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58 Troubleshooting Appendix A: Specifications Appendix B: Console Connection 7210 SAS-D Installation Guide Page 7 List of Figures Page 8 7210 SAS-D Installation Guide Preface About This Manual This guide provides site preparation recommendations, step-by-step procedures to rack mount the Alcatel-Lucent 7210 SAS-D®, and instructions and notes to avoid injury or switch damage during installation and maintenance. Follow the safety procedures and guidelines when working with and near electrical equipment.

Warning statements and notes are provided in each chapter. Audience This guide is intended for network installers and system administrators who are responsible for installing, configuring, or maintaining networks. This guide assumes you are familiar with electronic and networking technologies. 7210 SAS-D Installation Guide Page 9 Preface Information Symbols Table 1 describes symbols contained in this guide. Table 1: Information Symbols Symbol Meaning Description Danger This symbol warns that improper handling and installation could result in bodily injury. An electric shock hazard could exist. Before you begin work on this equipment, be aware of hazards involving electrical circuitry, networking environments, and instigate accident prevention procedures. Caution This symbol warns that improper handling and installation could result in equipment damage or loss of data. Warning This symbol warns that improper handling may reduce your component or system performance. Note This symbol provides additional operational information. Class 1 Laser Product Class 1 laser products are listed in the MDA installation guides. Only approved Class 1 replaceable laser transceivers should be used with this product. Technical Support If you purchased a service agreement for your 7210 SAS-D and related products from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller for assistance. If you purchased an Alcatel-Lucent service agreement, contact technical assistance at: Web: Page 10 7210 SAS-D Installation Guide 7210 SAS-D Overview This chapter describes the 7210 SAS-D features and includes the following sections: • "Introduction" on page 12 • "Switch Features and Architecture" on page 15 • "Features" on page 16 • "Hardware Description" on page 18 7210 SAS-D Installation Guide Page 11 Introduction Introduction 7210 SAS-D is an ethernet demarcation and backhaul unit with support for 4 x 10/100/1000 Base-T fixed ports and 6 x 100/1000 SFP ports, for use typically as a customer premise unit (CPE).

It supports line-rate switching on all the ports. It is a service-aware Ethernet switch with support for QinQ layer-2 uplinks. It has an integrated power supply and supports fan-less operation. It is available in two variants: • 7210 SAS-D supporting normal operating temperature range (i.e. 0° C to 40° C). Its primary application, is for use as a CPE/demarc unit in delivery of business services. 7210 SAS-D is available with either an AC or DC power supply. • 7210 SAS-D ETR supporting extended temperature range (i.e. -40° C to 65° C). It is targeted for applications requiring an extended temperature range. This unit has a stratum-3 Oscillator to allow for support of SyncE and 1588v2. Its primary application is in use for mobile back haul. 7210 SAS-D ETR will be available with three power supply options as given below: A DC unit supporting -48V DC power supply with an optional external backup power supply An AC unit with an optional external backup supply. Page 12 7210 SAS-D Installation Guide 7210 SAS-D Overview Switch Features The 7210 SAS-D is a service-aware Layer 3 switch. It supports up to 10 connections including 6 100/1000 fiber-optic SFP ports and 4 10/100/1000 Base-T fixed copper ports.

The chassis is available with either an AC power module or DC power module, as shown in the following illustrations: 7210SASAc 0001 Figure 1: 7210 SAS-D AC Chassis Front Panel 7210SASDC 0001 Figure 2: 7210 SAS-D DC Chassis Front Panel The ETR-variant chassis is also available with either an AC power module or DC power module, as shown in the following illustrations: 7210SASDC 0001 Figure 3: 7210 SAS-D ETR AC Chassis Front Panel 7210SASDC 0008 Figure 4: 7210 SAS-D ETR DC Chassis Front Panel All of the 7210 SAS-D variant chassis include the following features: • 6 100/1000 fiber-optic SFP ports and 4 10/100/1000 Base-T fixed copper ports • One RJ-45 console (RS-232 interface) connector for device management • Embedded SR OS • Compact size: 1RU height, 10-inch rack-mountable metal enclosure, 7-inch depth (ETSI) Page 14 7210 SAS-D Installation Guide 7210 SAS-D Overview Switch Architecture The 7210 SAS-D employs a wire-speed, non-blocking switching fabric. This permits simultaneous wire-speed transport of multiple packets at low latency on all ports. The switch also features full-duplex capability on all ports, that effectively doubles the bandwidth of each connection. Network Management Options This switch contains a comprehensive array of LEDs for at-a-glance monitoring of network and port status. It also includes a management agent that enables you to configure or monitor your switch using its CLI, or by using SNMP applications. To manage the switch, you can make a direct connection to the console port (out-of-band) or you can manage it by using a network connection (in-band) using Telnet/SSH or SNMP-based network management software. 7210 SAS-D Installation Guide Page 15 Features Features The 7210 SAS-D includes the following features: • Wire speed, non-blocking, service-aware Ethernet switch • 6 100/1000 fiber-optic SFP ports and 4 10/100/1000 Base-T copper ports • Powered by SR OS for feature-rich Carrier Ethernet VPN services • Per-service quality of service (QoS) with up to eight levels of class-based queuing per port • Per-service OAM toolkit with IEEE 802.1ag, IEEE 802.3ah and local service mirroring • Ethernet features include IEEE 802.1q and QinQ (stacked VLAN IDs) • Dual homed connections uplinks to separate aggregation devices • Flexible deployment options with support for mesh and ring topologies • MEF 9 and MEF 14 compliant platform • Managed by the 5620 SAM • Supports integrated AC or DC power supply. • The chassis does not use a fan for cooling.

7210 SAS-D ETR chassis supports the following features: • Support for extended temperature range: -40° C to 65° C • Supports normal operating temperature range • Supports stratum-3 oscillator onboard, allowing for support of SyncE and 1588v2 • Supports an optional backup power supply for all the power supply options supported with ETR variant.

Note: 7210 SAS-D ETR hardware is capable of supporting Synchronous Ethernet and 1588v2. Please check the release notes for software support. Page 16 7210 SAS-D Installation Guide 7210 SAS-D Overview Connectivity The 7210 SAS-D includes the following connectivity features: • 100/1000 fiber-optic SFP ports and 10/100/1000Base-T copper SFP ports full-duplex connections. The SFP ports allow for use of 10/100/1000 Base-T copper SFPs. • Auto-negotiation on 10/100/1000 Base-T fixed copper ports enables each port to automatically select the optimum speed and communication mode (half or full duplex) if this feature is supported by the attached device. • IEEE 802.3-2005 Ethernet, Fast Ethernet and Gigabit Ethernet compliance ensures compatibility with standards-based network cards and switches from any vendor. 7210 SAS-D Installation Guide Page 17 Hardware Description Hardware Description The chassis is available with either an AC power module or DC power module, as shown in the following illustrations. AC Chassis 3 5 6 7 7210SASAc 0001A 1 4 2 Figure 5: 7210 SAS-D AC Chassis Front Panel 3 5 6 7 7210SASDC 0001A 1 4 2 Figure 6: 7210 SAS-D ETR AC Chassis Front Panel 18 7210 SAS-D Installation Guide 7210 SAS-D Overview The following section describes the front panel features of the 7210 SAS-D AC chassis: Table 2: 7210 SAS-D AC Chassis Front Panel Features Key Description 1 Power System and Port LEDs 2 100/1000 SFP ports 3 10/100/1000Base-T fixed copper ports 4 RJ-45 Console port 5 Power switch 6 DC power connection 7 Chassis ground connection point 7210 SAS-D Installation Guide Page 19 Hardware Description DC Chassis 3 5 6 7 7210SASDC 0001A 1 4 2 7 Figure 7: 7210 SAS-D DC Chassis Front Panel 3 5 6 7 7210SASDC 0008 1 2 4 7 Figure 8: 7210 SAS-D ETR DC Chassis Front Panel The following section describes the front panel features of the 7210 SAS-D DC chassis: Table 3: 7210 SAS-D DC Chassis Front Panel Features Key Description 1 Power System and Port LEDs 2 100/1000 SFP ports 3 10/100/1000Base-T fixed copper ports 4 RJ-45 Console port 5 Power switch 6 DC power connection 7 Chassis ground connection point 7210 SAS-D Installation Guide Page 21 Hardware Description Ethernet Interfaces The 7210 SAS-D provides 6 100/1000 SFP ports. Each port can be used for a direct connection to a subscriber's Customer Premises Equipment (CPE), or as an uplink to another aggregation node. The 7210 SAS-D also provides 4 10/100/1000Base-T fixed copper ports. Console Port The console port uses an RJ-45 connector with serial pins (see Table 11) that enables a connection to a terminal for performing switch monitoring and configuration operations. The terminal may be a PC or workstation that is running terminal emulation software, or a terminal configured as a Data Terminal Equipment (DTE) connection. A null-modem wired serial cable is supplied with the switch for connecting to this interface. The serial port configuration requirements are as follows: • Default Baud rate - 115200 bps • Character Size - 8 Characters • Parity - None • Stop bit - One • Data bits - 8 • Flow control - none Alarms When your system has a major alarm, the CPU will turn the status LED amber. Currently, the system provides an alarm for the following event: • Chassis temperature threshold exceeded • Major alarm is raised.

Air Ventilation 7210 SAS-D does not have fan. Operators must allow for at least three inches of clearance on all sides of the device to ensure proper airflow intake cooling system. Page 22 7210 SAS-D Installation Guide 7210 SAS-D Overview Power Modules The 7210 SAS-D comes with an integrated AC or DC power supplies. 7210 SAS-D support two power supply options - universal AC and -48V DC. 7210 SAS-D ETR provides three option: universal AC, -48V DC and 24V DC. Additionally, 7210 SAS-D ETR supports and optional external backup power supply. 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64 bytes from 10.10.170.22: icmp_seq=4 ttl=251 time<1ms. 10.10.170.22 PING Statistics ---5 packets transmitted, 0.00% packet loss round-trip min < 1ms, avg < 1ms, max < 1ms, stddev < 1ms. A:SN12# Configure the primary-config in the BOF and save the config A:SN12# bof primary-config cfl:/config.txt *A:SN12# bof save Writing BOF to cfl:/bof.cfg Saving BOF ... Completed. A:SN12# admin save Writing file to cfl:/config.txt Saving configuration Completed. A:SN12# Copy the TIMOS image from the FTP server to the flash:/ 7210 SAS-D Installation Guide Page 67 Initializing the System and Downloading Software A:SN12# file copy ftp://:10.10.170.22:/images/both.tim cfl:/both.tim Copying file ftp://:10.10.170.22:/images/both.tim... 1 file copied. A:SN12# Configure the BOF to pick up the image from internal flash: A:SN12# bof primary-image cfl:/both.tim *A:SN12# bof save Writing BOF to cfl:/bof.cfg Saving BOF ... Completed. A:SN12# Reboot the SAS-D. The device will pick up both the image and the configuration from the internal flash. Page 68 7210 SAS-D Installation Guide Configuring the 7210 SAS-D Establishing Switch Connections Access your newly installed switch two ways: • "Console Connection" on page 69 • "Telnet Connection" on page 70 Console Connection To establish a console connection, you will need the following: • An ASCII terminal or a PC running terminal emulation software set to the parameters shown in the table below • The included RJ-45 serial cable Table 12: Console Configuration Parameter Values Parameter Value Baud Rate 115,200 Data Bits 8 Parity None Stop Bits 1 Flow Control None To establish a console connection: Step 1 Connect the terminal to the console port on the front panel using the serial cable. Step 2 Power on the terminal. Step 3 Establish the connection by pressing the Enter key a few times on your terminal keyboard. Step 4 At the router prompt, enter the login and password. The default login is admin. The default password is admin. 7210 SAS-D Installation Guide Page 69 Establishing Switch Connections Telnet Connection To access the switch after a successful initialization with a Telnet connection from a PC or a workstation, configure an in-band management interface using the Tmos CLI. You can configure an in-band management interface using the IES service configuration. Note that IES service is supported only for the in-band management interface. The following is a sample configuration for configuring an in-band management IP interface using IES service: A:DuL-A->config>service# info -----customer 1 create description "Default customer" exit ies 4001 customer 1 create interface "inband-mgmt" create address 10.10.10.25/10 sap 1/1/1.0.* create exit exit no shutdown exit Telnet access provides the same options for user and administrator access as those available through the console port. To configure the 7210 SAS-D for Telnet access, you must have a device with Telnet software located on the same network. The 7210 SAS-D must have a management IP interface configured with an IP address. Each 7210 SAS-D is limited to a total of seven inbound/outbound Telnet or SSH sessions to guarantee that either inbound or outbound sessions will be available. Page 70 7210 SAS-D Installation Guide Configuring the 7210 SAS-D MAC addresses are listed on a small label on the chassis. The MAC address also displays in the show router arp command output. The 7210 SAS-D must have a management IP address. The IP address is manually configured. Running Telnet Once the IP parameters are configured, you can access the CLI command line with a Telnet connection. To establish a Telnet connection, run a Telnet program and issue the Telnet command, followed by the IP address: The following displays an example of a Telnet login: C:\>telnet 10.10.10.25 Login: admin Password: ALA-1# 7210 SAS-D Installation Guide Page 71 Establishing Switch Connections Page 72 7210 SAS-D Installation Guide Troubleshooting This chapter describes troubleshooting methods and procedures and includes the following sections: • "Diagnosing Switch Indicators" on page 74 • "Power Problems" on page 75 • "Installation" on page 76 • "In-Band Access" on page 77 7210 SAS-D Installation Guide Page 73 Diagnosing Switch Indicators Diagnosing Switch Indicators This switch can be easily monitored through panel indicators to identify problems. Table 13 describes common problems you may encounter and possible solutions. Table 13: Troubleshooting Symptom Possible Cause Action Power LED is OFF Power outlet, power cord, or power module may be defective. Also, the switch may be in the OFF position. • If using a DC power supply module, check the connections between the switch and the external DC power supply. If using an AC power module, check connections between the switch, the power cord, and the wall outlet. • Contact your dealer for assistance. Sys LED is Off Boot-up diagnostic program has detected a problem. • Power cycle the switch to try and clear the condition. • If the condition does not clear, contact your local dealer for assistance. Sys LED is Amber System has raised an alarm • Take measures to clear the alarm. Example - if the temperature has exceeded the operating range threshold, power down the switch,until the temperature goes down. Link LED is Off Network cable or Ethernet device attached to this port may be defective. • Verify that the switch and attached device are powered on. • Be sure the cable is plugged into both the switch and corresponding device. • Verify that the proper cable type is used and its length does not exceed specified limits. • Check the adapter on the attached device and cable connections for possible defects. Replace the defective adapter or cable if necessary. Page 74 7210 SAS-D Installation Guide Troubleshooting Power Problems If the power indicator does not turn on when the power cord is plugged in, you may have a problem with your power outlet, power cord, or internal power supply. However, if the unit powers off after running for a while, check for loose power connections, power losses or surges at the power. 7210 SAS-D Installation Guide Page 75 Installation Installation Verify that all system components have been properly installed. If one or more components appear to be malfunctioning (such as the power cord or network cabling), test them in an alternate environment where you are sure that all the other components are functioning properly. Page 76 7210 SAS-D Installation Guide Troubleshooting In-Band Access You can access the management agent in the switch from anywhere within the attached network using Telnet or network management software tools. However, you must first configure the switch with a valid IP address, subnet mask, and default gateway. If you have trouble establishing a link to the management agent, check to see if you have a valid network connection. Then verify that you entered the correct IP address. Also, be sure the port through which you are connecting to the switch has not been disabled. If it has not been disabled, then check the network cabling that runs between your remote location and the switch. NOTE: The management agent can accept up to four simultaneous Telnet sessions. If the maximum number of sessions already exists, an additional Telnet connection will not be able to log into the system. 7210 SAS-D Installation Guide Page 77 In-Band Access Page 78 7210 SAS-D Installation Guide Appendix A: Specifications This appendix provides system specifications and includes the following sections: • "Specifications" on page 80 7210 SAS-D Installation Guide Page 79 Specifications Specifications 7210 SAS-D Platform The following specifications are for the 7210 SAS-D (non-ETR) chassis. Table 14: 7210 SAS-D Specifications Item Width Height Depth Physical dimensions Size 10.43" (26.5 cm) Weight 3 lbs. (1.36 kg) 1.69" (1.5RU) (4.28 cm) 6.89" (17.5 cm) Environmental Operating Temperature 0° C to 40° C (32° F to 104° F) (standard) IEC 68-2-14 Humidity 5% to 95% non-condensing Vibration IEC 68-2-36, IEC 68-2-6 Shock IEC 68-2-29 Drop IEC 68-2-32 Telcordia NEBS Design to meet NEBS level 3 Input Input voltage -36VDC ~ -72VDC, Output: +12VDC 100~240 V, 50~60 Hz, Output: +12VDC Maximum power consumption 30 W Safety, EMC and Immunity Safety Page 80 CSA/NRTL (UL60950-1, CSA 22.2.No 60950-1) TUV/GS (EN60950-1) CB (EN60950-1) 7210 SAS-D Installation Guide Appendix A: Specifications Table 14: 7210 SAS-D Specifications (Continued) Item Width Height EMC Europe CE Mark: EN55022 Class A EN 300 386 North America: FCC 47 CFR Part 15 Class A ICES-003 Class A (Canada) Japan: VCCI CISPR 22 Class A Australia/New-Zeeland: C-Tick, CISPR 22 Class A Immunity EN55024, EN/IEC 61000-4-2/3/4/6/8/11 7210 SAS-D Installation Guide Depth Page 81 Specifications 7210 SAS-D ETR Platform The following specifications are for the 7210 SAS-D ETR chassis. Table 15: 7210 SAS-D ETR Physical dimensions Item Width Height Depth Physical dimensions Size 10.5" (26.7 cm) Weight 3 lbs. (1.36 kg) 1.75" (1.5RU) (4.4 cm) 7.0" (17.8 cm) Environmental Operating Temperature -40° C to 65° C (-40° F to 149° F) (standard) IEC 68-2-14 Humidity 5% to 95% non-condensing Vibration IEC 68-2-36, IEC 68-2-6 Shock IEC 68-2-29 Drop IEC 68-2-32 Telcordia NEBS Design to meet NEBS level 3 Input Input voltage -36VDC ~ -72VDC, Output: +12VDC 100~240 V, 50~60 Hz, Output: +12VDC +20VDC ~ +28VDC, Output: +24VDC Dual input power redundancy, with current sharing and hot-swap. Maximum power consumption 30 W Safety, EMC and Immunity Safety Page 82 CSA/NRTL (UL60950-1, CSA 22.2.No 60950-1) TUV/GS (EN60950-1) CB (EN60950-1) 7210 SAS-D Installation Guide Appendix A: Specifications Table 15: 7210 SAS-D Specifications (Continued) Item Width Height EMC Europe CE Mark: EN55022 Class A EN 300 386 North America: FCC 47 CFR Part 15 Class A ICES-003 Class A (Canada) Japan: VCCI CISPR 22 Class A Australia/New-Zeeland: C-Tick, CISPR 22 Class A Immunity EN55024, EN/IEC 61000-4-2/3/4/6/8/11 7210 SAS-D Installation Guide Depth Page 83 Specifications Japan VCCI Class A Declaration This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions. RoHS and WEEE Comply with European RoHS and WEEE requirements. Comply with the Chinese RoHS legislations. Page 84 7210 SAS-D Installation Guide Appendix B: Console Connection This appendix provides port specifications about console port: • "Console Port Pin Assignment" on page 86 7210 SAS-D Installation Guide Page 85 Console Port Pin Assignment Console Port Pin Assignment The RJ-45 serial port on the front panel is used to connect to the switch for out-of-band console configuration. The on-board configuration program can be accessed from a terminal or a PC running a terminal emulation program. The pin assignments used to connect to the serial port are provided in Table 16. Table 16: Serial Cable Wiring Page 86 RJ45 Pin Usage RTS 1 Used as defined. Should be connected NC 2 Not used. Should not be connected TXD 3 Used as defined. Should be connected GND 4 Used as defined. Should be connected GND 5 Used as defined. Should be connected RXD 6 Used as defined. Should be connected NC 7 Not used. Should not be connected CTS 8 Used as defined. Should be connected 7210 SAS-D Installation Guide Appendix B: Console Connection 7210 SAS-D Installation Guide Page 87 Console Port Pin Assignment Page 88 7210 SAS-D Installation Guide Thank you for your participation! * Your assessment is very important for improving the workof artificial intelligence, which forms the content of this project