



Dial Plan Longest Match

Document Release History

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Feature History

Release	Modification
Release 9.6(1)	This feature was introduced on Cisco PGW 2200.
Patches: CSCOGs016 and CSCOnn018	

This document describes the support for using the longest match in a dial plan even when a shorter dial plan digit string match is available.

This feature is described in the following sections:

- [Feature Overview, page 1](#)
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Feature Overview

This feature provides support for using the longest match in a dial plan even when a new dial plan matches a shorter digit string. Currently, with various result types, like ROUTE, CAUSE, ANNOUNCEMENT, the dial plan changeover is forced, and so the longest match is ignored.

With the introduction of the new Dial Plan Longest Match feature, the PGW 2200 uses the longest dial plan match to select the best result type. Consequently, it will not jump to a new dial plan if there is another terminal result that has a potentially longer match. This applies to all of the results mentioned for A-analysis and B-analysis in the “[Longest Match in A-Number Analysis](#)” section on page 2 and “[Longest Match in B-Number Analysis](#)” section on page 3.

The Dial Plan Longest Match feature is further explained in the following two sections:

- [Basic Result Analysis](#)—explains the current call processing capability
- [New Call Processing Behavior](#)—explains the new functionality with the introduction of the Dial Plan Longest Match feature.

Basic Result Analysis

This section explains the basic result analysis based on the current call processing capability.

Result analysis enables you to group actions into result sets that can be attached at different points of analysis. The main attachment points are pre-analysis, A-number analysis, B-number analysis, and cause analysis.

When you are configuring results, certain result types require extra configuration to provide additional data. The following are examples of two such result types.

- Number modification, in which the digits are inserted into a number. These new digits must be configured first and stored before the actual result, which will make use of these digits, is defined. For example, if the B-number is 4841234 and the intention with a B-number modification (BMODDIG result) is to insert 703 at the front of the number, the "703" digit string must be created first. Once the digit string is created, the actual B-number modification result can be defined through use of the "703" digit string data.
- When A-number screening is required, if the screening is triggered from the B-number digit analysis, it is necessary to identify the database area that contains the A-number screening data for calls destined to this particular B-number. The database area is called the Service name. The service name data must be defined separately before the actual A-number screening result is defined.

For detailed information on the existing call processing behavior, see the Dial Plan Overview section in the *Cisco Media Gateway Controller Software Release 9 Dial Plan Guide* at the following URL: http://www.cisco.com/univercd/cc/td/doc/product/access/sc/re19/dplan/dp_ovrvm.htm#wp1340395

New Call Processing Behavior

This new longest match feature results in a new call processing behavior which enhances the basic analysis capability the following five situations:

- [Longest Match in A-Number Analysis](#)
- [Longest Match in B-Number Analysis](#)
- [Dial Plan Changing](#)
- [Overlap Dial Plan Changing](#)
- [Ported Number Handling](#)

Longest Match in A-Number Analysis

With analysis set to the new call processing capability, the following A-number analysis will be subject to longest matching where the new call processing result replaces the old one:

- ANNOUNCEMENT
- BLACKLIST
- CAUSE
- NEW_DIALPLAN
- A_NUM_DP_TABLE

Longest Match in B-Number Analysis

With analysis set to the new call processing capability, the following B-number analysis will be subject to longest matching where the new call processing result replaces the old one:

- ANNOUNCEMENT
- BLACKLIST
- CAUSE
- TERM_INFO
- NEW_DIALPLAN
- A_NUM_DP_TABLE
- ROUTE
- COND_ROUTE
- PERC_ROUTE
- MGCPDIALPKG
- E_PORTED_NUM
- E_ROUTE_NUM

Dial Plan Changing

With analysis set to the new call processing capability, dial plan changeover is not a forced action. Previously, a changing result with a ROUTE or ANNOUNCEMENT result would always force a dial plan change. Now change is optional and is carried out only if it is the longest match among the other results.

For example, in the original capability, if there is a number 1234, and the results at digits 12 was NEW_DIALPLAN, and at 123, the result was ROUTE, the dial plan was changed over. With the new capability, the status of the NEW_DIALPLAN and A_NUM_DP_TABLE results are “reduced” so that these can be longest matched against the other results. In this example, the call would be completed with the ROUTE result at digits 123, and there would be no dial plan changeover.

The new feature applies to all of the results listed below:

- For A-number analysis:
 - CAUSE
 - BLACKLIST
 - ANNOUNCEMENT
 - NEW_DIALPLAN
 - A_NUM_DP_TABLE
- For B-number analysis:

- CAUSE
- BLACKLIST
- ANNOUNCEMENT
- TERM_INFO
- ROUTE
- COND_ROUTE
- PERC_ROUTE
- MGCPDIALPKG
- E_PORTED_NUM
- E_ROUTE_NUM
- A_NUM_DP_TABLE
- NEW_DIALPLAN

Overlap Dial Plan Changing

When you are working with the analysis set to the new call processing capability, before processing a dial plan changeover, overlap calls are checked to see if analysis is complete. If it is not, then instead of forcing a dial plan changeover at this time, the system waits for digits. This allows for further digits to be analyzed in the search for a longer match. These extra digits might produce a different result, for example, ROUTE or ANNOUNCEMENT, which would then be executed instead of the change. This prevents the call from moving into the wrong dial plan and risking a failed call.

Following a valid change, an overlap call might still run out of digits and need more digits for the analysis to be complete. In that case, the analysis will return an appropriate indication to call control, forcing the call to wait for further digits. In overlap working, an initial address message (IAM) is delivered, and then further digits are delivered in subsequent address messages (SAM), which are received from the previous switch or line.

In addition, when the analysis capability is set to the new call processing capability, it changes back to the first dial plan rather than waiting for further digits in the current one. This allows the new analysis request to be processed as a completely new procedure and supports longest matching.

Ported Number Handling

When you are processing ported numbers, if the PGW 2200 is a donor switch, the B-number analysis result E_PORTED_NUM is used. When detecting this result, the PGW does a times-10 database lookup with the called party number, and if it finds a match, a routing number is returned and this is added as a prefix to the called number. The number is then reanalyzed with the intention of finding a routing to the recipient switch.

With basic analysis capability, it was possible to provision a ROUTE result that could be used to route the call if the number was not matched in the same result set as the E_PORTED_NUM. In such cases, a ROUTE result either at a prior or later point in the digit tree will be used to complete the call.

With the new call processing capability, the E_PORTED_NUM and E_ROUTE_NUM results are now also subject to longest matching, along with the B-number analysis results CAUSE, BLACKLIST, NEW_DIALPLAN, ANNOUNCEMENT, TERM_INFO, ROUTE, COND_ROUTE, PERC_ROUTE, MGCPDIALPKG, and A_NUM_DP_TABLE. Consequently, a ported result displaces and removes any previous ROUTE result. Also if a ported result was configured with a default ROUTE result in the same result set, this latter ROUTE result would remove the E_PORTED_NUM and invalidate the porting.

To avoid this situation, routing data is preserved, provided that the ROUTE result is either before the E_PORTED_NUM result in the or is colocated with it in the same result set. Any route result at a later point in the digit tree overwrites and removes the ported result, as required with longest matching.

Reverting to First Dial Plan When There Are Insufficient Digits in Overlap

The Dial Plan Longest Match feature enables you to revert to the original dial plan when there are insufficient digits, and the existing dial plan changeover handling does not provide the flexibility you need throughout your dial plan structure.

The following examples show how the feature works.

Main dial plan

49 – Move to new dial plan 0001.

49123 – Move to new dial plan 0002.

0001 dial plan

491 – Route1

0002 dial plan

49123 – Route2

Example 1 – In the case of B-number 4912345, given the way the dial plans are provisioned, it is expected that the analysis in dial plan "Main" will result in a changeover to new dial plan 0002 from where the call will be routed. If the signaling mode is "Enbloc," this obviously works without any problem; however, in "Overlap" mode with certain call scenarios there can be a problem.

Example 2 – If the IAM delivers digits 49 and then the SAM delivers 12345, with the old functionality, 49 will result in a changeover to dial plan 0001 where the analysis would run out of digits. This would result in a wait for more digits within dial plan 0001. When digits 12345 are received in a SAM message, a new analysis attempt is made, and analysis continues from dial plan 0001, where the call is finally routed after matching 491 using Route1. The problem is that the call was routed via dial plan 0001, but the customer expected this to route via 0002 using the longest match.

To address this problem, the new overlap multiple dial plan functionality is altered so that if the analysis runs out of digits and waits for new digits, it changes back to the first dial plan. When a new analysis request is made (with further digits), it is treated as a new request and not as a continuation of the previous analysis.

With such functionality in place, in Example 2 after the IAM delivers digits 49, the dial plan is changed over to 0001 and runs out of digits. A wait for further digits is started, but this time the analysis changes back to dial plan "Main" before waiting. When the SAM message delivers digits 12345, the complete number 4912345 is sent to analysis, where it is treated as a new request. Starting in dial plan "Main," the longest match would be found against 49123, and it will change over to dial plan 0002 where the call would finally be routed.

Restrictions

This feature has the following restriction: To be able to use an associated ROUTE result as a default (when the called number is not matched in the times-10 database), you must define it *prior* to the E_PORTED_NUM result being determined or within the same result set as the E_PORTED_NUM. Otherwise, the ROUTE result removes the E_PORTED_NUM and invalidates the porting.

Related Features and Technologies

The following features and technologies are related to this feature:

- Conditional A-Number Digit Modification (Release 9.5(2))
- Multiple Dial plans
- Local Number Portability

Related Documents

This document contains information that is related strictly to this feature. The documents that contain additional information related to the Cisco Media Gateway Controller (MGC) are listed below:

- *Release Notes for Cisco Media Gateway Controller Software Release 9.6(1)*
- *Cisco Media Gateway Controller Hardware Installation Guide*
- *Regulatory Compliance and Safety Information for the Cisco Media Gateway Controller*
- *Cisco Media Gateway Controller Software Release 9 Installation and Configuration Guide*
- *Cisco Media Gateway Controller Software Release 9 Provisioning Guide*
- *Cisco Media Gateway Controller Software Release 9 Dial Plan Guide*
- *Cisco Media Gateway Controller Software Release 9 MML Command Reference*
- *Cisco Media Gateway Controller Software Release 9 Messages Reference Guide*
- *Cisco Media Gateway Controller Software Release 9 Billing Interface Guide*
- *Cisco Media Gateway Controller Software Release 9 Management Information Base Guide*
- *Cisco Media Gateway Controller Software Release 9 Operations, Maintenance, and Troubleshooting Guide*

Supported Platforms

The hardware platforms supported for the Cisco MGC software are described in the *Cisco Media Gateway Controller Hardware Installation Guide*.

Supported Standards, MIBs, and RFCs

Standards

No new or modified standards are supported by this feature.

MIBs

No new or modified MIBs are supported by this feature.

For more information on the MIBs used in the Cisco MGC software, refer to the *Cisco Media Gateway Controller Release 9 Management Information Base Guide*.

RFCs

No new or modified RFCs are supported by this feature.

Prerequisites for Using this Feature

You must have Cisco MGC software Release 9.6(1). Prerequisites for this release can be found in the *Release Notes for the Cisco Media Gateway Controller Software Release 9.6(1)*.

XECfgParm.dat Configuration Tasks

You must configure the XECfgParm.dat file in the Cisco MGC software to enable this feature. The following sections describe the tasks related to configuring the XECfgParm.dat file for this feature:

- [Configuring The XECfgParm.dat File For This Feature, page 7](#)
- [Verifying the XECfgParm.dat Changes, page 8](#)

Configuring The XECfgParm.dat File For This Feature

This section contains the steps necessary for configuration of the dial plan in the XECfgParm.dat file to support this feature. If you are installing and configuring the Cisco MGC software on your system for the first time, use the procedures in the *Cisco Media Gateway Controller Software Release 9 Installation and Configuration Guide* at:

<http://www.cisco.com/univercd/cc/td/doc/product/access/sc/re19/swinstl/index.htm>

Come back to this section once you encounter the analysisCapabilityLevel parameter in the XECfgParm.dat file.



Caution

Configuration of the Cisco MGC software requires that the system software be shut down. In a simplex system, calls cannot be processed during system shutdown. In a continuous service system, your system loses the ability to maintain calls during a critical event while the system software on one of the PGW hosts is shut down.

To configure the XECfgParm.dat file for this feature, perform the following steps:

- Step 1** If you have not already done so, open the /opt/CiscoMGC/etc/XECfgParm.dat file on the active and standby Cisco PGW hosts. Use a text editor, such as vi.
- Step 2** If you have not already done so, ensure that the pom.dataSync parameter is set to false on the active and standby Cisco PGW hosts.
- Step 3** Search for the analysisCapabilityLevel parameter and enter the value 1 to enable this feature, or enter 0 to disable it on Cisco PGW 2200.
- Step 4** Return to the installation steps in the *Cisco Media Gateway Controller Software Release 9 Installation and Configuration Guide* at:

<http://www.cisco.com/univercd/cc/td/doc/product/access/sc/re19/swinstl/index.htm>

Verifying the XECfgParm.dat Changes

To verify the XECfgParm.dat settings for this feature, perform the following steps:

- Step 1** Log in to the standby Cisco MGC as root and change directories to the etc subdirectory by entering the following UNIX command:

```
cd /opt/CiscoMGC/etc
```
- Step 2** Open the XECfgParm.dat using a text editor, such as vi.
- Step 3** Search for the analysisCapabilityLevel parameter and enter the value 1 to enable the feature. The default is 0.
- Step 4** Log in to the active Cisco MGC, start an MML session, and enter the following command:

...

Repeat steps 1 through 4 for the newly standby Cisco MGC host. Once you have verified the settings on both hosts, the procedure is complete.

Configuration Examples

This section provides a configuration example for the XECfgParm.dat parameters associated with this feature. Additional configuration examples for the Cisco MGC software can be found in the *Cisco Media Gateway Controller Software Release 9 Installation and Configuration Guide*.

Reference Information

The following sections contain reference material related to this feature. Information is included on the following areas:

- [Configuring The XECfgParm.dat File For This Feature, page 7](#)
- [Verifying the XECfgParm.dat Changes, page 8](#)
- [Configuration Examples, page 8](#)
- [XECfgParm.dat Parameters, page 8](#)
- [Additional Data Word for Result Types E_PORTED_NUM and E_ROUTE_NUM, page 10](#)
- [Dial Plan Basics, page 11](#)

XECfgParm.dat Parameters

The XECfgParm.dat file configuration parameters added for this feature are in the table below. For information on the other XECfgParm.dat parameters, refer to the *Cisco Media Gateway Controller Software Release 9 Installation and Configuration Guide*.

Table 1 *XECfgParm.dat Parameters*

Configuration Parameter	Definition
*analysisCapabilityLevel (Affects PGW Release 9.6(1) or later)	<p>Defines the call processing behavior of the PGW analysis function. When this parameter is set to zero or Null, the existing analysis behavior is maintained. When set to 1, the longest match capability is enabled.</p> <p>Valid values: 1, 0</p> <p>where</p> <p>0=existing analysis behavior</p> <p>1=longest match capability enabled</p> <p>Property domain: XE Parameter</p> <p>Dynamically reconfigurable: No</p>

Additional Data Word for Result Types E_PORTED_NUM and E_ROUTE_NUM

A new data word (dw2) is added to the ported results, as detailed below:

Table 2 Data Words

Data Word Options	Description
E_PORTED_NUM(<RemovePfxDig>,<UsePartialNumber>)	<p><i>RemovePfxDig</i>: Dw1(existing): Integer value indicating the number of prefix digits to remove from called number before reading the Ported or Number termination database table.</p> <p>Default value is 0.</p> <p><i>UsePartialNumber</i>: Dw2 (new) – Integer value indicating whether to interrogate the times-10 database with a full number (forcing enbloc behavior) or a partial number.</p> <p>Value 1= partial number Value 0 (default) = Full number</p> <p>Example: E_PORTED_NUM(1,1)</p> <p>Data Word Types: I,I</p> <p>Analysis Point: Intermediate</p> <p>Valid For: B</p>
E_ROUTE_NUM(<RemovePfxDig>,<UsePartialNumber>)	<p><i>RemovePfxDig</i>: Dw1(existing): Integer value indicating the number of prefix digits to remove from called number before reading the Ported or Number termination database table.</p> <p>Default value is zero.</p> <p><i>UsePartialNumber</i>: Dw2 (new) - Integer value indicating whether to interrogate the times ten database with a full number (forcing enbloc behavior) or a partial number.</p> <p>Value 1= partial number Value 0 (default) = Full number</p> <p>Example: E_ROUTE_NUM(1,1)</p> <p>Data Word Types: I,I</p> <p>Analysis Point: Intermediate</p> <p>Valid For: B</p>

**Note**

For existing dial plans this allows defaulting to the current behavior, so this change has no effect. Only system users who specifically want partial number matching must activate this function by setting `dw2 = 1` when provisioning these result-types.

Dial Plan Basics

For more information on Dial Plan Basics, see the *Cisco Media Gateway Controller Software Release 9 Dial Plan Guide* on the following URL:

<http://www.cisco.com/univercd/cc/td/doc/product/access/sc/re19/dplan/index.htm>

Obtaining Documentation

Cisco provides several ways to obtain documentation, technical assistance, and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation on the World Wide Web at this URL:

<http://www.cisco.com/univercd/home/home.htm>

You can access the Cisco website at this URL:

<http://www.cisco.com>

International Cisco websites can be accessed from this URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which may have shipped with your product. The Documentation CD-ROM is updated regularly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual or quarterly subscription.

Registered Cisco.com users can order a single Documentation CD-ROM (product number DOC-CONDOCCD=) through the Cisco Ordering tool:

http://www.cisco.com/en/US/partner/ordering/ordering_place_order_ordering_tool_launch.html

All users can order annual or quarterly subscriptions through the online Subscription Store:

<http://www.cisco.com/go/subscription>

Click Subscriptions & Promotional Materials in the left navigation bar.

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpk/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:

<http://www.cisco.com/en/US/partner/ordering/index.shtml>

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

You can submit e-mail comments about technical documentation to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

For all customers, partners, resellers, and distributors who hold valid Cisco service contracts, the Cisco Technical Assistance Center (TAC) provides 24-hour-a-day, award-winning technical support services, online and over the phone. Cisco.com features the Cisco TAC website as an online starting point for technical assistance. If you do not hold a valid Cisco service contract, please contact your reseller.

Cisco TAC Website

The Cisco TAC website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The Cisco TAC website is available 24 hours a day, 365 days a year. The Cisco TAC website is located at this URL:

<http://www.cisco.com/tac>

Accessing all the tools on the Cisco TAC website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a login ID or password, register at this URL:

<http://tools.cisco.com/RPF/register/register.do>

For P1 or P2 cases (your production network is down or severely degraded) or if you do not have Internet access, contact Cisco TAC by telephone. Cisco TAC engineers are assigned immediately to P1 and P2 cases to help keep your business operations running smoothly.

To open a case by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete listing of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Opening a TAC Case

Using the online TAC Case Open Tool is the fastest way to open P3 and P4 cases. (P3 and P4 cases are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Case Open Tool automatically recommends resources for an immediate solution. If your issue is not resolved using the recommended resources, your case will be assigned to a Cisco TAC engineer. The online TAC Case Open Tool is located at this URL:

<http://www.cisco.com/tac/caseopen>

For P1 or P2 cases (P1 and P2 cases are those in which your production network is down or severely degraded) or if you do not have Internet access, contact Cisco TAC by telephone. Cisco TAC engineers are assigned immediately to P1 and P2 cases to help keep your business operations running smoothly.

To open a case by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete listing of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

TAC Case Priority Definitions

To ensure that all cases are reported in a standard format, Cisco has established case priority definitions.

Priority 1 (P1)—Your network is “down” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Priority 2 (P2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Priority 3 (P3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Priority 4 (P4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The Cisco Product Catalog describes the networking products offered by Cisco Systems, as well as ordering and customer support services. Access the Cisco Product Catalog at this URL:
http://www.cisco.com/en/US/products/products_catalog_links_launch.html
- Cisco Press publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press online at this URL:
<http://www.ciscopress.com>
- Packet magazine is the Cisco quarterly publication that provides the latest networking trends, technology breakthroughs, and Cisco products and solutions to help industry professionals get the most from their networking investment. Included are networking deployment and troubleshooting tips, configuration examples, customer case studies, tutorials and training, certification information, and links to numerous in-depth online resources. You can access Packet magazine at this URL:
<http://www.cisco.com/packet>
- iQ Magazine is the Cisco bimonthly publication that delivers the latest information about Internet business strategies for executives. You can access iQ Magazine at this URL:
<http://www.cisco.com/go/iqmagazine>
- Internet Protocol Journal is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:
http://www.cisco.com/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html
- Training—Cisco offers world-class networking training. Current offerings in network training are listed at this URL:
<http://www.cisco.com/en/US/learning/index.html>

Glossary

Table 3 contains definitions of acronyms and technical terms used in this feature module.

Table 3 *Acronyms and Definitions*

Acronym	Definition
IAM	initial address messages
MGC	Media Gateway Controller
PGW	PSTN Gateway
PSTN	public switched telephone network
SAM	subsequent address messages

