Avaya Aura® Application Enablement Services Overview

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Chapter 1: 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 Communication Manager standalone implementations and Session Manager configurations with Communication Manager as an Access Server. AE Services does not support Communication Manager as a Feature Server.

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

For information about new features for Release 6.1, see Chapter 2: New Features for AE Services Release 6.1. AE Services 6.1 is backward compatible with previous releases of Communication Manager, going back to Release 4.0. For more information about feature compatibility, see AE Services Release 6.1 compatibility on page 69. To learn more about Avaya Aura® contact your Avaya client executive or authorized business partner. Also visit the Avaya Support Web site http://www.avaya.com/support.

AE Services offers

AE Services Release 6.1 provides the following product offers.

Avaya Aura® Application Enablement Services on Avaya Aura® System Platform

This offer was introduced in Release 5.2. Also referred to as Application Enablement Services on System Platform or AE Services on System Platform, this offer includes a hardware platform

(Avaya Common Server – Dell™ R610), operating system (Red Hat Enterprise Linux 5), the Avaya Aura® System Platform software (System Platform Release 6.0), the AE Services Release 6.1 software, and a maintenance contract with Avaya. Customers who want to take advantage of the Application Enablement Services on System Platform High Availability Failover feature must obtain this offer. For information about the High Availability Failover feature, see *Implementing Avaya Aura® Application Enablement Services on Avaya Aura® System Platform* Release 6.1.

Avaya Aura® Application Enablement Services Bundled Server

This offer does not include hardware. It is software for customers with an existing Bundled Server S8510 hardware platform who want to install or upgrade to AE Services Release 6.1. The High Availability Failover feature is not available with the Bundled Server offer.

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.

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Caribbean and Latin America	786–331–0860
Europe, Middle East, and Africa	36–1238–8334
Asia Pacific	65–6872–8686

Chapter 2: New Features for AE Services Release 6.1

Processor Ethernet enhancements

Beginning with AE Services 6.1, Processor Ethernet (PE) connections can be utilized in Enterprise Survivable Server (ESS) and Local Survivable Processor (LSP) environments. In addition, customers can choose which ESS and LSP nodes to use while running in a fragmented state. Fragmentation can occur when the main Communication Manager fails over to ESS/LSP nodes. If there are multiple switch connections to the same switch, then it is possible for each switch connection to end up on a different ESS/LSP node. This can be avoided by setting a priority level to each of the nodes.

AE Services 5.2 introduced support for PE connections 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 began support for PE connections on all Communication Manager platforms (S8300, S8400, S85xx, S87xx, and S8800). However, Release 5.2 did not support the use of PE connections in ESS and LSP environments. In Release 5.2, a CLAN interface had to be used for AE Services to Communication Manager connectivity in all ESS and LSP configurations.

For more information about ESS and LSP configurations, see Support for an Enterprise Survivable Server configuration on page 21.

Note:

Partial PE support can be achieved between AE Services 6.1 and Communication Manager 5.1. However, for full support of PEs, Communication Manager 6.0 is required.

DMCC enhancements

AE Services 6.1 provides .NET DMCC clients for the following operating systems:

- Windows 7 Professional (32-bit and 64-bit in 32-bit compatibility mode)
- Windows 7 Enterprise (32-bit and 64-bit in 32-bit compatibility mode)
- Windows 7 Ultimate (32-bit and 64-bit in 32-bit compatibility mode)

- Windows Server 2008 R2 (64 bit in 32-bit compatibility mode)
- Windows XP Professional (32-bit)
- Windows 2003 Server Standard Edition (32-bit)

AE Services 6.1 also provides:

- automatic re-registration of DMCC endpoints when Communication Manager fails over to ESS or LSP.
- a unified API for DMCC call control services (including Java and XML SDKs) with key focus on enabling Microsoft.NET developers to adopt AE Services for CTI-based applications.
- a new “Service Link Status Changed” event that indicates when the service link status associated with a device has changed.

TSAPI enhancements

AE Services 6.1 provides TSAPI clients for the following operating systems:

- RHEL 5 (32-bit and 64-bit in 32-bit compatibility mode)
- RHEL 4 (32-bit)
- Windows 7 Professional (32-bit and 64-bit in 32-bit compatibility mode)
- Windows 7 Enterprise (32-bit and 64-bit in 32-bit compatibility mode)
- Windows 7 Ultimate (32-bit and 64-bit in 32-bit compatibility mode)
- Windows Server 2008 R2 (64 bit in 32-bit compatibility mode)
- Windows XP Professional (32-bit)
- Windows 2003 Server Standard Edition (32-bit)

CVLAN enhancements

AE Services 6.1 provides CVLAN clients for the following operating systems:

- RHEL 5 (32-bit and 64-bit in 32-bit compatibility mode)
- Windows 7 Professional (32-bit and 64-bit in 32-bit compatibility mode)
- Windows 7 Enterprise (32-bit and 64-bit in 32-bit compatibility mode)
- Windows 7 Ultimate (32-bit and 64-bit in 32-bit compatibility mode)

- Windows Server 2008 R2 (64 bit in 32-bit compatibility mode)
- Windows XP Professional (32-bit)
- Windows 2003 Server Standard Edition (32-bit)

IBM Sametime clustering

AE Services 6.1 supports IBM Sametime clustering. IBM Sametime clustering consists of multiple IBM Sametime servers configured to operate together, providing failover and load balancing for IBM Sametime instant messaging and presence functionality. IBM Sametime multiplexers are a configuration that allows for the offloading of Sametime User Connection Management to a separate Sametime Community Services multiplexer.

AES Sametime integration can operate in the following configurations:

- Sametime community cluster with multiplexer co-resident on the Sametime server
- Sametime community cluster with multiplexer on separate servers
- Multiple Sametime community clusters with multiplexers on separate severs
- Load balancer in front of Sametime community cluster

IPv6 addresses

AE Services 6.1 supports IPv6 addressing for connection to Communication Manager 6.0 or later. IPv6 addresses for the AE Services server as well as supporting clients connecting to an IPv6 address on the AE Services server are supported.

Historical Metric Data Collector

AE Services 6.1 introduces the Historical Metric Data Collector (HMDC) feature, which enables you to collect, store, and view AE Services metrics. You can use this data to view the performance of the AE Services server and create forecasts about expected loads in coming months and special events.

You can collect performance data from the following groups:

- System
- Transport
- CVLAN
- TSAPI
- DMCC
- DLG

To administer the HMDC feature, you must use the Command Line Interface (CLI). From the CLI, you can:

- Specify the type of data you want to collect and the collection interval.
- Generate reports that are saved to a .csv file. For each report, you can specify the time interval (start date and stop date), the sort criteria (date data was collected or metric group), and the metric group in which you are interested.
- Clean up (that is, delete) historical data.

Note:
To run the report, you must be a member of the group *susers*.

AE Services will generate an automated report daily for the metrics sampled on that particular day. The report is stored in the location **`$HMDC_HOME/reports/report_<date>.cvs`**.

For more information about the HMDC feature, see the *Avaya Aura®Application Enablement Services Administration and Maintenance Guide*.

Third-party call control of remote stations associated with a SIP endpoint

AE Services 6.1 supports the Communication Manager 6.0 Feature Access Code (FAC) capability to redirect third-party call control commands to a remote H.323 station registered at a SIP endpoint address. This allows the Avaya one-X Portal application to support Telecommuter and Road Warrior modes for users that have SIP endpoints on their desktops. Activation of this feature via FAC also allows the EC500 feature to function correctly for SIP endpoints.

ASAI and associated API enhancements

AE Services 6.1 provides enhancements to the ASAI interface and to the APIs that are downstream of ASAI to allow Avaya Aura Contact Center, as well as potentially other

applications, to work better with physical phones. Enhancements were made to Call Control Services so that Third Party Call Control events (ServiceInitiated, Originated, and Held) will contain EventCause values of TRANSFER or CONFERENCE when a manual transfer or conference is initiated by a physical phone.

TSAPI, DMCC and associated client enhancements

AE Services 6.1 provides enhancements to the DMCC and TSAPI interfaces so that Third Party Call Control events (ServiceInitiated, Orginated, and Held) will contain EventCause of CONSULTATION when a ConsultationRequest is made.

These enhancements will be leveraged by Avaya Aura Contact Center, as well as potentially other applications.

Chapter 3: AE Services Product Summary

Introduction

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. A description of each service that is included in AE Services is provided in this chapter. For a high-level illustration of AE Services see AE Services configuration at a glance on page 18.

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 47.

- DMCC first-party call control
  - DMCC with Device Control provides 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 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.
- Routeing Services

DMCC call recording solutions - IP Migration Readiness and Optimization analysis

For 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

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, completing routing of incoming calls, receiving notifications of events, invoking Communication Manager features and querying Communication Manager for information. Java Telephony API (JTAPI) 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 47.

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 Web Services Definition Language (WSDL) and Simple Object Access Protocol (SOAP) connectivity.

For more information about the Web services SDKs, see Application Enablement Services SDKs on page 47.

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.

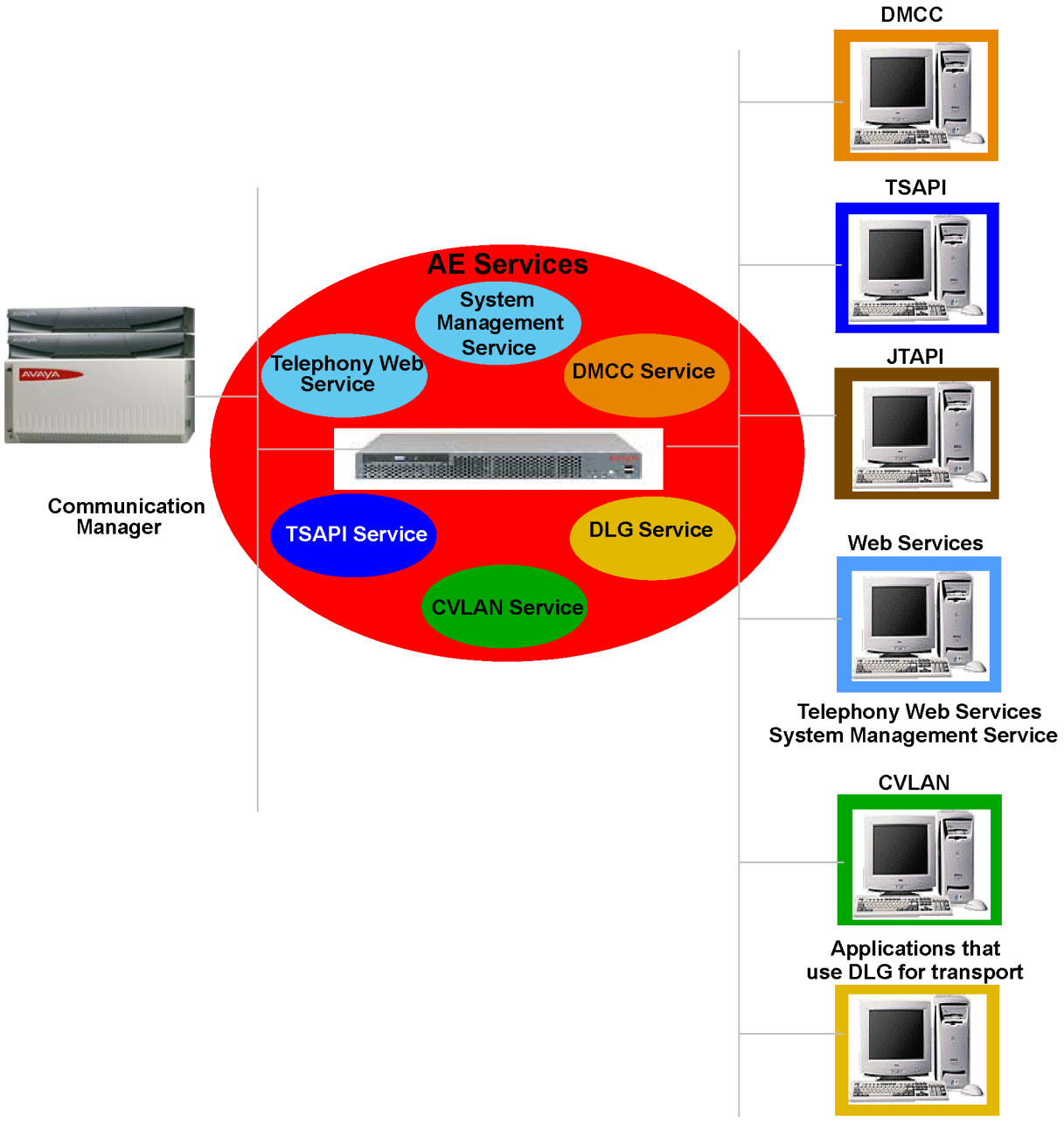
CVLAN service

The CallVisor LAN (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, completing 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 DEFINITY LAN Gateway (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.

AE Services configuration at a glance



Chapter 4: Network Security and Reliability

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 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 unlock a Linux account

The Lock/Unlock Login feature in 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 AE Services Management Console (**Security** > **Audit** > **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.

Additional AE Services security features information

For more information about AE Services security features, see *White Paper on Security in Application Enablement Services for the Bundled, AES on System Platform and Software Only Solutions*, located on the Avaya Support Web site http://www.avaya.com/support.

Secure application links

You can configure all AE Services APIs to use secure application links. The AE Services client 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 Programmers 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.

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

Prior to AE Services 6.1, only switch connections on CLANs where supported for Enterprise Survivable Server (ESS) configurations. Beginning with AE Services 6.1, switch connections on both CLANs and Processor Ethernet (PE) connections are supported for ESS configurations. Additionally, any DMCC endpoints registered to the main switch (using the Time-to-Service feature) will automatically re-register to the ESS or LSP.

Note:

A combination of CLANs and PEs for ESS configurations are supported if the main switch connection is configured as a CLAN. If the main switch connection is configured as a PE connection, then all ESS configurations should be configured as PE connections.

Note:

Partial PE support can be achieved between AE Services 6.1 and Communication Manager 5.1. However, for full support of PEs, Communication Manager 6.0 is required.

Uninterrupted telephony is important for many enterprises, especially for mission-critical applications. Avaya Communication Manager 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.

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

Chapter 5: Guidelines and requirements for configuring AE Services

This topic 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 6.1 High Availability (HA) Configurations,* located on the Avaya Support Web site http://www.avaya.com/support.

- 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 an 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 and you are using Communication Manager licenses for DMCC endpoints , you would not use the transport link. If you want to use WebLM's DMCC-DMC licenses, you need a transport link.
  - If your applications use an AEP connection, AE Services can support up to 16 connections to Communication Manager servers. For more information, see Configurations that use AEP connections on page 24.
- AE Services recommends that you use the Processor Ethernet interface for all 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 and ESS, it is required that Communication Manager be configured for H.323 registration using the Time-to-Service feature in order to do silent recovery of DMCC registrations. For AE Services 6.1, 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 sessions and 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 21.

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. If, however, you use CLANs, AE Services strongly recommends that you use at least 2 CLANs for each switch connection to Communication Manager.

- TSAPI

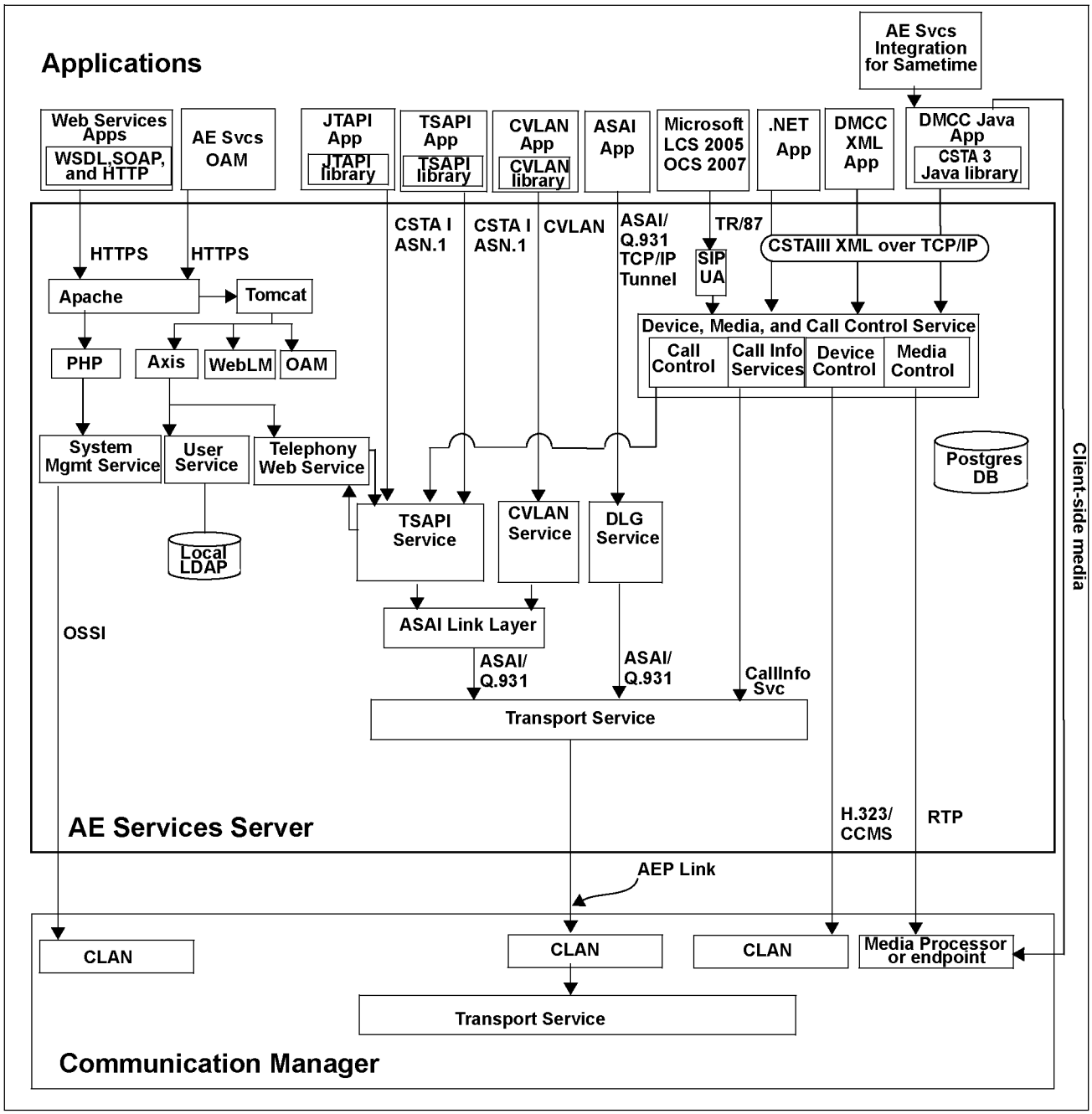
  The following APIs, services, and integrations also use the TSAPI service:

  - 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
  - DMCC endpoint registration using WebLM's DMCC-DMC licenses
  - Telephony Web Services

- DMCC with Call Information Services
- CVLAN
- DLG

Chapter 6: AE Services Architecture

AE Services architecture at a glance

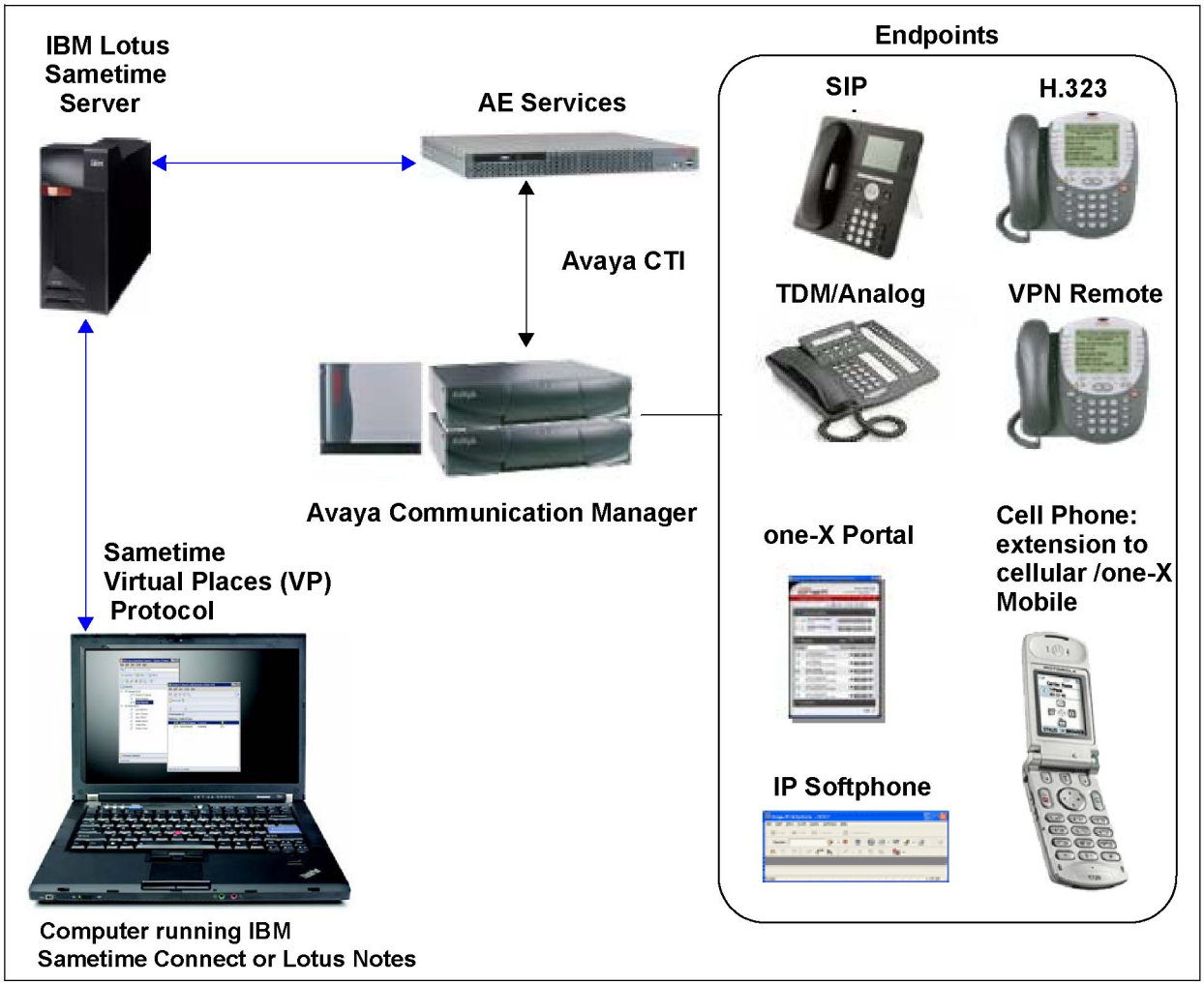


AE Services integration for IBM Lotus Sametime

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 in AE Services 4.2. For Release 6.1, AE Services now supports IBM Sametime 8.5.0 and 8.5.1, in addition to IBM Sametime 8.0.2 and 7.5.

The AE Services integration for IBM Lotus Sametime 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.



AE Services integration with Microsoft Office Communication Server

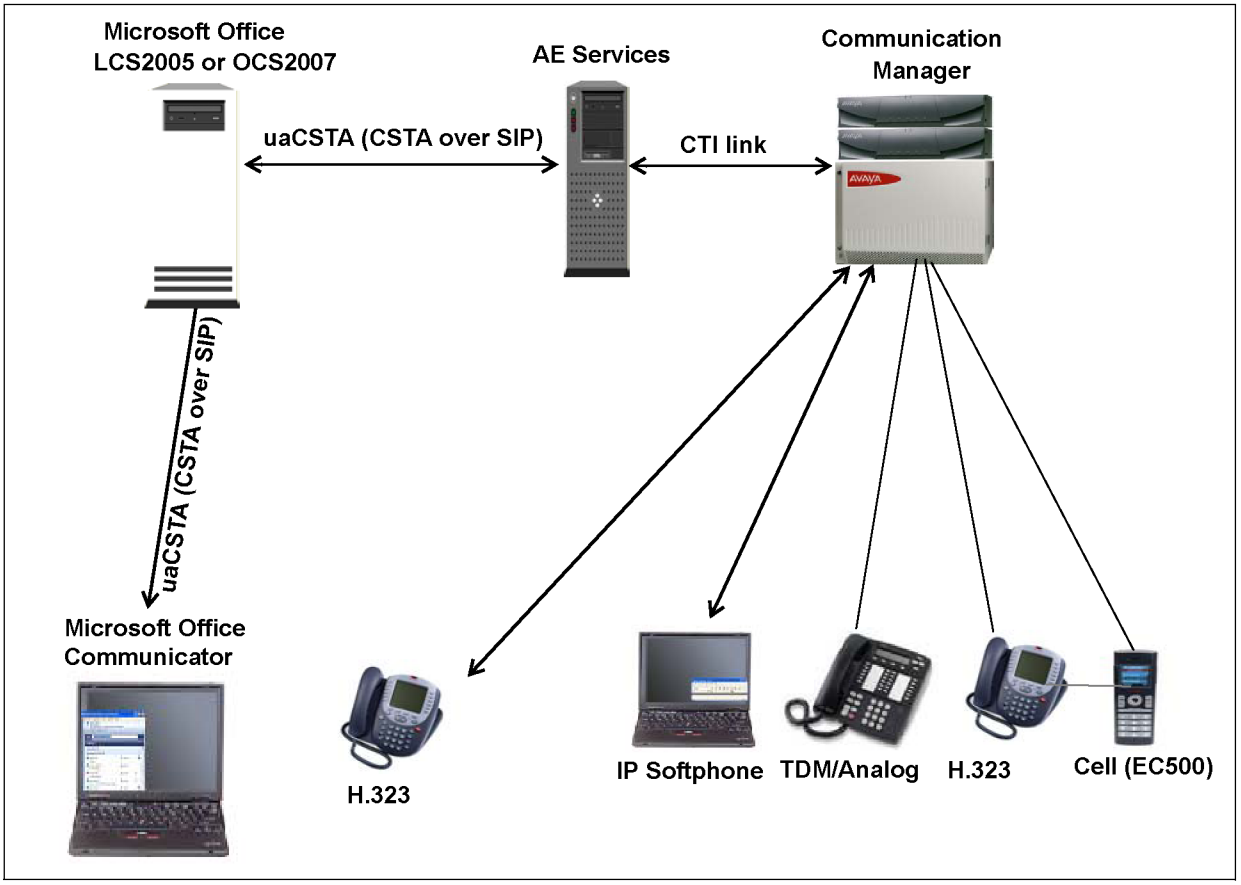
AE Services provides an integration solution that is compatible with either of the following Microsoft Office platforms:

- 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.



Chapter 7: Session Initiation Protocol (SIP)

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 or later 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, or Avaya Session Manager (ASM)

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

SIP limitations

The following topics list the SIP limitations for AE Services. For more information about SIP limitations, see the Application Enablement Services Release Notes.

DMCC

All third-party call control capabilities are supported for the endpoints listed in SIP support on page 31. 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. If

the DMCC endpoint is registered as dependent to the SIP extension, it will not receive media.

- 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 purposes such as pressing buttons, monitoring LEDs, and monitoring display.

TSAPI/JTAPI

All third-party call control capabilities are supported for the endpoints listed in SIP support on page 31, 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 on page 31, 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 Calls 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

Chapter 8: AE Services Licensing

AE Services licensing summary

The table in this topic summarizes how features are licensed on Communication Manager and AE Services. For further information about licensing for a specific product, see the following topics:

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	Not applicable	Not applicable	Unified Desktop

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.**
Communications Server			
AE Services Integration IBM Lotus Sametime	Not applicable	Not applicable	Unified Desktop
DMCC - Device and Media Control	IP-API_A • 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 Communication Manager is less than Release 5.1, new and add-on licenses are licensed in IP_API_A on Communication Managerlicense 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	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 the Communication Manager 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 AE Services, while allowing customers to continue to be able to use the previously purchased IP_API_A licenses as well. If Communication Manager is Release 6.0 or later, all new DMCC licenses are added to VALUE_DMCC_DMC on theAE Services license file only.

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.**
	licensed in IP_API_A on Communication Manager or the AE Services license file, consumes an IP_STA license and STA 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 Device, Media, and Call Control (DMCC)	None	• Unified Desktop • 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) If Communication Manager is Release 6.0 or later, all new DMCC licenses are added to VALUE_DMCC_DMC on theAE Services license file only.

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.**
	licensing on page 38.		
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	• AES Advanced Small Switch • AES Advanced Medium Switch • AES Advanced Large Switch
Web Services - Telephony Web Service	Computer Telephony Adjunct Links	None	None
Web Services- System Management Service	None	None	SMS Proxy SMS_OSSI
CVLAN Service (Avaya Interaction Center)	Computer Telephony Adjunct Links	Increased Adjunct Route Capacity (for adjunct routing applications)	CVLAN Proprietary Links
CVLAN Service (Non-Avaya applications) **Note:** ASAI Core and ASAI Plus are included for one Communication Manager server when purchasing the	ASAI Core	• CTI Stations • Phantom Calls • Adjunct Routing (Communication Manager 5.1 or later) • Increased Adjunct Route Capacity	CVLAN ASAI

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.			
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

Application Enablement Protocol connections licensing

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

In releases prior to AE Services Release 5.2, must have an 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. For more information, see Configurations that use AEP connections on page 24. 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.

AE Services integration for Microsoft Office Communications Server licensing

The AE Services integration with either Microsoft Office Live Communications Server 2005 or Microsoft Office Communications Server 2007 requires the Unified Desktop Edition RTU (Right To Use) license.

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 *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 AE Services Unified Desktop Edition RTU (Right To Use) license.

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

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

Device, Media, and Call Control (DMCC) licensing

The 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 Release 4.2 or higher and Communication Manager is 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 (in other words, if AE Services is Release 4.1 or lower and Communication Manager is Release 5.0 or lower), 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 information provided above about factoring in release levels continues to apply. Effective with Communication Manager Release 6.0, all new DMCC licenses will be added only to the AE Services license file VALUE_DMCC_DMC field.

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. For more information, see Application Enablement Protocol connections licensing on page 37.

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 Application Enablement Protocol connection license. For more information, see Application Enablement Protocol connections licensing on page 37.

Web services licensing

For the Telephony Web Service, Communication Manager requires Computer Telephony Adjunct Links to be licensed for Web services.

System Management Service (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. The TSAPI Advanced license provides access to a different set of features than the TSAPI Basic User 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 or control a station. In the license file it is referred to as a “Simultaneous User” license. It is scaled in terms of the number of agents or stations that you want to monitor and control.

The TSAPI basic user license requires that you license and enable Computer Telephony Adjunct Links on Communication Manager. The following table shows the TSAPI basic user license capabilities in terms of TSAPI service requests.

Call Control Service Group	Monitor Service Group
Alternate Call Answer Call Clear Connection Conference Call Consultation Call Deflect Call Hold Call Make Call Pickup Call Reconnect Call Retrieve Call Single Step Conference Single Step Transfer Transfer Call	Monitor Device Change Monitor Filter

Once a TSAPI basic user license has been allocated on behalf of a station, that license will remain in use as long as one of the following conditions exists:

- The station is being monitored.
- There are any calls present at the station.

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 following table shows the capabilities provided with the TSAPI advanced license.

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.

If you have a routing application that requires additional capacity, you have the option of licensing the Increased Adjunct Route Capacity feature on Communication Manager.

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: ASAI Plus, 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 CVLAN 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: ASAI Plus, 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

Beginning 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 are 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 Comparison of standard licensing and enterprise-wide licensing on page 42.
- For examples of licensing configurations, see Licensing configuration examples on page 43.

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	AE Services introduced support for enterprise-wide licensing with Release 4.2.

Standard licensing	Enterprise-wide licensing
continues to be used for standalone AE server licensing.	
A standard license is generated by the Product Licensing and Delivery System (PLDS) 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) is generated by the 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.
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.

Licensing configuration examples

To understand how licensing configurations work, this section provides a description of standard licensing and enterprise-wide licensing.

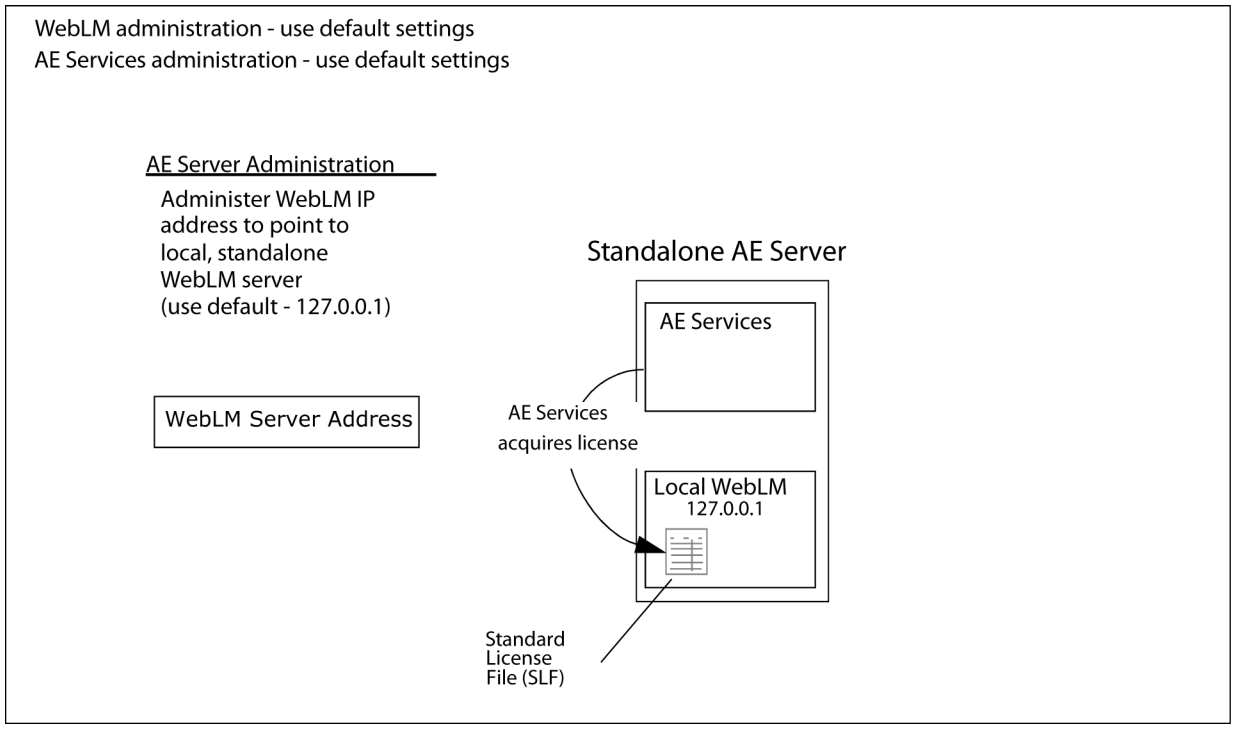
Standard licensing

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. The following figure illustrates the standard licensing configuration.

Note:

If you use the standalone configuration, use the default settings on the WebLM Server Address page in the AE Services Management Console.

Standalone configuration (without enterprise-wide licensing)



Enterprise-wide licensing — allocating licenses or features

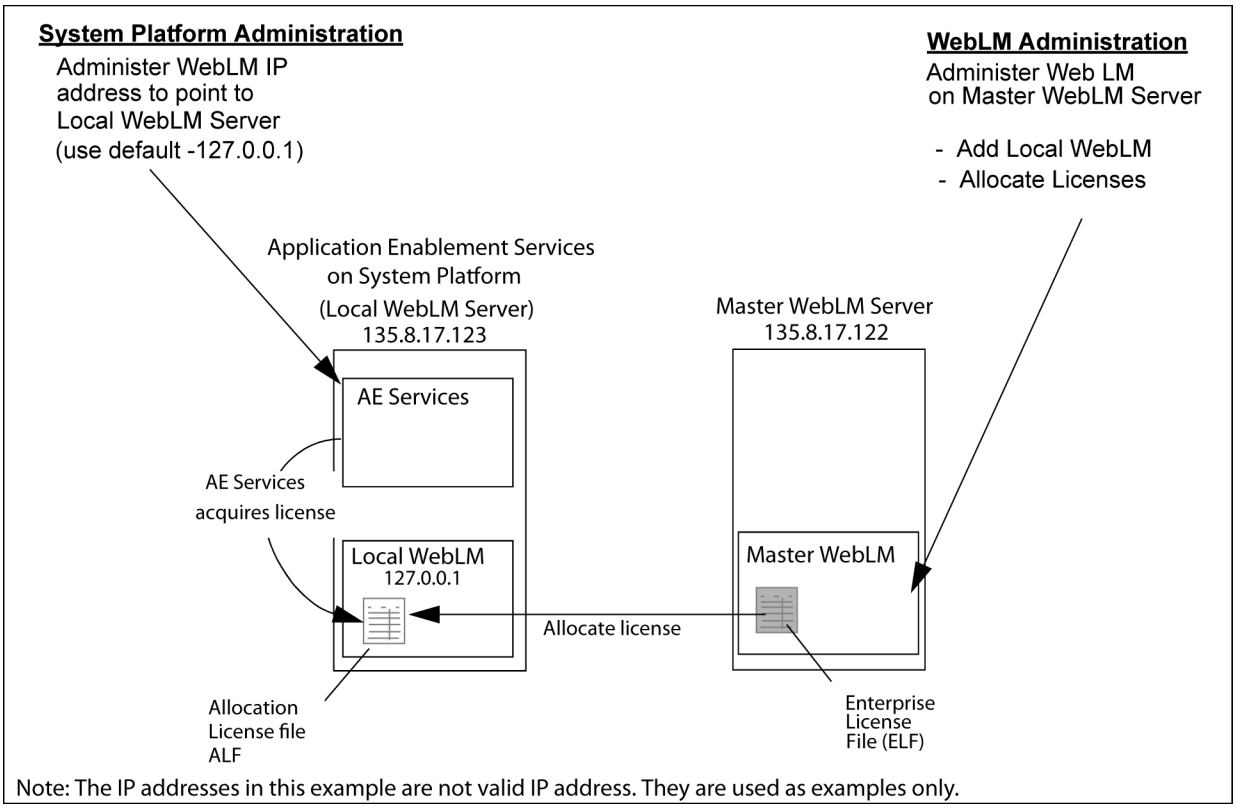
Starting with Release 4.2, AE Services expanded its licensing capabilities to include enterprise-wide licensing. Enterprise-wide licensing provides the flexibility to move capacities and features from one AE Sever to another. For example, prior to AE Services 4.2, if you had purchased 3 AE Servers with 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.

Because this configuration relies on a master enterprise license file (ELF), which generates allocation license files (ALF), it is referred to as an ELF/ALF configuration. Each ALF will reside on an AE Server with a Local WebLM Server. This is the recommended model for AE Services enterprise configurations. If you use the ELF/ALF model, you do not need to change the default settings on the WebLM Server Address page.

For this configuration you must use WebLM Administration to configure the local WebLM so the master WebLM server can allocate licenses to the AE Server. (In the WebLM Administration, select **Licensed Products** > **Application Enablement (CTI)** > **Configure Local WebLMs** > **Add Local WebLM**.)

The following figure illustrates an ELF/ALF configuration.

Enterprise-wide licensing — allocating licenses or features



For information about setting up this type of configuration, see Setting up a configuration for allocating licenses.

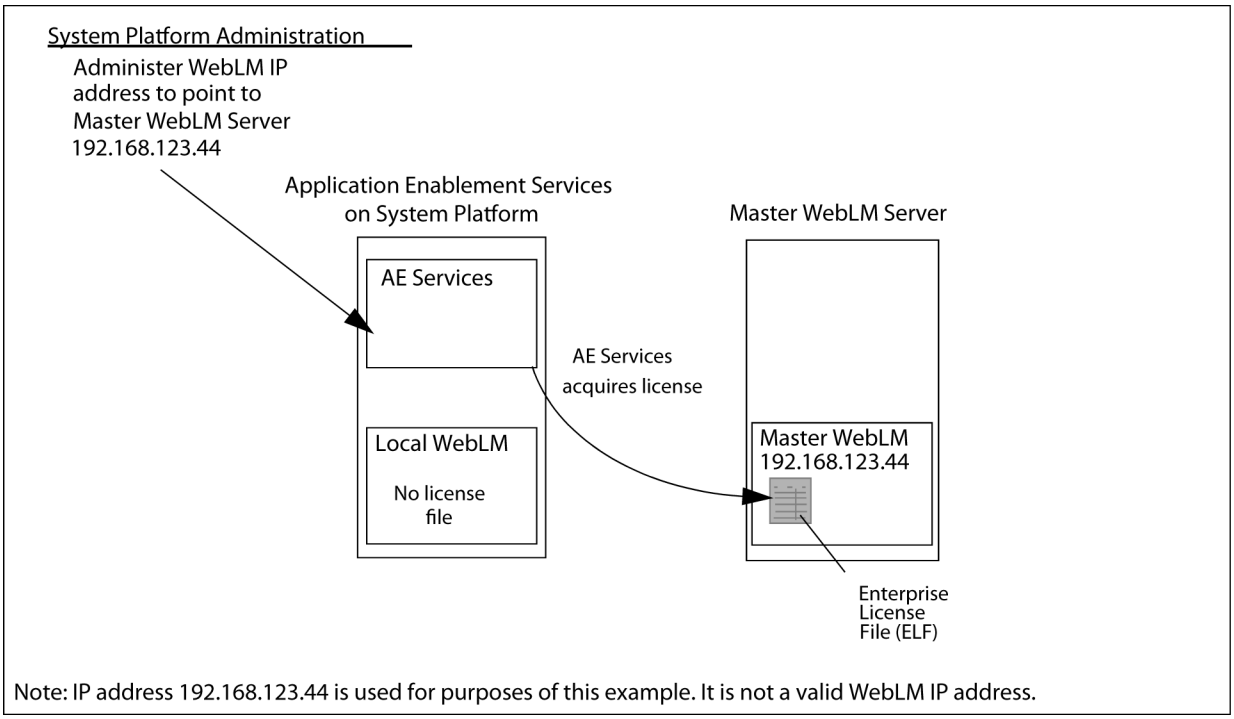
Enterprise-wide licensing — pointing to a master license on a remote server

Another type of enterprise licensing configuration is an enterprise license file (ELF)-only configuration. In an ELF-only configuration, the enterprise license file resides on a master WebLM server, and one or more AE Servers point to the IP address of the master WebLM server. No allocation license files (ALFs) reside on AE servers.

If you use the ELF-only configuration, you must administer the WebLM Server Address page in the AE Services Management Console with the WebLM IP address and WebLM port number for the master WebLM server that hosts the ELF.

The following figure illustrates an ELF-only configuration.

Enterprise-wide licensing – pointing to a master license on a remote server



Caution:

Using the ELF-only configuration is not recommended because network latency and outages can affect the ability of the AE Server to acquire licenses, and it creates a single point of failure for licensing.

Additional documents

See the following documents for more information about AE Services licensing.

- *Implementing Avaya Aura® Application Enablement Services on Avaya Aura® System Platform*, Release 6.1
- *Implementing Avaya Aura® Application Enablement Services for a Bundled Server* , Release 6.1
- *Implementing Avaya Aura® Application Enablement Services in a Software-Only Environment*, Release 6.1
- *Avaya Aura® Application Enablement Services Administration and Maintenance Guide*, Release 6.1

Chapter 9: Application Enablement Services SDKs

All Application Enablement Services Software Development Kits (SDKs), with the exception of the TSAPI SDK, are available on the Avaya Support Web site http://www.avaya.com/support 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. The following table lists the SDKs provided with Application Enablement Services.

Name	Distribution	Material code/URL
Application Enablement Services TSAPI SDK	Contact your account executive	700500048
Application Enablement Services DMCC Java SDK	Avaya DevConnect Developer Program	http://www.avaya.com/support www.avaya.com/devconnect
Application Enablement Services DMCC XML SDK	Avaya DevConnect Developer Program	http://www.avaya.com/support www.avaya.com/devconnect
Application Enablement Services DMCC .NET SDK	Avaya DevConnect Developer Program	http://www.avaya.com/support www.avaya.com/devconnect
Application Enablement Services Web Service — Telephony SDK	Avaya DevConnect Developer Program	http://www.avaya.com/support www.avaya.com/devconnect
Application Enablement Services JTAPI SDK	Avaya DevConnect Developer Program	http://www.avaya.com/support www.avaya.com/devconnect

Chapter 10: Communication Manager features not supported

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 Communication Manager 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 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. Asingle-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.

Chapter 11: Capacities for AE Services

AE Services integration for Microsoft Office Communication Server

Requires 2 G memory and hardware platform equivalent to the Avaya S8510/Dell 1950.

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 2 G 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

IBM Sametime Connect Clients per AE Server	
	1000 DMCC clients in client media mode at 18,000 BHCC

Capacities for calls in DMCC applications

The number of simultaneous active calls that Device, Media, and Call Control (DMCC) 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 DMCC capacities listed in Table 1: Non-server media (client media, telecommuter, and no-media) on page 52 and Table 2: Server media on page 53 with the Communication Manager resources and capacities described in Communication Manager capacities for DMCC on page 54 to make sure that you have adequate Communication Manager resources for a given DMCC implementation.

Table 1: 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 (Avaya Common Server – Dell R610, S8800, Dell 1950, or equivalent customer-provided 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

Session and H323 Signaling Encryption	AE Server Capacity	Traffic Rate for Applications
		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 (Avaya Common Server – Dell R610, S8800, Dell 1950, or equivalent customer-provided 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).

Table 2: Server media

	Code 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

Note:

Traffic rate for applications is a gap of 10 seconds between each set of 100 registrations.

Communication Manager capacities for DMCC

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 DMCC 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

Component	Capacity
Simultaneous Communication Manager Servers	16
Simultaneous sessions/logins per Communication Manager	5

Component	Capacity
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

	Avaya Common Server – Dell R610	S8800	S8710 S8720	S8720XL S8730	S8510	S8500B S8500C	S8400	S8300x G430 G700 G350 G250	S83xx G450
AE Services servers per Communication Manager	16	16	16	16	16	16	16	16	16
AE Services server interfaces (Processor Ethernet or CLAN)	16	16	16	16	16	16	16	16	16
Inbound messages per second per AE Services connection (CLAN)	200	200	200	200	200	200	200	200	200
Inbound messages per second per AE Services connection (Processor Ethernet)	1000	1000	1000	1000	1000	720	240	240	240
Outbound messages	240	240	240	240	240	240	240	240	240

	Avaya Common Server – Dell R610	S8800	S8710 S8720	S8720XL S8730	S8510	S8500B S8500C	S8400	S8300x G430 G700 G350 G250	S83xx G450
per second per AE Services connection (CLAN)									
Outbound messages per second per AE Services connection (Processor Ethernet)	1000	1000	1000	1000	1000	720	240	240	240
Messages per second per system (full duplex with 5 CLANs)	1000 (see note below)	1000 (see note below)	1000 (see note below)	1000 (see note below)	1000 (see note below)	720	240	240	240

Note:

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 plus 1 redundant CLAN will be able to reach 1000 msgs/sec.

System capacities – AE Services server 6.1

Component	Capacity
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 Communication Manager (1 CLAN)	200

Component	Capacity
Messages per second per AE Server connection to Communication Manager (processor ethernet)	1000
Messages per second per AE Server connection from Communication Manager (1 CLAN)	240
Messages per second per AE Server connection from Communication Manager (processor ethernet)	1000
Messages per second (per system)	1000 (see Note below)

Note:

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 plus 1 redundant CLAN 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 is 32,768.

CVLAN service capacities

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

DLG service capacities

Component	Capacity
Clients supported	16
Links	16

TSAPI service capacities

Component	Capacity
Users (client connections) **Note:** A client connection refers to a unique AE Services session established by a TSAPI application. A single client connection may be used to monitor and control multiple stations or agents.	2500
Links	16 (each to a different Communication Manager)

Note:

For any AE Server, there may be only one TSAPI link to any given Communication Manager.

Chapter 12: AE Services Documentation

AE Services documentation for Release 6.1

The following table lists the latest release of each AE Services document. Most of the documents listed are Release 6.1. Those listed that are for earlier releases have not required an update and remain compatible with AE Services 6.1.

	Document title	Number	Release
1	*Avaya Aura® Application Enablement Services Overview*	02-300360	6.1
2	*Implementing Avaya Aura® Application Enablement Services on Avaya Aura® System Platform*	02–603468	6.1
3	*Implementing Avaya Aura® Application Enablement Services in a Software-Only Environment*	02-300355	6.1
4	*Implementing Avaya Aura® Application Enablement Services for a Bundled Server Upgrade*	02-300356	6.1
5	*Avaya Aura® Application Enablement Services Administration and Maintenance Guide*	02-300357	6.1
6	*Avaya Aura® Application Enablement Services Implementation Guide for Microsoft Live Communications Server 2005 or Microsoft Office Communications Server 2007*	02-601893	6.1
7	*Avaya Aura® Application Enablement Services Integration Guide for IBM Lotus Sametime*	02-602818	6.1
8	*Avaya Aura® Application Enablement Services Online Help* (packaged with Application Enablement Services software and not available on the Web)	Not applicable	6.1
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

	Document title	Number	Release
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 Avaya DevConnect Site)	Not applicable	5.2
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 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 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 Avaya DevConnect Site)	Not applicable	3.1
18	*Avaya Aura® Application Enablement Services TSAPI and CVLAN Client and SDK Installation Guide*	02-300543	6.1
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	*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 Avaya DevConnect Site)	Not applicable	5.2
24	*Application Enablement Services ASAI Technical Reference*	03-300549	4.1
25	*Application Enablement Services ASAI Protocol Reference*	03-300550	3.1

Select documents based on products you use

One way of identifying the appropriate documents to use is to select 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

  This 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)

  This guide provides the implementation details that you need when you are designing or implementing an application, such as which features and interfaces are supported by AE Services.

- *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.

Guidelines for selecting documents based on your role within an organization

Planners

If you are involved with planning an Application Enablement Services server installation use this document, the *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. This guide is a high-level planning and implementation guide for integrating AE Services and 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* , 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 this 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* , 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 this 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, 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, use the following documents.

- *Implementing Avaya Aura® Application Enablement Services for a Bundled Server* , 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, use the following documents.

- *Implementing Avaya Aura® Application Enablement Services in a Software-Only Environment*, 02–3003565.
- *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 and CVLAN clients and SDKs, refer to *Avaya Aura® Application Enablement Services TSAPI and CVLAN Client and SDK Installation Guide*, 02–300543.

Application developers

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 on page 47.

Avaya DevConnect Program

Application developers who want to take advantage of the AE Services APIs or protocols are encouraged to participate in the Avaya DevConnect Program. The Avaya 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, go to the Avaya DevConnect Web site 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 introduced 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 Services 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 more information about Web services, see the *Avaya Aura® Application Enablement Services Web Services Programmer's Guide*, 02–300362.

DMCC API programmers

Application Enablement Services provides DMCC programmers with tools that help them learn how to use the APIs and with SDKs for implementing the APIs.

Note:

DMCC API was formerly known as Communication Manager API.

• To see the capabilities of an AE Services DMCC application, see “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's Guide*, 02–300358
- *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 Avaya DevConnect Site)
- *Avaya Aura® Application Enablement Services Device, Media, and Call Control Java Programmer 's Guide*, 02–300359
- *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 Avaya DevConnect Site)
- *Avaya Aura® Application Enablement Services Device, Media and Call Control API .NET Programmer's Guide*, 02–602658
- *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 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 *Avaya Aura® Application Enablement Services TSAPI and CVLAN Client and SDK Installation Guide*, 02-300543.
- *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. This document 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, use the *Application Enablement Services TSAPI for Avaya Communication Manager Programmer's Reference*, 02-300544, as your primary reference.

JTAPI programmers

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

- *Avaya Aura® Application Enablement Services JTAPI Programmers Guide*, 02-603488. This document describes how to use the 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 the 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 clients and SDKs, see the *Avaya Aura® 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 this document. Consult this document when a high level of detail is required.
- *Application Enablement Services ASAI Protocol Reference*, 03–300550. CVLAN uses the ASAI protocol. Consult this document when a high level of detail regarding information elements and the layout of ASAI messages is required.

ASAI programmers

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

Note:

AE Services does not support newly-developed ASAI applications.

- *Application Enablement Services ASAI Technical Reference*, 03–300549. This document provides technical descriptions of ASAI third-party call control capabilities.
- *Application Enablement Services ASAI Protocol Reference*, 03–300550. This document provides byte-level descriptions of ASAI messages.

Appendix A: AE Services Release 6.1 compatibility

This appendix describes the clients, API, and versions of Communication Manager that AE Services 6.1 supports. Additionally, this appendix describes the Communication Manager platforms that support AE Services 6.1.

API and client compatibility

AE Services 6.1 supports the API and clients described in this topic.

DMCC compatibility

Note:

- DMCC 3.x refers to any of the following releases: 3.0, 3.1, 3.1.1, 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 5.x refers to any of the following releases: 5.0, 5.2, 5.2.2.
- DMCC API refers to any of the following releases: XML API, .NET SDK and Java SDK on JDK 5.0.

AE Services 6.1 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 AE Services 6.1 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 theAE Services 6.1 DMCC Service.

- DMCC 3.1.x XML applications:

XML developers should be aware that AE Services 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 6.1 DMCC Service.

- DMCC 4.0.x XML applications:

  The DMCC 4.0. XML applications will work with the AE Services 6.1 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 6.1 DMCC Service.

- DMCC 4.1.x XML applications:

  The DMCC 4.1 XML applications will work with the AE Services 6.1 DMCC Service.

- The 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 6.1 DMCC Service.

- DMCC 4.2.x XML applications:

  The DMCC 4.2.x XML applications will work with the AE Services 6.1 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 AE Services 6.1, the Telephony Web Service does not introduce any new features.

System Management Service compatibility

For AE Services 6.1, the System Management Service does not introduce any new features.

TSAPI compatibility

AE Services 6.1 TSAPI Service includes all of the functionality provided by AE Services 3.x, 4.x, 5.2 and Avaya CT 1.x. AE Services 6.1 TSAPI Service is backward compatible with the following TSAPI/JTAPI clients and libraries: AE Services 4.x and 5.2.

CVLAN compatibility

The AE Services 6.1 CVLAN Service includes all of the functionality provided by AE Services 3.x through 5.2 CVLAN Service, CVLAN on MAPD, and the CVLAN R9 Server for Linux. The AE Services 6.1 CVLAN Service is backward compatible with the following CVLAN clients and libraries: AE Services 4.1.x and 5.2.

DLG compatibility

AE Services 6.1 and Communication Manager 5.1 releases do not introduce any new DLG Service features.

- The AE Services 6.1 DLG Service includes all of the functionality provided by previous releases of the AE Services DLG Service (3.x through 5.2), the “DLG on the MAPD”, and the “Co-Res (co-resident) DLG.”
- The AE Services 6.1 DLG Service is compatible with existing applications that rely on the DLG Service.

AE Services compatibility with Communication Manager

AE Services 6.1.2 is compatible with the following Communication Manager releases:

- Communication Manager 5.0
- Communication Manager 5.1
- Communication Manager 5.2 and 5.2.1
- Communication Manager 6.0 and 6.0.1
- Communication Manager 6.2

Communication Manager 6.2 is compatible with AE Services 6.1.2.

AE Services compatibility with Communication Manager 6.0 CTI interfaces

AE Services relies on the CLAN and the Processor Ethernet for communications with 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).

Communication Manager platform	Communications interface
S8300	Processor Ethernet only

Communication Manager platform	Communications interface
S8400	Processor Ethernet and CLAN
S85xx	Processor Ethernet and CLAN
S87xx MultiConnect (MC)	Processor Ethernet and CLAN
S87xx IP (see note below)	Processor Ethernet and CLAN
S88xx IP (see note below)	Processor Ethernet and CLAN
Avaya Common Server – Dell R610 (see note below)	Processor Ethernet and CLAN

Note:
With AE Services 5.2 or later and Communication Manager 5.2.1 or later, switch connections, H.323 links, and SMS connections can now be established directly to the Processor Ethernet on Communication Manager S87xx, S8800, and Avaya Common Server – Dell R610.

Communication Manager 6.0 - ASAI capabilities

For customer-developed CVLAN and ASAI-based applications, Communication Manager must be provisioned with ASAI features.

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

ASAI Plus features

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

ASAI Optional Features

- CTI Stations
- Phantom Calls
- Adjunct Routing
- Increased Adjunct Route Capacity

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 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	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 OAM Web 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 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	Lightweight Directory Access Protocol. LDAP 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 changes 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.
PKI	Public Key Infrastructure. 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	Product Licensing and Delivery System. AE Services 6.1 uses the PLDS for license management and software distribution.
Registration, Administration, and Status	Abbreviated as RAS. RAS 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. The TSAPI or CVLAN Service sends the call to the application for routing. Communication Manager does not route these calls. Also referred to as adjunct routing.

RTP Real-time Transport Protocol. RTP is an Internet standard for transmission of time-critical data, and for control of the transmission.

SIP 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 OAM. A Tlink refers to a switch connection between a specific switch and a specific AE Server.

Transport link A Transport link is a secure TCP/IP connection between the AE Services server and a CLAN 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 OAM.

	The CLAN IP addresses that you administer from the Edit CLAN IPs page in OAM are used to set up TLS connections between AE Services and Communication Manager. These are 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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