



ICM-to-ICM Gateway Overview

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ICM-to-ICM Gateway

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

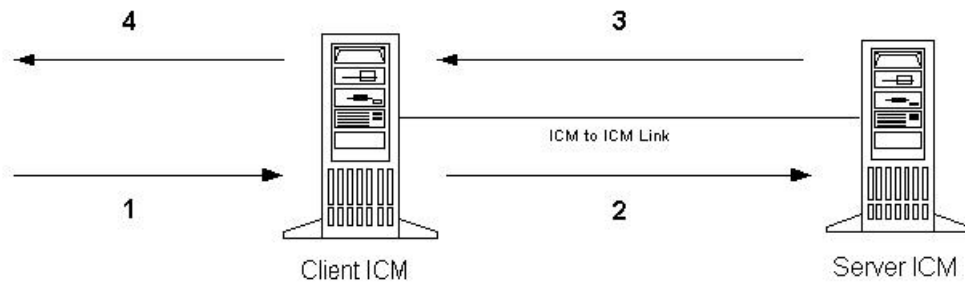
Following are some business scenarios where ICM-to-ICM Gateway functionality can be useful:

- 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 companies merge (for example, a bank and an insurance company), each of which has a contact center that uses Unified CCE. The corporation can use the ICM-to-ICM Gateway 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 asks whether they also want to rent a car, and then transfers the calls 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 multinational corporation encompasses several geographic regions; each geographic region has its own Unified CCE.

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

The following figure illustrates basic ICM-to-ICM Gateway call flow:



1. A Client ICM receives a request. This request 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)
2. The Client ICM executes a script. At some point, the script begins a route request to the other Unified CCE, referred to as the Server ICM. The Server ICM must find a destination label for the call.
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.
4. When the Client ICM receives the destination label from the Server ICM, it automatically passes the label directly to the routing client that initiated the route request.

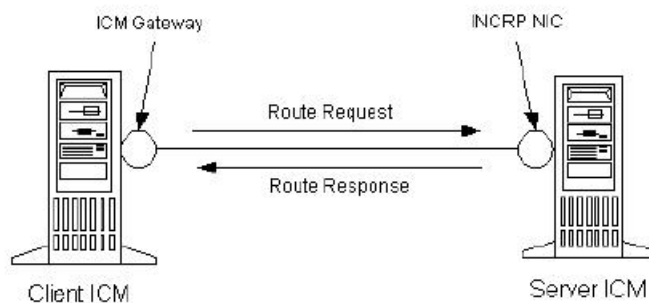
ICM-to-ICM Communication

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

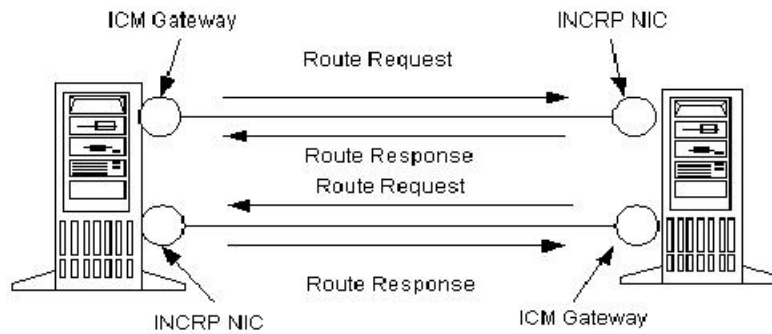
The component on the Server ICM is called an **INCRP Network Interface Controller (INCRP NIC)**. The NIC receives route requests and sends responses back to the requester. An ICM can have an INCRP NIC, as well as other types of NICs.

Both the ICM Gateway and the INCRP NIC run on the CallRouter, so no additional hardware is required.



The ICM-to-ICM link 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 Unified

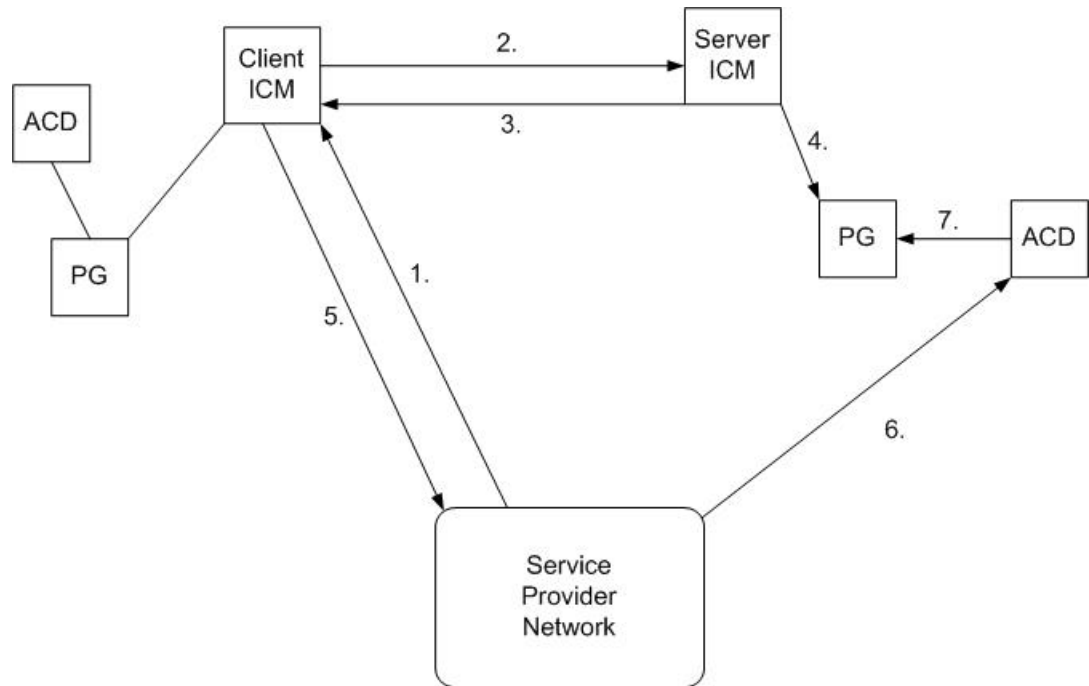
CCEs as well, so that each ICM can send call requests to each other. In this case, each Unified CCE needs an ICM Gateway and an INCRP NIC, as shown in the following figure.



INCRP only supports direct connections between two ICMs. Unified CCE instances that are not directly connected with an ICM-to-ICM link cannot send call requests through another ICM.

Pre-routing

The following figure illustrates a call flow scenario for a call that is pre-routed from one ICM to another.

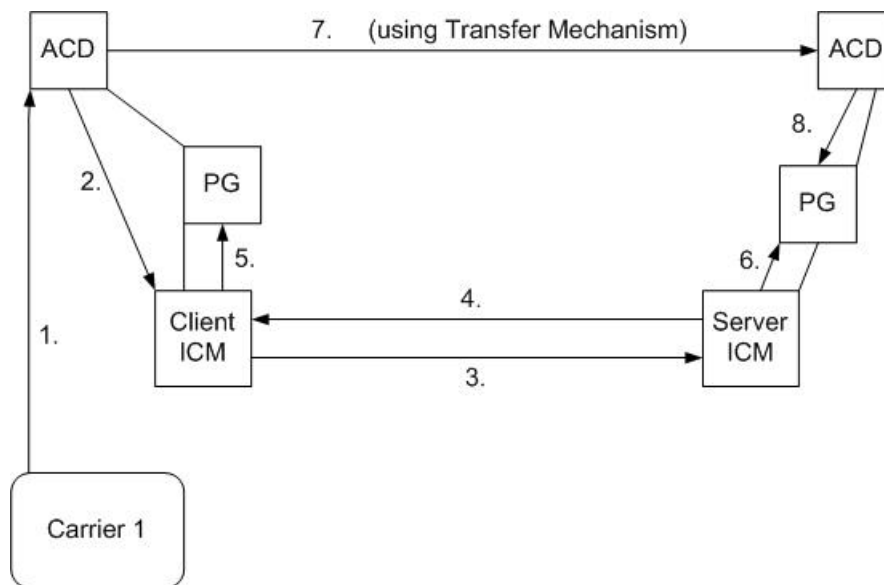


1. The Service Provider network sends a route request to the Client ICM.
2. The Client ICM receives the pre-route request and executes a routing script that determines that another Unified CCE instance must handle the route request, and forwards the route request to the Server ICM.
3. The Server ICM executes a script that selects a peripheral target for the call and sends the corresponding label to the Client ICM.

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.
5. The Client ICM forwards the destination label (that it received in Step 3) to the network.
6. The network connects the call to the selected destination on the Server ICM ACD/Agent.
7. If this call 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

The following figure a call flow scenario for a post-routed call transfer from one ICM to another.



1. A call terminates at an ACD that is connected to the Client ICM. This call can be a pre-routed call or a call sent without ICM control.
2. The agent begins 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 Client ICM.
 - The agent sends a call transfer request to the CTI Server (not shown). This transfer request must have the post-route flag set, so that a post-route request is issued to the Client ICM before transferring the call.



Note Network transfers do not work across instances. You cannot perform a Network Transfer from one Customer ICM instance to another Customer ICM instance, even if you have a mesh configuration. With a mesh configuration, you can only perform a local transfer within your ICM instance. For example, if one side of the Client ICM is co-located with only one side of the Server ICM, you can set the co-located instance as a preferred connection in order to avoid unnecessary WAN traffic to the other side.

While the ICM Gateway works regardless of the Routing Client type, the NICCallID data is only provided if the original Routing Client can perform a network transfer. Since Peripheral Gateways are not capable of performing network transfers, in this case the NICCallID field is not meaningful. In addition, the NICCallID has no bearing on the pre-route, it is only used during the post-route phase.

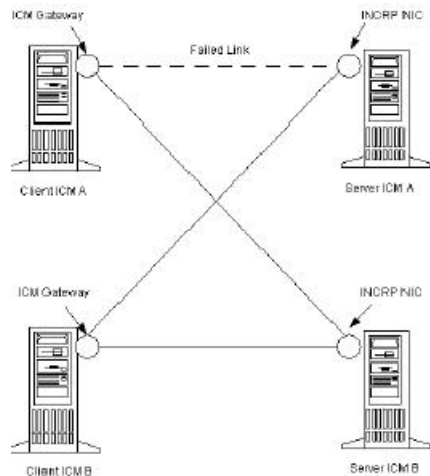
3. The Client ICM receives the post-route request along with the call context and runs a scheduled script that determines that the Server ICM must handle the route request. The Client ICM forwards the route request to the Server ICM.
4. The Server ICM selects a destination for the call and responds back to the Client ICM with the selected label. The Server ICM also returns the (possibly modified) call context to the Client ICM.
5. After receiving the label, Client ICM can validate (if enabled in the Remote ICM Script Node), and then pass the label onto its routing client (the PG in this case). 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.
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 8). 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.
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.
8. If this call is a translation route call, the ACD connected to the Server ICM receives the call, requests the call detail information from the PG (where it has been waiting since Step 6), and sends the call to an agent.

Logical Connection Management and Fault Tolerance

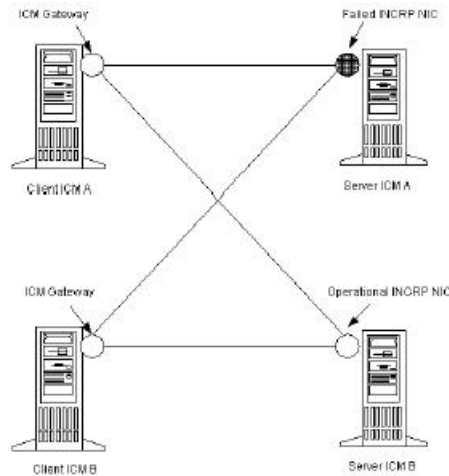
Because the Unified CCE is typically deployed as a synchronous duplex pair, the ICM-to-ICM Gateway is likewise deployed between Unified CCE pairs. This deployment leverages the Unified CCE fault-tolerant architecture and keeps the synchronous CallRouter pairs in sync.

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.

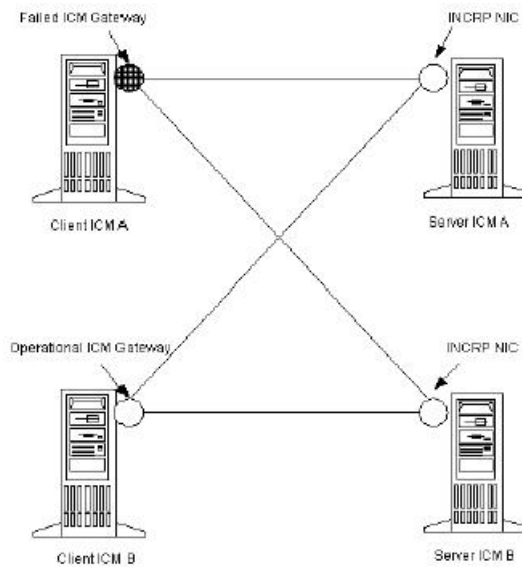


- If an INCRP NIC fails, the Client CallRouters are synchronized and can communicate via the remaining INCRP NIC.



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 CallRouters on the Server ICMs are synchronized and can communicate via the remaining ICM-to-ICM Gateway.



Note For a more complete discussion of Unified CCE Fault Tolerance, refer to the *Solution Design Guide for Cisco Unified Contact Center Enterprise* at <https://www.cisco.com/c/en/us/support/customer-collaboration/unified-contact-center-enterprise/products-implementation-design-guides-list.html> and the *Serviceability Guide for Cisco Unified ICM/Contact Center Enterprise* at <https://www.cisco.com/c/en/us/support/customer-collaboration/unified-contact-center-enterprise/products-installation-and-configuration-guides-list.html>

ICM-to-ICM Gateway Requirements

Both the Client ICM and Server ICM must be supported releases of ICM, and they must be within one major version of each other. If two connected ICMs are running different releases of ICM software, only the ICM-to-ICM Gateway features supported by the lowest numbered release are available.

Refer to the *Unified Contact Center Enterprise (Unified CCE) Software Compatibility Guide* for more information.

