EAGLE® 5 ISS

Feature Manual - ECAP

TEKELEC

Table of Contents

List of Figures

List of Tables

Chapter

1

Introduction

Topics:

The Eagle Collection Application Processor, or ECAP, is a dedicated standalone platform for the collection of EAGLE 5 ISS traffic statistics data. The ECAP provides a user interface for configuration and application control and generates log files for monitoring and maintenance purposes.

Overview

The Eagle Collection Application Processor (ECAP) is a dedicated standalone platform for the collection of EAGLE® 5 ISS traffic statistics data. The ECAP platform is a frame mounted system that includes two or more ECAP servers, a power distribution breaker panel, and two Ethernet switches. The ECAP server is a T1100 Application Server (AS) running the Integrated Q.752 MTP/SCCP Accounting Feed application. The Eagle Collector Application Process collects raw MSUs from the EAGLE 5 ISS and generates data files that contain structured counts supporting ITU-*T Recommendation Q.752, Section 7*. These counts are sent to another system for accounting activities.

The Integrated Accounting Feed application provides basic MTP and SCCP accounting and measurements capability on the EAGLE 5 ISS platform in accordance with ITU-*T Recommendation Q.752, Section 7*. The concepts discussed in ITU-*T Recommendation Q.752, Section 7* are known as "cascade remuneration" and "cascade remuneration verification", and are based on the principle that the originator of a message pays the network operator who owns the next node in the message's path for accepting the messages and subsequent processing. This operator then pays the network operator who owns the next node in the message's path, and so on until the message finally reaches its final destination, which could be in yet another network.

The ECAP platform is an adjunct system to the Tekelec portfolio of products that work in conjunction with the EAGLE 5 ISS and other system(s) so that the raw MSU data can be converted into accounting records in accordance with *Section 7*. The ECAP generates periodic traffic data files which are transferred to a configured Aggregator, allowing detailed usage reports to be compiled across all monitored links in the system. This system takes the STPLAN feed from EAGLE 5 ISS and collects specific information from each MSU. In general, the information consists of OPC, DPC, SI, SCCP CdPA, SCCP CgPA, and MAP Opcode. These values are organized and written to files and "pushed" to an external system for final analysis.

Note:

For the purpose of this document, a 'data file' is defined as a compiled file of peg counts and other measurements in XML format.

A single ECAP server can process up to 5000 MSUs per second, providing precise measurements of MSUs and octets transmitted. See *Table 2: MSU to Server Mapping* on page 9 for adding multiple ECAPs to an EAGLE 5 ISS system to increase capacity.

The ECAP provides a user interface for configuration and application control and generates log files for monitoring and maintenance purposes.

Scope and Audience

This manual is intended for anyone responsible for installing, maintaining, and using the Integrated Accounting Feed application in the EAGLE 5 ISS. Users of this manual and the others in the EAGLE 5 ISS family of documents must have a working knowledge of telecommunications and network installations.

Manual Organization

This manual is organized into the following chapters:

- *Introduction* on page 1, contains general overview of the ECAP system, general information about the organization of this manual, the audience, references to other Tekelec documentation you might need, information on customer assistance, documentation packaging, delivery, and updates, and a list of acronyms and abbreviations used in the document.

- *Feature Description* on page 7, provides a functional description of the Integrated Accounting Feed application and ECAP system, including overviews of the architecture and connectivity, hardware requirements, and considerations.

- *ECAP Configuration* on page 17, describes how to configure the components that comprise the Integrated Accounting Feed application.

- *Maintenance* on page 33, describes maintenance tasks for the Integrated Accounting Feed application, including alarms, disaster recovery, log files, and health check procedures.

- *MSU to XML Field Mapping* on page 47, describes how MSU parameters that come into the ECAP server relate to the peg count fields in the ECAP data file.

Related Publications

For information about additional publications that are related to this document, refer to the *Related Publications* document. The *Related Publications* document is published as a part of the *Release Documentation* and is also published as a separate document on the Tekelec Customer Support Site.

Documentation Availability, Packaging, and Updates

Tekelec provides documentation with each system and in accordance with contractual agreements. For General Availability (GA) releases, Tekelec publishes a complete EAGLE 5 ISS documentation set. For Limited Availability (LA) releases, Tekelec may publish a documentation subset tailored to specific feature content or hardware requirements. Documentation Bulletins announce a new or updated release.

The Tekelec EAGLE 5 ISS documentation set is released on an optical disc. This format allows for easy searches through all parts of the documentation set.

The electronic file of each manual is also available from the Tekelec Customer Support site. This site allows for 24-hour access to the most up-to-date documentation.

Printed documentation is available for GA releases on request only and with a lead time of six weeks. The printed documentation set includes pocket guides for commands and alarms. Pocket guides may also be ordered as a set or individually. Exceptions to printed documentation are:

- Hardware or Installation manuals are printed only without the linked attachments found in the electronic version of the manuals.
- The Release Notice is available only on the Customer Support site.

Note:

Customers may print a reasonable number of each manual for their own use.

Documentation is updated when significant changes are made that affect system operation. Updates resulting from Severity 1 and 2 PRs are made to existing manuals. Other changes are included in the documentation for the next scheduled release. Updates are made by re-issuing an electronic file to the customer support site. Customers with printed documentation should contact their Sales Representative for an addendum. Occasionally, changes are communicated first with a Documentation Bulletin to provide customers with an advanced notice of the issue until officially released in the documentation. Documentation bulletins are posted on the Customer Support site and can be viewed per product and release.

Documentation Admonishments

Admonishments are icons and text throughout this manual that alert the reader to assure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage.

Table 1: Admonishments

![danger icon]	**DANGER**: (This icon and text indicate the possibility of *personal injury*.)
![warning icon]	**WARNING**: (This icon and text indicate the possibility of *equipment damage*.)
![caution icon]	**CAUTION**: (This icon and text indicate the possibility of *service interruption*.)

Customer Care Center

The Tekelec Customer Care Center offers a point of contact for product and service support through highly trained engineers or service personnel. The Tekelec Customer Care Center is available 24 hours a day, 7 days a week at the following locations:

- Tekelec, USA

  Phone:

+1 888 367 8552 (US and Canada only)

+1 919 460 2150 (international)

Email: *support@tekelec.com*

- Tekelec, Europe

   Phone: +44 1784 467804

   Email:*ecsc@tekelec.com*

When a call is received, a Customer Service Report (CSR) is issued to record the request for service. Each CSR includes an individual tracking number.

After a CSR is issued, the Customer Care Center determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, information regarding the serial number of the system, Common Language Location Identifier (CLLI), initial problem symptoms (includes outputs and messages) is recorded. A primary Customer Care Center engineer is also assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

Emergency Response

In the event of a critical service situation, emergency response is offered by the Tekelec Customer Care Center 24 hours a day, 7 days a week. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with an EAGLE 5 ISS that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical problems affect service and/or system operation resulting in:

- A total system failure that results in loss of all transaction processing capability

- Significant reduction in system capacity or traffic handling capability

- Loss of the system's ability to perform automatic system reconfiguration

- Inability to restart a processor or the system

- Corruption of system databases that requires service affecting corrective actions

- Loss of access for maintenance or recovery operations

- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with the Tekelec Customer Care Center.

Hardware Repair and Return

Any system components being returned for repair or replacement must be processed through the Tekelec Return Material Authorization (RMA) procedures. A hardware repair is defined as an item returned to Tekelec due to a failure, with the returned item being repaired and returned to the customer. It is essential that serial numbers are recorded correctly. RMAs cannot be created without a valid serial number. All repair and quality information is tracked by serial number.

Locate Product Documentation on the Customer Support Site

To view or download product documentation, log into the Tekelec Customer Support site at:

https://support.tekelec.com/index.asp

1. Log in with your user name and password. (Click on **Need an Account?** if you need to register).
2. Select **EAGLE** from the Product Support menu.
3. Select the release number from the Release menu.
4. Locate the Notices section to view the latest Feature Notice.
5. Locate the Manuals section to view all manuals applicable to this release.

   The documentation is listed in alphabetical order by the manual name. Only the first three manuals display. Click **more…** to see the remaining manuals.
6. Locate the latest revision of the manual name.

   Confirm the release number and last available revision.

   Select the 936-xxxx-x01 part number to download the complete documentation set with all linked files.

   Note: The electronic file for this part number is quite large.
7. To view a manual, double-click the manual name.
8. To download a manual, right-click and select **Save Target As**.

   Note: Customers may print a reasonable number of each manual for their own use.

Chapter

2

Feature Description

Topics:

This chapter contains information regarding the workings of the Integrated Accounting Feed application, which runs on the Eagle Collector Application Processor (ECAP). This application allows detailed usage files to be compiled across all monitored links in the system. In addition, the Integrated Accounting Feed application provides a user interface for configuration and application control and generates log files for monitoring and maintenance purposes.

Introduction

The Integrated Accounting Feed application runs on the Eagle Collector Application Processor (ECAP) and provides a broad compliance to the requirements for basic MTP and SCCP accounting and measurements functionality as described in ITU-*T Recommendation Q.752, Section 7* and *Tables 15 and 16*.

The Integrated Accounting Feed application performs collection of EAGLE® 5 ISS traffic statistics data. ECAP is one or more T1100-based servers that run in an integrated fashion with EAGLE 5 ISS that receives MSUs from the EAGLE 5 ISS and feeds them to an accounting system.

A single ECAP server can process up to 5000 MSUs per second, providing precise measurements of MSUs and octets transmitted. Multiple ECAP servers can be connected to an EAGLE 5 ISS server for increased processing bandwidth.

The ECAP server periodically generates data files which are transferred to an accounting system, consisting of a server configured as an Aggregator. This application allows detailed usage files to be compiled across all monitored links in the system. See *Architectural Overview* on page 12 for more information.

Note:

The Aggregator may consist of a single server or an IP cluster that uses a virtual IP address.

The application provides a user interface for configuration and application control and generates log files for monitoring and maintenance purposes.

Hardware Requirements

Hardware requirements for the ECAP platform are as follows (refer to *Figure 1: ECAP T1100 Frame* on page 11):

- T1100 AS Frame

  Note:

  Release 1.0 supports a single ECAP Frame.

- Power Distribution breaker panel
- Two Ethernet Switch units
- A T1100 server, running the Integrated Q.752 MTP/SCCP Accounting Feed feature.
- The maximum number of ECAP Servers is six.
- The number of ECAP Servers per frame is two to six.
- The EAGLE 5 ISS system used with the ECAP must be equipped with SSEDCM card types running the VXWSLAN application. The VXWSLAN application cards must be provisioned with 100 Mbps links in order to achieve 5000 MSUs/sec.

The ECAP Servers are configured in an n+1 configuration based on the maximum expected traffic rate as shown in *Table 2: MSU to Server Mapping* on page 9.

Table 2: MSU to Server Mapping

MSU per Second	Servers
<= 5000	2
5001 to 10000	3
10001 to 15000	4
15001 to 20000	5

MSU per Second	Servers
20001 to 25000	6

Figure 1: ECAP T1100 Frame
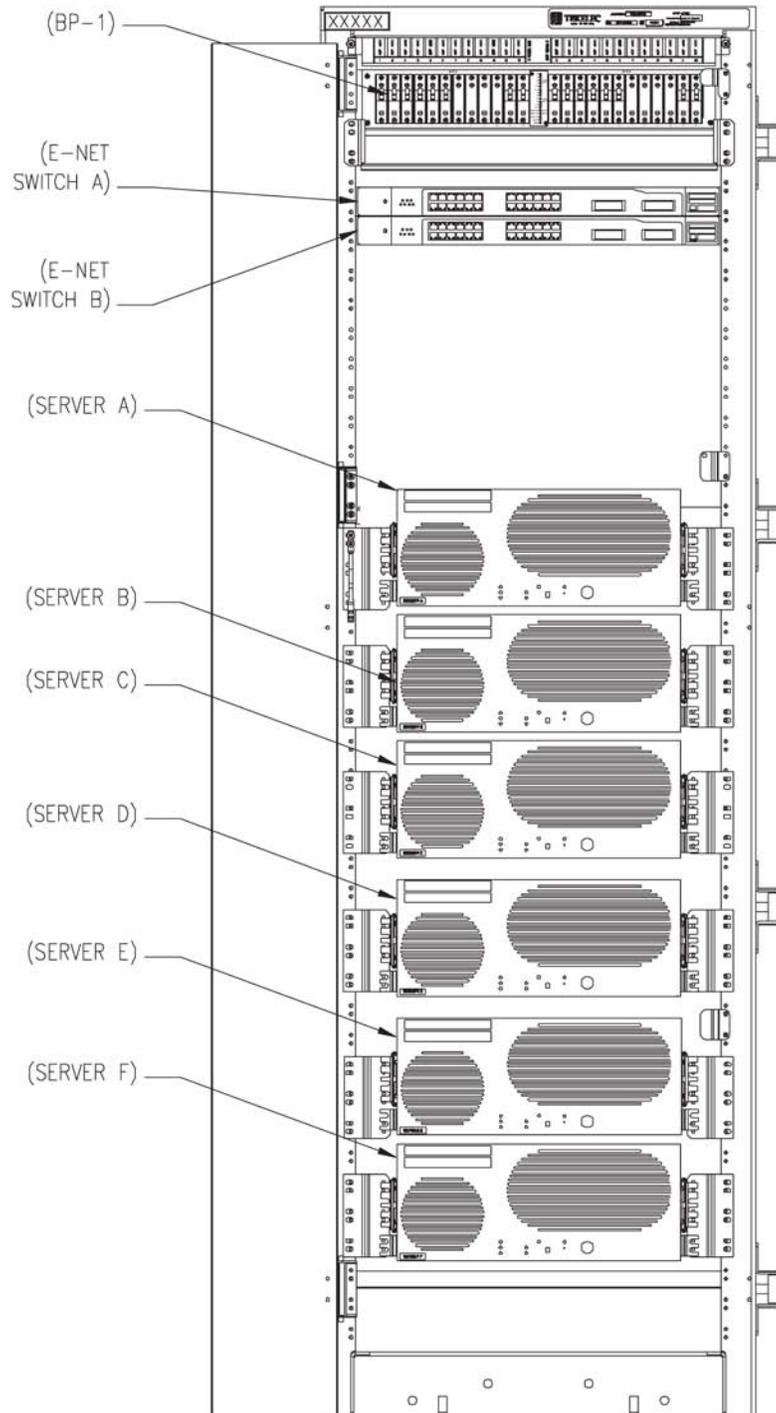
Architectural Overview

Figure 2: Integrated Accounting Feed Architectural Overview on page 12 provides a high-level architectural view of the Integrated Accounting Feed application as it runs on the ECAP system. The EAGLE 5 ISS (100) connects to the Collector (101) via a direct connected Ethernet cable. The data feed from the EAGLE 5 ISS to the Collector is the STPLAN (104). The Collector runs on the T1100 series of Tekelec Servers. The set of Collector hardware and software (the Integrated Accounting Feed application) is considered the ECAP.

The Collectors are connected to the Aggregator (102) via a WAN Ethernet connection (105). The Aggregator (102) collects data from all Collectors and performs any processing decided by the customer (103).

Figure 2: Integrated Accounting Feed Architectural Overview
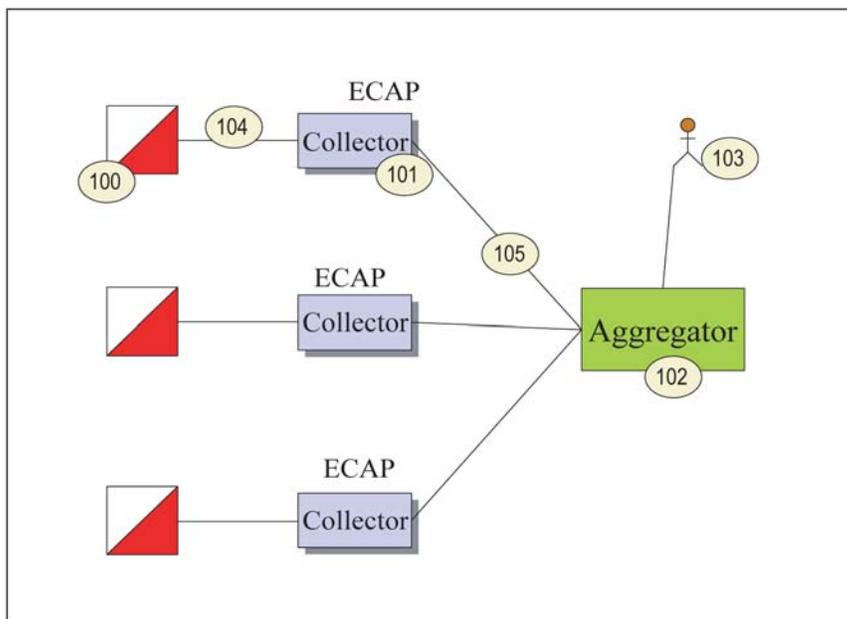
Table 3: Integrated Accounting Feed Architecture Terms on page 12 defines the terms used in the above figure.

Table 3: Integrated Accounting Feed Architecture Terms

Term	Definition
Collector	The Collector function runs on the ECAP servers. This function receives the STPLAN MSU feed and parses the MSUs in the feed into categories based on provisioning rules. The Collector provides the interface to the Aggregator function.

Term	Definition
Aggregator	The Aggregator function accepts the data feed from all Collector functions within the customer's network and compiles user-defined accounting reports.
	The Aggregator function is installed on a system defined by the customer. This system should have the following characteristics:
	• Ability to accept an XML file
	• Ability to accept a 'push'
	• Ability to sustain an IP connection and support Virtual IP, including a virtual IP address.
	Note:
	The ability to support Virtual IP is recommended but not a requirement.
	• Ability to enable SecureShell

Interconnectivity

Figure 3: Interconnectivity Overview provides a high-level view of interconnectivity for the Integrated Accounting Feed application.

The number of ECAP Servers (200) and Interface Cards (201) is dependent on the number of MSU that need to be collected to provide the measurement data. The capacity of 5000 MSU per server is the benchmark. The T1100 servers and Interface Cards are configured on a one-for-one basis (1:1).

The Aggregator (102) must be capable of retrieving data files from at least 20 ECAP Servers.

An NMS (111) is used to capture SNMP traps generated by each server.

Maintenance Personnel (109) access the Collectors via the Customer Network (108) that is connected to the Dual Ethernet Switches (107).

Figure 3: Interconnectivity Overview
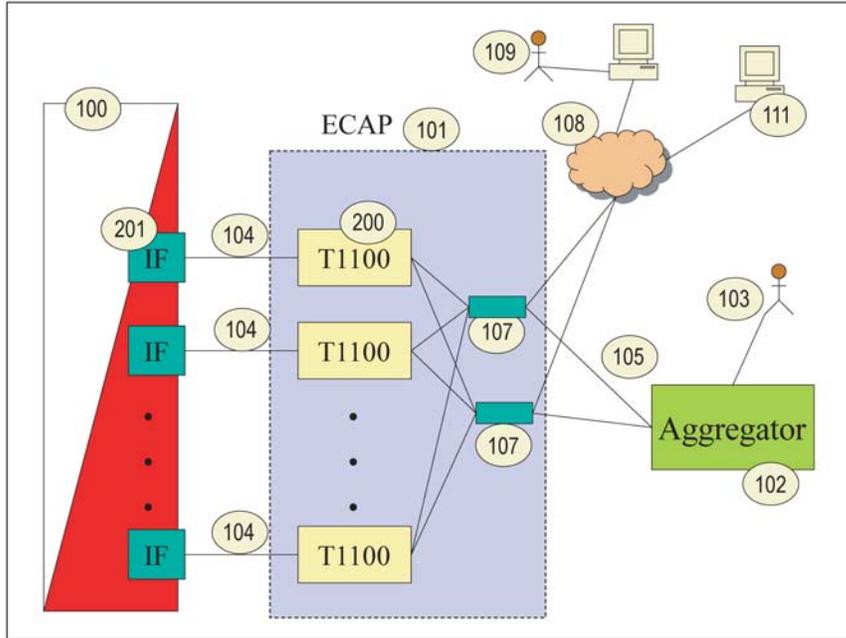
See *Architectural Overview* on page 12 for a description of the other details in the above figure.

A diagram showing a detailed view of the EAGLE 5 ISS/ECAP/Aggregator connectivity is shown in *Figure 4: Aggregator/ECAP/EAGLE 5 ISS Connectivity Diagram* on page 15. This diagram includes the types of connection that flow between each component.

Figure 4: Aggregator/ECAP/EAGLE 5 ISS Connectivity Diagram
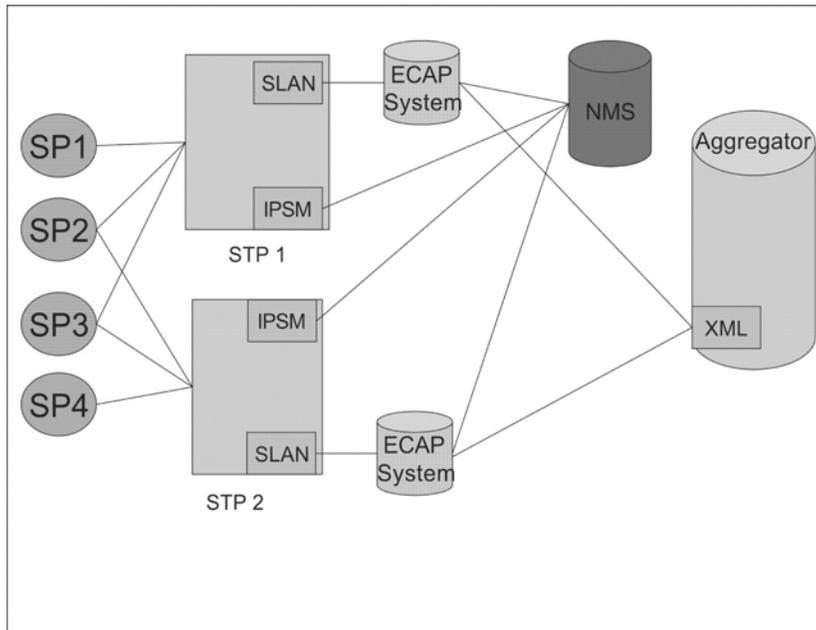
The connectivity elements are as follows:

- **EAGLE 5 ISS Connectivity**

  - SLAN to ECAP for Q.752 accounting information
  - IPSM to NMS for alarms monitoring

- **ECAP Connectivity**

  - Ethernet to EAGLE SLAN for Q.752 accounting information retrieval.
  - Ethernet to NMS for alarm transfer
  - Ethernet to Aggregator for XML data transfer

- **Aggregator Connectivity**

  - LAN to ECAP for Q.752 accounting information in XML data format. See *MSU to XML Field Mapping* on page 47 for more details.

Integrated Accounting Feed Considerations

Some considerations for optimal ECAP performance are listed below.

- The Integrated Accounting Feed application must be configured to use the ITU protocol via `ecapcfg`.

  Note:

  ANSI is provided as a possible protocol for the ECAP server (see *Configuring the Integrated Accounting Feed Application* on page 28). However, ITU is the only supported protocol for Release 1.0.

- The Integrated Accounting Feed application cannot aggregate data to the linkset level. Aggregation of peg counts must be done by the Aggregator.

- Because of the nature of the EAGLE 5 ISS and its SLAN subsystem, no other application requiring SLAN copied MSUs may operate simultaneously with the EAGLE 5 ISS that is being used to run the Integrated Accounting Feed application.

- If over 50% of the message traffic consists of MSUs that are greater than 200 bytes, then the ECAP server is not able to reach the 5000 MSUs/second process rate.

Chapter

3

ECAP Configuration

Topics:

The Integrated Accounting Feed application requires configuration tasks to be performed on the Aggregator, NMS, ECAP network, Integrated Accounting Feed application, and EAGLE 5 ISS. This chapter includes instructions for configuring the tools within the Integrated Accounting Feed application.

Introduction

The Integrated Accounting Feed application requires configuration tasks to be performed on the Aggregator, NMS, ECAP network, Integrated Accounting Feed application, and EAGLE® 5 ISS. It is recommended that these tasks be performed in the following sequence:

- Configure the Aggregator (customer-specific)
- Configure the ECAP Network Interfaces
- Configure File Transfer from the ECAP server to the Aggregator
- Configure NTP to synchronize time between the ECAP server and the Aggregator
- Configure the NMS on the NMS system (customer specific) and configure the ECAP server to send SNMP traps to the NMS
- Configure the Integrated Feed Application
- Configure the EAGLE 5 ISS SLAN cards
- Configure Gateway Screening on EAGLE 5 ISS

Configuring the Aggregator

The Aggregator must be configured to receive data files from the ECAP. These configuration tasks are mostly customer-specific. However, an RSA Public Key must be generated from the File Transfer Interface and added to the Aggregator. See *Configuring File Transfer* on page 22 for more information.

Configuring ECAP Network Interfaces

Each ECAP server requires three operational network interfaces. All interfaces are standard 100Mbps IP connections. While each ECAP server connects to only one Aggregator, the Aggregator

may receive measurements data from multiple ECAP servers associated with a single EAGLE 5 ISS. *Figure 5: Network Configuration* on page 19 provides an example network configuration.

Figure 5: Network Configuration
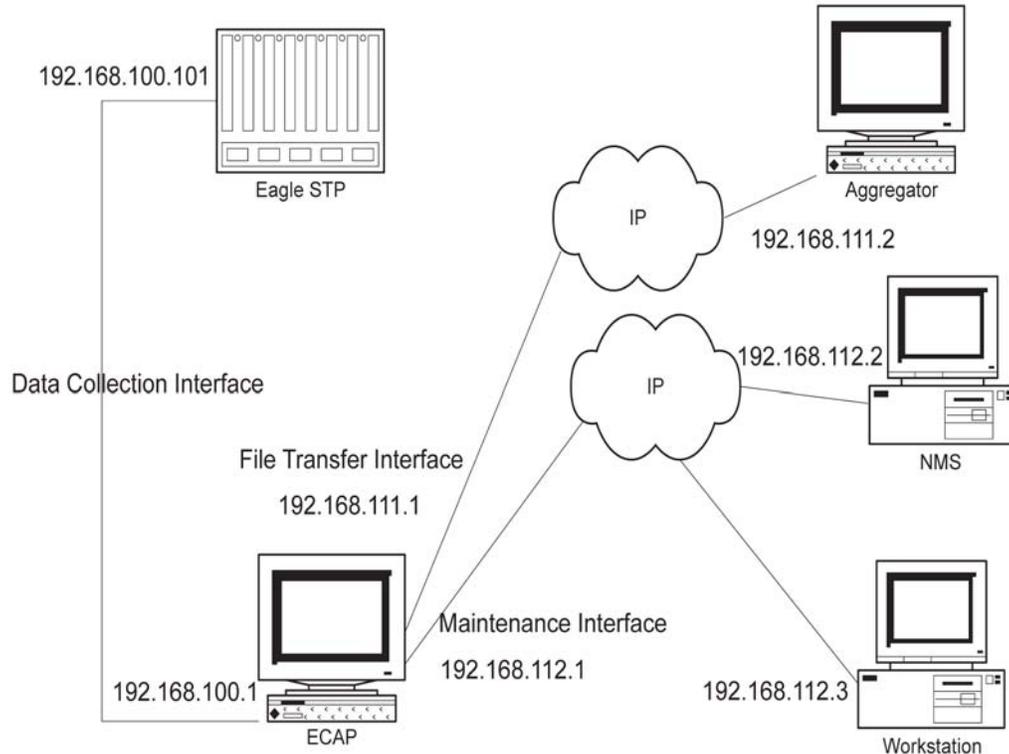
The Data Collection Interface is the incoming MSU data network interface. This interface connects an ECAP server to the EAGLE 5 ISS SLAN card via a direct IP connection. Each ECAP server interfaces with one and only one SLAN card.

The File Transfer Interface is used to transfer data files from the ECAP server to the Aggregator. This is a secure interface.

The Maintenance Interface is an OAM interface that allows monitoring of alarms by a remote NMS. This interface supports secure remote login via SSH.

ECAP network configuration is managed by `platcfg`. Use the following procedure to configure the interfaces. See *Table 4: ECAP Network Parameters* on page 21 for a list of recommended interface settings.

Procedure 3-1 Configuring Network Interfaces

1. Log in to the ECAP server as the `platcfg` user.
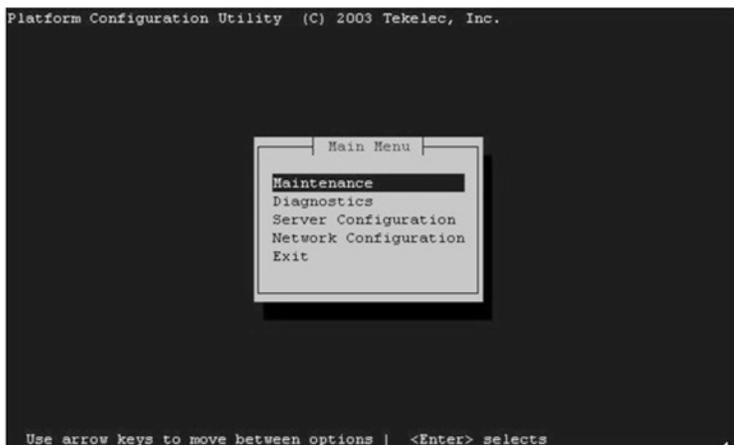
2. Select **Network Configuration** from the Platform Configuration Utility Main Menu and press **Enter**.
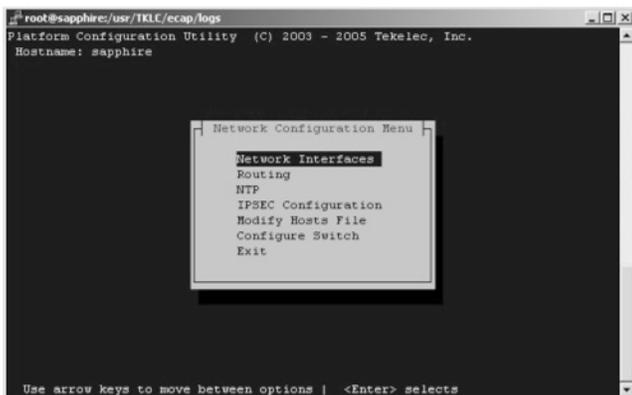
3. Select **Network Interfaces** from the Network Configuration Menu and press **Enter**.
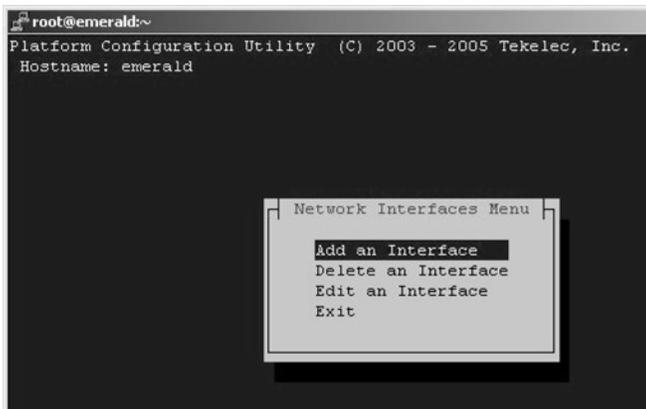
4. Select **Edit an Interface** from the Network Interfaces Menu and press **Enter**.
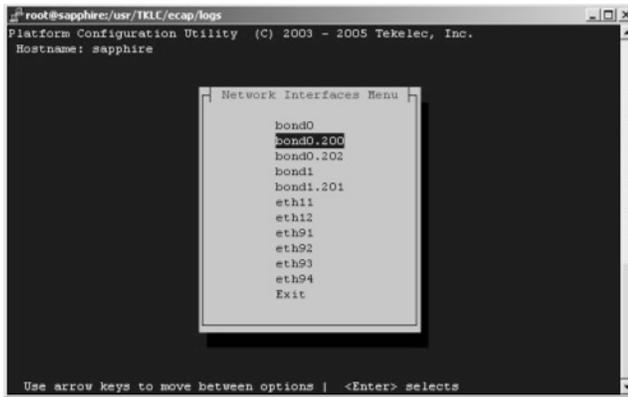
5. Select the device that corresponds to the interface you want to configure and press **Enter**.

   See *Table 4: ECAP Network Parameters* on page 21 for a list of interfaces and their associated devices.
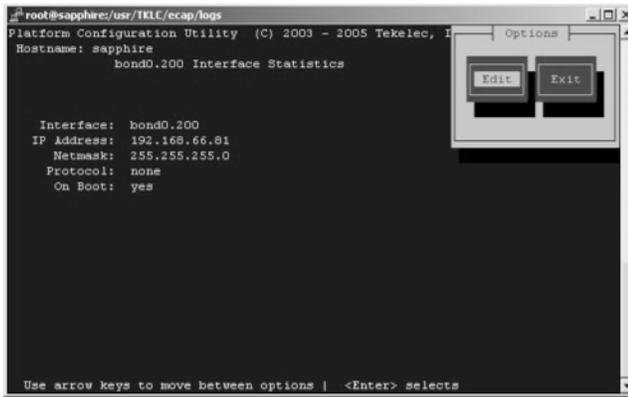
6. Select **Edit** to configure the interface, using the settings in *Table 4: ECAP Network Parameters* on page 21.

7. Save and **Exit** the menu.

Table 4: ECAP Network Parameters

Parameter	Data Collection Interface	File Transfer Interface	Maintenance Interface
Device	eth93	bond0.200 **Note:** Device bond0.200 is a VLAN-tagged device of bond0.	bond1.201 **Note:** Device bond1.201 is a VLAN-tagged device of bond1.
IP Address	Default at install: 1A: 192.168.100.1	locally administered	locally administered

Parameter	Data Collection Interface	File Transfer Interface	Maintenance Interface
	1B: 192.168.100.2 1C: 192.168.100.3 1D: 192.168.100.4 1E: 192.168.100.5 1F: 192.168.100.6		
Netmask	255.255.255.0	locally administered	locally administered
Boot Protocol	none	none	none
Start on Boot	yes	yes	yes

For bonded interfaces such as the File Transfer and Maintenance Interfaces, when taking down individual physical interfaces enslaved to the bond with the `ifdown` or `ifconfig down` commands (e.g. `ifdown eth12`), perform the following steps to bring the bonds back up correctly:

1. `ifup` or `ifconfig up` on the bonded interface (e.g. `ifup bond0`).
2. `ifup` or `ifconfig up` on the VLAN-tagged bonded interface (e.g. `ifup bond0.200`.)

The bonded interface should then be up and working correctly again.

Configuring File Transfer

In addition to the network configuration tasks listed above, the File Transfer Interface must be configured to automatically push data files from the ECAP server to the Aggregator. In normal operating conditions, the ECAP server pushes data files to the Aggregator every 30 minutes.

To configure the File Transfer Interface to perform this function, run the `ssh-keygen` command from each ECAP server to generate the ECAP server's RSA public key.

Output from `ssh-keygen` appears as follows:

CAUTION:

Do NOT enter a passphrase when prompted.

```
# ssh-keygen -t rsa Generating public/private rsa key pair. Enter file
 in which to save the key (your_local_home/.ssh/id_rsa): Enter
passphrase (empty for no passphrase): Enter same passphrase again:
Your identification has been saved in id_rsa. Your public key has been
 saved in id_rsa.pub. The key fingerprint is:
17:5a:e7:77:ad:2c:0b:8e:f3:97:f8:20:53:79:69:55 ecapadm@ecap1
```

After generating the public key, place the contents of the `id_rsa.pub` key file on the Aggregator in the FTP user's home directory in order to gain FTP access to the Aggregator FTP directory. Use *Procedure 3-2* on page 23 or *Procedure 3-3* on page 23 depending on the OS of the Aggregator.

Procedure 3-2 Adding the RSA Public Key to a Linux/UNIX Aggregator

1. Copy the `id_rsa.pub` file to the ftp user's home directory on the Aggregator.

    ```
    [ecap1] # scp ~/.ssh/id_rsa.pub
    ftpuser@aggregator:/home/ftpuser/id_ecap1_rsa.pub
    ```

    ```
    ftpuser@aggregator's password:
    id_rsa.pub 00%  604     0.5KB/s   --:-- ETA
    ```

2. `ssh` to the Aggregator to put the key file in the correct place.

    ```
    [ecap1] # ssh ftpuser@aggregator
    ```

    ```
    ftpuser@aggregator's password:
    ```

3. If the ftpuser does not have an `.ssh` directory under their home directory, it must be created
    and permissions set to 700. The contents of the ECAP's public key file must then be appended
    to the `authorized_keys` file in the `.ssh` directory, and the file's permissions set to 644.

    ```
    [aggregator] # mkdir -p ~/.ssh
    ```

    ```
    [aggregator] # chmod 700 .ssh
    ```

    ```
    [aggregator] # cat id_ecap1_rsa.pub >> .ssh/authorized_keys
    ```

    ```
    [aggregator] # chmod 644.ssh/authorized_keys
    ```

    ```
    [aggregator] # exit
    ```

4. Test the steps performed above using the `ssh` command:

    ```
    [ecap1] # ssh ftpuser@aggregator
    ```

If the steps were performed correctly, you will be logged on to the Aggregator and will not be
prompted for a password. The command line prompt will correspond to the display on the
Aggregator.

The Integrated Accounting Feed application will be able to transfer data files to the Aggregator
once the application has been configured via `ecapcfg` (see *Configuring the Integrated Accounting
Feed Application* on page 28).

To configure the File Transfer Interface on the ECAP for an Aggregator that uses a virtual IP
address (IP cluster node), the following additional steps must be performed at the ECAP.

a. Repeat the *Procedure 3-2* on page 23 for each member of the cluster that shares the virtual IP
address.

b. Test the File Transfer Interface as described in *Step 4* on page 23 for each member of the cluster.
Do NOT use the virtual IP address of the cluster. Use the IP address of each member's physical
network device.

c. Edit the `/var/TKLC/ecap/ecapadm/.ssh/known_hosts` file. This file will have server SSH
keys defined, one per line, in the format `<ip address> ssh-rsa <ssh key>`. Find the IP
addresses for each member of the IP node cluster, and replace the server's physical IP address
with the cluster's virtual IP address.

d. Test the File Transfer Interface as described in *Step 4* on page 23 for each member of the cluster
using the virtual IP address.

Procedure 3-3 Adding the RSA Public Key to a Windows Aggregator

1. Copy the ECAP's `id_rsa.pub` file to the Aggregator, following the steps in the above procedure.

2. Append the appropriate authorized keys file used on the Aggregator, which is usually `authorized_keys` or `authorized_keys2`.

   Note:

   Refer to your SSH User's Manual for the appropriate way to do this.

Configuring NTP

Synchronize each ECAP server's local time with the Aggregator via NTP. This allows the entire ECAP/Aggregator network to have synchronized time.

Use the following procedure to configure NTP using `platcfg`.

Procedure 3-4 Configuring NTP

1. Log in to the ECAP server as the `platcfg` user.
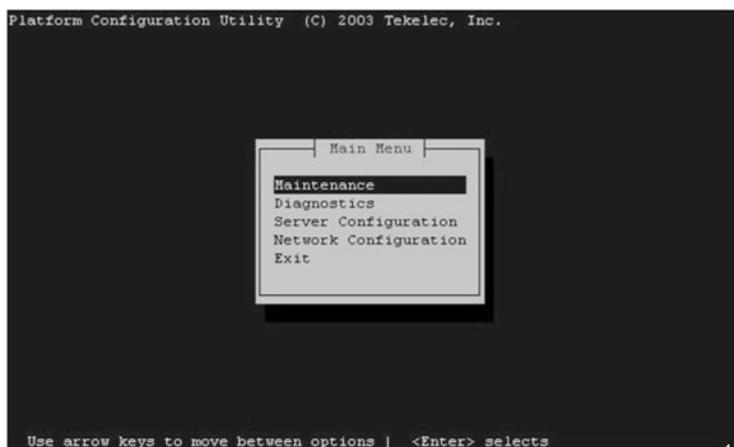
2. Select **Network Configuration** from the Platform Configuration Utility Main Menu and press **Enter**.


3. Select **NTP** from the Network Configuration Menu and press **Enter**.

```
Platform Configuration Utility  (C) 2003 Tekelec, Inc.        ─┤ Options ├─

                     Time Servers                        ┌──────┐ ┌──────┐
                                                         │ Edit │ │ Exit │
                                                         └──────┘ └──────┘
   Server                   IP
   ───────────────────────  ──────────────────────
   ntpserver1
   ntpserver2
   ntpserver3
   ntppeerA
   ntppeerB










   Use arrow keys to move between options |  <Enter> selects
```

4. Select **Edit.**

5. Edit the IP addresses as desired and click **Exit**.

   Note:

   NTP will be functional on the server when only one server is defined; however, providing more than one server will make the protocol more reliable.

6. Save and **Exit** the menu.

Configuring NMS

ECAP servers generate SNMP traps to capture platform alarms. The MIBs required for platform traps are pre-existing, the snmpAgent used for platform alarms is activated during ECAP installation, and most of the hardware checks that would result in traps are defaulted to enabled. However, the Integrated Accounting Feed application also requires enabling the following:

- Breaker Panel/Power System traps

- Platform process traps if more or less than one instance of MeasServer, TimeServer, sentryd, or Logd are found

- Network ping traps if the Data Collection, File Transfer, or Maintenance Interfaces (see *Configuring ECAP Network Interfaces* on page 18) are down

- IP Bonding traps if the File Transfer or Maintenance Interfaces (see *Configuring ECAP Network Interfaces* on page 18) are down.

These traps are enabled by configuring the NMS IP address for the location where the traps will be destined.

NMS configuration tasks involve configuring both the actual system used to monitor alarms and configuring the ECAP server to send alarms to the NMS.

Configuring the NMS used to monitor alarms involves customer-specific tasks. At a minimum, the Port Number and Community String must be configured. Refer to the documentation for your system for information on configuring these parameters.

Use the following procedure to configure the ECAP server to send alarms to the NMS.

Procedure 3-5 Configuring the ECAP Server for NMS

1. Log in to the ECAP server as the `platcfg` user .
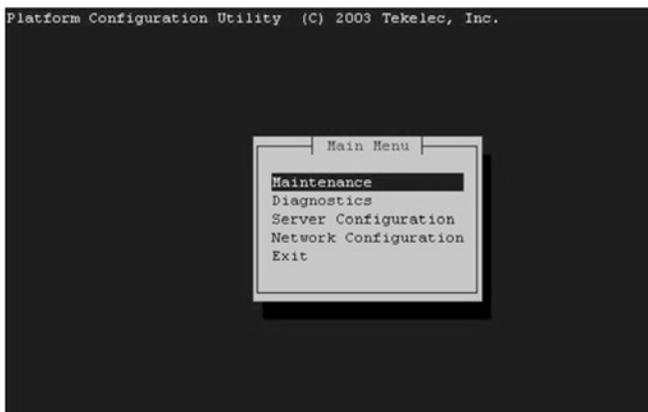
2. Select **Server Configuration** from the Platform Configuration Utility Main Menu and press **Enter**.
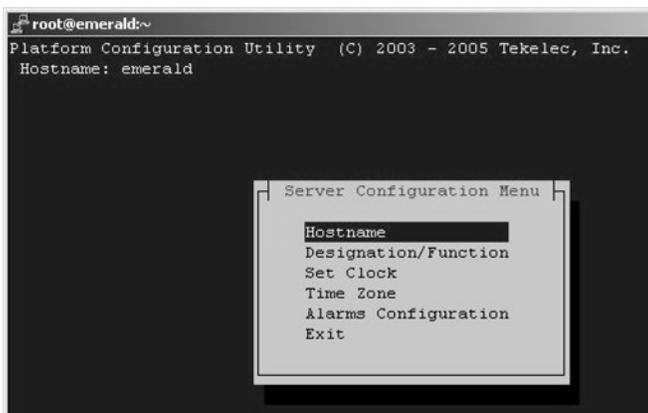
3. Select **Alarms Configuration** from the Server Configuration Menu and press **Enter**.
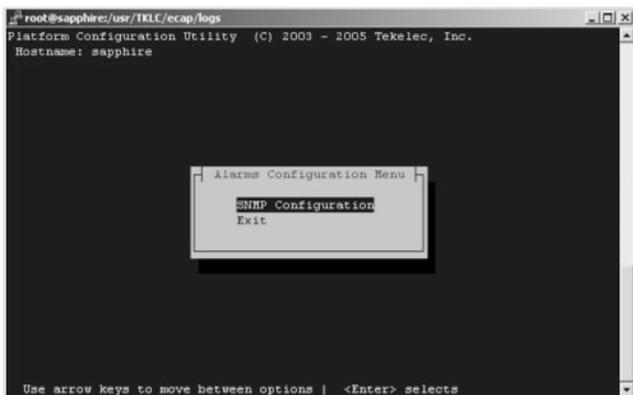
4. Select **SNMP Configuration** from the Alarms Configuration Menu and press **Enter**.
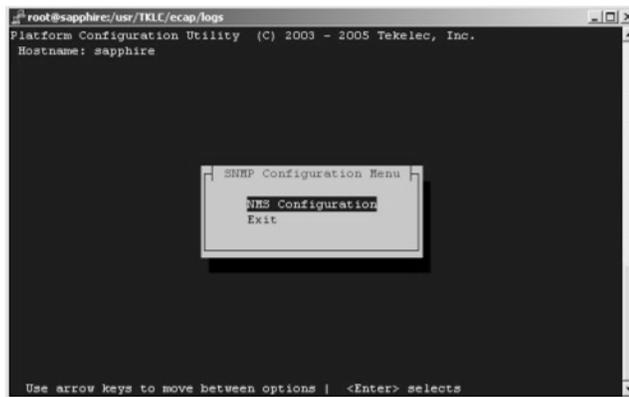
5. Select **NMS Configuration** from the Server Configuration Menu and press **Enter**.
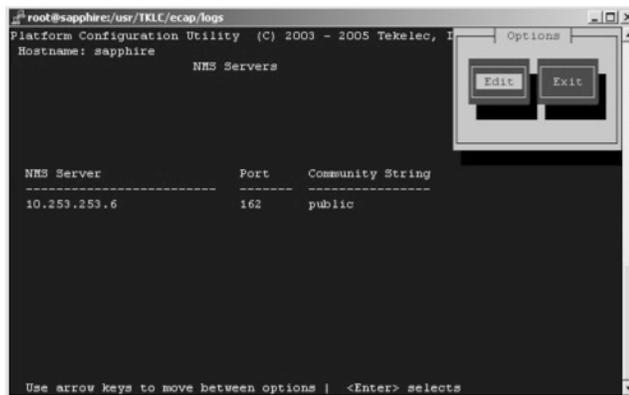
6. Select **Edit**.
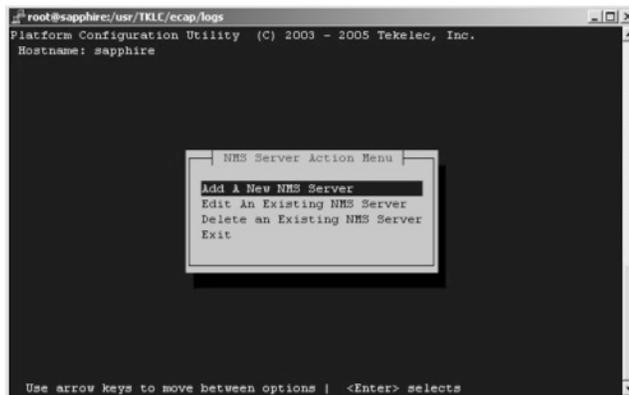
7. Select a task from the NMS Server Action menu.

You can add, edit, or delete an NMS Server.

Note:

The SNMP Community String and Port Number values must match the values configured on the NMS.

8. Save and **Exit** the menu.

Configuring the Integrated Accounting Feed Application

The Integrated Accounting Feed application automatically creates the **ecapadm** and **ecapuser** accounts. The **ecapadm** user can control or configure the Integrated Accounting Feed application and run the `savelogs` command (see *Savelogs* on page 43). The **ecapadm** user is part of the ecap group.

The **ecapuser** account is a limited account that can NOT control or configure the Integrated Accounting Feed application. However, this user may run `savelogs`. The **ecapuser** user is part of the ecap group.

The Integrated Accounting Feed application is configured via the `ecapcfg` command. Entering this command opens the Integration Accounting Feed Configuration Menu.

The Configuration Menu provides options that describe the EAGLE 5 ISS and Aggregator configuration values. A graphical representation of the menu layout is provided in *Figure 6: Integrated Accounting Feed Configuration Menu* on page 28.

Figure 6: Integrated Accounting Feed Configuration Menu
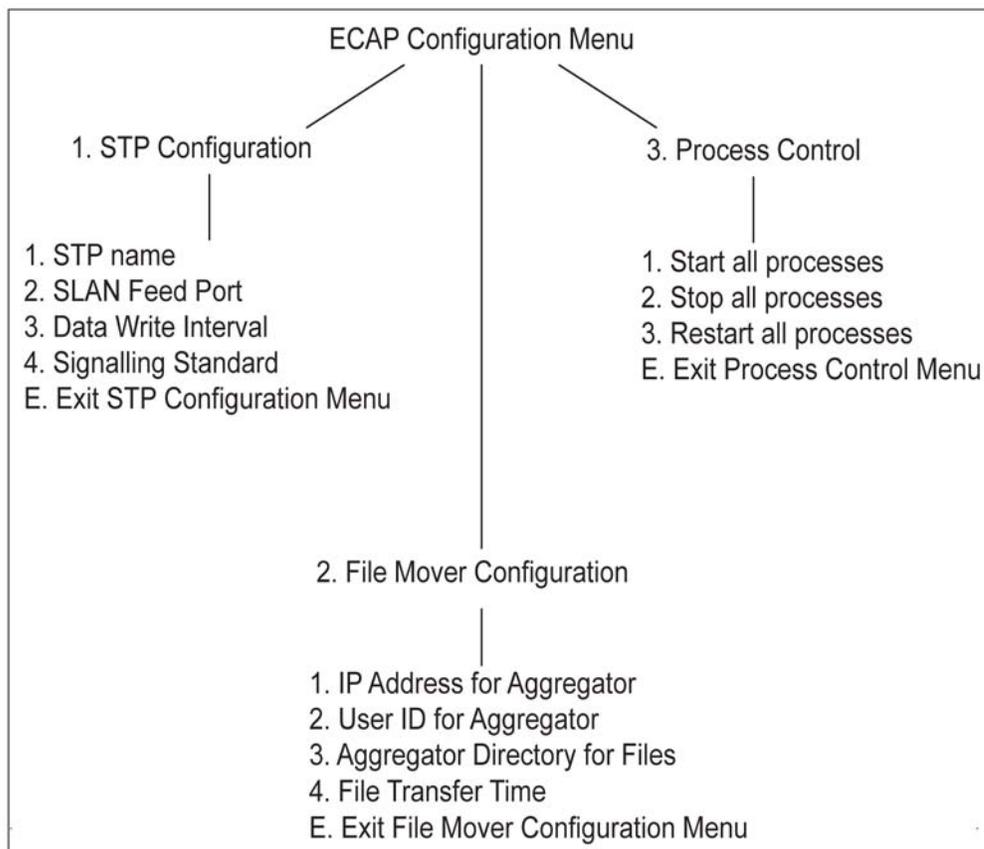
The menu options and their functions are provided in *Table 5: Configuration Menu Options* on page 29.

Table 5: Configuration Menu Options

Menu Option	Description	Range of Values
STP Configuration	Displays a set of options that enable the operational parameters associated with the EAGLE 5 ISS MSU feed to be set or changed.	[1..4, E]
STP name	Sets the STP name that is used in the filename of the data file transferred to the Aggregator. Typically, the STP name reflects the STP CLLI from which the ECAP is receiving MSUs.	The value has a 12-character limit.
SLAN Feed Port	Sets the port number that the application monitors for the EAGLE 5 ISS MSU feed. The value entered must match the "ipport" parameter in the `ent-ip-node` EAGLE 5 ISS configuration command (see *Configuring SLAN Cards* on page 30).	[1024..5000]
Data Write Interval	Sets the interval, in minutes, at which the Integrated Accounting Feed application generates the data file. This file is stored on the ECAP server and periodically transferred to the Aggregator.	[1, 5]
Signalling Standard	Sets the protocol by which the ECAP server interprets the MSUs from the EAGLE 5 ISS.	[ANSI, ITU] **Note:** ITU is the only supported protocol for Release 1.0.
File Mover Configuration	Displays a set of options that enable the parameters associated with the Aggregator configuration to be set or changed.	[1..3, E]

Menu Option	Description	Range of Values
IP Address for Aggregator	Sets the IP address for the Aggregator. The locator must be specified as an IP address.	The value must be a decimal-separated 4-octet value, with each octet in the 0-255 range.
User ID for Aggregator	Sets the user name that is used to log in to the Aggregator when transferring data files	No restrictions
Aggregator Directory for Files	Sets the path to the directory in which the data files will be stored on the Aggregator	No restrictions.
File Transfer Time	Sets the number of minutes after the half hour to send data files to the Aggregator (1 - xx:01 and xx:31, 2 - xx:02 and xx:32, etc.)	[1...5]
Process Control	Displays a set of options that enable the application processes to be started and stopped.	[1..3, E]
Start all processes	If action is confirmed, this option starts all application processes that are not currently running.	[Y, y, N, n]
Stop all processes	If action is confirmed, this option stops all running application processes.	[Y, y, N, n]
Restart all processes	If action is confirmed, this option stops all running application processes, and then restarts all processes.	[Y, y, N, n]

Configuring SLAN Cards

The EAGLE 5 ISS SLAN card must be configured to interface with an ECAP server via the Data Collection Interface.

Use the `ent-dlk` and `ent-ip-node` commands to establish the links for the SLAN cards. See *Table 6: SLAN Card Parameters* on page 31 for a list of these commands and their parameters as they apply to the Integrated Application Feed application. Refer to the *Commands Manual* for a complete discussion of how to use these commands to configure SLAN cards for the EAGLE 5 ISS.

Table 6: SLAN Card Parameters

Command	Parameters	Description
`ent-dlk`	:loc=XXXX	Location of the SLAN card
	:ipaddr=x.x.x.x **Note:** The IP addresses given to the right are the default addresses for the ECAP servers and the recommended addresses for the SLAN cards. These locations can be changed; however, the SLAN cards must be located within the same subnet as the associated ECAP server.	Locally allocated static IP address of the SLAN card. The guideline for allocating the particular IP address is as follows: ECAP IP 192.168.100.1 (Server 1A) to SLAN IP 192.168.100.101 ECAP IP 192.168.100.2 (Server 1B) to SLAN IP 192.168.100.102 ECAP IP 192.168.100.3 (Server 1C) to SLAN IP192.168.100.103 ECAP IP 192.168.100.4 (Server 1D) to SLAN IP 192.168.100.104 ECAP IP 192.168.100.5 (Server 1E) to SLAN IP 192.168.100.105 ECAP IP 192.168.100.6 (Server 1F) to SLAN IP 192.168.100.106
	:speed=100	Sets the port speed to 100Mbps
`ent-ip-node`	:loc=XXXX	Location of the SLAN card
	:ipaddr=x.x.x.x	IP address of the ECAP Data Collection Interface
	:ipappl=stplan	Sets the application that will be using the interface
	:cap=100	Maximum percentage of ethernet capacity allocated to this connection

Command	Parameters	Description
	:ipport=[1024..5000]	Port through which EAGLE 5 ISS and ECAP communicate. The value entered must match the "SLAN feed port" parameter in the ECAP configuration as shown in *Table 5: Configuration Menu Options* on page 29.

Configuring Gateway Screening

Gateway Screening measures an MSU attempting to enter the EAGLE 5 ISS against predefined criteria in the EAGLE 5 ISS database to determine whether the MSU should be allowed to enter.

Refer to the Database *Administration Manual – Gateway Screening* for information on configuring Gateway Screening.

The stop action `copy` set must be configured for the Integrated Accounting Feed application. This set is used to copy the MSU for the STPLAN.

Note:

The gateway screening stop action set can only have one `copy` stop action.

Chapter

4

Maintenance

Topics:

This chapter contains information and instructions used to maintain proper function of the Integrated Accounting Feed application. These maintenance checks include various alarms, disaster recovery plans, log files, and system health checks.

Alarms

The following alarms are associated with the Integrated Accounting Feed application:

- The ECAP server raises alarms and provides SNMP traps that are monitored via a customer NMS.

- Connectivity problems between the EAGLE® 5 ISS and ECAP server are raised as UAMs on the EAGLE 5 ISS.

- Conditions associated with the Integrated Accounting Feed application may impact operation and may have associated alarms.

These alarms and conditions are discussed in the following sections.

Platform Alarms

All standard alarming and monitoring services for the platform running the Integrated Accounting Feed application are provided. Additional alarming services include breaker panel alarms, ECAP process alarms, and alarms on the File Transfer and Maintenance Interfaces.

These alarms are monitored by an NMS which receives SNMP traps. In order for the NMS to monitor the SNMP traps, the Maintenance Interface must be configured per *Procedure 3-1* on page 19, and the ECAP server must be configured to send alarms to the NMS per *Procedure 3-5* on page 26. The customer is responsible for providing the network connectivity between the ECAP Maintenance Interface and the NMS as identified in *Figure 5: Network Configuration* on page 19.

Table 7: Critical Platform Alarms on page 36 through *Table 9: Minor Platform Alarms* on page 37 list the Critical, Major, and Minor platform alarms for the Integrated Accounting Feed application.

Use the following procedure to obtain additional information on the alarms raised.

Procedure 4-1 Viewing Information on Alarms

1. Log in to the ECAP server as the `platcfg` user.
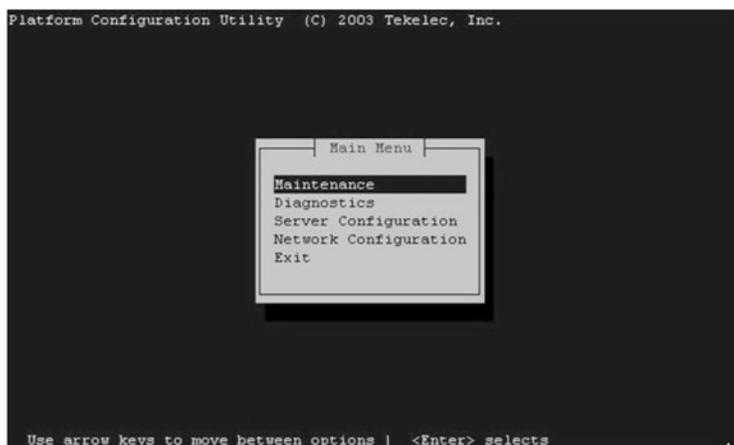
2. Select **Diagnostics** from the Platform Configuration Utility Main Menu and press **Enter**.
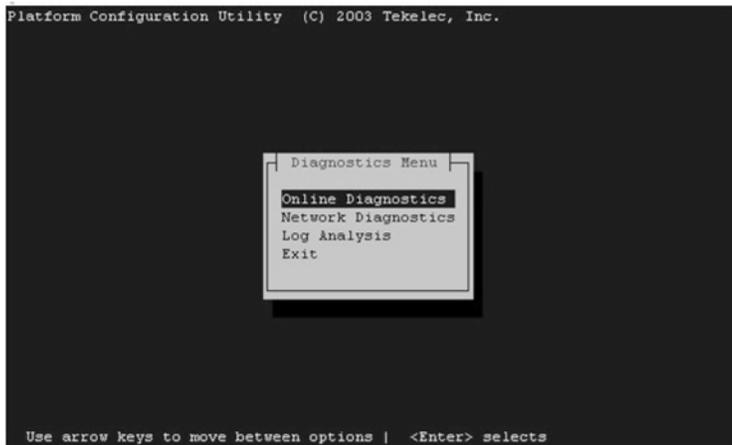
3. Select **Online Diagnostics** from the Network Diagnostics Menu and press **Enter**.
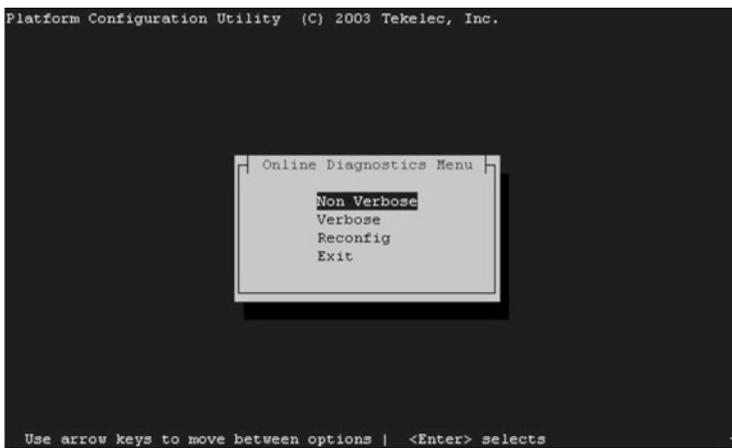
4. Select **Verbose** from the Online Diagnostics menu and press **Enter**.
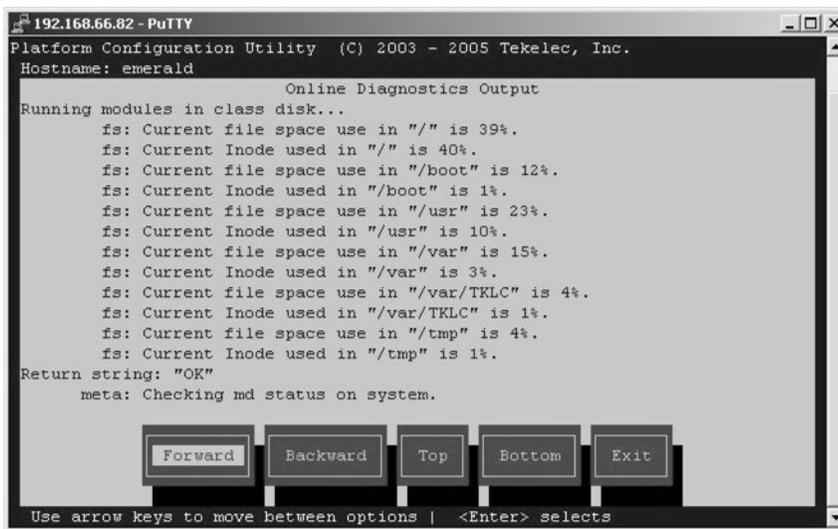
5. An output report, containing debug information for each individual test performed on the server, is displayed.

6. Select **Exit** to return to the Online Diagnostics menu.

Table 7: Critical Platform Alarms

Alarm Text	Range of Values	Alarm Data String Value
Breaker Panel Feed Unavailable	on or off	1000000000000001
Breaker Panel Breaker Failure	on or off	1000000000000002
Breaker Panel Monitoring Failure	on or off	1000000000000004
Power Feed Unavailable	on or off	1000000000000008
Power supply #1 Failure	on or off	1000000000000010
Power supply #2 Failure	on or off	1000000000000020
Power supply #3 Failure	on or off	1000000000000040

Table 8: Major Platform Alarms

Alarm Text	Range of Values	Alarm Data String Value
Server Fan Failure	on or off	3000000000000001
Server Internal Disk Error	on or off	3000000000000002
Server Platform Error	on or off	3000000000000008
Server File System Error	on or off	3000000000000010
Server Platform Process Error **Note:** This alarm means that one of the processes is dead.	on or off	3000000000000020
Server Ram Shortage Failure	on or off	3000000000000040
Server Swap Space Shortage Failure	on or off	3000000000000080

Alarm Text	Range of Values	Alarm Data String Value
Server Disk Space Shortage Error	on or off	3000000000001000
Server Temperature Error	on or off	3000000000004000
Server Mainboard Voltage Error	on or off	3000000000008000
Server Power Feed Unavailable	on or off	3000000000010000
Server Disk Health Test Error	on or off	3000000000020000
Server Disk Unavailable Error	on or off	3000000000040000
Device Interface Error **Note:** This alarm means that the File Transfer Interface is down.	on or off	3000000000100000

Table 9: Minor Platform Alarms

Alarm Text	Range of Values	Alarm Data String Value
Server Disk Space Warning	on or off	5000000000000001
Server Application Process Error	on or off	5000000000000002
Warning Server Hardware Configuration Error	on or off	5000000000000004
Server Software Configuration Error	on or off	5000000000000010
Server Swap Space Shortage Warning	on or off	5000000000000020
Server Temperature Warning	on or off	5000000000000080
Server NTP Daemon Not Synchronized	on or off	5000000000000200

Alarm Text	Range of Values	Alarm Data String Value
Server CMOS Battery Voltage Low	on or off	5000000000000400
Server Disk Self Test Warning	on or off	5000000000000800
Device Interface Warning **Note:** This alarm means that either the File Transfer Interface or the Maintenance Interface has one bonded link down.	on or off	5000000000002000

EAGLE 5 ISS Alarms

Connectivity problems that occur on the Data Collection Interface between the EAGLE 5 ISS and ECAP server are raised as UAMs on the EAGLE 5 ISS. See *Table 10: EAGLE 5 ISS UAMs* on page 38 for a list of these UAMs.

Refer to the *Maintenance Manual* for more information on the EAGLE 5 ISS related alarms.

Table 10: EAGLE 5 ISS UAMs

UAM	Message Text	Resolution
0152	LIM(s) have been denied STPLAN service.	The SLAN subsystem cannot process all of the MSUs from the LIM and SCCP cards. MSUs have been discarded. Remedy: 1. Use the `rept-stat-slan` command to verify that the EAGLE 5 ISS SLAN subsystem is IS-NR and is sending MSU packets to ECAP. Refer to the *Commands Manual* for information on the `rept-stat-slan` command. 2. Perform a network health check (see *Network Check* on page 44). If not successful, configure the network using `platcfg` (see *Configuring*

UAM	Message Text	Resolution
		ECAP Network Interfaces on page 18).
		3. Verify MeasServer is running by performing a process check (see *Health Check* on page 43).
		4. SLAN capacity has been exceeded. Additional SLAN/ECAP pairs may be needed to increase MSU processing capacity.
0153	STPLAN not available	There are no SLAN cards in the IS-NR state.
		Remedy:
		1. Use the `rept-stat-slan` command to verify that the EAGLE 5 ISS SLAN subsystem is IS-NR and is sending MSU packets to ECAP. Refer to the *Commands Manual* for information on the `rept-stat-slan` command.
		2. Perform a network health check (see *Network Check* on page 44). If not successful, configure the network using `platcfg` (see *Configuring ECAP Network Interfaces* on page 18).
0155	STPLAN connection unavailable	SLAN link has been canceled or ECAP application MeasServer or TimeServer process terminated.
		Remedy:
		1. Verify MeasServer and TimeServer are running by performing a process check (see *Health Check* on page 43).
		2. The physical link between the EAGLE 5 ISS SLAN card and the ECAP server has been disconnected. Perform a

UAM	Message Text	Resolution
		network health check (see *Network Check* on page 44).

Integrated Accounting Feed Conditions

The conditions listed in *Table 11: Integrated Accounting Feed Conditions* on page 40 may impact Integrated Accounting Feed operation. If these conditions occur, follow the procedures listed in the Resolution column. If the provided corrective procedures do not work, contact the Tekelec Customer Care Center (see *Customer Care Center* on page 4).

Table 11: Integrated Accounting Feed Conditions

Condition	Resolution
No data files on the Aggregator	The ECAP server is operational and periodically generating data files, but the files are not being transferred to the Aggregator. Remedy: 1. Determine whether the Device Interface Error major platform alarm (see *Table 8: Major Platform Alarms* on page 36) has been raised. If it has, go to Step 3. If not, go to Step 2. 2. Verify that FileMover is periodically running (see *Crontab Check* on page 43) and configured correctly via ecapcfg. If not, re-run ecapcfg to set up FileMover and/or start the ECAP processes. See *Configuring the Integrated Accounting Feed Application* on page 28. 3. Perform a network health check (see *Network Check* on page 44). If not successful, configure the ECAP network using platcfg (see *Configuring ECAP Network Interfaces* on page 18).
Data files are zero length	The ECAP disk is probably full. This causes the filename to be generated, but no data is stored in the file. Remedy: 1. Check available disk space (see *Disk Space Check* on page 44). 2. Verify that FileMover and FileScrubber are periodically running (see *Crontab Check* on page

Condition	Resolution
	43) and configured correctly via `ecapcfg`. If not, re-run `ecapcfg` to set up the processes and/or start the ECAP processes (see *Configuring the Integrated Accounting Feed Application* on page 28).
Data file contains no records	The data file contains standard data header but no record entries. This occurs when no MSU records are received from EAGLE 5 ISS. There are no SLAN cards in the IS-NR state. Remedy: 1. Use the `rept-stat-slan` command to verify that the EAGLE 5 ISS SLAN subsystem is IS-NR and is sending MSU packets to ECAP. Refer to the *Commands Manual* for information on the `rept-stat-slan` command. 2. Verify gateway screens are properly configured (see *Configuring Gateway Screening* on page 32). The EAGLE 5 ISS SLAN card will only copy MSUs that have been screened.
MSU/octet counts are less than expected	The MSU peg counts reported by ECAP do not correspond to EAGLE 5 ISS measurements for the same time period. Remedy: 1. Check EAGLE 5 ISS alarm log for UAM 0152 (see *Table 10: EAGLE 5 ISS UAMs* on page 38). If present, MSUs have been discarded during the copy to ECAP due to traffic volume or Data Collection Interface disconnect. Perform a network health check (see *Network Check* on page 44). 2. Verify gateway screens are properly configured (see *Configuring Gateway Screening* on page 32). The EAGLE 5 ISS SLAN card will only copy MSUs that have been screened. 3. Use the `rept-ftp-meas:type=systot:enttype=stplan` command to obtain an STPLAN measurement report. Use this report to determine the number of MSUs flowing to the ECAP server from EAGLE 5 ISS. Refer to the *Commands Manual* for information on the `rept-ftp-meas` command.

Disaster Recovery

No specific backup routine is provided by ECAP, therefore no specific restore routine is present.

The following failures could lead to disaster if allowed to persist for an ECAP server. See *Table 11: Integrated Accounting Feed Conditions* on page 40 for a list of associated condition messages and corrections.

- Aggregator and/or both File Transfer Interfaces to Aggregator down or misconfigured: This will eventually lead to a disk full condition on the ECAP server if not corrected within a week due to an accumulation of data files. If the Aggregator is down or in fault condition, this must be corrected according to methods and procedures described by Aggregator documentation. When the link becomes active, all accumulated data files are sent to the Aggregator at the next File Transfer interval. If a significant amount of data is sent to the Aggregator in one 30-minute interval, it could result in a degraded performance level for the ECAP server during the transfer.

- Dead Integrated Accounting Feed processes or Data Collection Interface down or misconfigured: Other ECAP servers in the ECAP system handle the load that would normally be sent to the ECAP server whose Data Collection Interface is down. If another ECAP server goes down or its Data Collection Interface goes down or is misconfigured, this could cause the ECAP/SLAN system to go into overload and lose data packets. Therefore, this scenario should also be corrected as soon as possible.

In the event of a catastrophic failure where ECAP hardware fails, contact the Tekelec Customer Care Center (see *Customer Care Center* on page 4).

Log Files

The Integrated Accounting Feed application generates log files for the following processes (see *Process Check* on page 43 for a description of the processes):

- MeasServer
- TimeServer
- FileMover
- FileScrubber
- Logd
- sentryd
- surv

These logs are written to the /usr/TKLC/ecap/logs directory. The current log file is <process>.log, where <process> is the name of the process that is writing to the log file.

When the log file for any of the processes reaches 16 MB, that file is archived to <process>.log.1. A maximum of four log archives are maintained in the /usr/TKLC/ecap/logs directory: <process>.log.1 - <process>.log.4 with.1 being the newest archive and .4 being the oldest. Each time a log file is archived to .1, the existing archives are renamed, and the oldest archive (.4) is discarded.

Savelogs

Logs and other relevant system information may be saved for debugging purposes by issuing the `savelogs` command. This command creates and stores a compressed tarball (*.tar.Z) in the /tmp directory to be offloaded by scp/sftp and viewed later.

Health Check

Use the health checks described in the following sections to ensure the Integrated Application Feed is running properly.

Process Check

The process health check ensures that processes associated with the Integrated Accounting Feed application are running.

The following processes should always be running:

- sentryd: Keeps the other Integrated Accounting Feed application processes up and running
- MeasServer: Receives and decodes EAGLE 5 ISS SLAN packets, and stores them to a data file
- TimeServer: Responds to time queries from the EAGLE 5 ISS SLAN card
- Logd: Manages all ECAP logging

The following processes run periodically:

- FileMover: Moves data files to the Aggregator then archives the files on the ECAP
- FileScrubber: Deletes data files that are more than 48 hrs old
- surv: Ensures the sentryd process is running

The process health check is performed by the `ps` and `grep` commands. The expected command/output is as follows:

```
 #ps -ef | grep TimeServer
root 24159 1 0 08:50? 00:00:00/usr/TKLC/ecap/bin/TimeServer

 #ps -ef | grep MeasServer
ecapadm 24159 1 0 08:50? 00:00:00/usr/TKLC/ecap/bin/MeasServer
```

Crontab Check

The `crontab` command is used to ensure that the FileMover and FileScrubber processes described above have been set up to be run periodically by the system.

Note:

The minutes entry (5, 35) for FileMover may vary, but should be 30 minutes apart.

The expected command/output is as follows:

```
 # crontab -1
5,35 * * * * /usr/TKLC/ecap/bin/FileMover
0 * * * * /usr/TKLC/ecap/bin/ FileScrubber-d
```

```
/usr/TKLC/ecap/xml/archive_ftp-t 172800
*/5 * * * * /usr/TKLC/ecap/bin/surv
```

Disk Space Check

The disk space check is used to verify that disk space on `/dev/vgapp/ecap-vol` is not approaching 100%.

The expected command output is as follows:

```
 # df
...
/dev/vgapp/ecap-vol 103212320 40556 97928884 1% /usr/TKLC/ecap ...
```

Network Check

The Network Diagnostics commands are used to verify connectivity between the EAGLE 5 ISS SLAN card and the ECAP server and between the ECAP server and the Aggregator. Along with the conditions listed in *Table 11: Integrated Accounting Feed Conditions* on page 40, this check should be done in response to the Device Interface Error or Device Interface Warning platform alarms (see *Table 8: Major Platform Alarms* on page 36 and *Table 9: Minor Platform Alarms* on page 37). These diagnostic tasks are accessed through `platcfg` and include the following:

- Netstat: enables you to access network statistics for the ECAP server
- Ping: enables you to attempt an ICMP ping of another ECAP server on the network
- Traceroute: enables you to trace the network route to another ECAP server on the network.

Verifying EAGLE 5 ISS to ECAP Connectivity

Use the following procedure to access the Network Diagnostics to verify connectivity between the EAGLE 5 ISS SLAN card and the ECAP Server.

Procedure 4-2 Verifying Connectivity between EAGLE 5 ISS SLAN Cards and the ECAP Server

1. Log into ECAP as the `platcfg` user.
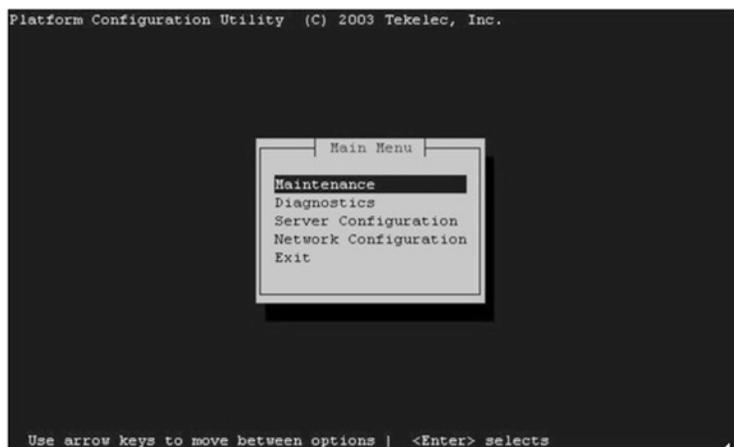
2. Select **Diagnostics** from the Platform Configuration Utility Main Menu and press **Enter**.
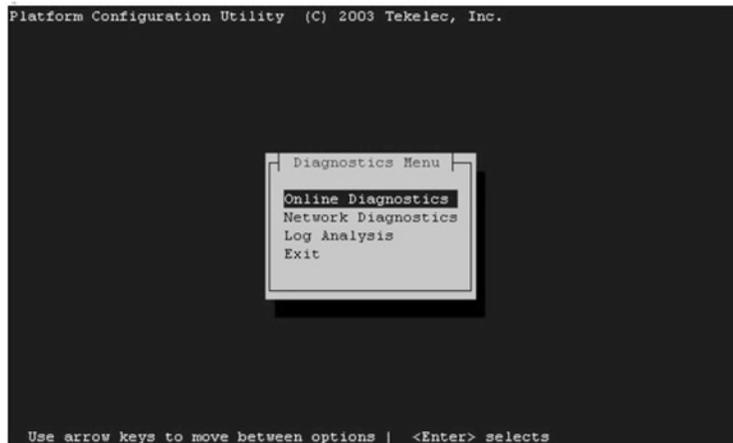
3. Select **Network Diagnostics** from the Diagnostics Menu and press **Enter**.
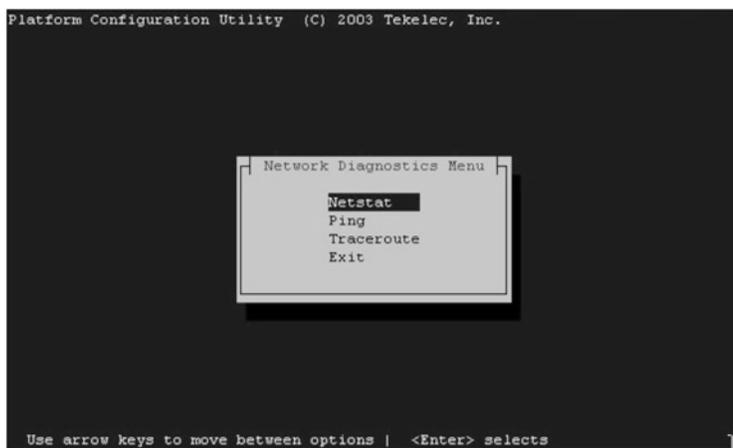
4. Select the desired task from the Network Diagnostics Menu and press **Enter**.

5. Perform the desired task.

6. Save and **Exit** the menu.

Verifying ECAP to Aggregator Connectivity

Verify the connectivity between the ECAP and the Aggregator using the Network Diagnostics described in *Verifying EAGLE 5 ISS to ECAP Connectivity* on page 44.

In addition to these tasks, you must also perform a secure shell connectivity check.

The expected command output is as follows:

```
# cd ~
# touch sshtest
# scp sshtest aggregator_id@aggregator:/home/aggregator_t id
sshtest                                              100% 0 0.0KB/s --:--ETA
```

If the network check passes, you may safely remove the sshtest test file by using the `rm` command on the ECAP server, and whatever method necessary on the Aggregator. If the `scp` command asks for a password, see the appropriate procedure for your operating system in *Configuring File Transfer* on page 22.

Appendix

A

MSU to XML Field Mapping

Topics:

This appendix provides information on how the MSU parameters that come into the ECAP server relate to the peg count fields in the data file. An overview of the generated data files is provided, along with examples of the MSU parameters.

Introduction

This appendix provides information on how the MSU parameters that come into the ECAP server relate to the peg count fields in the data file. An overview of the generated data files is provided, along with three samples: an ISUP MSU, an SCCP MSU, and an SCCP MSU with a TCAP layer (MAP MSU). For each example, the fields that are extracted from the MSU and copied to the data file are highlighted.

The MSU contents displayed in the following examples do not contain Layer 2 information, which causes the 3 octet discrepancy between the length of the MSU contents displayed and the `<octcount>` field in the XML output. The `<octcount>` field includes the 3 octets of Layer 2 in its count, e.g. the ISUP MSU contents show octets 0-27 (28 octets), while the `<octcount>` field shows 31.

Data Files

The Integrated Accounting Feed application generates data files periodically. These files are stored in the `/usr/TKLC/ecap/xml/pending_ftp` directory until they are copied to the Aggregator. Once a file has been copied to the Aggregator, it is moved to the `/usr/TKLC/ecap/xml/archive_ftp` directory where it remains for approximately 48 hours.

The Filename format adheres to the following:
`<stp>_<collector>_<enddate>_<endtime>.xml`

The data included in the filename adheres to the descriptions, ranges, and formats described for the corresponding tags in *Table 12: Data File Tags* on page 48.

The data files contain the measurement peg counts in an XML format. The file tags are described in *Table 12: Data File Tags* on page 48

Table 12: Data File Tags

Tag	Range of Values	Description
<ecapreport> </ecapreport>	N/A	A section delimiter that identifies a data file for a specific node and interval
<stp> </stp>	unrestricted	Character string representing the name of the STP node that generated the data file. Derived from the STP name entered via the Integrated Accounting Feed Configuration Menu See (*Configuring the Integrated Accounting Feed Application* on page 28).

Tag	Range of Values	Description
<collector> </collector>	63[[A..Z][a..z][0..9] [-]]	String of up to 63 characters representing the hostname of the ECAP server generating the data file
<startdate> </startdate>	[01..31][01..12] [0000..9999]	Decimal representation of the collection start date of the records contained in the data file. Date is local to the ECAP server generating the file. Format is DDMMYYYY.
<starttime> </starttime>	[00..23][00..59] [00..59]	Decimal representation of the collection start time of the records contained in the data file. Time is local to the ECAP server generating the file. Format is HHMMSS.
<enddate> </enddate>	[01..31][01..12] [0000..9999]	Decimal representation of the collection end date of the records contained in the data file. Date is local to the ECAP server generating the file. Format is DDMMYYYY.
<endtime> </endtime>	[00..23][00..59] [00..59]	Decimal representation of the collection end time of the records contained in the data file. Time is local to the ECAP generating the file. Format is HHMMSS.
<record> </record>	N/A	Section delimiter that identities a new data file
<signallingstandard> </signallingstandard>	"ANSI", "ITU-I", "ITU-N", or "undefined"	Character string (without quotes) representing the protocol by which the data file was decoded. "undefined" is an invalid protocol and represents an error in decoding.
<linkid> </linkid>	[0..65535]	EAGLE 5 ISS STP link ID on which the MSUs were received

Tag	Range of Values	Description
		(incoming link). This is a decimal value.
<si> </si>	"isup" or "sccp"	Character string (without quotes) representing the message service type. "isup" represents an MTP message. "sccp" represents an SCCP or MAP message.
<mtp> </mtp>	N/A	Section delimiter that identifies the MTP layer point codes (Routing Label)
<opc> </opc>	[000..255][000..255] [000..255] (ANSI), or [000..007][000..255] [000.007] (ITU-I), or [0..16383] (ITU-N)	Decimal representation of the Originating Point Code from the MTP layer
<dpc> </dpc>	[000..255][000..255] [000..255] (ANSI), or [000..007][000..255] [000.007] (ITU-I), or [0..16383] (ITU-N)	Decimal representation of the Destination Point Code from the MTP layer
<sccp> </sccp>	N/A	A section identifier that identifies the SCCP layer information
<cgpadigits> </cgpadigits>	[], [0..9999999999999 99999999] [0..FFFFFFFFFFFFFFFFFFFFF]	Decimal or hexadecimal representation of the Calling Party Address. This field is optional or may contain up to 21 digits.
<cdpadigits> </cdpadigits>	[], [0..9999999999999 99999999] [0..FFFFFFFFFFFFFFFFFFFFF]	Decimal or hexadecimal representation of the Called Party Address. This field is optional or may contain up to 21 digits.

Tag	Range of Values	Description
<cgpapc> </cgpapc>	[], [000..255][000..255] [000..255] (ANSI), or [000..007][000..255] [000.007] (ITU-I), or [0..16383] (ITU-N)	Decimal representation of the Originating Point Code from the SCCP layer. This field is optional.
<cdpapc> </cdpapc>	[], [000..255][000..255] [000..255] (ANSI), or [000..007][000..255] [000.007] (ITU-I), or [0..16383] (ITU-N)	Decimal representation of the Destination Point Code from the SCCP layer. This field is optional.
<map> </map>	N/A	A section identifier that identifies the MAP layer information
<opcode> </opcode>	[0..255]	Decimal representation of the MAP operation code. Identifies the MAP operation performed.
<msucount> </msucount>	[1..4294967295]	Decimal representation of the number of MSUs processed with the specified MTP and/or SCCP parameters
<octcount> </octcount>	[1..4294967295]	Decimal representation of the number of octets processed with the specified MTP and/or SCCP parameters. This number excludes the Layer 1 Flag and CRC information.

Data File XML DTD

The XML DTD describes the content and structure of the measurement report data fields.

```
<!ELEMENT ecapreport (stp,collector,date,time,record*)>
<!ELEMENT stp (#PCDATA)>
<!ELEMENT collector (#PCDATA)>
<!ELEMENT startdate (#PCDATA)>
<!ELEMENT starttime (#PCDATA)>
<!ELEMENT enddate (#PCDATA)>
<!ELEMENT endtime (#PCDATA)>
```

```
<!ELEMENT record (signallingstandard,linkid,si,mtp,sccp?,map?,msucount,octcount)>

<!ELEMENT signallingstandard (#PCDATA)>
<!ELEMENT linkid (#PCDATA)>
<!ELEMENT si (#PCDATA)>
<!ELEMENT mtp (opc,dpc)>
<!ELEMENT opc (#PCDATA)>
<!ELEMENT dpc (#PCDATA)>
<!ELEMENT sccp (cgpadigits?,cdpadigits?,cgpapc?,cdpapc?)>
<!ELEMENT cgpadigits (#PCDATA)>
<!ELEMENT cdpadigits (#PCDATA)>
<!ELEMENT cgpapc (#PCDATA)>
<!ELEMENT cdpapc (#PCDATA)>
<!ELEMENT map (opcode)>
<!ELEMENT opcode (#PCDATA)>
<!ELEMENT msucount (#PCDATA)>
<!ELEMENT octcount (#PCDATA)>
```

ISUP MSU

The following is an example of ISUP MSU with the ECAP data file.

```
*** Start of MTP Level 3 ***
                        MSU
0000 00000101 05
     ----0101    ----.-- Service Indicator ISDN User Part
     --00----    ----.-- Spare                                   0
     00------    ----.--  Network Indicator                        00 -
International Network
0001 00100010 22 K---.-- Destination Point Code 2-4-2
0002 10010000 90
     --010000
     10------    K---.-- Origination Point Code 2-2-2
0003 00000100 04
0004 00000100 04
     ----0100
     0000----    ----.-- Signalling Link Code                   0

*** Start of ISDN User Part ***
                        Initial address
0005 00000000 00 K---.-- Circuit Identification Code       0
0006 00000000 00
     ----0000
     0000----    ----.-- Spare                                 0
0007 00000001 01 .T-..E. Message Type                        01
0008 00000000 00        Nature of connection indicators
     ------00    ----.-- Satelite Indicator                     00 - no
satelite circuit in the connection
     ----00--    ----.-- Continuity Check Indicator        00 - continuity
 check not required
     ---0----    ----.-- Echo Control Device Indicator        0 - outgoing
half echo control dev not inclu
     000-----    ----.-- Spare                                   0
                        Forward call indicators
0009 00000000 00
     -------0    ----.-- National/International Call Indicator   0 - call to
be treated as national call
     -----00-    ----.-- End-to-End Method Indicator           00 - no
end-to-end method available
     ----0---    ----.-- Interworking Indicator                 0 - no
```

```
interworking encountered
     ---0----    ----.-- End-to-End Information Indicator    0 - no
end-to-end information available
     --0-----    ----.-- ISDN User Part Indicator            0 - ISDN user
 part not used all the way
     00------    ----.-- ISDN User Part Preference Indicator    00 - ISDN user
 part preferred all the way
0010 00000000 00
     -------0    ----.-- ISDN Access Indicator               0 - originating
 access non-ISDN
     -----00-    ----.-- SCCP Method Indicator               00 - no
indication
     ----0---    ----.-- Spare                               0
     0000----    ----.-- Reserved for National Use           0
0011 00000000 00 ----.-- Calling party's category           00000000 -
Calling party's cagtegory unknown at this time
0012 00000000 00 ----.-- Transmission Medium Requirement     00000000 -
speech
                       Variable Portion
0013 00000010 02 .---.-- Called party number Pointer         Offset 0015
0014 00000000 00 .---.-- Optional Portion Pointer            Points to
Nothing
                       Called party number
0015 00001100 0c .--..-- Called party number Length          12
0016 00000000 00
     -0000000    ----.-- Nature of Address Indicator         0000000 - spare

     0-------    ----.-- Odd/Even Indicator                  0 - even number
 of address signals
0017 00000000 00
     ----0000    ----.-- Spare                               0
     -000----    ----.-- Numbering Plan Indicator            000 - spare
     0-------    ----.-- Internal network number indicator   0 - routing
to internal network number allowed
0018 00000000 00 ------- Address
00000000000000000000
0019 00000000 00
0020 00000000 00
0021 00000000 00
0022 00000000 00
0023 00000000 00
0024 00000000 00
0025 00000000 00
0026 00000000 00
0027 00000000 00
```

ECAP XML Output

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE ecapreport SYSTEM "ecapreport.dtd">
<ecapreport>
  <stp>e1021201</stp>
  <collector>nc11xvader</collector>
  <startdate>26092005</startdate>
  <starttime>102800</starttime>
  <enddate>26092005</enddate>
  <endtime>102900</endtime>

  <record>
    <signallingstandard>ITU-I</signallingstandard>
    <linkid>1</linkid>
    <si>isup</si>
    <mtp>
      <opc>002-002-002</opc>
```

```
        <dpc>002-004-002</dpc>
    </mtp>
    <msucount>1</msucount>
    <octcount>31</octcount>
  </record>

</ecapreport>
```

SCCP MSU

The following is an example of SCCP MSU with the ECAP data file. If an SCCP MSU contains a CgPA or CdPA point code, the point code is copied to the peg count report, but only if the point code differs from the OPC or DPC.

```
*** Start of MTP Level 3 ***
                        MSU
0000 00000011 03
     ----0011    ----.-- Service Indicator SCCP
     --00----    ----.-- Spare                                 0
     00------    ----.-- Network Indicator                     00 -
International Network
0001 00010010 12 K---.-- Destination Point Code 2-2-2
0002 01010000 50
     --010000
     01------    K---.-- Origination Point Code 2-2-1
0003 00000100 04
0004 00000100 04
     ----0100
     0000----    ----.-- Signalling Link Code                 0

*** Start of SCCP ***
                        Unitdata
0005 00001001 09 .T-..E. Message Type                          09
0006 10000000 80
     ----0000    .....-- Protocol Class                       Class 0
                         Variable Portion
     1000----    ----.-- Message Handling                      1000 - return
 message on error
0007 00000011 03 .---.-- Called Party Address                 Offset 0010
0008 00010011 13 .---.-- Calling Party Address                Offset 0027
0009 00100011 23 .---.-- Data Portion Pointer                 Offset 0044
0010 00010000 10 .--..-- Called Party Address Length          16
0011 01001011 4b
     -------1    .--..-. Point Code Indicator                 Included
     ------1-    .--..-. Subsystem Number Indicator           Included
     --0010--    .....-- Global Title indicator               0010 - Global
 title w/ translation type
     -1------    ----.-- Routing indicator                    1 - route on
SSN
     0-------    ----.-- Reserved for National use            0 - Reserved
for National use
0012 00010010 12 ----.-- Signalling Point Code 4-2-2
0013 00100000 20
0014 00000000 00 ----.-- Subsystem Number                    0
0015 00001000 08 ----.-- Translation Type                    8
0016 00100001 21 ------- Address information 123456789012345678910
0017 01000011 43
0018 01100101 65
0019 10000111 87
0020 00001001 09
```

```
0021 00100001 21
0022 01000011 43
0023 01100101 65
0024 10000111 87
0025 00001001 09
0026 00000001 01
0027 00010000 10 .--..-- Calling Party Address Length            16
0028 01001011 4b
     -------1  .--..-. Point Code Indicator                   Included
     ------1-  .--..-. Subsystem Number Indicator             Included
     --0010--  .....-- Global Title indicator                 0010 - Global
 title w/ translation type
     -1------  ----.-- Routing indicator                      1 - route on
SSN
     0-------  ----.-- Reserved for National use              0 - Reserved
for National use
0029 00010001 11 ----.-- Signalling Point Code                4-2-1
0030 00100000 20
0031 00000000 00 ----.-- Subsystem Number                    0
0032 00000010 02 ----.-- Translation Type                    2
0033 10010000 90 ------- Address information 09876543210987654321 90
0034 01111000 78
0035 01010110 56
0036 00110100 34
0037 00010010 12
0038 10010000 90
0039 01111000 78
0040 01010110 56
0041 00110100 34
0042 00010010 12
0043 00001001 09
                          Data Portion

*** Start of TCAP and SCCP Management ***
                          TCAP Layer
0044 00000101 05 .--..-- TCAP Length                          5
0045 01100010 62 .T-..E. Begin Message                        98
0046 00000011 03 .--..-- Message Length                       3
                          Transaction Portion
0047 01001000 48 .--..-. Originating TX ID                    72
0048 00000001 01 .--..-- Transaction ID Length                1
0049 00000000 00 ----.-- Originating Transaction ID           00
                          Optional Dialogue Portion
                          -
                          Optional Comonent Portion
```

ECAP XML Output

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE ecapreport SYSTEM "ecapreport.dtd">
<ecapreport>
  <stp>e1021201</stp>
  <collector>nc11xvader</collector>
  <startdate>27092005</startdate>
  <starttime>111700</starttime>
  <enddate>27092005</enddate>
  <endtime>111800</endtime>

  <record>
    <signallingstandard>ITU-I</signallingstandard>
    <linkid>0</linkid>
    <si>sccp</si>
    <mtp>
      <opc>002-002-001</opc>
```

```
        <dpc>002-002-002</dpc>
     </mtp>
     <sccp>
       <cgpadigits>09876543210987654321 90</cgpadigits>
       <cdpadigits>12345678901234567890 10</cdpadigits>
       <cgpapc>004-002-001</cgpapc>
       <cdpapc>004-002-002</cdpapc>
     </sccp>
     <msucount>1</msucount>
     <octcount>53</octcount>
   </record>

</ecapreport>
```

MAP MSU

The following is an example of SCCP MSU with a TCAP layer with the ECAP data file.

```
*** Start of MTP Level 3 ***
                         MSU
0000 00000011 03
     ----0011    ----.-- Service Indicator SCCP
     --00----    ----.-- Spare                               0
     00------    ----.-- Network Indicator                   00 -
International Network
0001 00010010 12 K---.-- Destination Point Code 2-2-2

0002 01010000 50     --010000          01------    K---.-- Origination Point
Code 2-2-1

0003 00000100 04
0004 00000100 04
     ----0100
     0000----    ----.-- Signalling Link Code                0

*** Start of SCCP ***

                        Unitdata
0005 00001001 09 .T-..E. Message Type                         09
0006 10000000 80
     ----0000    .....-- Protocol Class                      Class 0
                         Variable Portion
     1000----    ----.-- Message Handling                    1000 - return
 message on error
0007 00000011 03 .---.-- Called Party Address                Offset 0010
0008 00010011 13 .---.-- Calling Party Address               Offset 0027
0009 00100011 23 .---.-- Data Portion Pointer                Offset 0044
0010 00010000 10 .--..-- Called Party Address Length         16
0011 00001011 0b
     -------1    .--..-. Point Code Indicator                Included
     ------1-    .--..-. Subsystem Number Indicator          Included
     --0010--    .....-- Global Title indicator              0010 - Global
 title w/ translation type
     -0------    ----.-- Routing indicator                   0 - route on
GT
     0-------    ----.-- Reserved for National use           0 - Reserved
for National use
0012 00010010 12 ----.-- Signalling Point Code 4-2-2

0013 00100000 20
```

```
0014 00000000 00 ----.-- Subsystem Number                         0
0015 00001000 08 ----.-- Translation Type                         8
0016 00100001 21 ------- Address information 12345678901234567889010
0017 01000011 43
0018 01100101 65
0019 10000111 87
0020 00001001 09
0021 00100001 21
0022 01000011 43
0023 01100101 65
0024 10000111 87
0025 00001001 09
0026 00000001 01
0027 00010000 10 .--..-- Calling Party Address Length      16
0028 01001011 4b
     -------1    .--..-. Point Code Indicator             Included
     ------1-    .--..-. Subsystem Number Indicator        Included
     --0010--    .....-- Global Title indicator           0010 - Global
 title w/ translation type
     -1------    ----.-- Routing indicator                1 - route on
SSN
     0-------    ----.-- Reserved for National use        0 - Reserved
for National use
0029 00010001 11 ----.-- Signalling Point Code 4-2-1

0030 00100000 20
0031 00000000 00 ----.-- Subsystem Number                         0
0032 00000010 02 ----.-- Translation Type                         2
0033 10010000 90 ------- Address information 09876543210987655432190
0034 01111000 78
0035 01010110 56
0036 00110100 34
0037 00010010 12
0038 10010000 90
0039 01111000 78
0040 01010110 56
0041 00110100 34
0042 00010010 12
0043 00001001 09
                       Data Portion

*** Start of TCAP and SCCP Management ***
                       TCAP Layer
0044 00100010 22 .--..-- TCAP Length                       34
0045 01100001 61 .T-..E. Unidirectional Message            97
0046 00100000 20 .--..-- Message Length                    32
                       Optional Dialogue Portion
                       Dialogue Portion
0047 01101011 6b .--..-. Dialogue Portion Tag              107
0048 00010100 14 .--..-- Dialogue Portion Length           20
0049 00101000 28 .--..-. External Tag                      40
0050 00010010 12 .--..-- External Length                   18
0051 00000110 06 .--..-. Object Identifier Tag             06
0052 00000111 07 .--..-- Object Identifier Length          7
                       Dialogue-as-ID value
0053 00000000 00 .--..-. CCITT Q Recommendation            00
0054 00010001 11 .--..-. Q                                 17
0055 10000110 86 .--..-. Document 773 (X'305)              1414
0056 00000101 05
0057 00000001 01 .--..-. as(1)                             01
0058 00000001 01 .--..-. dialoguePDU                       01
0059 00000001 01 .--..-. Version1 (1)                      01
0060 10100000 a0 .--..-. ASN.1-type Tag                    160
0061 00000111 07 .--..-- ASN.1-type Length                 7
0062 01100000 60 ---..-- Dialogue PDU Selection            Dialogue Request
```

```
 Tag
0063 00000101 05 .--..-- Request Length                        5
                         Optional Protocol Version
                         -
0064 10100001 a1 .--..-. Application Context name Tag          161
0065 00000011 03 .--..-- AC Length                             3
0066 00000110 06 .--..-. Object Identifier Tag                 6
0067 00000001 01 .--..-- Object Identifier Length              1
0068 00000110 06 .--..-. Context Data                          06
                         Optional User Information
                         -
                         -
                         Component Portion
0069 01101100 6c .--..-. Component Portion Tag                 108
0070 00001000 08 .--..-- Component Portion Length              8
                         Invoke Component
0071 10100001 a1 .--..-. Invoke Tag                            161
0072 00000110 06 .--..-- Invoke Length                         6
                         Invoke ID
0073 00000010 02 .--..-. Invoke ID Tag                         2
0074 00000001 01 .--..-- Invoke ID Length                      1
0075 00000000 00 ----.-- Invoke ID                             0
                         Optional Linked ID
                         -
                         Operation Code
0076 00000010 02 ---..-- Operation Code Tag                    Local Operation
 Code
0077 00000001 01 .--..-- Operation Code Length                 1
0078 00000101 05 ----.-- Operation Code 05
                         Optional parameters
```

ECAP XML Output

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE ecapreport SYSTEM "ecapreport.dtd">
<ecapreport>
  <stp>e1021201</stp>
  <collector>nc1lxvader</collector>
  <startdate>26092005</startdate>
  <starttime>154300</starttime>
  <enddate>26092005</enddate>
  <endtime>154400</endtime>

  <record>
    <signallingstandard>ITU-I</signallingstandard>
    <linkid>0</linkid>
    <si>sccp</si>
    <mtp>
      <opc>002-002-001</opc>
      <dpc>002-002-002</dpc>
    </mtp>
    <sccp>
      <cgpadigits>09876543210987654321</cgpadigits>
      <cdpadigits>1234567890123456789010</cdpadigits>
      <cgpapc>004-002-001</cgpapc>
      <cdpapc>004-002-002</cdpapc>
    </sccp>
    <map>
      <opcode>5</opcode>
    </map>
    <msucount>1</msucount>
    <octcount>82</octcount>
  </record>
```

```
</ecapreport>
```

Glossary

Aggregator

A dedicated server where ECAP XML data files are sent; responsible for aggregating data from multiple ECAPs into billable form.

An Aggregator MUST have the following characteristics:

- SSH capable
- Parse and accumulate XML output from multiple ECAP servers
- 1 virtual IP address
- Format and generate billing reports that are useful to the customer

ANSI

American National Standards Institute

ANSI develops and publishes standards. ANSI is a non-commercial, non-government organization which is funded by more than 1000 corporations, professional bodies, and enterprises.

AS

Application Server

CdPA

Called Party Address

CgPA

Calling Party Address

CLLI

Common Language Location Identifier

C

CMOS   Complementary Metal Oxide
                                            Semiconductor

CRC   Cyclic Redundancy Check

CSR   Customer Service Request

D

Data Collection Interface   Incoming MSU data network
                                            interface from the EAGLE SLAN
                                            card.

Database   All data that can be administered
                                            by the user, including cards,
                                            destination point codes, gateway
                                            screening tables, global title
                                            translation tables, links, LNP
                                            services, LNP service providers,
                                            location routing numbers, routes,
                                            shelves, subsystem applications,
                                            and 10 digit telephone numbers.

DPC   Destination Point Code

                                            DPC refers to the scheme in SS7
                                            signaling to identify the receiving
                                            signaling point. In the SS7 network,
                                            the point codes are numeric
                                            addresses which uniquely identify
                                            each signaling point. This point
                                            code can be adjacent to the EAGLE
                                            5 ISS, but does not have to be.

E

ECAP   EAGLE Collector Application
                                            Processor

                                            A dedicated standalone platform
                                            for the collection of EAGLE 5 ISS
                                            traffic statistical data.

F

FTP   File Transfer Protocol.

I

ICMP

Internet Control Message Protocol

ID

Identity, identifier

IP

Internet Protocol

IP Address

The location of a device on a TCP/IP network. The IP Address is a number in dotted decimal notation which looks something like [192.168.1.1].

IPSM

IP Services Module

A card that provides an IP connection for Telnet and FTP-based Table Retrieve applications. The IPSM is a GPSM-II card with a one Gigabyte (UD1G) expansion memory board in a single-slot assembly running the IPS application.

IS-NR

In Service - Normal

ISS

Integrated Signaling System

ISUP

ISDN User Part

ITU

International Telecommunications Union

K

Key

For the ICNP feature, a unique DS value used to access a table entry, consisting of a number length and number type.

L

L

LAN   Local Area Network

                                           See also STP LAN.

LIM   Link Interface Module

M

MAP   Mobile Application Part

MB   Megabyte — A unit of computer
                                           information storage capacity equal
                                           to 1,048, 576 bytes.

MSU   Message Signaling Unit

MTP   Message Transfer Part

                                           Module Test Plan

N

NMS   Network Management System

                                           An NMS is typically a standalone
                                           device, such as a workstation,
                                           that serves as an interface
                                           through which a human network
                                           manager can monitor and control
                                           the network. The NMS usually
                                           has a set of management
                                           applications (for example, data
                                           analysis and fault recovery
                                           applications).

NTP   Network Time Protocol

O

OAM   Operations, Administration, and
                                           Maintenance

OPC   Originating Point Code

O

OS   Operations Systems

R

RMA   Return Material Authorization

RSA   Regional Service Area

                                                        Rural Statistical Areas

S

SCCP   Signaling Connection Control Part

SI   Service Indicator

SLAN   Signaling Transfer Point Local
                                                       Area Network.

SNMP   Simple Network Management
                                                       Protocol.

SSEDCM   Single Slot Enhanced Data
                                                       Communications Module

SSH   Secure Shell

STP   Signal Transfer Point

STPLAN   Signaling Transfer Point Local
                                                       Area Network

                                                       The generic program load and
                                                       application used by the ACM card
                                                       to support the STP LAN
                                                       application. This GPL does not
                                                       support 24-bit ITU-N point codes.

T

TCAP   Transaction Capabilities
                                                       Application Part

U

UAM   Unsolicited Alarm Message.

V

VXWSLAN   An application used by the DCM
                                                       card to support the STP LAN
                                                       application. This GPL does not
                                                       support 24-bit ITU-N point codes.

W

WAN   Wide Area Network

X

XML   Extensible Markup Language