

**Oracle® Communications
EAGLE Application B Card**

Hardware and Installation Guide

E52615-01 Revision A

March 2014

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Chapter 1

About This Manual

Topics:

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- *Where to Find Information in This Manual.....8*
- *Related Publications.....9*
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This chapter describes how to use the manual, where to find other information about this product, and how to contact the *Customer Care Center*.

Introduction

The Oracle Communications EAGLE Application B Card (E5-APP-B) is a complete application server platform designed to operate within a heavy duty EAGLE shelf. An E5-APP-B card consists of the card, a microprocessor, 8 GB RAM, and two removable drive modules with an operating system and an application, such as EPAP, loaded.

Note: This manual includes links to documents that are specific to a given product. For more information about linked documents, see [Where to Find Information in This Manual](#).

Each time this manual is published, the revision level is changed. For example, the first time this manual is published, it uses Revision A; the second time it is published, it uses Revision B.

Where to Find Information in This Manual

This sections outlines the organization of this manual.

Table 1: Manual Organization

Chapter Number and Title	Description
About This Manual	Describes how to use the manual, where to find other information, how to contact Customer Care Center , and Hardware Repair and Return .
Safety and Pre-Installation Requirements	Lists general safety instructions that readers should be familiar with and lists site requirements that should be verified before installing an E5-APP-B card.
E5-APP-B Card Overview	Presents an overview of hardware components that can be included in an E5-APP-B card.
Installing and Removing E5-APP-B Cards	Describes how to install an E5-APP-B card into a heavy duty EAGLE shelf.
ExAP or LSMS Network Integration	Provides network integration information for the application that the E5-APP-B card uses.

Programs Needed to View Linked Documents

Linked documents are in Portable Document Format (PDF), which has a file type of .pdf. PDF is also the format of this manual. When a PDF link is clicked, the linked document is opened in the same window as this manual. To return to this manual, click the Back button on the PDF display window.

Applications Documents

The E5-APP-B card supports a variety of applications. For more information, refer to application documentation in the documentation set.

Note: Application documentation may also contain information about additional hardware.

Related Publications

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

Documentation Availability, Packaging, and Updates

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

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

The electronic file of each manual is also available from the [Tekelec Customer Support](#) site. This site allows for 24-hour access to the most up-to-date documentation, 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 Problem Reports (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.

Locate Product Documentation on the Customer Support Site

Access to Tekelec's Customer Support site is restricted to current Tekelec customers only. This section describes how to log into the Tekelec Customer Support site and locate a document. Viewing the document requires Adobe Acrobat Reader, which can be downloaded at www.adobe.com.

1. Log into the [Tekelec Customer Support](#) site.





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**.

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 2: Admonishments

Icon	Description
 DANGER	Danger: (This icon and text indicate the possibility of <i>personal injury</i> .)
 WARNING	Warning: (This icon and text indicate the possibility of <i>equipment damage</i> .)
 CAUTION	Caution: (This icon and text indicate the possibility of <i>service interruption</i> .)
 TOPPLE	Topple: (This icon and text indicate the possibility of <i>personal injury and equipment damage</i> .)

Customer Care Center

The Tekelec Customer Care Center is your initial point of contact for all product support needs. A representative takes your call or email, creates a Customer Service Request (CSR) and directs your requests to the Tekelec Technical Assistance Center (TAC). Each CSR includes an individual tracking number. Together with TAC Engineers, the representative will help you resolve your request.

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:

Tekelec - Global

Email (All Regions): support@tekelec.com

- **USA and Canada**

Phone:

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

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

Phone:

+1-919-460-2150

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:

8:00 a.m. through 5:48 p.m. (GMT minus 3 hours), Monday through Friday, excluding holidays

- **Chile**
Phone:
1230-020-555-5468
- **Colombia**
Phone:
01-800-912-0537
- **Dominican Republic**
Phone:
1-888-367-8552
- **Mexico**
Phone:
001-888-367-8552
- **Peru**
Phone:
0800-53-087
- **Puerto Rico**
Phone:
1-888-367-8552
- **Venezuela**
Phone:
0800-176-6497
- **Europe, Middle East, and Africa**
Regional Office Hours:
8:30 a.m. through 5:00 p.m. (GMT), Monday through Friday, excluding holidays
- **Signaling**
Phone:
+44 1784 467 804 (within UK)
- **Software Solutions**
Phone:
+33 3 89 33 54 00
- **Asia**
 - **India**
Phone:

+91-124-465-5098 or +1-919-460-2150

TAC Regional Support Office Hours:

10:00 a.m. through 7:00 p.m. (GMT plus 5 1/2 hours), Monday through Saturday, excluding holidays

- **Singapore**

Phone:

+65 6796 2288

TAC Regional Support Office Hours:

9:00 a.m. through 6:00 p.m. (GMT plus 8 hours), Monday through Friday, excluding holidays

Problem Report (PR)

The assigned Technical Support engineer opens a problem report (PR) using problem criteria as defined in “TL-9000 Quality System Metrics (Book Two, Release 3.0)” and the following sections.

Critical

Critical problems severely affect service, capacity/traffic, billing, and maintenance capabilities and requires immediate corrective action, regardless of time of day or day of the week, as viewed by a customer upon discussion with the supplier. For example:

- A loss of service that is comparable to the total loss of effective functional capacity of an entire switching or transport system.
- A reduction in capacity or traffic handling capacity such that expected loads cannot be handled.
- Any loss of safety or emergency capability (for example, 911 calls).

Major

Major problems cause conditions that seriously affect system operations, maintenance, and administration, etc., and require immediate attention as viewed by the customer upon discussion with the supplier. The urgency is less than in a critical situations because of a lesser immediate or impending effect on system performance, customer, and the customer’s operation and review. For example:

- Reduction in any capacity/traffic measurement function
- Any loss of functional visibility and/or diagnostic capability
- Short outage equivalent to system or subsystem outages, with accumulated duration of greater than two minutes in any 24-hour period, or that continue to repeat during longer periods
- Repeated degradation of DS1 or higher rate spans or connections
- Prevention of access for routine administrative activity
- Degradation of access for maintenance or recovery operations
- Degradation of the system’s ability to provide any required critical or major trouble notification

- Any significant increase in product related customer trouble reports
- Billing error rates that exceed specifications
- Corruption of system or billing databases

Minor

Other problems that a customer does not view as critical or major are considered minor. Minor problems do not significantly impair the functioning of the system and do not significantly affect service to customers. These problems are tolerable during system use.

Engineering complaints are classified as minor unless otherwise negotiated between the customer and supplier.

Emergency Response

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

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

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

Hardware Repair and Return

Any system components being returned for repair or replacement must be processed through the Tekelec Return Material Authorization (RMA) procedures. A hardware repair is defined as an item returned to Tekelec due to a failure, with the returned item being repaired and returned to the customer. It is essential that serial numbers are recorded correctly. RMAs cannot be created without a valid serial number. All repair and quality information is tracked by serial number. [Table 3: Basic RMA Types](#) lists the basic RMA types. [Table 4: RMA Reasons for Return](#) lists the RMA return reasons.

Table 3: Basic RMA Types

Replacement Type	Description	Turnaround
Priority Advance Replacement	Customer requests the URGENT replacement of a damaged product	Same Day Shipment
Advance Replacement	Customer request the replacement of a damaged product	Shipment Within 3 Business Days
Repair / Return	Customer will return a damaged product for repair	Shipment Within 5 Days After Receipt
Expendable	A damaged part, such as a cable, is replaced, but the Customer does not return the damaged product	Depends on Urgency - Shipment Within 3 Business Days

Table 4: RMA Reasons for Return

Reason for Return	Description
Damaged by Environment	Product damaged by environmental phenomena such as water damage or earthquake.
Damaged in Shipment	Damaged between shipment from Tekelec and receipt at the Customer's installation site.
DOA – Dead on Arrival	Product is not functional when it is first installed at the Customer's location.
Lab Return	Products returned from lab sites.
Product Capture	Defect to be captured by Quality or Engineering (not Product Recall).
Product Deficiency	Anything wrong with the part that doesn't fall into another category.
Product Recall	Products recalled by divisions for the repair of a defect or replacement of defective products.
Return – No Product Deficiency	Anything returned without the product being defective.

Repair and Return Shipping Instructions

All returned equipment, assemblies, or subassemblies must be shipped to the Tekelec Repair and Return Facility specified by the [Customer Care Center](#). The item being returned must be shipped in the

original carton or in an equivalent container assuring proper static handling procedures and with the freight charges prepaid.

The assigned RMA number must be clearly printed on the “RMA#” line of the shipping label on the outside of the shipping package. If the RMA number is not placed on the label, the return could be delayed.

Procedure - RMA

1. Obtain and confirm the following information before contacting the *Customer Care Center*:

- Your name:
- Company name:
- Call-back number:
- Email address:
- Which product you are calling about?
- Site location:
- CLEI number
- System serial number (NT, CE, LM, DS, etc.):
- Complete software release (e.g., 28.0.1-41.53.0):
- Upgrade forms
 - WI005153
 - WI005154
 - WI005218
 - WI005219
 - WI005220
- Tekelec card type: (e.g., MPL, DSM, etc.):
- Tekelec card part number (870-####-##):
- Associated serial number (102#####):
- Reason for return or replacement (isolated from system):
- Full name of person the replacement card is being shipped to:
- Shipping address:

Note: If possible, include associated alarms (UAMs) and a copy of the associated output (capture file).

2. Contact the *Customer Care Center* and request a Return of Material Authorization (RMA).

3. If the item is a like-for-like advance replacement, the *Customer Care Center* arranges for shipment of the replacement item to the customer.

a) Wait for the replacement component to arrive.

- b) Package the defective component in the box of materials you received with your replacement. Use proper static handling procedures.
 - c) Label the outside and inside of the box with your RMA number clearly visible. Place the packing slip from the received replacements on the inside of your box.
 - d) Ship the defective component to the return address listed on the packing slip.
4. If the item is a repair/return, the [Customer Care Center](#) arranges for shipment of the replacement item to the customer.
 - a) Package the defective component in a suitable package for shipping. Use proper static handling procedures.
 - b) Label the outside and inside of the box with your RMA number clearly visible. Include a packing slip with all the information from [Step 1](#) along with the RMA number.
 - c) Ship the defective component to the following address:

TEKELEC
Attn: RMA Department
5200 Paramount Parkway
Morrisville, NC 27560
RMA#: <assigned by Tekelec>
 - d) Wait for the repaired component to arrive.

Locating E5-APP-B Card Part Numbers

Each E5-APP-B card FRU has labels that contain the following information that may be needed for the RMA:

- Part number (to identify the type of FRU)
- Serial number (to provide more information about the specific FRU)
- CLEI (Common Language Equipment Identifier, a label that identifies the manufacturer and the part)

In addition to part numbers on each FRU, the E5-APP-B card has several labels that contain part number information for drive module FRUs on the E5-APP-B card. These labels allow part number information to be gathered without removing the E5-APP-B card.

To locate the part number information, use the indicated procedure below:

- E5-APP-B card, use [Locating E5-APP-B Card Part Number Information](#)
- Drive module assembly, use [Locating Drive Module Assembly Part Number Information](#)

Locating E5-APP-B Card Part Number Information

The part number information for the E5-APP-B card is located on the label on the faceplate of the E5-APP-B card. Use this label to verify the correct part number if you ever need to replace the E5-APP-B card.

1. Request assistance from the Customer Care Center to determine which slot (1 through 17) contains the E5-APP-B card that needs to be replaced.
2. See [Locating Drive Module Assembly Part Number Information](#) for the location information of each E5-APP-B card on the label.



Warning: Always wear an ESD wrist strap grounded to the bench or frame when working on electronic components.

Locating Drive Module Assembly Part Number Information

The part number information for drive module assemblies is located on the label on the drive module assembly. Use this label to verify the correct part number if you ever need to replace a drive module assembly. See [Figure 1: E5-APP-B Card Label Locations](#).

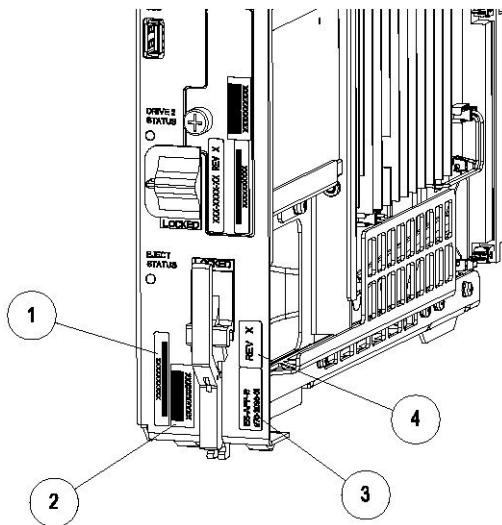


Figure 1: E5-APP-B Card Label Locations

- Serial Number Label (1)
 - CLEI Label (2)
 - Part Number Label (3)
 - Revision Label (4)
1. Request that the Customer Care Center assist you in determining whether the drive module assembly that needs to be replaced is in drive A or drive B.
 2. Find the part number information on the drive module. See [Figure 2: Drive Module Label Locations](#) for illustration.

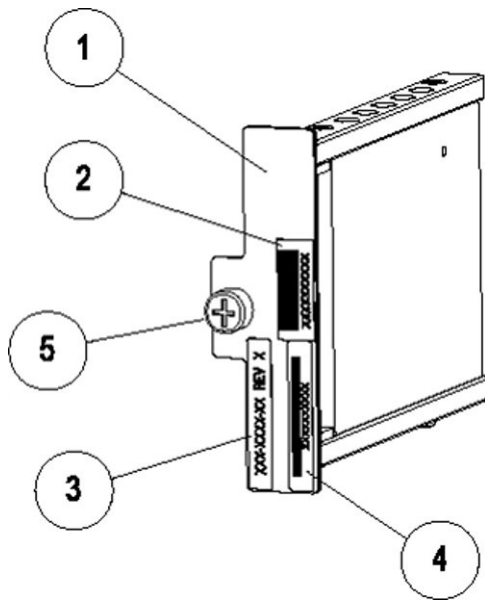


Figure 2: Drive Module Label Locations

- Drive module Assembly (1)
- CLEI Label (2)
- Part Number and Revision Label (3)
- Serial Number Label (4)
- Locking Screw (5)



WARNING

Warning: Always wear an ESD wrist strap grounded to the bench or frame when working on electronic components.

3. Report the requested part number information on the drive module label.

Chapter 2

Safety and Pre-Installation Requirements

Topics:

- [Introduction.....21](#)
- [Safety Information.....21](#)
- [Regulatory Compliance and Certification.....22](#)
- [Pre-Installation Site Requirements.....24](#)

This chapter lists general safety instructions that readers should be familiar with and site requirements that should be verified before installing Oracle Communications E5-APP-B cards into an EAGLE shelf.

Introduction

This chapter presents general safety considerations to be kept in mind when installing or replacing Oracle Communications products, a listing of regulatory compliance statements and certifications that Oracle Communications products support, and site requirements for installing Oracle Communications products.

Safety Information

Safety icons and text are used throughout Oracle Communications manuals to warn the reader of the potential of personal injury, service interruption, and equipment damage. For information about what each of the icons mean, see [Documentation Admonishments](#).

Before beginning any procedure described in this manual, ensure that you are familiar with each of the following safety admonishments. Additional safety admonishments may be included, or repeated, for specific procedures.



Topple: Always read and understand instructions completely before working on, moving, raising or lowering the frame, any portion of the frame, or attachments to the frame or equipment.



Topple: Never try to unpack any frame from the shipping container without at least two people to steady any movement of the frame and related components. At least two people are required to safely move and position any frame.



Topple: Never pull out the shelf of any frame that is not anchored properly. Some frames are required to be attached to overhead ladder racks before shelves are extended.



Danger: No commercially AC powered equipment may be used or placed within 7 ft. of -48V equipment. AC powered equipment within 7 ft. of -48V equipment may create a shock or current loop that can be severely hazardous to personnel and equipment.



Danger: Do not wear metal, chains, rings, watches, or jewelry or carry exposed metal, keys or tools in pockets when working on system equipment or other related electrostatic-sensitive components. Always wear a wrist strap or other electrostatic protection when handling printed circuit boards and other electrostatic-sensitive devices.



Warning: Do not leave or allow unused metal objects, such as screws or washers, to remain anywhere within the equipment. Remove all unused material from the equipment.



Warning: Do not allow any metal shavings to remain in the equipment area. Metal Shavings may result from over tightened screws or bolts. These small metal particles are hazardous to electronic equipment. Be careful not to over tighten screws or bolts.



Warning: Do not use tie wraps on or above the top traverse arms on a frame. Always trim tie wrap flush and turn the trimmed tie wrap to the rear of the cable.



Caution: All personnel associated with the installation of these systems must adhere to all safety precautions and use required protection equipment, to avoid the possibility of injury to personnel, service degradation, and/or service interruption.



Caution: These systems have redundant power supplies to allow service during normal maintenance. When repairs require a total power disconnect, both input supply sources must be disconnected. This causes service interruption and takes down the systems.



Caution: This equipment has a connection between the earthed conductor of the DC supply circuit and the earthing conductor.



Caution: The Branch Circuit Overcurrent Protection shall be rated minimum -48V, maximum 60A.



Caution: Equipment is to be installed in restricted access areas in accordance with articles 110-16, 110-17, and 110-18 of the National Electric Code, ANSI/NFPA 70.



Caution: A readily accessible disconnect device that is suitable, approved, and rated shall be incorporated in the field wiring.



Caution: Connect to a reliably grounded SELV source which is reliably earthed and electrically isolated from the AC source.



Caution: Use only listed closed loop connectors for connection to the supply.

Note: Use a minimum of 26 AWG telecommunications line cord for connection to the modem.

Regulatory Compliance and Certification

Oracle Communications products are tested to meet the following regulatory standards:

- Network Equipment Building System (NEBS) level 3 as listed in Telcordia SR-3580.
- Applicable Telcordia Electromagnetic Compatibility and Electrical Safety requirements in GR-1089-CORE.
- Applicable Physical Protection requirements in GR-63-CORE.
- Relevant directives and harmonized standards in support of the products Compliance European (CE) mark required in Europe. [Figure 3: European Directives CE Mark](#) shows the mark used to indicate this compliance.



Figure 3: European Directives CE Mark

- Relevant standards in ElectroMagnetic Compatibility (EMC) directive 2004/108/EC.
- Relevant standards in Safety directive 2006/95/EC, supported by Certified Body (CB) Test Certificates issued by the National Certification Body as tested to IEC 60950 with national differences for participating countries .
- Underwriters Laboratories (UL) listed under UL File E200146 for USA and c-UL for Canada. [Figure 4: Combined UL Mark for the United States and Canada](#) shows the mark used to indicate this compliance.



Figure 4: Combined UL Mark for the United States and Canada

- Relevant standards in SJ/T 11363-2006 for limits of certain hazardous substances.

部件名称 (Parts)	有毒有害物质或元素 (Hazardous Substance)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr ⁶⁺)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件 (Metal Parts)	○	○	○	○	○	○
电路模块 (Circuit Modules)	×	○	○	○	○	○
电缆及电缆组件 (Cables & Cable Assemblies)	×	○	○	○	○	○
塑料和聚合物部件 (Plastic and Polymeric parts)	○	○	○	○	○	○

- : 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/Txxxx-xxxx标准规定的限量要求以下。
Indicates that the concentration of the hazardous substance in all homogeneous materials in the parts is below the relevant threshold of the SJ/T 11363-2006 standard.
- ×: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/Txxxx-xxxx标准规定的限量要求。
Indicates that the concentration of the hazardous substance of at least one of all homogeneous materials in the parts is above the relevant threshold of the SJ/T 11363-2006 standard.

Figure 5: Hazardous Substances

Pre-Installation Site Requirements

Before installing E5-APP-B cards into an EAGLE shelf, make sure that the requirements described in both of the following sections have been met.

- [Generic Site Requirements](#)
- [Grounding and Power Requirements](#)

Generic Site Requirements

Ensure that the site where the product will be installed conforms to the specifications listed in the following sections. These specifications are standard telephony industry requirements for equipment installation.

Fire Protection

Local fire protection codes must be satisfied in the equipment room where the system is to be located.

Environmental Requirements

Oracle Communications products are designed for environments that have temperature and humidity controls. Temperature and humidity controls must be activated as quickly as possible for equipment to operate at an optimum level.

When temperature and humidity controls fail, the equipment has been tested to operate within the following ranges:

- Temperature
 - 5° C to 40° C (41° F to 104° F) for normal operation
 - -5° C to 50° C (23° F to 122° F) for no more than 96 hours in duration and at elevations less than 1800 meters
 - -5° C to 50° C (23° F to 122° F) for storing the product
- Humidity
 - 5% to 85% non-condensing for normal operation
 - 5% to 90% non-condensing (but not to exceed 0.024 kilograms of water per kilogram of dry air) for no more than 96 hours in duration and at elevations less than 1800 meters

Oracle Communications products are tested to operate at an elevations within the following range:

- Minimum: 60 meters below sea level at ambient temperature of 30° C (86° F)
- Maximum: 4000 meters above sea level at ambient temperature of 40° C (104° F)

HVAC Requirements

Oracle Communications products are designed to bring cool air in from the bottom front and exit heated air out the top rear of the installed equipment.

The required HVAC (Heating, Ventilation, and Air Conditioning) capacity depends on the installed equipment. To calculate needed HVAC capacity, determine the total wattage of the installed equipment and use the following formula:

$$\text{BTUs/hr.} = \text{watts} \times 3.413$$

The amount of power required by frame components is found at: [DC_PowerReqmts.pdf](#).

The E5-APP-B card must be installed in a fully populated EAGLE shelf with a fan tray and air management cards, if necessary.

Lighting

Adequate lighting should be provided in the room where the equipment is to be located. Lighting fixtures must be far enough from the equipment and cables to prevent heat damage and to allow safe access to equipment and cables.

Earthquake Resistance

All Oracle Communications system configurations are designed to assure that the system remains operational during and after an earthquake, even when the system is located on the upper floors of a zone 4 central office.

Space Requirements

Provide space as described in [Generic Site Requirements](#). These space requirements provide for Oracle Communications equipment installed in a 23-inch heavy-duty frame, which measures 7 feet high. Separator panels and end panels add to the width of multiple frame systems.

Table 5: Space Requirements

Building Area	Dimensions	Notes
Halls	4.5 feet wide by 8 feet tall (1.4 meters wide by 2.4 meters tall)	To provide a clear, uncluttered route for moving equipment between the loading/receiving dock and the planned system location
Frame location	30 inches wide by 24 inches deep (76.2 cm wide by 60.96 cm deep)	Floor area recommended for one Oracle Communications frame (multiply by the number of frames listed on the Initial Sales Order) Total area per frame = 720 square inches (5.0 square feet) (0.465 square meters)
Side aisles	4 feet (1.2 meters)	To allow maneuvering frames into place and provide ample work space around the equipment
Front and rear access	3 feet 6 inches (107 cm)	From walls or other frames
Side access	12 inches (31 cm)	From walls or other frames

In addition, when planning the installation, be sure to take into account spare hardware storage, modems, terminals, printers, cross connect panels, and all other items that might require space in a system.

Floor Loading

Oracle Communications products installed in heavy-duty control or extension frames are designed for installation on raised or solid floors, which are recommended to have a distributed load capacity of no less than 100 pounds per square foot (504 kg/m²) and a maximum weight of EAGLE 5 ISS 850 lbs (386 kg).

Use the following equation to calculate the floor loading:

$$\text{Distributed floor capacity} = \text{Total equipment weight} / \text{floor area}$$

Grounding and Power Requirements

Before installing E5-APP-B cards into an EAGLE shelf, make sure that the grounding and power requirements in the appropriate following sections have been met.

- [Grounding Requirements](#)
- [EAGLE Shelf Power Requirements](#)

Grounding Requirements

Oracle Communications systems operate as digital isolated ground plane systems in a central office environment and require a single connection to the central office ground window. The system's ground cables must provide the sole grounding connection between the entire system and the central office grounding.



Warning: Always install an isolator pad between the frame and ground. Oracle Communications frames are shipped with isolator pads to completely isolate the frames from ground. If a non-Oracle Communications frame is used, an isolator pad must be provided.

The system can use three types of grounding paths:

- Battery return

The battery return grounding path is the return path for all –48VDC loads in the system. This path is isolated from other system grounds and connects to the rest of the central office through the –48VDC return connections located on the breaker panels of each frame.

- Logic Ground

Some system types require connection to a logic ground. The logic ground path provides a common voltage reference point between all circuit boards of a system. Each connection terminates to the system ground. The logic ground path is shown on your system's interconnect drawing. The logic ground path does not carry current.

- Frame/shelf ground

The frame/chassis ground path provides a low impedance connection for all metal parts of the entire system, including the frame, doors, shelves, and end panels. Each frame/chassis connection within the system lineup terminates to the frame and connects to the main ground by way of Htaps, #6 American Wire Gauge (AWG) to 1/0 cable.

Note: The frame/chassis ground path does not carry current.

For products installed in a frame, the doors installed are grounded to the frame through a two-hole lug ground wire and through a screw-down latch. [Figure 6: Door Grounding Strap Placement](#) shows a cutaway view example of an open frame door showing the door ground strap.

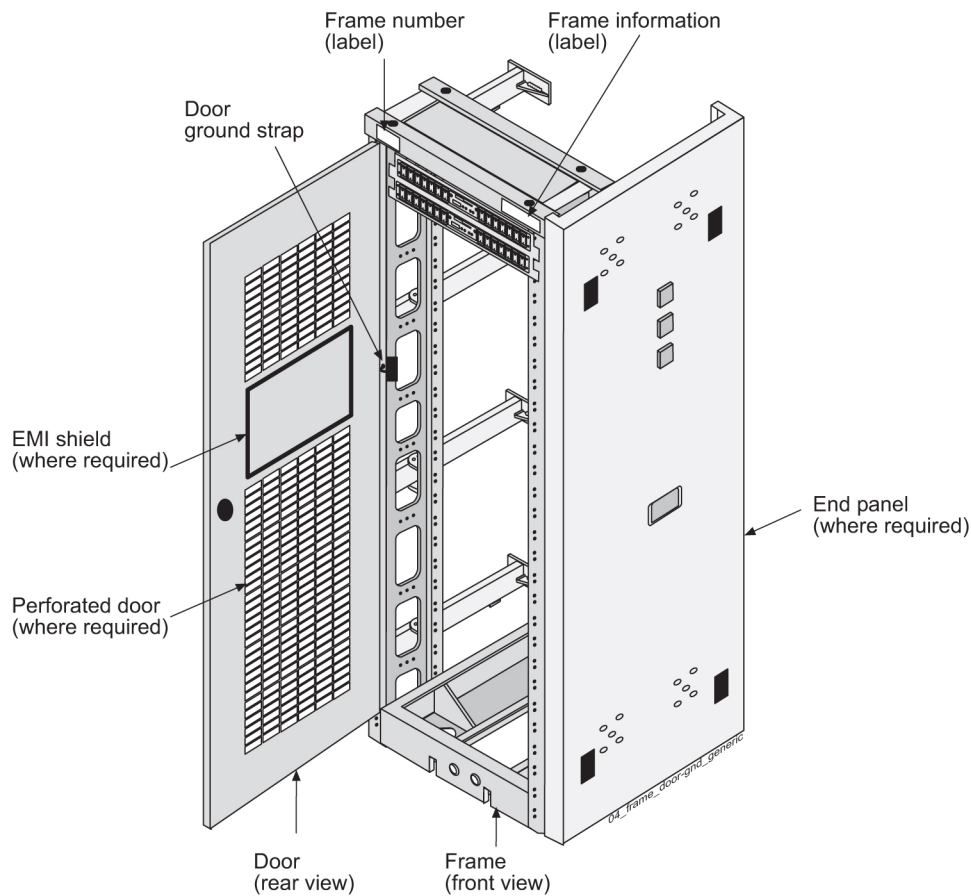


Figure 6: Door Grounding Strap Placement

EAGLE Shelf Power Requirements

E5-APP-B cards use power resources of the frame in which the EAGLE shelf is installed. Each card is fused at 3A. There is detailed information in the Power Calculator spreadsheet available on the Oracle Communications Customer Support site.

Note: Eagle cannot provision two E5-APP-B cards running the same application in slots with the same power sources in different frames unless the force=yes parameter is used.

Chapter 3

E5-APP-B Card Overview

Topics:

- *Introduction.....30*
- *E5-APP-B Card.....30*
- *E5-APP-B Card Features.....31*
- *E5-APP-B Card Components.....34*
- *E5-APP-B Card Interfaces.....34*
- *Electrical Features.....35*
- *Mechanical Design and Maintenance Features.....35*
- *E5-APP-B Card Diagnostics.....36*

This chapter presents an overview of the E5-APP-B card package, components, and adapter interfaces.

Introduction

E5-APP-B card packages are designed to be integrated with features that run on a Signal Transfer Point (STP). E5-APP-B cards for these applications run in a Direct Current (DC) environment and are delivered as a pair to be installed in an EAGLE using heavy duty frames, along with breaker panels and Ethernet communication equipment.

Note: The E5-APP-B Card is not IMT Bus capable.

For more information about EAGLE shelves, see the *EAGLE Hardware Guide*.

This chapter provides an overview of E5-APP-B cards and highlights E5-APP-B card features, components, and adapter interfaces.

E5-APP-B Card

An E5-APP-B card comes with two removable drive modules when first ordered. A complete shipping package for applications includes:

- Two E5-APP-B standard EAGLE double-wide cards, identified as A and B. Each E5-APP-B card is loaded at the factory with platform software and application software.
- Two removable drive modules for each separate card. For more information about these components, refer to the documentation delivered with the product.

Figure 7: E5-APP-B Card In Shelf shows an example E5-APP-B card in a shelf(1).

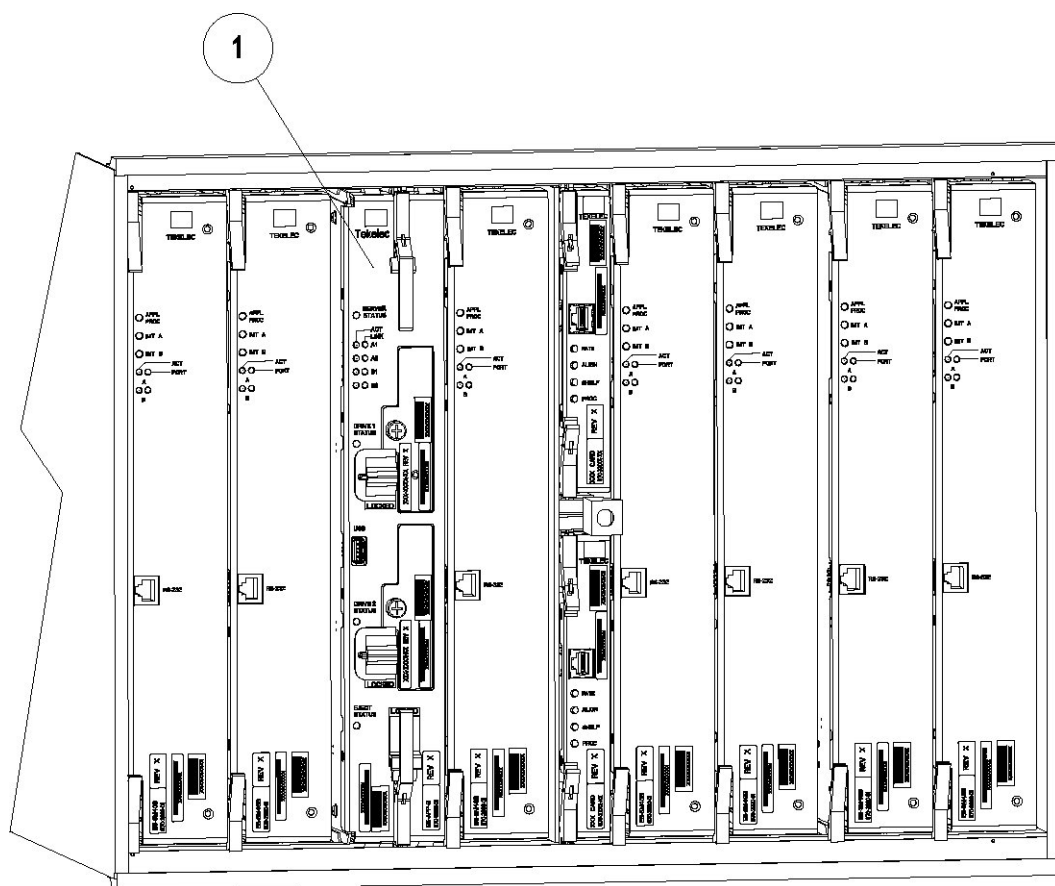


Figure 7: E5-APP-B Card In Shelf

E5-APP-B Card Features

A single E5-APP-B card is a general-purpose application server (AS) that offers high transaction rates with low latency. It supports a variety of application solutions for the wireless and wireline telecommunications infrastructure to provide the building blocks for next-generation signaling systems.

The E5-APP-B card is a scalable computing platform constructed with state-of-the-art components packaged on a double-wide card designed to fit into two slots of an EAGLE shelf. Each E5-APP-B card has two removable drive modules. E5-APP-B cards are installed in pairs for redundancy and high availability.

Figure 8: E5-APP-B Card shows a single E5-APP-B card. This view shows where hardware components, especially Field Replaceable Units (FRUs), are located.

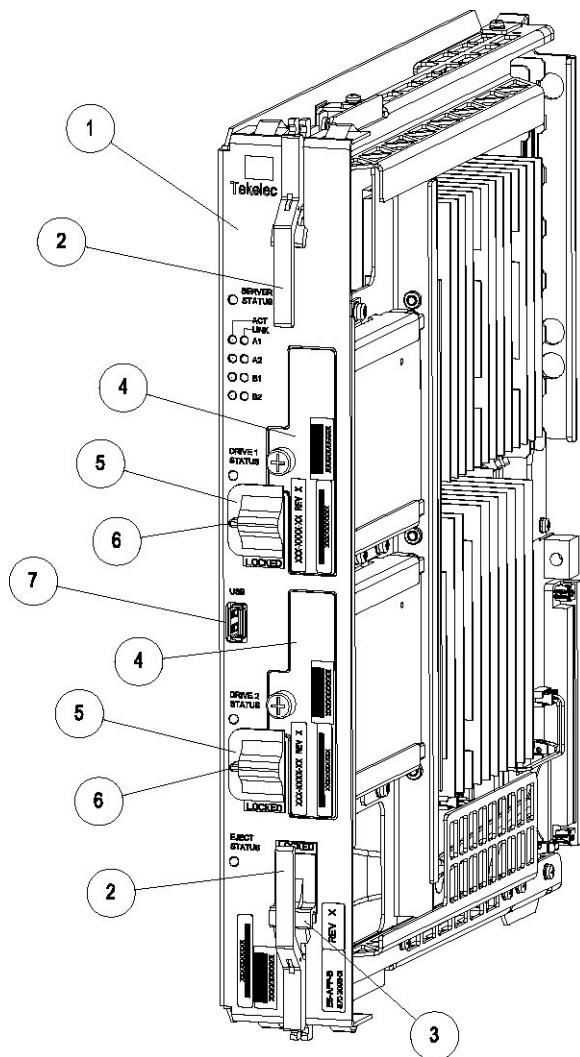


Figure 8: E5-APP-B Card

The following are Field Replaceable Units:

- E5-APP-B card (1)
- Drive Module (4)

For more information about FRUs, see the corresponding *Alarms and Maintenance* manual included in this release.

The other features components are:

- Injector/Ejector (2)
- Ejector Switch (3)
- Drive module locking switch (5)
- Switch lock release (6)
- USB Port (7) - Used for software upgrades

E5-APP-B Card Status Indicators

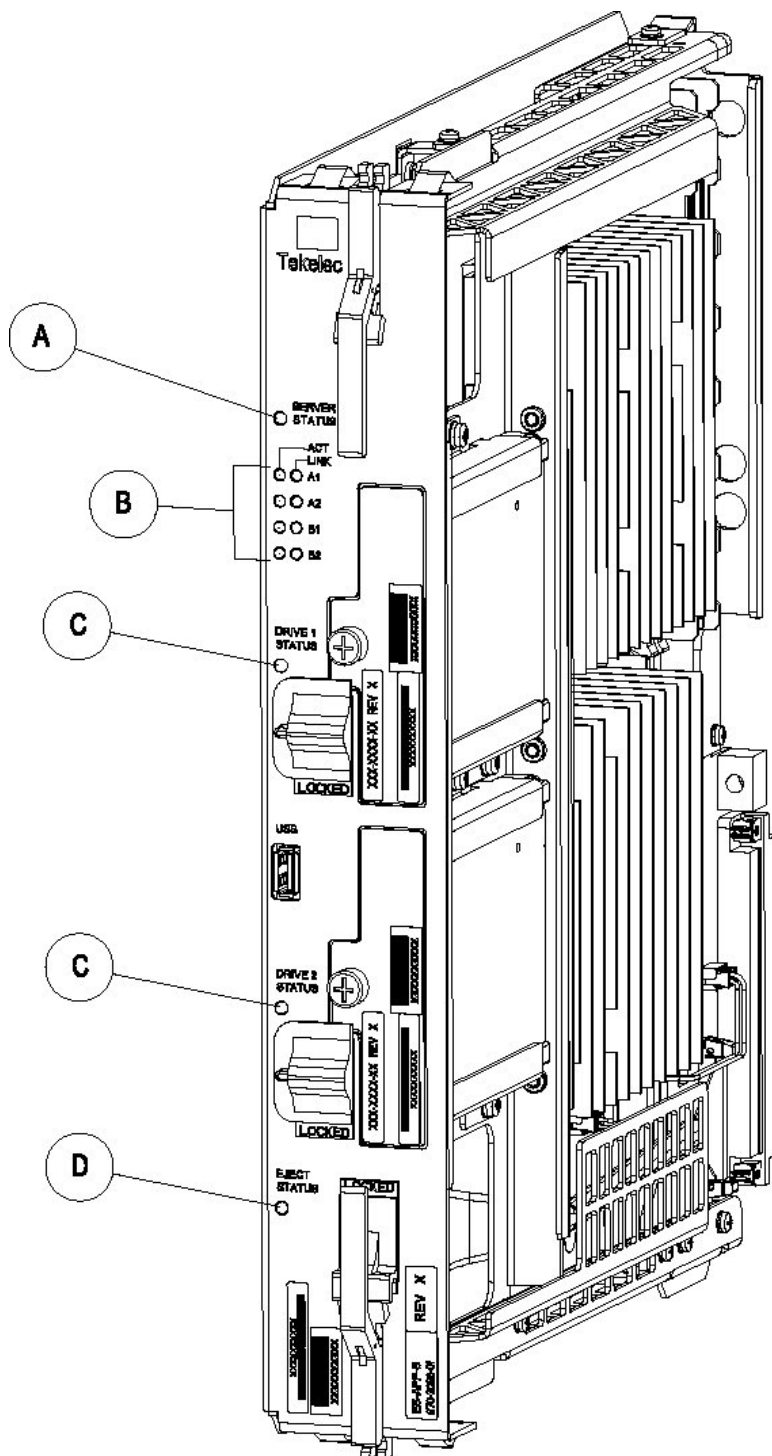


Figure 9: E5-APP-B Card Indicators

The following light-emitting diode (LED) status indicators (see [Figure 9: E5-APP-B Card Indicators](#)) can be found on the E5-APP-B card:

- One Server Status indicator (A)
- Four E-Net link and Active LED status indicators (B)
- Two drive module status indicators (C)
- One Card Eject status indicator (D)

For more information about the diagnostics that manage these alarm and status indicators, see [E5-APP-B Card Diagnostics](#).

E5-APP-B Card Installation

A single E5-APP-B card is installed in two adjacent EAGLE shelf slots. To install two E5-APP-B cards for redundancy (the recommended configuration), the EAGLE must have room to install two double-width cards.

E5-APP-B Card Components

The E5-APP-B card consists of the following standard hardware components:

- Dual Core 2.66GHz 64-bit processor
- Active/Trial BIOS architecture
- 1333 megahertz (MHz) processor front side bus speed
- 8 GB DDR2 DRAM
- Light Emitting Diode (LED) status display
- Hardware monitors that read and report:
 - Supply and core voltages
 - Fan alarm inputs
 - Ambient and processor temperatures
- Two drive modules (Field-replaceable Units (FRUs))

E5-APP-B Card Interfaces

The E5-APP-B card includes interfaces for accommodating expansion, control and configuration, network connectivity, and peripheral support.

[Table 6: E5-APP-B Card Interfaces](#) shows the basic interfaces on the E5-APP-B card.

Table 6: E5-APP-B Card Interfaces

Interface	Description
Four Serial interfaces	Standard RS-232D serial interfaces are usually used for connecting to other equipment. The Serial interfaces are accessed via backplane adapters.
One USB port - For software upgrades	One Universal Serial Bus (USB) port to support direct connectivity to peripherals. The USB port is accessible from the E5-APP-B card front panel.
Fan Alarm	Fan Alarms are received through the application GUI. See E5-APP-B Fan Alarms for more information.
Four 1 Gigabit (Gb) Ethernet ports	Ethernet ports to communicate with other nodes on the network. The Ethernet ports are accessed via backplane adapters.

Electrical Features

The E5-APP-B card has the following standard electrical features:

- Operates from -40 VDC to -56.7 VDC power input, according to Network Equipment Building System (NEBS) requirements in accordance with typical telecommunications applications
- Includes short-circuit protections and safety precautions in accordance with common standards

Mechanical Design and Maintenance Features

The E5-APP-B card mechanical design meets all applicable NEBS requirements and is designed to protect all active components. The design has efficient component cooling using low-impedance air paths, and its compact size allows multiple units to be configured in a shelf with zero clearance.

The E5-APP-B card has been designed for easy maintenance. The following components are Field-replaceable Units (FRUs):

- The E5-APP-B card
- The drive module assembly

The disk drives have high mean time between failures (MTBF) and can be easily replaced.

Note: When removing or replacing FRUs, use the procedures in the corresponding *Alarms and Maintenance* manual for this release. Use the inject/eject switch on the E5-APP-B card before switching OFF all circuit breakers or power distribution units supplying redundant power. For more information about troubleshooting systems and performing soft shutdowns, see the appropriate maintenance manual for the application.

E5-APP-B Card Diagnostics

All components that comprise the E5-APP-B card platform are designed for testability to ensure that operational status can be accurately determined and that appropriate levels of fault detection and isolation are possible with a minimum of effort.

The following levels of diagnostics are provided:

1. Online diagnostics actively monitor the health of a running E5-APP-B card platform. When online diagnostics encounter a problem, an alarm is raised and front fascia light-emitting diodes (LEDs) are illuminated to indicate the status of certain components of the E5-APP-B card. For more information about the E5-APP-B card LEDs, see [Table 7: E5-APP-B LED Table](#). Online diagnostics can be run while maintaining in-service operation of node.

Diagnostics enable troubleshooting of installed systems by verifying operational capability of Field Replaceable Units (FRU) and operational status of peripheral system components (such as cables and connectors) through automated testing initiated by FRU components. Examples are loop-back and link tests.

Table 7: E5-APP-B LED Table

LED Name	HW/SW Controlled	Description
Server Status	SW	Solid Red - Server is halted Flashing Red - Server is booting Solid Amber - TKLC configuration beginning Solid Green - TPD loaded/operational state Flashing Green - Server is shutting down
Drive 1 Status	SW/HW	HW: Flashing Green - Drive activity SW: Flashing Red - Impending drive removal SW: Steady Red - Drive ready for removal
Drive 2 Status	SW/HW	HW: Flashing Green - Drive activity SW: Flashing Red - Impending drive removal SW: Steady red - Drive ready for removal
Eject Status	SW	Red - Card ready for extraction Flashing Red - Card preparing for extraction Off - Card is not ready for extraction
Act LED A1	HW	Flashing Green - Link Activity
Act LED A2	HW	Flashing Green - Link Activity
Act LED B1	HW	Flashing Green - Link Activity

LED Name	HW/SW Controlled	Description
Act LED B2	HW	Flashing Green - Link Activity
Link LED A1	HW	Green - 10/100 Link Speed Amber - 1000 Link Speed
Link LED A2	HW	Green - 10/100 Link Speed Amber - 1000 Link Speed
Link LED B1	HW	Green - 10/100 Link Speed Amber - 1000 Link Speed
Link LED B2	HW	Green - 10/100 Link Speed Amber - 1000 Link Speed

Chapter 4

Installing and Removing E5-APP-B Cards

Topics:

- *Introduction.....39*
- *Provisioning Rules for E5-APP-B Cards.....39*
- *Installing an E5-APP-B Card.....41*
- *Removing an E5-APP-B Card.....44*
- *E5-APP-B Card Adapter Interfaces.....46*
- *Changing Passwords.....47*

This chapter covers provisioning rules and installation and removal procedures for the E5-APP-B cards.

Introduction

This chapter describes how to install and remove an E5-APP-B card from an EAGLE shelf.

Note: E5-APP-B cards are installed in an EAGLE in pairs to operate redundantly and provide high availability service.

Although installed in an EAGLE slot in an EAGLE shelf, an E5-APP-B card does not use the IMT bus. However, the E5-APP-B card does use power provided by the EAGLE frame. Because the E5-APP-B card is not detected on the IMT bus, it is not calculated into the power consumption needs of the unit; Therefore, certain power requirements apply to the E5-APP-B card. Refer to the [Obtaining the EAGLE Power Calculator](#) to manually determine EAGLE frame power consumption needs with the E5-APP-B card installed. With EAGLE Release 45.0, E5-APP-B will be part of the frame Power Calculation automatically if it is entered into the EAGLE System.

Provisioning Rules for E5-APP-B Cards

When installing an E5-APP-B card in an EAGLE shelf, take the following provisioning rules under consideration:

Note: In order to facilitate the ability to use a common spare E5-APP-B card for all applications, spare E5-APP-B cards are delivered with only the 64-bit version of the Oracle Communications Tekelec Platform (TPD) operating system pre-installed. When replacing an existing LSMS E5-APP-B card with a spare E5-APP-B card, ensure that the card has the 32-bit version of TPD installed. Refer to the *TPD Initial Product Manufacture User's Guide* for assistance. For all applications (including LSMS), after verifying that the TPD version is correct, refer to the application-specific Installation/Upgrade Procedure to install the application.

- E5-APP-B cards must be installed on separate power feeds within the shelf for redundancy purposes.
- E5-APP-B cards must be installed in odd number slot locations (i.e., xx01, xx03, xx05, etc.).
- Fan trays (890-0001-xx) are required for all EAGLE shelves that host an E5-APP-B card.
- Air management cards must be placed in open full-height slots within the shelf to provide proper air flow to the E5-APP-B cards.
- E5-APP-B based Oracle Communications EAGLE LNP Application Processor (ELAP) or EAGLE Application Processor Provisioning (EPAP) systems do not support DSM cards (870-1984-xx). DSM cards must be replaced with Oracle Communications EAGLE Service Module (E5-SMxG) cards.

E5-APP-B Fan Alarms

E5-APP-B cards that are being deployed in a remote EAGLE shelf or in EAGLE shelf 6200 or 6300 will have adapters and fan alarm cables installed so the application will receive Fan Alarms through the application Graphical User Interface (GUI).

E5-APP-B cards that are deployed in EAGLE shelf 1200 through 6100 will not have fan alarm cables and adapters. Fan alarms are displayed on the EAGLE terminal.

IMT Bus

The following IMT bus considerations apply when installing and provisioning an E5-APP-B card in an EAGLE shelf.

- E5-APP-B cards for EPAP, ELAP, or LSMS will not be on the IMT bus regardless of placement in an existing Eagle shelf. However, they can be deployed in EAGLE shelves connected to the IMT bus if the frame is in the EAGLE line-up.
- The E5-APP-B card must be provisioned and its power consumption specified when the card is installed in any slot in the 1100 through 6300 shelves so that its power consumption may be included with the EAGLE Power Calculations.
- Other EAGLE cards can be used in shelves connected to the IMT bus.
- EAGLE shelf positions 6200 and 6300 do not connect to the IMT bus (existing EAGLE shelf limit on IMT bus remains 16).

E5-APP-B Power Guidelines

When installing an E5-APP-B card in an EAGLE shelf, the following power guidelines apply:

- Dual 60 A power feeds *are recommended* for all frames that host B series cards. EAGLE frames that host B series cards *may require* dual 60 Amp power feeds, depending on frame configuration.
- Frames equipped with 30 A power feeds/FAP can support one shelf with a fan assembly but an upgrade to 60A power feeds/FAP is recommended.
- Frames equipped with 40 A power feeds/FAP can support two shelves with fan assemblies, but an upgrade to 60A power feeds/FAP is recommended.
- For non-standard frame configurations, use the Power Calculator Tool (SS005963) to determine if adequate power feeds exist at the customer site. For more information on Obtaining the EAGLE Power Calculator, see the following section.

Obtaining the EAGLE Power Calculator

To retrieve the Eagle Power Calculator:

1. Log into the [Tekelec Customer Support](#) site.

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. Enter SS005963 into the search field.
4. Save the file to a local directory.

E5-APP-B Card Distance Limitations

When installing an E5-APP-B card in an EAGLE shelf, take the following distance limitations under consideration:

- 328 Feet (100 Meters) maximum cable length between Switches and EAGLE Service Modules.

- 100 Feet (30.5 Meters) maximum cable length between E5-APP-B cards and Switches for serial connectivity
- 100 Feet (30.5 Meters) maximum cable length between E5-APP-B cards and Eagle Control Shelf for serial MMI connectivity to the B server card (Optional: ELAP and EPAP only)
- 328 feet (100 Meters) maximum cable length between Switches and E5-APP-B

Installing an E5-APP-B Card

To install an E5-APP-B card into an EAGLE shelf:

Note: The E5-APP-B Card should arrive in the LOCKED state. If it arrives UNLOCKED, skip to step 4.

1. On the E5-APP-B card, slide the Ejector switch (4) up to the UNLOCKED position. See [Figure 10: E5-APP-B Card Inject Hardware Switch, UNLOCKED](#).

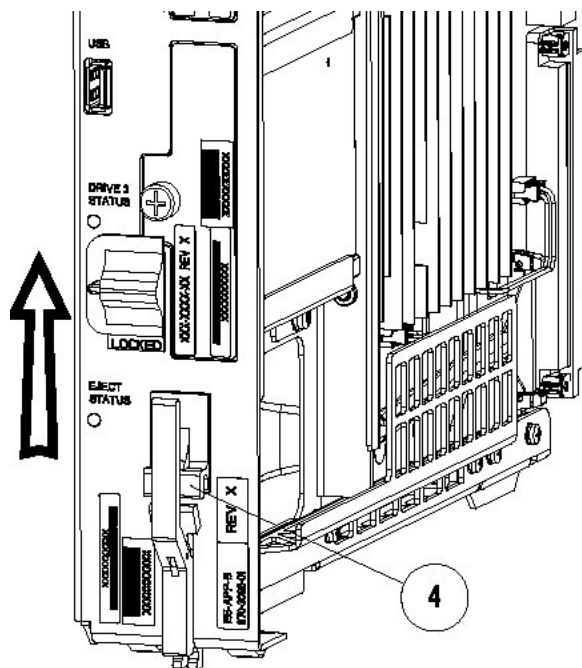


Figure 10: E5-APP-B Card Inject Hardware Switch, UNLOCKED

2. Grasp the upper and lower card Inject/Eject (I/E) lever release (3) just underneath the I/E lever, and press it to meet the I/E lever. This is the mechanical interlock for the card (see [Figure 12: E5-APP-B Card Inject Levers](#)).
3. While holding the I/E interlock and lever, pull the levers (2) away from the card until they are parallel to the floor.

[Figure 11: E5-APP-B Card UNLOCKED](#) illustrates the angle of the interlocks and levers just before inserting E5-APP-B Card into the EAGLE shelf.



Figure 11: E5-APP-B Card UNLOCKED

4. Insert the E5-APP-B card into the EAGLE shelf.

Carefully align the edges of the card with the top and bottom card guides. Then, push the card along the length of the card guides until the rear connectors on the card engage the mating connectors on the target shelf backplane.

5. Push in the top and bottom inject/eject clamps (see [Figure 12: E5-APP-B Card Inject Levers](#)).

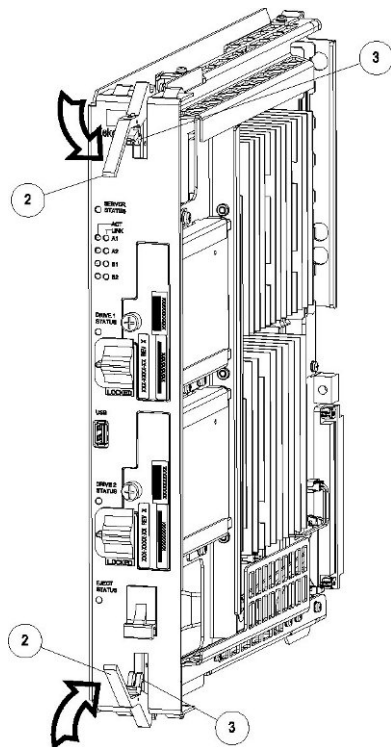


Figure 12: E5-APP-B Card Inject Levers

This locks the card in place and ensures a strong connection with the pins on the target shelf backplane.

6. Slide the E5-APP-B H/S switch (4) down to the LOCKED position (see [Figure 13: E5-APP-B Card Inject Hardware Switch, LOCKED](#)).

Note: When the Ejector switch goes from UNLOCKED to LOCKED, the E5-APP-B Eject Status LED blinks red as the E5-APP-B card goes online.

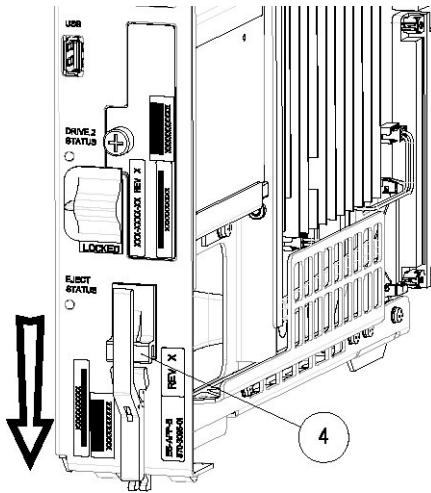


Figure 13: E5-APP-B Card Inject Hardware Switch, LOCKED

7. WAIT for the E5-APP-B Eject Status LED to go from blinking red to off.

Removing an E5-APP-B Card

Procedure - Remove E5-APP-B card

Refer to the *Hardware and Installation Guide* for E5-APP-B on halting the E5-APP-B Card software.

1. On the APP-B card, slide the Ejector switch (4) up to the UNLOCKED position (see [Figure 14: E5-APP-B Card Eject Hardware Switch, UNLOCKED](#)).



Caution: If the Ejector switch goes from locked to unlocked and the E5-APP-B card is in service, the card will halt.

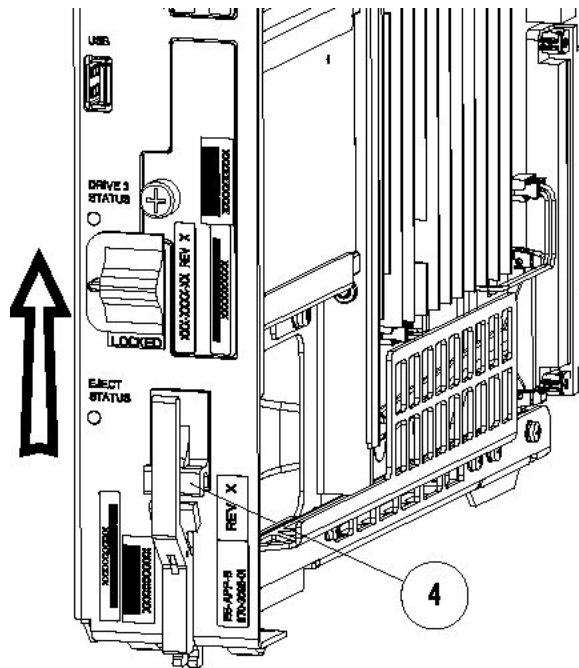


Figure 14: E5-APP-B Card Eject Hardware Switch, UNLOCKED

2. WAIT for the E5-APP-B Eject Status LED to go from blinking red to a steady red.
3. Grasp the upper and lower card Inject/Eject (I/E) lever release (3) just underneath the I/E lever, and press it to meet the I/E lever. This is the mechanical interlock for the card.

See [Figure 15: E5-APP-B Card UNLOCKED](#)

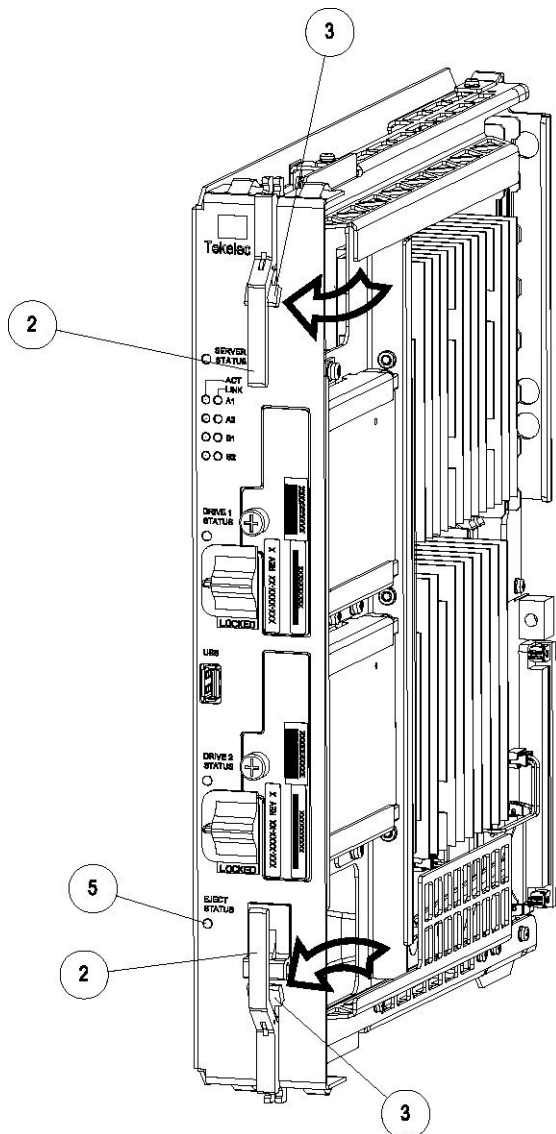


Figure 15: E5-APP-B Card UNLOCKED

4. While holding the I/E interlock and lever, pull the levers (2) away from the shelf until they are parallel to the floor.
5. Remove the E5-APP-B card from the EAGLE shelf.

E5-APP-B Card Adapter Interfaces

The E5-APP-B card supports an upper and a lower backplane adapter, which supports the following interfaces:

- 1 Gigabit (Gb) Ethernet (830-1102-03)
- Serial (830-1407-01)

- Fan alarm

Changing Passwords

For security purposes, Oracle recommends that all default passwords be changed and kept in a secure location.

- To change the passwords for E5-APP-B platforms, refer to the application manual for the application loaded on each server.

Note: There should always be a person on-site who knows the new passwords. If there is a need to contact the [Customer Care Center](#), provide the passwords on request.

Appendix

A

ExAP or LSMS Network Integration

Topics:

- [*Introduction.....49*](#)
- [*Network Overview.....49*](#)
- [*Customer-Supplied Information.....55*](#)
- [*Network Configuration.....55*](#)
- [*Firewall and Router Filtering Considerations....56*](#)

This chapter provides network integration information for Multi-Purpose Server (MPS) systems and Oracle Communications LSMS (Local Service Management Systems).

Introduction

The MPS platform can be configured as an Oracle Communications EAGLE LNP Application Processor (ELAP) or EAGLE Application Processor Provisioning (EPAP) server. The MPS platform is an ELAP/EPAP system based on the E5-APP-B card platform.

The MPS provides an interface between the customer provisioning network and the EAGLE Service Module (SM) cards. As the customer's data is updated, the MPS stores the data and updates the SM cards. An MPS is usually co-located with an EAGLE. If you need to install an MPS at a distance from the EAGLE, contact your [Customer Care Center](#) for assistance.

The LSMS uses a NAS to backup system and application logs, as well as databases. The E5-APP-B NAS has a two-drive storage in RAID configuration to save the LSMS logs and database. The NAS is initially configured through the primary LSMS using tty serial terminal.

Network Overview

ExAP Network Connections

ELAP and EPAP provide network connections to allow interaction with SMs, other MPS Servers, and the remote provisioning system. There are four network connections. [Network Overview, Figure 16: EPAP Network Connections](#), [Figure 17: ELAP Network Connections](#) and [Table 9: ELAP Interconnect Table](#) illustrate the networks and how they are connected.

All networks, except the provisioning network, use internal connections in the MPS. Only the provisioning network connects to the customer's network. All networks use TCP/IP and UDP/IP as the transport protocol.

- The provisioning network uses the Ethernet interface that typically connects to an external wide area network (WAN). This interface provides connectivity to the remote MPS system, an LSMS, or to a customer-provided provisioning system.
- The main SM Network uses the Ethernet interface that connects to the primary network port on all SM cards. This network has sufficient capacity to support up to 32 (for EPAP, 18 for ELAP) SMs. The primary port on all SM cards runs at 100BaseT.
- The backup SM Network uses the Ethernet interface that connects to the backup network port on all SM cards. This network has sufficient capacity to support up to 32 SMs. The backup port on all SM cards runs at 100BaseT.
- The Synchronization Network uses the Ethernet interface that is on private LAN segment. This interface provides direct connectivity between MPS A and MPS B.

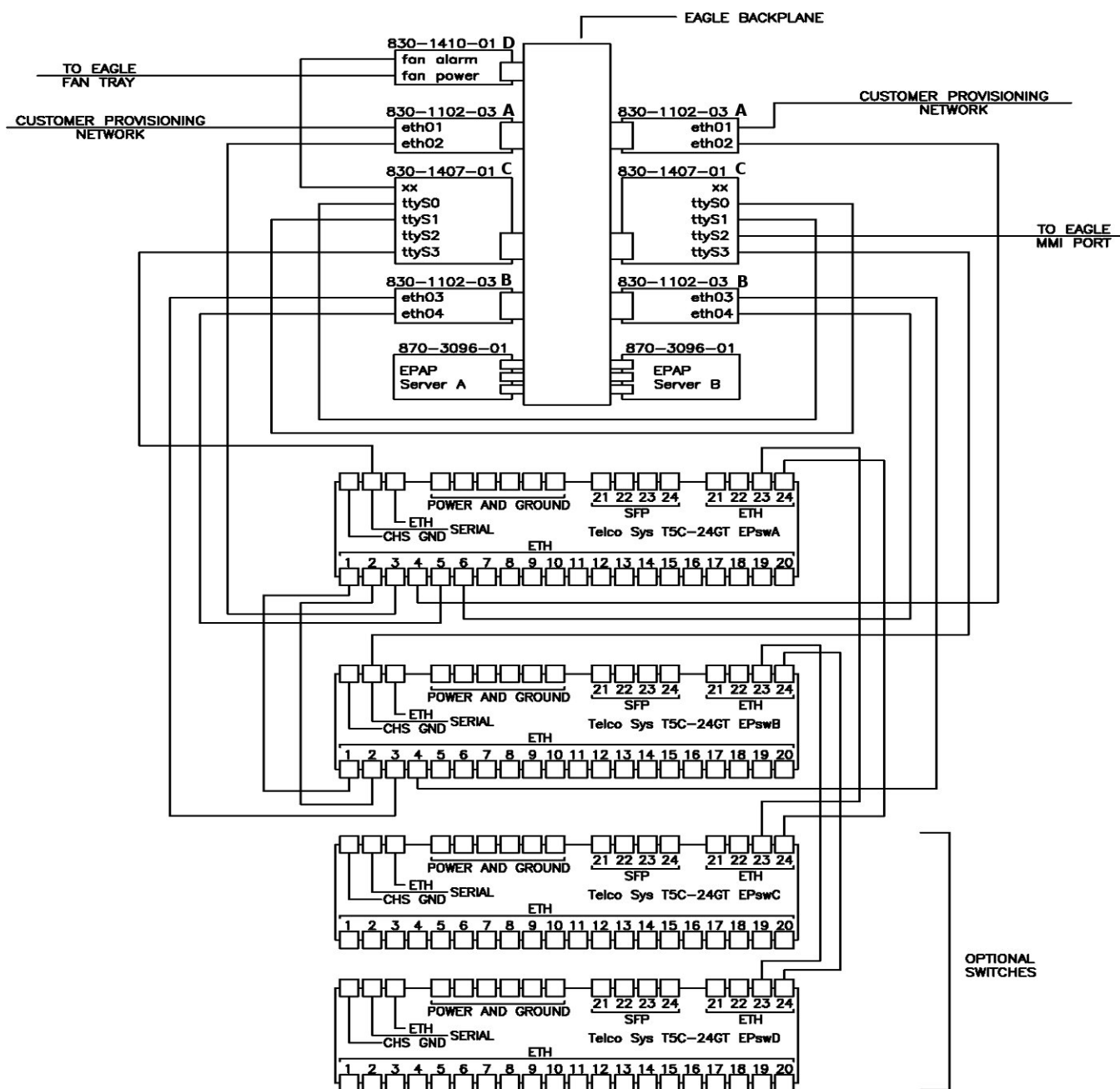


Figure 16: EPAP Network Connections

- A. Adapter installed in the Upper position, odd slot
- B. Adapter installed in the Lower position, odd slot
- C. Adapter installed in the Lower and Upper position, even slot
- D. Adapter installed on EAGLE backplane fan Connector (Power and Alarm)

Table 8: EPAP Interconnect Table

Cable Part Number	To	From
830-1173-68 CAT 5 Crossover	Switch A port 1	Switch B port 1
830-1173-68 CAT 5 Crossover	Switch A port 2	Switch B port 2
830-1220-XX Serial Roll Over	Card / Server A, (P3) 830-1407-XX	Card /Server B, (P4) 830-1407-XX
830-1220-XX Serial Roll Over	Card /Server A, (P4) 830-1407-XX	Card /Server B, (P3) 830-1407-XX
830-1220-XX Serial Roll Over	Card /Server A, (P6) 830-1407-XX	Switch A Console Port
830-1220-XX Serial Roll Over	Card /Server B, (P6) 830-1407-XX	Switch B Console Port
830-1174-XX CAT 5 Straight	Card /Server A Port A (P2) 830-1102-03	Customer Provisioning Network ETH01
830-1174-XX CAT 5 Straight	Card /Server B Port A (P2) 830-1102-03	Customer Provisioning Network ETH01
830-1174-XX CAT 5 Straight	Card /Server A Port A (P3) 830-1102-03	Switch A Port 3 ETH02
830-1174-XX CAT 5 Straight	Card /Server B Port A (P3) 830-1102-03	Switch A Port 4 ETH02
830-1174-XX CAT 5 Straight	Card /Server A Port B (P2) 830-1102-03	Switch B Port 3 ETH03
830-1174-XX CAT 5 Straight	Card /Server B Port B (P2) 830-1102-03	Switch B Port 4 ETH03
830-1174-XX CAT 5 Straight	Card /Server A Port B (P3) 830-1102-03	Switch A Port 5 ETH04
830-1174-XX CAT 5 Straight	Card /Server B Port B (P3) 830-1102-03	Switch A Port 6 ETH04
830-1173-68 Optional	Switch A port 23 (CAT 5) Crossover	Switch C port 23
830-1173-68 Optional	Switch A port 24 (CAT 5) Crossover	Switch C port 24
830-1173-68 Optional	Switch B port 23 (CAT 5) Crossover	Switch D port 23
830-1173-68 Optional	Switch B port 24 (CAT 5) Crossover	Switch D port 24
830-1413-XX	Card Server A (P2) 830-1407-XX	Eagle Backplane Fan Connector (J2 B) 830-1410-XX

830-1413-XX	Card Server B (P2) 830-1407-XX	Eagle Backplane Fan Connector (J3 A) 830-1410-XX
830-1212-XX	Card Server B (P5)	Eagle MMI Port Optional Cable, requires adapter 830-1423-XX

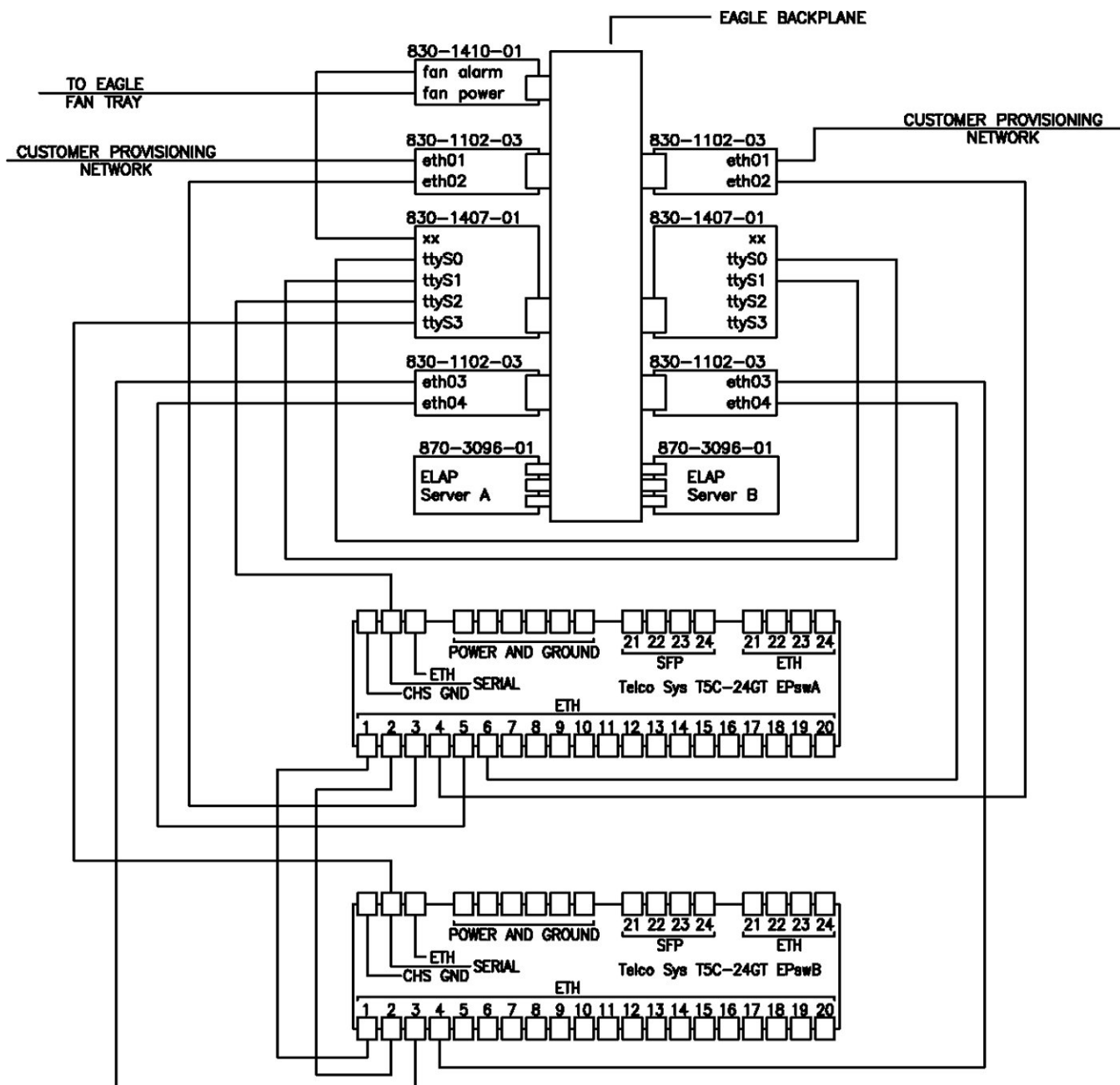


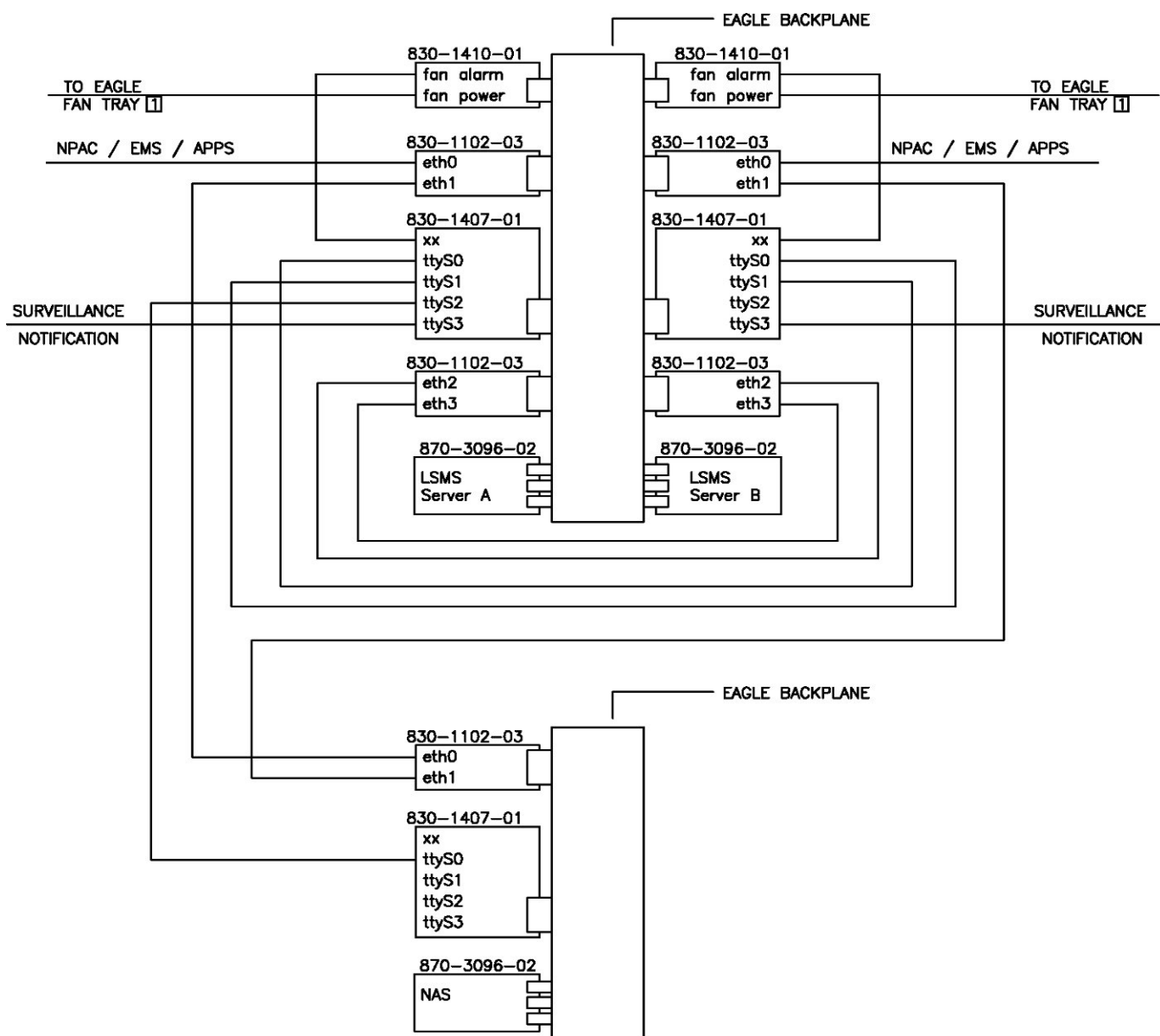
Figure 17: ELAP Network Connections

Table 9: ELAP Interconnect Table

Cable Part Number	To	From
830-1173-68 CAT 5 Crossover	Switch A port 1	Switch B port 1
830-1173-68 CAT 5 Crossover	Switch A port 2	Switch B port 2
830-1220-XX Serial Roll Over	Card / Server A, (P3) 830-1407-XX	Card /Server B, (P4) 830-1407-XX
830-1220-XX Serial Roll Over	Card /Server A, (P4) 830-1407-XX	Card /Server B, (P3) 830-1407-XX
830-1220-XX Serial Roll Over	Card /Server A, (P5) 830-1407-XX	Switch A Console Port
830-1220-XX Serial Roll Over	Card /Server B, (P6) 830-1407-XX	Switch B Console Port
830-1174-XX CAT 5 Straight	Card /Server A Port A (P2) 830-1102-03	Customer Provisioning Network ETH01
830-1174-XX CAT 5 Straight	Card /Server B Port A (P3) 830-1102-03	Switch A Port 3 ETH02
830-1174-XX CAT 5 Straight	Card /Server A Port A (P3) 830-1102-03	Switch A Port 4 ETH02
830-1174-XX CAT 5 Straight	Card /Server B Port A (P2) 830-1102-03	Switch B Port 3 ETH03
830-1174-XX CAT 5 Straight	Card /Server A Port B (P3) 830-1102-03	Switch A Port 5 ETH04
830-1174-XX CAT 5 Straight	Card /Server B Port B (P2) 830-1102-03	Customer Provisioning Network ETH01
830-1174-XX CAT 5 Straight	Card /Server A Port B (P2) 830-1102-03	Switch B Port 4 ETH03
830-1174-XX CAT 5 Straight	Card /Server B Port B (P3) 830-1102-03	Switch A Port 6 ETH04
830-1413-XX	Card Server A (P2) 830-1407-XX	Eagle Backplane Fan Connector (J2 B) 830-1410-XX

LSMS Network Connections

The Local Service Management System (LSMS) uses a NAS to backup system and application logs, as well as databases. The following figure illustrates the network and how it is connected.



1 WHEN INSTALLED IN A STAND-ALONE SHELF, THE FAN ALARMS ARE CONNECTED TO THE FIRST E5-APP-B SERVER IN THE SHELF

Figure 18: LSMS and NAS Network Connections

Table 10: LSMS Interconnect Table

Cable Part Number	To	From
830-1174-XX CAT 5 Straight	Card /Server A Port A (P2) 830-1102-03	Customer Provisioning Network ETH0
830-1174-XX CAT 5 Straight	Card /Server B Port A (P2) 830-1102-03	Customer Provisioning Network ETH0

830-1174-XX CAT 5 Straight	Card /Server A Port A (P3) / ETH1 830-1102-03	Card /NAS Port A (P2) / ETH0 830-1102-03
830-1174-XX CAT 5 Straight	Card /Server B Port A (P3) / ETH1 830-1102-03	Card /NAS Port A (P3) / ETH1 830-1102-03
830-1174-XX CAT 5 Straight	Card /Server A Port B (P2) / ETH2 830-1102-03	Card /Server B Port B (P2) / ETH2 830-1102-03
830-1174-XX CAT 5 Straight	Card /Server A Port B (P3) / ETH3 830-1102-03	Card /Server B Port B (P3) / ETH3 830-1102-03
830-1220-XX Serial Roll Over	Card Server A (P3) 830-1407-XX	Card /Server B, (P4) 830-1407-XX
830-1220-XX Serial Roll Over	Card Server A (P4) 830-1407-XX	Card /Server B, (P3) 830-1407-XX
830-1220-XX Serial Roll Over	Card Server A (P5) 830-1407-XX	Card /NAS, (P3) 830-1407-XX
830-1220-XX Serial Roll Over	Card Server A (P6) 830-1407-XX	Surveillance Notification
830-1220-XX Serial Roll Over	Card Server B (P6) 830-1407-XX	Surveillance Notification
830-1413-XX	Card Server A (P2) 830-1407-XX	Eagle Backplane Fan Connector (J2 B) 830-1410-XX (P6)
830-1413-XX	Card Server B (P2) 830-1407-XX	Eagle Backplane Fan Connector (J3 B) 830-1410-XX (P6)

Customer-Supplied Information

The customer's network administrator provides the following information:

- Two IP addresses on the provisioning network
- Netmask of the provisioning network
- Default router on the provisioning network

Network Configuration

SM and Sync Network addresses are configured to default values at ExAP or LSMS initialization and should not need to be changed. If they need to be changed for any reason, refer to sections "Network Connection" and "Configuration Menu" in the *Administration and LNP Feature Activation* manual for ELAP, or the *Administration Manual* for EPAP.

The provisioning network addresses are configured using the ExAP or LSMS user interface configuration menu; refer to “Configuration Menu” in the *Administration and LNP Feature Activation* manual for ELAP or the *Administration Manual* for EPAP.

Firewall and Router Filtering Considerations

If a firewall is installed in the provisioning network between the MPS systems or between the MPS system(s) and the provisioning system, it must be configured to allow selected traffic to pass.

For firewall protocol filtering for the various interfaces, see either the *Administration Manual* for EPAP or the *Administration and LNP Feature Activation* manual for ELAP.

A

AC

Alternating Current
Application Context
Authentication Center
Area Code

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 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.
Action Set
Authentication Server

A

Authentication servers provide public access to certificates, and are integrated with electronic information retrieval systems to this end. Free access to certificates is necessary to support authentication in open systems.

Application Simulator

Test tool that can simulate applications and/or SMSCs.

D

DC

Direct Current
Data Collection

DRAM

Dynamic Random Access Memory
A type of memory chip that has to be refreshed periodically.

DS1

Digital Signal Level-1
(1.544Mbits/sec)
A widely used standard in telecommunications in North America and Japan to transmit voice and data between devices. The data transmitted over a physical T1 line.

E

E5-APP-B

The E5-APP-B card is a complete application server platform designed to operate within a heavy duty EAGLE shelf. An E5-APP-B card consists of the card, a microprocessor, 8 GB RAM, and two removable drive modules with an operating system and an application, such as EPAP, loaded.

E

ELAP	<p>EAGLE Local Number Portability Application Processor</p> <p>The EAGLE LNP Application Processor (ELAP) platform provides capacity and performance required to support the ported number database.</p>
EPAP	<p>EAGLE Provisioning Application Processor</p>
ESD	<p>Electro-Static Discharge</p>

F

FRU	<p>Field Replaceable Unit</p> <p>A circuit board or part that can be quickly and easily removed and replaced by the user or by a technician without having to send the entire product or system to a repair facility.</p>
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G

GB	<p>Gigabyte — 1,073,741,824 bytes</p>
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I

IP	<p>Intelligent Peripheral</p> <p>Internet Protocol</p> <p>IP specifies the format of packets, also called datagrams, and the addressing scheme. The network layer for the TCP/IP protocol suite 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.</p>
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L**LAN****Local Area Network**

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.

LED**Light Emitting Diode**

An electrical device that glows a particular color when a specified voltage is applied to it.

LSMS**Local Service Management System**

An interface between the Number Portability Administration Center (NPAC) and the LNP service databases. The LSMS receives LNP data from the NPAC and downloads that data to the service databases. LNP data can be entered into the LSMS database. The data can then be downloaded to the LNP service databases and to the NPAC.

M**MHz****Megahertz****MPS****Multi-Purpose Server**

The Multi-Purpose Server provides database/reload functionality and a variety of high capacity/high speed offboard database functions for applications. The MPS resides in the General Purpose Frame.

Messages Per Second

M

A measure of a message processor's performance capacity. A message is any Diameter message (Request or Answer) which is received and processed by a message processor.

MTBF

Mean Time Between Failures

N

NEBS

Network Equipment Building Systems

The most common set of safety, spatial and environmental design guidelines applied to telecommunications equipment in the United States. NEBS was developed by Bell Labs in the 1970s to standardize equipment that would be installed in a central office. This document lists the generic requirements for all new telecommunications equipment systems used in central offices and other telephone buildings.

P

PDF

policy decision function

A policy decision point for service-based local policy control of IP bearer resources. Policy decisions are made within the MPE device.

PR

Problem Report

R

RMA

Return Material Authorization

RS

Requirement Specification
Redirect Server

S

SM Short Message

STP Signal Transfer Point

The STP is a special high-speed switch for signaling messages in SS7 networks. The STP routes core INAP communication between the Service Switching Point (SSP) and the Service Control Point (SCP) over the network.

Spanning Tree Protocol

T

TCP/IP Transmission Control Protocol/Internet Protocol

U

UDP User Datagram Protocol

USB Universal Serial Bus

W

WAN Wide Area Network

A network which covers a larger geographical area than a LAN or a MAN.