

Cisco Unified ICM ACD Supplement for Alcatel 4400

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Preface

Purpose

This document contains the specific information you need to maintain an Alcatel 4400 Peripheral Gateway (PG) in a Cisco Unified Intelligent Contact Management (Unified ICM) environment. It is intended to be used as the Alcatel 4400-specific companion to the Cisco Unified ICM documentation set.

While other Unified ICM documents (for example, the *Configuration Guide for Cisco Unified ICM/Contact Center Enterprise and Hosted*, and the *Scripting and Media Routing Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*) cover general topics such as configuring an overall Unified ICM and writing scripts to route contact center requests, the *ACD Supplement for Alcatel 4400* provides specific information on configuring an Alcatel 4400 PG by making any necessary adjustments to the Alcatel Call Center Distributor (CCD) configuration.

Audience

This document is intended for system managers. The reader should understand Unified ICM functions as described in the *Installation and Setup Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*, *Configuration Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*, and *Scripting and Media Routing Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*. The reader should also have specific knowledge of the Alcatel 4400 ACD.

Organization

Chapter 1, “Overview”

Provides an overview of ACD interface and hardware and software requirements.

Chapter 2, “ACD Configuration”

Describes items in the Alcatel 4400 configuration that must be checked to ensure compatibility with the Unified ICM.

Chapter 3, “Unified ICM Configuration”

Provides information about setting up connections for the Alcatel 4400 ACD with the Peripheral Gateway.

Chapter 4, “Post-Routing”

Describes the features of Unified ICM Post-Routing available with the Alcatel 4400 PG.

Appendix A, “Procmon Commands”

Describes some of the commands accessible for the PIM through *procmon*.

Appendix B, “Troubleshooting Tips”

Gives a couple of troubleshooting scenarios with the Alcatel 4400 ACD.

Typographic Conventions

This manual uses the following conventions:

- Boldface type is used for emphasis; for example:
Real-time information **is not** stored in the central database.
- Italic type indicates one of the following:
 - A newly introduced term; for example:
A skill group is a collection of agents who share similar skills.
 - A generic syntax item that you must replace with a specific value; for example:
IF (condition, true-value, false-value)
 - A title of a publication; for example:
For more information see the *Installation and Setup Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*.
- Sans serif type with small caps is used to represent keys on your keyboard; for example:
Press the SHIFT key to select a range of items.
- An arrow (→) indicates an item from a pull-down menu. For example, the Save command from the File menu is referenced as File→Save.

Other Publications

For more information on Unified ICM, see the following documents:

- *Administration Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*
- *Installation and Setup Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*
- *Configuration Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*
- *Scripting and Media Routing Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*

For information on Cisco Network Applications Manager (NAM), see the following documents:

- *Product Description Guide for Cisco Unified ICM Hosted*
- *Setup and Configuration Guide for Cisco Unified ICM Hosted Edition*
- *Multiple-NAM Setup and Configuration Guide for Cisco Unified ICM Hosted*

Obtaining Documentation, Obtaining Support, and Security Guidelines

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[Hhttp://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html](http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html)

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1 Overview

The Alcatel 4400 PG connects to the Alcatel 4400 ACD via an Ethernet connection. Alcatel also provides a TCP server port 2555 for CSTA connection between the 4400 CCD and telephony applications. Primarily, a single TCP link provides all of the information required by the Alcatel PIM for successful Unified ICM monitoring and routing.

1.1 ACD Interface Requirements

The Alcatel 4400 PG requires an Ethernet connection to the Alcatel 4400 ACD. It must be on the same LAN segment as the 4400 for performance reasons, like reducing latency in messages, etc. If the PG is duplexed, then a second Ethernet connection on the LAN will be required.

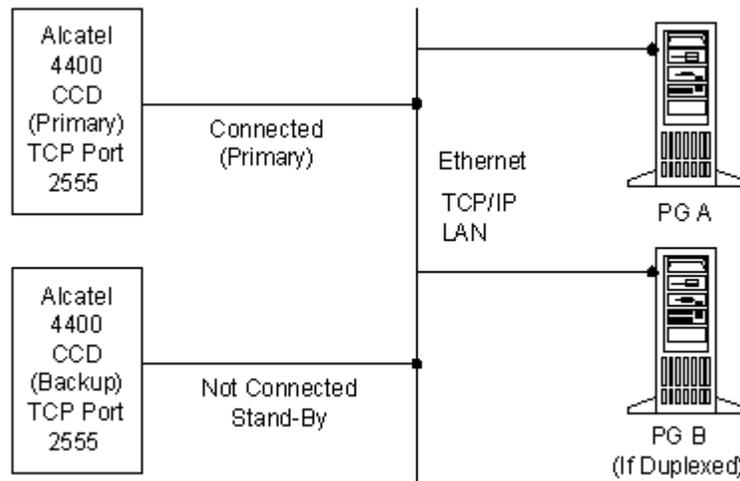


Figure 1: Alcatel 4400 Hardware Configuration

Alcatel provides a **TCP server port 2555** for CSTA connection over an Ethernet link between the 4400 CCD and telephony applications. This single link provides all of the information required by the Alcatel PIM for successful Unified ICM monitoring and routing. There can also be a Standby 4400 that won't be utilized unless the primary 4400 fails, drops the link, or if some other detectable failure occurs.

The Alcatel PG supports duplexing if desired by the customer. If duplexing is utilized, only one PG is active (and connected to the 4400) at any given time. When a failure occurs, the standby PG goes active.

1.2 Hardware and Software Requirements

1.2.1 Software Versions

The 4400 PG requires the 4400 to be running CCD software with CSTA-2 support. The software must be:

- Business release 2.1, and binary release B3.513.42 or higher.
- Business release 3.0, and binary release C3.530.11.G or higher.
- Business release 3.2, and binary release C1.706.11 with ACD/CCD Version 4.4.46.7.
- Business release 4.2, and binary release D2.304.4L with ACD/CCD Version 4.4.75.11.

The two major business releases supported are Business Release 2.1, and Business Release 3.x. The major difference between them is with Release 3.x; no events are received for a monitored Agent until the Agent is/has-gone idle. In version 2.1, events for an Agent or calls are received as soon as the monitor is done. Version 3.x also supports Statistical Pilots. SendDTMF, a CSTA Service is also supported in Release 3.x. Business Release 4.2 changes the internal architecture of the CSTA server on the switch but does not require any special configuration changes on the Unified ICM.

Business Release 2.x

When running Business Release 2.x, the checkbox titled ‘No Events Received For Calls In Progress’ in the PIM properties dialog box during setup must be **UNCHECKED**.

Note: SendDTMF is **not** supported in Alcatel Business Release 2.x.

Business Release 3.x, 4.x

When running Business Release 3.x or 4.x, the checkbox titled ‘No Events Received For Calls In Progress’ in the PIM properties dialog box during setup must be **CHECKED**.

Note: SendDTMF is supported in Alcatel Business Release 3.x.

Statistical Pilots

Alcatel Business Release 3 supports the concept of Statistical Pilots. These are ‘pre’ pilots that can be used for statistical purposes on the Alcatel 4400, and have a different greeting guide. These Statistical Pilots in turn route to real Pilots; thus a many to one relationship can exist between Statistical Pilots, and real pilots.

No events are received for Statistical Pilots. However, the Called Number received on the delivered event when the call hits the ‘real’ pilot is the DN of the Statistical Pilot.

When Statistical Pilots are used, a peripheral target, and route must be created for each Statistical Pilot. The route should point to the service target that is the REAL pilot.

This is necessary for proper statistics on the 4400 when using Statistical Pilots. After this is done, route statistics can be used to get a breakdown of the service or Pilot calls by Statistical Pilot.

1.2.2 Licensing

Licensing is by monitored devices. To figure out how many licenses the user needs, they should use the following formula. Please note that the term “configured” refers to the configuration done in the Unified ICM peripheral monitor table. This formula is intended to be a starting point, and the system manager is advised that having more licenses than this formula is desirable to allow for expansion. The Licensing on the 4400 is currently broken up into two classes:

- ACD devices
- Business devices

For switch software version 3.0 and above, Pilots need not be counted for license considerations. However, one Pilot Monitoring License must be purchased for the switch.

(Number of Configured Agents)
+ (Number of Configured Pilots) Total ACD Devices
= Total ACD Device Monitor licenses required

(Number of Virtual Zs for Translation Routing)
+ (Number of Virtual Zs for Post/Hunt Group Routing)
= Total Business Device Monitor licenses required

Virtual Zs used for CSTA routing need not be included in the license count, as they are not monitored.

Note: In addition to the formula mentioned above it is important for the system manager to consider any other CTI products that will be connecting to the switch, and the number of licenses they will use. This should be added to the above computed figure.

1.3 Supported Unified ICM Features

The Alcatel 4400 PG supports the following Unified ICM features:

- Pre-Routing
- Post-Routing
- Enterprise CTI (includes third-party call control)
- Agent reporting
- Duplexed PG implementation

1.4 Features Not Supported

The Alcatel 4400 PG does not support the following Unified ICM features:

- Routing to Skill Groups is not supported.
- Extension calls cannot be held.

Note: Like all other legacy PGs, IPTA (Unified ICM Picks The Agent) is not supported on the Alcatel 4400.

2 ACD Configuration

Owing to the Ethernet link connectivity, the changes required to the Alcatel 4400 ACD configuration is simplified to the points noted in the “ACD Interface Requirements,” section, in Chapter 1, “Overview.” However, certain configuration and operation restrictions must be confirmed on the 4400 for the proper functioning of the Unified ICM. This chapter describes these restrictions.

2.1 4400 Restrictions

For proper functioning of the Unified ICM, there must be certain restrictions placed on the 4400 configuration and operation. These are summarized in the following two sections.

2.1.1 Configuration Restrictions

Pilot to Queue Directions

On the 4400, a Pilot may have up to 10 directions linking it to the 4400 queues (Refer to Item 1 in Figure 2: Alcatel 4400 Distribution Model). These queues may consist of waiting queues, virtual queues, and dummy queues. Only one (1) waiting queue direction is allowed. In other words, no priority is assigned in the Unified ICM because only one queue-direction is supported.

Skill Group Length Limitation

Skill groups (Processing Groups) on the 4400 should be limited to 7 decimal digits maximum. This restriction applies both for configuration on the 4400, and within the Unified ICM.

However, it is possible to overcome this limitation by using the following method that can alternatively be used to configure skill groups.

Normally, the processing group (Skill Group) number as known on the Alcatel 4400 is entered in the peripheral Number field of the Skill Group Table. In cases where the length of the skill group number on the 4400 exceeds 7 digits, a unique number should be placed in the peripheral number field of the skill group table. The number as known on the peripheral should be entered in the extension field of the skill group configuration.

For example, if the skill group (Processing group) on the peripheral is 12345678, you would enter any unique number in the peripheral number field, let's say '345678', and you would enter '12345678' in the extension field.

Note: There need not be any relation between the number used in the Peripheral # and the actual skill group number on the switch. In the above example, we could have used '1' for the peripheral number of skill group 12345678. For more related information, please refer to section 3.17 CTI Considerations.

2.1.2 Operational Restrictions

It is absolutely imperative that the configuration on the Unified ICM matches that of the Alcatel 4400. This requires that no manual changes be done to the configuration during normal operations. Scheduled changes may be used so long as, when the 4400 changes configuration, the Unified ICM simultaneously schedules a new script and routing configuration based on the call-type.

In other words, manual closing or changing of Pilots is not allowed. The only entity that may change dynamically at any time due to operator/human action are the Agents. If resources become blocked due to Agent unavailability, this information will be properly reflected on the Unified ICM.

2.2 Setting the Switch for Packet Tracing

The following instructions apply to switch business releases prior to 4.x. The following instructions will not work on switch releases 4.x and higher. In the event that tracing information sent and received by the 4400 is necessary, the 4400 has the capability to capture the packets in trace mode, as well as other Alcatel specific information. Please refer to the Alcatel 4400 specific documentation (shipped with the switch by Alcatel) for full information on how to enable/disable tracing should it become necessary for diagnostic purposes.

To enable/disable tracing, you need to log into the switch as root, and proceed as follows:

1. `cd /tmpd`
2. `vi debug` (if it does not exist, then create it).
3. edit/add lines in the file so that it has two lines. The first line containing a 4, the second line containing an 'N'.
4. exit the editor

Upon the next PIM connection, files logfile.nnnnn are created to trace the connection information. To turn the switch tracing off, simply edit the same file and change the '4' to a '0'.

Note: It is advisable that you set switch tracing off after you are finished working with it to avoid performance degradation.

3 Unified ICM Configuration

This chapter describes the object mapping between the Unified ICM and the Alcatel 4400 ACD.

3.1 Alcatel 4400 Distribution Model

3.1.1 Entities and Definitions

The 4400 uses **Pilots, Queues, and (Resource) Groups** to manage and service call flow. In addition, there is a **resource selection and call selection** process used in distributing calls. There are other mechanisms consisting of **distribution thresholds, handicaps, ring time-outs, etc.**, that also are used in the call management process.

Figure 2: Alcatel 4400 Distribution Model depicts the relationship between Pilots, Queues, Groups, and also illustrates the resource selection, and call selection process used to distribute calls. Also used in the 4400 documentation is the term **address**, which is any dialable number for an Agent, pilot, voice message, etc.

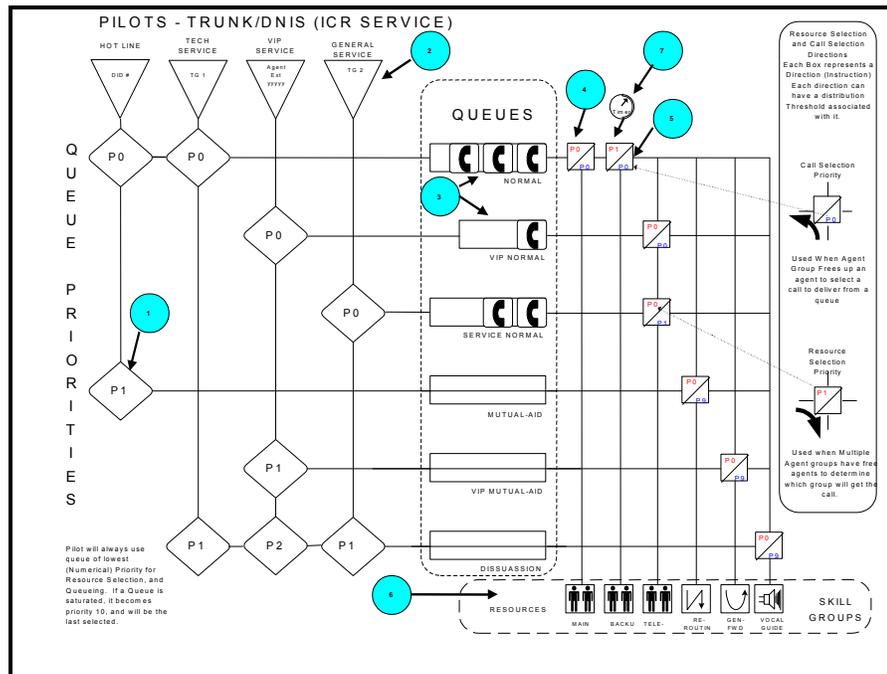


Figure 2: Alcatel 4400 Distribution Model

- (1) Pilot Queue Priority (*Only 1 Waiting Queue Per Pilot Allowed – Priority unimportant*)
- (2) Pilot Entry Point
- (3) Queues (Calls shown in queues)
- (4) Resource selection priority within direction (*Priorities are not configured in Unified ICM*)
- (5) Call selection priority within direction (*Priorities are not configured in Unified ICM*)
- (6) Resource groups

- (7) Distribution time-out associated with a routing direction to an Agent processing group.

3.2 Peripheral Configuration

The Unified ICM Peripheral corresponds to the Alcatel 4400 ACD.

3.2.1 Peripheral Configuration Parameters

On the Alcatel 4400 PG, there is only one configuration parameter. It specifies the Unified ICM variable to map correlator data to. It is used to place correlator data into a call variable during specific call events received from the 4400, and also used to set correlator data on the 4400 during routing.

Table 1: Configuration Parameters

Parameters	Options/arguments	Use
/cd	PVn where n is 1-10.	Specifies the variable (1-10) to set/store the correlator data in.
<p>Notes:</p> <ol style="list-style-type: none"> You must type the command /cd before PVn. Example: /cd PV4 cd and PV are both case-sensitive. 		

3.3 Monitored Stations

The Alcatel 4400 PG requires a list of pilot, Agent, and virtual device extensions that are used to monitor events from the 4400. This list is configured in the Unified ICM database by placing entries in the “Peripheral Monitor” table. In order to add single devices (Pilots, Agents, Virtual devices, and Physical Devices), the Parameter field of the peripheral monitor is filled in with the device. In order to add a range of devices, the ‘Param String’ field is used. The format of the extension range string consists of one device followed by a “-” and ending with the last device in the range. The PG assumes that all devices in the range are to be monitored. Both single devices and ranges of devices need to be entered in peripheral monitor entries.

There are three monitor types that should be used in the peripheral monitor table. ACD_DN should be selected for all Agents and pilots that do not utilize routing. “Virtual Routing Device” should be selected for virtual devices that will be used for translation routing, or Post routing under a hunting group. “Routing Device” should be used for any Pilots/Devices that will be doing a true CSTA Post routing.

3.4 Peripheral Targets and Routes

Peripheral Targets are the means that the Unified ICM maps/directs calls to Services, Skill Groups or Agents. A Peripheral Target is specified by a Network Trunk Group and a DNIS pair. Each Peripheral Target is

associated with a single Route. A Route is associated with a Target Type (Skill Group, Agent, etc.). For accounting purposes, each Route is associated with a Service. It is this mapping that will allow the Peripheral Gateway to associate a Service when a new call arrives on the Alcatel 4400.

To enable the Alcatel 4400 event monitoring messages, the DNIS configured in the Unified ICM Peripheral Targets must correspond to the Pilot Number, defined on the Alcatel 4400.

3.5 Trunk Groups

The Alcatel 4400 does not forward any Trunk Group information to the PG. Therefore, the Trunk Group configuration is not applicable to the PG. In order to configure peripheral targets, however, a Network TrunkGroup has to be defined along with at least one Trunk Group. This Trunk Group should be used for each configured peripheral target.

3.6 Trunks

Individual trunks are not monitored by the Alcatel 4400 Peripheral gateway. As a result, Trunk information is not required in the Unified ICM configuration.

3.7 Services

Item (2) in the Figure 2: Alcatel 4400 Distribution Model corresponds to a Unified ICM Service that is mapped to a 4400 Pilot. The Service Peripheral Number is equivalent to the Pilot number on the Alcatel 4400. When configuring a service in Unified ICM, the user should enter the following:

- The extension of the Pilot in the Peripheral Number field
- The name of the Pilot in the Peripheral Name field
- The Description may optionally be filled in
- All other fields should be left at their default values

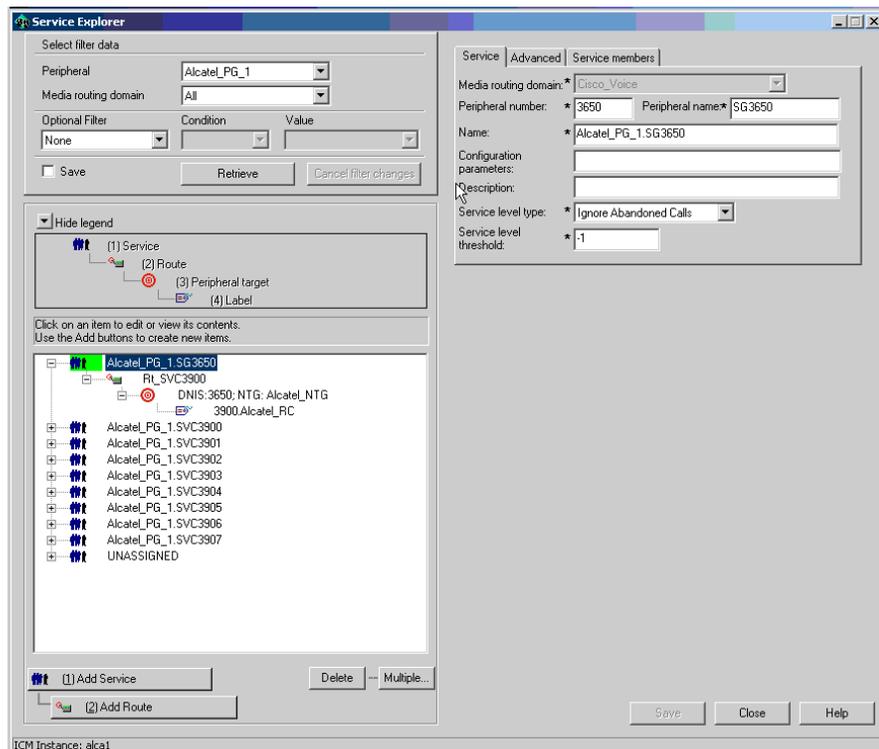


Figure 3: Example Unified ICM Service Configuration for the 4400

Figure 3: Example Unified ICM Service Configuration for the 4400 shows the GUI during the Services Configuration.

3.8 Skill Groups

Item (6) in Figure 2: Alcatel 4400 Distribution Model corresponds to the Skill Groups mentioned in this section. A Unified ICM Skill Group is equivalent to an Agent or processing group on the Alcatel 4400. The Skill Group peripheral number is the Processing group number on the 4400. When configuring a Skill Group in Unified ICM, the user should enter the following. Please note that Skill Groups are limited to 7 full decimal digits.

Note: Longer entries will not be flagged in error, but will not be recognized by Unified ICM. This limitation requires CTI to use the ‘peripheral number’ of the skill group as defined in Unified ICM when logging in, etc. For more related information, please refer to Section 3.17 CTI Considerations. When configuring for Skill Groups in the Unified ICM, the user should enter the following:

- The Agent processing group number in the peripheral number field. This is limited to 7 full decimal digits. *In the case where the processing group is more than 7 digits, this should be a unique number no longer than 7 digits.*
- The name of the Skill Group in the peripheral name field
- Optionally the user may enter a description in the description field
- All other fields should be left at their default values
- In the case where the processing group number is more than 7 digits, the actual processing group number should be placed in the **Extension** field

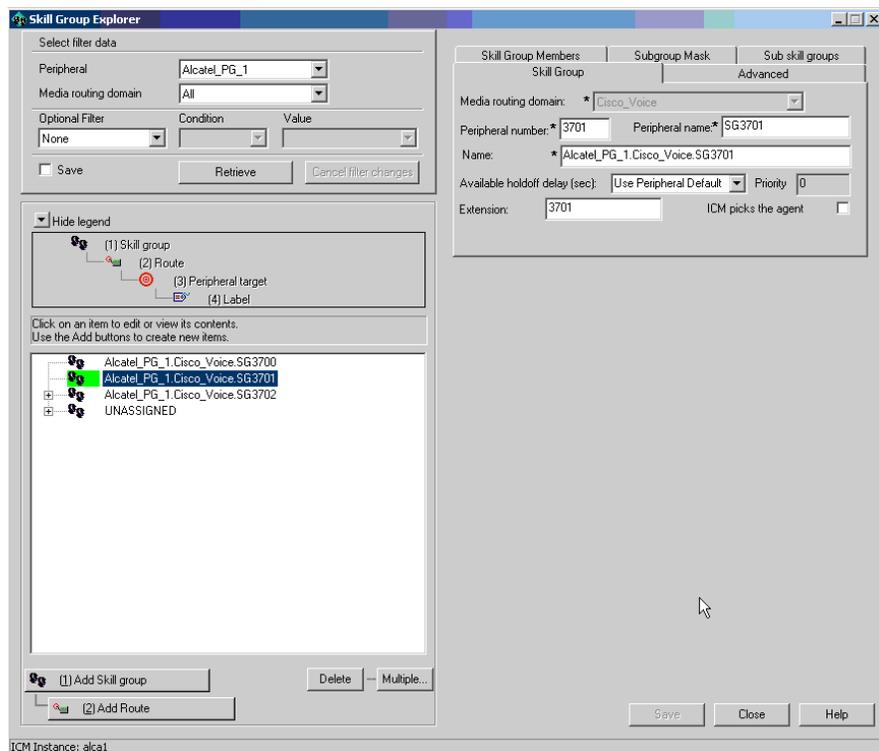


Figure 4: Example Unified ICM Skill Group Configuration for the 4400

3.9 Agents

The Alcatel 4400 PG does not require Agent configuration in the Unified ICM database.

3.10 Agent to Skill Group Mapping

When the 4400 PG starts, it checks the status for each monitored Agent and device. For all logged in Agents, the PG retrieves the Skill Group of the Agent. After startup, the PG keeps track of Agent to Skill Group mappings by receiving Agent logon and logout events from the 4400. The following table provides the mappings of Agent states on the 4400 and how they map to Cisco Agent states.

Table 2: Cisco/Alcatel 4400 Agent State Mappings

4400 Agent Events	Cisco Agent States
Agent Logged Off	AS_LOG_OUT
Agent Logged On	AS_LOG_IN
Agent Not Ready	AS_NOT_READY
Agent Ready	AS_AVAILABLE
Agent Work Not Ready	AS_WORK_READY
Agent Busy	AS_TALKING

The Alcatel 4400 PG does not require the Agent Busy event, and therefore, the Agent Busy event is not received due to its being filtered out at startup time. The PG sets the Agent state to AS_TALKING when the Agent is connected to a call.

3.11 Routes

A Unified ICM Route loosely corresponds to a Pilot on the 4400. For reporting purposes, a route should be configured for each Pilot that is a target of a configured ACD Pilot number.

3.12 Translation Routes

To use translation routes on the 4400, the route pool should use virtual (Ghost) devices on the 4400. These must be configured prior to using translation routing. When creating the virtual Z device in the configuration of the 4400, it is important that the ‘**Ghost Z feature**’ field is set to ‘**without**’ so that the CSTA events will be received for the device. The CSTA routing box should also NOT be checked on virtual devices.

 Directory Number	<input type="text" value="3650"/>	 
 Ghost Z	<input checked="" type="checkbox"/> True	
 Ghost Z Feature	<input type="text" value="Without"/>	
 CSTA routing	<input type="checkbox"/> True	

Figure 5: Partial 4400 Virtual Device Configuration for Translation Routing

3.13 CSTA Routing Client

The Unified ICM 4400 Peripheral Gateway supports post routing requests from the 4400. No configuration parameters are required in the configuration string. Post routing is possible for 4400 Pilots and Devices only. In order for routing to take place on any particular pilot, the CSTA routing box in the 4400 configuration screen must be checked for that pilot to enable routing. Also, in the Unified ICM configuration, the Pilot must be included in the peripheral monitor table with the “Routing Device” type, in order for routing to be enabled.

Note: If the Cisco 4400 PG is installed in an environment where multiple CTI hosts will be connecting to the 4400, routing results could be adversely affected. In the case where multiple hosts enable routing on the same device, the last such (Route enable) request will be the host computer that the 4400 sends the CSTA route requests to. If you are planning on multiple CTI hosts, it is suggested that you either allow only one CSTA host to do CSTA routing, or very carefully make sure the devices that each host handles routing of are mutually exclusive of each other.

3.14 Dialed Numbers

Dialed Numbers on the 4400 consist of a range from 1 to 8 numeric digits, depending upon the switch configuration. The dialed number specified in a CSTA routing request will be the Pilot Number or device number on the 4400.

3.15 Labels

Unified ICM labels that are returned to the 4400 for routing can be any Pilot Number, Agent Number, Device Number, Virtual Device number, or Hunting group number defined on the 4400.

3.16 Off Switch Transfers

In order to accommodate transferring to off switch destinations, Pilots routing through dummy queues to the mutual aid processing groups is the suggested method. Using this method, the mutual aid processing group can be used to target the call off-switch.

3.17 CTI Considerations

3.17.1 Registry Settings

MaxPrivateCallsPerAgent Registry Setting

When using CTI with the Alcatel PIM, confirm that the following CTI Server (Gateway) is set to 0.

HKEY_LOCAL_MACHINE\SOFTWARE\Cisco\ICR\{Customer}\CG{n}[A/B]\CG\CurrentVersion\CTIServer\Dynamic\MaxPrivateCallsPerAgent.

Note: If this value is NOT set to zero, an undesirable behavior will occur during conference completes.

3.17.2 Skill Group Peripheral Numbers

Normally, using a 7-digit skill group, or lesser, no special consideration must be given to using skill groups as they should be configured to match those on the switch. However, when using an 8-digit or above, for configuring skill groups, the skill group will be the ‘peripheral number’ configured for that skill group in the Peripheral Skill group table and not the processing group number on the switch.

For example, assume you have a skill group (processing group) 87654321 on the switch. It might be configured in the peripheral skill group table as peripheral number 1, and extension 87654321. Throughout the Unified ICM, skill groups are referred to by their peripheral number and not by the extension. What this means is that any of the CTI clients will see this as skill group 1 (the peripheral number), and not as 87654321. Additionally, when a CTI client issues a request that involves a skill group (e.g. a login request) it must refer to the peripheral number.

3.18 Setup Information Required for Unified ICM Configuration

The following table gives you some setup information that you would need during the Unified ICM configuration.

Table 3: Setup Information for Unified ICM Configuration

Item	Info
4400 IP Address	Get from Site Manager or A4400
Pilot Numbers	Get from 4400 Configuration, Note if they will be performing CSTA routing or not
Agent Group Numbers	Get from 4400 Configuration
Agent IDs	Get from 4400 Configuration
Queue IDs	Get from 4400 Configuration

(Currently Not used by Unified ICM, but keep a reference for support use)

Virtual Devices for Translation Routing	Get from 4400 Configuration
Virtual Devices for Post-Routing	Get from 4400 Configuration
Hunting groups	Get from 4400 Configuration

4 Post-Routing

This chapter describes the features of Unified ICM Post-Routing available with the Alcatel 4400 PG. It also discusses any considerations you should be aware of when using Post-Routing or Translation Routing on the PG.

4.1 CSTA Routing (Routing Limitations on 4400)

Using CSTA Routing on the 4400 is limited to Pilots and physical devices. In addition, associated call data is not supported via CSTA routing. The destination device must be on switch, and can be any dialable number. That is, the destination device can be a Pilot, a device, an Agent, a virtual device, or a hunting group.

The route request occurs only when the outside call initially hits the switch. Any transfers to the routing pilot will have no effect once the call is routed to an Agent. An Agent cannot dial a pilot through a consultation call; thus an Agent's consultation call cannot be CSTA routed.

When using CSTA routing, the total number of simultaneous routing requests is limited to the number of CSTA parking devices configured on the switch. A simple rule for estimating this is:

Number of Virtual devices = Number of Post-Routing operations to perform within 3 seconds.

Note: Special Consideration: During CSTA routing, the 4400 'parks' the calls on special virtual devices. These are set up on the 4400 in the same manner as the virtual devices for translation routing with the exception that the 'Ghost Z feature' field **MUST** be set to 'Routing' and the CSTA routing box must be unchecked. This unchecking of the CSTA routing box will allow the timeout to be included in the pool of parking devices for CSTA routing. The 'parking devices' do not have to be configured in any way on the PG. Enough 'parking' devices should be configured to handle the total number of possible simultaneous CSTA routing requests.

 Directory Number	<input type="text" value="3674"/>		
 Ghost Z	<input checked="" type="checkbox"/> True		
 Ghost Z Feature	<input type="text" value="Routing"/>		
 CSTA routing	<input type="checkbox"/> True		

Figure 6: Partial Virtual Device Configuration for CSTA Routing Parking Device

Note: The Timer 240 in the switch controls the timeout for CSTA routing requests. The timeout is in 100 millisecond units. It is initially set to 50, which allows up to 5 seconds before the ACD will use the default route. This timeout should be set initially to 30 to allow up to 3 seconds for a route select response from the router.

4.2 Delivered/Divert Post Routing (Virtual Devices)

Virtual devices are used on the 4400 for Agent Post routing. The destination device must be on the switch, and can be any dialable number. That is, the destination device can be a Pilot, a device, an Agent, a virtual device, or a hunting group.

This Delivered/Divert Post-Routing method works by the Agent dialing a hunting group number, which in turn delivers the Agent's consultation call to a virtual device. The PG receives a delivered event for the device, and requests a route, based upon the dialed number for the hunting group. The call is then diverted to the desired destination. If the destination is a pilot, then only a blind transfer is possible. If the destination is an Agent, or a phone set, then the source Agent may consult with the Agent/operator prior to transferring the call.

Note: Only inside calls can be routed using this Delivered/Divert Post-Routing method. Direct calls into the hunting group will not result in routing. It is envisioned that an *Agent* will use this post routing feature to re-route a call that has already been answered.

Note: When a call is post-routed by the Unified ICM, no 'new' correlator data will be associated with the call. However, any correlator data that has already been established with the call via translation routing by the Unified ICM, or through other means on the switch, will be preserved through the routing on switch.

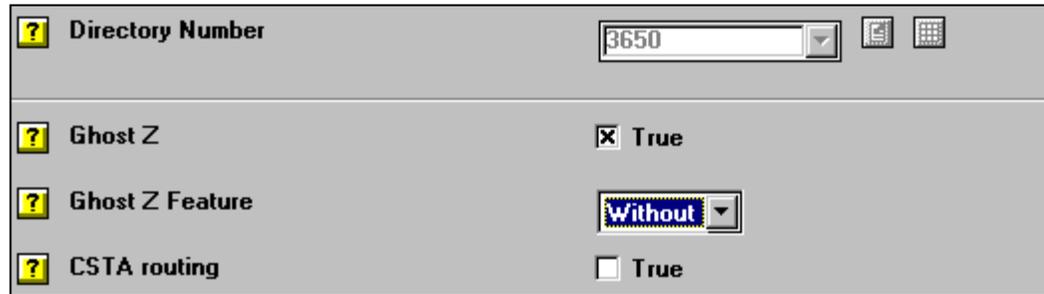
4.2.1 Post-Routing using Hunting Groups and Virtual Devices

Enough virtual devices must be configured under each hunting group to ensure that the maximum number of simultaneous requests can be satisfied. If this number is exceeded, the source Agent will know by receiving a menu/message allowing Agents to park the call, or receive a call back. They – the agents, should not park the call if it comes up, and therefore it means that not enough virtual devices are allocated to that hunting group.

The number of virtual devices to configure one Hunting Group is related to the flow of calls to be Post-Routed through this Hunting Group. A simple rule to estimate the number of Virtual devices is:

Number of Virtual devices = Number of Post-Routing operations on that particular hunting group to perform within 3 seconds.

When defining the virtual devices for Post-routing, the Virtual Z box should be checked, the 'Ghost Z feature' field must be left at 'without', and the CSTA routing box should remain unchecked.



A screenshot of a configuration window for a 4400 virtual device. It contains four rows of settings:

Directory Number	3650
Ghost Z	<input checked="" type="checkbox"/> True
Ghost Z Feature	Without
CSTA routing	<input type="checkbox"/> True

Figure 7: Partial 4400 Virtual Device Configuration for Delivered/Divert Post Routing

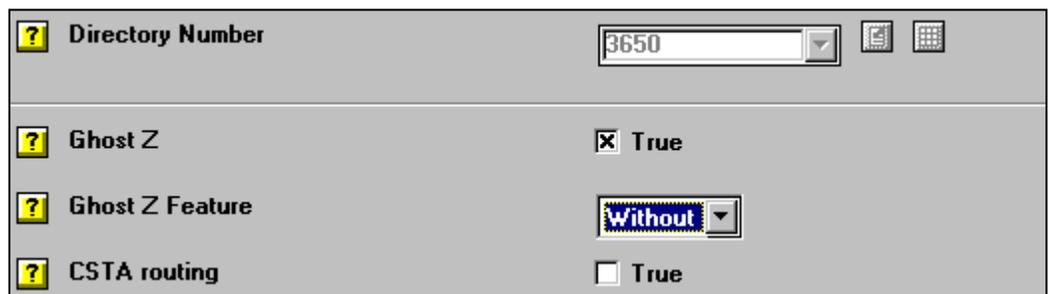
4.3 Translation Routing

Virtual devices are used on the 4400 for translation routing. The destination device must be on the switch, and can be any dialable number. That is, the destination device can be a Pilot, a device, an Agent, a virtual device, or a hunting group.

For Translation Routing, enough virtual devices must be configured to account for all the possible translation routes. There should be enough translation routes to cover all the possible calls 'in-transit' from the network to the ACD at any given time. Exceeding this limit is not an issue since Unified ICM will manage the utilization of these 'routes'. A simple rule for estimating this is:

Number of Virtual devices = Number of Translation-Routing operations to perform within 10 seconds.

When defining the virtual devices for Post-routing, the Virtual Z box should be checked, the 'Ghost Z feature' field must be left at 'without', and the CSTA routing box should remain unchecked.



A screenshot of a configuration window for a 4400 virtual device, identical to Figure 7. It contains four rows of settings:

Directory Number	3650
Ghost Z	<input checked="" type="checkbox"/> True
Ghost Z Feature	Without
CSTA routing	<input type="checkbox"/> True

Figure 8: Partial 4400 Virtual Device Configuration for Translation Routing

5 Appendix A: Procmon Commands

The following describes some of the commands accessible for the PIM through procmon.

pim_trace commands

The following table documents the pim_trace bits available through pim_trace. The list (without explanations) can also be retrieved through the procmon ltrace command.

Trace Bit	Meaning
CSTA_MONITOR_START_messages	Will trace all Monitor Start messages
CSTA_UNIVERSAL_FAILURE_message	Will trace all failure messages
CSTA_QUERY_DEVICE_messages	Will trace all query device messages
CSTA_SNAPSHOT_DEVICE_message	Will trace all snapshot device messages
CSTA_AGENT_EVENT_message	Will trace all Agent events
CSTA_CALL_EVENT_message	Will trace all call event messages
CSTA_STATUS_EVENT_message	Will trace Status event (System Status) messages
CSTA_MAINTENANCE_EVENT_message	Will trace maintenance event messages
CSTA_THIRD_PARTY_message	Will trace CSTA third party messages

CSTA_ROUTING_message	Will trace routing (ROUTE_REQUEST, ROUTE_SELECT, etc) messages
CSTA_MONITOR_STOP_message	Will trace monitor stop messages
CSTA_QUERY_TIMER_message	Will trace query timer messages/events
CSTA_PRIVATE_DATA	Will trace the private data contents of messages
CSXTA_CALL_PARTY_UPDATE	Will trace call party update messages
CSTA_rawdata	Will trace the raw data transmitted/received over the socket in hex
Skill_Group_Translation	Will display skill group translation (when extension # is used) during events
locks	Will trace call, peripheral and agent locks
timer_call	Will trace setting/execution of call timers
timer_agent	Will trace setting/execution of agent timers
timer_monitor	Will trace setting/execution of monitor timers
timer_service	Will trace setting/execution of Service timers
nm_pings	Will trace Node manager PING messages
interactive_queuing	Will trace messages related to interactive queuing
int_q	

to_opc	Will Trace all CSTA messages that the PIM sends to OPC.
sweep_call_delq	Trace Sweeps of the call deletion queue
private_data	Show private data on event tracing
call_party_update	Will trace calls to CallPartyUpdate
Unusual	Will trace information on 'unusual' events or happenings
monitor_id	Will trace the Monitor ID on events
inprogress_calls	Will trace information related to in progress calls.

Additional procmon commands

The following table documents specific additional commands that the PIM supports. These are in addition to the standard PIMLIB procmon commands.

Command	Use
acdmonitors, acdml [/active] [/notactive] [mon string prefix]	Will Display ACD Monitor List
reset	Will reset the PIM and connection, used for testing
setActiveSkillGroup, setGroup	Set Active Skill Group for an Agent. Used for testing only
tp_alterate_connection, alterate	Will perform a third party Alternate Call
tp_answer_call, answer	Will perform a third party Answer Call
tp_associate_data, as	Will perform a third party Associate Data
tp_clear_connection, clear	Will perform a third party Clear Connection
tp_conference_call, conference	Will perform a third party Conference Call

tp_consultation_call, consultation	Will perform a third party Consultation Call
tp_divert_call, divert	Will perform a third party Divert Connection
tp_hold_call, hold	Will perform a third party Hold Call
tp_make_call, make	Will perform a third party Make Call
tp_reconnect_connection, reconnect	Will perform a third party Reconnect Call
tp_retrieve_call, retrieve	Will perform a third party Retrieve Call
tp_sendDTMF_data, dtmf	Will perform a third party DTMF Data
tp_set_agent_state, set_state	Will perform a third party Set Agent State
tp_set_routing	Will set CSTA routing on a device on/off
tp_transfer_connection, transfer	Will perform a third party Transfer Connection

6 Appendix B: Troubleshooting Tips

Capture for Replay Setup

Sometimes, for support reasons, it is desirable to enable the PIM to capture the data stream coming from the switch so it can be sent to support to be analyzed. Proceed as follows to enable the PIM to capture the data stream:

1. Shut down the PIM.
2. Modify the Registry Key 'CaptureMessages' in the dynamic key of the PIM registry to be non-zero.

The dynamic key of the PIM is:

```
HKEY_LOCAL_MACHINE\SOFTWARE\GeoTel\ICR\{Customer}\{Node}\
PG\CurrentVersion\
PIMS\pim{n}\AlcaData\Dynamic
```

3. Run the PIM normally, capturing any situations in question.
4. Shut down the PIM.
5. Take the capture files (.cap) from the directory `\icr\{customer}\{node}\cstacap` and copy them to a safe location.

Note: You may want to ensure that this directory is empty before beginning the capture process.

6. Copy the file `\icr\{customer}\{node}\pim{n}_monitems.bak` to that same directory.
7. Modify the registry setting back to zero?
8. Restart the PIM?

Eventually, that is, when the TAC and the customer are satisfied with the having captured the issue), these files will then be sent to the requesting party:

```
HKEY_LOCAL_MACHINE\SOFTWARE\GeoTel\ICR\JCO2\PG1A\PG\CurrentVersion\
PIMS\pim1\AlcaData\Config
```

Tips to use the 4400 PG

- If at any time, an Agent through some action attempts to be connected to a pilot, they will only have the option of doing a blind transfer of their party or of reconnecting to their party. The 4400 will at no time allow an Agent to be connected to a Pilot.

Release 3.0 and above does allow an agent to perform a consultative call to another agent if the Pilot has this feature activated by checking the “Pilot Supervised Transfer” box in the Pilot configuration.

- Timer 240 controls the CSTA routing timeout for ALL requests from the switch. The timeout is in 100 millisecond units. It is recommended that this timeout be set to 30. This will allow up to 3 seconds ($30 * 100 = 3000\text{ms}$ or 3 seconds) for CSTA ROUTE-REQUESTS to be responded to with a ROUTE-SELECT.
- If you were using hunting groups for Agent Initiated Post Routing, you would use Virtual Devices and not Analog Devices.
- Hunting groups cannot share virtual devices.

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