SIP Feature Server Deployment Guide

Configure SIP Feature Server applications

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Configure SIP Feature Server applications

Your Feature Server deployment differs depending on the deployment option you choose: single-site, multisite (with one or multiple data centers), or Business Continuity (single-site or multisite). If you haven't yet decided, review the options.

You must install and configure Cassandra database management system before installing Feature Server.

> **Important**
>
> Feature Server versions prior to 8.1.203 might have been installed with the embedded Cassandra database. This setup is now obsolete and not recommended for new deployments.

These instructions include the Cassandra options specific to Feature Server. To learn more about Cassandra, see the Cassandra wiki and the DataStax Cassandra documentation website.

> **Important**
>
> After SIP Feature Server is started for the first time, the option **[Cluster].disable-initial-import** must be configured and set to `true`. For more details, refer to Configuration Options.

Single-site

To deploy Feature Server on a single site, you deploy two Feature Server instances configured as an active-active HA (High Availability) pair, running with a single SIP switch and SIP Server. See Deployment Options for architectural details.

To deploy SIP Feature Server on a single site:

1. Ensure that you have met all the installation prerequisites for SIP Feature Server. If you assign port numbers, ensure that you do not use any of the reserved ports.
2. Configure the SIP Feature Server applications: In Genesys Administrator, use the supplied template (**Templates > GenesysSIPFeatureServer_812.apd**) to create an application. Note the Application object name, which the application installer requires.
3. Create a Host for the target machine.
4. If this is the first Feature Server instance you are deploying:
   - Designate it to handle the initial synchronization of data from Configuration Server to all Feature

Servers in a tenant. In the **Cluster > Options** tab of the Feature Server `Application` in Genesys Administrator, set `master` to `true`. See Configuration options.

- In the **Cassandra** section:
  - set **replicationOptions** to `DC1=2`
  - set **replicationStrategyClassName** to `NetworkTopologyStrategy`

5. For new deployments,
   1. set **connection-type** to `cql` in the **Cassandra** section.
      - If you use Cassandra prior to 4.X or you are deploying Feature Server in an environment that has Embedded Cassandra and your Cassandra version isn't listening on port 9042, you might need to set the value to `thrift`.
   2. set **nodes** in the **Cassandra** section with a list of Cassandra cluster node(s) that works with the newly deployed instance of Feature Server.
   3. set **cassandra-counter** to `false` in the **VoicemailServer** section. SIP Feature Server uses Cassandra counters to maintain the MWI count for the mailboxes. The Cassandra counters are not stable and may result in inconsistency in the MWI count. When **cassandra-counter** is set to `false`, Feature Server maintains consistency in the MWI count at all times.
6. For the other Feature Server, in the **Cluster** section of the Feature Server `Application`, set `master` to `false` and `confsync` to `false`.
   Important: Ensure that you designate only one Feature Server instance as the master.
7. In the Feature Server Connections tab, add the SIP Server to the Feature Server. Ensure that the PortID is the default SIP Server port.
8. Ensure that your Configuration Server history log settings are large enough to accommodate all configuration changes that occur whenever you simultaneously shut down your master Feature Server and your confsync-enabled Feature Server (note that such shutdowns are not recommended; try to leave at least one confsync-enabled server running at all times). In the **[history-log]** section of the Configuration Server application object:
   - set **expiration** to at least the maximum number of days you expect your servers to be offline
   - set **max-records** to the maximum number of configuration records you expect your servers to handle during the offline period

   For option details, see Configuration Server Configuration Options.
9. Review the current known issues and recommendations for this release.
10. To install Feature Server, run `install.sh` (Linux) or `setup.exe` (Windows) from the product DVD. Follow the installer prompts, using the default values except for:
    - Set the deployment mode to `Standalone`.
    - Supply the Cassandra cluster name (use the same name for all Cassandra instances in the Cassandra cluster).

> **Important**
>
> Depending on the version of Feature Server you use, you might have to provide a Cassandra storage location that is not part of the installation directory and Seeds (the IP address of the master Feature Server). Setting these options initialize the embedded Cassandra used in previous releases. Skip this step

> if you plan to use external Cassandra with the latest version of Feature Server.

11. Set the **startCassandra** parameter (`com.genesyslab.common.application.cassandraServer`) to `false` in **<Feature Server installed directory>\launcher.xml** (or launcher_64.xml on linux).
12. Set up the co-located/external Cassandra cluster by referring the following articles:
    - Deploy co-located/external Cassandra cluster
    - Configure SIP Feature Server for co-located/external Cassandra cluster.
13. If this is the master Feature Server, disable the server firewall.
14. Repeat the above steps to create the non-master Feature Server, keeping in mind the differences between the master instance and the other instance.
15. If your environment includes **more than two** Feature Server instances per SIP switch, create an FQDN that includes the IP addresses of all the **N** Feature Server instances (the total number of instances minus 1), then set up a DNS server (your choice) to distribute the workload if the first instance goes down.
    For example, if 172.24.128.34, 172.24.128.35, and 172.24.128.36 are the IP addresses of three instances, you create the FQDN with any of the two instances: `FQDN1 = fs.genesys.com`, which resolves to 172.24.128.34 and 172.24.128.35. You use the IP address of the "extra" instance as the *FS(n+1) IP address*, and the *FQDN1* value, during the Configure voicemail and Implement device management procedures.
16. To enable a Transport Layer Security autodetect (upgradable) connection, configure an autodetection port. See Introduction to Genesys Transport Layer Security in Genesys 8.1 Security Deployment Guide.
17. If you are planning to use the **Dialplan** functionality, provide the **process-launcher** option in the **python** section pointing to a Python 3.X executable.
18. Set the remaining Feature Server configuration options.

Appendix

Use the following configuration if you're using an Embedded Cassandra cluster in your SIP Feature Server deployment. However, note that this cluster mode is being deprecated beginning with version 8.1.203.xx and will no longer be supported in future versions.

To configure an embedded Cassandra cluster, follow all the steps from the above procedure but replace the Step-11 configuration with the following:

1. Edit the file ***Cassandra storage location*/etc/Cassandra.yaml**:
   - Verify that the file contains these properties and values, and update as needed (do not change any other values):
     - `cluster_name: 'FeatureServerCluster'` (or whatever name you supplied as the Cassandra cluster name during installation)
     - `data_file_directories: *Cassandra storage location*/storage/data`
     - `commitlog_directory: *Cassandra storage location*/storage/commitlog`
     - `endpoint_snitch: PropertyFileSnitch/GossipingPropertyFileSnitch`
     - `listen_address: *IP address or FQDN of the instance that you are configuring*`

- `saved_caches_directory: Cassandra storage location/storage/saved_caches`
- `storage_port: 7000` (set each Cassandra node to 7000)
- `-seeds: master Feature Server IP address or FQDN`
  Cassandra nodes use the seed node list to find each other and learn the topology of the ring.

2. For `PropertyFileSnitch`, in the Feature Server home/resources folder, create or edit the **cassandra-topology.properties** file and add the following, where the data center names are the names you specified in the **replicationOptions** configuration option earlier:
   - `#Cassandra Node IP=Data Center:Rack`
   - `IP or FQDN of the FS1 host=data center 1 name:RAC1`
   - `IP or FQDN of the FS2 host=data center 1 name:RAC2`
3. For `GossipingPropertyFileSnitch`, in the Feature Server home/resources folder, create or edit the **cassandra-rackdc.properties** file in each node and add data center and rack information specific to that node, where the data center names are the names you specified in the **replicationOptions** configuration option earlier:
   - `dc=name of data center to which the specific node belongs`
   - `rack=name of rack to which the specific node belongs`

Multisite (single DC)

You can deploy Feature Server in a multisite (multi-switch) environment, using one or multiple data centers:

- Use a single data center if your sites are co-located.
- Use multiple data centers, one for each site, if your sites are in different physical locations.

Multisite configurations require a minimum of four Feature Server instances, two for each site.

To deploy SIP Feature Server in a multisite, single-data center environment:

1. Ensure that you have met all the installation prerequisites for SIP Feature Server. If you assign port numbers, ensure that you do not use any of the reserved ports.
2. Configure the SIP Feature Server applications: In Genesys Administrator, use the supplied template (**Templates > GenesysSIPFeatureServer_812.apd**) to create an application. Note the Application object name, which the application installer requires.
3. Create a Host for the target machine.
4. If this is the first Feature Server instance you are deploying:
   - Designate it to handle the initial synchronization of data from Configuration Server to all Feature Servers in a tenant. In the **Cluster > Options** tab of the Feature Server `Application` in Genesys Administrator, set `master` to `true`. See Configuration options.
   - In the **Cassandra** section:
     - set **replicationOptions** to `DC1=3` or more, depending on the number of nodes in the cluster:

increment the value by one for each node you add beyond 4.

- set **replicationStrategyClassName** to `NetworkTopologyStrategy`

5. For new deployments,
   1. set **connection-type** to `cql` in the **Cassandra** section.
      1. If you use Cassandra prior to 4.X or you are deploying Feature Server in an environment that has Embedded Cassandra and your Cassandra version isn't listening on port 9042, you might need to set the value to `thrift`.
   2. set **nodes** in the **Cassandra** section with a list of Cassandra cluster node(s) that works with the newly deployed instance of Feature Server.
   3. set **cassandra-counter** to `false` in the **VoicemailServer** section. SIP Feature Server uses Cassandra counters to maintain the MWI count for the mailboxes. The Cassandra counters are not stable and may result in inconsistency in the MWI count. When **cassandra-counter** is set to `false`, Feature Server maintains consistency in the MWI count at all times.
6. On **one** other Feature Server instance on each site, in the **Cluster** section of the Feature Server `Application`, set `master` to `false` and `confsync` to `true`. On **all** other instances, set `master` to `false` and `confsync` to `false`.
   Important: Ensure that you designate only one Feature Server instance as the master.
7. In the Feature Server Connections tab, add the SIP Server to the Feature Server. Ensure that the PortID is the default SIP Server port.
8. Ensure that your Configuration Server history log settings are large enough to accommodate all configuration changes that occur whenever you simultaneously shut down your master Feature Server and your confsync-enabled Feature Server (note that such shutdowns are not recommended; try to leave at least one confsync-enabled server running at all times). In the **[history-log]** section of the Configuration Server application object:
   - set **expiration** to at least the maximum number of days you expect your servers to be offline
   - set **max-records** to the maximum number of configuration records you expect your servers to handle during the offline period

   For option details, see Configuration Server Configuration Options.
9. Review the current known issues and recommendations for this release.
10. To install Feature Server, run `install.sh` (Linux) or `setup.exe` (Windows) from the product DVD. Follow the installer prompts, using the default values except for:
    - Set the deployment mode to `Standalone`.
    - Supply the Cassandra cluster name (use the same name for all Cassandra instances in the Cassandra cluster).

    > **Important**
    >
    > Depending on the version of Feature Server you use, you might have to provide a Cassandra storage location that is not part of the installation directory and Seeds (the IP address of the master Feature Server). Setting these options initialize the embedded Cassandra used in previous releases. Skip this step if you plan to use external Cassandra with the latest version of Feature Server.

11. Set the **startCassandra** parameter (`com.genesyslab.common.application.cassandraServer`) to

`false` in **<Feature Server installed directory>\launcher.xml** (or launcher_64.xml on linux).

12. Set up the co-located/external Cassandra cluster by referring the following articles:
    - Deploy co-located/external Cassandra cluster
    - Configure SIP Feature Server for co-located/external Cassandra cluster.
13. If this is the master Feature Server, disable the server firewall.
14. Repeat the above steps for each Feature Server instance you want to create (at least four total), keeping in mind the differences between the master instance and the other instances.
15. If your environment includes **more than two** Feature Server instances per SIP switch, create an FQDN that includes the IP addresses of all the **N** Feature Server instances (the total number of instances minus 1), then set up a DNS server (your choice) to distribute the workload if the first instance goes down.
    For example, if 172.24.128.34, 172.24.128.35, and 172.24.128.36 are the IP addresses of three instances, you create the FQDN with any of the two instances: `FQDN1 = fs.genesys.com`, which resolves to 172.24.128.34 and 172.24.128.35. You use the IP address of the "extra" instance as the *FS(n+1) IP address*, and the *FQDN1* value, during the Configure voicemail and Implement device management procedures.
16. To enable a Transport Layer Security autodetect (upgradable) connection, configure an autodetection port. See Introduction to Genesys Transport Layer Security in Genesys 8.1 Security Deployment Guide.
17. If you are planning to use the **Dialplan** functionality, provide the **process-launcher** option in the **python** section pointing to a Python 3.X executable.
18. Set the remaining Feature Server configuration options.

Appendix

Use the following configuration if you're using an Embedded Cassandra cluster in your SIP Feature Server deployment. However, note that this cluster mode is being deprecated beginning with version 8.1.203.xx and will no longer be supported in future versions.

To configure an embedded Cassandra cluster, follow all the steps from the above procedure but replace the Step-11 configuration with the following:

1. Edit the file ***Cassandra storage location*/etc/Cassandra.yaml**:
   - Verify that the file contains these properties and values, and update as needed (do not change any other values):
     - `cluster_name: 'FeatureServerCluster'` (or whatever name you supplied as the Cassandra cluster name during installation)
     - `data_file_directories: `*`Cassandra storage location`*`/storage/data`
     - `commitlog_directory: `*`Cassandra storage location`*`/storage/commitlog`
     - `endpoint_snitch: PropertyFileSnitch/GossipingPropertyFileSnitch`
     - `listen_address: `*`IP address or FQDN of the instance that you are configuring`*
     - `saved_caches_directory: `*`Cassandra storage location`*`/storage/saved_caches`
     - `storage_port: 7000` (set each Cassandra node to 7000)
     - `-seeds: `*`master Feature Server IP address or FQDN`*
       Cassandra nodes use the seed node list to find each other and learn the topology of the

ring.

2. For `PropertyFileSnitch`, in Feature Server home/resources folder, create or edit the **cassandra-topology.properties** file and add the following, where the data center names are the names you specified in the **replicationOptions** configuration option earlier:
   - `#Cassandra Node IP=Data Center:Rack`
   - `IP or FQDN of the FS1 host=data center 1 name:RAC1`
   - `IP or FQDN of the FS2 host=data center 1 name:RAC2`
3. For `GossipingPropertyFileSnitch`, in the Feature Server home/resources folder, create or edit the **cassandra-rackdc.properties** file in each node and add data center and rack information specific to that node, where the data center names are the names you specified in the **replicationOptions** configuration option earlier:
   - `dc=name of data center to which the specific node belongs`
   - `rack=name of rack to which the specific node belongs`

Multisite (multiple DCs)

You can deploy Feature Server in a multisite (multi-switch) environment, using one or multiple data centers:

- Use a single data center if your sites are co-located.
- Use multiple data centers, one for each site, if your sites are in different physical locations.

Multisite configurations require a minimum of four Feature Server instances, two for each site. In multi-data center mode, each site contains its own data center.

To deploy SIP Feature Server in a multisite, multiple-data center environment:

1. Ensure that you have met all the installation prerequisites for SIP Feature Server. If you assign port numbers, ensure that you do not use any of the reserved ports.
2. Configure the SIP Feature Server applications: In Genesys Administrator, use the supplied template (**Templates > GenesysSIPFeatureServer_812.apd**) to create an application. Note the Application object name, which the application installer requires.
3. Create a Host for the target machine.
4. If this is the first Feature Server instance you are deploying:
   - Designate it to handle the initial synchronization of data from Configuration Server to all Feature Servers in a tenant.In the **Cluster > Options** tab of the Feature Server `Application` in Genesys Administrator, set `master` to `true`. See Configuration options.
   - In the **Cassandra > Options** tab:
     - set **replicationOptions** to *`data center 1 name`*=2,*`data center 2 name`*=2 (remember these data center names to use in the `cassandra-topology.properties` file you create or edit below)
     - set **replicationStrategyClassName** to `NetworkTopologyStrategy`
5. For new deployments,

1. set **connection-type** to `cql` in the **Cassandra** section.
    1. If you use Cassandra prior to 4.X or you are deploying Feature Server in an environment that has Embedded Cassandra and your Cassandra version isn't listening on port 9042, you might need to set the value to `thrift`.
2. set **nodes** in the **Cassandra** section with a list of Cassandra cluster node(s) that works with the newly deployed instance of Feature Server.
3. set **cassandra-counter** to `false` in the **VoicemailServer** section. SIP Feature Server uses Cassandra counters to maintain the MWI count for the mailboxes. The Cassandra counters are not stable and may result in inconsistency in the MWI count. When **cassandra-counter** is set to `false`, Feature Server maintains consistency in the MWI count at all times.

6. On **one** other Feature Server instance on each site, in the **Cluster** section of the Feature Server `Application`, set `master` to `false` and `confsync` to `true`. On **all** other instances, set `master` to `false` and `confsync` to `false`.
   Important: Ensure that you designate only one Feature Server instance as the master.
7. In the Feature Server Connections tab, add the SIP Server to the Feature Server. Ensure that the PortID is the default SIP Server port.
8. Ensure that your Configuration Server history log settings are large enough to accommodate all configuration changes that occur whenever you simultaneously shut down your master Feature Server and your confsync-enabled Feature Server (note that such shutdowns are not recommended; try to leave at least one confsync-enabled server running at all times). In the **[history-log]** section of the Configuration Server application object:
   - set **expiration** to at least the maximum number of days you expect your servers to be offline
   - set **max-records** to the maximum number of configuration records you expect your servers to handle during the offline period

   For option details, see Configuration Server Configuration Options.
9. Review the current known issues and recommendations for this release.
10. To install Feature Server, run `install.sh` (Linux) or `setup.exe` (Windows) from the product DVD. Follow the installer prompts, using the default values except for:
    - Set the deployment mode to `Standalone`.
    - Supply the Cassandra cluster name (use the same name for all Cassandra instances in the Cassandra cluster).

    > **Important**
    >
    > Depending on the version of Feature Server you use, you might have to provide a Cassandra storage location that is not part of the installation directory and Seeds (the IP address of the master Feature Server). Setting these options initialize the embedded Cassandra used in previous releases. Skip this step if you plan to use external Cassandra with the latest version of Feature Server.

11. Set the **startCassandra** parameter (`com.genesyslab.common.application.cassandraServer`) to `false` in **<Feature Server installed directory>\launcher.xml** (or launcher_64.xml on linux).
12. Set up the co-located/external Cassandra cluster by referring the following articles:
    - Deploy co-located/external Cassandra cluster
    - Configure SIP Feature Server for co-located/external Cassandra cluster.

13. If this is the master Feature Server, disable the server firewall.
14. Repeat the above steps for each Feature Server instance you want to create, keeping in mind the differences between the master instance and the other instances.
15. In an environment with more than two Feature Server instances, you must create an FQDN that includes the IP addresses of all the **N** Feature Server instances (the total number of instances minus 1), then set up a DNS server (your choice) to distribute the workload if the first instance goes down.
    For example, if 172.24.128.34, 172.24.128.35, and 172.24.128.36 are the IP addresses of three instances, you create the FQDN with any of the two instances: `FQDN1 = fs.genesys.com`, which resolves to 172.24.128.34 and 172.24.128.35. You use the IP address of the "extra" instance as the *FS(n+1) IP address*, and the *FQDN1* value, during the Configure voicemail and Implement device management procedures.
16. To enable a Transport Layer Security autodetect (upgradable) connection, configure an autodetection port. See Introduction to Genesys Transport Layer Security in Genesys 8.1 Security Deployment Guide.
17. If you are planning to use the **Dialplan** functionality, provide the **process-launcher** option in the **python** section pointing to a Python 3.X executable.
18. Set the remaining Feature Server configuration options.

Appendix

Use the following configuration if you're using an Embedded Cassandra cluster in your SIP Feature Server deployment. However, note that this cluster mode is being deprecated beginning with version 8.1.203.xx and will no longer be supported in future versions.

To configure an embedded Cassandra cluster, follow all the steps from the above procedure but replace the Step-11 configuration with the following:

1. Edit the file ***Cassandra storage location*/etc/Cassandra.yaml**:
   - Verify that the file contains these properties and values, and update as needed (do not change any other values):
     - `cluster_name: 'FeatureServerCluster'` (or whatever name you supplied as the Cassandra cluster name during installation)
     - `data_file_directories: `*`Cassandra storage location`*`/storage/data`
     - `commitlog_directory: `*`Cassandra storage location`*`/storage/commitlog`
     - `endpoint_snitch: PropertyFileSnitch/GossipingPropertyFileSnitch`
     - `listen_address: `*`IP address or FQDN of the instance that you are configuring`*
     - `saved_caches_directory: `*`Cassandra storage location`*`/storage/saved_caches`
     - `storage_port: 7000` (set each Cassandra node to 7000)
     - `-seeds: `*`master Feature Server IP address or FQDN`*
       Cassandra nodes use the seed node list to find each other and learn the topology of the ring.
2. For `PropertyFileSnitch`, in the folder ***Feature Server home*/resources**, create or edit a file called `cassandra-topology.properties` and add the following, where the data center names are the names you specified in the **replicationOptions** configuration option above:
   - `# Cassandra Node IP=Data Center:Rack`

- *IP or FQDN of the FS1 host=data center 1 name*:RAC1
- *IP or FQDN of the FS2 host=data center 1 name*:RAC2
- *IP or FQDN of the FS3 host=data center 2 name*:RAC1
- *IP or FQDN of the FS4 host=data center 2 name*:RAC2
- # default for unknown nodes
- default=*data center 1 name*:RAC1

3. For GossipingPropertyFileSnitch, in the Feature Server home/resources folder, create or edit the **cassandra-rackdc.properties** file in each node and add data center and rack information specific to that node, where the data center names are the names you specified in the **replicationOptions** configuration option earlier:
   - dc=name of data center to which the specific node belongs
   - rack=name of rack to which the specific node belongs

Business Continuity

Though you can achieve some degree of Business Continuity by deploying Feature Server in single-data center mode, the recommended deployment uses multiple data centers, which provides disaster recovery. All Business Continuity deployments must contain at least two Feature Server instances per site.

To deploy SIP Feature Server in Business Continuity mode:

1. Ensure that you have met all the installation prerequisites for SIP Feature Server. If you assign port numbers, ensure that you do not use any of the reserved ports.
2. Configure the SIP Feature Server applications: In Genesys Administrator, use the supplied template (**Templates > GenesysSIPFeatureServer_812.apd**) to create an application. Note the Application object name, which the application installer requires.
3. Create a Host for the target machine.
4. If this is the first Feature Server instance you are deploying:
   - Designate it to handle the initial synchronization of data from Configuration Server to all Feature Servers in a tenant. In the **Cluster > Options** tab of the Feature Server Application in Genesys Administrator, set master to true. See Configuration options.
   - In the **Cassandra > Options** tab:
     - set **replicationOptions** to *data center 1 name*=2,*data center 2 name*=2 (remember these data center names to use in the cassandra-topology.properties file you create or edit below)
     - set **replicationStrategyClassName** to NetworkTopologyStrategy
5. For new deployments,
   1. set **connection-type** to cql in the **Cassandra** section.
      1. If you use Cassandra prior to 4.X or you are deploying Feature Server in an environment that has Embedded Cassandra and your Cassandra version isn't listening on port 9042, you might need to set the value to thrift.

2. set **nodes** in the **Cassandra** section with a list of Cassandra cluster node(s) that works with the newly deployed instance of Feature Server.
3. set **cassandra-counter** to `false` in the **VoicemailServer** section. SIP Feature Server uses Cassandra counters to maintain the MWI count for the mailboxes. The Cassandra counters are not stable and may result in inconsistency in the MWI count. When **cassandra-counter** is set to `false`, Feature Server maintains consistency in the MWI count at all times.

6. On **one** other Feature Server instance on each site, in the **Cluster** section of the Feature Server `Application`, set `master` to `false` and `confsync` to `true`. On **all** other instances, set `master` to `false` and `confsync` to `false`.
   Important: Ensure that you designate only one Feature Server instance as the master.
7. In the Feature Server Connections tab, add the SIP Server to the Feature Server. Ensure that the PortID is the default SIP Server port.
8. Ensure that your Configuration Server history log settings are large enough to accommodate all configuration changes that occur whenever you simultaneously shut down your master Feature Server and your confsync-enabled Feature Server (note that such shutdowns are not recommended; try to leave at least one confsync-enabled server running at all times). In the **[history-log]** section of the Configuration Server application object:
   - set **expiration** to at least the maximum number of days you expect your servers to be offline
   - set **max-records** to the maximum number of configuration records you expect your servers to handle during the offline period

   For option details, see Configuration Server Configuration Options.
9. Review the current known issues and recommendations for this release.
10. To install Feature Server, run `install.sh` (Linux) or `setup.exe` (Windows) from the product DVD. Follow the installer prompts, using the default values except for:
    - Set the deployment mode to `Standalone`.
    - Supply the Cassandra cluster name (use the same name for all Cassandra instances in the Cassandra cluster).
    - Supply a Cassandra storage location, but do **not** use the installation directory.

    > **Important**
    >
    > Depending on the version of Feature Server you use, you might have to provide a Cassandra storage location that is not part of the installation directory and Seeds (the IP address of the master Feature Server). Setting these options initialize the embedded Cassandra used in previous releases. Skip this step if you plan to use external Cassandra with the latest version of Feature Server.

11. Set the **startCassandra** parameter (`com.genesyslab.common.application.cassandraServer`) to `false` in **<Feature Server installed directory>\launcher.xml** (or launcher_64.xml on linux).
12. Set up the co-located/external Cassandra cluster by referring the following articles:
    - Deploy co-located/external Cassandra cluster
    - Configure SIP Feature Server for co-located/external Cassandra cluster
13. If this is the master Feature Server, disable the server firewall.
14. Repeat the above steps for each Feature Server instance you want to create, keeping in mind the

differences between the master instance and the other instances.

15. In an environment with more than two Feature Server instances, you must create an FQDN that includes the IP addresses of all the **N** Feature Server instances (the total number of instances minus 1), then set up a DNS server (your choice) to distribute the workload if the first instance goes down.
    For example, if 172.24.128.34, 172.24.128.35, and 172.24.128.36 are the IP addresses of three instances, you create the FQDN with any of the two instances: `FQDN1 = fs.genesys.com`, which resolves to 172.24.128.34 and 172.24.128.35. You use the IP address of the "extra" instance as the *FS(n+1) IP address*, and the *FQDN1* value, during the Configure voicemail and Implement device management procedures.
16. To enable a Transport Layer Security autodetect (upgradable) connection, configure an autodetection port. See Introduction to Genesys Transport Layer Security in Genesys 8.1 Security Deployment Guide.
17. If you are planning to use the **Dialplan** functionality, provide the **process-launcher** option in the **python** section pointing to a Python 3.X executable.
18. Set the remaining Feature Server configuration options.

Appendix

Use the following configuration if you're using an Embedded Cassandra cluster in your SIP Feature Server deployment. However, note that this cluster mode is being deprecated beginning with version 8.1.203.xx and will no longer be supported in future versions.

To configure an embedded Cassandra cluster, follow all the steps from the above procedure but replace the Step-11 configuration with the following:

1. Edit the file ***Cassandra storage location*/etc/Cassandra.yaml**:
   - Verify that the file contains these properties and values, and update as needed (do not change any other values):
     - `cluster_name: 'FeatureServerCluster'` (or whatever name you supplied as the Cassandra cluster name during installation)
     - `data_file_directories: `*`Cassandra storage location`*`/storage/data`
     - `commitlog_directory: `*`Cassandra storage location`*`/storage/commitlog`
     - `endpoint_snitch: PropertyFileSnitch/GossipingPropertyFileSnitch`
     - `listen_address: `*`IP address or FQDN of the instance that you are configuring`*
     - `saved_caches_directory: `*`Cassandra storage location`*`/storage/saved_caches`
     - `storage_port: 7000` (set each Cassandra node to 7000)
     - `-seeds: `*`master Feature Server IP address or FQDN`*
       Cassandra nodes use the seed node list to find each other and learn the topology of the ring.
2. For `PropertyFileSnitch`, in the folder ***Feature Server home*/resources**, create or edit a file called `cassandra-topology.properties` and add the following, where the data center names are the names you specified in the **replicationOptions** configuration option above:
   - `# Cassandra Node IP=Data Center:Rack`
   - *`IP or FQDN of the FS1 host=data center 1 name`*`:RAC1`
   - *`IP or FQDN of the FS2 host=data center 1 name`*`:RAC2`

- *IP or FQDN of the FS3 host=data center 2 name*:RAC1
- *IP or FQDN of the FS4 host=data center 2 name*:RAC2
- # default for unknown nodes
- default=*data center 1 name*:RAC1
- For GossipingPropertyFileSnitch, in the Feature Server home/resources folder, create or edit the **cassandra-rackdc.properties** file in each node and add data center and rack information specific to that node, where the data center names are the names you specified in the **replicationOptions** configuration option earlier:
- dc=name of data center to which the specific node belongs
- rack=name of rack to which the specific node belongs