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
System Summary

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

*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
**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
**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
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 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.
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
- 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 MDS
- RFC 2439 Route Flap Damping
- RFC 2842 Capabilities Advertisement
- RFC 2918 Route Refresh Capability
- RFC 2370 OSPF Opaque LSA Option
- RFC 1058 RIP v1
- RFC 1723 RIP v2
- RFC 1812 RIP Requirements
- RFC 1122 RIP Requirements
- RFC 1122 DVMRP Host Requirements
- RFC 1256 ICMP Router Requirements
- RFC 1112 IGMP
- RFC 2236 IGMP v2
- RFC 2362 PIM-SM
- PIM-DM v1
- DVMRP v3-07
- RFC 2336 IGMP v2

General Routing Protocols
- MSDP
- RFC 2283 MBGP

Others
- RFC1354 IP Forwarding MIB
- RFC 1757 RMON Groups 1,2,3,9
- RFC 2068 HTTP
- RFC 2030 SNMP
- RFC 2338 VRRP
- 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
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

FastIron System Power Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply(s)</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>-70 to -40 VDC Consump. (Amps)</td>
<td>17A</td>
<td>17A</td>
<td>33A</td>
<td>70A</td>
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<tr>
<td>100-120 VAC Consump. (Amps)</td>
<td>8A</td>
<td>8A</td>
<td>15A</td>
<td>30A</td>
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<tr>
<td>200-240 VAC Consump. (Amps)</td>
<td>4A</td>
<td>4A</td>
<td>7.5A</td>
<td>15A</td>
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<tr>
<td>AC frequency</td>
<td>47 – 63 Hz</td>
<td>47 – 63 Hz</td>
<td>47 – 63 Hz</td>
<td>47 – 63 Hz</td>
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<tr>
<td>Max BTUs (fully populated)</td>
<td>4552</td>
<td>9000</td>
<td>9000</td>
<td>10,236</td>
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FastIron System Physical Specifications

<table>
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<tr>
<th></th>
<th>FastIron 400</th>
<th>FastIron 800</th>
<th>FastIron 1500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>8.75&quot;h x 17.5&quot;w x 15&quot;d (22.2 x 44.5 x 38.1 cm)</td>
<td>20.75&quot;h x 17.5&quot;w x 15.25&quot;d (52.7 x 44.5 x 38.7 cm)</td>
<td>29.75&quot;h x 19.0&quot;w x 15.25&quot;d (75.68 x 48.33 x 38.7 cm)</td>
</tr>
<tr>
<td>Weight (fully loaded)</td>
<td>60 lbs (29.9 kg)</td>
<td>117 (43.7 kg)</td>
<td>170 lbs (374 kg)</td>
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</table>
## Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FI400</td>
<td>4-slot FastIron 400 Chassis</td>
</tr>
<tr>
<td>FI800</td>
<td>8-slot FastIron 800 Chassis</td>
</tr>
<tr>
<td>FI1500</td>
<td>15-slot FastIron 1500 Chassis</td>
</tr>
<tr>
<td>RPS3</td>
<td>90-220VAC Power Supply for FastIron 400 &amp; FastIron 800</td>
</tr>
<tr>
<td>RPS3DC</td>
<td>48VDC Power Supply for FastIron 400 &amp; FastIron 800</td>
</tr>
<tr>
<td>RPS4</td>
<td>90-220VAC Power Supply for FastIron 1500 only</td>
</tr>
<tr>
<td>RPS4DC</td>
<td>48VDC Power Supply for FastIron 1500 only</td>
</tr>
<tr>
<td>J-FxGMR4</td>
<td>8-port mini-GBIC based Gigabit management module - requires mini-GBICs</td>
</tr>
<tr>
<td>J-F2404GMR4</td>
<td>24-port 10/100BaseT (RJ-45) and 4-port Gigabit management module - requires mini-GBICs (double-wide module)</td>
</tr>
<tr>
<td>J-F48E</td>
<td>48-port 10/100BaseT (RJ-45) interface module (double-wide module)</td>
</tr>
<tr>
<td>J-F48T</td>
<td>48-port 10/100BaseT (RJ-21) Telco interface module</td>
</tr>
<tr>
<td>J-F24FX</td>
<td>24-port 100Base-FX (MTRJ) for 50 or 62.5µm MMF interface module</td>
</tr>
<tr>
<td>J-F24FX-SR</td>
<td>24-port 100Base-FX (MTRJ) for 9 or 10µm SMF interface module (15km)</td>
</tr>
<tr>
<td>J-F24FX-IR</td>
<td>24-port 100Base-FX (MTRJ) for 9 or 10µm SMF interface module (40km)</td>
</tr>
<tr>
<td>J-FxG</td>
<td>8-port mini-GBIC based Gigabit interface module</td>
</tr>
<tr>
<td>J-F16Gx</td>
<td>16-port 1000Base-X (mini-GBIC) Gigabit interface module</td>
</tr>
<tr>
<td>J-F16GC</td>
<td>16-port 100/1000Base-T (RJ45) interface module</td>
</tr>
<tr>
<td>E1MG-SX</td>
<td>1000Base-SX mini-GBIC optic, MMF, LC connector</td>
</tr>
<tr>
<td>E1MTG-SX</td>
<td>1000Base-SX mini-GBIC optic, MMF, MTRJ connector</td>
</tr>
<tr>
<td>E1MG-LX</td>
<td>1000Base-LX mini-GBIC optic, SMF, LC connector</td>
</tr>
<tr>
<td>E1MG-LHA</td>
<td>1000Base-LHA mini-GBIC optic, SMF, LC connector</td>
</tr>
<tr>
<td>F10Gx-SR</td>
<td>1-port 10 Gigabit Ethernet module with 850nm LAN Optics (up to 300 meters on MMF)</td>
</tr>
<tr>
<td>F10Gx-LR</td>
<td>1-port 10 Gigabit Ethernet module with 1310nm LAN Optics (up to 10 km on SMF)</td>
</tr>
<tr>
<td>F10Gx-ER</td>
<td>1-port 10 Gigabit Ethernet module with 1550nm LAN Optics (up to 40 km on SMF)</td>
</tr>
<tr>
<td>F10Gx2</td>
<td>2-port 10 Gigabit Ethernet Base module – requires optics: select 10G-XNPK-LR or 10G-XNPK-ER</td>
</tr>
<tr>
<td>10G-XNPK-LR</td>
<td>1310nm serial pluggable Xenpak optic only (SC) for up to 10km over SMF</td>
</tr>
<tr>
<td>10G-XNPK-ER</td>
<td>1550nm serial pluggable Xenpak optic only (SC) for up to 40km over SMF</td>
</tr>
</tbody>
</table>

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