

Mastering Avaya DEFINITY and Aura Communication Manager: The Definitive Guide to Enterprise PBX Administration

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The evolution of enterprise telecommunications is inextricably linked to the development of the **Avaya DEFINITY** system. Originally a product of AT&T and later Lucent Technologies before becoming the flagship of Avaya, the DEFINITY platform set the gold standard for Private Branch Exchange (PBX) architecture. Even as modern enterprises transition toward **Avaya Aura® Communication Manager**, the fundamental principles of DEFINITY administration remain critical for technical professionals managing legacy hardware or hybrid environments. This guide provides an exhaustive technical deep-dive into the administration, maintenance, and logical configuration of these robust systems, bridging the gap between legacy G3 systems and modern enterprise cloud solutions.

1. The Architectural Framework of DEFINITY and Avaya Aura

To administer a DEFINITY or Avaya Aura system effectively, one must understand the underlying hardware and software synergy. The system evolved through several major iterations, including the **DEFINITY G3 (General 3)**, **Prologix**, and the **ECS (Enterprise Communications Server)** series, eventually culminating in the **S87x00/S8x00** media server series and modern virtualized Communication Manager instances.

1.1 Hardware Components and the TDM Bus

Legacy DEFINITY systems rely on a **Time Division Multiplexing (TDM) bus**, a high-speed backplane that facilitates communication between various circuit packs. Key hardware components include:

- **Processor Circuit Packs:** The "brain" of the system (e.g., TN2402 or TN790) that handles call processing and system logic.
- **Switch Node Interface (SNI):** Used in multi-carrier cabinets to link different port networks.
- **Port Packs:** Interface cards for analog (TN746B), digital (TN2214B), and trunk lines (TN767 or TN464).
- **Expansion Interface (EI):** Facilitates the connection between the central processor and remote port networks via fiber optic links.

1.2 The Transition to IP: DLG and H.323

As mentioned in technical documentation regarding the **Definity LAN Gateway (DLG)**, the transition from pure TDM to IP-integrated systems allowed the PBX to communicate with external data networks. This laid the groundwork for modern VoIP, enabling the system to support H.323 and eventually SIP protocols, which are now standard in the **Avaya Aura®** ecosystem.

2. Core Administration Interfaces

The role of a site administrator involves managing system resources through specific interfaces. While modern administrators use **Avaya Site Administration (ASA)**, the underlying logic remains command-line driven.

2.1 Avaya Site Administration (ASA)

ASA is the primary Windows-based GUI/Terminal emulator used to manage Communication Manager. It provides several modes of operation:

- GEDI (Graphically Enhanced Directory Interface): A form-based interface that allows administrators to fill out fields rather than typing raw commands.
- Terminal Emulation: The classic 513 or 4410 terminal mode where commands are typed directly. This is often preferred by senior engineers for its speed and access to low-level maintenance commands.
- Site Administration VA: Used for automated tasks such as scheduling backups and generating reports.

2.2 The Command Paradigm: Action + Object

Administration follows a strict syntax: **[Action] [Object] [Qualifier]**. Understanding this syntax is the first step in mastering the "Little Instruction Book" of basic administration. The primary actions include:

- Add: Create a new object (e.g., add station 1234).
- Change: Modify an existing object (e.g., change trunk-group 1).
- Display: View settings without making changes.
- List: Generate a summary of multiple objects (e.g., list extension-type).
- Status: Real-time monitoring of a hardware or software component (e.g., status station 1234).
- Remove: Delete an object from the database.

3. Technical Comparison: System Evolutions

The following table illustrates the technical capabilities across different generations of the system, highlighting why certain manuals like the **DEFINITY ECS Release 8.2 Administrator's Guide** remain relevant for legacy support.

Feature/Platform	DEFINITY G3i/G3s	DEFINITY ECS (r8.2)	Avaya Aura CM (Modern)
Max Stations	Up to 2,400	Up to 25,000	Up to 41,000 per instance
Architecture	Proprietary Hardware	Proprietary Hardware	Virtual Appliance (Linux)
Signaling	TDM / Analog / Digital	TDM / H.323	SIP / H.323 / TDM Gateways
Management Tool	Terminal / Manager II	ASA / Terminal	System Manager / ASA
Storage Media	Flash/Optical Drive	HDD / Flash	SSD / SAN / Cloud

4. Advanced Call Routing: Coverage Paths and Vectoring

A primary responsibility of the system administrator is the logical flow of calls. This is handled through **Coverage Paths** and **Call Vectoring**.

4.1 Coverage Path Logic

A Coverage Path defines what happens to a call when the intended recipient is busy or does not answer. In the **DEFINITY ECS Administrator's Guide**, this is described as a sequence of "points."

- Point 1: Usually the user's voicemail (e.g., an AUDIX hunt group).
- Point 2: A secondary assistant or a coverage answer group.
- Criteria: Administrators can specify coverage based on "Inside" vs "Outside" calls and status (Busy, Don't Answer, All, Active).

4.2 Call Vectoring and ACD

For call centers, **Call Vectoring** provides the "if-then-else" logic. A vector consists of a series of steps:

1. wait-time 2 secs hearing ringback
2. collect 1 digits after announcement 1001
3. route-to number 0 if digit = 1
4. queue-to skill 1st pri m

This allows for complex Automatic Call Distribution (ACD) where calls are routed based on agent availability, time of day, or caller input.

5. Integrating AUDIX for Unified Messaging

DEFINITY AUDIX(Audio Information Exchange) was the integrated voice mail solution for the DEFINITY platform. Understanding its administration is key to a complete system management strategy.

5.1 The Link Between PBX and AUDIX

The communication between the PBX and AUDIX typically occurs over a specialized link. In legacy systems, this might be a **DCP (Digital Communications Protocol)** link or an IP link in later versions. The administrator must ensure that the **Hunt Group** for AUDIX is correctly configured in the PBX to allow for MWI (Message Waiting Indicator) activation.

5.2 Essential AUDIX Commands

To manage voice mailboxes, administrators use a different set of commands within the AUDIX interface:

- add subscriber [extension]: Creates a new voice mailbox.
- change cos [number]: Modifies the Class of Service for a group of subscribers, defining mailbox size and message retention.
- list history: Views the audit trail for mailbox changes or login attempts.

6. Dial Plan and Trunking Mechanics

The **Dial Plan** is the roadmap of the PBX. It tells the system how to interpret digits dialed by a user. A standard North American dial plan might define 4-digit or 5-digit extensions for internal use, while 9 is reserved for external access.

6.1 Uniform Dialing Plan (UDP)

In multi-site environments, a UDP allows users to dial extensions at remote offices as if they were local. The administrator must configure the **AAR (Automatic Alternate Routing)** and **ARS (Automatic Route Selection)** tables to dictate which trunk groups (ISDN-PRI, SIP, or Analog) the call should take based on cost and availability.

6.2 Trunk Group Configuration

Trunking connects the PBX to the Public Switched Telephone Network (PSTN). Key parameters include:

- Group Type: isdn-pri, sip, or co (Central Office).
- Service Type: public-ntwrk or tie-line.
- Signaling Group: Links the D-channel of a PRI or the signaling IP of a SIP trunk to the trunk group.

7. System Maintenance and Troubleshooting

A Senior Technical Writer must emphasize that administration is 50% configuration and 50% maintenance. The **DEFINITY G3 Installation Administration and Maintenance** manual highlights several critical diagnostic tools.

7.1 Error Logs and Alarms

The command display alarms is the first line of defense. Alarms are categorized into:

- Major: Critical failures that affect a large number of users or system stability (e.g., Processor failure).
- Minor: Failures affecting a limited number of ports or non-critical features.
- Warning: Informational alerts, often related to maintenance thresholds or software sync issues.

7.2 Testing Circuits

The test command allows for non-destructive and destructive testing of hardware. For example, test board 01a05 will run a battery of tests on the circuit pack located in Cabinet 1, Carrier A, Slot 5. This will check the TDM interface, the onboard power, and the specific port signaling.

7.3 Common Failure Modes

Symptom	Potential Cause	Resolution Command
No Dial Tone	Port failure or wiring issue	test station [ext]
One-Way Audio	IP/TDM gateway sync error	status media-processor
Trunk Busy Out	PSTN circuit down	test trunk-group [x]
MWI not working	Link down between PBX and AUDIX	status link [x]

8. Security: COS and COR Framework

System security is managed through two primary mechanisms: **Class of Service (COS)** and **Class of Restriction (COR)**.

8.1 Class of Service (COS)

COS defines which features a user can access from their terminal. This includes features like Call Forwarding, Data Privacy, and Priority Calling. There are 16 available COS groups (0-15), which are assigned on the station form.

8.2 Class of Restriction (COR)

COR is more critical for cost control and security. it defines the **Calling Permission** of an endpoint. For example, a COR can be configured to allow local calls but block international calls. COR also uses **FRL (Facility Restriction Levels)**; if a trunk group has an FRL of 5, only users with a COR FRL of 5 or higher can use that trunk.

9. Practical Implementation: Adding a New Station

To synthesize the information provided in the **Avaya User Guides**, here is the technical workflow for adding a new digital station to a DEFINITY or Aura system:

1. Identify an Available Port: Use list configuration all to find an empty port on a TN2214 or TN2464 board.
2. Execute Command: Type add station [extension].
3. Define Station Type: Enter the hardware model (e.g., 2420, 6408D, 9608).
4. Assign Port: Enter the physical cabinet/carrier/slot/port address.
5. Configure Security: Assign the appropriate COR and COS based on the user's role.
6. Set Coverage: Assign a Coverage Path (e.g., path 1 for voicemail).
7. Button Assignment: Program features on the physical buttons (e.g., abbr-dial, call-app, send-calls).

10. The Future of Administration: Moving Toward Automation

As enterprises scale, the manual entry of commands becomes inefficient. Modern Avaya Site Administration involves using **Import/Export** tools to manage thousands of stations via CSV files. Furthermore, the integration of **Avaya Aura System Manager (SMGR)** introduces a centralized web-based management layer that synchronizes Communication Manager, Session Manager, and Presence services.

However, the technical debt of legacy systems remains a significant factor in global telecommunications. The resilience of the DEFINITY architecture—evident in the continued use of manuals from 1996 and 2000—showcases the importance of a solid foundation in TDM principles. Whether managing a legacy **G3 Prologix** or a cutting-edge **Avaya Auracloud** instance, the administrator's goal remains the same: ensuring high-availability,

secure, and efficient communication across the enterprise.

In conclusion, mastering the Avaya ecosystem requires a dual understanding of historical hardware constraints and modern software flexibility. By leveraging the comprehensive documentation available from early ECS releases through modern Site Administration references, technical professionals can ensure their systems remain operational, secure, and ready for the next evolution in unified communications.

Baca Juga (Artikel Terkait)

- [The Comprehensive Guide to Avaya 9620L IP Telephony: Technical Architecture, Deployment, and Enterprise Integration](#)

URL: <http://alaskawriters.com/avaya-9620l-ip-telephone-technical-guide.pdf>

- [The Definitive Technical Guide to Alcatel-Lucent OmniPCX Enterprise \(OXE\) and OXE Purple Architecture](#)

URL: <http://alaskawriters.com/alcatel-lucent-omnipcx-enterprise-oxe-purple-technical-guide.pdf>

Tags: #Avaya DEFINITY #PBX Administration #Avaya Aura #Communication Manager #Telephony Engineering

