Tropos 9422
Mobile Public Safety Mesh Router

TROPOS networks
GREENER, SAFER, SMARTER

FEATURES

Tropos Mesh OS

- Patented, purpose-built layer 3 mesh routing intelligence
- Predictive Wireless Routing Protocol dynamically employs links across multiple frequency bands to form the highest throughput, lowest latency end-to-end path
- Spectrum and Application-Based Routing Engine provides rule-based traffic segmentation, preserving 4.9GHz for public safety while delivering dynamic fault tolerance on the second band
- Dynamic channel assignment, automatic power control and automated data rate selection provide the most efficient use of RF spectrum
- Redundant, self-configuring and self-healing network architecture
- Adaptive Mesh Connectivity Engine compensates for Wi-Fi client variations, improving connection reliability
- High-speed, session-persistent roaming

Secure Management

- User-defined traffic filters
- 802.1x/802.11i/WPA2
- MAC address access control lists
- AES encryption of mesh data and control traffic
- Secure local and remote configuration via HTTPS
- SNMP-based element management system

Platform

- 4.9GHz radio for meshing and client access
- Best-in-class link budget for superior RF propagation
- Optimized for vehicle mounted with 12V power supply, external antennas and optional GPS
- FIPS 140-2 certifiable

The Tropos® System Architecture delivers the maximum scalability, high capacity at low cost and great user experience as demanded by public safety agencies and municipalities. The Tropos System Architecture combines the innovative and patented Tropos Mesh OS, the industry's most sophisticated metro-scale mesh routing intelligence, with Tropos analysis and control tools for centralized visibility, provisioning and management, and purpose-built Tropos routers with peerless 802.11 radio performance. Tropos' complete solution enables public safety agencies and municipalities to deliver citywide mobile multi-megabit connectivity for IP-based data, video and voice applications.

The Tropos 9422 mobile public safety router is designed for public safety use. It uses 4.9 GHz and 2.4 GHz radios to extend the fixed wireless mesh infrastructure and provide client coverage and connectivity. The Tropos Mesh OS, including Predictive Wireless Routing Protocol (PWRP), Advanced Mesh Connectivity Engine (AMCE) and Mesh Edge Service Management (MESM), provides the industry's most scalable mesh protocol.

A unique Tropos feature, SABRE (Spectrum and Application Based Routing Engine), provides software-enabled policy-based multi-band mesh routing. SABRE reserves the 4.9GHz band for public safety use, while optionally allowing the use of 2.4GHz spectrum to provide fault tolerance and enhance network capacity. It provides rule-based traffic segmentation, separating public safety from other traffic by carrying applications on the 4.9 MHz spectrum, while supporting dynamic fault tolerance in the event of link congestion or failure. SABRE ensures that each packet is routed along the optimal and appropriate path for both mesh and capacity injection layers. Utilizing the embedded Tropos Mesh OS, the Tropos 9422 creates a self-organizing and self healing 4.9 GHz or 2.4 GHz wireless mesh that intelligently selects the optimum end-to-end data path through the mesh. Because the Tropos Mesh OS consumes negligible bandwidth, networks can be scaled to many thousands of routers without client throughput or network capacity degradation.

Tropos 9422 routers create a mobile infrastructure to extend Tropos wireless public safety networks. The Tropos 9422 offers wireless access to both 4.9 GHz or 2.4 GHz client devices in its proximity and extends the mesh by providing wireless uplinks to other Tropos routers. The Tropos 9422 is optimized for vehicle mounting, provides in-vehicle access via Ethernet and can be easily fitted with an optional GPS receiver. Examples of public safety uses include:

Mobile Mesh Bridge: because of the superior RF characteristics of the Tropos 9422, users can connect to the Tropos public safety network via an Ethernet port on in-vehicle laptops for more reliable connections. Optimized for mobility, the Tropos 9422 provides fast handoffs.

Client Coverage Extension: each vehicle becomes a mobile hot spot, allowing officers to maintain broadband access while moving outside of their vehicles with 2.4 GHz or 4.9 GHz clients.

Tactical Mesh Zone: vehicle-mounted Tropos 9422s mesh to create a tactical hot zone, temporarily covering an area during events and emergencies.
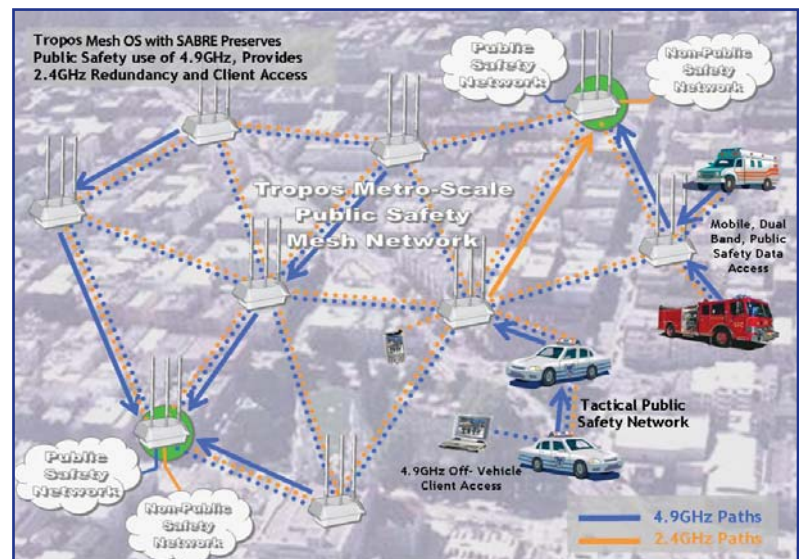
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TECHNICAL SPECIFICATIONS

Wireless
- IEEE 802.11b/g
- Frequency band: 2.4-2.483 GHz
- Modulation: 802.11g - OFDM (64-QAM, 16-QAM, QPSK, BPSK)
  802.11b - DSSS (DBPSK, DQPSK, CCK)
- TX Power: 36dBm (EIRP)
- Optional 6.0dBi omni-directional or 12dBi sector antenna(s)
- Media Access Protocol: CSMA/CA with ACK
- RX Sensitivity:

-100dBm @ 1 Mbps	-89dBm @ 18 Mbps
-95dBm @ 5.5 Mbps	-86dBm @ 24 Mbps
-91dBm @ 11 Mbps	-83dBm @ 36 Mbps
-94dBm @ 6 Mbps	-78dBm @ 48 Mbps
-92dBm @ 12 Mbps	-76dBm @ 54 Mbps

- Transmit and receive diversity

- IEEE 802.11a
- Frequency band: 4.940 - 4.990 GHz
- Modulation: 802.11a - OFDM (64-QAM, 16-QAM)
- TX Power: 29dBm (EIRP)
- Media Access Protocol: CSMA/CA with ACK
- RX Sensitivity:

-94dBm @ 6 Mbps	-86dBm @ 24 Mbps
-93dBm @ 9 Mbps	-83dBm @ 36 Mbps
-92dBm @ 12 Mbps	-78dBm @ 48 Mbps
-89dBm @ 18 Mbps	-76dBm @ 54 Mbps

- Configurable support for 20MHz, 10 MHz or 5 MHz channels

Networking
- TCP and VPN session persistent roaming
- Full 802.11b/g client compatibility
- NAT support
- Layer 2 and Layer 3 support
- DHCP Server and Relay
- Sub-interface support
- Two (2) 10/100 Base-T Ethernet ports (Management and CPE connection)
- Two (2) Type-A USB ports
- Console port (for factory use) and Serial port

Management
- HTTPS to on-board configuration management tools
- Secure local and remote configuration via HTTPS
- SNMP V2c
- Tropos MIB
- Browser-based management tool
- Simple configuration save and restore
- Network & client monitoring and statistical capture features

Security
- Authentication: 802.11i, WPA, WPA2, 802.1x (including EAP-TLS/TTLS/SIM/PEAP
- Encryption: WEP, TKIP, AES
- AES encryption of mesh and control traffic
- Multiple BSSIDs & ESSIDs (ESSID suppression)
- Full VPN compatibility (VPN filtering—rejects non-VPN traffic)
- MAC address access control lists
- HTTPS only to on-board management tools
- Packet filtering
- FIPS 140-2 certifiable

Environmental Specifications
- Operating temperature range: -40°C to 70°C
- Storage temperature range: -40°C to 85°C
- Shock & vibration: MIL-STD-202E, Method 204C
- Humidity range: 10-95% non-condensing
- IP Level 21

Optional Accessories
- GPS receiver with external puck antenna

Mounting Options
- Vehicle mounted in protected area such as trunk or cargo space
- Vertical or horizontal mounting orientation

Approvals
- FCC CFR 47 Part 15, Class B
- FCC Part 90
- UL 60950-1
- CSA 22.1 No. 950

Hardware Specifications
- Autosensing 10/100 BaseT Ethernet
- Power input: 10.0 to 32.0VDC
- Power consumption: 8W typical
- Polarity protection
- Low voltage disconnect protection
- Automotive over-voltage protection, SAE J1211
- Automotive mini-blade fuse and socket, externally accessible
- Network status lamp
- Remote network status indicator
- Dimensions:
  13.1 in wide x 7.91 in deep x 3.85 in high
- Weight: 9 lbs max., with mounting brackets

Protection Circuits
- Antenna Protection: ≤ 0.5µJ for 3kA @ 8/20µS Waveform
- Electrical Protection:
  - EN61000-4-5 Level 4 AC Surge Immunity
- Data Protection:
  - EN61000-4-2 Level 4 ESD Immunity

Warranty
- One (1) year on parts and labor; return to point of purchase
- *Optional* standard and premium support packages available

Package Contents
- Tropos 9422
- Mounting bracket and accessories
- Hardware Installation and Quick Start Guides

Ordering Information:
Part Number: 94222100
Tropos 9422 mobile router, variable power; N connectors, bracketry

For additional configuration options please contact your Tropos Representative

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networks

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