Avaya Aura® Communication Manager Overview and Specification Release 6.2

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Contents

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, functionality, capacities, and limitations within the context of solutions and verified reference configurations.

Related resources

Documentation

The following table lists the documents related to this product. Download the documents from the Avaya Support website at http://support.avaya.com.

Title	Description	Audience
Design		
Avaya Aura® Communication Manager Security Design	Describes security-related issues and security features of Communication Manager.	Sales Engineers, Solution Architects
Avaya Aura® Solution Design Considerations and Guidelines	Describes the Avaya Aura® solution, IP and SIP telephony product deployment, and network	Sales Engineers, Solution Architects

Title	Description	Audience
	requirements for integrating IP and SIP telephony products with an IP network.	
Avaya Aura® Communication Manager System Capacities Table	Describes the system capacities for Avaya Aura® Communication Manager.	Sales Engineers, Solution Architects
Implementation		
Implementing Avaya Aura® Communication Manager	Describes the implementation instructions for Avaya Aura® Communication Manager.	Sales Engineers, Solution Architects, Implementation Engineers, Support Personnel
Maintenance and Troubleshooting		
Avaya Aura® Communication Manager Reports	Describes the reports for Avaya Aura® Communication Manager.	Sales Engineers, Solution Architects, Implementation Engineers, Support Personnel
Administration		
Administering Avaya Aura® Communication Manager	Describes the procedures and screens for administering Communication Manager.	Sales Engineers, Implementation Engineers, Support Personnel
Administering Network Connectivity on Avaya Aura® Communication Manager	Describes the network connectivity for Communication Manager.	Sales Engineers, Implementation Engineers, Support Personnel
Understanding		
Avaya Aura® Communication Manager Feature Description and Implementation	Describes the features that you can administer using Communication Manager.	Sales Engineers, Solution Architects, Support Personnel
Avaya Aura® Communication Manager Screen Reference	Describes the screens that you can administer using Communication Manager.	Sales Engineers, Solution Architects,

Title	Description	Audience
		Support Personnel
Avaya Aura® Communication Manager Call Center Elite Overview and Specification	Describes tested product characteristics and capabilities, including product overview and feature descriptions, interoperability, performance specifications, security, and licensing requirements.	Sales Engineers, Solution Architects, Support Personnel

Training

The following courses are available on https://www.avaya-learning.com. To search for the course, in the **Search** field, enter the course code and click **Go**.

Course code	Course title
ATC00838VEN	Avaya Media Servers and Implementation Workshop Labs
AVA00383WEN	Avaya Aura® Communication Manager Overview
AVA00279WEN	Communication Manager - Configuring Basic Features
ATI01672VEN, AVA00832WEN, AVA00832VEN	Avaya Aura® Communication Manager Fundamentals
ATI02348IEN, ATI02348VEN	Avaya Aura® Communication Manager Implementation
AVA00836H00	Communication Manager Basic Administration
AVA00835WEN	Avaya Communication Manager Trunk and Routing Administration
5U00040I	Avaya Aura® Communication Manager Maintenance and Troubleshooting
5U0041I	Avaya Aura® Communication Manager Administration
AVA00833WEN	Avaya Communication Manager - Call Permissions
AVA00834WEN	Avaya Communication Manager - System Features and Administration

Avaya Mentor videos

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- Click the name of a playlist to scroll through the posted videos.

Support

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Warranty

Avaya provides a 90-day limited warranty on Communication Manager. To understand the terms of the limited warranty, see the sales agreement or other applicable documentation. In addition, the standard warranty of Avaya and the details regarding support for Communication Manager in the warranty period is available on the Avaya Support website at http://support.avaya.com/ under **Help & Policies** > **Policies & Legal** > **Warranty & Product Lifecycle**. See also **Help & Policies** > **Policies & Legal** > **License Terms**.

Chapter 2: Communication Manager overview

Avaya Aura® Communication Manager is the open, highly-reliable and extensible IP Telephony foundation on which Avaya delivers Intelligent Communications to enterprises, large and small. Communication Manager effectively scales from less than 100 users up to 36,000 users on a single system.

Communication Manager is an important component of the Avaya Aura architecture, which consolidates several components into a holistic package that enterprises need for Unified Communications. Communication Manager software is part of all the Avaya Aura® editions. This software is available with a single-user licensing fee.

Communication Manager provides centralized call control for a distributed network of gateways and a wide range of analog, digital, and IP-based communication devices. Communication Manager comes with several built-in mobility applications, call center features, advanced conference calling, and E911 capabilities.

With support for SIP, H.323, and other industry-standard communications protocols, Communication Manager provides centralized voice mail and attendant operations to organizations and call centers, across multiple locations.

Communication Manager can be configured as an evolution server or a feature server. Communication Manager configured as an evolution server uses the full-call model to provide Communication Manager features to SIP and non-SIP endpoints. As a feature server, Communication Manager only supports SIP endpoints registered to Avaya Aura® Session Manager. Communication Manager configured as a feature server uses the IP Multimedia Subsystem (IMS) half-call model for full application sequencing.

Feature Description

Communication Manager offers a wide variety of basic and advanced telephony features that include the following:

- Port network and gateway connectivity
- Trunk connectivity
- Public networking and connectivity
- Intelligent networking
- Data interfaces
- Call center feature support

- Computer telephony integration
- Automatic call distribution
- Call routing
- Telecommuting and remote office
- Localization support
- Interfaces for feature customizing

Port network and gateway connectivity

Communication Manager supports the following connectivity features:

- Circuit-switched network
- Branch gateway control for Avaya Branch gateways
- Separation of bearer and signaling

For more information about port network and gateway connectivity, see *Avaya Aura® Solution Design Considerations and Guidelines*, 03-603978.

Trunk connectivity

Communication Manager supports the following types of trunks:

- DS1 trunks
- H.323 trunks
- IP trunks
- SIP trunks
- Auxiliary trunks
- Central Office (CO) trunks
- Direct Inward Dialing (DID) trunks
- Direct Inward/Outward Dialing trunks
- E911 CAMA trunks
- Foreign Exchange (FX) trunks
- ISDN trunks
- Release Link trunks (RLT)
- Tie trunks
- Wide Area Telecommunications Service (WATS) trunks

For more information about trunks, see *Avaya Aura® Solution Design Considerations and Guidelines*, 03-603978.

Communication Manager public networking and connectivity

Communication Manager supports the following public networking features:

- Caller ID on analog trunks
- Caller ID on digital trunks
- Flexible billing
- Local exchange trunks
- QSIG Supplementary Service for advice of call charges

For more information about public networking trunks, see *Avaya Aura® Communication Manager Feature Description and Implementation*, 555-245-205.

Related topics:

Trunk connectivity on page 12

Communication Manager intelligent networking

Communication Manager Intelligent networking features include:

- VoIP network quality monitoring
- Multiple switch configuration
- Call routing over tandem network
- Extension number portability
- IP support for audio and video calls
- Standards-based control for branch gateways, Avaya 8XXX server, HP ProLiant DL360 G7 server, and Dell™ PowerEdge™ R610 server
- QSIG Unicode support
- Uniform dial plan for extension-to-extension dialing between private-switching systems

For more information about intelligent networking features, see *Avaya Aura® Communication Manager Feature Description and Implementation*, 555-245-205.

Communication Manager data interfaces

Communication Manager data interface features include:

- Administered connections
- Data call setup
- Data hot line
- Data privacy
- Data restriction
- Default dialing
- IP asynchronous links
- Multimedia Application server interface
- Multimedia calling
- Advice of charge information for BRI endpoints

For more information about data interface features, see *Avaya Aura® Communication Manager Feature Description and Implementation*, 555-245-205.

Call Center

Avaya Aura® Call Center applications provide a fully integrated telecommunications platform to meet call center needs of customers.

Using Call Center applications, such as Avaya Aura® Call Center Elite, customers can:

- Reach out through outbound dialing
- Combine historic and real-time contextual customer information
- Optimize agent utilization and productivity
- Enhance supervisor performance to deliver superior customer experience

For description of Call Center features, see *Avaya Aura® Call Center Feature Reference*.

Communication Manager Automatic Call Distribution

Automatic Call Distribution (ACD) is the basic building block for call center applications. With ACD, you can:

- Distribute incoming calls efficiently and equitably among available agents
- Direct incoming calls to the first idle or most idle agent within a group of agents
- Integrate call center applications with for effective handling of calls

For more information, see *Avaya Aura® Call Center Overview and Specification* and *Avaya Aura® Call Center Feature Reference*.

Computer Telephony Integration

With Computer Telephony Integration (CTI), you can control Communication Manager features by using external applications and integrate a customer database with call control features.

Avaya Computer Telephony is a server software that integrates the premium call control features of Communication Manager with customer information. Avaya Computer Telephony delivers the architecture and platform that supports call center applications, along with application programming interfaces (APIs).

Communication Manager mobility

Communication Manager supports the following mobility features:

- Personal Station Access (PSA)
- Automatic Customer Telephone Rearrangement (ACTR)
- Administration Without Hardware
- Avaya Extension to Cellular (EC500)
- E911 ELIN for IP wired extensions
- Avaya Wireless Telephone Solutions (AWTS)
- Terminal Translation Initialization (TTI)
- TransTalk 9000
- X-station mobility

For more information, see *Avaya Aura® Communication Manager Feature Description and Implementation*, 555-245-205.

Collaboration

To collaborate with groups of peers, customers, and partners, Communication Manager provides collaboration features that include the following:

Conferencing:

- Abort conference on hang-up
- Three-party conference
- Six-party conference
- Conference and transfer display prompts
- Toggle and swap capabilities for conference and transfer
- Group listen

Note:

Group listen is not available for IP telephones.

- Hold and unhold conference

Note:

Hold and unhold conference is not available for BRI stations or attendant consoles.

- Meet-me Conference
- Expanded Meet-me conference
- No-dial tone conference
- No-hold conference
- Select line appearance conference
- Selective conference party display
- Selective party drop
- Selective conference mute
- Enhanced SIP signaling

Multimedia calling:

- Multimedia Application Server Interface
- Multimedia call early answer on vectors and stations
- Multimedia Call Handling (MMCH)
- Multimedia call redirection to multimedia endpoint
- Multimedia data conferencing (T.120) through an ESM

- Multimedia hold, conference, transfer, and drop
- Multimedia queuing with voice announcement

Paging and intercom:

- Code calling access
- Group paging
- Automatic intercom
- Dial intercom
- Loudspeaker paging access
- Manual signaling
- Whisper page

For more information, see *Avaya Aura® Communication Manager Feature Description and Implementation*, 555-245-205.

Communication Manager call routing

Communication Manager provides the following call routing features:

- Automatic routing
- En bloc dialing and Call Type Digit Analysis
- Generalized route selection
- Multiple location support
- Alternate facility restriction levels
- Traveling Class Marks
- Answer detection

For more information, see *Avaya Aura® Communication Manager Feature Description and Implementation*, 555-245-205.

Telecommuting and Remote Office

Communication Manager supports the following telecommuting features:

- Redirected off-net call coverage
- Extended user administration of redirected calls (telecommuting access)
- Off-premises station
- Remote access permits authorized callers from remote locations

Communication Manager localization

Communication Manager supports a range of language features, such as administrable language displays and country-specific localization. Communication Manager localization features are:

- Administrable language displays
- Administrable loss plan
- Bellcore calling name ID
- Busy tone disconnect.
- Country-specific localization
- Multinational Locations
- QSIG support for Unicode
- World class tone detection
- XOIP Tone Detection Bypass

For more information, see *Avaya Aura® Communication Manager Feature Description and Implementation*, 555-245-205.

Communication Manager customization features

Communication Manager provides the following interfaces for customization:

- Device and media control API
- Co-resident branch gateway
- Java telephony application programming interface (JTAPI)
- Telephony Services Application Programming Interface (TSAPI)
- Automatic Number Identification (ANI)

For more information, see *Avaya Aura® Communication Manager Feature Description and Implementation*, 555-245-205.

New in this release

Communication Manager Release 6.2 provides the following features:

- SIP and H.323 dual registration
- SIP to H.323 Direct Media
- SIP INFO out-of-band DTMF digit processing
- Source-based routing
- International CPN prefix
- Increase Test Type 100 Timer
- Look Ahead Routing for 404 and 407 SIP Messages
- Signaling group usage for SIP signaling groups
- VDN option for DID/Tie/ISDN/SIP intercept treatment
- Call preservation for Communication Manager
- Connection Preserving Migration of SIP trunks on H.248 gateways
- Conference Factory URI
- Service Observing Next Call Listen Only Access Code
- Microsoft Office Communicator integration
- Support for Internet codec G722.2
- Group Paging feature for SIP phones
- Service Pack and Dot Release Guardian
- Type 3 License Allocation Algorithm
- Main and survivable server split registration prevention
- System Platform service pack infrastructure

For detailed information about the new features for this release, see *What's New in Avaya Aura® Communication Manager Release 6.2, Communication Manager Messaging Release 6.2, Session Manager Release 6.3, and Branch Gateway Release 6.2*, 03-601818.

Chapter 3: Interoperability

Product compatibility

The current release of Avaya Aura® Communication Manager is compatible with the following Avaya products.

Product	Release
G250, G530, and G700 Gateway	30.x.y
G430 and G450 Gateway	31.x.y
Avaya Aura® System Manager	6.2
Avaya Aura® Session Manager	6.2
System Platform Software and Service Pack	R6.2.0.0.27
96X1 Deskphones H.323	6.2
96x1 Deskphones SIP	6.2
Avaya Agile Communication Environment™	3.0
Avaya Aura® Application Enablement Services	6.1
Avaya Aura® Communication Manager Messaging	SA 4.0.2
Avaya Aura® Conferencing	6.0
Avaya Aura® Messaging	6.1
Avaya Aura® Presence Services	6.1
Avaya Aura® Session Border Controller	6.0
Avaya Aura® System Platform	6.2
Avaya one-X® Agent	2.5
Avaya one-X® Client Enablement Services	6.1
Avaya one-X® Communicator	6.0 and 6.1
Avaya one-X® Mobile	6.1
Call Management System	16.2 and 16.3
G860 Media Gateway	2.1.1

Product	Release
IQ	5.2
Interaction Center	7.3
Meeting Exchange - Enterprise Edition	5.2
Modular Messaging	5.2
Proactive Outreach Manager	2.5

For more information about Avaya product compatibility, see the compatibility matrix.

Server compatibility

Communication Manager as a template is a virtualized version that runs on System Platform. The Communication Manager template image has all the features that Communication Manager supports, whether the image is on a duplicated server or a branch server.

The following table provides the information about servers compatible with each template type.

Template type	Applications supported	Server
Main or Survivable Core template	• Avaya Aura® Communication Manager • Avaya Aura® Communication Manager Messaging • Utility Services	• S8510 • S8800 • Dell™ PowerEdge™ R610 • HP ProLiant DL360 G7
Survivable Remote template	• Avaya Aura® Communication Manager • Branch Session Manager • Utility Services • Avaya Aura® Communication Manager Evolution Server • Avaya Aura® Communication Manager Feature Server	• S8510 • S8800 • Dell™ PowerEdge™ R610 • HP ProLiant DL360 G7

Note:

Avaya no longer sells the S8800 and S8510 servers. You can only reuse the S8800 and S8510 servers with an upgrade.

For information on template capacities, see *Avaya Aura® Communication Manager System Capacities Table*, 03-300511.

For information about hardware specifications, see *Avaya Aura® Communication Manager Hardware Description and Reference*, 555-245-207.

Operating system compatibility

The following table provides information about the operating system versions compatible with the various releases of Communication Manager.

Communication Manager release	Linux version	Kernel version
6.2	Red Hat Enterprise Linux 5.3	2.6.18-238.AV02 XEN
6.0.1	Red Hat Enterprise Linux 5.3	2.6.18-128.AV14 XEN
6.0	Red Hat Enterprise Linux 5.3	2.6.18-128.AV11 XEN
5.2.1	Red Hat Enterprise Linux 4.0	2.6.18-128.AV07 PAE

Note:

Communication Manager uses a modified version of Red Hat Enterprise Linux.

Supported endpoints

Avaya Aura® Communication Manager supports the following analog, digital and IP-based communication devices:

- Avaya IP deskphones
- Avaya one-X® IP Telephones
- Avaya 4600-Series IP Telephones
- Avaya digital deskphones and telephones
- Avaya Callmaster telephone
- Avaya DECT Handsets
- Avaya IP wireless telephones

- Avaya Attendant Console
- Avaya analog telephones
- Avaya IP conference phones
- Avaya A175 Desktop Video Device
- Avaya 1000 Series Video Conferencing endpoint
- 96x1 H.323 and 96x1 SIP Deskphones

For a complete list of supported devices, see *Avaya Aura® Communication Manager Hardware Description and Reference*, 555-245-207

Chapter 4: Performance specification

Capacity and scalability specification

Resource	Release 5.2.x	Release 6.0	Release 6.2
SIP endpoints for general business configurations	18,000	18,000	36,000
Crisis Alert buttons for special application SA8608	250	250	750
Maximum number of bridges to the principal party's call appearance	25	25	63
Maximum number of bridges to the principal party's call appearance for special application SA9018	127	127	255
Maximum number of table entries for the IP-network-map table	500	500	4000
Video-Capable H.323 stations	12,000	12,000	18,000
Communication Manager servers supported by one AES Server	16	16	16
Overall administered trunks	12,000	24,000	24,000
Remote MWI per Extension	80	80	80
DS1 Circuit Packs including MM710s (PRI/ Station only, Total (PRI +Line-side DS1)	522	522	522

Resource	Release 5.2.x	Release 6.0	Release 6.2
Offer Limit: Administered trunks for CM-ES	12,000	12,000	12,000
Offer Limit: Administered trunks for CM-FS	-	For Release 6.0: 12,000 For Release 6.0.1: 24,000	24,000
Administered trunks for Analog/ISDN/IP/SIP trunk pool	-	24,000	24,000
Offer Limit: Simultaneous in use SIP Trunks	7,000	7,000	7,000

For the entire list of updated capacities, see *Avaya Aura® Communication Manager System Capacities Table*, 03-300511.

Traffic specification

In Communication Manager, the processor occupancy or the server occupancy consists of:

- Static occupancy
- Call processing occupancy
- System management occupancy

Due to the bursty nature of system management functions, a fixed portion of the total processing capacity is assigned to system management. For all Communication Manager servers, 27% of the total processing capacity of the system is allocated to system management. If the total processor occupancy exceeds approximately 92%, all system management operations are delayed, and subsequent call attempts are rejected.

Considerations:

To ensure that the proposed solution design handles the anticipated traffic load, the Avaya Sales Factory team determines the Communication Manager CPU occupancy. Some of the considerations for calculating the traffic usage are as follows:

- Busy Hour Call Completion (BHCC) for inbound calls.
- Call vectoring, especially for announcements that Communication Manager plays for calls in queue.
- The number of simultaneous active SIP trunks: The active SIP trunks that support calls in a queue have a greater impact on Communication Manager CPU occupancy than the number of active SIP trunks that support calls being handled by agents.
- The Communication Manager release, CPU clock speed, and server duplication mode.

- Computer Telephony Integration (CTI) operations, such as monitoring, adjunct routing, and third-party call control.
- Intelligent Customer Routing (ICR) and Best Service Routing (BSR) operations.

For more information about traffic engineering and specifications, see *Avaya Aura® Communication Manager Solution Design Considerations and Guidelines*, 03-603978.

Survivability specification

Communication Manager offers two survivability options: survivable core and survivable remote. Survivable core servers ensure business continuity in the event of connection failure or events leading to total failure of main server complex. Survivable remote servers enhance redundancy for branch gateways within networks. Survivable remote servers take over segments that loose connection from their primary call server and provide those segments with Communication Manager operation until the outage is resolved.

Survivable core server

The survivable core server provides survivability to an Avaya configuration. Survivable core servers provide a survivability option for all IP port networks, as well as Processor Ethernet for registration of gateways and IP sets. This option is available for Communication Manager only.

Survivable remote server

The survivable remote server provides survivability to IP and SIP telephones and to branch gateways when the connection to the core fails. The survivable remote server provides survivability for both, Communication Manager and Session Manager..

For more information about survivability options, see *Avaya Aura® Communication Manager Survivability Options*, 03-603633.

Dial plan specification

The Dial Plan feature supports intra-server dialing for extensions that coexist with the server as well as for extensions at remote locations. To support inter-server dialing, Communication Manager uses the uniform dial plan (UDP) to route a call from the local server. With the Dial Plan feature, you can set extensions of maximum 13 digits. You can further extend the extension limit to 18 digits by using uniform dial plans.

To preserve the dial plan for extensions and attendants in a multiple independent node network that is being migrated to a single distributed server, Communication Manager provides the Multi-location Dial plan feature.

To assign short extensions to different branches and have the same numbering format across all the branches, you can use the Per-Location Dial Plan feature.

Define the dial plan information for each type of call, including:

- Attendant
- Automatic alternate routing (AAR)
- Automatic Route Selection (ARS)
- Dial access codes, including feature access codes (FACs) and trunk access codes (TACs)
- En bloc extensions (enb-ext)
- Extensions
- FACs only
- Prefixed extensions

For more information about the dial plan feature, see *Avaya Aura® Communication Manager Feature Description and Implementation*, 555-245-205.

Call Admission Control specification

To protect voice traffic from being negatively affected by other voice traffic and to prevent WAN links from being overloaded, you can set a limit on the bandwidth consumption by using Call Admission Control (CAC) mechanisms. The CAC concept is applicable to voice traffic only, and not data traffic.

In case of an oversubscription of data traffic on a particular link in the network, queueing, buffering, or packet drop resolve the congestion. However, for real-time traffic, which is sensitive to both, latency and packet loss, it is better to deny network access under network congestions than to allow traffic to be dropped and delayed. CAC is, therefore, made before a voice call is established. Application of CAC is based on the network resources available to provide suitable QoS for the new call.

The bandwidth limit is applicable to all calls, regardless of the CODEC of the calls. Therefore, while administering the field for bandwidth consumption limit, ensure that either all calls use the same CODEC or that the manual limit is set after considering the highest possible bandwidth consumed by the specified inter-region CODEC set.

Note:

If SRTP media encryption is used for SIP and H.323 calls, adjust CAC for the additional bandwidth consumption imposed by the authentication process. SRTP authentication adds up to 4 (HMAC32) or 10 (HMAC80) bytes to each packet.

Chapter 5: Security specification

Communication Manager security, privacy, and safety

Communication Manager provides security features for detecting probable breaches, taking measures to protect the system, and tracking and notifying activities. Communication Manager also provides real-time media encryption for environments where enhanced voice privacy over a LAN/WAN is required.

Communication Manager supports:

- Industry Standard STRP (Secure Real Time Protocol) for authentication and media encryption
- Real Time Media and Signaling Encryption
- Access Security Gateway
- Malicious Call Tracking
- Toll Fraud protection
- Emergency Calling Services (E911)

The first security layer is the isolation of Communication Manager telephony servers from the rest of the enterprise network to safeguard the servers from viruses, worms, DoS (Denial of Service) and other attacks. To reduce susceptibility to malicious attacks,Communication Manager uses the minimum number of services and access ports. To secure the voice stream and signaling channels, Communication Manager employs encryption between servers, gateways and endpoints.

The second security layer incorporates a hardened Linux operating system with inherent security features for Avaya Servers with Communication Manager. This operating system provides the functions necessary to protect the core applications from malicious attacks.

Communication Manager and the gateways use encryption as the third layer of Avaya security. This security strategy ensures privacy for the voice stream. Alongside encryption, integrated signaling security protects and authenticates messages to all connected gateways and IP telephones, and eliminates tampering with confidential call information.

The Avaya Product Security Support Team (PSST) is responsible for the following:

- Managing Avaya product vulnerabilities and threats
- Maintaining information posted at http://support.avaya.com/security

- Performing security testing and auditing of Avaya core products
- Resolving security-related field problems in support of Avaya Global Services
- Managing the securityalerts@avaya.com mailbox

For more information about security design, see *Avaya Aura® Communication Manager Security Design*.

Related topics:

RTP encryption on page 30
Timers and key exchange details on page 30

RTP encryption

Communication Manager supports the following high-strength encryption algorithms, all based on RFC3711:

- Avaya Encryption Algorithm (AEA) a 104-bit, RC4-like encryption algorithm
- Advanced Encryption Standard (AES, 128-bit)
- SRTP

In all of these encryption algorithms, the encryption keys are dynamically created on a per-connection basis. The keys are created within the gatekeeper and transmitted to the endpoints and processing boards over the secure links. Additionally, separate keys are produced for the transmit and receive streams of each call. In case of conference calls, a unique pair of keys is assigned for encrypting the payload of each endpoint (one for transmit and one for receive). With the introduction of SRTP, derivation of additional keys is performed for authentication of the RTP and RTCP (SRTP) messages.

Since all of these keys are dynamically created and assigned, they are stored only in RAM and are not accessible by administrators or users. RTP keys are not escrowed.

Timers and key exchange details

Key negotiation for IPSI (AES-128-Cipher Block Chaining) and H.248 (AES-128-Output FeedBack) streams are EKE with 128-bit Diffie-Hellman and fixed symmetric keys. Both are rekeyed whenever Communication Manager starts or reconfigures a stream. The average cycle length for AES/SRTP with AES-128-CBC is reported to be 2127, which is too long to permit a practical attack. Avaya uses a block size of 128 bits to maximize the average cycle length. Hence, a cycle of any length is invisible unless the transmitted information is identical.

SRTP inherently provides anti-replay and integrity protection because once SRTP accepts a packet, it does not accept the same packet again. In addition, packets contain the session key along with the SSRC (synchronization source) that are different for each packet.

Port utilization

The main server, survivable remote servers, and survivable core servers use specific ports for registration and translation distribution.

Note:

Use ports 80 and 443 to gain access to System Management Interface (SMI). Use port 5022 for the secured System Access Terminal (SAT).

Use the following table to determine which ports are available in the customer network.

Port	Used by	Description
20	ftp data	
21	ftp	
22	ssh/sftp	
23	telnet server	
68	DHCP	
514	Communication Manager 1.3	To download translations
1719 (UDP port)	The survivable core server	To register to the main server
1024 and above	Processor Ethernet	To connect to TCP outgoing
1956	Command server - IPSI	
2312	Telnet firmware monitor	
5000 to 9999	Processor Ethernet	To connect to TCP incoming
5010	IPSI/Server control channel	

For more information about port utilization, see the Communication Manager port matrix on the Avaya Support website at http://www.avaya.com/support.

Chapter 6: Licensing requirements

To use the Communication Manager software, you require a valid Communication Manager license file. Without a valid license file, Communication Manager enters the License Error mode, with a 30-day grace period. If the grace period expires before a valid license file is installed, Communication Manager enters the License Restricted mode. In this mode, Communication Manager does not save changes made to it during an update or an administration.

Communication Manager 6.x uses the Avaya Product Licensing and Delivery System (PLDS) to manage license entitlements and generate license files. The license file contains information regarding the product, major release, license features, and capacities. PLDS provides the ability to move licenses between CM servers, provided the support offer and move policy are followed. Earlier versions of Communication Manager, except for Midsize Business Template (MBT) Communication Manager 5.2.1, continue to use the Remote Feature Activation (RFA) online tool to generate license files. MBT Communication Manager 5.2.1 and Communication Manager 6.0 and later use PLDS to manage licenses.

Starting from Release 6.2, Communication Manager uses the Service Pack and Dot Release Guardian technology to protect and control the authorized use of service packs and dot releases. This technology inserts the Support End Date (SED) in the license file and compares it with the publication date of the service pack or the dot release, thus, preventing the use of a service pack or a dot release that has a publication date after the SED.

The following table summarizes the licensing information for the various releases of Communication Manager:

Versions	License system	Separate license required for survivable servers?
Communication Manager 6.x	Avaya Product Licensing and Delivery System (PLDS)	N
Communication Manager 5.2.1 MBT	Avaya Product Licensing and Delivery System (PLDS)	N
Communication Manager 5.2.1	Remote Feature Activation (RFA)	Y
Communication Manager 5.2	Remote Feature Activation (RFA)	Y

Virtual appliance licensing on VMware

Each Communication Manager software deployed on VMware uses a single instance of WebLM license server to host the license file. The WebLM instance located within System Manager is the first and the preferred WebLM instance.

In a network of multiple Communication Manager systems, each Communication Manager or Communication Manager software-duplication pair requires a separate license file. In such a network, the first Communication Manager or Communication Manager software-duplication pair must have a license file installed on System Manager. Because an enterprise cannot have multiple active instances of System Manager, the subsequent Communication Manager license files must be installed on a standalone WebLM vAppliance.

Chapter 7: Virtualization specification

Communication Manager 6.2 is available as an open virtual application (OVA) that can be installed on VMware vSphere 5.0. The Communication Manager VMware virtualization environment is available in a vAppliance package, which is ready for deployment on VMware certified hardware.

Note:

Communication Manager 6.2 does not support VMware vSphere 4.1.

Communication Manager on VMware is deployed either as a simplex or as a duplicated Communication Manager software-duplication pair. The Communication Manager Simplex OVA deployment supports VMware high availability.

The Communication Manager virtual machine requires the following set of resources to be available on the ESXi host before deployment. These resources are specified in the Communication Manager OVA.

VMware component	Description
ESXi host	The physical machine that runs the ESXi Hypervisor software.
ESXi hypervisor	A platform to simultaneously run multiple operating systems on the host computer.
vSphere client	The client application installed on a personal computer or accessible through a web interface. It connects to a vCenter server or directly to an ESXi server where vCenter is not used. Supports installation and management of virtual machines.
vCenter	A software to centrally control and monitor each level of the virtual infrastructure. Provides alarms and monitors performance of ESXi hosts and virtual machines.

Glossary

Automatic Call Distribution	A programmable device at the contact center. Automatic Call Distribution (ACD) handles and routes voice communications to queues and available agents. ACD also provides management information that can be used to determine the operational efficiency of the contact center.
Busy Hour Call Completions	A measure of dynamic traffic calls that can be completed in an average busy hour.
Call Admission Control	A method of limiting voice traffic over a particular link in a network.
Call Management System	An application that enables customers to monitor and manage telemarketing centers by generating reports on the status of agents, splits, trunks, trunk groups, vectors, and VDNs. Call Management System (CMS) enables customers to partially administer the Automatic Call Distribution (ACD) feature.
Codec	A coder and decoder (Codec) is a device that encodes or decodes a signal.
Communication Manager	A key component of Avaya Aura®. It delivers rich voice and video capabilities and provides a resilient, distributed network for media gateways and analog, digital, and IP-based communication devices. It includes advanced mobility features, built-in conference calling, contact center applications and E911 capabilities.
Multi-Location Dial Plan	An Avaya feature that provides a mechanism for merging systems with overlapping dial plans. With this feature, users can retain their original n-digit dialing.
S8300	A Communication Manager server supporting medium-sized customers.
Session Manager	A SIP routing and integration tool that is the core component within the Avaya Aura® solution.
System Manager	A common management framework for Avaya Aura® that provides centralized management functions for provisioning and administration to reduce management complexity.

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