

Supporting Variable Length Dial Plans for Cisco CallManager Route Patterns – an Exercise in Designing a Route Pattern that Covers a National Dial Plan

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Introduction

Cisco CallManager installations in North America are able to use the '@' macro in the route patterns to allow the use of variable length dial plans. If a caller dials a seven digit local number, or a ten/eleven digit long distance number, the call will be sent out to the public switched telephone network (PSTN) immediately after the last digit is dialed. However, this macro does not work outside of North America. In the past, customers have used the alternative route pattern of 0.! to handle calls with variable length dial plans. This wildcard character allows a called number string of any length, but it will wait a default interdigit timeout of ten seconds before sending the called number to the gateway device. Customers have the option of shortening this timer, but it can lead to problems with users who pause mid way through dialing. The Cisco CallManager may interpret the pause as the end of dial delay and outpulse an incomplete number.

As an alternative to using the '!' wildcard, following is a case study in developing a variable length dial plan for a national numbering scheme. With this dial plan users can dial services, informational, local and long distance numbers without the need to wait the interdigit timeout period.

The international access code will still use the ! wildcard, as we cannot match all foreign dial plans, this is normally not a concern for most users.

This document describes how to make Cisco CallManager dial the PSTN number as soon as the last digit is dialed.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This configuration was tested using Cisco CallManager version 3.07 and IOS® Software version 12.1.3aXI5 IP plus feature set on the Gateway Router. This example assumes a Cisco CallManager outside access code of 0.

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

Designing a Dial Plan that Meets Your Requirements

In this example, we will be creating a national dial plan that corresponds to the Australian national numbering system. It should be a simple matter to apply these principles to any other country, provided they use a consistent numbering scheme for local and long distance calls.

The dial plan below was developed for a CallManager located in a regional area. The customer wanted to have multiple levels of call barring that allowed for local (local exchange area only), regional STD (long distance), state STD, national STD and ISD (International) access. This was accomplished by creating granular matches on the dialed numbers and separating the numbers with the local prefix (555XXXXX) from the other number combinations. The different route patterns were put into separate partitions. Then calling party search spaces that included the different partitions were created. This provided an easy way of controlling outdial access from each handset.

Note: You will need to modify this area of the dial plan to suit the local numbers where the Cisco CallManager is situated. The [] wildcards allow specifying a range of numbers, which reduces the overall number of similar route patterns.

The Australian Dial Plan consists of eight digit local numbers for the local exchange area. The first two digits of the eight digit local number are a region code. There is a two digit long distance (STD) access code which works on a state basis (leading digit is always 0, for example: 02) and it uses 0011 as the international access code. Mobile phones are in the range 04XX XXXXXX. Freecall Informational services come under 1-30X-XXXXXX, 1-800-XXXXXX, 1-900-XXXXXX or 13XXXX. Emergency calls use 000.

The 0055 Paycall Informational services have not been included in this dial plan, although this could have easily been done. The customer did not want access for this service, though it would have been an easy matter to specify the 0055XXXXXX number range as a route pattern, then set the block this pattern option to bar the calls.

Please note that this is not an exhaustive list of all possible combinations. It is likely that there are other numbers that are not listed here, so it would be worthwhile to investigate the particular dial plan of your locality. Phone books often have lists of area code and informational/service numbers.

Dial Plan		
Route	Pattern	Comments
0.000		emergency
0.013		information

0.123X		medical
0.124XX		medical
0.125XXX		medical
0.1194		time
0.1196		weather
0.12455		information
0.130XXXXXXXX	130XXXXXXXX	Freecall numbers
0.13[1-9]XXX	130000	Freecall information
0.1[8-9]XXXXXXXX	1-800/1-900	Freecall numbers
0.0[2-9]XXXXXXXX	02XXXXXXXX 09XXXXXXXX	national/mobile
0.[2-4]XXXXXXXX	2XXXXXXXX - 4XXXXXXXX	STD - VIC - state
0.[6-9]XXXXXXXX	6XXXXXXXX - 9XXXXXXXX	STD - VIC - state
0.5[0-4]XXXXXX	50XXXXXX - 54XXXXXX	STD - VIC - regional
0.5[6-9]XXXXXX	56XXXXXX - 59XXXXXX	STD - VIC - regional
0.55[0-4]XXXXX	550XXXXX - 554XXXXX	STD - VIC - regional
0.55[6-9]XXXXX	556XXXXX - 559XXXXX	STD - VIC - regional
0.555XXXXX		Local exchange numbers - 8 digit numbers
0.0011!		International - uses interdigit timeout (10 seconds)
0.0011!#		International - uses # as end of dial character

Configuring the Dial Plan in Cisco CallManager

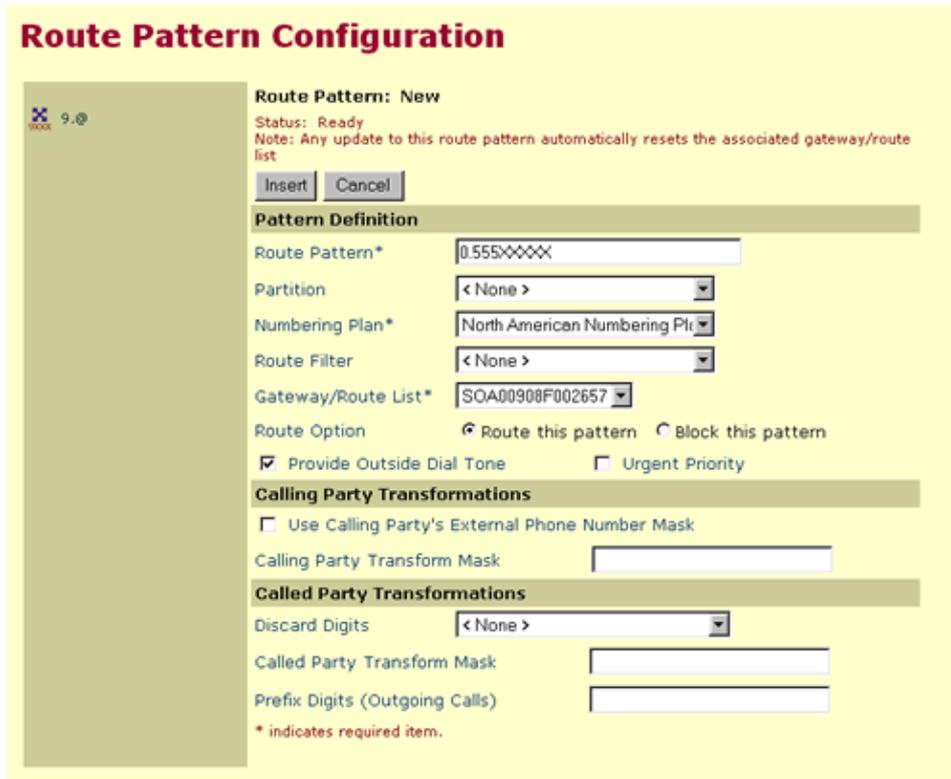
Follow the steps below to configure the dial plan in Cisco CallManager.

1. Enter an Access code of 0 '!' as the access code delimiter. Add the route pattern digits or wildcard matches.
2. Ensure that the **Route this pattern** and **Provide secondary dial tone** options are set.
3. Point the route pattern to a gateway device (H323, MGCP , SAA or SDA).
4. If the gateway device is MGCP, SAA or SDA (Skinny protocol), the access code needs to be discarded. Under Called Party Transformations, set discard digits to <pre-dot>.
5. If the gateway device is an IOS based H323 gateway, the access code needs to be passed with the called digits. Under Called Party Transformations, set discard digits to <none>.

6. Insert the Route Pattern into the database.
7. If the gateway device is an IOS based H323 gateway, proceed to Configuring the Router to Route the Calls

Verifying the Dial Plan

Verify the Dial Plan by examining the contents of the Route Pattern Configuration screen.



The screenshot shows the 'Route Pattern Configuration' interface. At the top, it says 'Route Pattern: New' with a status of 'Ready'. A note indicates that any update to this route pattern automatically resets the associated gateway/route list. There are 'Insert' and 'Cancel' buttons. The 'Pattern Definition' section includes fields for 'Route Pattern*' (0.555XXXXX), 'Partition' (< None >), 'Numbering Plan*' (North American Numbering Plan), 'Route Filter' (< None >), and 'Gateway/Route List*' (SOA00908F002657). Below this, there are radio buttons for 'Route this pattern' (selected) and 'Block this pattern', and checkboxes for 'Provide Outside Dial Tone' (checked) and 'Urgent Priority'. The 'Calling Party Transformations' section has a checkbox for 'Use Calling Party's External Phone Number Mask' (unchecked) and a 'Calling Party Transform Mask' field. The 'Called Party Transformations' section includes 'Discard Digits' (< None >), 'Called Party Transform Mask', and 'Prefix Digits (Outgoing Calls)'. A legend at the bottom states '* indicates required item.'

Once configured, the Cisco CallManager Dial Plan configuration should look something like this:

Route Pattern Configuration

Route Pattern: 0.0011!#
Status: Insert completed
Note: Any update to this route pattern automatically resets the associated gateway/route list

New Copy Update Delete Cancel

Pattern Definition

Route Pattern* 0.0011!#
Partition < None >
Numbering Plan* North American Numbering Plt
Route Filter < None >
Gateway/Route List* SOA00908F002657 (Edit)
Route Option Route this pattern Block this pattern
 Provide Outside Dial Tone Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask
Calling Party Transform Mask

Called Party Transformations

Discard Digits < None >
Called Party Transform Mask
Prefix Digits (Outgoing Calls)

* indicates required item.

0.[2-4]XXXXXXXX
0.[6-9]XXXXXXXX
0.0[2-9]XXXXXXXX
0.000
0.0011!
0.0011!#
0.013
0.1[8-9]XXXXXXXX
0.1194
0.1196
0.123X
0.12455
0.124XX
0.125XXX
0.13[1-9]XXX
0.130XXXXXXXX
0.5[0-4]XXXXXX
0.5[6-9]XXXXXX
0.55[0-4]XXXXX
0.55[6-9]XXXXX
0.555XXXXX
9.@

Configuring the Router to Route the Calls

This section explains how a Cisco IOS gateway is configured as a CallManager H323 gateway.

On the gateway router POTS dial peer that points to the PSTN ports, use a destination pattern of '0' to match the leading digit (access code) of the dialed digits that come from the CallManager. This explicit match on the '0' will cause the dial peer to strip off the leading 0, hence the rest of the called number is sent out. This is shown in the configuration segment below.

```
!  
dial-peer voice 100 pots  
  direct-inward-dial  
  
!-- DID for incoming calls  
  
  destination-pattern 0  
  
!-- 0 is stripped when call is placed  
  
  port 1/0:15  
  
!-- Direct the call to the PRI port 1/0  
  
!
```

You do not need any other POTS dial peers unless there are multiple POTS ports that will go into a hunt group. For example, if you had two FXO ports, the dial peers would look like this:

```
!  
dial-peer voice 100 pots  
  destination-pattern 0  
  port 1/0/0
```

```
!  
dial-peer voice 101 pots  
  destination-pattern 0  
  port 1/0/1  
!
```

The calls will then cycle through these two configured voice ports.

Summary

Cisco CallManager installations outside of North America are unable to use the inbuilt '@' route pattern macro as it only relates to the North American numbering plan. By using the procedure in this application note, customers can develop local dial plans for their CallManager systems that remove the need to wait an interdigit timeout, and it allows calls to be placed as soon as the minimum required number of digits has been keyed in on the handsets.

Related Information

- [Voice Technology Support](#)
- [Voice and Unified Communications Product Support](#)
- [Troubleshooting Cisco IP Telephony](#) 
- [Technical Support – Cisco Systems](#)

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