SERVERIRON®

350, 450 AND 850 APPLICATION SWITCHES

SERVERIRON 350   SERVERIRON 450   SERVERIRON 850

HIGH PERFORMANCE APPLICATION ACCELERATION, WEB OPTIMIZATION AND SECURITY

FEATURES

► *Purpose-built high-performance and high-availability application switches for business-critical IP and Web services*

► *Highly-advanced acceleration, security, Web optimization, load balancing and ultra high availability for IP applications*

► *High density Gigabit and 10-Gigabit Ethernet support for highly-scalable server farms*

► *Superior DoS protection up to 3.6 million (wire-speed 2.5 Gigabit rate) SYN/sec, and 30 DoS signatures*

► *Scalable to support 30,000,000 concurrent sessions, 300,000 Layer 4 connections per second and over 10 Gbps of application throughput*

► *High-availability with hitless and stateful session failover in many advanced modes*

► *Industry's most powerful content analysis engine, including HTTP, FIX, DNS and SIP (VoIP)*

► *HTTP multiplexing and server connection offload to optimize Web server performance and capacity*

► *Scalable and on-demand expansion for integrated SSL acceleration to support secure Web transactions*

► *Highly transparent DNS-based global load balancing solution for datacenter redundancy and geographic scalability*

► *Industry's most innovative modular, compact and resilient design starting at 2U height*

► *Integrated wire-speed Layer 2/3 switching and routing, and always-on network monitoring with standards-based hardware-assisted sFlow*

► *Ultra high availability and scalability for perimeter security devices including Firewalls, Anti-Virus gateways, VPN devices and Intrusion appliances with highly advanced FW and VPN Load Balancing*

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ServerIron® 350, 450 and 850 High-Performance Application Switches

Foundry Networks®' ServerIron 350, 450 and 850 switches provide high performance Layer 2 through 7 switching, enabling highly secure and scalable IP and Web application service infrastructure. Foundry's TrafficWorks™ software suite of application traffic management powers the ServerIron switches to efficiently distribute application traffic to the "best" servers using real-time measurements of server utilization and response time. The highly intelligent ServerIron Layer 4-7 application switches use information that resides beyond the traditional Layer 2 and 3 packet headers, deep in the application messages, to direct client requests to available and fast-responding servers. These switches transparently support any IP-based applications, and offer specialized acceleration and optimization features for Web services. The ServerIron 350, 450 and 850 switches further improve service availability by securing the servers from many forms of Denial of Service (DoS), virus and worm attacks. These switches act as a reliable last line of defense for server farms and applications. Superior performance delivered by Foundry's innovative 3rd generation network processor technology offers security without sacrificing application performance. The switches also simplify server farm management and application patching by allowing resources to be easily removed and inserted into the resource pool. Simplified management reduces operational costs and keeps the total cost of ownership (TCO) to a minimum.

Built on Foundry's proven JetCore™ ASIC architecture, the ServerIron 350, 450 and 850 switches support high density Gigabit and 10-Gigabit Ethernet for superior server farm scalability and service performance. The JetCore ASIC supports hardware-assisted standards-based sFlow network monitoring for all application traffic flows, which helps improve manageability and security of network and server resources. The ServerIron switches forward traffic flows based on Layer 4 through Layer 7 definitions, and deliver industry-leading performance for higher layer application switching functions. Superior content-switching capabilities include support for up to 256 highly customizable rules based on URL, HTTP header, XML, cookie, SSL ID, SIP (VoIP), DNS, and FIX protocol and application content. Furthermore, the ServerIron 350, 450 and 850 switches provide the foundation for high service availability, disaster recovery, and location and server transparency for consistent user experience from multiple geographically separated data centers.

These systems use Foundry's highly-advanced multi-processor technology in the management modules. Each management module is equipped with four processors. One processor is dedicated for reliable device management and control, and the other three processors are used for processing traffic on application flows. The ServerIron switches are upgradeable to include integrated SSL acceleration and Web optimization using a dedicated service module.

ServerIron's extensive and customizable service health check capability helps monitor Layer 2, Layer 3, Layer 4, and Layer 7 connectivity, service availability, and server response time. The health checks ensure real-time detection of service problems. Client requests are automatically and rapidly re-distributed to other available servers capable of delivering the best service performance. To provide peak IP and Web service availability, ServerIron switches support many advanced modes of high availability options with real-time session synchronization between two ServerIron devices to protect against session loss
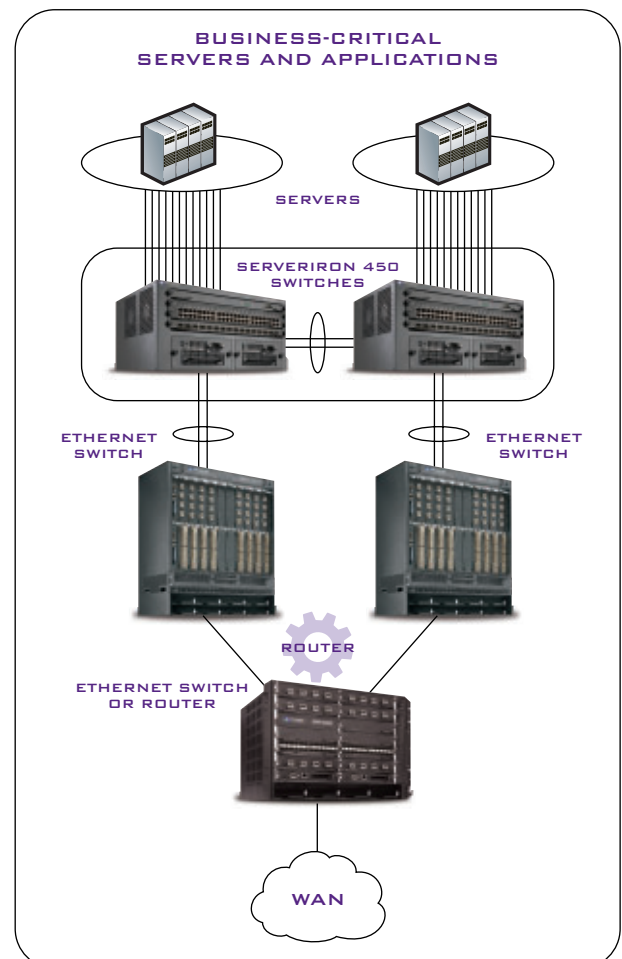
▶ *Figure 1: ServerIron 450 Switches for Highly Available and Scalable Applications and Server Farms*

during switch failures. In the event that one device fails, the other one takes control of client traffic without losing existing sessions or connectivity. To ease management of two ServerIron switches deployed in high availability modes, Foundry features support for advanced configuration synchronization to minimize configuration errors, and consequently network downtime.

The ServerIron 350, 450 and 850 switches are simple to configure and manage using the Foundry Command Line Interface (CLI) or built-in Web-browser based interface. The CLI uses well-known industry-standard syntax, allowing network administrative staff to easily configure all Foundry products. In addition, the ServerIron switches support Simple Network Management Protocol (SNMP) to allow device management using applications such as HP OpenView. The IronView Network Manager (INM) can be used to monitor and chart traffic, and also to perform comprehensive configuration management for Foundry switches.

ServerIron 350, 450 and 850 Platform Benefits

- ▶ *High Performance and Modular Design*—*Choice of high-performance models starting with the compact 2U high ServerIron 350 to the highly scalable ServerIron 850 with eight modular slots*

- ▶ *Redundant Power Supplies*—*Support for redundant and hot-swappable power supplies on all models, with front serviceability on the ServerIron 450 and 850 systems*

- ▶ *Hot-Swappable Modules*—*Hot-swappable modules, and expansion slots for management and line modules to provide increased performance and port density*

- ▶ *Dual-Active Management Modules*—*Optional second active management module for redundancy and performance upgradeability*

- ▶ *Upgradeable to Integrated SSL Acceleration*—*Optional service module future upgrade to add integrated and scalable SSL acceleration*

- ▶ *Design Flexibility*—*Seamless network integration with support for many different topology designs including one-arm, in-line, DSR, and direct attached servers*

- ▶ *Security*—*Wire-speed ACL and sFlow network monitoring combined with highly secure embedded real-time OS*

- ▶ *Reliability*—*Resilient switching and routing foundation with advanced support for RIPv2, OSPF, VRRP and VRRP-E*

- ▶ *Scalability*—*Expansion from 2 to 112 Gigabit ports in a single system, and support for 10-Gigabit Ethernet application switching*

- ▶ *Flexible Connectivity*—*Copper and fiber gigabit media options, and support for high-density Gigabit over Copper (GoC)*

- ▶ *Investment Protection*—*A unique platform to meet existing and future needs for features, performance and scalability*

ServerIron 350, 450 and 850— Key IP and Web Traffic Management Applications

- ▶ *Efficient Server Load Balancing (SLB)*—*Distribute IP-based application flows, and transparently balance traffic among multiple servers while continuously monitoring server, application and content health, which enhances overall reliability and availability of application services*

- ▶ *Intelligent Application Content Inspection and Switching*—*Avoid replicating application content and functions on all servers, and scale and optimize performance for targeted application needs. Defeat application level attacks by using deep content inspection and filtering of application messages.*

- ▶ *Disaster Recovery and Global Server Load Balancing (GSLB)*—*Distribute services transparently across multiple sites and server farm locations, and balance the traffic across those sites/servers on a global basis while monitoring site/server and application health. By directing clients to the best site for the fastest content delivery, ServerIron enhances overall application availability and reduces bandwidth costs. Site level redundancy and rapid transparent failover are supported for disaster recovery.*

- ▶ *Robust Application Security*—*Shield server farms and applications from wire-speed multi-Gigabit rate DoS and DDoS attacks, virus and worm attacks while serving legitimate application traffic at peak performance*

- ▶ *Enterprise Application Support*—*ServerIron can be deployed in many Enterprise environments where IP and Web based applications are used, including the popular applications like Oracle, BEA WebLogic, IBM WebSphere, PeopleSoft and Siebel. ServerIron supports customer features to load balance and provide persistence for such applications to deliver the benefits of high availability, security and accelerated performance.*

- ▶ *SYN-Guard™*—*ServerIron protects server farms against multiple forms of Denial of Service (DoS) attacks, such as TCP SYN and ACK attacks, by monitoring and tracking session flows. Only valid connection requests are sent to the server. ServerIron 350, 450 and 850 switches are capable of defeating DoS attacks at the industry's highest rate of up to 7.5 million SYN/sec to meet growing security threats.*

- *HTTP Multiplexing (Server Connection Offload)—Increases server performance, availability, response time and security by offloading connection management from the servers. Using persistent HTTP 1.0 and 1.1 connections to the server, the ServerIron streams a large number of client connections to few server connections. Connection offload allows the servers to dedicate resources for high-performance application content delivery.*

- *Application Rate Limiting—Protects server farms by controlling the rate of TCP and UDP connections on an application port basis. Protects servers against malicious attacks from high-bandwidth users by rate limiting individual user connections.*

- *High Performance Access Control—Using Access Control Lists (ACLs) and Extended ACLs, network administrators can restrict access to specific applications from a given address or subnet*

- *Application Redirection—ServerIron can use HTTP redirect to send traffic to remote servers if the requested service or content is not available on the local server farm. Clients are transparent to unavailable local resources.*

- *High Availability Application Switching—When deployed in active-standby mode, the standby ServerIron will assume control and preserve the state of existing sessions in the event the primary load-balancing device fails. In active-active mode, both ServerIron switches work simultaneously and provide a backup for each other while supporting stateful fail-over.*

- *Integrated SSL Acceleration (Future Upgrade)— The ServerIron 350, 450 and 850 switches can be upgraded to include an SSL acceleration service module in the system to optimize the performance of secure Web transactions. This module can be hot plugged into an installed switch to add SSL acceleration on demand in the application infrastructure.*

- *Advanced Firewall and Security Device Load Balancing— Increase firewall and perimeter security device performance by distributing Internet traffic load across multiple firewall and other perimeter security appliances. Overcome scalability limitations, increase throughput and performance, and improve resiliency by eliminating the perimeter security devices including Firewalls, Anti-Virus gateways, VPN devices and Intrusion appliances as "single points of failure".*

- *Transparent Cache Switching (TCS)—Eliminate the need to configure each client browser, improve Internet response time, decrease WAN access costs, and increase overall Web caching solution resiliency by balancing web traffic across multiple caches. ServerIron improves service availability by implementing cache health checking and redirects client requests to the next available cache server or directly to the origin server in the event of a cache or server farm failure.*

Key ServerIron Benefits

MAXIMIZING PERFORMANCE, AVAILABILITY, SECURITY, SCALABILITY AND ROI OF APPLICATION INFRASTRUCTURE

Improved Application Performance

ServerIron switches, with their intelligent application–aware load balancing and content switching, significantly improve application performance by optimally utilizing all available server resources. Foundry switches perform highly flexible real time health checks to the servers, and distribute load efficiently to the best servers. Intelligent content switching maximizes utilization and performance by eliminating the need to replicate content and application functions on all the servers.
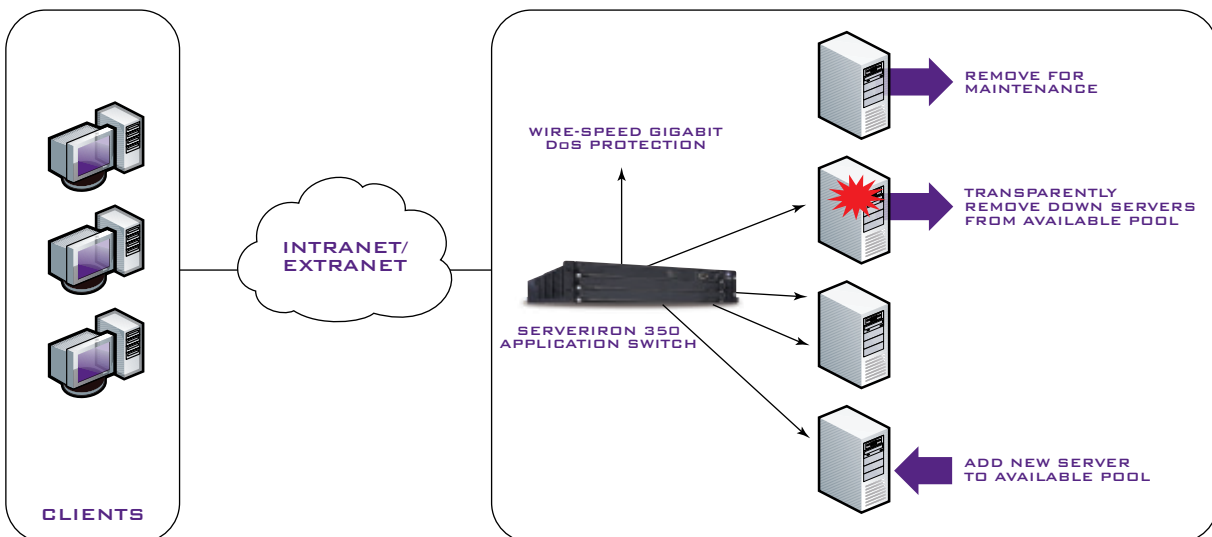
► *Figure 2: Virtual Server Farm with Easy Management and Automatic Failover*

Maximum Application Availability

ServerIron switches provide maximum availability to applications by intelligently distributing traffic among available servers, and dynamically monitoring the ability of servers to deliver optimal performance. Using customizable health checks, the switches transparently react in real time to server farm problems by redistributing client traffic. ServerIron switches can be deployed in multiple high-availability modes with hitless and stateful session synchronization and failover to extend high availability of applications even through switch failures.

Robust Application and Server Farm Security

With the application and content intelligence built in, ServerIron switches detect and discard viruses and worms that spread through application level messages. Legitimate application traffic is load balanced at high performance while preventing and defeating attacks. Industry leading ServerIron switches reliably protect against many forms of DoS and Distributed DoS (DDoS) attacks up to 3.6 million attack packets per second (See Figure 3).

**Massive Application and Server Farm Scalability**

Scaling applications and server farms is essential to accommodate growth, and is cost-effectively met by the ServerIron application switches. These switches provide virtually unlimited scalability to IP-based applications by allowing the use of multiple servers with load balancing and failover. There is no need for forklift upgrades to the server farms and disruption to applications.

High Return on Investment (ROI)

ServerIron application switches provide quick ROI, and also improve the ROI of application and server infrastructure. They support significantly higher application traffic and users on existing infrastructure by maximizing the utilization of installed server resources. With support for "Server Connection Offload" feature, the ServerIron solution reduces connection management overhead on the servers and dedicates server resources to application processing, which improves overall performance and capacity of the server farms. On-demand and unlimited virtual server farm scalability eliminates the need for forklift upgrades, and dramatically improves the ROI of the server infrastructure.

Multi-Site Redundancy and Geographic Scalability with Global Server Load Balancing

The ServerIron 350, 450 and 850 switches can redirect client traffic geographically among multiple sites by site availability, site load, and site response time. These switches also measure client/server proximity as defined by round trip delay and geographic location. All these features can work in conjunction with the network's existing DNS servers, resulting in minimal network disruption when implementing GSLB. The ServerIron switches continually monitor the sites to detect any changes in servers or services due to varying health and traffic
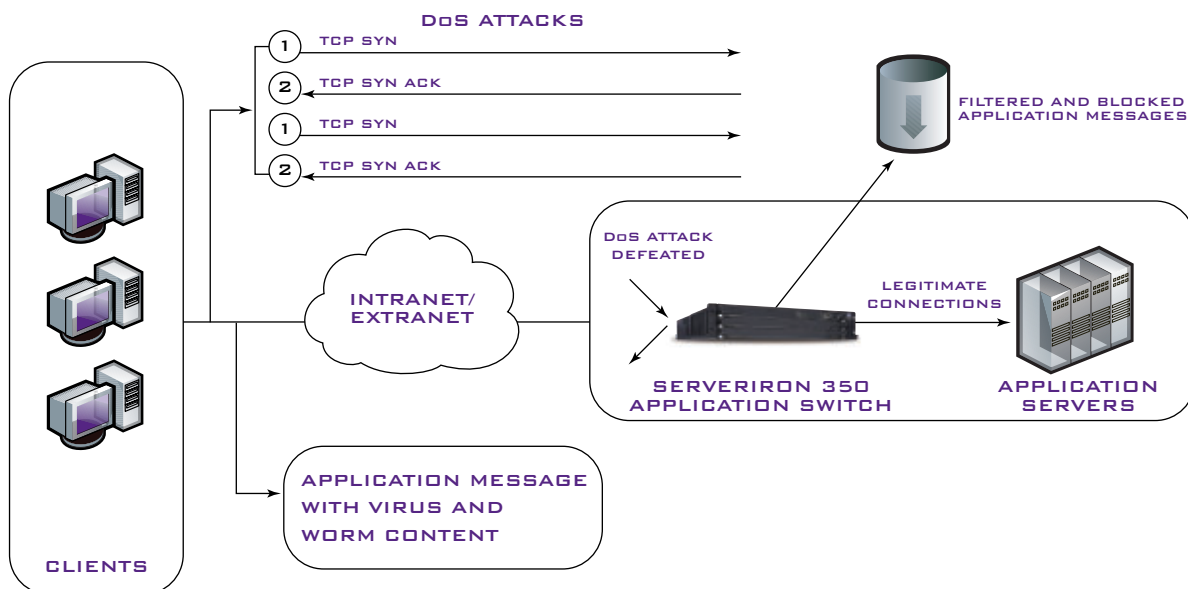
▶ *Figure 3: Securing the Server Farms and Applications from High-Speed Malicious Attacks*

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conditions. Configurable site load thresholds enable network administrators to fine tune the health checking parameters to best suit the site's server and service capabilities.

Additionally, the ServerIron switches use geographic site selection to keep the requests within continental domains. They constantly monitor application traffic to create a knowledge base that enables a more intelligent GSLB methodology, powering smarter site selection criteria. The GSLB solution provides the following key functions:

► *Acts as a DNS proxy to transparently intercept and modify the DNS responses, thereby directing users to the best site*

► *Leverages existing DNS servers and minimizes disruption to the existing DNS environment*

► *Provides continuous site monitoring to detect changes in site health conditions*

► *Allows the network administrator to tune individual site load thresholds through configurable settings*

► *Monitors and selects sites by measuring site, server and application responsiveness*

► *Adds an evolutionary knowledge based in the global server load balancer that enables smarter site selection as more clients access the site*

Foundry's ServerIron systems offer another unique multi-site redundancy solution with "VIP Route Health Injection". This capability marries VIP and server health with intelligent route propagation to the Internet using standards-based routing protocols. This solution provides business-continuity to IP applications that do not rely on DNS protocol for service name resolution.

Technical and Physical Specifications

LOAD BALANCING METHODS

- Least connections
- Response time
- Response time + least connections
- Round robin
- Weighted distribution
- Bandwidth and Weighted Bandwidth
- Host Proximity

LAYER 2 SWITCHING CAPABILITIES

- 32,000 MAC addresses
- 802.1d Spanning Tree Protocol
- 802.1p prioritization
- Policy-based VLANs
- Port-based VLANs
- Layer 3 protocol VLANs
- Layer 3 protocol and subnet VLANs
- 802.1q VLAN tagging

PROTOCOL SUPPORT

- TCP
- UDP
- SSL
- FTP
- Telnet
- SMTP
- HTTP
- IMAP4
- LDAP
- NNTP
- POP3
- DNS
- BootP
- TFTP
- SNMP
- VRRP/VRRPe
- IPSec
- RADIUS
- VoIP
- SIP
- WTS (Windows Terminal Server)

STANDARDS COMPLIANCE

- 802.3, 10BaseT
- 802.3u 100BaseTX, 100BaseFX
- 802.3z 1000BaseSX
- 802.3z 1000BaseLX
- 802.1q VLAN Tagging
- 802.1d Bridging
- 802.1w RSTP
- 802.1ad Link Aggregation
- 802.3 Ethernet Like MIB
- Repeater MIB
- Ethernet Interface MIB
- SNMPV2c
- SNMP MIB II

NETWORK MANAGEMENT

- Integrated Command Line Interface
- SSH
- Web-based GUI
- Telnet
- SNMP
- RMON
- IronView Network Manager (INM)
- HP OpenView

SAFETY AGENCY APPROVALS

- EN 60950/EN 60825/IEC 950
- UL 1950-CSA 950 Electromagnetic Emission Certification
- FCC Class A–EN 55022/CISPR–22 Class A/VCCI Class A
- CE Mark

IMMUNITY

- Generic: EN 50082-1
- ESD: IEC 61000-4-2; 4 kV CD, 8 kV AD
- Radiated: IEC 61000-4-3; 3V/m
- EFT/Burst: IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
- Conducted: IEC 61000-4-6; 3V

ENVIRONMENTAL

- Operating Temperature: 0 °C to 40 °C (32 °F to 104 °F)
- Relative Humidity: 5 to 90%,@ 40 °C (104 °F), non-condensing
- Operating Altitude: 10,000 ft (3,000 m) maximum
- Storage Temperature: –25 °C to 70 °C (–9 °F to 158 °F)
- Storage Altitude: 15,000 ft (4,500 m) maximum
- Storage Humidity: 95% maximum relative humidity, non-condensing

MOUNTING OPTIONS

- 19" Universal EIA (Telco) Rack
- Tabletop

Platform	ServerIron 350	ServerIron 450	ServerIron 850
Concurrent sessions	15,000,000 (scalable to 30,000,000)	15,000,000 (scalable to 30,000,000)	15,000,000 (scalable to 30,000,000)
Layer 4 connections per second	150,000 (scalable to 300,000)	150,000 (scalable to 300,000)	150,000 (scalable to 300,000)
DoS protection (SYN/sec)	3.6 million (scalable to 7.5 million)	3.6 million (scalable to 7.5 million)	3.6 million (scalable to 7.5 million)
Application Throughput	6 Gbps (scalable to 12 Gbps)	6 Gbps (scalable to 12 Gbps)	6 Gbps (scalable to 12 Gbps)
Maximum 10/100 ports	48	48	144
Maximum Gigabit ports	32	48	112
Maximum 10-Gigabit ports	4	6	14
Total number of ports	48	64	160
Layer 3 switching capabilities	OSPF, RIPv2, VRRP, VRRP-E, Supports servers on different subnets from that of Virtual IP address	OSPF, RIPv2, VRRP, VRRP-E, Supports servers on different subnets from that of Virtual IP address	OSPF, RIPv2, VRRP, VRRP-E Supports servers on different subnets from that of Virtual IP address
Physical dimensions	3.46" h x 17.45" w x 22.63" d (8.78 cm x 44.32 cm x 57.48 cm)	8.75" h x 17.5" w x 15" d (22.2 cm x 44.5 cm x 38.1 cm)	20.75" h x 17.5" w x 15.25" d (52.7 cm x 44.5 cm x 38.7 cm)
Weight	40 lbs fully loaded (18.2 kg)	60 lbs fully loaded (29.9 kg)	117 lbs fully loaded (43.7 kg)
Power requirements	3-slot Chassis with Single (1) Power Supply: Input Voltage and Current Power Supply Rating –70 to –40VDC: 17A 100 to 120VAC (auto–ranging): 8A 200 to 240VAC (auto–ranging): 4A AC line frequency: 47–63 Hz	4-slot Chassis with Single (1) Power Supply: Input Voltage and Current Power Supply Rating –70 to –40VDC: 17A 100 to 120VAC (auto–ranging): 8A 200 to 240VAC (auto–ranging): 4A AC line frequency: 47–63 Hz	8-slot Chassis with Single (1) Power Supply: Input Voltage and Current Power Supply Rating –70 to –40VDC: 17A 100 to 120VAC (auto–ranging): 8A 200 to 240VAC (auto–ranging): 4A AC line frequency: 47–63 Hz

Ordering Information

Part Number	Description
ServerIron 350, 450 and 850 Base Platforms	
SI350	3-slot 2U high chassis equipped with WSM6 (Web Switching Management Module) that automatically aligns itself with up to two additional JetCore based line modules installed in the chassis for high-performance Layer 4–7 switching applications
SI450	4-slot chassis equipped with WSM6 (Web Switching Management Module) that automatically aligns itself with up to three additional JetCore based line modules installed in the chassis for high-performance Layer 4–7 switching applications
SI450-DC	4-slot −48V DC chassis equipped with WSM6 (Web Switching Management Module) that automatically aligns itself with up to three additional JetCore based line interface modules installed in the chassis for high-performance Layer 4–7 switching applications
SI850	8-slot chassis equipped with WSM6 (Web Switching Management Module) that automatically aligns itself with up to seven additional JetCore based line modules installed in the chassis for high-performance Layer 4–7 switching applications
SI850-DC	8-slot −48V DC chassis equipped with WSM6 (Web Switching Management Module) that automatically aligns itself with up to seven additional JetCore based line modules installed in the chassis for high-performance Layer 4–7 switching applications
S350	3-slot 2U high ServerIron 350 chassis with single AC power supply
S350-S	3-slot 2U high ServerIron 350 chassis, NO power supply
S450	4-slot ServerIron 450 chassis with single AC power supply
S450-DC	4-slot ServerIron 450 chassis with single −48V DC power supply
S450-S	4-slot ServerIron 450 SPARE chassis, NO Power supply
S850	8-slot ServerIron 850 chassis with single AC power supply
S850-DC	8-slot ServerIron 850 chassis with single −48V DC power supply
S850-S	8-slot ServerIron 850 SPARE chassis, NO Power supply
ServerIron 350, 450 and 850 Module Options	
J–B2Gx	2-port 1000Base-X (mini-GBIC) JetCore line Module
J–B4Gx	4-port 1000Base-X (mini-GBIC) JetCore line Module
J–BxG	8-port 1000Base-X (mini-GBIC) JetCore line Module
J–B16Gx	16-port 1000Base-X (mini-GBIC) JetCore line Module
J–B16GC	16-port 100/1000Base-T (RJ45) JetCore line Module
J–B24FX	24-port 100Base-FX JetCore line Module
B10Gx1	1-port 10-Gigabit Ethernet Base Module (optics required)
B10Gx2	2-port 10-Gigabit Ethernet Base Module (optics required)
J–B48E-A	48-port 10/100Base-TX (RJ45) double-wide JetCore line
J–B2404CF	24-port 10/100Base-TX (RJ-45) and 4-port Gigabit (copper and fiber combo) double-wide JetCore line Module
ServerIron 350, 450 and 850 System Options	
WSM6	WSM6 Web Switch Management Module. Use for spare or dual-active modules for redundancy and double performance
ServerIron 350, 450 and 850—10-Gigabit Ethernet Optics	
10G-XNPK-SR	850nm serial XENPAK plug-in transceiver (SC), target range of 300m over MMF
10G-XNPK-LR	1310nm serial pluggable XENPAK optic only (SC) for up to 10km over SMF
10G-XNPK-ER	1550nm serial pluggable XENPAK optic only (SC) for up to 40km over SMF
ServerIron 350, 450 and 850 Mini GBIC Options	
E1MG-SX	1000Base-SX mini-GBIC optic, MMF, LC connector
E1MTG-SX	1000Base-SX mini-GBIC optic, MMF, MTRJ connector
E1MG-LX	1000Base-LX mini-GBIC optic, SMF, LC connector
E1MG-LHA	1000Base-LHA mini-GBIC optic, SMF, LC connector
E1MG-LHB	1000Base-LHB mini-GBIC optic, SMF, LC connector, 150km Maximum reach
E1MG-TX	1000BASE-TX Mini-GBIC Copper, RJ-45 Connector
ServerIron 350, 450 and 850 Premium Software Upgrade	
TRFWRKS-PREM	ServerIron chassis Premium TrafficWorks GSLB and Layer-3 Upgrade

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