SIP Feature Server Deployment Guide

Appendix: Sample deployments

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Appendix: Sample deployments

You can use these sample deployments as a model for your chosen deployment option: single-site, multi-site, or Business Continuity.

Single-site deployment

Server configuration

A single-site server could contain the following characteristics:

- SIP Server switch with 2000 extensions.
- Two FS instances as an active-active HA pair, one instance (FS-VM) acting as primary for voicemail, dial plan, and provisioning, and another instance (FS-DM) acting as primary for device management.
- Two IVR profiles, one profile for voicemail and another for device management:
  - IVR profile for voicemail:
    initial-page-url = `http://FS-VM IP:port/fs`

    alternatevoicexml = `http://FS-DM IP:port/fs`
  - IVR profile for device management:
    initial-page-url = `http://FS-DM IP:port/fs/dm/ivr`

    alternatevoicexml = `http://FS-VM IP:port /fs/dm/ivr`
- GAX with FS GAX plugin and DM GAX plugin.
  For example:
  - [dm-gax-plugin]: **fs_urls** = `http://FS-DM IP:port/fs,http://FS-VM IP:port/fs`
  - [fs-gax-plugin]/[fs]: **fs_urls** = `http://FS-VM IP:port/fs,http://FS-DM IP:port/fs`
- DNS Server: FQDN (fs1.genesys.com) with the IP address of the two FS instances in DNS Server.
  For example: fs1.genesys.com, which resolves to IP of FS-DM, IP of FS-VM
- DHCP Server with the provisioning URL as option 66/160. The URL contains the FQDN that belongs to the two FS instances (`http://fs1.genesys.com:port/fs/dm/prov`).
- SIP Server with internal or Feature Server dial-plan
- Both the Feature Server applications include the option **fs_url** as `http://fs1.genesys.com/8080/fs`.
- In the SIP Switch:
  - a Trunk DN with contact = RM address and prefix = the prefix of the IVR number configured in Device Management settings
  - a Trunk Group DN with name `gcti_provisioning`
  - For devices behind an SBC, create a trunk with the following options under the **TServer** section:
    - **contact** = *SBC address*
    - **oos-options-max-forwards** = 1

    - **oosp-transfer-enabled** = `true`
- To enable SIP authentication for a device, add the following option in the **[TServer]** section on the extension DN assigned to the device:
    - **authenticate-requests** = `register,invite`
    - **password** = Any alphanumeric value.

For more information, see how to Enable SIP authentication for a device.

When Feature Server is deployed with co-located/external Cassandra cluster, then refer the configuration details here.

Zero-touch provisioning

1. Create a device for the IP Phone, assign a profile, and assign DN 1000 to the phone.
2. Connect the IP Phone to the LAN.
    - The phone sends a DHCP a request to get the IP Address.
    - DHCP Server responds to the request with the provisioning URL as option 66/160.
    - The phone sends a configuration file (**MAC.cfg**) request to the provisioning URL: `http://fs1.genesys.com/fs/dm/prov`
    - Feature Server responds with the appropriate configuration file which is already configured.
    - When it receives the configuration file, the phone reboots automatically and is configured with the extension 1000.
    - The phone sends a REGISTER message to SIP Server with DN 1000 and is ready to take calls.

IVR provisioning

1. Create a default device management profile.
2. Connect the IP Phone to the LAN.
    - The phone sends a DHCP request to get the IP Address.
    - DHCP Server responds IP address with provisioning URL as option 66/160
    - The phone sends the configuration file (**MAC.cfg**) request to the provisioning URL:`http://fs1.genesys.com/fs/dm/prov`.
    - Feature Server responds with the default configuration file.
    - The phone registers to SIP Server with the special number `gcti_provisioning`.
    - When the agent lifts the phone receiver, the phone automatically dials the IVR via SIP Server by using the IVR number.
    - The voice prompt requests the user to assign an extension, and after the extension number 1001 is entered, phone will be notified for getting updated configuration.
    - On phone request, Feature Server provides an updated configuration file and the phone is configured with extension 1001.

- The phone sends a REGISTER message to SIP Server with DN 1001 and is ready to take calls.

Multi-site deployment

Server configuration

A multi-site deployment could contain the following server characteristics:

- Two sites, **Site1** and **Site2**.
- Two SIP Switches, one for each site, with 2000 extensions in each switch.
- Four Feature Server instances installed as two active-active pairs, one active-active FS instance per switch:
  - **Site1: FS1-VM, FS1-DM**
  - **Site2: FS2-VM, FS2-DM**
- The DNS Server includes three FQDNs:
  - FQDN1 (fs1.genesys.com) contains the IP addresses of all the FS instances in the DNS Server: FS1-DM, FS1-VM, FS2-VM, and FS2-DM
  - FQDN2 (fs2.genesys.com) contains the IP addresses of the two Site1 FS instances in the DNS Server, in this order: FS1-VM, FS1-DM
  - FQDN3 (fs3.genesys.com) contains the IP addresses of the two Site2 FS instances in the DNS Server, in this order: FS2-DM, FS2-VM
- Three IVR profiles, two for voicemail (Site1 and Site2) and one for device management:
  - IVR profile for voicemail at Site1:
    initial-page-url = `http://fs2.genesys.com:port/fs`

    alternatevoicexml = `http://fs3.genesys.com:port/fs`
  - IVR profile for voicemail at Site2:
    initial-page-url = `http://fs3.genesys.com:port/fs`

    alternatevoicexml = `http://fs2.genesys.com:port/fs`
  - IVR profile for device management (for both sites):
    initial-page-url = `http://`*`FS1-DM IP`*`:port/fs`

    alternatevoicexml = `http://fs1.genesys.com:port/fs`
- GAX with FS GAX plugin and DM GAX plugin, and four FS instances:
  - [dm-gax-plugin]: fs_urls = `http://`*`FS1-DM IP`*`:port/fs,http://`*`FS1-VM IP`*`:port/fs, http://`*`FS2-DM IP`*`:port/fs,http://`*`FS2-VM IP`*`:port/fs`
  - [fs-gax-plugin]/[fs]: `fs_urls = http://`*`FS1-VM IP`*`:port/fs,http://`*`FS1-DM IP`*`:port/fs, http://`*`FS2-VM IP`*`:port/fs,http://`*`FS2-DM IP`*`:port/fs`
- One DHCP Server with the provisioning URL as option 66/160:
  `http://fs1.genesys.com:port/fs/dm/prov`

- Two SIP Servers, SIPS1 and SIPS2, use multi-site ISCC configuration.
- Feature Server application options, in the **dm** section:
  - Site1: option **fs_url** = `http://fs2.genesys.com:8080/fs` (FQDN2)
  - Site2: option **fs_url** = `http://fs3.genesys.com:8080/fs` (FQDN3)
- In each SIP Switch:
  - A Trunk DN with contact = RM address and prefix = the prefix of the IVR number configured in Device Management settings
  - A Trunk Group DN with name `gcti_provisioning`
  - For devices behind an SBC, create a trunk with the following options under the **TServer** section:
    - **contact** = *SBC address*
    - **oos-options-max-forwards** = 1
    - **oosp-transfer-enabled** = `true`
  - To enable SIP authentication for a device, add the following option in the **[TServer]** section on the extension DN assigned to the device:
    - **authenticate-requests** = `register,invite`
    - **password** = Any alphanumeric value.

For more information, see how to Enable SIP authentication for a device.

When Feature Server is deployed with co-located/external Cassandra cluster, then refer the configuration details here.

Zero-touch provisioning

1. Create a device for the IP Phone, assign a profile, and assign the DN 1000 to the phone.
2. Connect the IP Phone to the LAN.
   - The phone sends a DHCP request to get the IP Address from the DHCP Server.
   - The DHCP Server responds to the request with the provisioning URL `http://fs1.genesys.com:port/fs/dm/prov` as option 66/160.
   - The phone resolves `fs1.genesys.com` and selects a Feature Server node from Site 1 or Site 2.
   - The phone sends a device configuration file (**MAC.cfg**) request to the selected node with the provisioning URL: `http://fs1.genesys.com/fs/dm/prov`.
   - The selected node sends the provisioned configuration file to the phone.
   - The phone reboots automatically and is configured with the extension 1000 when it starts.
   - The phone sends a REGISTER message to SIPS1 with DN 1000 and is ready to take calls.

IVR provisioning

1. Create a default device management profile.

2. Complete the necessary configurations for IVR provisioning.
3. Connect the IP Phone to the LAN.

    - The phone sends a DHCP request to get the IP Address from the DHCP Server.
    - The DHCP Server responds to the request with the provisioning URL `http://fs1.genesys.com:port/fs/dm/prov` as option 66/160.
    - The phone resolves `fs1.genesys.com` and selects a Feature Server node from Site 1 or Site 2.
    - The phone sends a configuration file (**MAC.cfg**) request to the selected node with the provisioning URL: `http://fs1.genesys.com/fs/dm/prov`.
    - The selected node sends the default configuration file to the phone.
    - The phone registers to SIP Server with the special number `gcti_provisioning`.
    - When the agent lifts the phone receiver, the phone automatically uses the IVR number to dial IVR through SIP Server.
    - The voice prompt requests the user to assign an extension. When the user enters the extension number 2000, the phone is notified that it needs an updated configuration.
    - On the phone request, Feature Server provides an updated configuration file and the phone is configured with extension 2000.
    - The phone sends a REGISTER message to SIPS2 with DN 2000 and is ready to take calls.

Business Continuity deployment

Server configuration

A Business Continuity deployment could contain the following server characteristics:

- Two sites, **Site1** and **Site2**.
- Two SIP Switches, one for each site, with 2000 extensions in each switch.
- All extensions on both switches are synchronized.
- Four Feature Server instances installed as two active-active pairs, one active-active FS instance per switch:
    - **Site1: FS1-VM, FS1-DM**
    - **Site2: FS2-VM, FS2-DM**
- The DNS Server includes three FQDNs:
    - FQDN1 (fs1.genesys.com) contains the IP addresses of all the FS instances in the DNS Server: FS1-DM, FS1-VM, FS2-VM, and FS2-DM
    - FQDN2 (fs2.genesys.com) contains the IP addresses of the two Site1 FS instances in the DNS Server: FS1-VM, FS1-DM
    - FQDN3 (fs3.genesys.com) contains the IP addresses of the two Site2 FS instances in the DNS Server: FS2-VM, FS2-DM
- Business Continuity deployment supports IVR-based device provisioning. The deployment needs three IVR profiles: two for voicemail and one for device management.

  - IVR profile for voicemail at Site1:
    initial-page-url = `http://fs2.genesys.com:port/fs`

    alternatevoicexml = `http://fs3.genesys.com:port/fs`
  - IVR profile for voicemail at Site2:
    initial-page-url = `http://fs3.genesys.com:port/fs`

    alternatevoicexml = `http://fs2.genesys.com:port/fs`
  - IVR profile for device management (for both sites):
    initial-page-url = `http://fs2.genesys.com:port/fs/dm/ivr`

    alternatevoicexml = `http://fs3.genesys.com:port/fs/dm/ivr`
- GAX with FS GAX plugin and DM GAX plugin, and four FS instances:
  - [dm-gax-plugin]: fs_urls = `http://`*`FS1-DM IP`*`:port/fs,http://`*`FS1-VM IP`*`:port/fs, http://`*`FS2-DM IP`*`:port/fs,http://`*`FS2-VM IP`*`:port/fs`
  - [fs-gax-plugin]/[fs]: `fs_urls = http://`*`FS1-VM IP`*`:port/fs,http://`*`FS1-DM IP`*`:port/fs, http://`*`FS2-VM IP`*`:port/fs,http://`*`FS2-DM IP`*`:port/fs`
- DHCP Server with the provisioning URL as option 66/160. The URL contains the FQDN that belongs to the four FS instances (`http://fs1.genesys.com:port/fs/dm/prov`).
- Two SIP Servers, SIPS1 and SIPS2, use BC configuration.
- Feature Server application options, in the **dm** section:
  - Site1: option **fs_url** = `http://fs2.genesys.com:8080/fs` (FQDN2)
  - Site2: option **fs_url** = `http://fs3.genesys.com:8080/fs` (FQDN3)
- In each SIP Switch:
  - A Trunk DN with contact = RM address and prefix = the prefix of the IVR number configured in Device Management settings
  - A Trunk Group DN with name `gcti_provisioning`
  - For devices behind an SBC, create a trunk with the following options under the **SIP Switch > TServer** section:
    - **contact** = *`SBC address`*
  - **oos-options-max-forwards** = `1`
  - **oosp-transfer-enabled** = `true`
  - To enable SIP authentication for a device, add the following option in the **[TServer]** section on the extension DN assigned to the device:
    - **authenticate-requests** = `register,invite`
    - **password** = Any alphanumeric value.

    For more information, see how to Enable SIP authentication for a device.
- Business Continuity deployment supports IVR-based device provisioning, for DNs that are associated with a Disaster Recovery profile. See BC Associations.

When Feature Server is deployed with co-located/external Cassandra cluster, then refer the

configuration details here.

Zero-touch provisioning

1. Create a device for the IP Phone, assign a profile, and assign DN 1000 to the phone.
2. Connect the IP Phone to the LAN.
    - The phone sends a DHCP request to get the IP Address.
    - DHCP Server responds to the request with provisioning URL as option 66/160.
    - The phone sends the configuration file (**MAC.cfg**) request to the provisioning URL: `http://fs1.genesys.com/fs/dm/prov`
    - FS responds with the appropriate configuration file, which is already configured.
    - The phone reboots automatically and is configured with the extension 1000 when it starts.
    - The phone sends a REGISTER message to both SIPS1 and SIPS2 with DN 1000 and is ready to take calls.

IVR provisioning

1. Create two Disaster recovery device management profiles with Preferred and Peer SIP server details for both Site 1 and Site 2.
2. Complete the necessary configurations for IVR provisioning.
3. Connect the IP Phone to the LAN.
    - The phone sends a DHCP request to get the IP Address from the DHCP Server.
    - The DHCP Server responds to the request with the provisioning URL `http://fs1.genesys.com:port/fs/dm/prov` as option 66/160.
    - The phone resolves `fs1.genesys.com` and selects a Feature Server node from Site 1 or Site 2.
    - The phone sends a configuration file (**MAC.cfg**) request to the selected node with the provisioning URL: `http://fs1.genesys.com/fs/dm/prov`.
    - The selected node sends the default configuration file to the phone.
    - The phone registers to both Preferred and Peer SIP Servers with the special number `gcti_provisioning`.
    - When the agent lifts the phone receiver, the phone automatically uses the IVR number to dial IVR through Preferred SIP Server.
    - The voice prompt requests the user to assign an extension. When the user enters the extension number 2000, the phone is notified that it needs an updated configuration.
    - On the phone request, Feature Server provides an updated configuration file and the phone is configured with extension 2000.
    - The phone sends a REGISTER message to both SIPS1 and SIPS2 with DN 2000 and is ready to take calls.

IVR provisioning when the preferred server is down

When the preferred server is down and an agent lifts the phone receiver, the phone automatically uses the IVR number to dial IVR through the Peer SIP Server. The workflow continues by using the Peer SIP server.

Sample deployments for a co-located/external Cassandra cluster

You can use these sample deployments as a model for your chosen deployment option: single data center or multi-data center.

Single data center

A single data center cluster server must contain a minimum of two Cassandra nodes such as Cassandra node 1 and Cassandra node 2.

1. Configure **<Cassandra installed directory>\conf\cassandra.yaml** as follows:
   - `cluster_name: FeatureServerCluster`
   - `start_rpc: true`
   - `listen_address: Cassandra node IP address/hostname`
   - `rpc_address: Cassandra node IP address/hostname`
   - `seeds: Cassandra node 1 IP address/hostname`
   - `storage_port : 7000 (default value)`
   - `ssl_storage_port : 7001 (default value)`
   - `native_transport_port : 9042 (default value)`
   - `rpc_port : 9061 (default value)`
   - `endpoint_snitch: PropertyFileSnitch`
2. Configure **<Cassandra installed directory>\conf\cassandra-topology.properties** as follows:
   - `Cassandra node 1 IP address/hostname=DC1:RAC1`
   - `Cassandra node 2 IP address/hostname=DC1:RAC2`

Multi-data center

Following is a sample deployment for a multi-data centre.

1. A multi data center cluster server must contain a minimum of two data centers:
   - `Data center 1 => Cassandra node 1, Cassandra node 2`
   - `Data center 2 => Cassandra node 3, Cassandra node 4`

2. Configure **<Cassandra installed directory>\conf\cassandra.yaml** as follows:
   - `cluster_name: FeatureServerCluster`
   - `start_rpc: true`
   - `listen_address: Cassandra node IP address/hostname`
   - `rpc_address: Cassandra node IP address/hostname`
   - `seeds: IP addresses/hostnames of Cassandra node 1, Cassandra node3`
   - `storage_port : 7000 (default value)`
   - `ssl_storage_port : 7001 (default value)`
   - `native_transport_port : 9042 (default value)`
   - `rpc_port : 9061 (default value)`
   - `endpoint_snitch: PropertyFileSnitch`
3. Configure the **<Cassandra installed directory>\conf\cassandra-topology.properties** as follows:
   - `Cassandra node 1 IP address/hostname=DC1:RAC1`
   - `Cassandra node 2 IP address/hostname=DC1:RAC2`
   - `Cassandra node 3 IP address/hostname=DC2:RAC1`
   - `Cassandra node 4 IP address/hostname=DC2:RAC2`