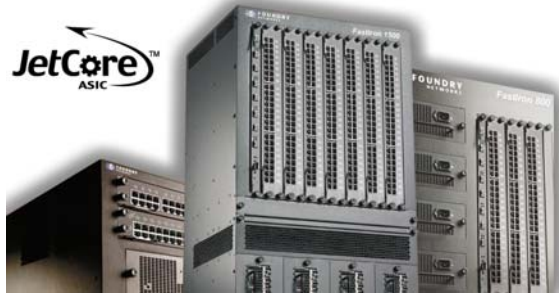


DATASHEET

FASTIRON 400, 800, AND 1500


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The FastIron 400, 800 and 1500 systems are the first in the industry to provide Enterprise customers with a complete end-to-end LAN solution – from the wiring closet to the LAN backbone – based on a single product family. The new JetCore(TM) enabled FastIron systems simplify sparing, network operations and administration for dramatic savings in Total Cost of Ownership (TCO).

Based on Foundry's third-generation JetCore ASIC chipset, the FastIron 400, 800 and 1500 systems deliver unparalleled port density, advanced Layer 2/3 feature sets, rich Quality of Service (QoS), bandwidth management for Voice over IP (VoIP) and 10 Gigabit Ethernet interfaces to scale the network backbone with massive bandwidth capacity.

Highlights

- Unparalleled port density up to 672 10/100Base-TX, 232 Gigabit Ethernet, 228 Gigabit Ethernet over Copper, or 28 10-Gigabit Ethernet ports in a single modular system that occupies only 17 Rack Units (RU)
- Rich QoS features with wire-speed fine-grain bandwidth management and a complete multicast feature set provides a superior foundation for Voice over IP (VoIP) and next-generation streaming media applications
- Advanced Layer 2/3 feature set including integrated IP, IPX, AppleTalk and OSPF protocols
- State-of-the-art Ternary Content Addressable Memory (TCAM) delivers wire-speed switching and Policy Based Routing (PBR)
- ASIC based sFlow™ (RFC 3176) support provides Enterprises with per-port, wire-speed network monitoring for capacity planning and security analysis
- Superior high availability with redundant management modules including temperature sensors, hot-swappable, load-sharing power supplies and hot-swappable interface modules
- IronShield™ security protects against Denial of Service (DoS) attacks and prevents unauthorized access to networks and server farms
- Jumbo frame support on Gigabit and 10 Gigabit Ethernet interfaces easily scales server farm throughput

FASTIRON 400, 800, AND 1500

System Summary



Feature	FastIron 400	FastIron 800	FastIron 1500
Slots	4	8	15
Switching Capacity	128 Gbps	256 Gbps	480 Gbps
Equipped with 10GbE*	101 Mpps	220 Mpps	429 Mpps
Equipped with Gig E*	83 Mpps	178 Mpps	345 Mpps
Max 10/100 ports	144	336	672
Max Gigabit ports	56	120	232
Max 10 Gigabit ports	6	14	28
Height	8.75"	20.75"	29.75"
Power Supply Redundancy	1+1	N+1	N+1

*Million Packets per second (Mpps) numbers are aggregate based on switching capacities of the line cards

Key Features and Benefits

Superior High Availability

- **Redundant, Hot-swappable Management and Interface Modules** — rapid fault detection and failover for increased reliability and expandability
- **Redundant, Hot-swappable Load-sharing Power Supplies** — increased system reliability and circuit redundancy with the ability to mix AC and DC power within the same system
- **Superior Layer 2 Redundancy** — Rapid Spanning Tree Protocol (STP) based on IEEE 802.1w and link aggregation based on IEEE 802.3ad for rapid convergence, minimal network downtime and minimal packet loss
- **Layer 3 Redundancy** — VRRP, VRRP-E (Enhanced), and VSRP for router redundancy

Advanced Layer 2 Feature Set

- **Extensive Spanning Tree Protocol features:**
 - *Rapid Spanning Tree Protocol (IEEE 802.1w)* — sub-second convergence using a pre-calculated failover link
 - *Fast Port Span* — faster convergence on ports that are attached to end stations, with convergence in as few as four seconds
 - *Fast Uplink Span* — convergence on uplink ports on wiring closet switches in just four seconds
 - *Single-instance STP* — support third-party devices that run a single spanning tree instance in accordance with the 802.1s specification
 - *Per VLAN STP (PVST)* — multiple spanning trees within a single system for VLAN load-sharing and increased network reliability

FASTIRON 400, 800, AND 1500



- **Dynamic VLANs** — simplified network address administration with logical assignment of users to virtual communities based on port, protocol or subnet, minimizes broadcast traffic and ensures network security
- **Link Aggregation based on IEEE 802.3ad** — logical links containing up to four 100 Mbps or eight Gigabit Ethernet or four 10GbE links to scale bandwidth and protect against link, port or interface module failure
- **Mirror/Monitor Port** — monitoring and troubleshooting of single or multiple switch ports without disruption to existing traffic flows, aiding fault isolation

Complete Layer 3 Functionality

- **Integrated Switch Routing (ISR)** — reduce dependencies on external routers allowing network managers to configure a FastIron switch to route Layer 3 traffic including IP, IPX, AppleTalk and OSPF protocols.
- **Industry Standard Routing Protocols** — dynamic IP routing using RIP and OSPF
 - **RIP** — simple solution for small to medium size network infrastructures, allowing administrators to assign IP addresses without defining sophisticated route propagation strategies
 - **OSPF** — flexible route propagation for medium to large enterprise networks, allowing administrators to pre-determine network paths for specific traffic, define route summarization properties to minimize route table overhead, and take advantage of Equal Cost Multi Path (ECMP) for increased bandwidth utilization and redundancy
- **Policy Based Routing (PBR)** — customized routing decisions based on source address, allowing Enterprise customers to deliver enhanced security, increased reliability, and efficient network bandwidth use for mission-critical applications such as VoIP
- **Network Address Translation (NAT)** — allows Enterprise networks to translate private IP addresses into public IP addresses when traversing the Internet, conserving IP address space and increase network security.

VoIP Foundation – Advanced QoS and Bandwidth Management

- **Advanced QoS** — enforce or change traffic priority based on port, VLAN, source MAC, ACL, 802.1p, Type of Service (ToS) or DiffServ settings to prioritize business-critical flows
- **Ultra-low Latency** — industry-leading port-to-port latency of 5 microseconds for superior call quality when using VoIP
- **Multiple Queuing Methods** — Strict Priority (SP) or Weighted Fair Queuing (WFQ) provide flexibility in enforcing traffic prioritization
- **Wire-Speed, Fine-grain Bandwidth Management** — Traffic classification and bandwidth enforcement based on port, port plus priority, or Layer 4 ACLs, from 1 Mbps up to 1 Gbps in increments as small as 256 Kbps

Scalable Multicast Implementation

- **Comprehensive Multicast Feature Set** — hardware-based multicast features allow network managers to efficiently deploy streaming media applications for improved employee collaboration and productivity
- **Diverse Multicast Protocol Support** — IGMP, DVMRP, MSDP, PIM-SM (Sparse Mode) and PIM-DM (Dense Mode) give administrators the flexibility of supporting a variety of applications with complete interoperability to existing applications

FASTIRON 400, 800, AND 1500



- **Superior Multicast Scalability and Performance** – Up to 64,000 Layer 2 multicast groups with sub-second join and leave latency for industry-leading multicast performance and scalability

Cohesive, Unified and Easy-to-use Network Management

- **Comprehensive Network Management** – cohesive, integrated solutions simplify network operations and maintenance
 - **IronView Network Manager™** – web-based, centralized, graphical interface for enterprise-wide configuration, maintenance and change management
 - **Command Line Interface (CLI)** – industry-standard configuration interface minimizes training requirements and operational maintenance costs
 - **Web Interface** – easy to use Graphical User Interface (GUI) standard with every Foundry product dramatically reduces installation time and cost
- **sFlow (RFC 3176)** – per port, wire-speed network monitoring delivers detailed traffic statistics for capacity planning and real-time network monitoring, without impacting network performance

IronShield™ Security

- **Wire-speed Extended Access Control Lists (ACL)** – control packet forwarding and restrict access to the system management interface, while providing wire-speed switching and routing
 - **Feature-rich ACL Implementation** – identify traffic based on source or destination IP address, IP protocol type, TCP or UDP port, IP precedence or TOS values
 - **Selective ACL Logging** – collect statistics for packets matching deny or permit conditions
 - **ACL Scalability** – up to 4,096 ACLs
 - **Ease of Administration** – identify an ACL by name or number, or add a comment line
 - **ACL Syntax Compatibility** – uniform ACL syntax across all Foundry products is compatible with the syntax of other major vendors
- **Secure Shell and Secure Copy** – secure access to the administration and management interface over the network
- **Protection Against Denial Of Service (DoS) Attacks** – prevent or minimize network downtime and protect against malicious users by limiting TCP SYN and ICMP traffic; protect against broadcast storms by limiting broadcast traffic
- **User Authentication** – authentication with AAA, 802.1x, RADIUS, TACACS, and TACACS+ to prevent unauthorized network access
- **Wire-speed Rate Limiting** – limit and enforce bandwidth use to prevent unauthorized network bandwidth hogging
- **sFlow (RFC 3176)** – cost-effective, scalable, wire-speed network monitoring to detect unusual network activity

Industry Leading Performance

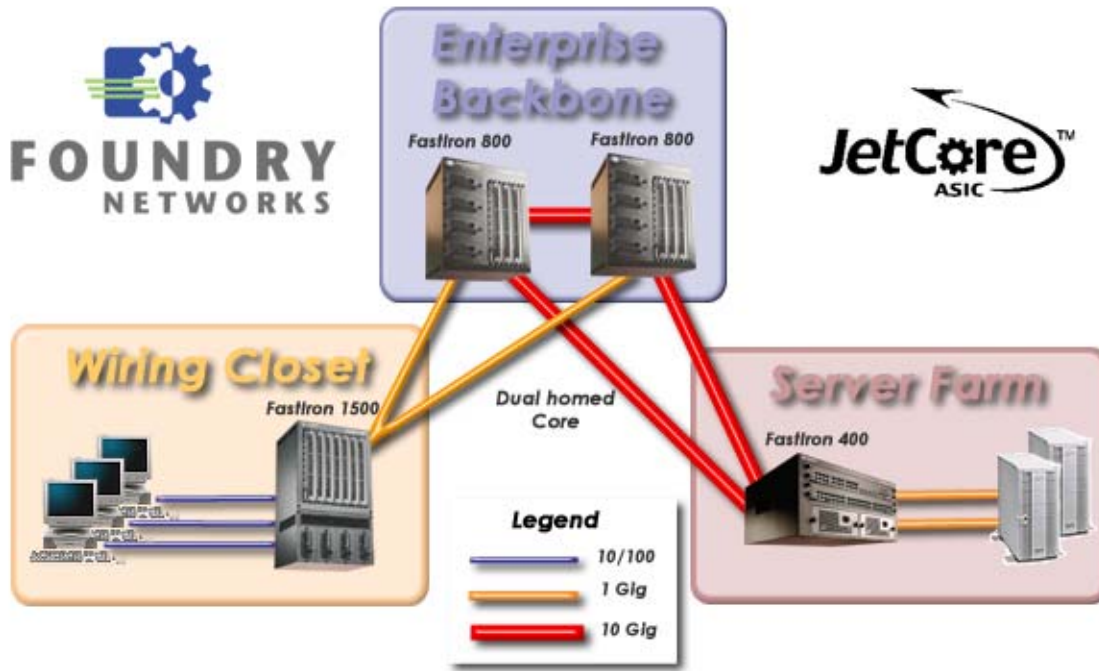
- **Industry's Highest Switching Performance** – non-blocking, distributed switching architecture with a parallel cross-point switch fabric provides up to 480 Gbps of aggregate switching capacity, and 178 million packets per second switching performance
- **State-of-the-art TCAM** – wire-speed Layer 2/3 switching and PBR with industry-leading switching capacity and scalability
- **Jumbo Frames** – dramatically scales server throughput with minimal impact on server processing resources

FASTIRON 400, 800, AND 1500



Product Deployment Applications

Industry Leading Enterprise Solution



FastIron Systems for End-to-End Enterprise Solution

The new JetCore-based FastIron systems are the first in the industry to provide Enterprise customers with a complete end-to-end LAN solution, ranging from the wiring closet to the LAN backbone, based on a single product family. The single JetCore product family simplifies network operations, administration, and sparing requirements, leading to dramatic savings in TCO.

The new JetCore-based FastIron systems include advanced Layer 2/3 feature sets that deliver industry-leading scalability and performance, with embedded support for IP, IPX and AppleTalk based switching. Integrated fine-grain bandwidth provisioning, sFlow™ (RFC 3176), rich QoS, complete multicast, and jumbo frames provide a foundation for VoIP and next-generation streaming media applications.

Complemented by the JetCore-based FastIron 4802 workgroup switch, the FastIron 400, 800 and 1500 systems empower Enterprise customers to harness network performance into a competitive business advantage and improve productivity by exploiting the efficiencies of intranet, Internet and extranet applications.

FASTIRON 400, 800, AND 1500



FastIron 400, 800 and 1500 for Enterprise Wiring Closets

The FastIron 400, 800 and 1500 modular systems provide an ideal choice for Enterprise wiring closets. Leading with price/performance, these products offer superior port density, serviceability, high availability, security and advanced Layer 2/3 feature sets. Redundant management modules providing rapid failover, IEEE 802.1w based Rapid Spanning Tree Protocol (STP), and ultra-low latency of 5 microseconds delivers the critical high availability and performance required for mission-critical applications including VoIP.

Shipping with full Layer 2 and base Layer 3 capabilities, the FastIron modular systems can be upgraded to a full Layer 3 feature set. The easy upgrade path provides Enterprise customers with a "future-proof" technology while enabling interoperability with existing infrastructures.

The addition of new JetCore-based interface modules, including a 48-port RJ-21 (Telco) auto-sensing 10/100 interface module and a 16-port Gigabit copper auto-sensing 100/1000 interface module, provide the industry's most compact port density while supporting a smooth migration path for Gigabit-to-the-desktop. You can swap modules to easily adapt to business needs, without costly forklift upgrades.

FastIron 400, 800 and 1500 for Enterprise Server Farm Connectivity

The FastIron 400, 800, or 1500 Layer 2/3 switches are ideal for server farm connectivity, providing cost-effective 100/1000 auto-sensing Gigabit Ethernet over copper interfaces for scaling server bandwidth.

The new 16-port 100/1000 auto-sensing Gigabit over copper interface module provides industry-leading port density up to 232 Gigabit ports in a single system that consumes just 17 rack units. Jumbo frame support on these cost-effective modules enables Enterprise customers to reduce CPU cycles during server farm backup operations.

The JetCore-based FastIron systems also support the new 10 Gigabit Ethernet interface module, to scale backbone connectivity. In addition, Foundry's IronShield™ security features protect the server farm against Denial of Service (DoS) attacks and provide administration security. These security features eliminate unnecessary network downtime caused by malicious hacker attacks.

FastIron 400, 800 and 1500 for Enterprise LAN Backbone

The JetCore-based FastIron systems feature industry-leading Gigabit port density including fiber and copper Gigabit Ethernet interfaces, a critical requirement in the LAN backbone.

Continuing Foundry's technology leadership, the new FastIron systems offer wire-speed, non-blocking Layer 3 switching, delivering the industry's highest switching capacity of up to 480 Gbps. TCAM technology, an enhancement to Foundry's hardware forwarding technology, is a feature of the JetCore ASIC chipset, which provides superior performance and scalability in the LAN backbone and data center.

Advanced multicast capabilities, wire-speed Access Control Lists, and complete integrated OSPF routing capabilities provide robust routing and filtering, while 10 Gigabit Ethernet interfaces or IEEE 802.3ad-based trunk groups enable Enterprise customers to immediately scale inter-switch connections in the LAN backbone to meet increasing bandwidth requirements.

DATASHEET

FASTIRON 400, 800, AND 1500



Technical Specifications

IEEE Compliance

- 802.3,10BaseT
- 802.3u 100BaseTX, 100BaseFX
- 802.3z 1000BaseSX
- 802.3z 1000BaseLX
- 802.3ab 1000BaseT
- 802.3ae 10 Gigabit Ethernet
- 802.3x Flow Control
- 802.3ad Link Aggregation
- 802.1p/q VLAN Tagging
- 802.1d Bridging
- 802.1w Rapid STP
- 802.1x authentication
- 802.3 Ethernet Like MIB
- Repeater MIB
- Ethernet Interface MIB
- SNMP V1,V2c
- SNMP MIB II

RFC Compliance*OSPF*

- RFC 2178 OSPF
- RFC 1583 OSPF v2
- RFC 1587 OSPF NSSA
- RFC 1745 OSPF Interactions
- RFC 1765 OSPF Database Overflow
- RFC 1850 OSPF Traps
- RFC 2154 OSPF w/Digital Signatures (Password, MD-5)
- RFC2328 OSPF v2
- RFC 1850 OSPF v2 MIB
- RFC 1997 Communities Attributes
- RFC 2385 TCP MD5
- RFC 2439 Route Flap Damping
- RFC 2842 Capabilities Advertisement
- RFC 2918 Route Refresh Capability
- RFC 2370 OSPF Opaque LSA Option

RIP

- RFC 1058 RIP v1
- RFC 1723 RIP v2
- RFC 1812 RIP Requirements

IP Multicast

- RFC 1122 Host Extensions
- RFC 1122 DVMRP Host Requirements
- RFC 1256 ICMP Router Discovery Protocol
- RFC 1112 IGMP
- RFC 2236 IGMP v2
- RFC 2362 PIM-SM
- PIM-DM v1
- DVMRP v3-07
- RFC 2336 IGMP v2

- MSDP

- RFC 2283 MBGP

General Routing Protocols

- RFC 791 IP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 783 TFTP
- RFC 826 ARP
- RFC 768 UDP
- RFC 894 IP over Ethernet
- RFC 903 RARP
- RFC 906 TFTP Bootstrap
- RFC 1027 Proxy ARP
- RFC 854 TELNET
- RFC 951 BootP
- RFC 1122 Host Requirements
- RFC 1256 IRDP
- RFC 1519 CIDR
- RFC 1542 BootP Extensions
- RFC 1591 DNS (client)
- RFC 1812 General Routing
- RFC 1541 and 1542 DHCP
- RFC 2131 BootP/DHCP Helper
- RFC 2338 VRRP

Others

- RFC1354 IP Forwarding MIB
- RFC 1757 RMON Groups 1,2,3,9
- RFC 2068 HTTP
- RFC 2030 SNMP
- RFC 2138 RADIUS
- RFC 3176 sFlow

Network Management

- IronView Network Manager (INM) Web based graphical user interface
- Integrated Standard based Command Line Interface (CLI)
- sFlow (RFC 3176)
- Telnet
- SNMP
- RMON
- HP OpenView for Sun Solaris, HP-UX, IBM's AIX, and Windows NT Standalone Windows NT

DATASHEET

FASTIRON 400, 800, AND 1500



Element Security Options

- AAA
- 802.1x
- RADIUS
- Secure Shell (SSH v1)
- Secure Copy (SCP)
- TACACS/TACACS+
- Username/Password (Challenge and Response)
- Bi-level Access Mode (Standard and EXEC Level)
- Protection for Denial of Service attacks, such as TCP SYN or Smurf Attacks

Environmental

- Operating Temperature: 5 °C to 40 °C (41 °F to 104 °F)
- Relative Humidity: 5 to 80%, @40 °C (104 °F), non-condensing
- Storage Temperature: -40 °C to 70 °C (-40 °F to 158 °F)
- Storage Altitude: 10,000 ft (3,000 m) maximum
- Storage Humidity: 95% maximum relative humidity, non-condensing

Safety Agency Approvals

- EN 60950 / IEC 950
- UL 1950
- CSA 950 Electromagnetic Emission Certification
- FCC Class A
- EN 55022 / CISPR-22 Class A; VCCI Class A

Immunity

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

Warranty

- 1-year hardware
- 90-day software

Mounting Options

- 19" Universal E A (Telco) Rack Tabletop

FastIron System Power Specifications

	FastIron 400	FastIron 800	FastIron 800	FastIron 1500
Power Supply(s)	1	1	2	1
-70 to -40 VDC Consumption (Amps)	17A	17A	33A	70A
100-120 VAC Consumption (Amps)	8A	8A	15A	30A
200-240 VAC Consumption (Amps)	4A	4A	7.5A	15A
AC frequency	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz
Max BTUs (fully populated)	4552	9000	9000	10,236

FastIron System Physical Specifications

	FastIron 400	FastIron 800	FastIron 1500
Dimensions	8.75"h x 17.5"w x 15"d (22.2 x 44.5 x 38.1 cm)	20.75"h x 17.5"w x 15.25"d (52.7 x 44.5 x 38.7 cm)	29.75"h x 19.0"w x 15.25"d (75.68 x 48.33 x 38.7 cm)
Weight (fully loaded)	60 lbs (29.9 kg)	117 (43.7 kg)	170 lbs (374 kg)

DATASHEET

FASTIRON 400, 800, AND 1500


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Ordering Information

Part Number	Description
FI400	4-slot FastIron 400 Chassis
FI800	8-slot FastIron 800 Chassis
FI1500	15-slot FastIron 1500 Chassis
RPS3	90-220VAC Power Supply for FastIron 400 & FastIron 800
RPS3DC	48VDC Power Supply for FastIron 400 & FastIron 800
RPS4	90-220VAC Power Supply for FastIron 1500 only
RPS4DC	48VDC Power Supply for FastIron 1500 only
J-FxGMR4	8-port mini-GBIC based Gigabit management module - requires mini-GBICs
J-F2404GMR4	24-port 10/100BaseT (RJ-45) and 4-port Gigabit management module - requires mini-GBICs (double-wide module)
J-F48E	48-port 10/100BaseT (RJ-45) interface module (double-wide module)
J-F48T	48-port 10/100BaseT (RJ-21) Telco interface module
J-F24FX	24-port 100Base-FX (MTRJ) for 50 or 62.5µm MMF interface module
J-F24FX-SR	24-port 100Base-FX (MTRJ) for 9 or 10µm SMF interface module (15km)
J-F24FX-IR	24-port 100Base-FX (MTRJ) for 9 or 10µm SMF interface module (40km)
J-FxG	8-port mini-GBIC based Gigabit interface module
J-F16Gx	16-port 1000Base-X (mini-GBIC) Gigabit interface module
J-F16GC	16-port 100/1000Base-T (RJ45) interface module
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
F10Gx-SR	1-port 10 Gigabit Ethernet module with 850nm LAN Optics (up to 300 meters on MMF)
F10Gx-LR	1-port 10 Gigabit Ethernet module with 1310nm LAN Optics (up to 10 km on SMF)
F10Gx-ER	1-port 10 Gigabit Ethernet module with 1550nm LAN Optics (up to 40 km on SMF)
F10Gx2	2-port 10 Gigabit Ethernet Base module – requires optics: select 10G-XNPK-LR or 10G-XNPK-ER
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

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Foundry Networks, Inc.
 Headquarters
 2100 Gold Street
 P.O. Box 649100
 San Jose, CA 95164-9100

U.S. and Canada Toll-free: (888) TURBOLAN
 Direct telephone: +1 408.586.1700
 Fax: 1-408-586-1900
 Email: info@foundrynet.com
 Web: <http://www.foundrynet.com>