Cisco Unified ICM
ACD Supplement for NEC NEAX 2400/7400 (OAI/Infolink Interface)

February, 2010

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCBs public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

CCDE, CCENT, CCSI, Cisco Eos, Cisco HealthPresence, Cisco IronPort, the Cisco logo, Cisco Nurse Connect, Cisco Pulse, Cisco SensorBase, Cisco StackPower, Cisco StadiumVision, Cisco TelePresence, Cisco Unified Computing System, Cisco WebEx, DCE, Flip Channels, Flip for Good, Flip Mino, Flipshare (Design), Flip Ultra, Flip Video, Flip Video (Design), Instant Broadband, and Welcome to the Human Network are trademarks; Changing the Way We Work, Live, Play, and Learn, Cisco Capital, Cisco Capital (Design), Cisco:Financed (Stylized), Cisco Store, Flip Gift Card, and One Million Acts of Green are service marks; and Access Registrar, Aironet, AllTouch, AsyncOS, Bringing the Meeting To You, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, CCVP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Lumin, Cisco Nexus, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Collaboration Without Limitation, Continuum, EtherFast, EtherSwitch, Event Center, Explorer, Follow Me Browsing, GainMaker, iLYNX, IOS, iPhone, IronPort, the IronPort logo, Laser Link, LightStream, Linksys, MeetingPlace, MeetingPlace Chime Sound, MGX, Networkers, Networking Academy, PCNow, PIX, PowerKEY, PowerPanels, PowerTV, PowerTV (Design), PowerVu, Prisma, ProConnect, ROSA, SenderBase, SMARTnet, Spectrum Expert, StackWise, WebEx, and the WebEx logo are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0910R)

Any Internet Protocol (IP) addresses used in this document are not intended to be actual addresses. Any examples, command display output, and figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses in illustrative content is unintentional and coincidental.

Contents

Tables

Figures

Preface

Purpose

This document provides supplementary information that is specific to the NEC NEAX 2400/7400 ACD with OAI/Infolink Interface.

While other Unified ICM documents cover general topics such as configuring an overall Unified ICM system and writing scripts to route contact center requests, this supplement provides specific information on configuring a NEC NEAX 2400/7400 Switch in the Unified ICM environment.

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 is also assumed to have specific knowledge of the NEC NEAX 2400/7400 Switch.

Organization

Chapter 1, "Overview"

Provides an introduction to the hardware and software requirements for configuring the NEC NEAX switch

Chapter 2, "Object Mapping"

Discusses the elements of object mapping between the NEC NEAX and Unified ICM.

Chapter 3, "Unified ICM Configuration"

Describes how to configure the NEC ACD in Unified ICM using the Peripheral Monitor Configuration Tool.

Chapter 4, "NEC PG setup"

Describes how to configure the NEC PG for the NEAX 2400/7400 ACD.

Chapter 5, "NEC Switch Configuration"

Describes how to prepare the NEC switch in different configurations.

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 *Database Schema 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

- For information on obtaining documentation, obtaining support, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at: http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Documentation Feedback

- You can provide comments about this document by sending email to the following address: ccbu_docfeedback@cisco.com
- We appreciate your comments.

1. Overview

The NEC Peripheral Gateway (PG) monitors Agent and call activity, and allows CTI Agent control as well as call control on the NEC ACD through the OAI/Infolink Interface.

The NEC PG can be run either in simplex or duplex configurations. In a duplex configuration, only one side of the PG maintains the OAI/Infolink connections at any given time, the other side remains idle.

See the section on NEC OAI/Infolink Interface, for more information.

This chapter covers the type of hardware and software interface that the NEC NEAX ACD requires, its limitations, as well the enhancements that have been incorporated.

1.1. ICM version

The NEC NEAX 2400 and the NEAX 7600 switch supports ICM version 4.0/4.1 and above. CTI Server support for third-party call and Agent control is available with ICM version 4.1 onwards.

1.2. NEC OAI/Infolink Interface

The CTI interface supported on the NEC switch is the NEC OAI/Infolink Interface. The OAI/Infolink Interface was developed to support an Application's integration of Voice and Data (i.e., Screen Pop CTI Application). The OAI/Infolink helps monitor call and Agent state transitions as well as provides Post Route capabilities.

At startup, the NEC PIM configures both an Infolink and an OAI session with the NEAX.

Opening an Infolink session automatically provides monitoring and controlling capability for all devices known to the ACD.

The OAI session is to get additional information, such as off-hook and call release events, not provided by Infolink, and to monitor calls on devices that are not known to the ACD. Unlike Infolink, OAI requires that each device be individually monitored. For possibly hundreds, or thousands of devices, this can require quite a bit of time and network bandwidth, as well as resources at the switch that can be in critical supply during busy hours. For more information, see the section on Agent Status Request Delay.

The PIM[1] will maintain the Infolink and OAI connections indefinitely. If the PIM has a shutdown, or the network or the switch causes the connection to drop at any time, the PIM will go idle. If duplex PGs are used, the other PIM should be reactivated seconds later to maintain the OAI/Infolink connections. During reactivation, the PIM will form new connections to the switch. If the old ports are still busy for some reason, then the connections will be made to a new port (the switch supports up to 16 ports).

Note: The PIM doesn't make the port selection itself. It calls a function in the DLL provided by the NEC; the DLL and the switch then together determine which ports are to be used. The function allows the PIM to force a particular port to be used, but this is optional and the PIM does not force the selection of port. Also, the PIM does enable heartbeats on the connection to the switch. If the connection is dropped for any reason, the switch will detect it and recover the port.

1.2.1. Agent Status Request Delay

To allow a tradeoff to be made between the time it takes for startup to be complete, and the network and switch resources used during startup, the *AgentStatusRequestDelay* registry value can be set to increase or decrease

---

[1]

A PIM (Peripheral Interface Manager) is a Unified ICM module that allows communication between a peripheral and the PG. For example, if you have one NEC NEAX ACD and a duplexed PG, each PG has one PIM.

the rate at which monitor start commands are sent. This startup delay affects the start of monitoring of both ACD-aware and ACD-non-aware devices, as well as the sending of Infolink *Agent Status Request* messages which are used to determine the logged in status of configured positions.

The AgentStatusRequestDelay has a default value of 50ms, which is the time between sending of monitor start commands for the devices configured in the Unified ICM Peripheral Monitor Table (see the chapter on Unified ICM Configuration, for more information).

The registry path is as follows:

```
\HKEY_LOCAL_MACHINE
\SOFTWARE
      \Cisco System, Inc\ICM
                 \<customer name, e.g. NEC>
                 \<node name, e.g. PG1A>
                 \PG\Current Version
                 \PIMS\<pim, e.g. pim1>
                   \NEAXData\Config
                     \AgentStatusRequestDelay
```

1.3. OAI/Infolink Interface Requirements and Limitations

The following are the requirements and limitations for the OAI/Infolink interface:

- Any NEC NEAX 2400 or NEAX 7600 switch which supports the OAI/Infolink protocols and has ACD software version 4.12 and above is supported. As additional versions of the ACD software are released and tested with Unified ICM, this document will be updated to reflect the range of ACD software versions supported.

- The OAI/Infolink connections are based on a TCP connection to the NEC switch. Note that the switch does not allow the configuration of a default gateway or 1st hop router, so it is necessary for the NEC PG to be located on the same IP subnet as the switch.

- CTI clients don't follow the hard-set when a conference is initiated from the hard-set on the NEC ACD. This is because the NEC PG doesn't currently support the processing of certain events from the NEC ACD. This behavior is a limitation of the NEC PG.

- Additional applications may also monitor the NEC switch at the same time as the NEC PG. However, refer to NEC documentation for the specific switch to see exactly how many applications can do so.

1.4. NEC Feature Enhancements

The NEC NEAX PIM is enhanced to provide the **Alternate** and **Reconnect** functionalities from the CTI soft-phone. **Alternate** and **Reconnect** features are supported starting from the ICM versions listed below:

- ICM 5.0 SR12 ES12
- 6.0 SR7
- 7.0 SR4

1.4.1. Alternate Functionality

The **Alternat**e functionality allows you to toggle between the primary call (customer call) and the consult call. To use this feature, press the **Alternate** button on the CTI soft-phone.

1.4.2. Reconnect Functionality

The **Reconnect** functionality allows you to clear the consult call, and retrieve the primary call (customer call). To use this feature, press the **Reconnect** button on the CTI soft-phone.

2. Object Mapping

This chapter describes the object mapping between the Unified ICM and the NEC ACD switch.

It is very important to understand the Call Distribution Mode for the NEC NEAX switch in order to configure and maintain the relationships between the ACD database objects and the Unified ICM database objects.

2.1. Agent

The Unified ICM object Agent is made up of the following fields:

- A SkillTargetID
- A Peripheral Number
- An Extension Number
- A State
- A list of active Skill Group assignments
- A First and a Last Name

From the Unified ICM perspective, the Agent Object is uniquely identified by the Unified ICM SkillTargetID. The Unified ICM SkillTargetID allows for the CallRouter to target a specific call to an Agent (Not Currently Implemented).

Table 1 defines the Agent object components used when mapping the Agent between Unified ICM and the NEC ACD.

Table 1: Unified ICM to NEC Agent Mapping

Unified ICM Agent	NEC Agent	Description
SkillTargetID	None	Unified ICM SkillTargetID defined by Cisco
PeripheralNumber	PositionID	NEC Identifier for the position the Agent logged onto. The Position Identifier is assigned to the ACD set where an Agent login occurs.
Extension	PositionID	Same.
FirstName	Not available.	First Name of Agent.
LastName	Not available	Last Name of Agent.

The Agent Position Identifier to Agent mapping is dynamic and occurs when an Agent logs onto an ACD set on the NEC.

The NEC Agent will be configured dynamically by the NEC PIM based on the Call and Agent events received from the NEC switch. For those Agents configured in the Unified ICM database, the PIM will report to OPC the state transitions with the Agent's configured PeripheralNumber. The NEC PIM does not restrict Agents from being configured in the Unified ICM database. The Skill Group association for Agents is dynamically assigned based on NEC Infolink events. NEC system administrators have the ability to re-assign an Agent position to another Skill Group while an Agent session is active on an ACD position. The Unified ICM can migrate the Agent's Skill Group assignment when this occurs. This will be accomplished by

logging the Agent out of the old Skill Group assignment and then logging the Agent back in under the new Skill Group assignment.

2.1.1. NEC Agent State to Unified ICM Agent State Mapping

Table 2 defines the OAI/Infolink Agent State Event mapping to the Unified ICM Agent State. The PIM will transition an Agent's state based on these ACD Position events.

Table 2: OAI/Infolink Events to Unified ICM Agent State Mapping

NEC Infolink State	Unified ICM State
Vacant	AS_LOG_OUT
Logon	AS_LOG_OUT
Ready	AS_AVAILABLE
Work (not on call)	AS_WORK_READY
Break	AS_NOT_READY
On call (not held)	AS_TALKING
On call (all calls held)	AS_HOLD

2.2. Skill Group

The Unified ICM Skill Group abstraction is defined as "a collection of Agents that share a common set of skills."

The Unified ICM Skill Group contains the following fields:

- A SkillTargetID
- A Peripheral Number
- A Peripheral Name and
- An Extension Number

The NEC Splits is consistent with the Unified ICM definition of a Skill Group. The SkillTargetID is utilized by the CallRouter to target Skill Groups in the Unified ICM Scripting Language. Table 3 defines the Skill Group/NEC Split Object member mapping used when configuring a Skill Group in the Unified ICM.

Table 3: Unified ICM to NEC Skill Group Mapping

Unified ICM Skill Group	NEC Skill Group	Description
SkillTargetID	None	Unified ICM SkillTargetID defined by Cisco
PeripheralNumber	Last four to six digits of the Split number	Last four to six digits of the Split.
Extension	Split number	Split number.
Peripheral Name	Split Name	Name associated with

		the Split.

Calls are answered by Agents assigned to the Split based on the arrival and priority of the call. A call waiting longer in the Priority 1 queue will not be serviced if a call is pending in the Priority 0 queue. Calls offered to a Split that has available Agents are assigned to the MOST IDLE Agent.

Note: To use Sub Skill groups, enable the Sub Skill Group Mask. If unchecked, it will have an impact on reporting.

2.3. Service

The Unified ICM Service abstraction is defined as "a type of caller need that the peripheral handles" (e.g., Quotes, Sales, Brokerage). The Unified ICM will choose a Service based on the current Unified ICM Routing Script that is scheduled for the dialed number being requested. The Router responds to the Routing Client with the Label that is specific to the Routing Client Type defining how the call is to be treated.

For Network Routing Clients, the Call is directed to an ACD on a particular Trunk Group with a specific DNIS and/or ANI.

For ACD Routing Clients, the Label defines a target on the ACD that performs a specific call treatment. This could include on or off switch processing of the call.

The NEC ACD will follow either of these call delivery models. When the call arrives at the ACD, it is offered to the Split associated with the Pilot number of the call. In both the NEC and Unified ICM models, Agent/Skill Groups may be associated with one or more services.

A Service Object has to be configured for each ACD Pilot number.

The "Extension" configured in the Unified ICM Service Object must correspond to the Pilot number defined on the NEC.

Each Service Object has to be associated with a PeripheralTarget and Route object in the Unified ICM Configuration Tool.

Table 4 defines the Service Object member mapping used when configuring a Service in the Unified ICM.

Table 4: Unified ICM to NEC Service Mapping

Unified ICM Service	NEC Service	Description
SkillTargetID	none	Unified ICM SkillTargetID defined by Cisco
PeripheralNumber	Last four to six digits of Pilot number	Last four to six digits of Pilot number – either for a CCV or a hunt group.
Extension	Pilot number	

2.4. Peripheral Target

Peripheral Targets are the means through which 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 again associated with a single Route.

A Route is associated with a Target Type (Service, Skill Group, Agent or Translation Route). For accounting purposes, each Route is associated with a Service. It is this mapping that will allow the Peripheral Gateway to define the CallType (Service) when a new call arrives on the NEC.

The DNIS configured in the Unified ICM Peripheral Target must correspond to the ACD Pilot number defined on the NEC.

2.5. Trunk Groups and Trunks

To enable reporting on trunk groups, they must be configured in Unified ICM.

Note: Unified ICM Trunk Groups correspond to NEC Routes.

Trunks need not be entered in the Unified ICM trunk configuration. As long as the trunk groups are configured, the trunks will be automatically configured by Unified ICM as events are reported for those trunks.

Note: All outbound trunks and their trunk groups must be configured in the Peripheral Monitor Table – see the chapter on Unified ICM Configuration.

2.6. Default Peripheral Route

If the PG is informed of a call for which there is no Unified ICM Peripheral Configuration (PeripheralTarget/Route and/or Service not configured), the call is not tracked. This is likely to occur when the Unified ICM configuration does not match the configuration defined on the NEC. An example of this would be when a customer is not routing all call types handled by the switch, but the CTI Link provides events on all Call Types.

To allow some type of monitoring of calls which have no definitive Route/Service mapping, the Unified ICM provides the Peripheral Default Route.

The Peripheral Default Route provides a place holder to gather statistics on calls monitored by the OAI/Infolink Link and which do not map to the Unified ICM configuration. The Unified ICM will gather Route/Service statistics associated with these unknown calls along with their Termination Call details.

From the Termination Call details of the call associated with the Peripheral Default Route, the customer can track down the unknown call types. The Termination Call detail will provide the DNIS/Pilot number associated with the call. The customer can then update the Unified ICM configuration to include the non-configured call types.

2.7. Dialed Numbers

Unified ICM dialed numbers for the peripheral's routing client correspond to the Pilot Numbers or other DNs on the NEC switch that are to be Post Routed.

2.8. Labels

Unified ICM labels for the peripheral's routing client correspond to destinations where calls can be routed. Labels can be configured for any number that can be dialed on the switch. For example, this could be an ACD Pilot number, Hunt Group Pilot number, or other on- or off-switch dialable numbers.

Each destination to which Post Routed calls is sent should have a Unified ICM label configured. The label string is set to the destination as it would be dialed from a phone set. For example, labels may be configured to route calls to an ACD Pilot number, Hunt Group Pilot number, Personal Pilot number, or PBX extension.

The "Label" field in the Label Configuration dialog of Unified ICM Configuration Manager has the format as defined in Table 5.

Table 5: NEC PG Label Format

Label Format	Example	Meaning
DN	9136245686	DialedDigits for redirectDestination is 9136245686.

2.9. Routes

A Unified ICM route is mapped to one or more Unified ICM peripheral targets. A Unified ICM peripheral target is a network target identified by a network trunk group and DNIS that terminates on the NEC NEAX ACD. A peripheral target is equivalent to the combination of DNIS and the (network) trunk group(s) through which incoming ACD calls arrives.

No special configuration consideration is required for routes in the Unified ICM environment.

2.10. Routing Clients

An NEC PG supports Post Routing. The NEC PG routing client is active whenever the PG itself is active.

Use the Unified ICM Configuration Manager to configure a routing client.

No special configuration consideration is required for routing clients in the Unified ICM environment.

3. Unified ICM Configuration

All Unified ICM configurations that are unique to the NEC PG are done in the Peripheral Monitor Configuration tool.

3.1. Unified ICM Configuration Considerations

The following elements and their configuration in the Unified ICM environment have already been discussed in the chapter Object Mapping.

- Agents
- Skill Groups
- Services
- Trunk Groups and Trunks
- Dialed numbers
- Labels
- Service Member Mappings
- Skill Group Member Mappings
- Routes
- Routing Client

3.2. Peripheral Configuration Parameters

The "Configure a PG" option in Unified ICM Configuration Manager automatically creates a peripheral object with appropriate defaults for a NEC peripheral. If desired, these values can be modified through the peripheral screen in Unified ICM Configuration Manager.

3.3. Attributing Calls to Unified ICM Routes

For Unified ICM route statistics, the PG attributes calls to Unified ICM routes by looking for a peripheral target that matches the Trunk Group and DNIS for the call and using the route associated with that peripheral target. If no matching peripheral target is found, then the call is attributed to the default route for the peripheral (if one is configured).

3.4. Peripheral Monitor Configuration

There are three types of configuration in the Peripheral Monitor Table.

Two of these configurations involve the use of the OAI protocol to supplement the monitoring and third-party control capability of Infolink. As mentioned before, at startup, the NEC PIM configures both an Infolink and an OAI session with the NEAX.

All the three configurations are discussed in detail in the subsequent sections.

All Unified ICM configurations which are unique to the NEC PG are done in the Peripheral Monitor Configuration tool, for which a sample screen is shown in Figure 1.
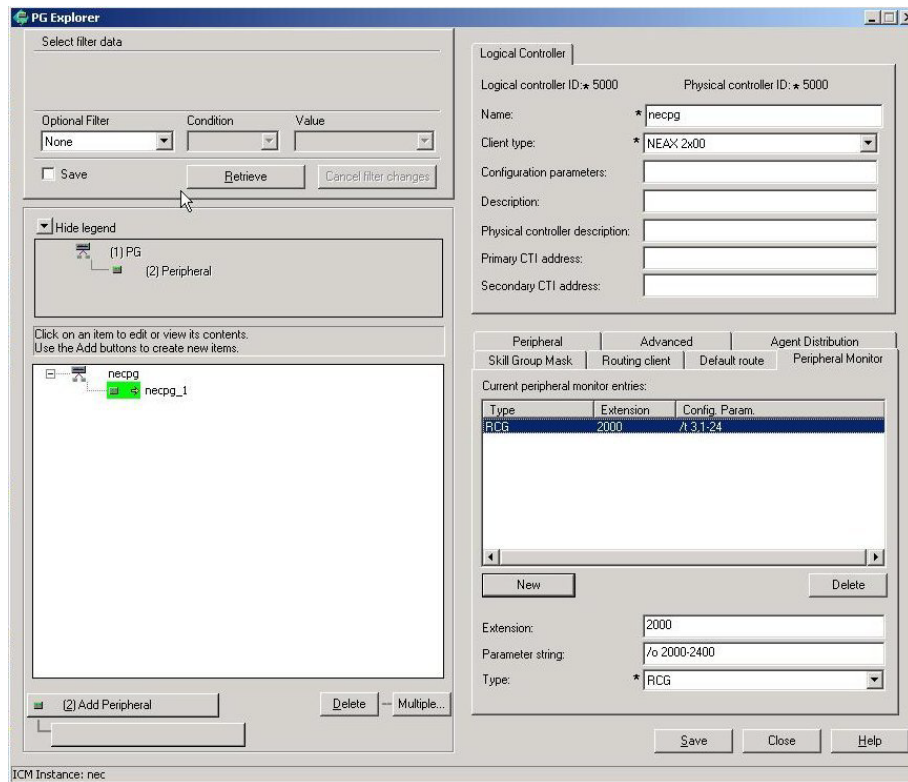
Figure 1: Peripheral Monitor Configuration

3.4.1. Configuration of OAI Monitored ACD-aware Devices

Opening an Infolink session automatically provides monitoring and controlling capabilities for all devices known by the ACD. However, some call events are not properly reported by Infolink, and the OAI protocol is used to get these additional call events. Unlike Infolink, OAI requires that monitoring be started for each device individually. For this reason, all PBX and Business stations, and outbound trunks on the switch must be configured in one or more entries of the Peripheral Monitor Table. This enables the NEC PG to correctly start monitoring of these devices.

Note: To avoid excessive data entry, a range can be provided. This range can include devices that are not configured on the switch; however, the specification of ranges that include such unconfigured devices should be minimized. This prevents a load on the network and the switch at startup. Each such entry contains fields with values as indicated in Table 6.

Table 6: ACD-aware Device Format

Extension	Param String	Peripheral Monitor Type
0 (or any other value)	<start of range>-<end of range>	RCG

Figure 2 shows the configuration screen of the ACD-aware devices.
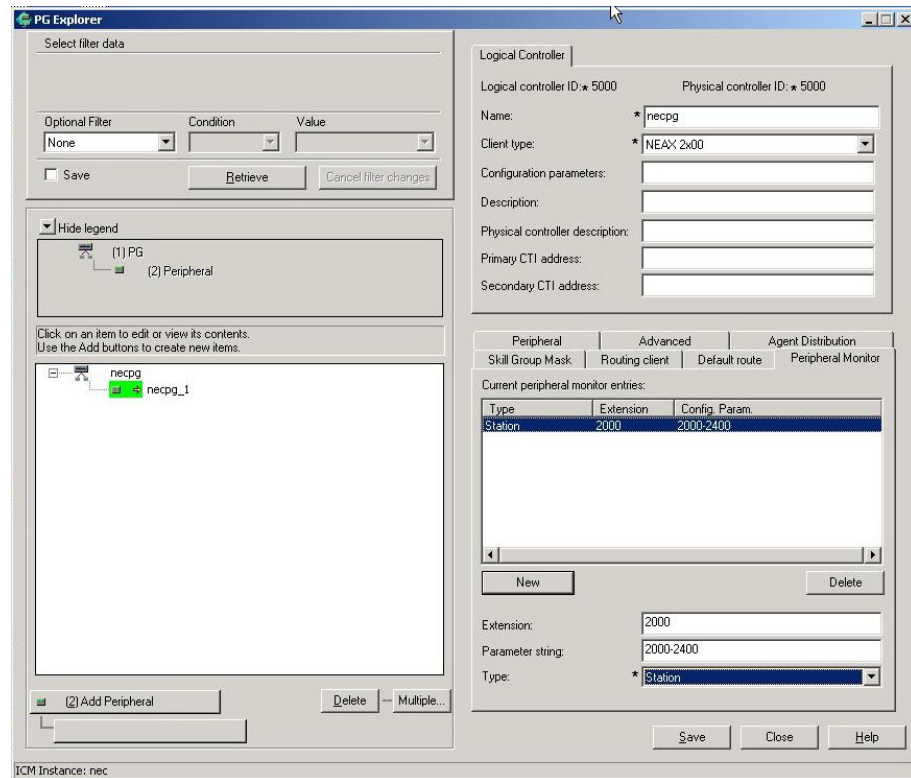
Figure 2: Configuration of ACD Aware Device Screen

3.4.2. Configuration of OAI Monitored Non-ACD-aware Devices

Some devices, such as non-ACD-configured VRU ports, are not known to the ACD and are not reported with the Infolink protocol. For these ports, one or more additional entries must be made in the Peripheral Monitor Table enabling the NEC PG to start monitoring these devices. A format description and example of one of these entries is shown in Table 7.

Table 7: Non ACD-aware Device Format

Extension	Param String	Peripheral Monitor Type
0 (or any other value)	/o <start of range>-<end of range>	RCG
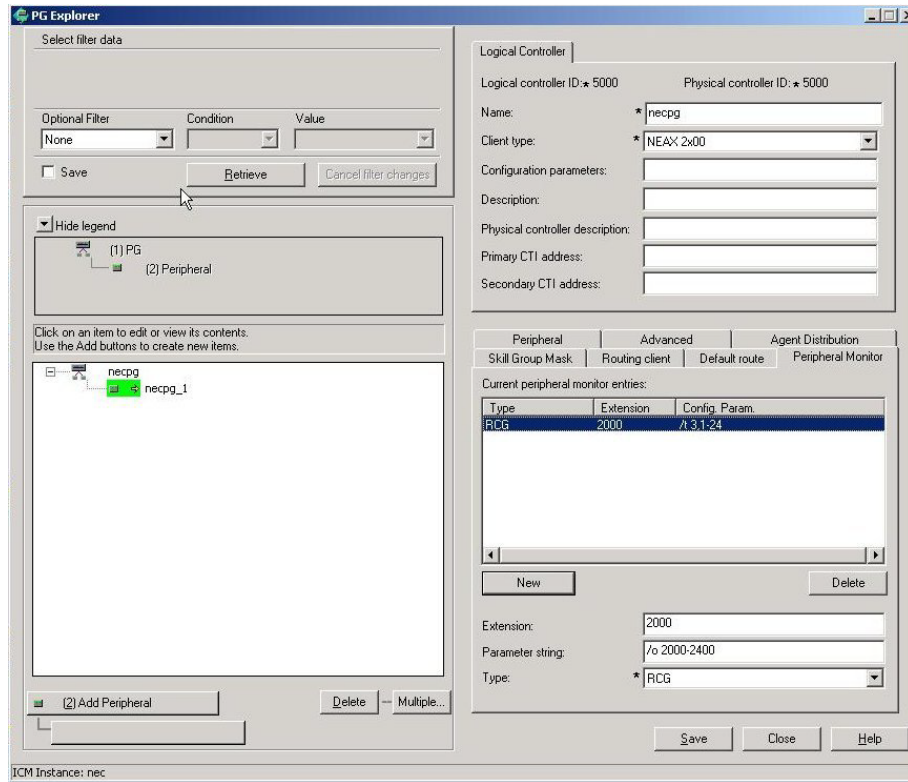
Figure 3: Configuration of non ACD-aware Device Screen

Outbound Trunks (or dual inbound/outbound trunks) must also be configured in the format defined in Table 8.

Table 8: Outbound Trunk Format

Extension	Param String	Peripheral Monitor Type
0 (or any other value)	/t <trunk group>, <start of trunk range>-<end of trunk range>	RCG

For example to configure trunks 1 to 24 for trunk group 2, the Param String should be "/t 2, 1-24".

Note: All Param String entries must be in the form of a range, even when configuring a single number. In such cases, the start and end values must match the configured number.

3.4.3. Configuration of Post Route Split

Post routing on the NEC PG works by using Pilot numbers that invoke CCVs queuing to a special split called the Post Route split (see the chapter on NEC Switch Configuration, for more information). This split must be configured in the NEC switch and the split number must be configured in the Peripheral Monitor Table. A single entry must be created which has fields with values as defined in Table 9.

Table 9: Post Route Split Format

Extension	Param String	Peripheral Monitor Type
0 (or any other value)	/p <post route split number>	RCG

For instance, if the post route split number is 99, then the param string value should be "/p 99".

Note: For documentation purposes, other text may be used as long as it begins with a "/p" and the only number in the param string is the post route split number. For instance, a param string value of "/post route` split = 99" is also valid.

Figure 4 is a sample screen for configuring the Post Route Split.
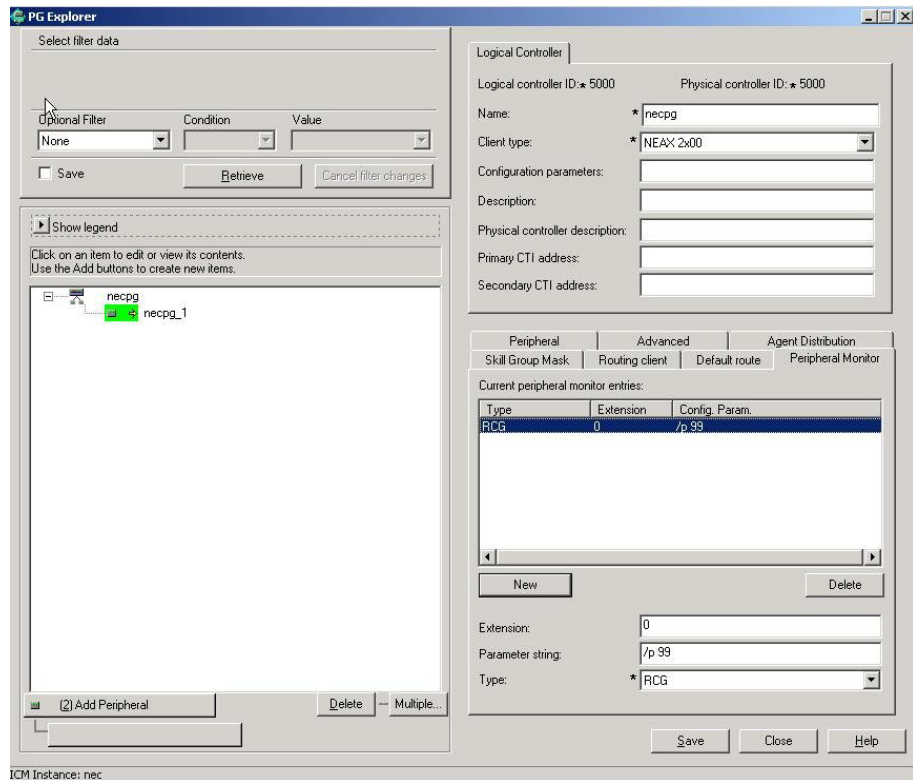
Figure 4: Configuration of Post Route Split Screen

4. NEC PG Setup

The NEC PG setup for the NEAX 2400/7400 is common to the other NECs. This chapter is a refresher for the setup.

If you require a full description, please refer to the *Installation and Setup Guide for Cisco Unified ICM Enterprise Edition.*

4.1. Preparing for the Setup

The NEC PG is an OAI application and it requires the installation of NEC's Open Application Interface (OAI) NT API Libraries. Obtain a setup disk from the NEC to install the libraries and DLLs that are required to interface to the NEC-2400 and NEC-2000 switches.

In addition, NEC provides a security device (dongle) that must be installed in the PG's parallel port, along with a serial number and key that must be entered during the NEC library setup. The PG setup will check for the installation of the NEC library, and will block completion of the PG setup if NEC library installation is not complete.

The PG setup disk also contains a copy of the NEC library setup; however, the dongle, serial number, and security key must be obtained from the NEC. To fake installation of the NEC library for the purposes of running a PG with the ACD simulator, the following key may be defined in the registry:

```
HKLM\SOFTWARE\NECAM\OAI Platform\Serial
Numbers\OAIDLL\1#OAIDLL#RUN
```

4.2. Configuring the PG in Web Setup Tool

Follow the steps below to configure the PG in the Web Setup Tool.

1. Begin with the Web Setup Tool by selecting a Unified ICM Instance and then **Add** (to add a PG) or **Edit** (to edit an existing PG)
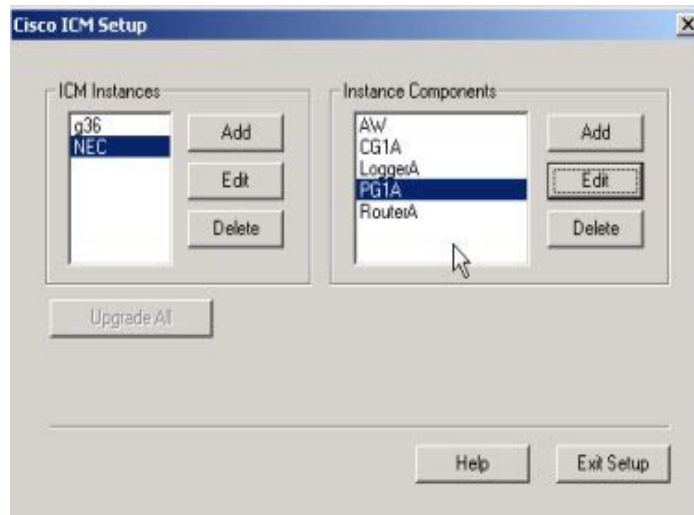
Figure 5: Web Setup Tool Screen

2. Select Production mode and Auto start at system startup. Also select Duplexed Peripheral Gateway, if desired. Select a PG ID and the NEAX2400 ACD type and the appropriate side of a duplexed pair. Click **Next**.
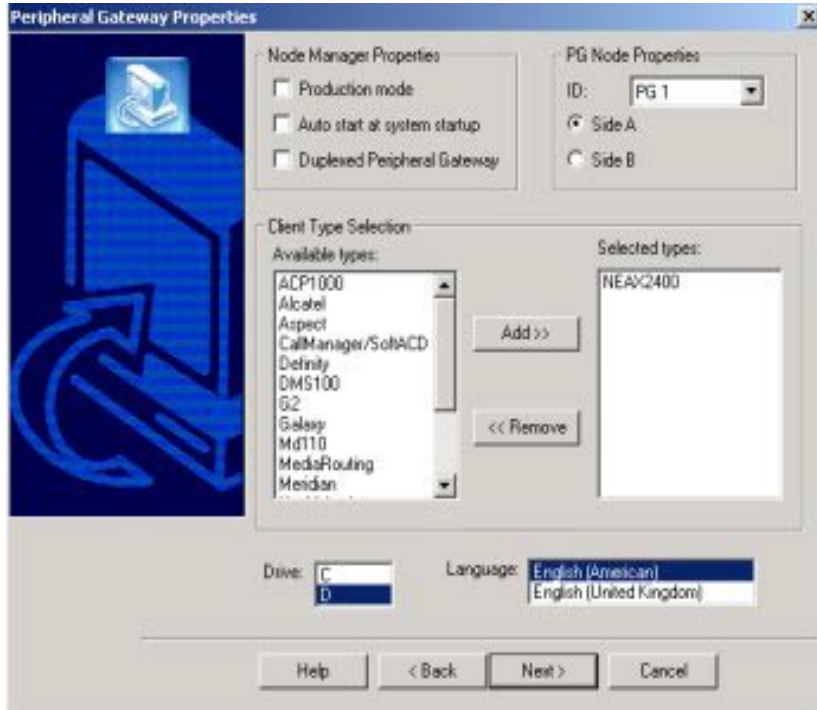
Figure 6: Peripheral Gateway Properties Screen
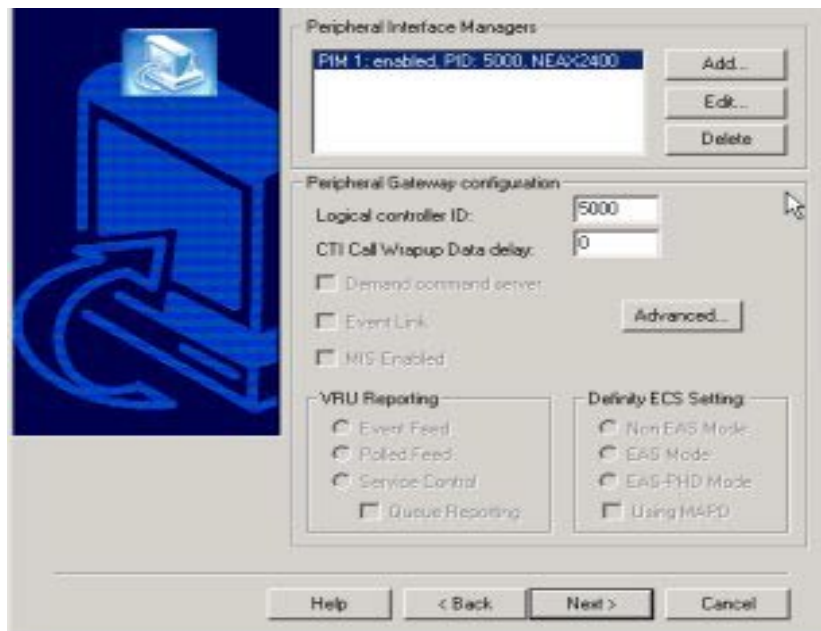
3. **Add** or **Edit** the PIM

Figure 7: Peripheral Gateway Component Screen

4. Configuration of the PIM is the only NEC-specific portion of the PG Setup. Select the Peripheral Name and Peripheral ID. Configure the IP address of the OAI/Infolink interface of the NEC switch. You can find this by using the AIPT command of the NEC IMXMAT utility. See the chapter on NEC Switch Configuration, for more information. The Port Number Start and Port Number End should be set to the port number of the first port in the 16 port range of ports provided by the NEC switch – this is currently 1024, but NEC may change this in the future. Click **OK**.
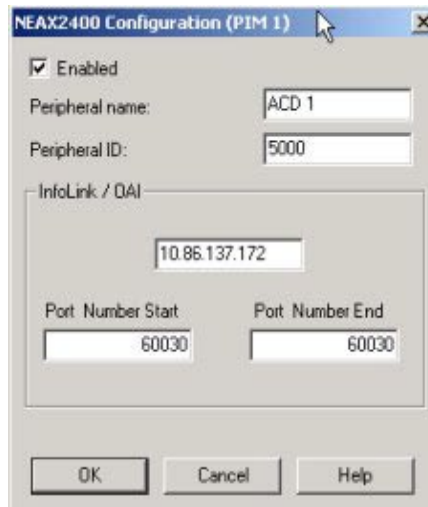
Figure 8: NEAX2400 Configuration Screen

5. Enter the DMP Properties as indicated in the Installation Guide for Cisco Unified ICM. Click **Next**.
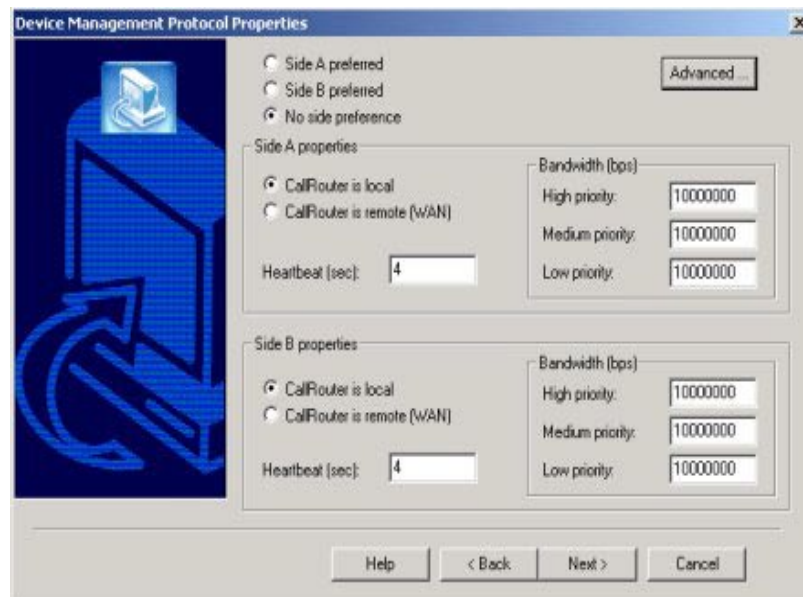
Figure 9: DMP Properties Screen

6. Enter the Peripheral Gateway Network Interfaces as indicated in the *Configuration Guide for Cisco Unified ICM Enterprise and Hosted*. Click **Next**.
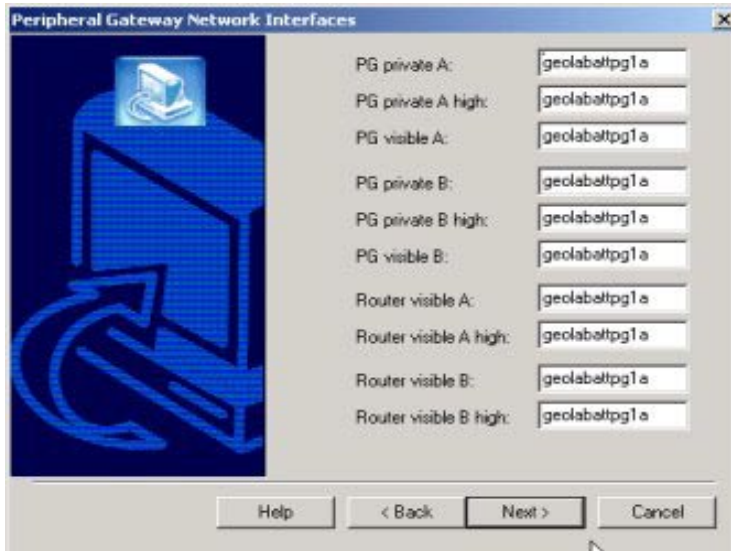
Figure 10: Peripheral Gateway Interface Screen

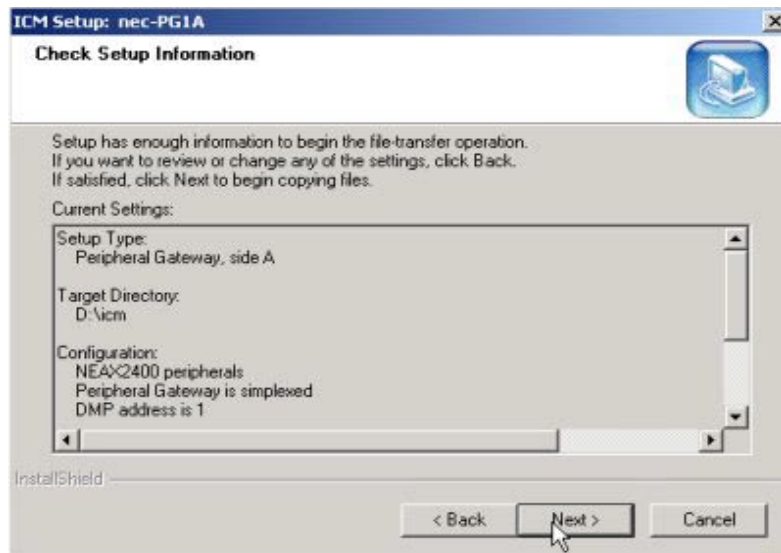7. Check for the correctness of the setup information, and click **Next** to finish setup.

Figure 11: Completed PG Setup Screen

5. NEC Switch Configuration

This chapter describes the configuration options that are required for the operation of the NEC PG.

Two utilities are provided by NEC to configure the switch.

The first section describes the configuration required for the NEC PG using the IMXMAT utility, which configures the PBX portion of the switch.

The second section describes the configuration required for the NEC PG using the ACDMAT utility, which configures the ACD portion of the switch.

5.1. IMXMAT Configuration

This configuration is performed using NEC's IMXMAT utility.

Follow the steps mentioned to use the IMXMAT utility.

1. No special configuration is required to support the NEC PG, except to set the IP address of the OAI/Infolink ports. To do so, use the AIPT command as shown in Figure 12.
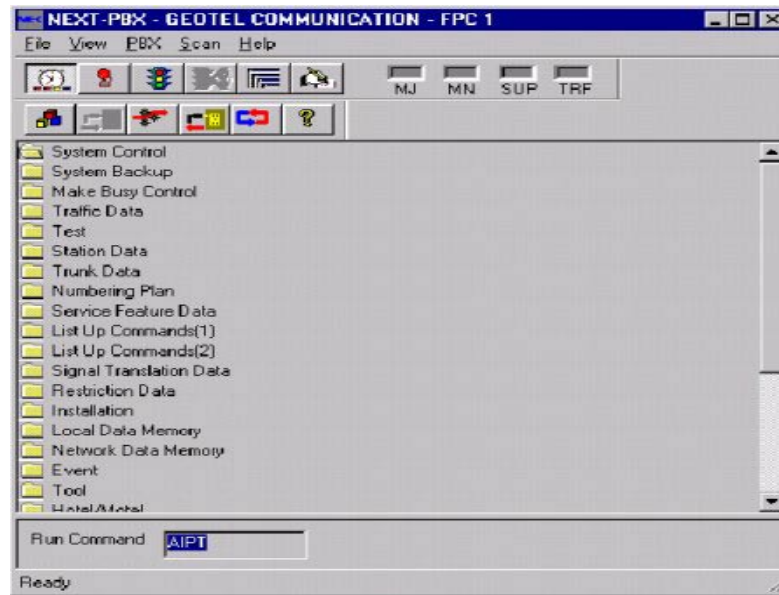
Figure 12: AIPT Command in IMXMAT

2. Select the AIPT command to set the OAI/Infolink IP address, which results in the display of the AIPT windows.

Note: Do not add, change, or delete the port, except on the advice of your local network administrator– the IP address shown is only an example. When the port is configured, the IP address should be recorded for use in the Web Setup Tool.

No default gateway or 1st hop router can be configured, so it is necessary for the NEC PG to be located on the same IP subnet as the NEC switch.

Figure 13: AIPT Command Screen

5.2. ACDMAT Configuration

This configuration is performed using NEC's ACDMAT utility whose main screen is shown in Figure 14.

Figure 14: ACDMAT Command Screen

5.3. Agent Configuration

Agent configuration is performed using the ACDLOG command with an example screen shown in Figure 15.

For the Agent Logon configuration, the following limitations must be noted.

- Due to a limitation in the NEC Infolink third-party Agent control, in order to log on an Agent using the CTI interface, the Agent's logon split cannot be ambiguous. The logon split is ambiguous only if all the following are true:
  - The Agent is configured for Single Split (Multi-split is "No")
  - Multiple allowed splits are configured
  - The logon position is configured for "Any" split (see the section on Position Configuration)

In addition, due to the same NEC limitation, if the Agent is configured for Multi-split, CTI will log the Agent into all of the Allowed splits. It is not possible to select a subset of those splits for logon.
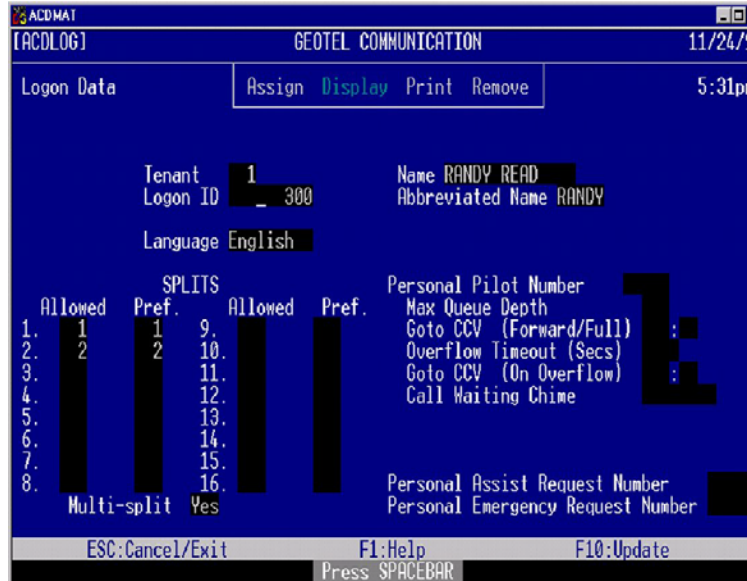

Figure 15: ACDLOG Command Screen

5.4. Position Configuration

Position configuration is performed with the ACDPSN command. A sample screen is shown in Figure 16.

No special configuration is required for a position. However, note the limitations on CTI Agent logon described in Agent Configuration.

Figure 16: ACDPSN Command Screen

5.5. Split Configuration

Split configuration is performed using the ACDSPL command. An example screen is shown in Figure 17.

No special configuration is required for any split, however in order to support post routing, a single special post route split must be created. No Agents should ever be configured or logged into this split, but the split must be configured to a queue – for instance "Agent Queuing" set to "Priorities". The PG will attempt to post route any call which is queued to this split. The CCV which queues to this split should be programmed to handle cases where post routing does not occur within a desired timeout period (recommended at 2 seconds), by dequeueing and queuing to a default split.

Different CCVs may be configured for different Post Route Pilot numbers to enable different timeout handling for the different Post Route pilot numbers, if desired.

Figure 17: ACDSPL Command Screen

5.6. CCV Configuration

CCV configuration is performed using the ACDCCV command. A sample screen is shown in Figure 18.

No special configuration is required for any CCV, except that at least one special post route CCV must be created to handle post route Pilot numbers, and the post route Split. See sections Split Configuration and Pilot Configuration for more information.

Figure 18: ACDCCV Command Screen

5.7. Pilot Configuration

Pilot configuration is performed using the ACDPLT command. A sample screen shown in Figure 19.

No special configuration is required for pilot numbers, except that a set of additional pilot numbers must be configured for pre- and post-routing. See Split Configuration for more information on the post route split. Also see the Unified ICM documentation set for Cisco for more information on pre- and post-routing and the "DNIS pool".

Figure 19: ACDPLT Command Screen

5.8. Trunk Group Configuration

Trunk Group configuration is performed using the ACDTG command. A sample screen is shown in Figure 20.

No special configuration is required for Trunks and Trunk Groups.
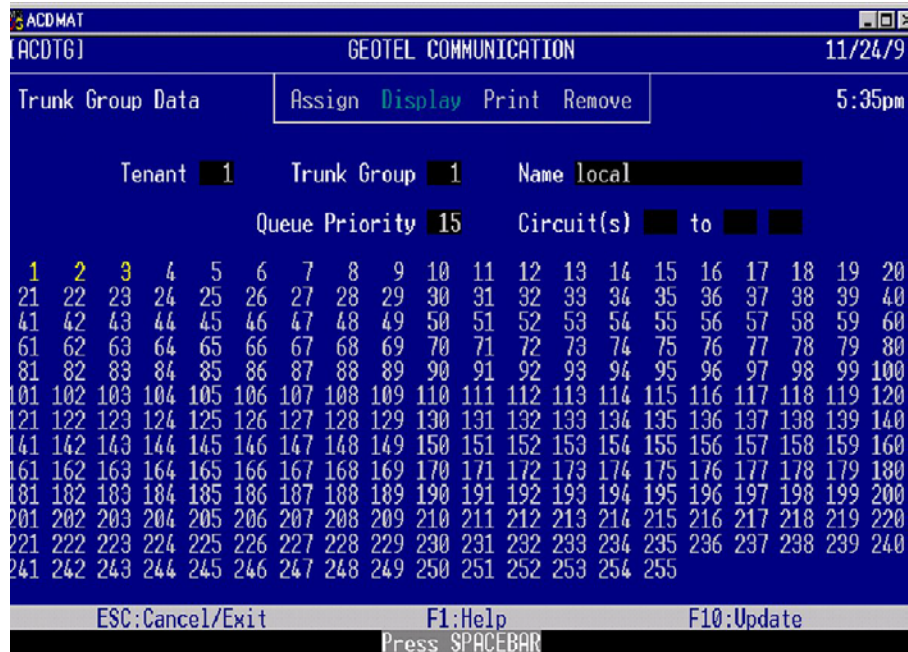
Figure 20: ACDTG Command Screen

5.9. System User Data

System user data configuration is performed with the ACDUD1 command. A sample screen is shown in Figure 21.

For the System User Data Page 1 configuration, the following two fields must be set as in Table 10.

Table 10: System User Data Configuration

Field Name	Value	Description
Incoming Call message	"Iq" (Not "IQ")	The "Iq" setting allows split information to be included in Infolink Queued messages
Infolink with Call ID	"Yes"	The "Yes" setting causes the ACD to provide a CallID field in many Infolink messages.

Also note that ACD version 4.12 requires a patch to enable ACD features shown here, which will not be generally available until version 4.13, but which are required by the NEC PG. The patch is affected by using the Alt-E

command from the ACDMAT main screen and reassigning a particular memory value – the address of this memory depends upon the ACD version and must be provided by NEC.

Figure 21: System User Data Screen

5.10. Outbound Calls

The NEC switch does not make Predictive Calls in the classic Predictive sense. To make Predictive calls, the switch "predicts" Agent availability and dials the outbound call. This does not tie up an Agent while the call is placed and before it is answered. In the NEC case, when an OutboundCallRequest (Infolink message IE) is sent to the switch, the call is queued to a Pilot specified in the Request. An available Agent logged into a Split corresponding to this Pilot is found and the call is connected to him/her before any outbound dialing is performed.

The CallDisposition (Infolink IZ message) does not correspond to "Network Reached." The switch utilizes a tenant-relative timer, and as soon as the timer goes off, it just sends the IZ with disposition "answered" guessing that this is indeed the case. And since this message only appears after the call is answered, the "Network Reached" indication is moot.

Index