



Configure Global Dial Plan Replication

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Global Dial Plan Replication Overview

Use global dial plan replication to create a global dial plan that spans across the Intercluster Lookup Service (ILS) network. When you enable Global Dial Plan Replication, you configure the dial plan component on one cluster, and ILS replicates that information throughout the ILS network.

When you enable Global Dial Plan Replication, each cluster in an ILS network advertises its global dial plan data, including the global dial plan data that was configured locally and any data that was learned from other clusters, to the ILS network. Global dial plan data includes the following:

- Directory universal resource indicators (URIs)
- Alternate numbers
- Advertised patterns
- PSTN failover
- Route strings
- Learned Global Dial Plan Data
- Imported Global Dial Plan Data

Directory URIs

ILS advertises the full catalog of locally configured directory URIs when you choose **Advertise Globally via ILS** option. See the [URI Dialing Overview](#) for more information on how to configure URI dialing.

Alternate Numbers

Alternate numbers allow you to configure globally routable numbers that can be dialed from anywhere within an ILS network. Cisco Unified Communications Manager allows you to create two types of alternate numbers:

- Enterprise alternate numbers

- +E.164 alternate numbers

Advertised Patterns

Advertised patterns allow you to create summarized routing instructions for a range of enterprise alternate numbers or +E.164 alternate numbers and replicate that pattern throughout an ILS network so that all clusters within the ILS network know the pattern. Advertised patterns prevent you from individually configuring routing information for each alternate number. Advertised patterns are never used by the local cluster on which they are configured; they are only used by remote clusters that learn the pattern through ILS. You can also configure Public Switched Telephone Network(PSTN) failover information for patterns that are advertised by ILS.

PSTN Failovers

Unified Communications Manager uses a PSTN failover number to reroute only those calls that are placed to patterns, alternate numbers, or directory URIs that were learned through ILS. Communications Manager does not reroute calls to the PSTN failover number for calls that are placed to locally configured patterns, alternate numbers, and directory URIs.

When you enable Global Dial Plan Replication, you can configure ILS to replicate a PSTN failover rule for learned directory URIs, learned numbers, and learned patterns. If the dial string for an outgoing call matches a learned pattern, learned alternate number, or learned directory URI, and Unified Communications Manager cannot route the call over a SIP trunk, Unified Communications Manager uses the calling party's Automatic Alternate Routing (AAR) CSS to reroute the call to the associated PSTN failover number.

Route Strings

ILS advertises the local route string to the ILS network. Each global dial plan data element associates to a route string that identifies the home cluster for that element. Remote clusters use the route string with a SIP route pattern to route to the various clusters in an ILS network. When a user in a remote cluster dials a directory URI or alternate number that was learned through ILS, Unified Communications Manager matches the associated route string to a SIP route pattern, and routes the call to the trunk that is specified by the SIP route pattern.

When a user assigns route string to a cluster, ILS associates that route string to all the global dial plan data that is local to that cluster (including locally configured directory URIs, alternate numbers, advertised patterns, and PSTN failover information).



Note If the SIP Route Pattern name contains dashes, you must ensure that there are no numerical digits between dashes. However, you can use a combination of letters and numbers or letters only, if there are more than one dash.

Examples of right and wrong SIP Route Patterns are listed in the following:

Correct Patterns:

- abc-1d-efg.xyz.com
- 123-abc-456.xyz.com

Incorrect Patterns :

- abc-123-def.xyz.com
 - 1bc-2-3ef.xyz.com
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Learned Global Dial Plan Data

Unified Communications Manager stores in the local database all global dial plan data that is learned through ILS. In addition to replicating locally configured data, ILS advertises all global dial plan data that the local cluster has learned from other clusters in the ILS network. This ensures that all advertised data reaches each cluster in the ILS network. Learned global dial plan data includes learned directory URIs, learned alternate numbers, learned patterns, learned PSTN failover rules, and learned route strings.

In Cisco Unified CM Administration, you can view the following types of learned global dial plan data:

- Learned Alternate Numbers
- Learned Enterprise and +E.164 Patterns
- Learned Directory URIs

Imported Global Dial Plan Data

Unified Communications Manager allows you to import global dial plan data from a CSV file into any hub cluster in an ILS network. ILS replicates the imported global dial plan data throughout the ILS network that allows you to interoperate Unified Communications Manager with a Cisco TelePresence Video Communications Server or a third-party call control system. Imported global dial plan data includes directory URIs, +E.164 patterns, and PSTN failover rules that were imported manually from a CSV file



Note Imported data includes only global dial plan data that is imported manually into Unified Communications Manager. Imported global dial plan data does not include data that was learned through ILS.

Global Dial Plan Replication Prerequisites

Follow the procedures to set up an ILS network in the [ILS Configuration Task Flow](#).

Global Dial Plan Replication Task Flow

Procedure

	Command or Action	Purpose
Step 1	Enable ILS Support for Global Dial Plan Replication, on page 5.	Enable ILS support for Global Dial Plan Replication to share dial plan information between participating ILS-enabled clusters.
Step 2	Set Up Alternate Number, on page 5.	(Optional) If you want to set up alternate numbers that you can dial between clusters, configure alternate number replication.
Step 3	Set Up Advertised Pattern for Alternate Numbers, on page 6.	(Optional) If you want to summarize your alternate numbers with a pattern, set up an advertised pattern, and assign a PSTN failover rule for the pattern.
Step 4	Set Up PSTN Failover, on page 7.	(Optional) If you want to set up a PSTN failover number for specific directory URIs or alternate numbers, assign an alternate number as the PSTN failover number for all the directory URIs and alternate numbers that are associated to a specific directory number.
Step 5	Assign Partitions for Learned Numbers and Patterns, on page 7.	(Optional) Assign route partitions to the alternate numbers and patterns that the local cluster learns through ILS.
Step 6	Block a Learned Pattern, on page 8.	(Optional) To prevent a local Unified Communications Manager cluster from routing calls to a learned alternate number or learned alternate number pattern, you can configure a local blocking rule on that cluster.
Step 7	Set Database Limits for Learned Data, on page 9.	Set a database limit to determine the number of learned objects that Unified Communications Manager can write to the local database.
Step 8	Import Global Dial Plan Data, on page 9.	(Optional) If you want your ILS network to interoperate with a Cisco TelePresence Video Communication Server or third-party call control system, import directory URI catalogs from a CSV file for the other system into any hub cluster in the ILS network.

What to do next

If you want to dial directory universal resource indicators (URIs) across clusters, set up URI dialing in the local cluster. For details, see the [URI Dialing Overview](#).

Enable ILS Support for Global Dial Plan Replication

To enable ILS support for Global Dial Plan Replication in the local cluster, follow this procedure:

Procedure

- Step 1** Log in to the Cisco Unified Communications Manager publisher node.
 - Step 2** From Cisco Unified CM Administration, choose **Advanced Features > ILS Configuration**.
 - Step 3** Check the **Exchange Global Dial Plan Replication Data with Remote Clusters** check box.
 - Step 4** In the **Advertised Route String** text box, enter a route string for the local cluster.
 - Step 5** Click **Save**.
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Set Up Alternate Number

Create an enterprise alternate number or +E.164 alternate number and associate the alternate number with a directory number. When you dial the alternate number, the phone that is registered to the associated directory number, rings.



Note Each alternate number that you set up must associate with a single directory number. However, that directory number can associate to both an enterprise alternate number and a +E.164 alternate number at the same time.

Before you begin

[Enable ILS Support for Global Dial Plan Replication, on page 5.](#)

Procedure

- Step 1** From Cisco Unified CM Administration, choose **Call Routing > Directory Number**.
- Step 2** From the **Find and List Directory Numbers** window, find and select the directory number to which you want to associate the alternate number.
- Step 3** From the **Directory Number Configuration** window, click one of the following options depending on the type of alternate number that you want to assign:
 - **Add Enterprise Alternate Number.**
 - **Add +E.164 Alternate Number.**
- Step 4** In the **Number Mask** field, enter the number mask that you want to apply to the directory number.
The **Alternate Number** field displays how the alternate number appears after Cisco Unified Communications Manager applies the number mask.
- Step 5** (Optional) If you want to enable local routing for the alternate number, perform the following steps:
 - a) Check the **Add to Local Route Partition** check box.

b) From the **Route Partition** drop-down list, choose a route partition that is assigned to a local calling search space.

- Step 6** (Optional) If you want to use a number pattern to set up intercluster routing for this alternate number, click **Save**.
- Step 7** (Optional) If you want to set up intercluster routing for this alternate number, check the **Advertise Globally via ILS** check box for this alternate number.
- Step 8** (Optional) If you want to assign a PSTN failover number to this alternate number, from the **PSTN failover** drop-down list, assign a number as the PSTN failover.
- Step 9** Click **Save**.

What to do next

[Set Up Advertised Pattern for Alternate Numbers, on page 6.](#)

Set Up Advertised Pattern for Alternate Numbers

Use advertised patterns to summarize a range of Enterprise alternate numbers or E.164 alternate numbers. You can advertise the pattern to the ILS network to enable intercluster calling to numbers that match the pattern.

Procedure

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- Step 1** From Cisco Unified CM Administration, choose **Call Routing > Global Dial Plan Replication > Advertised Patterns**.
- Step 2** From the **Find and List Advertised Patterns** window, do either of the following:
- Click **Find** and select an existing pattern.
 - Click **Add New** to create a new pattern.
- Step 3** In the **Pattern** field, enter the number pattern. For example, 54XXX summarizes a range of numbers between 54000 - 54999.
- Step 4** In the **Pattern Type** field, select the pattern type: **Enterprise Number Pattern** or **E.164 Number Pattern**.
- Step 5** From the radio buttons, select whether you want to apply a PSTN Failover.
- **Don't use PSTN Failover**
 - **Use Pattern as PSTN Failover**
 - **Apply Strip Digits and Prepend Digits to Pattern and Use for PSTN Failover**—If you choose this option, enter the digits in the **PSTN Failover Strip Digits** and **PSTN Failover Prepend Digits** fields.
- Step 6** Click **Save**.
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Set Up PSTN Failover

Perform the following procedure to assign a PSTN failover number for directory URIs or alternate numbers and advertise that PSTN failover number to the ILS network. Remote clusters can use the PSTN failover number for calls to learned directory URIs or learned alternate numbers.

Before you begin

[Set Up Advertised Pattern for Alternate Numbers, on page 6.](#)

Procedure

- Step 1** From Cisco Unified CM Administration, choose **Call Routing > Directory Number**.
- Step 2** From the **Find and List Directory Numbers** window, find and select the directory number that is associated to the directory URI or alternate number for which you want to assign a PSTN failover number. The appears.
- Step 3** (Optional) If the alternate number that you want to use as the PSTN failover does not exist, in the **Directory Number Configuration** window, choose one of the following options depending on the type of alternate number that you want to assign:
- **Add Enterprise Alternate Number.**
 - **Add +E.164 Alternate Number.**
- Step 4** In the **PSTN Failover** drop-down list, choose the alternate number that you want to use as the PSTN failover.
- Step 5** Click **Save**.
- Cisco Unified Communications Manager associates that PSTN failover number to that directory number. Global Dial Plan Replication advertises that number to the ILS network as the PSTN failover number for all the directory URIs and alternate numbers that are associated to that directory number.
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What to do next

[Assign Partitions for Learned Numbers and Patterns, on page 7.](#)

Assign Partitions for Learned Numbers and Patterns

You must assign learned numbers and learned patterns to a partition. You can define your own partitions or use the predefined default partitions. Unified Communications Manager is installed with the following predefined partitions for learned alternate numbers and number patterns:

- Global Learned Enterprise Numbers.
- Global Learned E.164 Numbers.
- Global Learned Enterprise Patterns.
- Global Learned E.164 Patterns.



Note You cannot assign a learned number or learned pattern to a NULL partition.

Procedure

- Step 1** From Cisco Unified CM Administration, choose **Call Routing > Global Dial Plan Replication > Partitions for Learned Numbers and Patterns**.
- Step 2** Configure the fields in the **Partitions for Learned Numbers and Patterns** window. For more information on the fields and their configuration options, see the system Online Help.
- Step 3** Click **Save**.

Note The route partition must also exist in the calling search space that is used by the calling party in order for calls to be placed to numbers in the partition.

Block a Learned Pattern

Complete this optional task if you want to set up a blocking rule that prevents the local cluster from routing calls to specific enterprise alternate numbers, +E.164 alternate numbers, or number patterns that were learned through the ILS.

Before routing a call to a learned number or learned pattern, ILS checks to see if a local blocking rule matches the dial string. If the blocking rule matches, Unified Communications Manager does not route the call.

Procedure

- Step 1** From Cisco Unified CM Administration, choose **Call Routing > Global Dial Plan Replication > Block Learned Numbers and Patterns**.
- Step 2** Perform one of the following tasks:
- Click **Find** and select an existing blocking rule to edit.
 - Click **Add New** to create a new blocking rule.
- Step 3** In the **Pattern** field, enter the pattern or number that you want to block. For example, 206XXXXXXX can be used to block calls to 2065551212.
- Step 4** If you want to block calls based on the dial string prefix, enter the **Prefix**.
- Step 5** If you want to block calls from being sent to a specific cluster, enter the **Cluster ID** of the cluster.
- Step 6** From the **Pattern Type** drop-down list, select how you want to apply the blocking rule:
- **Any**—Choose this option if the blocking rule applies to both enterprise number patterns and +E.164 patterns.
 - **Enterprise Pattern**—Choose this option if the blocking rule applies to enterprise number patterns only.
 - **+E.164 Pattern**—Choose this option if the blocking rule applies to +E.164 number patterns only.

Step 7 Click **Save**.

Set Database Limits for Learned Data

Set a database limit to determine the number of learned objects that Unified Communications Manager can write to the local database.

Procedure

- Step 1** From Cisco Unified CM Administration, choose **System > Service Parameters**.
 - Step 2** Choose the **Server** where you want to configure the parameter.
 - Step 3** From the **Service** drop-down list, choose **Cisco Intercluster Lookup Service (Active)**. If the service does not appear as active, ensure that the service is activated in Cisco Unified Serviceability.
 - Step 4** Under **Clusterwide Parameters (ILS)** section, set an upper limit for the **ILS Max Number of Learned Objects in Database** service parameter.
 - Step 5** Click **Save**.
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Note This service parameter determines the maximum number of entries that Unified Communications Manager can write to the database for data that is learned through ILS. The default value of the service parameter is 100,000 while the maximum value of the service parameter is 1,000,00

If you reduce the service parameter to a value that is lower than the current number of ILS-learned entries that are saved in the database, Unified Communications Manager does not write additional ILS learned objects to the database. However, the existing database entries remain.

Import Global Dial Plan Data

Use this procedure if you are interoperating with a Cisco TelePresence Video Communications Server, a third-party call control system, or another system that is not running ILS. You can import a catalog of directory URIs, +E.164 patterns and PSTN failover rules from the other system into a hub cluster in the ILS network. ILS replicates the catalog throughout the ILS network so that the clusters can place calls to the other system.

Before you begin

Export your dial plan catalogs from the other system to a CSV file.

Procedure

- Step 1** From Cisco Unified CM Administration, choose **Call Routing > Global Dial Plan Replication > Imported Global Dial Plan Catalog**.
- Step 2** From the **Find and List Imported Global Dial Plan Catalogs** window, perform one of the following tasks:

- Click **Find** and select an existing catalog from the resulting list.
- Click **Add New** to add a new catalog.

Step 3 From the **Imported Global Dial Plan Catalog Settings** window, in the **Name** field, enter a unique name to identify the catalog that you want to import.

Step 4 (Optional) In the **Description** field, enter a description of the catalog.

Step 5 In the **Route String** field, create a route string for the system from which you are importing the catalog.

Note Route strings can be up to 250 alphanumeric characters long and can include dots and dashes.

Step 6 Click **Save**.

Step 7 From Cisco Unified CM Administration, choose **Bulk Administration > Upload/Download Files**.

- Click **Add New**.
- Click **Browse** and select the CSV file for the catalog that you want to import.

Note Ensure that the CSV file that you use for the import is compatible with the version of Cisco Unified Communications Manager. For example, a CSV file that is compatible to import into Version 9.0(1) is not compatible with Version 10.0(1).

Step 8 In the **Select the Target** drop-down list, select **Imported Directory URIs and Patterns**.

Step 9 In the **Select Transaction Type** drop-down list, select **Insert Imported Directory URIs and Patterns**.

Step 10 Click **Save**.

Step 11 From Cisco Unified CM Administration, choose **Bulk Administration > Directory URIs and Patterns > Insert Imported Directory URIs and Patterns**.

Step 12 In the **File Name** drop-down list, choose the CSV file that contains the catalog that you want to import.

Step 13 In the **Imported Directory URI Catalog** drop-down list, choose the catalog that you named in the **Imported Global Dial Plan Catalog** window.

Step 14 In the **Job Description** text box, enter a name for the job that you are about to run.

Step 15 Perform one of the following steps:

- If you want to run the job now, select the **Run Immediately** option, and click **Submit**.
- If you want to schedule the job to run at a specified time, select the **Run Later** radio button and click **Submit**.

Note If you choose the **Run Later** option, you must use the Bulk Administration Job Scheduler to schedule when the job runs.

Cisco Unified Communications Manager saves all imported +E.164 patterns to the Global Learned +E.164 Patterns partition.



Note You can also export all locally configured directory URIs, +E.164 number patterns, and their associated PSTN failover rules to a CSV file that you can import into the other call control system. Refer to the menus at **Bulk Administration > Directory URIs and Patterns > Export Local Directory URIs and Patterns** for details.
