Avaya Call Management System
Overview and Specification

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Chapter 1:   Introduction

Purpose

This document describes tested product characteristics and capabilities including product overview and feature descriptions, interoperability, performance specifications, security, and licensing requirements.

Intended audience

This document is intended for anyone who wants to gain a high-level understanding of the product features, functions, capacities, and limitations within the context of solutions and verified reference configurations.

Document changes since last issue

The following changes have been made to this document since the last issue:

- Added a section on new features of CMS R17 R4 in the *New in this release* section.

- Updated the capacities table to include the capacity numbers for the HP DL380P G8 platform.

- Updated the table capacities and upgrades for each hardware platform being sold for new CMS R17 installations or for existing platforms being upgraded to CMS R17 in the *Capacity and Scalability* section.

- Updated the table Capacities in a VMWare configuration to reflect updated Agent Skill pairs for small VMWare configuration.

Related resources

Documentation

You can download the document you need from the Avaya Support website at
http://support.avaya.com.

The following table lists the documents pertaining to CMS:

Document title	Description	Audience
Planning		
Avaya CMS Overview and Specification	Describes CMS features, specifications, and compatibility of CMS with other products. The specifications include performance, capacity, traffic, high availability, and dial plan.	All
Administration		
Avaya CMS Administration	Provides instructions on administering a Contact Center using Avaya CMS Supervisor.	Avaya CMS administrators and Split/Skill supervisors with limited access to CMS
Avaya CMS Call History Interface	Describes the format of the Call History data files, and how to transfer these files to another computer.	Avaya support personnel and Contact Center administrators
Avaya CMS Security	Describes how to implement security features in CMS.	Avaya support personnel, Avaya factory personnel, and Contact Center administrators
Avaya CMS Switch Connections, Administration, and Troubleshooting	Describes how to connect and administer Avaya communication servers or switches that are used with Avaya CMS.	Avaya support personnel and Contact Center administrators
Installation		

Document title	Description	Audience
Avaya CMS SIMT for Linux	Describes how to install, configure, and maintain Avaya CMS.	Avaya support personnel, Avaya factory personnel, and Contact Center administrators
Overview		
Avaya CMS Change Description	Describes the new features in the current release.	All
Application		
Avaya CMS Database Items and Calculations	Provides CMS users with the knowledge to understand, in detail, how CMS calculates the numbers displayed on CMS and Avaya CMS Supervisor reports within the CMS database.	CMS users who need to understand how CMS calculates numbers for reports
User Guides		
Avaya CMS Supervisor Reports	Describes the purpose and usage of CMS Supervisor reports.	Contact Center administrators and personnel responsible for determining the effectiveness of the contact center

Training

The following courses are available on www.avaya-learning.com. Enter the course code in the **Search** field and click **Go** to search for the course.

Course Code	Course Title
AVA00398WEN	Avaya Call Management System Administration
AVA00400WEN	Avaya CMS Maintenance and Troubleshooting
AVA00399WEN	CMS Report Fundamentals

Avaya Mentor videos

Avaya Mentor is an Avaya-run channel on YouTube that includes technical content on how to install, configure, and troubleshoot Avaya products.

Visit http://www.youtube.com/AvayaMentor.

Enter a key word or key words in the Search channel to search for a specific product or topic. Click the name of a playlist to scroll though the posted videos.

Support

Visit the Avaya Support website at http://support.avaya.com for the most up-to-date documentation, product notices, and knowledge articles. On the Avaya Support website at http://support.avaya.com, search for notices, release notes, downloads, user guides, and resolutions to issues. Use the Web service request system to create a service request. Chat with live agents to help answer questions. If an issue requires additional expertise, agents can quickly connect you to a support team.

Warranty

Avaya Inc. provides a limited warranty on this product. Refer to your sales agreement to establish the terms of the limited warranty. In addition, Avaya's standard warranty language, as well as information regarding support for this product, while under warranty, is available through the Avaya Support Web site:

http://www.avaya.com/support

For information about the standard Avaya warranty and support for Call Management System during the warranty period, see the Avaya Support website at http://support.avaya.com/ in **HELP & POLICIES** > **Policies & Legal** > **Maintenance and Warranty Information**.

See also **HELP & POLICIES** > **Policies & Legal** > **License Terms**.

Chapter 2:   Overview

Avaya Call Management System (CMS) is a software product for businesses and organizations that receive a large volume of telephone calls processed through the Automatic Call Distribution (ACD) feature of the Avaya Aura® Communication Manager system. Avaya CMS collects call-traffic data, formats management reports, and provides an administrative interface to the ACD feature on the Communication Manager system.

Avaya CMS runs on the Solaris and Red Hat Enterprise Linux® (RHEL) operating systems and uses several operating system utilities to communicate with terminals and printers, log errors, and execute processes. CMS utilizes the INFORMIX database management system, which provides an interface to the CMS historical database.

Avaya CMS stores ACD data in a real-time database as well as a historical database. Real-time databases include tables for the current intrahour interval data and the previous intrahour interval data. The storage interval can be 15, 30, or 60 minutes. Historical databases include tables for the intrahour, daily, weekly, and monthly data. The historical database can store 62 days of intrahour historical data, 5 years or 1825 days of daily historical data, and 10 years or 520 weeks of weekly and monthly historical data.

Avaya CMS provides two options for contact center data resiliency:

- High Availability CMS: For data redundancy with two systems operating in tandem.
- Survivable CMS: For business continuity in multilocation contact centers and continued operation in the event of a disaster at the controlling site.

Avaya CMS is a flexible and scalable software that is ideal for small single-location contact centers, large multilocation application, or contact centers of similar sizes. You can use Avaya CMS to analyze the performance of a single agent, a specific skill, a large number of agents or agent skills on up to eight ACD systems.

Avaya CMS includes the Avaya CMS Supervisor feature to monitor contact center performance and activity from a PC within your contact center, at home, or on the road. Using Avaya CMS Supervisor, managers can monitor, in real time, any area of contact center performance such as the number of abandoned calls, average hold time, and number of calls in a queue. Avaya CMS also includes the Avaya CMS Supervisor Web feature to monitor contact center performance and activity with a web browser.

Feature description

CMS offers the following salient features:

- CMS reporting
- CMS Supervisor PC client
- CMS Supervisor Web client
- CMS Mobile Supervisor
- ACD administration
- Backup support
- IPv6 support

CMS reporting

CMS provides real-time, historical, and integrated reporting to track all activities in the contact center. Using CMS reports, you can take decisions regarding entities like agents, split/skills, vectors, vector directory numbers (VDN), and trunks.

CMS stores all the ACD data received from Communication Manager or the communication server in the real-time and historical databases. Real-time databases include tables for the current intrahour interval data and the previous intrahour interval data. The storage interval can be 15, 30, or 60 minutes. Historical databases include tables for the intrahour, daily, weekly, and monthly data.

CMS Supervisor PC client

The Avaya CMS Supervisor PC client software is a Windows-based interface to the Avaya CMS server. Using this interface, you can carry out nearly all the operations available from the CMS server interface, including:

- Remotely administering most aspects of the CMS server, such as defining Dictionary entries, setting user permissions, and adjusting data storage intervals and capacities.
- Running reports to view the activity in your call center.

CMS Supervisor Web client

You can use Avaya CMS Supervisor Web, or the CMS Web-based reporting tool, to access CMS reports from a wide range of hardware platforms. Avaya CMS Supervisor Web has a single point of installation which eliminates the need to install a client on multiple computers.

Avaya provides CMS Supervisor Web as an alternative to CMS Supervisor PC client so that customers can reduce the overheads associated with traditional CMS Supervisor PC client deployment.

CMS Mobile Supervisor

CMS Mobile Supervisor is an iPad application that the supervisors and operations managers of a contact center can use to monitor the agents and the health of the contact center when the supervisors and operations managers are away from their desks.

CMS Mobile Supervisor is a real-time reporting tool that displays specific real-time summary views of skills and agent activity with the capability to drill through to individual agent details.

ACD administration

CMS provides an administrative interface to the communication server. From the ACD interface, you can view or change parameters related to ACDs, call vectoring, and Expert Agent Selection (EAS) on the communication server. An administrator can also run reports that describe your contact center configuration.

For example, an administrator can:

- Add or remove agents from splits/skills.
- Move extensions between splits/skills.
- Change splits/skills assignments.
- Change trunk group-to-split.
- Change trunk group-to-VDN.
- Change VDN-to-vector assignments.
- Start an agent trace.
- List the agents being traced.
- Create, copy, and edit call vectors.

Backup support

CMS supports backup and restore to and from tape and Tivoli Storage Manager (TSM) LAN backup. CMS also supports backup, restoration, and migration to and from the following:

- Symantec Netbackup 7.0 Server, LAN backup

- Tivoli Storage Manager 5.5 and 6.2.1, LAN backup

- USB storage device, nontape backup

- NFS mounted file system, nontape backup

IPv6 support

CMS supports IPv6 connectivity. The integration between CMS and Communication Manager over IPv6 is seamless. You can configure IPv6 Communication Manager or ACD sources by using the `cmsadm` command through the `acd_create` option in the same way as IPv4. This configuration requires the use of IPv6 addresses instead of IPv4 addresses. CMS Supervisor Web and CMS Mobile Supervisor can also use IPv6. CMS also integrates with Supervisor PC Client, Terminal Emulator, and Network Reporting over IPv6. No extra configuration is required to enable the IPv6 capabilities of CMS reporting client applications. IPv6 protocol and name resolution, and connectivity is automatic. Use of IPv6 is transparent to CMS users. All features of CMS work exactly the same with IPv6 as they do with IPv4.

New in this release

CMS R17.0 supports the following features:

- Support for Linux® operating system for low and mid-sized offer. The low and mid size offers run CMS server software on Dell R620 hardware. The operating system running on the Dell R620 server is Red Hat Enterprise Linux® (RHEL) 6.3.

- VMware® support. Avaya Customer Experience Virtualized Environment integrates Avaya Aura® Contact Center applications with VMware® virtualized server architecture. Avaya Customer Experience Virtualized Environment provides benefits like fewer servers and racks, reduced power consumption, deployment of Avaya products in a virtualized environment on customer-specified servers and hardware, and lowering operational expenses. For deploying Avaya CMS in an Avaya Customer Experience Virtualized Environment, see *Deploying Avaya Call Management System in an Avaya Customer Experience Virtualized Environment.*

- Upgrade summary. CMS R17 T5120 or T5220 systems require CMS Upgrade Express (CUE) for an upgrade. Earlier platforms running CMS R15 require the platform upgrade procedure to upgrade to R17.

- Alarming changes. Simple Network Management Protocol (SNMP) alarming is the new alarming method and replaces alarming through modems. CMS achieves SNMP alarming using Secure Access Link (SAL).

- Backup options available. Serial Attached SCSI (SAS) connectivity for tape drives is available on all Dell R620 systems that are shipped with CMS R17. Avaya can recommend several variants of tape drives to the customer, but the customer is responsible for obtaining and installing their tape drive. The other options for backup are LAN backup, which includes Tivoli Storage Manager 6.3 and Netbackup 7.5, and NFS-mounted file system.

- CMS Supervisor Web client. The CMS Supervisor Web client user interface and online help has been localized into the following languages:
  - French
  - German
  - Italian
  - Spanish
  - Portuguese
  - Russian
  - Korean
  - Japanese
  - Simplified Chinese

- CMS media changes. CMS base software includes Alarm Origination Manager (AOM). CMS installation procedure does not install Supplemental Services for RHEL (Linux®) systems.

CMS R17 R2 supports the following features:

- Capacities changes. CMS R17 R2 supports up to 800,000 agent/skill pairs for the overall system limit. See Capacity and scalability specifications on page 21 for more information.

  Note:
  You need the new Dell R720 hardware platform for the higher agent/skill pair capacities.

- High end Dell R720 hardware platform. The Dell R720 hardware platform has twelve 300-GB disks in a RAID 10 configuration which provide the Dell R720 platform with approximately 1.5 TB of database storage capability. You need the Dell R720 platform to use the increased agent/skill pairs capacities for CMS R17 R2.

CMS R17 R3 supports the following features:

- CMS Mobile Supervisor: CMS Mobile Supervisor is an iPad application that the supervisors and operations managers of a contact center can use to monitor agents and the health of the contact center when they are away from their desks. Using the capabilities of CMS Mobile Supervisor, the contact center supervisors and operations managers get the current status of the contact center activities on their iPad.

- Increase in capacities:
  - The concurrent agents capacity for R17 Low End Hardware Platform, or Dell R620 low, is 400.
  - The agent group capacity of 99 agents is available on Dell R720, VMware large configuration, and Oracle T4.

CMS R17 R4 supports the following features:

- HP DL380p Gen8 Server. The HP server hardware platform has eight 300-GB disks in a RAID 10 configuration which provide the HP platform with capacities similar to the SPARC T4-1 platform.

- Support for VMWare 5.5.

Chapter 3:   Interoperability

Product compatibility

The following table lists the different releases of CMS software that are compatible with the following communication server software releases:

Communication server software release	CMS software release								
	R3V9	R3V11	R12	R13.x	R14.x	R15	R16	R16.x	R17
DEFINITY R9.1, R9.2	Yes[1]	Yes	Yes	Yes	Yes	No	No	No	No
Avaya Call Processing R9.5	Yes[1]	Yes	Yes	Yes	Yes	No	No	No	No
Avaya Call Processing R10	Yes[1]	Yes	Yes	Yes	Yes	No	No	No	No
Communication Manager 1.1, 1.2, 1.3	No	Yes[1]	Yes	Yes	Yes	No	No	No	No
Communication Manager 2.0, 2.1, 2.2	No	No	Yes[1]	Yes	Yes	Yes	Yes	Yes	Yes
Communication Manager 3.0, 3.1	No	No	No	Yes[1]	Yes	Yes	Yes	Yes	Yes
Communication Manager 4.0	No	No	No	No	Yes[1]	Yes	Yes	Yes	Yes
Communication Manager 5.0, 5.1	No	No	No	No	Yes[1]	Yes	Yes	Yes	Yes
Communication Manager 5.2	No	No	No	No	No	Yes[1]	Yes	Yes	Yes
Communication Manager 5.2.1	No	No	No	No	No	Yes	Yes[1]	Yes	Yes
Communication Manager 6.0	No	No	No	No	No	Yes	Yes	Yes[1]	Yes[1]
Communication Manager 6.2	No	No	No	No	No	Yes	Yes	Yes[1]	Yes[1]

1. Recommended release combination

Third-party product requirements

The following table lists some of the third-party products that the customer provides:

Third-party Product	Description	Connectivity
SAS LTO-5 tape drive (hardware)	This tape drive is attached to T4-1 SPARC systems for providing tape backups for CMS data.	The tape drive connects to the CMS server using the external SAS HBA card. CMS software seamlessly integrates with this tape drive for backing up CMS and system data using the tape option for backups.
SAS LTO-4 tape drive (hardware)	This tape drive is attached to Netra X4270 and T5120/T5220 systems for providing tape backups for CMS data.	The tape drive connects to the CMS server using the external SAS HBA card. CMS software seamlessly integrates with this tape drive for backing up CMS and system data using the tape option for backups.
US Robotics Faxmodem Comsphere 3910 (hardware)	Using this modem, personnel at a remote support center can dial in to a Netra X4270 CMS server and do maintenance.	The modem connects to the CMS server using the remote console port and provides console access to a remote computer.
U.S. Robotics Sportster 33.6 Faxmodem (hardware)	Using this modem, personnel at a remote support center can dial in to a T5120/T5220 CMS server and do maintenance.	The modem connects to the CMS server using the remote console port and provides console access to a remote computer.

Operating system compatibility

CMS server software runs on Solaris 10 08/11, and Red Hat Enterprise Linux® (RHEL) 6.3.

Operating system compatibility for CMS Supervisor Web client

CMS Supervisor Web client is supported on the following browsers and OS combinations:

- Internet Explorer (R17)
    - Version 8 and 9 on Windows Vista and Windows 7
- Internet Explorer (R17 R2)
    - Version 10 on Windows 7 and 8
    - Version 10 Modern on Windows 8
    - Version 11 and 11 Modern on Windows 8.1
- Firefox (R17)
    - Version 3.6.23 and 7.0.1 on Windows Vista, and Windows 7
- Firefox (R17 R2)
    - Version 35
- Chrome (R17 R2)
    - Version 39
- Safari (R17)
    - Version 5.1.1 on Mac OS X 10.6 and10.7
- Safari (R17 R2)
    - Version 6 on OS X 10.7 (Lion) and OS X 10.8 (Mountain Lion)
    - Version 7 on OS X 10.9 (Mavericks)

Operating system compatibility for CMS Supervisor PC client

CMS Supervisor PC client is supported on the following OS combinations:

- Windows Vista
- Windows 7
- Windows 8 non-touch
- Citrix XenApp 6.5 Enterprise on Windows 2008 R2 Enterprise 64-bit SP1

- Citrix XenApp 6.5 Enterprise on Windows 2008 R2 Enterprise 64-bit
- Citrix XenApp 6.0 Enterprise on Windows 2008 R2 Enterprise 64-bit SP1
- Citrix XenApp 6.0 Enterprise on Windows 2008 R2 Enterprise 64-bit
- Citrix XenApp 5.0 Enterprise on Windows 2003 R2 Enterprise 32-bit SP2
- Citrix XenApp 5.0 Enterprise on Windows 2003 R2 Enterprise 32-bit

Chapter 4:   Performance specifications

Capacity and scalability specifications

The following tables list the capacities for each hardware platform being sold for new CMS R17 installations or for existing platforms being upgraded to CMS R17. Only T5120, T5220, and Netra X4270 systems can be upgraded to R17.

New shipments

Capacity	R17 low end hardware platform (Dell R620 Low)	R17 midsize hardware platform (Dell R620 Mid)	HP 380P G8 hardware platform	R17 R2 high end hardware platform (Dell R720)
Memory	8 GB	16 GB	64 GB	64 GB
Peak busy-hour call volume	10,000	200,000	400,000	400,000
Concurrent supervisors[1]	30	200	1,600	1,600
Concurrent Agents	400[2]	5,000	10,000	10,000
Third-party software	3	3	7	7
Agent skill pairs[3]	100,000	200,000	200,000	800,000[2]
Reports per Supervisor session	5	5	10	10
Report elements	5	5	12	12
Active agent traces	200	1,000	5,000	5,000
30 seconds Average refresh rate	10% at 3 seconds	50% at 3 seconds	100% at 3 seconds	100% at 3 seconds
Internal Call History (ICH) records	4,000 per 20 mins	4,000 per 20 mins	4,000 per 20 mins	4,000 per 20 mins
External Call History (ECH) records	300,000 per 20 mins	300,000 per 20 mins	300,000 per 20 mins	300,000 per 20 mins

1. The total capacity of concurrent CMS Supervisors is the combined capacity of CMS Supervisor PC clients, CMS Supervisor Web clients, and CMS Supervisor Mobile clients.

2. This concurrent agent capacity is effective in CMS R17 R4 in the ASD configurator.

3. CMS can support a system wide limit of 800,000 agent skill pairs, with a per ACD limit of 100,000 agent skill pairs. See Maximum values with multiple ACD deployment for more information.

The Dell R720 introduces new CMS system wide capacities. The new CMS system wide capacities come with restrictions, so review Maximum values with multiple ACD deployment for specific restrictions when using the higher system wide capacities.

Note:
All the per ACD capacities remain unchanged.

New system wide capacities

CMS attribute	System wide capacity	Per ACD capacity
Agent skill pair	800,000	100,000
Total VDNs	54,000	30,000
Total splits or skills	54,000	8,000
Total trunks	40,000	12,000
Total trunk groups	8,000	2,000
Total vectors	32,000	8,000
Total call work codes	4,000	1,999
Agent trace records (AAR)	5,100,000	5,100,000

The following table represents the maximum values with multiple ACD deployment on a Dell R720 system supporting 800,000 agent skill pairs:

Maximum values with multiple ACD deployment

Basic Maximum Values					
Agent/skill pairs	300,000	300,000	400,000	500,000	800,000
Interval length (30)	30	15	30	30	30
Interval data days saved	31	31	15	31	15
Daily data days saved	1,825	730	1,825	730	730

Note:

There is no impact on daily, weekly, and monthly limits. When the capacity limit of agent skill pairs crosses 200,000, there is an impact on the interval data storage.

Upgrades

Capacity	Netra X4270	Sun Enterprise T5120 4-core	Sun Enterprise T5220 or T5120 8-core		SPARC T4-1	
Memory	4 GB	4 GB or 8 GB	16 GB	32 GB	32 GB	64 GB
Peak busy-hour call volume	200,000	200,000	250,000	400,000	400,000	400,000
Concurrent supervisors[1]	200	200	400	800	800	1600
Concurrent Agents	5,000	5,000	10,000		10,000	
Third-party software	3	3	5	7	7	7
Agent skill pairs[2]	200,000	200,000	200,000		200,000	
Reports per Supervisor session	5	5	8	10	10	10
Report elements	5	5	8	12	12	12
Active agent traces	200	200	400	600	2,000	5,000
30 seconds average refresh rate	10% at 3 seconds	10% at 3 seconds	50% at 3 seconds	100% at 3 seconds	100% at 3 seconds	100% at 3 seconds
Internal Call History (ICH) records	4,000 per 20 mins	4,000 per 20 mins	4,000 per 20 mins		4,000 per 20 mins	
External Call History (ECH) records	300,000 per 20 mins	300,000 per 20 mins	300,000 per 20 mins		300,000 per 20 mins	

1. The total capacity of concurrent CMS Supervisors is the combined capacity of CMS Supervisor PC clients and CMS Supervisor Web clients.

2. CMS supports a system wide limit of 200,000 agent skill pairs, with a per ACD limit of 100,000 agent skill pairs.

Capacities in a VMWare configuration

Parameter	Small VMWare configuration No equivalent real hardware machine	Medium VMware configuration — about equivalent to mid-sized Dell R620 with Linux	Large VMWare configuration — about equivalent to high-end Enterprise T4 with Solaris
Peak busy-hour call volume	30,000	200,000	400,000
Concurrent supervisor sessions[1]	50	200	1,600[2]
Concurrent Agents	500	5,000	10,000
Third-party software	3	3	7
Agent skill pairs[3]	100,000	200,000	200,000-R17.0 R1 800,000-R17.0 R2[3]
Reports per Supervisor session	3	5	10
Report elements	5	5	12
Percentage of supervisors that can run reports with a 3 second refresh rate	0%	50%	100%
Active agent traces	250	1,000	5,000
Internal Call History (ICH) records	4,000 per 20 mins	4,000 per 20 mins	4,000 per 20 mins
External Call History (ECH) records	10,000 per 20 mins	60,000 per 20 mins	300,000 per 20 mins

1. This value is the total number of active CMS Supervisor PC client and CMS Supervisor Web client sessions.

2. Of the 1600 sessions supported, only 800 can be CMS Supervisor Web client sessions.

3. Supporting 800,000 agent skill pairs requires greatly increased disk space for interval data. Customers should create up to 8 additional disk volumes. See *Deploying Avaya Call Management System in an Avaya Customer Experience Virtualized Environment* for full details on disk space usage recommendations.

Traffic specifications

See the entry for *Peak busy-hour call volume* in the *New ships* and *Upgrades* tables in Capacity and scalability specifications on page 21.

Redundancy and high availability

The primary purpose of the Avaya CMS High Availability (HA) option is to ensure an uninterrupted data stream between the communication server or switch and the CMS server. With HA, two CMS servers are connected to one communication server or switch. This connection eliminates the traditional single point of failure between the CMS server and the communication server or switch.

Both CMS servers collect data independently from the communication server. Both CMS servers provide full CMS capabilities. If either server fails, loses connection to the communication server, or must be brought down for maintenance, the alternate server can carry the entire CMS activity load.

Duplicate hardware is a key component of the CMS HA system. The function of the duplicate hardware is to eliminate a single point of failure in order to prevent data loss due to hardware failures. The dual ACD link feature addresses ACD link failures, and the alternative ACD link provides increased ACD link reliability. A C-LAN circuit pack or an ethernet port provides TCP/IP connectivity between the communication server and the CMS server. Each ACD link requires a separate C-LAN circuit pack or ethernet port that supports different network routes to eliminate as many single points of failure as possible.

The following figure displays a typical CMS HA configuration with a primary or active server and a secondary or standby server:
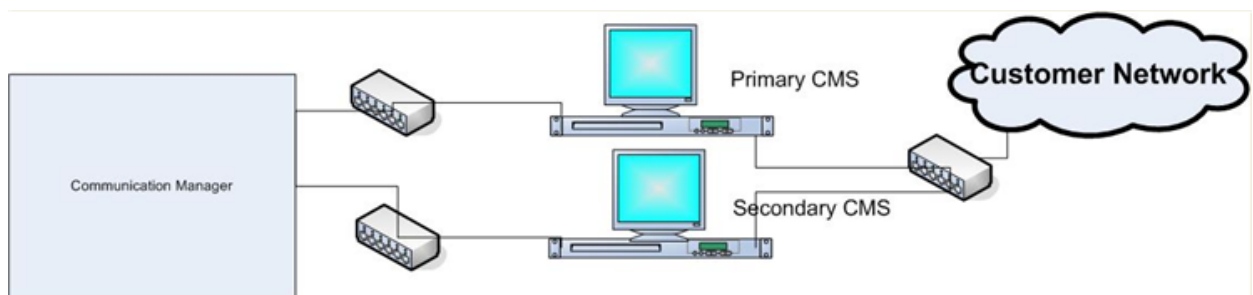
Dial plan specification

CMS R17 and later supports up to 15 digits with the Expanded Dial Plan (EDP) feature, including Expert Agent Selection (EAS) Agent IDs and VDNs without truncation. For full EDP support, use Communication Manager 5.2.1. With Communication Manager 4.0 through 5.2, you need extended dial plan Special Application SA9062 to allow CMS to use full EDP support.

Chapter 5: Security

Security specifications

CMS provides the following security features for secure operation:

- Operating system hardening

  CMS achieves operating system hardening by the following procedures:

  - *Patching and patch qualification*: CMS includes all necessary components including security patches at the time of release. Avaya receives additional patch notifications and certifies new Solaris OS patches. Avaya then assembles the Sun patch clusters and makes the clusters available to customers through Product Change Notices (PCN).

  - *Operating System-level security logs and audit trails*: You can use log files to detect suspicious system activity. The customer can review these log files on a routine basis for signs of unusual activities. For more information, see *CMS Security*.

  - *Banner modifications*: Altering the telnet and ftp network service banners hides operating system information from individuals who want to take advantage of known operating system security holes.

  - *Email and SMTP*: You must not configure CMS as a mail relay and must disable the Simple Mail Transfer Protocol (SMTP) daemon.

  - *User file permissions and masks*: You can implement the CSI Hardening offer or upgrade to set the default umask to 022.

- Authentication and session encryption

  CMS achieves authentication and session encryption by the following procedures:

  - *User authentication and authorization*: CMS uses login and password security measures provided by the Solaris OS and provides multiple levels of system access. To authenticate users, CMS uses Solaris capabilities based on Pluggable Authentication Modules (PAM). At the system level, CMS uses the standard UNIX permissions. In CMS, you can administer data permissions for each user.

  - *Password complexity and expiration*: You can enable and modify the password expiration attributes through the CMSADM menu. You can set the expiration intervals from 1 to 52 weeks and the Solaris parameters in MINWEEKS, MAXWEEKS, and WARNWEEKS.

  - *Logging for failed logins*: You can log the failed login attempts in the system message log, `syslog`.

- – *Multiple login prevention*: With the CSI hardening offer, you cannot log in more than once concurrently.

- – *Use of ssh*: CMS provides a simplified installation of secure Supervisor client login over a public or unsecured network. To do this installation, CMS uses Secure Shell (SSH), a protocol that encrypts the packets sent between a client workstation and a host server. This procedure secures the transmission of login information and other sensitive data.

- Application security

  CMS achieves application security by SPI link, application-level audit logging, and database security controls.

- Physical security

  CMS achieves physical security by physical server protection and EEPROM/BIOS security.

- Services security and CMS support

  CMS achieves services security and CMS support by remote connectivity and authentication, and services password management.

Port utilization

Call Management System R17 Port Matrix lists all the ports and protocols that CMS uses. Avaya Direct, Business Partners, and customers can find the port matrix document at http://support.avaya.com/security. On the Web page, select the **Avaya Product Port Matrix Documents** link, and click the Port Matrix document for CMS. You can gain access to the port matrix document only after you log in to the Avaya Support site using the valid support site credentials.

Chapter 6:   Licensing requirements

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Glossary

Automatic Call Distribution (ACD)	1) A switch feature that channels high-volume incoming and outgoing call traffic to agent groups identified by splits or skills. 2) An agent state in which the extension is engaged in an ACD call.
Automatic Number Identification (ANI)	An industry term for notification of the calling party number (CPN). When the calling party is connected through a switch, the CPN can be either a billing number for the switch or the station identification (SID) number.
AUX	An agent state in which the agent is doing non-ACD work, is on a break, or is in a meeting. Agents enter AUX work by pressing the AUX WORK button or dialing the access code from their voice terminal. Agents can also enter AUX work by disconnecting to make or answer an extension call while in AVAIL mode or with a call on hold.
backup	The process of protecting data by writing the contents of the disk to an archive, such as a tape device, that can be removed from the computer environment and stored safely.
Call Prompting	A switch feature that routes incoming calls based on information supplied by the caller such as an account number. The caller hears an announcement, and the system prompts the user to select from the options listed in the announcement.
Call Vectoring	A switch feature that provides a highly flexible method for processing ACD calls using VDNs and vectors as processing points between trunk groups and splits. Using Call Vectoring, the system can route calls independent of splits.
Call Work Code (CWC)	An ACD capability using which the agent can enter a string of digits during or after the call and send the digits to *CMS* for management reporting.
dequeued and abandoned (DABN)	A trunk state in which the trunk quickly becomes idle after the caller abandons the call.
Dictionary	A CMS capability used to assign easily interpreted names to contact center entities such as login IDs, splits/skills, trunk groups, VDNs, and vectors.
direct agent ACD (DACD)	An agent state in which the agent is on a direct agent ACD call.
direct agent ACW (DACW)	An agent state in which the agent is in the after call work (ACW) state for a direct agent ACD call.
direct inward dialing (DID)	The use of an incoming trunk to dial directly from a public network to a communications system without help from an attendant.
entity	A generic term for an agent, split/skill, trunk, trunk group, VDN, or vector.

expected wait time (EWT)	An estimate of how long a caller has to wait to be served by a contact center while in a queue. EWT is based on current and past traffic, handling time, and staffing conditions. EWT does not include time spent in vector processing before being placed in a queue and time spent ringing an agent with manual answering. This calculation is a switch-based calculation.
Expert Agent Selection (EAS)	An optional Communication Manager feature that routes incoming calls to an agent who is a member of the specific skill required to handle the problems of the caller.
forced busy (FBUSY)	A trunk state in which the caller receives a forced busy signal.
forced disconnect (FDISC)	A trunk state in which the caller receives a forced disconnect.
Look Ahead Interflow (LAI)	A switch feature that can be used to balance the call load among multiple contact centers. LAI works with Call Vectoring and ISDN Primary Rate Interface (PRI) trunks to intelligently route calls between contact centers. Using this feature, multiple contact centers can share workloads and expand hours of coverage, and contact centers can transparently handle calls in different time zones.
maintenance busy (MBUSY)	A trunk state in which the trunk is out of service for maintenance purposes.
Outbound Call Management (OCM)	A set of switch and adjunct features using Adjunct/Switch Applications Interface (ASAI) that distributes outbound calls initiated by an adjunct to internal extensions, which are usually ACD agents.
skill	An attribute that is associated with an ACD agent and that qualifies the agent to handle calls requiring the attribute. An agent can be assigned up to 60 skills. For example, the ability to speak a particular language or the expertise to handle a certain product.
split	A group of extensions that receive calls.
switch	A system providing voice or voice and data communication services for a group of terminals.
trunk	A telephone circuit that carries calls between two switches, between a central office and a switch, or between a central office and a telephone.
trunk group	A group of trunks that are assigned the same dialing digits, either a phone number or a direct inward dialed (DID) prefix.
vector	A list of steps that process calls according to a user definition. The steps in a vector can send calls to splits, play announcements and music, disconnect calls, give calls a busy signal, or route calls to other destinations based on specific criteria.

Vector Directory Number (VDN)

An extension number that enables calls to connect to a vector for processing. A VDN can connect calls to a vector when the calls arrive over an assigned automatic-in trunk group or when the calls arrive over a DID trunk group and the final digits match the VDN. The VDN by itself can be dialed to access the vector from any extension connected to the switch.

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