

Core network 10 Gigabit IP Router Platform Overview



About Wireless Excellence

Founded in 1996 and with headquarters in Oxford UK, Wireless Excellence Limited is a leading designer and supplier of outdoor and indoor Broadband Wireless communication products.

With a complete range of solutions including Radio, Microwave, Millimeter-Wave, Free Space Optics, WiFi and 4G/LTE solutions, customers in over 80 countries have chosen Wireless Excellence as the “one stop shop” solution of choice for dependable wireless networking.

About Our WiFi Range

CableFree IP Ethernet solutions deliver the power, connectivity, high-demand services and cost-effectiveness that are crucial to increased return on investment whilst offering the flexibility to support virtually any wireless broadband network. The platform combines superior access performance with the flexibility to facilitate a wide range of applications.

The technology is designed to speed deployment and time to market, while helping control equipment, management and installation costs.

System Features

- Powerful 10 Gigabit Hotspot Controller & Router
- Intended for use in Wireless Excellence wireless networks
- 1U or 2U 19" Rack-mount enclosure versions
- High-power CPU and networking hardware
- Carrier-class RadioOS and resiliency features
- Six PCI-E Gigabit Ethernet Interfaces in base model
- Multiple 2x 10GBE ports on option cards
- Extra 1G ports on option cards
- Options for RJ45 copper & Optical SFP interfaces

Applications

- Wireless ISP and Hotspots
- Bandwidth control, Authentication, NAT, Routing
- Traffic grooming and shaping
- Traffic Aggregation for Backhaul connections

Sophisticated Embedded Software Router Platform

Wireless Excellence WiFi AP-Hotspots are high quality enterprise-grade WLAN components. These products embody powerful carrier-class routers with advanced features giving major advantages over conventional wireless bridges or access points. Such features include:

Choice of CPU from 1 up to 3GHz • IP Bridging • Layer3 IP Routing • Border Gateway Protocol (BGP) • Ethernet-over-IP (EoIP) interfaces • Virtual Router Redundancy Protocol (VRRP) • WISP & hotspot –specific features including Walled Garden, Cookies, RADIUS authentication, accounting, control of connection time • uplink and downlink bandwidth control on a per-user basis • DHCP Client and Server • Network Address Translation (NAT); Stateful firewall and NAT; Easy DMZ deployment; IPsec, VPN tunnelling (PPTP, L2TP, EoIP, IPIP), VLAN and PPPoE; Transparent security: multiple STP bridges with packet filtering; many other features

Optimised for Broadband Internet and Wireless ISP (WISP) networks

Wireless Excellence Internet Routers offer major advantages over 'off-the-shelf' router products. Examples are:

- Many features optimised and designed for WISP environment
- Traffic aggregation, grooming and per-user bandwidth controls
- Virtual Router Redundancy Protocol (VRRP) allows two routers to be configured with one in 'hot standby' for high-availability applications Hotspot features including Radius authentication and per-user bandwidth controls
- Stateful firewall and NAT; Easy DMZ deployment; IPsec, VPN tunnelling (PPTP, L2TP, EoIP, IPIP), VLAN and PPPoE; Transparent security: multiple STP bridges with packet filtering;
- HTTP and DNS caching proxy; P2P rate-limiting and blocking system

Standards Compliance

Wireless Excellence Internet routers features advanced features with full standards compliance. Features include:

Routing Performance

IP Packet transmission performance (switching performance, for 64 byte packets) over 400k pps, over than 3Gbps throughput

Networking

IEEE 802.1Q VLAN tagging up to 4095 VLANs

IEEE 802.3AD Link Aggregation

Security

Authentication, authorization and accounting through RADIUS, MAC or/and TACACS for protection remote or local access(RFC 2138, 2139)

Filter for restriction of IP traffic with based the address and TCP/UDP/ICMP port destination and origination (access control lists)

MAC address filtering

Traffic Classification via Mangle (source MAC address, IP address or address range, IP address type, port or port range, IP protocols, protocol options, interface, ToS (DSCP) byte, packet content, packet size)

Peer-to-Peer protocols filtering Firewall

Stateful packet inspection (mangle: L4-7)

Intrusion Detection & Prevention Systems

PAP / CHAP / MSCHAP1 / MSCHAP2

IPSec

IKE (Internet Key Exchange)

Virtual Private Networks (VPNs)

Diffie-Hellman (DH) key exchange protocol (RFC2409)

Authentication Header (AH) protocol

Encapsulating Security Payload (ESP) protocol

General Routing Encapsulation (GRE) protocol

Tunnel and Transport modes

MD5 hash algorithm
Secure hash algorithm (SHA)
VPN through firewall and NAT
DES, 3DES, AES (128, 192, 256 bits) encryption

Optional hardware encryption acceleration
Secure Shell v2 (SSH2) protocol client & server
Network Time Protocol (NTP) (RFC 1305)

Protocols

IPv4 (50k routes) and IPv6 (25k routes)
(RFC 791, 815, 919, 922, 1191, 2460, 2464, 2463, 2462, 1981, 2473, 2893, 3056)
Frame Relay according (RFC 1490)
ARP, RARP and Proxy ARP (RFC 826, 1027, 1293, 2390, 925,903)
CIDR, ICMP (RFC 950, 792, 1256)
IP over IP Tunnels (RFC 2003)
Point to Point Tunnel protocol (PPTP) with over 100 tunnels supported (RFC 2637)
Point-to-Point protocol (PPP) (RFC 1661, 1662)
Point-to-Point Protocol over Ethernet (PPPoE) with over 100 tunnels supported (RFC 2516)
HDLC
IP encapsulation over X.25 (RFC 1356)
DHCP server, relay and agent (RFC 2131, 3315)
Quality of Service – QoS RFC 2474, 2475, 2597, 2598, 2697, 2698
Network Address Translation (NAT)
RFC 1631, 3022, 2663
RIPv1 and v2
RIPng
OSPFv2, OSPFv3 (RFC 2328, 3101, 2740)
IS-IS
BGPv4
RFC 1771, 1997, 2858, 2545
ECMP (Equal Cost Multi-Path) (RFC 2992)
Explicit Congestion Notification (ECN) marking (RFC3168)
Spanning Tree Protocol (STP) 802.1D
Rapid Spanning Tree Protocol (RSTP) 802.1w
Protocol Independent Multicast (PIMv1 and v2)
IGMP for IP Multicast (RFC 2236, 2362, 3973)
VOIP support
H.323
SIP (client, location and registrar server)
RFC 3261, 3262, 3263, 3326, 2976, 3311, 2327, 3264

Media Gateway Control Protocol (MGCP)
Gatekeeper Discovery and RAS
SCCP
Media Gateway operation for the protocols SIP and H.323
Codecs for ADPCM, G.711, G.723.1, G.726, G.728, G.729 and G.729a
Audio Call Control
Ports FXO when relevant modules installed
Ports FXS when relevant modules installed
Remote Administration
Command Line Interface (CLI)
Remote Windows graphical user interface (GUI)
Telnet
SSHv2 Client & Server
SNMPv2 and v3, MIB2 and Trap support
RFC 1904, 1905, 1906, 1907, 1213, 2011, 2012, 2013, 2737, 2233, 1215
TFTP Storage and retrieval of management information & operating system; software packages upload/download
Log Management features
Monitoring and mapping of traffic flows
Graphical presentation of statistical parameters; Voltage & Router temperature; CPU Utilisation; Memory Utilisation; Traffic per interface; Daily, weekly, monthly and yearly reports
Visual Indication (LEDs) to monitor router status including power, link speed, status/traffic, alarm
Diagnostic Tools
Bandwidth measurements
Packet Sniffer
Ping
Realtime Traffic Monitor based on protocol name, source address, destination address, port
Traceroute
Network Monitoring
System Watchdog
Regulatory Compliance
RoHS compliant
CE compliant
UL 60950, EN 60950
EMC compliance, FCC Class A, EN55022, CISPR22

Hotspot Applications & Features – Authenticated Internet Access

Hotspot is a Plug & Play access system in RadioOS that allows users to connect to the Internet after providing a username and password. It works in wireless or wired networks, and allows applying rules and restrictions to individual users. Accounting, user database, MAC authentication and much more – perfect for hotels, Internet cafes, airports and schools.

- Easy and flexible solution for hotels, Internet cafes, airports, ships, schools, universities
- Client authentication by user name and password, IP or MAC address, license agreement
- Plug & Play access possible
- Data rate shaping, quota (session-timeout, downloaded/uploaded traffic limit)
- Authentication and accounting locally, or on the RADIUS server
- User accounting by time, data sent/received
- Real-time user status information
- Universal Client
- DHCP server assigned IP addresses
- Customized HTML pages for login (create your own design)
- Walled Garden
- iPass support
- SSL secure web login

Firewall Functionality – complete data security

Quality of Service features:

- Improved HTB algorithm with burst support for building traffic queue hierarchy
- Traffic grouping using firewall mangle classifications, (ToS supported)
- SFO, RED, PFIFO, BFIFO queues
Per-connection queue for automatic fair data rate distribution between traffic groups Use for:
- Protecting the customer's hosts
- Enforcing the internet usage policy from the customer's network
- Protecting the router from unauthorized access
- Hiding the private network behind one external address (using Masquerading)
Applying queuing to outgoing traffic

Scalable, Modular Design for Future Proof Upgrades

Removable modules shown:

Chassis will take up to 5 modules

Each module has up to 8x GE ports or Nx 10GBE ports



Close-up pictures show how modules can be removed and replaced

Accessories

2x 10G Ethernet	2 port 10 Gigabit Ethernet card to support multiple up-links
8x Gigabit Ethernet	8 port Gigabit Ethernet card to support multiple links. Copper RJ45 and Fibre SFP options (MM, SM)
O/S Software	Higher level licenses for Public Wireless LAN, Hotspot, etc
Management Suite	Full range of solutions for centralised, remote and local management are available

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