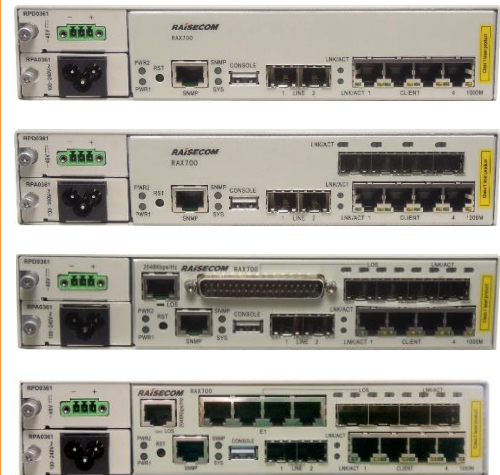




## RAX711-R – Multi-service Ethernet/MPLS Intelligent Terminal

Raisecom RAX711-R series, as a new generation Ethernet/MPLS terminal, is optimized for multiservice access and IP/MPLS network. It is well suited for the cost-effective access of residential, business and mobile services, and help service providers to push the MPLS network to the last-mile. The RAX711-R series offers high capacity in a compact size (1RU by 1/2RU width), with 2xGE ports as line side, 4xGE combo ports and 4xE1 ports as client side. The RAX711-R series provides a comprehensive and scalable feature set of Layer 2 VPN (L2VPN), Layer 3 VPN (L3VPN), VRF-Lite, PWE3 services with routing, MPLS, TDMoP, clock synchronization technologies optimized for service providers. It also supports a broad set of hardware-based end-to-end OAM tools (IEEE802.1ah/IEEE802.3ag/Y.1731/RFC2544) to help providers reduce their OpEx and to assure the agreed SLA, like Jitter, delay and packet loss.



RAX711-R

### Highlights >>

<b>IP MPLS</b>	Supports multiple routing functions, such as OSPF, ISIS, BGP, and MP-BGP, and supports LDP and RSVP-TE to dynamically establish MPLS tunnels and PW services.
<b>Multiservice</b>	Supports multiple service type, including L2VPN, L3VPN, PWE3, VRF-Lite service. 4xE1 interfaces for connecting legacy TDM network.
<b>Committed resiliency &amp; Protection</b>	Supports link-based, protocol-based, and service-based multi-layer protection functions, such as LAG/LACP, primary/secondary link aggregation, G.8031, G.8032, G.8131, TE Hot-standby, PW protection, and LSP protection with sub 50ms switching time.
<b>Hardware-based SLA</b>	Hardware-based BFD, MPLS-TP OAM and Y.1731 features supply multi-layer continuity check, frame delay, frame jitter and packet loss measurement mechanism. Includes on-board, line-rate RFC2544 testing capabilities for end-to-end SLA verification.
<b>Management</b>	Supports auto-Provisioning, plug & play. End-to-end configuration and service management in Raisecom NView platform.
<b>Synchronization for MBH</b>	Compliant with ITU-T G.8261/G.8262 (SyncE) for network-based synchronization.
<b>High Availability</b>	Supports graceful restart for routing protocol. Dual hot-swappable power supply design.

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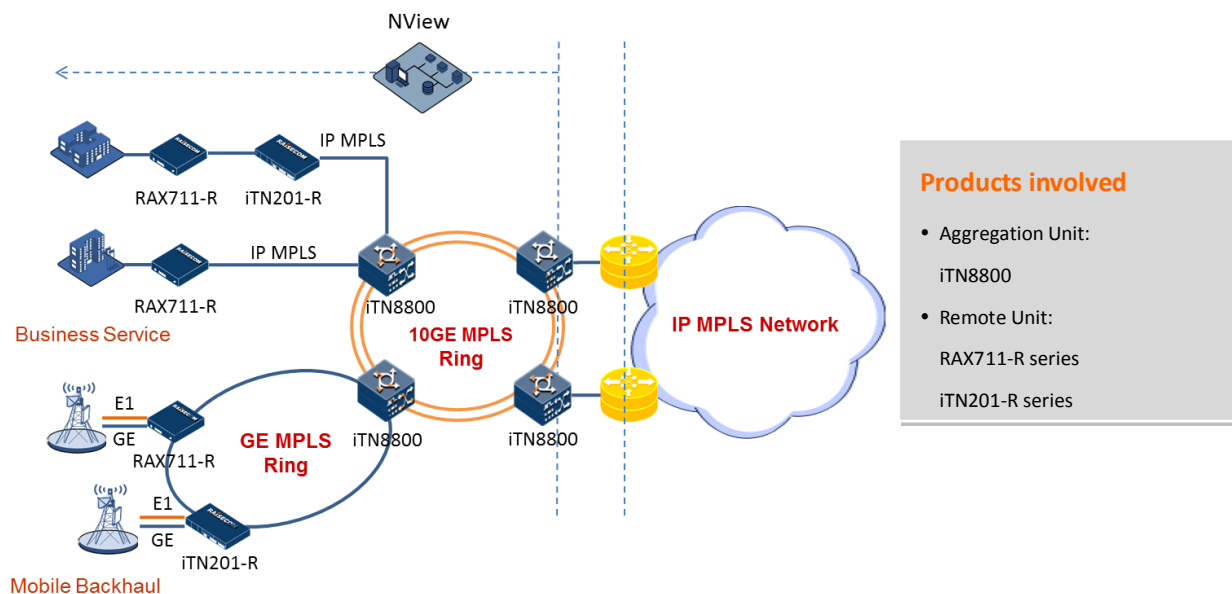
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Application >>



- Products involved**
- Aggregation Unit:  
iTN8800
  - Remote Unit:  
RAX711-R series  
iTN201-R series

Figure.1 Multi-Service delivery

**Large Enterprise, Small/Medium Business services Application**

The RAX711-R series can work together with iTN8800/iTN201-R for Large Enterprise, Small/Medium Business services. Its huge capacity, service-based QoS and protection mechanism allow Imaging/video distributions, business data, L2VPN, L3VPN, TDM services etc. Meanwhile, such solution can guarantee Carrier-grade end-to-end SLA (hardware-based) performance monitoring for frame delay, flame jitter and packet loss. Its low-cost compact design with IP MPLS technologies will help service providers to push MPLS network to the last-mile and build a uniform MPLS network.

**New Generation Mobile Backhaul Application**

The RAX711-R series enables service providers to transmit GE bandwidth and native TDM traffic with sync Ethernet frame when converging and migrating 2G and 3G to 4G and newer IP-based mobile technologies. It is easy to create GE ring with iTN201-R/iTN8800 with Ethernet G.8032 or MPLS technologies. To guarantee the huge mobility data application as well as voice, its PW protection/LSP protection/TE Hot-standby features conform to switch over within 50ms. MPLS-TP OAM, Y.1731 and RFC2544 will help to report the quality of service from end-to-end.

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## Key Features >>

<b>Ethernet service</b>	IEEE 802.1Q VLAN; 4K active VLANs; QinQ; VLAN translate
<b>MPLS Service</b>	MPLS VPWS,VPLS, L3VPN LDP for LSP/PW, MPLS-TP, RSVP-TE
<b>PWE3</b>	PW payload type: SAToP, CESoPSN PSN type: MPLS Configurable Jitter buffer & RTP
<b>Layer 3 Service</b>	IPv4 Stack and IPv4 hardware forwarding OSPF for IPv4, ISIS for IPv4, BGP for IPv4, MP-BGP, VRRP, VRF-Lite
<b>Switching mode</b>	Store and Forward mode 16Mbit switching buffer
<b>MAC Address Table</b>	MAC address learning/add/remove/searching Up to 32K MAC addresses
<b>Route Table</b>	Up to 4K FIB table
<b>Packet forwarding</b>	MTU: 9600 byte (default: 1500 byte) Storm control on DLF, Multicast and Broadcast packets
<b>Link Aggregation</b>	Up to 8 link aggregation groups Load balance based on MAC, MPLS label and IP address
<b>Link Resilience</b>	PW redundancy, PW dual-home protection PW 1:1 and LSP 1:1 based on ITU-T G.8131 TE Hot-standby ITU-T G.8031 ELPS & ITU-T G.8032 ERPS Port based Ethernet local loop detection Link fault pass through
<b>IP and MPLS OAM</b>	IPv4 Ping, IPv4 Traceroute LSP Ping/PW Ping/Tunnel Ping/L3VPN Ping LSP Traceroute/PW Traceroute/Tunnel Traceroute/L3VPN Traceroute Supports BFD message is sent per 3.3ms BFD for OSPF/ISIS/VRRP, BFD for PW/Static LSP/LDP LSP/CR-LSP/Tunnel/IP
<b>MPLS-TP OAM</b>	Supports MPLS-TP OAM on PW/LSP/Section based on ITU-T G.8113.1 Supports Check message is sent per 3.3ms Supports Hardware-based Frame Delay and Packet Loss Measurement Supports CC/LB/LT/AIS/RDI/APS/LM/DM/CSF
<b>Carrier Ethernet OAM</b>	Supports IEEE 802.3ah EFM-OAM link management Dying gasp message in case of power failure Supports IEEE 802.1ag CFM and ITU-T Y.1731 SLA

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Supports Check message is sent per 3.3ms  
Supports Hardware-based Frame Delay and Packet Loss Measurement  
Supports ETH-CC/LB/LT/AIS/RDI/LCK/APS/LM/DM/LCK  
Supports IEEE 802.1ag CFM and ITU-T Y.1731 SLA over MPLS PW EFP

**SAT** Supports RFC2544 over MPLS PW EFP

**ACL** Supports MAC/IP/MPLS based ACL and L2~L4 based ACL MAP  
Supports user defined ACL  
MAC based ACL combination with VLAN/CoS/MAC/EtherType  
IP based ACL combination IP/L4 protocol/DSCP/VRF  
MPLS based ACL combination with MPLS Label/MPLS EXP

**QoS** Supports Port/Trunk/VlanIf/Sub-interface mapping  
Supports CoS/DSCP/MPLS EXP mapping  
Supports SP, WRR, DRR, SP+WRR, and SP+DRR scheduling  
Supports port-based/flow-based shaping  
Up to 8 queues per port  
Flow-based statistics/mirroring/rate-limiting/redirecting/VLAN-rewriting  
Rewriting of 802.1p CoS/DSCP per EVC  
Supports Weighted Random Early Detection, weight 0-15

**MPLS QoS** Supports MPLS Pipe and Uniform mode  
Bandwidth configuration check between PW/LSP/Port  
H-CAR(Hierarchical bandwidth rate-limit) between PW/LSP/Port

**Rate-Limit** Supports ingress rate-limit and egress rate-limit  
Based on Flow/RFC2697/RFC2698/RFC4115/MEF modes

**LLDP** Discovery remote base on link layer  
Get remote basic information

**Mirror** Mirroring per port  
Separate mirroring configurations for ingress port & egress port & CPU port

**Synchronization** SyncE according to ITU-T G.8261/G.8262, supports SSM-QL

**DHCP** Supports DHCP client

**High Available** Supports graceful restart on OSPF, ISIS, BGP

**Statistics** Ingress and egress statistics based on Port/Interface/Rate-Limit/VPWS/VPLS  
In-profile and out-profile statistics based on ACL

**Management** CLI/ARP/Telnet/Console/SNMP/SSH/SysLog/Trap  
Raisecom NMS  
FAN/Power/Temperature/CPU/Memory/Module management

**Safety Features** Client classification and password protection

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RADIUS & TACACS+  
 CPU protection based on rate-limit  
 Port Isolation

**Time management**      Timezone, Time modification  
 Supports SNTP & NTP

**DDM**                      SFP digital diagnostic function

## Specifications >>

<b>Performance</b>	Switching fabric: 8Gbps
<b>Physical Interface</b>	Management port: 1 console (USB); 1 out band SNMP(RJ45) Network interfaces: 2 x GE SFP Client interfaces: 4 x GE Combo 1 x 2Mbit/2MHz Clock Interface (RJ45) 4 x E1 Interfaces (RJ45/DB37)
<b>Power Specs</b>	220V AC (100 to 240V AC) -48V DC (-36 to -72V DC) Full load: ≤25W
<b>User Conditions</b>	Operating temp: -10~50°C (14~122°F) Storage temp: -25~70°C (-13~158°F) Humidity: 10~90% non-condensing
<b>Lightning Proof</b>	6kV
<b>Dimensions</b>	220(W) x 180(D) x 43.6(H) mm <sup>3</sup>
<b>Weight</b>	≤ 2.5Kg

## Compliances >>

<b>Standards &amp; protocols</b>	IEEE802.3 IEEE802.3z IEEE802.3x IEEE802.3ad Link Aggregation IEEE802.1p IEEE802.1Q VLAN IEEE802.1ad QinQ IEEE802.3ah OAM&IEEE802.1ag CFM ITU-T G.8261/G.8262 SyncE ITU-T Y.1731 Services OAM ITU-T G.8031 ELPS ITU-T G.8032 ERPS ITU-T G.8131 MPLS Linear Protection ITU-T G.8113.1 MPLS-TP OAM RFC2544 RFC2328 OSPFv2 RFC1195 IS-IS RFC4271 BGPv4 RFC4760 MP-BGP RFC3031 MPLS Architecture RFC3985 PWE3 RFC4664 L2VPN RFC4762 VPLS RFC2547 BGP/MPLS VPN RFC5036 LDP RFC4447 LDP for PW RFC3209 RSVP-TE RFC5880 BFD RFC5086 CESoPSN RFC4553 SAToP RADIUS TACACS+ SNMPv1/v2c/v3 EMC Class A MEF 9 & MEF 14
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## Ordering Information >>

<b>RAX711-R-4GE-X</b>	2 GE SFP line ports, 4 GE client copper interface, X can be any combination of AC and DC
<b>RAX711-R-4GC-X</b>	2 GE SFP line ports, 4 GE client combo interface, X can be any combination of AC and DC

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**RAX711-R-4GC4E1-S-X** 2 GE SFP line ports, 4 GE client combo interface, 4 E1 interface(DB37), X can be any combination of AC and DC

**RAX711-R-4GC4E1-BL-S-X** 2 GE SFP line ports, 4 GE client combo interface, 4 E1 interface(RJ45), X can be any combination of AC and DC

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