

The Network Switching Center consists of a collection of switching and management products based on Internet Protocol (IP) architecture. These products manage the routing of voice and data messages to mobile subscribers by performing high-speed voice packet routing and switching using commercial off-the-shelf components. A high-availability configuration is supported to meet the continuous network operations requirements of public safety agencies.



Product Overview

The Network Switching Center (NSC) is the heart of the OpenSky/NetworkFirst/P25^{IP} packet-switched network. The Network Switching Center is made up of four main components: the Network Management System that manages the hardware and software components of the networks, the Network Switching Server (NSS) that routes calls among users, the Interoperability Gateway that provides connection points to other technologies, and standard LAN/WAN networking equipment. All of the components in the Network Switching Center are commercial off-the-shelf (COTS) computer and networking equipment that leverage the IP industry.

Network Management System

The Network Management System is composed of a Regional Network Manager (RNM) for networks with a single Network Switching Center (NSC) and a Centralized Network Manager (CNM) for networks with multiple NSCs and RNMs. The Network Manager provides management support for the various hardware and software components that make up the network. It identifies faults, provides audible alerts, and reconfigures system components to maintain continuous operations.

Network Switching Server

The NSS routes calls to and from each voice group or mobile data user on a real-time basis. The NSS regulates voice and data traffic on the network. Each voice user belongs to a voice group of peers. A network administrator assigns the members of a voice group and sets the voice group parameters including priority, hang time, preferred site, and response time. The NSS maintains these voice group files. The NSS routes the IP voice traffic of one member to all the other members of a given voice group.

Interoperability Gateway

The Interoperability Gateway provides interfaces to other mobile radio technologies through 4-wire analog interfaces. Voice calls are routed between OpenSky/NetworkFirst/P25^{IP} users and the Interoperability Gateway by the NSS as necessary. The Interoperability Gateway also supports a Public Switched Telephone Network (PSTN) interface for telephone interconnect users.

Network Topology

The topology of a network is divided into autonomous regions, which are further divided into cells. Each cell contains a collection point to

allow groups of audio sources entry into the system. At a higher level, each region contains a Network Switching Center which handles the voice and network control traffic between cells within and among regions.

The Network Switching Center can be configured with fully redundant hardware and software operating in a high-availability configuration to ensure the continuous network operation required in mission-critical applications.

The NSS is hosted on a SunTM server that is physically linked to a backup system containing redundant hardware and software configurations for emergency or troubleshooting purposes. The Network Management components also reside on Sun workstations. Multiple PC clients can be attached to management workstations for remote access and control.

For More Information

For more information about this or any other M/A-COM Wireless Systems product, call toll free in the U.S. 1-800-368-3277. From outside the U.S. call 1-434-455-9223 (Asia Pacific), 1-434-455-9229 (Latin America and Middle East), and 1-434-455-9219 (Europe).

OpenSky

M/A-COM's OpenSky Wireless Private Network is a fully interoperable digital trunked communications network for public safety, utility, federal, transit, and industrial markets. OpenSky is a complete end-to-end Voice over Internet Protocol (VoIP) solution and employs packet technology to provide integrated voice and data. The OpenSky radio network is the only private land mobile radio communications system that provides clean integration of data messaging with trunked digital voice on the same RF channel. Integrated voice and data over Time Division Multiple Access (TDMA) allows users to perform multiple communication functions at the same time on one radio. The use of TDMA doubles call capacity by allowing two simultaneous voice calls per 25 kHz channel.

NetworkFirst

Public safety communications in today's world faces unprecedented challenges. More than ever, Homeland Security and Situation Readiness depend heavily on effective communication among federal, state, county, and local agencies. M/A-COM's NetworkFirst answers the call for an emergency communications network that provides local, regional, state, and even nationwide connectivity. NetworkFirst uses cost-effective Internet Protocol (IP) packet switched technologies to provide a fast, cost-effective means of achieving multi-agency interoperability, regardless of radio type, frequency, or mode. NetworkFirst creates the most technologically advanced permanent communications network available in the industry today, providing a technology backbone that is extremely flexible, allowing communications requirements to expand – without a wholesale system changeout.

P25^{IP}

M/A-COM's P25^{IP} (P25 to the power of IP) is the first completely Internet Protocol (IP)-based conventional mobile radio communications system developed for users requiring the secure digital voice and data capabilities of Project 25 (P25). P25^{IP} is part of a portfolio of solutions that M/A-COM offers for wide-area communication systems – each of which is capable of meeting the communications requirements of public safety, public service and first responders. Within the M/A-COM portfolio, the P25^{IP} network provides an excellent fit for those agencies which have lower user densities (few users covering larger geographic areas) but still require feature-rich secure voice and data communications. P25^{IP} is also particularly appropriate for users operating with non-exclusive VHF and UHF frequencies. For federal users, P25^{IP} meets the Congressional and NTIA mandates for the narrowband (12.5 kHz) migration.

General Specifications

Refer to the individual product data sheets for specifications.

- Regional Network Manager – ECR-7052
- Centralized Network Manager – ECR-7132
- Interoperability Gateway – ECR-7054
- Network Switching Server – ECR-7053