Avaya Callback Assist
Overview and planning guide

Release 4.6.1.0

September 2017

Notice

While reasonable efforts have been made to ensure that the information in this document is complete and accurate at the time of printing, Avaya assumes no liability for any errors. Avaya reserves the right to make changes and corrections to the information in this document without the obligation to notify any person or organization of such changes.

Documentation disclaimer

"Documentation" means information published by Avaya in varying mediums which may include product information, operating instructions and performance specifications that Avaya may generally make available to users of its products and Hosted Services. Documentation does not include marketing materials. Avaya shall not be responsible for any modifications, additions, or deletions to the original published version of documentation unless such modifications, additions, or deletions were performed by Avaya. End User agrees to indemnify and hold harmless Avaya, Avaya's agents, servants and employees against all claims, lawsuits, demands and judgments arising out of, or in connection with, subsequent modifications, additions or deletions to this documentation, to the extent made by End User.

Link disclaimer

Avaya is not responsible for the contents or reliability of any linked websites referenced within this site or documentation provided by Avaya. Avaya is not responsible for the accuracy of any information, statement or content provided on these sites and does not necessarily endorse the products, services, or information described or offered within them. Avaya does not guarantee that these links will work all the time and has no control over the availability of the linked pages.

Warranty

Avaya provides a limited warranty on Avaya hardware and software. Refer to your sales agreement to establish the terms of the limited warranty. In addition, Avaya's standard warranty language, as well as information regarding support for this product while under warranty is available to Avaya customers and other parties through the Avaya Support website: http://support.avaya.com or such successor site as designated by Avaya. Please note that if You acquired the product(s) from an authorized Avaya Channel Partner outside of the United States and Canada, the warranty is provided to You by said Avaya Channel Partner and not by Avaya.

Licenses

THE SOFTWARE LICENSE TERMS AVAILABLE ON THE AVAYA WEBSITE, HTTP://SUPPORT.AVAYA.COM/LICENSEINFO OR SUCH SUCCESSOR SITE AS DESIGNATED BY AVAYA, ARE APPLICABLE TO ANYONE WHO DOWNLOADS, USES AND/OR INSTALLS AVAYA SOFTWARE, PURCHASED FROM AVAYA INC., ANY AVAYA AFFILIATE, OR AN AVAYA CHANNEL PARTNER (AS APPLICABLE) UNDER A COMMERCIAL AGREEMENT WITH AVAYA OR AN AVAYA CHANNEL PARTNER. UNLESS OTHERWISE AGREED TO BY AVAYA IN WRITING, AVAYA DOES NOT EXTEND THIS LICENSE IF THE SOFTWARE WAS OBTAINED FROM ANYONE OTHER THAN AVAYA, AN AVAYA AFFILIATE OR AN AVAYA CHANNEL PARTNER; AVAYA RESERVES THE RIGHT TO TAKE LEGAL ACTION AGAINST YOU AND ANYONE ELSE USING OR SELLING THE SOFTWARE WITHOUT A LICENSE. BY INSTALLING, DOWNLOADING OR USING THE SOFTWARE, OR AUTHORIZING OTHERS TO DO SO, YOU, ON BEHALF OF YOURSELF AND THE ENTITY FOR WHOM YOU ARE INSTALLING, DOWNLOADING OR USING THE SOFTWARE (HEREINAFTER REFERRED TO INTERCHANGEABLY AS "YOU" AND "END USER"), AGREE TO THESE TERMS AND CONDITIONS AND CREATE A BINDING CONTRACT BETWEEN YOU AND AVAYA INC. OR THE APPLICABLE AVAYA AFFILIATE ("AVAYA").

Avaya grants You a license within the scope of the license types described below, with the exception of Heritage Nortel Software, for which the scope of the license is detailed below. Where the order documentation does not expressly identify a license type, the applicable license will be a Designated System License. The applicable number of licenses and units of capacity for which the license is granted will be one (1), unless a different number of licenses or units of capacity is specified in the documentation or other materials available to You. "Software" means computer programs in object code, provided by Avaya or an Avaya Channel Partner, whether as stand-alone products, pre-installed on hardware products, and any upgrades, updates, patches, bug fixes, or modified versions thereto. "Designated Processor" means a single stand-alone computing device. "Server" means a Designated Processor that hosts a software application to be accessed by multiple users. "Instance" means a single copy of the Software executing at a particular time: (i) on one physical machine; or (ii) on one deployed software virtual machine ("VM") or similar deployment.

License type(s)

Designated System(s) License (DS). End User may install and use each copy or an Instance of the Software only on a number of Designated Processors up to the number indicated in the order. Avaya may require the Designated Processor(s) to be identified in the order by type, serial number, feature key, Instance, location or other specific designation, or to be provided by End User to Avaya through electronic means established by Avaya specifically for this purpose.

Copyright

Except where expressly stated otherwise, no use should be made of materials on this site, the Documentation, Software, Hosted Service, or hardware provided by Avaya. All content on this site, the documentation, Hosted Service, and the product provided by Avaya including the selection, arrangement and design of the content is owned either by Avaya or its licensors and is protected by copyright and other intellectual property laws including the sui generis rights relating to the protection of databases. You may not modify, copy, reproduce, republish, upload, post, transmit or distribute in any way any content, in whole or in part, including any code and software unless expressly authorized by Avaya. Unauthorized reproduction, transmission, dissemination, storage, and or use without the express written consent of Avaya can be a criminal, as well as a civil offense under the applicable law.

Third Party Components

"Third Party Components" mean certain software programs or portions thereof included in the Software or Hosted Service may contain software (including open source software) distributed under third party agreements ("Third Party Components"), which contain terms regarding the rights to use certain portions of the Software ("Third Party Terms"). As required, information regarding distributed Linux OS source code (for those products that have distributed Linux OS source code) and identifying the

Table of Contents

ABOUT THIS DOCUMENT 7

Intended audience 7

Related documents 7

Glossary 8

OVERVIEW 9

Avaya Callback Assist (CBA) call flow 9
- CTI environment 10
- SIP environment 10
- AACC environment 11

Customer First vs. Agent First 11
- Customer First 11
- Agent First 12

Customer First Phantom Pool call flow details 13

Customer First Priority Queuing call flow details 14

Call Back Assist high availability feature 15

Callback Assist Dynamic Routing Engine feature 15

Callback Assist (CBA) – Dynamic Routing (DR) integration for Call Center Elite 17

Integration with Avaya Oceana™ 3.3 19

CALLBACK ASSIST FEATURES 21

IMPLEMENTATION PREREQUISITES 24

Pre-installation checklist 24

Environment configuration 25

Licensing 25
- Acquiring a license file 25
- WebLM 25
- Grace Period 26

Orchestration Designer License 27
Third-party components and licenses 27
Permissive Use Policy 27

FUNCTIONAL DESCRIPTION 28

Components 28
Web Administration application 28
IVR Applications 29
Database Server 30
Callback Engine 30
Audio File Storage 30
Reports 31
BSR Service 31

CALL FLOW SCENARIOS FOR MAIN FEATURES 33

SIP Environment 33
Offering callback to inbound caller 33
Caller Rejects callback offer 33
Schedule callback delivery Call Flow Agent First Strategy 35
Immediate Offering and Delivery Call Flow Agent First Strategy 37
SIP Customer First Phantom Pool 37
SIP Customer First Priority Queuing 38

DEPLOYING CALLBACK ASSIST 40

Deployment architecture overview 40

High Availability deployment 42
Environment support 42
Installation 43
Component operation 44
Multiple site support 45
Multiple Zone Support 47

Deployments 48

GENERAL CONSIDERATIONS 50

CTI applications 50

Avaya Interaction Center integration 50

Call flow modifications 50

DNIS or called numbers **51**

Support for Communication Manager 6.2 feature – ICR Pullback **51**
Requirements for this feature: 51

Audio formats **51**

Custom messages and translations **52**

Callback Assist Web Services API **53**

SOLVING COMMON CONTACT CENTER PROBLEMS **54**

Offering Immediate or Scheduled Callback to customers **54**

Offering callback configurations **54**

Reviewing customer information before a callback **54**

Reporting management solutions **55**

Managing data **56**

Migrating data **56**

Performing Web-based reporting and administration **56**

SUPPORT **57**

Information required for support **57**

Support limitations and restrictions **57**

Remote access for technical support **58**

Support contacts **58**
Contacting Avaya technical support 58
Contacting Avaya Professional Services 58
Escalating a technical support issue 58

About this document

The Avaya Callback Assist (CBA) Overview Guide provides an overview and functional description of the Callback Assist application. The document also lists the features of the CBA application and the environment configuration requirements to install the application.

The document does not provide in-depth technical information about CBA or such associated topics like installing or administering CBA. For a list of documents that provide specific information on such topics, see *related documents*.

Intended audience

The document is addressed to following user groups:

- Contact center management: Site administrators, supervisors, other Individual or business groups that manage contact centers, who can benefit from the Callback Assist solution.
- Customers: The contact center users. They are also referred to as *callers* in the document.
- Agents: Contact center agents. They are also referred as *agents* in the document.

Related documents

The *Avaya Callback Assist overview and planning guide* is part of the Callback Assist documentation set. The other documents in the documentation set are as follows:

- *Installing and configuring Avaya Callback Assist*
  Provides environment configuration requirements and procedural information to install and configure Callback Assist.
- *Administering Avaya Callback Assist*
  Provides information on administering and using Callback Assist.
- *Avaya Callback Assist reporting guide*
  Provides information on the Callback Assist Reporting feature.
- *Avaya Callback Assist Web services API guide*
  Provides information on Callback Assist Web services API.
- *Avaya Callback Assist migration guide*
  Provides information on preparing the user for migrating to the latest version of Callback Assist and procedure to migrate.

- *Avaya Callback Assist Release Notes*
  Provides information on the latest version of Callback Assist.

Glossary

Some of the frequently used terms in the document are as follows:

Term	Definition
CBA	Callback Assist
Caller or Customer	Person who calls up the contact center
Agent	Contact center agents
Communication Manager	Avaya Aura® Communication Manager
AES	Avaya Application Enablement Services
ASM	Avaya Aura® Session Manager
AA EP	Avaya Aura® Experience Portal (earlier known as Avaya Voice Portal)
EWT	Estimated Wait Time
PSTN	Public Switched Telephone Network
SBC	Session Border Controller
UUI	User to User Information
IC	Interaction Center
ISDN	Integrated Services Digital Network
VDN	Vector Directory Number
BSR	Best Service Route
AACC	Avaya Aura® Contact Center

Overview

Avaya Callback Assist (CBA) call flow

Avaya Callback Assist (CBA) provides enhanced control over your interactions with the contact centers and enables you to make an informed decision based on your *estimated wait time (EWT)* and queue position. You can decide whether to hold for a contact center agent or leave a message requesting a callback. CBA enables you to interact with a set of recorded voice prompts that move you efficiently and intuitively through the process. CBA can be installed in three different environments (also known as platforms) based on your business requirements, namely CTI, SIP and AACC. CBA also offers high availability configuration.

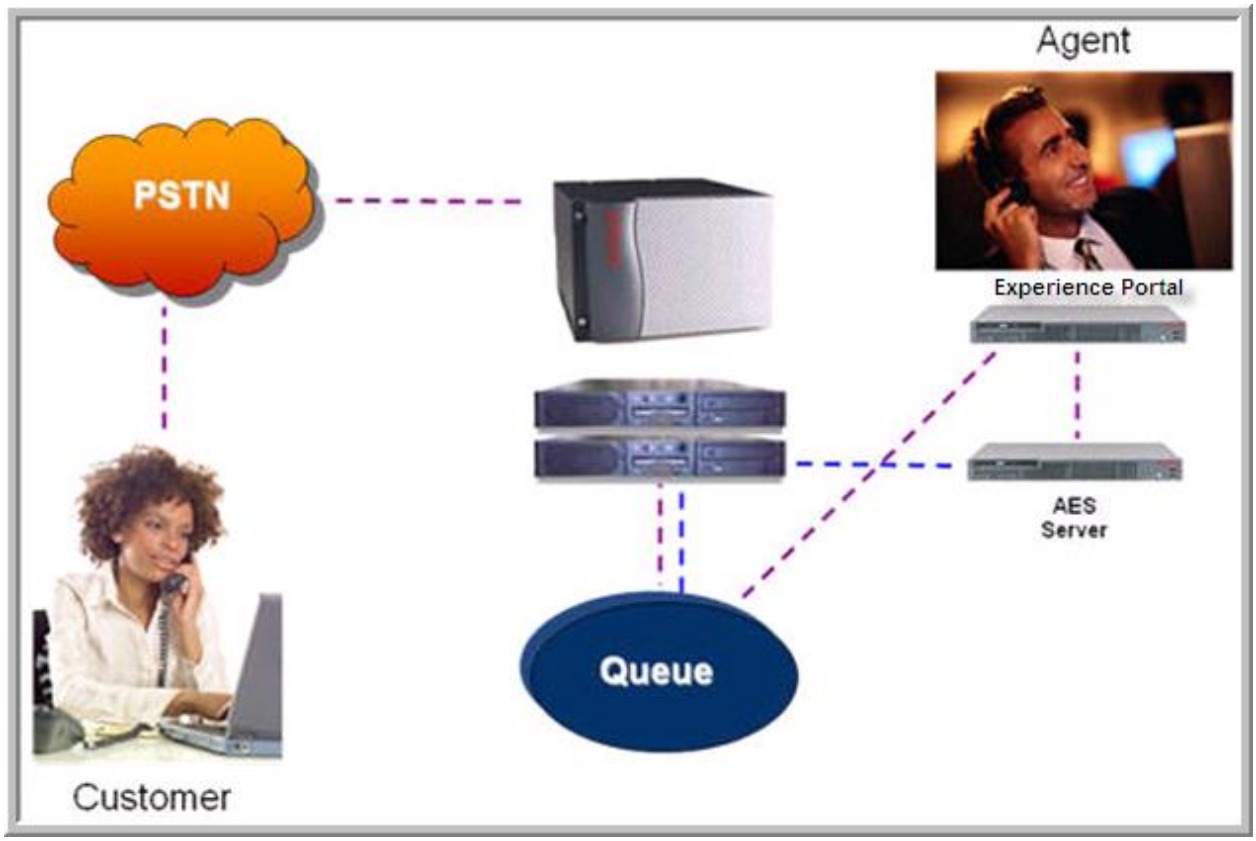


Figure 1 – Avaya Callback Assist application work flow

Note:

- Starting from release 3.2, CBA can be deployed in a SIP (Session Initiation Protocol) environment supporting multiple Avaya Communication Manager Systems.

- Starting from release 4.0, CBA offers two types of callback delivery strategy in a SIP environment installation, namely Customer First and Agent First.
- Starting from release 4.1, CBA offers three types of installation modes: CBA components with external database, PostgreSQL database server for CBA, and CBA components and PostgreSQL database server.
- Starting from release 4.1.4, CBA offers:
    - Three types of callback delivery strategy in a SIP environment: Agent First, Customer First Phantom Pool and Customer First Priority Queuing.
    - The BSR Components are now shipped and automatically installed by CBA installation process.
- When there are no available agents (logged out or in AUX mode) the EWT cannot be calculated.

CTI environment

When you place a call, the call reaches Avaya Aura® Communication Manager (CM) through the public switched telephone network (PSTN). Communication Manager checks for the availability of an agent. If an agent is available, the call is directed to the agent. If all the agents are busy, the call is queued in Communication Manager. Once a call is queued and you are waiting for an agent, CBA informs you about your estimated wait time to reach an agent. If you are unable to wait for an agent, you can opt for an immediate callback or a scheduled callback. For immediate callbacks, the system makes a call to you the moment an agent is available. For scheduled callbacks, the system directs the call to an available agent at the date and time scheduled by you.

SIP environment

In a SIP-enabled environment, the incoming call reaches a Session Border Controller (SBC) through the PSTN. The SBC directs the call to Avaya Aura® Session Manager (ASM), which routes the call based on the configured rules. If during the call processing, the system sends the call to CBA, then ASM routes the call to Avaya Experience Portal (AAEP) that hosts the CBA Call Control Application. At this time, CBA takes control of the call and based on its configured rules, offers you an option to leave a callback request or to keep waiting in queue till an agent is available.

If you leave a callback request, the system stores the callback request in the CBA internal database for processing at a later time. Once the system detects scheduled time to deliver the stored callback request, the system launches a new instance of the CBA Call Control Application in AVP and instructs the CBA Call Control Application to call you and then merge the call with the agent. Actions differ slightly for an Agent First or Customer First delivery strategy, but in general, the CBA Call Control Application queues a call to the configured skill in Communication Manager and makes

the call at the scheduled date and time. After successfully contacting the agent and the customer, the system merges both the calls, and at this stage the callback request is considered complete.

Starting on Callback Assist 4.1.4, the BSR Components are now shipped with Callback Assist and does not require a separate installation. Please refer to *Installing and Configuring Avaya Callback Assist* guide for further details.

AACC environment

In a SIP environment where the contact center is managed using Avaya Aura® Contact Center (AACC), it is AACC that handles the customer call and routes the call based on the configured rules. If during the call processing, the business logic indicates that you should be offered a callback request, then AACC informs you about the estimated wait time (EWT) and offers the option to leave a callback request. If you accept the offer, then the system routs the call to CBA using the Avaya Experience Portal that hosts the CBA Call Control Application. At this time, CBA takes control of the call and based on its configured rules, guides you through various callback request offering options. Once you finish providing all the inputs or all the required parameters, the system stores the request in the internal CBA database. When the CBA Engine component detects the scheduled time to deliver the stored request, CBA launches a new instance of the CBA Call Control Application in Experience Portal, instructing it to call the customer and then merges the call with the agent.

The CBA Call Control Application puts a call in queue to the configured skillset in AACC. At the scheduled date and time, CBA makes the call. Once customer and the agent are successfully contacted, both calls will be merged and the callback request will be considered complete.

Customer First vs. Agent First

Callback Assist (CBA) offers you three types of callback delivery strategy modes when you install CBA in a SIP environment: Customer First Phantom Pool, Customer First Priority Queuing or Agent First. You must choose the callback delivery strategy mode during the installation and two strategies cannot be used simultaneously. Similarly, if you want to change the callback delivery strategy mode later, you must run the installation script again and select the required callback delivery strategy mode after specifying SIP as your CBA installation environment.

Customer First

In this callback delivery strategy mode, the system delivers the callback first to you, the customer. When CBA is scheduled to call you to complete a callback request, CBA will try to have you online

before delivering the call to an agent. After connecting you, the system connects the call to an agent based on the agent's availability.

From an agent's perspective, the callback call in a Customer First scenario is similar to any inbound queued call. But as compared to an Agent First callback, the agent has no preparation time before speaking to you.

Customer First Phantom Pool	Customer First Priority Queuing
Recommended for high load queues with high Expected Wait Time (EWT)	Recommended for low Expected Wait Time (EWT) queues and when high priority queuing can be used
Vectors use standard queuing	Affects queue reporting due to high priority queuing on vectors
If Agents are available strategy might change to Agent First	Always performs Customer First
Preserves UUI, but If strategy changes to Agent First, UUI is not preserved	Preserves UUI
Controlled Customer waiting time in queue	Customer waiting time in queue can increase and affect priority queue
Requires two AAEP ports to complete callback but controls transfer and outcome	Uses only one AAEP port to complete callback by performing a blind transfer to agent VDN

Agent First

In this callback delivery strategy mode, the system delivers the callback first to the contact center agent. After the system delivers the callback to the agent, the agent can listen to the information collected from the customer during the callback registration process. For example, customer name, reason for calling, and so on.

When the agent finishes reviewing customer information, the system places a call to the customer and then connects the agent to the call. In an Agent First callback scenario, the agent is immediately available to speak to the customer.

Note: As compared to a Customer First callback delivery strategy mode, the Agent First callback delivery strategy mode can introduce increased idle time for the agent in situations where the customer does not answer the call back.

Customer First Phantom Pool call flow details

When Customer First Phantom Pool delivery strategy mode is enabled, the CBA engine keeps a pool of MPP sessions, each one tied to a specific callback configuration and each one with a phantom call queued to the configuration's agent skill.

When calling a customer, if the call attempt is not successful, CBA tries to reuse the MPP session to call another customer, thus improving the resource utilization.

When delivering callback requests using the Customer First Phantom Pool delivery strategy mode, the CBA engine performs the following tasks:

1. Calculates the number of requests pending for each callback configuration.
2. Based on the outbound call success ratio, CBA determines the number of sessions required to deliver the pending requests.
3. Sends a query asking the number of active and available CBA sessions already in place in the MPP server for each callback configuration.
4. If there are less active sessions than the amount required to deliver the available callback requests, CBA will launch new sessions to reach the required number.

Each CBA session in the MPP serve woks as follows:

1. When started, CBA places a phantom call to the agent queue specified in the callback configuration for a particular session. At this point, the phantom call is not related to any specific callback request.
2. With the phantom call in place, the EWT of the call (not of the skill) is monitored by the CBA engine.
3. When the EWT of the call is less than the configured threshold, a request will be fetched from the CBA database to be delivered.
4. When the session successfully acquires a callback request to process, CBA update an existing phantom call session with the request's UUI information through a SIP update.
5. Calls the customers.
6. If the customers answer, CBA asks them to identify themselves by using the information they recorded during the callback request offering.
7. After identifying the customers successfully, CBA asks them to wait while connecting the call to an available agent.
8. After delivering a queued phantom call to the agent, CBA will merge the call with the customer call. In this scenario, the agent is not offered to accept or reject the callback request, instead the agent is instantaneously connected to the customer and thus minimizing the time wasted by the agent while waiting for a customer to be contacted.

If the customer call was not successful or if the customers fail to identify themselves, then CBA marks the callback for a future retry attempt and then fetches a new request from the CBA database. The user-to-user-interface (UUI) of this newly fetched request will be sent to the queued phantom call, replacing the previous UUI.

In the previous scenario, if an agent becomes available before a customer is available, then the agent is asked to hold while a customer is being contacted. If the customer is contacted successfully, then the customer and the agent call will be merged. On the other hand, if the contact attempt is unsuccessful, the agent will be informed of such an event and the call will be dropped.

Note:

Customer First Phantom Pool requires minimum staffing of 25 ACD agents, staffing at levels lower than 25 ACD agents (not including in AUX mode) will translate in high variance in customer waiting in queue time among calls, hence increased customer waiting queue time in some calls, and more callbacks than expected being handled as in Agent First.

Customer First Priority Queuing call flow details

When Customer First Priority Queuing delivery strategy mode is enabled, CBA queries the AAEP EPM platform to get the number of available ports and starts as many as delivery of callbacks processes as possible.

When calling a customer, if the call attempt is not successful, CBA terminates the MPP session without even trying to reach an Agent, thus without affecting Agent ACT.

When delivering callback requests using the Customer First Priority Queuing delivery strategy mode, the CBA engine performs the following tasks:

1. Calculates the number of requests pending for each callback configuration.
2. Obtains the number of available ports on AAEP that can be used.
3. Launch new sessions on MPPs to process pending callbacks.
4. Updates callback status to progressing state.

Each CBA session in the MPP serve woks as follows:

1. When started, CBA places an outbound call to customer.
2. When customer answers, CBA asks them to identify themselves by using the information they recorded during the callback request offering.
3. After identifying the customers successfully, CBA asks them to wait while connecting the call to an available agent.
4. CBA performs a blind transfer to Agent Queue VDN which queues the call with high priority.

Call Back Assist high availability feature

Starting from release 4.1, Callback Assist supports a deployment composed of a single Callback Assist (CBA) database server shared by multiple Callback Assist (CBA) servers for high availability. With the high availability configuration, the CBA primary database server is replicated to a secondary server for addressing failover, and thus offering the ability to connect multiple CBA components to the CBA database. This provides the ability to have multiple CBA entry points, that is, multiple Web Services and multiple voice applications, and multiple CBA engines to support failover and load balancing.

Starting from release 4.6, Callback Assist supports a new deployment type where the CBA components and CBA database are collocated in the same server.

High availability deployments are only supported for SIP environments (both Agent First and Customer First delivery strategies). CTI and AACC environments do not support high availability configurations. Installing multiple CBA servers sharing the same database instance in a CTI or AACC environment would lead to random call disconnections and failures.

Besides offering the ability to configure failover for the CBA database, CBA also offers the ability to configure multiple sites, that is, an Avaya Aura® Experience Portal (EPM) system to handle inbound and outbound call traffic. CBA also supports failover among the configured sites, so that the failure of a single Experience Portal system does not prevent CBA from receiving or delivering callback requests.

Callback Assist Dynamic Routing Engine feature

The Callback Assist Dynamic Routing Engine is a powerful feature that allows developers to plug in routing logic to Callback Assist (CBA) by implementing a simple interface. This feature adds the flexibility to let customers take their own routing decision when a CBA phantom call is required to launch to an Agent skill set. So now any callback request that requires to be delivered can query the Agent skill set to use dynamically giving the flexibility, responsibility, and reducing the configuration needed on CBA.

The CBA Dynamic Routing interface is built as a SOAP Service and provides to developers a Web Service Definition Language (WSDL) document to create the routing engine. Customers can start routing calls based on their own business rules and reduce the complexity of having multiple CBA configurations, by following the procedures to configure CBA as specified in the *Administering Avaya Callback Assist* guide and implementing the engine as specified in the *Avaya Callback Assist Web services API* guide.

The CBA Dynamic Routing Engine feature is available from Callback Assist release 4.1 and available only for SIP deployments using the Agent First strategy.

The following diagram illustrates how CBA queries the Dynamic Routing Engine.

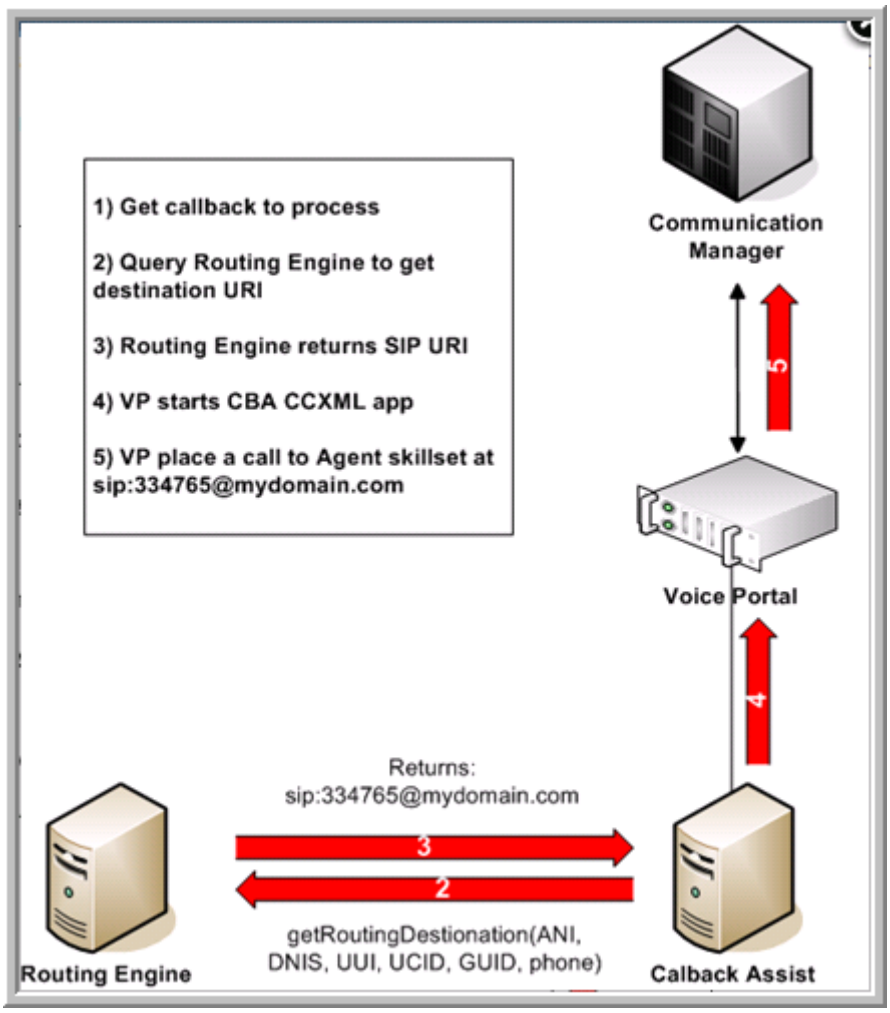


Figure 2 – Avaya Callback Assist querying Dynamic Routing Engine

Callback Assist (CBA) – Dynamic Routing (DR) integration for Call Center Elite

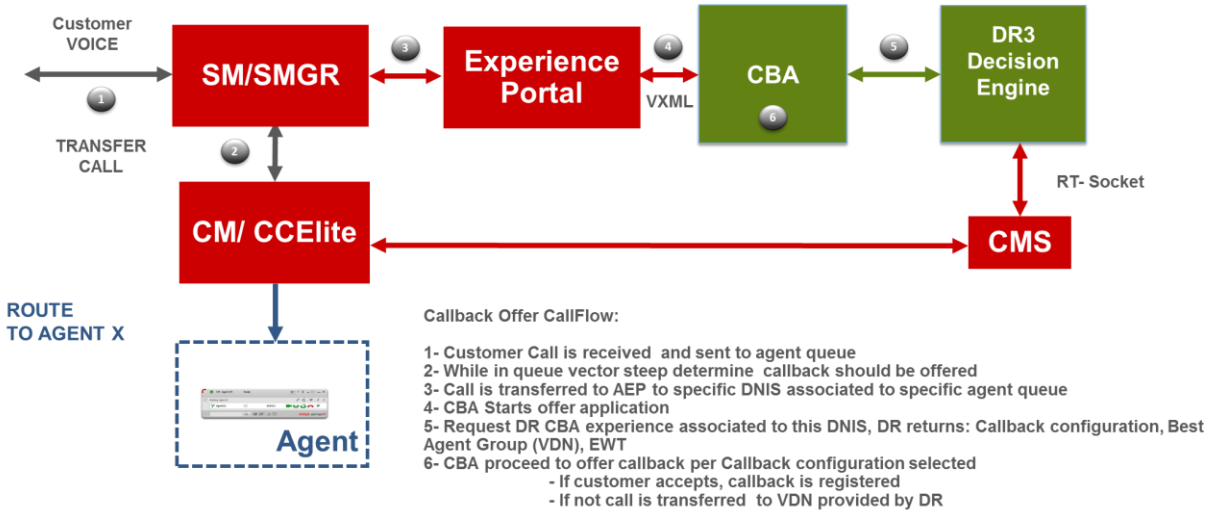
The main objective of this integration is to extend CBA capabilities by leveraging ***DR Release 3.1.6*** functionality, not only to replace current SIP pooling BSR architecture but also to enable new and more sophisticated ways to offer callbacks. This integration can also be used as an extension to those systems where DR is already present.

1. **Receive metrics from CMS:**
   Leveraging the integration to DR CBA can now retrieve metrics from CMS replacing standard SIP pooling method.

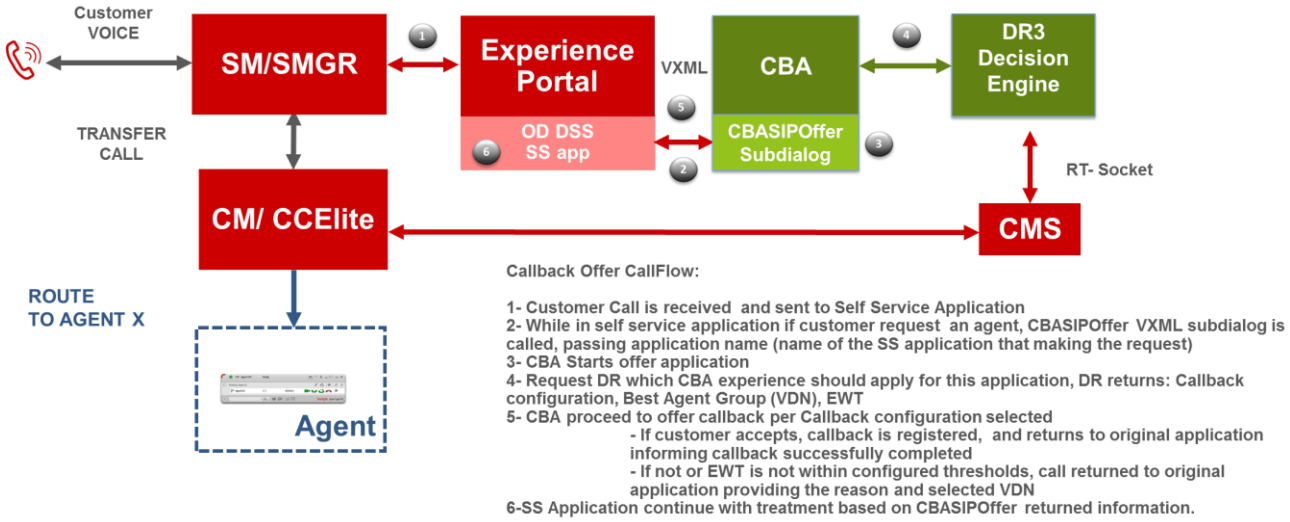
2. **Decouple Incoming DNIS and Queuing VDN from callback configuration:**
   With DR integration callback configurations will not be tied to a queuing VDN, instead a DR segmentation table will allow administering which callback configuration and queuing VDN is required for each call type, based on either the incoming DNIS or any other application Key.

3. **Support new use cases to offer Callback:**
   This integration supports not only current use case to offer callback from CC Elite queue, but also simplifies offering callback from Experience Portal in front applications. Reducing calls transfer to queue, as now EWT and thresholds can be validated before leaving the AEP.

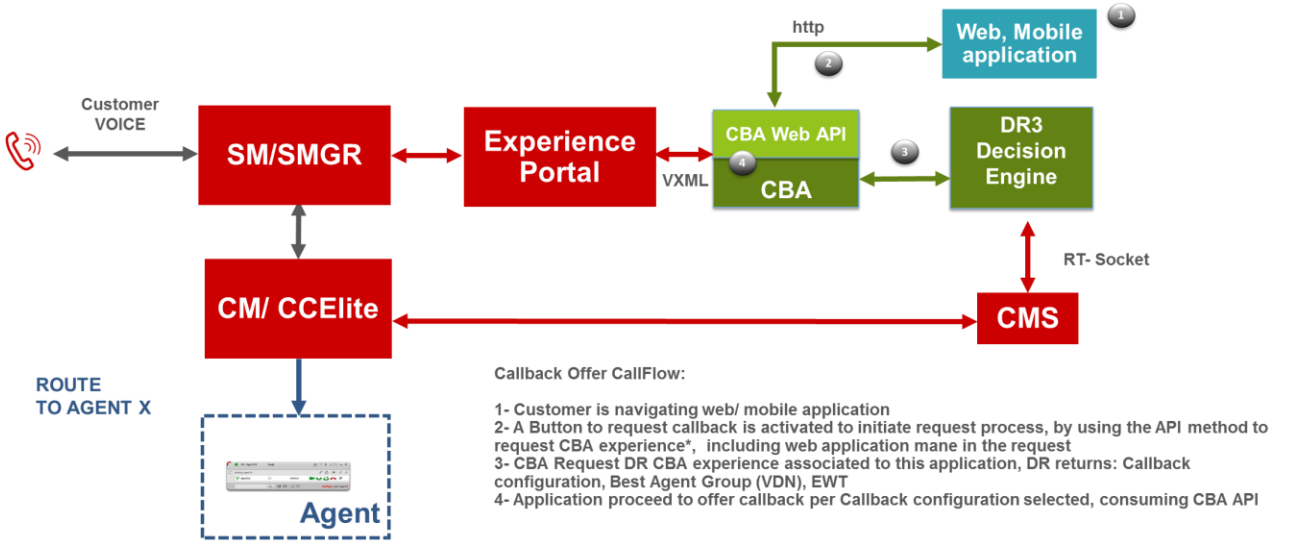
   Use Case 1: CBA Offer when Call Transferred to CBA DNIS from a Vector or IVR



Use Case 2: CBA Offered from AEP OD/DSS Self-service application



Use Case 3: Callback requested through web API, from web, mobile or other applications



Additional Use Cases: With the utilization of a full DR (Tier III) license, additional routing and experience selections use cases can be created.

Integration with Avaya Oceana™ 3.3

Overview:

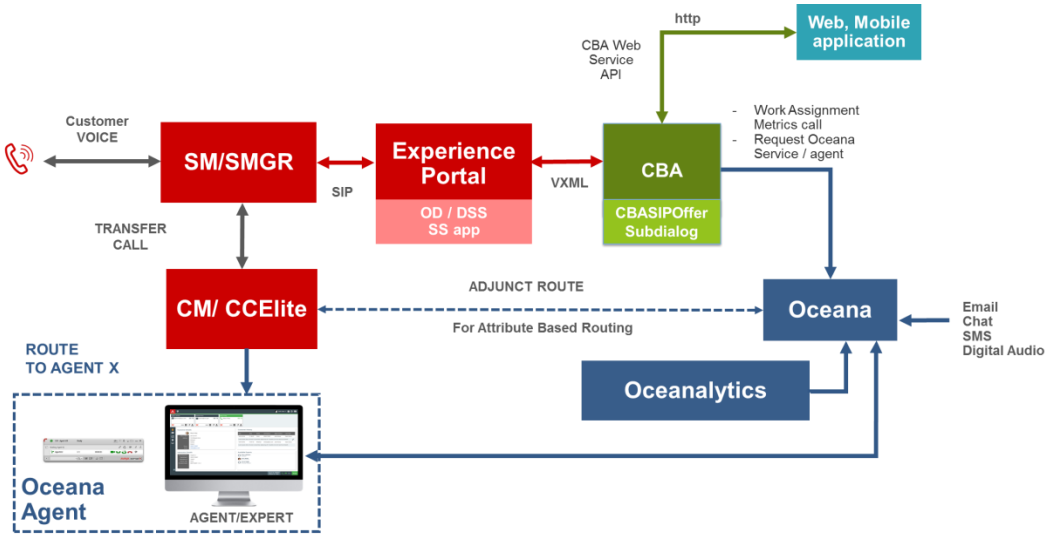
When CBA is integrated to Oceana, a new callback request can be created from web or mobile applications through the CBA Web Services API, which was extended to work with Oceana, or through the provided DTMF dialog modules.

In a typical Oceana voice routing scenario an Experience Portal application will answer the call, retrieve customer intent and create the Oceana context. Given this operation Callback Assist for Oceana Offer dialog will be initiated from the Self Service application by calling CBASIPOffer sub dialog module (refer to **Inbound as a VXML sub dialog** in the **Installing and Configuring Avaya Callback Assist** guide for more information).

Note: *when the Oceana Self Service application is created with EP&T Dynamic Self Service (DSS), CBASIPOffer module can be directly configured from an EVA node in a DSS call flow.*

In CBA 4.6.1 this integration is available only for Customer First Priority Queue callback delivery strategy.

CBA in Oceana environment high level Callflow:



CBA Offered from AEP OD/DSS Self-service application (Invoking CBASIPOffer as VXML sub dialog):

1. Incoming call is routed to AAEP MPP Port via Session Manager
2. Based on dialed number, AAEP launches OD/Dynamic self service call flow
3. Customer attributes such as language, department, product etc., are captured.
4. When customer needs to be transferred to an agent, self service application creates a new Oceana context with schema to request an agent in an Oceana service.
5. **CBASIPOffer** sub dialog is called, passing context ID as a parameter
6. CBA retrieves the set of attributes and place a query to WA to retrieve EWT
7. Callback configuration will be selected based on DNIS

8. If EWT is within configured thresholds, will proceed with offer menu, going through all standard steeps to create a new callback request. Context ID and it's information will be stored in CBA database associated to CBA request ID
9. If out of configured EWT thresholds or customer does not accept callback, control will be returned to self service application to proceed with the call transfer to Oceana Service.
10. Context Touchpoint will be updated with offer result.

CBA Offered from Web or Mobile application

1. Customer is navigating web/ mobile application
2. A new Oceana context with schema is created to store transfer attributes as well as any other information.
3. A Button to request callback will be presented, when selected a web application will present a series of questions to collect required information, using CBA API's to get configuration information.
4. If required a CBA API method can be used to retrieve EWT from WA, or it can be obtained directly from WA API.
5. Web application sends request to create a new callback, including contextID, contact number and callbackconfiguration, etc. When is accepted a callback request ID is returned.
6. ContextId and information will be stored in CBA database associated to CBA request ID
7. Touchpoint will be updated with result.

CBA for Oceana - Callback Delivery Customer First Priority Queue Callflow

1. When is time to place the call, CBA will retrieve callback request information stored during the offer.
2. CBA will verify is the context is still active, if not it will be recreated.
3. CBA places the call to customer:
    a. When answered a Customer First menu will be presented to confirm acceptance
4. If accepted CBA will proceed to request transfer the customer call to Oceana agent with priority:
    a. Context will updated and set to highest priority.
    b. CBA transfers call to Oceana routing VDN including Service request ID
5. Customer is transferred to first Oceana agent available

Administration:

When CBA is working integrated to Oceana there will be several differences on the callback administration:

- **BSR:** BSR configuration is not required as metrics will come from work assignment
- **Oceana Configuration (New):** Used to configure Oceana Core Data and Work Assignment access.
- **Callback configuration:** A new Oceana check box is included in the general tab to enable Oceana integration on this callback configuration.

Notes:

1. CBA for Oceana can be enabled per Callback configuration, so CBA for elite can also can be used on the same CBA customer first priority queue instance.

2. CBA always queries Work Assignment for metrics (either from Offer or Delivery) with “Priority” 5. During delivery when the customer call is transferred to Oceana VDN it sets the “Priority” to 1 (highest) in the context. CBA never uses the priority that is defined in the Oceana context (at the time of context creation).

Callback Assist features

The features of Callback Assist are as follows:

- **Offer immediate or scheduled callbacks:** Provides two options for offering callback services, immediate callback and scheduled callback. *Immediate callbacks* are performed when an agent becomes available. *Scheduled callbacks* are performed accordingly to the customer’s choice and time slot availability;
- **Ability to perform wait treatment on AAEP or CM:** Available only on SIP environments; Callback Assist provides two options to perform wait treatment handling when caller rejects callback offering or when it fails to register a callback; wait treatment on AAEP or wait treatment on CM (ACD). *Wait treatment on AAEP* is the existing feature since Callback Assist 3.2 where caller is kept on AAEP and is presented with a configurable audio message. On the other hand, with *Wait treatment on CM*, callers are transferred to a configurable destination (for example a VDN number) and left the AAEP platform, enabling all wait treatment capabilities available on ACD. Wait treatment on CM is configurable as a system-wide configuration or per queue configuration basis for major flexibility. See Call Flow on *Call Flow Scenarios for main features* section.
- **Emergency Destination:** Available only on SIP environments; Provides a destination route to be configured when there are unrecoverable errors in scenarios where inbound callers are interacting with the offering prompts. This new destination can be configured on a system-wide basis but also under the application URL for flexibility. See Administering Callback Assist guide for further details.
- **High availability deployment:** Starting from release 4.1, Callback Assist supports a deployment composed of a single CBA database server shared by multiple CBA servers for high availability. With the high availability configuration, the CBA primary database server is replicated to a secondary server for addressing failover, and thus offering the ability to connect multiple CBA components to the CBA database. This provides the ability to have multiple CBA entry points, that is, multiple Web Services and multiple voice applications, and multiple CBA engines to support failover and load balancing.
- **Multiple callback configurations:** Allows the administrators to configure multiple callback configurations and link them to different VDN’s, giving great power and flexibility;
- **Full configuration of time slot offering:** Allows the administrator to set up recurring, weekly-based time slots when immediate callback and scheduled callbacks are offered;

- **Dynamic prompting:** Allows the administrator to configure what is collected from the caller and spoken to the agent;
- **Dynamic Routing Engine:** Allows developers to plug in routing logic to Callback Assist by implementing a simple interface. This feature adds the flexibility to let customers take their own routing decision when a CBA phantom call is required to launch to an Agent skill set.
- **Agent First or Customer First delivery strategy:** Offers two types of callback delivery strategy in a SIP environment, namely Customer First and Agent First. In the *Customer First* strategy, the system calls the customer prior to having an agent available, thus reducing agent handling time and improving agent productivity;
- **Voiced information to customer:** *Estimated Wait Time (EWT)* and *Queue Position (QPOS)* can be spoken to the caller;
- **EWT Threshold callback offer triggering:** Estimated Wait Time *(EWT)*threshold can be used to determine whether callback will be offered;
- **CTI Screen Pop Preservation**: *User to User Information (UUI)* is preserved from original call and can be used to screen pop customer information to the agent on a callback;
- **Improved call anchoring for SIP Offering Call Flow**: During the offering of callback option to caller, CBA creates the phantom call only after registration of callback or if caller decided to remain in queue.
- **Web based administration application:** By the utilization of a robust AJAX web framework and an intuitive administration interface there is no need to install a specific desktop client application and the management of CBA can be done remotely on virtually any machine that has a Web browser.
- **Accessible Web based reports:** Many contact centers have problems distributing reports to all the people who need to see the data. CBA's Web-based reporting provides users access to previously inaccessible reports. With the appropriate permissions, users can access reports from a URL and the data may be exported to a CSV file. There is a Call Disposition Report, an Hourly Summary Report, a Daily Summary Report, a Pending Callback Requests Report and a Canceled Callback Requests Report. This has the following benefits:
    - Access to specific reports is not limited by location;
    - IT support for remote users is eliminated because contact centers no longer need to buy and maintain a client application on each desktop;
- **Daily Summary Report:** Enables a supervisor to view date-wise consolidated report with the information of immediate and scheduled callbacks as requested and delivered to agents. It allows a supervisor to analyze the effectiveness of CBA and its adoption by customers;
- **Hourly Summary Report:** Similar to the daily summary report, an hourly summary report allows a supervisor to analyze hour by hour CBA workload for a single date for the specific period.

Based on the report, a supervisor can do the best resource distribution and time slot offering to optimize service to the callers;

- **Call Disposition Report:** Enables a supervisor to view the detailed status of all calls made through CBA to analyze the effectiveness of customer callbacks;

  Note: The reports have an option to filter for fax machines or answering machines. If you do not have the Call Classification feature set up in your system, the system will not provide any results;

- **Pending Callback Requests Report:** Allows the supervisors to generate a report containing the latest data on outstanding callback requests on a daily basis. They can sort the report to display the scheduled callback or immediate callback requests in groups. Based on this report information, the user with proper access rights can cancel the delivery of any outstanding callback requests;
- **Canceled Callback Requests Report:** The Canceled Callback Request Report displays all the callbacks that are canceled between dates by the caller or the agent, through the Pending Callback Requests Report, Web service, or through a phone;
- **Manage and export report data:** The site administrator can configure the amount of time that report data should be kept and purged by application. Also, he can export all data in a CSV file format.
- **Standard license management:** ***Avaya Callback Assist*** leverages Avaya WebLM, a centralized license management solution that offers a common interface across the Avaya product range;
- **Standard-compliant Web Service Interface:** ***Avaya Callback Assist*** exposes a SOAP-based web service API that allows easy integration with customer or third party solutions.

Implementation prerequisites

Before an Avaya Professional Services representative or a Business Partner installs Callback Assist (CBA), you must consider several items for planning the installation and preparing your application host or hosts. The following section provides a list of requirements for preparing the systems for a CBA installation.

Pre-installation checklist

Completing the pre-installation activities help you prepare the installation task easier. The following checklist lists the high-level planning activities:

Activity	Completed?
Check the required software and infrastructure requirements.	
Determine the deployment option: single host deployment or modular host deployment.	
Verify the hardware requirements based on the required deployment option.	
Check all the licensing requirements.	
Schedule Avaya support to re-administer AACC, AAEP, SMGR systems and the Communication Manager systems to work with CBA, if required.	
Determine if any special firewall ports are required.	

Environment configuration

For information on setting up the required environment configuration, see the following sections in the *Installing and configuring Avaya Callback Assist* guide:

- Browser Requirements
- Hardware Requirements
- Software Requirements

Licensing

Licensing ensures that you can access and deploy all the product functionality and features for which you have paid as a customer. A license or a license file is an Extensible Markup Language (XML) file. The license file contains information regarding the product, major releases, and licensed features and capacities.

You must acquire a license for using Callback Assist 4 or higher. After installing Callback Assist, upload the license file to the WebLM Server to be able to offer and deliver callback requests. The WebLM Server for Callback Assist 4.x is the same as Avaya Experience Portal WebLM Server. Contact your Avaya Professional Services representative for more information on licensing.

If during normal operations, Callback Assist is not able to verify the license in the WebLM Server or if the license is not valid, then the system provides a grace period of 30 days. During grace period full Callback Assist functionality will be available. During this period CBA periodically verifies for proper license in the WebLM Server, and if found, CBA returns to normal operation. If CBA could not return to normal operation within 30 days, CBA will stop accepting and delivering callback requests after the grace period.

Acquiring a license file

License files for Avaya Callback Assist are generated by Avaya Professional Services Advanced Application Support group.

Contact your Avaya Professional Services representative or Business Partner to acquire a license file.

WebLM

WebLM is a Web-based tool that facilitates easy tracking of licenses. To track and manage licenses in an organization, WebLM requires a license file. Contact your Avaya Professional Services representative for more information on licensing.

Callback Assist 4.x supports the following features through licensing:

- Callback Assist ports: The system reserves a CBA port for each callback request that is in the process of being delivered. That is, if the license contains 100 CBA ports, then the system can deliver only up to 100 callback requests at a time.

  In HA deployment when the switch over happens from master to standby the acquired ports will be released by CBA immediately so that, it will be available for the new master to acquire. But in a situation of network outage the ports cannot be released by CBA and it will take 10 minutes to be released (10 minutes is the default time out for the ports in WebLM).

- Customer First feature: The Customer First feature must be available in the license file before you can use the Customer First delivery strategy mode.

- Web services API: You must enable the Web Services API in the license file to perform any operation through the Callback Assist Web service API.

- Scheduled Callbacks: You must enable scheduled callbacks to be able to offer and deliver scheduled callback requests. If you do not enable the scheduled callback feature, the system will offer and deliver only immediate callback requests.

The high-level steps involved in activating licensing for Callback Assist 4.x are as follows:

- Perform a successful installation of Callback Assist 4.x.
- Acquire a license file for Callback Assist 4.x through your Avaya Professional Services representative or Avaya certified Business Partner as required.
- Upload the license file on the WebLM Server. The WebLM Server for Callback Assist 4.x is the same as Avaya Experience Portal WebLM Server, although you can use any available WebLM server that complies with the Callback Assist requirements.
- Specify the required ports for Callback Assist 4.x using the License page in the CBA Web Administration application.

Note: Starting from Callback Assist 4.1.6 Avaya Web License Manager (WebLM) is installed along with Callback Assist Package. But still we can use the external WebLM also.

Using this Local WebLM Server we can configure license for CBA Administration and Avaya Orchestration Designer.

Grace Period

The Grace Period consists of 30 consecutive days after Callback Assist cannot communicate with the WebLM server. If for any reason Callback Assist enters Grace Period, full functionality will be available for the period of 30 days.

After 30 days, Callback Assist will stop accepting or delivering callbacks.

Orchestration Designer License

As Callback Assist relies on Avaya Aura Orchestration Designer for VXML Call Flows, it is required to install an Orchestration Designer license in addition to Callback Assist license. For Orchestration Designer license features and usage, see *Getting Started Orchestration Designer guide* on Avaya Support Site.

Third-party components and licenses

During the CBA installation, the system creates a folder named **`Licenses`** in the CBA installation directory. This folder contains copies of the third-party software licenses for the various third-party components included in CBA.

Permissive Use Policy

Avaya might support specific non-standard CBA deployments. Contact your Avaya Professional Services representative for a copy of this policy.

Functional description

This section provides a functional description of Callback Assist (CBA).

Components

The CBA components are as follows:

- Web Administration application
- IVR Applications
- Database Server
- Callback Engine
- Audio File Storage
- Reports
- BSR Service

Web Administration application

The CBA Web Administration application provides centralized control to your operation through a Web-based interface. You can use the CBA Web Administration application for the following functions:

- Have administrative access through a Web-based interface, so there is no requirement for a client software installation and maintenance.
- Create user roles and grant permissions to control access to both administration and sensitive reporting data.
- Administer configuration settings from IVR and Callback Engine.
- Create and manage multiple rules for the callback calls.
- Administer, enable, and disable rules to allow announcement of EWT and threshold values to control callback options offered to customers. These rules are configured for multiple callback requests for incoming calls.

IVR Applications

CBA leverages the Avaya Experience Portal interactive voice response (IVR) platform to interact with the customers and contact center agents to offer and launch callback requests. CBA includes the following IVR applications:

- CBA Customer: Handles incoming calls from the callers and offers them the opportunity to request a callback service by leaving the phone number and specific data as configured in Web Administration application.
- CBA Agent: Plays the saved caller information to an agent and provides the options to replay caller information, call the caller, or cancel the callback request. These options are configured in the Web Administration application.

The IVR applications consist of the following features:

- *VXML* based application built using Avaya Dialog Designer.
- Utilizes own application server.
- Plays *Queue Position (QPOS)* and *Estimated Wait Time (EWT)* to customer.
- Welcome, goodbye, and questions messages configurable from the Web Administration page.
- Supports the following languages:
  - Dutch
  - German
  - Italian
  - Polish
  - Russian
  - English (United Kingdom)
  - English (United States)
  - French
  - Italian
  - Japanese
  - Portuguese (Brazilian)
  - Turkish

  - Spanish (Latin American)
  - Cantonese Chinese
  - Mandarin Chinese
  - Arabic
  - Korean
  - Custom
- Validates customer data entry.
- Supports DTMF and Recording questions (Speech Recognition not supported).
- Supports pre-recorded *.wav* files and TTS messages.

Database Server

CBA uses *PostgreSQL*, an open source, ACID compliant, object-relational database management system (RDBMS) to maintain configuration information and callback registrations.

Callback Engine

The Callback Engine is the core component of the CBA application. The Callback Engine is responsible for managing all callback configurations, callbacks requested by callers, and callback operations performed by agents. The Callback Engine monitors the callback request queue and performs scheduling and management of all information associated with a particular callback (*UUI* and recorded information). The Callback Engine interacts with the Web administration application, IVR, and also with CTI (which is the Avaya Application Enablement Server) to interact with the contact center agents and place the return calls.

From 4.4 release a site/zone can have more than one auxiliary EPMs. If a zone/site has more than one auxiliary EPM the callback requests placed on that site/zone are load balanced between the available auxiliary EPMs using round robin load balancing algorithm.

Audio File Storage

The Audio File Storage is a distributed database whose purpose is to store the audio files that are configured in the Web administration application. The audio files are served to the MPP to be played to the customer and agent.

Reports

CBA provides a set of standard reports to provide feedback on each operation, allowing the site administrators and supervisors to monitor the performance of the application closely. Thus, the site administrators and supervisors can optimize the utilization of contact center by planning their resource distribution effectively. CBA provides reports in the following areas:

- Call Disposition Report
- Hourly Summary Report
- Daily Summary Report
- Pending Callback Requests Report
- Canceled Callback Requests Report

BSR Service

The BSR (Best Service Route) component enables to treat multiple skills in the same or different CMs as a single logical agent queue. This component is required in a SIP environment, while it is not used in CTI one.

In the BSR component, the basic entity is a call center application, basically a group of VDN destinations the queue the incoming call in an agent skill. The VDN destinations may be hosted in the same or in different CMs. This grouping represents all the agent queues that can handle a specific type of customer call. In more detail, the call center application is composed of 1 or more pairs of polling and queuing VDNs. The polling VDN is the one that can be queried to obtain the EWT of a specific skill. The queuing VDN is the one that should be used to queue a call to that same skill. In a SIP environment, each callback configuration is assigned a single call center application. Several callback configurations can share the same call center application.

When a call arrives to CBA, the callback configuration to handle the call will be searched for, based on the incoming DNIS. Once a valid callback configuration is found, the BSR is queried to find the EWT of the call center application and the VDN of the agent queue that has this EWT. If the customer chooses to wait in queue or requests an immediate callback, then a call is placed to this VDN to wait for an agent once the offering phase completes. This is shown in the SIP call flows in this document.

The BSR component also participates in the callback delivery phase. In this case, once the CBA Engine founds a callback request to dispatch, it will query the BSR to find the best VDN to reach an agent to complete the callback request. Once a valid VDN is retrieved, a new CCXML session is started in the Experience Portal, configured to place a call to the VDN previously found.

Whenever CBA queries the BSR to find the best VDN, BSR will also look at the Business Hours and Holiday configuration settings. By default Business Hours and Holiday configuration is configured as 24x7 and No Holidays respectively. BSR service returns the “Default VDN” during holidays and out of Business Hours. If wait treatment is configured to be performed on CM, then the "Wait Treatment on CM Destination" is going to override the “Default VDN”.

Call Flow Scenarios for main features

This section provides some sample call flow diagrams for most common Callback Assist scenarios.

SIP Environment

The following scenarios are only valid on SIP environments but apply to all strategies.

Offering callback to inbound caller

Caller is presented with offering prompts and succeeds to register a callback.

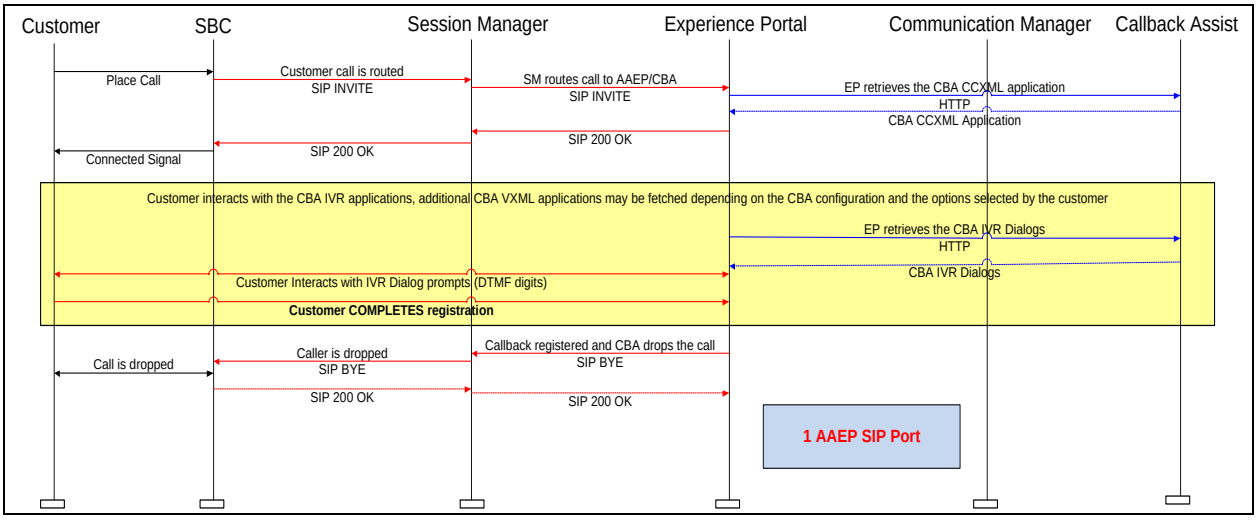


Figure 3 – SIP Agent First offering call flow, with the customer leaving a Scheduled callback request

Caller Rejects callback offer

There are two different call flows here based on the value of “Wait Treatment on CM” parameter. See *Callback Assist features* for a feature functional description.

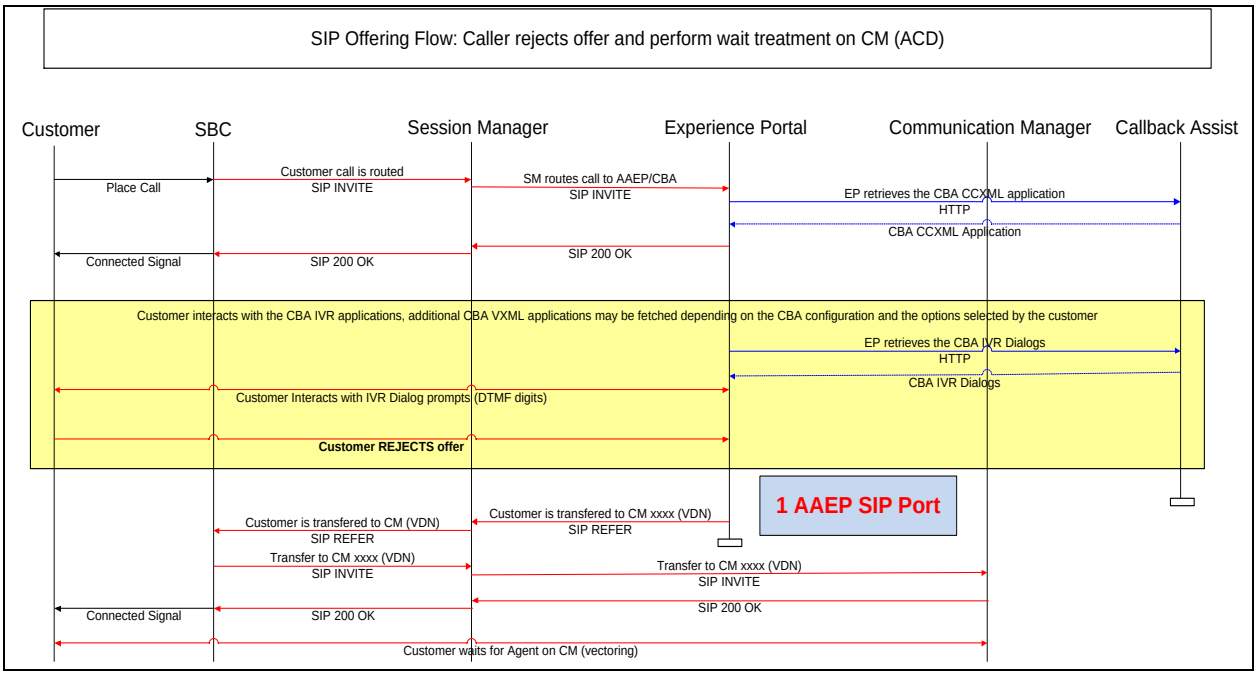


Figure 4 - Caller Rejects callback offer (WT on CM)

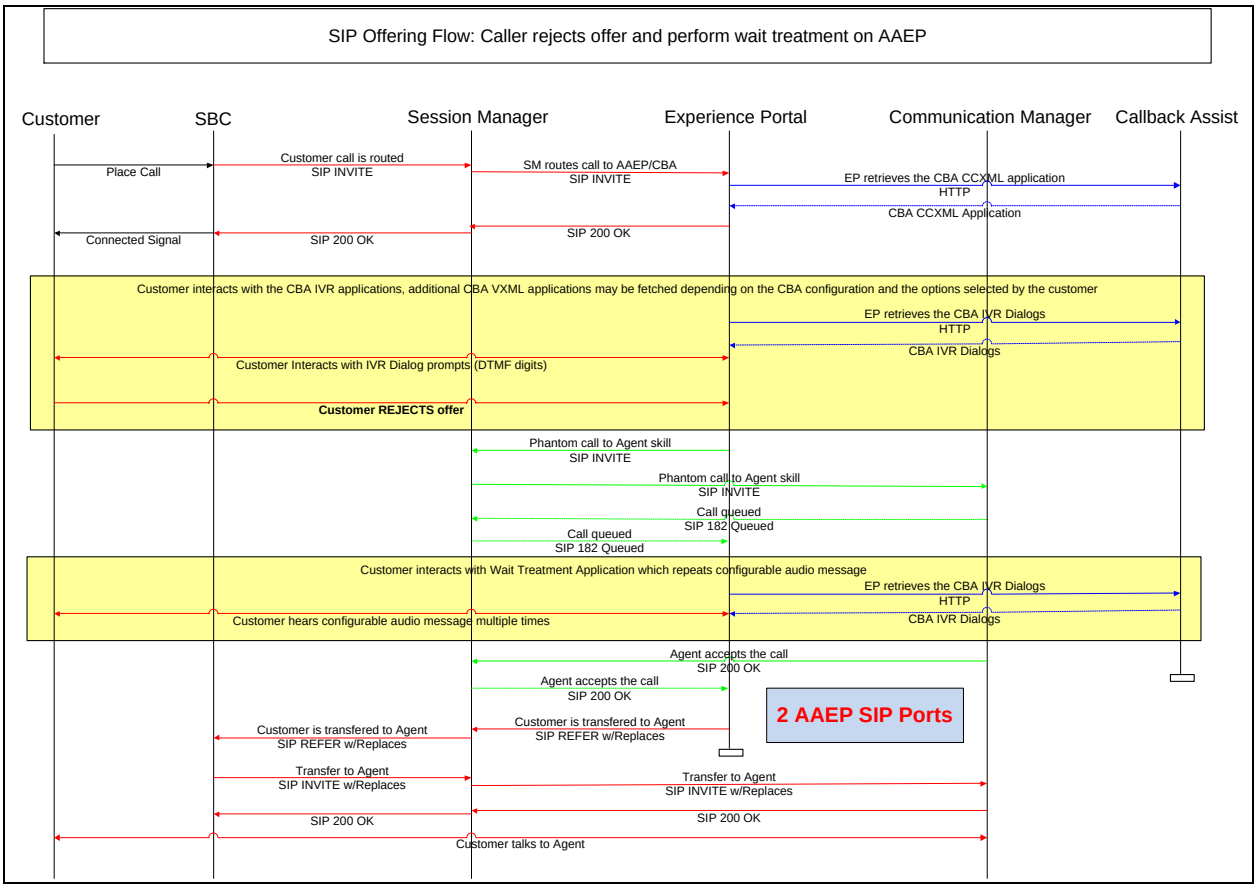


Figure 5 - Caller Rejects callback offer (WT on AAEP)

Schedule callback delivery Call Flow Agent First Strategy

Callback Assist starts MPP session and contacts both Agent and Customer.

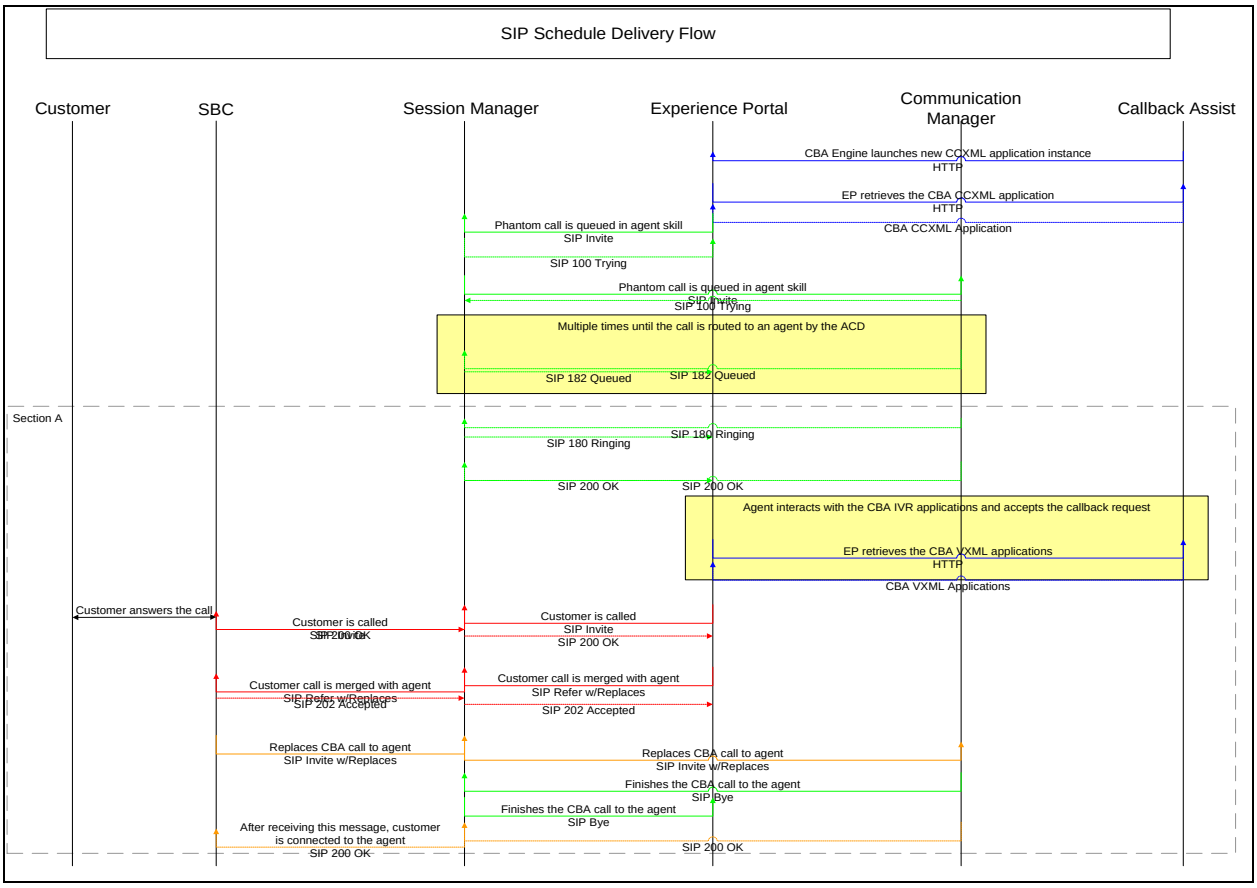


Figure 6 – SIP Agent First delivery call flow

The Figure 6 shows the call flow when using the Merge the Agent Call on to the Customer Call default value of Disabled. If this global setting is set to Enabled, then the last part of the call flow would change as shown in Figure 7.

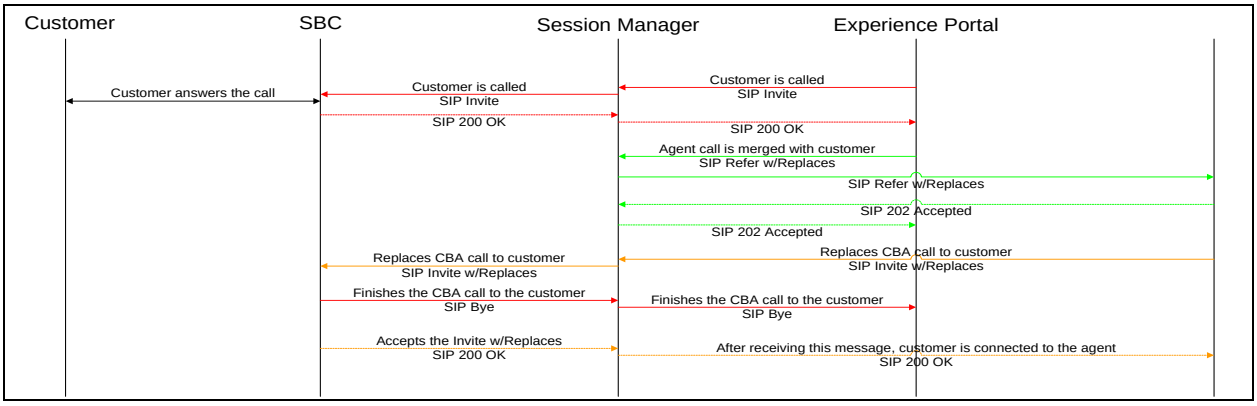


Figure 7 – SIP Agent First delivery call flow extract with *Merge the Agent Call on to the Customer Call* set to *Enabled*

Immediate Offering and Delivery Call Flow Agent First Strategy

Customer registers callback, and then application starts MPP session and contacts both Agent and Customer.

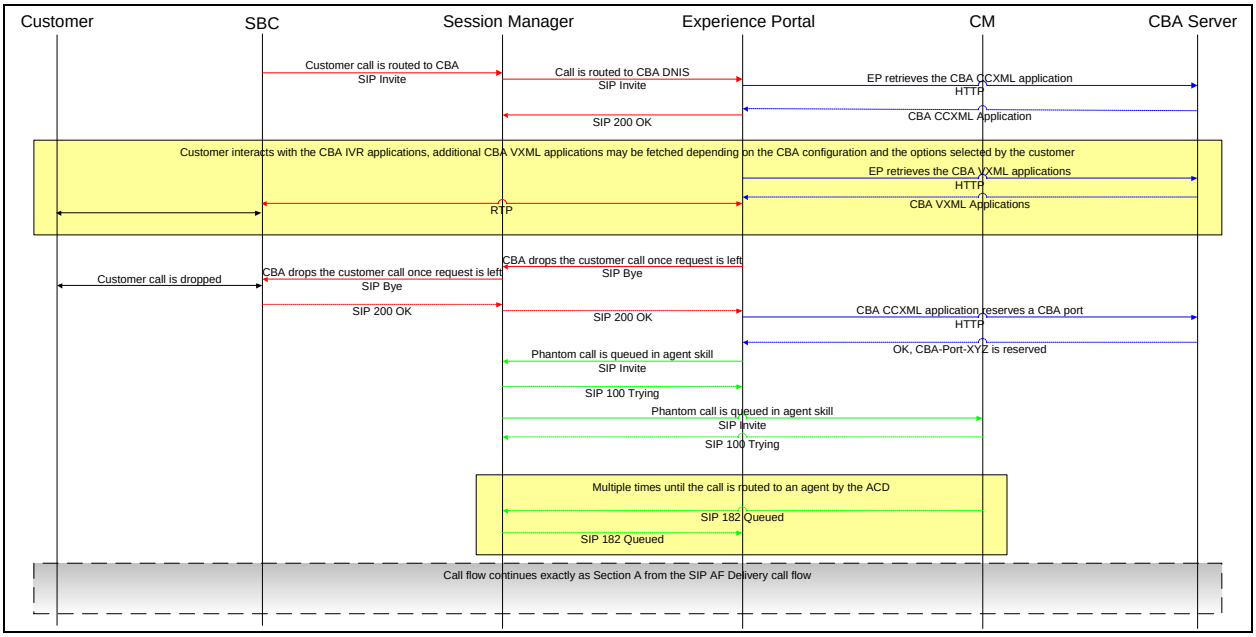


Figure 8 – SIP Agent First offering and delivery call flow for an Immediate Callback request

The basic difference between the call flows for a schedule and an immediate callback request is that in the case of an immediate, the phantom call is placed after the customer hangs up and a CBA port is reserved. Once the phantom call is routed to an agent the call flow proceeds as in the regular delivery phase. In case a CBA port is not available, then the phantom call won't be created and the callback request marked to be retried when a port is available. In such a situation, the delivery call flow would be the same as a schedule callback.

SIP Customer First Phantom Pool

The call flow for the offering phase is the same as the one for Agent First delivery strategy, so it is not repeated in this section. Below is a diagram illustrating delivery phase of a callback using Customer First Phantom Pool strategy.

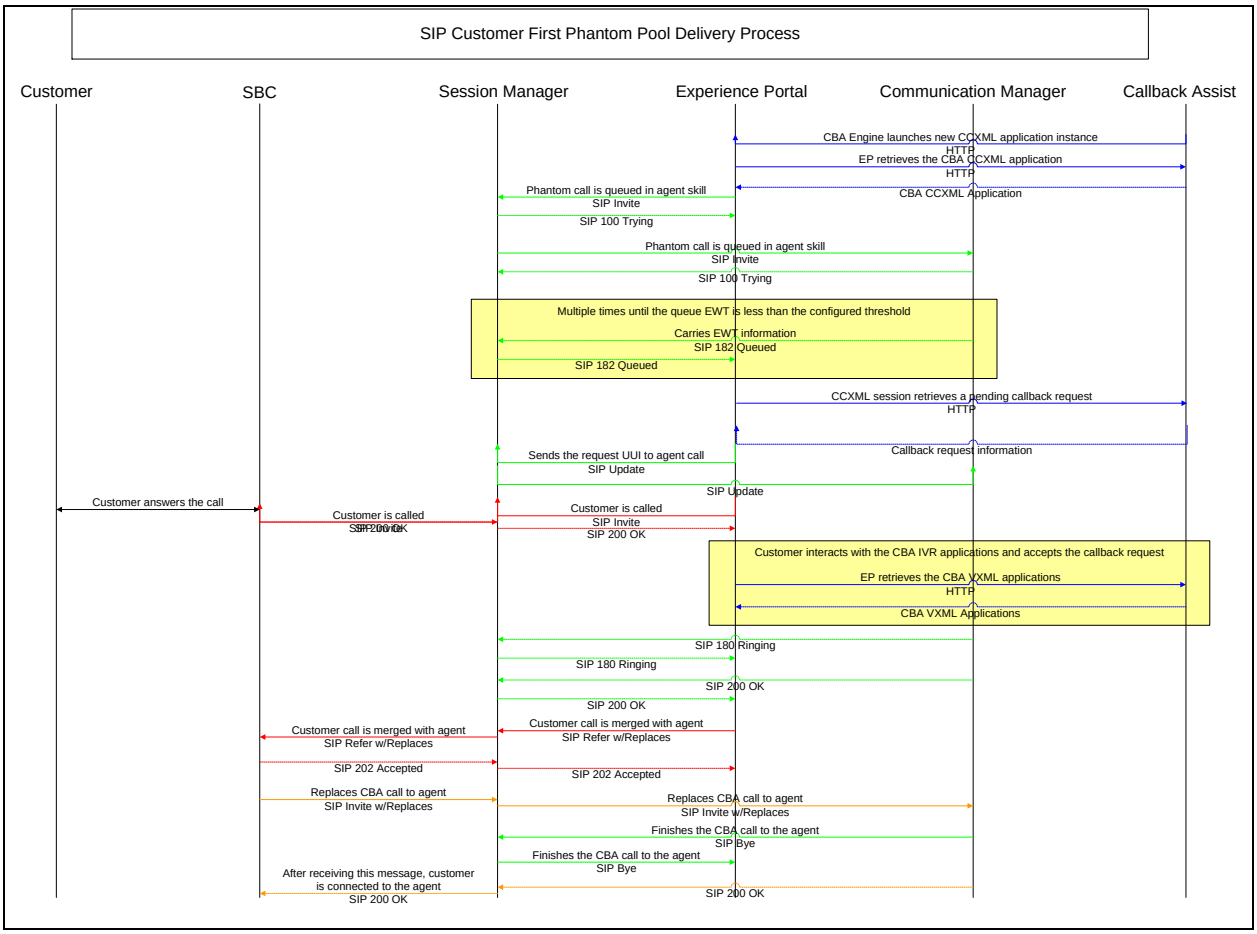


Figure 9– SIP Customer First delivery call flow

Similar to Agent First delivery strategy, the merging of the customer and agent calls is controlled by the *Merge the Agent Call on to the Customer Call* parameter. Figure 6 shows the call flow when this setting has a value of *Disabled*. If it is set to *Enabled*, then the call flow would end as shown in Figure 7.

SIP Customer First Priority Queuing

The call flow for the offering phase is the same as the one for Agent First delivery strategy, so it is not repeated in this section. Below is a diagram illustrating the delivery phase of Priority Queuing.

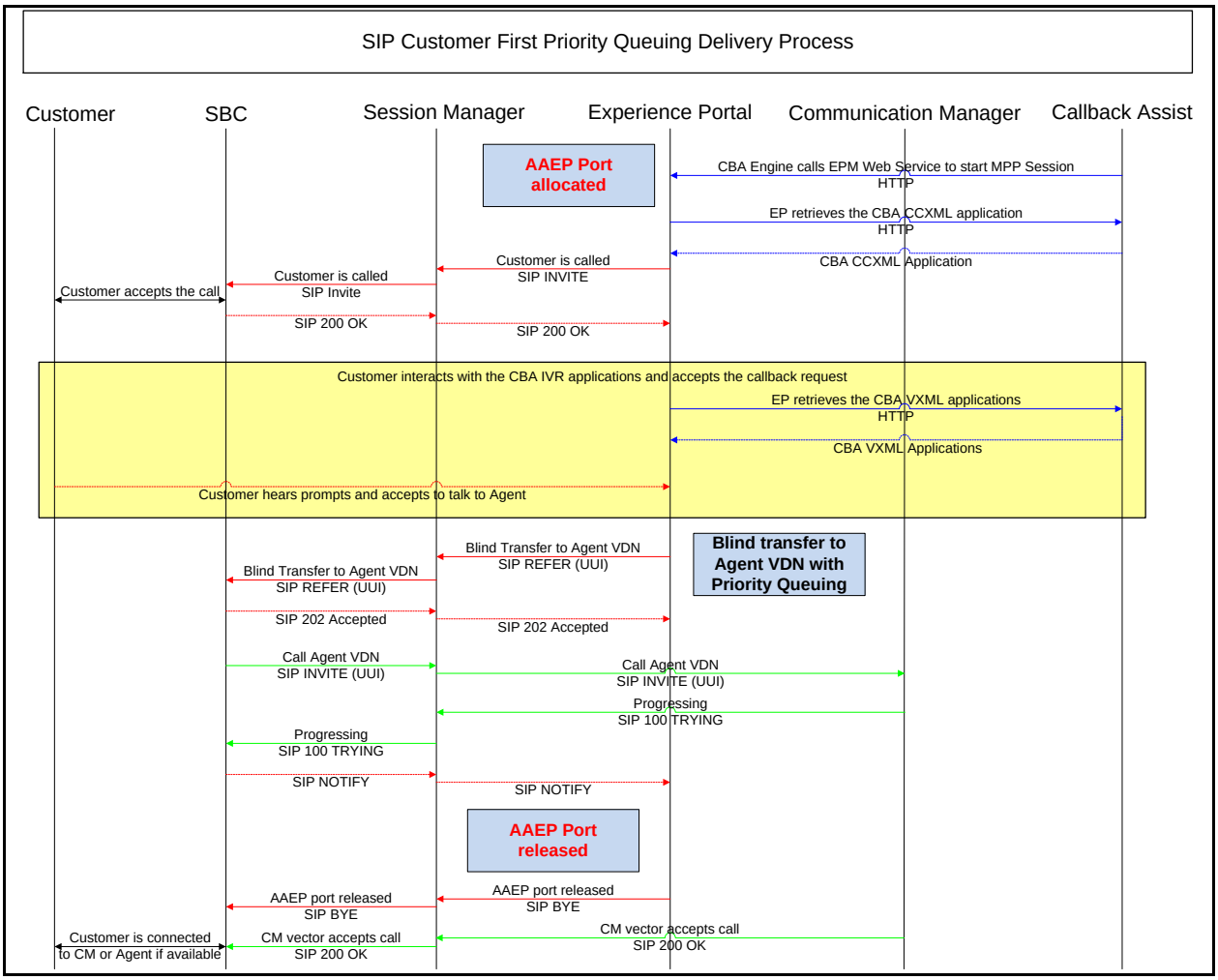


Figure 10 - Customer First Priority Queuing Strategy

Deploying Callback Assist

This section provides an overview of the Callback Assist (CBA) deployment architecture and the deployment options.

Deployment architecture overview

The design of the CBA system is flexible so that you can optimize the configuration based on your specific requirements. You can install the CBA application according to the capacity and performance requirements for the contact center agents, supervisors, and the call volumes. The application can be installed on a single host machine or on different host machines with the distribution of modular components. The components of CBA are as follows:

- Web administration application
- IVR application
- Callback Engine
- Reporting and Maintenance
- Audio File Storage
- Database Engine

Starting from CBA 4.1, CBA offers two types of deployment options:

- Single box deployment
  Installs the CBA components and the PostgreSQL database in the single server.
- High Availability deployment
  Installs CBA components in one server and configures PostgreSQL in an external database. Starting from release 4.6, Callback Assist supports a new deployment type where the CBA components and CBA database are collocated in the same server.

  An HTTP Load Balancer is configured for handling the following:

  - SOAP Web Services
  - Web Administration application
  - VMXL/CCXML applications
  - Audio File Server services

  For more information on High Availability, see the *Call Back Assist high availability feature* section in this document.

The following images show the difference between a single box deployment and a high availability deployment.

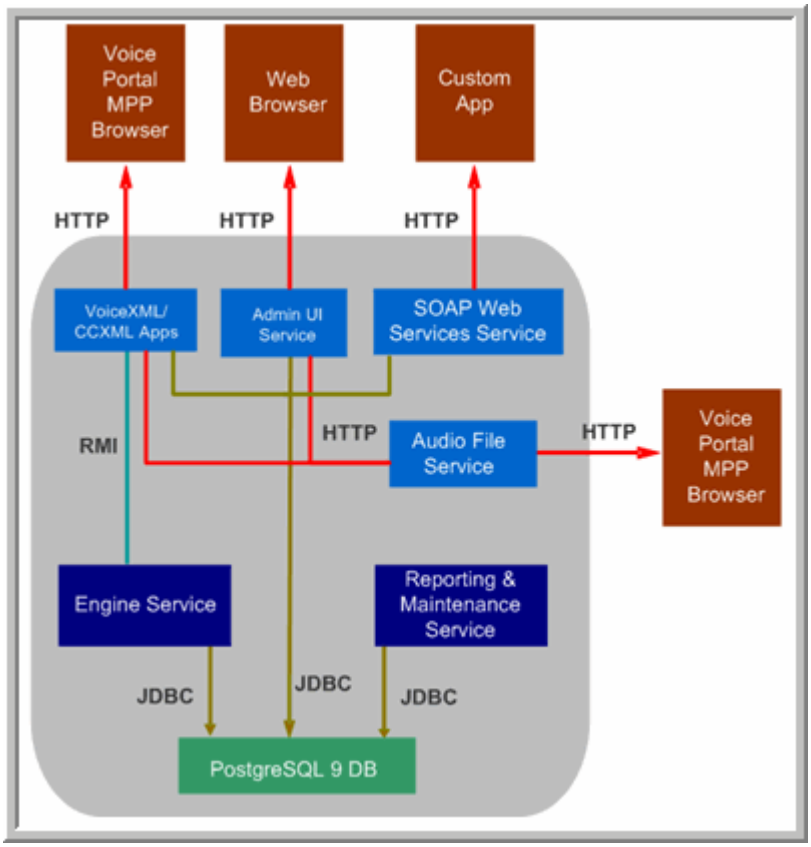


Figure 11 – CBA single box deployment architecture

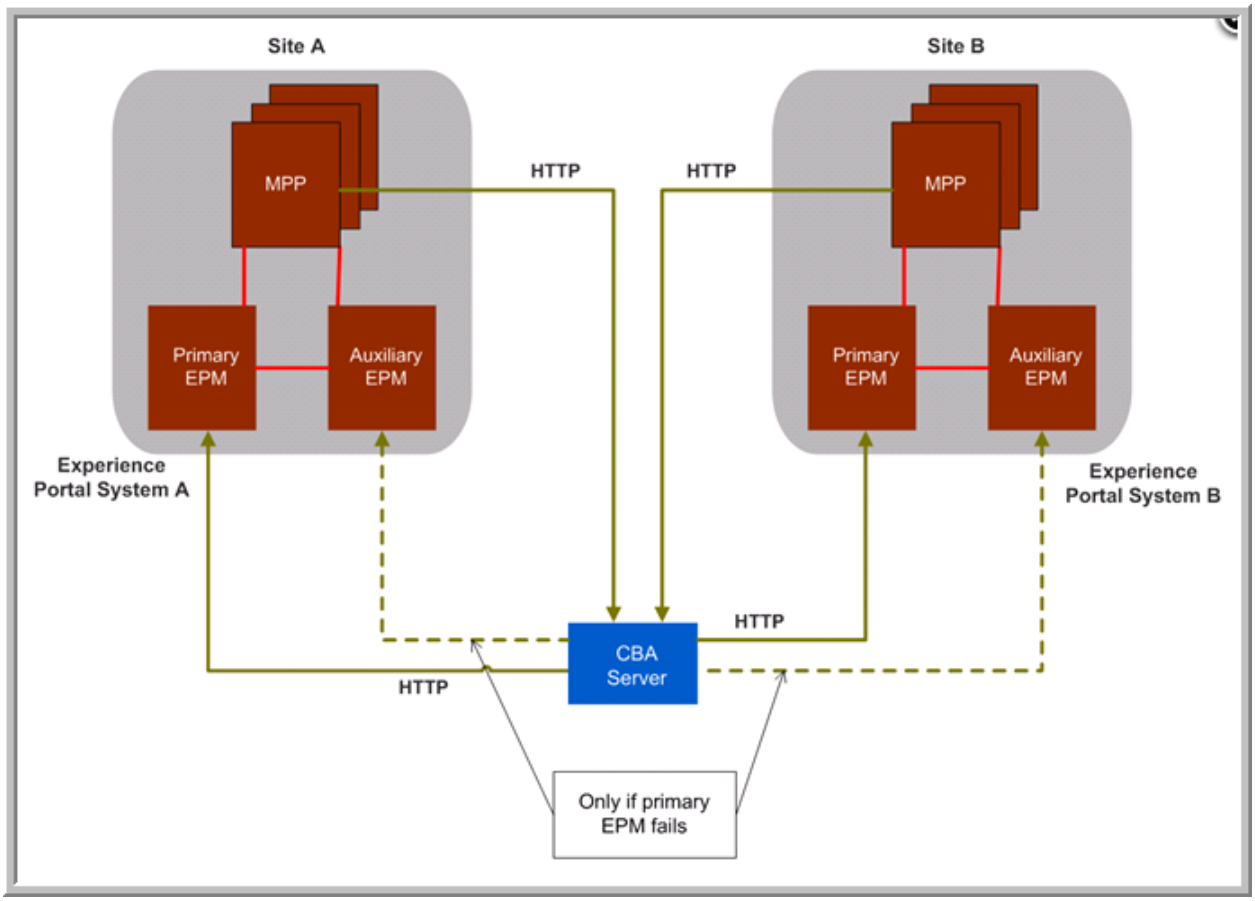


Figure 12– CBA high availability deployment architecture

High Availability deployment

In a high availability deployment, multiple CBA servers are connected to a replicated PostgreSQL database for reliable data storage, with multiple Experience Portal servers to receive inbound traffic and perform callback outbound calls. Although most samples presented in this document include only two CBA server instances and two Experience Portal systems for brevity, deployments are not limited to these numbers and can include multiple CBA servers and multiple Experience Portal systems.

Environment support

High availability deployments are only supported for SIP environments (both Agent First and Customer First delivery strategies). CTI and AACC environments do not support high availability configurations. Installing multiple CBA servers sharing the same database instance in a CTI or AACC environment would lead to random call disconnections and failures.

Installation

The CBA installer offers three different types of installation modes to support high availability as follows:

- Callback Assist Components with external Database
  Installs CBA components with an external and already installed CBA database.
- PostgreSQL Database Server for Callback Assist
  Installs a standalone PostgreSQL 9.1 Server for CBA.
- Callback Assist Components and PostgreSQL Database Server
  Installs CBA on a single box.

Using these installation types, an administrator can have a single CBA database server that is shared by multiple CBA servers for high availability. This provides the ability to have multiple CBA entry points, that is, multiple Web Services and multiple voice applications, and multiple CBA engines to support failover and load balancing. In a high availability configuration, the CBA primary database server is replicated to a secondary server for addressing failover of the database service.

If the user selects the *Callback Assist Components with external Database* option, then a CBA PostgreSQL database must be already installed beforehand, so that when the installer prompts, the user can provide a valid IP Address or host name for the database server. The installer then validates if the server is a valid CBA database server. The CBA database server must be running while installing the CBA components. After completing the validation, the installer prompts the user to specify the required platform type.

If the user selects the PostgreSQL Database Server for Callback Assist option, the CBA installer installs a PostgreSQL v9.1 server with all the required permissions, roles, and data. The installer prompts the user to provide a destination directory in which the database will be installed. CBA does not support the use of an external non-CBA PostgreSQL database.

If the user selects the Callback Assist Components and PostgreSQL Database Server option, the CBA components and the PostgreSQL Database server are installed in a single server.

The system always overrides the platform type and the delivery strategy with the options selected in the latest installation. For example, the user selects the following in the first instance: the CBA components are installed on server A, the external CBA database is installed on Server B, and the SIP Platform and the Agent First are chosen as the required platform type and delivery strategy respectively. In the second instance, the user installs the CBA Components with external Database Server B on Server C. Then, the user chooses SIP as the platform type and Customer First as the delivery strategy. In this scenario, the system will override the SIP Agent First for Server A from first instance, with the SIP Customer First platform in the second instance. This happens because both Server A and Server C share the same Database Server C, and therefore, have the same callback configuration. Therefore, the installer prompts the user to specify the required platform after

selecting either CBA components or PostgreSQL Database as a single box installation, or when choosing to install CBA components with an external database.

Component operation

When CBA is installed in a high availability configuration, the different CBA components operate in different modes.

The CBA Web Administration application runs concurrently in all the CBA servers. Accessing any instance would produce the same results. So this application supports load balancing using an HTTP load balancer that supports a "sticky session" routing strategy. Using a load balancer has the benefit that the user would always access the application through the load balancer URL, so that they would be unaffected in the event that any of the CBA servers is down due to a crash or a planned maintenance activity.

The Web Services and IVR applications also support load balancing. The IVR application, similar to the CBA Web Administration application requires a load balancer that supports sticky sessions routing strategy. The Web Services component does not require sticky session's strategy as each web service request is independent from the others.

The Audio File Storage component works in a replicated cluster and need to keep track of which nodes are in the cluster. When uploading a new audio file, this file is automatically replicated to the other nodes in the cluster to support failover from one node to another. This audio file will then be accessible through any node in the cluster. If one node is shut down or crashes, the surviving nodes will be able to serve all audio files and continue normal operation until the unavailable node is restored. To support this cluster, each node must be able to connect to all other nodes in the cluster. But this cluster is dynamic, when a new node is added, it just needs to be configured to reach one cluster node, the new instance information will be automatically propagated to the rest of the cluster, without any manual reconfiguration. The Audio File Storage cluster supports load balancing, without any special strategy, as each HTTP request to retrieve a file is independent of the rest.

The CBA Engine and Maintenance components do not support load balancing. They work in a master/slave mode. Out of all the CBA Engine components that are connected to the same centralized database, one is selected to be the master and all the rest work in slave mode. The master Engine is the one that will perform the callback request delivery and the CBA port management. If the master Engine is shut down or crashes, one of the Engine components that were working on slave mode will be promoted to master mode. The CBA Report and Maintenance component works in the same manner, independently of the Engine component. That is, in any given moment, the Engine and Maintenance master instances may be in different servers. The Component Status page in the CBA Web Administration application will show the status of the CBA Engine and Maintenance components master and slave instances.

The CBA PostgreSQL database supports replication. The database replication has to be manually configured to have a complete high availability deployment. The CBA installation does not automatically configure the data replication between the PostgreSQL instances. Details and steps for this configuration are covered in the Database Replication Guide.

Multiple site support

Besides offering the ability to configure failover for the CBA database, CBA also offers the ability to configure multiple sites, which is an Avaya Aura® Experience Portal system. Each CBA site configuration is composed of a primary and an auxiliary Experience Portal Manager (EPM) definition.

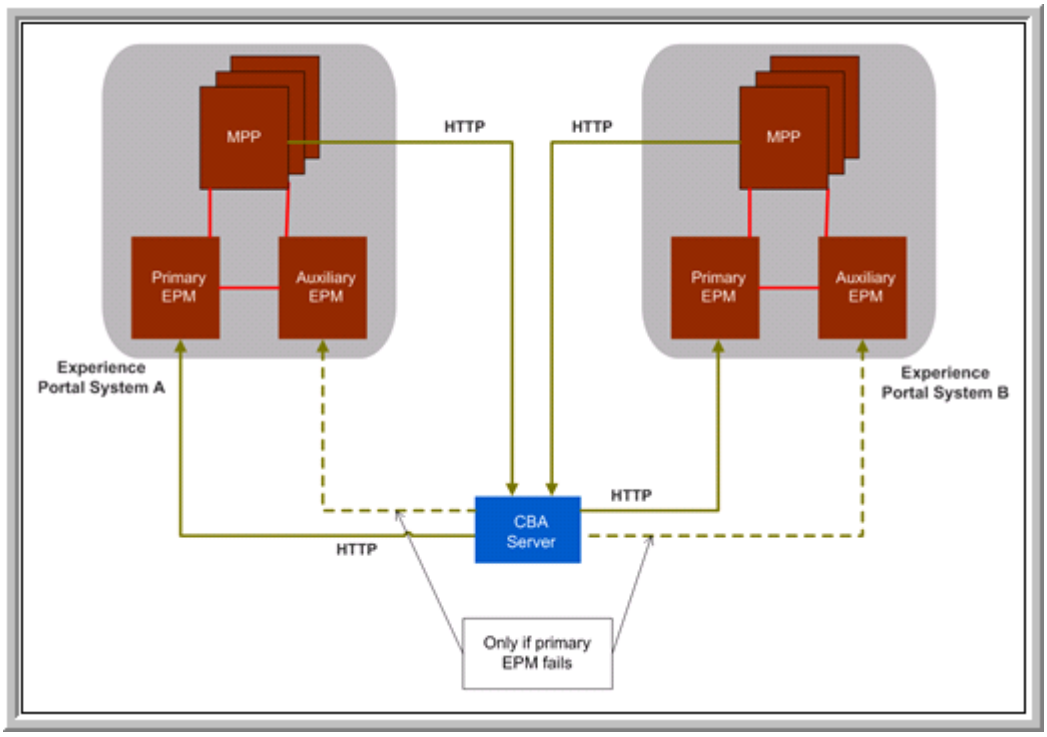


Figure 13 – CBA with multiple sites deployment architecture

When CBA receives a call, it will verify if the EPM of the Experience Portal system belongs to any of the CBA managed sites. For this, it will try to match the EPM IP address to each of the IP addresses of the primary or auxiliary EPM of the enabled sites. If a matching IP is found, then the given site is assigned to the callback request. If no EPM is found, then the caller is redirected to the optional out destination of the Callback BSR Call Center application. Once the callback request is registered and CBA tries to deliver it, the CBA Engine component will try to place the outbound call from the same site that received the inbound call and was associated to the callback request. The auxiliary EPM of the site will be tried first. If there are more than one auxiliary EPM, the EPM will be selected on a round robin basis for each request. If none of the auxiliary EPM responds, the primary EPM will be tried next. If primary EPM does not respond either, CBA will try to use the failover sequence of this

site. It will try the first site's auxiliary EPM and the first site's primary, and will follow with each of the sites in sequence in order until one EPM responds. If there are more than one auxiliary EPM for any failover site, the EPM will be selected on a round robin basis for each request. If the site is disabled after the callback is placed, the callback will be launched using the Default primary EPM.

Only connection errors are consider as failures and are moved to the following EPM, configuration error responses are not retried on another EPM. For example, if the request associated site EPM is configured wrongly, and the web service request returns with an error response, the callback request delivery is considered unsuccessful. In that scenario, the system does not try the callback request in another site and the callback request is left in an error status and tried again in the future to the same site.

> **Note:** To support callback request delivery failover from one site to another, the CCXML Callback Outbound Application must have exactly the same configuration in all the EPMs.

The multiple sites support can be combined with a high availability deployment. That is, multiple CBA servers connected to the same CBA database can operate together with multiple Experience Portal systems.

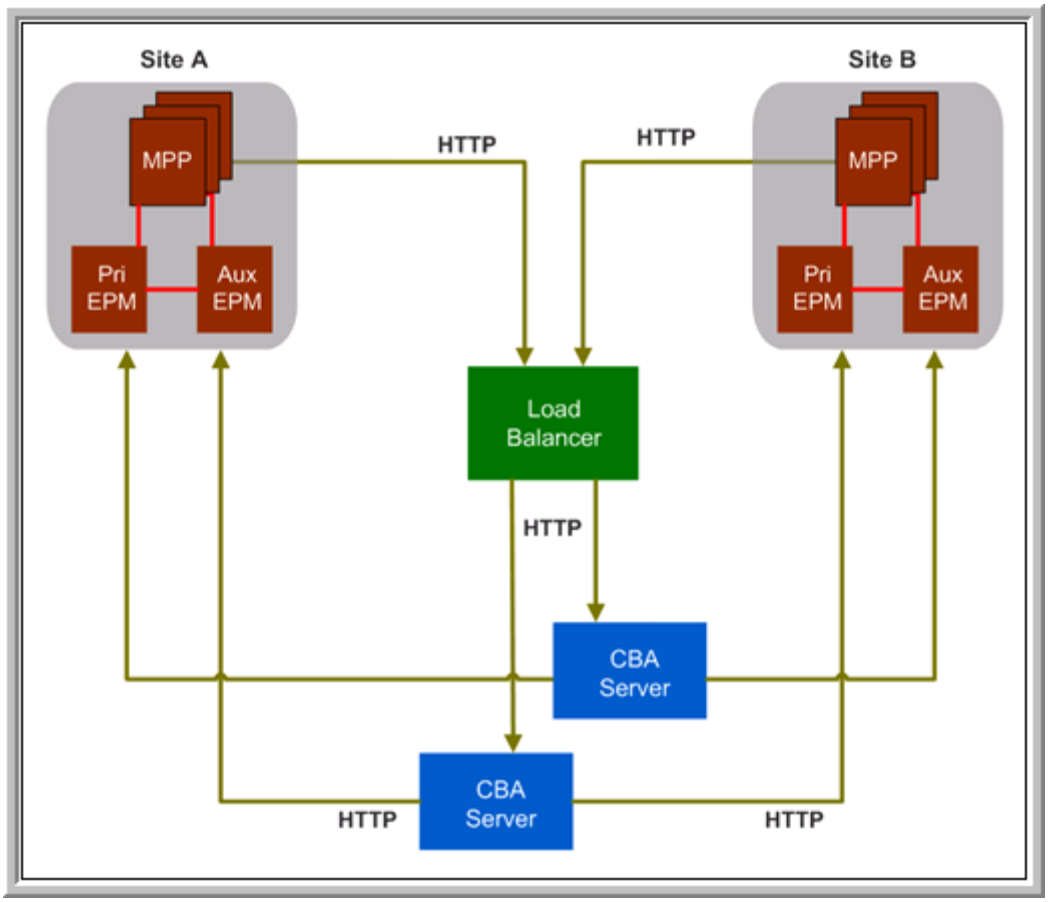


Figure 14 – Multiple CBA servers with multiple sites deployment architecture

Multiple Zone Support

Besides offering the ability to configure failover for the CBA database, CBA also offers the ability to configure multiple zones, which is an Avaya Aura® Experience Portal system. Each CBA zone configuration is composed of a primary and auxiliary Experience Portal Managers (EPM) definition. A zone definition in CBA requires at least one auxiliary EPM associated to it. Zones without auxiliary EPMs are not supported by CBA.

When CBA receives a call, it will verify if the EPM of the Experience Portal system belongs to any of the CBA managed zones. For this, it will try to match the EPM IP address to each of the IP addresses of the primary or auxiliary EPM of the enabled zones. If a matching IP is found, then the given zone is assigned to the callback request. If no EPM is found, then the caller is redirected to the optional out destination of the Callback BSR Call Center application. Once the callback request is registered and CBA tries to deliver it, the CBA Engine component will try to place the outbound call from the same zone that received the inbound call and was associated to the callback request. The auxiliary EPM of the zone will be tried first. If there are more than one auxiliary EPM, the EPM will be selected on a round robin basis for each request. If none of the auxiliary EPM responds, the primary EPM will be tried next. If primary EPM does not respond either, CBA will try to use the failover zone of this zone. If there are more than one auxiliary EPM for failover zone, the EPM will be selected on a round robin basis for each request. If the zone is disabled after the callback is placed, the callback will be launched using the Default primary EPM.

Only connection errors are consider as failures and are moved to the following EPM, configuration error responses are not retried on another EPM. For example, if the request associated zone EPM is configured wrongly, and the web service request returns with an error response, the callback request delivery is considered unsuccessful. In that scenario, the system does not try the callback request in another zone and the callback request is left in an error status and tried again in the future to the same zone.

Note: To support callback request delivery failover from one zone to another, the CCXML Callback Outbound Application must have exactly the same configuration in all the EPMs.

The multiple zones support can be combined with a high availability deployment. That is, multiple CBA servers connected to the same CBA database can operate together with multiple Experience Portal systems.

Deployments

CBA has the flexibility to support multiple and different ACDs including Call Center Elite and Avaya Aura Contact Center. CBA also supports different switches including Communication Manager and Avaya Communication Server 1000. At present, CBA supports the following options:

- **CTI Environment**: Traditional deployment of Communication Manager with Call Center Elite in a pure H.323 environment.
- **SIP Call Center Elite Environment**: One or multiple Communication Manager Servers with Call Center Elite in a SIP environment.

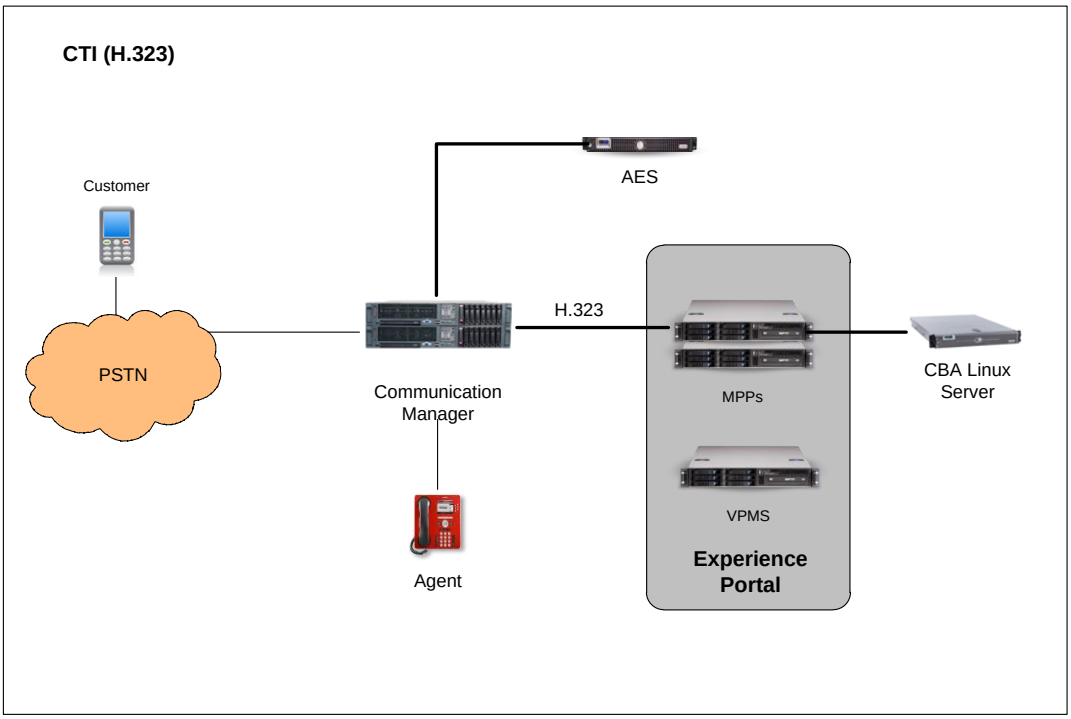


Figure 15 – CBA in a CTI environment

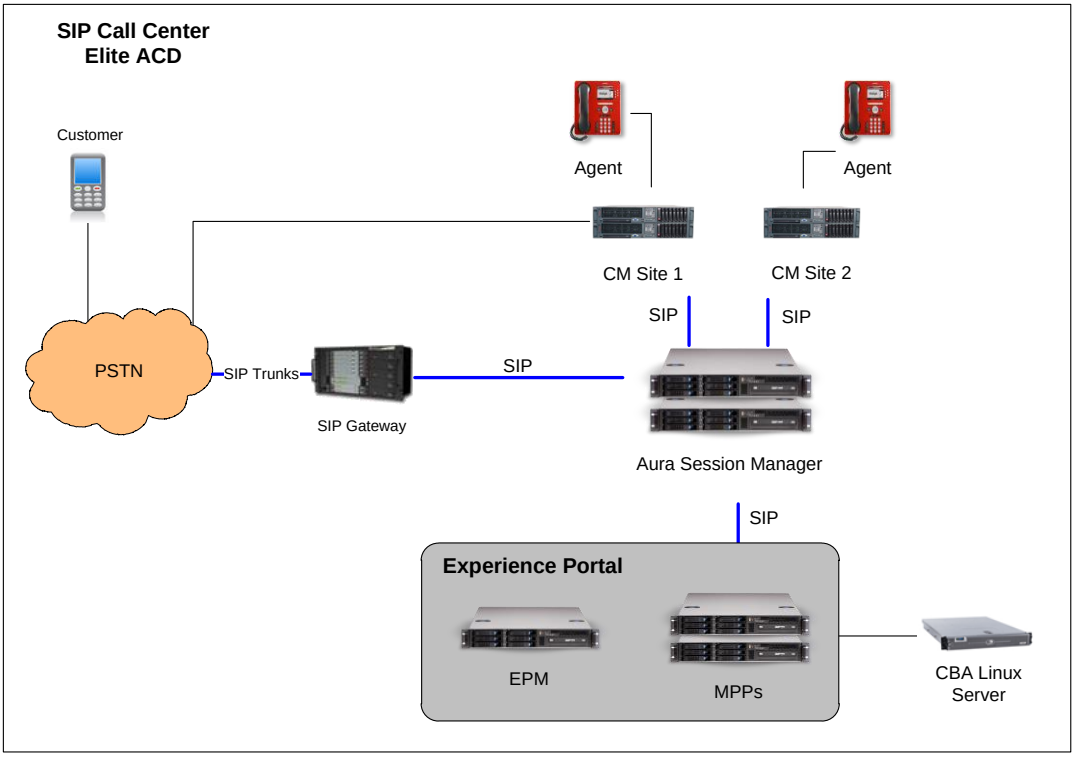


Figure 16 – CBA in a SIP Call Center Elite ACD environment

General considerations

This section provides some general considerations that must be observed during the deployment phase of CBA.

CTI applications

CBA works with CTI applications that insert unique identifier information in the UUI (User-User Information) field of Adjunct Switch Application Interface (ASAI).

CTI frameworks that insert unique values in the UUI field should perform in the same way.

Important: CTI applications that use fields other than UUI, such as, ANI, Dialed Number Identification Service (DNIS), and Collected Digits will NOT perform a screen pop up when the call representing the callback request is delivered to the agent.

CBA is capable of collecting data stored in the UUI field of a customer call and attaching the data to the associated callback call.

Avaya Interaction Center integration

Avaya Interaction Center (IC) has been tested with CBA and presents customer data to the agent provided the call has been routed to IC before being offered a callback.

Important: If the system is configured to use EDU, check the time to purge the data from EDU server. The EDU ID is stored in UUI field and, therefore, is restored when a callback call is placed in the agent's queue. However, the availability of EDU data on EDU server is uncertain.

Call flow modifications

CBA requires some modifications to be made to the call flows where a callback offer is required. These modifications include inserting a *converse vector step* and another vector for the *phantom calls* to queue to the appropriate agent skill.

DNIS or called numbers

Calls arriving on an Integrated Services Digital Network (*ISDN*) PRI or IP trunk present the DNIS sent from the network to CBA**,** unless:

- VDN Override is set on all VDNs that are touched by the call before delivering to CBA**.**
- The feature *VDN Override for ISDN Trunk ASAI Messages* is set to "***y***" for the VDN which routes to the vector that communicates with CBA.

Support for Communication Manager 6.2 feature – ICR Pullback

Starting from Release 4.1, Callback Assist supports the ICR Pullback feature added to Communication Manager 6.2. This feature provides a mechanism for an adjunct application to mark specific calls as non-abandoned. From the perspective of Callback Assist, the general idea is that if a phantom call created by ICR or Callback Assist needs to be dropped, that is, pulled back, Callback Assist can indicate to Communication Manager that the phantom call should not be considered as an abandoned call thereby removing the potential for false abandon reporting in CMS.

For more information on this feature, see *Avaya Callback Assist CMS Considerations - 4.1* available at the Avaya Support website.

Requirements for this feature:

- Avaya Aura® Communication Manager 6.2 and Avaya Call Center Elite.
- Callback Assist SIP Installation.
- Avaya Call Management System 16.3 or later.

Audio formats

For the voice custom question and message prompts, the *.wav* files must be in one of the following formats:

- Raw (header less) 8 kHz 8-bit mono µ-law
- Raw (header less) 8 kHz 8-bit mono A-law
- AV (RIFF header) 8 kHz 8-bit mono µ-law
- AV (RIFF header) 8 kHz 8-bit mono A-law

Custom messages and translations

CBA supports the following languages. But you must translate the message content into the required language, as Avaya does not provide translated messages. Avaya provides the messages only in English (US):

- Dutch
- German
- Italian
- Polish
- Russian
- English (United Kingdom)
- English (United States)
- French
- Italian
- Japanese
- Portuguese (Brazilian)
- Turkish
- Spanish (Latin American)
- Cantonese Chinese
- Mandarin Chinese
- Arabic
- Korean
- Custom

For more information and examples of a list of customer messages, agent messages, and configurable messages to configure during a callback configuration, see the *Appendix: Custom Messages section* in the *Avaya Callback Assist Administration Guide*.

Callback Assist Web Services API

Web Services API uses the SOAP XML-based messaging format over the standard HTTP application protocol. SOAP has the advantage of being widely used, with clients available in most programming languages. Callback Assist Web Services API is a standards-compliant method of programmatically offering call flow functionality, like creating immediate and schedule callback requests, and validating agenda availability.

Starting from release 3.2, Callback Assist Web Services API feature introduces a new type of Callback configuration called Web Enabled Configurations. The current Callback configurations are called Voice Enabled Configurations and there is an option to have both configurations tied up which is called Composite Configurations. This new type of configuration exposes a new entity called WebCallback Request, the request which is created through the Web Service API.

Important:

Callback Assist Web Services API works only with Web Enabled Configurations or Composite Configurations. There are differences between Web Enabled Configurations and Voice Enabled Configurations in terms of interface, and Web Enabled Configurations provide more flexibility.

For more information on Callback Assist Web Services API, see *Avaya Callback Assist Web Services API Guide*.

Solving common contact center problems

One of the most challenging problems that contact centers experience is handling high volume of incoming calls. In addition to call handling, contact centers have to ensure that customers are satisfied even during the long waiting period. The customer calls are queued and attended when an agent is available.

The following section describes some of the more prevalent contact center problems that Callback Assist (CBA) has resolved.

Offering Immediate or Scheduled Callback to customers

At times, the calls to a contact center are queued due to several situations. These situations are unavailability of contact center agents and meeting of the minimum and maximum EWT. To avoid such circumstances, Avaya has introduced CBA that works when the queued calls are redirected to the CBA application. CBA helps the contact centers to offer a callback request to the customers based on the availability of agents and customers' preferences. CBA offers two options to the customers to best fit their requirements: *Immediate callbacks* and *Scheduled Callbacks*. *Immediate callbacks* are done when agent is available. *Scheduled callbacks* are done according to the customer's preference and the contact center's time slot availability.

Offering callback configurations

Site administrators in a contact center can use CBA to create multiple callback configurations and link them to different Vector Directory Number (VDN). This provides great power and flexibility to the site administrators. The site administrators can also use CBA to configure weekly and recurring time slots when immediate and scheduled callbacks are requested.

Reviewing customer information before a callback

CBA facilitates the recording of answers to questions presented to the customers-much like a script when the customer requests a callback. Later, the agent receives the callback request through the *phantom call* initiated by CBA. The contact center agent listens to the recorded answers and retrieves the customer data using User to User Interface (UUI). The data displayed on the UUI helps an agent to be better prepared to exceed customer's expectation when the customers receive a callback. This leads to a higher degree of customer satisfaction.

Reporting management solutions

CBA provides the following reporting management solutions to the site administrators and supervisors in a contact center:

- **Daily Summary Report:** Provides a consolidated report on daily basis with all the relevant information of immediate and scheduled callbacks as requested and delivered to agents. You can analyze the effectiveness of CBA and its adoption by customers through the Daily Summary Reports.
- **Hourly Summary Report:** Provides an hour by hour CBA workload analyses for a specific period on a single date. Based on the report, you can enhance the resource distribution and time slot offering to optimize service to the customers.
- **Call Disposition Report:** Provides a detailed status of all calls made through CBA to analyze the effectiveness of customer callbacks.
- **Pending Callback Requests Report:** Provides latest data on outstanding callback requests on a daily basis. You can sort the report to display the scheduled callbacks and immediate callbacks in groups. You must have an administrator role or a Report Pending Callback role to access and generate this report.
- **Canceled Callback Requests Report:** Provides latest data on all the callbacks that are canceled between dates by the customer or the agent through the Pending Callback Requests Report, Web service, or through a phone. You must have an administrator role or a Pending Callback Cancelation role to access and generate this report.
- **Report data management and export:** Helps you configure the duration to store and purge report data by application. In addition, you can export the data to the CSV file format.
- **Reports Accessibility:** Provides access to the reports for distribution to the users who want to view it. The Web-reporting feature of CBA also enables users to access the previously inaccessible reports. With the required permissions, users can access reports from a specific URL. Web-reporting has the following advantages:
  - Reports are accessible regardless of the geographical location.
  - Need of purchase and maintenance of a client application on each desktop machine in contact centers is eliminated, thus ruling out the IT support for remote users.
- **Dynamic prompting:** Helps you configure data that is collected from the calls.
- **Voiced information to customers:** Provides information about the *Estimated Wait Time (EWT)* and *Queue Position (QPOS)* to the customer.
- **EWT threshold callback offer triggering:** Helps determine the callback request based on the Estimated Wait Time *(EWT)* threshold.

- **CTI Screen Pop Preservation**: Preserves and displays the information collected from the first call from the customer the UUI. During a callback, an agent can use the UUI pop up screen to view the preserved customer information.
- **Multiple Pending Requests Handling**: You can restrict the number of pending callback requests to only one for customers, based on the ANI (Calling Number) and callback configuration. Customers can also choose to cancel their previous requests or choose to wait to receive the callback.
- **Web-based reports**: Makes all the reports available through a Web-based interface and the data can be exported to CSV file.
- **Web-based administration application**: Eliminates the need to install a specific desktop client application through the utilization of a robust AJAX Web framework and an intuitive administration interface. You can manage CBA remotely on virtual machine enabled with a Web-browser.

Managing data

You can store up to six months of historical data to generate reports of your CBA application. However, the site administrators can choose to purge data before this schedule to preserve resources for security and archive reasons. CBA provides the flexibility to administrators to tailor a policy that best fits their needs.

Migrating data

All CBA reports have a data export feature that you can use to send data to other applications. Some applications that can use this feature are: workforce management systems, wallboards, business data analysis, and agent adherence applications. The data format is the standard *CSV (Comma-Separated Value)*, compatible to most applications available in the market.

Performing Web-based reporting and administration

You can access the CBA Web administration through a predefined URL from an internet browser to run reports and administer the system. Web-based reporting and administration has the advantage of simplifying desktop maintenance by eliminating the need to install or upgrade additional client software.

The CBA Web administration takes advantage of *AJAX* capabilities and delivers a rich experience without compromising on the easiness of deployment over a Web browser.

Support

The Avaya Professional Services (APS) organization offers complete range of professional services starting from planning and design to support of the CBA system. For more information about APS offers, contact your account representative or call APS. For contact information, see *Support contacts*.

Information required for support

When you contact your Avaya Professional Services representative, you must provide the following information:

- Your full name, organization, and telephone number where an Avaya representative can contact you about the problem.
- The Avaya Sold-To number, also known as the Functional Location (FL) number.
- A description of the problem.
- The type of service contract your organization has with Avaya.
- Your Avaya AACC, AAEP and CBA release information.
- Your Avaya Communication Manager, IVR or VP, and Avaya AES release information.
- A description of the CBA hardware, CBA deployment, and operating system software.
- A description of any APS contracts for CBA.
- Remote access to the CBA systems.

For more information, see *Remote access for technical* support.

Support limitations and restrictions

The following limitations and restrictions apply to CBA software support:

- The CBA software warranty only applies to the software media. The warranty does not apply to the entire CBA solution. If the problem is an indirect issue with the actual CBA software, you might be charged for software support. At this time, the only exception to this rule is software bug issues.
- You might purchase an Avaya service contract, or you may pay for software support when needed (*a-la carte basis*) per call. If you are uncertain about the details or expiration date of an existing service contract, contact your Avaya sales representative.

- Only the hardware or software that meets Avaya's requirements must be added to the CBA configuration. If your Avaya support representative suspects a non-standard hardware or software that is causing CBA related problems, you will be asked to remove the components that are not supported or out of compliance.

Remote access for technical support

Avaya support personnel require remote access to provide technical support. You must set up one of the following methods in order to provide remote access:

- Secured Access and Control (SAC)
  Visit http://support.avaya.com/sac/for more information about SAC.
- WebEx and Avaya Web Conferencing

Support contacts

The Support contacts for CBA are listed below.

Contacting Avaya technical support

Avaya provides support telephone numbers for you to report problems or ask questions about your product.

For United States support:

1-800-242-2121

For international support:

See the 1-800 Support Directory listings on the Avaya Web site.

Contacting Avaya Professional Services

Contact the Avaya Professional Services (APS) organization for more information about maintenance offers.

If you are within the United States, you can call 1-866-282-9266.

U.S. and international customers can also visit the Contact Center APS Web site.

Escalating a technical support issue

Avaya Global Services Escalation Management provides the means to escalate urgent service issues. For more information, see the *Escalation Management* listings on the Avaya Web site.