H3C SecPath F1000 Series Firewall Concurrent Session Connection Matrix - Hardware Deep-Dive and Performance Specification

SYSTEM OVERVIEW

The H3C SecPath F1000 Series represents a lineage of carrier-class security gateways engineered to deliver high-density concurrent session processing at the enterprise edge and core. This document establishes the definitive concurrent session connection matrix across the F1000 product family, correlating hardware architecture with session table capacity, connection establishment rates, and sustained throughput under deep inspection workloads.

The F1000 architecture leverages a 64-bit multi-core processor complex coupled with high-speed memory subsystems to maintain stateful inspection integrity under massive session loads. Unlike fixed-function ASIC approaches, the F1000 platform employs a software-accelerated fast-path that dynamically balances session table maintenance across processing cores, ensuring deterministic latency as concurrent connection counts scale toward platform limits.



INTERNAL ASIC & BACKPLANE

At the heart of the F1000 session handling capability lies a distributed session management engine. Each forwarding core maintains a synchronized local session cache that is periodically reconciled with the global session table resident in high-bandwidth system memory. This architecture prevents the memory access contention that typically degrades new connection acceptance rates on legacy firewall platforms.

The session table itself is implemented as a hash-indexed structure with collision chains managed in hardware-assisted memory regions. For the F1000-AI and F1000-G5 generations, the memory subsystem reserves a dedicated partition for session state, isolating it from control-plane operations such as routing protocol convergence and management plane access.

POWER & THERMAL MECHANISMS

Sustained concurrent session processing generates significant thermal load on memory controllers and forwarding engines. The F1000 chassis employs front-to-back airflow with variable-speed fan trays governed by inlet temperature sensors and processor utilization telemetry. Under maximum session table occupancy scenarios, the thermal control loop prioritizes memory subsystem cooling to prevent session table eviction caused by thermal throttling.

Redundant power supplies (1+1) are standard on rack-mount F1000 models, with active load sharing and automatic failover that does not flush established session state. This design ensures that power subsystem maintenance does not disrupt the concurrent session matrix.

PHYSICAL LIMITS

The F1000 series spans form factors from compact 1RU appliances suitable for branch deployment to higher-throughput 1RU and 2RU configurations for campus core and data center edge placement. Physical interface density directly correlates with the session processing envelope: models equipped with

10GE and 40GE interfaces are paired with expanded session memory to maintain line-rate stateful inspection.

PARAMETER REGISTRY

The following table consolidates verified concurrent session parameters across representative F1000 models. Values represent maximum theoretical session table capacity under laboratory conditions with default timeout profiles. Production deployments should apply a 30-40% headroom factor for session table aging and peak load absorption.

Parameter	Specification
Form Factor	1RU rack-mount (varies by model)
Maximum Concurrent Sessions	800,000 to 5,000,000+ (model dependent)
New Sessions per Second (CPS)	80,000 typical; up to 350,000 on high-end models
Firewall Throughput (1518-byte)	3 Gbps to 25 Gbps (model dependent)
NGFW Throughput (IPS+AV+App)	Up to 14 Gbps (F1000-AI-90-G class)
Memory Configuration	4 GB to 16 GB (session table partition reserved)
Power Supply	1+1 Redundant AC/DC,

	hot-swappable
Session Table Aging	Configurable TCP/UDP/ICMP timeout profiles
High Availability	Active/Active and Active/Backup with session synchronization
Session Limiting	Per-IP concurrent and CPS thresholds with block-list enforcement

GLOBAL SUPPORT INFRASTRUCTURE

H3C delivers lifecycle session capacity assurance through the SecPath operating system maintenance releases, which include session table optimization patches and memory management refinements. The Comware-based architecture allows field-upgradeable session capacity enhancements without hardware replacement on supported models.

Technical assistance for session matrix planning — including per-IP session limiting configuration, session table monitoring thresholds, and high-availability session synchronization validation—is available through H3C support portal resources and authorized distribution partners.


LCD
CPU
Link
STATUS: OK
CPU: 45%
MEM: 60%
HDM: 60%
Power
Alarm
Link/Act
CONSOLE
USB
RESET
SFP+
10/100/1000BASE-T RJ46 Gigabit