Colubris NETWORKS™

The Intelligent Wireless Networking Choice™

5000 Series MultiService Controllers

Overview

Colubris MultiService Controllers (MSCs) are the central nervous system in the Colubris Intelligent Mobility System (CIMS), controlling the operation of intelligent access points distributed throughout a wireless zone, building or campus. MSCs deliver a range of services to wireless client devices and ensure consistent quality and security as clients roam throughout the network. With plug-and-play capabilities, they simplify WLAN deployment and minimize network operations costs.

MSCs compose the control plane in a Colubris TriPlane™ architecture, centrally controlling a network of hundreds of multiservice access points per MSC. The architecture offers all the benefits of centralized management and control without the traditional penalty of centralized switching, thus reducing backbone traffic by as much as 98% when compared with other WLAN solutions. By leveraging intelligence distributed in MSCs and other system elements, CIMS optimizes performance, mobility and migration to new wireless standards and technologies.

The Colubris Operating System (COS) embedded in all MSCs works with other CIMS components to create Virtual Service Communities (VSCs) – discrete groups of network users with assigned service policies. COS provides VSC users with access to one or more applications that share a common set of QoS and security policies. Once installed, Colubris MSCs can easily be upgraded via software to take advantage of new COS features.

CIMS is a modular system offering unrivaled scalability. Any number of 5000 Series Controllers can be deployed in a network, controlling up to 200 MultiService Access Points (MAPs), which, in turn, can be clustered to facilitate management and ensure seamless service. The 5000 Series Controllers feature full IP routing and network services that enable them to connect directly to a cable or DSL modem and provide a turnkey remote site networking solution. Colubris' Network Management System (NMS) provides a single, centralized system for managing your entire WLAN as an integrated whole, whether it consists of a single controller and a handful of access points, or literally thousands of controllers and tens of thousands of access points.

Key Features:

- Colubris' premier platform for delivering WLAN services with consistent quality and performance
- Centrally controls a network of up to 200 multiservice access points per multiservice controller
- Automatic multiservice access point discovery, configuration and software updates speed installation
- Colubris TriPlane™ architecture scales to thousands of users with unprecedented performance
- Embedded Colubris Operating System ensures consistent delivery of Virtual Service Communities
- Award-winning public/guest Internet access service creates easy-to-use hotspot services
- Sub-50 millisecond Inter-subnet roaming handoffs deliver toll quality voice performance
- Maintains per packet end-to-end QoS for roaming client devices
- Designed to support demanding VoIP and fixed mobile convergence applications

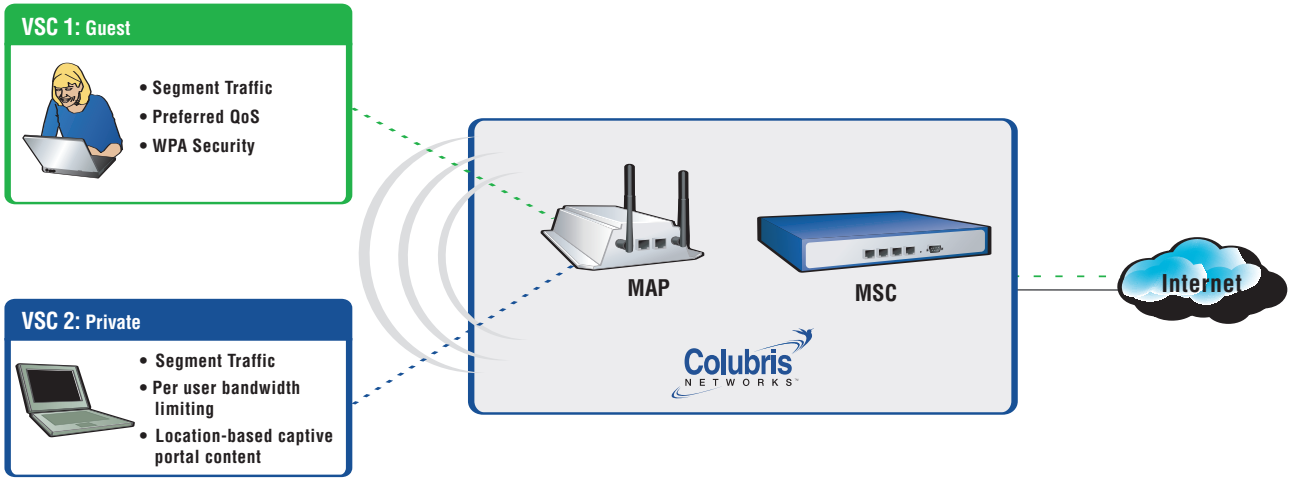
TriPlane™ Architecture: WLAN Switching At Its Most Intelligent

The Colubris TriPlane architecture optimizes WLAN efficiency and performance by switching client traffic at the network edge. MSCs process only network control and management information, enabling client traffic to flow directly from source to destination without unnecessary detours. Because MSCs handle only a small fraction of total WLAN traffic, they are highly scalable and deliver excellent price/performance.

The TriPlane architecture optimizes network efficiency by integrating WLAN traffic flows into the enterprise or service provider's wired network. Traffic flows are switched by intelligent access points at the network edge, enabling traffic to follow the most direct path from ingress to egress, optimizing the use of costly high-speed backbone links. TriPlane leverages the strong security and QoS features embedded in LAN networks by exposing WLAN client traffic flows to the wired network's IDS/IPS, network admission control and VLAN security features.

The TriPlane architecture maintains end-to-end QoS for real-time applications by leveraging the wireline network's native 802.1p and DiffServ prioritization capabilities. CIMS translates wireless and wireline priority schemes at the WLAN/LAN boundary. This enables all traffic, regardless of source or destination, to be classified and prioritized by wireline switches and routers according to existing QoS policies.

CIMS Creates Virtual Service Communities



MSC provides public/guest access service on VSC1 and access to private network services on VSC2, enforcing a corresponding set of QoS and security policies for each user type.

Colubris Fast Roaming: Seamless Mobility Throughout the Network

The fast roaming feature enables portable devices to maintain seamless network connectivity as they move between MAPs. The MSC and the MAPs it controls form a mobility group that work together to coordinate fast hand-offs within and across subnet boundaries. For large-scale networks, the MSC features mobility clustering, which enables multiple MSCs and associated MAPs to be interconnected into a single WLAN with fast roaming across the entire network.

A feature of the COS Mobility Pack configuration, fast roaming is transparent to the client device and requires no special client software. Using a secure implementation of the Inter Access Point Protocol, the MSC caches client security profiles in MAPs that are adjacent to the MAP servicing an authorized client. The MSC manages client profile information to ensure complete service continuity, including encryption key, VLAN assignment and more. Devices using WPA2 (IEEE 802.11i) encryption can maintain continuous security as they roam.

CIMS leverages standards-based IP networks for connectivity between an MSC and the group of intelligent MAPS it controls, giving network designers the flexibility to deploy WLANs in a range of network topologies. To enable seamless roaming between MAPs connected to different IP subnets, the MSC forms a GRE tunnel and forwards packets to the client device's "home" MAP, enabling the client to maintain complete connectivity with its originally assigned IP subnet.

Simplified Configuration, Deployment and Operation

For trouble-free deployment in geographically distributed networks, Colubris MSCs automate discovery, authentication and configuration with a group of MAPs. Using standard dynamic look-up procedures, MAPs identify the MSC to which they are assigned. Mutual authentication using digital certificates assures security and eliminates the risk of rogue access point connectivity. Once authenticated, the MSC establishes an encrypted tunnel for exchange of configuration and control information with the MAP.

The MSC provides centralized management for all MAPs in its mobility group. It eliminates time-consuming access point configuration, trouble-shooting and maintenance tasks by providing a single management interface for the mobility group. The MSC automates installation of access point software upgrades and ensures a consistent set of services are delivered throughout the network. All security, quality of service and other policies can be centrally defined through the MSC's intuitive and secure web GUI.

The MSCs also feature CLI interfaces which provide easy and secure configuration. An embedded VPN client secures all SNMP management traffic, and secure FTP protocols protect downloadable software and configuration files. They also feature detailed status displays that simplify troubleshooting.

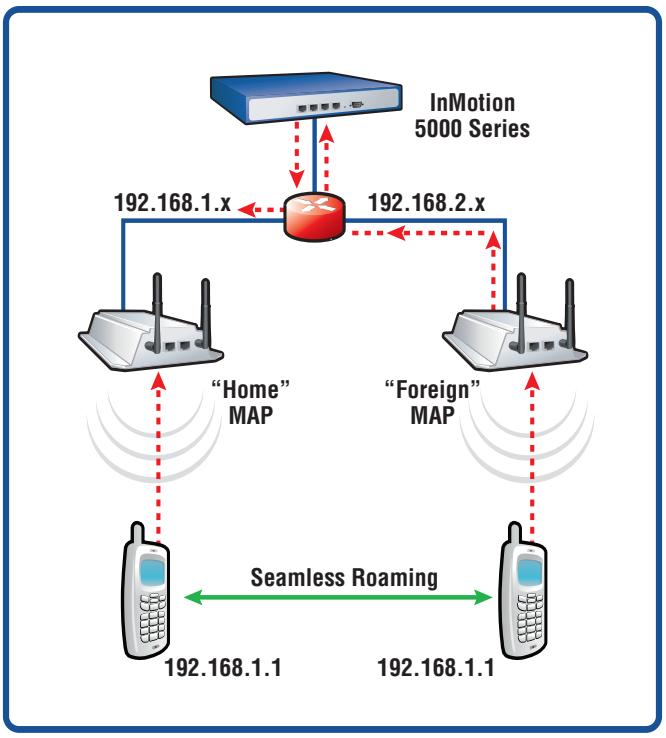
For large networks, the Colubris MSC is fully manageable by Colubris' powerful, standalone Network Management System. With Colubris NMS, organizations can centralize management for an entire network of MSCs and MAPs.

Best-in-Class Public/Guest Internet Access Service

The Public/Guest Internet Access Service is based on Colubris' award-winning access controller products. Included as a standard feature in all MSC configurations, this service provides convenient Internet access with the ironclad security and high performance that make Colubris a leader in this market. Designed to deliver the best possible user experience, the Public/Guest Internet Access Service features include Colubris' Zero Configuration Service Interface, which adapts to any client device's IP address and Web proxy settings, plus a customizable, Web login screen for easy sign-on.

To ensure seamless applications support, the Public/Guest Internet Access Service features Colubris' advanced IP networking capabilities, including Adaptive NAT™, SMTP redirect and DHCP services, providing transparent support for demanding applications, such as VPN tunneling, and e-mail.

Fast Intra/Inter Subnet Roaming



MultiService controllers work with MAPs to forward all roaming traffic to the cient's home IP subnet for consistent network performance, QoS and security.

A rich feature set allows service providers to create a centrally managed hotspot network. Support for a captive portal enables users to access special Web content. A standards-based RADIUS interface provides access to a remote authentication, authorization and accounting (AAA) system. MSCs collect activity statistics to support per-user billing by data volume and elapsed session time. Alternatively, operators can outsource these functions using the MSC's integrated support for leading third-party hotspot billing services.

Sophisticated wholesale and location-based services can easily be created using multiple Virtual Service Communities. Traffic from each VSC can be segmented and directed to separate network operations centers. Bandwidth can be allocated per VSC and per user using the service's wide array of bandwidth management features. The service gives enterprises the assurance of knowing they can provide Internet access to guests without compromising the security and performance of other applications. All traffic can be mapped to a specific VLAN, limiting access to specific network resources. At the same time, QoS policies eliminate competition for limited WLAN bandwidth between the guest and internal services that are sharing the network.

Optimized for Superior Voice-Over-WLAN Support

With an MSC controlling its operation, the Colubris Intelligent Mobility System delivers toll-quality voice services that leverage existing VoIP systems and extends telephony services to wireless phones. CIMS features support for a wide range of standards-based and proprietary WLAN phones, including popular SpectraLink™ and Vocera™ handsets. WMM™ QoS mechanisms support emerging third-party phone clients and provide four levels of prioritization, enabling video and data services to be converged on the same WLAN.

Tested under rigorous conditions, CIMS consistently delivers excellent voice performance, regardless of the amount of other traffic types that may also be using the network. Fast roaming ensures voice session hand-offs occur in under 50 milliseconds. With the flexibility of configurable power-save signals, handset battery performance is optimized, enabling CIMS to improve handset recharge cycle time by as much as 50% over competing WLAN solutions.

5000 Series MSC Products At-A-Glance

The 5000 Series MSC product family includes models for small-, medium- and large-site applications. All models provide the same full-featured network services, enabling a single architecture to be deployed across a range of locations. Special MSC software configurations are offered for customers that require only a Guest/Public Internet Access Service.

5000 Series MSC Products

	MSC-5100		MSC-5200		MSC-5500	
COS Configuration	Access Service	Mobility Pack	Access Service	Mobility Pack	Access Service	Mobility Pack
Services						
Fast Roaming & VoWLAN Support		✓		✓		✓
Plug-and-Play MAP Management	✓	✓	✓	✓	✓	✓
Public/Guest Internet Access	✓	✓	✓	✓	✓	✓
Max. MAPs* (controlled/ autonomous)	10/unlimited		40/unlimited		200/unlimited	
Max. Public/Guest Access Users	100		500		2,000	
Rack Mount Enclosure	1U		1U		1U	
Network Interfaces	(2)10/100/1000 Ethernet		(2)10/100Ethernet		(2)10/100/1000 Ethernet	

* Capacity limits apply only to MAPs that are connected to the MSC in Controlled Mode

Product Specifications

Model Number	**MSC-5100 MultiService Controller**	**MSC-5200 MultiService Controller**	**MSC-5500 MultiService Controller**
Network Ports	(2) Auto-sensing 802.3 10/100/1000 BASE-T (1) DB-9 male serial port	(2) Auto-sensing 802.3 10/100 BASE-T (2) Expansion ports (reserved) (1) DB-9 male serial port	(2) Auto-sensing 802.3 10/100/1000 BASE-T (1) RJ-45 serial port
Status LEDs	Power, (2) Ethernet activity	Power, storage activity, Ethernet activity	Power, storage activity, Ethernet activity
Power Inputs	48 VDC; 6 Watts, typical 802.3af PoE compliant	100-240 VAC, 50/60 Hz; 100 Watts, typical	100-240 VAC, 50/60 Hz; 100 Watts, typical
Temperature Range	Operating: 5°C to 50°C	Operating: 0°C to 50°C	Operating: 5°C to 50°C
Humidity	20% to 90% typical (non-condensing)	5% to 95% typical (non-condensing)	20% to 90% typical (non-condensing)
Regulatory Approvals	FCC Part 15-subpart B (Class B), CSA NRTL (C22.2 No 950, UL 60950-1), Canada Class A ICES-003, Industry Canada ICES03, Australia and New Zealand, Class A, United Kingdom NS/G/1234/J/100003, EU EMC Directive 89/336/EEC, Class A CISPR 22/EN55022, EN6100-3-2, EN6100-3-3, EN55024 Japan VCCI	FCC Part 15-subpart B (Class A), CSA NRTL (C22.2 No 950, UL 60950-1), Canada Class A ICES-003, Industry Canada ICES03, Australia and New Zealand, Class A, United Kingdom NS/G/1234/J/100003, EU EMC Directive 89/336/EEC, Class A CISPR 22/EN55022, EN6100-3-2, EN6100-3-3, EN55024 Japan VCCI	FCC Part 15-subpart B (Class A), CSA NRTL (C22.2 No 950, UL 60950-1), Canada Class A ICES-003, Industry Canada ICES03, Australia and New Zealand, Class A, United Kingdom NS/G/1234/J/100003, EU EMC Directive 89/336/EEC, Class A CISPR 22/EN55022, EN6100-3-2, EN6100-3-3, EN55024 Japan VCCI
Overall Physical Dimensions	H: 4.4 cm (1.74 in); L: 19.1 cm (7.5 in); W: 25.4 cm (10.0 in); Shipping Weight: 9.8 Kg (21.59 lbs)	H: 4.4 cm (1.73 in); L: 36.0 cm (14.17 in); W: 42.8 cm (16.87 in); Shipping Weight: 9.8 Kg (21.59 lbs)	H: 4.4 cm (1.73 in); L: 43.7 cm (17.2 in); W: 42.8 cm (16.87 in); Shipping Weight: 16 Kg (35 lbs)

Networking Specifications

Networking	Bridging and routing: IEEE 802.1d compliant bridging; RIP v1 (RFC 1058) and v2 (RFC 1723) Stateful Firewall Other: PPPoE Client (RFC 2516); ICMP (RFC 792); IEEE 802.1q VLAN tagging
Client Access Control and Security Functions	SSL protected universal access method (web-based authentication); MAC address authentication using local or RADIUS access lists; 802.1x authentication using EAP-SIM, EAP-TLS, EAP-TTLS and PEAP Web: Web proxy server; support for centralized portal DHCP: Server (RFC 2131); Client; Relay, Option 82 (RFC 3046) Address Management: NAT (RFC 1631); Colubris Networks Adaptive NAT™; CIDR (RFC 1519) AAA Security: RADIUS Client (RFC 2865 and 2866) using EAP-MD5, PAP, CHAP, MSCHAP v2 Fixed-IP client address spoofing Per site and per user access lists; white list and black list support Bandwidth limiting per user or per VLAN Concurrent users: Up to 100 for MSC-5100, up to 500 for MSC-5200, up to 2,000 for MSC-5500 DNS Relay, SMTP Redirection
Intra/Inter Subnet Roaming	TLS protected Inter Access Point Protocol for secure communication with MAPs Generic Route Encapsulation (RFC 2784)
Network Management	Fully manageable using InCharge Network Management System SNMP v2c, MIB-II with TRAPS, RADIUS Authentication MIB (RFC 2618), Colubris extensions for user session control and AP management; RIPv2 extension MIB (RFC 1724) Embedded HTML management tool with secure access (SSL and VPN) Scheduled configuration and firmware upgrades from central server Per user activity records by time used or data transferred Remote Syslog

Colubris NETWORKS™

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