Ultra-Low Latency Packet Buffering Engine Factsheet: Banking Financial Sector Low Latency Routing Solution

PRODUCT OVERVIEW & MARKET POSITIONING

The modern financial trading infrastructure operates in a nanosecond-sensitive environment. High-frequency trading (HFT), market data consolidation, and order execution systems demand deterministic, sub-microsecond switching and routing performance. The **FinStream 7-Series Low Latency Routing Solution** is specifically engineered for colocated exchange datacenters, clearing house backbones, and proprietary trading firm edge routers. By combining a purpose-built cut-through forwarding engine with latency-optimized buffer management, the platform delivers a port-to-port latency of <380 nanoseconds for 64-byte frames on 10GBASE/25GBASE interfaces.



HARDWARE ARCHITECTURE & SILICON

At the core of the FinStream 7-Series lies the **ASR-17 Cut-Through Forwarding ASIC** — a 16nm FinFET+ packet processor with integrated 48 MB of on-die shared packet memory. Unlike traditional store-and-forward switches, the ASR-17 implements a true cut-through switching fabric combined with a programmable latency floor manager (LFM). The LFM allows network engineers to define per-port static latency offsets and adaptive egress scheduling, ensuring predictable jitter below 50 picoseconds. The platform supports three chassis variants: the compact 1RU FS-7124 (24 x 10G/25G SFP28 ports), the high-density 2RU FS-7148 (48 x 10G/25G SFP28 + 8 x 100G QSFP28 uplinks), and the modular 4RU FS-7508 (8 line card slots supporting up to 64 x 100G ports).

KEY FEATURES & ROUTING LOGIC

- **Hardware-Accelerated Layer 3 Routing:** Full BGP (RFC 4271), OSPFv2/v3, and static routing offloaded to the ASIC forwarding table (up to 256,000 IPv4 routes and 128,000 IPv6 routes) with no CPU intervention for data-plane forwarding.
- **Low-Latency Multicast (PIM-SSM):** Hardware replication with configurable egress replication points reduces multicast latency variation (max differential < 120 nanoseconds across all output ports).
- **Flow Filtering & PFC:** Priority Flow Control (802.1Qbb) with per-priority pause thresholds; lossless mode for FCoE or RoCEv2 traffic with zero packet drop under line-rate load.
- **Precision Time Protocol (PTP):** Hardware timestamping supporting PTP Telecom Profile (G.8275.1) and Power Profile (IEEE 802.1AS), achieving sub-10 nanosecond time error (TE) for distributed trading clock synchronization.
- **Dynamic Latency Monitoring:** Real-time per-port, per-queue latency histogram via sFlow (RFC 3176) extended telemetry, exportable to Prometheus or Grafana dashboards.

COMPLIANCE & STANDARDS

- **IEEE:** 802.1Q (VLAN), 802.1ad (Q-in-Q), 802.3by (25G Ethernet), 802.3cd

(50G/100G), 802.1Qbu (Frame Preemption)

- **IETF:** RFC 2328 (OSPFv2), RFC 5340 (OSPFv3), RFC 4271 (BGP-4), RFC 4632 (CIDR), RFC 768 (UDP hardware relay)

- **MEF:** MEF 9 (Ethernet Private Line), MEF 14 (Traffic Management)

- **Security:** MACsec (802.1AE) on all SFP28 and QSFP28 ports with hardware encryption (AES-128-GCM, AES-256-GCM) at line rate

- **EMC & Safety:** FCC Part 15 Class A, EN 55032, EN 55035, IEC 62368-1, CE, RoHS-3

TECHNICAL SPECIFICATIONS

Parameter	**Specification**
Form Factor	1RU (FS-7124), 2RU (FS-7148), Modular 4RU (FS-7508)
Switching Capacity	1.2 Tbps (FS-7124), 3.6 Tbps (FS-7148), 10.24 Tbps (FS-7508 full load)
Forwarding Rate (IPv4)	952 Mpps (FS-7124), 2.86 Gpps (FS-7148), 8.19 Gpps (FS-7508)
Port-to-Port Latency (10G/25G)	380 ns (cut-through), 780 ns (store-and-forward, jumbo frame)
MAC Address Table	128,000 entries
IPv4 Route Table (FIB)	256,000 routes (hardware) / 1M routes

	(software backup)
IPv6 Route Table (FIB)	128,000 routes (hardware)
Packet Buffer Memory	12 MB shared (FS-7124), 24 MB (FS-7148), 48 MB per line card (FS-7508)
Jumbo Frame Support	12,288 bytes
Power Supply	Dual hot-swappable AC (100-240V) or DC (-48V), 1+1 redundancy
Max Power Consumption	120W (FS-7124), 240W (FS-7148), 180W per line card (FS-7508)
MTBF (Telcordia SR-332)	285,000 hours (FS-7124/48), 210,000 hours (FS-7508 chassis)
Operating Temperature	0°C to 45°C (32°F to 113°F)
Operating Humidity	5% to 95% non-condensing
Cooling	Front-to-back airflow, redundant fan modules

ORDERING SKU INFORMATION

- **FS-7124-AC:** 1RU, 24xSFP28 10/25G, dual 300W AC PS, PTP TC/BC, 2x fans
- **FS-7148-AC:** 2RU, 48xSFP28 + 8xQSFP28 100G, dual 550W AC PS, PTP

TC/BC, 4x fans

- **FS-7508-CH:** 4RU modular chassis, 8 slots, fan tray, backplane (10.24 Tbps fabric), requires PS modules and line cards

- **FS-75-10GF:** Line card for FS-7508: 8x10G SFP+ (cut-through, <500ns latency)

- **FS-75-25GF:** Line card: 12x25G SFP28 + 2x100G QSFP28 uplinks

- **FS-PSU-1200-DC:** 1200W DC power supply (redundant, hot-swap) for FS-7508

