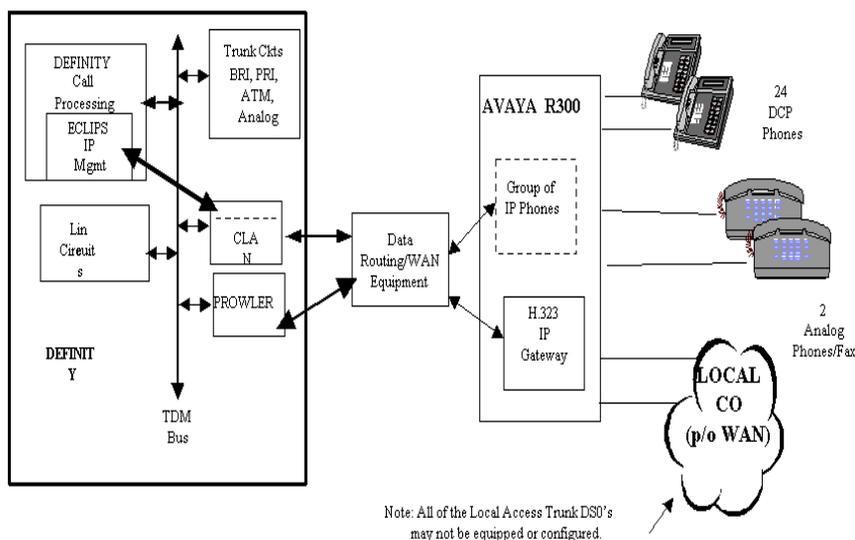
Figure 2.   DEFINITY Call Processing for Remote Stations and Trunks

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DEFINITY to remote office signal flow

Signaling messages (as part of call processing) are sent from the Switch Processor Element (SPE), across the internal DEFINITY backplane bus, and forwarded to the C-LAN module. From the Ethernet output of the C-LAN board, the signaling information is wrapped in IP packets and sent across the WAN over to the Avaya R300. The Router Engine in the Avaya R300 directs these wrapped signalling packets across the API to the Remote Angel (on the Combo Blade).

For a main site supported, digital station set, the bearer information is communicated from the digital line card (for example, DCP) onto the DEFINITY TDM backplane bus and sent 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 is communicated 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 3 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.
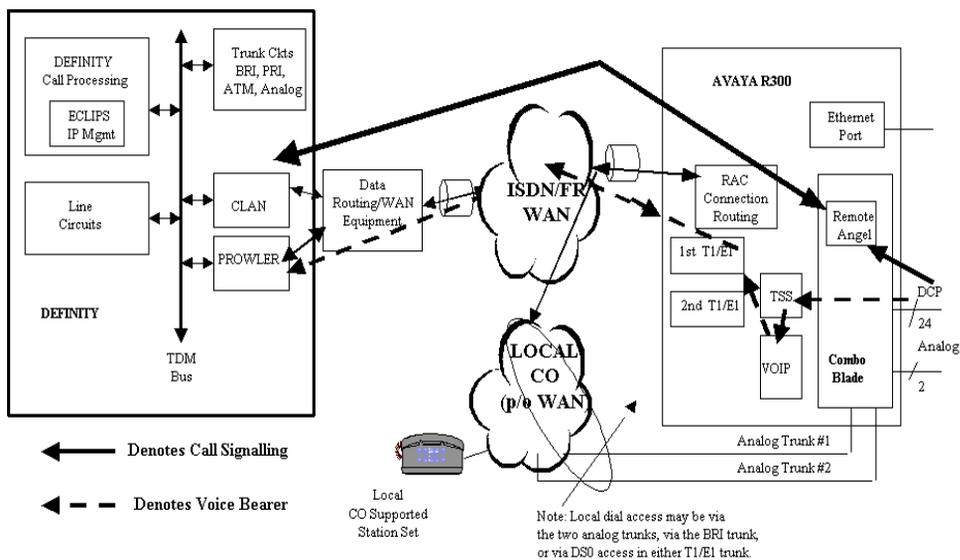
Figure 3.   Avaya R300 Serving as the WAN Access Concentrator

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The Avaya R300 can be connected 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.

The illustration in 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 offers the ability to offer both T1/E1 ports, along with 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). The configuration of network resources (what you actually subscribe to from your WAN service provider) determines what ports on the Avaya R300 are actually used. T1/E1 trunks may be configured in a fractional mode. The Avaya R300's Ethernet port can connect to subtending router(s) if your local LAN configuration is this size.

Avaya R300 with existing WAN access equipment

When the Avaya R300 co-exists (subtends) in an office environment with existing WAN access concentration/routing equipment, two configurations are available:

- Connection via its Ethernet port over to the local IP LAN (see)

- Connection via its Serial WAN port (V.35) over to the Serial input of a WAN router (see)

The Avaya R300 offers the ability for DEFINITY call routing to use local access trunks. These local access trunks may be directly connected to a WAN service provider network, or the T1/E1 WAN trunks may be subtending to an existing drop and insert T1/E1 connection on the existing WAN access equipment.

The Avaya R300 offers the ability to offer both T1/E1 ports, along with two analog trunk ports and BRI ports. The configuration of available port types will depend on the whether the Avaya R300 is a North American or global unit. The configuration of network resources (what you actually subscribed to from your WAN service provider) determines what ports on the Avaya R300 are actually used. T1/E1 trunks may be configured in a fractional mode.

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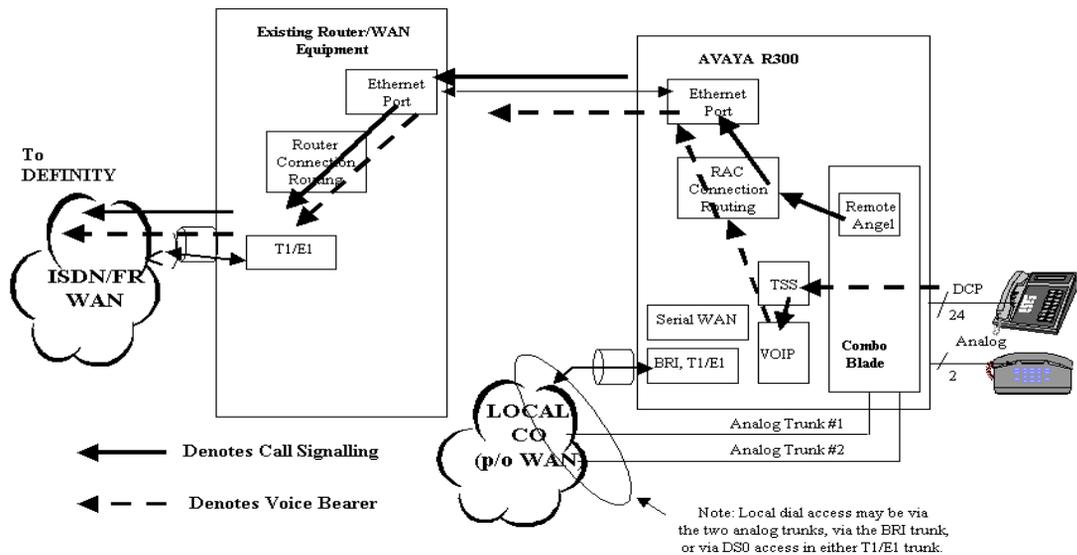
Figure 4.   Avaya R300 Co-existing with WAN Access Concentrator
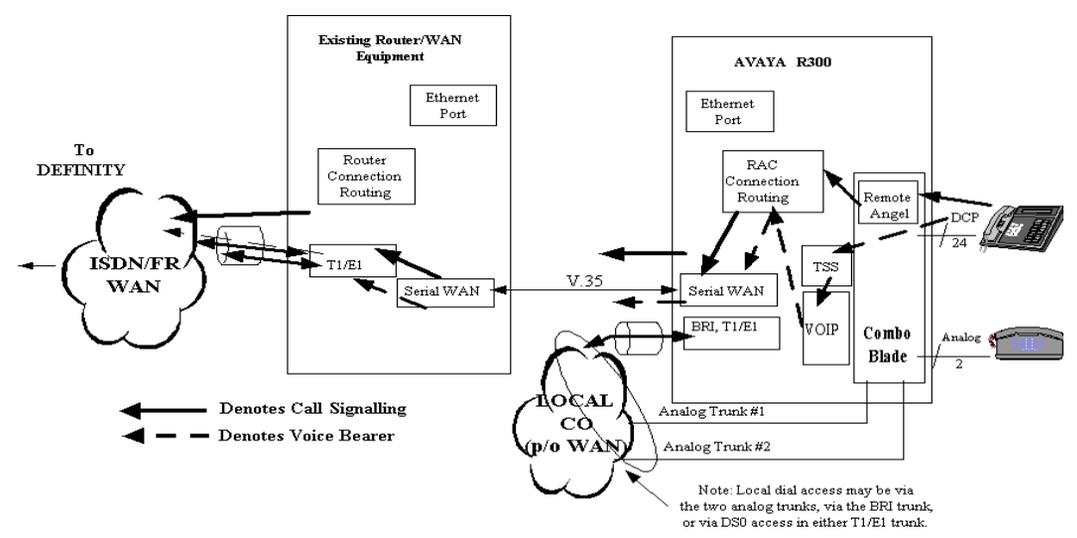
Figure 5.   Avaya R300 Subtending to Existing WAN Access Concentrator (Serial WAN Connected to Router)

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Avaya R300 with local LAN supported IP Softphones and telephones

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Avaya R300 with local LAN supported IP Softphones and telephones

The Ethernet interface of the Avaya R300 can connect to your LAN with both native IP-based data clients, as well as native IP-based voice clients. In Release 9, both IP Softphones (IP voice client application) resident on your PC; or the new Model 46xx IP telephones will be available.

The IP-based voice and data clients will be connected in a subnet. This subnet is provided by point-to-point serial Ethernet connections to a Level 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. (See Figure 6 below.)
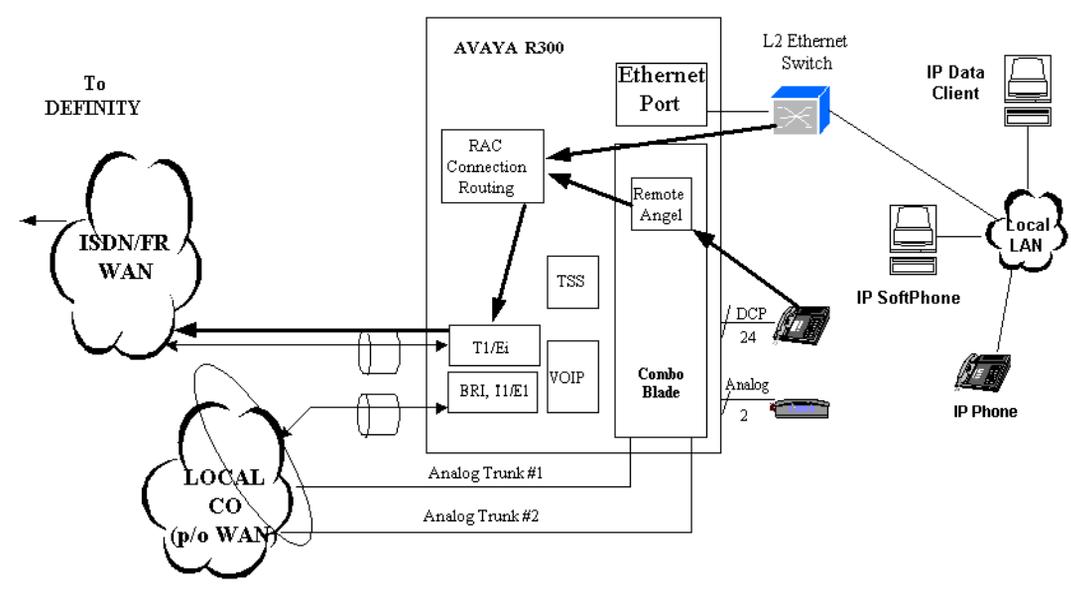
Figure 6. Interface Between the Avaya R300 and IP-based Data and Voice Clients

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Emergency transfer at the DEFINITY Remote Office

The Avaya R300 Emergency Transfer feature provides some limited telephone service in the case of disaster. This feature enables a relay contact set to directly cut-through the tip and ring of the two analog station ports and to connect them to the two wire analog trunk interface. These two analog stations operate in a loop-start trunk mode (for example, go off-hook to seize an out-going CO trunk connection). See Figure 7 on page 11.

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

The Emergency Transfer relays operate by:

- Loss of power on the Avaya R300's Combo Blade

- Failure of the Keep-Alive registration message, indicating loss of connectivity back to a main DEFINITY site.

System management for the Remote Office

Avaya R300 Administration

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

- DEFINITY main switch

- Avaya R300 voice/data switch

The DEFINITY is managed for administration via a SAT interface and/or via the DEFINITY System Administration (DSA) or DEFINITY Network Administration (DNA) tools. The Lucent-Ascend Command Line Interface manages the administration of the Avaya R300. Within the Avaya R300, the TAOS operating system is designed to support a menu-driven administration system. This system provides for the full administration of the Avaya R300 Combo Blade's voice features. Figure 7 on page 11 shows the current tools available for configuration management on the Avaya R300.

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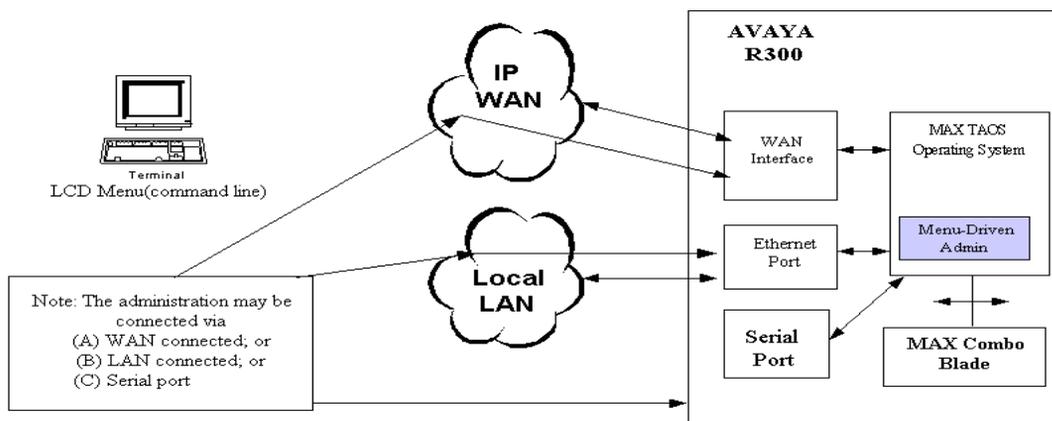
Figure 7.   Avaya R300 Administration System

Avaya R300 Fault Management

The NAVIS Access network management tool or a SNMP manager manages the Avaya R300 for fault and performance. As long as your network connection supports IP-based communication, the NAVIS system can communicate with the Avaya R300. The NAVIS Connect system (PC-based) may communicate with the Avaya R300 via a WAN-based IP network, a local LAN, or with a directly connected serial communications port.

The DEFINITY is managed 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 the Lucent-Ascend's NAVIS Network Management product operate on the HP OpenView network management application platform. In fact, they both can concurrently run together under a common platform. See .

NAVIS Access is supported on the following platforms:

* Windows NT 4.0

* Solaris 2.5 (Sparc, Intel)

* SunOS 4.1.4

* HPUX 9, HPUX10

* AIX 4.1

* BSD/OS 3.0

* Digital Unix (OSF/1) v4.0

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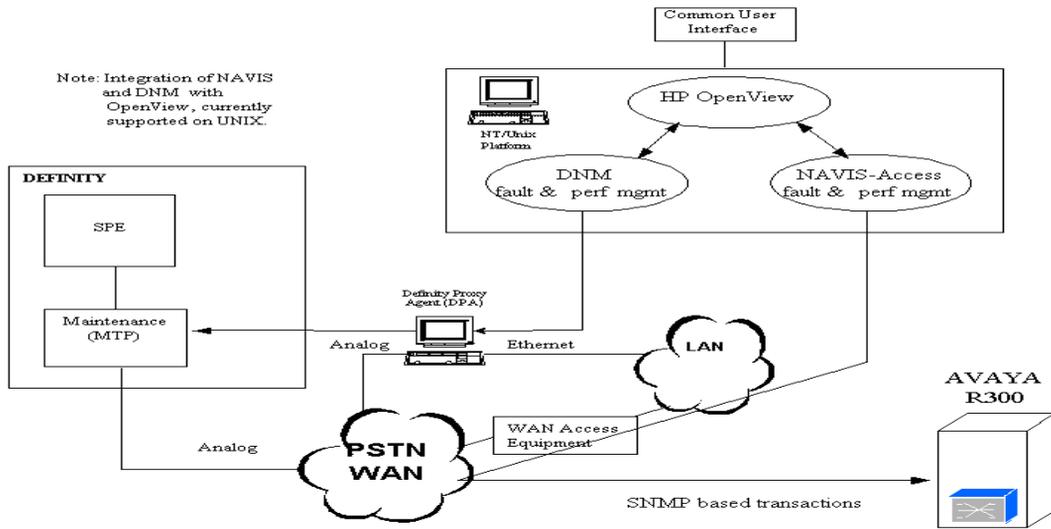
Figure 8. Avaya R300 Fault & Performance Management

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Avaya R300 Specifications and Network Design

2

What is the Avaya R300?

The Avaya R300 is a small, rack-mountable unit (1.75 in. x 17.5 in. x 17 in.) that features two expansion slots. The right slot, as you look at the front of the unit, houses a DSP blade (for Voice over IP option). As you look at the back of the unit, another slot houses the new Combo Blade. The Combo Blade supports 24 two-wire Digital DCP stations, 2 analog stations, and 2 analog (600 ohm) loop start trunks. A single DEFINITY switch can support multiple Avaya R300 units as described in Table 1.

Table 1.   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
IP 600	16

The Avaya R300 and DEFINITY IP Solutions endpoints use common DEFINITY call processing resources, therefore the number of Avaya R300 units that can be supported is additive, not mutually exclusive with the number of IP Solutions endpoints supported.

The Avaya R300 provides a cost-effective method for providing the full range of DEFINITY functionality at a remote site. The remoted telephony has all of the capabilities of that which is "directly connected" to the DEFINITY switch at the main site. The Avaya R300 also provides voice and data convergence as voice and data can share the same WAN link between the DEFINITY and the Remote Office.

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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 Requirements

The main DEFINITY system may be a DEFINITY G3r, G3si, G3csi, DEFINITY One, or IP 600. The main DEFINITY system must use DEFINITY Release 9 (R9) or newer release software, and the Remote Office option 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).

In order for you to administer analog/digital stations and analog/digital trunks on the Avaya R300, you must subscribe to the appropriate Right to Use (RTU) software for these telephony features members.

Number of ports and Avaya R300 units

Table 2 describes the total number of ports and Avaya R300 units supported by DEFINITY.

Table 2. Number of ports and Avaya R300 units

Description of Items	G3r	G3si	G3csi	DEFINITY One/IP 600
Total stations (max)	5000	1000	400	200 total ports
Total trunks (max)	4000	400	400	200 total ports
Total Remote Office Ports supported in all Remote Offices (administration limit)	5000	1000	1000	1000
Maximum Number of Avaya R300 units supported	250	80	80	80
Maximum Number of Network Regions Supported	250	80	80	16

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Table 2.   Number of ports and Avaya R300 units — *Continued*

Description of Items	G3r	G3si	G3csi	DEFINITY One/IP 600
Maximum Number of Locations Supported	44	44	44	1
TN799C C-LAN: supports up to 442 sockets and is an engineered value (The number of C-LANS supported for all platforms will increase to an unspecified quantity.)	10	3	2	1
TN2302 Media Processor: supports up to 64 simultaneous voice calls and is an engineered value	25	5	4	1

The number of TN2302AP IP Media Processors required is based on the volume of traffic offered by the active calls on an Avaya R300. 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 calls shuffling. For more information about shuffling, see .

Number of terminals and trunks supported by the Avaya R300

An individual Avaya R300 supports 26 stations (24 DCP and 2 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. This feature enables a relay contact set to directly cut-through the tip and ring of the two 600 ohm analog station ports and to connect them to the two-wire analog trunk interface. These two analog stations are operating in a loop-start trunk mode (for example, go off-hook to seize an out-going CO trunk connection). Note that the DCP stations are not operable in power failure mode. For this feature, the Emergency Transfer relay(s) are operated either by a loss of power on the Avaya R300 Combo blade or by loss of registration with the main switch, indicating loss of connectivity back to a main DEFINITY site. This connectivity loss (could be the main ECS, WAN, LAN) will initiate an emergency transfer within 60 seconds.

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 IDSN PRI T1.

■   30 DS0 trunks per E1 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).

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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 3.   Supported telephones

2-wire DCP phones

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)

Analog phones

- 6210
- 6218
- 6220

model 2500 sets

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Power and physical attributes - Avaya R300

Table 4 describes the dimensions and power attributes of the Avaya R300 unit.

Table 4.   Avaya R300 attributes

Attribute	Value
Input Power Voltage	100 VAC-240 VAC Universal Input
Input Power Frequency	50/60 Hz
Input Power	230 W maximum
Fuse	5A/250 V (not user-accessible)
Current	3 A maximum
Weight	17 lbs (7.7 kg)
Height	1.72" (4.37 cm)
Width	17.62" (44.76 cm) (19" rack mount)
Depth	16" (40.64 cm)

Avaya R300 Interconnect module

Each Avaya R300 will be supplied with one Avaya R300 Interconnect module which provides an effective way to interconnect stations and trunks to the Avaya R300. Each Interconnect module supports 24 DCP stations, 2 analog stations and 2 analog CO trunk interfaces. Not all connections will be used for each installation and the CO trunks are not supported in some countries.

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 a Interconnect module is not used, the installation must provide "phantom" power for each DCP station some other way (for example, 110-interconnect punch down 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 (indicating a short).

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Power and physical attributes - Avaya R300 Interconnect module

Table 5 describes the dimensions and power attributes of the Interconnect Module.

Table 5.   Avaya R300 Interconnect module attributes

Attribute	Value
Input Power Voltage	100 VAC-240 VAC Universal Input
Input Power Frequency	50/60 Hz
Input Power	240 W maximum
Fuse	Power supply is fused for protection (not accessible). Auto-protect for overcurrent, overvoltage on output, over temperature
Current	3 A maximum
Weight	2 lbs (0.9kg)
Height	1.72" (4.37 cm)
Width	17.62" (44.76 cm)
Depth	8" (20 cm)

Cabling

The following cabling is required for the Avaya R300:

- Power cord (appropriate for country of installation)
- DB9-DB9 serial cable
- 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.

- 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.

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The following cabling is required for the Avaya R300 Interconnect module:

- Power cord (appropriate for country of installation)

- Cable to connect analog and DCP stations to the unit

Additionally, all network 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 Basic Installation and Configuration Guide, Appendix C, Cables and Connectors*.

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 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.

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50-pin female connector on Y-cable

The 50-pin female connector on the Y-cable provides the communication flow 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 telco 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, 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

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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 9):

- Voice bearer traffic (carried on IP streams, over WAN network channels)

- H.323V2 call signaling/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)
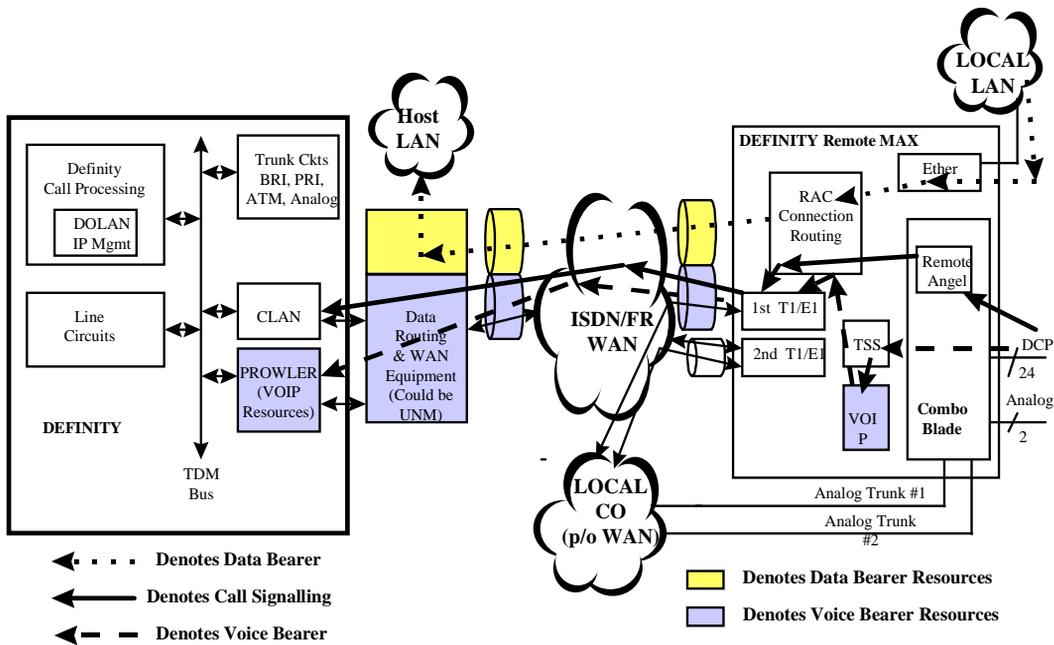
Figure 9. Bandwidth engineering for the Avaya R300

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Network Components

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

- IP Media Processors

- Host-side WAN or LAN access/routing equipment

- WAN Network Services Subscription

- Avaya R300 WAN Access Trunks

- Multi-Voice DSP Resources in the Avaya R300

IP Media Processor

In DEFINITY, 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 choice of CODECs used for voice is under the supervision of the DEFINITY call processing. To conserve on bandwidth for WAN network services, use a compression algorithm.

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/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/public network provider.

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

WAN network services subscription

The supporting network is arranged/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/E1, full T1/E1, frame relay, etc.

- number of network interfaces (for example, multiple T1/E1)

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Remote Office WAN access trunks

The Avaya R300 offers a variety of WAN interfaces. The North American model offers two T1 interfaces. The Global model offers two E1 interface interfaces. These interfaces are referred to as "digital trunks". These interfaces may be used for network control/bearer communication to the host switch site, or local access trunks (to the local network central office).

Since the traffic within T1/E1 trunks is actually a group of individually switched DS0 (64Kbps) pipes, traffic within these T1/E1 facilities can be directed 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.

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

MultiVoice 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, which supports 16 channels of TDM voice to IP voice conversion, is now available. The DSP-30 module, which supports 30 channels of TDM voice to IP voice conversion, will be available in the near future.

The Connection Management software module in the Avaya R300 determines if both parties are connected via local ports (either local access trunks or DCP/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 channel is utilized for each party that is connected.

Engineering bandwidth components

The five networking components must be engineered appropriately. A general equation might be: Total Bandwidth = (Aggregate voice bandwidth) + (Aggregate data bandwidth).

- 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. You would take the amount of equipped stations (DCP, analog), together with the amount of equipped local access trunks), and calculate the amount of average traffic that is networked back to the DEFINITY host site. A typical configuration could have as many as half of the calls be networked back to the DEFINITY. In this example, you would multiply the number of endpoints by the CODEC used, to determine needed bandwidth.

⇒ NOTE:
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.

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Shuffling

Shuffling refers to an IP endpoint's ability to redirect its IP audio stream in the middle of a call. This feature is new for DEFINITY Release 9. 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.

Prior to Release 9, all audio streams were set up between an endpoint and a Media Processor board on DEFINITY. If one IP endpoint called another, the IP audio was routed to a 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 2 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. The second drawback was that the audio quality suffered due to the unneeded conversion from IP audio to TDM audio and back again to IP audio. Finally, the distance of the IP routed call was unnecessarily long, 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 software and both IP endpoints must be capable of shuffling.

If the Avaya R300 is incapable of shuffling, or if the DEFINITY switch is not administered to allow shuffling, all calls route through the Media Processor board on the DEFINITY. This applies even to calls from one Avaya R300 station to another, or from an Avaya R300 station to an Avaya R300 trunk. Thus, calls would use additional DEFINITY resources and exhibit poor audio quality due to the IP-TDM-IP conversion. The calls would also utilize unnecessary DSP resources in the Avaya R300, and these DSP resources are a valuable resource that could easily become exhausted if all calls were utilizing them. The audio quality could also decrease for Avaya R300 endpoints because the audio packets would be making, in most cases, two trips across the WAN link. Since all remote calls would be unnecessarily routed across the toll network back to the DEFINITY, costs for WAN service would increase.

To implement shuffling on the Avaya R300, administer the DEFINITY 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)

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C-LAN resources at DEFINITY ECS

Each station set will require one active TCP/IP control link for as long as the set is both physically connected and the station is administered to "TTI" or "named" on the Avaya R300 unit. 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 needs a number of C-LAN circuit packs greater than or equal to the total socket usage divided by 442 and then rounded up.

IP Media Processor resources

In DEFINITY, the IP Media Processor supports audio conferencing and bearer TDM-based traffic to IP-based traffic. In order to provide bearer conversion, this module supports voice processing algorithms through DSPs designed to support 64 resources: subtract one resource per G.711 call, subtract two resources per G.729 call.

DSP resources

The DSP farm on the Avaya R300 converts calls from TDM to IP for voice/fax traffic through the Avaya R300 across an IP network to DEFINITY or to another Avaya R300. The DSP-16 card is available now; the DSP-30 card will be available in the near future. The DSP farm can convert, at most, 30 voice streams between IP and PCM-TDM. Conversions are not required between two voice (analog or DCP) endpoints within the same Avaya R300 or between these voice stations and incoming or outgoing calls on local trunks connected to the Avaya R300.

LAN/WAN access/routing equipment

The supporting network is arranged in terms of a negotiated network service between the customer and the service provider. This service is a function both of service type (for example, fractional T1/E1, full T1/E1, frame relay) and the number of network interfaces (for example, multiple T1/E1). The 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.

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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 within a Network Region in the same manner as other DEFINITY IP resources such as a Media Processor are assigned to a Network Region. DEFINITY permits the administrator to specify, by region, an ordered set of CODECs to be used for connecting endpoints within the region and a set to be used to interconnect an endpoint in the region to an endpoint in another region. Separate Avaya R300 units within the same office, or in different offices that are close 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 among themselves.

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 u-law 64k

- G.711 u-law 56k

The Avaya R300 always advertises CODECs to DEFINITY at registration time in the order shown above. The order of the CODECs that the Avaya R300 advertises to DEFINITY 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. DEFINITY 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 on DEFINITY.

For example, suppose a CODEC set on DEFINITY consists of G.7111 Mu-law 64K, followed by G.729, and G.723.1. DEFINITY 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 DEFINITY to select one of the other CODECs over G.729 is to have a CODEC set that does not include G.729 at all.

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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, it is desirable to use a low bit rate CODEC like G.729 (8k), as opposed to G.711 (64k) to conserve WAN bandwidth.

Possibly, a site could have two Avaya R300s present at the same location. In this case, you might prefer to use G.729 for all calls between the host DEFINITY and the Avaya R300s, but use G.711 between the two Avaya R300s. The reasoning is that it would be good to use G.729 across the WAN (which has reduced bandwidth). This can be accomplished using multiple network regions and multiple CODEC sets.

When administering the DEFINITY, the administrator would place the Media Processor boards in network region 1, and place both the Avaya R300s in network region 2. The administration 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 what 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 network region assigned to an Avaya R300 is the network region assigned to all stations supported by that Avaya R300.

You can use network regions to control interconnection of endpoints within a remote office or between a remote office and the main switch or other remote offices. You can also use network regions to define administrative considerations, in particular, Quality of Service definitions. If different Quality of Service 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.

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911 Emergency Assistance calls

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

Development of an E911 strategy for the Avaya R300 ensures that emergency assistance calls are routed to the appropriate PSAP. The absence of a Avaya R300 911 strategy would potentially result in 911 emergency assistance calls from Avaya R300 endpoints being routed to the Public Safety Answering Point (PSAP) assigned to the main DEFINITY. The calls should be routed to the PSAP designated to field emergency calls originating from the Avaya R300 location. The Avaya R300 911 strategy has two requirements:

- 911 calls originating 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.

- Avaya R300 911 calls must be accompanied by correct automatic number 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. Each DEFINITY system has the capacity to support up to 44 locations. Accordingly, each DEFINITY provides the ability to accurate route 911 emergency access request calls to these locations. It is possible to support more than 44 Avaya 300s using this strategy if multiple units are associated to a single location. In cases where one DEFINITY is 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.

The following diagram is an example of a DEFINITY Remote Office configuration with two Avaya R300 units connected via a LAN or T1 interface to a central controlling DEFINITY. One Avaya R300 is located in Holmdel, New Jersey, and the other is located in Denver, Colorado. The controlling DEFINITY 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.

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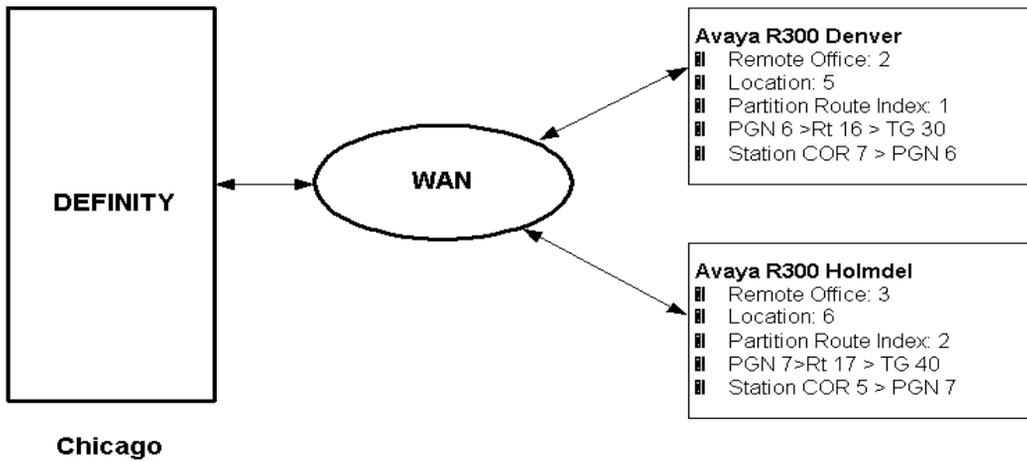
Figure 10.   Remote office configuration for 911 strategy

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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.

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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.

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Required equipment and information

On the main DEFINITY PPN or EPN (DEFINITY ECS r, si, or csi platform, DEFINITY ONE, or IP 600):

- Release 9 or later software

- TN799C Control-LAN (C-LAN) circuit pack in a DEFINITY system for firmware download (A TN799B will work as long as one C-LAN circuit pack is a TN799C.)

- TN2302AP IP Media Processor circuit pack

- Router/Access concentrator to serve as IP gateway

- IP address for C-LAN circuit pack

- IP address for IP Media Processor

- WAN Router (with Network Services)

At the remote site:

- Avaya R300 (and associated cables)

- Interconnect module (and associated cables)

- Mounting rack (optional)

- Terminal/ PC for administering the Avaya R300

    — 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

    — directory to store files

- IP Network Tap (valid IP address and subnet mask which is customer supplied)

- U.S. Robotics 9.6 K modem or the equivalent (for remote maintenance)

> **NOTE:**
> At least one modem is required for maintenance. If there are two Avaya R300 units, then two modems should be supplied in case one of the modem links is faulty. For additional Avaya R300 units, telnet may be enabled between Avaya R300 units with a modem, or additional modems are required for each additional Avaya R300 unit.

Required tools

- #2 cross (Phillips) screwdriver for the Avaya R300

- #2 cross (Phillips) screwdriver for R300 Interconnect module

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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

- Interconnect the Avaya R300 and Interconnect module

- Connect DCP and analog telephones, Ethernet, T1 lines, to the Avaya R300 and R300 Interconnect module

- Administer on DEFINITY system

- Administer on the Avaya R300

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:

- Power cord (ensure the cord is correct for the country of installation)

- DB9-DB9 serial cable

- 15-ft (x-m) Y cable (Comcode #84522991)

- 25-to-9 pin adapter

- Mounting brackets

- Avaya R300

    — combo blade - preinstalled and preconfigured for the Avaya R300

    — DSP30 or DSP16 card - preinstalled and preconfigured for the Avaya R300

- *MAX 3000 Installation and Basic Configuration Guide* book

- *Getting Started with the Avaya R300 Remote Office* book (this book)

- Avaya DEFINITY Release 9 documentation CD

The Avaya R300 Interconnect module:

- Power cord (ensure the cord is correct for the country of installation)

- Mounting brackets (come installed)

- Avaya R300 Interconnect module

- Rubber Feet (packed in plastic)

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Off-Premises Circuit Protection

Protection from hazardous voltages and currents is required for all off-premises (out-of-building) trunks. Both over-voltage (lightning, power induction, and so forth) and sneak current protection are required. 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. Over-voltage protection is normally provided by the local telephone company.

■ T1 / E1 / DS1 circuits require isolation from exposed facilities. This insulation must be provided external to the T1 / E1 / DS1 circuit pack, and be must be equipment agency-approved for this application. A CSU (T1), LIU (E1), or other equipment that provides equivalent protection, is assumed.

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.

Install Sneak Fuse Panels

Sneak current protection is required between the incoming RJ21X or RJ2GX network interface and the system for both trunk and off-premises circuit packs.

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

Table 6.   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 can be ordered using PEC code 63210. The SCP-110 protectors are used with 110-type hardware and on the 507B Sneak Fuse Panel. The SCP-110 Protectors can be ordered separately and installed on the 157B connecting block. Fifty protectors are required per block.

Install the 507B near the network interface or MDF with locally-obtained #12 ¾-inch screws (or equivalent).

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Mount Avaya R300

Refer to the *MAX 3000 Installation and Basic Configuration 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 all other connections have been made.

Mount Avaya R300 Interconnect module

➡ NOTE:

If not using a mounting rack, place the R300 Interconnect module on top of the Avaya R300 with the backs aligned.

If mounting in the same rack as the Avaya R300, mount the Interconnect module above the Avaya R300 with the backs aligned (see Figure 11).

Figure 11.   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.

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Wall-Mount the Interconnect unit:

The plywood and the hardware to mount the plywood are installer-provided.

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.

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. Slide the ejector on the Combo Blade as far to the right as possible, then gently slide the ejector back to the left. The ejector moves about 1/8" to the left and locks (stops) to reveal connector pins. The ejector is now correctly positioned so you can insert the 68-pin connector. (see Figure 12).
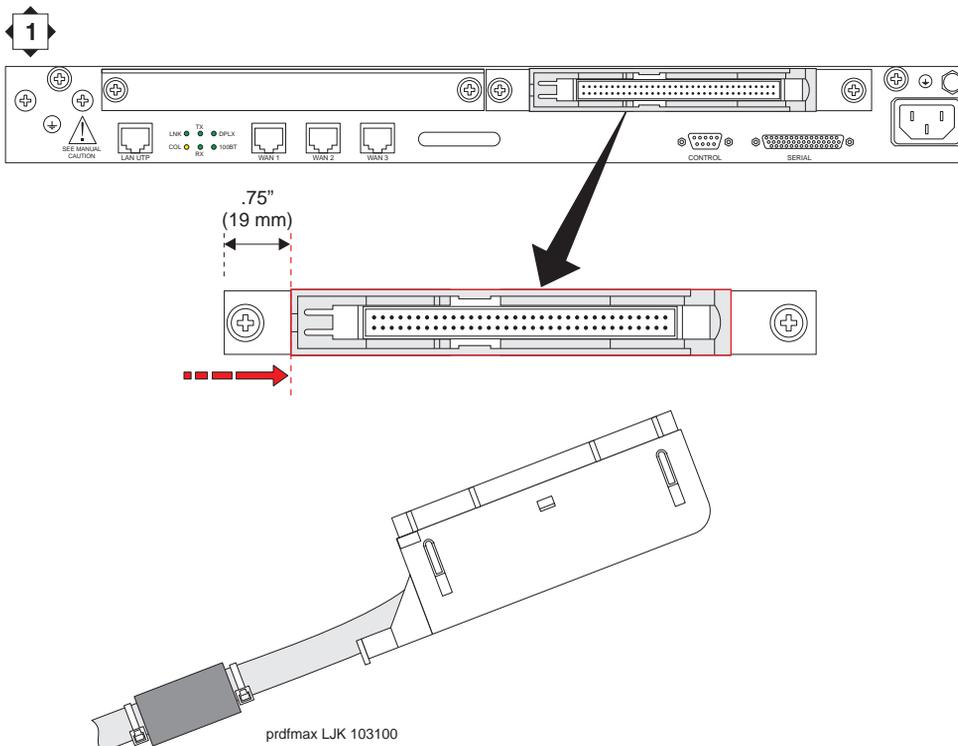
Figure 12. Ejector lock in connector insertion position

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2. Place the top of the 68-pin connector at a 45-degree angle to the far right side of the pins (see Figure 13).

prdfmax2 LJK103100
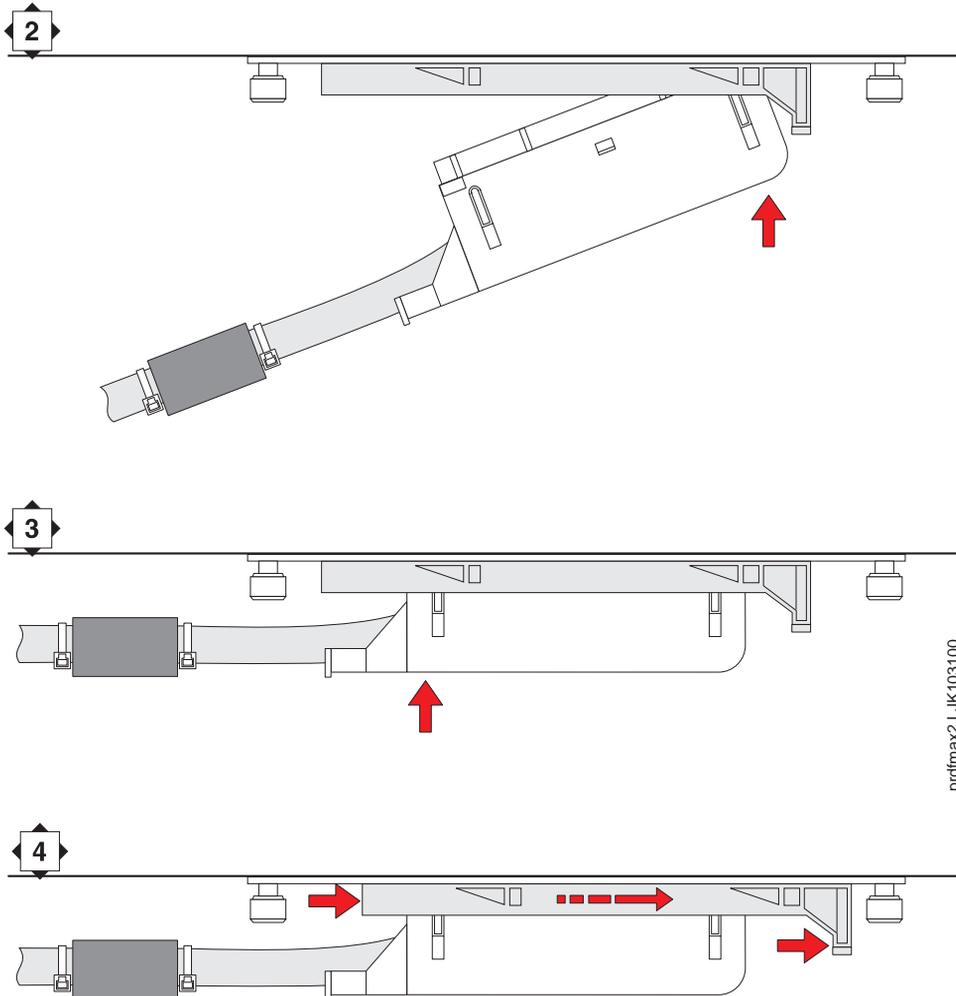
Figure 13. **Connector at proper angle (45 degrees) for insertion**

3. Move the connector so it is parallel to the pins.

4. Firmly push the connector in until it clicks into place.

⚠ **CAUTION:**

Do not force the connector into place if it isn't aligned properly. If you force the connector, you can bend the pins. Also be sure the connector is not installed upside down. This is possible.

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5. 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.*

Complete connections

Refer to Figure 14 for port and connection descriptions for the Avaya R300 and R300 Interconnect module and Figure 15 for connection diagram for the Avaya R300 and R300 Interconnect module.

1. Plug in the Ethernet connection (D8W).

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 telephones with D8W connector (up to 24, 8400-series phones).

5. Plug in analog telephones 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 7 on page 41.

9. Familiarize yourself with Avaya R300 back-panel lights listed in Table 8 on page 41.

10. Observe LEDs on the front of the Avaya R300 to make sure everything is working properly (see Figure 16 on page 42).

> **➡ NOTE:**
> The Alarm LED on the Avaya R300 stays lit until you administer the Avaya R300.

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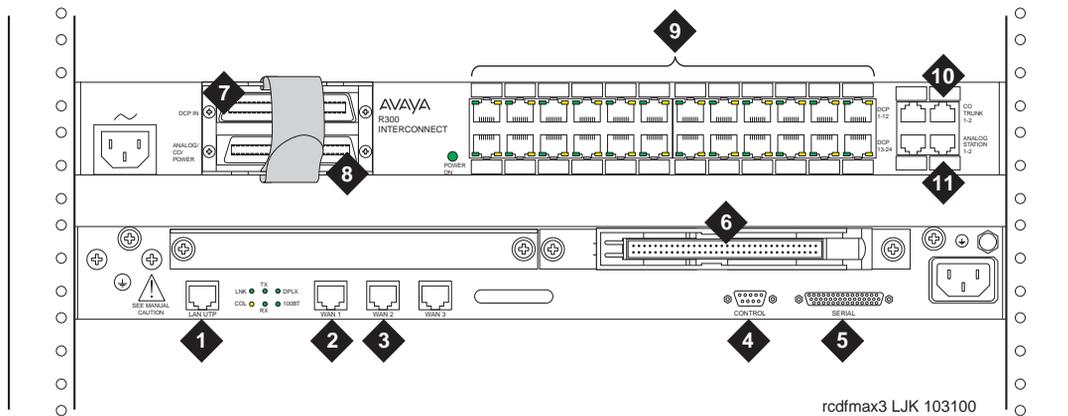
Figure Notes

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 with Y-cable connector

7. DCP connector (male)

8. Analog connector (female)

9. DCP telephone connectors

Figure 14.   Port and connections for the Avaya R300 and Interconnect module
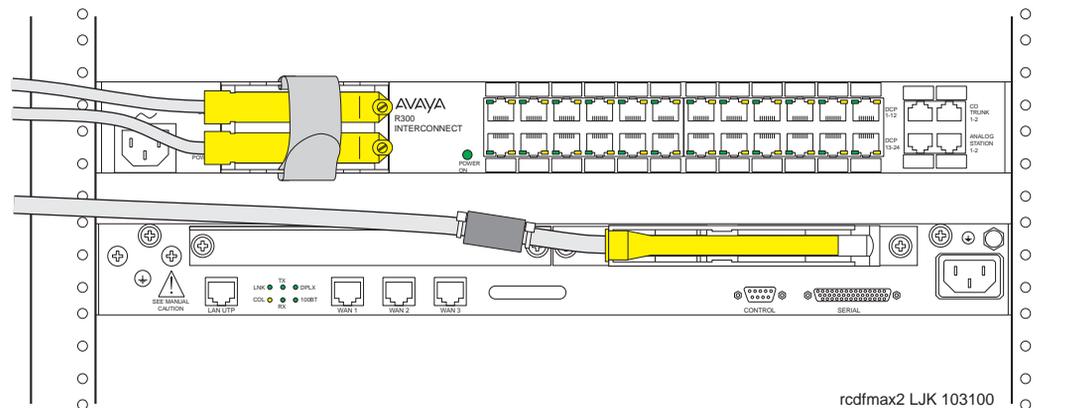
Figure 15.   Connection diagram for the Avaya R300 and Interconnect module

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Table 7. Avaya R300 front-panel lights

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. 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).

Table 8. Avaya R300 back-panel lights

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.

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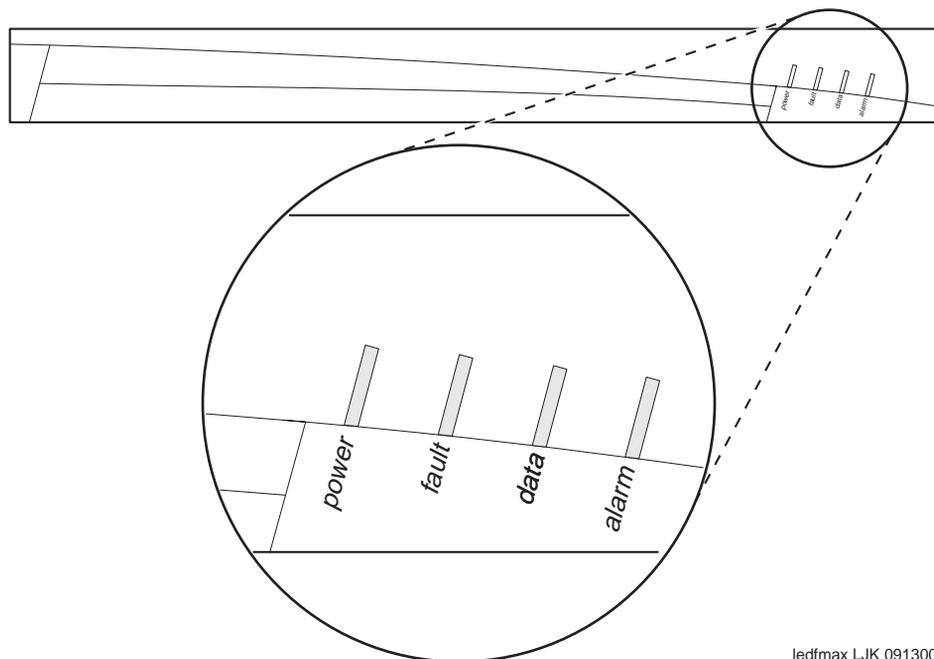
ledfmax LJK 091300

Figure 16.   Avaya R300 front-panel lights

Connect the modem

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. Other modems may have to be configured 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 telephone line to the left most analog-line port on the modem as shown in Figure 17 on page 43.

3. Make sure that the modem's DIP switches are set as shown in Figure 17 on page 43 and Table 9 on page 43.

4. Plug the modem into an AC power outlet.

5. Turn on the modem using the switch located on the front of the modem.

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modfrob2 LJK 100600
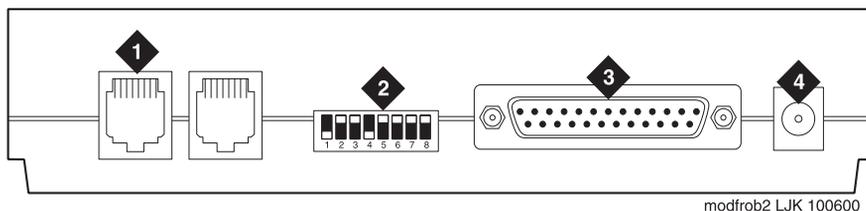
Figure Notes

1. Connect analog line here.

2. DIP switches must be set as described in Table 9.

3. Connect MODEM connector here.

4. Connect power connector here.

Figure 17.   External modem connections for U.S. Robotics modem

Table 9.   U.S. Robotics Modem dip switch settings for 9.6K modem

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

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Configuring an external modem   44

Configuring an external modem

External modems that are not U.S. Robotics 9.6K modems pre-configured for the Avaya R300 should be configured on a PC using a modem communication program such as MS HyperTerm.

1. Connect the maintenance modem to the PC's serial port.

2. Set the communication program to the following settings:

   — 9600bps

   — 8 Data Bits

   — 1 Stop Bit

   — No Parity

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 9 on page 43.

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3 Avaya R300 Installation and Upgrade
Upgrading Avaya R300 software 45

Upgrading Avaya R300 software

For information on upgrading an Avaya R300, see Avaya's support website. Additionally, information on upgrading the Avaya R300 is available for ftp from Lucent-Ascend at ftp://ftp.ascend.com/pub/Software-REleases/Max/upgrade-instructions.txt. The MAX 3000 upgrade instructions are the same instructions to upgrade the Avaya R300.

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

- Trivial File Transfer Protocol (TFTP) server software. TFTP server software is available from Walusoft (http://www.walusoft.co.uk/products.htm) or other websites but is not supplied with the Avaya R300

- Telnet capabilities

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.

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4　DEFINITY Administration for the Avaya R300
Before you start　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　47

DEFINITY Administration for the Avaya R300

4

Before you start

The DEFINITY system must be configured to recognize the Avaya R300. Use the following terms and conventions to help you with this configuration and administration:

- 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 "telephone" and "voice terminal" to refer to phones.

- 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 an abbreviated 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.

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4   DEFINITY Administration for the Avaya R300
Administer customer options   48

■ 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.

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 8
                        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 (page 1)

2. Verify that the following fields are enabled:

■ G3 Version:**V9** or greater

■ Maximum Administered Remote Office Trunks: total number of trunks for all Avaya R300 units supported by this DEFINITY

■ Maximum Concurrently Administered Remote Office Stations: total number of stations for all Avaya R300 units supported by this DEFINITY

3. Go to page 3 of this screen.

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4 DEFINITY Administration for the Avaya R300
Administer customer options   49

```
display system-parameters customer-options                    Page 3 of 8
                      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 (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 8
                      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 (page 4)

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4   DEFINITY Administration for the Avaya R300
Administer customer options   50

6. Verify that the Remote Office field is enabled.

7. Go to page 8 of this screen.

```
display system-parameters customer-options               Page 8 of 8
             Maximum IP Registrations by Product ID

Product ID  Rel  Limit    Product ID Rel  Limit    Product ID Rel Limit
Ascend Mul  ___: 5000    _____ ___   0____    _____ ___ _____
IP Agent    ___: 50      _____ ___   0____    _____ ___ _____
IP Phone    ___: 20      _____ ___   0____    _____ ___ _____
IP ROMax    ___: 30      _____ ___   0____    _____ ___ _____
IP Soft     ___: 50      _____ ___   0____    _____ ___ _____
Ascend_Mul  ___: 0____   _____ ___   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** and **Ascend Mul**

   ■ Limit: Total number of remote office stations for **IP ROMax** and total
     number of Avaya R300 trunk gateways for **Ascend_Mul**.

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4 DEFINITY Administration for the Avaya R300
Administer IP Boards 51

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 5.   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.

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4　DEFINITY Administration for the Avaya R300
　Administer IP Boards　　　　　　　　　　　　　　　　　　　　　　　　52

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 1      134.23.107.22        _____  ___.___.___.___
 _____   ___.___.___.___      _____  ___.___.___.___
 _____   ___.___.___.___      _____  ___.___.___.___
 _____   ___.___.___.___      _____  ___.___.___.___
 _____   ___.___.___.___      _____  ___.___.___.___
 _____   ___.___.___.___      _____  ___.___.___.___
 _____   ___.___.___.___      _____  ___.___.___.___
 _____   ___.___.___.___      _____  ___.___.___.___
 _____   ___.___.___.___      _____  ___.___.___.___
```

Screen 6.　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 node-names ip                                          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 7.　IP Interfaces

5. Verify that the C-LAN and IP Media Processor resources are allocated and assigned to Net Reg (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.

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4 DEFINITY Administration for the Avaya R300
Administer IP Boards 53

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 8. Data Module

3. Administer the following fields:

- Type: Type **Ethernet**.

- Port: Type **17**.

- Link: The link must be must be in the range **1 – 33** for G3r, or **1 – 25** for G3si and G3csi, and not previously assigned on this switch.

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4 DEFINITY Administration for the Avaya R300
Administer CODECs 54

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 (mu-law) with no silence suppression and packet size 30ms.

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 9.   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.

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4   DEFINITY Administration for the Avaya R300
    Administer network regions   55

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? n
   802.1p/QEnabled? n                          IP Audio Hairpinning?  n
```

Screen 10.   IP Network Region

- Name: Assign a unique name to the network region.

- CODEC Set: Assign the CODEC set for the Avaya R300 associated with this Network Region.

- `UDP Port Range Min:` Type 2048.

- `UDP Port Range Max:` Type 65525.

- Direct IP-IP Audio Connection: Type y (yes) to allow shuffling between Avaya R300 endpoints

2. Assign QoS values as appropriate.

3. 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.

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4   DEFINITY Administration for the Avaya R300
     Administer multiple locations   56

```
status network-region 1                                Page   1 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 11.   Inter Network Region Connection Management

    4. Specify whether the region you are changing is connected to another region.

    5. Specify which CODEC-set to use for inter-region connections.

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, establish location parameters for each Avaya R300 region.

Instructions

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

    2. On the Locations screen, fill in the following fields:

- Name: Assign a name for this location, for example, Chicago- Avaya R300

- TimeZone Offset: The time difference in hours and minutes from the DEFINITY.

- Daylight Savings Rule: Assign the day light 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.

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4 DEFINITY Administration for the Avaya R300
Administer Remote office　　　　　　　　　　　　　　　　　　　　　　　　　　57

Administer Remote office

Perform Remote Office administration on the DEFINITY before registering the Avaya R300 endpoints with the DEFINITY. 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 12. Remote Office

2. Administer 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.

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4   DEFINITY Administration for the Avaya R300
       Administer Remote office   58

Remote Office Stations

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

```
add station 6001                                            Page 1 of X
                             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 13.   Station

2. Administer 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.

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4   DEFINITY Administration for the Avaya R300
Administer Remote office   59

```
change station 12345                              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?
   Messaging Server Name:                 Coverage After Forwarding?
                                  Direct IP-IP Audio Connections? y
                                             IP Audio Hairpinning?
```

Screen 14.   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.

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4 DEFINITY Administration for the Avaya R300
Set up signaling group 60

Set up signaling group

Each Avaya R300 has its own listen port and signaling group. Set up a new trunk group, or use an existing trunk group administered for H.323 signaling.

Instructions

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: ___

                                              Max number of CA TSC:  ___
                                           Trunk Group for NCA TSC:  ___
     Trunk Group for Channel Selection:  6
         Supplementary Service Protocol: _


  Near-end Node Name:  clan                Far-end Node Name: remote office 6
Near-end Listen Port:  5001               Far-end Listen Port:1720

        LRQ Required? _          Calls Share IP Signaling Connection?  _
        RRQ Required? y

                                    Bypass If IP Threshold Exceeded?  _
                                     Direct IP-IP Audio Connections?  _

                                           Interworking Message: _____
```

Screen 15. Signaling Group

2. On the signaling group screen, fill in the following fields:

   - Group Type: type **H.323**.

   - Remote Office: type **y**.

   - 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**.

3. Press ENTER to save your changes.

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4   DEFINITY Administration for the Avaya R300
  Set up signaling group   61

Setting up a trunk group

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

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

```
add trunk-group next                                               Page 1 of x
                              TRUNK GROUP

Group Number: 6                    Group Type: ISDN          CDR Reports: _
  Group Name: Remote office 6               COR: __       TN: ___      TAC: 6
   Direction: _____       Outgoing Display? _       Carrier Medium: ____
 Dial Access? _                  Busy Threshold: ___          Night Service: _____
Queue Length: ___
Service Type:tie                   Auth Code? _           TestCall ITC: ____
                   Far End Test Line No:_
TestCall BCC: _
 TRUNK PARAMETERS
    Codeset to Send Display:_ Codeset to Send National IEs:_
  Maximum Message Size to Send:__  Charge Advice:____
Supplementary Service Protocol:_   Digital Handling (in/out):____

          Trunk Hunt:_____
                                        Digital Loss Group:__
Calling Number - Delete: ____ Insert:_____Number Format:_____
                 Bit Rate: _____    Synchronization: _____     Duplex: ____
Disconnect Supervision - In? _  Out? _
Answer Supervision Timeout: _
```

Screen 16.   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.

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4 DEFINITY Administration for the Avaya R300
Set up signaling group   62

```
                              TRUNK GROUP
                                  Administered Members    (min/max): 0/0
                             Total Administered Members: 0
 GROUP MEMBER ASSIGNMENTS
      Port           Code 5Fx Name     Night           Sig Grp
 1:IP_____         _____    _____         2_____
 2:IP_____         _____    _____         2_____
 3:IP_____         _____    _____         2_____
 4:IP_____         _____    _____         2_____
 5:IP_____         _____    _____         2_____
 6:_____          _____    _____         _____
 7:_____          _____    _____         _____
 8:_____          _____    _____         _____
 9:_____          _____    _____         _____
```

Screen 17.   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 signaling group that supplies the signaling channel for
      this trunk group.

5. Type **change signaling-group <number of signaling group>** and press
   ENTER to return to the Signaling Group screen.

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.

   Add as many channels you can have on the switch.

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4   DEFINITY Administration for the Avaya R300
    Add phones to remote office location   63

Add phones to remote office location

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

Instructions

IP Telephones

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

   > **NOTE:**
   > For IP Telephones 8411D, 6416D, 6416M, 6424D, and 6424M, type **shift mute 42**.

```
add station 6001                                              Page 1 of X
                                  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 18.   **Station**

2. On the Station screen, complete the following fields:

   - Type: Type in the model of the phone you are adding.

   - 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.

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4 DEFINITY Administration for the Avaya R300
  Add phones to remote office location   64

```
change station 12345                               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?
    Messaging Server Name:                 Coverage After Forwarding?
                                       Direct IP-IP Audio Connections? y
                                                IP Audio Hairpinning?
```

Screen 19.   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: 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 20.   Station (page 1)

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4 DEFINITY Administration for the Avaya R300
Add phones to remote office location

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2. On the Station screen, complete the following fields:

- IP Softphone: Type **y** (yes).

- Media Complex Ext: Type the H.323 extension.

3. Go to page 2 of the Station screen.

```
change station 12345                               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?
  Messaging Server Name:              Coverage After Forwarding?
                                 Direct IP-IP Audio Connections? y
                                         IP Audio Hairpinning?
```

Screen 21.   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).

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4 DEFINITY Administration for the Avaya R300
Add phones to remote office location 66

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5 Avaya R300 Administration

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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.

A minimal administration must be done using the control serial port to administer an IP address and a default Gateway on the Avaya R300. Following the administration of the IP address and the default Gateway, the remaining configuration can be done in a telnet session to the Avaya R300.

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5 Avaya R300 Administration
The Avaya R300 interface

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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 status windows are set to a default by the system and can be manually changed using the up arrow key to display the system menu.

```
|-------- 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                | |Main Status Menu    | |00-200 15:10:34  ??|
|>50-000 Enter Date              | |> 30-000 Empty      | |>M31  Line    Ch   |
| 60-000 Serial WAN              | |   40-000           | | Ethernet up       |
|                                | |  50-000 Empty      | |                   |
|                                | |-------------------|  |-------------------|
|                                | |10-100 NET/00       | |40-400 Ether Stat  |
|                                | |>10-100:Line 1 Stat | |>Rx Pkt:   3486092 |
|                                | | 10-200:Line 2 Elat | | Tx Pkt:     10056 |
|                                | | 10-300:Errors  Sys | |   Col:     3530   |
|                                | |-------------------|  |-------------------|
|                                | |00-100 Sys Option   | |Main Status Menu   |
|                                | |>Security Prof: 1  ^| |>00-000 System   ^|
|                                | | Software +7.4b0    | | 10-000 Net/T1     |
|                                | | S/N: 7883401     v | | 20-000 Empty    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 default status window setup uses the following menu items in the appropriate status window:

- Status 1 - 10-100
- Status 2 - 70-000
- Status 3 - 30-000
- Status 4 - 00-200
- Status 5 - 40-300
- Status 6 - 40-400
- Status 7 - 00-100
- Status 8 - 40-100

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The Avaya R300 interface 69

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:

1. From the Main Edit Menu, select System>Sys Config>Status

2. Type 30-000.

3. Press 2 to save your changes.

4. Press the Left Arrow key twice to return to the Main Edit Menu.

The system must be reset for the default status window setup to be implemented.

Additional information on the status windows can be found 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 first 12 DCP lines are represented by the top row of symbols, and DCP lines 13-24 are represented by the bottom row of symbols.

  - The 2 analog lines are represented by the two symbols under the **A**.

  - When a line has a **.** (dot), it is not registered with DEFINITY.

  - 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 - 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 - 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 pane 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.

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5 Avaya R300 Administration
Assign IP address to the Avaya R300

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Assign IP address to the Avaya R300

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        |
|                            |  | Software +8.0.0+  |  |                    |
|                            |  | 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 key to exit the Ether Options profile.

   A confirmation menu appears.

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Assign a gateway to Avaya R300   71

```
|-------- 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        |
|                            |  | Software +8.0.0+  |  |                   |
|                            |  | 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 key twice to return to the Main Edit Menu.

Assign a gateway to Avaya R300

To assign a default gateway to the Avaya R300, you set the Gateway field in the Static Rtes profile, which is located in Ethernet > Static Rtes. 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        |
|                            |  | Software +8.0.0+  |  |                   |
|                            |  | 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.
```

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Confirm IP assignment

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2. Type the IP address of the gateway in the Gateway field. This should be set to the default gateway for your subnet.

3. Press the Left Arrow key to exit the Static Rtes 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:          0 |  |   Col:       3530 |
|                            |    |--------------------|  |--------------------|
|                            |    |00-100 Sys Option  |  |40-100 Sessions   ??|
|                            |    |>Security Prof: 1  ^|  |>  0 Active        |
|                            |    | Software +8.0.0+  |  |                   |
|                            |    | 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 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

Confirm IP assignment

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.

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Assign system information to Avaya R300   73

Assign system information to Avaya R300

The remaining configuration and administration can be done either through 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.

1. From the Main Edit Menu, select System > Sys Config.

2. In the System> Sys Config menu, complete the following 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 u-law.)

```
|-------- MAX EDIT -----------   |-------------------|  |-------------------|
|00-100 Sys Config        ?? |  |10-100 1234567890 ??|  |30-000 Line Stat   |
|>Name=                    ^ |  | L1/RA nnnnnnnnnn   |  |  123456789012 A   |
| Location=                  |  |   12345678901234   |  |   ---..........-  |
| Contact=                   |  |   nnnnnnnnnnnnnn   |  |   ............-   |
| 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        |
|                            |  | Software +8.0.0+  |  |                   |
|                            |  | 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.
```

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5 Avaya R300 Administration
Configure Avaya R300 T1 lines (PSTN) 74

3. Check the Date and Time fields and correct them, as needed.

4. Press the Left Arrow key to exit the Sys Config 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          |   |   nnnnnnnnnnnnnnn  |  |  .............-    |
|                            |   |--------------------|  |--------------------|
|                            |   |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         |
|                            |   | Software +8.0.0+   |  |                    |
|                            |   | 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.
```

5. Press 2 to save your changes.

6. Press the Left Arrow key twice to return to the Main Edit Menu.

Configure Avaya R300 T1 lines (PSTN)

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.

Specifying and configuring 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.

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5   Avaya R300 Administration
Configure Avaya R300 T1 lines (PSTN)   75

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 line's point-of-presence.

Specifying 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 Encoding field to None (identical to AMI, but without density enforcement), AMI, or B8ZS to specify the encoding used on this line.

3. 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.

4. Set the Length parameter as appropriate for your site. If you are using the internal CSU, keep it at the default value.

5. Set the Front End field to CSU to enable the internal CSU. Disable the internal CSU by setting Front End to DSX.

6. Set the Buildout field to specify proper line attenuation. Obtain this information from your service provider. The default is 0dB.

7. 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).

8. Set the Ch24 field to the D Channel only if the trunk is configured to be ISDN.

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 are used to support ANI authentication of Avaya R300 users and single-stage dialing, respectively. 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

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Configure Avaya R300 T1 lines (PSTN)   76

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

Saving the Line 1 profile

Save the line configuration by doing the following:

1. From the Main Edit Menu, select T1>Net/T1>Line_Config.

2. In the T1>Net/T1>Line_Config menu, review and select any of the following profiles:

   - 10-101

   - 10-102

   - 10-103

   - 10-104

3. When you finish configuring the line, save its profile.

4. Press the Left Arrow or Escape key to exit the Line 1 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        |
|                              | | Software +8.0.0+  | |                   |
|                              | | 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.
```

5. Press 2 to save your changes.

6. Press the Left Arrow key twice to return to the Main Edit Menu.

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5   Avaya R300 Administration
Configure Avaya R300 Combo Blade Card   77

Configure Avaya R300 Combo Blade Card

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.

Configuring 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 telephone is not plugged into the interconnect unit. Unavailable telephones should be administered as DISABLED to conserve resources on the switch.

   - Extension Number: (If in TTI or Disabled mode, Extension Number is marked N/A)

   - Extension Password: (If in TTI or Disabled mode, Extension Password is marked 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   |  |   nnnnnnnnnnnnnnn   |  |  .............-    |
|  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        |
|                           |  | Software +8.0.0+  |  |                   |
|                           |  | 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.
```

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Configure Avaya R300 Combo Blade Card   78

3. Press the Left Arrow or Escape key to exit the DCP Line *X* 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       |
|                            |   | Software +8.0.0+   |  |                  |
|                            |   | 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 key twice to return to the Main Edit Menu.

Configuring analog lines

Configure analog lines by doing the following:

1. From the Main Edit Menu, select Definity Combo Blade > Mod Config > Analog
   Line *X*.

2. In the Definity Combo Blade > Mod Config > Analog 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 telephone is not plugged into the interconnect unit.
     Unavailable telephones should be administered as DISABLED to conserve
     resources on the switch.

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

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

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Configure Avaya R300 Combo Blade Card   79

```
|-------- MAX EDIT ------------  |-------------------|  |-------------------|
|30-100 Mod Config         ?? |  |10-100 1234567890 ??|  |30-000 Line Stat   |
| Analog 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        |
|                             |  | Software +8.0.0+  |  |                   |
|                             |  | 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 Escape key to exit the Analog Line *X* 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        |
|                             |  | Software +8.0.0+  |  |                   |
|                             |  | 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 key twice to return to the Main Edit Menu.

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Configure Avaya R300 Combo Blade Card

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Configuring analog information

For analog lines, administer common analog information.

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

2. Complete the following fields:

   - Country Code

   - Balance Network

   - CODEC Gain

   - Ringing pattern

   - Recall Window min

   - Recall Window max

   - Forward Disconnect Time

3. Press the Left Arrow or Escape key to exit the Analog Common 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         |
|                            |  | Software +8.0.0+  |  |                    |
|                            |  | 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 key twice to return to the Main Edit Menu.

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5   Avaya R300 Administration
    Configure Avaya R300 DNS information

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Configure Avaya R300 DNS information

Configuring DNS information is optional, but recommended. The only reason to input DNS information is so a user can use symbolic names for servers, etc. from the diagnostic prompt and terminal server prompt. It provides a domain name for the Avaya R300, a primary and secondary Domain Name Server IP address, and primary and secondary WINS IP addresses (optional). A unit can fully function without configuring DNS information. 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:**

   The DNS menu is not immediately visible from the Ethernet > Mod Config menu. Press the down arrow 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        |
|                            |  | Software +8.0.0+  |  |                   |
|                            |  | 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.
```

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5 Avaya R300 Administration
Configure Avaya R300 VOIP information 82

3. Press the Left Arrow or Escape key to exit the DNS 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        |
|                           |    | Software +8.0.0+  | |                   |
|                           |    | 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 key twice to return to the Main Edit Menu.

Configure Avaya R300 VOIP information

Configure the Voice Over IP (VOIP) information in the Ethernet profile on the Avaya R300.

The VOIP card in the Avaya R300 does not need to be configured.

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:

   - GK IP Adrs: (This is the IP address of the C-LAN board which is the gatekeeper on DEFINITY.)

   - VPN Mode: (If set to No, you will require a password to access the trunk.)

   - Frames/Packet: (Enter the number of audio frames sent per packet. Match your audio frame information on the Avaya R300 with DEFINITY.)

   ⇒ **NOTE:**
   The Avaya R300 uses 5ms audio frames for G.711, so to match three 10ms frames on DEFINITY, the Avaya R300 requires 6 frames/packet set in the Frames/Packet field.

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Configure Avaya R300 VOIP information

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- Pkt Audio Mode:

  This has no bearing on what CODEC is selected. DEFINITY administration controls the Avaya R300 CODEC selection.

- Enable Adaptive Jtr Buf: (Set to Yes.)

- Max Jtr Buf: (Set the maximum range for the Jtr Buffer.)

- Initial Jtr Buf Size: (Set the minimum range for the Jtr Buffer.)

- DTMF Tone Passing: (Set to Out of Band.)

- Single Dial Enable (Use to enable/disable single stage dialing of MultiVoice calls)

  — 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 telephone 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.

```
|-------- MAX EDIT -----------  |-------------------|  |-------------------|
|40-100 Mod Config        ?? |  |10-100 1234567890 ??|  |30-000 Line Stat    |
| VOIP Options..           ^ |  | L1/RA nnnnnnnnnn   |  |  123456789012 A    |
| >GK IP Adrs=123.45.67.89   |  |   12345678901234   |  |  ---..........-    |
|  Keepalive Timer=120       |  |   nnnnnnnnnnnnnnn   |  |  .............-    |
|  Reg Retries=5             |  |-------------------|  |-------------------|
|  Reg Retry Timer=5         |  |10-200 1234567890 ??|  |00-200 15:10:34   ??|
|  Pri GK Retries=1          |  | L2/DS @@@@@@@@@@   |  |>M31  Line    Ch    |
|  VPN Mode=No               |  |   12345678901234   |  | Ethernet up        |
|  Pkt Audio Mode=G.711 U Law |  |   @@@@@@@@@@@@@@@   |  |                    |
|  Frames/Packet=6           |  |-------------------|  |-------------------|
|  Silence Detect/CNG=No     |  |40-300 WAN Stat   ??|  |40-400 Ether Stat ??|
|  Enable Adaptive Jtr Buf=Yes |  |>Rx Pkt:       118^|  |>Rx Pkt:   3486092 |
|  Max Jtr Buf Size=19       |  | Tx Pkt:       511 |  | Tx Pkt:     10056 |
|  Initial Jtr Buf Size=2    |  | CRC:          0v|  |  Col:        3530 |
|  Enable Local DNS Table=No |  |-------------------|  |-------------------|
|  LTOS Enabled=No           |  |00-100 Sys Option  |  |40-100 Sessions   ??|
|  Precedence=N/A          v |  |>Security Prof: 1  ^|  |>  0 Active        |
|                            |  | | Software +8.0.0+ ||  |                    |
|                            |  | | 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.
```

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Saving and restoring profiles 84

3. Press the Left Arrow or Escape key to exit the VOIP profile.

   A confirmation menu appears.

```
|-------- MAX EDIT -----------  |-------------------|  |-------------------|
|EXIT?                     ?? |  |10-100 1234567890 ??|  |30-000 MLine 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        |
|                            |  | Software +8.0.0+  |  |                   |
|                            |  | 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 key twice to return to the Main Edit Menu.

Saving and restoring profiles

Save profiles and use those profiles as backups for an existing Avaya R300 unit, or use the saved profiles to configure additional Avaya R300 units.

Profiles are plain text files and can be edited or updated with any text editor and then restored 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 *Chapter 5, Maintaining and Troubleshooting the Avaya R300 Remote Office Communicator.*

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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 *Chapter 5 Maintaining and Troubleshooting the Avaya R300 Remote Office Communicator.*

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 *Chapter 5 Maintaining and Troubleshooting the Avaya R300 Remote Office Communicator.*

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 *Chapter 5, Maintaining and Troubleshooting the Avaya R300 Remote Office Communicator.*

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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 and an autotype feature, and that is 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 a 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 *Chapter 5, Maintaining and Troubleshooting the Avaya R300 Remote Office Communicator.*

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.

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5 Avaya R300 Administration
Saving and restoring profiles   *87*

Upload a remote configuration

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 *Chapter 5, Maintaining and Troubleshooting the Avaya R300 Remote Office Communicator.*

The Upd Rem Cfg (Upload Remote Configuration) command opens a connection to a RADIUS server to upload the Avaya R300 terminal-server banner, list of Telnet hosts, IP static routes, IP address pool, and other configuration information from the RADIUS user file. The Avaya R300 retrieves configuration from RADIUS at system startup or by use of this command.

When you highlight Upd Rem Cfg and press Enter, the Avaya R300 opens a connection to the RADIUS server and uploads the configuration information.

When you select the Upd Rem Cfg command from the Sys Diag menu. RADIUS adds the routes as follows:

- RADIUS looks for entries having the format route-*unit_name*-1, where *unit_name* is the system name.

- If at least one entry exists, RADIUS loads all existing entries having the format route-unit_name-num to initialize the IP routing table.

  The variable num is a number in a sequential series, starting with 1.

- The Avaya R300 unit queries route-*unit_name*-1, then route-*unit_name*-2, and so on, until it receives an authentication reject from RADIUS.

- Once the host-specific routes are loaded, RADIUS loads the global configuration entries; these configurations have the format route-*num.*

- The Avaya R300 unit queries route-1, then route-2, and so on, until it receives an authentication reject from RADIUS.

The routes remain in effect until the next restart or until overwritten by dynamic updates or routes specified in Connection profiles.

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When you upload this remote configuration information, keep in mind the following:

- The Avaya R300 reads Dialout-Framed-User entries with the password `ascend`.

- The Upd Rem Cfg command does not update the terminal-server banner or list of Telnet hosts if the Remote Conf parameter is set to No.

- If the Ascend-Authen-Alias attribute is defined in RADIUS, the Upd Rem Cfg command also updates the Avaya R300 system name used when establishing PPP calls.

   NOTE:
   In some cases, you might wish to update the Avaya R300 unit's routing tables when connecting to a user whose profile includes `Service-Type=Framed`. In this case, set the Framed-Route attribute in an incoming user profile to specify the user's IP address and subnet mask in the `host_ipaddr` and `subnet_mask` arguments. The route you specify in this manner exists only during the time the call is online. When you enter a nonzero router address for `router_ipaddr` and it is different from the caller's address, the static route of a dial-in frame persists even after the connection goes offline.

Example: This example shows two RADIUS pseudo-user profiles defining global static IP routes:

```
route-1 Password=ascend Service-Type=Outbound
Framed-Route=10.0.200.33/29 10.0.200.37 1 n lala-gw-out
Framed-Route=10.0.200.50/29 10.0.200.37 1 n lala-gw-out
Framed-Route=10.0.200.47/29 10.0.200.49 1 n nana-gw-out

route-2 Password=ascend Service-Type=Outbound
Framed-Route=11.0.200.33/29 11.0.200.37 1 n zzz-gw-out
Framed-Route=12.0.200.47/29 11.0.200.49 1 n kk-gw-out
```

Resetting the Avaya R300

The Avaya R300 unit needs to be reset 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 Rest 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. The system does some clean-up with DEFINITY when reset using one of the other methods.

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6

Troubleshooting

No IP connectivity between Avaya R300 and DEFINITY IP Resource

If the Avaya R300 cannot "ping" to a DEFINITY IP resource board (C-LAN or Media Processor), do the following:

- Verify the physical connection from the Avaya R300 and DEFINITY IP Resource board to network.

- 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 IP resource board from another system on the LAN. If there is no response from the C-LAN board, verify that its IP address, subnet mask, and Default Gateway are correctly administered on the DEFINITY.

- Attempt to verify network connectivity using systems not directly associated with the Avaya R300 or DEFINITY (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.

Endpoint not registered with DEFINITY

If the endpoint you are testing is not registered with DEFINITY, do the following:

- Verify that endpoint being tested is in TTI or Named mode, and not in Disabled mode.

- 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).

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- If endpoint being tested is in TTI mode, refer to section TTI Endpoint Not Registered with DEFINTIY.

- If endpoint being tested is in Named mode, refer to section Named Endpoint Not Registered with DEFINITY.

TTI endpoint not registered with DEFINITY

If the TTI endpoint you are testing is not registered with DEFINITY, 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. TTI is enabled on page 2 of the Change System-Parameters Features screen.

Named endpoint not registered with DEFINITY

If the Named endpoint being tested is not registered with DEFINITY, 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.

- 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)

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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 or 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.

- 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.

1. The IP address for the Avaya R300 on the DEFINITY Node Names was incorrect.

2. The extension number associated with DCP port 1 on the Avaya R300 was correctly administered on the DEFINITY, but the security code for the DEFINITY station does not match the password for the station on the Avaya R300.

3. Another Avaya R300 station, IP telephone, or IP softphone is registered with that extension number. If you type **status station** at the DEFINITY, 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

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- Received a token of 35 bytes

- Received data on connection 4

- Received Register Reject

- freeSignalingPort: freed port 7004

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 the supported station tables in Chapter 1.

- Verify that the phones are properly plugged into the Avaya R300 Interconnect. (Hit the "Test" button.)

- Verify that the 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 Interconnect unit.

- Verify the Y-cable is correctly plugged into the Combo Blade Card on the Avaya R300 unit.

Phones do not have audio

If the phones connected through the Avaya R300 do not have 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, the phone is not getting power, and you should refer to the section Phones Not Receiving Power 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 the section No IP connectivity between Avaya R300 and DEFINITY Gatekeeper (C-LAN).

- 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 the section No IP connectivity between Avaya R300 and DEFINITY IP resource.

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- Verify that the endpoints are registered with DEFINITY. 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 to section Endpoint Not Registered with DEFINITY.

- Verify that the Avaya R300 is opening the audio channel to DEFINITY. 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 DEFINITY, and a dash '**-**' is displayed when the phone is on-hook.

Voice quality is poor

If the voice quality on the phones connected to the Avaya R300 is poor, or below standard voice quality, review the following:

- Direct IP-IP Audio Connection must be set to **yes** for a station, the signaling group the station is in, the network region that the station is in, and for the system, as well. If the field is set to **no** in any of those locations, then the quality of voice over an IP connection may be poor.

  Verify that the Direct IP-IP Audio Connection field is set to **yes** in the following screens:

  — Station, page 2

  — Feature-Related System Parameters, page 10

  — Signaling Group, page 1

  — IP Network Region, page 1

- 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 TN2303 media processor are set to 100mbit operation.

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Alarms and MIBs

Avaya R300 Native MIBs

For information about the Alarms and MIBs native to the Avaya R300 machine, refer to *Max Administration Guide, Chapter 9, SNMP Traps to Monitor Performance*.

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 a Avaya R300 SNMP agent that accesses a slot card's Management Information Base (MIB). The main MIB, called ascend.mib can be downloaded at ftp://ftp.avaya.com/pub/Software-Releases/Max/Current/MIB/.

This approach was adopted in defining the Combo Blade MBI since the Combo Blade resides in a 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.

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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.

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 chronological timeline of the events.

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Terminal Server mode 96

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.

For a list of commands available from the DO menu and a description of those commands, see *MAX Reference, Chapter 2, DO Menu Commands.*

Terminal Server mode

Typing the Term Serv command in the diagnostic window, or selecting Terminal Server from the DO menu starts a terminal-server session.

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 more details about the terminal- server interface, see the *Network Configuration Guide* for your MAX.

Access the terminal- server mode in one of the following 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`.

Use the terminal- server to ping or telnet to another Avaya R300 unit.

Type `quit` to exit the terminal- server mode.

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.*

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External maintenance modem

The external maintenance modem can be used either by Avaya tech 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''.

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