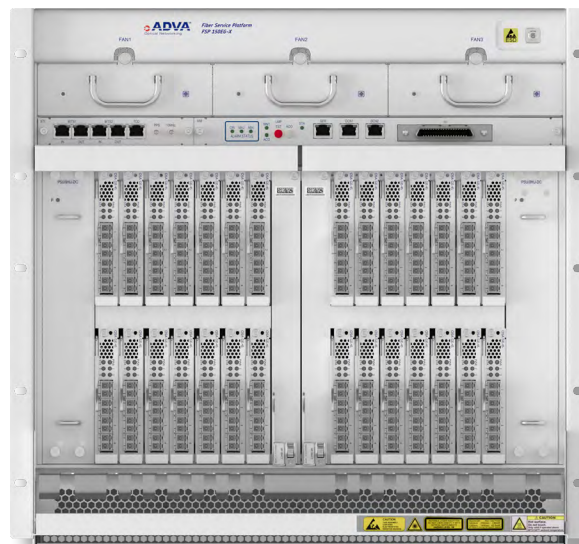


FSP 150 EG-X

Carrier Ethernet aggregation and service gateway

As connectivity demands are in constant growth, service providers need to scale their Carrier Ethernet backhaul offering to address larger applications. But service providers don't want to invest in expensive and complicated solutions. They need a cost-effective solution that offers scalability and management simplicity.

Our FSP 150EG-X is an edge gateway optimized to deliver cost-effective capacity, scalability and resiliency for Carrier Ethernet 2.0 service aggregation and handover in a central office or other high-density environments. The high-capacity, non-blocking edge gateway provides a central aggregation solution for Carrier Ethernet demarcation devices. With an advanced demarcation technology, our FSP 150EG-X enables service providers to offer intelligent service assurance, compliant with the latest OAM standards such as 802.3ah, 802.1ag, Y.1731 and Y.1564 (MEF-compliant). What's more, acting as a timing gateway, the FSP 150EG-X simultaneously supports Synchronous Ethernet and IEEE 1588v2 across packet backhaul networks.



Your benefits

- ✔ **Multi-technology**
Address different access technologies, including fiber, PDH and SONET/SDH of various rates, and E1/T1 pseudowire emulation
- ✔ **Optimized for ENNI demarcation**
Fulfil stringent service hand-off requirements in open access, mobile backhaul and business Carrier Ethernet 2.0 applications
- ✔ **Highly resilient design**
High degree of resiliency at the service and equipment level enabling highest service availability
- ✔ **Unique timing flexibility**
Simultaneous support of Synchronous Ethernet and IEEE 1588v2 across packet backhaul networks
- ✔ **Part of the FSP 150 product family**
Consistent design model for end-to-end Ethernet service management
- ✔ **Operational efficiency**
Ensemble Controller, including Ensemble Packet Director, enables fast service roll out and tracking of big amounts of services

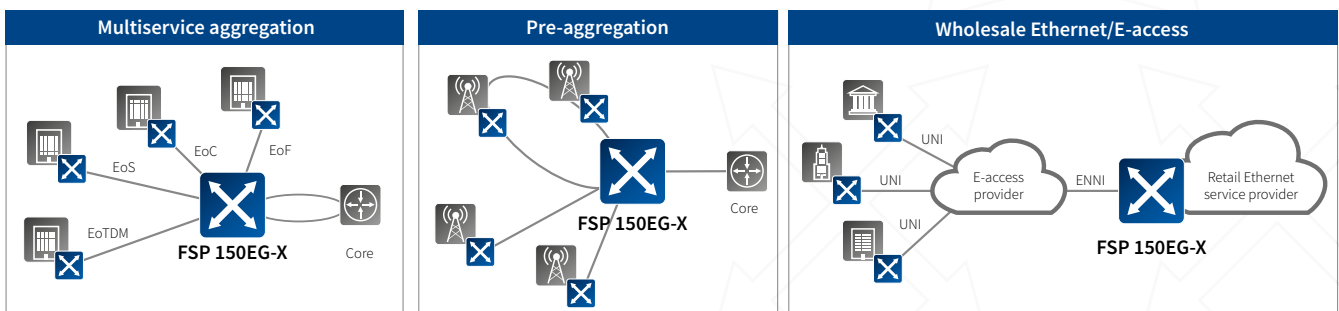
High-level specifications

<p>System capacity</p> <ul style="list-style-type: none"> • 140G centralized full duplex switch fabric • 24 slots for data traffic • Redundant switch fabric, shelf controller and timing module units 	<p>Traffic modules</p> <ul style="list-style-type: none"> • 36 x 10/100BaseT (Mini RJ-21) • 10 x 100/1000BaseX (SFP) • 1 x 10GBaseX (XFP) LAN/WAN-PHY • 4 x OC-3/STM-1 or 1+1 OC-12/STM-4 channelized 	<p>Resiliency</p> <ul style="list-style-type: none"> • IEEE 802.3ad link aggregation – active/standby mode with optional load balancing • ITU-T G.8032 Ethernet ring protection switching • 1+1 SONET/SDH linear protection switching
<p>Synchronization</p> <ul style="list-style-type: none"> • ITU-T G.8261 / G.8262 / G.8264 SyncE on all interfaces • Sync status message support • IEEE 1588v2 G.8265.1, G.8275.1 PTP profiles and G.8273.2 boundary clock 	<p>Ethernet OAM</p> <ul style="list-style-type: none"> • IEEE 802.3ah EFM-OAM link management • IEEE 802.1ag CFM • ITU-T Y.1731 PM • ITU-T Y.1564 service activation testing with MEF-compliant SAT PDUs 	<p>Environmental</p> <ul style="list-style-type: none"> • 10RU chassis, ETSI compliant • Dual modular AC (90 to 264VAC) or DC (-36 to -72VDC) PSU • Operating temperature: 0 to +45°C • Max. power consumption: 950W

Applications in your network

High capacity Carrier Ethernet aggregation and service gateway for mobile backhaul, wholesale access and business applications

- Common platform addressing different access technologies including fiber, PDH and SONET/SDH of various rates, and E1/T1 pseudowire emulation
- High degree of resiliency at the service and equipment level for mission-critical Carrier Ethernet 2.0 backhaul applications



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Product specifications are subject to change without notice or obligation.



System capacity

- 140G centralized, full duplex switch fabric
- 24 single-width / 12 double-width data traffic slots
- Dedicated slots for switch fabric, shelf controller unit and timing module

Redundancy

- Redundant switch fabric, shelf controller and timing module
- Dual power supplies
- Three modular fan trays

Network topology

- Linear point-to-point, hub-and-spoke, ring and mesh topologies

Traffic modules

- 36 x 10/100BaseT (Mini RJ-21)
- 10 x 100/1000BaseX (SFP)
- 1 x 10GBaseX (XFP) LAN/WAN-PHY
- 4 x OC-3/STM-1 channelized or 1+1 OC-12/STM-4 channelized for EoSONET/SDH
- 4 x OC-3/STM-1 channelized or 1+1 OC-12/STM-4 channelized for E1/T1 PWE3/SAToP

Protection and resiliency

- IEEE 802.3ad link aggregation – active/standby mode with optional load balancing
- ITU-T G.8032 Ethernet ring protection switching
- 1+1 SONET/SDH linear protection switching

VLAN Support

- 4096 VLANs per port
- 2000 VLAN-based EVCs system-wide
- IEEE 802.1Q customer-tagged and stacked VLANs (Q-in-Q)
- 2-tag management (push / pop / swap) for c-tag and s-tag
- IEEE 802.1ad provider bridging (c-tag, s-tag)
- Configurable TPID for Q-in-Q frames

Traffic Management

- Acceptable client frame policy: tagged or untagged
- Service classification based on 802.1p, 802.1Q and IP-TOS/DSCP
- MEF-compliant policing (CIR / CBS / EIR / EBS) with three-color marking and eight classes of service
- Hierarchical queuing and shaping

Ethernet OAM

- IEEE 802.3ah EFM-OAM link management
- IEEE 802.1ag Connectivity fault management (CFM)
- ITU-T Y.1731 performance monitoring
- ITU-T Y.1564 service activation testing with MEF-compliant SAT PDUs
- Terminal and facility loopbacks on port- and VLAN-level for all interfaces
- Cable diagnostics with benchmarks (electrical interfaces only)
- MEF-compliant Layer 2 control protocol disposition
- Link loss forwarding for local link and network path failures

Performance monitoring

- RFC 2819 RMON Etherstats on a per-port and per-service basis
- 5-minute, 15-minute and 1-day performance data bins
- ITU-T Y.1731 frame loss and delay measurement
- Synthetic frame loss and delay measurement
- Multi-CoS monitoring on EVCs
- Threshold-setting and threshold-crossing alerts
- Physical parameter monitoring for SFP optics, including TCAs
- MEF-35/36 SOAM PM collection

Synchronization

- ITU-T G.8261 / G.8262 / G.8264 SyncE on all interfaces
- Sync Status Message support
- IEEE 1588v2 PTP for Time-of-Day and frequency distribution
- ITU-T G.8265.1 and G.8275.1 PTP Telecom Profiles, G.8273.2 Telecom boundary clock
- Dual BITS-in and BITS-out with BITS sync status messaging
- Time-of-day input / output (1PPS, ToD) and 10MHz input / output
- Hardware-based time-stamping with nanosecond accuracy
- NTP client-mode operation supporting multiple servers

Management and security

Local management

- Serial connector (RS-232 / RJ45) using CLI
- Two DCN LAN ports (RJ45) for DCN redundancy
- Local LAN port (RJ45) using CLI, SNMP and Web GUI interfaces

Remote management

- Maintains VLAN and MAC-based management tunnels

Protocols

- Telnet, SSH (v2), HTTP / HTTPS, SNMP (v1 / v3)

Secure administration

- Configuration database backup and restore
- System software download via FTP, HTTPS, SFTP or SCP
- Remote authentication via RADIUS
- SNMPv3 with authentication and encryption
- Access control list (ACL)

IP routing

- DHCP, RIPv2 and static routes, ARP cache access control

System logging

- Alarm log, audit log and security log

Regulatory and standards compliance

- MEF CE 2.0 certified
- IEEE 802.1Q (VLAN), 802.1p (Priority), 802.1ag (CFM), 802.3ah (EFM), 802.1x
- ITU-T Y.1731, G.8010/Y.1306, G.8011.1+2, G.8012, G.8031 (APS)
- MEF-6.1, 9, 10.2, 11, 14, 20, 21, 22.1, 23.1, 25, 26, 30, 33, 35
- IETF RFC 2544 (frame tests), RFC 2863 (IF-MIB), RFC 2865 (RADIUS), RFC 2819 (RMON)
- MEF-compliant ITU-T Y.1564 service activation testing
- ANSI C84.1-1989
- ETSI 300 132-2, BTNR2511, ETS 300-019/-019-2-[1,2,3]/-753
- NEBS Level 3 certified
- Telcordia GR-499, GR-63-CORE, SR-332
- Safety IEC / UL / EN 60950, 21CFR1040.10, EN 60825, EN 50371, EN 300-386, EN 50160, IEC 60320 / C14
- EMI EN 300-386, GR-1089-CORE, ETS 300-132, FCC Part 15, Class B, Industry Canada

Environmental

- Dimensions: 10RU Chassis, 443mm x 444mm x 277mm / 17.4" x 17.5" x 10.9" (W x H x D), ETSI-compliant
- Operating temperature: +0 to +45°C
- Storage temperature: -40 to +70°C (GR-63-CORE)
- Humidity: 5 to 95%, B1 (non-condensing)
- Modular DC-PSU: -36 to -72VDC with over-voltage and over-current protection
- Modular AC-PSU: 90 to 264VAC with over-voltage and over-current protection
- Maximum power consumption: 950 Watts