Cisco Virtual PGW 2200 Softswitch Domain-Based Routing Feature Module
For Cisco Hosted Collaboration Solution 9.0
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Feature description

Domain-Based Routing (DBR) enhances the Cisco Virtual PGW 2200 (VPGW) Softswitch analysis and routing functions to allow the VPGW Softswitch to route calls based on user and domain names. These changes allow the VPGW Softswitch to simultaneously route calls using E.164 numbers, domain names, user names, or a combination of E.164 and non-E.164 data.

DBR also introduces domain-based call screening functions and translation tables to map E.164 numbers to domain and user names.

Benefits

The Domain-Based Routing provides the following benefits:

- Routing based on user and domain name together with existing E.164 analysis
- New call features for domain-based calls, including
  - Screening based on source domain name
  - Translation from URI to E.164 numbers
  - The ability to specify a source domain
- Session Initiation Protocol (SIP) 302 Redirection Rejection—The capability to reject a SIP 302 request either unconditionally or in the case where the Contact header is non-E.164.
- SIP Refer Rejection—The capability to reject a SIP Refer request unconditionally or when the Refer-To header does not contain an E.164 number.

Prerequisites

The VPGW Softswitch must be running VPGW Softswitch Software Release 9.9(1). Prerequisites for this release can be found in the Release Notes for the Virtual PGW 2200 (VPGW) Softswitch Software Release 9.9(1).

Restrictions or limitations

- DBR is supported for SIP only.
- The DBR feature does not support DBR for SIP calls that are transmitted through EISUP.
- Lawful Intercept is not supported for calls routed based on source domain, destination domain, or username.
- The IP_SOURCE_SCREEN result type is supported for blacklist screening only.
- The IP_SET_SOURCE_DOMAIN result type is supported for preanalysis and A- and B-number analysis only.

Related features and technology

The following features are related to the Domain-Based Routing feature:

- SIP Profiles
- SIP Loose Routing
- SIP-I Protocol
- P-Asserted headers
- Remote-Party-Id headers
- Enhanced LNP
Supported standards, MIBs, and RFCs

This section identifies the new or modified standards, MIBs, and RFCs that are supported by Domain-Based Routing feature.

Standards
No new or modified standards are supported by the DBR feature.

MIBs
No new or modified MIBs are supported by the DBR feature.

RFCs
No new or modified RFCs are supported by the DBR feature.

Configuring domain-based call processing

DBR introduces a domain routing policy (DRP) table, that allows you to configure the VPGW Softswitch to analyze calls based on user and domain names. The DRP table establishes a separate preanalysis structure for calls that use domain names rather than E.164 numbers.

The following sections describe how to use the DRP table:

- DRP Table
- The DRP Table

Understanding the DRP table basics

The VPGW Softswitch uses the DRP table to analyze calls as follows:

- The VPGW Softswitch enters DRP processing only if the source domain is populated.
- If a call contains domain information and E.164 information the VPGW Softswitch completes DRP processing. If the VPGW Softswitch cannot obtain routing from DRP processing, it proceeds to the next preanalysis table (NOA_A).
- If a call contains domain information only, the VPGW Softswitch completes DRP processing and exits the preanalysis stage.

Note: The IP_DEST_TRANS result type enables more flexible call routing by allowing you to translate a non-E.164 destination to an E.164 destination (domain to phone number) as well as a non-E.164 destination to another non-E.164 destination (a domain name to another domain name). For more information about translation, see Using the IP_DEST_TRANS result type.
The following figure shows the new preanalysis design.

For a summary of the current preanalysis design, see *Cisco Virtual PGW 2200 (VPGW) Softswitch Release 9.9 Dial Plan Guide*.

### The DRP table

The DRP table is a sequential list of result sets that the VPGW Softswitch executes when analyzing domain-based calls. The DRP can contain up to six steps, each of which contain the name of a result set. The DRP table allows you to define the VPGW Softswitch’s domain-based call processing according to your needs.

The following table shows a sample DRP table.
Table 1  Sample domain routing policy table

<table>
<thead>
<tr>
<th>Index</th>
<th>Result Set Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ResultSet1</td>
</tr>
<tr>
<td>2</td>
<td>ResultSet2</td>
</tr>
<tr>
<td>3</td>
<td>ResultSet3</td>
</tr>
<tr>
<td>4</td>
<td>ResultSet4</td>
</tr>
<tr>
<td>5</td>
<td>ResultSet5</td>
</tr>
<tr>
<td>6</td>
<td>ResultSet6</td>
</tr>
</tbody>
</table>

For existing result set types, the VPGW Softswitch processes the result sets sequentially. Analysis ends when the VPGW Softswitch has processed all the steps in the table or it reaches a DRP_EXIT result type.

However, DBR also introduces several new result types that can contain references to other result sets. For more information about the new result types, see New TimesTen Tables.

New TimesTen tables

The Domain-Based Routing feature adds the following new tables to the TimesTen database:

- Source Domain/Username Blacklist Screening table
- Destination Domain/Username translation table
- Route selector table

The VPGW Softswitch uses TimesTen for these functions in order to accommodate the potentially large volume of entries. For more information about the new TimesTen tables, see components.

New dial plan tables

This feature also introduces two new dial plan tables:

- $DRP—Allows you to define the result sets that the VPGW Softswitch executes at each step in the DRP table. For more information, see Domain Routing Policy (DRPTABLE) Table.
- $DomainStrings—Allows you to define domains for use with the IP_SET_SOURCE_DMN result type. For more information, see Domain Strings (DMNMODSTRING) Table.

New result types

The VPGW Softswitch feature introduces six new result types that allow you to configure the VPGW Softswitch to process domain-based calls. The new result types are

- IP_SOURCE_SCREEN—Provides screening capabilities for non-E.164 calls. This result is supported for blacklist screening only. For more information, see Using the IP_SOURCE_SCREEN result type.
- IP_SET_SOURCE_DOMAIN—Allows you to set the source domain name for domain-based calls. This result is supported for preanalysis and A and B number analysis only. For more information, see Using the IP_SET_SOURCE_DMN result type.
- IP_DEST_TRANS—Translates a destination into another format, such as an E.164 destination (domain) to a non-E.164 destination (phone number). You can also use IP_DEST_TRANS to translate a non-E.164
destination to another non-E.164 destination (a domain name to another domain name). For more information, see Using the IP_DEST_TRANS result type.

- **IP_ROUTE_SEL**—Allows the VPGW Softswitch to select a route based on a destination user or domain name, source user or domain name, or a combination of the two. For more information, see Using the IP_ROUTE_SEL result type.

- **DRP_EXIT**—Directs the VPGW Softswitch to exit from the DRP stage of preanalysis. For more information, see Using the DRP_EXIT result type.

**Note** The IP_SET_SOURCE_DOMAIN result type is available in A- and B- analysis. All other result types are available in preanalysis only.

### Nested result sets

The Domain-Based Routing feature allows you to create a nested group of result sets that allows for more complex handling of domain-based calls. The IP_SOURCE_SCREEN, IP_DEST_TRANS, and IP_ROUTE_SEL result types have two data words, foundSetName (dw3) and notFoundSetName (dw4), that direct the VPGW Softswitch to execute another result set. Applying a nested result set diverts the VPGW Softswitch from normal processing of the DRP table until all nested results have been processed.

When the VPGW Softswitch executes a nested result, it performs a database lookup and records the outcome (found or not found). If the result value is found in the database and dw3 is set, the VPGW Softswitch executes the result set in dw3. If the result value is not found in the database and dw4 is set, the VPGW Softswitch executes the result set in dw4; otherwise it moves to the next result in the result set.

To create a nested result set, use the foundSetName and notFoundSetName data words to specify result sets that the VPGW Softswitch executes. You can nest results up to three levels.

**Note** You can specify in a DRP step and also reference it in the foundSetName and notFoundSetName data words.

### Nested Result Processing Example

The following example shows a complex implementation of nested result sets and explains how the VPGW Softswitch processes the configuration.

In this example, the following assumptions are made:

- The received source and destination are all non-E.164.
- The Dplongest match feature is enabled.
The following figure shows the VPGW Softswitch processing of a set of results.

**Figure 2**

Sample preanalysis Using Nested Results
The VPGW Softswitch processes the result set configuration as follows:

1. The VPGW Softswitch receives an incoming call and begins to process it using a dial plan. The first step in the DRP table is a result set that contains the following results:
   - IP_SourceScreen
   - IP_Dest_Trans
   - IP_RoutingSelect

2. The VPGW Softswitch executes the IP_SourceScreen result, and the source number is not found in the screening table. However, IP_SourceScreen data word 4 (notFoundSet) contains a nested result set.

3. The VPGW Softswitch moves to this result set and executes the first result type, IP_Dest_Trans. The VPGW Softswitch finds a match, but data word 3 (FoundSet) contains a nested result set.

4. The VPGW Softswitch executes this result set, beginning with IP_RoutingSelect.

5. The VPGW Softswitch collects the New_DialPlan result and exits the DRP when it processes the Exit_DRP result.
   - When the remaining stages of preanalysis are complete, the VPGW Softswitch executes the dial plan changes collected earlier. This means that the VPGW Softswitch restarts preanalysis using the new dial plan.

**Call processing**

The following sections describe how the VPGW Softswitch processes a SIP Invite in order to determine a source and list of destinations.

**Source selection**

The following sections describe how the VPGW Softswitch determines a source URI.

**Single source URI**

DBR does not impact how the VPGW Softswitch determines the source URI for SIP Invites with a single source URI. If the header contains a P-asserted or Remote Party ID (RPID) header, the VPGW Softswitch uses this header to determine the source URI; otherwise, the VPGW Softswitch uses the From header to determine the source URI.

**Multiple source URIs**

The VPGW Softswitch evaluates SIP Invites with multiple source URIs as follows:

- If the Invite contains a P-Asserted or RPID header, the VPGW Softswitch uses it to define the source URI.
- If no P-asserted or RPID header is present, the VPGW Softswitch uses the URI in the From header.
- If the Invite contains multiple P-Asserted or RPID headers, the VPGW Softswitch uses the following rules:
  - If all the P-Asserted or RPID headers are domains (non-E.164), the VPGW Softswitch uses the first header found in analysis as the source.
  - If one of the P-Asserted or RPID contains a phone number (E.164), the VPGW Softswitch uses it as the source and as the A number used in analysis. The settings for respectSIPURIUserParam can override this behavior.
  - If all the P-Asserted or Remote-Party-Id headers are phone numbers (E.164), the VPGW Softswitch uses the first header found in analysis as the source.
**Destination selection**

The VPGW Softswitch determines the destination URI by building a prioritized list of destination URIs on the SipIngressRoutingControl trunk group property settings.

SipIngressRoutingControl defines the preferred SIP header used for ingress routing decisions as determined from the initial Invite message. It has the following values:

- 1—Explicit Route header: The VPGW Softswitch uses the Route header, followed by the RequestLine header, followed by the To header.
- 2—RequestLine: The VPGW Softswitch uses the RequestLine header, followed by the To header.
- 3—To header: The VPGW Softswitch uses the To header.

For more information about SipIngressRoutingControl, see *Cisco Virtual PGW 2200 (VPGW) Softswitch Release 9.9 Provisioning Guide*.

**Analysis**

The VPGW Softswitch continues DRP analysis until it has evaluated all the destinations in the SIP Invite header. If the VPGW Softswitch does not find a route, it restarts analysis on the next destination in the header. The VPGW Softswitch exits the DRP stage as soon as it finds a route. The VPGW Softswitch incorporates the SIPAttributes property value of a trunk when determining a route.

The VPGW Softswitch records source and destination information for incoming and outgoing calls in the Call Data Records (CDRs).

**Call redirection handling**

Prior to the introduction of the Domain-Based Routing feature, the VPGW Softswitch supported call redirection using recursion, local treatment, and backward transit. The following sections describe how the VPGW Softswitch handles call redirection using the DBR feature.

- Call Redirection for Non-E.164 Headers
- SIP 302 Rejection
- SIP Refer Rejection

**Call redirection for non-E.164 headers**

The following table summarizes how the VPGW Softswitch handles call redirection for calls with non-E.164 URIs.

<table>
<thead>
<tr>
<th>Inbound SIP Trunk Supports E.164</th>
<th>Inbound SIP Trunk Does Not Support E.164</th>
<th>Outbound SIP Trunk Supports E.164</th>
<th>Outbound SIP Trunk Does Not Support E.164</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recursion</td>
<td>Local Treatment</td>
<td>Recursion</td>
<td>Local treatment</td>
</tr>
</tbody>
</table>

**SIP 302 rejection**

This feature adds the ability for the VPGW Softswitch to reject a SIP 302 (Moved Temporarily/redirection) request unconditionally or when the Contact header does not contain an E.164 number. You can apply this capability to
• Trunks that do not support non-E.164 URIs. This setting helps ensure that the VPGW Softswitch does not redirect domain-based calls to a trunk that cannot support them.

• Trunks that cannot complete backward transit for the 302 request when the incoming trunk configuration indicates that it does not support domain-based calls.

To use this capability, use data words 1 and 2 for the FACILITY result type. For more information about the updates to the FACILITY result type, see FACILITY.

The following figure shows the call flow for 302 rejection.

Figure 3 SIP 302 Redirection Rejection

SIP refer rejection

DBR introduces the ability to reject a SIP Refer request unconditionally or when the Refer-To header does not contain an E.164 number. You can apply this capability to

• Trunks that do not support non-E.164 URIs. This helps ensure that the VPGW Softswitch does not refer domain-based calls to a trunk that cannot support them.

• Trunks that cannot complete backward transit for the Refer request when the incoming trunk configuration indicates that it does not support domain-based calls.

To use this capability, use data words 1 and 2 for the FACILITY result type. For more information about the updates to the FACILITY result type, see FACILITY.

The following figure shows the call flow for a Refer rejection.
Updated CDR viewer

DBR updates the CDR viewer utility for use with domain-based calls. The new interface incorporates the source and destination URI. The following figure shows the new interface.
For more information about the CDR viewer, see *Cisco Virtual PGW 2200 (VPGW) Softswitch Software Release 9 Operations, Maintenance, and Troubleshooting Guide*.

**Dial plan procedures**

The following sections describe how to use the new result types that allow you to control how the VPGW Softswitch dial plan processes domain-based calls:

- **IP_SOURCE_SCREEN**
- **IP_SET_SOURCE_DMN**
- **IP_DEST_TRANS**
- **IP_ROUTE_SEL**
- **DRP_EXIT**

For more information on the tasks related to creating a dial plan, see *Cisco Virtual PGW 2200 (VPGW) Softswitch Release 9.9 Dial Plan Guide*. 
**IP_SOURCE_SCREEN result type**

The IP_SOURCE_SCREEN result type allows you to screen non-E.164 calls based on a source URI. This capability allows you to restrict calling permissions for a user or group of users on your network, which can be useful for purposes such as billing or security.

This result is supported for blacklist screening only. The following sections describe how to use the IP_SOURCE_SCREEN result type.

**Add IP_SOURCE_SCREEN result type**

Use the following steps to add the IP_SOURCE_SCREEN result type:

**Step 1**  
Log in to the active VPGW Softswitch, start an MML session, and enter the following command to add a dial plan:

```
mml> numan-add:dialplan:custgrpid="dpl1"
```

**Step 2**  
Enter the following command to add a result set:

```
mml> numan-add:resulset:custgrpid="dpl1",name="set1"
```

**Step 3**  
Enter the following command to add the service table entry:

```
mml> numan-add:service:custgrpid="dpl1", name="group1"
```

**Step 4**  
Now add the IP Source Screen result type to a result set and define the result set in the result table:

```
mml> numan-add:resulttable:custgrpid= "dpl1", name="result1", resulttype= "IP_SOURCE_SCREEN", dw1="1", dw2="group1", dw3="foundResultSet", dw4="notFoundResultSet", setname="set1"
```

**Note**  
Data words 2, 3, and 4 are optional.

Where:

- `custgrpid`—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- `name`—The name of the result table in the resultset.
- `resulttype`—Indicates the result type being provisioned.
- `screenType` (dw1)—The type of blacklist screen to apply. Valid values are
  - 1= Blacklist screening of source (username + host domain)
  - 2= Blacklist screening of source username only
  - 3= Blacklist screening of source host domain only
- `serviceName` (dw2)—The name of the service.
- `foundSetName` (dw3)—The result set that the VPGW Softswitch executes if the user or domain name matches an entry in the blacklist.
- `notFoundSetName` (dw4)—The result set that the VPGW Softswitch executes if the user or domain name does not match an entry in the blacklist.
- `setname`—The name of an existing result set.

Repeat Step 4, as necessary, to add IP_SOURCE_SCREEN result types to the result table.

**Modify IP_SOURCE_SCREEN result type**

To modify the IP_SOURCE_SCREEN result type, complete the following steps:
Step 1 To modify the result type, log in to the active VPGW Softswitch, start an MML session, and enter the following command:

```
mml> numan-ed: resulttable: custgrpid="dp11", name="result1", resulttype="IP_SOURCE_SCREEN", dw1="1", dw2="group1", dw3="foundResultSet", dw4="notFoundResultSet", setname="set1"
```

Where:
- **custgrpid**—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- **name**—The name of the result table in the resultset.
- **resulttype**—Indicates the result type that you are modifying.
- **screenType** (dw1)—The type of blacklist screen to apply. Valid values are:
  - 1= Blacklist screening of source (username + host domain)
  - 2= Blacklist screening of source username only
  - 3= Blacklist screening of source host domain only
- **serviceName** (dw2)—The name of the service.
- **foundSetName** (dw3)—The result set that the VPGW Softswitch executes if the user or domain name matches an entry in the blacklist.
- **notFoundSetName** (dw4)—The result set that the VPGW Softswitch executes if the user or domain name does not match an entry in the blacklist.
- **setname**—The name of an existing result set.

Step 2 To verify that the command was executed successfully, enter the following command:

```
mml> numan-rtrv: resulttable: custgrpid="dp11", setname="set1", name="result1"
```

Step 3 Repeat Steps 1 and 2, as necessary, to modify the IP_SOURCE_SCREEN result type in the dial plan.

Delete IP_SOURCE_SCREEN result type

To delete an IP_SOURCE_SCREEN entry in the result table, complete the following steps:

Step 1 Log in to the active VPGW Softswitch, start an MML session, and enter the following command:

```
mml> numan-dlt: resulttable: custgrpid="dp11", name="result1", resulttype="IP_SOURCE_SCREEN", dw1="1", dw2="group1", dw3="foundResultSet", dw4="notFoundResultSet", setname="set1"
```

This command deletes the IP_SOURCE_SCREEN result type from the result table.

Step 2 To verify that the command was executed successfully, enter the command:

```
mml> numan-rtrv: resulttable: custgrpid="dp11", name="result1", setname="set1"
```

Step 3 Repeat Steps 1 and 2, as necessary, to remove other IP_SOURCE_SCREEN result types from the result table.

**IP_SET_SOURCE_DMN result type**

The IP_SET_SOURCE_DMN result type allows you to set the source domain name for domain-based calls. You can use this capability to hide the origin of a call from nontrusted users or disguise the origin of a call for business purposes. This result is supported for preanalysis and A and B number analysis only.

The following sections describe how to use the IP_SET_SOURCE_DMN result type.
Add IP_SET_SOURCE_DMN result type

Use the following steps to add the IP_SET_SOURCE_DMN result type:

**Step 1**  Log in to the active VPGW Softswitch, start an MML session, and enter the following command to add a dial plan:
```
mml> numan-add:dialplan:custgrpid="dpl2",overdec="yes"
```

**Step 2**  Enter the following command to add a result set:
```
mml> numan-add:resultset:custgrpid="dpl2",name="set3"
```

**Step 3**  Enter the following command to add a new domain string:
```
uman-add:dmnmodstring: custgrpid="dpl2",name="domainname1", dmnstring="dmnstring1"
```

**Step 4**  Add the IP_SET_SOURCE_DMN result type to a result set and define the result set in the result table:
```
uman-add:resulttable:custgrpid="dpl2", name="result1", resulttype="IP_SET_SOURCE_DMN", dw1="domainname1", dw2="0", dw3="0", setname="set3"
```

Where:
- **custgrpid**—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- **name**—The name of an existing result table.
- **resulttype**—Indicates the result type being provisioned.
- **dmnString (dw1)**—An existing domain name string in the dmnnmodstring table.
- **applicationStatus (dw2)**—Specifies whether the command can override an existing entry. 0 indicates that the VPGW Softswitch overwrites the source domain on the outgoing side; 1 specifies that the VPGW Softswitch does not overwrite the original source domain obtained during call analysis.

**Note**  For an SS7-originated call, setting dw2 to 0 or 1 has the same effect because there is no source domain. For a SIP-originated call, the dw2 settings determine whether the VPGW Softswitch overwrites the domain name obtained during call analysis.

- **applyTo (dw3)**—Specifies the headers that the VPGW Softswitch rewrites with the new source domain. 0 sets the VPGW Softswitch to apply the command to all source headers that are present; 1 sets the VPGW Softswitch to apply the command to the current source header only.

**Note**  Bear in mind that trunk group property settings control which headers the VPGW Softswitch inserts into a call; the VPGW Softswitch does not insert new headers such as From, P-asserted, or RPID (remote party ID) headers unless you set the appropriate trunk group properties.

- **setname**—The name of an existing result set.

**Step 5**  Repeat Step 4, as necessary, to add IP_SET_SOURCE_DMN result types to the result table.

Modify IP_SET_SOURCE_DMN result type

To modify the IP_SET_SOURCE_DMN result type, complete the following steps:

**Step 1**  Log in to the active VPGW Softswitch, start an MML session, and enter the following command to modify a line in the result table:
```
mml> numan-ed:resulttable:custgrpid="dpl2", name="result1", resulttype="IP_SET_SOURCE_DMN", dw1="domainname1", dw2="0", dw3="0", setname="set3"
```
Where:

- **custgrpid**—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- **name**—The name of an existing result table.
- **resulttype**—Indicates the result type that you are modifying.
- **dmnString (dw1)**—An existing domain name string in the dmnmodstring table.
- **applicationStatus (dw2)**—Specifies whether the command can override an existing entry. 0 indicates that the command can override an existing entry; 1 indicates that the command cannot override an existing entry.
- **applyTo (dw3)**—Specifies which source headers to which the VPGW Softswitch applies the command. 0 sets the VPGW Softswitch to apply the command to all source headers that are present; 1 sets the VPGW Softswitch to apply the command to the current source header only.
- **setname**—The name of an existing result set.

**Step 2** To verify that the command was executed successfully, enter the following command:

```
mml> numan-rtrv:resulttable:custgrpid="dpl2",name="result1", setname="set3"
```

If the command succeeds, the output shows the modified result type.

**Step 3** Repeat Steps 1 and 2, as necessary, to modify the IP_SET_SOURCE_DMN result type in the dial plan.

---

**Delete IP_SET_SOURCE_DMN result type**

To delete an IP_SET_SOURCE_DMN result type from the result table, complete the following steps:

**Step 1** Log in to the active VPGW Softswitch, start an MML session, and enter the following command:

```
mml> numan-dlt:resulttable:custgrpid="dpl2",name="result1",resulttype="IP_SET_SOURCE_DMN", dw1="domainname1", dw2="0", dw3="0", setname="set3"
```

This command deletes the IP_SET_SOURCE_DMN result type from the result table.

**Step 2** To verify that the command was executed successfully, enter the following command:

```
mml> numan-rtrv:resulttable:custgrpid="dpl2", name="result1", setname="set3"
```

If the command succeeds, the output does not show the deleted result type.

**Step 3** Repeat Steps 1 and 2, as necessary, to remove IP_SET_SOURCE_DMN result types from the result table.

---

**IP_DEST_TRANS result type**

The following sections describe how to use the IP_DEST_TRANS result type.

The IP_DEST_TRANS result type can translate between two E.164 or non-E.164 destinations, such as the following:

- A domain to a phone number: rcool@cisco.com translates to 1234567890@cisco.com.
- A phone number to a domain: 1234567890@cisco.com translates to rcool@cisco.com.
- A domain to another domain: rcool@cisco.com translates to rcool@example.com.

**Add IP_DEST_TRANS result type**

Perform the following steps to add the IP_DEST_TRANS result type:
Step 1  Log in to the active VPGW Softswitch, start an MML session, and enter the following command to add a dial plan:

```
mml> numan-add:dialplan:custgrpdd="dpl2",overdec="yes"
```

Step 2  Enter the following command to add a result set:

```
mml> numan-add:resultset:custgrpdd="dpl2",name="dmnrtgset1"
```

Step 3  Enter the following command to add a service name to the service table:

```
mml> numan-add:service:custgrpdd="dpl2",name="set3"
```

Step 4  Now add the IP_DEST_TRANS result type to a result set and define the result set in the result table:

```
mml> numan-add:resulttable: custgrpdd="dpl2", name="result1", resulttype="IP_DEST_TRANS", dw1="1", dw2="set3", dw3="foundSet", dw4="notFoundSet", setname="dmnrtgset1"
```

Where:

- **custgrpdd**—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- **name**—The name of an existing result table.
- **resulttype**—Indicates the result type that you are adding.
- **inputAndAction** (dw1)—Determines whether the VPGW Softswitch translates the destination of the user and host (1) or the destination host only (2).
- **serviceName** (dw2)—An existing service name.
- **foundSetName** (dw3)—An existing result set that the VPGW Softswitch executes if the user or domain name matches an entry in the table.
- **notFoundSetName** (dw4)—An existing result set that the VPGW Softswitch executes if the user or domain name does not match an entry in the table.

**Note**  You must define a result set before referencing it in data word 3 or 4. For this example, we assume that you have already defined the result sets referenced in the foundSet and notFoundSet parameters.

- **setname**—The name of an existing result set.

Step 5  Repeat Step 4, as necessary, to add IP_DEST_TRANS result types to the result table.

**Modify IP_DEST_TRANS result type**

To modify the IP_DEST_TRANS result type, complete the following steps:

Step 1  To modify an entry in the IP_DEST_TRANS table, log in to the active VPGW Softswitch, start an MML session, and enter the following command:

```
mml> numan-ed:resulttable: custgrpdd="dpl2", name="result1", resulttype="IP_DEST_TRANS", dw1="1", dw2="set3", dw3="foundSet", dw4="notFoundSet", setname="dmnrtgset1"
```

Where:

- **custgrpdd**—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- **name**—The name of an existing result table.
- **resulttype**—Indicates the result type being provisioned.
- **inputAndAction** (dw1)—Determines whether the VPGW Softswitch translates the destination of the user and host (1) or the destination host only (2).
- **serviceName** (dw2)—The name of an existing service.
- `foundSetName(dw3)`—The result set that the VPGW Softswitch executes if the user or domain name matches an entry in the table.
- `notFoundSetName(dw4)`—The result set that the VPGW Softswitch executes if the user or domain name does not match an entry in the table.

**Note** You must define a result set before referencing it in data word 3 or 4.

- `setname`—The name of an existing result set.

This command modifies the IP_DES_TRANS result type in the result table.

**Step 2** To verify that the command was executed successfully, enter the following command:
```
mml> numan-rtrv:resulttable: custgrpId="dpl2", name="result1", setname="dmnrtgset1"
```
If the command succeeds, the output shows the modified result type.

**Step 3** Repeat Steps 1 and 2, as necessary, to modify the IP_DES_TRANS result type in the dial plan.

---

### Delete IP_DEST_TRANS result type

To delete an IP_DEST_TRANS result type from the result table, complete the following steps:

**Step 1** Log in to the active VPGW Softswitch, start an MML session, and enter the following command:
```
mml> numan-dlt:resulttable: custgrpId="dpl2", name="result1", resulttype="IP_DEST_TRANS", dw1="1", dw2="set3", dw3="foundSet", dw4="notFoundSet", setname="dmnrtgset1"
```
This command deletes the IP_DEST_TRANS result type from the result table.

**Step 2** To verify that the command was executed successfully, enter the following command:
```
mml> numan-rtrv:resulttable: custgrpId="dpl2", name="result1", setname="dmnrtgset1"
```
If the command succeeds, the output does not show the deleted result type.
Repeat Steps 1 and 2, as necessary, to remove IP_DEST_TRANS result types from the result table.

---

### IP_ROUTE_SEL result type

The IP_ROUTE_SEL result type allows the VPGW Softswitch to route domain-based calls according to their destination user or domain name, source user or domain name, or a combination of the two. This result replicates the routing options for E.164 calls, while providing more flexibility about the information used to route the call.

The following sections describe how to use the IP_ROUTE_SEL result type.

#### Add IP_ROUTE_SEL result type

Use the following steps to add the IP_ROUTE_SEL result type:

**Step 1** Log in to the active VPGW Softswitch, start an MML session, and enter the following command to add a dial plan:
```
mml> numan-add:dialplan:custgrpId="dpl2", overdec="yes"
```

**Step 2** Enter the following command to add a new result set:
```
mml> numan-add:resultset:custgrpId="dpl2", name="dmnrtgset1"
```
Step 3 Enter the following command to add a service name to the service table:

```
mml> numan-add:service:custgrpid="dpl2", name="set3"
```

Step 4 Now add the IP_ROUTE_SEL result type to a result set and define the result set in the result table:

```
mml> numan-add:resulttable: custgrpid="dpl2", name="result1", resulttype="IP_ROUTE_SEL", dw1="1", dw2="set3", dw3="foundSet", dw4="notFoundSet", setname="dmnrtgset1"
```

Where:
- custgrpid—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- name—The name of the result table in the resultset.
- resulttype—Indicates the result type being provisioned.
- inputDataType (dw1)—Specifies the data that the VPGW Softswitch uses to select the route. Valid values are:
  - 1 = route selection against destination (user + host)
  - 2 = route selection against destination host only
  - 3 = route selection against source (user and host)
  - 4 = route selection against source host only
  - 5 = route selection against both destination (user and host) and source (user and host)
  - 6 = route selection against both destination (host only) and source (host only)
  - 7 = route selection against both destination (user and host) and source (host only)
  - 8 = route selection against both destination (host only). And source (user and host)
- serviceName (dw2)—Service name which must already exist in the $service table (optional)
- foundSetname (dw3)—The result set that the VPGW Softswitch executes if the data matches an entry in the table.
- notFoundSetname (dw4)—The result set that the VPGW Softswitch executes if the data does not match an entry in the table.
- setname—Result set name. The name you give to the result set. The name can be as many as 20 alphanumeric characters enclosed in straight quotes.

Step 5 Repeat Step 4, as necessary, to add IP_ROUTE_SEL result types to the result table.

Modify IP_ROUTE_SEL result type
To modify the IP_ROUTE_SEL result type, complete the following steps:

Step 1 To modify a line in the IP_ROUTE_SEL table, log in to the active VPGW Softswitch, start an MML session, and enter the following command:

```
mml> numan-ed:resulttable: custgrpid="dpl2", name="result1", resulttype="IP_ROUTE_SEL", dw1="1", dw2="set3", dw3="foundSet", dw4="notFoundSet", setname="dmnrtgset1"
```

Where:
- custgrpid—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- name—The name of the result table in the resultset.
- resulttype—Indicates the result type being provisioned.
- inputDataType (dw1)—Specifies the data that the VPGW Softswitch uses to select the route. Valid values are:
  - 1 = route selection against destination (user + host)
  - 2 = route selection against destination host only
  - 3 = route selection against source (user and host)
  - 4 = route selection against source host only
  - 5 = route selection against both destination (user and host) and source (user and host)
  - 6 = route selection against both destination (host only) and source (host only)
- 7 = route selection against both destination (user and host) and source (host only)
- 8 = route selection against both destination (host only) and source (user and host)
  - serviceName (dw2)—Service name that must already exist in the $service table (optional)
  - foundSetName (dw3)—The result set that the VPGW Softswitch executes if the data matches an entry in the table.
  - notFoundSetName (dw4)—The result set that the VPGW Softswitch executes if the data does not match an entry in the table.
  - setName—Result set name. The name you give to the result set. The name can be as many as 20 alphanumeric characters enclosed in straight quotes.

Step 2 To verify that the command was executed successfully, enter the following command:

```
mml> numan-rtrv:resulttable: custgrpdir="dpl2", name="result1", setname="dmnrtgset1"
```

Step 3 Repeat Steps 1 and 2, as necessary, to modify the IP_ROUTE_SEL result type in the dial plan.

Delete IP_ROUTE_SEL result type

The IP_ROUTE_SEL result type allows the VPGW Softswitch to select a route based on a destination user or domain name, source user or domain name, or a combination of the two. To delete an IP_ROUTE_SEL result type from the result table, complete the following steps:

Step 1 Log in to the active VPGW Softswitch, start an MML session, and enter the following command:

```
mml> numan-dlt:resulttable: custgrpdir="dpl2", setname="dmnrtgset1", name="result1"
```

This command deletes the IP_ROUTE_SEL result type from the result table.

Step 2 To verify that the command was executed successfully, enter the following command:

```
mml> numan-rtrv:resulttable: custgrpdir="dpl2", setname="dmnrtgset1", name="result1"
```

Step 3 Repeat Steps 1 and 2, as necessary, to remove IP_ROUTE_SEL result types from the result table.

DRP_EXIT result type

The DRP_EXIT result type directs the VPGW Softswitch to exit from an individual step of the DRP table or to exit DRP analysis completely. The following sections describe how to use the DRP_EXIT result type.

Note The DRP_EXIT result type is optional. If you do not use it, the VPGW Softswitch exits from DRP analysis when it has processed all steps in the DRP table and any nested result sets. For more information, see Nested Result Sets.

Add DRP_EXIT result type

Use the following steps to add the DRP_EXIT result type:

Step 1 Log in to the active VPGW Softswitch, start an MML session, and enter the following command to add a dial plan:

```
mml> numan-add:dialplan:custgrpdir="dpl2", overdec="yes"
```

Step 2 Enter the following command to add a new result set:

```
mml> numan-add:resultset:custgrpdir="dpl2", name="dmnrtgset1"
```
Step 3  Add the DRP_EXIT result type to a result set and define the result set in the result table:

```
mml> numan-add:resulttable: custgrpid="dp12", name="result1", resulttype="DRP_EXIT", dw1="1", setname="dmnrtgset1"
```

Where:
- `custgrpid`—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- `name`—The name of the result table in the resultset.
- `resulttype`—Indicates the result type being provisioned.
- `drpExitType (dw1)`—Specifies the type of exit from preanalysis. Valid values are
  - 1 = Exit current DRP step and move to the next step
  - 2 = Exit from entire DRP stage of preanalysis
- `setname`—Result set name. The name you give to the result set. The name can be as many as 20 alphanumeric characters enclosed in straight quotes.

Step 4  Repeat Step 2, as necessary, to add DRP_EXIT result types to the result table.

Modify DRP_EXIT result type
To modify the DRP_EXIT result type, complete the following steps:

Step 1  Log in to the active VPGW Softswitch, start an MML session, and enter the following command to modify a line in the result table:

```
mml> numan-ed:resulttable: custgrpid="dp12", name="result1", resulttype="DRP_EXIT", dw1="1", setname="dmnrtgset1"
```

Where:
- `custgrpid`—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- `name`—The name of the result table in the resultset.
- `resulttype`—Indicates the result type being provisioned.
- `drpExitType (dw1)`—Specifies the type of exit from preanalysis. Valid values are
  - 1 = Exit current DRP Step and move to the next step
  - 2 = Exit from entire DRP stage of preanalysis
- `setname`—Result set name. The name you give to the result set. The name can be as many as 20 alphanumeric characters enclosed in straight quotes.

This command modifies the DRP_EXIT result type in the result table.

Step 2  To verify that the command was executed successfully, enter the following command:

```
mml> numan-rtrv:resulttable:custgrpid="dp12", setname="dmnrtgset1", name="result1"
```

If the command succeeds, the output shows the modified result type.

Step 3  Repeat Steps 1 and 2, as necessary, to modify the DRP_EXIT result type in the dial plan.

Delete DRP_EXIT result type
To delete an DRP_EXIT result type from the result table, complete the following steps:

Step 1  Log in to the active VPGW Softswitch, start an MML session, and enter the following command:

```
mml> numan-dlt:resulttable: custgrpid="dp12", setname="dmnrtgset1", name="result1"
```

This command deletes the DRP_EXIT result type from the result table.
Step 2  To verify that the command was executed successfully, enter the following command:

```
mml> numan-rtrv:resulttable:custgrpid="dp12", name="result1", resulttype="DRP_EXIT"
```

If the command succeeds, the output does not show the deleted result type.

Step 3  Repeat Steps 1 and 2, as necessary, to remove DRP_EXIT result types from the result table.

---

**MML command reference**

This section documents new, modified, or deleted Man-Machine Language (MML) commands. All other MML commands are documented in the Cisco Virtual PGW 2200 (VPGW) Softswitch Release 9.9 MML Command Reference.

**New MML commands**

This section contains the MML commands that are new for this feature.

**NUMAN-ADD:DESTTRANS**

Purpose:  This MML command adds an entry to the destination username/domain translation table. For more information about the destination username/domain translation table, see Destination Username/Domain Translation (DESTTRANS) Table.

Syntax:  
```
mml> numan-add:desttrans: custgrpid="custgrpid",
destdmnstring="destdmnstring", svcname="svcname",
displayname="displayname", username="username",
domainname="domainname", uriparameters= "uriparameters"
```

Input description:
- **custgrpid**—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- **destdmnstring**—The destination username (bob@cisco.com) or domain name (cisco.com).
- **svcname**—The MML name of a service.
- **displayname**—The display name for the user, such as BobOffice.

RFC 3261 provides for two formats for this parameter: a quoted string or a series of tokens. To use a series of tokens, enter the displayname in normal MML syntax. To use a quoted string, use the escape sequence %22. For example, the display name “TerryOffice” (including quotation marks) is “%22TerryOffice%22”.

- **username**—A username.
- **domainname**—The new domain name.
- **uriparameters**—URI parameters that the VPGW Softswitch adds to the header.

**Note**  The uriparameters value must start with a semicolon.
Output description:

- COMPLD—The table addition succeeds.
- DENY—The table addition fails.

Examples: The MML command shown in the following example adds one entry in the destination username/domain translation table:

```
mml> numan-add:desttrans: custgrpid="dp11", destdmnstring="bob@cisco.com", svcname="destgroup1", displayname="BobOffice", username="bjones", domainname="example.com", uriparameters=";USER=phone"
```

MGC-01 - Media Gateway Controller 2008-08-01 16:40:09.168 EDT
M COMPLD
"Desttrans"
;

Comments: Performance impact category: A

**NUMAN-ADD:DMNMODSTRING**

Purpose: This MML command adds an entry to the domain strings table. For more information about the DRP, see Domain Strings (DMNMODSTRING) Table.

Syntax:

```
uman-add:dmnmodstring:custgrpid="custgrpid", name="tablename", dmnstring="dmnstring"
```

Input description:

- `custgrpid`—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) to identify the dial plan.
- `name`—The MML name of the source modification string.
- `dmnstring`—The domain name to modify, such as cisco.com or example.com.

Output description:

- COMPLD—The table addition succeeds.
- DENY—The table addition fails.

Examples: The MML command shown in the following example adds one entry in the domain strings table:

```
mml> numan-add:dmnmodstring:custgrpid="T002", name="dmn1", dmnstring="example.com"
```

MGC-01 - Media Gateway Controller 2008-08-04 10:22:29.141 EDT
M COMPLD
"dmnmodstring"
;

Comments: Performance impact category: A
NUMAN-ADD:DRPTABLE

Purpose: This MML command adds an entry to the domain routing policy (DRP) table.

Syntax: `numan-add:drptable:custgrpid="custgrpid", drpstepnum="drpstepvalue", setname="dmnrtgset1"`

Input description:
- `custgrpid`—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- `drpstepnum`—The step number in the DRP table (1–6).
- `setname`—The result set that the VPGW Softswitch executes at the given step of the DRP table.

Output description:
- `COMPLD`—The table addition succeeds.
- `DENY`—The table addition fails.

Examples: The MML command shown in the following example adds one entry in the DRP table:

```
mml> numan-add:drptable: custgrpid="T002", drpstepnum="1", setname="dmnrtgset1"
```

MGC-01 - Media Gateway Controller 2008-08-01 16:40:09.168 EDT
M COMPLD
"Drptable"
;

Comments: Performance impact category: A

NUMAN-ADD:ROUTESEL

Purpose: This MML command adds an entry to the route selection table.

Syntax: `numan-add:routesel:custgrpid="custgrpid", destdmstring="destdmstring", srcdmnstring="srcdmnstring", svcname="svcname", rtlistname="rtlistname"`

...
Input description:

- **custgrpid**—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) to identify the dial plan.
- **destdmnstring**—The destination username (bob@cisco.com) or domain name (cisco.com).
- **srcdmnstring**—The source username (bob@example.com) or domain name (example.com).
- **svcname**—The MML name of a service.
- **rtlistname**—The MML name of a route list.

Output description:

- **COMPLD**—Provision succeeds
- **DENY**—Provision fails

Examples: The MML command shown in the following example adds one entry in the route selection table:

```
numan-add:routesel:custgrpid='dpl1',"destdmnstring"='cisco.com', "srcdmnstring"='example.com', svcname='svcname', rtlistname='rtlistcisco1'
```

MGC-01 - Media Gateway Controller 2008-08-04 10:30:27.394 EDT
M COMPLD "routesel"
;

Comments: Performance impact category: A

**NUMAN-ADD:SOURCEBLACK**

Purpose: This MML command adds an entry to the source domain blacklist table.

Syntax: 

```
mml> numan-add:sourceblack:custgrpid="custgrpid", srcdmnstring="srcdmnstring", svcname="svcname"
```

Input description:

- **custgrpid**—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- **srcdmnstring**—The name of the source domain.
- **svcname**—The MML name of a service.

Output description:

- **COMPLD**—The table addition succeeds.
- **DENY**—The table addition fails.
Examples: The MML command shown in the following example adds one entry in the source blacklist table:

```
mml> numan-add:sourceblack:custgrpid="dp11", svcname="destgroup1", srcdmnstring="cisco.com"
```

```
MGC-01 - Media Gateway Controller 2008-08-04 10:35:41.680 EDT
M COMPLD
"sourceblack"
```

Comments: Performance impact category: A

**NUMAN-RTRV:DESTTRANS**

Purpose: This MML command retrieves entries in the destination username/domain translation table.

Syntax:

```
mml> numan-rtrv:desttrans: custgrpid="custgrpid", svcname="svcname", destdmnstring="destdmnstring"
mml> numan-rtrv:desttrans:custgrpid="custgrpid", "all"
```

Input description:

- **custgrpid**—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) to identify the dial plan.
- **svcname**—The MML name of a service.
- **destdmnstring**—The domain name to be translated.
- **all**—Retrieves all entries in the DESTTRANS table.

Output description:

- **RTRV**—Retrieve succeeds.
- **DENY**—Retrieve fails.

Examples: The MML command shown in the following example retrieves one entry in the destination username/domain translation table:

```
mml> numan-rtrv: desttrans: custgrpid="dp11", svcname="destgroup1", destdmnstring="cisco.com"
```

```
MGC-01 - Media Gateway Controller 2008-08-01 16:43:09.101 EDT
M RTRV
"session=sessionname:desttrans"
/*
CustGrpId ServiceName DestUserDomain NewDisplay NewUser
NewDomain NewUriParameters
---------------------------------------------
dp11 destgroup1 bob@cisco.com BobOffice bjones
example.com ;USER=phone
*/
```
NUMAN-RTRV:DMNMODSTRING

Purpose: This MML command retrieves an entry from the domain strings table.

Syntax:
```mml>
uman-rtrv:dmnmodstring:custgrpdid="custgrpdid",
      name="tablename"
```
```mml>
uman-rtrv:dmnmodstring:custgrpdid="T002",
      all
```

Input description:
- `custgrpdid`—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- `name`—The MML name of the source modification string.
- `all`—Displays all entries in the domain strings table.

Output description:
- `RTRV`—Retrieve succeeds.
- `DENY`—Retrieve fails.

Examples: The MML command shown in the following example retrieves one entry from the domain strings table:
```mml>
uman-rtrv:dmnmodstring:custgrpdid="dp11",
      name="dmn1"
```
```
MGC-01 - Media Gateway Controller 2008-08-04
10:23:44.807 EDT
M  RTRV
"session=sessionname:dmnmodstring"
/*
dmnName           dmnString
-------           -------
example.com       cisco.com
*/
```

Comments: Performance impact category: A

NUMAN-RTRV:DRPTABLE

Purpose: This MML command retrieves entries in the route selection table.

Syntax:
```numan-rtrv:drptable:custgrpdid="custgrpdid",
      drpstepnum="drpstepvalue"
```
```numan-rtrv:drptable:custgrpdid="T002"
```
Input description:

- **custgrpid**—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- **drpstepnum**—The step number in the DRP table (1–6).
- **all**—Displays all entries in the route selection table

Output description:

- **RTRV**—Retrieve succeeds.
- **DENY**—Retrieve fails.

Examples:
The MML command shown in the following example retrieves one entry from the DRP table:

```
mml> numan-rtrv:drptable:custgrpid="T002", drpstepnum="1"
```

```
MGC-01 - Media Gateway Controller 2008-08-01 16:54:51.010 EDT
M  RTRV
"session=sessionname:drptable"
/*
stepIndex resultSetName
----- ----------
1   dmnRtgExitSet
*/
```

Comments: Performance impact category: A

**NUMAN-RTRV:ROUTESEL**

Purpose: This MML command retrieves entries from the route selection table.

Syntax:

```
mml> numan-rtrv:routesel:custgrpid="custgrpid",
"destdmnstring="destdmnstring",
srcdmnstring="srcdmnstring", svcname="svcname",
rtlistname="rtlistname"
```

```
mml> numan-rtrv:routesel:custgrpid="custgrpid", "all"
```
Input description:

- **custgrpid**—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) to identify the dial plan.
- **destdmnsstring**—The destination username (bob@cisco.com) or domain name (cisco.com).
- **srcdmnsstring**—The source username (bob@example.com) or domain name (example.com).
- **svcname**—The MML name of a service.
- **rtlistname**—The MML name of a route list.
- **all**—Retrieves all entries in the ROUTSEL table.

Output description:

- **RTRV**—Retrieve succeeds.
- **DENY**—Retrieve fails.

Examples:
The MML command shown in the following example retrieves one entry in the route selection table:

```
mml> numan-rtrv:rtrv:routesel:custgrpid="dpl1","destdmnsstring="cisco.com",srcdmnsstring="example.com",svcname="svcname",rtlistname="rtlistcisco1"
```

```
MGC-01 - Media Gateway Controller 2008-08-04 10:33:15.042 EDT
M RTRV
"session=sessionname:routesel"
/*
CustGrpId  ServiceName  DestUserDomain  SrcUserDomain  Route List Name
---------  -----------------  ---------------  ---------------  ---------------
---------  -----------------  ---------------  ---------------  ---------------
dpl1     destgroup1  cisco.com  fred@example.com  rtlist60
*/
```

Comments: Performance impact category: A

---

**NUMAN-RTRV:SOURCEBLACK**

Purpose: This MML command retrieves entries from the source domain blacklist table.

Syntax:

```
mml> numan-rtrv:sourceblack:custgrpid="custgrpid",
srcdmnsstring="srcdmnsstring", svcname="svcname"
mml> numan-rtrv:sourceblack:custgrpid="custgrpid", "all"
```
Input description:
- `custgrpid`—Customer group ID. A 4-digit numeric string (enclosed in straight quotes) that identifies the dial plan.
- `srcdmnstring`—The name of the source domain.
- `svcname`—The MML name of a service.
- `all`—Retrieves all entries in the SOURCEBLACK table.

Output description:
- RTRV—Retrieve succeeds.
- DENY—Retrieve fails.

Examples:
The MML command shown in the following example retrieves one entry from the source blacklist table:

```
mml> numan-rtrv:sourceblack:custgrpid="dp11", svcname="destgroup1", srcdmnstring="cisco.com"

MGC-01 - Media Gateway Controller 2008-08-04 10:37:11.471 EDT
M RTRV
 "session=sessionname:sourceblack"
 /*
 CustGrpId ServiceName SourceUserDomain
 ------------------------------
 dp11 destgroup1 cisco.com
 */
```

Comments: Performance impact category: A

Software Changes
The following sections document software changes related to the Domain-Based Routing feature.

Dial Plan Components
The following sections discuss the dial plan components that are added, modified, or deleted for the Domain-Based Routing.

For information on other dial plan components in the VPGW Softswitch software, see Cisco Virtual PGW 2200 (VPGW) Softswitch Software Release 9.9 Dial Plan Guide.

Domain Strings (DMNMODSTRING) table
The Domain Strings table allows you to define domains for use with the IP_SET_SOURCE_DMN result type. The following table summarizes the structure of the domain strings table structure.

<table>
<thead>
<tr>
<th>Parameter MML Name</th>
<th>Parameter Description</th>
<th>Parameter Values (Default)</th>
</tr>
</thead>
</table>


<table>
<thead>
<tr>
<th>NAME</th>
<th>Source modification name</th>
<th>MML name of the Source modification string</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMNSTRING</td>
<td>The name of a domain</td>
<td>A unique domain name value, such as cisco.com or example.com</td>
</tr>
</tbody>
</table>

**Domain Routing Policy (DRPTABLE) table**
The Domain Routing Policy (DRP) table allows you to define the result sets that the VPGW Softswitch executes at a given step in the DRP table. For more information about the DRP table, see *Using the DRP Table*. The following table summarizes the DRP table structure.

*Table 4 DRPTABLE component structure*

<table>
<thead>
<tr>
<th>Parameter MML Name</th>
<th>Parameter Description</th>
<th>Parameter Values (Default)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRPSTEPNUM</td>
<td>The step number in the DRP table.</td>
<td>1–6 (0)</td>
</tr>
<tr>
<td>SETNAME</td>
<td>The name of the result set that the VPGW Softswitch runs at a given step in the DRP table.</td>
<td>The MML name of a result set</td>
</tr>
</tbody>
</table>

**Source Blacklist Screening (SOURCEBLACK) table**
The Source Blacklist Screening (SOURCEBLACK) table allows you to screen calls based on their source domain name. The following table summarizes the Source Blacklist Screening table.

*Table 5 SOURCEBLACK component structure*

<table>
<thead>
<tr>
<th>Parameter MML Name</th>
<th>Parameter Description</th>
<th>Parameter Values (Default)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRCDMNSTRING</td>
<td>The domain name to be screened.</td>
<td>A unique domain name value, such as cisco.com or example.com.</td>
</tr>
<tr>
<td>SVCNAME</td>
<td>SVCNAME</td>
<td>The MML name of a service.</td>
</tr>
</tbody>
</table>

**Route Selection (ROUTESEL) table**
The Route Selection table allows the VPGW Softswitch to route calls based on the source and destination domain names. The following table summarizes the Route Selection table structure.

*Table 6 ROUTESEL component structure*

<table>
<thead>
<tr>
<th>Parameter MML Name</th>
<th>Parameter Description</th>
<th>Parameter Values (Default)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESTDMNSTRING</td>
<td>The name of the destination domain</td>
<td>A unique domain name value, such as cisco.com or example.com.</td>
</tr>
</tbody>
</table>
The name of the source domain
A unique domain name value, such as cisco.com or example.com

Service name
The MML name of a service

Route list name
The MML name of a route list

Destination Username/Domain Translation (DESTTRANS) table
The Destination Username/Domain Translation table translates the non-E.164 destinations to E.164 destinations (domains to phone numbers). The following table summarizes the Destination username/Domain Translation table structure.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MML Name</th>
<th>Parameter Description</th>
<th>Parameter Values (Default)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESTDMNSTRING</td>
<td></td>
<td>The domain name to be translated</td>
<td>A username and domain, such as <a href="mailto:bob@cisco.com">bob@cisco.com</a>.</td>
</tr>
<tr>
<td>SVCNAME</td>
<td></td>
<td>Service name</td>
<td>The MML name of a service</td>
</tr>
<tr>
<td>DISPLAYNAME</td>
<td></td>
<td>New display name</td>
<td>A name describing the function for the user, such as BobOffice</td>
</tr>
<tr>
<td>USERNAME</td>
<td></td>
<td>New user name</td>
<td>A username, such as bjones</td>
</tr>
<tr>
<td>DOMAINNAME</td>
<td></td>
<td>New domain name</td>
<td>A unique domain name value, such as example.com</td>
</tr>
<tr>
<td>URIPARAMETERS</td>
<td></td>
<td>New complete URI parameter</td>
<td>A URI parameter beginning with a semicolon, such as ;USER=phone</td>
</tr>
</tbody>
</table>

SIP Attributes (SIPRTTRNKGRP) table
The DBR feature modifies the SIP Attributes table to add the DomainBasedRtgSupport field. This field allows you to specify whether a trunk group supports non-E.164 based routing.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MML Name</th>
<th>Parameter Description</th>
<th>Parameter Values (Default)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME</td>
<td></td>
<td>Trunk group number</td>
<td>A valid trunk group number</td>
</tr>
<tr>
<td>URL</td>
<td></td>
<td>The IP address or URL of the SIP proxy service</td>
<td>A valid IP address, host name, or domain name</td>
</tr>
<tr>
<td>SIPPROXYPORT</td>
<td></td>
<td>UDP port number used by the SIP proxy server</td>
<td>A valid UDP port number</td>
</tr>
<tr>
<td>VERSION</td>
<td></td>
<td>SIP version of the SIP proxy server</td>
<td>A valid SIP version number, such as 2</td>
</tr>
</tbody>
</table>
Result type definitions

The DBR feature introduces several changes to the result types for the VPGW Softswitch. These changes are summarized in the following sections.

For information on other result type definitions for the VPGW Softswitch software, see Cisco Virtual PGW 2200 (VPGW) Softswitch Release 9.9 Dial Plan Guide.

New result types

The DBR feature adds five new result types. The following table summarizes the new result types.

Table 9 New result types

<table>
<thead>
<tr>
<th>Result Number</th>
<th>Result type</th>
<th>Data Word 1</th>
<th>Data Word 2</th>
<th>Data Word 3</th>
<th>Data Word 4</th>
<th>Analysis Points</th>
<th>Result type Valid for</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>IP_SOURCE_SCREEN</td>
<td>screenType</td>
<td>serviceName</td>
<td>foundSetName</td>
<td>notFoundSetName</td>
<td>X</td>
<td>Intermediate</td>
</tr>
<tr>
<td>79</td>
<td>IP_DEST_TRANS</td>
<td>inputAndAction</td>
<td>serviceName</td>
<td>foundSetName</td>
<td>notFoundSetName</td>
<td>X</td>
<td>End Point</td>
</tr>
<tr>
<td>80</td>
<td>IP_SET_SOURCE_DMN</td>
<td>dmnString</td>
<td>applicationStatus</td>
<td>applyTo</td>
<td></td>
<td>X</td>
<td>A-digit Analysis</td>
</tr>
<tr>
<td>81</td>
<td>IP_ROUTE_SEL</td>
<td>inputDataType</td>
<td>serviceName</td>
<td>foundSetName</td>
<td>notFoundSetName</td>
<td>X</td>
<td>B-digit Analysis</td>
</tr>
<tr>
<td>82</td>
<td>DRP_EXIT</td>
<td>drpExitType</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>Cause</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>Preanalysis</td>
</tr>
</tbody>
</table>

Note: Ensure that the remote trunk matches this configuration.
The following section contains definitions of each result type listed in preceding table.

**IP_SOURCE_SCREEN**

The following table summarizes the IP_SOURCE_SCREEN result type.

<table>
<thead>
<tr>
<th>Option</th>
<th>Example</th>
<th>Data Word Types</th>
<th>Analysis Point</th>
<th>Type of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP_SOURCE_SCREEN (&lt;screenType&gt;, &lt;serviceName&gt;, &lt;foundSetName&gt;, &lt;notFoundSetName&gt;)</td>
<td>IP_SOURCE_SCREEN (1, Telco1, T001, T002)</td>
<td>I, S, S, S</td>
<td>Intermediate</td>
<td>Preanalysis</td>
</tr>
</tbody>
</table>

IP_SOURCE_SCREEN has the following data words:
- **screenType** (dw1)—The type of blacklist screen to apply. Valid values are:
  - 1 = Blacklist screening of source (username + host domain)
  - 2 = Blacklist screening of source username only
  - 3 = Blacklist screening of source host domain only
- **serviceName** (dw2)—The name of the service.
- **foundSetName** (dw3)—An existing result set that the VPGW Softswitch executes if it finds a match in the IP Source Screening table.
- **notFoundSetName** (dw4)—An existing result set that the VPGW Softswitch executes if it does not find a match in the IP Source Screening table.

**Note**  Data words 2, 3, and 4 are optional.

**IP_DEST_TRANS**

The following table summarizes the IP_DEST_TRANS result type.

<table>
<thead>
<tr>
<th>Option</th>
<th>Example</th>
<th>Data Word Types</th>
<th>Analysis Point</th>
<th>Type of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP_DEST_TRANS (&lt;inputAndAction&gt;, &lt;serviceName&gt;, &lt;foundSetName&gt;, &lt;notFoundSetName&gt;)</td>
<td>IP_DEST_TRANS (1, “group1”, “resultset1”, “resultset2”)</td>
<td>I, S, S, S</td>
<td>Intermediate</td>
<td>Preanalysis</td>
</tr>
</tbody>
</table>

IP_DEST_TRANS has the following data words:
- **inputAndAction** (dw1)—Determines whether the VPGW Softswitch translates the destination of the user and host (1) or the destination host only (2)
- **serviceName** (dw2)—The name of the service
- foundSetName (dw3)—The result set that the VPGW Softswitch executes if the user or domain name matches an entry in the table
- notFoundSetName (dw4)—The result set that the VPGW Softswitch executes if the user or domain name does not match an entry in the table

**IP_SET_SOURCE_DMN**

The following table summarizes the IP_SET_SOURCE_DMN result type.

<table>
<thead>
<tr>
<th>Option</th>
<th>Example</th>
<th>Data Word Types</th>
<th>Analysis Point</th>
<th>Type of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP_SET_SOURCE_DMN</td>
<td>IP_SET_SOURCE_DMN (1,1)</td>
<td>S, I, I</td>
<td>Intermediate</td>
<td>Preanalysis, A-number analysis, B-number analysis</td>
</tr>
</tbody>
</table>

**IP_SET_SOURCE_DMN** has the following data words:
- dmnnString (dw1)—The name of the source domain.
- applicationStatus (dw2)—Specifies whether the command can override an existing domain name entry. The following values are valid:
  - 0 = The command can override a domain name entry.
  - 1 = The command cannot override an existing domain name entry.
- applyTo (dw3)—Specifies the source headers to which the VPGW Softswitch applies the command. The following values are valid:
  - 0 = Sets the VPGW Softswitch to apply the command to all source headers that are present
  - 1 = Sets the VPGW Softswitch to apply the command to the current source header only

**IP_ROUTE_SEL**

The following table summarizes the IP_ROUTE_SEL result type.

<table>
<thead>
<tr>
<th>Option</th>
<th>Example</th>
<th>Data Word Types</th>
<th>Analysis Point</th>
<th>Type of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP_ROUTE_SEL</td>
<td>IP_ROUTE_SEL (1, “group1”, “T002”, “T004”)</td>
<td>I, S, S, S</td>
<td>Intermediate</td>
<td>Preanalysis</td>
</tr>
</tbody>
</table>

**IP_ROUTE_SEL** has the following data words:
- inputDataType (dw1)—Specifies the data that the VPGW Softswitch uses to select the route. Valid values are
  - 1 = Route selection against destination (user + host)
  - 2 = Route selection against destination host only
  - 3 = Route selection against source (user and host)
  - 4 = Route selection against source host only
  - 5 = Route selection against both destination (user and host) and source (user and host)
- 6 = Route selection against both destination (host only) and source (host only)
- 7 = Route selection against both destination (user and host) and source (host only)
- 8 = Route selection against both destination (host only) and source (user and host)

- serviceName (dw2) — Service name that must already exist in the service table (optional).
- foundSetName (dw3) — The result set that the VPGW Softswitch executes if the data matches an entry in the table
- notFoundSet (dw4) — The result set that the VPGW Softswitch executes if the data does not match an entry in the table

**DRP_EXIT**

The following table summarizes the DRP_EXIT result type.

<table>
<thead>
<tr>
<th>Option</th>
<th>Example</th>
<th>Data Word Types</th>
<th>Analysis Point</th>
<th>Type of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRP_EXIT (&lt;drpExitType&gt;)</td>
<td>DRP_EXIT (1)</td>
<td>I</td>
<td>Intermediate</td>
<td>Preanalysis</td>
</tr>
</tbody>
</table>

DRP_EXIT has one data word, drpExitType (dw1). This data word specifies the type of DRP exit. Valid values are

- 1 = Directs the VPGW Softswitch to exit current DRP step and move to the next step
- 2 = Directs the VPGW Softswitch to exit from entire DRP stage of preanalysis

**Results added to preanalysis**

DBR adds six existing A and B analysis result types to preanalysis. The following table summarizes the existing result types that are now available in preanalysis.

<table>
<thead>
<tr>
<th>Result Number</th>
<th>Result type</th>
<th>Data Word 1</th>
<th>Data Word 2</th>
<th>Data Word 3</th>
<th>Data Word 4</th>
<th>Analysis Points</th>
<th>Result Type Valid for:</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>CAUSE</td>
<td>cause</td>
<td></td>
<td></td>
<td></td>
<td>X X X X</td>
<td>Preanalysis</td>
</tr>
<tr>
<td>7</td>
<td>FACILITY</td>
<td>type</td>
<td>treatment</td>
<td></td>
<td></td>
<td>X X X</td>
<td>Preanalysis</td>
</tr>
<tr>
<td>47</td>
<td>CODEC</td>
<td>CodecIdx</td>
<td>action</td>
<td></td>
<td></td>
<td>X X X</td>
<td>Preanalysis</td>
</tr>
<tr>
<td>36</td>
<td>CHARGE_ORIGIN</td>
<td>chgOrigin</td>
<td></td>
<td></td>
<td></td>
<td>X X</td>
<td>Preanalysis</td>
</tr>
<tr>
<td>72</td>
<td>DTMF_CAP</td>
<td>DtmfCap</td>
<td></td>
<td></td>
<td></td>
<td>X X X</td>
<td>Preanalysis</td>
</tr>
<tr>
<td>37</td>
<td>CG_PRES_IND</td>
<td>presIndic</td>
<td></td>
<td></td>
<td></td>
<td>X X X</td>
<td>Preanalysis</td>
</tr>
</tbody>
</table>
For information about these result types, see *Cisco Virtual PGW 2200 (VPGW) Softswitch Release 9.9 Dial Plan Guide*.

**Modified result types**

The DBR feature modifies the result types listed in the following table.

### Table 16 Modified result types

<table>
<thead>
<tr>
<th>Result Number</th>
<th>Result Type</th>
<th>Data Word 1</th>
<th>Data Word 2</th>
<th>Data Word 3</th>
<th>Data Word 4</th>
<th>Analysis Points</th>
<th>Result Type Valid for:</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>NEW_DIALPLAN</td>
<td>CustGrpId</td>
<td>AnalysisType</td>
<td></td>
<td></td>
<td>X</td>
<td>X X X X X</td>
</tr>
<tr>
<td>7</td>
<td>FACILITY</td>
<td>type</td>
<td>treatment</td>
<td></td>
<td></td>
<td>X</td>
<td>X X X X X</td>
</tr>
<tr>
<td>42</td>
<td>RETRY_ACTION</td>
<td>RetryType</td>
<td>redirAnPhase</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

The following paragraphs contain definitions of the result type listed in the preceding table.

**NEW_DIALPLAN**

The DBR feature modifies the NEW_DIALPLAN result type to allow the VPGW Softswitch to restart at the A Number stage of analysis. To use this setting, set data word 2 to a value of 3.

The following table summarizes the updated NEW_DIALPLAN result type.

### Table 17 NEW_DIALPLAN result type

<table>
<thead>
<tr>
<th>Option</th>
<th>Example</th>
<th>Data Word Types</th>
<th>Analysis Point</th>
<th>Type of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEW_DIALPLAN</td>
<td>NEW_DIALPLAN (“T001”, 1)</td>
<td>S, 1</td>
<td>Intermediate</td>
<td>Preanalysis, A-number analysis, B-number analysis, Cause analysis</td>
</tr>
<tr>
<td>(&lt;custGrpId&gt;,&lt;AnalysisType&gt;)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NEW_DIALPLAN has the following data words:

- custGrpId—Identifies the new dial plan to which the VPGW Softswitch switches.
- AnalysisType—Indicates the stage in which number analysis should start in the new dial plan. This data word applies to B-number analysis only. Valid values are as follows:
  - 0 = Default
  - 1 = Start analysis at preanalysis stage
  - 2 = Start analysis at B-number stage
  - 3 = Start analysis at A-number stage (new value)
FACILITY

The DBR feature modifies the FACILITY result type to introduce new values for data words 1 and 2. You can use these values to conditionally reject calls based on source or destination domain name.

The DBR feature also adds the FACILITY result type to preanalysis.

The following table summarizes the FACILITY result type.

**Table 18 FACILITY result type**

<table>
<thead>
<tr>
<th>Option</th>
<th>Example</th>
<th>Data Word Types</th>
<th>Analysis Point</th>
<th>Type of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>FACILITY (&lt;type&gt;, &lt;treatment&gt;)</td>
<td>FACILITY(2, 2, 0, 0)</td>
<td>1, 1</td>
<td>Intermediate</td>
<td>Preanalysis, A-number analysis, B-number analysis</td>
</tr>
</tbody>
</table>

The DBR feature introduces the following new data word values:

- **Type (dw1)**—The DBR feature introduces the value 6 (Terminating Call Transfer treatment action) for DW1 (Type). This value controls handling of Call Transfer and Refer requests.
- **Treatment (dw2)**—The DBR feature introduces the values 5 and 6 for DW2 (Treatment). These values determine the action taken when the terminating side of a call issues a redirect.

Thus, the updated Facility result type has the following data words:

- **Type (dw1)**
  - 1 = Proxy Mode required
  - 2 = Originating Redirection treatment action
  - 3 = Originating Call Transfer treatment action
  - 4 = Terminating Redirection treatment action
  - 5 = Originating Redirection Rejection treatment action
  - 6 = Terminating Call Transfer treatment action (new value)
- **Treatment (dw2)**
  - This data word provides the actions required based on the Type data word value. Valid values are 1–6.

The DBR feature defines two new values for data word 2 for use when data word 1 (Type) is set to 4 (Terminating Redirection treatment action). The following table summarizes these values.

**Table 19 Data Word Values for Use With Terminating Redirection Treatment Action**

<table>
<thead>
<tr>
<th>dw1 Value</th>
<th>dw2 Value</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
<td>Unconditional rejection of Redirection Request (SIP 302)</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>Rejection of Redirection Request (SIP 302) when the CONTACT header is non- E.164</td>
</tr>
</tbody>
</table>

The DBR feature defines two new values for data word 2 for use when data word 1 (Type) is set to 6 (Terminating Call Transfer Treatment action). The following table summarizes these values.

**Table 20 Data Word Values for Use With Terminating Call Transfer Treatment Action**

<table>
<thead>
<tr>
<th>dw1 Value</th>
<th>dw2 Value</th>
<th>Action</th>
</tr>
</thead>
</table>

41
Unconditional rejection of Call Transfer/Refer requests

<table>
<thead>
<tr>
<th>Option</th>
<th>Example</th>
<th>Data Word Types</th>
<th>Analysis Point</th>
<th>Type of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>RETRY_ACTION (&lt;RetryType&gt;,&lt;redirAnPhase&gt;)</td>
<td>RETRY_ACTION(1, 0)</td>
<td>I, I</td>
<td>Intermediate</td>
<td>Cause analysis</td>
</tr>
</tbody>
</table>

RETRY_ACTION has the following data words:
- RetryType (dw1)—The manner in which the VPGW Softswitch retries the call. Valid values are:
  - 1 = Reattempt
  - 2 = TGAdvance
  - 3 = Redirect
- redirAnPhase (dw2)—The phase of analysis in which the VPGW Softswitch restarts when retrying a call. Valid values are:
  - 0 = B-number analysis (default value)
  - 1 = Preanalysis

**Cause and location codes**

This section describes the cause and location codes that are updated for this feature. For table setup examples for cause and location codes, see “Cisco Virtual PGW 2200 (VPGW) Softswitch Release 9.9 Dial Plan Guide”.

This feature introduces the IC_BLACKLIST_SRC_MATCHED cause code. IC_BLACKLIST_SRC_MATCHED uses internal value 222 and is mapped to the corresponding SIP cause code, 403 Forbidden.

**Dial plan examples**

This section provides the following examples of dial plan provisioning for this feature. Additional examples of dial plan provisioning for the VPGW Softswitch software can be found in the Cisco Virtual PGW 2200 (VPGW) Softswitch Release 9.9 Dial Plan Guide.

In these examples, the assumption is that you have already created route lists with the following names:
- rlistcisco1
- rlistcisco2
- rlistdefaultswbd
IP_DEST_TRANS example

In this example, the IP_DEST_TRANS result type is used to translate the destination URI and displayname from Bob <sip:bob@dbrpgw.cisco.com:5060> to JoeAtlanta <sip:Joe@abc.cisco.com:5079>;user=phone. The VPGW Softswitch routes the call based on the new destination URI using the routelist rtlistcisco2.

prov-stp:
; Start a new MML session
prov-sta::srcver="active", dstver="TRANS",confirm
prov-ed:siprttrnkgrp:name="2002", domainbasedrtgsupport=1, url="abc.cisco.com"
numan-add:dialplan:custgrpdir="T002", overdec="YES"
numan-add:service:custgrpdir="T002", name="group1"
; Defines destination translation from Bob to JoeAtlanta
numan-add:desttrans:custgrpdir="T002", svcname="group1",
destdmnstring="bob@dbrpgw.cisco.com", displayname="JoeAtlanta", username="Joe", domainname="abc.cisco.com:5079", uriparameters=";user=phone"
; Adds JoeAtlanta to the Route Selection table to enable routing based on the destination; domain name.
numan-add:routesel:custgrpdir="T002", svcname="group1",
destdmnstring="Joe@abc.cisco.com", rtlistname="rtlistcisco2"
; Result sets
numan-add:resultset:custgrpdir="T002", name="drpstep1"
numan-add:resultset:custgrpdir="T002", name="dmnRtgExitSet"
numan-add:resultset:custgrpdir="T002", name="routeCall"
; Result table entries
numan-add:resulttable:custgrpdir="T002", resulttype="DRP_EXIT", dw1="2", setname="dmnRtgExitSet"
numan-add:resulttable:custgrpdir="T002", resulttype="IP_ROUTE_SEL", dw1="1", dw2="group1", dw3="dmnRtgExitSet", setname="routeCall"
; Adds a result set that translates based on the user and host. The VPGW Softswitch;
routes the call if the set is found.
numan-add:drptable:custgrpdir="T002", drpstepnum="1", setname="drpstep1"
Prov-dply::

IP_SET_SOURCE_DMN example

In this example, the IP_SET_SOURCE_DMN result type is used to overwrite the source domain of incoming traffic with the source domain abc.cisco.com. The VPGW Softswitch routes calls based on the new source domain using routelist rtlistcisco2.

prov-stp:
; Start a new MML session
prov-sta::srcver="active", dstver="SETDOMAIN", confirm
; Enable Domain-Based Routing using trunk group 2002
prov-ed:siprttrnkgrp:name="2002", domainbasedrtgsupport=1, url="abc.cisco.com"
numan-add:dialplan:custgrpdir="T002", overdec="YES"
; Add abc.cisco.com to the route selection table
numan-add:routesel:custgrpdir="T002", svcname="group1",
srcdmnstring="abc.cisco.com", rtlistname="rtlistcisco2"
; Add abc.cisco.com to the Domain Strings table
numan-add:dmnmodstring:custgrpdir="T002", name="domainname1",
dmnstring="abc.cisco.com"
; Add result sets
numan-add:resulset:custgrpdir="T002", name="rsetdrpstep1"
numan-add:resultset:custgrpdir="T002", name="dmnRtgExitSet"
; Result table entries
numan-add:resultable:custgrpdir="T002", resulttype="DRP_EXIT", dw1="2", setname="dmnRtgExitSet"
; Adds a result set that overwrites the source domain on the outgoing side. The

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vPGW Softswitch applies this change to the current source header only.
numan-add:resulttable:custgrpid="T002", name="resultchangesrc1",
resulttype="IP_SET_SOURCE_DMN", dw1="domainname1", setname="rsetdrpstep1",
dw2="0", dw3="1"
numan-add:resulttable:custgrpid="T002", name="resultrsell1",
resulttype="IP_ROUTE_SEL", dw1="4", dw2="group1", dw3="dnnRtgExitSet",
setname="rsetdrpstep1"
numan-add:drptable:custgrpid="T002", drpstepnum="2", setname="rsetdrpstep1"
Prov-dply:

**IP_ROUTE_SEL example**

In this example, the IP_ROUTE_SEL result type is used to route calls based on the destination hostname joe@cisco.com or the destination domain cisco.com.

prov-stp:
; Start a new MML session
prov-sta::srcver="active", dstver="mod_ver01", confirm
numan-add:dialogplan:custgrpid="T002", overdec="YES"
numan-add:resultset:custgrpid="T002", name="dmnrtgset1"
numan-add:resultset:custgrpid="T002", name="finalDefaultRtgSet"
numan-add:resultset:custgrpid="T002", name="dmnRtgExitSet"
numan-add:resultset:custgrpid="T002", name="dmnrtgDefaultSet"
numan-add:service:custgrpid="T002", name="group1"
; Adds a route selection table entry to route based on destination domain
joe@cisco.com
numan-add:routesel:custgrpid="T002", destdmnstring="joe@cisco.com",
svcname="group1", rtlistname="rtlistcisco1"
; Adds a route selection table entry to route based on destination domain
cisco.com
numan-add:routesel:custgrpid="T002", destdmnstring="cisco.com",
svcname="group1", rtlistname="rtlistcisco2"
numan-add:resulttable:custgrpid="T002", name="resultexitdrp",
resulttype="DRP_EXIT", dw1="2", setname="dmnRtgExitSet"
numan-add:resulttable:custgrpid="T002", name="resultfinalrte",
resulttype="ROUTE", dw1="rtlistdefaultswbd", setname="finalDefaultRtgSet"
; Adds a result that selects a route based on the destination hostname
numan-add:resulttable:custgrpid="T002", name="resultrsel1",
resulttype="IP_ROUTE_SEL", dw1="2", dw2="group1", dw3="dnnRtgExitSet",
dw4="finalDefaultRtgSet", setname="dnnrtgDefaultSet"
; Adds a result that selects a route based on destination user and hostname
numan-add:resulttable:custgrpid="T002", name="resultrsel2",
resulttype="IP_ROUTE_SEL", dw1="1", dw2="group1", dw3="dnnRtgExitSet",
dw4="dnnrtgDefaultSet", setname="dnnrtgset1"
numan-add:drptable:custgrpid="T002", drpstepnum="1", setname="dnnrtgset1"
Prov-dply:

**IP_SOURCE_SCREEN example**

In this example, calls are screened based on the source domain example.com. Non-screened calls are routed based on the destination URI dbrpgw.cisco.com.

prov-stp:
; Start a new MML session
prov-sta::srcver="active", dstver="source_screen", confirm
; Enable non-164 routing on the siprrtrnkgrp
prov-edisiprrtrnkgrp:name="2002", DomainBasedRtgSupport="1",
url="dbrpgw.cisco.com"
; Add result set entries
numan-add:resultset:custgrpid="T002", name="screenURI"
numan-add:service:custgrpid="T002", name="group1"
; Add a route selection entry to route based on the destination
bob@dbrpgw.cisco.com
Example with all result types

In this example, two domain routing policy (DRP) table steps and all of the result types introduced in the DBR feature are defined.

A VPGW Softswitch with this configuration would process calls as follows:

- In DRP step 1, the VPGW Softswitch screens SIP calls based on the source domain example.com. When a match is found, the VPGW Softswitch uses the IP_SET_SOURCE_DMN table to change the source domain from example.com to abc.cisco.com. When DRP step 1 is complete, the VPGW Softswitch proceeds to DRP step 2.
- In DRP step 2, the VPGW Softswitch translates the destination domain and port number from dbrpgw.cisco.com to atlanta.cisco.com:5079 and routes calls based on the destination URI bob@atlanta.cisco.com.

prov-stp::
; Start a new MML session
prov-sta::srcver="active", dstver="nested", confirm
; Add a new entry in the service table
numan-add:service:custgrpid="T002", name="group1"
; Enable DBR on trunk group 2002
prov-edisiptrngrp:name="2002", domainbasedrtgsupport=1,
url="bob@atlanta.cisco.com"
; Add entries in TimesTen tables
numan-add:routesel:custgrpid="T002", svcname="group1",
destdmnstring="bob@dbrpgw.cisco.com", rtlistname="rtlist002"
numan-add:sourceblack:custgrpid="T002", svcname="group1",
srcdmnstring="example.com"
numan-add:desttrans:custgrpid="T002", svcname="group1",
destdmnstrings="dbrpgw.cisco.com", domainname="atlanta.cisco.com:5079"
; Add result set entries
numan-add:resultset:custgrpid="T002", name="drpstep1"
numan-add:resultset:custgrpid="T002", name="drpstep2"
numan-add:resultset:custgrpid="T002", name="setSource"
numan-add:resultset:custgrpid="T002", name="exitdrp"
numan-add:resultset:custgrpid="T002", name="trans"
numan-add:resultset:custgrpid="T002", name="routeCall"
; Add example.com to domain strings table
numan-add:dmnmodstring:custgrpid="T002", name="domainname1",
dmnstring="abc.cisco.com"
; Add result table entries for DRP step 1
numan-add:resulttable:custgrpid="T002", setname="exitdrp",
resulttype="DRP_EXIT", dw1="2", setname="exitdrp"
numan-add:resulttable:custgrpid="T002", name="changesource",
resulttype="IP_SET_SOURCE_DMN", dw1="domainname1", setname="setSource", dw2="0", dw3="1"
numan-add:resulttable:custgrpid="T002", name="screen",
resulttype="IP SOURCE SCREEN", dw1="2", dw2="group1", dw3="setSource"
; Add result table entries for DRP step 2
numan-add:resulttable:custgrpid="T002", name="resultrsell",
resulttype="IP_ROUTE_SEL", dw1="1", dw2="group1", dw3="exitdrp",
setname="routeCall"
Worksheets

You can use the following worksheets to implement the DBR feature.

Provisioning worksheets

This section contains a worksheet for the provisioning components required for this feature. For worksheets covering the rest of the provisioning components in the VPGW Softswitch software, refer Cisco Virtual PGW 2200 (VPGW) Softswitch Release 9.9 Provisioning Guide.

<table>
<thead>
<tr>
<th>Table 22 Provisioning Worksheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>9001</td>
</tr>
</tbody>
</table>

Dial plan worksheets

This section contains worksheets for the dial plan components required for this feature. For worksheets covering the rest of the dial plan components in the VPGW Softswitch software, refer Cisco Virtual PGW 2200 (VPGW) Softswitch Release 9.9 Dial Plan Guide.

<table>
<thead>
<tr>
<th>Table 23 IP_SOURCE_SCREEN worksheet example</th>
</tr>
</thead>
<tbody>
<tr>
<td>CustgrpId</td>
</tr>
<tr>
<td>9001</td>
</tr>
</tbody>
</table>
### Table 24 IP_SET_SOURCE_DOMAIN worksheet Example

<table>
<thead>
<tr>
<th>CustgrpId</th>
<th>Result Type</th>
<th>DW1</th>
<th>DW2</th>
<th>DW3</th>
<th>Set Name</th>
<th>Digitstring</th>
</tr>
</thead>
<tbody>
<tr>
<td>9001</td>
<td>IP_SET_SOURCE_DOMAIN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 25 IP_DEST_TRANS worksheet example

<table>
<thead>
<tr>
<th>CustgrpId</th>
<th>Result Type</th>
<th>DW1</th>
<th>DW2</th>
<th>DW3</th>
<th>DW4</th>
<th>Set Name</th>
<th>Digitstring</th>
</tr>
</thead>
<tbody>
<tr>
<td>9001</td>
<td>IP_DEST_TRANS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 26 IP_ROUTE_SEL worksheet example

<table>
<thead>
<tr>
<th>CustgrpId</th>
<th>Result Type</th>
<th>DW1</th>
<th>DW2</th>
<th>DW3</th>
<th>Set Name</th>
<th>Digitstring</th>
</tr>
</thead>
<tbody>
<tr>
<td>9001</td>
<td>IP_ROUTE_SEL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TimesTen Database updates**

You can update a table in the TimesTen database in the following way.

- `db-bulkcp` is best suited to bulk loading new entries into the database. `db-bulkcp` supports adding entries only.
- `MML` import/export allows you to quickly insert, update, and delete table entries.
- `MML` commands, like `numan-add`, allow you to change the entries live on the database one at a time. This method is a simpler but slower.

**Load bulk data with `db-bulkcp` tool**

The `db-bulkcp` tool allows you to quickly add a large number of records to the TimesTen database.

The benefits of using `db-bulkcp` are

- The `db-bulkcp` tool is highly efficient; it can load 20 million ported numbers in less than an hour.
- `Db-bulkcp` is safer than `MML`. `MML` can accomplish the import/export function in a single transaction, but it might cause some serious problems due to the excessive data collected in the transaction log when there are a
huge number of entries to be imported. For this reason, db-bulkcp encapsulates 5000 rows as a single transaction.

Db-bulkcp can detect duplicate rows.

To load data into the TimesTen database, follow these steps:

**Note**  The rows preceded by # are for guidance only; you can keep these rows or delete them.

**Step 1** Prepare a file according to the format shown in the example.

```plaintext
##ttBulkCp
#
# CISCO.PORTEDNUMBERS, 4 columns
# columns:
#    1. CALLEDNUM    CHAR(20)
#    2. ROUTINGNUM   CHAR(20)
#    3. MINLENGTH    TINYINT
#    4. MAXLENGTH    TINYINT
# end
#
"123456789","444",0,0
"1234567890","555",5,12
"1234567891","5566",3,9
......
```

**Note** This file format does not include the type column used for MML import and export commands.

**Step 2** Use the following command to import the file:

```plaintext
# db-bulkcp import tablename filename
```

**Note** You can also export data by specifying export instead of import.

### Import and export with MML

You can import data in MML using the prov-add command. This method uses the following file format:

```plaintext
#type digitString routingNum minlength maxlength
1 124333    DFFF 5   12
3 124666    DEEE 5   12
```

**Note** A type value of 1 adds an entry; a value of 3 modifies an existing entry.

To import data with MML, use the following command:

```plaintext
mml> prov-add:files:name="TKGFile",file="<dir_name>/export_trkgrp.dat",action="import"
```

For more information about importing with MML, see the *Cisco Virtual PGW 2200 (VPGW) Softswitch Release 9.9 Provisioning Guide*.

### Translation Verification tool (callver)
The DBR feature modifies the Translation Verification Tool (callver) so that it supports domain-based calls. The following new fields are now available for domain-based (non-E.164) calls:

- Source username
- Source hostname
- Destination username

The following figure shows the modified Translation Verification Tool.
The Domain-Based Routing feature updates the Mini-parse Trace tool introduced in CSCsk32769. The tool has been modified to capture the following information:

**Mini-parse Trace Analysis tool**

The Domain-Based Routing feature updates the Mini-parse Trace tool introduced in CSCsk32769. The tool has been modified to capture the following information:
Glossary

Acronym Expansions

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2BUA</td>
<td>Back-to-back user agent</td>
</tr>
<tr>
<td>CDR</td>
<td>Call detail record</td>
</tr>
<tr>
<td>DBR</td>
<td>Domain-based routing</td>
</tr>
<tr>
<td>DNS</td>
<td>Domain name system</td>
</tr>
<tr>
<td>DTMF</td>
<td>Dual tone multi-frequency</td>
</tr>
<tr>
<td>DRP</td>
<td>Domain routing policy</td>
</tr>
<tr>
<td>GA</td>
<td>Generic analysis</td>
</tr>
<tr>
<td>LNP</td>
<td>Local number portability</td>
</tr>
<tr>
<td>MGC</td>
<td>Media gateway controller</td>
</tr>
<tr>
<td>RPID</td>
<td>Remote party ID</td>
</tr>
<tr>
<td>SIP</td>
<td>Session Initiation Protocol</td>
</tr>
<tr>
<td>URI</td>
<td>Universal resource identifier</td>
</tr>
<tr>
<td>URL</td>
<td>Universal resource locator</td>
</tr>
</tbody>
</table>

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