Defence Communications Systems

SENTINEL MSR115 TACTICAL ROUTER MULTI-SERVICE ACCESS & NETWORKING DEVICE

Sentinel Multiservice Switch Router (MSR115) is a reliable and secure dual stack IPv4/IPv6 networking solution for tactical military use. MSR115 successfully operates in both land deployable segment, and naval domain.

MSR115 exploits all the benefits deriving from IP technology in terms of system versatility and service convergence. At the same time, it provides enhanced networking features with respect to optimised Quality-of-Service (QoS) for any different application or service, network mobility, resilience and system security. As such, MSR115 provides consistent routing performances across its wire speed interfaces together with non blocking multilayer switching capacity up to 64 Gbps.

MSR115 combines high-grade throughput performance with innovative services and protocols support in an extremely scalable architecture.

KEY FEATURES

- Compact, ruggedised suitable to tactical military use in deployable land and naval domain according to MIL-STD-810G, MIL-STD-461E
- Reliable dual stack IPv4/IPv6 networking solution with non-blocking multilayer switching capacity and full hardware redundancy capabilities
- Reactive routing algorithms tailored for military and mission critical applications
- Gigabit Ethernet, wideband and narrowband serial interfaces to carry out extremely scalable network architectures
- Connection-Less and Connection-Oriented traffic management
- End to End Military QoS for Connection-Oriented traffic
- Multi Level Priority and resources preemption capabilities for Connection-Oriented traffic
- Integrated Service features: VoIP server and gateway functions with support of civilian and military supplementary services, interworking with STANAG/EUROCOM military and PSTN civilian external networks.

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A wide range of interfaces is available to establish network connections over Ethernet and narrowband and wideband serial links. In addition to standard IP protocols, extra networking solutions are introduced for faster topology convergence and graceful network performance degradation upon link failures or nodes disruption.

Along with standard DiffServ QoS policies, advanced bandwidth reservation mechanisms are implemented in support of mission critical applications (real time data). Our Company is committed in a continued support of MSR115 products to keep the embedded standard protocols at the state-of-art of the approved IETF protocol Suites.

On the network interfaces Forward Error Correction mechanisms can be run to meet high-grade link quality requirements in presence of Bit Error Rate (BER) up to 10-3. Network resilience and security are further guaranteed thanks to the distributed MSR115 architecture and redundant networking engine, and the capability to support Multi-Level Security architectures.

QUALITY OF SERVICE MANAGEMENT

MSR115 provides a robust IP network solution capable of managing - at the same time - Connection Less (CL) traffic and Connection Oriented (CO) traffic.

The equipment is able to manage Connection Less traffic by means of a DiffServ paradigm, which allows prioritising voice, video and data by using packet marking. Moreover, Policy Based Routing (PBR) provides a Provisioned QoS allowing the MSR115 to route the packets differently using policy rules. As far as the Connection Oriented traffic is concerned, the equipment is able to guarantee a dynamic bandwidth allocation and the delivery of End-to-End QoS to the different data, voice and video applications with full support of military user services (priority, pre-emption, security, etc).

End-to-End QoS is guaranteed during the whole connection time by means of Call Admission Control and traffic shaping/engineering capabilities purposely developed by Leonardo.

Up to 5 (classified) +1 (unclassified) security levels are provided on traffic flow basis and the equipment is able to route the traffic according to the pertinent security level. Upon link failures, the equipment provides automatic rerouting of current traffic flows through different (weighted) available paths. The allocation of the available systems resources is concurrently ruled by security, priority and traffic control policies.

The MSR115 is fully interoperable with Leonardo MPS and CD switches.

ROUTING PROTOCOLS

The MSR115 supports any relevant standard routing protocols, such as OSPF and BGP, in line with typical user requirements.

What makes the MSR115 tailorable to military and mission critical applications is its ability to manage Advanced Flood Search routing, offering an extremely rapid convergence time in case of lost link. Policy Based Routing (PBR) and GRE tunneling complete the offer for advanced features.

INTEGRATED SERVICES

The MSR115 is able to work on demand as Integrated Service Router, performing Voice over IP (VoIP) processing, providing legacy user accesses and assuring interworking functionalities towards legacy networks and users supporting both civilian and military communication protocols.

MSR115 is able to fully interoperate with the CD family tactical switches and to provide complete support to EUROCOM, STANAG, ITU-T and ETSI standards. Moreover, by integrating the Sentinel IP Calling Suite, MSR115 is able to provide civilian and military VoIP services in accordance with H.323 and SIP standards.

VoIP military extensions, such as management of precedence and pre-emption, PTT signalling, self-affiliation and self-deaffiliation of users, nomadic users management, digital conference, non secure warning tone make MSR115 suitable to meet military VoIP needs in both tactical and mobile scenarios.

When deployed in conjunction with the Sentinel VoIP phone, user access to VoIP military services is highly enhanced.

TECHNICAL SPECIFICATION

The MSR115 provides one slot for network processing unit and up to five expansion slots in a compact rugged chassis available in two different form factors: 1 rack unit and 3 rack units. The expansion slots can accommodate a wide range of different network and user access interfaces or a redundant routing engine. The product is designed to meet stringent mechanical, environmental and electromagnetic stresses in accordance with the applicable MIL-STD specifications.

IP Interworking
- OSPFv2
- BGPv4
- GRE Tunneling
- PIMv2-SM
- IGMPv2.

Advanced Routing
- Advanced Flood Search routing
- Classical Flood Search routing
- Areas Bounded Flood Search routing
- Policy Based Routing.

Redundancy
- Fault Tolerant architecture
- VRRP.

Security
- Firewalling through Access Control Lists
- Up to 5+1 security domains for traffic flows.

QOS
- DiffServ and QoS E2E
- Connection-Oriented flows, traffic shaping, advanced scheduling
- Link Fragmentation Mechanism.

Network Services
- DHCP
- IPv6 Stateless Router Autoconfiguration
- Proxy ARP
- Network Synchronisation.

Layer 2 Features
- Transparent bridging
- MAC learning, aging and switching by hardware
- VLAN according to IEEE 802.1q
- Rapid Spanning Tree Protocol according to IEEE 802.1w
- InterVLAN routing.

Integrated service features
- Standard and military basic and supplementary VoIP services, supporting H.323 and SIPv2
- Telephonic addressing formats according to standard and military numbering plans: ITU-T E.164, STANAG 4214 Ed. 1 and Ed. 2, STANAG 5046, STANAG 4705

- Support of a wide set of voice codings: G.711 A and u- law, G.726 ADPCM16 and ADPCM32, CVSD16 and CVSD32, G.729.1 CELP 8kbps , G.165 echo canceller
- Interoperability with legacy users/network equipment such as Leonardo MPS and CD switches, ISDN PABX, ISDN and EUROCOM/STANAG Gateways.

INTERFACE UNITS

Tactical Management Routing Engine unit
- Usable in MSR115 3U equipment
- 1 x RS232 serial interface for management
- 1 x 10/100 Base T Ethernet interface for management
- Redundancy capability
- Provided of packet processor with 64 Gbps non blocking switching capacity.

Tactical Management Routing Engine (MRE-1U) unit
- Usable in MSR115 1U equipment
- 1 x RS232 serial interface for management
- 1 x 10/100 Base T Ethernet interface for management
- 2 x 1000 Base Lx or Sx Ethernet LAN/WAN interfaces
- 2 x 10/100/1000 Base T autosensing Ethernet LAN/WAN interfaces
- Provided of packet processor with 12 Gbps non blocking switching capacity.

Tactical IP5GigaOPT-BT unit
- 2 x 1000 Base Lx or Sx Ethernet LAN/WAN interfaces with L2/L3 switch functionality embedded
- 3 x 10/100/1000 Base T autosensing Ethernet LAN/WAN interfaces with L2/L3 switch functionality embedded.

Tactical IP4GigaBT unit
- 4 x 10/100/1000 Base T autosensing Ethernet LAN/WAN interfaces.

Tactical IP4GigaOPT unit
- 4 x 1000 Base Lx or Sx Ethernet LAN/WAN interfaces.

Tactical ATM155OPT unit
- 4 x ATM STM-1 optical interfaces.

Tactical MRFEC unit
- 3 x Synchronous/Asynchronous serial interfaces based on ATM technology individually configurable as:
  - Up to 2 Mbps IAW ITU-T V.11/V.35
  - Up to 128 kbps IAW ITU-T V.28
  - 2/8/34 Mbps IAW ITU-T G.703 (coaxial)
- Forward Error Correction capability individually operable
- Fragmentation mechanism.

Tactical MRFEC-HSSI unit
- 3 x High Speed Serial interfaces individually configurable as DTE interfaces with bit rate from 64 Kbps up to 52 Mbps, IAW HSSI
- Forward Error Correction capability individually operable
- Fragmentation mechanism.

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INTEGRATED SERVICE INTERFACE UNITS

Tactical ISDNE1T1 unit
- 4 x ISDN E1/T1 interfaces configurable in transparent mode or signalling mode.

Tactical EUROCOM unit
- 4 x EUROCOM AMI/HDB3 interfaces configurable with different electrical interfaces (EUROCOM A, G.703, STANAG 4210) and bit rate (from 256 kbps up to 2 Mbps), and supporting the following signalling protocols: Leonardo Eurocom Trunk and STANAG 4206.

Tactical CDP-ANL unit
- 4 x Conditioned Diphase interfaces operating at 32 kbps or 64 kbps or 128 kbps able to transport data traffic
- 8 x 6 wires E&M Analog interfaces able to transport audio traffic generated by FSK modems, HF, UHF and VHF radio devices.

Tactical MSAG unit
- Dedicated platform to perform both IP Calling Suite and VoIP Gateway functions according to SIP/H.323 signalling protocols extended with support of military supplementary services
- Provision of local hardware devices to mix flows of multiparty voice services and to carry out transcoding functions.

MANAGEMENT

Auto-Diagnostic
- Power-on self-test
- General Alarm.

Local Terminal
- RS232 asynchronous serial line with ASCII protocol.

NMS/EMS Control Through Ethernet Interface
- SNMPv3 protocol
- Telnet protocol
- Configuration files via XML
- TFTP saving and restoring configuration.

POWER SUPPLY

DC Source
- Voltage: 48 VDC
- Maximum Consumption
  - 240W in MSR115-3U maximal configuration
  - 80W in MSR115-1U maximal configuration.

PHYSICAL

Size
- MSR115-1U: 64 x 491 x 477 mm (H x W x D)
- MSR115-3U: 153 x 491 x 477 mm (H x W x D).

Weight
- Up to 10 kg in minimal configuration
- Up to 45 kg in maximal configuration.

ENVIRONMENTAL

- According to MIL-STD-810G
- Operating Temperature: -40°C ÷ +55°C
- Humidity: 95% non condensing.

MECHANICAL

- According to MIL-STD-810G.

EMI/EMC

- According to MIL-STD-461E
- CE: Electromagnetic Compatibility according to ETSI 300-386.

ELECTRICAL SAFETY

- According to CEI EN 60950-1.

INSTALLATION

- 19" racks
- Fixed, shelters, tents, on the field in land domain
- Fixed, on board ships in naval domain.