# Tekelec EAGLE ® 5 Integrated Signaling System

## Feature Manual - ECAP

**910-5679-001 Revision A**

**April 2009**

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This product is covered by one or more of the following U.S. and foreign patents:
U.S. Patent Numbers:
5,732,213; 5,953,404; 6,115,746; 6,167,129; 6,324,183; 6,327,350; 6,456,845; 6,606,379; 6,639,981; 6,647,113; 6,662,017; 6,735,441; 6,745,041; 6,765,990; 6,795,546; 6,819,932; 6,836,477; 6,839,423; 6,885,872; 6,901,262; 6,914,973; 6,940,866; 6,944,184; 6,954,526;6,954,794; 6,959,076; 6,965,592; 6,967,956; 6,968,048; 6,970,542; 6,987,781; 6,987,849; 6,990,089; 6,990,347; 6,993,038; 7,002,988; 7,020,707; 7,031,340; 7,035,239; 7,035,387; 7,043,000; 7,043,001; 7,043,002; 7,046,667; 7,050,456; 7,050,562; 7,054,422; 7,068,773; 7,072,678; 7,075,331; 7,079,524; 7,088,728; 7,092,505; 7,108,468; 7,110,780; 7,113,581; 7,113,781; 7,117,411; 7,123,710; 7,127,057; 7,133,420; 7,136,477; 7,139,388; 7,145,875; 7,146,181; 7,155,206; 7,155,243; 7,155,505; 7,155,512; 7,181,194; 7,190,702; 7,190,772; 7,190,959; 7,197,036; 7,206,394; 7,215,748; 7,219,264; 7,222,192; 7,227,927; 7,231,024; 7,242,695; 7,254,391; 7,260,086; 7,260,207; 7,283,969; 7,286,516; 7,286,647; 7,286,839; 7,295,579; 7,299,050; 7,301,910; 7,304,957; 7,318,091; 7,319,857; 7,327,670
Foreign Patent Numbers:
EP1062792; EP1308054; EP1247378; EP1303994; EP1252788; EP1161819; EP1177660; EP1169829; EP1135905; EP1364520; EP1192758; EP1240772; EP1173969; CA2352246

**Ordering Information**

Your Tekelec Sales Representative can provide you with information about how to order additional discs.

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# 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 11 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 9, 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 41, 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 57, describes how MSU parameters that come into the ECAP server relate to the peg count fields in the ECAP data file.

## 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**:<br>(This icon and text indicate the possibility of *personal injury*.) |
|  | **WARNING**:<br>(This icon and text indicate the possibility of *equipment damage*.) |
|  | **CAUTION**:<br>(This icon and text indicate the possibility of *service interruption*.) |

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The Customer Care Center is available 24 hours a day, 7 days a week, 365 days a year, and is linked to TAC Engineers around the globe.

Tekelec TAC Engineers are available to provide solutions to your technical questions and issues 7 days a week, 24 hours a day. After a CSR is issued, the TAC Engineer determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, normal support procedures apply. A primary Technical Engineer is assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

Tekelec Technical Assistance Centers are located around the globe in the following locations:

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Email (All Regions): support@tekelec.com

- **USA and Canada**

  Phone:

  1-888-FOR-TKLC or 1-888-367-8552 (toll-free, within continental USA and Canada)

  1-919-460-2150 (outside continental USA and Canada)

  TAC Regional Support Office Hours:

  8:00 a.m. through 5:00 p.m. (GMT minus 5 hours), Monday through Friday, excluding holidays

- **Central and Latin America (CALA)**

  Phone:

  USA access code +1-800-658-5454, then 1-888-FOR-TKLC or 1-888-367-8552 (toll-free)

  TAC Regional Support Office Hours (except Brazil):

  10:00 a.m. through 7:00 p.m. (GMT minus 6 hours), Monday through Friday, excluding holidays

  - **Argentina**

    Phone:

    0-800-555-5246 (toll-free)

  - **Brazil**

    Phone:

    0-800-891-4341 (toll-free)

    TAC Regional Support Office Hours:

8:30 a.m. through 6:30 p.m. (GMT minus 3 hours), Monday through Friday, excluding holidays

- **Chile**

  Phone:

  1230-020-555-5468

- **Columbia**

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  01-800-912-0537

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  Phone:

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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.

## 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 (*support.tekelec.com*). This site allows for 24-hour access to the most up-to-date documentation, including the latest versions of Feature Notices.

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 separately. Exceptions to printed documentation are:

- Hardware or Installation manuals are printed 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.

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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.

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   **Note:** If you have not registered for this new site, click the **Register Here** link. Have your customer number available. The response time for registration requests is 24 to 48 hours.

2. Click the **Product Support** tab.
3. Use the Search field to locate a document by its part number, release number, document name, or document type. The Search field accepts both full and partial entries.
4. Click a subject folder to browse through a list of related files.
5. To download a file to your location, right-click the file name and select **Save Target As**.

# 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 13 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 40.1 supports a single ECAP Frame.

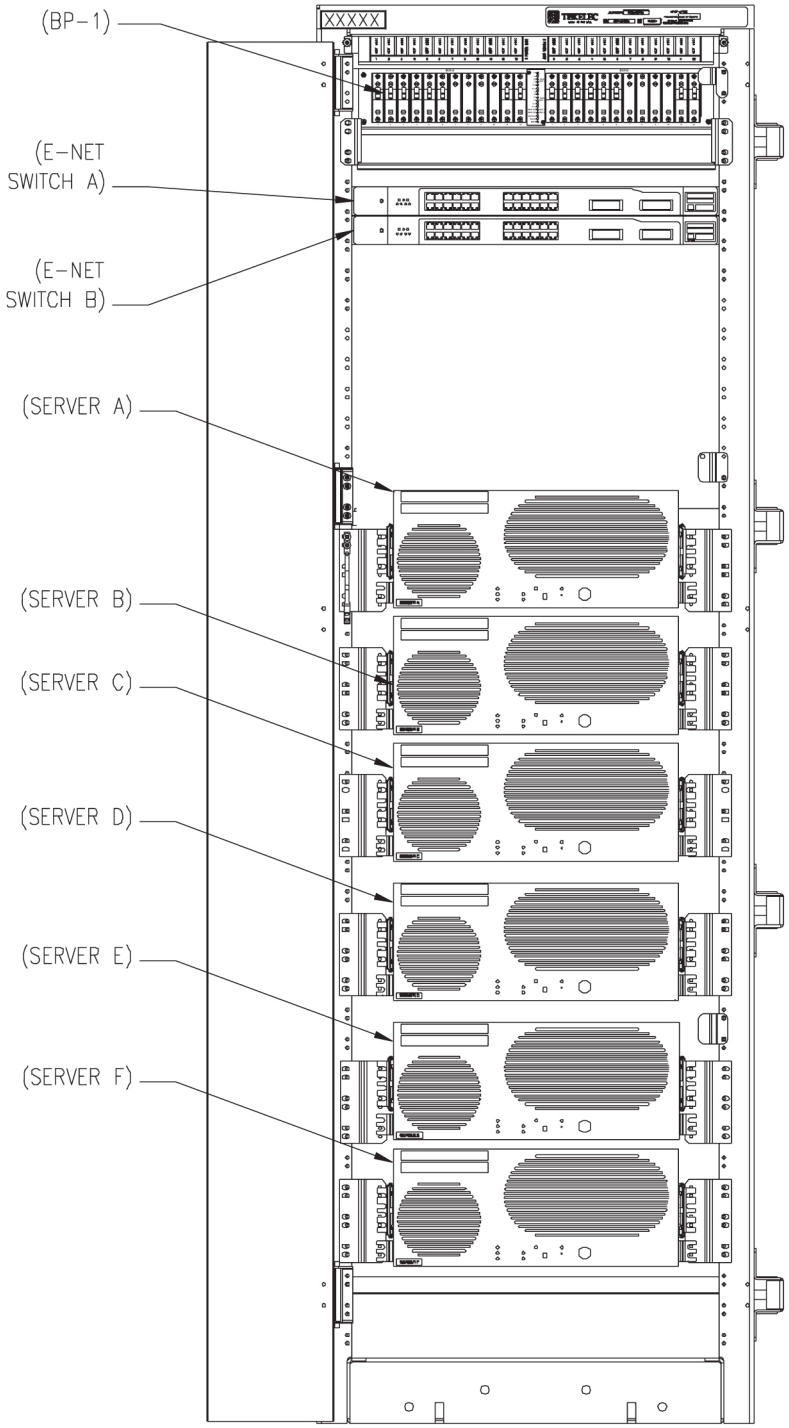
- Power Distribution breaker panel
- Two Ethernet Switch units
- A T1100 server, running the Integrated Q.752 MTP/SCCP Accounting Feed feature.
- The maximum number of ECAP Servers is six.
- The number of ECAP Servers per frame is two to six.
- The EAGLE 5 ISS system used with the ECAP must be equipped 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 11.

**Table 2: MSU to Server Mapping**

| MSU per Second | Servers |
|---|---|
| <= 5000 | 2 |
| 5001 to 10000 | 3 |
| 10001 to 15000 | 4 |
| 15001 to 20000 | 5 |
| 20001 to 25000 | 6 |

**Figure 1: ECAP T1100 Frame**


(BP-1)
(E-NET SWITCH A)
(E-NET SWITCH B)
(SERVER A)
(SERVER B)
(SERVER C)
(SERVER D)
(SERVER E)
(SERVER F)

## Architectural Overview

*Figure 2: Integrated Accounting Feed Architectural Overview* on page 13 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**

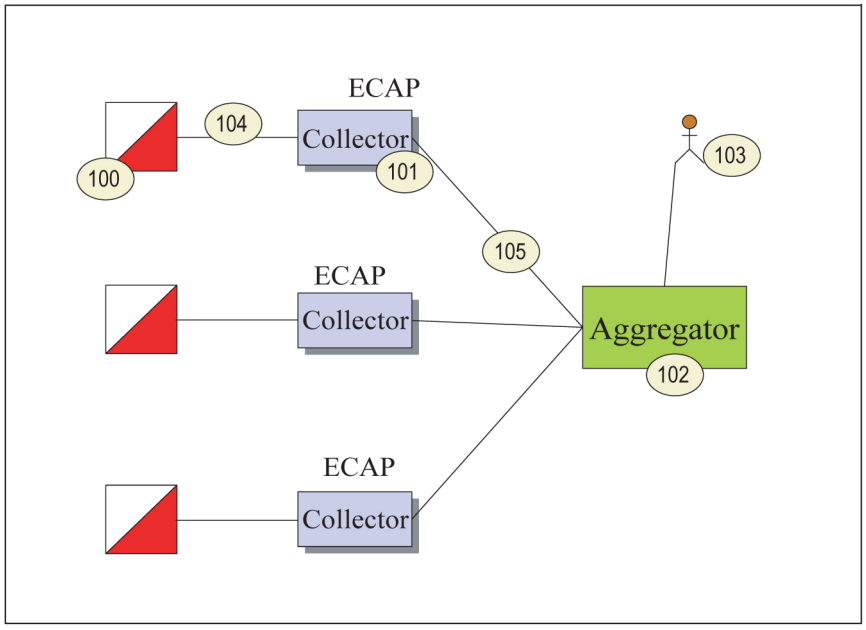



*Table 3: Integrated Accounting Feed Architecture Terms* on page 13 defines the terms used in the above figure.

**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.<br>The Aggregator function is installed on a system defined by the customer. This system should have the following characteristics:<br>• Ability to accept an XML file<br>• Ability to accept a 'push'<br>• Ability to sustain an IP connection and support Virtual IP, including a virtual IP address<br>**Note:**<br>The ability to support Virtual IP is recommended but not a requirement.<br>• Ability to enable SecureShell |

## Interconnectivity

*Figure 3: Interconnectivity Overview* on page 14 provides a high-level view of interconnectivity for the Integrated Accounting Feed application.

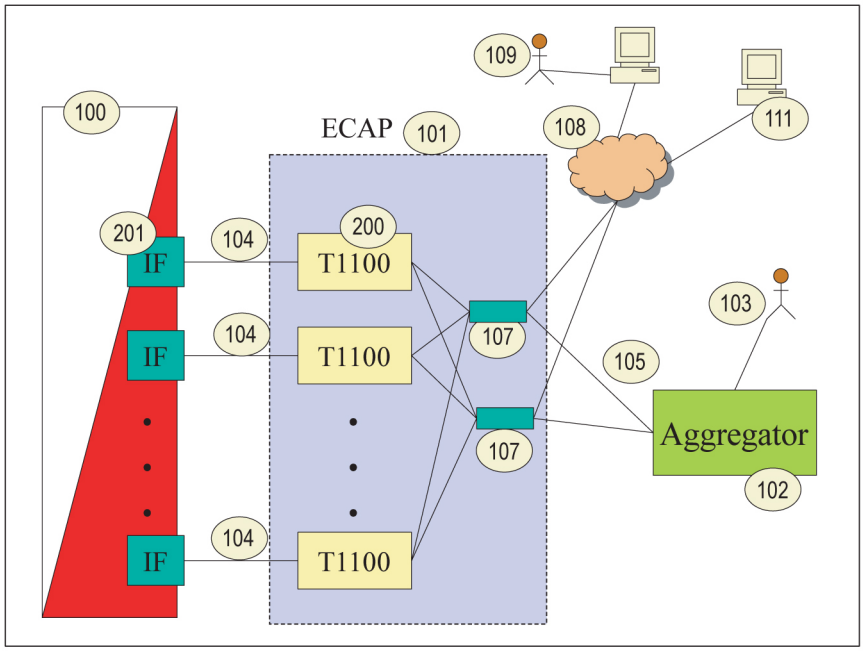
The number of ECAP Servers (200) and Interface Cards (201) is dependent on the number of MSU that need to be collected to provide the measurement data. The capacity of 5000 MSU per server is the benchmark. The T1100 servers and Interface Cards are configured on a one-for-one basis (1:1).

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).

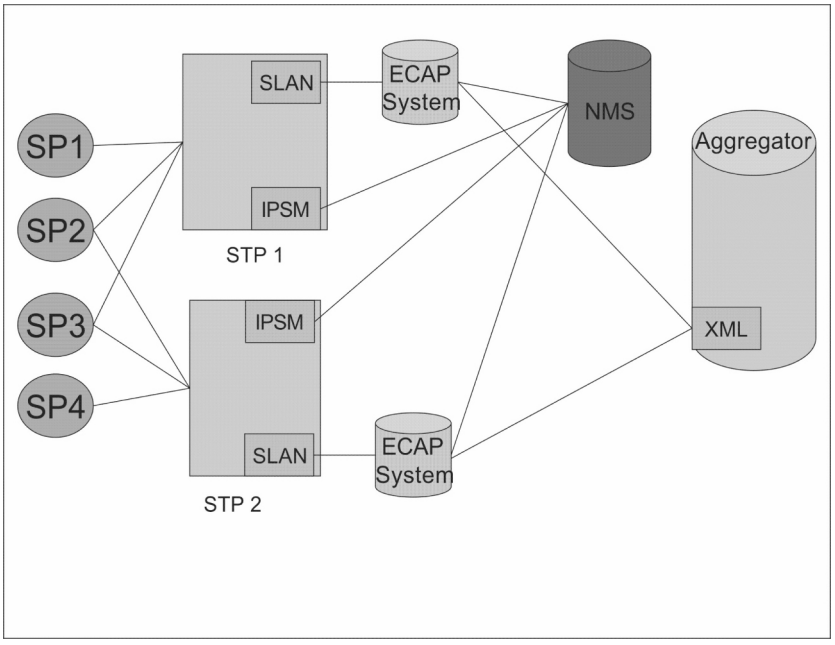
**Figure 3: Interconnectivity Overview**




See *Architectural Overview* on page 13 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 57 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 29). However, ITU is the only supported protocol for Release 40.1.

- 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 SLAN card.
- 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

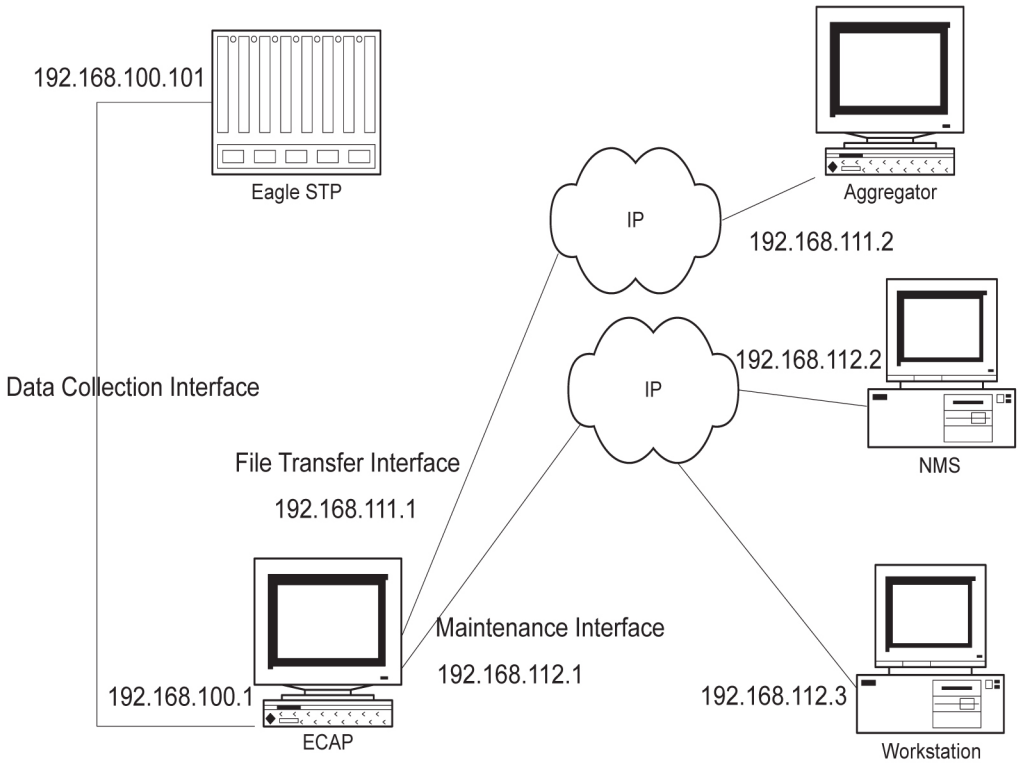
## Configuring the Aggregator

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 18 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.

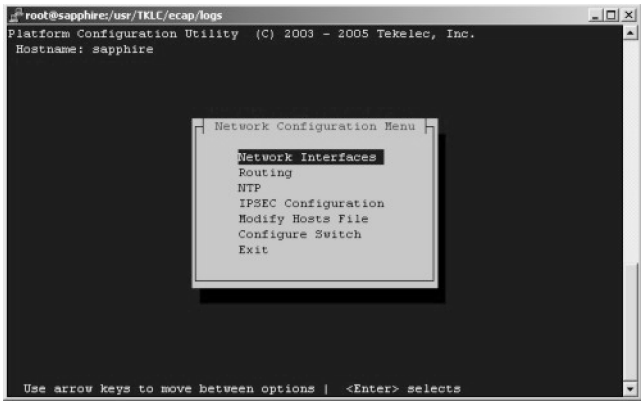
The Maintenance Interface is an OAM interface that allows monitoring of alarms by a remote NMS. This interface supports secure remote login via SSH.

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.

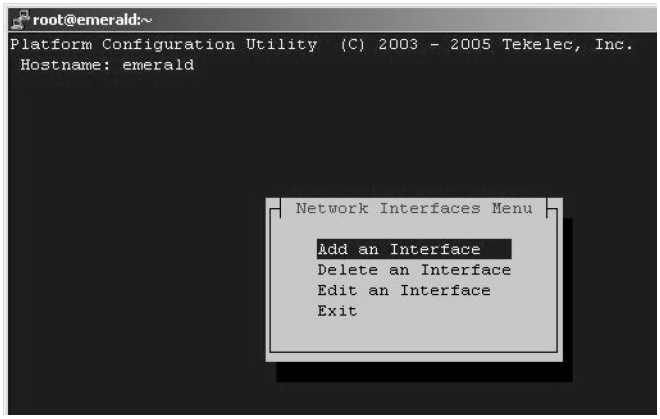
**Procedure**

1. Log in to the ECAP server as the `platcfg` user.

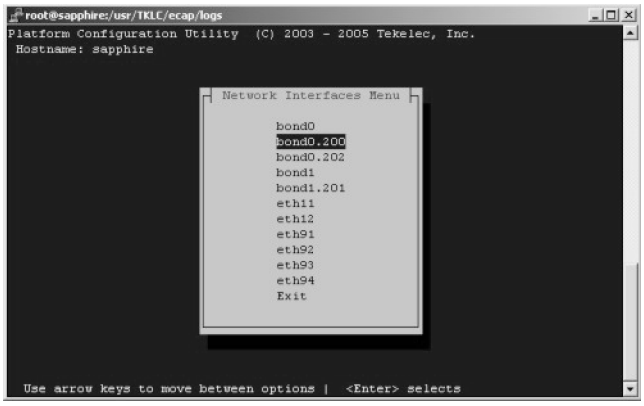

2. Select **Network Configuration** from the Platform Configuration Utility Main Menu and press **Enter**.




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

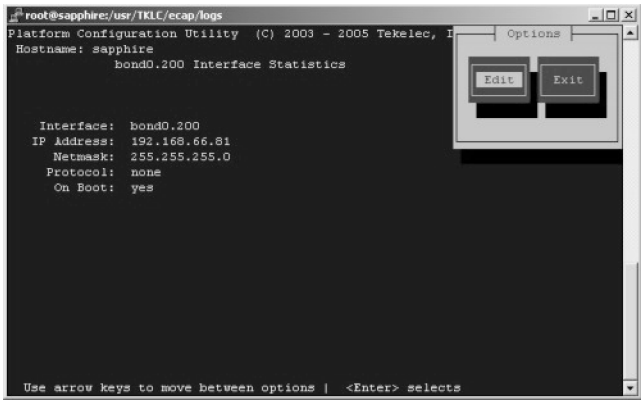



4. Select **Edit an Interface** from the Network Interfaces Menu and press **Enter**.




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 (T1100) | bond1.201 (T1100)<br>**Note:**<br>Device bond1.201 is a VLAN-tagged device of bond1. | bond0.200 (T1100)<br>**Note:**<br>Device bond0.200 is a VLAN-tagged device of bond0. |
| IP Address | Default at install:<br>1A: 192.168.100.1 | locally administered | locally administered |

| Parameter | Data Collection Interface | File Transfer Interface | Maintenance Interface |
|---|---|---|---|
| | 1B: 192.168.100.2<br>1C: 192.168.100.3<br>1D: 192.168.100.4<br>1E: 192.168.100.5<br>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 listed network configuration tasks, 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. This public key must then be placed on the Aggregator.

1. Log into the the ECAP server as `ecapadm` user.
2. Generate the RSA Public key using the `ssh-keygen` command.

   Output from `ssh-keygen` appears as follows:

```
[ecap1] # 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
```


**CAUTION:** Do *NOT* enter a passphrase when prompted. Just press **Enter**.

After generating the public key, place the contents of the `id_rsa.pub` key file on the Aggregator in the <agg_userId> home directory in order to gain file transfer access to the Aggregator FTP directory. Use *Adding the RSA Public Key to a Linux/UNIX Aggregator* on page 23 or *Adding the RSA Public Key to a Windows Aggregator* on page 24 depending on the OS of the Aggregator.

**Note:**

The **<agg_userId>** represents the user name that is used to log into the Aggregator when transferring data file. This informaton is configured in the *File Mover Configuration Menu* within `ecapcfg` for the Primary Aggregator (and optionally on the Backup Aggregator). See *Configuring the Primary Aggregator* on page 36 or *Configuring the Backup Aggregator* on page 36 for more information.

## Adding the RSA Public Key to a Linux/UNIX Aggregator

After generating the public key, the `id_rsa.pub` key file must then be placed on the Aggregator in the <agg_userId> directory in order to gain file transfer access to the Aggregator FTP directory.

**Note:**

- The **<agg_userId>** represents the user name that is used to log into the Aggregator when transferring data file.
- The **<homeDir>** represents the home directory of the <agg_userId> on the Aggregator.

This information is configured in the *File Mover Configuration Menu* within `ecapcfg` for the Primary Aggregator (and optionally on the Backup Aggregator). See *Configuring the Primary Aggregator* on page 36 or *Configuring the Backup Aggregator* on page 36 for more information:

**Note:**

- If both a Primary and Backup Aggregator are configured using the `ecapcfg`, you *MUST* repeat *Adding the RSA Public Key to a Linux/UNIX Aggregator* on page 23 for each Aggregator configured.
- When following these steps for a Backup Aggregator, you must substitute *bak1_aggregator* for all instances of the word aggregator in the given commands.

**Procedure**

1. Copy the `id_rsa.pub` file to the home directory on the Aggregator.

```
[ecap1] # scp ~/.ssh/id_rsa.pub
<agg_userId>@aggregator:<homeDir>/ecap_id_rsa.pub

<agg_userId>@aggregator's password:
id_rsa.pub 100%  604     0.5KB/s   --:-- ETA
```

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

```
[ecap1] # ssh <agg_userId>@aggregator

<agg_userId>@aggregator's password:
```

3. If the <agg_userId> does not have an `.ssh` directory under the 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 ecap_id_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 <agg_userId>@aggregator
```

5. 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 *Adding the RSA Public Key to a Linux/UNIX Aggregator* 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 24 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 24 for each member of the cluster using the virtual IP address.

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 29).

## Adding the RSA Public Key to a Windows Aggregator

After generating the public key, the `id_rsa.pub` key file must then be placed on the Aggregator in order to gain file transfer access to the Aggregator FTP directory.

**Procedure**

1. Copy the ECAP's `id_rsa.pub` file to the Aggregator.
2. Append the contents of the id_rsa.pub file to 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.

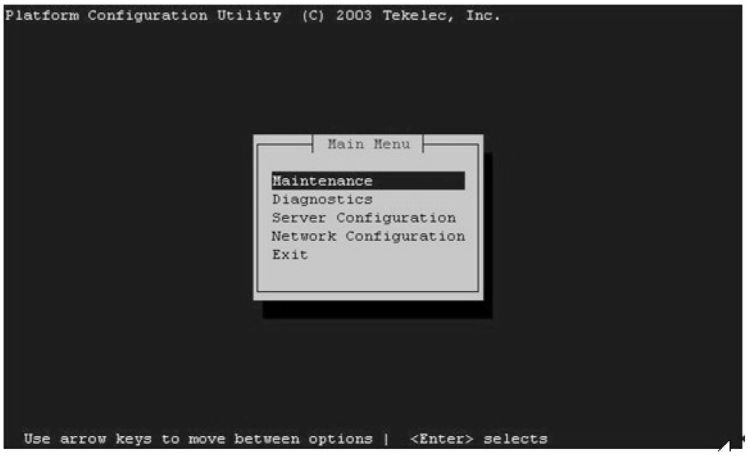
# Configuring NTP

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

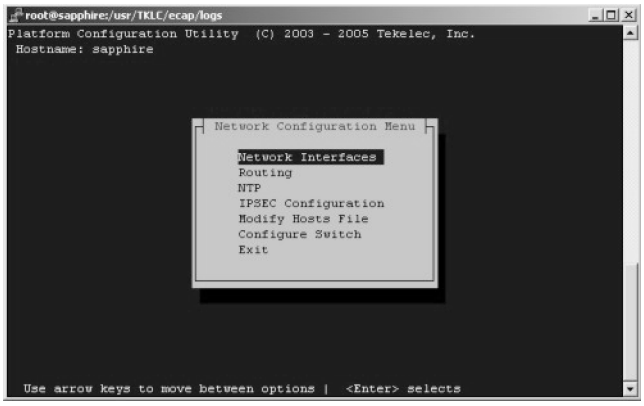
Use the following procedure to configure NTP using `platcfg`.

**Procedure**

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**.


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.

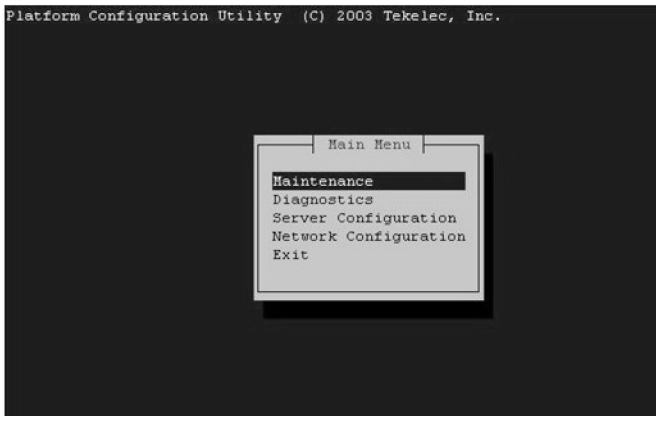
NMS configuration tasks involve configuring both the actual system used to monitor alarms and configuring the ECAP server to send alarms to the NMS.

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.

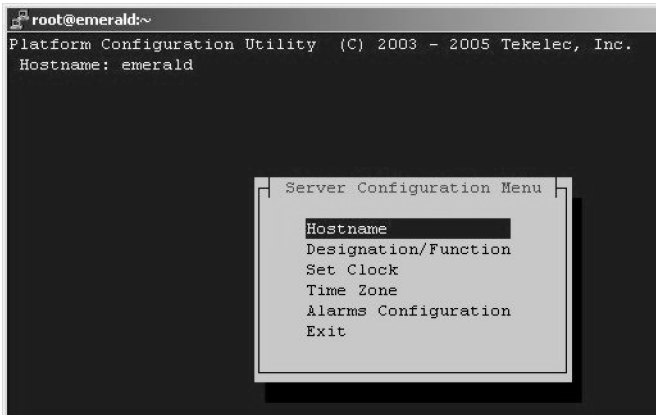
Use the following procedure to configure the ECAP server to send alarms to the NMS.

**Procedure**

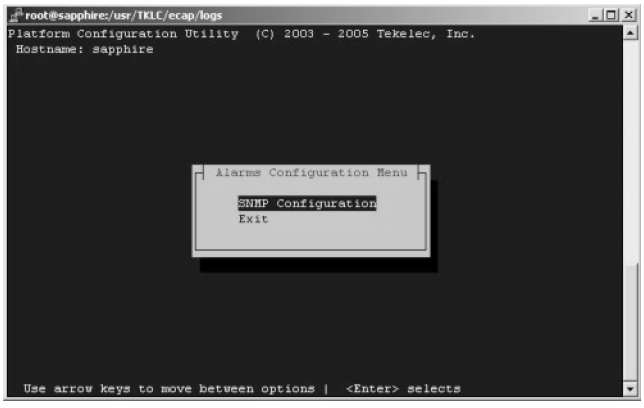
1. Log in to the ECAP server as the `platcfg` user .



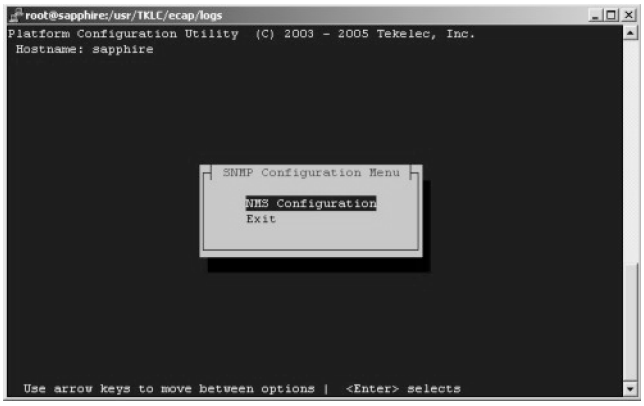

2. Select **Server Configuration** from the Platform Configuration Utility Main Menu and press **Enter**.



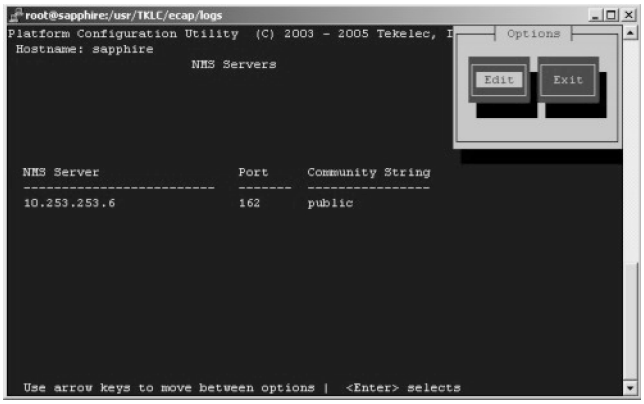

3. Select **Alarms Configuration** from the Server Configuration Menu and press **Enter**.



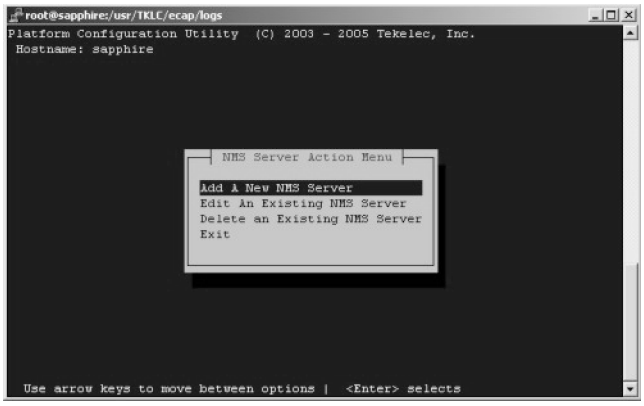

4. Select **SNMP Configuration** from the Alarms Configuration Menu and press **Enter**.




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

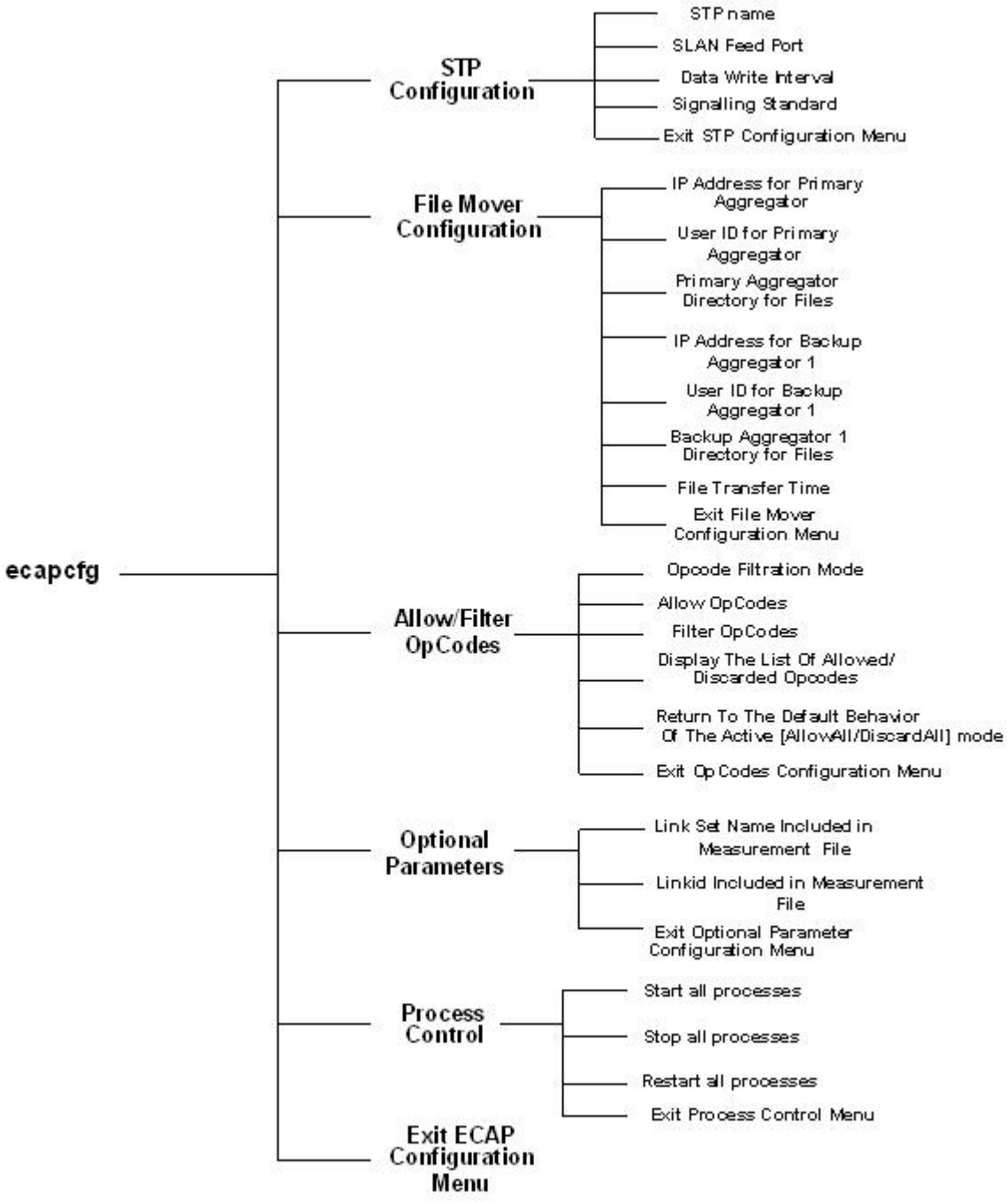
The Integrated Accounting Feed application automatically creates the **ecapadm** and **ecapuser** accounts. The **ecapadm** user can control or configure the Integrated Accounting Feed application and run the `savelogs` command (see *Savelogs* on page 51). The **ecapadm** user is part of the ecap group.

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 29.

**Figure 6: Integrated Accounting Feed Configuration Menu**




The menu options and their functions are provided in *Table 5: Configuration Menu Options* on page 31.

**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 37). | [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.<br>**Note:** For information on changing the Data Write Interval, see *Changing Data Write Intervals* on page 35. | [1, 5] |
| Signalling Standard | Sets the protocol by which the ECAP server interprets the MSUs from the EAGLE 5 ISS. | [ANSI, ITU]<br>**Note:**<br>ITU is the only supported protocol for Release 40.1. |
| **File Mover Configuration** | Displays a set of options that enable the parameters | [1..7, E] |

| Menu Option | Description | Range of Values |
|---|---|---|
| | associated with the Aggregator configuration to be set or changed. | |
| IP Address for Primary Aggregator | Sets the IP address for the Primary 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 Primary Aggregator | Sets the user name that is used to log in to the Primary Aggregator when transferring data files. | No restrictions. |
| Primary Aggregator Directory for Files | Sets the path to the directory in which the data files will be stored on the Primary Aggregator. | No restrictions. |
| IP Address for Backup Aggregator 1 | Sets the IP address for Backup Aggregator 1. The locator must be specified as an IP address.<br>**Note:** This value cannot be set until the value for IP Address for Primary Aggregator is set. | The value must be a decimal-separated 4-octet value, with each octet in the 0-255 range. |
| User ID for Backup Aggregator 1 | Sets the user name that is used to log in to Backup Aggregator 1 when transferring data files.<br>**Note:** This value cannot be set until the value for IP Address for Primary Aggregator is set. | No restrictions. |
| Backup Aggregator 1 Directory for Files | Sets the path to the directory in which the data files will be stored on Backup Aggregator 1.<br>**Note:** This value cannot be set until the value for IP Address for Primary Aggregator is set. | No restrictions. |
| File Transfer Time | Sets the number of minutes after the half hour to send data files to the Aggregator (1 - xx:01 | [1...5] |

| Menu Option | Description | Range of Values |
|---|---|---|
| | and xx:31, 2 - xx:02 and xx:32, etc.) | |
| **Allow / Filter OpCodes** | Displays a set of options that allows control over the set of opcodes that are included in the measurements data. | [1..5, E] |
| OpCode Filtration Mode | Sets the OpCode Filtration mode for the ECAP by specifying the manner in which OpCodes are filtered. (Start with all OpCodes being counted or no OpCodes being counted). | [1 for AllowAll, 2 for DiscardAll]<br>**Note:** The default behavior for each mode is as follows:<br>• AllowAll - All MSU packets will be counted by the ECAP. This is the default mode for the ECAP.<br>• DiscardAll - All MSU packets will be discarded by the ECAP. |
| Allow OpCodes | Sets the OpCodes which are counted by the ECAP. In DiscardAll mode, the specified OpCode will be added to the list of allowed OpCodes. In AllowAll mode, the specified OpCodes will be removed from the list of discarded OpCodes.<br>**Note:** This command is additive, meaning that the OpCodes specified will be added to the current allowed OpCode list for DiscardAll mode. | [OpCode Values]<br>**Note:** There is a maximum of ten (10) space delimited opcode values per invocation of this menu option. An opcode must be an integer between 0 and 255. |
| Filter OpCodes | Sets the OpCodes which will be discarded by ECAP. In AllowAll mode, the specified OpCodes will be added to the list of discarded OpCodes. In DiscardAll mode the specified OpCodes will be removed from the list of allowed OpCodes. | [OpCode Values]<br>**Note:** There is a maximum of ten (10) space delimited opcode values per invocation of this menu option. An opcode must be an integer between 0 and 255. |

| Menu Option | Description | Range of Values |
|---|---|---|
| | **Note:** This command is additive, meaning that the OpCodes specified will be added to the current discarded OpCode list for AllowAll mode. | |
| Display the List of Allowed / Discarded OpCodes | Displays a list containing all of the discarded or allowed OpCodes specified for the active mode. | |
| Return to the Default Behavior of the Active [AllowAll/DiscardAll] Mode | Clears the list of all the discarded or allowed OpCodes. This returns the active opcode filtration mode to the default behavior. | |
| **Optional Parameters** | Displays a set of optional parameters that can be configured.<br>**Note:** These parameters are only applicable if the EAGLE 5 ISS SLANLSN parameter is set to ON. | [1..2, E] |
| Link Set Name Included in Measurement File | If set to Y, then the Incoming/Outgoing Link Set Names will be placed in the output XML file. By default this field will be set to N (disabled). | [Y, y, N, n]<br>**Note:** Either the "Link Set Name Included in Measurement File" or the "Linkid Included in Measurement File" option must be enabled. |
| Linkid Included in Measurement File | If set to Y, then the linkid will be placed in the output XML file. By default, this field will be set to Y (enabled). | [Y, y, N, n]<br>**Note:** Either the "Link Set Name Included in Measurement File" or the "Linkid Included in Measurement File" option must be enabled. |
| **Process Control** | Displays a set of options that enable the application | [1..3, E] |

| Menu Option | Description | Range of Values |
|---|---|---|
| | processes to be started and stopped. | |
| 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] |

**Note:** When changes to the STP configuration parameters (with exception of the Data Write Interval) are saved, all the ECAP processes will be restarted. For more information on Data Write Interval, see *Changing Data Write Intervals* on page 35.

## Changing Data Write Intervals

A Data Write Interval (DWI) is a time interval measured in minutes at which the ECAP server generates a measurements peg count file. A DWI will always end on a time boundary that is divisible by the DWI value. For example, if the DWI is set for five (5) minutes, then measurement files will always be written on 5-minute boundaries such as 5:20, 5:25, 5:30, etc. A file would not be written on a boundary that is not divisible by 5, such as 5:22.

When a DWI is modified, the current interval completes and the measurement file is written. The next interval will begin with the new DWI value. The first interval with the new DWI value will end at the next divisible boundary. Depending on whether the DWI value is increased or decreased, the first interval can be shortened.

### DWI is Increased

When a DWI is increased, the first interval with the new DWI can be shortened. From then on, full intervals will occur.

For example, if the current DWI value is set at 1-minute intervals, measurement files are written at every 1-minute boundary (7:19, 7:20, 7:21, etc). At 7:21:32, the DWI value is changed from 1 to 5. The behavior is that the current 1-minute interval completes and a measurement file is written at 7:22:00. This covers the time period between 7:21:01 - 7:22:00.

The next interval with the new DWI value of 5 begins at 7:22:01. This interval will end at the next boundary divisible by five, which is 7:25:00. At 7:25:00, a measurement file is written to cover the time period between 7:22:01 and 7:25:00. This is a shortened 3-minute interval. From then on, measurement files will be written at normal 5-minute intervals (7:30, 7:35, 7:40, etc).

## Configuring the Primary Aggregator

Use the `ecapcfg` command to configure the IP address, user ID, and the directory for the Primary Aggregator. See *Table 5: Configuration Menu Options* on page 31 for restrictions on the these values.

**Procedure**

1. Log in to the ECAP server as the `ecapadm` user.
2. Use the `ecapcfg` command to open the ECAP Configuration menu.
3. Select **2** from the ECAP Configuration Menu and press **Enter** to open the File Mover Configuration menu.
4. Select **1** from the File Mover Configuration menu and press **Enter**.

   ```
   IP Address = [default]?
   ```

   Enter the Primary Aggregator IP address and return to the File Mover Configuration menu.
5. Select **2** from the File Mover Configuration menu and press **Enter**.

   ```
   USER ID = [default]?
   ```

   Enter the Primary Aggregator User ID and return to the File Mover Configuration menu.
6. Select **3** from the File Mover Configuration menu and press **Enter**.

   ```
   Aggregator Directory for Files = [default]?
   ```

   Enter the Primary Aggregator file storage directory path name and return to the File Mover Configuration menu.
7. Select **E** from the File Mover Configuration menu and press **Enter** to close the File Mover Configuration menu.
8. Select **E** from the ECAP Configuration menu and press **Enter**.

   ```
   Save Configuration and Restart ECAP (y or n)?
   ```

   Enter **Y** at the command prompt to save the configuration changes and start the ECAP processes.

   **Note:** Entering **N** at the command prompt discards the configuration changes and does not restart the ECAP processes.

## Configuring the Backup Aggregator

Use the `ecapcfg` command to configure the IP address, user ID, and the directory for the Backup Aggregator. See *Table 5: Configuration Menu Options* on page 31 for restrictions on the these values.

**Procedure**

1. Log in to the ECAP server as the `ecapadm` user.
2. Use the `ecapcfg` command to open the ECAP Configuration menu.
3. Select **2** from the ECAP Configuration Menu and press **Enter** to open the File Mover Configuration menu.
4. Select **4** from the File Mover Configuration menu and press **Enter**.

   ```
   IP Address = [default]?
   ```

   Enter the Backup Aggregator 1 IP address and return to the File Mover Configuration menu.

5. Select **5** from the File Mover Configuration menu and press **Enter**.

   ```
   USER ID = [default]?
   ```

   Enter the Backup Aggregator 1 User ID and return to the File Mover Configuration menu.
6. Select **6** from the File Mover Configuration menu and press **Enter**.

   ```
   Aggregator Directory for Files = [default]?
   ```

   Enter the Backup Aggregator 1 file storage directory path name and return to the File Mover Configuration menu.
7. Select **E** from the File Mover Configuration menu and press **Enter** to close the File Mover Configuration menu.
8. Select **E** from the ECAP Configuration menu and press **Enter**.

   ```
   Save Configuration and Restart ECAP (y or n)?
   ```

   Enter **Y** at the command prompt to save the configuration changes and start the ECAP processes.

   **Note:** Entering **N** at the command prompt discards the configuration changes and does not restart the ECAP processes.

## Configuring SLAN Cards

### Configuring the SLAN Cards to Interface with an ECAP Server

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 37 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<br>**Note:**<br>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; | Locally allocated static IP address of the SLAN card.<br>The guideline for allocating the particular IP address is as follows:<br>ECAP IP 192.168.100.1 (Server 1A) to SLAN IP 192.168.100.101 |

| Command | Parameters | Description |
|---|---|---|
| | however, the SLAN cards must be located within the same subnet as the associated ECAP server. | ECAP IP 192.168.100.2 (Server 1B) to SLAN IP 192.168.100.102<br>ECAP IP 192.168.100.3 (Server 1C) to SLAN IP192.168.100.103<br>ECAP IP 192.168.100.4 (Server 1D) to SLAN IP 192.168.100.104<br>ECAP IP 192.168.100.5 (Server 1E) to SLAN IP 192.168.100.105<br>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. |
| | :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 31. |

**Congfiguring the SLAN Card to Allow the Incoming and Outgoing Linkset Names**

The EAGLE 5 ISS SLAN card must be configured to allow the incoming and outgoing linkset names to be included in the STPLAN message format using the `chg-ss7opts` command with the `slanlsn` parameter. The `slanlsn` parameter has two values: .

- `on` – The incoming and outgoing linkset names are copied into the STPLAN message format.
- `off` – The incoming and outgoing linkset names are not copied into the STPLAN message format.

The following example displays output for the `rtrv-ss7opts` command the `slanlsn` parameter is provisioned.

`rtrv-ss7opts`

```
rlghncxa03w 09-03-17 16:02:05 GMT  EAGLE5 40.1.0

SS7 OPTIONS
----------------------
SLANLSN              on
```

Refer to the *Database Administration - Features Manual* and the *Commands Manual* for a complete discussion of these commands.

## 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.

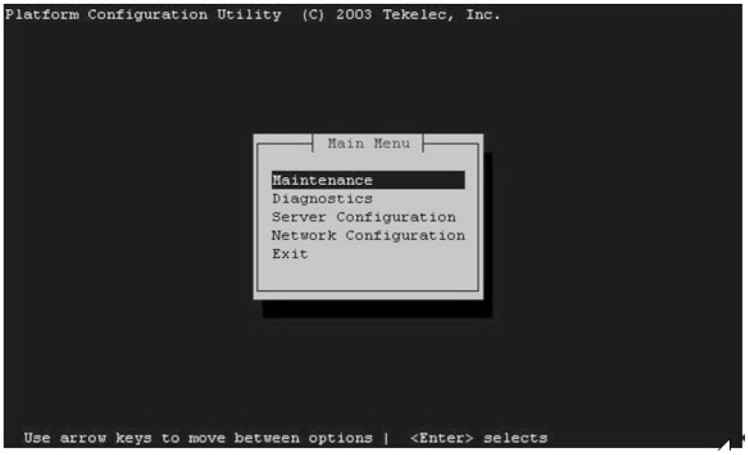
These alarms are monitored by an NMS which receives SNMP traps. In order for the NMS to monitor the SNMP traps, the Maintenance Interface must be configured per *Configuring ECAP Network Interfaces* on page 18, and the ECAP server must be configured to send alarms to the NMS per *Configuring NMS* on 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 18.

*Table 7: Critical Platform Alarms* on page 44 through *Table 9: Minor Platform Alarms* on page 45 list the Critical, Major, and Minor platform alarms for the Integrated Accounting Feed application.

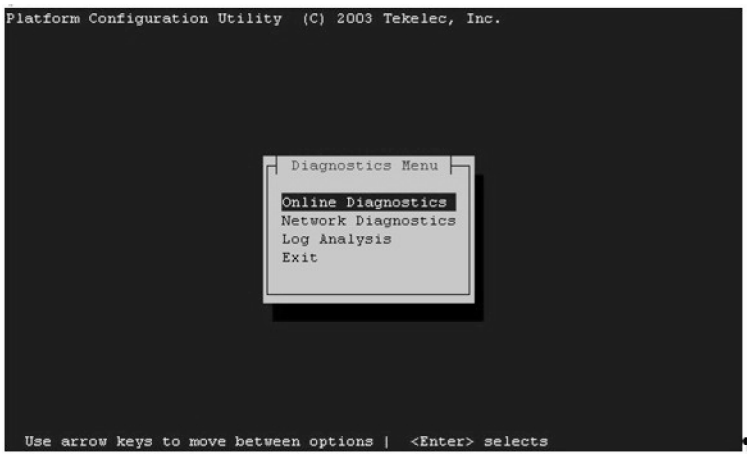
Use the following procedure to obtain additional information on the alarms raised.

**Procedure**

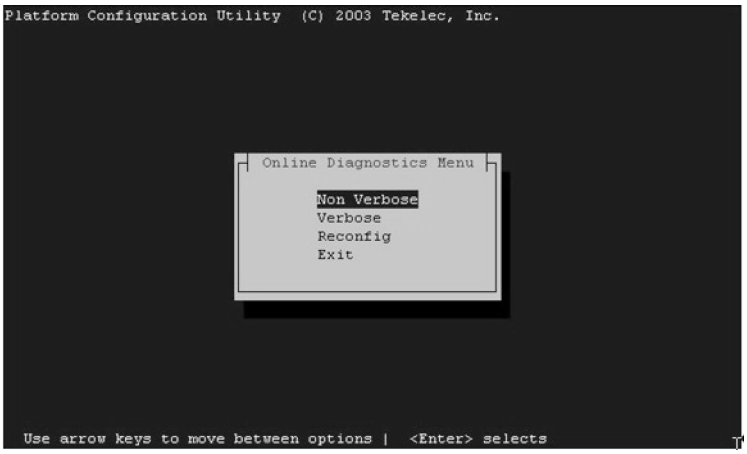
1. Log in to the ECAP server as the `platcfg` user.



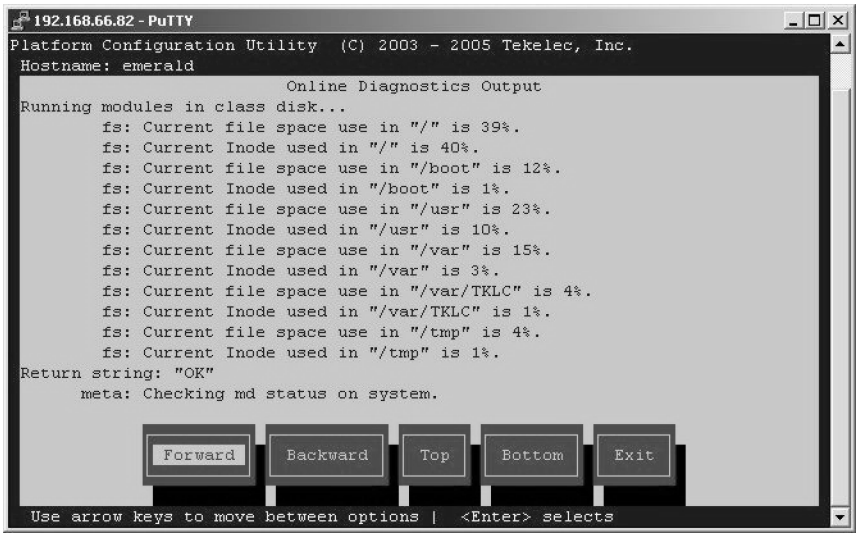

2. Select **Diagnostics** from the Platform Configuration Utility Main Menu and press **Enter**.




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<br>**Note:**<br>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 Provisioning Network Error | on or off | 3000000000000100 |
| Server Eagle Network A Error | on or off | 3000000000000200 |
| Server Eagle Network B Error | on or off | 3000000000000400 |
| Server Sync network Failure | on or off | 3000000000000800 |
| 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<br>**Note:**<br>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 |

| Alarm Text | Range of Values | Alarm Data String Value |
|---|---|---|
| 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 |
| Server CMOS Battery Voltage Low | on or off | 5000000000000400 |
| Server Disk Self Test Warning | on or off | 5000000000000800 |
| Device Interface Warning<br>**Note:**<br>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 46 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.<br>Remedy:<br>1. Use the `rept-stat-slan` command to verify that the |

| UAM | Message Text | Resolution |
|---|---|---|
| | | 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.<br>2. Perform a network health check (see *Network Check* on page 53). If not successful, configure the network using `platcfg` (see *Configuring ECAP Network Interfaces* on page 18).<br>3. Verify MeasServer is running by performing a process check (see *Health Check* on page 51).<br>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.<br>Remedy:<br>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.<br>2. Perform a network health check (see *Network Check* on page 53). 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. |

| UAM | Message Text | Resolution |
|---|---|---|
| | | Remedy:<br>1. Verify MeasServer and TimeServer are running by performing a process check (see *Health Check* on page 51).<br>2. The physical link between the EAGLE 5 ISS SLAN card and the ECAP server has been disconnected. Perform a network health check (see *Network Check* on page 53). |

## Integrated Accounting Feed Conditions

The conditions listed in *Table 11: Integrated Accounting Feed Conditions* on page 48 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.<br>Remedy:<br>1. Verify that the files are not on the Backup Aggregator.<br>2. Determine whether the Device Interface Error major platform alarm (see *Table 8: Major Platform Alarms* on page 44) has been raised. If it has, go to Step 3. If not, go to Step 2.<br>3. Verify that FileMover is periodically running (see *Crontab Check* on page 52) 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 29.<br>4. Perform a network health check (see *Network Check* on page 53). If not successful, configure the ECAP network using `platcfg` (see |

| Condition | Resolution |
|---|---|
| | *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.<br>Remedy:<br>1. Check available disk space (see *Disk Space Check* on page 52).<br>2. Verify that FileMover and FileScrubber are periodically running (see *Crontab Check* on page 52) 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 29). |
| 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.<br>There are no SLAN cards in the IS-NR state.<br>Remedy:<br>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.<br>2. Verify gateway screens are properly configured (see *Configuring Gateway Screening* on page 39). The EAGLE 5 ISS SLAN card will only copy MSUs that have been screened. |
| Data file contains no tag for incominglinksetname/outgoinglinksetname | The data file contains standard data file header with the record entries, but the tag entry for incominglinksetname and outgoinglinksetname is missing.<br>Remedy:<br>**1.** Use the `rtrv-ss7opts` command to determine whether the SLANLSN parameter on EAGLE 5 ISS is set to ON. This parameter can be set using the `chg-ss7opts` command. |

| Condition | Resolution |
|---|---|
| | **Note:** The default value for this parameter is OFF.<br>2. In the ecapcfg under the Optional Parameters menu, verify that the Link Set Name included in measurement file option is set to Y. |
| 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.<br>Remedy:<br>1. Check EAGLE 5 ISS alarm log for UAM 0152 (see *Table 10: EAGLE 5 ISS UAMs* on page 46). 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 53).<br>2. Verify gateway screens are properly configured (see *Configuring Gateway Screening* on page 39). The EAGLE 5 ISS SLAN card will only copy MSUs that have been screened.<br>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 48 for a list of associated condition messages and corrections.

- Aggregator and/or 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 52 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 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
root  24159  1  0 08:50 ?        00:00:00 /usr/TKLC/ecap/bin/MeasServer
```

### Crontab Check

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

**Note:** Crontab is configured **per user**. You must be logged in as user **ecapadm** when executing this command.

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
```

**Note:** The minutes entry (5, 35) for FileMover may vary, but should have a difference of 30 minutes.

### 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 48, 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 44 and *Table 9: Minor Platform Alarms* on page 45). These diagnostic tasks are accessed through `platcfg` and include the following:

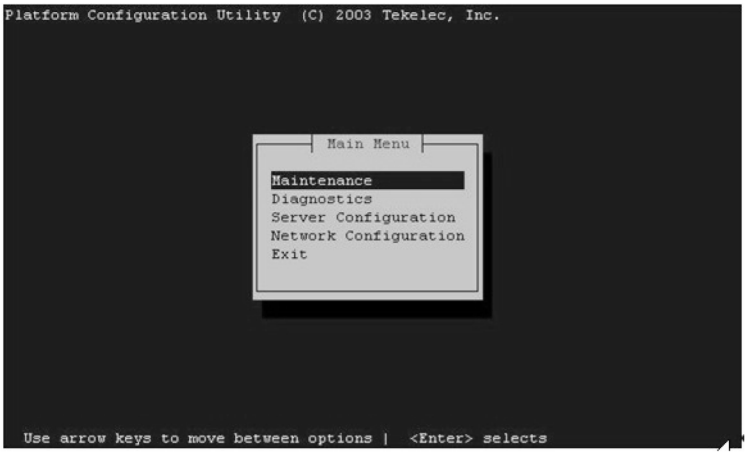
- Netstat: enables you to access network statistics for the ECAP server.
- Ping: enables you to attempt an ICMP ping of another ECAP server on the network.
- Traceroute: enables you to trace the network route to another ECAP server on the network.

## Verifying EAGLE 5 ISS to ECAP Connectivity

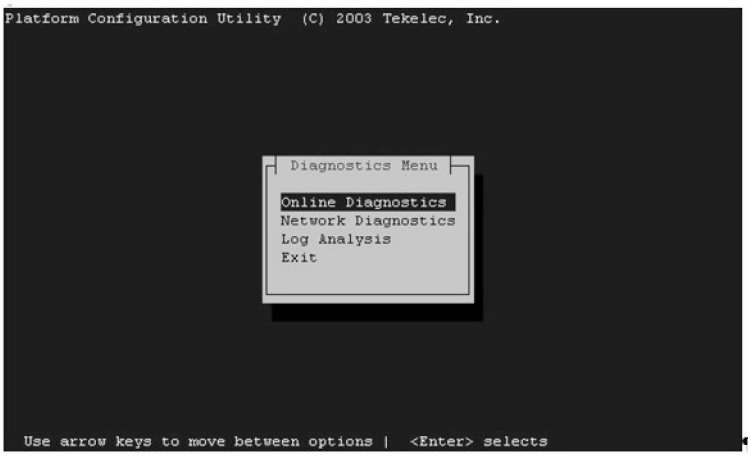
Use the following procedure to access the Network Diagnostics to verify connectivity between the EAGLE 5 ISS SLAN card and the ECAP Server.

**Procedure**

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 53.

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 <agg_userId>@aggregator:<homeDir>
sshtest                                       100% 0 0.0KB/s --:--ETA
```

If the network check passes, you should not be prompted for a password. After the bnetworkl 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 58.

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 58.

**Table 12: Data File Tags**

| Tag | Range of Values | Description |
|---|---|---|
| <ecapreport><br></ecapreport> | N/A | A section delimiter that identifies a data file for a specific node and interval. |
| <stp><br></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 29). |

| Tag | Range of Values | Description |
|---|---|---|
| <collector><br></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><br></startdate> | [01..31][01..12]<br>[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><br></starttime> | [00..23][00..59]<br>[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><br></enddate> | [01..31][01..12]<br>[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><br></endtime> | [00..23][00..59]<br>[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><br></record> | N/A | Section delimiter that identities a new data file |
| <signallingstandard><br></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><br></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.<br>This tag will be present for all the MSUs captured with the SLANLSN parameter OFF in EAGLE. If the SLANLSN parameter is set to ON, the linkid tag may or may not be present based on whether the Linkid Included in Measurement File option is enabled using the ecapcfg utility. |
| <incominglinksetname><br></incominglinksetname> | 10[[A..Z][a..z][0..9][-]] | The EAGLE 5 ISS STP Incoming Link Set Name on which the MSUs were received (incoming link). This is a string.<br>This tag will be present if the SLANLSN parameter has been set to ON via EAGLE 5 ISS command `chg-ss7opts`, and if the Link Set Name Included in Measurement File option is enabled using the ecagcfg utility. |
| <outgoinglinksetname><br></outgoinglinksetname> | 10[[A..Z][a..z][0..9][-]] | The EAGLE 5 ISS STP Outgoing Link Set Name on which the MSUs are transmitted (outgoing link). This is a string.<br>This tag will be present if the SLANLSN parameter has been set to ON via EAGLE 5 ISS command `chg-ss7opts`, and if the "Link Set Name Included in measurement file" option is enabled using the ecagcfg utility. |
| <si><br></si> | “isup” or “sccp” | Character string (without quotes) representing the message service type. “isup” represents an MTP message. |

| Tag | Range of Values | Description |
|---|---|---|
| | | "sccp" represents an SCCP or MAP message. |
| <mtp><br></mtp> | N/A | Section delimiter that identifies the MTP layer point codes (Routing Label). |
| <opc><br></opc> | [000..255][000..255]<br>[000..255] (ANSI), or<br>[000..007][000..255]<br>[000.007] (ITU-I), or [0..16383] (ITU-N) | Decimal representation of the Originating Point Code from the MTP layer. |
| <dpc><br></dpc> | [000..255][000..255]<br>[000..255] (ANSI), or<br>[000..007][000..255]<br>[000.007] (ITU-I), or<br>[0..16383] (ITU-N) | Decimal representation of the Destination Point Code from the MTP layer. |
| <sccp><br></sccp> | N/A | A section identifier that identifies the SCCP layer information. |
| <cgpadigits><br></cgpadigits> | [], [0..9999999999999<br>99999999]<br>[0..FFFFFFFFFFFFFFFFFFFF] | Decimal or hexadecimal representation of the Calling Party Address. This field is optional or may contain up to 21 digits. |
| <cdpadigits><br></cdpadigits> | [], [0..9999999999999<br>99999999]<br>[0..FFFFFFFFFFFFFFFFFFFF] | Decimal or hexadecimal representation of the Called Party Address. This field is optional or may contain up to 21 digits. |
| <cgpapc><br></cgpapc> | [],<br>[000..255][000..255]<br>[000..255] (ANSI), or<br>[000..007][000..255]<br>[000.007] (ITU-I), or [0..16383] (ITU-N) | Decimal representation of the Originating Point Code from the SCCP layer. This field is optional. |

| Tag | Range of Values | Description |
|---|---|---|
| <cdpapc><br></cdpapc> | [], [000..255][000..255]<br>[000..255] (ANSI), or<br>[000..007][000..255]<br>[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><br></map> | N/A | A section identifier that identifies the MAP layer information. |
| <opcode><br></opcode> | [0..255] | Decimal representation of the MAP operation code. Identifies the MAP operation performed. |
| <msucount><br></msucount> | [1..4294967295] | Decimal representation of the number of MSUs processed with the specified MTP and/or SCCP parameters. |
| <octcount><br></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 incominglinksetname (#PCDATA)> <!ELEMENT outgoinglinksetname (#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)>
```

**Note:** The linkid is present if the SLANLSN parameter on Eagle 5 ISS is set to OFF. If the parameter SLANLSN is set to ON, the the ecapcfg utility can be used to configure whether or not it is present in the measurement file. By default, it is present.

**Note:** The incominglinksetname and the outgoinglinksetname are not present if the SLANLSN parameter on EAGLE 5 ISS is set to OFF. If the parameter is set to ON, then the ecapcfg utility can be used to configure whether or not it is present in the measurement file. By default, it is not present.

## 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**

If the SLANLSN parameter is set to OFF, or if the 'Link Set Name included in measurement file' option is disabled:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE ecapreport SYSTEM "ecapreport.dtd">
<ecapreport>
  <stp>e1021201</stp>
  <collector>nc1lxvader</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>
```

If the SLANLSN parameter is set to ON, and the 'LinkSet Name included in measurement file' option is enabled:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE ecapreport SYSTEM "ecapreport.dtd">
<ecapreport>
  <stp>e1021201</stp>
  <collector>nc1lxvader</collector>
  <startdate>26092005</startdate>
  <starttime>102800</starttime>
  <enddate>26092005</enddate>
  <endtime>102900</endtime>

  <record>
    <signallingstandard>ITU-I</signallingstandard>
    <linkid>1</linkid>
    <incominglinksetname>abc</incominglinksetname>
    <outgoinglinksetname>xyz</outgoinglinksetname>
    <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 123456789012345678901 0
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 0987654321098765432190
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**

If the SLANLSN parameter is set to OFF or if the 'Link Set Name included in measurement file' option is disabled:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE ecapreport SYSTEM "ecapreport.dtd">
<ecapreport>
  <stp>e1021201</stp>
  <collector>nc1lxvader</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>
```

If the SLANLSN parameter is set to ON and the 'Link SetName included in measuremnt file' option is enabled:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE ecapreport SYSTEM "ecapreport.dtd">
<ecapreport>
  <stp>e1021201</stp>
  <collector>nc1lxvader</collector>
  <startdate>27092005</startdate>
  <starttime>111700</starttime>
  <enddate>27092005</enddate>
  <endtime>111800</endtime>
```

```
  <record>
    <signallingstandard>ITU-I</signallingstandard>
    <linkid>0</linkid>
    <incominglinksetname>abc</incominglinksetname>
    <outgoinglinksetname>xyz</outgoinglinksetname>
    <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 123456789012345678901O
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 0987654321098765432190
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**

If the SLANLSN parameter is set to OFF or if the 'Link Set Name included in measurement file' option is disabled:

```
<?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 90</cgpadigits>
```

```
      <cdpadigits>123456789012345678901O</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>
```

If the SLANLSN parameter is set to ON and the 'Link Set Name included in measurement file' option is enabled:

```
<?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>
    <incominglinksetname>abc</incominglinksetname>
    <outgoinglinksetname>xyz</outgoinglinksetname>
    <si>sccp</si>
    <mtp>
      <opc>002-002-001</opc>
      <dpc>002-002-002</dpc>
    </mtp>
    <sccp>
      <cgpadigits>09876543210987654321O</cgpadigits>
      <cdpadigits>123456789012345678901O</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

## A

**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

An organization that administers and coordinates the U.S. voluntary standardization and conformity assessment system. 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

A logical entity serving a specific Routing Key. An example of an Application Server is a virtual switch element handling all call processing for a unique range of PSTN trunks, identified by an SS7 DPC/OPC/CIC_range. Another example is a virtual database element, handling all HLR

**A**

transactions for a particular SS7 DPC/OPC/SCCP_SSN combination. The AS contains a set of one or more unique Application Server Processes, of which one or more normally is actively processing traffic.

**C**

CdPA — Called Party Address

The portion of the MSU that contains the additional addressing information of the destination of the MSU. Gateway screening uses this additional information to determine if MSUs that contain the DPC in the routing label and the subsystem number in the called party address portion of the MSU are allowed in the network where the EAGLE 5 ISS is located.

CgPA — Calling Party Address

The point code and subsystem number that originated the MSU. This point code and subsystem number are contained in the calling party address portion of the signaling information field of the MSU. Gateway screening uses this information to determine if MSUs that contain this point code and subsystem number area allowed in the network where the EAGLE 5 ISS is located.

CLLI — Common Language Location Identifier

The CLLI uniquely identifies the STP in terms of its physical location. It is usually comprised of a combination of identifiers for the STP's city (or locality), state (or

**C**

province), building, and traffic unit identity. The format of the CLLI is:

The first four characters identify the city, town, or locality.

The first character of the CLLI must be an alphabetical character.

The fifth and sixth characters identify state or province.

The seventh and eighth characters identify the building.

The last three characters identify the traffic unit.

CMOS — Complementary Metal Oxide Semiconductor

CMOS semiconductors use both NMOS (negative polarity) and PMOS (positive polarity) circuits. Since only one of the circuit types is on at any given time, CMOS chips require less power than chips using just one type of transistor.

CRC — Cyclic Redundancy Check

A number derived from, and stored or transmitted with, a block of data in order to detect corruption. By recalculating the CRC and comparing it to the value originally transmitted, the receiver can detect some types of transmission errors.

**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

**D**

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

A client-server protocol that allows a user on one computer to transfer files to and from another computer over a TCP/IP network.

**I**

ICMP — Internet Control Message Protocol

ID — Identity, identifier

IP — Internet Protocol

IP specifies the format of packets, also called datagrams, and the addressing scheme. The network layer for the TCP/IP protocol suite

**I**

| | |
|---|---|
| | widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation and re-assembly through the data link layer. |
| 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<br>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**

| | |
|---|---|
| LAN | Local Area Network |

**L**

A private data network in which serial transmission is used for direct data communication among data stations located in the same proximate location. LAN uses coax cable, twisted pair, or multimode fiber.

See also STP LAN.

LIM — Link Interface Module

Provides access to remote SS7, X.25, IP and other network elements, such as a Signaling Control Point (SCP) through a variety of signaling interfaces (V.35, OCU, DS0, MPL, E1/T1 MIM, LIM-ATM, E1-ATM, IPLIMx, IPGWx). The LIMs consist of a main assembly and possibly, an interface appliqué board. These appliqués provide level one and some level two functionality on SS7 signaling links.

**M**

MAP — Mobile Application Part

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

MSU — Message Signaling Unit

The SS7 message that is sent between signaling points in the SS7 network with the necessary information to get the message to its destination and allow the signaling points in the network to set up either a voice or data connection between themselves. The message contains the following information:

**M**

- The forward and backward sequence numbers assigned to the message which indicate the position of the message in the traffic stream in relation to the other messages.
- The length indicator which indicates the number of bytes the message contains.
- The type of message and the priority of the message in the signaling information octet of the message.
- The routing information for the message, shown in the routing label of the message, with the identification of the node that sent message (originating point code), the identification of the node receiving the message (destination point code), and the signaling link selector which the EAGLE 5 ISS uses to pick which link set and signaling link to use to route the message.

MTP — The levels 1, 2, and 3 of the SS7 protocol that control all the functions necessary to route an SS7 MSU through the network.

**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).

**N**

| | |
|---|---|
| NTP | Network Time Protocol |

**O**

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|---|---|
| OAM | Operations, Administration, and Maintenance<br>The generic load program (application) that operates the Maintenance and Administration Subsystem which controls the operation of the EAGLE 5 ISS. |
| OPC | Originating Point Code |
| OS | Operations Systems |

**R**

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|---|---|
| RMA | Return Material Authorization |
| RSA | Regional Service Area<br>Rural Statistical Areas |

**S**

| | |
|---|---|
| SCCP | Signaling Connection Control Part |
| SI | Service Indicator |
| SLAN | Signaling Transfer Point Local Area Network<br>A feature in the EAGLE 5 ISS that copies MSUs selected through the gateway screening process and sends these MSUs over the Ethernet to an external host computer for further processing. |
| SNMP | Simple Network Management Protocol. |

## S

| | |
|---|---|
| | An industry-wide standard protocol used for network management.<br><br>The SNMP agent maintains data variables that represent aspects of the network. These variables are called managed objects and are stored in a management information base (MIB). The SNMP protocol arranges managed objects into groups. |
| SSEDCM | Single Slot Enhanced Data Communications Module |
| SSH | Secure Shell<br><br>A protocol for secure remote login and other network services over an insecure network. SSH encrypts and authenticates all EAGLE 5 ISS IPUI and MCP traffic, incoming and outgoing (including passwords) to effectively eliminate eavesdropping, connection hijacking, and other network-level attacks. |
| STP | Signal Transfer Point<br><br>STPs are ultra-reliable, high speed packet switches at the heart of SS7 networks, which terminate all link types except F-links. STPs are nearly always deployed in mated pairs for reliability reasons. Their primary functions are to provide access to SS7 networks and to provide routing of signaling messages within and among signaling networks. |
| STPLAN | Signaling Transfer Point Local Area Network |

| | |
|---|---|
| **S** | |
| | 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** | |
| VLAN | Virtual Local Area Network<br>A logically independent network. A VLAN consists of a network of computers that function as though they were connected to the same wire when in fact they may be physically connected to different segments of a LAN. VLANs are configured through software rather than hardware. Several VLANs can co-exist on a single physical switch. |
| 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 |

# Index