

Release 4.0 2/7/2017

## General Router Features

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- Fail-safe software update over the air (FOTA) - Software profile management - Manual/automatic software and configuration updates - Module firmware updates - Update via USB, HTTP, HTTPS, FTP, TFTP, SFTP - Command Line Interface (CLI) accessible via Telnet/SSH/HTTP(s) - Time synchronisation with timezone support - Multiple admin and user accounts - Remote RADIUS authentication - Certificate management for Public-Key-Infrastructure - Simple Certificate Enrollment Protocol (SCEP) - Logging, Log Rotation, Syslog Client/Server - Configurable LEDs - Watchdog supervision - Licensing mechanism - OSS License viewer

## Link Management

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- Link prioritization and aggregation - Multipath Traffic Distribution - Weighted balancing per TCP/IP session - Multipath TCP (MPTCP) RFC6824, RFC6356 - Support for IP-Passthrough - Static address assignment and DHCP - Maximum Transfer Unit (MTU) configurable - Link Supervision and high-availability features

## Interfaces

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- Ethernet 100M/1GE with switch/hub functionality - Virtual LAN (VLAN) according to IEEE 802.1Q/802.1P - PPP over Ethernet (PPPoE) - Multi-SIM / Soft-SIM support - Mobile Interfaces with CHAP/PAP authentication and header/data compression - Multi-APN support - Signal strength monitoring - Modem queries (Hayes AT/USSD) - ISDN Calls - WLAN operation mode client, access-point, managed - WLAN abgn/ac 2.4/5GHz 20/40/80 MHz - WLAN Multi-client support with authentication mechanisms:

WEP (64/128bit)  
 WPA-PSK (802.11i)  
 WPA-RADIUS (EAP-PEAP/MSCHAPv2)  
 WPA-EAP-TLS (802.1x/EAPOL)

- WLAN Multi-SSID support with authentication:

WPA-PSK (802.11i)  
 WPA-RADIUS (802.1x/RADIUS)  
 WPA-EAP-TLS (802.1x/EAPOL)

- Support for 802.11w PMF, Hidden SSID, Isolated clients, RADIUS Accounting - WLAN Configurable antenna gain - WLAN CAPWAP support - Pluggable USB storage, serial and ethernet adapters supporting

chipsets PL2303, CH341, FTDI, Pegasus, Asix, RNDIS

- RS232/RS485 interface with Serial-to-IP server - Digital Input/Output ports - GNSS with active/passive

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antenna - GPS standalone and MS-assisted - GPS server with raw/json mode - GNSS supervision -  
Audio cards - CAN interfaces - RS232/RS485 ports

## IP/Routing Protocols

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- Protocols like IP, TCP, UDP, ARP, ICMP - Destination- and policy-based routing - Multipath routing - Mobile-IP (MIP) RFC5944 mobile node and home agent - Open Shortest Path First (OSPFv2) - Border Gateway Protocol (BGPv4, BGPv4+, BGPv4-) - Multicast (Static Routing / IGMP Proxy) - TCP Maximum Segment Size (TCP-MSS) Clamping - Spanning Tree Protocol (STP) - Rapid Spanning Tree Protocol (RSTP) IEEE 802.1D-2004 - Transparent Bridging - Discovery Protocols LLDP, CDP, SONMP, EDP, FDP, IRDP (RFC1256) - Redundancy VRRPv2 Daemon RFC2338

## QoS —

- Dynamic bandwidth congestion - Diffserv-based traffic shaping - Stochastic Fair Queuing (SFQ) classes - Hierarchical Token Bucket (HTB) qdiscs - Priority-based queuing (PRIO)

## VPN Protocols

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- OpenVPN routed and bridged (Client/Server) supporting:

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TUN/TAP support over UDP/TCP
password/certificate-based authentication
Keepalive monitoring
Gateway redirection
Compression
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- IPsec routed (Initiator/Responder) supporting:

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NAT traversal
IKEv1/IKEv2
MOBIKE
PSK, PKI, XAUTH
Dead-Peer-Detection, PFS
Extended cipher suites
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- PPTP routed and bridged (Client/Server) RFC2637 supporting

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PAP, CHAP, MS-CHAPv2
CCP stateless MPPE128
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- GRE routed and bridged (Client/Server) - CSD Dial-In Server

## Firewall

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- Stateful inspection firewall - Address and port groups - Connection tracking for AMANDA, FTP, H323, IRC, BROADCAST, SNMP, PPTP, SIP, TFTP - Network Address Translation (NAT) - Network Address Port Translation (NAPT) - Masquerading - Bridge filtering

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## Services

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- Dynamic Host Control Protocol (DHCP) RFC2131/RFC3315 Client/Relay/Server - DHCP Options 3, 6, 44, 82 - Domain Name System (DNS) Caching Server RFC1035 - Static DNS Hosts - E-Mail Client RFC821/RFC822 with TLS/MD5 support - SMS receiver and sender - Network Time Protocol (NTP) Client/Server with NTPv2, NTPv3, NTPv4 support - Dynamic DNS (DynDNS), div. Provider, GnuDIP, RFC2136 DNS Updates - Event Manager with support for sending SMS, E-Mail, SNMP traps - Telnet Server - SSH Server with password / public-key authentication - SNMP Agent (v1,v2c,v3) with MIB support for:

MIB-II (RFC1213), SNMPv2-MIB (RFC3418), IF-MIB (RFC2863), IP-MIB (RFC1213),  
TUNNEL-MIB (RFC4087), HOST-RESOURCES-MIB (RFC2790), SNMP-FRAMEWORK-MIB, SNMPv2-SMI (RFC2578),  
LLDP-MIB, LLDP-EXT-MED-MIB, VENDOR-MIB

- HTTP/HTTPS Server - FTP Server - Voice Gateway with SIP agent and call routing supporting

Voice-Over-Mobile, SIP registrar, SIP direct, SIP user-agent and Audio

- Coovachilli Hotspot

### Programmability

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- System Development Kit (SDK) for customer-specific functions and applications. - Linux Containers (LXC) with support for lightweight virtualization of multiple isolated Linux systems

### Troubleshooting

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- Network debugging tools (ping, traceroute, tcpdump, speed-test) - Network monitoring and statistics (darkstat) - System debugging with adjustable debug levels for particular applications - TechSupport for problem analysis

### Supported Modules

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- Option GTM661 (GSM/UMTS/GPS/VOICE/DIALIN) - Option GTM671 (GSM/UMTS/GPS/VOICE/DIALIN) - Huawei EM770 (GSM/UMTS/GPS/DIALIN) - Huawei EM820 (GSM/UMTS/GPS/DIALIN) - Huawei MC509 (CDMA/GPS) - Huawei ME909 (GSM/UMTS/LTE/GPS/VOICE) - Huawei ME909s (GSM/UMTS/LTE/VOICE/GPS) - Huawei MU609 (GSM/UMTS/VOICE/GPS) - Huawei MU790s (GSM/UMTS/VOICE/GPS) - Huawei EM100 (GSM/UMTS/eLTE) - Sierra MC7710 (GSM/UMTS/LTE/GPS/GLONASS) - Sierra MC7700/MC7750 (GSM/UMTS/LTE/GPS/VOICE) - Sierra MC7304 (GSM/UMTS/VOICE/GPS) - Sierra MC7354 (GSM/UMTS/VOICE) - Sierra MC7430 (GSM/UMTS/LTE/GPS) - Sierra MC7455 (GSM/UMTS/LTE/GPS) - Sierra MC9090 (GSM/UMTS/VOICE/GPS) - Cellient MPN200 (CDMA450) - Cellient MPL200 (GSM/UMTS/LTE450) - Triorail TRM-5 (GSM-R/VOICE) - GTM671 Atheros AR9285 802.11bgn - WLE200NX Atheros QCA988X 802.11acbg - WLE600VX Atheros AR9280 802.11abgn - TI WL18XX 802.11bgn - ublox NEO M8L Dead-Reackoning - NM PCM2903 Audio - NM

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CAN/RS485 - NM IBIS/RS232

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