

NetModule Router Software

General Router Features

- 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

- 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

- 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 802.11ac/b/g/n 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 antenna
- GPS standalone and MS-assisted
- GPS server with raw/json mode
- GNSS supervision
- Audio cards
- CAN Interfaces
- RS232/RS485 ports

IP/Routing Protocols

- 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 Protocol

- OpenVPN routed and bridged (Client/Server) supporting:
 - TUN/TAP support over UDP/TCP
 - password/certificate-based authentication
 - Keepalive monitoring
 - Gateway redirection
 - Compression
- IPsec routed (Initiator/Responder) supporting:
 - NAT traversal
 - IKEv1/IKEv2
 - MOBIKE
 - PSK, PKI, XAUTH
 - Dead-Peer-Detection, PFS
 - Extended cipher suites

- PPTP routed and bridged (Client/Server) RFC2637 supporting
 - PAP, CHAP, MS-CHAPv2
 - CCP stateless MPPE128
- GRE routed and bridged (Client/Server)
- CSD Dial-In server

Firewall

- 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

Services

- 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

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

Troubleshooting

- 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