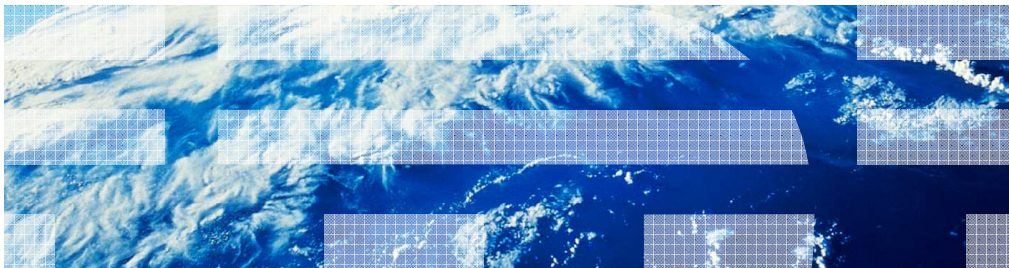


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# IBM WebSphere Application Server Communications Enabled Applications

## Communication services overview



This presentation provides an overview of the communication services included in the IBM WebSphere Application Server Communications Enabled Applications feature.

## Agenda

- Overview
- Communication services interfaces
  - Rest API
  - web services interfaces
- IP-PBX sample application
- Summary

This presentation will begin with a brief introduction to the communication services included in the IBM WebSphere Application Server Communications Enabled Applications feature. You will then be introduced to the different ways to access the communication services using REST requests, or web service requests. A description of the included sample IP-PBX application is provided before summarizing the presentation.

Section

**Overview**

This section gives an overview of the communication services provided by the IBM WebSphere Application Server Communications Enabled Applications feature.

## Communication services overview

- The communication services are server side services, available to drive communication in enterprise applications
- REST APIs
  - WebSphere system application invoked using REST APIs
  - Listening for requests
  - Drives the Communications Enabled Applications web widgets
- web service interface
  - Business application use

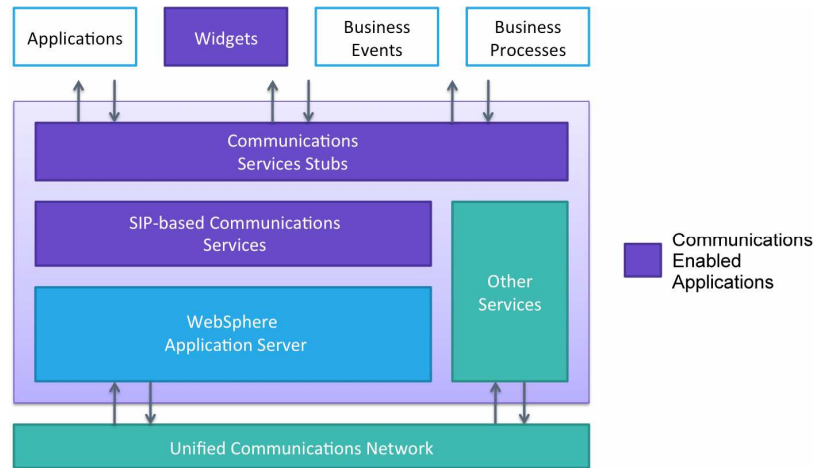
The IBM WebSphere Application Server Communications Enabled Applications (CEA) feature includes a server side component that is referred to as the communication service. The communication service provides the back end functionality to drive the features of CEA. These services perform activities to make calls between two parties, monitor call status, provide call notification of incoming calls, and register and un-register for call notification to name a few. The communication services are accessed by the web widgets using REST APIs, and can also be accessed using web services by business applications.

## Communication services

- Telephony and non-telephony enterprise application communication components access communication services
  - Telephone related activities routed through REST calls to the IP-PBX
  - Web co-browsing data passed through REST calls as well
- IP-PBX sample application
  - Ready to integrate testing solution
  - Rapid start to development
- Third party IP telephony tools can be integrated for testing

The communication services provide the back end functionality for both telephony and non-telephony actions for the Communications Enabled Applications feature of WebSphere Application Server. Telephone related activities performed by the communication services are routed through an IP-PBX to handle voice communication information processing. Non telephony related activities include handling co-browsing web data for the instance where two parties are browsing the same Web content in a co-browsing session using the collaboration dialog widget. A sample IP-PBX application is provided for testing. It allows developers to test telephony related programming components using third-party IP telephony softphones to simulate telephone calls. The sample IP-PBX application ultimately enables your organization to quickly begin developing telephony related application components.

## Overview diagram



The Communications Enabled Applications communication services layer connects the web widgets to the application server layer. The communication services accept requests either using the REST APIs or web services, and connect the requesting application layers to the unified communication network using an IP-PBX. The services also handle non-telephony related activities, such as passing data back and forth between two collaboration dialog widgets during a co-browsing Web session. For example, two parties are co-browsing a Web page. One party in the co-browsing session chooses to send a page they are viewing to the other party. That information is relayed by way of REST requests to the communication service layer. The communication service then passes the information along to the peer's collaboration dialog box. The peers collaboration dialog box will then display the page that the other party sent in the request.

Section

***Communication services interfaces***

This section will discuss the communication services interfaces, including the REST and web services interfaces.

## Communication services interfaces

- Two ways to access the communication services
  - REST API
  - web services
- REST APIs
  - Representational state transfer
  - Servlet accepts HTTP requests
  - Requests define operations to perform
    - Example: register a telephone number to monitor with the IP-PBX
  - Information sent to the servlet in either JSON or XML format

The communication services included in the Communications Enabled Applications feature can be accessed using REST API requests or web services requests. The REST requests are sent using HTTP requests, so they are perfect for any components that reside in the Web layer of an application. The HTTP requests that are sent to the communication services have a distinct format that indicates to the services what activities are being requested. Information needed by the communication services to perform the operation is provided in either JSON or XML format. JSON is a standard way to pass data that organizes data in key value pairs in a simple list format.



## Web services interface

- Business applications can access the communication services using web service calls
- web service calls are available for each telephony based REST application service call
- Performs in the same manner as REST API calls with one exception:
  - Web service defines endpoint listener that does not need to constantly poll REST servlet

The Communications Enabled Applications (CEA) web services interface is intended for use in the non-Web business application layer. For parts of an application that are not Web related, web service calls can be used to access the CEA telephony services. The Web service interface and the REST APIs support the same set of operations.

## Telephony actions

- These telephony actions are available from the REST servlet
  - Make a call
  - End a call
  - Get info on a call
  - Register for call notification
  - Polling for a call notification
  - Un-register for call notification

Several actions are included in the REST API provided by the Communications Enabled Applications communication service. These actions include the ability to make a call, end a call, and gather information related to an ongoing telephone call. APIs can be used to register a user for call notification, poll for available calls for call notification, and un-register for call notification. Long standing requests are used when a REST call to the communication services are used. If, for example, a call notification widget is polling the communication services to see if there are any available calls, there might not be any calls in progress. The request will remain active for 30 seconds to wait to see if a call will arrive before timing out and returning a response to the call notification widget indicating no calls are available. If a telephone call is received by the communication services within that 30 second window when a request is active, the service will return a response to the request as soon as the incoming call arrives.

## Web service actions

- web services has these actions
  - openSession
  - makeCall
  - endCall
  - closeSession
  - WS-Notification based asynchronous notifications

Web service calls can be made by non-Web components in an enterprise application to access the communication services from that application layer. web service calls are available to open a session, make a call, end a call, close a telephony session, and to use WS-Notification based asynchronous notifications. When Web services are used to open a session or close a session, call notification is registered and unregistered as part of the open and closing of the session.

## REST servlet co-browsing actions

- Enable collaboration
- Get collaboration status
- Start collaboration session with peer URI
- End collaboration session
- Fetch data from the peer
- Send data to the peer

The communication services provide functionality for more than just the telephony actions provided in the Communications Enabled Applications feature. The REST APIs can also be used to access the web collaboration functions of the communication services. REST requests exist for enabling a new collaboration session, to gather data about collaboration status of a co-browsing session, and can start a collaboration session with a peer URI. REST calls can also be used to end a collaboration session that is active, or send or fetch data from the peers collaboration dialog widget. This functionality can be seen in the collaboration dialog widget icons. Icons are shown in the collaboration dialog widget to show if the peer window is open, if the collaboration session is connected, and to display who is driving the co-browsing Web navigation. For more information on the collaboration dialog widget and these icon statuses, see the collaboration dialog widget presentation.

## Developing applications with web services

- WSDL file is provided
  - <http://host:port/commsvc.rest/ControllerService?wsdl>
- Using the WSDL file a web services client can be generated using an enterprise development IDE
- Rational Application Developer supports WebSphere Application Server web service client generation

Web services clients can be developed using the provided WSDL file. You can access the WSDL definition by pointing your browser to your application server at the URL indicated above. The WSDL file can then be downloaded and used to generate a web service client. Integrated development environment tools such as Rational Application Developer can be used to generate Web service clients using the WSDL file, and that client can then be used to integrate Web service calls into your applications.

## Example scenario

- A hardware store business wants to track how many times they receive service calls in a day
- Business application can be notified of each call that comes in and a counter can be incremented
- Business application registers with the IP-PBX to be notified of incoming calls with a web service call
- Upon receiving incoming calls, the IP-PBX notifies the CEA system which then sends a notification to the waiting listener registered using the web service
- The business application receives the notice, increments the counter keeping track of incoming calls
- Data can be stored and later accessed to create a report of how many calls the business receives daily

Here is an example of when you might want to integrate web services into your business applications to use the Communications Enabled Applications feature. In this example, a hardware store wants to track the number of service calls they receive in a day. They have a business application with a non-Web layer that can be notified each time a call arrives, and that business application can keep track of the number of incoming calls using a counter. The business application uses a web service client generated from the provided WSDL file. The application registers with the IP-PBX to be notified of incoming calls using the Web service client. When calls are received, the IP-PBX notifies the communication service, which then sends a notification to the listener that was registered with the initial Web service call by the business application. The business application receives the notification in its listener, and increments a counter. The data that the application gathers in its counter is logged and stored to be used in a report that is generated at the end of the business day.

Section

***IP-PBX sample application***

This section will discuss the included sample IP-PBX application.

## IP-PBX overview

- IP-PBX stands for internet protocol private branch exchange
- An IP-PBX is a business telephone system designed to deliver voice over a data network
- It interoperates with the PSTN (public switched telephone network)
- REST back end talks to an IP-PBX using SIP (session initiation protocol)
- The data exchanged includes XML messages based on CSTA (computer-supported telephony applications)
- SIP is used in telephony enterprise applications
- Telephony applications that perform telephone related actions communicate using an IP-PBX

A CSTA compliant IP-PBX is required to perform telephony development and testing tasks. An IP-PBX is used to deliver voice data over a network, and to interoperate with the public switched telephone network, to connect telephone calls from regular public telephones, to private telephone networks. The Communications Enable Applications REST service back end uses Session Initiation Protocol to request services from the IP-PBX.



## IP-PBX sample application

- The CEA samples package includes a sample IP-PBX (implemented as an enterprise application)
- This sample allows for a quick start to development and testing
- In production, an IP-PBX that supports TR/87 is used to drive telephony in enterprise applications
- In production an IP-PBX is loaded on a Linux blade server or similar system on a dedicated box
- Third party PBX systems can be used during development as well
  - Complex setup of PBX is required
  - Possibly time consuming for development purposes

Enterprise IP-PBX systems are typically quite expensive. A basic mock IP-PBX application is included in the Communications Enabled Applications (CEA) samples package. It can be used to develop and test telephony-enabled enterprise applications in a rapid and affordable manner. The mock IP-PBX is designed to work with Voice Over Internet Protocol (VOIP) clients such as CounterPath X-Lite. Applications can be thoroughly tested with the mock IP-PBX, and then moved to an environment where an enterprise quality IP-PBX is available for final verification testing. Although the sample IP-PBX is available, you can of course use other IP-PBX systems; however, the setup is likely to be more complex and time consuming.

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Section

**Summary**

This section will summarize the communication services overview presentation.

## Summary

- CEA communication services provide telephony and web collaboration support for enterprise applications
- REST servlet handles HTTP requests from Web based applications
- web service to integrate telephony into business applications
- Sample IP-PBX application provided for rapid start to development

The Communications Enabled Applications communication services provide the back end server side support for communication applications. The communication services can be accessed using REST APIs and web services in non-Web front end portions of enterprise applications. The REST servlet handles HTTP requests from Web components to access telephony actions.

A sample IP-PBX is provided, and can be used to develop and initially test communication enabled applications. Using the sample IP-PBX allows developers to test telephony related components without having the complex and often time consuming task of configuring and connecting to an enterprise IP-PBX.



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