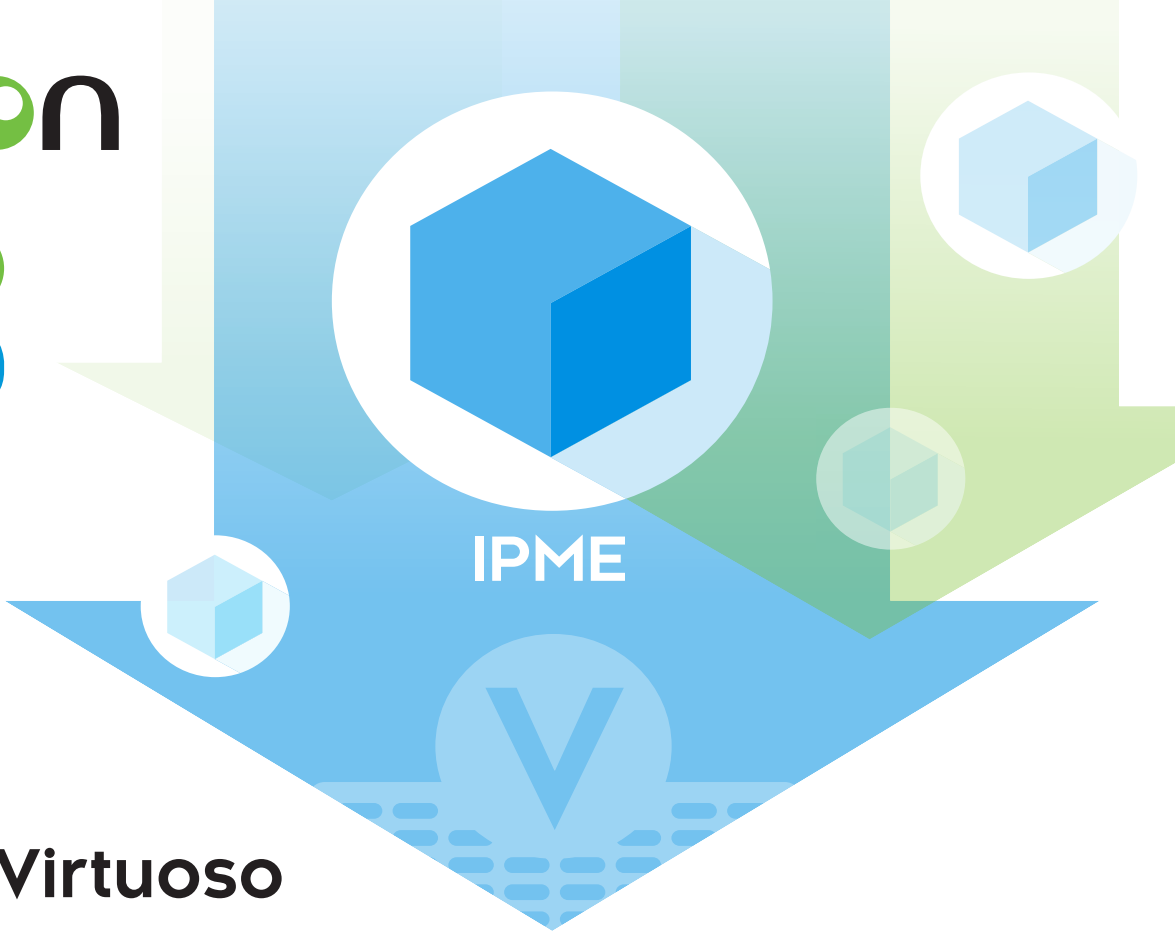
datasheet

Virtuoso Media Function



Nevion Virtuoso

IP Media Edge - Trust Boundary

Nevion Virtuoso's IP Media Edge Processor offers a trust boundary providing network isolation, media firewall, network stream protection and translation for RTP/IP media flows.

IP media trust boundaries provide security at the decarmation point between trusted and untrusted networks, ensuring valuable media assets are fully secured. Nevion's IP media edge (IPME) follows SMPTE RP 2129 recommended practice.

The IP Media Edge Processor incorporates advanced techniques for processing and protection of generic RTP/IP media flows.

Processing features include Network Address Translation (NAT) including unicast to/from multicast translation, bitrate policing, stream duplication, flow linearization and de-jittering.

Protection features include SMPTE ST 2022-7 hitless switching for RTP stream redundancy and SMPTE ST 2022-1/5 Forward Error Correction.

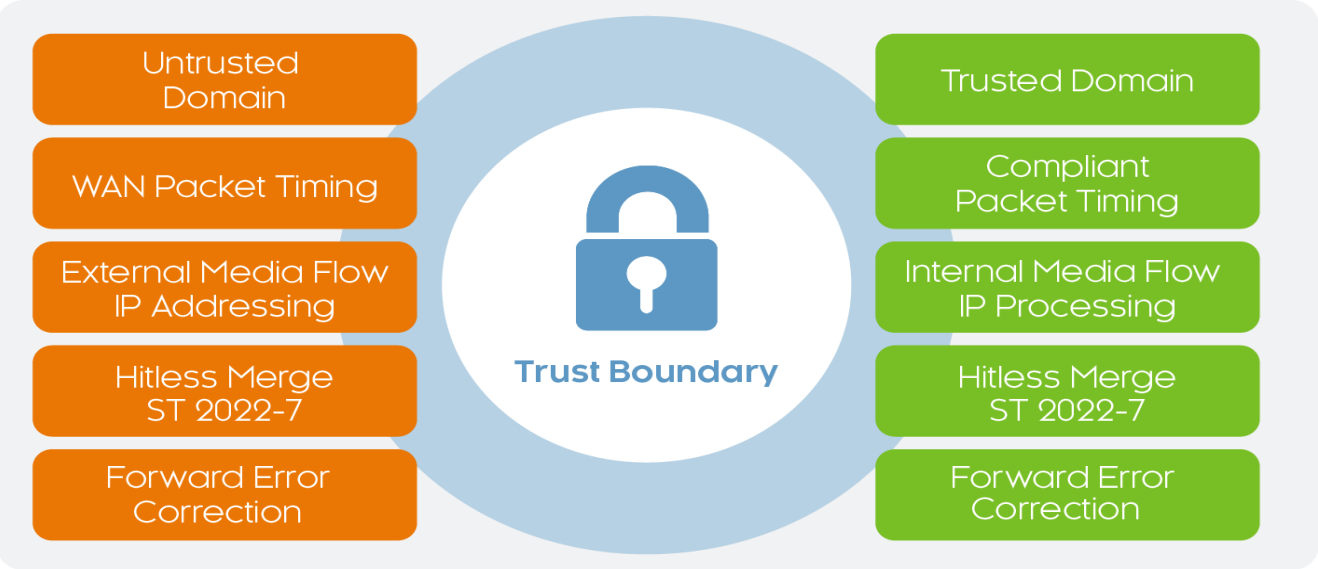
Focusing entirely on processing IP media flows to secure networks and optimize their performance, the IPME is a key addition to the Nevion Virtuoso Platform. Due to its dedicated hardware packet processing and complete isolation between Ethernet ports, the IPME is ideal for protecting the media network edge.

Applications

- Professional broadcast contribution
- Studio-to-studio media exchange
- Live sports and event contribution
- Managed video services over IP
- IP television/radio distribution networks

Key features

- IP gateway for generic RTP/IP streams
- Follows recommendations of SMPTE RP 2129
- Media firewall providing network isolation
- Quad network interfacing to 10GE or 1GE
- Network Address Translation (NAT)
- Unicast and Multicast support (IGMP v2/v3)
- VLAN (IEEE 802.1Q/P) support
- Network flow bitrate policing
- Network flow duplication - IP smallcast
- Standards-based Forward Error Correction supporting SMPTE ST 2022-1 and ST 2022-5
- Hitless switching with SMPTE ST 2022-7 for RTP/IP streams sent across dual network links
- RTP payload agnostic operation - RTP headers are fully preserved from input to output.
- Per-flow monitoring and analytics, including PDV/ jitter, packet loss, packet rate and bit rate.



Trust boundary

The trust boundary concept describes the demarcation point between domains and networks and the security aspects required to protect the integity of assets moving between them. Transitioning to IP networks has put resilience at the fore for broadcasters and media companies. IPME follows the recommendations of SMPTE RP 2129 when implementing secure media transport over IP networks..

WAN-LAN separation

The IPME 10G has built-in functionality to separate an external network (WAN) network from the local (LAN) network. This will greatly enhance the network edge security for service contributions, and enable proper separation of private and external networks, local and wide-area networks, or customer and transport networks (for service providers), thus making the IPME 10G acts as a firewall for media networks.

High capacity flow processing

IPME 10G supports simultaneous processing of 128 RTP/IP streams on 10GE per HBR accelerator. Maximum throughput is 9.1 Gbit/s + 9.1 Gbit/s using two interfaces and 6.5 Gbit/s per interface using four interfaces (total 26 Gbit/s bidirectional traffic).

Network address translation

Support for hardware-based network address translation (NAT) of IP and Ethernet layer whilst fully preserving RTP header and RTP payload. Enables multicast address changes, unicast to unicast address changes, as well as conversion from unicast to multicast, or multicast to unicast.

Bit rate policing

Protect the network from over-provisioning when many media flows share the same bandwidth-constrained link. Per-flow bit rate policing ensures the service does not negatively impact other media services on the network, and provides overall better utilization of available network bandwidth.

Stream monitoring

Provides analysis of received IP media and protected network flows. RTP layer monitoring of RTP sequence number errors (packet loss), jitter/PDV and packet inter-arrival timing statistics.

Hitless merge with SIPS / ST2022-7

Transmitting the same RTP/IP stream across dual, fully diverse network links enables receivers/decoders to utilize SMPTE ST 2022-7 Seamless IP Protection Switching (SIPS), which gives error-free transport even in case of severe packet loss or link outages as long as a packet arrives on either of the two network links.

Forward Error Correction

Standards-based Forward Error Correction for RTP/IP streams supporting SMPTE ST 2022-1 and ST 2022-5, to detect and correct intermittent packet loss.

Packet timing improvement

Provides optimal linearization of packet timing for constant bitrate IP media streams, ensuring maximum decodability by downstream equipment.

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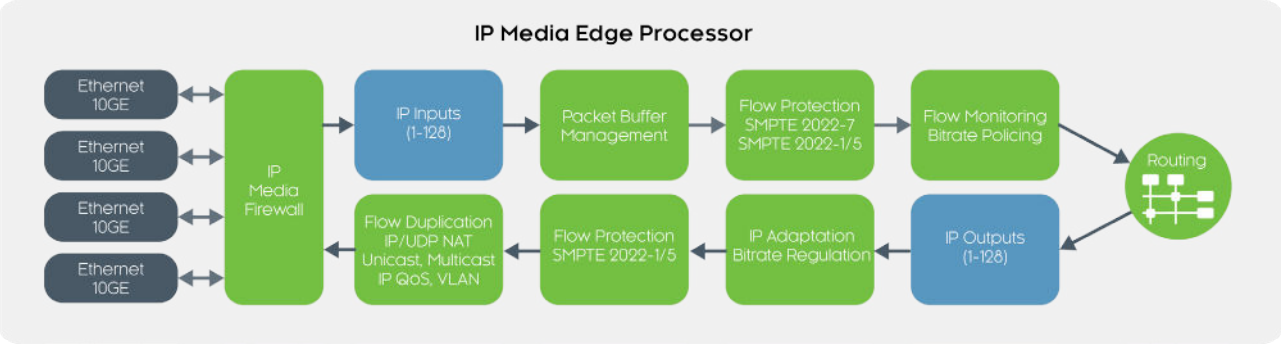

IP/Ethernet networking

Number of ports	Four (4) Ethernet SFP / SFP+
Ethernet	10GBase-SR/LR (IEEE 802.3ae) 1GBase-X (IEEE 802.3z) 1GBase-T (IEEE 802.3ab)
VLAN	Up to 128 VLANs IEEE 802.1Q (VLAN tag) IEEE 802.1P (VLAN priority)
IP QoS	DiffServ Code Point (DSCP) or IP TOS
Protocols	LLDP, DHCP, IPv4, IPv6
IP addressing	Static configuration or via DHCP
Unicast	Yes
Multicast	IGMPv3 SSM or IGMPv2 ASM
Media Flows	RTP/IP Up to 128 input flows Up to 128 output flows
Throughput	Per 10GE interface: 6.5 + 6.5 Gbit/s using four (4) interfaces (total 26 Gbit/s bidirectional traffic) 9.1 + 9.1 Gbit/s using two (2) interfaces (total 18.2 Gbit/s bidirectional traffic) Max bandwidth per stream 500,000 pkts per second (4 Gbit/s)
Discovery/Reg.	SDP (Session Description Protocol) NMOS IS-04 Discovery and Registration NMOS IS-05 Connection Management

Protection

Link redundancy	Hitless/seamless switching for all RTP flows compliant to SMPTE ST 2022-7:2019 Class C up to 150 ms delay difference between Flow A and B.
Loss protection (*)	SMPTE ST 2022-1 Forward Error Correction SMPTE ST 2022-5 Forward Error Correction

Property	ST 2022-1	ST 2022-5
L (Min, Max)	1, 254	1, 1020
D (Min, Max)	4, 32	4, 255
LxD (Max)	1024	6000
L+D (Max)	254	1020

Input switching	32 input switches. Up to 4 inputs per switch, supporting RTP/IP inputs Manual or automatic switching based on alarm status and severity

Input signal monitoring

Ethernet rate, frame rate, Rx frame count.
Payload rate.

RTP/IP monitoring	Bit rate per flow Packet/datagram rate per flow RTP stream continuity/sequence errors Packet delay variation (PDV/jitter) Packet inter-arrival time (IAT) Packet length for constant packet length (CPL) streams RTP payload type detection Last SSRC IP Statistics and logging

Media Server Appliance support

Please refer to Nevion Virtuoso Platform datasheet for details.

Virtuoso MI	Yes
Virtuoso RE	Yes

HBR Media Accelerator

Description	10G Media Accelerator hardware module. The 4x SFP+ ports can accommodate a combination of 1GE SFP, 10GE SFP+, SDI video and MADI audio interfaces. Software Media Functions are sold separately.
Product codes	VIRTUOSO-HW-HBR-SFP4 (24204)
Connectors	Four (4) SFP+
SFP config	Port 1-4 individually configurable for: 10 GigE (10GBase-SR/LR) 1 GigE (1000Base-X)
Sync input format	PTP (IEEE 1588v2:2008, SMPTE 2059-2)
Power consumption	Maximum 45W

(*) Contact Nevion for availability

Licenses

IPME-RTPx	Enables processing of RTP-IP service(s)
IPME-RTP-PROTx	Enables IP protection for RTP-IP service(s). Enables ST 2022-7 and SMPTE 2022-1/5 FEC
RTP-ISWX1	Enables alarm based input switch for RTP-IP services. Does not include RTP-IP in/out interfaces or other IP protection features (see above).

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