



Cisco ICM Software ICM-to-ICM Gateway User Guide

ICM Software Release 6.0(0)
September, 2004

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About This Guide

Purpose

This manual describes the ICM-to-ICM Gateway functionality that is part of Cisco's Intelligent Contact Management (ICM) software. It discusses ICM-to-ICM Gateway functionality, architecture, and call flows and provides step-by-step instructions for configuring ICM systems for ICM-to-ICM Gateway use.

Audience

This manual is intended primarily for system administrators who will be responsible for configuring ICM systems for ICM-to-ICM Gateway use.

Conventions

This manual uses the following conventions.

Format	Example
Boldface type is used for user entries, keys, buttons, and folder and submenu names.	Choose Edit > Find from the ICM Configure menu bar.
Italic type indicates one of the following: <ul style="list-style-type: none"> • A newly introduced term • For emphasis • A generic syntax item that you must replace with a specific value • A title of a publication 	<ul style="list-style-type: none"> • A <i>skill group</i> is a collection of agents who share similar skills. • <i>Do not</i> use the numerical naming convention that is used in the predefined templates (for example, persvc01). • <i>IF (condition, true-value, false-value)</i> • For more information, see the <i>Cisco ICM Software Database Schema Handbook</i>.
An arrow (>) indicates an item from a pull-down menu.	The Save command from the File menu is referenced as File > Save .

Organization

The manual is divided into the following chapters.

Chapter	Description
Chapter 1, “ICM-to-ICM Gateway Overview”	Provides an overview of ICM-to-ICM Gateway capabilities, gives examples of possible business uses, discusses ICM-to-ICM Gateway links and call flows, and states system requirements.
Chapter 2, “ICM-to-ICM Gateway Configuration”	Describes the configuration tasks that you need to perform on the Client ICM and the Server ICM in order to enable ICM-to-ICM Gateway functionality.

Other Publications

For additional information about Cisco Intelligent Contact Management (ICM) software, see the [Cisco web site](#) listing ICM documentation.

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:

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We categorize Cisco TAC inquiries according to urgency:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration. There is little or no impact to your business operations.
- Priority level 3 (P3)—Operational performance of the network is impaired, but most business operations remain functional. You and Cisco are willing to commit resources during normal business hours to restore service to satisfactory levels.
- Priority level 2 (P2)—Operation of an existing network is severely degraded, or significant aspects of your business operations are negatively impacted by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.
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<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco TAC website. Some services on the Cisco TAC website require a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to this URL to register:

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

If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco TAC website, you can open a case online at this URL:

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

If you have Internet access, we recommend that you open P3 and P4 cases online so that you can fully describe the situation and attach any necessary files.

Cisco TAC Escalation Center

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

Before calling, please check with your network operations center to determine the Cisco support services to which your company is entitled: for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). When you call the center, please have available your service agreement number and your product serial number.

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- 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 networking publications. Cisco suggests these titles for new and experienced users: *Internetworking Terms and Acronyms Dictionary*, *Internetworking Technology Handbook*, *Internetworking Troubleshooting Guide*, and the *Internetworking Design Guide*. For current Cisco Press titles and other information, go to Cisco Press online at this URL:

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- *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:

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- 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/le31/learning_recommended_training_list.html



ICM-to-ICM Gateway Overview

This chapter provides an overview of ICM-to-ICM Gateway. It discusses the following topics:

- Business uses for ICM-to-ICM Gateway
- The ICM-to-ICM Gateway link
- ICM-to-ICM Gateway call flows
- ICM-to-ICM Gateway fault tolerance capabilities
- ICM-to-ICM Gateway system and network configuration requirements

What is ICM-to-ICM Gateway?

ICM-to-ICM Gateway extends the ICM software capability by allowing agents to simultaneously post-route calls and supply additional call-related information to a second agent *on a different ICM*. This enables the initial agent to pass on gathered information without the customer's needing to repeat it to the second agent.

Following are some business scenarios where ICM-to-ICM Gateway functionality can be particularly useful.

- A customer calls the institutional department of a financial corporation for customer service assistance with a company-sponsored 401k. The customer then asks to be transferred to the retail department to obtain assistance with a personal account.

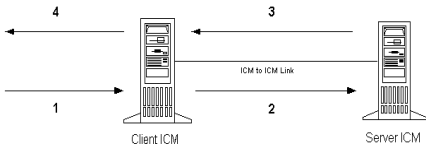
- Two corporations (for example, a bank and an insurance company), each of which has a contact center that uses an ICM, merge. It may often be desirable to transfer a call between the two companies; for example, to sell insurance to a bank customer.
- A customer calls a hotel to make a reservation. The hotel agent then asks the customer if he/she also needs to rent a car, and then transfers the customer to a car rental agent.
- A company uses an outsourcer to handle part of its overflow traffic. For example, the company service department handles paid support calls in-house but transfers warranty service requests to the outsourcer.
- A multi-national corporation encompasses several geographic regions; each geographic region has its own ICM.

In all these cases, ICM-to-ICM Gateway enables the call-related data to be transferred along with the call so the customer does not need to supply this information again.

ICM-to-ICM Gateway Call Flow

Figure 1-1 illustrates basic ICM-to-ICM Gateway call flow.

Figure 1-1 Basic ICM-to-ICM Gateway Call Flow



- Step 1** A Client ICM receives a request. This could be a pre-route request from a service provider network (in which case the routing client is a NIC) or a post-route request from an ACD/IVR (in which case the PG acts as the routing client)
- Step 2** The Client ICM executes a script. At some point the script initiates a route request to the other ICM, referred to as the Server ICM. At this point the Server ICM must find a destination label for the call.
- Step 3** The Server ICM executes a script to select a destination label for the call. The Server ICM handles this call as a normal route request, save for the fact that the routing client is another ICM and not a service provider network or an ACD/IVR. Once a destination label is selected the Server ICM sends it back to the Client ICM.
- Step 4** When the Client ICM receives the destination label from the Server ICM, it passes the label directly to the routing client that initiated the route request. This does not happen under script control, but is an automatic process.
-

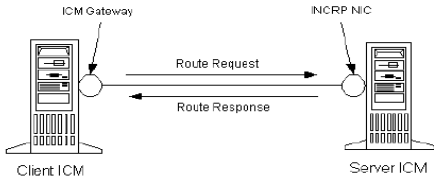
ICM-to-ICM Communication

The ICM-to-ICM Gateway link connects two ICMs through a Cisco proprietary protocol called INCRP (Intelligent Network Call Routing Protocol). Both ICMs have a component managing the connection.

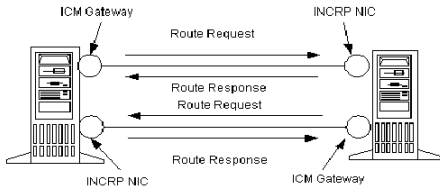
The component on the Client ICM is called an **ICM Gateway**. It sends the route requests and receives the responses (destination labels) from the Server ICM.

The component on the Server ICM is called an **INCRP Network Interface Controller (INCRP NIC)**. The NIC receives route requests and sends responses back to the requester. An ICM can have an INCRP NIC, as well as other types of NICs.

Both the ICM Gateway and the INCRP NIC are components that run on the Router machine, so no additional hardware is required.

Figure 1-2 ICM-to-ICM Link Components

The ICM-to-ICM link shown in [Figure 1-2](#) is a connection in one direction only. It allows the Client ICM to send route requests to the Server ICM, but not the other way around. It is possible to additionally reverse the roles of the ICMs as well, so that each ICM can send route requests to each other. In this case, each ICM needs an ICM Gateway and an INCRP NIC, as shown in [Figure 1-3](#).

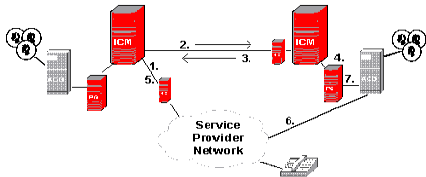
Figure 1-3 Bi-Directional ICM-to-ICM Link

INCRP supports direct connections between two ICMs only. ICMs that are not directly connected with an ICM-to-ICM link cannot send each other route requests through another ICM.

Pre-Routing

Figure 1-4 illustrates a call flow scenario for a call that is pre-routed from one ICM to another.

Figure 1-4 Example Pre-Routing Call Flow



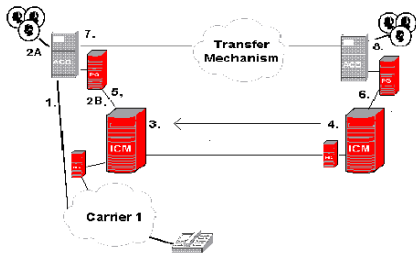
-
- Step 1** The Service Provider network sends a route request to the Client ICM.
- Step 2** The Client ICM receives the pre-route request and executes a routing script that determines that the route request should be handed to another ICM. The ICM forwards the route request to the Server ICM.
- Step 3** The Server ICM executes a script that selects a peripheral target for the call and sends the corresponding label back to the Client ICM.
- Step 4** If the selected target is reached using a translation route, the Server ICM sends the call context data to the selected peripheral, where it waits for the call to arrive. If translation routing is not used, this step is skipped.
- Step 5** The Client ICM receives the destination label from the Server ICM and forwards it to the network.
- Step 6** The network connects the call to the selected destination on the Server ICM ACD/Agent.

- Step 7** If this was a translation routed call, the ACD connected to the Server ICM requests the call detail information from the PG where it has been waiting since Step 4 and sends the call to an agent.

Post-Routing

Figure 1-5 illustrates a call flow scenario for a post-routed call transfer from one ICM to another.

Figure 1-5 Example Post-Routing Call Flow



- Step 1** A call terminates at an ACD that is connected to the Client ICM. This can be a pre-routed call or a call sent there without ICM control.
- Step 2** The agent initiates a post-route request in one of two ways:
- The agent transfers the call to a special number on the ACD, which prompts the ACD to issue a post-route request to the ICM.
 - The agent sends a call transfer request to the CTI Server (not shown). This transfer request should have the post-route flag set, so that a post-route request is issued to the ICM before transferring the call.

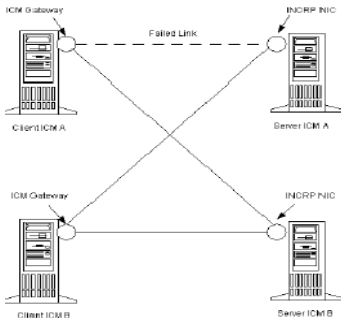
- Step 3** The Client ICM receives the post-route request along with the call context and runs a scheduled script for that call type.
- Step 4** The Server ICM selects a destination for the call and responds back to the Client ICM with the selected label. The Server ICM also returns the (possibly modified) call context to the Client ICM.
- Step 5** The Client ICM receives the label, attempts to validate it, and passes the label onto its routing client. If no label is received from the Server ICM (or the Server ICM is not online) the Client ICM provides a destination label and sends it to the routing client.
- Step 6** If the selected target was a peripheral target with an associated translation route, the Server ICM sends the translation route information to the PG, where the ACD waits until the call arrives at the ACD and the ACD retrieves the information from the PG (in step 7). If the selected target does not use a translation route, this step is skipped. In that case, the call context is still transferred to the Server ICM but it is not available for the receiving ACD, since it cannot be matched with the call.
- Step 7** The original PG and the ACD transfer the call to its destination. The PG sends the destination label to the ACD. The ACD uses that information to disconnect the agent who requested the call transfer and connects the incoming call leg to its destination using a tie line or public network trunk.
- Step 8** The ACD connected to the Server ICM receives the call, requests the call detail information from the PG if applicable, and sends the call to an agent.
-

Logical Connection Management and Fault Tolerance

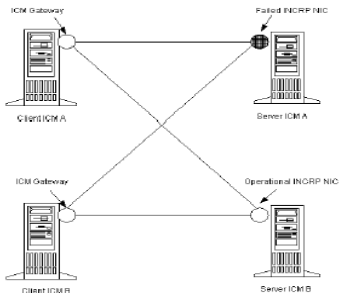
Because the ICM software is typically deployed as a synchronous duplex pair, the ICM-to-ICM Gateway is likewise deployed between ICM system pairs. This leverages the ICM software's fault tolerant architecture and keeps the synchronous router pairs in sync.

ICM-to-ICM Gateway addresses the following other possible points of failure as follows:

- In the case of a link failure, each INCRP NIC has a link to both ICM Gateway components. Each INCRP NIC can therefore maintain communications with the other ICM Gateway.



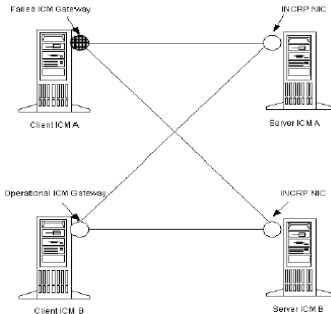
- If an INCRP NIC fails, the Client ICM's routers are synchronized and can communicate via the remaining INCRP NIC.



**Note**

If a link failure or a NIC failure occurs, calls that were in progress at the time of the failure may be lost.

- If an ICM-to-ICM Gateway fails, the Server ICM's routers are synchronized and can communicate via the remaining ICM-to-ICM Gateway.



For a full explanation of ICM Fault Tolerance, see the *Cisco ICM Enterprise Edition Administration Guide*.

ICM-to-ICM Gateway Requirements

The following are system requirements for ICM-to-ICM Gateway.

- Both Client ICM and Server ICM require ICM software version 4.5.1 or later. If two connected ICMs are running different versions of ICM software, only the ICM-to-ICM Gateway features supported by the lowest numbered version are available.

- An ICM communication network configuration that can support ICM-to-ICM Gateway. The Signaling Access Network (SAN) is strongly recommended, with the private network as an alternate if a SAN does not exist.

**Note**

See the *Cisco ICM Enterprise Edition Pre-installation Planning: Guide* for information about the Signaling Access Network and ICM communications network configurations.



ICM-to-ICM Gateway Configuration

This chapter includes instructions for the various tasks that you need to perform on the client and server systems in order for ICM-to-ICM Gateway to function correctly. For the Client ICM, these tasks include the following:

- Configuring an ICM Gateway process on the Router.
- Define Client ICM configuration data.
- Making the necessary script changes for sending pre-route or post-route requests to the Server ICM.
- Optionally, specifying a fixed local port number for the Network CIC process.
-

For the Server ICM, these tasks include the following:

- Installing and Configuring an INCRP NIC on the Router.
- Setting up the necessary translation route labels.
- Making the necessary script changes for returning calls and labels to the Client ICM.



Note

If you are implementing a bidirectional ICM-to-ICM Gateway link (see [Chapter 1, “ICM-to-ICM Gateway Overview”](#)), you need to perform Client side configuration and Server side configuration on **both** ICM systems.

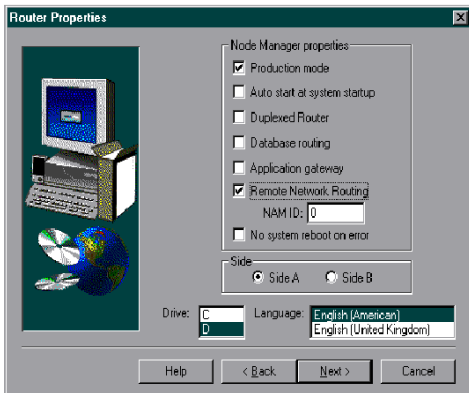
Client ICM Configuration

This section provides instructions for the configuration tasks you need to perform on the Client ICM.

Identify the Client for the Server

To identify the ICM Gateway Client for the ICM Gateway Server, run a full ICM Setup on the Client Router machine. For each ICM-to-ICM Gateway client, you must perform the following steps.

- Step 1** In the Router Properties screen, check the **Remote Network Routing** option box.



- Step 2** Specify a NAM ID (Client ICM ID) number in the **NAM ID** box provided.

- If this Client ICM is the only Client ICM that will be communicating with its associated Server ICM, accept the default of 0.
- If the associated Server ICM will be communicating with multiple Client ICMs, the NAM ID needs to be a unique number for each Client ICM in the configuration. In this case, it is recommended that you start NAM ID numbers from 0 and work upwards.

**Note**

Make a note of the NAM ID number that you specify for the client. You will need to specify this same NAM ID number during Server side configuration.

For more information on router installation, see the *Cisco ICM Enterprise Edition Installation Guide*.

Defining Client ICM Configuration Data

In a two-tier architecture, the Client ICM system requires only a subset of the normal ICM configuration data. [Table 2-1](#) summarizes the configuration data for a Client ICM.

Table 2-1 Configuration Data on a Client ICM

Table	Contents
Announcement	Any announcements used in Client ICM scripts.
Application Gateway	A remote ICM gateway for each instance on each associated Server ICM.
Business Entity	The default business entity only.
Call Type	Typically, one for each instance.
Call Type Map	Associate each Client ICM call type with a Client ICM script.
Dialed Number	All dialed numbers used on associated Server ICMs, plus those used for direct translation. (No default routes are defined for Client ICM dialed numbers.)

Table 2-1 Configuration Data on a Client ICM

Table	Contents
Dialed Number Map	Associates dialed numbers and calling line IDs with Client ICM call types.
Label	All labels that can be returned by associated Server ICMs, plus those used for direct translation.
Network Interface Controller	One required for the Network Interface Controller to the carrier network.
Peripheral Gateway (PG)	One or more for the Peripheral Gateway to the carrier network.
Prefix	Any prefixes used in Client ICM regions.
Region	Any regions used in Client ICM dialed number map.
Routing Client	One or more for the carrier network.
Script	One or more for each call type.

The Client ICM needs only a limited configuration (dialed numbers, labels, basic routing scripts, etc.) while the instance-specific scripts, configuration, real-time, and historical data are stored on the Server ICM.

To set up your Client ICM configuration, run Configuration Manager on a Client ICM Admin Workstation.

For instructions on using Configuration Manager, see the *Cisco ICM Enterprise Edition Configuration Guide*.

Create or Configure the Gateway Process on the Router

An Application Gateway process must be configured on the Client ICM for each Server ICM that the Client ICM is going to communicate with.

Configuring A New Gateway

If you need to configure a new Application Gateway, perform the following steps.

- Step 1** From the ICM Configuration Manager on an Admin Workstation associated with the Client ICM, select **Calls > Application Gateway > Application Gateway List**. The Application Gateway List window appears.
- Step 2** Click **Retrieve**.
- Step 3** Click **Add**. The Attributes tab appears.

The screenshot shows the 'Application Gateway List' window. It has a title bar with the text 'Application Gateway List' and standard window controls. The window is divided into several sections:

- Select filter data:** A section with three dropdown menus labeled 'Optional Filter', 'Condition', and 'Value', all currently set to 'None'. Below these are three buttons: 'Save', 'Retrieve', and 'Cancel filter changes'.
- Application Gateway:** A list box with a single entry 'Name' and a '+' icon to its left. Below the list are three buttons: 'Add', 'Delete', and 'Play'.
- Attributes:** A section with two tabs: 'Connection Side A' and 'Connection Side B'. The 'Connection Side A' tab is active. It contains several fields:
 - Name: A text input field.
 - Application gateway ID: A text input field containing '0'.
 - Type: A dropdown menu set to 'Remote ICM'.
 - Preferred side: A dropdown menu set to 'Side A'.
 - Encryption: A dropdown menu set to '<None>'.
 - Fault tolerance: A dropdown menu set to '<None>'.
 - Connection: A dropdown menu set to 'Duplex'.
 - Description: A text input field.
- Buttons:** At the bottom right of the window are three buttons: 'Save', 'Close', and 'Help'.

At the bottom left of the window, the text 'ICM Instance: oust1' is visible.

- Step 4** Specify the following values on the Attributes tab:
- **Name.** Enter a name for the ICM Gateway.
 - **Type.** Choose **Remote ICM**.
 - **Preferred Side.** Indicates the preferred side of the Gateway to use when both are available. If only one side is available, ICM software uses that side regardless of preference.
 - **Encryption.** Indicates whether requests to the Application Gateway are encrypted. Choose **None**.
 - **Fault Tolerance.** If the Application Gateway is duplexed, specifies the fault-tolerance strategy it uses. Choose **None**.
 - **Connection.** Choose whether the Gateway is Duplex (has both a Side and Side B connection), Simplex A (only has a Side A), or Simplex B (only has a Side B).
 - **Description.** (Optional.) Additional information about the gateway.

- Step 5** Click the **Save** button to create the gateway.



Note Make a note of the Application Gateway ID value, as you will need it when you run Setup to configure the INCRP NIC on the Server ICM.

- Step 6** To set the connection information, click on the **Connection Side A** tab or the **Connection Side B** tab.
- Step 7** To specify an address, click on the **Enter Address** button. The Enter NAM Addresses dialog box appears.

Enter NAM Addresses

NAM Mode

Single NAM Multiple NAMs

Address

IP Address/Name Instance Number Side

0 None

Address List

IP Address/Name	Instance Number	Side	NAM ID
-----------------	-----------------	------	--------

Add Update Remove

OK Cancel Help

Step 8 Specify the following information:

- **NAM Mode.** Select Single NAM.
- **IP Address/Name.** Enter the high priority IP address of the Server ICM. (Normally this is the public IP address, but if no public address is available, use the high priority private IP address.) This address *must* be the same address specified for the INCRP NIC on the targeted system. (You may use the hostname in place of the address.)
- **Instance Number.** Enter the number of the customer ICM on the Server ICM (0 through 24).
- **Side.** Indicate which side of the Client ICM prefers this connection:
 - **Side A.** Client ICM Side A prefers to use this connection.
 - **Side B.** Client ICM Side B prefers to use this connection.
 - **None.** Neither side of the Client ICM prefers to use this connection.

- **Both Side A and B.** Both sides of the Client ICM prefer to use this connection.



Note Consider network traffic in choosing this value. For example, if one side of the Client ICM is co-located with only one side of the Server ICM, you can make that the preferred connection in order to avoid unnecessary WAN traffic to the other side.

- Step 9** When finished, click **Save** to save the changes.

The bottom half of the ConnectionSide A and Connection Side B tabs display a number of timeout and limit values. Accept the defaults for these values.

Configuring an Existing Gateway

If the gateway process is already present on the Router, perform the following steps to configure it for ICM-to-ICM Gateway use.

- Step 1** Bring up the **Calls > Application Gateway > Application Gateway List** screen.

Select filter data

Optional Filter: None Condition: Value

Save Retrieve Cancel filter changes

Application Gateway

Name

Add Delete Reset

Attributes | Connection Side A | Connection Side B

Name *

Application gateway ID 0

Type * Remote ICM

Preferred side Side A

Encryption * <None>

Fault tolerance * <None>

Connection Duplex

Description

Save Close Help

ICM Instance: out1

- Step 2** Click **Retrieve**.
- Step 3** From the Application Gateway list, make note of the Application Gateway IDs number(s) for the server system(s). You will need to specify these Application Gateway ID number(s) during Server side configuration.
- Step 4** Configure the Connection Side A and Connection Side B tabs as needed. See the *Cisco ICM/IP Contact Center Software Enterprise Edition Scripting and Media Routing Guide* for instructions.
- Step 5** Bring up the **Enterprise > System Information** Screen.

- Step 6** In the Application Gateway section, click on **Remote ICM**. Accept the default values for the remaining fields on all tabs.

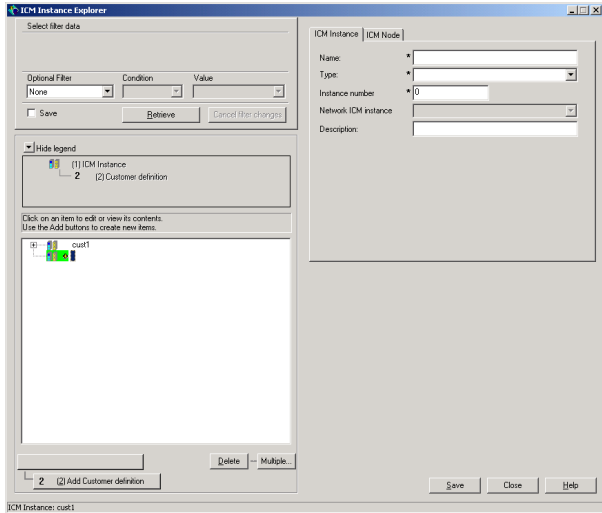
The screenshot shows the 'Application Gateway' configuration window. On the left, there are two radio buttons: 'Custom gateway' (unselected) and 'Remote ICM' (selected). To the right, there is a tabbed interface with four tabs: 'Timeout', 'Sessions', 'Heartbeats', and 'Errors'. The 'Timeout' tab is active, displaying three input fields with default values and units:

Field	Value	Unit
Request	500	milliseconds
Abandon	5000	milliseconds
Late	400	milliseconds

Configuring ICM Instances on the Client ICM

Perform the following steps *on the Client ICM system* to configure the associated Server ICM instance.

- Step 1** Start **Configuration Manager** from the **ICM Admin Workstation** group. The Configuration Manager window opens.
- Step 2** Open the ICM Instance List tool (**Enterprise > ICM Instance > ICM Instance Explorer**). The ICM Instance List window appears.
- Step 3** Click the **Retrieve** button.
- Step 4** Click the **Add ICM Instance** button.



Step 5 Specify the following on the ICM Instance tab:

- **Name.** The enterprise name for the Client ICM instance, as used in Setup.
- **Type.** (Drop-down list.) Select Network ICM.
- **Instance Number.** The instance number as defined in Setup.
- **Description.** (Optional.) Additional information about the ICM Instance.

Step 6 Click **Save**.

- Step 7** Click the **Add ICM Instance** button.
- Step 8** Specify the following on the ICM Instance tab:
- **Name.** The enterprise name for the Server ICM instance, as used in Setup.
 - **Type.** (Drop-down list.) Select Customer ICM.
 - **Instance Number.** The instance number as defined in Setup.
 - **Network ICM Instance.** (Drop-down list.) The associated Client ICM instance configured in Step 5.
 - **Description.** (Optional.) Additional information about the ICM Instance.
- Step 9** Click **Save**.
-

Client Script

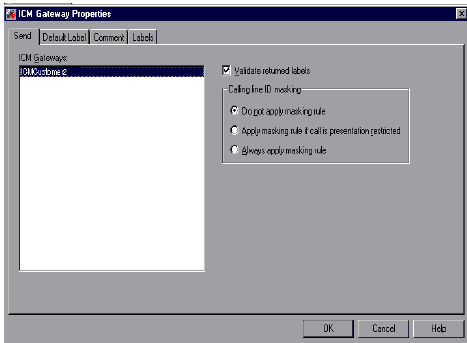
Typically, the client ICM originally receives the call and pre-routes it to an ACD. The call is then post-routed to a peripheral associated with the server system. The client determines the label associated with the server's peripheral by requesting the label from an ICM Gateway node in a script.

From the Script Editor, you can specify a local definition of the label that the ICM Gateway node returns. Perform the following steps:

-
- Step 1** Right click on the ICM Gateway node.



- Step 2** From the pop-up menu that appears, choose **Properties**. The ICM Gateway dialog box appears.



- Step 3** From the list, select the gateway to the ICM system to which you want to send the request.
- Step 4** Check the **Validate Returned Labels** check box if you want the Client ICM to validate the label that the Server ICM returns before passing it to the routing client. If the Server ICM is returning a dynamic label (an expression the Server ICM CallRouter converts to a character string and returns to the routing client as a label), do not check this box.
- Step 5** On the **Default Label** tab, specify a default label to be used if the Server ICM returns an invalid label.
- Step 6** Click **OK**.

Specifying a Fixed Local Port Number for the NetwrkCIC Process

In an ICM to ICM Gateway implementation, the NetwrkCIC process is a part of the Client ICM Router installation that manages the ICM Gateway. By default, the IP port used in the NetwrkCIC process for the public network communication to the Server ICM INCRP NIC process is selected dynamically at runtime.

ICM processes use IP port numbers between 39000 and 50000. If the NetwrkCIC port number selected is in this range, use the following formula to obtain the number for side A of a duplexed system

$$\text{Port number} = 40000 + (i * 40) + 33$$

where i is the instance number of an ICM instance. To find out the instance number, run the local setup program, select an instance and click the edit button. The “Edit Instance” dialog box will display the instance number.

For instance number 0, the port number will be 40033.

For side B, the port number is obtained by adding 1000 to the above number. This formula is intended to be stable. However, there is no guarantee that the formula will not change.

This dynamic port allocation is an issue for some ICM customers. You can *optionally* modify the NetwrkCIC process to use a specific port number. If a specific port number is provided in the registry of the Client ICM machine, the NetwrkCIC process will instead bind to that port number when communicating with the server INCRP NIC process.

To specify this port number, add the following registry entry on the Client ICM machine:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Cisco Systems, Inc.\ICM<instance name>\Router{A,B}\CIC\CurrentVersion\Configuration\CIC Public LAN IP Port
```

Specify this entry as a DWORD type.

This registry entry is not managed by the ICM Setup program. Therefore if you upgrade ICM software later, you must add the registry entry again.

If the registry entry is not present, the NetwrkCIC process uses the port dynamically allocated as usual.

If you change the port number while the NetwrkCIC process is running, you must restart the ICM router service for it to take effect.

Server Configuration

This section provides instructions for the configuration tasks you need to perform on the Server ICM.

Defining and Configuring the INCRP NIC

To set up the INCRP NIC for each instance on the Server ICM, you must perform the following tasks:

- Install the INCRP NIC, if you have not already done so
- Define the INCRP NIC using the NIC Explorer tool
- Add INCRP NIC information using ICM Setup

Installing the INCRP NIC

If you need to install the INCRP NIC, see the *Cisco ICM Enterprise Edition Installation Guide* for guidelines and procedures. Depending on your network interface, you may need to perform the following additional tasks:

- Set up the NICs in Setup's Device Management Protocol Properties dialog box.
- Enable a DMP device on the Server ICM for each physical controller (A through H).

How to Define the INCRP NIC

-
- Step 1** Within the ICM Admin Workstation group, double-click AW Select. The Select ICM AW Service window appears.
 - Step 2** Select the instance you will be configuring.
 - Step 3** From the ICM Configuration Manager, invoke the NIC Explorer tool. The NIC Explorer window appears.
 - Step 4** In the Select filter data box, click **Retrieve**. This enables the Add NIC button.
 - Step 5** Click **Add NIC**. A new NIC and its routing client display in the tree window. Next to each is a *To Be Inserted* icon.

On the right of the tree window, tabbed fields also display the new NIC's and routing client's configuration information.

Step 6 Enter the following in the Logical Interface Controller tab fields:

- **Name.** A name that will serve as the NIC name. The name can be up to 32 characters. The valid characters are upper-case and lower-case letters, digits, periods (.) and underlines (_). The first character of the name must be a letter or digit.
- **Client Type.**(Drop-down list.) The type of routing client serviced by the NIC. Select **INCRP**.



Note Selecting a type of routing client automatically places that type's default values in the Routing Client's Timeout Threshold, Late Threshold, Timeout Limit, Use DN/Label Map, and Client Type fields.

Logical Interface Controller | Physical Interface Controller

Controller ID: ★ UNASSIGNED

Name: ★

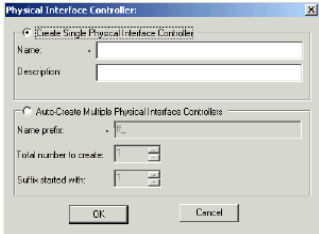
Client type: ★

Configuration parameters:

Description:

Add Physical Interface Controller

Step 7 Click the **Add Physical Interface Controller** button. The Physical Interface Controller dialog box appears.



Step 8 In the Create Single Physical Interface Controller section, specify an **Enterprise Name** and, optionally, a **Description**.

Step 9 Click **OK**. The Physical Interface Controller tab appears, displaying the information you specified, and an ID value of UNASSIGNED.

Step 10 Enter the following information in the Routing Client tab fields:

- **Name.** A name that will serve as the NIC Routing Client name. The name can be up to 32 characters. The valid characters are upper-case and lower-case letters, digits, periods (.) and underlines (_). The first character of the name must be a letter or digit.
- **Timeout threshold.** The maximum time, in milliseconds, the routing client can wait for a response to a routing request. The NIC sends a default response slightly before this threshold.
- **Late threshold.** A threshold value, in milliseconds, for classifying responses as late. Any response that exceeds this threshold is considered late even if it does not exceed the Timeout Threshold.
- **Timeout limit.** The maximum time, in seconds, for which the routing client waits for a response. This is the maximum time the routing client will tolerate consecutive response timeouts before it stops sending requests to the ICM software. If the routing client receives no responses from the ICM software within this limit, it terminates routing operation.

- **Client Type.**(Drop-down list.) The type of routing client that ultimately routes the call on the requesting ICM system. This should match the type of NIC running on the Client ICM.

Routing Client	
Routing client ID:	* 5000
Name:	* INCRP_1_RC
Timeout threshold:	* 1000
Late threshold:	* 500
Timeout limit:	* 10
Default call type:	NONE
Configuration parameters:	
Use DN/Label map:	<input type="checkbox"/>
Client type:	* CRSP
Description:	
Network routing client:	
Default media routing domain:	NONE

- Step 11** Click **Save**. The newly defined NIC is saved in the database, a Physical Controller ID is assigned, and the *To Be Inserted* icon is removed from the tree window.



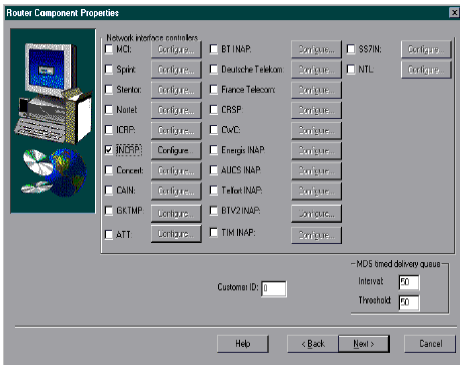
Note Make a note of the Physical Controller ID value. You need this value to set up the INCRP NIC on the CallRouter. If the NIC is duplexed, you need both Physical Controller ID values.

- Step 12** Click **Close** to exit the NIC Explorer.

Configuring the INCRP NIC in ICM Setup

To configure the INCRP NIC on the Server ICM, run ICM Setup and edit the Router from the Server Router machine (rather than from the installation CD). Perform the following steps.

- Step 1** On the Router Component Properties screen, click the **INCRP** check box.



- Step 2** Click on the **Configure** button. The INCRP NIC Properties screen appears.

INCRP NIC Properties

Network Interface Controller properties:

Physical controller: IP name: Handshake timeout:

Client ICM

Enable	Description	Client Id	AppGatewayId	Side A address	Side B address
<input checked="" type="checkbox"/>	First pair	0	0	0.0.0.0	0.0.0.0
<input type="checkbox"/>		0	0	0.0.0.0	0.0.0.0
<input type="checkbox"/>		0	0	0.0.0.0	0.0.0.0
<input type="checkbox"/>		0	0	0.0.0.0	0.0.0.0
<input type="checkbox"/>		0	0	0.0.0.0	0.0.0.0
<input type="checkbox"/>		0	0	0.0.0.0	0.0.0.0
<input type="checkbox"/>		0	0	0.0.0.0	0.0.0.0
<input type="checkbox"/>		0	0	0.0.0.0	0.0.0.0
<input type="checkbox"/>		0	0	0.0.0.0	0.0.0.0
<input type="checkbox"/>		0	0	0.0.0.0	0.0.0.0
<input type="checkbox"/>		0	0	0.0.0.0	0.0.0.0

OK Cancel Help

ICM Setup supports a maximum of ten clients.

- Step 3** In the Network Interface Controller section of this screen, ensure that the value for Physical Controller matches the Physical Controller ID value that was assigned to the NIC when you defined the NIC (see the previous section, [“Installing the INCRP NIC”](#)).
- Step 4** In the Client ICM section of this screen, enter the following information for each client for which this system is a server.
- **Enable.** Check the **Enable** box to enable the client.
 - **Description.** Enter a description of the client (optional).
 - **Client ID.** Enter the same value that you entered for NAM ID during client machine router setup on the Router Properties screen (see the section entitled [“Identify the Client for the Server”](#)).

- **Application Gateway ID.** Enter the application gateway ID. This **must** match the application gateway ID as shown on the Calls > Application Gateway All list screen (see the section entitled “[Create or Configure the Gateway Process on the Router](#)”).
- **Side A Address, Side B Address.** If you are using the Signaling Access Network, enter the Signaling Access Network IP address for the client. Otherwise, enter the Public Network IP address.

Step 5 Click OK.

Setting Up Translation Route Labels

From the ICM-to-ICM Gateway server's point of view it is doing a translation route to one of its peripheral targets. When you set up a translation route on the Server ICM, you must set up a label for the original routing client for a call to access each of the peripheral targets associated with the translation route. For example, if the routing client is an interexchange carrier (IXC), you must set up a label to the targets with the IXC. This allows the call to be initially sent to the translation route at the peripheral.

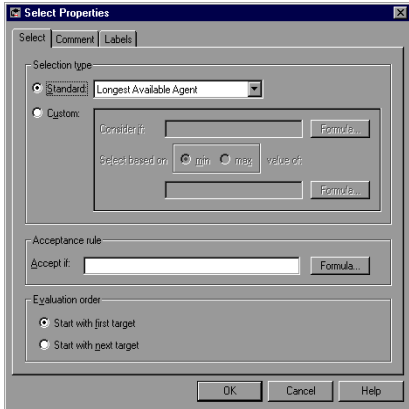
For instructions on how to run Translation Route Wizard and how to define translation route labels, see the *Cisco ICM Enterprise Edition Configuration Guide*.

Modifying Routing Scripts

The server has a script that handles requests from the client. The script is associated with a call type, which is in turn defined by the dialed number, calling line id, and caller entered digits.

From the Script Editor, you can specify the label that the server script returns to the client. For example, you could create a Select node that routes calls to specified services under certain conditions. Perform the following steps.

-
- Step 1** From Script Editor, connect the Select node to a Service node.
- Step 2** Right click on the Select node and choose Properties. The dialog box appears.



Step 3 Specify the criteria for selecting services.



Note

You can specify the label that the server script returns from other Script Editor nodes, such as the Label node. See the *Cisco ICM/IP Contact Center Software Enterprise Edition Scripting and Media Routing Guide* for more information.



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