

Mitel Open Integration Gateway

DEVELOPER GUIDE - FUNDAMENTALS

Release 3.0

November 2015



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**Mitel Open Integration Gateway
Developer Guide - Fundamentals
Release 3.0
November 2015**

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Introduction

The Mitel OIG is a web server that provides a single access point to web services available within a Mitel system. The Mitel OIG runs on the Mitel Standard Linux (MSL) operating system and can be deployed as an MSL software blade through the Mitel AMC licensing server, or as a virtual appliance downloaded from the Mitel OnLine website.

The Mitel OIG provides web services by integrating with a Mitel system (MiVoice Business cluster or single MiVoice Business node and Mitel applications). Mitel OIG supports the following web services:

- Session management service
- Call control services
- Data access services
- MiVoice Integrations service (only for Mitel MiVoice Integration Applications)

In general, software developers are required to join the Mitel Solutions Alliance (MSA) at one of the Developer Advanced membership levels in order to develop or modify Mitel OIG-based applications.

Software developers also have the option to evaluate the Mitel OIG development capabilities in advance of joining MSA, either by ordering the Mitel OIG 60-Day Trial (for Mitel end-customers – P/N 54005933), or by requesting a one-month reservation on the Mitel OIG Hosted Virtual Lab (for prospective commercial developers [click here](#)).

The following resources are available to support developers working with Mitel OIG.

- Mitel OnLine
- Mitel eDocs - Technical Documentation
- Mitel Solutions Alliance (MSA)
- Mitel Open Integration Gateway Training
- Technical Assistance

Mitel OnLine

Mitel OnLine is a web portal for information and resources about Mitel solutions, sales, support, training, partners, and more.

The Mitel OnLine URL is <http://portal.Mitel.com>.

The Mitel corporate website, <http://www.Mitel.com>, also provides links to Mitel OnLine in two places:

- In the ribbon along the top right section of the Mitel.com page, click **Login**.
- Log in to Mitel Connect.
- In the top left corner of the screen that appears, click **Mitel OnLine**.

Mitel eDocs - Technical Documentation

The Mitel eDocs Technical Documentation website provides the latest versions of the technical publications for Mitel products and solutions. Documents are organized by release under each product or solution.

The eDocs URL is <http://edocs.mitel.com/>.

eDocs can be accessed from Mitel OnLine by selecting **Products > Product Documents** in the ribbon area at the top of the Mitel OnLine home page.

eDocs can also be accessed from Mitel.com by selecting **Support > Product Documents** at the bottom of the page.



Note: You must have a Mitel OnLine account user name and password to view and download technical documentation.

Mitel OIG documentation

This document, *Mitel OIG Developer Guide - Fundamentals*, describes the Mitel Open Integration Gateway (Mitel OIG) and provides an overview of the Mitel OIG services for software developers creating applications that access a Mitel OIG.

The following Mitel OIG documentation is available on the Mitel Customer Documentation website (eDocs):

- Mitel OIG Product Bulletin
- *Mitel OIG Installation and Maintenance Guide*: This document provides details and instructions for installing the Mitel OIG and licensing it for applications and services.
- *Mitel OIG Engineering Guidelines*: The Engineering Guidelines provides guidance on network and system level requirements and performance.
- *Mitel OIG Developer Guide - Fundamentals (this guide)*: The fundamentals guide introduces the Mitel OIG application developer environment and general information that applies to developing applications relative for any of the Mitel OIG web services. This guide describes how to register an application with Mitel and request a Mitel certificate to be used in the application. The fundamentals document also includes a summary of the changes introduced for this release.



Note: Mitel recommends that you become familiar with the contents of this guide, the *Mitel OIG Developer Guide - Fundamentals*, before beginning to create Mitel OIG applications.

- *Mitel OIG Developer Guide - Session Management Service*: This developer guide provides application developers detailed requirements for working with the Session Management Service. This guide describes how an application opens a communication session with the Mitel OIG. Applications use this one communications session to access all other web services offered by the Mitel OIG.

- *Mitel OIG Developer Guide – Call Control Service*: This developer guide describes the Call Control Service details needed for creating applications that monitor and control devices and features configured within MiVoice Business nodes.
- *Mitel OIG Developer Guide - Data Access Service*: This developer guide describes the Data Access Service details needed for creating applications that receive MiVoice Business Data.
- *Global Call ID Developer Guide*: This guide provides guidelines for Mitel OIG applications that are written to track calls in a Mitel MiVoice Business system using a system wide call ID. The guide is available on the MSA Downloads portal.
- *Virtual Appliance Deployment Solutions Guide*: This guide provides engineering guidelines for deploying Mitel virtual appliances and applications in a VMware virtual infrastructure. The guide is available on the Mitel Customer Documentation (eDocs) website under the **Solutions Guides** heading - Virtual Appliance Deployment Solutions Guide.
- Mitel Standard Linux (MSL) documentation
- MiVoice Business documentation

The following MiVoice Integration guides describe administering and using the MiVoice Integration applications for Salesforce and Google. The MiVoice Integration documents are available on the Mitel eDocs website.

- *MiVoice Integration for Salesforce Administration Guide*
- *MiVoice Integration for Salesforce User Guide*
- *MiVoice Integration for Google Administration Guide*
- *MiVoice Integration for Google User Guide*

Mitel Solutions Alliance (MSA)

Mitel Solutions Alliance (MSA) is the Mitel developer partner program. MSA delivers resources to enable a wide range of third-party partners (3PPs) to successfully create applications and services that integrate and interoperate with Mitel's core business communications portfolio.

The following MSA resources exist for Mitel OIG.

- WSDL files for Mitel OIG 3.0 Call Control Web Service operations and events
- Mitel OIG 3.0 Sample Application Package
- *Global Call ID Development Guide*: The *Global Call ID Development Guide* provides guidelines for Mitel OIG applications that are written to track calls in a Mitel MiVoice Business system using a system wide call ID.
- Accessing the MSA portal

WSDL files for Mitel OIG 3.0 Call Control Web Service operations and events

Mitel provides WSDL files describing the Mitel OIG 3.0 Call Control Web Service. The WSDL files are available for download from the Mitel MSA web portal.

Mitel OIG 3.0 Sample Application Package

Mitel OIG sample applications and documentation is provided to test Mitel OIG 3.0 functionality and to be used as examples for creating custom applications. The application package is in a compressed file that can be downloaded from the Mitel MSA web portal.

The following Mitel OIG materials are provided in the package:

- Mitel OIG 3.0 documentation
 - Mitel OIG Developer Guide – Fundamentals
 - Mitel OIG Developer Guide – Session Management Service
 - Mitel OIG Developer Guide – Call Control Service
 - Mitel OIG Developer Guide – Data Access Service
 - Mitel Global Call ID Developer Guide
 - Mitel OIG 3.0 Release Notes
 - Mitel OIG WSDL files for Call Control Service
- Mitel OIG test tools and documentation
 - Mitel OIG Call Control Service Browser Tool
 - Mitel OIG Call Control Service Browser Tool User Guide
 - Mitel OIG Data Access Service Browser Tool
 - Mitel OIG Data Access Service Browser Tool User Guide
 - Mitel OIG Sample Applications
- Standard Call Control Polling Application
 - Includes: Visual Basic exe, source code and user guide
- Standard Call Control Event Handler Application
 - Includes: C# exe, source code and user guide
- Standard Call Control Polling Application
 - Includes: Java exe, source code and user guide
- Advanced Call Control both polling and event handler Applications
 - Includes: C# exe, source code and user guide
- Advanced Call Control IP Resiliency Applications
 - Includes: C# exe, source code and user guide
- Standard Data Access Polling Application
 - Includes: Java exe, source code and user guide

Accessing the MSA portal

To access the MSA member website:

1. Log in to Mitel OnLine <http://portal.Mitel.com>.
2. If your Mitel OnLine account is configured with MSA membership, a MSA menu item will be available.
3. On the **MSA** menu, click **MSA Downloads**.



Note: MSA Membership is required for access to the MSA web portal.

The MSA link will not appear on Mitel OnLine unless you have an MSA membership for your Mitel OnLine user account.

Mitel Open Integration Gateway Training

To find Mitel OIG training courses, log in to the Mitel Learning Management System at http://portal.mitel.com/wps/myportal/MOLPageDetails?WCM_GLOBAL_CONTEXT=/wps/wcm/myconnect/mitelonline/MitelOnline/Home/index_21615/LMS. In the **Find A Course** search window, enter "Open Integration Gateway".

The following Mitel OIG training courses are available for people new to Mitel OIG:

- Mitel OIG Primer: A basic overview and introduction to the Mitel Open Integration Gateway application including deployment, licensing, and operation.
- Mitel OIG Installer Installation and Maintenance Course: This training covers software installation (for both physical and virtual environments), and configuration for Technicians who will install the Mitel OIG at customer premises.
- Mitel OIG Developer Courses: This training covers software installation for physical and virtual environments, configuration, licensing, and certificate management for Developers who will use Mitel OIG to create and deploy telephony applications
- For students who are already certified on a previous release of Mitel OIG, you should take one or both of the free update courses:
 - Mitel OIG Installer Installation and Maintenance UPDATE Course
 - Mitel OIG Developer Installation and Maintenance UPDATE Course

Technical Assistance

MSA member support is available to all current members of the MSA program in good standing and who have sufficient incident credits available. Members can contact MSA via the web when they wish to report a problem or incident.

- TechCentral Tracker (TCT) for MSA Developer Support
- General Support
- Member Support
- Web Support
- Providing Feedback

TechCentral Tracker (TCT) for MSA Developer Support

The TechCentral Tracker (TCT) for MSA is an incident management web portal for MSA members that is used to report a problem and supply full problem information to Product Support. With the TCT for MSA, members can use the TCT web portal to create, modify, track and close Developer Support incidents, and to add log files and other supporting attachments to new or existing incidents.



Note: Refer to the *Mitel OIG Installation and Maintenance Guide* for more information regarding the types of logs needed for MSA support.

Developer access to the TCT for MSA portal requires an active MSA Membership, active MSA-on-MOL logon credentials, and a valid MSA Developer TechID.



Note: The TechID is not the same number as the MSA Technical Support ID Code (TSID) that you previously used to access the email-based MSA Developer Support organization.

You can access the new TCT for MSA portal by logging on to Mitel OnLine using your MSA-on-MOL logon credentials. Navigate to **Home > MSA > MSA Developer Support** and select **TechCentral Tracker for MSA**.

The *TCT User Guide for MSA Developers* is available on the MSA-on-MOL web portal to aid in incident creation and management.

Contact Mitel Support at TSN@Mitel.com with questions regarding access to, or use of, the TCT for MSA portal.

General Support

Inquiries or other difficulties that are not considered to be defect-related can be described in an electronic mail message to MSAInfo@Mitel.com.

Member Support

The Mitel MSA web site is designed for self-service. To access the MSA web portal, navigate to <http://www.mitel.com/>. Click **Login** in the uppermost navigation bar; and enter your MSA-on-MOL login credentials

Web Support

In the uppermost navigation bar of the MSA web pages, click **CONTACT US**. Since all Internet users can use this contact mechanism, we expect that the range of questions will be quite broad. When registered members use the web CONTACT US mechanism, Web Support will follow Mitel Product Support policies and guidelines.

Providing Feedback

Comments or suggestions relating to this document can be provided in an electronic mail message to MSAInfo@Mitel.com.

Mitel OIG 3.0 application-affecting changes

The following sections summarize the changes that have occurred in the Mitel OIG 3.0 release, and the changes to MiVoice Integration for Google and MiVoice Integration for Salesforce.

- Supports MiVoice Business 7.2 and MiVoice Business Multi Instance 2.0 SP1
- Now supports E.164 numbering format. See the *Mitel OIG Installation and Maintenance Guide* and the *Mitel OIG Engineering Guidelines* for more information.
- New MiVoice Integrations Demo Kit for Mitel resellers (P/N 54006307). Enables Mitel resellers to demonstrate the MiVoice Integration applications (for Salesforce and Google) to prospective end-customers.
- Mitel OIG supports 1500 applications or application instances.
- Mitel OIG supports 1500 hot desk users/ hot desk ACD agents when using MiVoice Integration for Salesforce to log in to Mitel OIG.
- Mitel OIG supports 250 MiVoice Business Instances.
- Mitel OIG uses MSL 10.3.

Changes to MiVoice Integration for Google

From the Mitel OIG MiVoice tab (in MSL), you can now:

- Import and export the User List. This is useful when you are running MiVoice Integration for Google without a corporate directory, as you can export the user list; make additions, changes, and deletions; and import the user list back in.
Note that MiVoice Integration for Google will not work with Mitel OIG unless there is a Google account to phone number mapping within the Mitel OIG; the mapping can be provided by enabling Mitel OIG access to a Google Domain Corporate User Directory (list of Google accounts with phone numbers) or importing a Google user list.
- Import and export the Localization file. Use this facility to change the language of the MiVoice Integration for Google user interface. Export the Localization file, translate and edit the UI strings, and import the Localization file.

Changes to MiVoice Integration for Salesforce

MiVoice Integration for Salesforce is now integrated with MiContact Center and supports full IVR features through connection with MiContact Center. Other primary features include:

- ACD Hot-desking agents and non-ACD contact center users
- Agent Make Busy, Do Not Disturb (DND)
- Account codes (stored on MiVoice Business)
- Classification codes – ACD calls only (Stored on MiContact Center - similar to account codes, but connected to the Work timer)
- User option for automatic screen pop in Salesforce
- Control of a hard phone set (SIP phones are not supported)

- Defines new licensing for Mitel OIG/MiVoice Integration for Salesforce with and without the use of MiContact Center.
 - **MiContact Center Edition**
When using Mitel OIG and MiVoice Integration for Salesforce **with** MiContact Center, Salesforce uses the MiVoice Business IVR, and gets call details from MiContact Center.
 - **General Business Edition**
When using Mitel OIG and MiVoice Integration for Salesforce without MiContact Center, Salesforce gets call details from MiVoice Business.

Administration User Interface Changes

The Mitel OIG Administration UI has been changed to:

- Add MiContact Center and MiVoice Business network elements
- Import and export user lists from the Google user directories
- Import and export UI language strings. This is used to change the language of the MiVoice Integration UI by importing a translated UI string file.

Refer to the Mitel OIG Installation and Maintenance Guide for detailed instructions.

Mitel OIG Overview

The Mitel Open Integration Gateway (Mitel OIG) is a web server that provides each Mitel OIG application a single point of access to web services available within a Mitel communication system. The Mitel OIG provides a service-oriented architecture. A Mitel OIG application opens a communication session with a Mitel OIG by logging in (i.e., sending a service operation or request to the Mitel OIG). After the Mitel OIG application is authenticated and authorized, the application can use this one communication session to access all Mitel OIG web services the application is authorized to use.

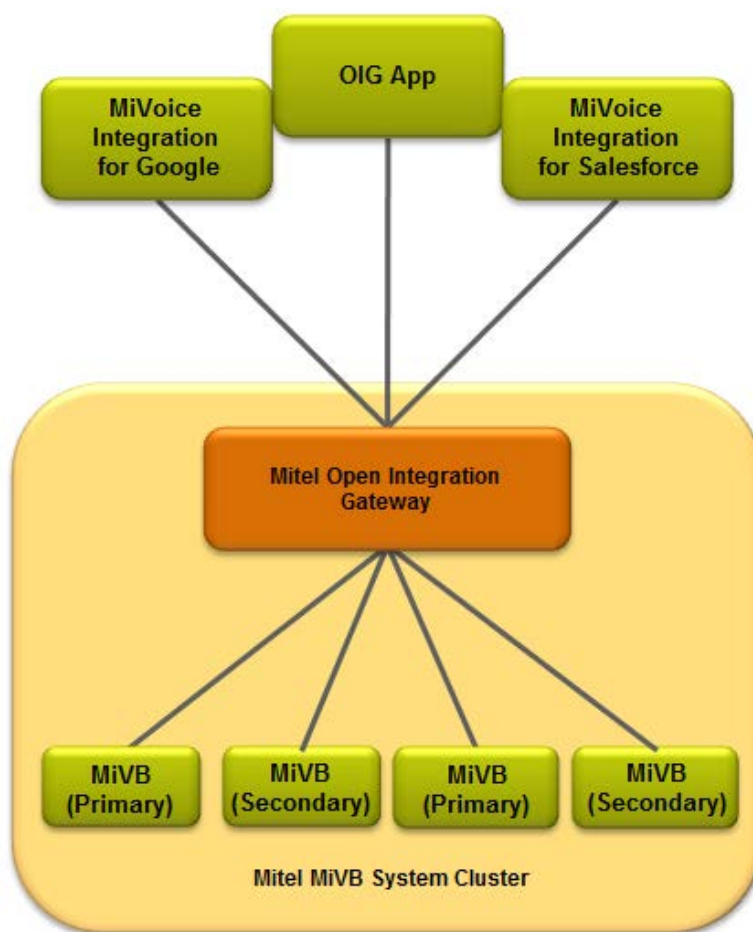
The Mitel OIG is installed on the Mitel Standard Linux (MSL) operating system and can be deployed as an MSL software blade through the Mitel AMC licensing server, or as a virtual appliance downloaded from the Mitel OnLine website.

The Mitel OIG allows applications to access features and functionality offered by a Mitel MiVoice Business system cluster (see Figure below).



Note: The Mitel OIG can communicate with a single MiVoice Business or a cluster of MiVoice Business instances. When there are two or more MiVoice Business instances, the MiVoice Business instances must be configured in a cluster. Mitel Open Integration Gateway cannot communicate with more than one MiVoice Business cluster. The Mitel OIG assumes that the directory number (DN) of a Mitel phone is unique in the MiVoice Business system cluster; two Mitel phones in the system cannot have the same DN.

Mitel OIG can also communicate with a single MiContact Center server. There can be one (only) MiContact Center Server connected to a Mitel OIG server.

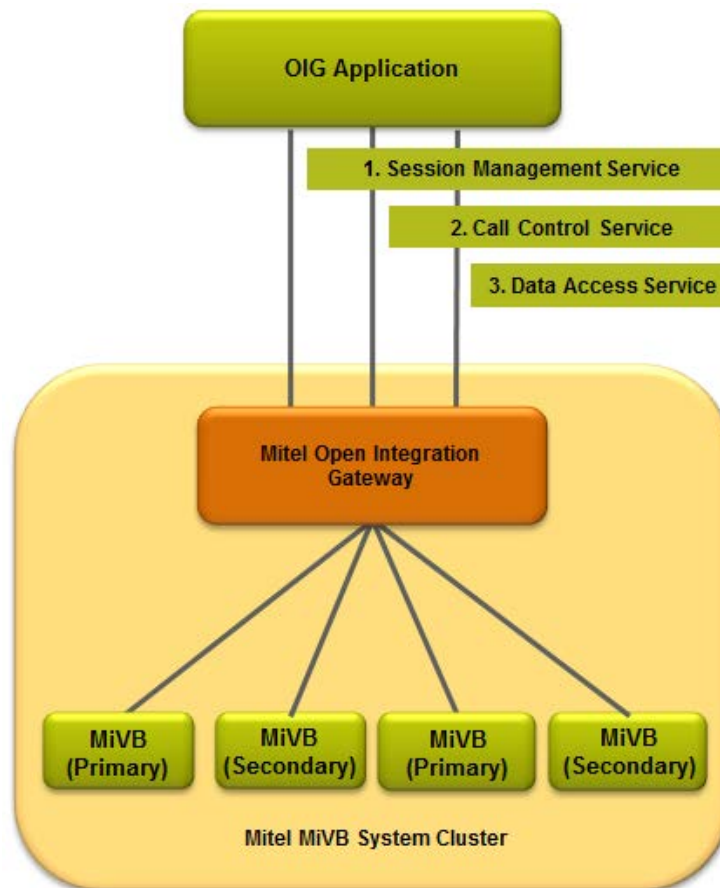
Figure 1: Mitel OIG system configuration

The Mitel OIG allows applications to submit requests using web service operations. The Mitel OIG processes each request and provides a response. Some requests result in a state change in the Mitel communication system and the Mitel OIG then initiates an event for the application. The Mitel OIG supports the following web services:

- **Session Management service** – Open communication session with Mitel OIG for services.
- **Call Control service** – Control and monitor CTI behavior in a Mitel communication system.
- **Data Access service** – Register for MiVoice Business configuration data change notifications and read MiVoice Business configuration data.



Note: Mitel also offers two applications that use the Mitel OIG; MiVoice Integration for Salesforce and MiVoice Integration for Google.

Figure 2: Mitel OIG application, server, and services relationship

The following sections provide more details about developing applications for Mitel OIG.

- Web Service Messaging Formats
- Mitel OIG Session Management Service

Web Service Messaging Formats (SOAP and REST)

Mitel OIG applications can access Mitel OIG services using two different web service messaging formats for Mitel OIG services.

- SOAP / XML
- REST / JSON

SERVICE	SOAP / XML	REST / JSON
Session Management Service	√	√
Call Control Service	√	Future release
Data Access Service	Future release	√

A Mitel OIG application can open a communication session (log in) with a Mitel OIG using either SOAP / XML or REST / JSON.

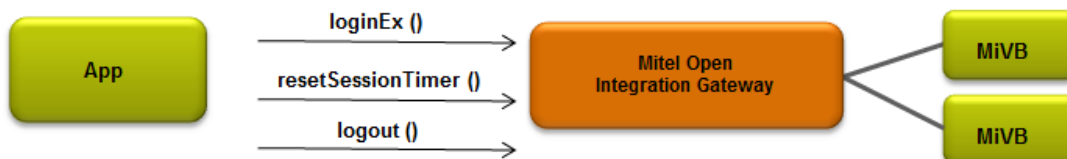
A Mitel OIG application must use SOAP / XML when accessing the Mitel OIG Call Control service. After being logged in using SOAP / XML, an application is allowed to use the Data Access service with REST / JSON. A subset of the existing Call Control service operations using REST / JSON is planned for a future release of Mitel OIG.

A Mitel OIG application must use REST / JSON when accessing the Mitel OIG Data Access service. If an application only requires the Data Access Service, the application can log in using REST / JSON. If the application requires both Call Control service and Data Access service the application must log in using SOAP / XML. Data Access services using SOAP / XML is planned for a future release of Mitel OIG

Mitel OIG Session Management Service

Each Mitel OIG application uses the Mitel OIG session management service to communicate with the Mitel OIG. The session management service describes how an application logs in, logs out, and maintains a Mitel OIG communication session keep-alive timer. The application must reset a keep-alive timer every 10 seconds or the Mitel OIG will terminate the communication session.

Figure 3: Session management



To log in to a Mitel OIG, each application needs the following parameters (Applications requiring advanced operations must also provide a Mitel certificate):

- company name
- application name
- application password
- local password
- version

The first three parameters are defined by the application developer when registering their application with Mitel. These three parameters do not change after they have been defined in the application. The fourth parameter (local password) is site-specific.

A Mitel OIG administrator uses the Mitel OIG Admin UI to create a local password specific to each application and a specific Mitel OIG. The local password controls the access of each individual application to each individual Mitel OIG. Each application that uses a Mitel OIG must provide a mechanism for a user to enter the local password and then the application must include the local password in the Mitel OIG loginEx operation, along with the other three parameters mentioned above.

The fifth parameter is a version number that is automatically included. The Mitel OIG application does not need to provide the version in the application login request (loginEx operation). The version parameter allows the Mitel OIG to determine the service version used by the application. See the Mitel OIG Developer Guides for more details on Mitel OIG services, operations and events.

The Mitel OIG Session Management Service allows an application to open a communication session with a Mitel OIG. Once the communication session is established and the Mitel OIG application is authenticated and authorized, the application can use the one communication session to access all Mitel OIG web services.

By providing or not providing a Mitel Certificate during log in, the application indicates what overall type of web services the application needs to use with the Mitel OIG. The Mitel OIG offers two overall types of web services.

Standard

This type provides the basic operations within Mitel OIG services. Standard operations focus on a system user: what an application needs to control and monitor what a user does within the Mitel system. To request this web services type, an OIG application must be registered on the Mitel Access Control List (ACL). See the *Mitel OIG Installation and Maintenance Guide*.

Advanced

This type provides more sophisticated behavior within Mitel OIG services. Advanced operations focus on overall system behaviors for many users. Advanced web services includes operations offered in the Standard web services type. To request the Advanced web services type, a Mitel OIG application must be registered on the Mitel Access Control List (ACL), and a Mitel Certificate must be obtained. See the *Mitel OIG Installation and Maintenance Guide* for more details about requesting an application account and requesting a Mitel certificate. See the Mitel OIG Developer Guides for more details on Mitel OIG services, operations, and events.

Mitel OIG Call Control Service

The Mitel OIG provides a Call Control service to control and monitor CTI functionality within a MiVoice Business system. The Call Control service is offered based on the web services type selected by the Mitel OIG application (i.e., when application opens a communication session with the Mitel OIG). There are two web services types.

Standard Call Control

The standard call control service allows applications to monitor and control the telephony activity of Mitel physical and logical devices (devices programmed or configured in Mitel

MiVoice Business instances) including IP phones, Personal Ring Groups and line appearances on multi-line phones. The Mitel OIG Standard Call Control Service allows applications to control and monitor a Mitel desktop phone in a way that is similar to a user manually controlling the phone.

Advanced Call Control

The advanced call control service includes third-party call control capabilities and offers a full suite of functionality from simple call control to contact center monitoring and control. Advanced Call Control Service provides monitoring and control of MiVoice Business functions, e.g., Hot Desk Agent login (Internal and External), Trunking, Ring Groups, Hunt Groups, ACD2, ACD Express.

Control relates to functions not normally associated with a specific desktop phone user. Support for MiVoice Business level monitoring (e.g., all conferences within a MiVoice Business) is included. Setting the phone message waiting lamp and auto answer are also provided in Advanced Call Control.

The Mitel OIG Call Control service is defined by Web Service Description Language (WSDL) files provided by Mitel. The WSDL and XSD files describe the service, its commands (operations), its responses, status events, and data definitions. When importing the WSDL files into a development environment, operation and parameter choices are generated automatically for each operation.

The Mitel OIG Call Control service is provided using SOAP and XML over HTTPS. Applications do not require software from Mitel to communicate with a Mitel OIG. An application does not need to integrate or compile in any Mitel code. Application developers are free to choose a programming language, a software development environment, an operating system, and a hardware platform for their application. The web service model decouples the Mitel OIG software from the application; only the WSDL and XSD files are needed.

The Mitel OIG Call Control service is defined using a request, response, and then event model. An application sends a request to activate a service operation and the Mitel OIG responds with success/failure and return data. The application needs to check for the success or failure of each operation. Operations trigger changes in the Mitel OIG and the Mitel MiVoice Business system. The changes are reported back to the application using events. An application must check the events returned following an operation before performing more operations. An application can poll the Mitel OIG for events or provide an asynchronous reporting mechanism (register an event handler with the Mitel OIG so that the Mitel OIG can send events to the application asynchronously; this reporting mechanism is described in the Mitel OIG Developer Guides.

Applications open monitors on devices and then receive events information about device state changes. For example, if an application opens a monitor on an IP Phone, the application will receive events when the IP Phone receives a call or makes a call. Opening a monitor also means the application is able to control the device. For example, an application can initiate a call on a monitored phone without any action by the phone user. Applications can also open monitors on phone features and receive events about phone feature state changes (e.g., phone Do-Not-Disturb (DND) status).

The Mitel OIG Call Control service uses a device model; not a user model or call model. An application receives call events, feature events, ACD events and system events. To allow an

application to track a call in a MiVoice Business system cluster, the Mitel OIG provides a Global Call ID in call status events. See the Global Call ID Developer Guide on the MSA web portal for more information.

To use the Mitel OIG Call Control service, an application must have information about the Mitel MiVoice Business system (i.e., MiVoice Business IP addresses, IP Phone prime line numbers, IP Phone line appearance button numbers, hot desk user numbers, etc.). The information required is defined in the Mitel OIG Developer Guides.

When using Mitel OIG, an application must provide the IP address of each MiVoice Business that provides devices to be monitored. If the MiVoice Business system supports MiVoice Business IP Phone Resiliency, the application must have the IP Addresses of both the primary and secondary MiVoice Business instances. The Mitel OIG must connect to a MiVoice Business to control and monitor the physical and logical devices configured in that MiVoice Business. An application cannot connect to MiVoice Business A to monitor and control a device configured in MiVoice Business B. MiVoice Business A has no knowledge of the device on MiVoice Business B.



Note: To enable Mitel MiVoice Integration for Salesforce and MiVoice Integration for Google, the Mitel OIG provides web services using REST and JSON over HTTPS. The operations provided to the MiVoice Integration applications are a subset of the operations provided by SOAP and XML over HTTPS.

Call Control Service Key Concepts

Mitel OIG Object IDs – The Mitel OIG allows an application to request an Object ID for each object of interest (i.e., MiVoice Business, IP Phone prime line, IP Phone line appearance button, hot desk user). The Mitel OIG provides the Object ID to the application. The application stores and uses the Object IDs in commands and for processing events. When an application is required to monitor an object, the application initiates a monitor operation (request) with the related Object ID.

Mitel OIG Operations – Each Mitel OIG service offers an application many possible operations. Operations are requests to the Mitel OIG. For example, an application requests an Object ID for a specific MiVoice Business node using the `getlcpld` operation. The Mitel OIG Call Control Service is divided into Standard and Advanced operations. The Advanced operations offer more sophisticated control and monitoring. Therefore, a deeper knowledge of MiVoice Business behavior is required for use of the advanced operations. A developer must specifically request the use of Standard or Advanced services when requesting an application account from Mitel. Refer to the *Mitel OIG Installation and Maintenance Guide* for instructions for requesting an application account from Mitel when registering OIG applications with Mitel.

Mitel OIG Monitors – To control and monitor an object (e.g., IP Phone), the application must open a monitor (i.e., the application initiates a monitor operation (request) with an IP Phone prime line Object ID). Once the application has created a monitor, the application can then send requests, get responses, and receive events related to the monitored object (i.e., IP Phone prime line, IP Phone line appearance button, hot desk user).

Mitel OIG Events – The Mitel OIG informs an application about status and state changes in objects (e.g., IP Phone prime line) using events. Each event has a name and associated event data. Each event also has a class name that defines the event data to expect. The event data provides specific details about monitored objects. An application uses events to

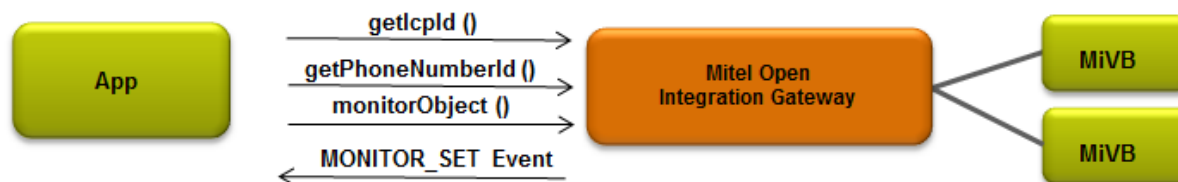
confirm that initiated requests were actually completed and to determine what requests to initiate next.

Mitel OIG Event Data – Each Mitel OIG event has data. The data provided depends on the event name and class. Events in the Call Event Class also have state and cause. The event state defines the state of the object being monitored. The event cause defines why the event was reported. All events contain data about the object being monitored. For example, events related to a monitor on an IP Phone Prime line contain the IP Phone number, IP Phone type, and name associated with the IP Phone number. The application needs to process the XML data provided in an event based on event name, class, and in some cases, state and cause. A Mitel OIG event also has a time stamp. The time format is time_t. This time stamp counts the seconds elapsed since 00:00 hours, Jan 1, 1970 UTC. The time applied is from the Mitel OIG server and not from an individual MiVoice Business controller.



Note: The Event Time in Mitel OIG events is a 64-bit Integer (e.g., a MONITOR_SET event has an event time of 1349360583326). The time is a millisecond value that is an offset from the Epoch, January 1, 1970 00:00:00.000 GMT.

Figure 4: Create IP phone monitor



Mitel OIG Data Access Service

The Mitel OIG Data Access Service provides a generic SQL like interface (read only) to the Mitel OIG PostgreSQL database using a REST/JSON messaging interface. The data in the Mitel OIG PostgreSQL database is provided by the MiVoice Business nodes in the Mitel MiVoice Business communication system. To receive the MiVoice Business data, the Mitel OIG server must be added as a Network Element to one of the MiVoice Business nodes in the Mitel MiVoice Business communication system. Instructions for adding a Mitel OIG server to a MiVoice Business system are contained in the following sections.



Note: The Mitel OIG 3.0 Data Access service requires MiVoice Business 7.2 and MSL 10.3.

There are two data access service types:

Standard Data Access

The standard data access service allows applications to read and get change notifications on MiVoice Business configuration data related to Mitel physical and logical devices (devices programmed or configured in Mitel MiVoice Business) including IP phones, Personal Ring Groups and line appearances on multi-line phones. The Mitel OIG Standard Data Access Service allows applications to retrieve MiVoice Business data that is needed when using

other Mitel OIG services (i.e., Application needs to know DN of MiVoice Business phone to create a monitor using Mitel OIG call control service).

Advanced Data Access

The advanced data access service will be provided in a future Mitel OIG release. When provided this service will allow read and write access to configuration data needed to when performing operations related to third-party call control capabilities (Hot Desk Agent login (Internal and External), Trunking, Ring Groups, Hunt Groups, ACD2, ACD Express).

The Mitel OIG Data Access service is defined in the *Mitel OIG Data Access Developer Guide*. This document describes the service and its commands (operations), responses, status events, and data definitions.

The Mitel OIG Data Access service is provided using REST and JSON over HTTPS. Applications do not require software from Mitel to communicate with a Mitel OIG. An application does not need to integrate or compile in any Mitel code. Application developers are free to choose a programming language, a software development environment, an operating system, and a hardware platform for their application. The web service model decouples the Mitel OIG software from the application.

The Mitel OIG Data Access service is defined using a request, response, and event model. An application sends a request to activate a service operation and the Mitel OIG responds with success or failure and return data. The application needs to check for the success or failure of each operation. Operations trigger changes in the Mitel OIG and the Mitel MiVoice Business system. The changes are reported back to the application using events. An application must check and process the events returned when registering for change notifications on the Mitel OIG server database. An application must poll the Mitel OIG for events related to data change notifications. The polling mechanism is described in the Mitel OIG Developer Guides.

Applications read Mitel OIG server data (configuration data collected from the MiVoice Business communication system) and then request data change notifications. For example, if an application reads phone view data and requests data change notifications on this view, the application will receive events when data in the phone view changes.

To use the Mitel OIG Data Access service, an application must have information about the Mitel MiVoice Business system (i.e., MiVoice Business IP addresses). The required information is defined in the Mitel OIG Developer Guides.

When requesting configuration data using Mitel OIG, an application must provide the IP address of a specific MiVoice Business node that will provide the data. The Mitel OIG must connect to the MiVoice Business communication system that has the MiVoice Business node to be able to retrieve the configuration data in that MiVoice Business node.

Mitel OIG Licensing

Licensing and delivery of the Mitel OIG software is similar to licensing and delivery of other Mitel software applications:

- Purchased by the Mitel customer (through their reseller)
- Downloaded and licensed via the Mitel Licensing AMC portal

- Deployed on Mitel Standard Linux (MSL)
- Available in physical and virtual versions.

The Mitel OIG software can be deployed as a Mitel MSL blade through the Mitel AMC licensing server, or as a virtual appliance downloaded from the Mitel OnLine Software Downloads web portal.

The Mitel OIG utilizes a Mitel Certificate Server (MCS) and Access Control List (ACL) to ensure that only authorized applications connect to a customer Mitel OIG. Refer to the *Mitel OIG Installation and Maintenance Guide* for more information.

The Mitel OIG hardware platform must have an Internet connection to allow the Mitel OIG software to connect to the Mitel AMC server to obtain application licenses. The Mitel OIG hardware platform also requires an Internet connection to allow the Mitel OIG software to connect to the MCS to obtain the latest ACL for confirmation of authorized applications.

The Mitel OIG is licensed to allow connected applications to use Web Services provided by Mitel MiVoice Business instances.

The AMC licenses for the Mitel OIG are shared by all connected applications. Separate licenses are required for the MiVoice Integration for Salesforce and the MiVoice integration for Google.

The AMC licensing for the MiVoice Business is separate from the AMC licensing for the Mitel OIG.



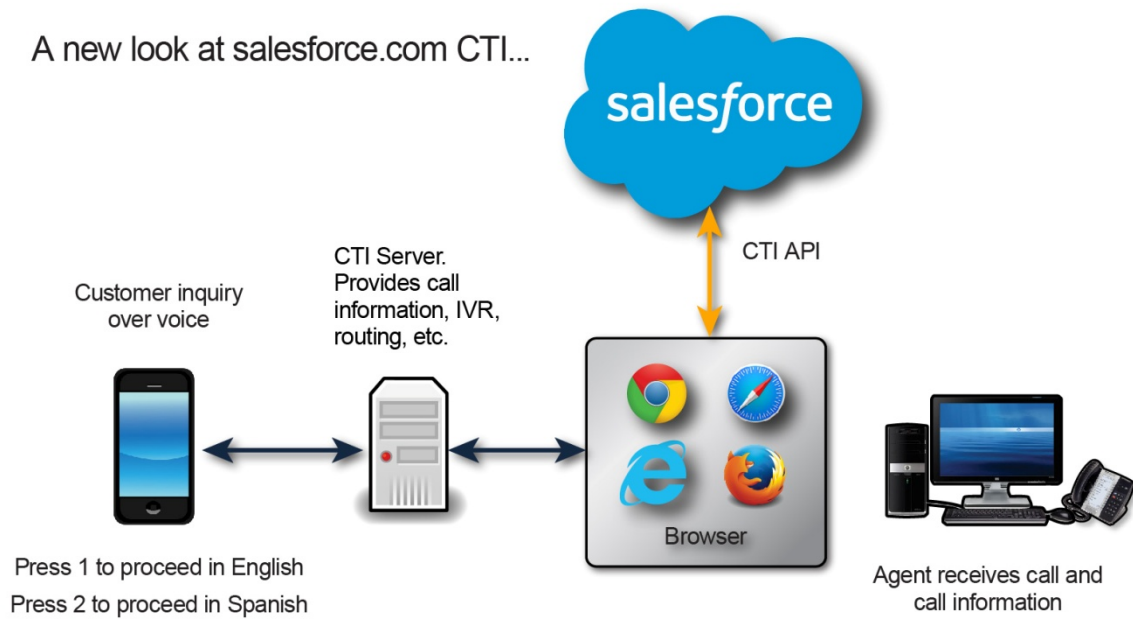
Note: Application Developers are responsible for communicating to Mitel Resellers and end customers the type of Mitel OIG application (standard or advanced) they provide. Application Developers are also responsible for communicating the number of Mitel OIG licenses typically required by their application. Refer to the *Mitel OIG Installation and Maintenance Guide* for more information about licensing.

MiVoice Integrations

The MiVoice Integrations are turn-key OIG-based applications that provide CTI functions (make call, answer call, transfer call, conference call, hold and retrieve call, and redirect call) to web browser users. When a user logs in, a web browser UI also displays a MiVoice UI. The MiVoice Integrations provide call-related features such as incoming call alert, access to a contact list, and ability to create a call log. The MiVoice Integrations use the Mitel OIG Call Control service to provide call features within each web browser UI. Refer to the MiVoice Integrations Guides for more details:

- *MiVoice Integration for Salesforce Administration Guide*
- *MiVoice Integration for Salesforce User Guide*
- *MiVoice Integration for Google Administration Guide*
- *MiVoice Integration for Google User Guide*

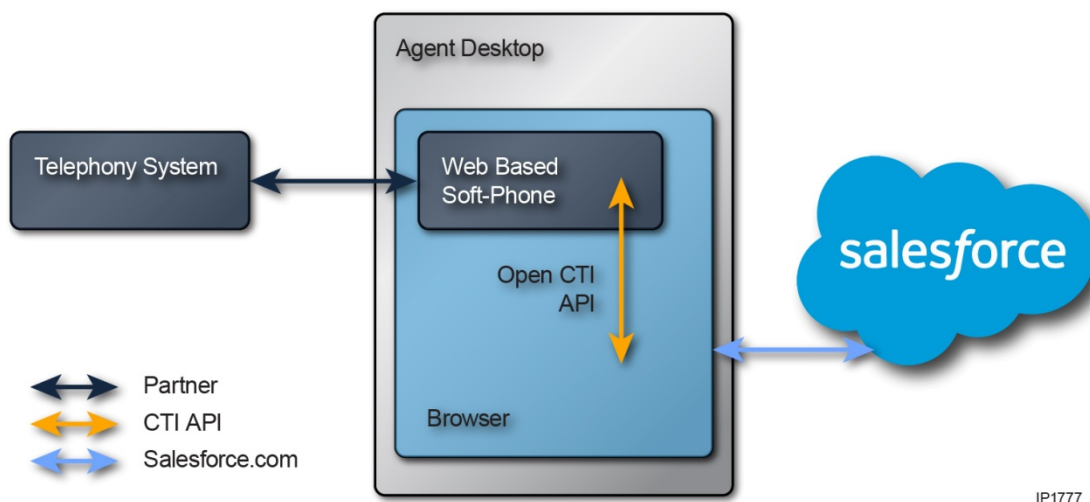
Figure 5: MiVoice Integration for Salesforce



IP1776

In this figure, the CTI server can be tightly integrated MiContact Center.

Figure 6: MiVoice Integration for Salesforce logical architecture



IP1777

Figure 7: MiVoice Integration for Google

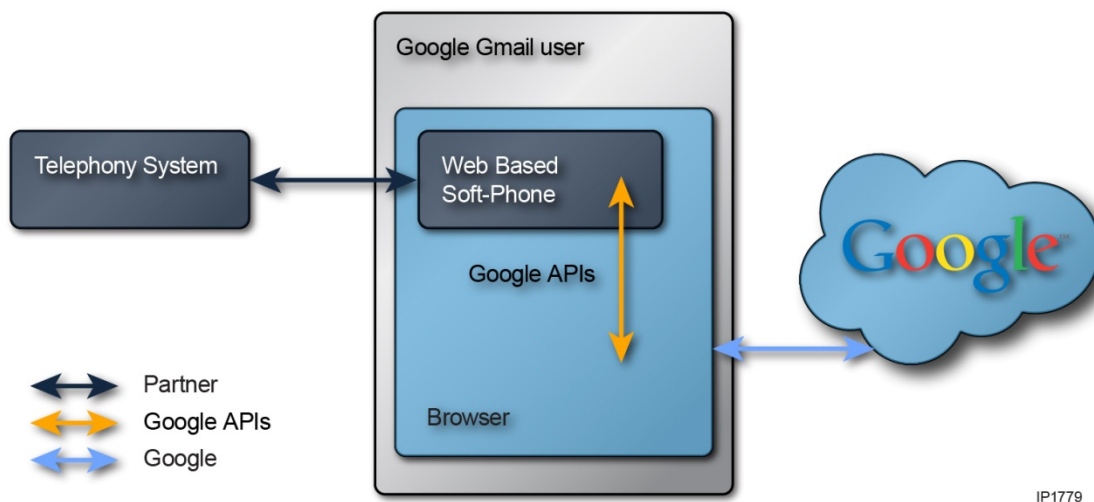
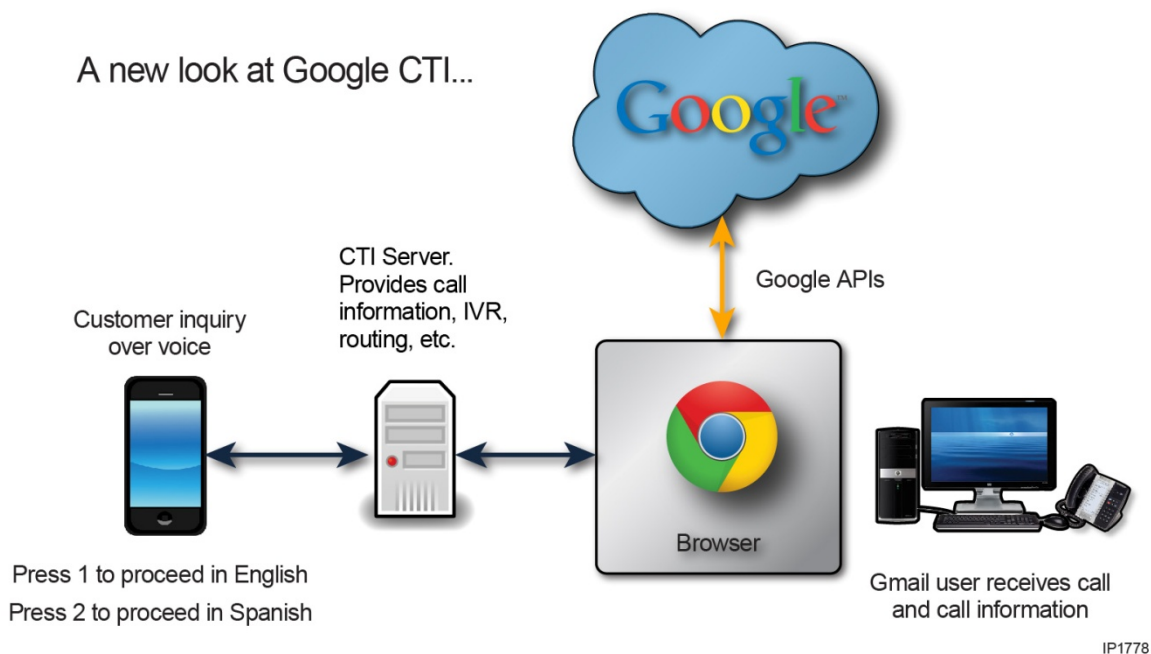


Figure 8: MiVoice Integration for Google logical architecture



Mitel Certificate Server (MCS) Overview

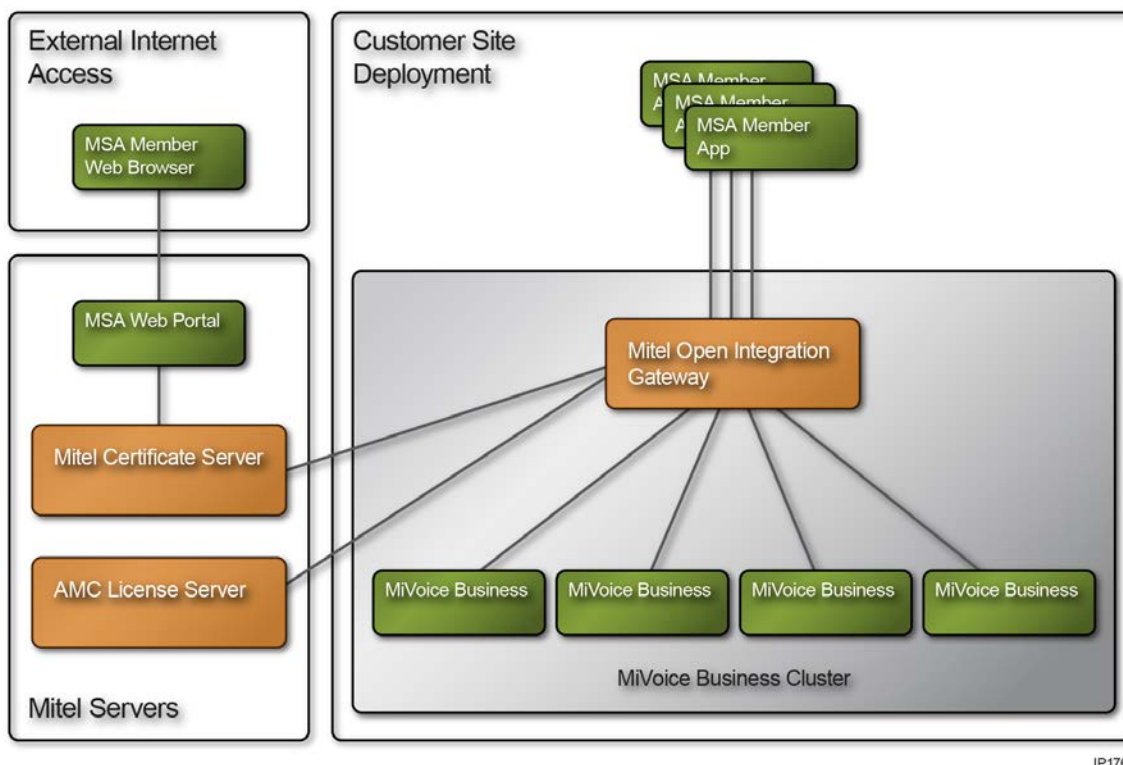
Before using the Mitel OIG, an application developer (MSA member) must register their applications with the Mitel Certificate Server (MCS). The MCS is accessible through the Internet. The Mitel OIG uses an Access Control List (ACL) from the MCS to identify approved applications. An application must be registered with the MCS and in the ACL before the application can communicate with a Mitel OIG.

The Mitel Certificate Server (MCS) also allows an application developer to request a Mitel certificate for their application. An application must have a Mitel certificate to use Mitel OIG Advanced Services like the Advanced Call Control Service.

Before an MSA-Authorized application can communicate with a deployed Mitel OIG, the following is needed:

- For Standard Mitel OIG communication, an MSA-Authorized User (MSA member) must register a company name, application name and application password with Mitel. This registration information is added to the Mitel Access Control List (ACL) in the MCS.
- For Advanced Mitel OIG communication, an MSA-Authorized User (MSA member) must request a Mitel Certificate. As part of the certificate the user also registers a company name, application name and application password with Mitel. This registration information is added to the ACL in the MCS. The Mitel Certificate is provided to the MSA-Authorized User (MSA member) user by the MCS.

When requesting Mitel OIG access, an MSA-Authorized User logs into the Mitel MSA-on-Mitel OnLine web portal using their MSA-on-MOL account credentials. In this case, the user must be an active MSA member and have an MSA account number (i.e., Mitel SAP number). Mitel MSA-on-MOL web portal web links direct the MSA-Authorized User to web forms provided by the MCS. Refer to the *Mitel OIG Installation and Maintenance Guide* for details.

Figure 9: Mitel Certificate server

MCS General Requirements

The MCS can be accessed by MSA-Authorized Users (MSA members or prospective Virtual Lab Users). Only MSA members can request Mitel certificates or request application registration to the MCS ACL. Prospective MSA members can request a time slot on the Mitel Hosted Virtual Test Lab, after authorization by MSA.

MSA-Authorized Users login to the Mitel MSA-on-MOL web portal using their MSA-on-MOL account credentials (web browser interface). From an MSA web page, an MSA-Authorized User clicks a new web link to open a web page hosted by the Mitel Certificate Server. The following web browsers are supported:

- Microsoft Windows Internet Explorer
- Google Chrome
- Firefox

If a Mitel Certificate request is approved, the MCS e-mails a Mitel Certificate and request approval to the MSA-Authorized User and registers the MSA-Authorized application in the ACL stored in the MCS.

If an application registration to ACL request is approved, the MCS e-mails the MSA-Authorized User notifying approval and registers the MSA-Authorized application in the ACL stored in the MCS.

The MSA Administrator has the ability to revoke an MSA-Authorized application. If an application is revoked, the MCS will indicate the application revocation in the ACL. A revoked application is denied access to all Mitel OIGs. An e-mail is sent to the application owner (MSA member) if an application is rejected. The e-mail will include instructions on how to contact MSA for more information.

Getting Started with Mitel OIG

Using the Mitel OIG is made easy with web services. The Mitel OIG web services are defined using WSDL files or through the use of REST / JSON. The Internet provides all the material needed to learn about web servers, web services, WSDL, SOAP / XML, REST / JSON, available toolkits, free development environments, tools, and sample code. This section provides information about how to get started and how to develop applications for the Mitel OIG...

First steps

The list below provides the recommended first steps to using the Mitel OIG:

1. Read the Mitel OIG user documentation.
2. Complete the Mitel OIG online training and certification process.
3. Use the Mitel hosted virtual test lab for the Mitel OIG (optional).
4. Install the Mitel OIG software.
5. Use Mitel OIG sample applications to execute different Mitel OIG service scenarios.
6. Create your own application.

Mitel Hosted Virtual Test Lab

Mitel offers Mitel OIG application developers access to a virtual test lab. The test lab allows developers to use provided sample applications to investigate how the Mitel OIG works. Developers are also allowed to create their own applications and test them against the Mitel OIG. The test lab has a predefined, ready-to-use configuration for ease of use. The Hosted Virtual Lab is intended for evaluation of the OIG platform and development environment, but it is not intended as a remote testing facility. Upon joining MSA, members are expected to establish an in-house Mitel OIG lab to meet their ongoing development and testing requirements

Refer to the *Virtual Test Lab User Guide* on the MSA web portal for more information. See the Developer Resources section in this guide for how to contact MSA to get more information.

Install Mitel OIG

When an application developer is ready to start using the Mitel OIG, the developer must obtain the Mitel OIG software from Mitel. Refer to the *Mitel OIG Installation and Maintenance Guide* for instructions on how to license and install the software.

Mitel Sample Applications

Mitel offers several sample applications for the Mitel OIG. The sample applications are very easy to install and use. Mitel OIG sample applications are available on the MSA web portal in the Mitel OIG Sample Application Package.

MiVoice Business configuration

A Mitel OIG can communicate with one or more MiVoice Business instances (maximum 250). To monitor and control phones on a specific MiVoice Business instance, the application must provide the IP address of a specific MiVoice Business instance.

The Mitel OIG can communicate with a single MiVoice Business instance or a cluster of MiVoice Business instances. When there are two or more MiVoice Business instances, the MiVoice Business instances must be configured in a cluster. Mitel OIG cannot communicate with more than one MiVoice Business cluster.

Each MiVoice Business system must have two Class of Service Options enabled, as defined in the table below. Refer to the *Mitel OIG Installation and Maintenance Guide* for additional Mitel OIG configuration information.

If either of these CoS options is disabled for a device, the Mitel OIG operations on the device do not function correctly.

CLASS OF SERVICE (COS) OPTIONS THAT MUST BE SET FOR EACH MONITORED DEVICE

HCI/CTI/TAPI Call Control Allowed: **Yes**

HCI/CTI/TAPI Monitor Allowed: **Yes**

EXAMPLES

Routing Devices use COS #1 only. If you are monitoring a routing device, COS #1 must have options set as indicated above.

The COS for an ACD Path and an Agent Group is defined by the COS of the first agent in the prime agent group for the ACD path. If you are monitoring ACD paths and querying ACD groups, the COS of the first agent must have options set as indicated above.

When monitoring ACD agents, the COS for each monitored agent must have options set as indicated above.

When monitoring trunks, the COS for each monitored trunk must have options set as indicated above.

When monitoring phones, the COS for each monitored phone must have options set as indicated above.

Mitel OIG System Configurations

A single application can communicate with one or more Mitel OIGs.

The Mitel OIG can communicate with one or more applications or application instances (maximum of 1500). Additional requirements include:

- The Mitel OIG and MiVoice Business instances must be co-located in the same Enterprise LAN.
- The Mitel OIG server must be added as a network element to the MiVoice Business System Data Synchronization (SDS) sharing network. For detailed information about SDS, see the *Using SDS Solutions Guide*, available on Mitel OnLine.
- The Mitel OIG server, MiCC and MiVoice Business controllers must be in the same LAN.

The Mitel OIG can be installed in a VMware server. The *Mitel OIG 3.0 Engineering Guidelines* defines the number of OIG instances that can be installed on one server. See also the *Virtual Appliance Deployment Solutions Guide* for all limits and capacity information.

The Mitel OIG can now be licensed for service providers. In such a configuration the Mitel OIG allows only Mitel MiVoice Integration applications (no third-party developed applications). Refer to the *Mitel OIG Installation and Maintenance Guide*. Also refer to the Mitel MiCloud Deployment and Blueprint documents and Engineering Guidelines for use of the Mitel OIG in Service Provider environments.



Note: The Mitel OIG assumes that the directory number (DN) for each device in the MiVoice Business system is unique. One Mitel phone cannot have the same DN as another Mitel phone in the same MiVoice Business system. For example; MiVoice Business A cannot have a phone configured with DN 1000 while MiVoice Business B also has a phone configured with DN 1000 (this constraint assumes MiVoice Business A and MiVoice Business B are not providing IP resiliency for each other).

- Up to six Mitel OIGs can communicate with one MiVoice Business.
- The Mitel OIG and MiVoice Business instances must be co-located in the same Enterprise LAN.
- The Mitel OIG is not recommended for use in a DMZ or as a firewall to the WAN.

MiContact Center Configuration (MiCC Edition only)

- One Mitel OIG server can be connected to one MiContact Center server.
- The Mitel OIG server must have internet access.
- The Salesforce solution must use SSL for all web services communication.
- MiVoice Business call control status messages are different depending on if the MiVoice Business system has one controller compared to a MiVoice Business system with 2 or more controllers in a system cluster. For example, calls passed between two MiVoice Business controllers may lose call details.
- One MiCC server can connect to multiple Mitel OIG servers
- Mitel OIG supports a total of 1500 hot desk users / hot desk ACD agents
- The MiVoice Business controllers must be configured in an SDS sharing network.
- The Mitel OIG server must be configured with a CA certificate.
- Mitel OIG must be licensed with Advanced Call Control service if MiVoice Integration for Salesforce is to be used by hot desk ACD agents. Advanced call control service supports hot desk users.
- Mitel OIG can be licensed with Standard Call Control service if MiVoice Integration for Salesforce is to be used only by hot desk users.
- To allow remote MiVoice Integration for Salesforce users, the Mitel OIG server must use a MiVoice Border Gateway web proxy as a front-end. The external FQDN for Mitel OIG must match the internal FQDN. The MiVoice Border Gateway web proxy must have the

same CA certificate as included in the Mitel OIG server. See the MSL Online Help for a description of how to request and install CA certificates.

Troubleshooting and testing

After installing the Mitel OIG, see the Mitel OIG Tools section in the Mitel OIG Developer Guides and the *Mitel OIG Installation and Maintenance Guide* for troubleshooting suggestions and for instructions about using the provided Mitel OIG tools. The Mitel OIG sample applications can also be used to check MiVoice Business operation and communication.

MiVoice Business and Mitel OIG Connection Failures

When a connection failure occurs between the Mitel OIG and a MiVoice Business, the application is sent a system event “ICP_COMMUNICATION_EVENT” which includes the MiVoice Business IcpId and the connection state “CONNECTION_FAILURE”. The application will receive call events of event type “OUT_OF_SERVICE” for all device monitors that connected to the failed MiVoice Business.



Note: OUT_OF_SERVICE events for phones on a MiVoice Business are generated by the Mitel OIG. In the event of a network problem in which the OIG cannot access a MiVoice Business, but the phones can still access the MiVoice Business, it is possible that the phones are still IN_SERVICE. This is not common, but it is possible.

In most cases when the MiVoice Business connection fails, the phones become active on the secondary MiVoice Business and the application receives an IN_SERVICE call event from the secondary controller. After any MiVoice Business connection failure, the Mitel OIG tries periodically to reconnect to the MiVoice Business and recover all monitors.

MiVoice Business connection recovery

After monitors are started on a MiVoice Business, if the connection to the MiVoice Business fails or the MiVoice Business is restarted, the Mitel OIG tries periodically to reconnect to the MiVoice Business and recover all monitors. Monitors are only stopped when an application invokes the stopMonitor operation and there are no other sessions monitoring that device, or the session is terminated due to inactivity and no other sessions are monitoring that device.

When a connection to a MiVoice Business is recovered, the application receives a system event ICP_COMMUNICATION_EVENT with a connection state set to CONNECTED. When the monitors are recovered the application receives a MONITOR_SET event.

If connections to a device’s primary and secondary MiVoice Business controllers both fail, the Mitel OIG tries to recover both connections and restart the monitors.

Creating your own application

Application developers familiar with WSDL and web services will have little difficulty in creating an application. Developers are free to choose the workstation hardware, operating system, software development environment and programming language. The Mitel OIG WSDL files allow software development environments (Visual Studio, NetBeans, Eclipse) to

auto-generate much of the code needed to communicate with the Mitel OIG. The specific application behavior is left to the developer.

The Mitel WSDL does not have an Internet-accessible target name space for XML schema definition. The developer must write code to access the correct location of the schema definitions. More information on this topic is provided with the Mitel OIG Sample Application Package.

The Mitel OIG Sample Application Package includes many sample applications available for developers. The entire package of source code and documentation are available online from the MSA portal.

Example: WSDL in Visual Studio using C#

If Microsoft Visual Studio is selected as the development environment and C# as the programming language, the following is an example of the simple steps needed to get started when creating an application.

1. Start Microsoft Visual Studio 2010.
2. Select **File > New Project > Windows Forms Application**.
3. Enter the name (e.g., Mitel OIGSampleApp)
4. Click **OK**.
5. Select **Project > Add Service Reference**, and click **Advanced**.
6. Click **Add Web Reference** and enter the URL that points to the SessionService.wsdl file (i.e., <http://10.40.224.130/mitel/oig/session/SessionService?wsdl>)

Where: 10.40.224.130 is the IP address of the Mitel OIG server)

7. Click the green arrow.
8. Enter Web reference name: "SessionService".
9. Click **Add Reference**.
10. Repeat the steps for the Standard Call Control Service by entering the URL to the StandardCCService.wsdl file (i.e., <http://10.40.224.130/mitel/oig/cc/StandardCCService?wsdl> where 10.40.224.130 is the IP address of the Mitel OIG server), enter Web reference name "StdCCService", and press "Add Reference"
11. Create an instance for the SessionService and StandardCCService in the C# form by selecting "Form1.cs" and clicking **View Code**.
12. Enter the following code in the public class Form1.

```
/*
```

```
* Sets up Mitel OIG Session service and Call Control service addresses.
```

```
*/
```

```
// Create the URI for the endpoint.
```

```
sessionServer = new SessionService.SessionService();
```

```
sessionServer.Url = "https://" + Mitel OIGServerAddr.Text + "/mitel/oig/session/SessionService";
```



```
ccService = new StdCCService.StandardCCService();
ccService.Url = "https://" + Mitel OIGServerAddr.Text + "/mitel/oig/cc/StandardCCService";
```

Then add application interfaces (full source for a C# sample application is available)

Example: WSDL in Visual Studio using Visual Basic

If Microsoft Visual Studio is selected as the development environment and Visual Basic as the programming language, the following is an example of the simple steps needed to get started when creating an application:

1. Start Microsoft Visual Studio 2010.
2. Select **File > New Project > Windows Forms Application**.
3. Enter the application name (e.g., Mitel OIGSampleApp).
4. Click **OK**.
5. Select **Project > Add Service Reference**.
6. Click **Advanced**.
7. Click **Add Web Reference** and enter the URL pointing to the SessionService.wsdl file - e.g., <http://10.40.224.130/mitel/oig/session/SessionService?wsdl>

Where 10.40.224.130 is the IP address of the Mitel OIG server.

8. Click the green arrow button.
9. Enter the Web reference name: "SessionService".
10. Click **Add Reference**.
11. Repeat steps for the Standard Call Control Service, enter the Web reference name "StdCCService", and click **Add Reference**.
12. Create an instance for the SessionService and StandardCCService in the Visual Basic form by selecting Form1.vb and selecting view code. Then enter the following code in the public class Form1:

```
'Create an instance of the Mitel OIG SessionService Web Service to login/logout
Dim Mitel OIGSessionSrv As New SessionService.SessionService
```

```
'Create an instance of the Mitel OIG StandardCCService Web Service to access call
control operations
Dim Mitel OIGcc As New StdCCService.StandardCCService
```

13. Add code to create URLs to the Mitel OIG services:

```
Mitel OIGSessionSrv.Url = "https://" + Mitel OIGServerIpAddr.Text +
"/mitel/oig/session/SessionService"
```

```
Mitel OIGcc.Url = "https://" + Mitel OIGServerIpAddr.Text +
"/mitel/oig/cc/StandardCCService"
```

Then add application interfaces (full source for a Visual Basic sample application is available).

REST / JSON Data Access Web Service

Representational State Transfer (REST) describes a pattern for interacting with content on remote systems, typically using HTTP/HTTPS. REST describes a way to access and modify existing content and how to add content to a system.

JavaScript Object Notation (JSON) is a lightweight data-interchange format that is easy for humans to read and write. It is easy for machines to parse and generate and it is based on a subset of the JavaScript Programming Language: Standard ECMA-262 3rd Edition - December 1999.

The Mitel REST / JSON Data Access web service provides a simple API to retrieve MiVoice Business configuration data and to be notified of configuration data changes. Since the web service is provided using standard HTTP(s) with a REST / JSON interface developers can choose their software language and development environment.

The following resources and operations are supported:

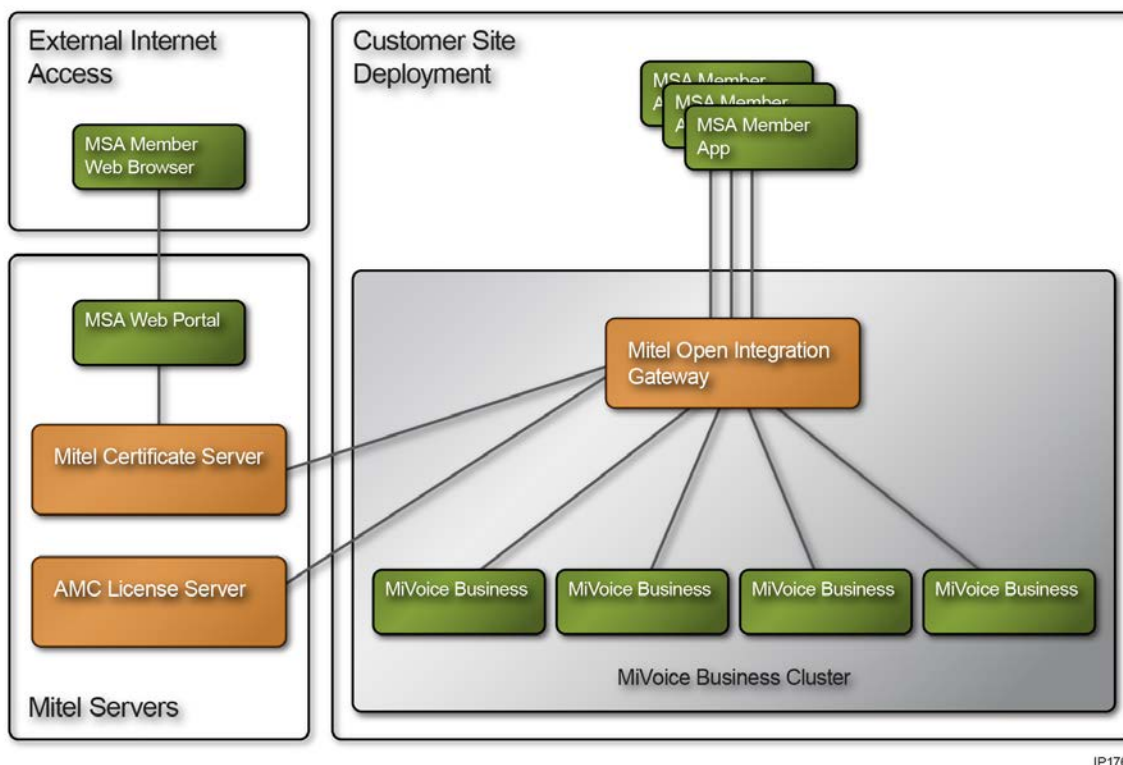
RESOURCE	OPERATIONS SUPPORTED
http://<Mitel OIGIPAddress>/Mitel /Mitel OIG/rest/resources/v1/ sessions	Get – Get a session (equivalent to login) Delete – Delete a session (equivalent to logout) Put – Update session inactivity timer
http:// <Mitel OIGIPAddress>/Mitel /Mitel OIG/rest/resources/v1/ databases	Get – Lists the databases accessible on this Mitel OIG
http:// <Mitel OIGIPAddress>/Mitel /Mitel OIG/rest/resources/v1/databases/ views	Get – Get the views accessible for a database
http:// <Mitel OIGIPAddress>/Mitel /Mitel OIG/rest/resources/v1/databases/views/ columns	Get – Get the columns for a view
http:// <MitelOIGIPAddress>/Mitel /Mitel OIG/rest/resources/v1/databases/ sql	Get – Get result from sql operation Delete – Delete sql operation Post – Insert sql operation Put – Update sql operation
http:// <Mitel OIGIPAddress>/Mitel /Mitel OIG/rest/resources/v1/databases/views/ events	Get – Get an event (trigger event)

RESOURCE	OPERATIONS SUPPORTED
http:// <Mitel OIGIPAddress>/Mitel /Mitel OIG/rest/resources/v1/databases/views/ triggers	
	Post – Create a trigger on a view
	Delete – Delete a trigger on a view

Mitel Certificate Server Access and Requests

This section describes how application developers register with the MCS to enable communication between their applications and a Mitel OIG. To use the standard web services offered by the Mitel OIG, a developer must register each of their applications with the MCS. To use advanced web services offered by the Mitel OIG, a developer must request a Mitel certificate for each of their applications. A Mitel certificate request includes application registration. See details in subsections below.

Figure 10: Access the Mitel Certificate server



Application Registration in MCS Access Control List (ACL)

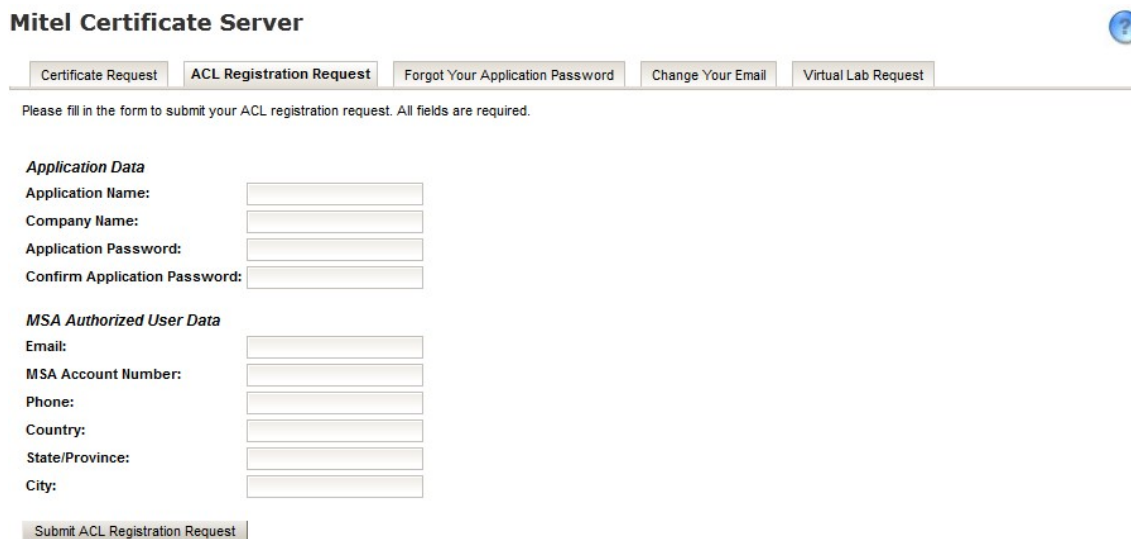
Mitel OIG application developers must register their applications with Mitel. Mitel OIG applications developers planning to use standard services must register their application information. Mitel OIG application developers planning to use advanced services must request a Mitel certificate from Mitel. Application registration is included when requesting a Mitel certificate, no additional application registration is required.

Application Registration Request

To access the MCS, an MSA-Authorized User (MSA Member) logs in through Mitel OnLine using an MSA-Authorized User account. The MSA-Authorized User is presented with the MSA web portal. Navigate to **Home > MSA > Open Integration Gateway Developer**

Administration to access the MCS Eventually an MCS web form is presented with an **ACL Registration Request** tab. Select this tab. An ACL registration request form is presented.

Figure 11: ACL registration request



Mitel Certificate Server

[Certificate Request](#)
[ACL Registration Request](#)
[Forgot Your Application Password](#)
[Change Your Email](#)
[Virtual Lab Request](#)

Please fill in the form to submit your ACL registration request. All fields are required.

Application Data

Application Name:
 Company Name:
 Application Password:
 Confirm Application Password:

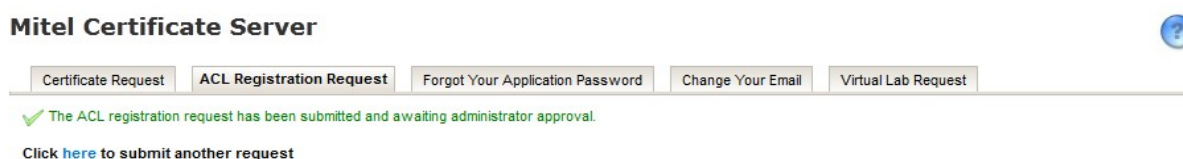
MSA Authorized User Data

Email:
 MSA Account Number:
 Phone:
 Country:
 State/Province:
 City:

[Submit ACL Registration Request](#)

The user must enter data into all of the required fields and then click **Submit ACL Registration Request**. The MCS validates the data entered. If the submitted data is valid, the MCS redirects the MSA-Authorized User to a new web page displaying a message that states an ACL registration request has been submitted for MSA Administrator approval.

Figure 12: Successful ACL registration request



Mitel Certificate Server

[Certificate Request](#)
[ACL Registration Request](#)
[Forgot Your Application Password](#)
[Change Your Email](#)
[Virtual Lab Request](#)

✓ The ACL registration request has been submitted and awaiting administrator approval.

Click [here](#) to submit another request

Application Registration Request Approval

Application registration approval is done by the MSA Administrator. The MSA Administrator logs in to the MCS and views a list of pending ACL registration requests. The MSA Administrator approves or denies each request based on the MSA-Authorized User information provided in the ACL registration request. After approval, the MCS does the following:

1. Adds the user-provided company name, application name, MSA account number and application password to the MCS ACL. Once approved and added to the MCS ACL, these names and passwords cannot be changed.
2. E-mails the MSA-Authorized User notifying approval using the e-mail address entered by the MSA-Authorized User during the application registration.

Registration Request Denial

If the MSA Administrator denies the request, the MCS e-mails the MSA-Authorized User notifying them of the denial, with the reason, using the e-mail address entered by the MSA-Authorized User. The denial e-mail includes instructions for contacting MSA for more information.

Revoking Applications

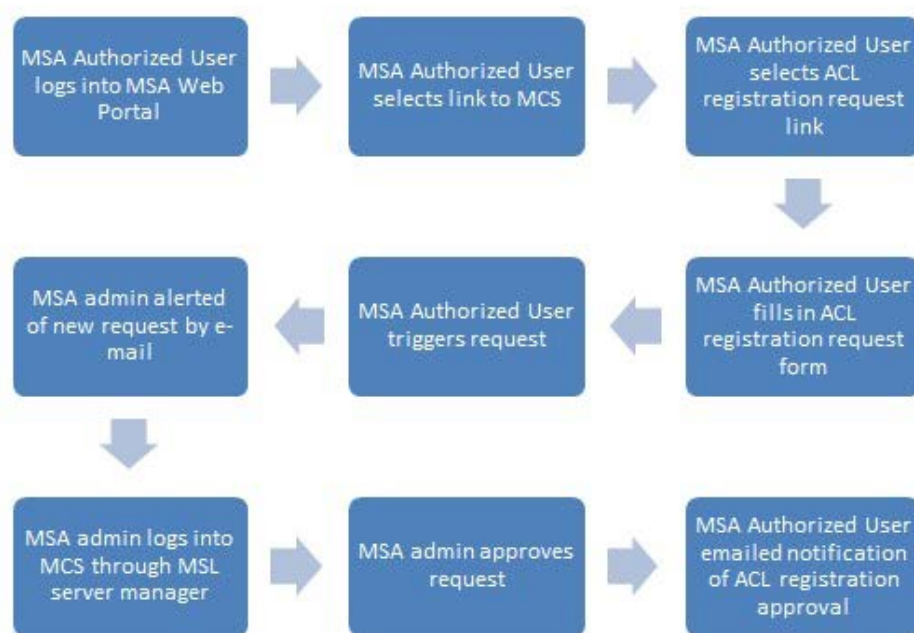
Revocation of applications from the ACL is done by the MSA Administrator. After an MSA – Authorized application has been registered in the MCS ACL, an MSA Administrator can decide to revoke the application. After an application has been revoked, the MCS does the following:

1. Updates the MCS ACL by tagging the application as revoked.
2. E-mails the MSA-Authorized User notifying them of the revocation decision and the reason. The revocation e-mail includes instructions about contacting MSA for more information.

ACL Retrieval

The MCS ACL is retrieved by deployed Mitel OIG instances every four hours, or upon manual Mitel OIG Administrator request. Deployed Mitel OIG instances request the ACL through a web service offered by the MCS. Deployed Mitel OIG instances use the ACL to deny or approve communication requests from applications.

Figure 13: ACL Registration request and approval flowchart



Mitel Certificate Request

MSA-Authorized Users (MSA Members) must request a Mitel certificate when their applications require Advanced service operations from the Mitel OIG. A Mitel certificate request automatically includes an “add application to ACL” request, so a user does not need to submit two MCS requests to obtain access to a Mitel OIG.



Note: A Mitel certificate is not required in Release 1.0. The Mitel certificate process is used in Mitel OIG 1.1 and later releases.

Certificate Request Process

To access the MCS, an MSA-Authorized User (MSA Member) logs in through Mitel OnLine using an MSA-Authorized User account. The MSA-Authorized User is presented with the MSA web portal. The web portal provides web links and instructions for accessing the MCS. Navigate to **Home > MSA > Open Integration Gateway Developer Administration** to access the MCS.

Figure 14: Certificate request

Mitel Certificate Server

Certificate Request | ACL Registration Request | Forgot Your Application Password | Change Your Email | Virtual Lab Request

Please fill in the form to submit your certificate request. All fields are required.

Application Data

Application Name:

Company Name:

Application Password:

Confirm Application Password:

MSA Authorized User Data

Email:

MSA Account Number:

Phone:

Country:

State/Province:

City:

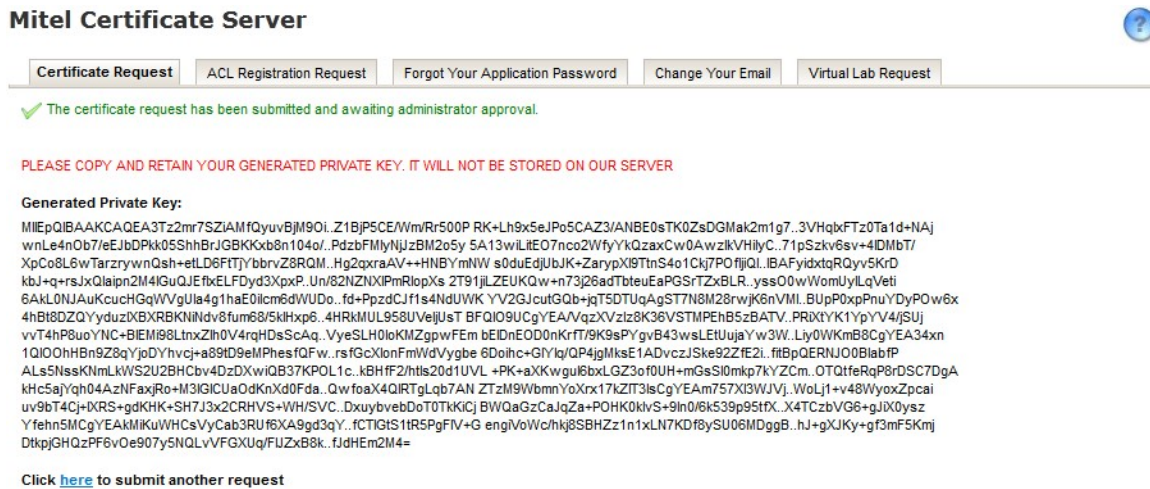
Submit Certificate Request

The MSA-Authorized User must enter data in all the required fields on the MCS web form, then click **Submit Certificate Request**. If the submitted data is valid, the MCS redirects the MSA-Authorized User to another web form, which displays the following:

1. A message stating that a certificate request has been submitted and is awaiting MSA Administrator approval.
2. A message stating that the displayed MSA-Authorized User private key must be copied before leaving this form. The MSA-Authorized User private key that is displayed is destroyed when the web form is closed -- it is lost if it is not copied. If the private key is lost, then the pending certificate will be invalid; an application must have the matching private key for a Mitel certificate. If the private key is lost, then another certificate request will have to be submitted.

3. The private key for the requested Mitel certificate.

Figure 15: Successful certificate request submission



The MSA-Authorized User must copy the private key and secure it in a safe location. The private key must be added to the application named in the Mitel certificate request. The application must use the private key to encrypt data, as part of Mitel OIG login. The MCS does not store a copy of the generated private key. After copying the private key, the MSA-Authorized User can exit the web browser session.

If the certificate request is approved, the MCS e-mails the Mitel certificate to the MSA-Authorized User.

Certificate Request Approval

Mitel certificate request approval can be accomplished manually by the MSA Administrator. The MSA Administrator logs in to the MCS to view a list of pending certificate requests. The MSA Administrator approves or denies each request based on the information entered by the MSA-Authorized User. After approval, the MCS does the following:

1. Generates a Mitel certificate that includes the MSA-Authorized User public key that matches the provided application private key. The certificate expiry date is set to 25 years.
2. Digitally signs the Mitel certificate using a Mitel private key.
3. E-mails the MSA-Authorized User the Mitel certificate, using the e-mail address entered by the MSA-Authorized User during the certificate request.
4. Adds the MSA-Authorized User application to the MCS ACL.

Certificate Request Denial

The MSA Administrator can deny a certificate request when reviewing the list of pending certificate requests. The MSA Administrator decides based on MSA-Authorized User information. Once denied, the MCS e-mails the MSA-Authorized User the denial and reason using the e-mail address provided by the MSA-Authorized User. The denial e-mail includes instructions for contacting MSA.

Regenerating a Certificate for an Application

If an MSA member loses an application private key, the user must request another certificate. This additional request is different than the initial certificate request. The application registration in the ACL does not change; a new certificate is generated. The MSA member logs in through Mitel OnLine using an MSA-Authorized User account. The MSA-Authorized User is presented with the MSA web portal. The web portal provides web links to a **Certificate Request** tab (see Figure 8). The MSA-Authorized User selects this tab. The MSA-Authorized User must enter data in all the required fields on the MCS web form, then click **Submit**. If the submitted data is valid, the MCS redirects the MSA-Authorized User to another web form displaying the following:



Note: The data entered must be exactly the same information that was entered during the application registration process. The company name, application name, and application password must be identical to those in the initial application registration.

1. A message that states a certificate regeneration request has been submitted and is awaiting MSA Administrator approval. This means that another certificate is being requested but the MCS ACL will remain the same (i.e., Company Name, Application Name, and application password do not change). If the user enters another application password, the password will be ignored. The existing application password in the ACL must be used by the application when logging in to a Mitel OIG (when the initial Company name, Application name, and application password are approved and added to the MCS ACL - the names and password CANNOT be changed).
2. A message that states the displayed MSA-Authorized User private key must be copied before leaving this form. The MSA-Authorized User private key displayed will be lost if not copied. If the private key is lost, then the pending certificate will be invalid and another certificate request will have to be submitted.
3. The private key associated with the additional Mitel certificate request.

Figure 16: Successful certificate regeneration request submission

Mitel Certificate Server

[Certificate Request](#)
[ACL Registration Request](#)
[Forgot Your Application Password](#)
[Change Your Email](#)
[Virtual Lab Request](#)

✓ The certificate request has been submitted and awaiting administrator approval.

⚠ The application password you submitted in this request will be disregarded since there are/is 1 previously approved certificate request(s) for the same application/company name app30/com30.
Please use the application password you submitted with your first certificate request.
If not sure what is the application password to use please submit a forgot your application password request to retrieve it.

PLEASE COPY AND RETAIN YOUR GENERATED PRIVATE KEY. IT WILL NOT BE STORED ON OUR SERVER

Generated Private Key:

```

MIEpQIBAAKCAQEAA3Tz2mr7SZiAMfQyuvBjM9Oi..Z1BjP5CE/Wm/Rr500P RK+Lh9x5eJPo5CAZ3/ANBE0sTK0ZsDGMak2m1g7..3VHqkFTz0Ta1d+NAj
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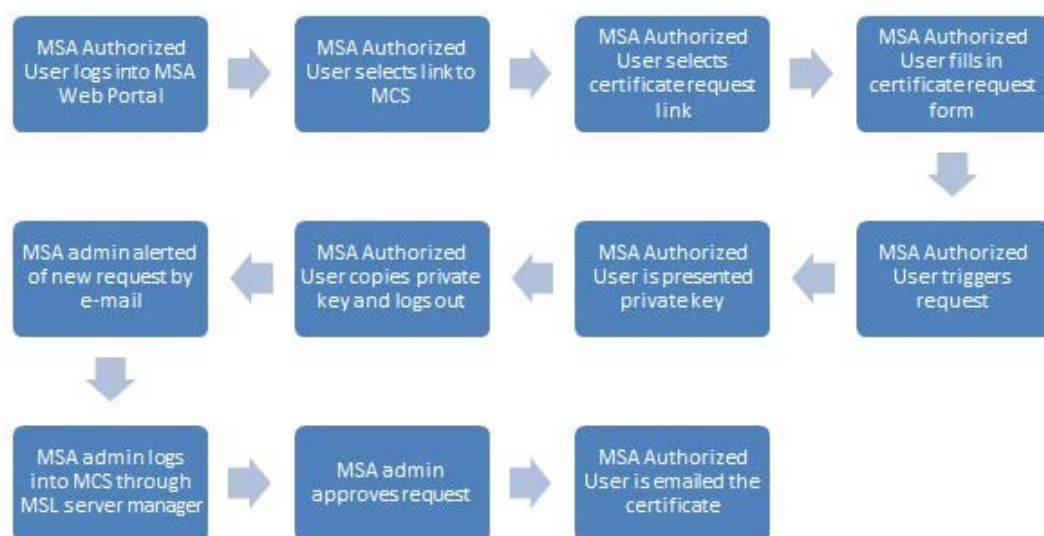
```

Click [here](#) to submit another request

The MSA-Authorized User must copy the private key and secure it in a safe location. The private key must be added to the application named in the Mitel certificate request. The application will be required to use the private key to encrypt data as part of Mitel OIG login. The MCS does not store a copy of the generated private key. After copying the private key, the MSA-Authorized User can exit the web browser session.

The MCS notifies (by e-mail) the MSA Administrator of the pending certificate request. If the MSA Administrator approves the certificate request, the MCS e-mails the Mitel certificate to the MSA-Authorized User.

Figure 17: Certificate request and approval flowchart



Glossary

ACD	Automatic Call Distribution
ACL	Access Control List
AMC	Applications Management Center (licensing server)
API	Application Programming Interface
CCS	Call Control Service
COS	Class of Service
DLL	Dynamic Link Library
DMZ	De-Militarized Zone
DNS	Domain Name Server
ICP	IP Communications Platform
IP	Internet Protocol
IVR	Interactive Voice Response
LAN	Local Area Network
MCS	Mitel Certificate Server
MiCC	MiContact Center
MOL	Mitel OnLine
MSA	Mitel Solutions Alliance (Mitel developer partner program)
MSL	Mitel Standard Linux (operating system)
MSP	Media Service Provider
Mitel OIG	Open Integration Gateway
PBX	Private Branch Exchange
PSTN	Public Switched Telephone Network
SDS	System Data Synchronization: A Mitel data sharing feature that allows changes to be made easily throughout a network of nodes, including MiVoice Business, MiCollab, and Mitel OIG.
TDM	Time Division Multiplexing
VOIP	Voice over IP
vLAN	Virtual Local Area Network
WAN	Wide Area Network
WSDL	Web Service Description Language

