System Release 7.17
ASTRO® 25
INTEGRATED VOICE AND DATA

System Overview and Documentation

NOVEMBER 2016

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As defined by the WEEE directive, this cross-out trash bin label means that customers and end-users in EU countries should not dispose of electronic and electrical equipment or accessories in household waste.

Customers or end-users in EU countries should contact their local equipment supplier representative or service centre for information about the waste collection system in their country.

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Contact Us

Motorola Solutions Support Center

The Solutions Support Center (SSC) is the primary Motorola Solutions support contact. Call:

- Before any software reload.
- To confirm troubleshooting results and analysis before removing and replacing a Field Replaceable Unit (FRU) and Field Replaceable Entity (FRE) to repair the system.

For...	Phone
United States Calls	**800-221-7144**
International Calls	**302-444-9800**

North America Parts Organization

For assistance in ordering replacement parts or identifying a part number, contact the Motorola Solutions Parts organization. Your first response when troubleshooting your system is to call the Motorola SSC.

For...	Phone
Phone Orders	**800-422-4210** (US and Canada Orders) For help identifying an item or part number, select choice 3 from the menu.
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Document History

Version	Description	Date
MN003234A01-A	Original release of the *System Overview and Documentation* manual.	November 2016

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About ASTRO 7.17 System Overview and Documentation

This manual provides an overview of the ASTRO® 25 new system features, documentation set, technical illustrations, and system-level disaster recovery that support the ASTRO® 25 radio communication system. This manual is intended for use by system managers.

What Is Covered In This Manual?

This manual provides the following reference information:

- Descriptions of the ASTRO® 25 system features for release 7.17. See ASTRO 25 7.17 System Features on page 19.
- Descriptions of the ASTRO® 25 systems manuals and quick start guides. See ASTRO 25 7.17 System Customer Documentation on page 21 and ASTRO 25 7.17 System Setup Guides on page 34.
- A visual overview of the site and subsystem configurations for ASTRO® 25 systems. See ASTRO 25 7.17 System Diagrams on page 37.
- The system-level disaster recovery process. See System-Level Disaster Recovery on page 79.

Helpful Background Information

Motorola Solutions offers various courses designed to assist in learning about the system. For information, go to http://www.motorolasolutions.com/training to view the current course offerings and technology paths.

Related Information

See the following document for associated information about the ASTRO® system.

Related Information	Purpose
Standards and Guidelines for Communication Sites (6881089E50)	Provides standards and guidelines to follow when setting up a Motorola communications site. Also known as the *R56* manual. This manual may be purchased on CD 9880384V83 by calling the North America Parts Organization at 800-422-4210 (or the international number: 302-444-9842).

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Chapter 1

ASTRO 25 7.17 System Features

This chapter provides a description of the features introduced in the ASTRO® 25 7.17 system.

1.1

Optional Feature Descriptions for the ASTRO 25 7.17 System

The ASTRO® 25 7.17 system release heralds new features into the Motorola P25 radio communication system. These features are add-ons to the standard 7.17 radio communication system.

Resiliency

Edge Availability with Wireline Console, which provides a fallback mode with wireline dispatch and “site to site” communications for a trunking subsystem when links to the zone core are unavailable.

Fleet Management

- User Login Alias Update, which allows for updates to log in aliases in the system.
- Over-The-Air Software Update to APX Radios on ASTRO 25 IV&D Trunking (L/M Cores), which allows a system administrator to change APX firmware and codeplug over the ASTRO® 25 talkgroup.
- KMF Web Based Thin Client on ASTRO® 25 IV&D (K/L/M Cores), which provides a new client for the Key Management Facility (KMF) utilizing a web interface. New features include a status dashboard and historical reporting.

Location Services

- Location on Push-To-Talk (PTT) on ASTRO® 25 Trunking IV&D (L/M Cores), which provides radio location updates to a customer mapping application with every voice transmission in addition to normal cadence location updates sent over the data channel.
- Interference Locator on ASTRO 25 Trunking (L/M Cores) with Simulcast
- Enhanced Geo Select on ASTRO 25 IV&D (K/L/M Cores), which allows for immediate operation upon crossing a Geo Fence with new entry/exit actions supported. Geo Select functionality is integrated into the Intelligent Middleware API allowing integration for third-party location vendors.

ASTRO 25 Applications

APX Personnel Accountability on ASTRO® 25 IV&D Trunking (L/M Cores), which provides integrated personnel accountability of each responder at an incident scene using the two-way portable radio. Each responder who has a radio which is operating on the incident scene talkgroup is instantly accounted for on an application used by the incident commander. The accountability feature integrated into the portable radio requires no additional s actions from the responder in order for their accountability information to be made available to the incident commander. The accountability function is available on any P25 radio operating on the P25 trunked radio system.

1.2
Standard Enhancement Descriptions for the ASTRO 25 7.17 System

The ASTRO® 25 7.17 system release heralds new features into the Motorola Solutions P25 radio communication system. These features are enhancements to the standard 7.17 radio communication system.

System Capacity Increases

The following capacity increases are available for the ASTRO 7.17 system:

- Active Data Users: The data user capacity shifts from 20,000/zone and 40,000/system to 48,000/zone, 48,000/system.
- Expanded Voice Radio Users: The voice radio user capacity increases from 64,000 IDs/zone and 128,000 IDs/system to 150,000 IDs/zone and 250,000 IDs/system.
- Configured Radio Users IDs Capacity for M3 Cores increases to 150,000 per zone and 250,000 per system.
- The console operator capacity for M3 Cores increases to 500.

1.3
Additional Updates for the ASTRO 25 7.17 System

The ASTRO® 25 7.17 system release offers the following updates.

Upgrades from ASTRO 25 Releases 7.15 and 7.16 to Release 7.17

ASTRO® 25 Release 7.17 includes upgrade support from Release 7.15 and 7.16.

System Upgrade Agreement (SUA) and SUA II Lifecycle subscriptions provide complete upgrade coverage that includes ASTRO® 25 release software, third-party software and security updates, certified hardware, and implementation costs associated with a system upgrade.

Information Assurance Updates

ASTRO® 25 Release 7.17 provides updates to the system infrastructure to include the most current information assurance standards.

Chapter 2

ASTRO 25 7.17 System Release Documentation

This chapter provides a high-level description of customer documentation associated with the ASTRO® 25 7.17 system release.

2.1 Documentation Updates and Ordering

ASTRO® 25 system documentation is provided in electronic format at the time the system is commissioned.

The latest versions of these manuals can be downloaded from the Motorola Online Web site. A user account and password are required for access.

2.2 ASTRO 25 7.17 System Customer Documentation

The following table provides an alphabetical listing and describes the manuals in an ASTRO® 25 7.17 system release. The Graphical User Interface (GUI) is part of this system documentation media and provides links to this documentation based on system configurations and features. The GUI also provides a search functionality to locate content across the manuals provided.

NOTICE: The Motorola Solutions ASTRO® 25 system manuals listed here do not provide information specific to your system implementation. Contact your system administrator for information specific to your system.

Table 1: ASTRO 25 System Documentation

Manual	Description
802.1x Service Ports on Switches	Provides information relating to the implementation and management of 802.1x standards to authenticate service users at designated Ethernet ports on HP switches and on the internal switch of GCP 8000 site controllers and GPB 8000 Reference Distribution Modules (RDMs), in an ASTRO® 25 system. This manual provides the device/port-level information.
Affiliation Display	Includes information and procedures on the use of the Affiliation Display software application to monitor the location and talkgroup affiliations of subscribers as they move within the coverage zone of an ASTRO® 25 IV&D system.
APX 7000L Data over Broadband Feature Guide	Provides Motorola Solutions-specific architecture and implementation processes for the APX 7000L LTE Data feature for ASTRO® 25 systems.
ASTRO 25 Express Standalone Infrastructure	Provides an introduction to the ASTRO® 25 Express System Infrastructure with GTR 8000 Expandable Site Subsystem, and includes information for installing, configuring, and maintaining the site.

Table continued…

Manual	Description
Repeater Site Infrastructure Setup Guide	Covers the implementation and management of an ASTRO® 25 system repeater site from a subsystem perspective.
Repeater Site with HPD Overlay	Provides information on the installation, configuration, and management of an ASTRO® 25 repeater site with HPD Overlay from the site perspective.
ASTRO 25 vCenter Application Setup and Operations Guide	Provides a description of the VMware vCenter application used to provide VMware fault tolerance and VMware high availability for virtual machines and includes process and procedures to support setup and operations for the VMware vCenter application in an ASTRO® 25 system.
ATIA Log Viewer	Includes information and procedures on the use of the ATIA Log Viewer software application to view the log files that the Air Traffic Router (ATR) and ZoneWatch applications generate. These files contain records of all recent zone activity, such as site registrations and calls processed on the ASTRO® 25 IV&D system.
Authentication Services	Provides information relating to the implementation and management of the Active Directory (AD) service, Remote Authentication Dial-In User Service (RADIUS), and Domain Name Service (DNS) in ASTRO® 25 systems.
Backup and Restore Services	Provides information relating to the implementation and management of a backup service for supported devices in an ASTRO® 25 system. This manual addresses server and client functions required for these services, and provides information relating to the implementation and replacement of the Network Attached Storage (NAS) hardware/software component.
CAI Data Encryption Module (CDEM) User Guide	Describes data encryption services provided by the CDEM for ASTRO® 25 Conventional IV&D applications. The CAI Data Encryption Module (CDEM) is an optional component of the Conventional IV&D feature. It is located with the Conventional IV&D PDG.
Call Processing and Mobility Management	Describes at depth the behavior of various ASTRO® 25 system infrastructure components and subscriber radios as they process calls and manage subscriber mobility.
Centralized Event Logging	Provides information relating to the implementation and management of the Centralized Event Logging feature available for ASTRO® 25 systems This feature enables the capture of operating system events generated by most devices in an ASTRO® 25 system. This manual includes information about the server function and the client function required for the feature.
Channel Partitioning	Describes the implementation and management of channel partitioning on an ASTRO® 25 IV&D system.
Configuration Manager for Conventional Systems User Guide	Covers the use of the Configuration Manager application to set Conventional System parameters for consoles, channels, and user objects.

Table continued…

Manual	Description
Configuration Manager for Trunking Systems User Guide	Covers the use of the Configuration Manager application to set Express Trunking System parameters for subscriber radios, subscriber radio users, and talkgroups configuration objects.
Console Site Bandwidth Management	Describes the bandwidth management feature associated with operating MCC 7500 consoles in an ASTRO® 25 IV&D system. The feature ensures efficient use of resources and transport of services in your system such as voice calls and data service.
Console Sites	Describes the implementation and management of MCC console sites in an ASTRO® 25 IV&D system from a site-level perspective.
L and M Core Conventional Architecture Engineer Guide	Identifies and describes the Centralized Conventional Architectures and Distributed Conventional Architecture supported by a Zone Core in an ASTRO® 25 radio communication system designed to support trunking and/or conventional channel resources.
Conventional Data Services	Provides descriptive and procedural content relating to the ASTRO® 25 Conventional data feature which includes a description of the feature, a description of the role of the components supporting this feature, a description of how conventional data call processing is implemented, and how data messages are processed. Additional information provided includes procedures for installation, configuration, operation, and troubleshooting.
Conventional Operations	Provides information regarding conventional channel resource operating characteristics in standalone systems or ASTRO® 25 radio communication systems with K Series, L Series, or M Series.
K Core Conventional Architecture Engineer Guide	Provides a description of the K Core system architecture supporting the Conventional Hub Sites and Conventional Base Radio Sites in ASTRO® 25 Conventional and Integrated Data systems.
Cooperative WAN Routing	Covers the installation and management of the Cooperative WAN Routing (CWR) solution which allows core and exit routers to interface directly with site and interzone links through a patch panel installed at the ASTRO® 25 IV&D system master site.
Core Security Management Server	Provides information relating to implementation and management of Core Security Management Server or CSMS. The CSMS hosts network security software components in an ASTRO® 25 IV&D system which include client and server functions supporting RADIUS authentication for remote access. This manual also includes information about managing system-wide anti-malware, anti-virus, and anti-spyware protection along with information associated with the firewall manager user interface hosted on the CSMS.

Table continued…

Manual	Description
Dispatch Console Backward Compatibility Reference Guide	Provides a list of console features supported by various ASTRO® 25 system releases. While the backward compatibility feature makes it possible to use an MCC 7500 Dispatch Console or MCC 7100 IP Dispatch Console in a system release before the system release in which the console was introduced, the features available for a backward compatible console can be limited to those features identified in this manual.
Dynamic Dual Mode for TDMA Operation Feature Guide	Provides information describing the Dynamic Dual Mode (DDM) architecture and the TDMA (Time Division Multiple Access) technology used ASTRO® 25 systems. This information includes the use of APCO 25 Phase 2 TDMA.
Dynamic Reports	Covers the use of the Dynamic Reports software application to display usage trends and patterns of activity for effective monitoring and reporting of ASTRO® 25 IV&D system performance.
Dynamic System Resilience	Provides information necessary to understand, operate, maintain, and troubleshoot the Dynamic System Resilience (DSR) feature which may be implemented on your ASTRO® 25 system. This feature adds a geographically separate backup zone core to an existing zone core to protect against catastrophic zone core failures.
Dynamic Transcoder User Guide	Provides procedures for implementing and managing a Windows-based dynamic transcoder virtual machine hosted on an ESXi-based virtual server. The dynamic transcoder implements a feature called dynamic transcoding, which allows talkgroup calls and unit-to-unit (private) calls to communicate between TDMA channels and FDMA channels at different sites.
Edge Availability with Wireline Console Feature Guide for Trunking Subsystems	Provides an overview of the Edge Availability with Wireline Console feature which supports the Trunking subsystem (Tsub) architecture in M core ASTRO® 25 systems. It also includes setup and management instructions for the Tsub. The Tsub provides dispatch and mobility services within a local area when normal system-wide area communication is not possible.
Encrypted Integrated Data Feature Guide	Provides information necessary to understand, install, configure, operate, maintain, and troubleshoot the Encrypted Integrated Data feature. This feature enables encryption of data calls between ASTRO® 25 subscriber units and data applications such as text messaging services that reside in the Customer Enterprise Network (CEN).
Enhanced Telephone Interconnect Feature Guide	Provides information describing the Enhanced Telephone Interconnect solution employing equipment supporting Voice-over-IP (VoIP) to allow individual subscriber units the ability to access the Public Switched Telephone Network (PSTN).
Fault Management Toolkit Developer Guide	Provides toolkit users with procedures, restrictions, and requirements for enabling Unified Event Manager to discover elements not supported by default in UEM.

Table continued…

Manual	Description
Fault Management Reference Guide	Provides a system-level perspective of fault management, troubleshooting, and preventive maintenance methodologies applicable to the ASTRO® 25 IV&D system.
FortiNet Firewall	Provides information relating to the implementation and replacement of the firewall appliances that Motorola Solutions provides, including a firewall in the DeMilitarized Zone (DMZ) between the ASTRO® 25 radio network infrastructure and a customer enterprise network (or the Motorola Solutions Support Center); a firewall in the ISSI.1 Network Gateway between the ASTRO® 25 system and the ISSI.1 peer system, and a Telephony Firewall in the Enhanced Telephone Interconnect subsystem. These firewalls include the following Juniper models: SSG5, SSG140, and SSG520M. See the *Zone Core Protection* manual for details about the SSG1000 and SSG2000 firewalls used for that feature.
FortiNet Firewall Manager	Provides information relating to the implementation of server software and user interface software supporting firewall management in an ASTRO® 25 IV&D system.
Fleetmapping and Band Plan Management	Describes the methodologies used to configure radio users and groups on an ASTRO® 25 IV&D system with the goal of optimizing system resources and provides an overall perspective of the system to assist with fleetmapping decisions. Also covers frequency band plan organization and management in the context of an ASTRO® 25 IV&D system.
Flexible Site and InterZone Links	Describes the Flexible Site and InterZone Links feature (also referred to as Ethernet links) that provides alternate connectivity options for linking zones and sites in a Motorola Solutions ASTRO® 25 system.
G-Series Equipment System Release Configuration Setup Guide	Provides information and procedures to downgrade the software of G-series equipment (GTR 8000, GCM 8000, and GCP 8000) to meet the operating characteristic of your ASTRO® 25 system release.
G-Series RF Site Devices LED Status Reference Guide	Provides light-emitting diode (LED) status for G-series products.
GCM 8000 Comparator	Covers the installation, configuration, and management of the GCM 8000 Comparator that supports voting, multicast, and simulcast operations.
GCP 8000 Site Controller	Describes the installation, configuration, and management of the GCP 8000 Site Controller used in ASTRO® 25 circuit and IP simulcast prime sites, repeater sites, HPD sites, and conventional sites.
Generic Application Server	Covers information required to implement, maintain, and replace Generic Application Server hardware, which is based on the Sun Netra platform and is used to host the virtual server ISSI.1 Network Gateway.
Generic MIB Devices and Objects Reference Guide	Contains a list of SDM3000 RTU devices that support the Generic Management Information Base (MIB) interface for

Table continued…

Manual	Description
	fault monitoring and managing, with respective objects and values for these devices.
GGM 8000 with IP Link Converter (IPLC) Functionality User Guide	Provides an overview of the IP Link Converter (IPLC) feature and describes how to cable, configure, and troubleshoot a GGM 8000 with IPLC functionality.
Glossary	Contains a collection of the explanations of words that express technical, or other uncommon words.
GPW 8000 Receiver	Provides information required to install, configure, and maintain the GPW 8000 Receiver that provides inbound coverage for subscriber radios that use the system. This manual includes information to install and configure the standalone GPB 8000 Reference Distribution Module (RDM) and Expansion Hub (XHub) components supporting the GPW 8000 (Trunking) Receiver. Each GPB 8000 RDM provides integrated Ethernet LAN switching and integrated site reference distribution to the GPW 8000 Receivers. The XHub component allows an RDM to support more GPW 8000 Receivers.
Group Data Gateway Feature Guide	Provides the installation, configuration, and operation procedures for the Group Data Gateway feature that supports distributing new subscriber firmware and language packs over the air by using a TDMA data channel for APX subscribers without interrupting the system functionality.
GTR 8000 Base Radio	Provides information required to install, configure, and maintain the GTR 8000 Base Radio, which provides the RF interface for voice, data, and control traffic transmissions between the infrastructure equipment and subscriber radios that use the system.
GTR 8000 Expandable Site Subsystem	Includes information about the GTR 8000 Expandable Site Subsystem (containing base radio, site controller, XHub, and RDM components) which provides the RF interface for voice, data, and control traffic transmissions between the infrastructure equipment and subscriber radios that use the system.
Historical Reports	Covers the use of the Historical Reports software application to generate reports that show system-wide and zone-level historical data for an ASTRO® 25 IV&D system.
HPD GTR 8000 Site Subsystem	Contains information required to install, configure, and manage the GTR 8000 Site Subsystem which provides the RF link between the site controller and the subscriber radios that use an HPD ASTRO® 25 system.
HPD Packet Data Resource Management	Describes how packet data transmissions are managed in the context of the High Performance Data (HPD) feature in an ASTRO® 25 system.
HPD Overlay System Infrastructure	Covers the implementation and management of HPD Overlay System from a high-level site perspective.
HPD Remote Site Infrastructure	Includes site-level information required to implement and manage an ASTRO® 25 HPD remote site. This type of site

Table continued…

Manual	Description
	provides RF coverage for subscriber units that use the High Performance Data (HPD) service.
HPD Standalone Master Site	Provides site-level implementation and management information relevant to the HPD standalone master site.
HPD Standalone System Infrastructure	Includes high-level information required to implement and manage an ASTRO® 25 HPD standalone system. This type of site provides RF coverage for subscriber units that use the High Performance Data (HPD) service.
Information Assurance Features Overview	Provides an overview of Information Assurance features for ASTRO® 25 systems, including a description of each feature and the impact of the feature on system implementation and management. Also provides information about services available from Motorola Solutions that is related to Information Assurance, and physical security considerations for the ASTRO® 25 system.
InfoVista User Guide	Covers the use of the optional InfoVista application to analyze the performance of the transport network on an ASTRO® 25 system.
Interference Locator Feature Guide	Contains details on the installation, configuration, and operation of the Interference Locator feature that provides the ability to detect, analyze, and locate an interfering RF signal located in a single simulcast site, gathering data from multiple subsites in ASTRO® 25 systems.
IP Packet Capture Feature Guide	Provides a comprehensive guide to the IP Packet Capture application, which captures transactions between network elements and collects performance statistics for the Virtual Management Servers (VMS) in the ASTRO® 25 system.
ISSI.1 Network Gateway Feature Guide	Includes information required to understand, install, manage, and troubleshoot an ISSI.1 Network Gateway Site, an interconnectivity solution for P25 ISSI.1 compatible systems.
ISSI 8000/CSSI 8000 Intersystem Gateway Feature Guide	Provides information associated with the ISSI 8000/CSSI 8000 feature in an ASTRO® 25 system. This manual includes information to install, configure, manage, and troubleshoot the Intersystem Gateway (ISGW) server application supporting the ISSI 8000/CSSI 8000 feature, which provides an enhanced interconnectivity solution for P25 compatible systems and third-party consoles to interface with the ASTRO® 25 system.
Key Management Facility User Guide	Provides descriptive and procedural information about the Key Management Facility (KMF) including a description of where the KMF can be found, a description of KMF encryption key management, as well as procedures on installation, configuration, operation, troubleshooting, and FRU/FRE replacement.
KMF CryptR User Guide	Provides information required to install, configure, and operate the CryptR2 unit connected to the host computer for the Key Management Facility (KMF) application. This KMF

Table continued…

Manual	Description
	CryptR unit replaces the internal Crypto Module used in previous KMF releases.
Kryptos User Guide	Provides information required to install, configure, and operate the CryptR2 unit connected to the host computer for the Key Management Facility (KMF) application. This KMF CryptR unit replaces the internal Crypto Module used in previous KMF releases.
KVL 4000 Advanced SECURENET User Guide	Provides step-by-step instructions for using the Key Variable Loader (KVL) to create and store encryption keys, and then load them into other Motorola Solutions secure equipment, such as radios, fixed encryption units, digital interface units (DIUs), and others. This manual describes the Advanced SECURENET operating mode.
KVL 4000 ASTRO 25 User Guide	Provides step-by-step instructions for using the Key Variable Loader (KVL) to create and store encryption keys, and then load them into other Motorola Solutions secure equipment, such as radios, fixed encryption units, digital interface units (DIUs), and others. This manual describes the ASTRO® 25 mode of operation.
KVL 4000 FLASHport Upgrade User Guide	Provides step-by-step instructions for upgrading the Key Variable Loader (KVL) (FLASHport). It also provides information for upgrading crypto modules of radios and other target units.
KVL 4000 Radio Authentication User Guide	Provides information associated with the use of the KVL 4000 for Radio Authentication.
License Manager	Provides information about the use of licenses to gain access to features and functions in the ASTRO® 25 system. It describes the installation of the software License Manager in the system and explains how to use the web-based License Manager user interface (UI) to load, view, and manage software licenses in the system.
Link Encryption and Authentication	Provides information relating to the implementation and management of the Router Encryption feature and Router Authentication features on ASTRO® 25 IV&D systems. Router Encryption provides a way to encrypt links between routers that traverse an untrusted network. The Router Authentication feature enables peer routers in an ASTRO® system to use pre-shared keys to authenticate messages they receive as part of the OSPF, BGP, and PIM-SIM routing protocols. This manual includes information about the encryption modules required to implement these features as well as configuration sequences that minimize downtime when adding these features to an existing system.
MAC Port Lockdown	Provides information relating to the implementation and management of MAC Port Lockdown for standard Ethernet ports on Hewlett-Packard® switches, and on the internal switch of GCP 8000 site controllers and GPB 8000 Reference Distribution Modules (RDMs), in an ASTRO® 25 system. Also provides information required for supplemental Ethernet port se-

Table continued…

Manual	Description
	curity, including the implementation of fiber optic ports on Hewlett-Packard® switches.
Master Site Infrastructure Set-up Guide	Covers site-level information required to install and maintain equipment at the ASTRO® 25 IV&D system master site.
MCC 7100 Instant Recall Recorder	Provides a setup and user guide for the MCC 7100 IP Dispatch Console (software only) feature. This manual provides a description of the MCC 7100 IP Dispatch Console position which can be installed on a personal computer client machine and it provides a description of the MCC 7100 software-based dispatch console position along with the requirements and considerations necessary for implementing this feature in an ASTRO® 25 system.
MCC 7100 IP Dispatch Console Setup and User Guide	Provides a setup and user guide for the MCC 7100 IP Dispatch Console (software only) feature. This manual provides a description of the MCC 7100 IP Dispatch Console position which can be installed on a personal computer client machine, and it provides a description of the MCC 7100 software-based dispatch console position along with the requirements and considerations necessary for implementing this feature in an ASTRO® 25 system.
MCC 7500 Dispatch Console with Voice Processor Module	Describes site-level characteristics of VPM-based Console Dispatch sites including theory of operation, installation, and configuration for hardware and software, operation, maintenance, and troubleshooting information.
MCC 7500/7100 Elite Admin User's Guide	Provides administrators with information required to configure and administer the MCC 7500 Elite Dispatch software application to enable communication paths between dispatch console operators and radio system resources.
MCC 7500/7100 Elite Dispatch User's Guide	Provides user guide information intended for dispatch console operators. This manual describes how to use the MCC 7500 Elite Dispatch software application.
MKM 7000 Console Alias Manager	Provides information required to install, configure, and operate the MKM 7000 Console Alias Manager (CAM) solution for generating and managing aliases at the console site level.
MLC 8000 Comparator Feature Guide	Provides information required to install, configure, manage, and operate the MLC 8000 hardware device which is used as an analog conventional comparator/voter (for analog IP simulcast and non-simulcast voting) and as a subsite link converter. The MLC 8000 facilitates conventional mixed mode conventional channels.
MLC 8000 Configuration Tool User Guide	Provides information about software used for configuration, analog voting display, and analog voting control for the MLC 8000 device, which is used as an analog conventional comparator/voter for analog IP-based simulcast and non-simulcast voting, and as a subsite link converter for conventional analog, digital, and mixed mode channels.
Mobile VPN Gateway	Provides a description of the Motorola Solutions Mobile VPN Gateway hardware and software platform and includes infor-

Table continued…

Manual	Description
	mation necessary to set up this server in a secure applications network.
MOSCAD Network Fault Management Feature Guide	Provides information required to install, configure, manage, and use the MOSCAD® Network Fault Management (NFM), an optional ASTRO® 25 IV&D solution that provides tools to configure, monitor, and control auxiliary system devices (such as tower lights, power, and environmental equipment) in communication sites.
Network Time Protocol Server	Provides information about the installation, configuration, and management of components that comprises the TRAK 9100 Network Time Protocol (NTP) server, an option supplied with the Simulcast Site Reference (SSR) that serves a time synchronization function for clients in an Ethernet network.
Packet Data Gateways	Covers the installation, configuration, and management of the IV&D Packet Data Gateway (PDG) and its components, namely the Packet Data Router (PDR), and the Radio Network Gateway (RNG).
PDEG Encryption Unit	Provides information on the PDEG Encryption Unit hardware, which is a component of the Encrypted Integrated Data (EID) feature and is located within the Customer Enterprise Network (CEN). The EID feature provides data encryption services for dedicated ASTRO® 25 Trunked Integrated Voice and Data applications between the CEN and subscriber radios.
Performance Management	Provides a high-level perspective of the tools and methodologies that can be used to manage the overall performance of an ASTRO® 25 IV&D system.
Private Network Management Client	Describes how to install, configure, and manage the Private Network Management client, a PC workstation which system administrators and technicians use for various system-related tasks such as viewing equipment operational status, monitoring network utilization and performance, or viewing alarms generated by system equipment.
Private Network Management Servers	Provides information on the installation, configuration, and management of the Private Network Management (PNM) servers, namely, Air Traffic Router (ATR), Unified Event Manager (UEM), Zone Database Server (ZDS), System Statistical Server (SSS), and Zone Statistical Server (ZSS).
Provisioning Manager	Provides a description of the Provisioning Manager server application. Includes information to tailor this application for system use and contains information to provision your ASTRO® 25 radio communication system with various system-level, user-level, and device-level configuration parameters required for proper system operation. This manual also includes reference and troubleshooting information to ensure efficient and effective use of this application.
Provisioning Manager Interface Developer and User Guide	Provides an operational description of the ASTRO® 25 Provisioning Manager Interface, and contains information to support development of applications designed to import and/or

Table continued…

Manual	Description
	export subscriber configuration data into and out of the Provisioning Manager application using an API (Application Programming Interface) and/or CSV (Comma-Separated Value) files. The API provides third-party solution vendors (such as Asset Management solutions, CAD, and fleetmapping) with the ability to integrate their applications with Provisioning Manager to keep information across systems in sync. With the Provisioning Manager Interface, data can be imported and/or exported in the form of spreadsheets that can be modified with common-off-the-shelf software applications.
Radio Authentication	Provides information to support customers who purchased radio authentication as part of the ASTRO® 25 system. This manual provides a description of the feature, a description of the hardware and software supporting this feature, as well as installation and configuration processes, operation procedures, troubleshooting, and maintenance information.
Radio Control Manager	Includes information and procedures on the use of the Radio Control Manager (RCM) application to monitor radio events, issue and monitor commands, and make informational queries of system status.
Radio Control Manager Reports	Provides a high-level description of the Radio Control Manager (RCM) Report features and the function it serves on your system.
Radio Features	Includes the information and procedures required to configure subscribers to operate on the ASTRO® 25 IV&D system.
RF Site Ethernet Ports and Speeds Reference Guide	Lists the supported data transfer speeds for Ethernet ports in the RF site devices.
Secure Communications Feature Guide	Provides descriptive information about the Secure Communications features found in an ASTRO® 25 Trunked and Conventional Integrated Voice and Data and ASTRO® 25 Conventional and Integrated Data systems. This manual is intended for use by technicians and system operators as a resource for understanding secure communications in ASTRO® systems. The manual should be used with the ASTRO® 25 system documentation and *Key Management Facility* manual.
Securing Protocols with SSH	Provides information relating to the implementation and management of the Secure SHell (SSH) protocol for secure transmission of data between devices in an ASTRO® 25 system. Includes configuration sequences that minimize downtime when adding this feature to a system that is already in operation.
Service Access Architecture	Provides information relating to the implementation of a secure connection between a service technician laptop and the ASTRO® 25 IV&D system. Examples of access scenarios are also provided.
Simulcast Site Reference	Provides information relating to the implementation and management of components for the Simulcast Site Reference

Table continued…

Manual	Description
	(SSR) and Global Navigation Satellite System (GNSS) receiver that provides the required time reference for simulcast subsystems in ASTRO® 25 systems.
Simulcast Subsystem with HPD Overlay	Covers the installation, configuration, and management of an ASTRO® 25 Simulcast Subsystem, with HPD Overlay from the site perspective.
SmartX Site Converter Feature Guide	Describes the interface between SmartZone®, OmniLink, and SMARTNET® 3600 systems and the ASTRO® 25 system. Includes descriptions of system configurations, theory of operation, installation, configuration, operation, maintenance, troubleshooting, and hardware replacement for the Voice Processor Module (VPM) hardware when used as a site converter.
SNMPv3	Provides information relating to the implementation and management of the SNMPv3 protocol in an ASTRO® 25 IV&D system. Simple Network Management Protocol (SNMP) is a set of protocols used for managing complex networks.
Software Download Manager	Covers the use of the Software Download Manager (SWDL) application to download firmware to site equipment individually or via download to all site devices as part of a single operation. This document also supports ASTRO® Express single-site trunking.
Summit Depot Service Manual VHF	Provides service-level documentation for summit-based equipment.
Summit Depot UHF R2 & R1 Service Manual	Provides service-level documentation for summit-based equipment.
System Overview and Documentation	Provides an overview of the ASTRO® 25 new system features, documentation set, technical illustrations, and system-level disaster recovery that support the ASTRO® 25 7.17 radio communication system.
GGM 8000 System Gateway	Provides information relating to the installation, configuration, and management of the GGM 8000 Gateway as used at in various network locations.
System LAN Switches	Provides use of Hewlett-Packard® (HP) switches in ASTRO® 25 systems, including LAN switches and backhaul switches. In addition to common procedures for installation, configuration, operation, and troubleshooting of the switches, this manual provides information for specific ASTRO® 25 system sites and features that HP switches can support.
S6000 and S2500 Routers	Provides information relating to the installation, configuration, and management of the S6000 and S2500 routers as used in various network locations.
Terminal Servers LX Series	Covers installation, configuration, and management of the InReach® 8000 (LX-4000S) series Terminal Server which supports a network management connection to servers and network transport equipment in the zone.

Table continued…

Manual	Description
Trunked Data Services Feature Guide	Describes the implementation and use of data services on ASTRO® 25 systems, specific to the Classic Data (IV&D) and Enhanced Data functionality, and the High Availability for Trunked IV&D and HPD feature.
Trunked IP Simulcast Subsystem Infrastructure	Covers the implementation and management of ASTRO® 25 trunked system IP simulcast prime and remote sites from a subsystem perspective. This type of subsystem employs GTR 8000 Base Radios or the GTR 8000 Expandable Site Subsystem.
Trunked IP Simulcast Subsystem Prime Site	Covers the installation, configuration, and management of an ASTRO® 25 trunked system IP simulcast prime site employing the GCP 8000 Site Controller and GCM 8000 Comparator.
Trunked IP Simulcast Subsystem Remote Site	Covers the installation, configuration, and management of an ASTRO® 25 trunked system IP simulcast remote site employing GTR 8000 Base Radios or the GTR 8000 Expandable Site Subsystem.
UEM/GMC Transition Setup Guide	Provides an introduction to a transition from Unified Event Manager (UEM) and MOSCAD Network Fault Management (NFM) software to a centralized and integrated management solution.
Unified Event Manager	Covers the use of Unified Event Manager (UEM), the application that provides reliable fault management services for devices in the ASTRO® 25 IV&D radio system.
Unified Network Configurator	Covers the use of Unified Network Configurator (UNC), a sophisticated network configuration tool that provides controlled and validated configuration management for system devices including routers, LAN switches, site controllers, and base radios, and is used to set up sites for the ASTRO® 25 IV&D system. UNC has two components: VoyenceControl and Unified Network Configurator Wizards (UNCW).
Unix Supplemental Configuration	Provides additional procedures that an organization may require for Solaris™-based and Linux-based devices, including procedures for configuring password aging, and welcome banners.
Virtual Management Server Hardware	Provides information for implementing, maintaining, and replacing common Hewlett-Packard® hardware for servers in an ASTRO® 25 system.
Virtual Management Server Software	Provides procedures for implementing and managing VMware ESXi-based virtual server hosts on the common Hewlett-Packard® hardware platform in an ASTRO® 25 system. Includes common procedures for virtual machines/virtual appliances on the virtual server host.
Voice Processor Module	Describes the hardware that serves as the foundation for the Voice Processor Module (VPM) used in MCC 7500 console subsystem, the SmartX Site Converter at remote sites, and the Telephone Media Gateway (TMG) in the zone core for the Enhanced Telephone Interconnect subsystem. Includes

Table continued…

Manual	Description
	descriptions, theory of operation, installation, and configuration for hardware and software, operation, maintenance, troubleshooting, and component replacement.
Vote Scan Feature Guide	Introduces the subscriber vote scan feature and describes how it can be implemented for use on ASTRO® Conventional multicast systems. The intended audiences for this document include system managers who want to familiarize themselves with the vote scan feature, and system technicians and administrators who implement or administer this feature on an ASTRO® Conventional System. This guide assumes that the user has a thorough understanding of ASTRO® Conventional Systems concepts and topologies, and is experienced implementing and/or configuring such systems.
Windows PC Recovery for K System	Provides instructions for restoring various Windows®-based components used in a system with a K core, and lists common errors to avoid.
Windows Supplemental Configuration Setup Guide	Provides additional procedures that must be performed on all Windows®-based devices in an ASTRO® 25 system, and additional procedures that are performed only for specific Windows®-based devices.
Zone Controller	Covers the zone controller, a key component of the ASTRO® 25 system master site. Includes information on the installation, configuration, and management of this software application.
Zone Core Protection Infrastructure	Provides information relating to the implementation and management of the Zone Core Protection (ZCP) feature available for ASTRO® 25 IV&D systems. ZCP is an optional configuration of hardware and software components for supporting network security at the zone core (master site). ZCP-specific components covered in this manual include ZCP firewalls, Mediation LAN switches, and a Motorola Solutions-supplied intrusion detection solution.
ZoneWatch	Covers the use of the ZoneWatch software application to monitor call processing resource assignments at sites in an ASTRO® 25 IV&D system.

2.3 ASTRO 25 7.17 System Setup Guides

The following table describes the customer documentation reference guides provided to guide the installation of hardware in an ASTRO® 25 system release.

Table 2: ASTRO® 25 System Customer Documentation Setup Guides

Title	Description
ASTRO 25 Express Setup Guide	Provides basic installation, configuration, and optimization content to support initial setup of the essential equipment in the ASTRO® 25 Express system.

Table continued…

Title	Description
ASTRO 25 Express Upgrade Setup Guide	Documents the overall strategy and process for upgrading an ASTRO® 25 Express System.
CSS Getting Started Guide	Provides Instructions for CSS installation and setup.
K Core Setup Guide	Provides basic installation, configuration, and optimization content to support initial setup of the essential equipment at the K core for the ASTRO® 25 Conventional & Integrated Data system.
K Core Remote Site Setup Guide	Provides basic installation, configuration, and optimization content to support initial setup of the essential equipment at the remote sites in an ASTRO® 25 Conventional & Integrated Data system.
K Core Upgrade Setup Guide	Outlines and summarizes the overall strategy and process for upgrading an ASTRO® 25 K core system.
KVL 4000 Setup Guide	Provides basic information on the use of the KVL 4000.
L Core Setup Guide	Provides basic installation, configuration, and optimization content to support initial setup of the essential equipment at the zone core of an ASTRO® 25 L Core Express system.
L Remote Site Setup Guide	Lists setup, test, and verification activities for the essential equipment at the remote site of an ASTRO® 25 L Core Express system.
MCC 7500 Dispatch Console/AIS with VPM Setup Guide	Describes the process and procedures needed to install and configure the MCC 7500 Dispatch Console and the MCC 7500 Archiving Interface Server.
MLC 8000 Setup Guide	Provides site-level information and sequences for implementing the MLC 8000 device which is used as an analog conventional comparator/voter for analog IP-based simulcast and non-simulcast voting, and as a subsite link converter for conventional analog, digital, and mixed mode channels.
Conventional QUANTAR Replacement Guide	Provides instructions for replacing conventional QUANTAR® stations with conventional analog, digital, and mixed mode GTR 8000 base radios. Also provides detailed comparisons of the devices.

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Chapter 3

ASTRO 25 7.17 System Diagrams

This chapter provides a visual overview of site and subsystem configurations for ASTRO® 25 systems.

NOTICE:
The system diagrams included here do not provide details on the many possibilities for RF site topologies in ASTRO® 25 systems. For detailed information on trunked RF sites, see the site manuals listed in the previous chapter. For examples of conventional site topologies and an overview of conventional devices and documentation, see the *Conventional Operations* manual.

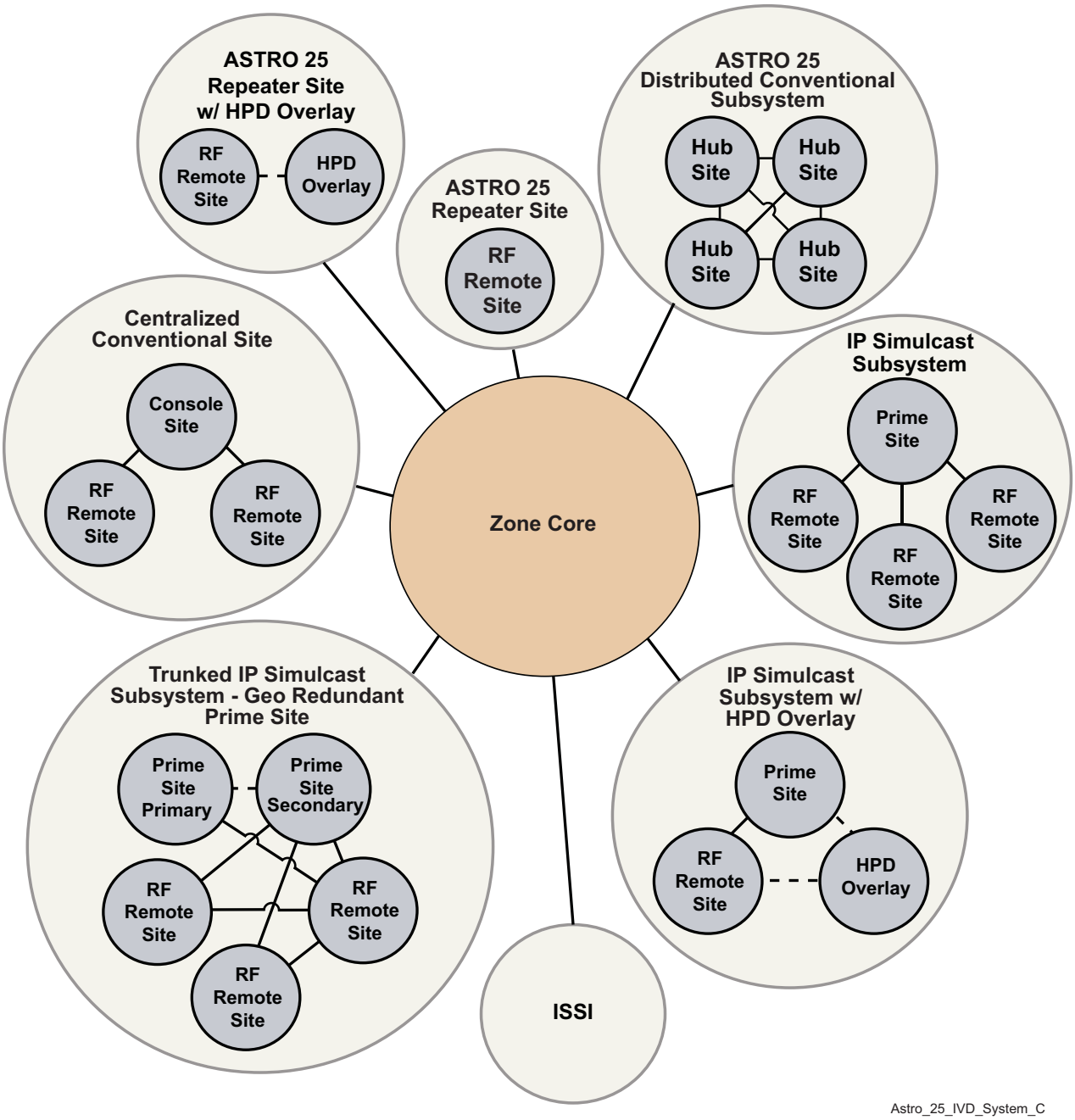
These diagrams do not show the TRAK Network Time Protocol server at core sites. Details are available in the *Network Time Protocol Server* manual.

3.1 ASTRO 25 7.17 System Diagrams Overview

The following pages provide a visual overview of the following system, site, and subsystem configurations for the 7.17 release of the ASTRO® 25 systems and ASTRO® 25 High Performance Data (HPD) systems.

NOTICE: System diagrams included in this document show T1/E1 links between sites and zones. An optional flexible site and InterZone links feature facilitates Ethernet backbone link implementation between select site types and between zones. For more information, see the *Flexible Site and InterZone Links* manual in this documentation set. Also, see the *Dynamic System Resilience Feature Guide* manual for advanced illustrations and additional configurations if your system has this feature.

Figure 1: ASTRO 25 Integrated Voice and Data Trunked System



3.2

ASTRO 25 7.17 L-Series System Diagrams

Figure 2: ASTRO 25 – Single Zone Small Scale Non-Redundant Zone Core (L1)

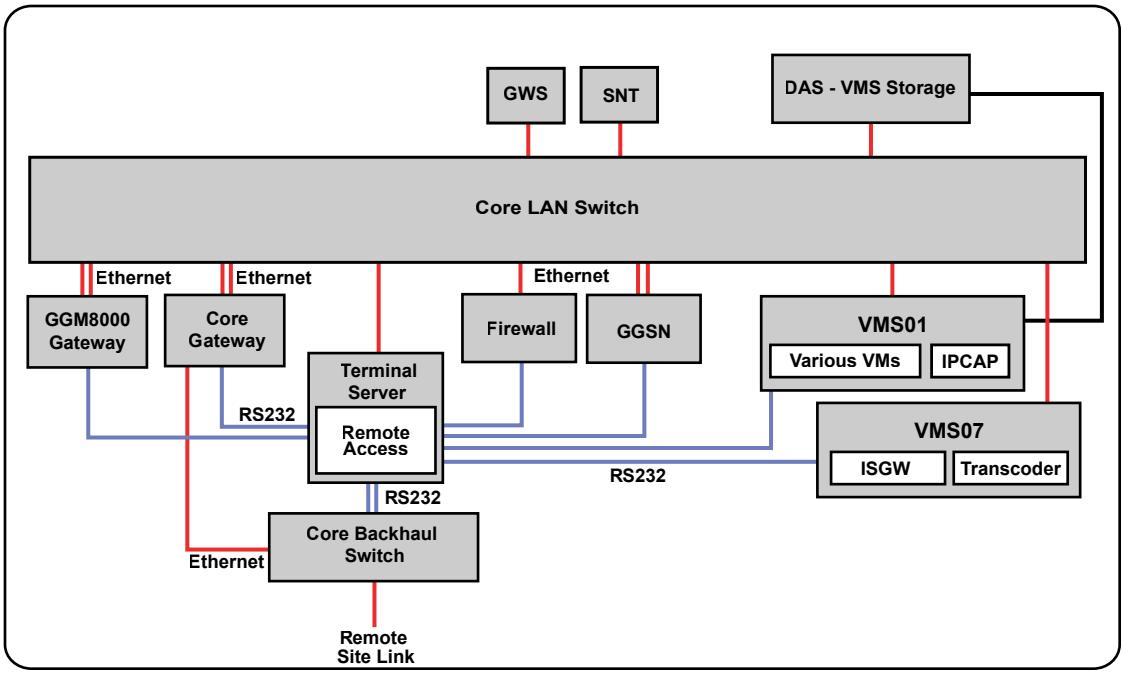


Figure 3: ASTRO 25 – Single Zone Small Scale Redundant Zone Core (L2)

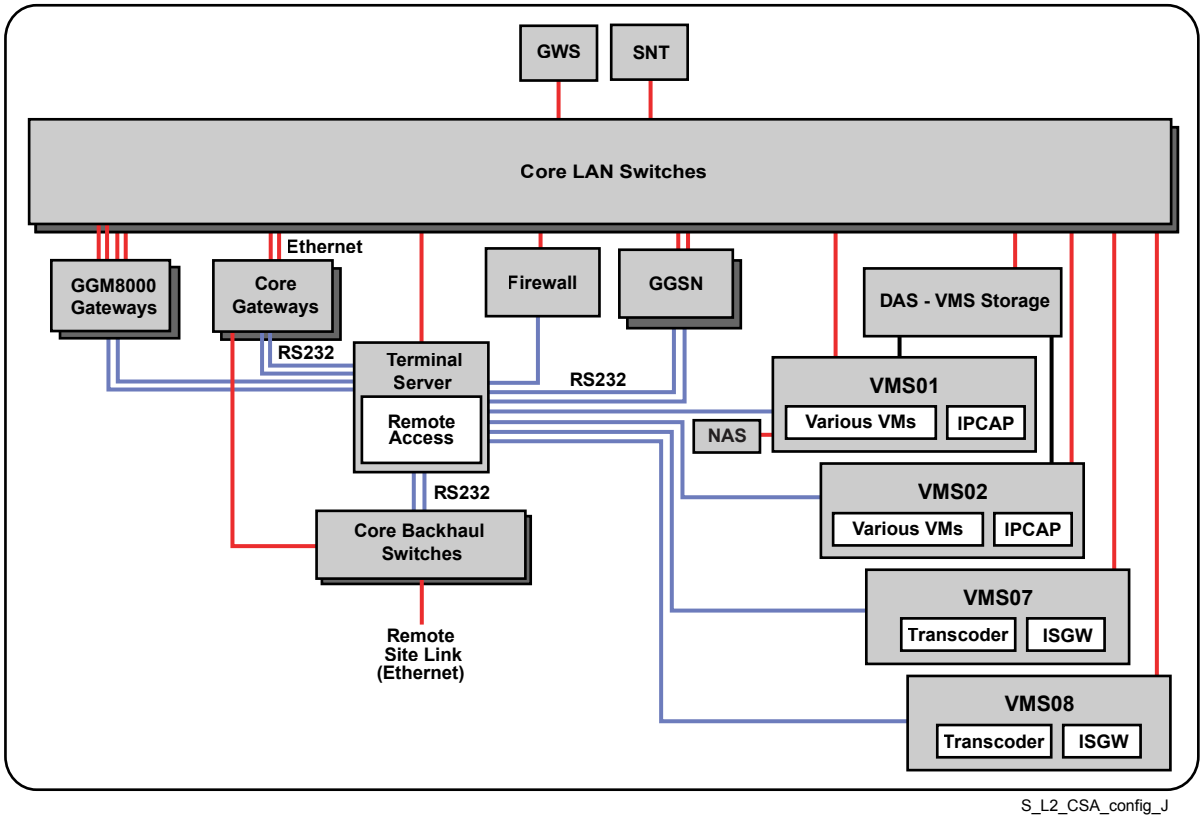
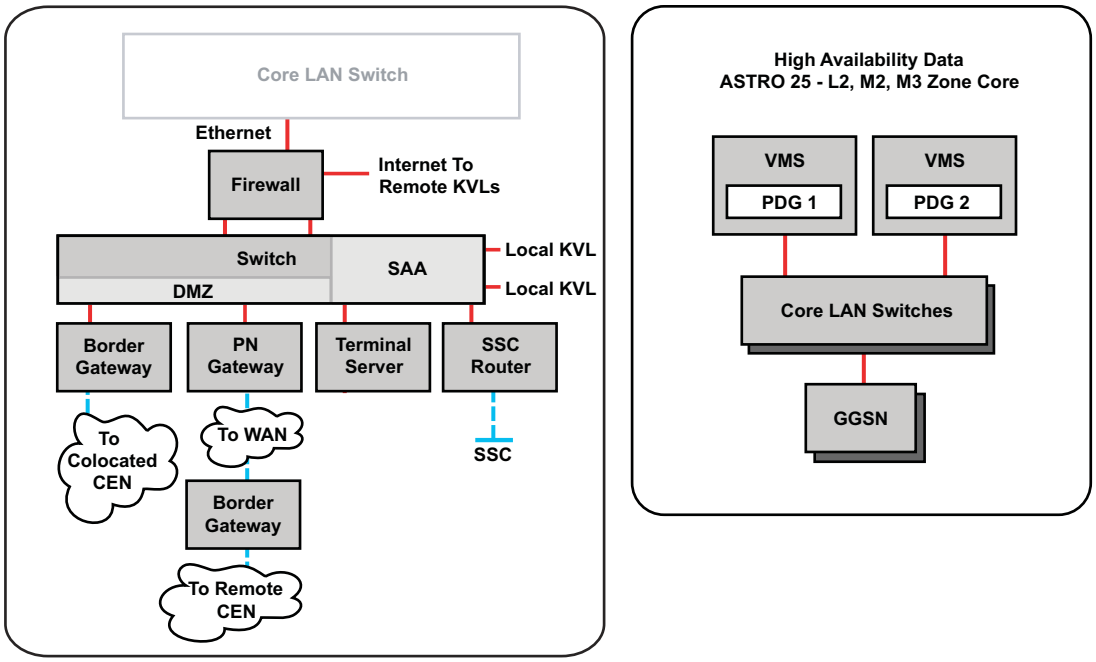


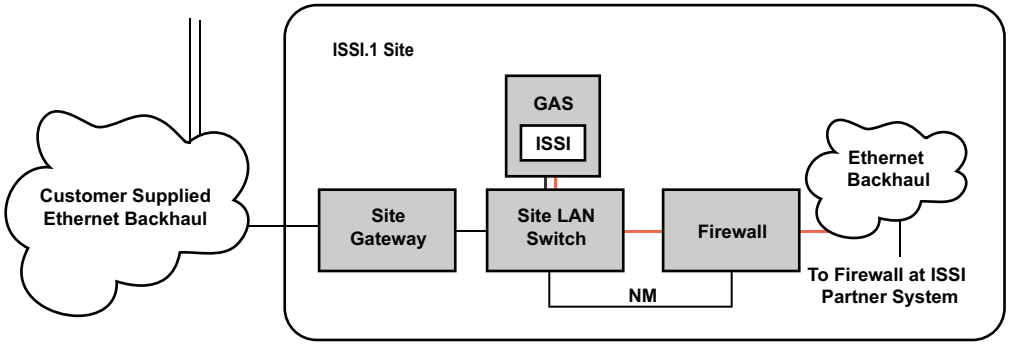
Figure 4: Zone Core (L1/L2) Options



S_L_Core_Zone_Core_Options_A

3.3 ASTRO 25 7.17 ISSI.1 System Diagram

Figure 5: ISSI.1 Gateway (L1/L2) Option

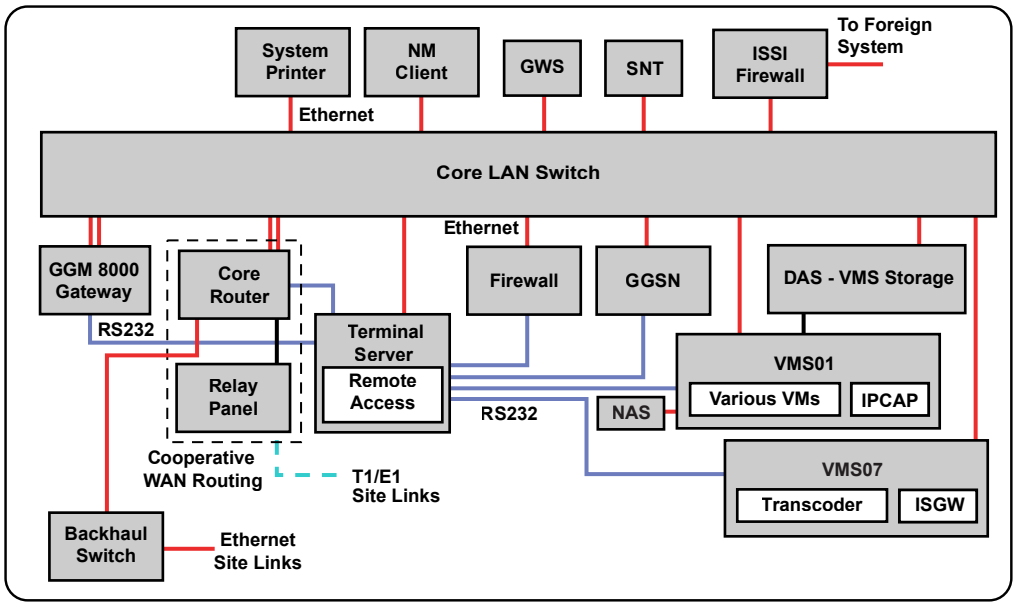


S_ISSI_GW_L_System_Option_A

3.4

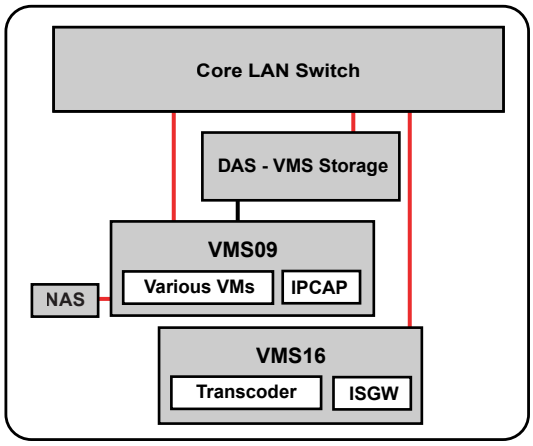
ASTRO 25 7.17 M-Series System Diagrams

Figure 6: Single Zone Non-Redundant Zone Core (M1)



S_A717_M1_Core_config_A

Figure 7: Backup Zone Core (M1)



S_A717_M1_Backup_Core_config_A

Figure 8: Single Zone Redundant Zone Core (M2)

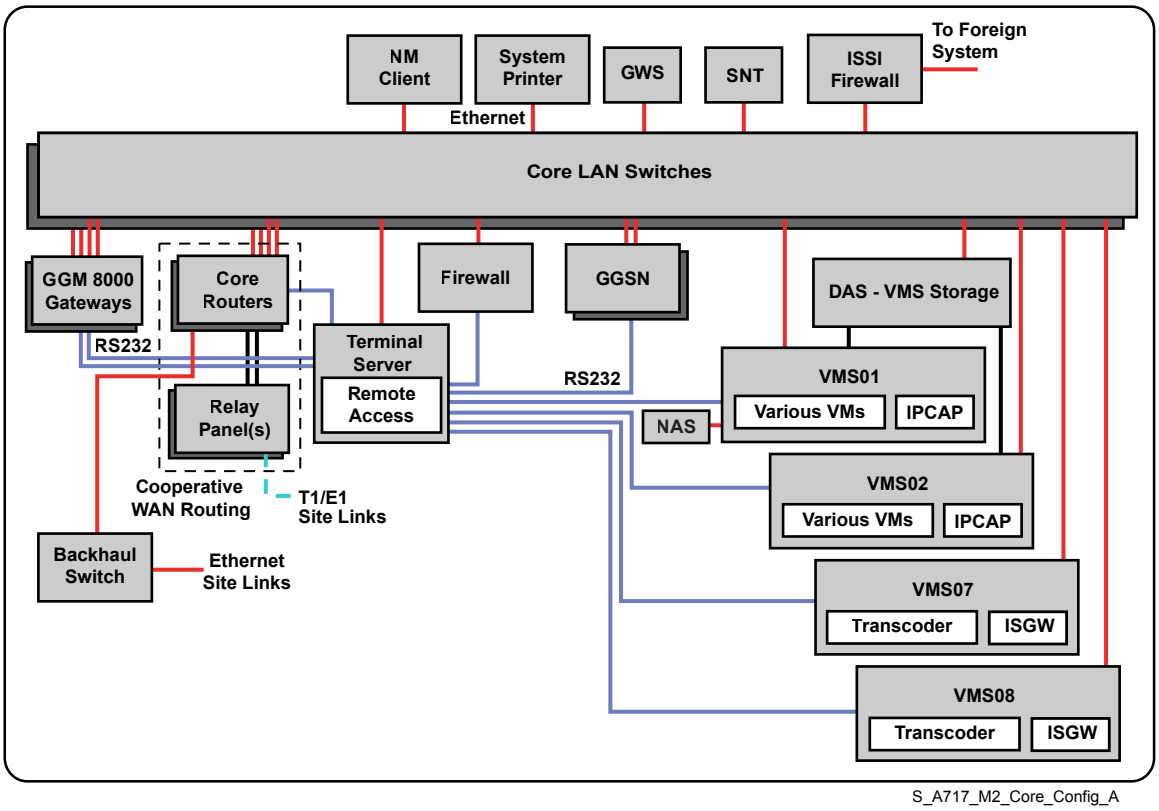
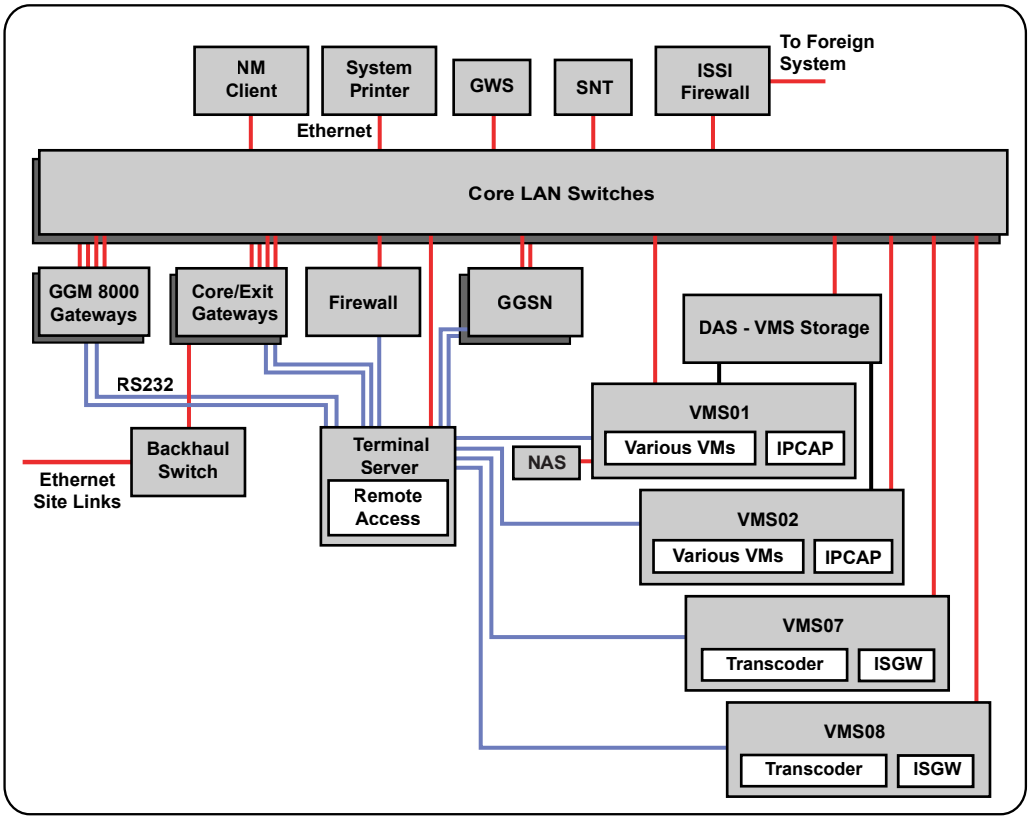
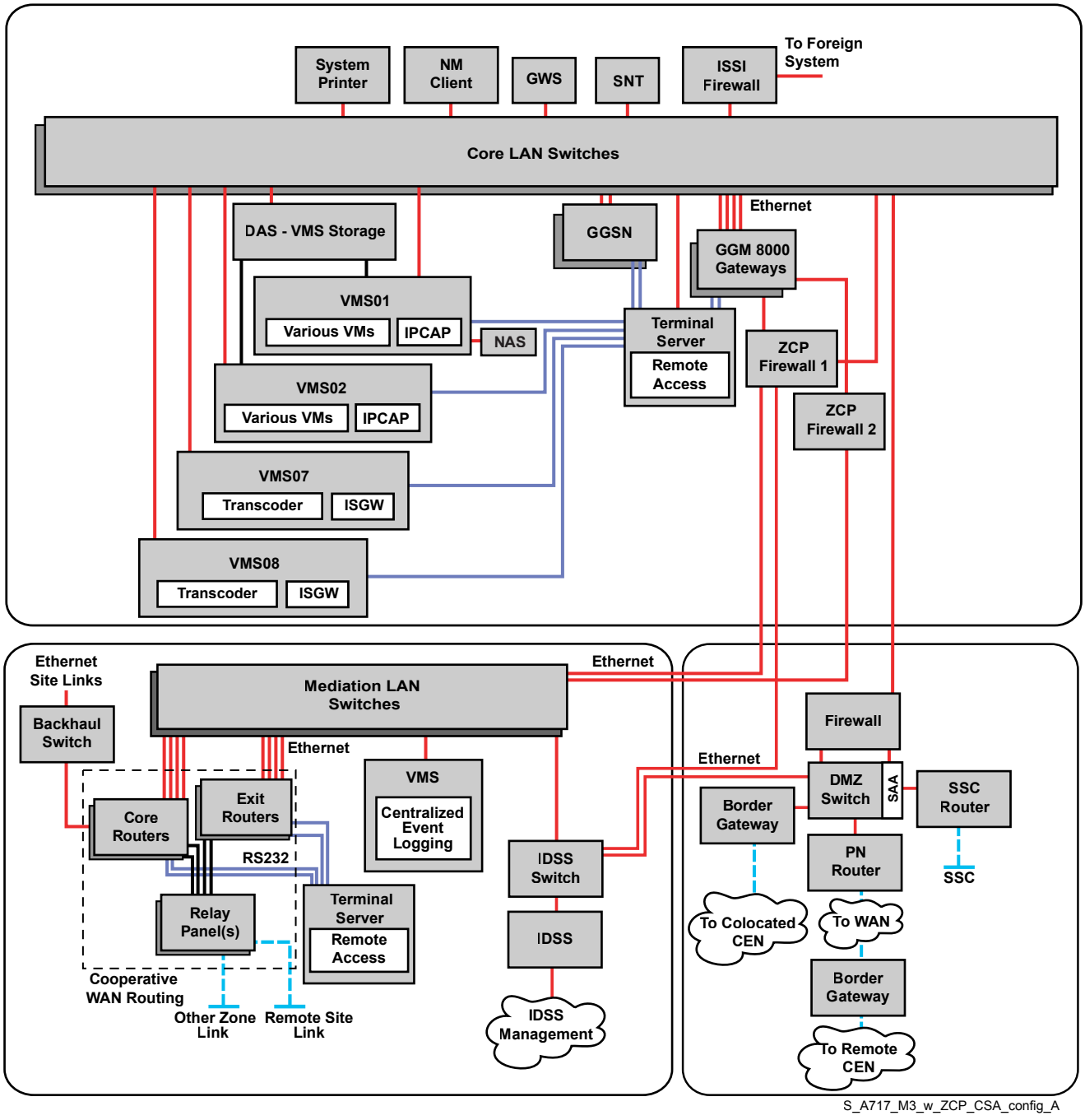


Figure 9: Multi-Zone Capable Zone Core (M3)



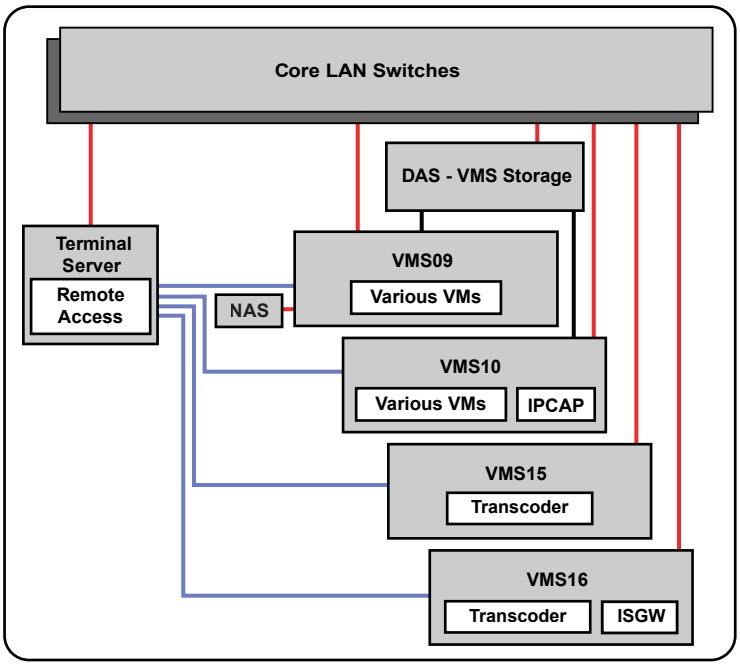
S_A717_M3_Primary_System_Zone_Core_Config_A

Figure 10: Multi-Zone Capable Zone Core (M3) with ZCP and HPD



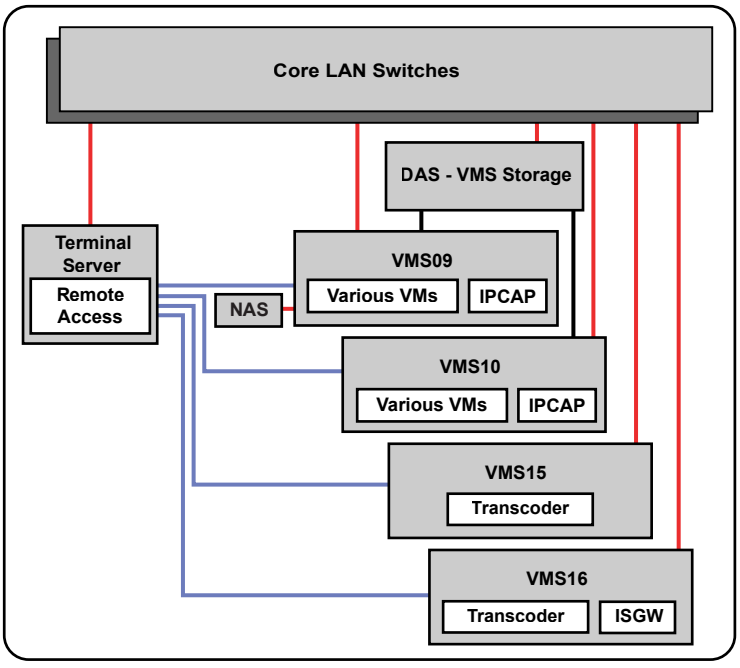
S_A717_M3_w_ZCP_CSA_config_A

Figure 11: Backup Zone Core (M3)



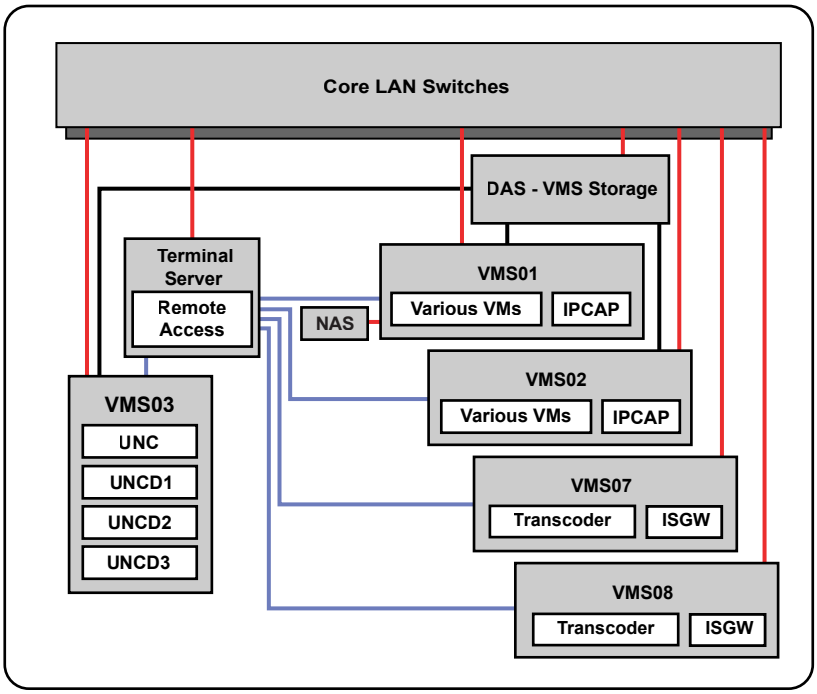
S_A717_M3_Backup_Core_B

Figure 12: Backup Add-On Zone Core (M3)



S_A717_M3_Backup_Add_on_Core_B

Figure 13: High Capacity UNC Zone Core (M3 Option)



S_A717_M3_HC_UNC_Option_A

3.5

ASTRO 25 7.17 Dynamic System Resilience System Diagrams

Figure 14: Multi-Zone Capable System with DSR/Non-DSR Zone Cores

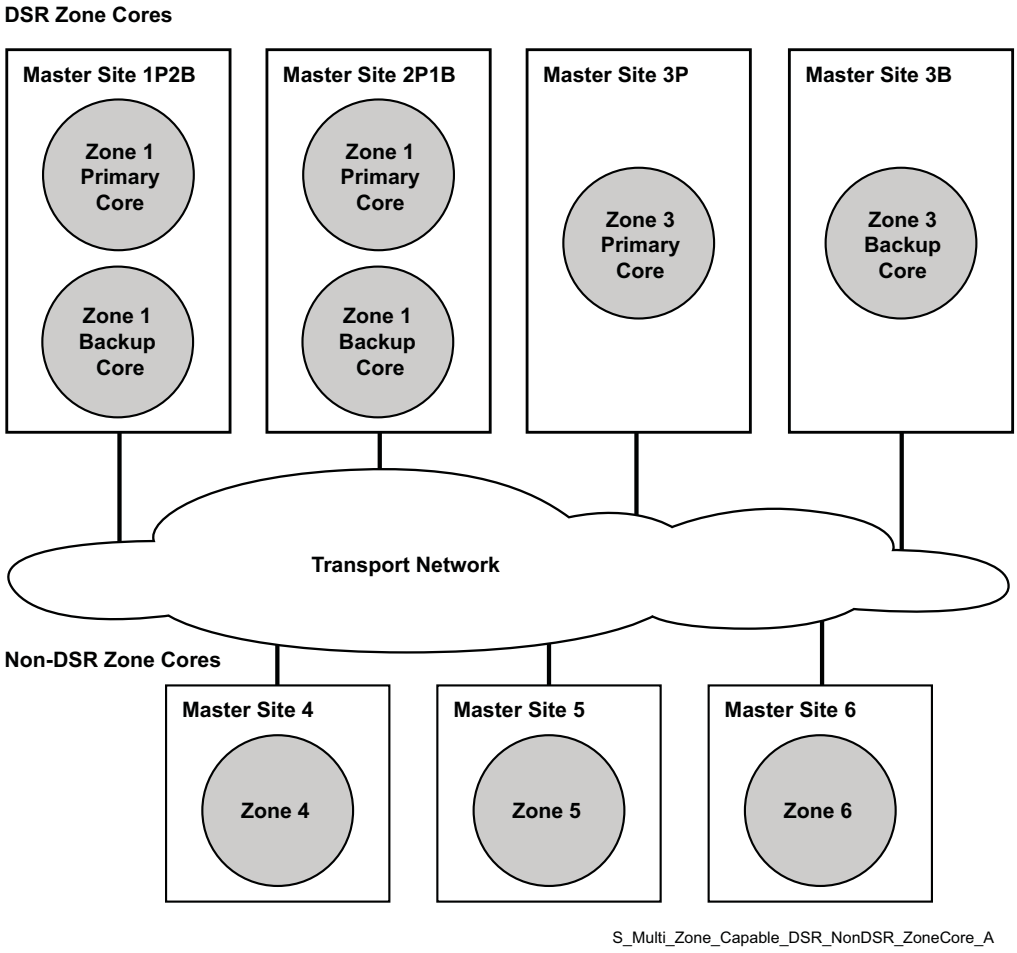


Figure 15: Dynamic System Resilience with Single Zone Non-Redundant

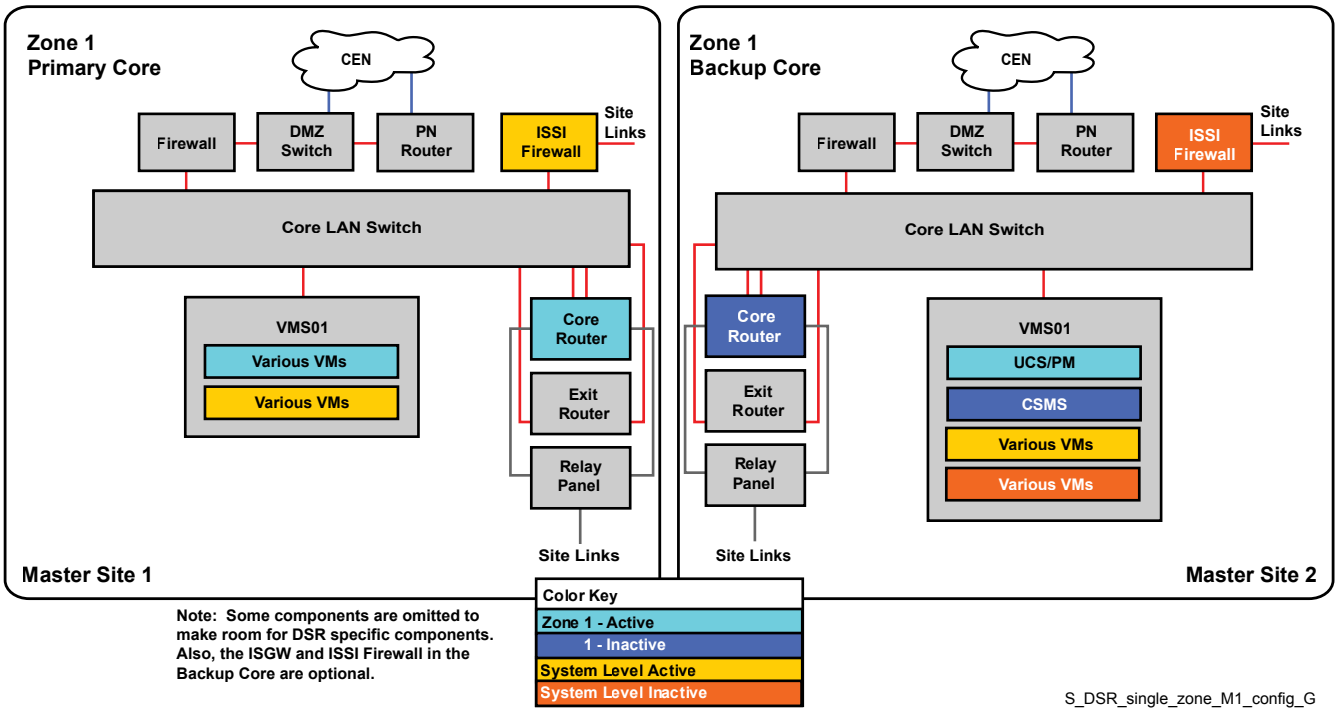


Figure 16: Dynamic System Resilience with Single Zone Redundant

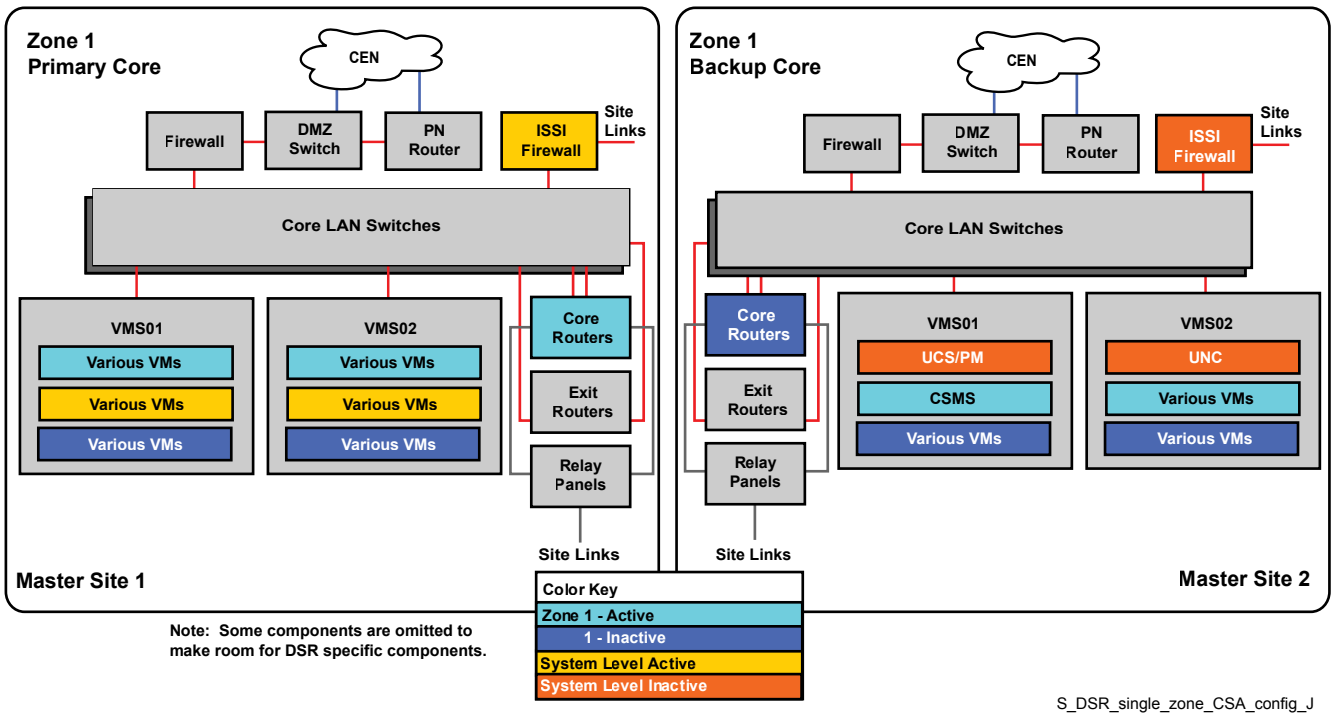
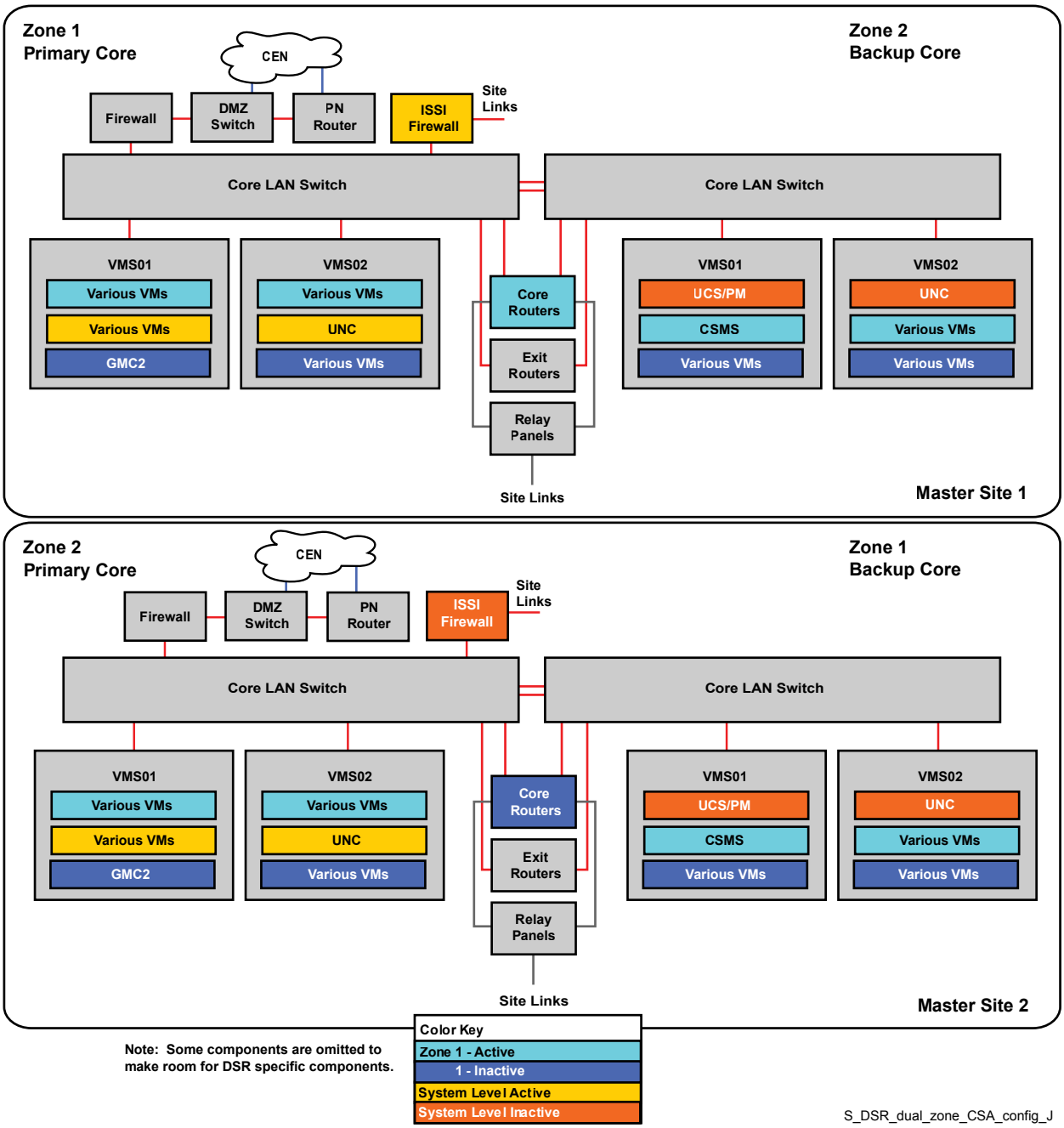


Figure 17: Dynamic System Resilience with Dual Zone



3.6

ASTRO 25 7.17 Options System Diagrams

Figure 18: Zone Core (M1/M2/M3) Options

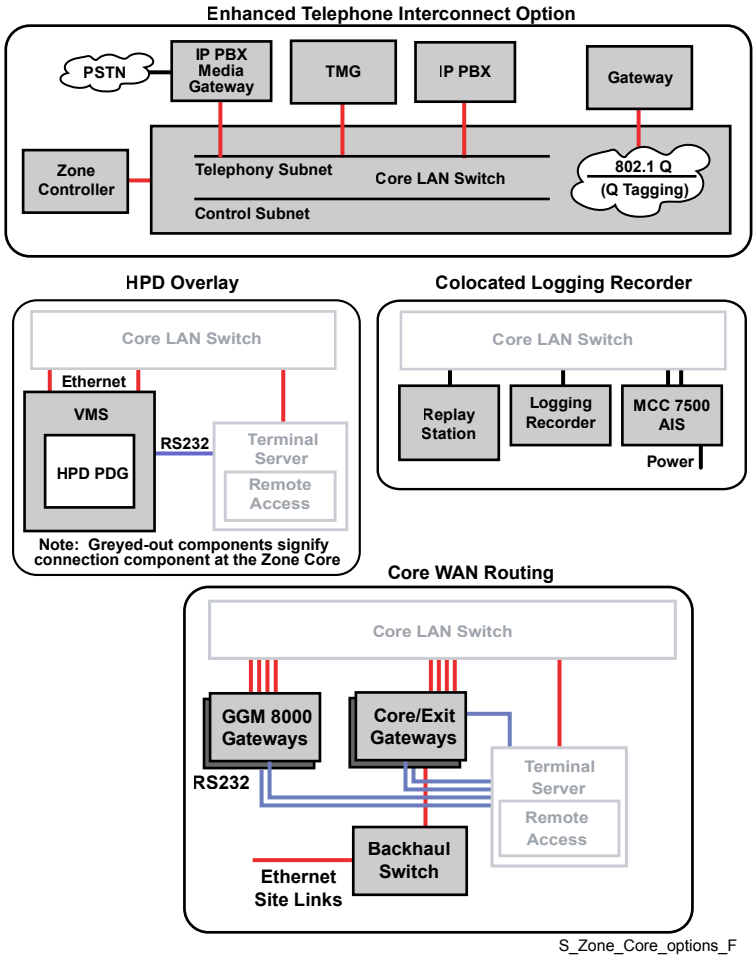
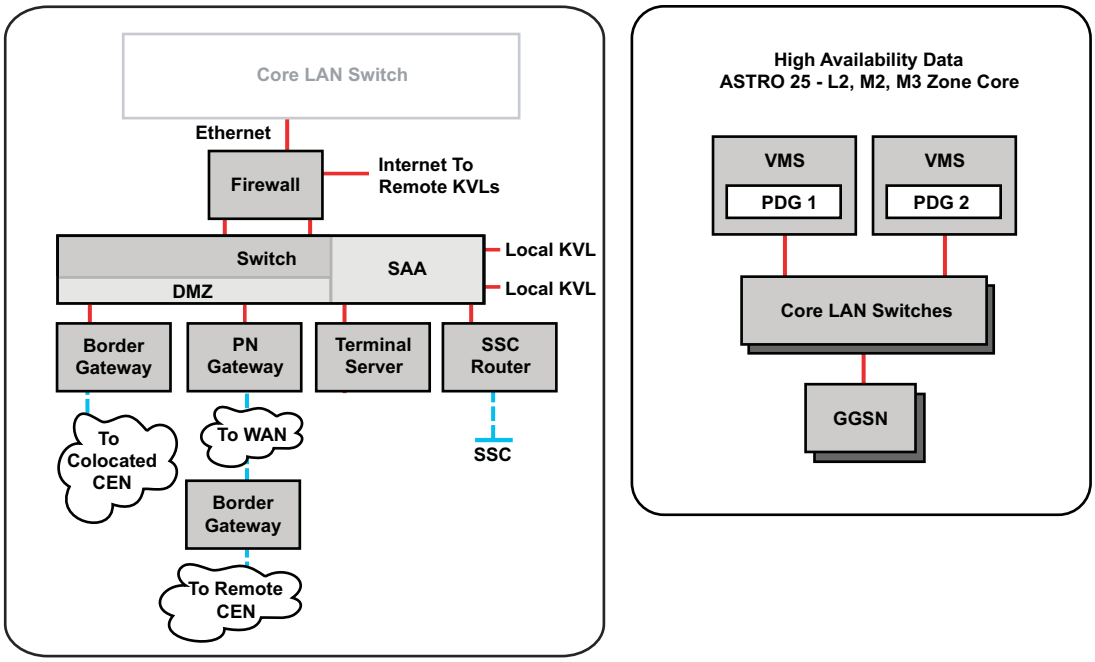


Figure 19: Zone Core Options



S_L_Core_Zone_Core_Options_A

Figure 20: Hybrid Site Links without DSR (M2/M3)

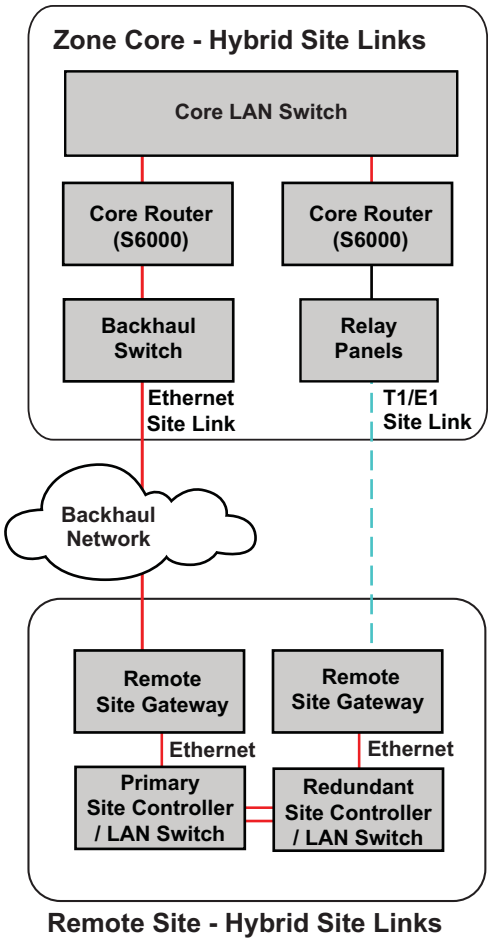


Figure 21: Hybrid Site Links with DSR (M2/M3) - Primary and Backup (Ethernet and T1/E1)

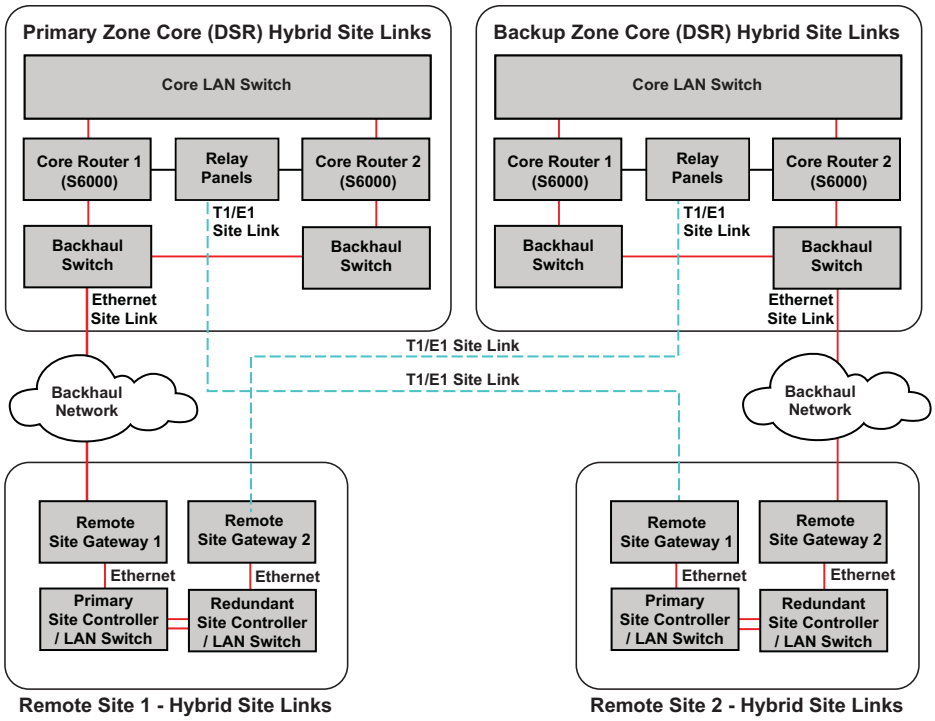


Figure 22: Hybrid Site Links with DSR (M2/M3) Primary Ethernet, Backup T1/E1

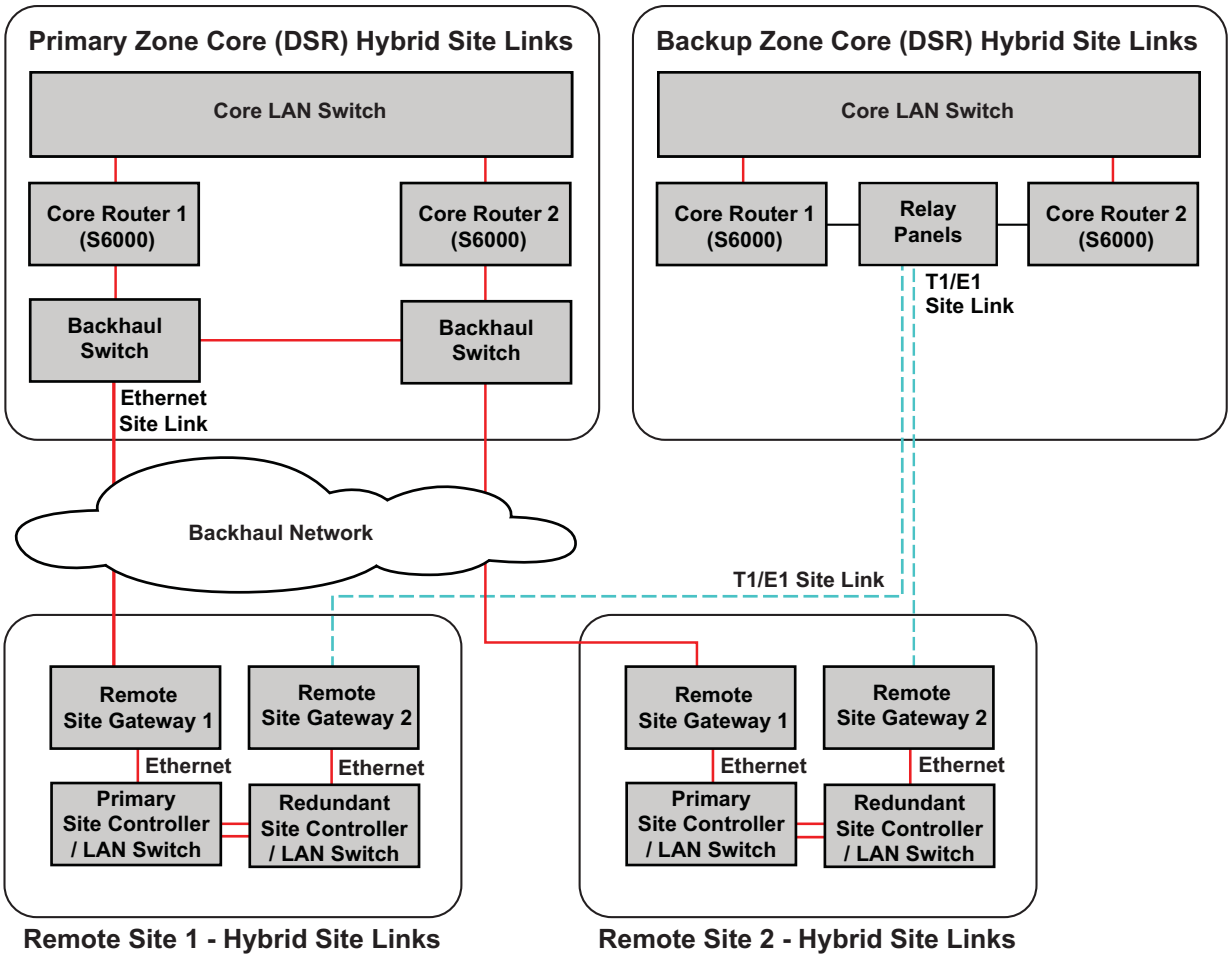


Figure 23: Zone Core (M1/M2/M3) Options with PTP

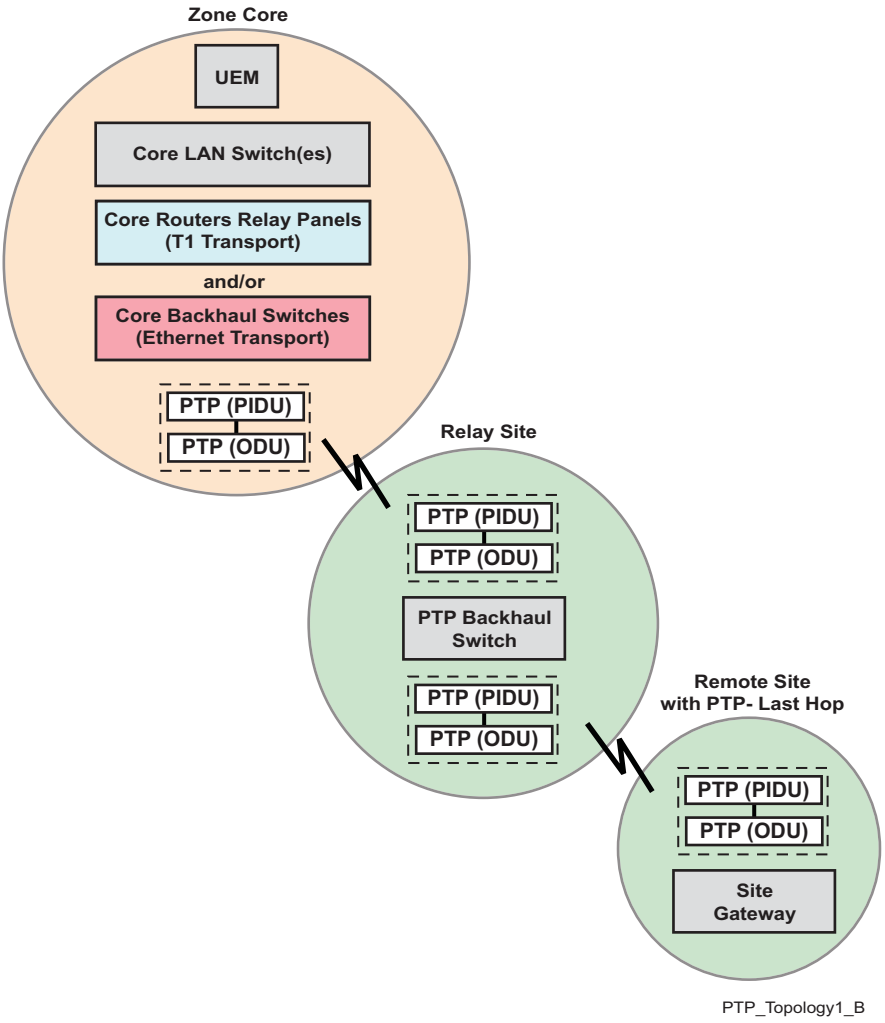
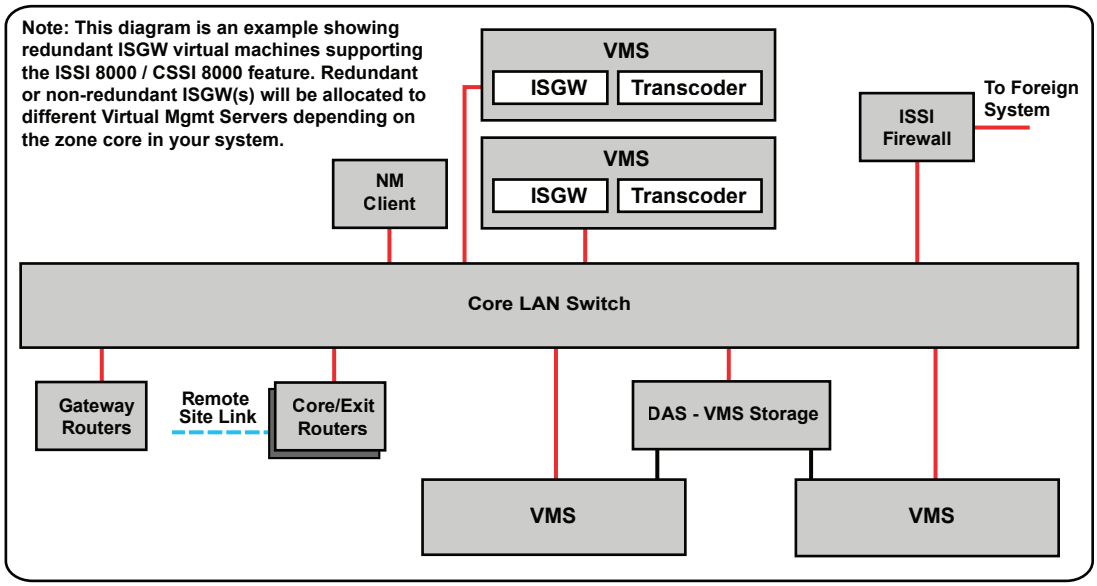
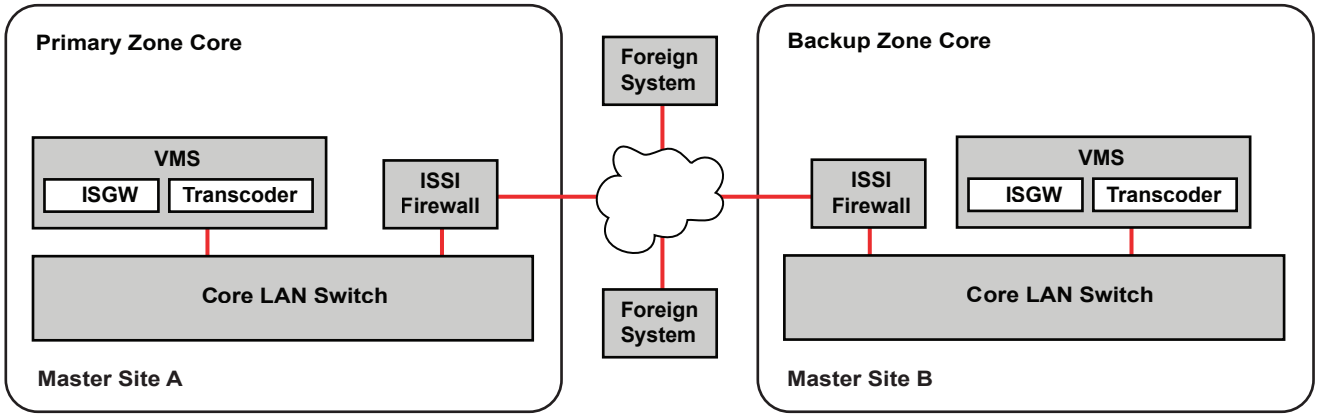


Figure 24: ISSI 8000/CSSI 8000 Zone Core Option



S_ISSI8000_M2_M3_CSA_Zone_Core_Options_D

Figure 25: ISSI 8000 with DSR Zone Core Option



S_ISSI8000_DSR_Zone_core_option_C

Figure 26: CSSI 8000 with DSR Zone Core Option

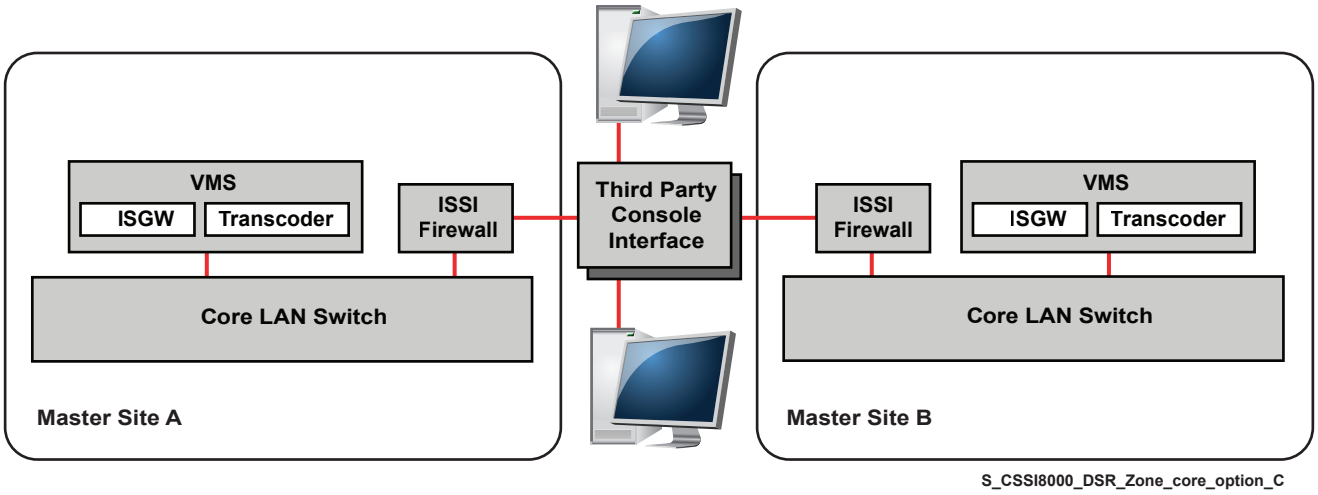


Figure 27: CSSI 8000 without DSR Zone Core Option

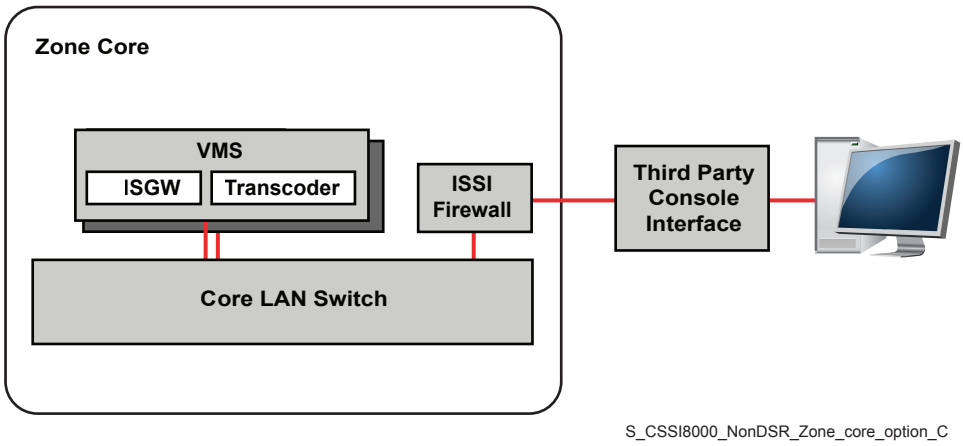
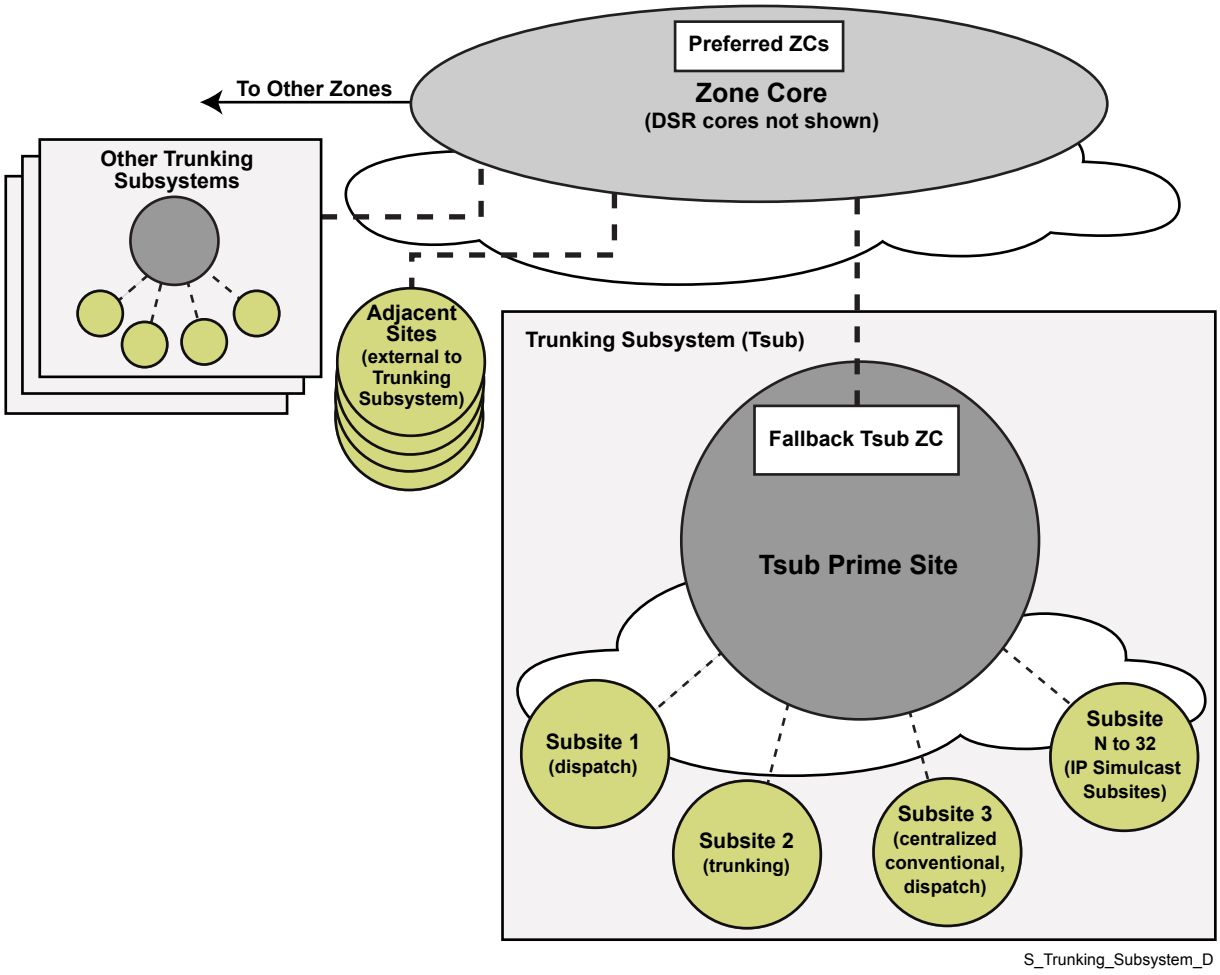


Figure 28: Trunking Subsystem for Edge Availability with Wireline Console Feature



3.7

ASTRO 25 7.17 IP Simulcast System Diagrams

Figure 29: ASTRO 25 Trunked System with IP Simulcast Subsystem

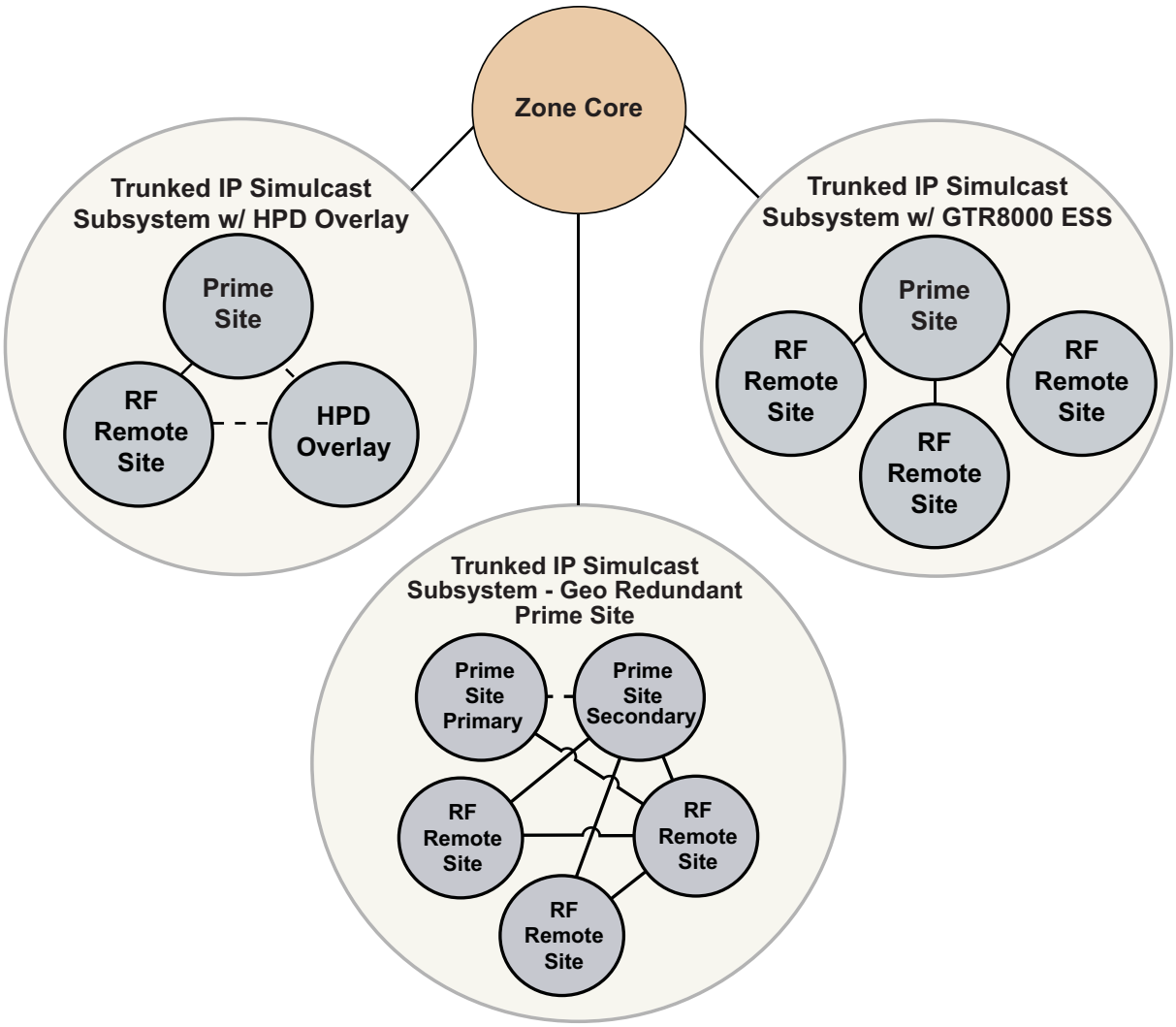
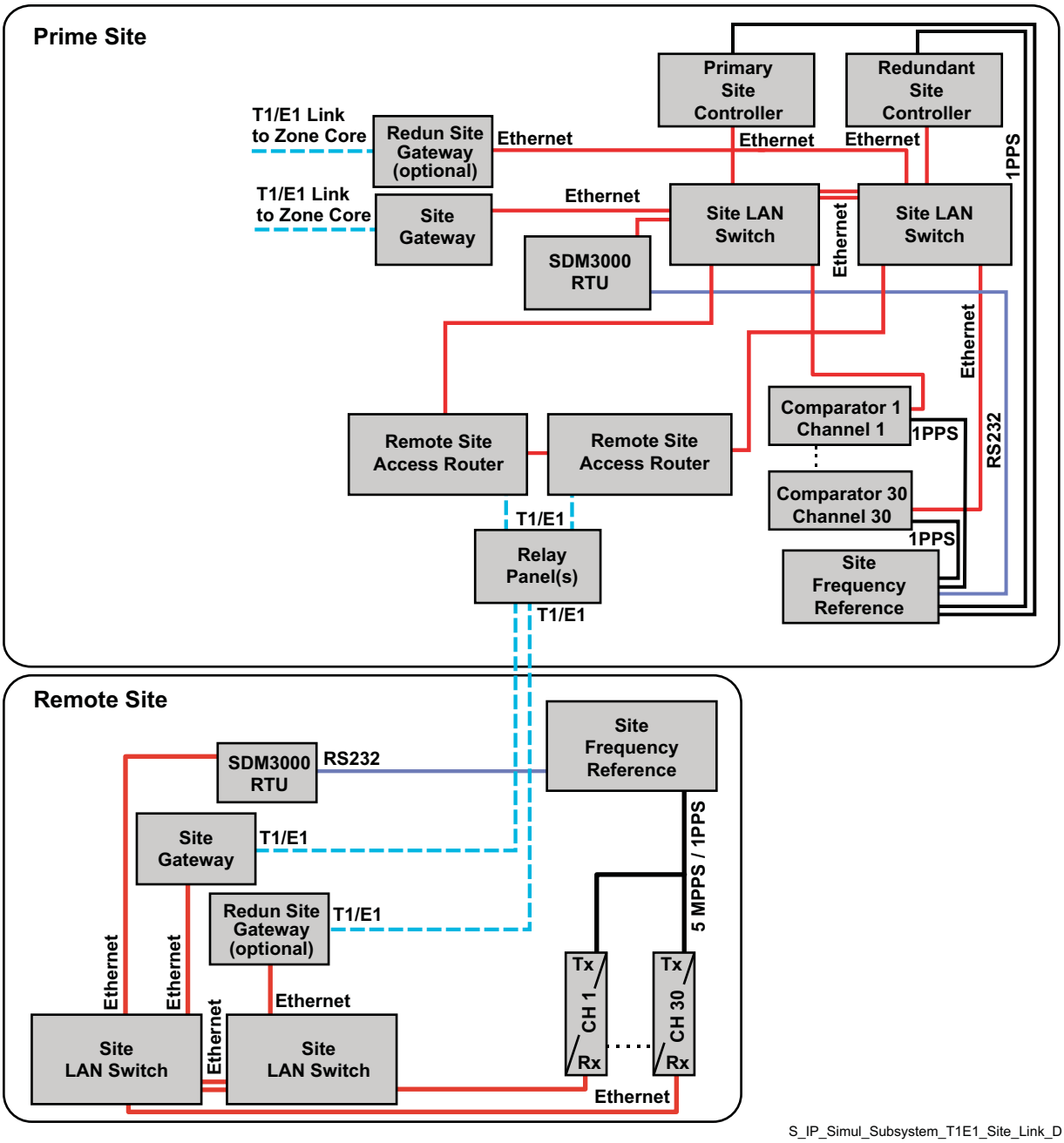
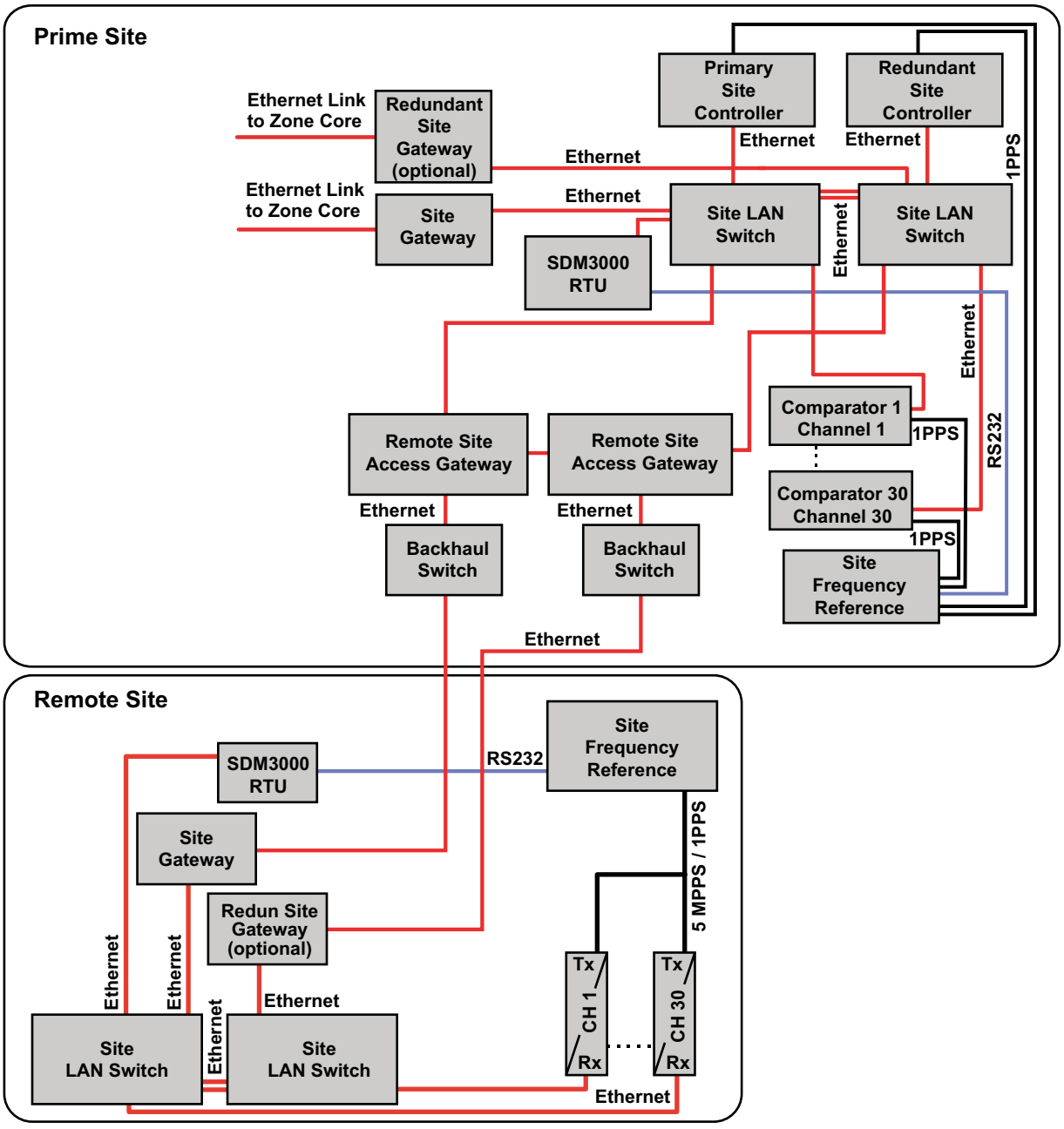


Figure 30: ASTRO 25 System Trunked IP Simulcast Subsystem (T1/E1 Site Links)



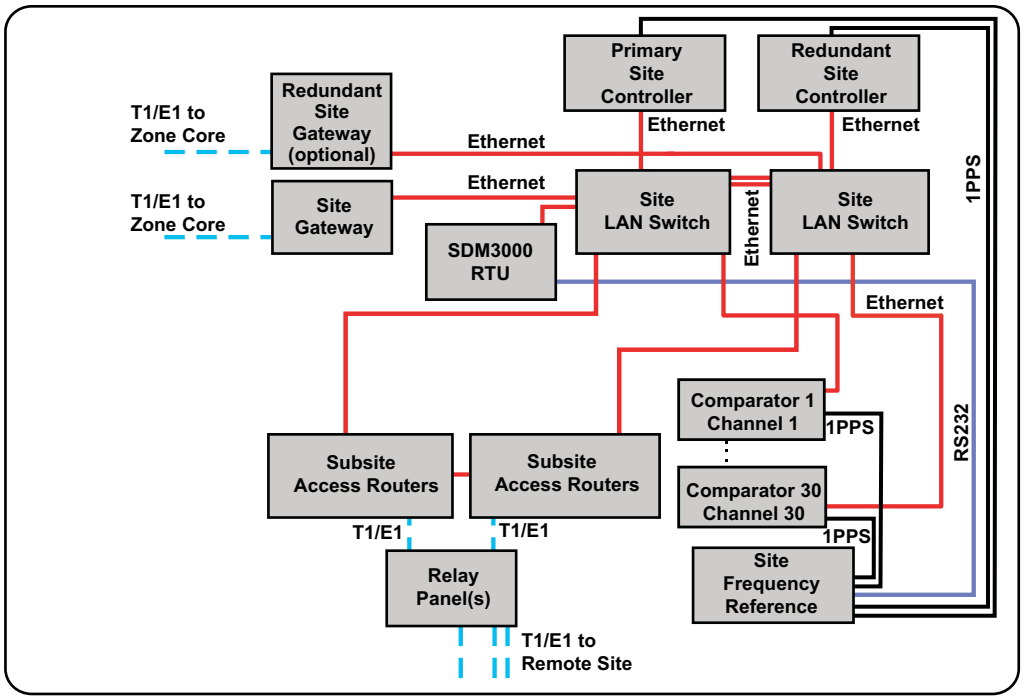
S_IP_Simul_Subsystem_T1E1_Site_Link_D

Figure 31: ASTRO 25 System Trunked IP Simulcast Subsystem (Ethernet Site Links)



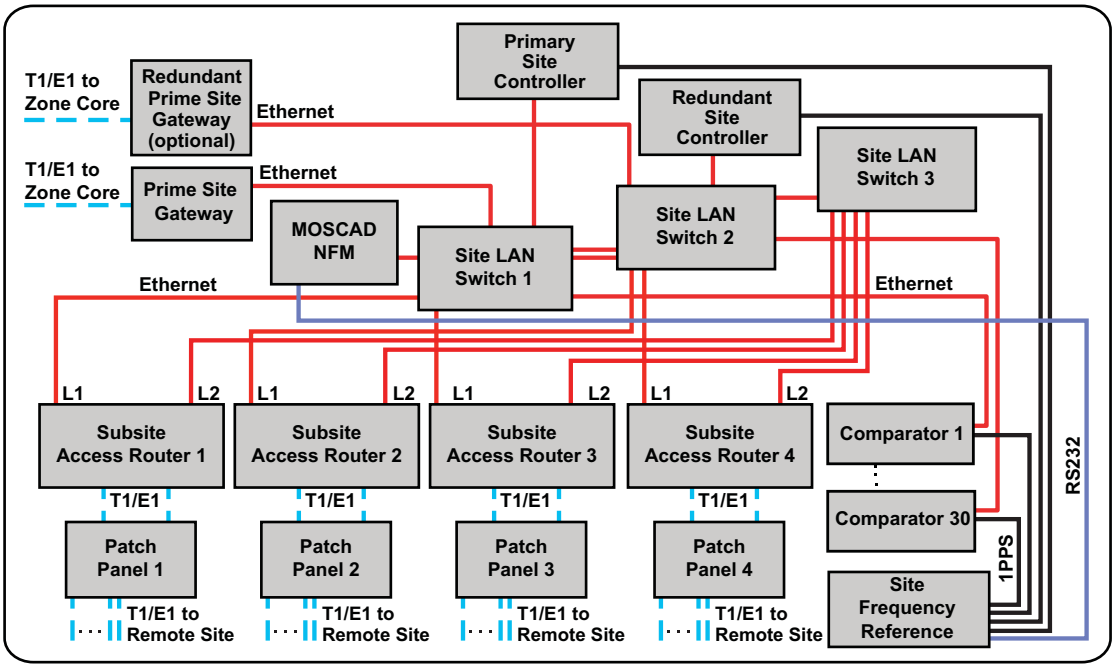
S_IP_Simul_Subsystem_Ethernet_Site_Link_E

Figure 32: Trunked IP Simulcast Prime Site without Redundant Comparators, T1/E1 Links (15 Subsites)



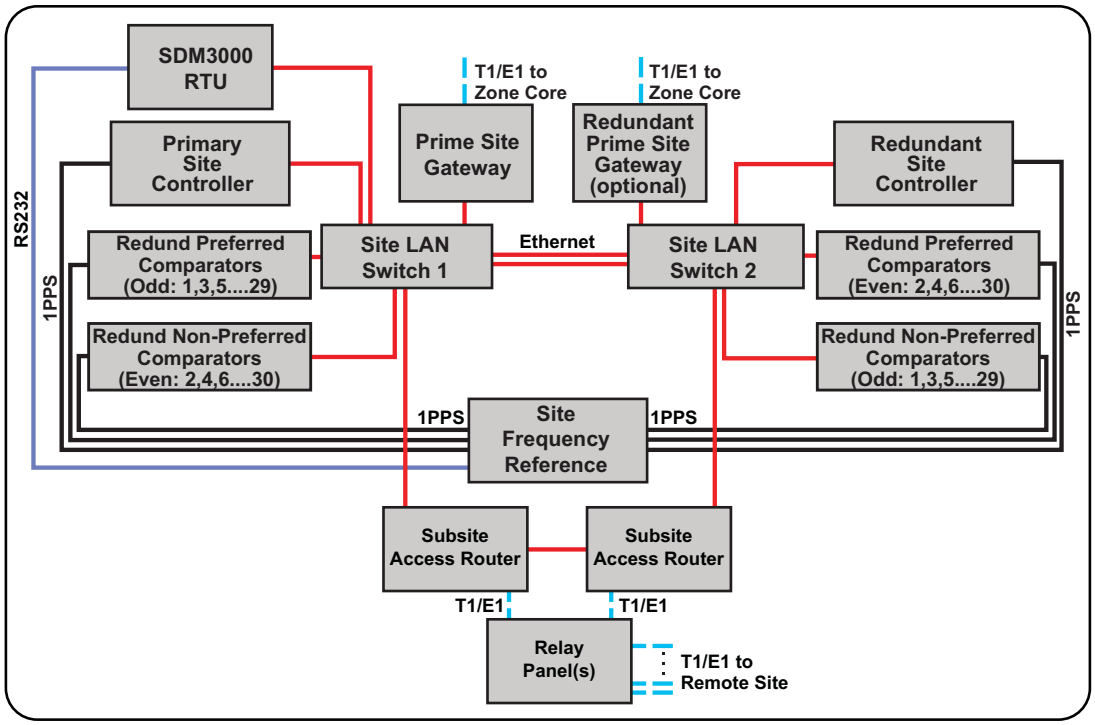
S_IP_Simul_Prime_Site_Non_Redun_Comp_T1E1_15_Subsite_A

Figure 33: Trunked IP Simulcast Prime Site without Redundant Comparators, T1/E1 Links (32 Subsites)



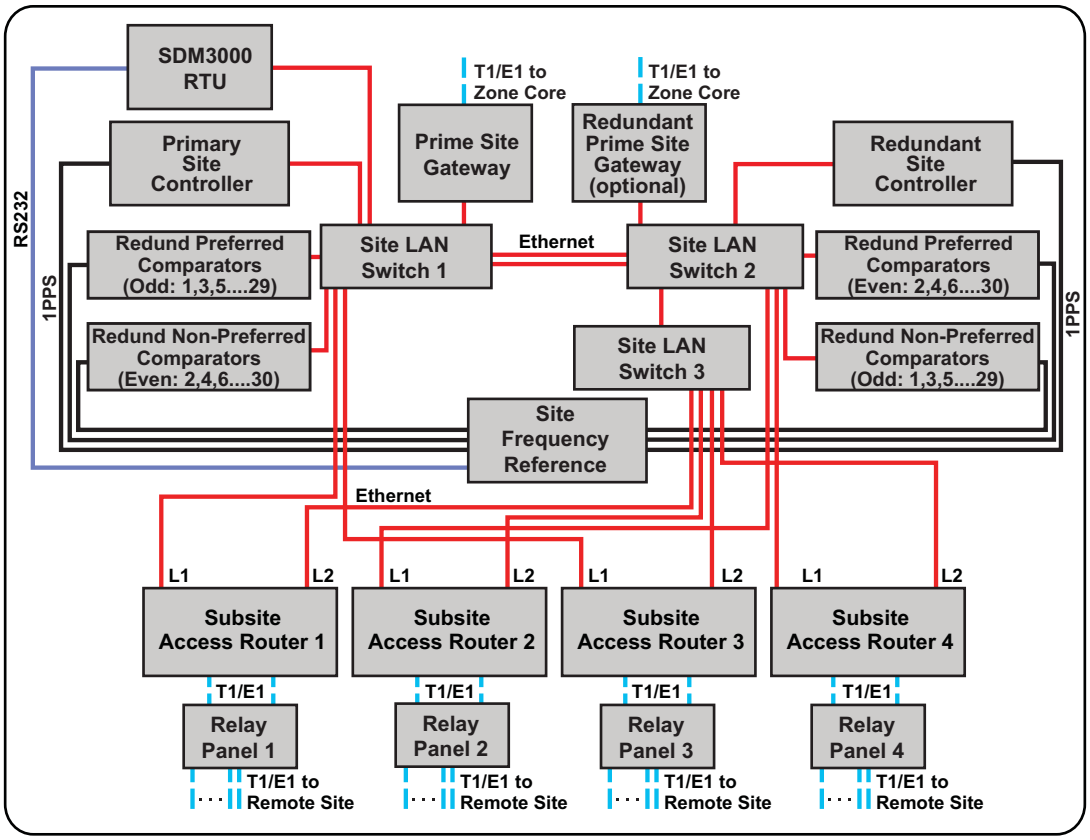
S_IP_Simul_Prime_Site_Non_Redun_Comp_T1E1_32_Subsite_B

Figure 34: Trunked IP Simulcast Prime Site with Redundant Comparators, T1/E1 Links (15 Subsites)



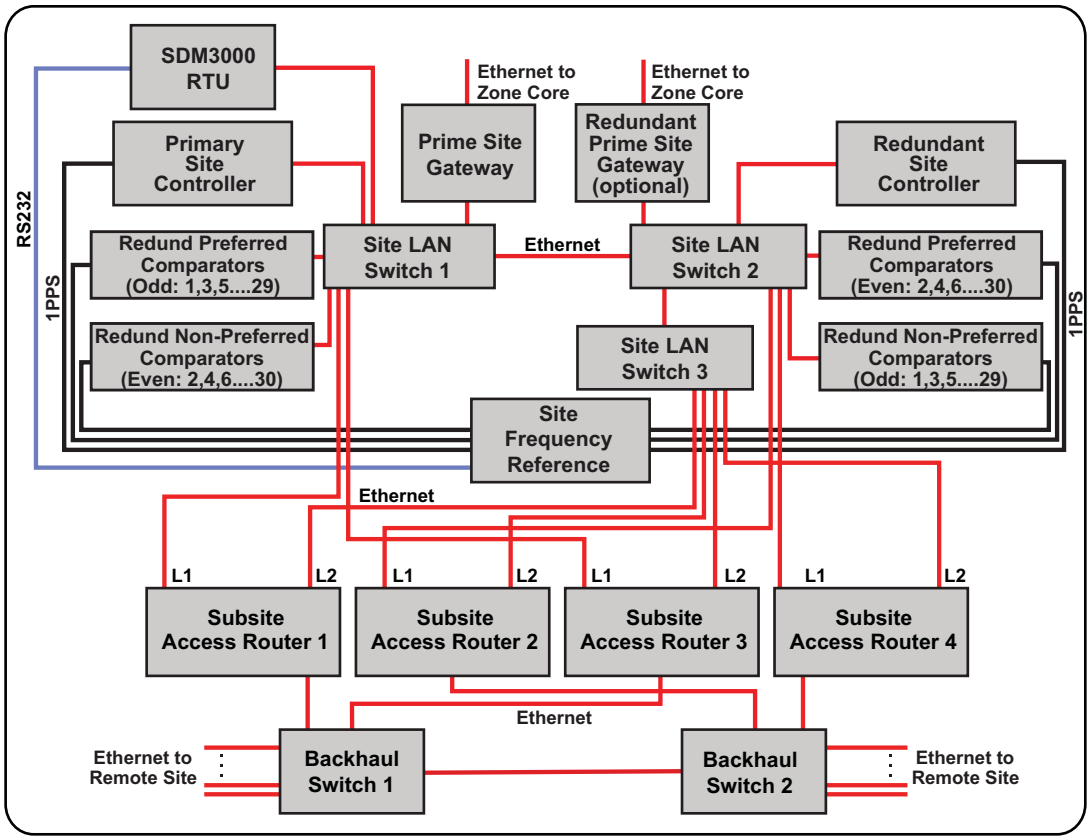
S_IP_Simul_Prime_Site_Redun_Comp_T1E1_15_Subsite_A

Figure 35: Trunked IP Simulcast Prime Site with Redundant Comparators, T1/E1 Links (32 Subsites)



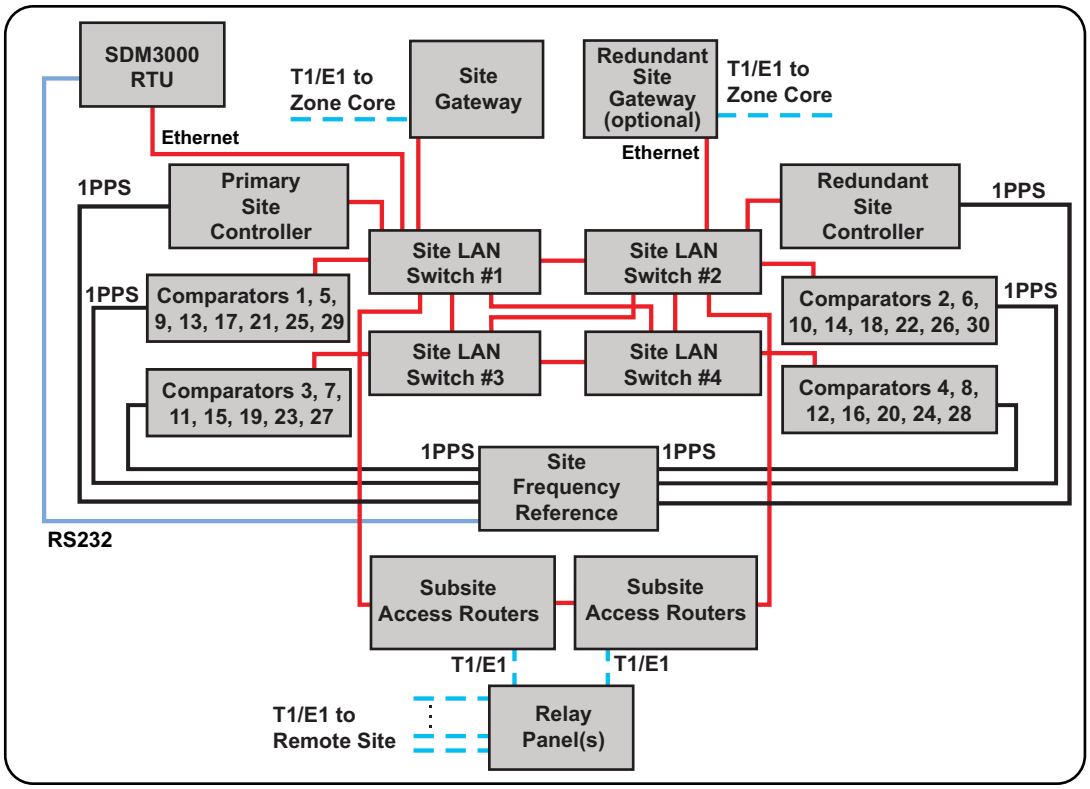
S_IP_Simul_Prime_Site_Redun_Comp_T1E1_32_Subsite_B

Figure 36: Trunked IP Simulcast Prime Site with Redundant Comparators and Ethernet Links (32 Subsites)



S_IP_Simul_Prime_Site_Redun_Comp_Ethernet_32_Subsite_B

Figure 37: ASTRO 25 System Trunked IP Simulcast Prime Site with High Availability



S_IP_Simul_Prime_Site_HA_Config_D

Figure 38: ASTRO 25 System Trunked IP Simulcast Prime Site with High Availability 32 Subsite Support

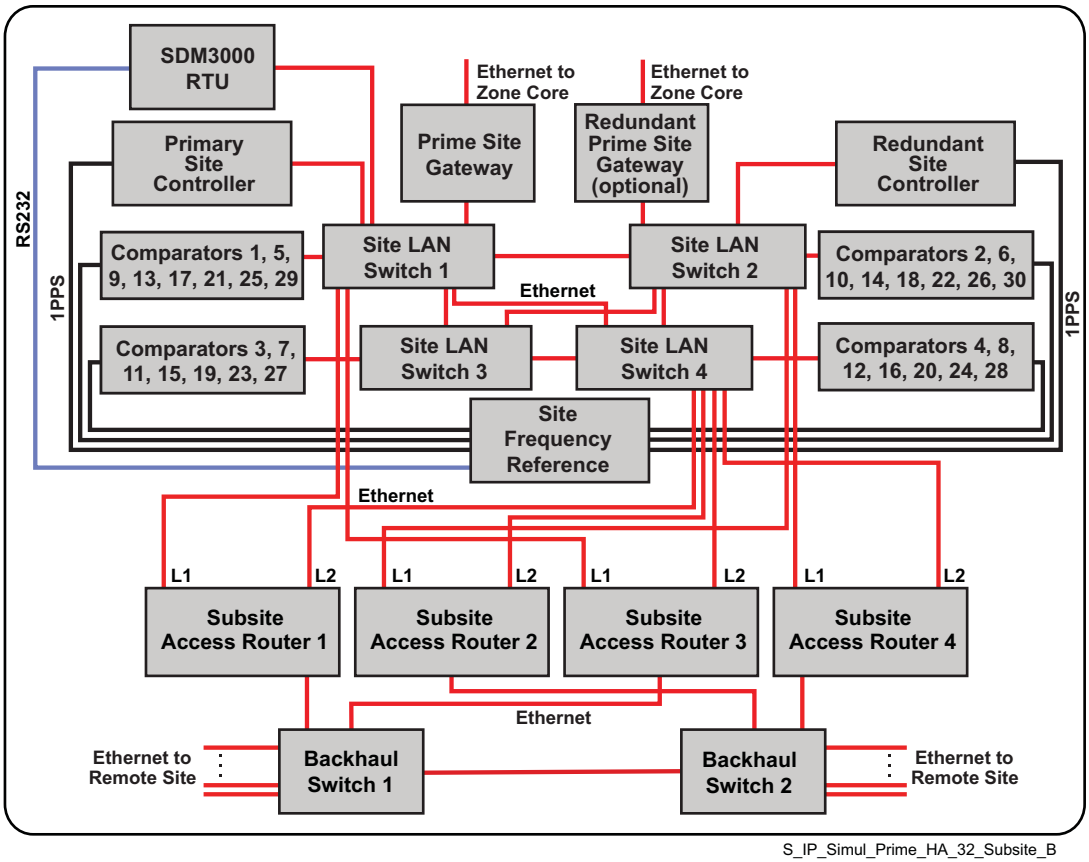
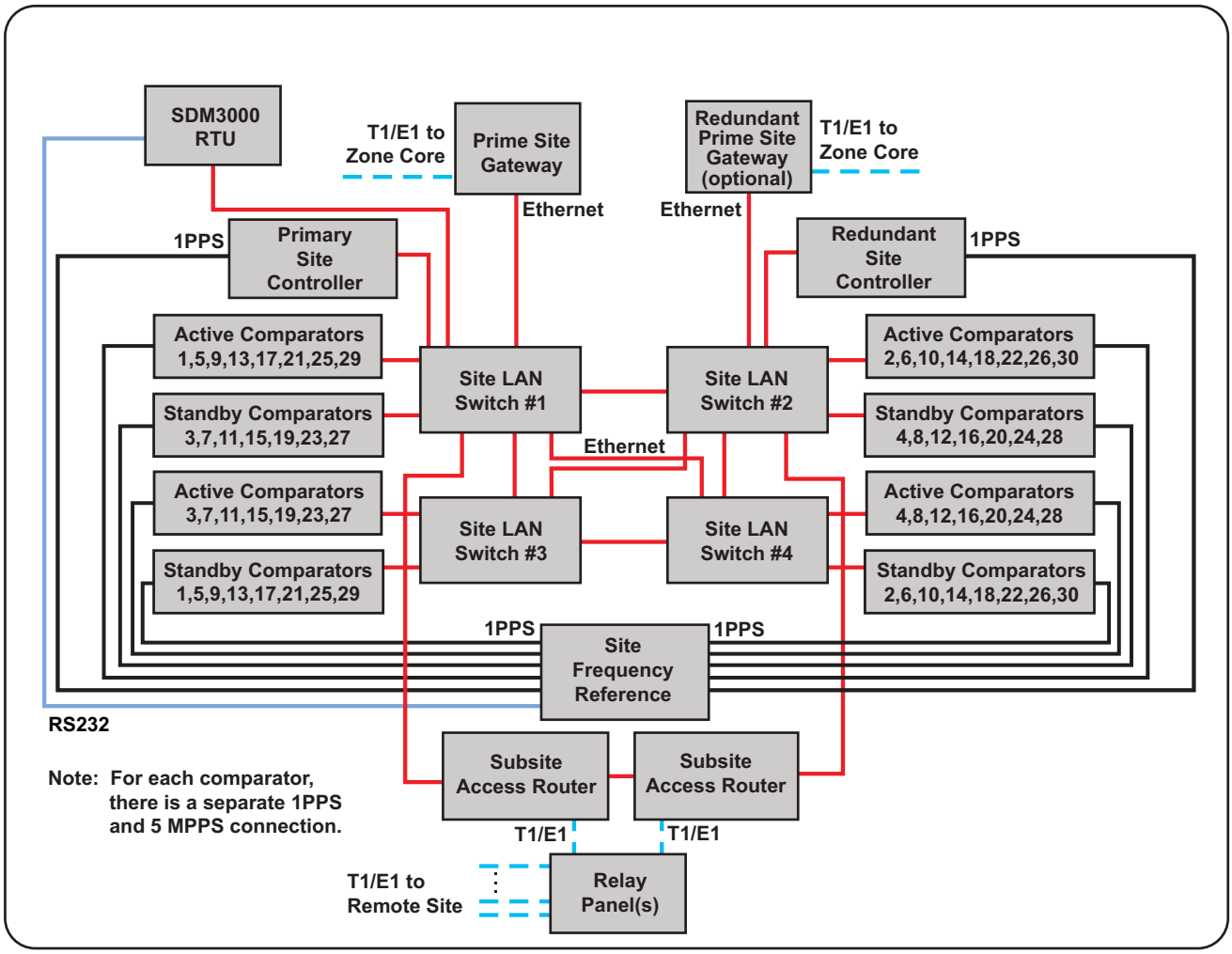
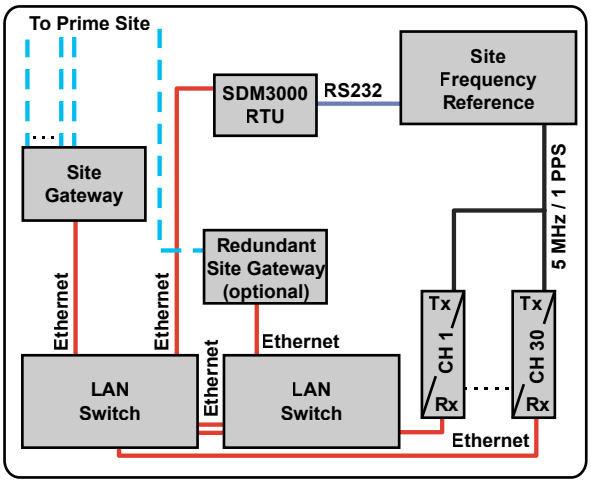


Figure 39: ASTRO 25 System Trunked IP Simulcast Prime Site with High Availability and Redundant Comparators



S_IP_Simul_Prime_Site_HA_Redun_Comp_D

Figure 40: ASTRO 25 System Trunked IP Simulcast Remote Site



S_IP_Simul_Remote_Site_C

Figure 41: ASTRO 25 System Trunked IP Simulcast Remote Site with Expandable Site Subsystem in Standard Configuration

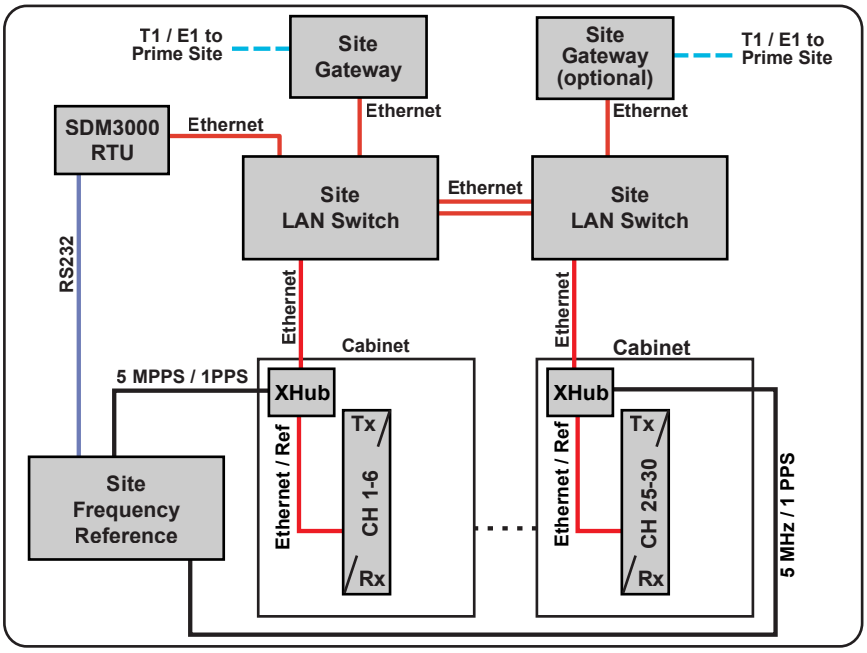


Figure 42: ASTRO 25 System Trunked IP Simulcast Remote Site with Expandable Site Subsystem and High Availability

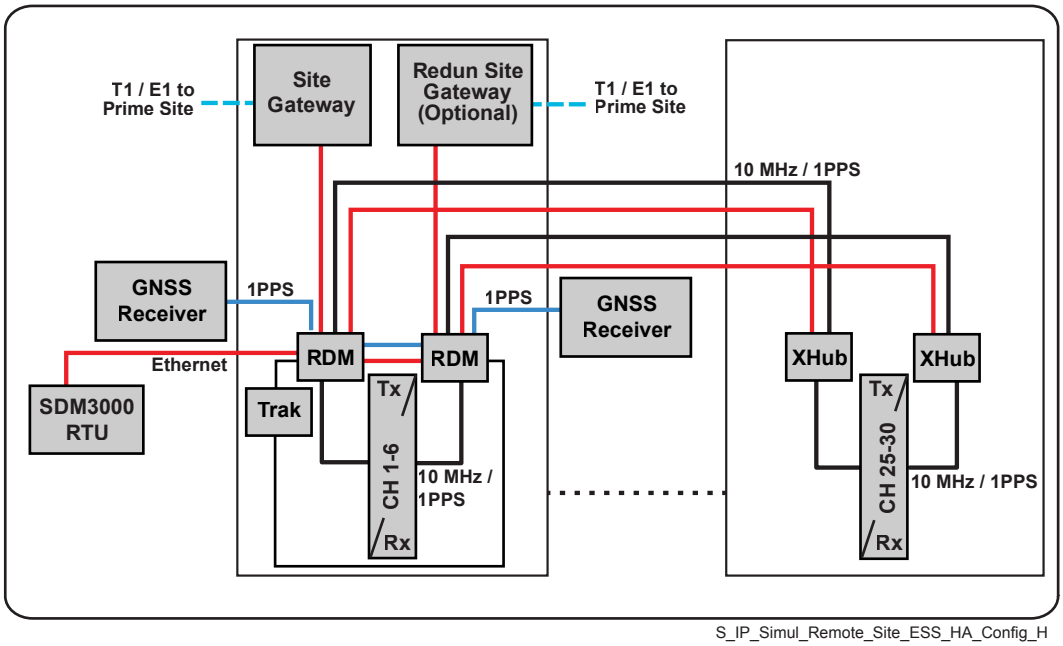
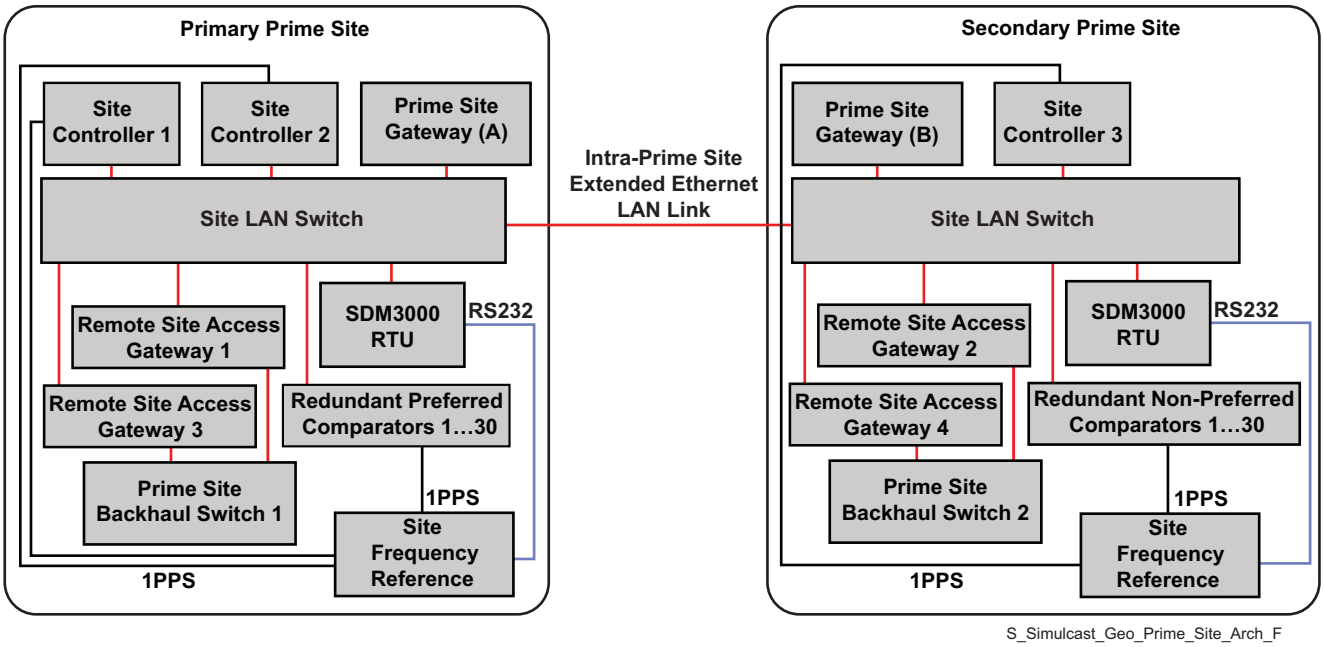


Figure 43: ASTRO 25 System Trunked IP Simulcast Prime Site with Geographical Redundancy



3.8

ASTRO 25 7.17 A25 Repeater Site System Diagrams

Figure 44: ASTRO 25 System with ASTRO 25 Trunked Repeater Sites

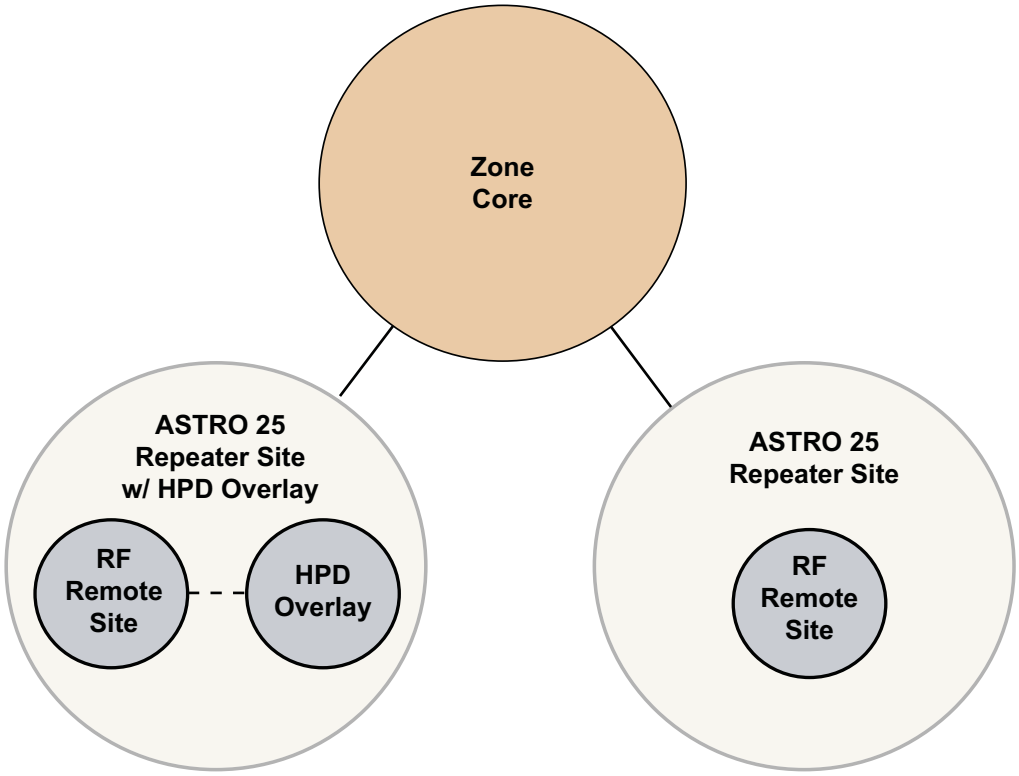
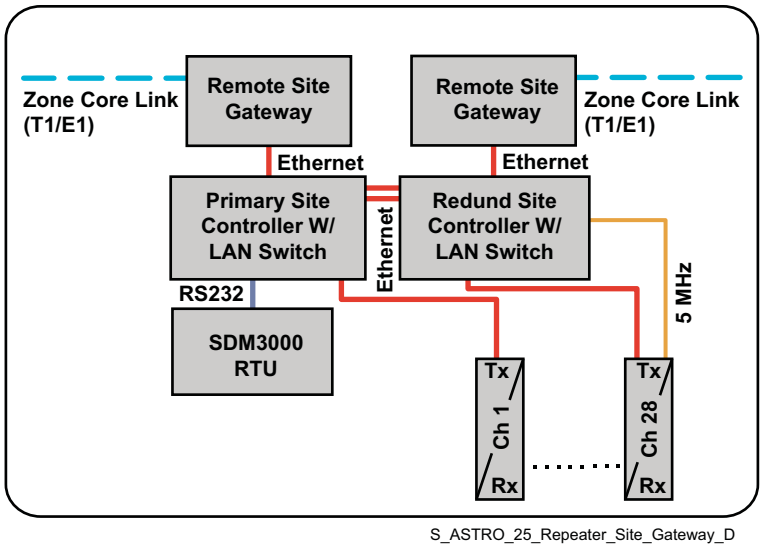


Figure 45: ASTRO 25 Trunked Repeater Site



3.9

ASTRO 25 7.17 MCC 7500 and MCC 7100 System Diagrams

Figure 46: MCC 7500 System Architecture

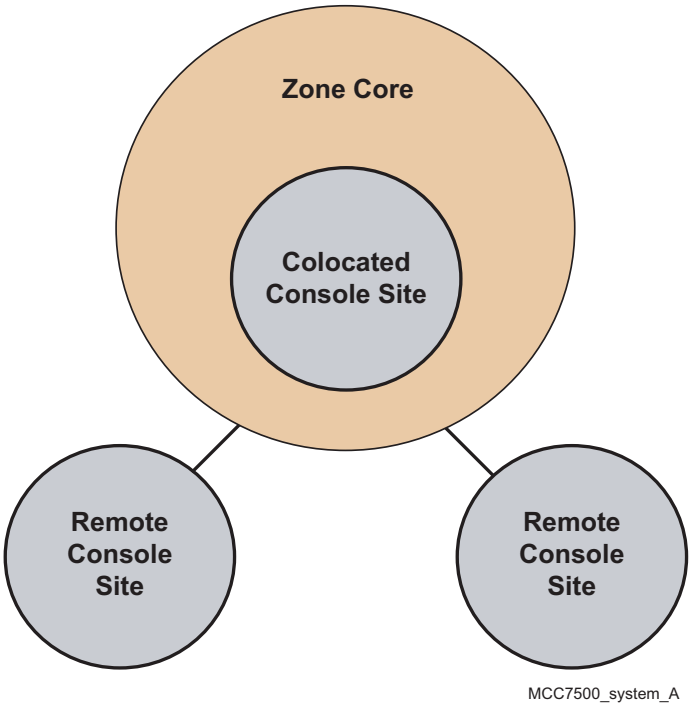
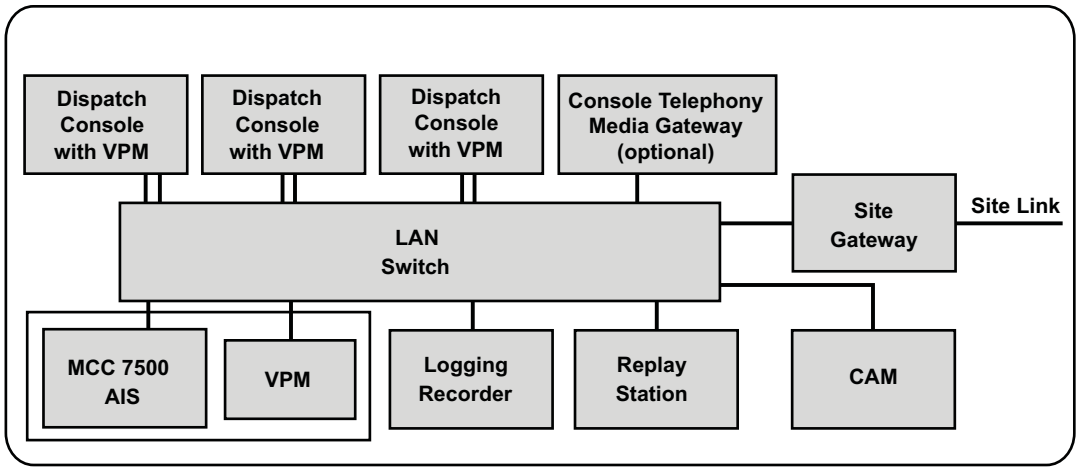
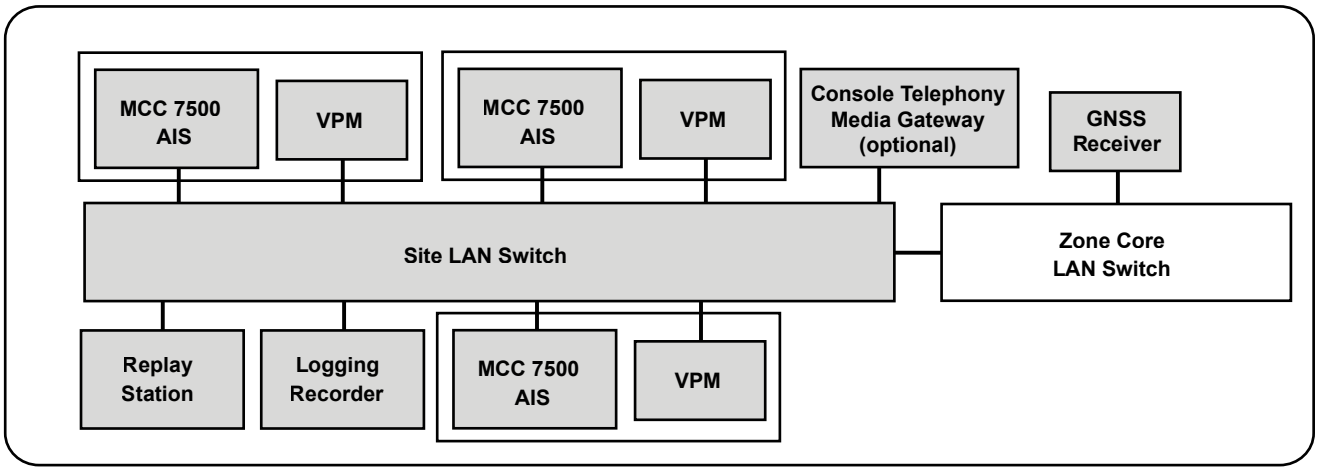


Figure 47: ASTRO 25 Remote Dispatch Console Subsystem with Logging Option



MCC7500_dispatch_console_subsystem_wlogging2_A

Figure 48: ASTRO 25 Colocated Dispatch Console Subsystem with Logging Option



MCC7500_dispatch_console_subsystem_colocated_w_zone_core_G

Figure 49: MCC 7100 System Architecture

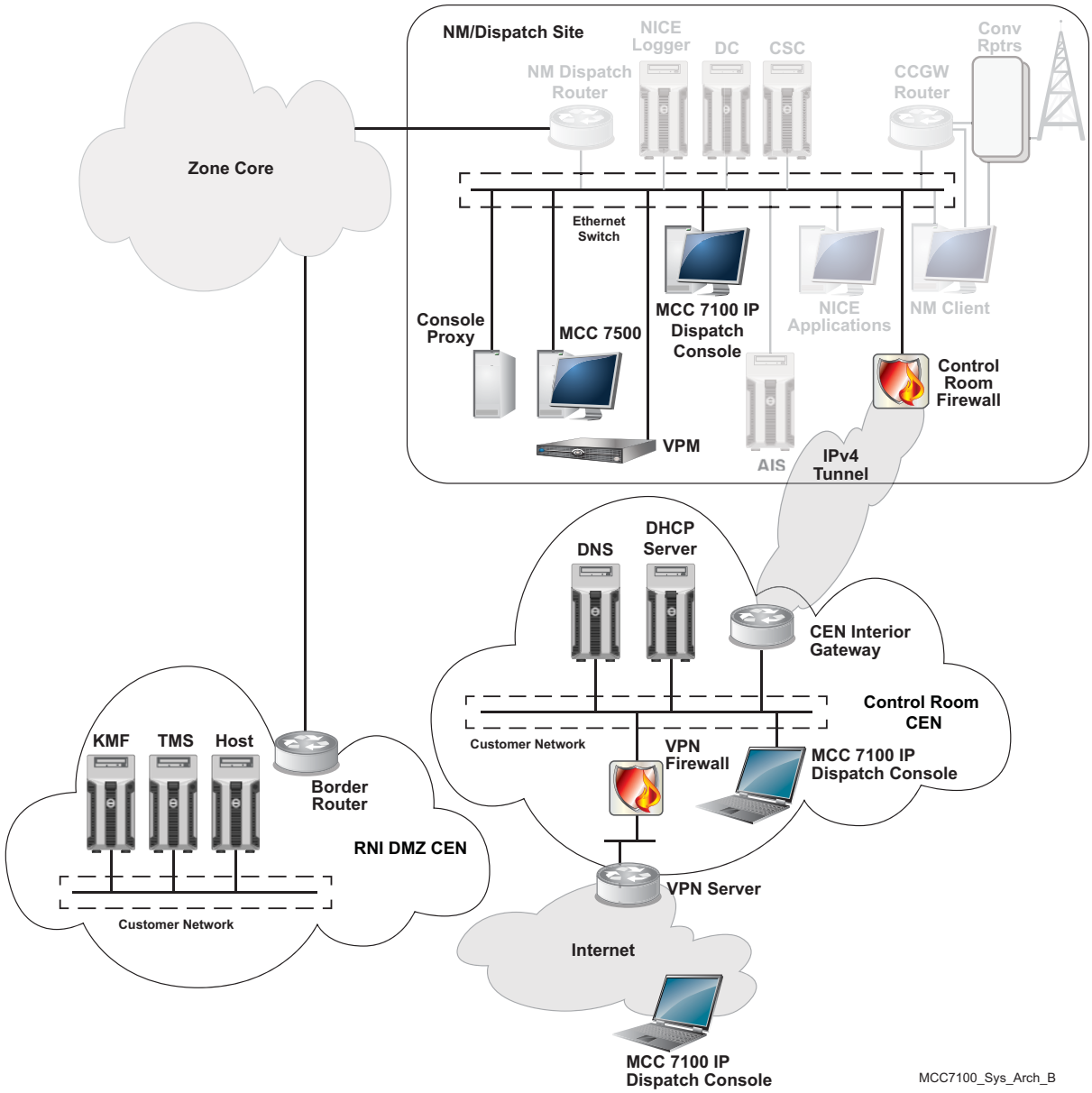
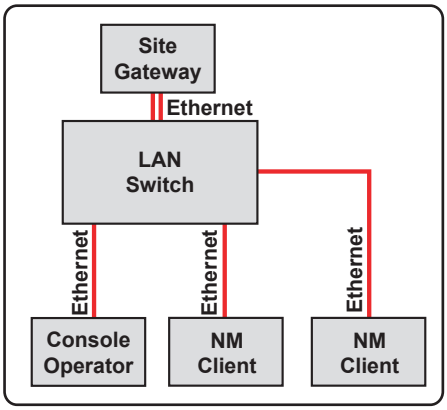


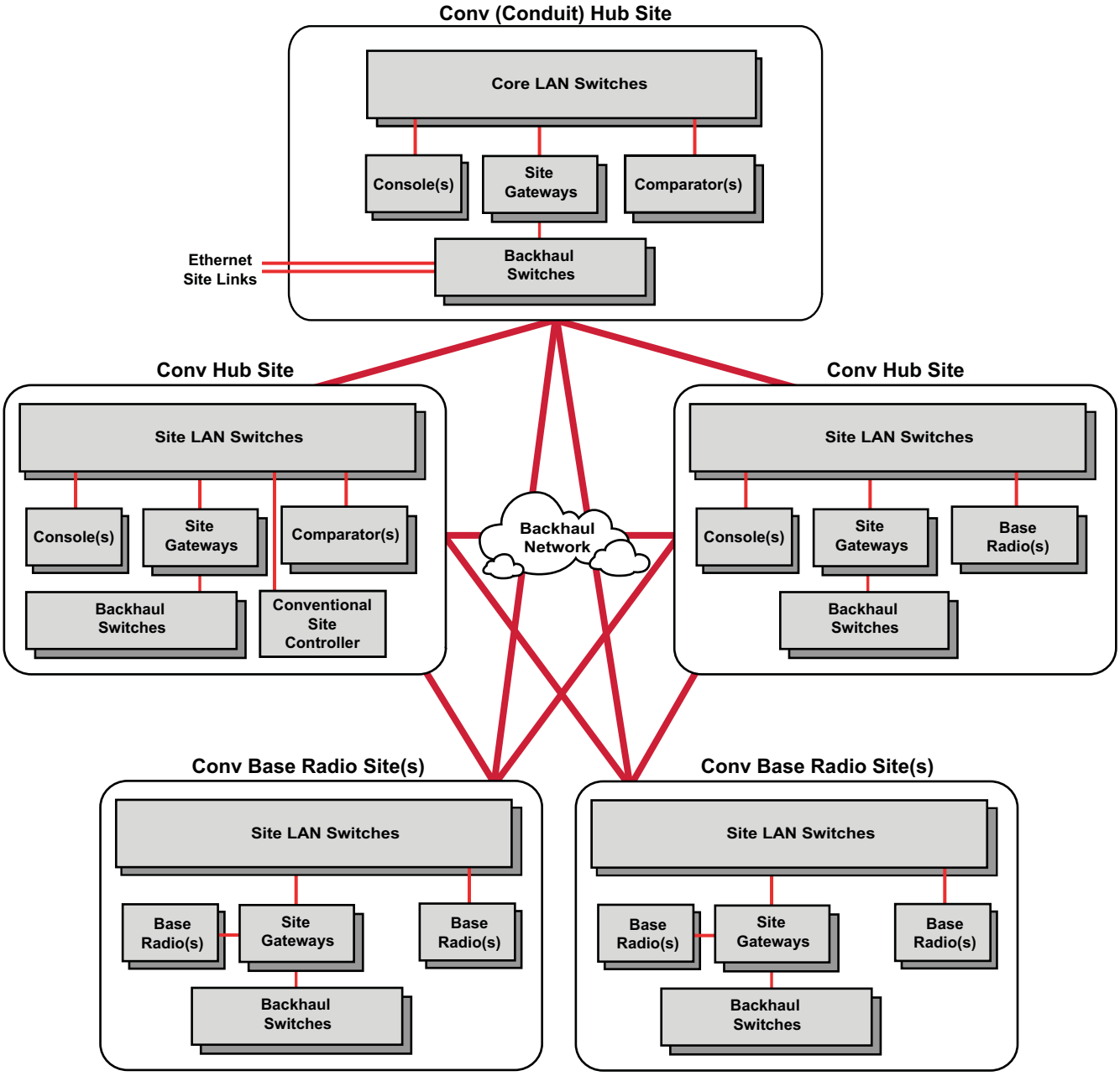
Figure 50: ASTRO 25 Remote Network Management (NM) Console Operator Site



3.10

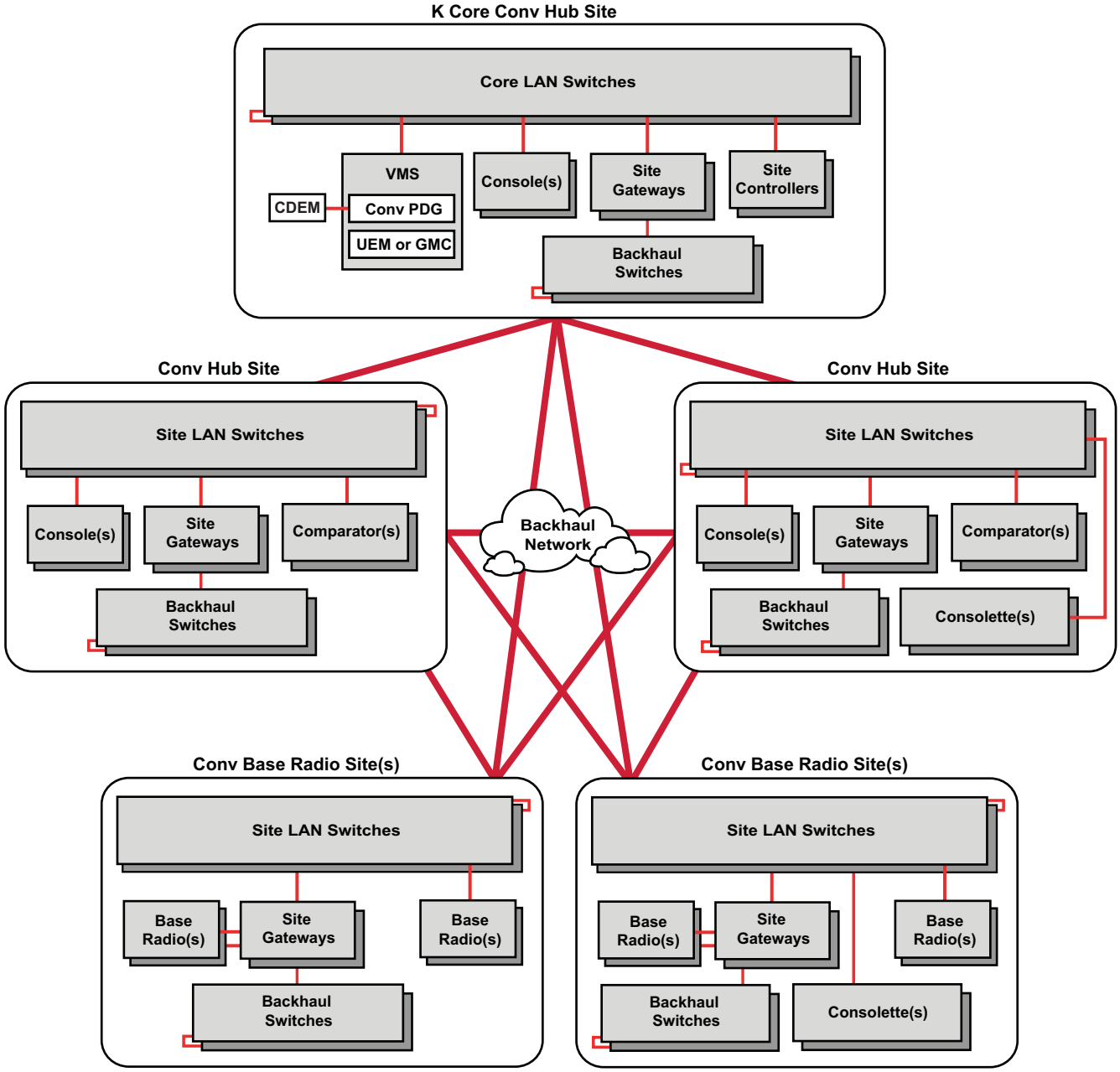
ASTRO 25 7.17 K-Series System Diagrams

Figure 51: ASTRO 25 Distributed Conventional Subsystem



K_Core_system_arch_conduit_hub_site_A

Figure 52: ASTRO 25 Distributed Conventional System with K Core



Note: This high-level system architecture diagram shows a conceptual view of the sites and their relationships. Not all components are shown and connections shown are hypothetical not physical.

K_Core_system_arch_K_core_conv_hub_site_B

Figure 53: ASTRO 25 Conventional and Integrated Data System (K1)

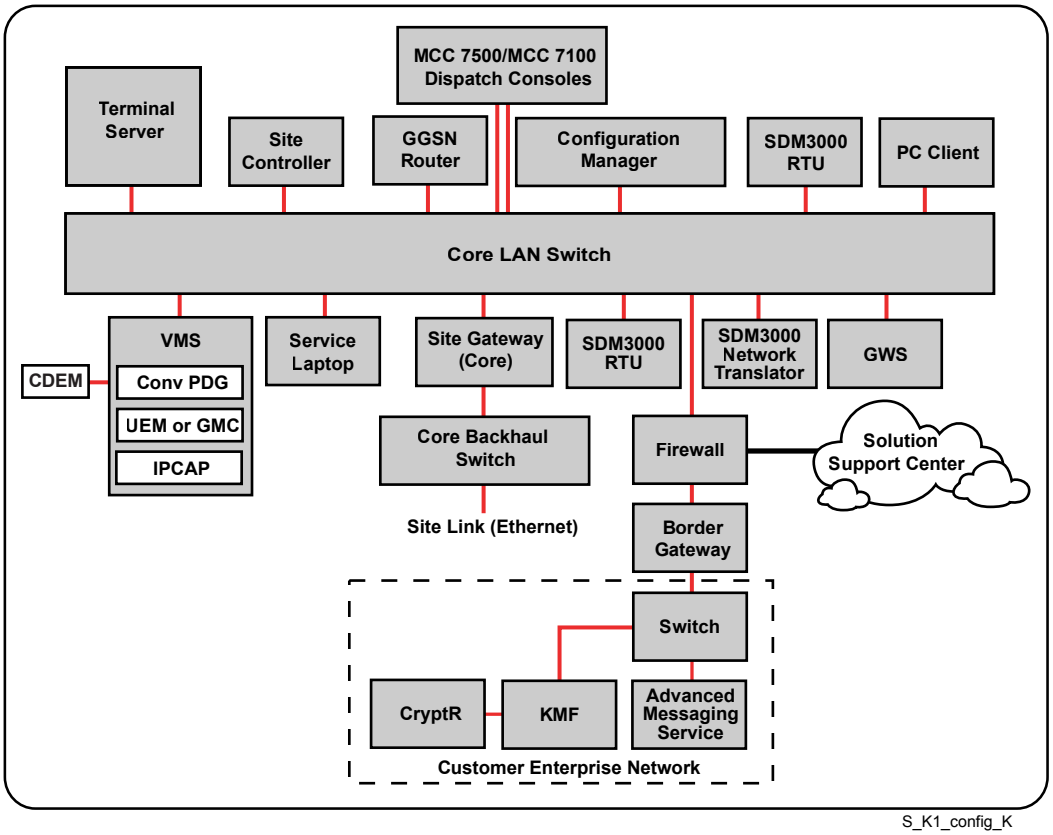


Figure 54: ASTRO 25 Conventional and Integrated Data System (K2)

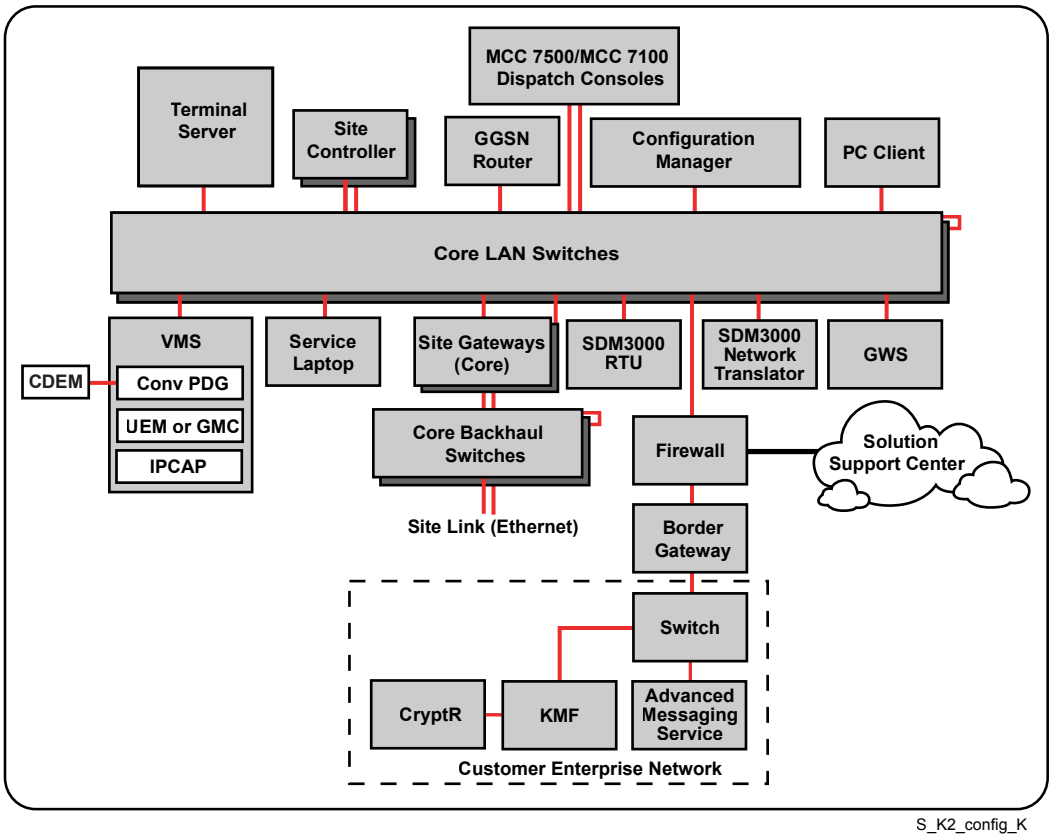


Figure 55: ASTRO 25 System K Core with Colocated Console and Base Radios

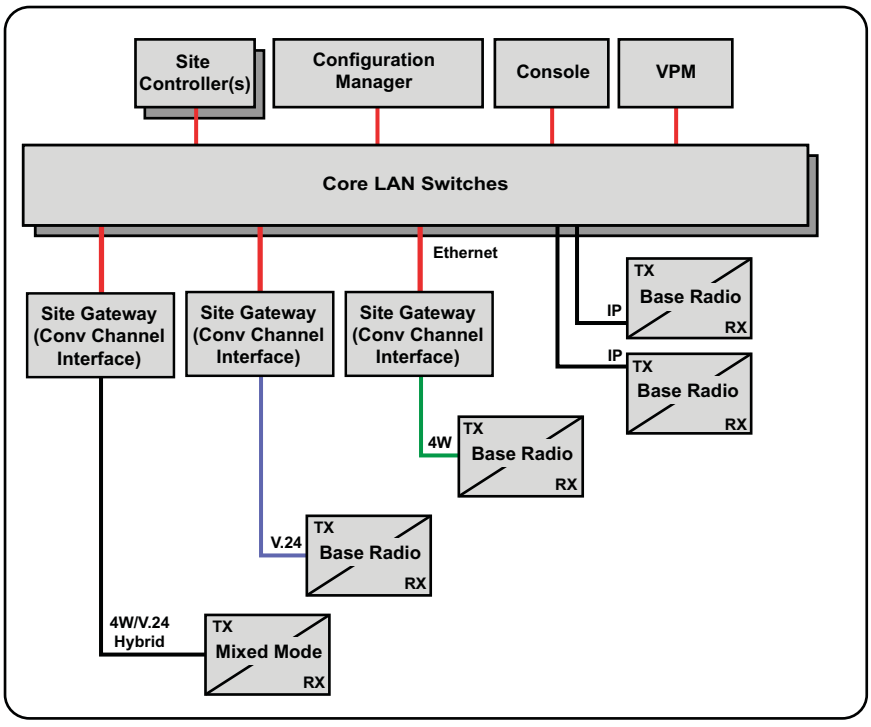
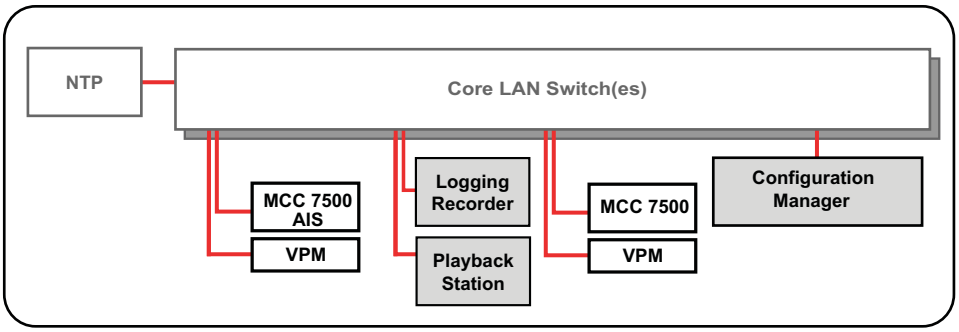


Figure 56: ASTRO 25 System K Core with Colocated Console and Audio Logging Subsystem



K_Core_Conv_MS_Audio_Logging_Subsys_A

Chapter 4

System-Level Disaster Recovery

This chapter provides a general process for implementing disaster recovery procedures for recovery of the RF Site, a Master Site, and a Dispatch Console Site in an ASTRO® 25 system.

IMPORTANT:
These processes provide a general guideline for implementing box-level disaster recovery procedures. The operator recovering the system must determine which specific recovery procedures to perform.

4.1 RF Site Recovery

This section provides a general process for implementing disaster recovery procedures for recovery of the RF Site in an ASTRO® 25 system.

IMPORTANT:
This process provides a general guideline for implementing box-level disaster recovery procedures. The operator recovering the system must determine which specific recovery procedures to perform.

4.1.1 Recovering an RF Site

Process:

1. Restore power.
2. Recover the site switch and the site router. If the Master Site is down, the site links stay down:
   - See “HP Switches – Disaster Recovery” in the *System LAN Switches* manual.
   - See “System Routers Disaster Recovery” in the *S6000 and S2500 Routers* manual.
   - See “System Gateways Disaster Recovery” in the *GGM 8000 System Gateway* manual.
3. Recover channels. If a site is in a failsoft mode:
   - See “GTR 8000 Expandable Site Subsystem Disaster Recovery” in the *GTR 8000 Expandable Site Subsystem* manual.
   - See “GTR 8000 Base Radio Disaster Recovery” in the *GTR 8000 Base Radio* manual.
   - See “Recovery Sequence for GTR 8000 Base Radio” in the *HPD GTR 8000 Site Subsystem* manual.
   - See “GCM 8000 Comparator Disaster Recovery” in the *GCM 8000 Comparator* manual.
4. Recover Site Controllers. See “GCP 8000 Site Controller Disaster Recovery” in the *GCP 8000 Site Controller* manual or “Recovery Sequence for GCP 8000 Site Controller” in the *HPD GTR 8000 Site Subsystem* manual.
5. Ensure that the site is in the Site Trunking mode waiting for a master site connection.
6. Restore the site link for all recovered sites. See “Refreshing a Site” in the *Unified Network Configurator* manual.
7. Restore the voice service for all recovered RF sites. See “Executing Quick Commands” in the *Unified Network Configurator* manual.

4.2
Master Site Recovery

This section provides a general process for implementing disaster recovery procedures for recovery of the Master Site (zone core) in an ASTRO® 25 system.

IMPORTANT:
This process provides a general guideline for implementing box-level disaster recovery procedures.

The operator recovering the system must determine which specific recovery procedure need to be performed.

4.2.1
Recovering a Master Site

Process:

1. Restore the power.
2. Recover the core LAN switches. See “HP Switches – Disaster Recovery” in the *System LAN Switches* manual.
3. Perform the following processes:
   a. Recover core network transport. See “System Routers Disaster Recovery” in the *S6000 and S2500 Routers* manual and “System Gateways Disaster Recovery” in the *GGM 8000 System Gateway* manual.
   b. Recover NM client 1. See “PNM Client Disaster Recovery” in the *Private Network Management Client* manual.
   c. Recover VMS02. See “Virtual Management Server Disaster Recovery” in the *Virtual Management Server Software* manual.
   d. Recover VMS01. See “Virtual Management Server Disaster Recovery” in the *Virtual Management Server Software* manual.
   e. Recover the BAR server. See “Backup and Restore Services Disaster Recovery” in the *Backup and Restore Services* manual.
4. Recover ZC01. See the “Zone Controller Disaster Recovery” the *Zone Controller* manual.
5. Enable ZC01. See the “Zone Controller Disaster Recovery” the *Zone Controller* manual.
6. Restore the site link for all recovered sites. See “System Routers Disaster Recovery” in the *S6000 and S2500 Routers* manual and “System Gateways Disaster Recovery” in the *GGM 8000 System Gateway* manual.
7. Restore the voice service for all recovered RF sites.
8. Recover System Domain Controller 01. See “Domain Controller Disaster Recovery” in the *Authentication Services* manual.
9. Recover network management servers.
   - Recover ATR. See the *Private Network Management Servers* manual.
   - Recover ZDS01. See the *Private Network Management Servers* manual.
   - Recover Provisioning Manager. See the *Private Network Management Servers* manual.
   - Recover UNC. See the *Private Network Management Servers* manual.
10. Recover Zone Domain Controller 01. See “Domain Controller Disaster Recovery” in the *Authentication Services* manual.

11 Enable UNC, PM, ATR, and ZDS01. Network configuration management restored console voice service and conventional voice resources restored for all available console and conventional sites.

12 Perform the following processes:

   a Recover PDG. See “Packet Data Gateway Disaster Recovery” in the *Packet Data Gateways* manual.

   b Recover CEN network. See “Virtual Management Server Disaster Recovery” in the *Virtual Management Server Software* manual.

13 Enable PDG. See “Packet Data Gateway Disaster Recovery” in the *Packet Data Gateways* manual.

14 Restore data services.

15 Restore Fault and Redundant Call Control (ZC02).

   - Recover UEM. See the *Private Network Management Servers* manual.
   - Recover and enable ZC02. See the *Zone Controller* manual.
   - Enable UEM. See the *Private Network Management Servers* manual.

   See the *MOSCAD Network Fault Management Feature Guide* manual, if present in your system.

16 Recover ancillary services.

4.3 Dispatch Console Site Recovery

This section provides a general process for implementing disaster recovery procedures for recovery of the Dispatch Console Site in an ASTRO® 25 system.

IMPORTANT:
This process provides a general guideline for implementing box-level disaster recovery procedures.

The operator recovering the system must determine which specific recovery procedure need to be performed.

4.3.1 Recovering a Dispatch Console Site

Process:

1 Restore power.

2 Recover site switch and the site router. If a Master Site is down, the site links stay down:

   - For a system LAN switches recovery process, see “HP Switches – Disaster Recovery” in the *System LAN Switches* manual.
   - For a S6000/S2500 system routers recovery process, see “System Routers Disaster Recovery” in the *S6000 and S2500 Routers* manual.
   - For a system gateways recovery process, see “System Gateways Disaster Recovery” in the *GGM 8000 System Gateway* manual.

3 Recover the operator console. See the *MCC 7500 Dispatch Console with Virtual Processor Module* and *MCC 7100 IP Dispatch Console Setup and User Guide* manual.

4 Restore the Master Site and enable the ZDS.

   a See “Master Site Operation” in the *Master Site Infrastructure Setup Guide* manual.

b See “Enabling a PNM Server Application” in the *Private Network Management Servers* manual.

5 Restore the site link for all recovered sites. See “Refreshing a Site” in the *Unified Network Configurator* manual.

6 Restore the voice service for all recovered RF sites. See “Executing Quick Commands” the *Unified Network Configurator* manual.