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IPME

Nevion Virtuoso
IP Media Edge

Nevion Virtuoso's IP Media Edge Processor offers network isolation, media firewall, network stream protection and translation for UDP and RTP IP media flows.

The IP Media Edge (IPME) Processor incorporates advanced techniques for processing and protection of UDP/IP and RTP/UDP/IP media flows.

Processing features include Network Address Translation (NAT), bitrate policing, stream duplication, flow linearization / de-jittering, and UDP/IP to RTP/UDP/IP conversion.

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.
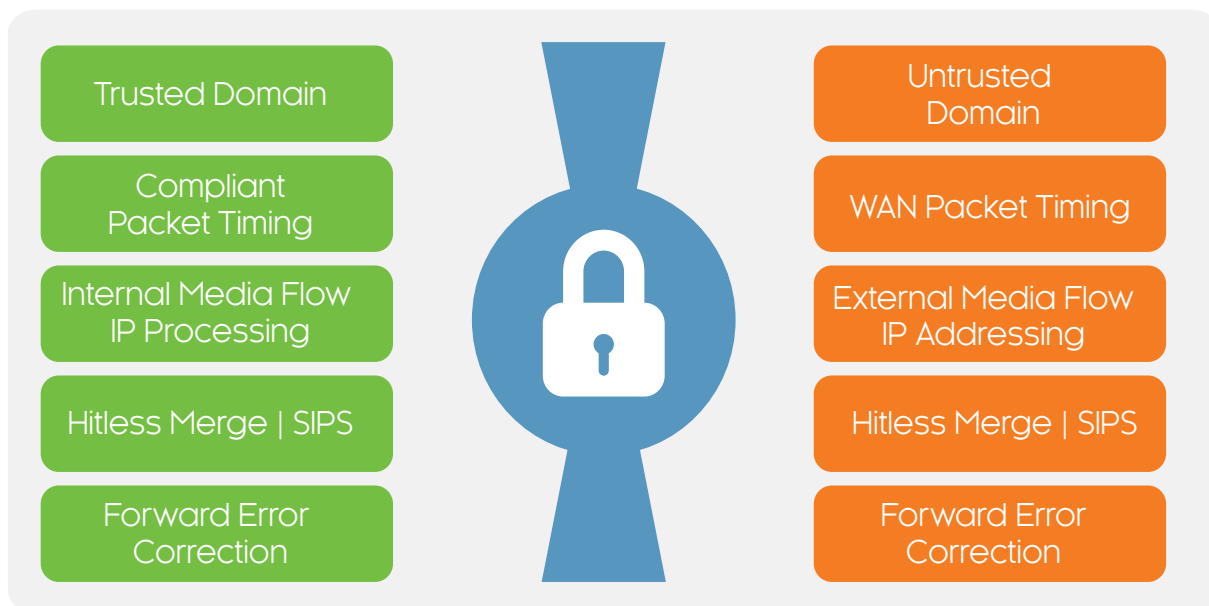
The IPME media function runs on the Virtuoso HBR Accelerator hardware module and supports any RTP streams via 10GE or 1GE.

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 RTP/UDP/IP and UDP/IP streams
- Media firewall providing network isolation
- Quad network interfacing to 10GE or 1GE
- Network Address Translation (NAT)
- Unicast and Multicast support (IGMP v2/v3)
- 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.

Trusted Domain		Untrusted Domain
Compliant Packet Timing	🔒	WAN Packet Timing
Internal Media Flow IP Processing		External Media Flow IP Addressing
Hitless Merge | SIPS		Hitless Merge | SIPS
Forward Error Correction		Forward Error Correction

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.

Flexible interfacing via SFP+

The IPME 10G Processor runs on the HBR accelerator that has 4 SFP+ cages, each supporting 10GE or 1GE.

High capacity flow processing

IPME 10G supports simultaneous processing of 128 UDP/IP or RTP/UDP/IP streams on 10GE per HBR accelerator. Maximum bandwidth is 10 + 10 Gbit/s input and 10+10 Gbit/s output traffic.

Network address translation

Support for hardware-based network address translation, enabling multicast addressing changes, unicast to unicast addressing 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 on packet loss.

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 is supported with SMPTE ST 2022-1 and ST 2022-5, to detect and correct intermittent packet loss.

RTP header insertion

Supports the insertion of RTP headers to UDP streams to provide packet timing and sequencing information allowing SIPS to be added for protection.

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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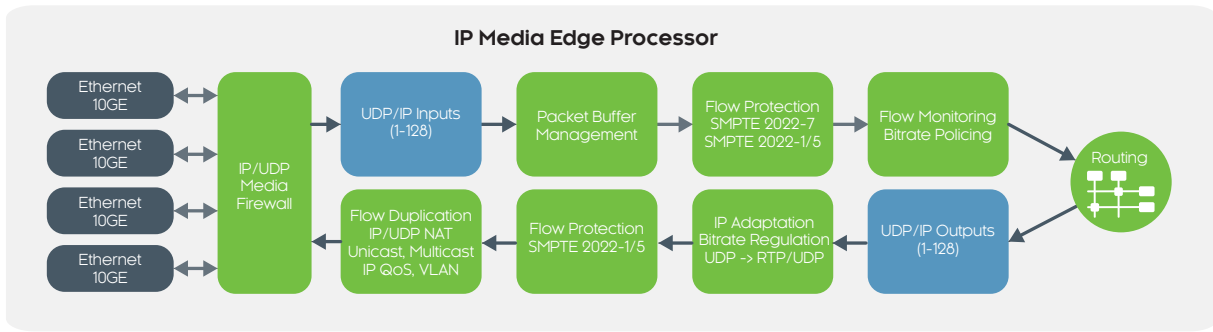
IP/Ethernet networking

Ethernet ports	4 x 10GBase-R SFP+ 10 Gigabit Ethernet 4 x 1GBase-X Gigabit Ethernet (*)
Media Flows	RTP/UDP/IP or UDP/IP Up to 128 input flows Up to 128 output flows
Throughput	Up to 1 Gbit/s or 10 Gbit/s input media bitrate, depending on license selected. Bitrate includes protection data (ST2022-7, FEC).
Multicast	IGMPv3 SSM or IGMPv2 ASM
IP QoS	DiffServ Code Point (DSCP) or IP TOS
VLAN	IEEE 802.1Q (VLAN tag) IEEE 802.1P (VLAN priority)

Flow protection

Link protection	SMPTE ST 2022-7 Class C up to 450 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

Flow monitoring

Stream continuity
PDV (jitter)
Packet-rate-per-flow and bit rate
Packet length for constant packet length (CPL) streams
RTP payload type detection

Media Server Appliance support

Virtuoso FA	Yes
Virtuoso MI	Yes

HBR Media Accelerator

Description	10G Media Accelerator hardware module. The 4x SFP+ ports can accommodate a combination of 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+
Ethernet network	10GE (10GBase-SR/LR) 1GE (1000Base-X) (*)
Sync input format	PTP (IEEE 1588v2:2008, SMPTE 2059-2)
Power consumption	Maximum 45W

(*) Contact Nevion for availability

Ordering Options

VIRTUOSO-HW-HBR-SFP4	Multi-channel high bitrate Media Accelerator (HW module). 4x SFP+ ports that can accommodate a combination of 10GE SFP+ and video SFPs. Additional licenses required for use with media adaptation/compression/processing/monitoring functions.
VIR-MI-SW-IPME-RTP128	License option enabling IP Media Edge (IPME) processing with 4x 10GE interfaces. Up to 10 Gb/s bandwidth of RTP/IP services. Processing features include bit-rate policing, IP flow address translation, and network isolation (e.g. bridging WAN/LAN networks). Maximum 128 RTP/IP services per IP Media Edge software, running on an HBR accelerator.
VIR-MI-SW-IPME-RTP-PROT[8/64/128]	License option for IP Media Edge (IPME) enabling SMPTE 2022-7 Seamless IP Protection Switching (SIPS) for RTP/IP transport over dual diverse network links for up to [8/64/128] RTP services on IP (2x[8/64/128] RTP input streams).

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