Application Card Installation

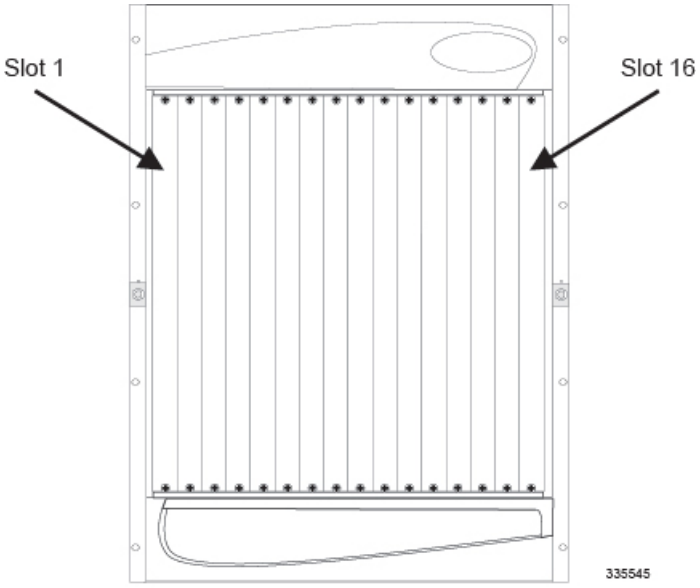
This chapter provides information on chassis configurations and instructions for installing application cards. Line cards are discussed in the Line Card Installation chapter.

This chapter includes the following sections:

Chassis Slot Numbering and Assignments

The chassis has 16 front-loading slots that host application cards. This allows the installation of redundant components and provides ample room for expanding the system. Chassis slots are labeled 1 through 16 from left to right.

Figure 1: Chassis Front Slot Numbering



ASR 5000 Platform

The following application cards are supported for use in the ASR 5000 chassis:

- **System Management Card (SMC):** The Session Management Card (SMC) is used with the packet processing cards (PSC2 or PSC3) in the ASR 5000 hardware platform. It serves as the primary controller, initializes the entire system, and loads the software's configuration image into other cards in the chassis. Up to two SMCs can be installed in the chassis: one primary and one redundant "hot-standby" card. Chassis slots 8 and 9 are reserved for the SMC only. By default, when the chassis' power is on, the SMC in slot 8 is active. The other SMC is automatically placed into standby mode.

  Caution Do not place any card other than an SMC into slots 8 or 9 of the ASR 5000. Doing so will cause damage to the card and possibly the chassis' mid-plane.

- **Packet Processing Cards:** The packet services cards provide the packet processing and forwarding capabilities within a system. Each packet processing card type supports multiple contexts, which allows you to overlap or assign duplicate IP address ranges in different contexts. The minimum recommended redundancy for packet services cards is one redundant card for up to 13 active cars.

The following table details the specific ASR 5000 chassis slot assignments for each of the above card types.

Table 1: Application Card Slot Assignments

Application Card Type	Chassis Slot Number(s)	Description
System Management Card (SMC)	8	Primary SMC
	9	Redundant SMC
Packet Processing Cards	1 through 7 and 10 through 16	Active or redundant packet processing cards all of the same type

Important To achieve optimal airflow performance in minimum system deployments, populate packet services cards within the chassis from the middle of the chassis outward. Leave an empty slot between the cards, when possible. For example, for four PSC2s, use slots 3, 5, 12, and 14. For two PSC2s, use slots 5 and 12. For more detailed information on SMCs and packet processing card types, refer to the *Hardware Platform Overview* chapter.

Packet Processing Card Redundancy

To optimize network efficiency and minimize down time, the system supports 1:n redundancy for packet processing cards of the same type.

When the system boots up, all packet processing cards enter standby mode, which means that the cards are available for use but offline. Installed components are made active through the software configuration process. Cards that are not configured to enter active mode, which brings them online, remain in standby mode as redundant components. Packet processing cards that normally operate in standby mode do not require line cards to be installed directly behind them, as these line cards are not used.

In the event of packet processing card failure, tasks are migrated from the active packet processing card to the standby card. The line card installed behind the packet processing card that was formerly active maintains the interfaces to the external network equipment. Redundancy Crossbar Cards (RCCs) provide a path for signalling and data traffic between the line card and the now active packet processing card.

Important For additional information about RCCs, refer to *Line Card Installation* in this guide.

Recommended Minimum Chassis Configuration

The recommended minimum chassis configuration for application cards, including redundancy, is as follows:

Slot Number	Card	Card State
8	SMC	Active
9	SMC	Standby
2 and 4 (see Note 1) 2, 3 and 4 (see Note 2)	PSC2 or PSC3	Active
11 (see Notes 1 and 2)	PSC2 or PSC3	Standby

Notes:

1. Minimum requirement for hardware redundancy.

2. Minimum requirement for hardware + software redundancy, MME service, SGSN service, as well as combined services on a single platform.

Install additional cards in the remaining chassis slots as required.

If you use the session recovery feature, a minimum of three active packet processing cards and one standby (redundant) packet processing card are required.

Installing Application Cards

The installation procedure is identical for all application cards. This section provides the instructions for installing application cards in the chassis.

Caution During installation, maintenance, and/or removal, wear grounding wrist and/or heel straps to avoid ESD damage to the components. Failure to do so could result in damage to electrical components and could potentially void your warranty.

Step 1 Determine the type of application card you are installing. Each application card is identified by the text near the bottom of its front panel.

Step 2 Determine which chassis slot to install the card in based on the information in Chassis Slot Numbering and Assignments, on page 1..

Step 3 Remove the blanking panel, if one is installed, covering the slot.

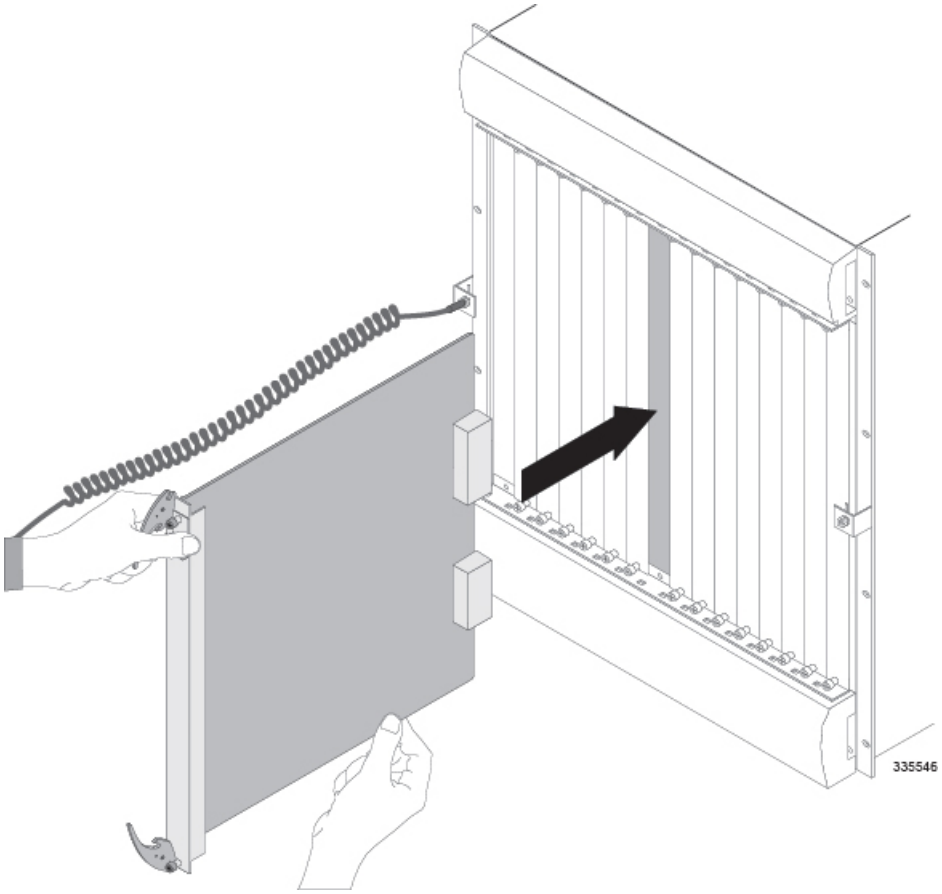
a) Use a Phillips #2 screwdriver to loosen the screws at the top and bottom of the blanking panel.

b) Holding the screws on the blanking panel, pull the blanking panel away from the chassis to expose the chassis slot.

Step 4 Slide the interlock switch on the card fully downward and flip both ejector levers fully outward and away from the front panel.

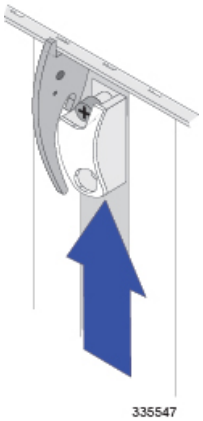
Step 5 Properly support the weight of the card and align it with the upper and lower card guides of the chassis slot. Gently slide the card into the slot until the levers touch the chassis frame.

Caution Take extra caution when installing packet processing cards. These cards contain heat sinks that could become loose or be damaged if they come into contact with another card while it is being inserted in the chassis slot.



Step 6 Push the ejector levers inward firmly and straight until the card is seated in the chassis midplane and you cannot push the ejector levers in any further. Press firmly on the card's faceplate to ensure that it is fully seated. The card's front panel should be flush against the chassis' upper and lower card mounts for the slot.

Step 7 Slide the interlock switch on the front panel of the application card upward to lock the ejector tab in place. The flange on the left-side of the interlock switch prevents movement of the ejector tab when raised completely.



Important You must slide the interlock switch upward before securing the card's top screw to the mounting rail.

Step 8 Use a Phillips #2 screwdriver to tighten the screws at the top and bottom of the application card's front panel to secure the card to the chassis.

Step 9 Repeat step 1 through step 8 for every application card you are installing.

Step 10 Install blanking panels over any unused chassis slots.

To reduce the risk of electric shock and to ensure proper ventilation, blanking panels must be used to cover any chassis slot that is not occupied by an application card.

Leere Steckplaetze muessen mit der dafuer vorgesehenen Abdeckplatte geschlossen werden, um die Luftzirkulation innerhalb des Geraets zu gewaehrleisten und um einen elektrischen Schlag zu vermeiden.

a) Position the blanking panel over the unused chassis slot.
b) Use a Phillips #2 screwdriver to tighten the screws at the top and bottom of the blanking panel to secure the panel to the chassis.
c) Repeat step a and step b for any additional unused chassis slots.

Step 11 Proceed to the *Line Card Installation* chapter.