Avaya Aura™ Application Enablement Services Overview

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Application Enablement Services Overview

What is Application Enablement Services?

Avaya Aura™ Application Enablement Services (AE Services) is a software platform that leverages the capabilities of Avaya Aura™ Communication Manager. AE Services provides an enhanced set of Application Programming Interfaces (APIs), protocols, and web services that expose the functionality of Avaya Communication solutions to corporate application developers, third-party independent software vendors, and system integrators.

Note:
AE Services supports existing CM standalone implementations and Session Manager configurations with Communication Manager as an Access Server. Application Enablement services *does not* support Communication Manager as a Feature Server.

AE Services runs on a Linux server and is tightly integrated with Avaya Communication Manager and Avaya Contact Center solutions. Application Enablement Services provides an open platform for supporting existing applications and serves as a catalyst for creating the next generation of applications and business solutions.

Introduction to AE Services Release 5.2

Release 5.2 is the initial 5.x release of AE Services.

For Release 5.2, Avaya introduces Avaya Aura™ Application Enablement Services on Avaya Aura™ System Platform (Application Enablement Services on System Platform). For information about new features for Release 5.2, see New features for AE Services Release 5.2 on page 9.

AE Services 5.2 is backward compatible with previous releases of Communication Manager, extending to Release 4.0. For more information about feature compatibility, see AE Services Release 5.2 compatibility on page 69. To learn more about Avaya Aura™, contact your Avaya Client Executive or Authorized Business Partner. Also, visit www.avaya.com.

AE Services offers

AE Services Release 5.2 provides the following product offers.

- **Avaya Aura™ Application Enablement Services on Avaya Aura™ System Platform** (also referred to as Application Enablement Services on System Platform or AES on System Platform)

  This offer is new for Release 5.2. The Application Enablement Services on System Platform offer includes the Avaya S8800 platform, operating system, AE Services software, and a maintenance contract with Avaya. Customers who want to take advantage of the Application Enablement Services on System Platform High Availability Failover (High Availability Failover) feature must obtain this offer.

- **Avaya Aura™ Application Enablement Services Bundled Server Upgrade**

  This offer is provided for existing AE Services Bundled Server customers who want to upgrade to AE Services Release 5.2. The High Availability Failover feature is not available with the Bundled Server upgrade.

- **Avaya Aura™ Application Enablement Services Software-Only**

  This offer is available for customers who want to install AE Services on a computer that meets or exceeds the minimum server requirements for AE Services. The High Availability Failover feature is not available with the Software-Only offer.

Related offers

- **Avaya Aura™ Midsize Enterprise**

  This offer includes the S8800 server, System Platform 1.1, Communication Manager 5.2.1, Communication Manager Messaging 5.2.1, AE Services 5.2, SIP Enablement Services 5.2.1, and Media Services. The Midsize Enterprise offer supports all AE Services 5.2 features, including High Availability Failover. The Midsize Enterprise offer supports a maximum throughput capacity of 400 mps.

New features for AE Services Release 5.2

Application Enablement Services on System Platform High Availability Failover

The Application Enablement Services on System Platform offer provides the optional Application Enablement Services on System Platform High Availability Failover feature (High Availability Failover). To use the High Availability Failover feature, you must have purchased the high availability option when ordering AE Services 5.2. This option produces an order with two S8800s and a Ethernet crossover cable. There will be a single license file for the S8800 pair. High Availability Failover can be purchased at the time of upgrade, if the upgrade is to Application Enablement Services, 5.2 on System Platform.

A High Availability Failover configuration consists of two servers that can be addressed and administered as a single entity. If one server fails, the second server quickly and automatically becomes available to client applications. This feature applies to the Application Enablement Services on System Platform offer only; it is not provided with the Software-Only offer or the Bundled Server upgrade offer.

High Availability Failover is backward compatible with all AE Services clients.

In a High Availability Failover configuration, DMCC registration information will be saved only if Communication Manager is 5.2, or later, and the Time To Service feature is enabled on the Communication Manager for the network region that the AE Services DMCC endpoints are going to register.

For more information about High Availability Failover, see the following documents:

- *Implementing Avaya Aura™ Application Enablement Services on Avaya Aura™ System Platform*, 02-603468
- *Avaya Aura™ Application Enablement Services Administration and Maintenance Guide,* 02-300357

Simple Network Management Protocol (SNMP) enhancements

AE Services 5.2 supports SNMP Protocol v1, v2, and v3 and the standard SNMP Management Information Bases (MIBs). Collectively, the AE Services 5.2 SNMP enhancements improve the monitoring capabilities available to AE Services customers who use Network Management Systems to collect AE Services system and performance metrics through the SNMP interface. In addition, a new set of alarms and SNMP traps/notifications have been added.

To take advantage of the SNMP enhancements, customers need to use the AE Services 5.2 MIBs available through the Product Licensing and Delivery System (PLDS).

Processor Ethernet enhancements

AE Services 5.2 introduces support for Processor Ethernet (PE) connection to Communication Manager S87xx and S8800 media servers running Communication Manager 5.2.1, or later. By adding support for S87xx and S8800, AE Services now supports PE connections on all Communication Manager platforms (S8300, S8400, S85xx, S87xx, and S8800).

- With AE Services 5.2 and Communication Manager 5.2.1, Switch Connections, H.323 links, and System Management Service connections can now be established directly to the Processor Ethernet on Communication Manager media servers.
- The Processor Ethernet connection supports the new maximum throughput capacity of 1000 mps on the S8510, S87xx, and S8800 Communication Manger media servers.
  - For S87xx and S8800 media servers, Processor Ethernet requires Communication Manager 5.2.1, or later.
  - For S8300, S8400, S8500, and S8510 Processor Ethernet can be used with Communication Manager releases prior to 5.2.1.
- In a High Availability Failover configuration, an AE Services Processor Ethernet link can survive a planned processor interchange without data loss.

Note:
Processor Ethernet connections are not supported in Enterprise Survivable Server (ESS)/Local Survivable Processor (LSP) configurations. For more information, see Support for an Enterprise Survivable Server configuration on page 20.

Increased capacity

Communication Manager 5.2.1 now supports 1000 mps for S8510, S87xx and S8800.

Application Enablement Services 5.2 on System Platform supports 1000 mps.

Application Enablement Services 5.2 on an S8510 or S8800 supports 1000 mps.

Application Enablement Services 5.2 on an S8500 supports 720 mps.

The Avaya Aura™ Midsize Enterprise offer supports a maximum throughput capacity of 400 mps.

Application Enablement Services 5.2 with Communication Manager 5.2.1 supports a message throughput capacity increase to 1000 messages per second (mps).

- CLAN Switch connections require a minimum of 5 CLANs to support the1000 mps message throughput capacity. To achieve this throughput capacity AE Services recommends using 6 CLANs.

- The Processor Ethernet connection supports the new maximum throughput capacity of 1000 mps on the S8510, S87xx, and S8800 Communication Manger media servers.
  - For S87xx and S8800 media servers, Processor Ethernet requires Communication Manager 5.2.1, or later.
  - For S8300, S8400, and S85xx Processor Ethernet can be used with Communication Manager releases prior to 5.2.1.
- The maximum throughput capacity for CTI message traffic is now 1000 mps full duplex across all AE Services AEP connections on a single AE Server or Communication Manager.
- The maximum throughput for the AE Services Bundled offer on the S8500 (IBM 306) will remain at 720 mps
- The maximum throughput capacity for the S8300, S8400 remains 240 mps from Communication Manager to AE Services and 200 mps from AE Services to Communication Manager.
- The maximum throughput capacity for AEP connections over CLAN remains 240 mps from Communication Manager to AE Services and 200 mps from AE Services to Communication Manager.

Thirty-day License Grace Period

If AE Services does not have access to a valid license file; for example, you were not able to get a license prior to installation, AE Services will run without a license for 30 days in license error mode.

Product licensing and delivery system (PLDS)

For Release 5.2, AE Services uses the Product licensing and delivery system (PLDS) for license management and software distribution. For more information about using PLDS, see the following documents.

- *Implementing Avaya Aura™ Application Enablement Services on Avaya Aura™ System Platform*, 02-603468
- *Avaya Aura™ Application Enablement Services Administration and Maintenance Guide,* 02-300357

Support for Avaya Secure Access Link

Secure Access Link (SAL) is the new IP based remote access, alarming support infrastructure for Avaya Products and Platforms. SAL provides:

- IP-based remote access to the customer product
- IP-based alarming from the customer product
- A software-only, channel-neutral solution

DMCC enhancements

AE Services 5.2 DMCC enhancements include the following:

- DMCC Service recovery

  This allows DMCC to persist selected runtime state during normal operation. If the DMCC service is restarted abnormally, it will restore the working state of the DMCC service such that the client application can continue operating with minimal interruption.
- UTF-8 Unicode support
- Advanced authentication and authorization policies
- Flexible application session characteristics
- Support for using the Time-to-Service (TTS) feature on Communication Manager 5.2
- A unified API for DMCC call control services
- The ability for three DMCC endpoints to register to an extension using only one AE Server

JTAPI enhancements

AE Services 5.2 JTAPI enhancements include the following:

- Adoption of the log4j logging framework
- Dynamic TSAPI.PRO property changes
- The ability to by-pass the TSAPI.PRO file, and provide TLINK information programatically
- Support for listeners
- Separate JTAPI error logs
- A new distribution model. The JTAPI implementation is provided as a .zip file; it is no longer distributed as a Windows client installer. The JTAPI .zip file now contains both the client and the SDK bundled together.

TSAPI enhancements

AE Services 5.2 TSAPI enhancements include the following:

- TSAPI trace management

  The TSAPI Spy trace on Windows and Linux TSAPI clients have been enhanced to allow users to specify the maximum TSAPI Spy trace file size (1MB - 10GB).

System Management Service enhancements

AE Services System Management Service (SMS) enhancements include the following:

- XML input and output (SMS introduces a new XML I/O interface)
- Unicode Support

  For more information about SMS enhancements, see the *Avaya Aura™ Application Enablement Services Web Services Programmer's Guide*, 02-300362.

Enhancements for the AE Services IBM Sametime integration

For Release 5.2, AE Services supports IBM Sametime 8.0.2.

Updates for the AE Services Implementation for Microsoft Office Communications Server

For Release 5.2, AE Services support Microsoft Office Communications Server 2007 R2.

The *AE Services Implementation Guide for Microsoft Live Communications Server 2005 or Microsoft Office Communications Server 2007* describes configuring Office Communication Server for load balancers.

New look and feel for the AE Services administrative interface

The AE Services administrative interface, the AE Services Management Console, includes a revised menu for Release 5.2. In previous releases, the administrative interface was called AE Services Operations, Administration, and Maintenance (OAM).

AE Services product summary

AE Services provides a platform that supports existing contact center application requirements, along with new, emerging APIs. Application Enablement Services provides programs that perform specific functions and provide application programming interfaces (APIs), protocols, and Web-based interfaces. Application Enablement services includes the following services. For a high-level illustration of AE Services, see Figure 1: AE Services configuration at a glance on page 17.

DMCC Service

The Device, Media, and Call Control (DMCC) service provides third-party call control as well as first party call control (device control and media control). The DMCC SDK provides a Java API as well as XML and .NET interfaces. For more information about the DMCC SDKs, see Application Enablement Services SDKs on page 45.

- **DMCC first party call control**
  - **DMCC with Device control** provides you with the ability to set up a DMCC softphone that gains exclusive or shared control of a softphone-enabled Communication Manager telephone or extension. A DMCC softphone is an instance of a phone or extension that is created by AE Services and then registered on Communication Manager.
  - **DMCC with Media Control** provides you with the ability to record media from a call into a WAV file or play a voice announcement or tone that is prerecorded in a WAV file. Media session control also provides a way for a client application to send and receive TTY characters over Real-time Transport Protocol (RTP) streams in the form of RFC2833 packets. Applications can use this capability to implement "Voice Carry Over" (VCO). The TTY capability is available in "client-media mode" only.
- **DMCC third party call control**

  DMCC with Call Control Services uses the TSAPI service to provide an expanded set of third party call control capabilities, such as the ability to place calls, create conference calls, deflect calls, reconnect call, and monitor call control events, just to name a few.

DMCC call recording solutions - IP Migration Readiness and Optimization analysis

For Device, Media, and Call Control (DMCC) call recording solutions, Avaya recommends that you use the Avaya IP Migration Readiness and Optimization services to help you safely implement IP-based solutions in a stable, optimized infrastructure.

These services include a two-phased, detailed analysis of the entire network to help assess whether you can deploy a converged IP solution such as AE Services without adversely affecting your existing network applications and services.

The first phase of this analysis is the Customer Infrastructure Readiness Survey (CIRS). Certified Avaya engineers conduct a high-level evaluation of the local and wide area network infrastructure to identify any significant network issues that must be resolved prior to deploying the proposed IP solution.

Phase 2 of this analysis, Network Analysis/Network Optimization (NANO), is required when the CIRS indicates that the network cannot support the proposed IP solution at the desired performance levels. Starting with the information and data gathered for the CIRS, Avaya engineers perform problem diagnosis to get at the root causes of network issues. They also provide functional requirements and recommendations for a network design that optimizes all of the resources needed to support the IP solution.

TSAPI Service

TSAPI is an abbreviation for Telephony Services API. TSAPI is a C/C++ based API that provides a full complement of third party call control capabilities such as controlling specific calls or stations, complete routing of incoming calls, receiving notifications of events, invoking Communication Manager features and querying Communication Manager for information. **JTAPI** (Java Telephony API) is a client-side interface to the TSAPI service, and, as such, it provides third party call control. For more information about the TSAPI SDK and the JTAPI SDK, see Application Enablement Services SDKs on page 45.

Web Services

Web services provide a higher-level abstraction than the finer grained APIs. Web services provide convenient access to commonly used functionality through a published WSDL (Web Services Definition Language) and SOAP (Simple Object Access Protocol) connectivity.

For more information about the Web Services SDKs, see Application Enablement Services SDKs on page 45.

System Management Service

The System Management Service exposes management features of Communication Manager. This service enables its clients to display, list, add, change and remove specific managed objects on Communication Manager.

Telephony Web Service

The Telephony Web Service is a web services interface that enables high level call control functionality over standard web services interfaces (SOAP/XML).The service hides the complicated concepts associated with traditional CSTA based call control such as connections, call identifiers and call states.

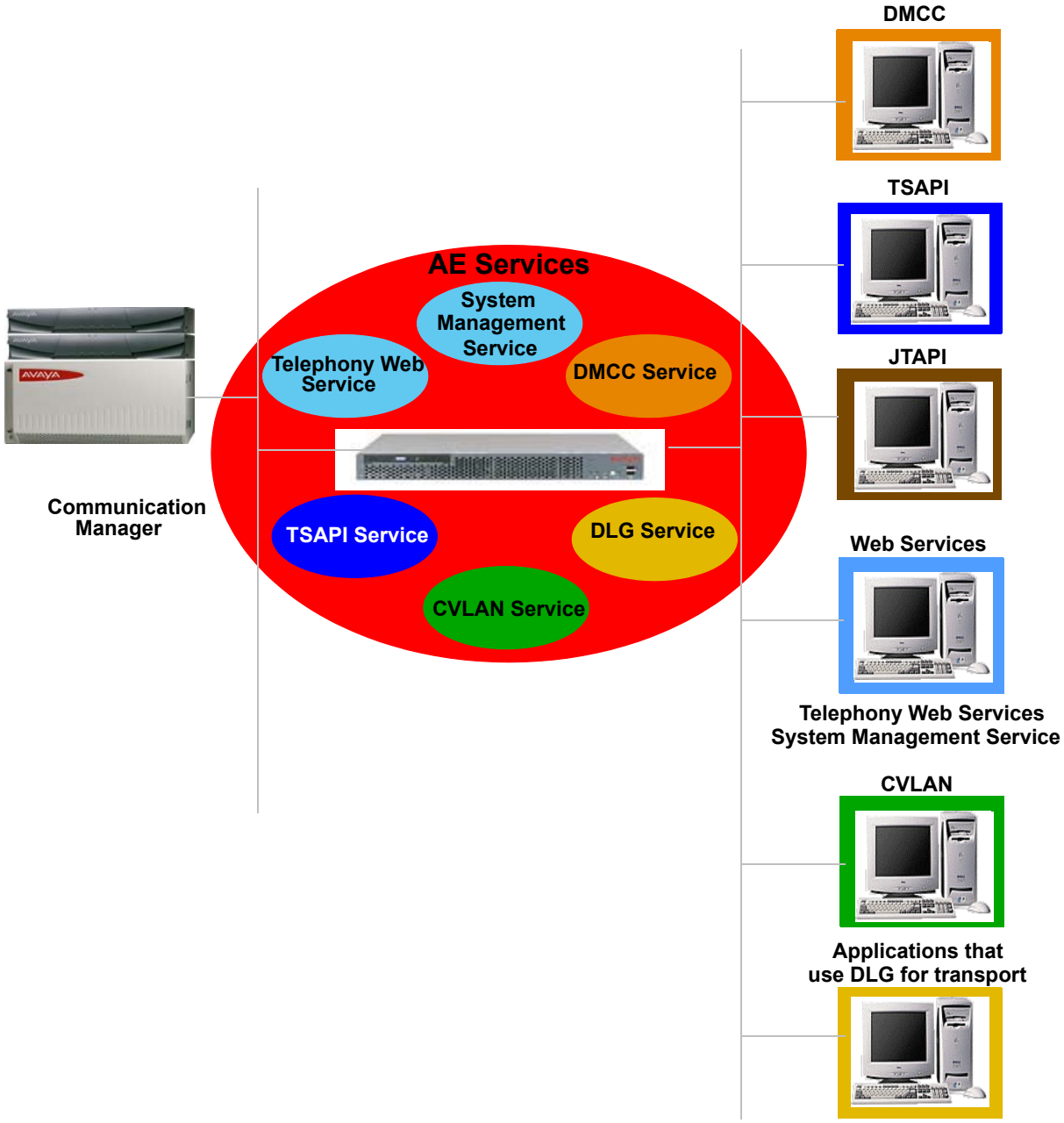
CVLAN Service

CVLAN is an abbreviation for CallVisor LAN. The CVLAN service is a C/C++ based API that enables applications to exchange ASAI messages with the AE Server. CVLAN provides a full complement of third party call control capabilities such as controlling specific calls or stations, complete routing of incoming calls, receiving notifications of events, invoking Communication Manager features and querying Communication Manager for information. CVLAN is an Avaya specific protocol and is not intended for new application development.

DLG Service

The DLG Service tunnels messages over TCP/IP. That is, the DLG Service supports a set of TCP/IP connections for the communications channel between Communication Manager and AE Services. The DLG Service is also used for transporting ASAI/Q.931 messages. DLG is an Avaya specific protocol and is not intended for new application development.

Figure 1: AE Services configuration at a glance



AE Services security features

The following list highlights the AE Services security features.

- **Linux Shell Access Control**

  The Modify Login page in the AE Services Management Console (**Security** > **Account Management** > **Modify Login**) provides the AE Services administrator with the ability to control Linux shell access for a Linux account.

- **Login Audit**

  The Unused Login Audit page in the AE Services Management Console (**Security** > **Audit** > **Login Audit**) lets the AE Services administrator enable an audit process for disabling any unused Linux account.

- **Unlock or Lock a Linux account**

  The Lock Unlock Login feature in the AE Services Management Console (**Security** > **Account Management** > **Lock Unlock Login**) lets the AE Services administrator lock or unlock a Linux account.

- **Login Reports**

  The Login Reports feature in the AE Services Management Console (**Security > Login Reports**) lets the AE Services administrator generate reports based on a login ID.

- **Role Based Access Control (RBAC)**

  Access to AE Services Management Console web pages can be restricted by user authorization level. The operations that users are allowed to perform such as read, edit and delete can also be restricted.

For more information about AE Services security features

For more information about AE Services security features, see *White paper on Avaya Aura™ Application Enablement Services 5.2 High Availability (HA) Configurations*, located on the Avaya Support Web site (http://www.avaya.com/support).

Network security and reliability

Secure application links

You can optionally configure all AE Services APIs to use secure application links. The AE Services client and SDK installation programs install certificates by default. You can use the default certificates for secure communications, or, if you have your own Public Key Infrastructure system already set up, you can install your own certificates.

DMCC API

The DMCC API provides:

- Validation of the AE Services server certificate on the DMCC client application
- Optional validation of the client certificate on the AE Server

For more information see the following documents:

- *Avaya Aura™ Application Enablement Services Device, Media and Call Control API Java Programmers Guide*, 02-300359
- *Avaya Aura™ Application Enablement Services Device, Media and Call Control API XML Programmers Guide*, 02-300358
- *Avaya Aura™ Application Enablement Services Device, Media and Call Control API .NET Programmers Guide*, 02-602658
- *Avaya Aura™ Application Enablement Services Administration and Maintenance Guide*, 02-300357

TSAPI, JTAPI, and CVLAN

TSAPI, JTAPI, and CVLAN provide validation of the server certificate.

For more information, see the following documents:

- *Avaya Aura™ Application Enablement Services TSAPI and CVLAN Client and SDK Installation Guide*, 02-300543.
- *Avaya Aura™ Application Enablement Services JTAPI Programmer's Guide*, 02-603488.

Web Services

For Web Services, AE Services provides a Tomcat RPM that includes a default certificate and a default keystore of encryption keys for use in connecting to the AE Services server via Secure Sockets Layer (SSL). For more information, see the *Application Enablement Services Web Services Programmer Guide*, 02-300362.

AE Services Link Resiliency and failover

AE Services provides an AEP connection that establishes and maintains a secure communication channel between AE Services and Communication Manager. This Transport Service, implemented on the AE Services server and on Communication Manager, tunnels ASAI and Call Information Services messages over TCP/IP, using a proprietary Avaya protocol called Application Enablement Protocol (AEP). The AEP connection is secured via Transport Layer Security (TLS).

An AEP transport connection is a secure TCP/IP connection between the AE Services server and a CLAN or Processor Ethernet connection on Communication Manager. When the Transport Service starts up, it establishes the Communication Manager/AEP transport connection sessions based on the switch connections administered in the AE Services Management Console.

As of AE Services 3.1, the Link Bounce Resiliency feature provides increased link reliability to the AEP transport connection. This feature ensures that no messages are lost during an interchange or a short network outage of up to 30 seconds.

One AE Services server can support up to 16 AEP transport connections. The 16 AEP connections provide a redundancy failover capability for configurations that use CLAN or Processor Ethernet connections.

- If a CLAN goes down or is not accessible over the network, the traffic is redistributed to the remaining CLANs. This failure should be transparent to the application, provided that the failed CLAN was not necessary to support the message bandwidth required by the application.
- If a Processor Ethernet connection goes down or is not accessible over the network, the session is still preserved. As long as it is reestablished within 30 seconds, no data will be lost.

Support for an Enterprise Survivable Server configuration

This feature applies to AE Services 3.1 and later.

Uninterrupted telephony is important for many enterprises, especially for mission-critical applications. Avaya Communication Manager (CM) provides Enterprise Survivable Server (ESS) and Local Survivable Processor (LSP) for failover from the main media server. This feature provides the ability for media gateways, endpoints, application servers like AE Services and its applications to continue their operations without major interruption.

AE Services recommends that all applications in an ESS configuration connect to a local AE Services server which, in turn, is connected to either the media server at the main site or a media gateway with an ESS or LSP at the remote site. In this configuration, the applications and associated AE Services server at the remote sites are always active and are supplying functionality for the local resources at the remote site. This type of configuration ensures the most seamless survivability in an ESS configuration.

Note:

You must use the CLAN interface for AE Services to Communication Manager connectivity in all ESS/LSP configurations. An AE Server that communicates over PE does not support the ESS and LSP configuration.

For more information, see *White paper on Avaya Aura™ Application Enablement Services 5.2 High Availability (HA) Configurations*, which is available on the Avaya Support Site (support.avaya.com).

Guidelines and requirements for configuring AE Services

This section provides some requirements and guidelines for configuring AE Services. For more information about configuring AE Services, see *White paper on Avaya Aura™ Application Enablement Services 5.2 High Availability (HA) Configurations*, which is available on the Avaya Support Site (support.avaya.com).

- Only one instance of the AE Services server software can reside on an AE Services server machine (requirement).
- More than one AE Services server can connect to the same Communication Manager server.
  - If your applications do not use a AEP connection, there is no limit to the number of connections to Communication Manager servers. For example, if you are using the DMCC service for Device and Media control only, you would not use the AEP connection.
  - If your applications use a AEP connection, there are limits to the number of connections to Communication Manager servers. For more information, see Configurations that use AEP connections on page 23.
- AE Services recommends that you use the Processor Ethernet interface for all configurations except ESS/LSP configurations.
- Applications must run on a separate client application machine (several applications can run on one machine if the machine has the resources to run these applications).
- It is recommended that Communication Manager be configured for H.323 registration using the Time-to-Service feature. For High Availability Failover, it is required that Communication Manager be configured for H.323 registration using the Time-to-Service feature. For AE Services 5.2, DMCC Device Control depends on the Call Information Link and the AEP connection to determine if the Communication Manager server supports the H.323 Time to Service registration feature for AE Services.
- An application should use a local HA cluster of Application Enablement Services on System Platform.
- An application that uses the Device, Media and Call Control (DMCC) service should keep trying to reestablish the DMCC session when it loses its socket communication link to the DMCC service because the runtime state is preserved.
- An application that uses the CVLAN, DLG or TSAPI service should reestablish its monitors/associations if it loses the socket connection to the service on the AE server because no runtime state is preserved for these services. In this configuration, the applications and associated AE Server at the remote sites are always active and are supplying functionality for the local resources at the remote site. This type of configuration ensures the most seamless survivability in an ESS configuration. For more information, see Support for an Enterprise Survivable Server configuration on page 20.

Configurations that use AEP connections

AE Services can support up to 16 AEP connections to Communication Manager. AE Services recommends that you use the Processor Ethernet interface for all configurations except ESS/ LSP configurations. If, however, you use CLANs, AE Services strongly recommends that you use at least 2 CLANs for each switch connection to Communication Manager.

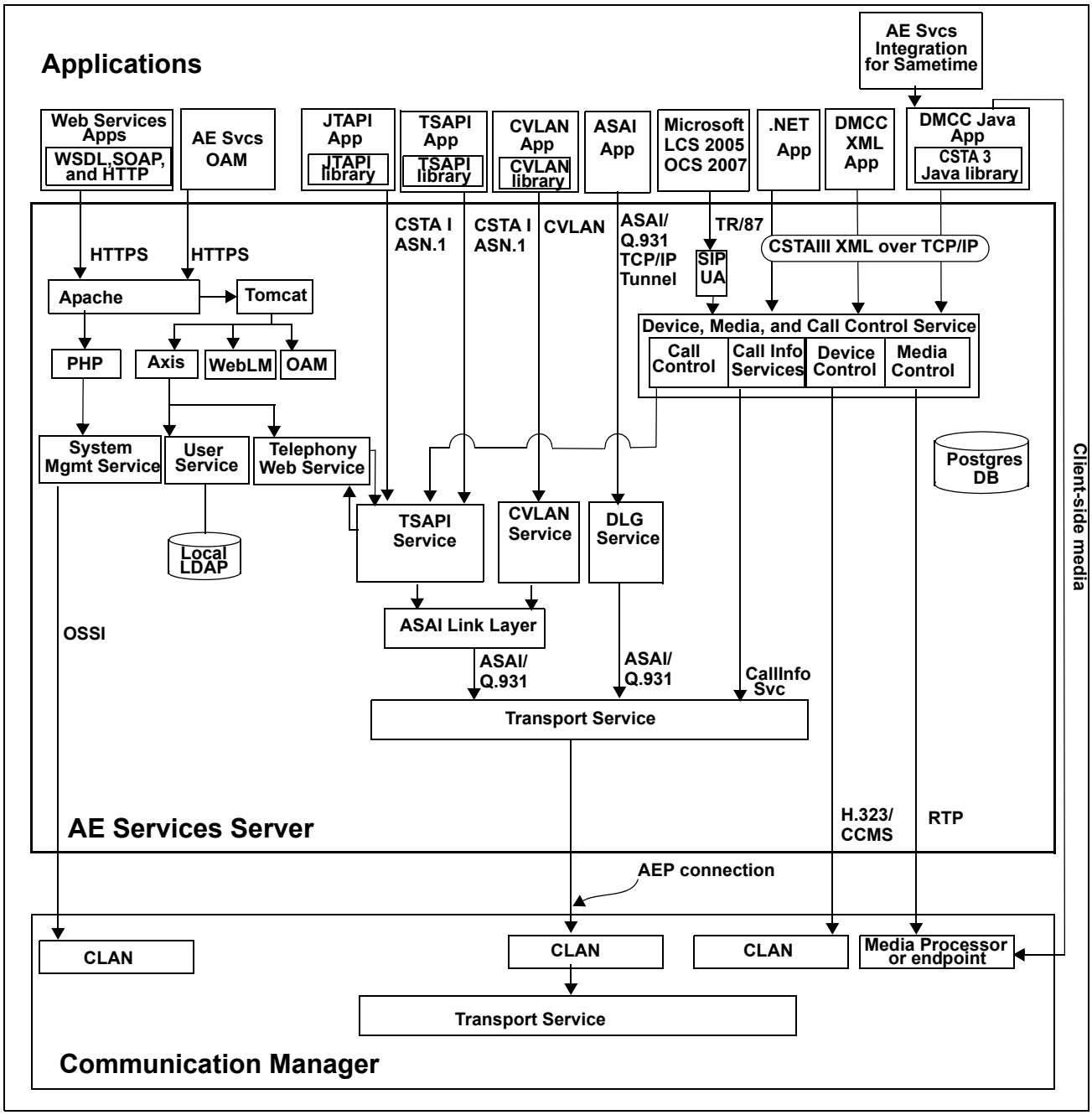
- TSAPI

  The following APIs, services, and integrations use the TSAPI service:

  - JTAPI
  - AE Services integration for IBM Lotus Sametime
  - AE Services integration for Microsoft Live Communications Server 2005
  - AE Services integration for Microsoft Office Communications Server 2007
  - DMCC with Call Control
  - Telephony Web Services
- DMCC with Call Information Services
- CVLAN
- DLG

AE Services architecture at a glance

The following diagram is a schematic depiction of AE Services.



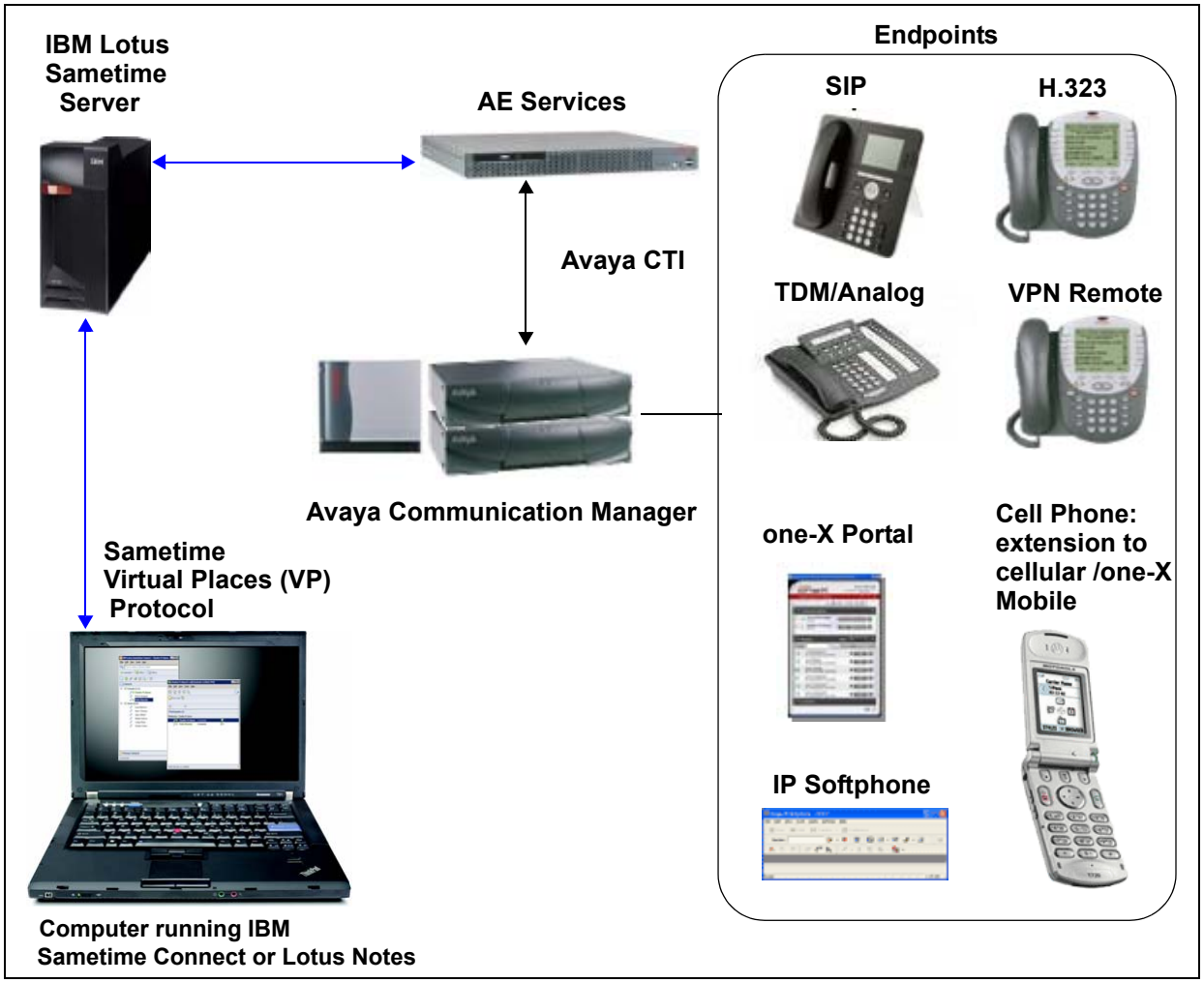
AE Services integration for IBM Lotus Sametime

The AE Services integration for IBM Lotus Sametime is a special implementation of the AE Services DMCC service that is positioned as an offer. The AE Services integration for IBM Lotus Sametime provides a solution for controlling your Avaya telephone or IP softphone using IBM Lotus Sametime. AE Services integration for IBM Lotus Sametime was introduced with AE Services Release 4.2. For Release 5.2, AE Services supports IBM Sametime 8.0.2.

It requires a Telephony Conferencing Provider Interface (TCSPI) plug-in which is provided by the DMCC client. In this configuration, the AE Server can support a mixed environment that includes TSAPI-, DMCC-, Web-Services-, CVLAN-, and DLG-based applications.

For more information, see the *Avaya Aura™ Application Enablement Services Integration Guide for IBM Lotus Sametime*, 02-602818.

Figure 2: AE Services integration for IBM Lotus Sametime



AE Services integration with Microsoft Office Communications Server

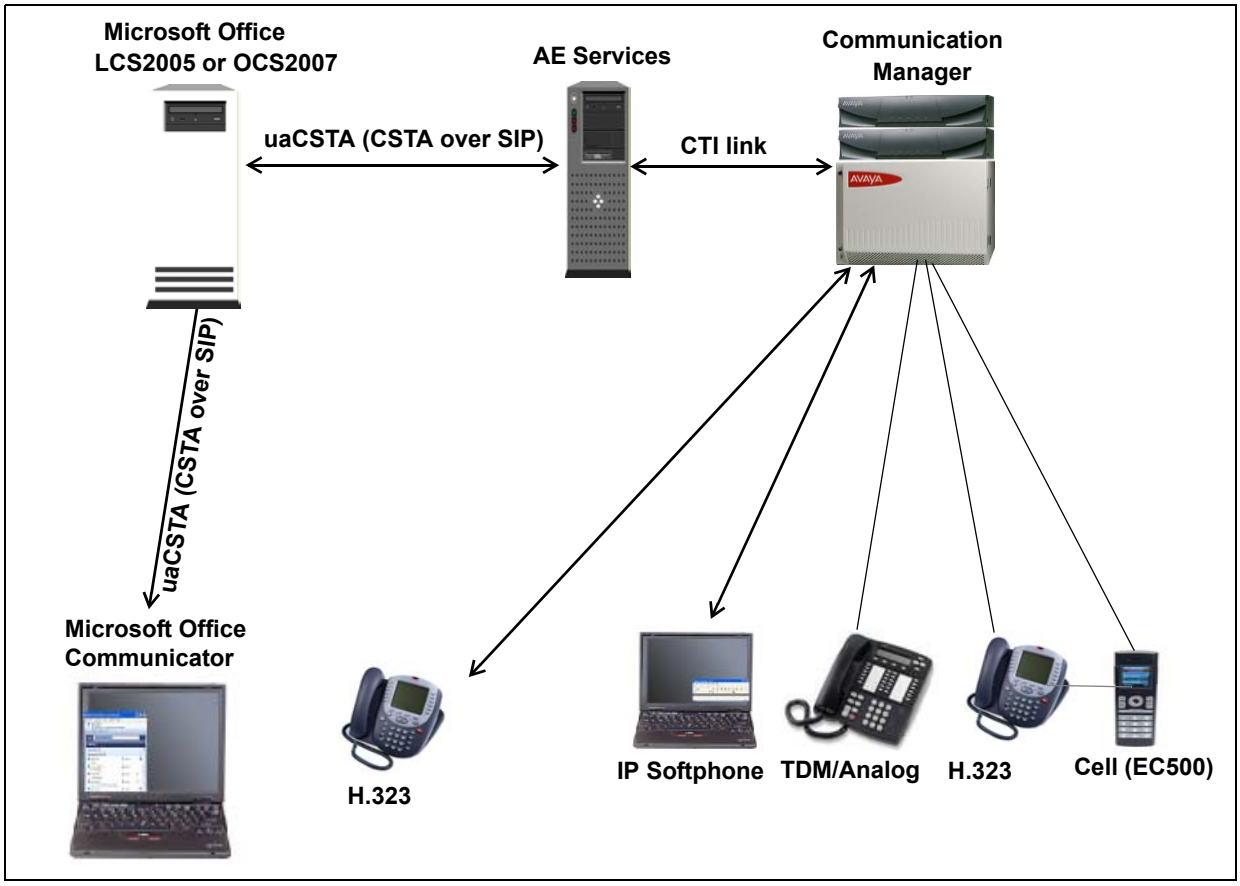
AE Services provides an integration solution that is compatible with either of the following Microsoft Office platforms:

- Microsoft Office Live Communications Server 2005
- Microsoft Office Communications Server 2007 R1 and R2

The AE Services integration with Microsoft Office products is a special implementation of the AE Services DMCC service that is positioned as an offer. The AE Services integration with Microsoft Office provides a solution for controlling your Avaya telephone or IP softphone using Microsoft Office Communicator. You do not have to install any Avaya software on the Microsoft Office client, and the AE Server can support a mixed environment that includes either of the AE Services Microsoft Office platforms as well as TSAPI-, DMCC-, Web-Services- CVLAN- and DLG-based applications. The AE Services integration with Microsoft Office Live Communications Server was initially released in AE Services 4.0. The AE Services integration with Microsoft Office Communications Server 2007 was initially released in AE Services 4.1.

For more information, see the *Avaya Aura™Application Enablement Services Implementation Guide for Microsoft Live Communications Server 2005 or Microsoft Office Communications Server 2007,* 02-601893.

Figure 3: AE Services integration with Microsoft Office Live Communications Server 2005 or Microsoft Office Communications Server 2007



SIP support

The Session Initiation Protocol (SIP) is a control (signaling) protocol for creating, modifying, and terminating sessions with one or more participants. These sessions include Internet telephone calls, multimedia distribution, and multimedia conferences. In more familiar terms, SIP means real-time communication, presence, and collaboration in a variety of forms including voice, video, or instant text messaging.

Specific Avaya SIP endpoints can be controlled with AE Services 4.1 (or later) and Communication Manager 5.0 (or later). AE Services 5.2 supports SIP enabled endpoints (Avaya 16CC and 9620, 9630, 9630G, 9640, and 9640G SIP endpoints with firmware version 2). The Avaya 16CC Endpoints can be used only with Expert Agent Selection (skills-based routing).

The requirements for SIP support are as follows:

- Communication Manager 5.0, or later
- SIP Enablement Services (SES) 5.0, or later

AE Services 4.1 with Avaya Communication Manager 5.0 and SIP Enablement Services (SES) 5.0 introduce the ability to control Avaya SIP endpoints via TSAPI/JTAPI. This capability is not available through DLG (DEFINITY LAN Gateway) or CVLAN.

SIP limitations

The following sections list the SIP limitation for AE Services. See also, Application Enablement Services Release Notes for more information about SIP limitations.

DMCC

All third party call control capabilities are supported for the endpoints listed in SIP support. The following scenarios are not supported for SIP endpoints:

- The media forking implementation approach to call recording introduced in AE Services 4.2 is not supported. That is, an application registering a DMCC softphone in dependent mode with the same extension as the user's SIP phone or softphone is not supported.
- With respect to device control, DMCC cannot register an application controlled softphone in dependent mode with the same extension as the user's SIP phone or softphone for the purposes of pressing buttons, monitoring LEDs, monitoring display, and so forth.

TSAPI/JTAPI

All third party call control capabilities are supported for the endpoints listed in SIP support, except the following capabilities:

- Send DTMF (Dual Tone Multi-Frequency) digits
- Third Party Selective Listening Disconnect
- Third Party Selective Listening Reconnect

IBM Lotus Sametime integration

All third party call control capabilities are supported for the endpoints listed in SIP support, except the following capabilities:

- Send DTMF (Dual Tone Multi-Frequency) digits
- Third Party Selective Listening Disconnect
- Third Party Selective Listening Reconnect
- The automatic setting and unsetting of the Send All Call feature based on a user's Do Not Disturb status does not work for SIP endpoints.

Microsoft Office Communications Server (OCS) integration

- Send DTMF (Dual Tone Multi-Frequency) digits
- Third Party Selective Listening Disconnect
- Third Party Selective Listening Reconnect

AE Services licensing

For a summary of the features that are licensed on Communication Manager and AE Services see Table 1: Licensing for AE Services on page 33. For a more complete description of product specific licensing, refer to the following topics:

- AEP connections - no license required as of Release 5.2 on page 36
- AE Services integration for Microsoft Office OCS licensing on page 36
- Device, Media, and Call Control (DMCC) licensing on page 37
- Web Services Licensing on page 38
- TSAPI Service (including JTAPI) licensing on page 39
- CVLAN Licensing on page 40
- DLG Licensing on page 41

Table 1: Licensing for AE Services

AE Services product or service	Required feature licensed on Communication Manager	Optional feature licensed on Communication Manager	AE Services feature
	Use **display system-parameters customer-options** command to see if the feature is provided by the Communication Manager License.		Use **WebLM** to see if this feature is provided by the Application Enablement license.
AE Services Integration with Office Communications Server	Not applicable	Not applicable	Unified CC API Desktop Edition
AE Services Integration IBM Lotus Sametime	Not applicable	Not applicable	Unified CC API Desktop Edition
DMCC - Device and Media Control	IP-API_A **Notes:** ● All preexisting DMCC/API licenses in IP_API_A Communication Manager license continue to remain there. ● If AE Services is less than Release 4.2 and CM is less than Release 5.1, new and add-on licenses are licensed in IP_API_A on Communication Manager license file only. IP API_A-only licensing applies if AE Services 4.2 does not have the DMCC License or if Communication Manager is 5.0 or a previous version. ● Adding a DMCC station, regardless of whether it is licensed in IP_API_A on Communication Manager or the AE Services license file, consumes an IP_STA license and STA license.	None	If AE Services is Release 4.2, or later, and Communication Manager is Release 5.1, or later, DMCC will be initially, for transitional reasons, licensed on AE Services (Value_DMCC_DMC) in addition to Communication Manager's IP_API_A. Any new or add-on licenses are added to both. Note that this is planned to be reconciled and retroactively corrected in the future. The goal is to transition in a future release to all new licenses being licensed solely in AES, while allowing customers to continue to be able to use the previously purchased IP_API_A licenses as well.
DMCC - Call Information Services	● None	None	Application Enablement Connection

Table 1: Licensing for AE Services (continued)

AE Services product or service	Required feature licensed on Communication Manager	Optional feature licensed on Communication Manager	AE Services feature
	Use **display system-parameters customer-options** command to see if the feature is provided by the Communication Manager License.		Use **WebLM** to see if this feature is provided by the Application Enablement license.
DMCC - Call Control	• Computer Telephony Adjunct Links • IP_STA • STA • Note for call control you need IP_A and STA. • All preexisting DMCC/ CMAPI licenses in IP_API_A continue to remain there. • If AE Services is less than Release 4.2 and CM is less than Release 5.1, new and add-on licenses are licensed in IP_API_A. • If using Call Control along with Device and Media control, see DMCC - Device and Media Control.	None	• Unified CC API Desktop Edition • If AE Services is Release 4.2, or later, and Communication Manager is Release 5.1, or later, any new or add-on licenses are added to the AE Services license file as well as to IP_API_A. Note that this is planned to be reconciled and retroactively corrected in the future. DMCC license - AE Services registration (AE Services 4.2 and later)
TSAPI Service (which includes JTAPI) for applications that use a Basic TSAPI license	Computer Telephony Adjunct Links	None	TSAPI Basic license (denoted as TSAPI Simultaneous users in license file)
TSAPI Service (which includes JTAPI) for applications that use an Advanced TSAPI license	Computer Telephony Adjunct Links	Increased Adjunct Routes	• TSAPI Advanced Small • TSAPI Advanced Medium • TSAPI Advanced Large
Web Services - Telephony Web Service	Computer Telephony Adjunct Links	None	TSAPI Basic license (denoted as TSAPI Simultaneous users in license file)
Web Services-System Management Service	None	None	SMS Proxy SMS_OSSI
CVLAN Service (Avaya Interaction Center)	Computer Telephony Adjunct Links	Increased Adjunct Routes	CVLAN

Table 1: Licensing for AE Services (continued)

AE Services product or service	Required feature licensed on Communication Manager	Optional feature licensed on Communication Manager	AE Services feature
	Use **display system-parameters customer-options** command to see if the feature is provided by the Communication Manager License.		Use **WebLM** to see if this feature is provided by the Application Enablement license.
CVLAN Service (Non-Avaya applications) **Note:** ASAI Core and ASAI Plus are included for one Communication Manager server when purchasing the CVLAN service.	ASAI Core	• CTI Stations • Phantom Calls • Adjunct Routing (Communication Manager 5.1 or later) • Increased Adjunct Route Capacity	CVLAN
DLG Service **Note:** ASAI Core and ASAI Plus are included for one Communication Manager server when purchasing the DLG service.	ASAI Core	• CTI Stations • Phantom Calls • Adjunct Routing (Communication Manager 5.1 or later) • Increased Adjunct Routes	DLG

AEP connections - no license required as of Release 5.2

As of AE Services 5.2, an Application Enablement Protocol (Application Enablement Protocol) is no longer discretely licensed in AE Services. This capability is provided to all licensed systems.

You must have an (Application Enablement Protocol) AEP license for each AEP Connection to Communication Manager. By default, AE Services provides two AEP connections to Communication Manager when the CLAN interface is used. You can administer total of 16 AEP connections but AE Services strongly recommends that you use 2 AEP connections to Communication Manager when the CLAN is used for connectivity. See Configurations that use AEP connections on page 23. Only a single AEP connection is required when connecting to Communication Manager using the Processor Ethernet interface.

If you want to increase the number of connections that are open for either throughput capacity or failover you will need to increase the number of AEP connections and CLAN cards.

Use WebLM to determine the number of AEP connections that you have licensed. Check for the number of "Application Enablement Connections" on the AE Services License file.

AE Services integration for Microsoft Office OCS licensing

The AE Services integration with either Microsoft Office Live Communications Server 2005 or Microsoft Office Communications Server 2007 requires the following licensing:

- AE Services Unified Desktop Edition RTU (Right To Use)

  Every active Microsoft Office Communicator client consumes one Unified Desktop license for the duration of the period that it has an active dialog with AE Services (every registered Microsoft Office Communicator, not only those in the call).

For more information, see the *Avaya Aura™Application Enablement Services Implementation Guide for Microsoft Live Communications Server 2005 or Microsoft Office Communications Server 2007*, 02-601893.

AE Services integration for IBM Lotus Sametime licensing

The AE Services integration for IBM Lotus Sametime integration requires the following licensing:

- AE Services Unified Desktop Edition RTU (Right To Use)
  - Every active Sametime Connect/Lotus Notes client will consume one Unified Desktop license for the duration of the dialog with AE Services.

For more information, see the *Avaya Aura™ Application Enablement Services Integration Guide for IBM Lotus Sametime*, 02-602818.

Device, Media, and Call Control (DMCC) licensing

The Device, Media, and Call Control Service (DMCC) Service provides control of devices and media streams and a subset of third party call control services.

- **DMCC Device and Media Control Service**

  Historically, licensing for registering a DMCC (formerly CMAPI) station was in the Communication Manager license file, via the IP_API_A field. For customers who had previously purchased those licenses, the IP_API_A licenses will continue to remain accessible by AE Services applications, regardless of which AE Services release the server is running.

  Factoring in release levels: In certain circumstances beginning in AE Services 4.2, purchases of new or add-on DMCC licenses are reflected in the AE Services license file as well as in the IP_API_A on Communication Manager. The release levels of both AE Services and Communication Manager determine where any new DMCC licenses will be placed.

  – If AE Services is at release 4.2, or higher, *and* Communication Manager is at Release 5.1, or higher, any new or add-on DMCC licenses will be added to the AE Services license file in addition to the IP_API_A in the Communication Manager license. Note that this double licensing will be reconciled in the future.

  – If one or both of these cases does *not* apply (if AE Services is at release 4.1 or lower, and Communication Manager is at release 5.0 or lower), any new or add on DMCC licenses will continue to be added to the IP_API_A in the Communication Manager license file only.

  For customers who have existing licenses in IP_API_A, and then purchase additional DMCC licenses, the statement about factoring in release levels continues to hold. Upon a registration request, AE Services will first attempt to consume a DMCC license from the AE Services license file. If these are exhausted, AE Services will look to IP_API_A for additional licenses to consume.

  Note:
  Regardless of whether DMCC registrations are licensed on Communication Manager or on AE Services, the addition of a DMCC station on Communication Manager also consumes an IP_STA license and an STA license.

- **DMCC Call Information Service**

  If you use the DMCC Call Information Service, no communication Manager licenses are required. The DMCC Call Information Service uses an Application Enablement Protocol connection license. See AEP connections - no license required as of Release 5.2 on page 36.

- **DMCC Call Control Service**

  If you use the DMCC Call Control Service you will need to license and enable Computer Telephony Adjunct Links on Communication Manager.

  Because the DMCC Call Control Service uses third party call control, you need the AE Services TSAPI Basic Users license. Also, the DMCC with Call Control uses an AEP Connection. See AEP connections - no license required as of Release 5.2 on page 36.

Web Services Licensing

Telephony Web Service - Communication Manager requires Computer Telephony Adjunct Links to be licensed for Web Services. AE Services requires a TSAPI Basic license for Telephony Web Services (denoted as TSAPI Simultaneous Users in the License file).

SMS Licensing

Beginning in AE Services 5.2, System Management Service (SMS) is no longer discretely licensed in AE Services. This capability is provided to all licensed systems.

TSAPI Service (including JTAPI) licensing

The TSAPI Service provides third party call control services. AE Services JTAPI is a client side interface to the TSAPI service, and, as such it provides third party call control as well.

For TSAPI (and JTAPI), AE Services provides two types of licenses: the TSAPI Basic Users license, and the TSAPI Advanced license. To use the TSAPI Advanced license you must purchase the TSAPI basic license. That is, the Advanced license does not include the capabilities provided by the TSAPI Basic Users license.

TSAPI Basic User license

The TSAPI Basic User license is often referred to as either an "agent-based license" or a "station based license." It is intended for applications that want to monitor a call or a station. In the license file it is denoted as a "Simultaneous User" file. It is scaled in terms of the number of agents or stations that you want to monitor.

The TSAPI Basic User license requires that you license and enable Computer Telephony Adjunct Links on Communication Manager. The Basic User License for TSAPI provides the following capabilities, in terms of TSAPI service requests.

Call Control Service Group	Monitor Service Group	Set Feature Service Group	Query Service Group
Alternate Call Answer Call Clear Call Clear Connection Conference Call Consultation Call Deflect Call Hold Call Make Call Pickup Call Reconnect Call Retrieve Call Transfer Call Single Step Transfer	Monitor Device Monitor Call Monitor Calls Via Device Change Monitor Filter Monitor Stop	Set MWI Set Bill Rate Set Do Not Disturb Set Forwarding Set Agent State Set Advice of Charge	Query Do Not Disturb Query Forwarding Query Agent State Query Device Info

The TSAPI Advanced License

The TSAPI Advanced License is intended for applications that launch calls (predictive dialing applications) or route calls. The TSAPI advanced license is based on the number of Communication Manager servers you want to license and the size of the Communication Manager platform: Small (S84xx), Medium (S85xx), and Large (S87xx and S8800).

Note:
When used as a replacement for the S85xx, the S8800 platform is a Medium platform.

The TSAPI Advanced License provides the following capabilities.

Call Control Service Group	Routing Service Group
Make Predictive Call Selective Listening Hold Selective Listening Retrieve	Route Select Route Select Inv

The TSAPI Advanced License requires that you license and enable the Communication Manager feature for Computer Telephony Adjunct Links. The TSAPI Advanced License requires the TSAPI Basic User license.

There are no additional requirements, but there is an option for the TSAPI Advanced license. If you have a routing application that requires additional capacity, you can license and enable the Communication Manager feature for Increased Adjunct Routes.

CVLAN Licensing

The CVLAN Service provides third party call control. The CVLAN Service is integrated with Avaya applications, and it is used by customer applications.

- When the CVLAN Service is used for customer applications, it requires a Communication Manager license for ASAI Core. CVLAN bundles ASAI Core and ASAI Plus for a single Communication Manager. Optionally, you can license the following features on Communication Manager: CTI Stations, Phantom Calls, Adjunct Route, and Increased Adjunct Route Capacity. Customer applications must use an ASAI-IP link type on Communication Manager. This link type requires ASAI Core and ASAI Plus.
- Avaya Interaction Center (IC) requires an ADJ-IP link type.

Note:
Avaya IC is the only application that can use an ADJ-IP link on Communication Manager.

DLG Licensing

The DLG Service requires a Communication Manager license for ASAI Core. DLG bundles ASAI Core and ASAI Plus for a single Communication Manager. Optionally, you can license the following features on Communication Manager: CTI Stations, Phantom Calls, Adjunct Route, and Increased Adjunct Route Capacity. Customer applications must use an ASAI-IP link type on Communication Manager. This link type requires ASAI Core and ASAI Plus.

Enterprise-wide licensing

Starting with Release 4.2, AE services supports enterprise-wide Licensing. With enterprise-wide licensing, AE Services customers are able to purchase any number of licenses and then allocate those licenses to various AE Servers at their own discretion.This means that AE Services customers will be able to pool or share all AE Services features, and Rights To Use (RTU) among AE Servers. This applies only to AE Services features licensed in the AE Services license file, and not those licensed in the Communication Manager license file.

- To compare standard licensing with enterprise-wide licensing, see Table 2.
- For more information about enterprise wide licensing, see Licensing configuration examples on page 42.

Table 2: Comparison of Standard licensing and Enterprise-wide licensing

Standard Licensing	Enterprise-wide licensing
AE Services has used the standard license file since the introduction of the platform (Release 3.0). The standard license file continues to be used for standalone AE server licensing.	AE Services introduces support for enterprise-wide licensing with Release 4.2.
A Standard License is generated by Remote Feature Authorization (RFA) from the system record for an AE Server.	Enterprise-wide licensing includes a master enterprise license file (ELF) and an allocation license file (ALF). • The master enterprise license file (ELF) file is generated by PLDS from the system record from the enterprise. The master license file can reside on an AE Server or a dedicated WebLM server. • The allocation license file (ALF) is generated by WebLM, based on features in the master license file and user allocations on the AE Server. The ALF or ALFs can reside on one or more AE Servers.

Table 2: Comparison of Standard licensing and Enterprise-wide licensing

Standard Licensing	Enterprise-wide licensing
The standard license file is installed on the AE Server. In a standard licensing arrangement, AE Services and the WebLM server must be co-resident.	With enterprise wide licensing, WebLM does not have to be co-resident with AE Services.
With standard licensing, a license can not be moved from one server to another, and capacities can not be reallocated.	With enterprise-wide licensing, you can reallocate enterprise capacities and features as desired.
The standard license file contains the Avaya root certificate used by DMCC, CVLAN, and TSAPI.	Enterprise Wide License File contains the Avaya root certificate used by DMCC, CVLAN, TSAPI, and DLG.

Licensing configuration examples

Prior to Release 4.2, AE Services supported Standard Licensing only. In a Standard Licensing configuration, the Standard license file (SLF) is installed on the AE Server and is controlled by the WebLM server running on the AE Server. For an illustration of Standard Licensing, see Figure 4: Standalone configuration (without enterprise Wide Licensing) on page 43.

Starting with Release 4.2, AE Services expanded its licensing capabilities to include the RFA-based Enterprise Wide Licensing (EWL). With Enterprise Wide Licensing you have the flexibility to move capacities and features from one AE Server to another. For example, prior to AE Services 4.2, if you had purchased 3 AE Servers with different licensing capacities, you could not move capacity purchased for one AE Server to another AE Server. With Enterprise wide licensing, you can move capacities or features from one server to another by using a master WebLM server to allocate license features to different AE Servers.

Examples of Enterprise Wide Licensing configurations are provided in the following figures:

- Figure 5: Enterprise licensing - allocating licenses or features on page 44

  Avaya strongly recommends the configuration depicted in Figure 5. For this configuration you must use WebLM Administration to configure the Local WebLM (**Licensed Products** > **Application Enablement** (CTI) > **Configure Local WebLMs** > **Add Local WebLM)** so the master WebLM server can allocate licenses to the AE Server.

- Figure 6: Enterprise wide licensing - pointing to a master license on a remote server on page 44

  Notice that in this configuration AE Services acquires the license from a remote WebLM server. This configuration is not recommended because network latency and outages can affect the AE Server's ability to acquire licenses.

  If you do elect to use Enterprise wide licensing with AE Services pointing to a master license on a remote server, you need to administer the administer the WebLM IP Address with the IP address of the Master WebLM server.

For more information see the following documents.

- *Implementing Avaya Aura™ Application Enablement Services on Avaya Aura™ System Platform*
- *Implementing Avaya Aura™ Application Enablement Services for a Bundled Server Upgrade,* 02-300356
- *Implementing Avaya Aura™ Application Enablement Services 5.2 in a Software-Only Environment*, 02-300355
- *Avaya Aura™ Application Enablement Services Administration and Maintenance Guide*, 02-300357

Figure 4: Standalone configuration (without enterprise Wide Licensing)

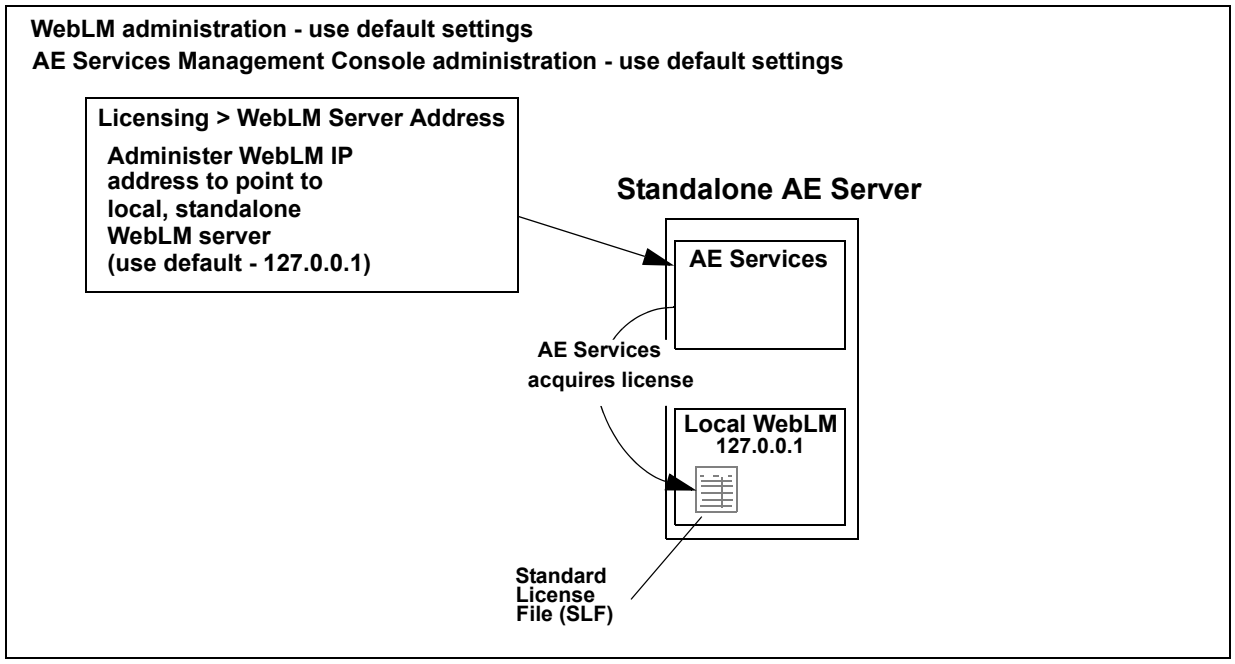


Figure 5: Enterprise licensing - allocating licenses or features

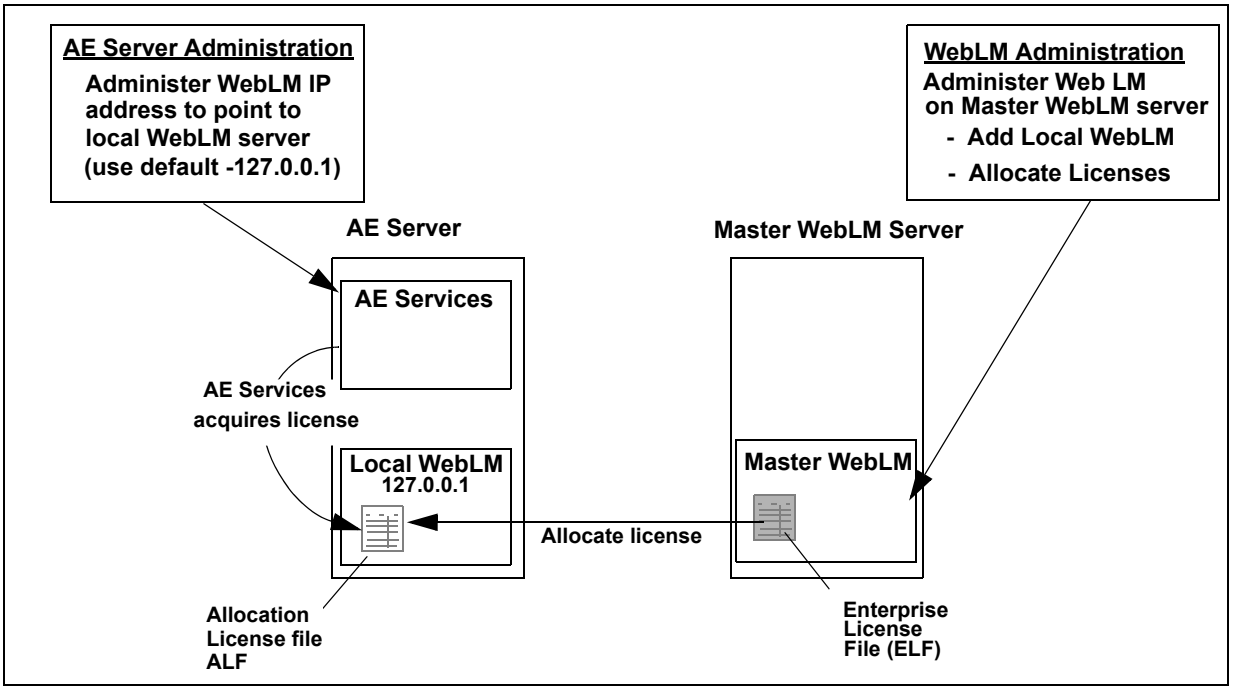
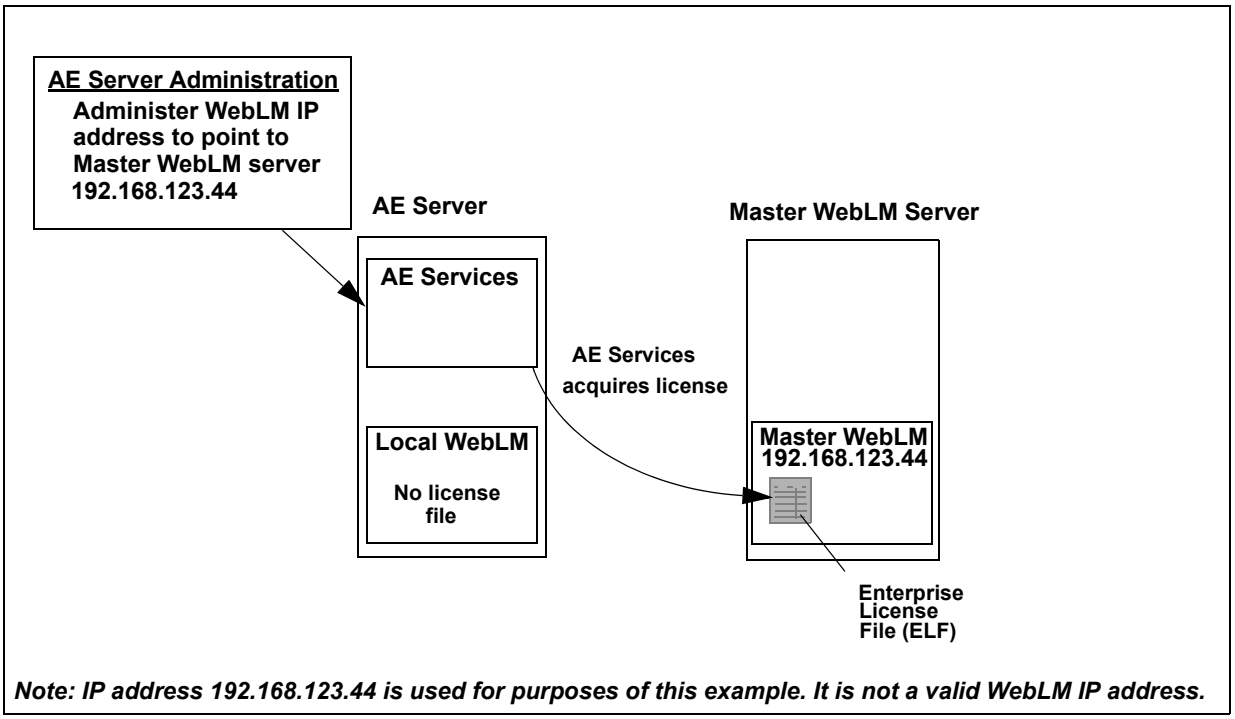


Figure 6: Enterprise wide licensing - pointing to a master license on a remote server



Note: IP address 192.168.123.44 is used for purposes of this example. It is not a valid WebLM IP address.

Application Enablement Services SDKs

Application Enablement Services provides the SDKs that are listed in Table 3. All SDKs, with the exception of the TSAPI SDK, are available on the Avaya Support Site (www.avaya.com) and the Avaya DevConnect Web site (www.avaya.com/devconnect), where you can download them at no charge. If you prefer a DVD-ROM copy of an SDK, contact your account executive.

Table 3: Application Enablement Services SDKs

Name	Distribution	Material code/URL
Application Enablement Services TSAPI SDK	Contact your account executive	700476831
AE Services DMCC Java SDK	Avaya DevConnect Developer Program	www.avaya.com www.avaya.com/devconnect
AE Services DMCC XML SDK	Avaya DevConnect Developer Program	www.avaya.com www.avaya.com/devconnect
AE Services DMCC .NET SDK	Avaya DevConnect Developer Program	www.avaya.com www.avaya.com/devconnect
AE Services Web Service-Telephony SDK	Avaya DevConnect Developer Program	www.avaya.com www.avaya.com/devconnect
AE Services Web Service-Telephony SDK	Avaya DevConnect Developer Program	www.avaya.cm www.avaya.com/devconnect
AE Services JTAPI SDK	Avaya DevConnect Developer Program	www.avaya.com www.avaya.com/devconnect

Communication Manager features not supported

This section describes Communication Manager features not supported by AE Services.

Maintenance state of Communication Manager endpoints

- ASAI is not informed of and does not report the maintenance state (in service/out of service) of any CM endpoints via a domain control.

QSIG Interactions

- **ASAI** - For ISDN trunks administered with Supplementary Service Protocol "b" (also referred to as QSIG-enabled), ASAI is not able to track calls with supplementary UUI information.

  ASAI does not support QSIG path replacement. If any of the QSIG optional parameters are enabled on the Communication Manager QSIG Optional Features form, ASAI can not keep track of the call.
- **CVLAN** - Because the CVLAN Service is implemented using ASAI, CVLAN support for this feature is also incomplete.
- **TSAPI** - The TSAPI Service does not properly handle certain call scenarios involving QSIG trunks.
- **JTAPI** - Because JTAPI is an interface to TSAPI, JTAPI does not properly handle certain call scenarios involving QSIG trunks.

Bridging

- **ASAI** - A bridged call appearance is selected for a Single-Step Conference by the Communication Manager only if there are no regular call appearances available at the added station. Other than that, bridging is not supported with either Single-Step Conference or Phantom Calls.
- **CVLAN** - Because the CVLAN Service is implemented using ASAI, CVLAN support for this feature is also incomplete.
- **TSAPI** - Because the TSAPI Service is implemented using ASAI, TSAPI support for this feature is also incomplete.
- **JTAPI** - Because JTAPI is an interface to TSAPI, JTAPI support for this feature is also incomplete.

Call Park

- **ASAI** - A call may be parked manually at a station by using the call park button (with or without the conference and transfer buttons), or by using the feature access code and the conference or transfer buttons. When a call is parked using the call park button (without either the conference or the transfer buttons) no event reports are generated. When the call is unparked, a Connected Event Report is generated with the calling and called numbers indicating the station on which the call had been parked, and the connected number is that of the station unparking the call. If the call remains active at the parking station (via conference), no changes occur to the listening disconnected paths as a result of parking. If the call drops from the parking station (via transfer), its paths are disconnected from everyone on the call. A Single-Step Conference request will be denied if the call is parked.
- **CVLAN** - Because the CVLAN Service is implemented using ASAI, CVLAN support for this feature is also incomplete.
- **TSAPI** - Because the TSAPI Service is implemented using ASAI, TSAPI support for this feature is also incomplete.
- **JTAPI** - Because JTAPI is an interface to TSAPI, JTAPI support for this feature is also incomplete.

Capacities for AE Services

This topic provides you with information about the limits and capacities of AE Services. In general, take these points into consideration when planning your configuration.

AE Services integration for Microsoft OCS

Requires 2G memory and hardware platform equivalent to the Dell 1950 Quad Core.

Microsoft Office Communicator Clients per AE Server	
AE Server Dedicated to Microsoft Office Communicator integration	Support for up to 20,000 concurrent clients at 24,000 BHCC
Microsoft Office Communicator and other API traffic	Support for up to 5,000 concurrent OC clients at 6000 BHCC and 2000 DMCC clients in client media mode at 36,000 BHCC or Support for up to 10,000 concurrent OC clients at 12,000 BHCC and 1000 DMCC clients in client media mode at 18,000 BHCC

AE Services integration for IBM Sametime

Requires 2G memory and hardware platform equivalent to the Dell 1950 Quad Core.

IBM Sametime Connect Clients per AE Server	
AE Server Dedicated to IBM Sametime integration	10,000 concurrent clients at 12,000 BHCC
IBM Sametime and other API traffic	Support for up to 5,000 concurrent Sametime clients at 6000 BHCC and 2000 DMCC clients in client media mode at 36,000 BHCC or Support for up to 10,000 concurrent Sametime clients at 12,000 BHCC and 1000 DMCC clients in client media mode at 18,000 BHCC

Capacities for calls in Device, Media, and Call Control applications

The number of simultaneous active calls that Device, Media, and Call Control applications can expect to handle depends on many factors.

- If either Client or Server Media mode is used, the following should be taken into consideration:
  - Your application's demand for VoIP resources relative to the VoIP resources available on Communication Manager
  - The codec used and packet size chosen for media
  - Media encryption
- Whether encryption is used for the application link or the signaling link

Compare the Device, Media, and Call Control capacities listed in Table 4 and Table 5 with the Communication Manager resources and capacities described in Capacities for calls in Device, Media, and Call Control applications on page 49 to make sure that you have adequate Communication Manager resources for a given Device, Media, and Call Control implementation.

Table 4: Non-server media (client media, telecommuter, and no-media)

Session and H323 Signaling Encryption	AE Server Capacity	Traffic Rate for applications
No	• 4,000 endpoints and a 36,000 BHCC (S8800 and Dell 1950 based AE Server) • 1,000 endpoints (x306 based AE Server*)	AE Services and Communication Manager can support up to 100 maximum registration requests by an application in a 10 second interval. This can be reached by having 5 CLANs, which are able to process 20 unencrypted registrations each per 10 second interval. Note that the same limit of 100 registrations in a 10 second interval applies for Processor Ethernet also. Developers need to consider this limit when designing applications (that is, a gap of 10 seconds is required between each set of 100 registrations if 5 CLANs are being utilized; a gap of 10 seconds is required between each set of 80 registrations if 4 CLANs are being utilized; and so forth).
Yes	• 3,200 endpoints and a 28,800 BHCC (S8800 and Dell 1950 based AE Server) • 800 endpoints (x306 based AE Server*)	AE Services and Communication Manager can support up to 20 maximum registration requests by an application in a 10 second interval. This can be reached by having 4 CLANs, which are able to process 5 encrypted registrations each. Note that the same limit of 20 registrations in a 10 second limit applies for Processor Ethernet also. Developers need to consider this limit when designing applications (that is, a gap of 10 seconds is required between each set of 20 registrations if 4 CLANs are being utilized; a gap of 10 seconds is required between each set of 15 registrations if 3 CLANs are being utilized; and so forth).

* Based on using an x306 based AE Server with the following specifications: 3.0 GHz processor, 800-MHz front-side bus, and 512 MB memory.

Table 5: Server media

	Codec Type	AE Server Capacity*	Traffic Rate for applications**
No signaling and media encryption	G729	120 endpoints	100 simultaneous registrations
	G711	75 endpoints	75 simultaneous registrations.
Signaling and media encryption	G729	96 endpoints	96 simultaneous registrations
	G711	60 endpoints	60 simultaneous registrations

* Based on using an IBM x306 based AE Server with the following specifications: 3.0 GHz processor, 800-MHz front-side bus, and 512 MB memory.

** A gap of 10 seconds between each set of 100 registrations.

Communication Manager capacities for Device, Media, and Call Control

Component	Capacity
For each IP endpoint in a call, including AE Services endpoints	● 1 VoIP channel is used (with a G.711 codec) ● 2 VoIP channels are used (with a G.729 codec)
TN2302 media processor card	64 channels
TN2602 Crossfire media processor card	320 channels
MM760 VoIP card	64 channels
G700 media gateway motherboard VoIP	64 channels
G350 media gateway motherboard VoIP	32 channels
TN799DP CLAN card	400 Device, Media, and Call Control station registrations
Processor Ethernet	● 400 DMCC station registrations for Communication Manager running on S83xx or S84xx series servers ● 4000 DMCC station registrations for Communication Manager running on S8510, S87xx, and S8800 series servers

Note:
Using encryption can reduce capacities by 15%.

System Management Services Capacities

Simultaneous Communication Manager Servers	A maximum of 16 Communication Manager Servers
Simultaneous sessions/logins per Communication Manager	5
Single Session - Average Number of Web Requests Serviced for Station Model	~6 Requests/Second
Multiplexed Sessions - Average Number of Web Requests Serviced for Station Model	~10 Requests/Second

System capacities - Communication Manager 5.2

Table 6: System Capacities - Communication Manager 5.2

	S8800	S8710, S8720	S8720XL, S8730	S8510	S8500B, S8500C	S8400	S8300x G430, G700, G350, G250	S8300x G450
AE Services servers per Communication Manager	16	16	16	16	16	16	16	16
AE Services Server Interfaces (Processor Ethernet or C-LAN)	16	16	16	16	16	16	16	16
Inbound Messages/ Second per AE Services Connection (CLAN)	200	200	200	200	200	200	200	200
Inbound Messages/ Second per AE Services Connection (Processor Ethernet)	1000	1000	1000	1000	720	240	240	240
Outbound Messages/ Second per AE Services Connection (CLAN)	240	240	240	240	240	240	240	240
Outbound Messages/ Second per AE Services Connection (Processor Ethernet)	1000	1000	1000	1000	720	240	240	240
Messages/Sec/ System (full duplex with 5 CLANs)	1000[1]	1000[1]	1000[1]	1000[1]	720	240	240	240

1. The overall system limit is not restricted by the type of underlying transport that is used. For example, either a single Processor Ethernet connection or 5 CLANs will be able to reach 1000 msgs/sec.

System Capacities - AE Services Server 5.2

Table 7: System Capacities - AE Services Server 5.2

Communication Manager Servers supported by one AE Server	16
Connections to a Communication Manager Server with one AE Server	16
Messages per second per AE Server Connection to CM (1 CLAN)	200
Messages per second per AE Server Connection to CM (Processor Ethernet)	1000
Messages per second per AE Server Connection from CM (1CLAN)	240
Messages per second per AE Server Connection from CM (Processor Ethernet)	1000
Messages per second (per system)	1000[1]

1. The overall system limit is not restricted by the type of underlying transport that is used. For example, either a single PE connection or more than five CLANs will be able to reach 1000 msgs/sec

ASAI associations

The number of supported domain controls on Communication Manager 4.0 is 32,000. This increase applies only to S85xx, S87xx, and S8800 servers. If Communication Manager is used for call center or other call control functionality, care must be taken to not exceed the total number of domain controls.

The number of supported generic associations on the AE Services Server (AE Server) is 32,768.

CVLAN Service capacities

Clients supported	60
ASAI associations	32k, shared over 16 links
Links	16

DLG Service capacities

Clients supported	16
Links	16

TSAPI Service capacities

Users (Client connections) **Note:** A client connection refers to a unique IP address connected to AE Services. This number is not related to the number of agents supported.	2500
Links	16 (each to a different Communication Manager)

Note:
TSAPI allows one link between one AE Server and one Communication Manager.

AE Services documentation for Release 5.2

Table 8 lists the latest release of each AE Services document. Most of the documents in the table are at Release 5.2, but a few remain at prior release levels. Although the content for these older documents did not change, they are compatible with AE Services, Release 5.2.

Table 8: AE Services documentation

	Document title	Number	Release
1	*Avaya Aura™ Application Enablement Services Overview*	02-300360	5.2
2	*Implementing Avaya Aura™ Application Enablement Services on Avaya Aura™ System Platform*	02-603468	5.2
3	*Implementing Avaya Aura™ Application Enablement Services 5.2 in a Software-Only Environment*	02-300355	5.2
4	*Implementing Avaya Aura™ Application Enablement Services for a Bundled Server Upgrade*	02-300356	5.2
5	*Avaya Aura™Application Enablement Services Administration and Maintenance Guide*	02-300357	5.2
6	*Avaya Aura™Application Enablement Services Implementation Guide for Microsoft Live Communications Server 2005 or Microsoft Office Communications Server 2007*	02-601893	5.2
7	*Avaya Aura™ Application Enablement Services Integration Guide for IBM Lotus Sametime*	02-602818	5.2
8	*Avaya Aura™ Application Enablement Services Online Help* (packaged with Application Enablement Services software and not available on the Web)	Not applicable	5.2
9	*Application Enablement Services TSAPI Exerciser Help* (Online, packaged with the AE Services TSAPI Client SDK software and not available on the Web)	Not applicable	4.2
10	*Avaya Aura™ Application Enablement Services Web Services Programmer's Guide*	02-300362	5.2
11	*Avaya Aura™ Application Enablement Services Device, Media, and Call Control API .NET Programmer's Guide*	02-602658	5.2
12	*Avaya Aura™ Application Enablement Services Device, Media, and Call Control .NET Programmer's Reference* (an HTML document available on the Web only at the Avaya Support Site or the Avaya Devconnect Site)	Not applicable	5.2
			1 of 2

Table 8: AE Services documentation (continued)

	Document title	Number	Release
13	*Avaya Aura™ Application Enablement Services Device, Media, and Call Control XML Programmer's Guide*	02-300358	5.2
14	*Avaya Aura™ Application Enablement Services Device, Media, and Call Control XML Programmer's Reference* (an HTML document available on the Web only at the Avaya Support Site or the Avaya Devconnect Site)	Not applicable	5.2
15	*Avaya Aura™ Application Enablement Services Device, Media, and Call Control Java Programmer's Guide*	02-300359	5.2
16	*Avaya Aura™ Application Enablement Services Device, Media, and Call Control Java Programmer's Reference* (an HTML document available on the Web only at the Avaya Support Site or the Avaya Devconnect Site)	Not applicable	5.2
17	*Application Enablement Services Device, Media, and Call Control Media Stack API Reference* (an HTML document available on the Web only at the Avaya Support Site or the Avaya Devconnect Site)	Not applicable	3.1
18	*Avaya Aura™ Application Enablement Services TSAPI and CVLAN Client and SDK Installation Guide*	02-300543	5.2
19	*Application Enablement Services TSAPI for Avaya Communication Manager Programmer's Reference*	02-300544	4.2
20	*Application Enablement Services TSAPI Programmer's Reference*	02-300545	4.1
21	*Avaya Aura™ Application Enablement Services CVLAN Programmer's Reference*	02-300546	4.1
22	*Avaya Aura™ Application Enablement Services JTAPI Programmer's Guide*	02-603488	5.2
23	*Avaya Aura™ Application Enablement Services JTAPI Programmer's Reference* (an HTML document available on the Web only at the Avaya Support Site or the Avaya Devconnect Site)	Not applicable	5.2
24	*Application Enablement Services ASAI Technical Reference*	03-300549	3.1
25	*Application Enablement Services ASAI Protocol Reference*	03-300550	3.1
			2 of 2

Selecting documents based on the product you use

This section provides an example of selecting a group of related AE Services documents for a specific product. For example, if you use the Device, Media, and Call Control (DMCC) API in a Java environment, the following documents would be applicable.

- *Avaya Aura™ Avaya Application Enablement Services Device, Media and Call Control API Java Programmers Guide*, 02-300359

  The DMCC Java Programmers Guide describes how to use the Device, Media and Call Control API, and it provides tips for writing an application.

- *Avaya Aura™ Application Enablement Services Device, Media, and Call Control Java Programmer Reference* (HTML document)

  When you are designing or implementing an application, you will need to know more specific information, such as what features and interfaces are supported by AE Services. Use the DMCC Java Programmer Reference for implementation details.

- *Avaya Aura™ Application Enablement Services Device, Media, and Call Control Media Stack API Reference* (HTML document)

  This document is optional. You will need this document if your DMCC application is handling its own media, and you are using the media stack provided by Avaya.

- *Avaya Aura™ Application Enablement Services Administration and Maintenance Guide*, 02-300357. See "Running a sample application - Device, Media, and Call Control services only" in Appendix B.

A general reference for using the AE Services documents

Here are some guidelines for using the documents based on your role within your organization.

Planners

Use the following documents if you are involved with planning an Application Enablement Services Server (AE Server) installation.

- *Avaya Aura™ Application Enablement Services Overview*, 02-300360

Depending on the scope of your planning, you might want to consult additional documents for more information. The following sections provide information about using additional documents for implementing Application Enablement Services.

AE Services with IBM Lotus Sametime integration

If you plan to integrate AE Services with IBM Lotus Sametime, see the following documents.

- *Avaya Aura™ Application Enablement Services Integration Guide for IBM Lotus Sametime*, 02-602818

  The *Application Enablement Services Integration Guide for IBM Lotus Sametime*, is a high-level planning and implementation guide for integrating AE Services IBM Lotus Sametime. It is directed toward an AE Services and a IBM Lotus Sametime administrative audience.

- *Implementing Avaya Aura™ Application Enablement Services on Avaya Aura™ System Platform*, 02-603468. If your integration uses the Application Enablement Services on System Platform offer, consult this document for information about installing AE Services.

- *Implementing Avaya Aura™ Application Enablement Services for a Bundled Server Upgrade*, 02-300356. If your integration uses the AE Services Bundled Server, consult this document for information about installing AE Services.

- *Implementing Avaya Aura™ Application Enablement Services 5.2 in a Software-Only Environment*, 02-300355. If your integration uses the AE Services Software-Only server consult this document for information about installing AE Services.

- *Avaya Aura™Application Enablement Services Administration and Maintenance Guide*, 02-300357. Use this document for information about administering Avaya Communication Manager and the AE Services server.

- *Avaya Aura™ Application Enablement Services Management Console online help.* Use online help for information about administering the AE Services server.

AE Services with Microsoft Office Communications Server integration

If you plan to integrate AE Services with Microsoft Office Live Communications Server 2005 or Microsoft Office Communications Server 2007, see the following documents.

- *Avaya Aura™ Application Enablement Services Implementation Guide for Microsoft Live Communications Server 2005 or Microsoft Office Communications Server 2007*, 02-601893
- *Implementing Avaya Aura™ Application Enablement Services on Avaya Aura™ System Platform*, 02-603468. If your integration uses the Application Enablement Services on System Platform offer, consult this document for information about installing AE Services.
- *Implementing Avaya Aura™ Application Enablement Services for a Bundled Server Upgrade*, 02-300356. If your integration uses the AE Services Bundled Server, consult this document for information about installing AE Services.
- *Implementing Avaya Aura™ Application Enablement Services in a Software-Only Environment*, 02-300355. If your integration uses the AE Services Software-Only server consult this document for information about installing AE Services.
- *Avaya Aura™ Application Enablement Services Administration and Maintenance Guide*, 02-300357. Use this document for information about administering Avaya Communication Manager and the AE Services server.
- *Avaya Aura™ Application Enablement Services Management Console online help.* Use online help for information about administering the AE Services server.

Installers and administrators - Application Enablement Services on System Platform

To install the AE Services software and to configure Communication Manager and AE Services, you will need to use the following documents.

- *Implementing Avaya Aura™ Application Enablement Services on Avaya Aura™ System Platform*, 02-603468.
- *Avaya Aura™ Application Enablement Services Administration and Maintenance Guide*, 02-300357.
- *Avaya Aura™ Application Enablement Services Management Console online help.*

Note:
AE Services does not assume that you will install a browser on the AE Server. To access WebLM (Avaya Web-based license management software) and to administer AE Services, you need a computer running a browser with network access to the AE Server.

Installers and administrators - Bundled Server Offer

To install the AE Services software and to configure Communication Manager and AE Services, you will need to use the following documents.

- *Implementing Avaya Aura™ Application Enablement Services for a Bundled Server Upgrade*, 02-300356.
- *Avaya Aura™ Application Enablement Services Administration and Maintenance Guide,* 02-300357
- *Avaya Aura™ Application Enablement Services Management Console online help.*

Note:
AE Services does not assume that you will install a browser on the AE Server. To access WebLM (Avaya Web-based license management software) and to administer AE Services, you need a computer running a browser with network access to the AE Server.

Installers and administrators - Software-Only Offer

To install the AE Services software and to configure Communication Manager and AE Services, you will need to use the following documents.

- *Implementing Avaya Aura™ Application Enablement Services in a Software-Only Environment*, 02-300355.
- *Avaya Aura™ Application Enablement Services Administration and Maintenance Guide*, 02-300357
- *Avaya Aura™ Application Enablement Services Management Console online help.*

Note:

AE Services does not assume that you will install a browser on the AE Server. To access WebLM (Avaya Web-based license management software) and to administer AE Services, you need a computer running a browser with network access to the AE Server.

If you are installing TSAPI, JTAPI, and CVLAN clients and SDKs

To install AE Services TSAPI, JTAPI, and CVLAN clients, refer to the *Application Enablement Services TSAPI and CVLAN Client and SDK Installation Guide*, 02-300543.

If you develop or maintain applications

Application Enablement Services provides Software Development Kits (SDKs) and programming documents for developing applications.

For a list of the Application Enablement Services SDKs, see "Application Enablement Services SDKs" in the *Avaya Aura™ Application Enablement Services Overview*, 02-300360.

About Avaya DevConnect

Application developers who want to take advantage of the AE Services APIs or protocols are encouraged to participate in the Avaya DevConnect Program.

The DevConnect Program gives you access to a comprehensive set of support and marketing programs that help you create the new generation of intelligent communications solutions. For more information about DevConnect, visit www.avaya.com/devconnect.

Web Services programmers

Application Enablement Services provides the following Web Services.

- System Management Service

  The System Management Service is used to enable SOAP-based access to Communication Manager Administration functions. AE Services 5.2 introduces the following SMS enhancements.

  - XML Formatted Input and Output
  - Template look and feel
  - Unicode Support
  - ISV Model Schema Enhancements

- Telephony Web Service

Note:
As of AE Service 4.1, the AE Services User Service SDK is discontinued. AE Services will not support applications written to the User Service. Applications developed for the User Service prior to AE Services 4.1 will continue to work on AE Services 4.1.

For information about Web Services, see the following document.

- *Avaya Aura™ Application Enablement Services Web Services Programmer Guide*, 02-300362

Device, Media, and Call Control API programmers

Application Enablement Services provides Device, Media, and Call Control programmers with tools for learning to use the APIs as well as SDKs for implementing the APIs. (Device, Media, and Call Control was formerly known as Communication Manager API.)

- To see some of the capabilities of an AE Services Device, Media, and Call Control application, refer to "Sample Device, Media, and Call Control applications" in the *Avaya Aura™Application Enablement Services Administration and Maintenance Guide*, 02-300357.
- If you are ready to program, see the following documents.
  - *Avaya Aura™ Application Enablement Services Device, Media, and Call Control XML Programmer Guide*, 02-300358
  - *Avaya Aura™ Application Enablement Services Device, Media, and Call Control XML Programmer Reference* (an HTML document available on the Web only at the Avaya Support Site or the Avaya Devconnect Site)
  - *Avaya Aura™ Application Enablement Services Device, Media, and Call Control Java Programmer Guide*, 02-300359
  - *Avaya Aura™ Application Enablement Services Device, Media, and Call Control Java Programmer Reference* (an HTML document available on the Web only at the Avaya Support Site or the Avaya Devconnect Site)
  - *Avaya Aura™* Application Enablement Services Device, Media and Call Control API .NET Programmers Guide, 02-602658
  - *Avaya Aura™* Application Enablement Services Device, Media and Call Control API .NET Programmers Reference (an HTML document available on the Web only at the Avaya Support Site or the Avaya Devconnect Site)

TSAPI programmers

If you program to TSAPI, use the following documents to develop or maintain your applications.

- *Avaya Aura™ Application Enablement Services TSAPI for Avaya Communication Manager Programmer's Reference*, 02-300544. Use this document as your primary reference for TSAPI applications. It documents all third party call control services, including Private Data Services, provided by Avaya Communication Manager. Private Data Services allow you to take advantage of the extended functionality of Communication Manager services.
  - For information about installing the TSAPI clients and SDKs, see the *Application Enablement Services TSAPI and CVLAN Client and SDK Installation Guide*, 02-300543.
- *Avaya Aura™ Application Enablement Services TSAPI Programmer's Reference*, 02-300545. This document describes the Telephony Services API, which is based on ECMA CSTA Standards 179 and 180. The TSAPI Programmer's Reference is required only if you need to learn the fundamental principles of TSAPI. If you are developing or maintaining TSAPI applications, and you are familiar with TSAPI, the *Application Enablement Services TSAPI for Avaya Communication Manager Programmer's Reference*, 02-300544 is your primary reference.

JTAPI programmers

If you program to JTAPI, see the following documents.

- *Avaya Aura™ Application Enablement Services JTAPI Programmers Guide*, 02-603488. This document describes how to use the Application Enablement (AE) Services JTAPI implementation to develop, debug, and deploy telephony applications
- *Avaya Aura™ Application Enablement Services JTAPI Programmer's Reference* (an HTML document available on the Web only at the Avaya Support Site and the Avaya Devconnect Site). This document provides you with a reference to API calls in the Avaya implementation of the Java Telephony API. This document describes all call control services, including Private Data Services, provided by Avaya Communication Manager. Private Data Services allow you to take advantage of the extended functionality of Communication Manager services.

CVLAN Programmers

If you program to the CVLAN API (which is an implementation of the ASAI protocol), use following documents.

Note:
AE Services does not support newly-developed CVLAN applications.

- *Avaya Aura™ Application Enablement Services CVLAN Programmer's Reference*, 02-300546. Use this document as your primary reference for CVLAN applications. It documents all call control services provided by Avaya Communication Manager.
  - For information about installing the CVLAN Client/SDK, see the *Application Enablement Services TSAPI and CVLAN Client and SDK Installation Guide*, 02-300543.
- *Application Enablement Services ASAI Technical Reference*, 03-300549. The CVLAN call control capabilities are based on the capabilities described in the ASAI Technical Reference. When a greater level of detail is required for working with these capabilities programmers can consult the ASAI Technical Reference.
- *Application Enablement Services ASAI Protocol Reference*, 03-300550. CVLAN uses the ASAI Protocol. When a greater level of detail is required for working with information elements and the layout of ASAI messages, programmers can consult the ASAI Technical Reference.

ASAI Programmers

If you program directly to the ASAI protocol, use the following documents as your primary reference for ASAI (Adjunct Switch Application Interface).

Note:
AE Services does not support newly-developed ASAI applications.

- *Application Enablement Services ASAI Technical Reference*, 03-300549. The ASAI Technical Reference provides technical descriptions of ASAI third party call control capabilities.
- *Application Enablement Services ASAI Protocol Reference*, 03-0300550. The ASAI Protocol Reference provides byte-level descriptions of ASAI messages.

Avaya Support contact information

For additional support, contact your Authorized Service Provider. Depending on your coverage entitlements, additional support may incur charges. Support is provided per your warranty or service contract terms unless otherwise specified.

Avaya Support Contact	Telephone
U.S. Remote Technical Services – Enterprise	800-242-2121
U.S. Remote Technical Services – Small Medium Enterprise	800-628-2888
U.S. Remote Technical Services – BusinessPartners for Enterprise Product	877-295-0099
BusinessPartners for Small Medium Product	Please contact your distributor.
Canada	800-387-4268
Caribbean and Latin America	786-331-0860
Europe, Middle East, and Africa	36-1238-8334
Asia Pacific	65-6872-8686

Appendix A: AE Services Release 5.2 compatibility

This appendix describes the clients, API, and versions of Communication Manager that AE Services Release 5.2 supports. Additionally, this appendix describes the Communication Manager platforms that support AE Services 5.2

API and client compatibility

DMCC compatibility

Note:
DMCC 3.x refers to any of the following releases: 3.0, 3.1., 3.1.2, 3.1.4, 3.1.6.
DMCC 4.x refers to any of the following releases: 4.0, 4.1, 4.2, 4.2.1, 4.2.2, 4.2.3, 4.2.4.
DMCC API refers to any of the following releases: XML API, .NET SDK and Java SDK on JDK 5.0.

AE Services 5.2 is compatible with the following DMCC API-based applications.

- DMCC 3.0.x Java API applications:

  The DMCC 3.0.x client library and Java SDK 1.5.2 will work with the AE Services 5.2 DMCC Service.

- DMCC 3.0.x XML applications:

  XML developers should be aware that AE Services has changed to ECMA 323 edition 3 and the schemas have therefore changed. DMCC 3.0.x XML applications should continue to request 3.0 protocol version (ECMA 323 edition 2).

- DMCC 3.1.x Java API applications:

  The DMCC 3.1.x client library and Java SDK 5.0 will work with the AE Services 5.2 DMCC Service.

- DMCC 3.1.x XML applications:

  XML developers should be aware that AE Services has changed to ECMA 323 edition 3 and the schemas have therefore changed. DMCC 3.1.x XML applications should continue to request 3.0 protocol version (ECMA 323 edition 2).

- DMCC 4.0.x Java API applications:

  The DMCC 4.0.x client library and Java SDK 5.0 will work with the AE Services 5.2 DMCC Service.

- DMCC 4.0.x XML applications:

  DMCC 4.0 XML applications will work with the AE Services 5.2 DMCC Service.

- DMCC 4.1.x Java API applications:

  The DMCC 4.1.x client library and Java SDK 5.0 will work with the AE Services 5.2 DMCC Service.

- DMCC 4.1.x XML applications:

  DMCC 4.1 XML applications will work with the AE Services 5.2 DMCC Service.

- DMCC 4.2.x Java API applications:

  The DMCC 4.2.x client library and Java SDK 5.0 will work with the AE Services 5.2 DMCC Service.

- DMCC 4.2.x XML applications:

  DMCC 4.2.x XML applications will work with the AE Services 5.2 DMCC Service.

Web Services compatibility

AE Services Web Services SDK sample applications are supported with Java SDK 1.4.2 or 5.0 on AE Services 4. 2. The WSDL can be used by other non-Java platforms (for example, .NET).

- For Release 5.2 the Telephony Web Service does not introduce any new features.

System Management Service compatibility

For Release 5.2 the System Management Service does not introduce any new features.

TSAPI compatibility

The AE Services 5.2 TSAPI Service includes all of the functionality provided by AE Services 3.x, 4.x, and Avaya CT 1.x. AE Services 5.2 TSAPI Service is backward compatible with the following TSAPI/JTAPI clients and libraries:

- AE Services 4.x

CVLAN compatibility

The AE Services 5.2 CVLAN Service includes all of the functionality provided by the AE Services 3.x through 4.x CVLAN Service, CVLAN on MAPD, and the CVLAN R9 Server for Linux. The AE Services 5.2 CVLAN Service is backward compatible with the following CVLAN clients and libraries:

- AE Services 4.1.x

DLG compatibility

The AE Services 5.2 and Communication Manager 5.1 releases do not introduce any new DLG Service features.

- The AE Services 5.2 DLG Service includes all of the functionality provided by previous releases of the AE Services DLG Service (3.x through 4.1), the “DLG on the MAPD”, and the “Co-Res (co-resident) DLG.”
- The AE Services 5.2 DLG Service is compatible with existing applications that rely on the DLG Service.

AE Services compatibility with Communication Manager

AE Services 5.2 is compatible with the following Communication Manager releases:

- Communication Manager 4.x (S8300, S8400, S8500, S8510, and S87xx)
- Communication Manager 5.0 (S8300, S8400, S8500, S8510, and S87xx)
- Communication Manager 5.1 (S8300, S8400, S8500, S8510, and S87xx)
- Communication Manager 5.2 (S8300, S8400, S8500, S8510, S87xx, and S8800)

From the viewpoint of Communication Manager, Communication Manager 5.2 is compatible with the following AE Services Releases:

- AE Services 4.x (4.0, 4.01, 4.1, 4.2, 4.2.2) and 5.x (5.2 is the initial 5.x release).

AE Services compatibility with Communication Manager 5.2 CTI interfaces

AE Services relies on the CLAN and the Processor Ethernet for communications with Avaya Communication Manager (the CLAN and the Processor Ethernet reside on Communication Manager). The following table describes the Communication Manager platforms that use either CLANs or the Processor Ethernet (or, in some cases, both).

Note:
Processor Ethernet connections are not supported in Enterprise Survivable Server (ESS)/Local Survivable Processor (LSP) configurations. For more information, see Support for an Enterprise Survivable Server configuration on page 20.

Communication Manager platform	Communications interface
S8300	Processor Ethernet only
S8400	Processor Ethernet and CLAN
S85xx	Processor Ethernet and CLAN
S87xx MultiConnect (MC)	Processor Ethernet and CLAN
S87xx IP[1]	Processor Ethernet and CLAN
S88xx[1]	Processor Ethernet and CLAN

1. With AE Services 5.2 and Communication Manager 5.2.1, Switch Connections, H.323 links, and SMS connections can now be established directly to the Processor Ethernet on Communication Manager S87*xx* and S8800.

Communication Manager 5.2 - ASAI Capabilities

For customer-developed CVLAN and ASAI-based applications, Communications Manager must be provisioned with ASAI features. The following list describes ASAI core, plus, and optional feature levels.

ASAI Core features

- Adjunct Call Control Group (for example, third party call control)
- Domain Control Group (for example, domain control of a station)
- Event Notification Group (for example, event stream for VDN)
- Request Feature Group (for example, login agent and send all calls)
- Set Value Group (for example, set message waiting indicator)
- Single Step Conference
- II Digits

Note:
On Communication Manager 5.1, the set of ASAI Core features remains unchanged.

ASAI Plus features

- Switch Classified call (Predictive Dialing)
- Answer Machine Detection (from within classified call)
- Selective Listening/Hold

Note:
For Communication Manager 5.1, the ASAI Adjunct Route feature has changed from an ASAI Plus to an ASAI Optional feature.

ASAI Optional Features

- CTI Stations
- Phantom Calls
- Adjunct Route new
- Increased Adjunct Routes

Note:
On Communication Manager 5.1, the ASAI Adjunct Route is an ASAI Optional feature.

Glossary

Application Enablement Protocol (AEP) connection	Refers to the secure TCP connection between the AE Server and Communication Manager. It tunnels ASAI messages and Call Information Services messages between AE Services and Communication Manager.
Application Enablement Protocol (AEP)	The protocol used by an AEP connection.
ASAI	Adjunct Switch Application Interface - ASAI is a protocol that enables software applications to access call processing capabilities provided by Avaya Communication Manager.
Authentication	The process of validating the identity of a user by means of user profile attributes.
Authorization	The process of granting a user the ability to carry out certain activities based on permissions.
CLAN	CLAN stands for Control LAN. CLAN refers to the Avaya TN799 Control LAN circuit pack, which resides on Communication Manager. AE Services relies on the CLAN for communicating with Communication Manager.
Call Information Service	The Call Information Service allows applications to get detailed call information and to determine the status of the call information link.
Computer Telephony Integration	Abbreviated as CTI. The integration of services provided by a computer and a telephone. In simplest terms, it means connecting a computer to a communications server (or switch) and having the computer issue commands that control calls.

CTI Link	The term CTI link refers to a generic link type that is used in the context of Communication Manager administration. As a generic link type, it can refer to any of the following AE Services links: CVLAN links, DLG links, and TSAPI links (JTAPI and the Telephony Web Service use TSAPI links). When an AE Services Management Console page, such as TSAPI Service Summary, displays a column heading for a CTI link type, it is referring to TSAPI link as it is administered on Communication Manager. Up to 64 links can be administered on Communication Manager.
DMCC Service	Device, Media, and Call Control. The DMCC Service encompasses, Device Control, Media Control, and Call Control capabilities. Device Control enables applications to monitor and control station lamps and displays. Media Control allows applications to direct media connections, play sounds, and interpret voice/tones on a media stream. Call Control allows applications to monitor and control calls.
JTAPI	Java Telephony Application Programming Interface. JTAPI is an API that provides access to the complete set of Third Party call control features provided by the TSAPI Service. JTAPI uses the TSAPI Service for communication with Avaya Communication Manager.
First Party Call Control	First party call control refers to the application acting as the user would operate their telephone. The application invokes operations such as “Go off-hook”, “Press button," and so forth, until the switch collects enough digits to initiate the call.
LDAP	LDAP is the acronym for Lightweight Directory Access Protocol, which defines a standard protocol for organizing directory hierarchies and a standard interface for clients to access directory servers.
Link	A communications channel between system components.
Monitor	A monitor refers to a capability that watches for activity on a call or a device. A monitor placed on a device or a call causes reports of changes in the status of the device or call to be sent to the client requesting the monitor. If your application places a device monitor on your phone, your application is notified of any change in your phone’s status (for example, an incoming call has been received, a call ended, and so forth). Many applications rely on monitors to provide this type of information.

Operations, Administration, and Maintenance	Abbreviated as OAM. The administrative interface for the Application Enablement Services platform for Releases 3.x through 4.x. For Release 5.2, it is renamed as the Application Enablement Services Management Console.
PKI	Public key Infrastructure. A PKI is a system or framework that provides users of a non-secure public network to securely and privately exchange data through the use of a cryptographic key pair that is provided by a trusted authority, typically a Certificate Authority. A public key infrastructure includes of a certificate authority (CA), a registration authority (RA) and a means of managing certificates.
Private Data	Private data is a switch-specific software implementation that provides value added services.
PLDS	Abbreviation for product licensing and delivery system.
Registration, Administration, and Status	Abbreviated as RAS, which is an International Telecommunications Union specification for terminal registration and authentication. RAS is part of the H.323 protocol suite.
Routing	Selecting an appropriate path for a call. When a routing application is started, it sends route registration requests, which contain a device ID, to Communication Manager. Routing requests instruct Communication Manager to send all incoming calls to these device IDs (in the TSAPI Service). The TSAPI Service sends the call to the application for routing. Communication Manager does not route these calls. Also referred to as adjunct routing.
RTP	Abbreviation for Real-time Transport Protocol, an Internet standard for transmission of time-critical data, and for control of the transmission.
SIP	Session Initiation Protocol. The Session Initiation Protocol (SIP) is a control (signaling) protocol for creating, modifying, and terminating sessions with one or more participants. These sessions include Internet telephone calls, multimedia distribution, and multimedia conferences.The current SIP specification only covers first party call control functionality.

SDK	Software Development Kit. An SDK is a package that enables a programmer to develop applications for a specific platform. Typically, an SDK includes one or more APIs, documentation, and perhaps programming tools.
Switch Connection Name	Switch Connection Name is a term that refers to either of the following: (1) A collection of Host Names or IP addresses associated with one (and only one) switch. This definition applies to the TSAPI Service, the Web Telephony Service, the CVLAN Service, and the DLG Service. (2) A collection of H.323 Gatekeepers that are associated with one (and only one) switch. AE Services supports up to 16 switch connections to Communication Manager. Switch Connection names, also referred to as switch connections can consist of multiple CLAN connections (up to 16).
Telephony Web Service	An interface that enables high level call control functionality over standard web services interfaces (SOAP/XML).The service hides the complicated concepts associated with traditional CSTA based call control such as connections, call identifiers and call states.
Third Party Call Control	Third party call control means that, rather than acting as the user, the application is making requests on the behalf of the user. A third-party make call says “Make a call from extension X to extension Y”.
Tlink	A Tlink is a service identifier that is created when the administrator adds a TSAPI Link in AE Services. A Tlink refers to a switch connection between a specific switch and a specific AE Server.

Transport link	Synonymous with AEP connection. A Transport link is a secure TCP/IP connection between the AE Services server and a CLAN or PE on Communication Manager. When the AE Services Transport Service starts up, it establishes the Transport link between the AE server and the Communication Manager server, based on administering a Switch Connection in AE Services. The CLAN and Processor Ethernet IP addresses that you administer in the AE Services Management Console are used to set up TLS connections between AE Services and CM. These TLS connections are called transport links.
TSAPI Service	The CSTA-based third party call control services provided by AE Services.
Web Services	A set of standards that allow a service to be described and consumed in a platform-neutral way.

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