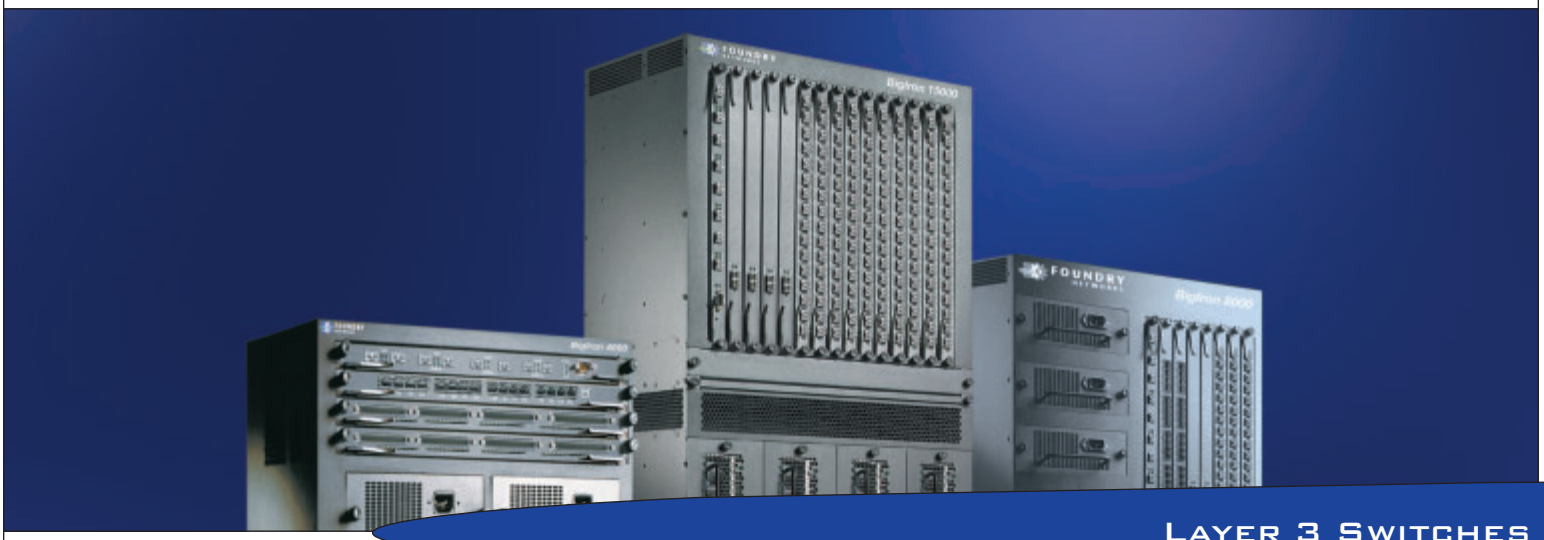
BIGIRON 4000, 8000, 15000



LAYER 3 SWITCHES

BigIron® 4000, 8000 and 15000 systems equipped with new JetCore® ASIC based modules offer 10 Gigabit Ethernet, leading Layer 2 scalability for Metro and Layer 3 scalability for ISPs. With carrier-class redundancy, fine-grain bandwidth management and wire-speed network monitoring and accounting features, the BigIron with JetCore is the product of choice for delivering high performance Metro Ethernet and Internet Service solutions.

JetCore based BigIron systems offer unparalleled Gigabit Ethernet and 10 Gigabit Ethernet density in a compact footprint. Powered by Foundry's Enterprise IronWare or Metro IronWare operating systems, BigIron Layer 3 switches offer wire-speed, non-blocking performance, rich Quality of Service (QoS) and advanced bandwidth management features for demanding service provider and enterprise environments.

JetCore ASIC

Key Features and Benefits

- *Unparalleled port density maximizes revenue per rack unit by minimizing the environmental requirements such as space, power and cooling. Scale up to 232 Gigabit Ethernet ports, 28 10 Gigabit Ethernet ports, or 672 10/100 ports in a single modular system with a total size of 17 rack units (RU).*
- *State-of-the-art Ternary Content Addressable Memory (TCAM) delivers large-scale wire-speed Layer 3 switching, Policy Based Routing (PBR) and robust OSPF and BGP4 implementations*
- *Protection against Denial of Service attacks using IronShield™ security with wire-speed extended Access Control Lists, Secure Shell, Secure Copy, SNMP v3, and authentication with AAA, 802.1x, RADIUS, and TACACS+*
- *Customized differentiated service offerings supporting voice, video and data on the same network with (QoS) and multicast capabilities*
- *On-demand bandwidth provisioning with wire-speed fine-grain bandwidth control*
- *Built-in sFlow™ technology (RFC 3176) delivers scalable network accounting and billing, capacity planning and security analysis solutions using Layer 2–7 per-port information*
- *Carrier-class system and network reliability with support for redundant management modules with rapid failover, hot-swappable power supplies and interface modules, Rapid STP, MRP, VRRP and VSRP*
- *Jumbo frame support on both Gigabit and 10 Gigabit Ethernet expands the data payload for network intense data transfer applications such as Storage Area Networks (SANs)*

FOUNDRY NETWORKS

System Summary

Feature	BigIron 4000	BigIron 8000	BigIron 15000
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 Ports Per System			
10/100 ports	144	336	672
Gigabit ports	56	120	232
10 Gigabit ports	6	14	28
Max Ports Per 7' Rack			
10/100 ports	1296	1344	1344
Gigabit ports	504	480	464
10 Gigabit ports	54	56	56
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

Purpose-built Feature Set for Demanding Service Provider and Enterprise Networks

Superior High Availability

- ***Redundant, hot-swappable management and interface modules***—*support for rapid fault detection and fail-over, coupled with hot-swappable interface modules, provide increased reliability and expandability without network down time*
- ***Redundant, hot-swappable load-sharing power supplies***—*enhances system reliability and circuit redundancy with the ability to mix AC & DC within the same system. The BigIron systems deliver industry-leading redundancy by supporting multiple load sharing power supplies.*
- ***Link Aggregation based on IEEE 802.3ad***—*improves reliability and performance while reducing the operations overhead by dynamically combining up to four 100 Mbps ports together, or up to four 10 Gigabit Ethernet or eight Gigabit Ethernet ports together. Cross module trunks can be created for additional protection while providing a single connection between two switches.*
- ***Network Level redundancy protocols for Layer 2 and Layer 3 networks***—*provide resiliency by having an alternate BigIron in case of failure from a primary or active device. VRRP and VRRPe support Layer 3 redundancy while MRP, VSRP, and RSTP support Layer 2 networks.*

Industry Leading Layer 2 Features

- ***Metro Ring Protocol (MRP)***—*Offers an alternative to Spanning Tree based designs and provides sub-second fault detection and fail-over specifically for Metro Ethernet ring topologies. MRP works in conjunction with VSRP and 802.3ad based link aggregation to provide bandwidth scalability and SONET like resiliency in Metro Ethernet networks.*
- ***Virtual Switch Redundancy Protocol (VSRP)***—*Offers an alternative to Spanning Tree based designs and provides sub-second fault detection and fail over protocol for mesh topologies. VSRP works in conjunction with MRP to provide SONET like resiliency required for critical Data Center and Metro Ethernet networks and protects against link or switch failures.*

- ***Foundry's next generation STP Innovations***—*Foundry's innovative features such as SuperSpan, Rapid STP (802.1w) and PVGST (802.1s) dramatically improve the availability and scalability of spanning tree based networks*
  - — ***Single-instance STP***—*provides a single instance of the STP to run on all the port-based VLANs within a single device, enabling BigIron systems to support third-party devices that run a single STP instance in accordance with the 802.1q specification*
  - — ***Per VLAN Spanning Tree (PVST)***—*allows Metro service providers control over the spanning tree protocol on an individual VLAN basis to provide traffic engineering*
  - — ***Per VLAN Group STP (PVGST) based on IEEE 802.1s***—*allows Metro service providers dramatic improvements in STP and VLAN scalability by servicing up to 4,096 VLANs with 2 to 16 STP or Rapid STP instances. PVGST also provides VLAN load balancing for all 4,096 VLANs for efficient utilization of all fiber in a Metro network.*
  - — ***SuperSpan***™***—****a unique innovation from Foundry that allows Metro service providers to build very large Layer 2 Metro Ethernet networks while simplifying manageability and network operations. Metro service providers can organize the network into smaller, faster converging, easy-to-manage standards-based STP domains using SuperSpan while being isolated from STP changes caused by subscriber network settings.*
  - — ***Rapid Spanning Tree Protocol based on IEEE 802.1w***—*Dramatically improves the spanning tree convergence time to sub-second by pre-calculating alternate fail-over links prior to a link outage*
- ***Super Aggregated VLANs (SAVs)***—*allows service providers to decouple the provider VLAN domains from customer VLAN domains. SAVs extend the number of 802.1q based VLANs beyond 4096 by aggregating traffic from multiple VLANs for a single customer into a single provider VLAN. This allows service providers to carry traffic for up to 16 million VLANs in a metro network by serving up to 4096 customers, with each customer using up to 4096 VLANs.*
- ***High Performance Layer 2 Multicast***—*offers efficient handling of multicast traffic in a Layer 2 environment such as Internet exchanges and Metro access networks*
  - — ***PIM Snooping*** —*Dramatically improves the performance of multicast applications such as streaming Video in a Layer 2 Metro by optimizing PIM traffic between Layer 3 Multicast devices that otherwise would propagate traffic to all VLAN port members*
  - — ***Internet Group Membership Protocol (IGMP)***—*Hardware-based multicast support that forwards only a single copy of a transmission to only the requesting port. Foundry's JetCore ASICs are unique in their ability to recognize and process the multicast join and leave messages embedded in the multicast traffic flows at the port level.*

Robust Layer 3 Feature Set

- ***Foundry's IronWare Software Suite***—*includes advanced Internet strength routing protocols deployed extensively by major ISPs in very large routing environments. BigIron supports the following scalable EGP and IGP protocols:*
  - — ***BGPv4***
  - — ***OSPF***
  - — ***IS-IS***
- ***Policy Based Routing (PBR)***—*provides customized routing decisions based on Source address allowing Metro customers to maintain single configurations while having access to different service offerings such as enhanced security, increased flexibility and access to preferred ISPs*
- ***Private VLANs***—*allow the service provider increased IP addressing flexibility by partitioning port-based VLANs for security while sharing a common router port*
- ***Comprehensive Multicast Routing Feature Set***—*provides hardware-based multicast support including DVMRP, MSDP, PIM-SM (Sparse Mode) and PIM-DM (Dense Mode) protocols that allows network managers to efficiently deploy next-generation streaming media applications for improved employee collaboration and productivity*
- ***VRRP and VRRPE (Enhanced VRRP)***—*enable the BigIron configured as router to act as a backup to other routers in the network. In the event of a router failure, the BigIron will automatically and seamlessly perform the tasks of the failed router. VRRPE Extends the capabilities of VRRP by providing network managers the convenience of a virtual interface to aid in traditional IP troubleshooting tools to ensure that a default router is actually up and operational.*

Dynamic Bandwidth Provisioning and Advanced Quality of Service (QoS)

- ***Wire-speed, fine-grain Bandwidth Management***—*JetCore ASICs can identify network traffic based on port, port plus priority, or Layer 4 ACLs and enforce bandwidth limits from 256 Kbps to 1 Gbps in increments as little as 256 Kbps. This allows service providers to meet customer SLAs and improve service velocity and provisioning.*
- ***Advanced QoS***—*allows administrators to 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 10 to 20 microseconds for superior call quality when using VoIP and other latency-sensitive traffic such as video*
- ***Multiple Queuing Methods***—*Strict Priority (SP) or Weighted Fair Queuing (WFQ) provides flexibility for network administrators in enforcing traffic prioritization*

Cohesive, Unified and Easy-To-Use Network Management

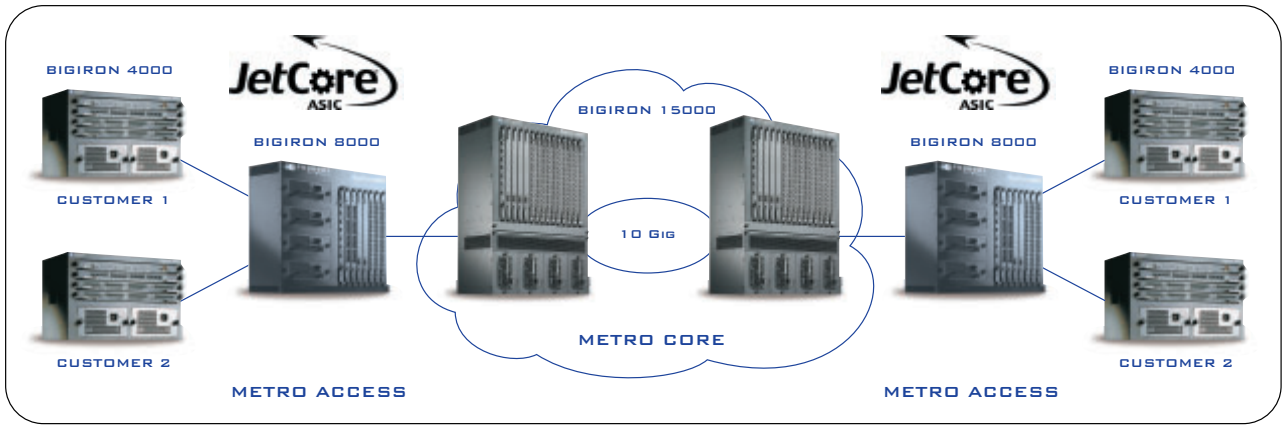
- ***Centralized Network Management***—*Foundry's IronView Network Manager is a web-based, graphical interface tool that empowers network operators to seamlessly control software and configuration updates for any Foundry product from a central station. This dramatically simplifies network provisioning, diagnostics and resolution, thus reducing the operational expenses.*
- ***Command Line Interface (CLI)***—*is an industry-standard configuration interface, consistent and common throughout Foundry's entire product portfolio*
- ***Web Interface***—*provides easy to use Graphical User Interface (GUI) for system configuration from standard Web browsers*
- ***sFLow (RFC 3176)***—*provides scalable, ASIC-based, wire-speed network monitoring and accounting with no impact on network performance. This allows network operators to gather a variety of sophisticated network statistics and information for capacity planning and real-time network monitoring purposes.*

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 the deny or permit conditions*
  - ***ACL Scalability***—*support for up to 4,096 ACLs*
  - ***Ease of Administration***—*identify an ACL by name or number, or add a comment line for ease of administration*
  - ***ACL Syntax Compatibility***—*uniform ACL syntax across all Foundry products provides compatibility with syntax of other major vendors*
- ***Secure Shell and Secure Copy***—*provide secure access to the administration and management interface over the network*
- ***Protection Against Denial Of Service (DoS) Attacks***—*prevents or minimizes network downtime and protects against malicious users by limiting TCP SYN and ICMP traffic and protects 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***—*enforce bandwidth policies to prevent unauthorized network hogging*
- ***SFlow (RFC 3176)***—*provides cost-effective, scalable, wire-speed network monitoring to detect unusual network activity*
- ***SNMPv3***—*Secured SNMP management with RFC 2570 through 2575, provides User-Based Security model (RFC 2574) for authentication and privacy services*

Applications

Global Ethernet™ Metro Solutions
JetCore Based BigIron Systems With 10 Gigabit Ethernet



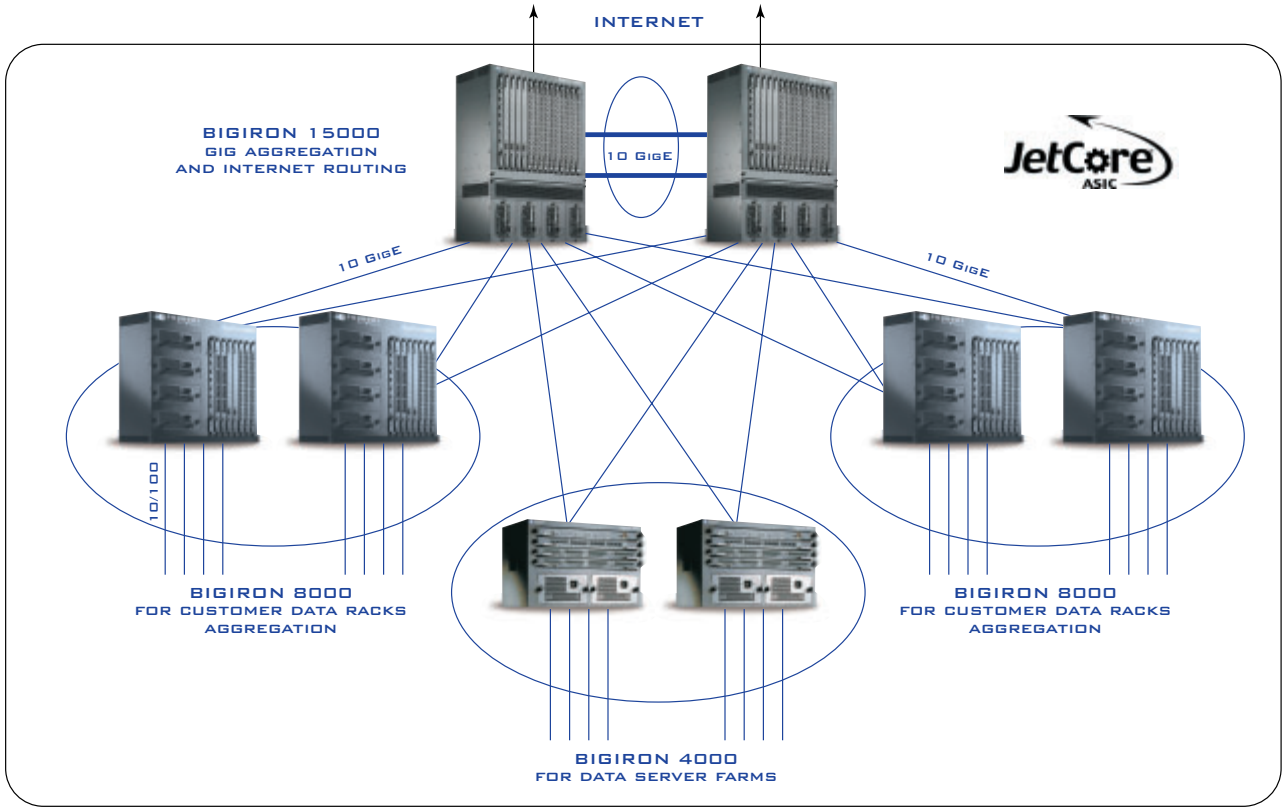
With the BigIron systems powered by JetCore modules and Foundry's IronWare operating system, Metro service providers can build simple, cost-effective Layer 2 and Layer 3 Metro networks to offer high-performance Transparent LAN Services (TLS) and Internet connectivity to enterprise customers. Foundry's new JetCore based systems, complemented by the current IronCore™ based systems, empower Metro service providers to harness the power of network performance into competitive business advantages by offering profitable high-performance bandwidth services.

In order to provide TLS for point-to-point and multi-point-to-multi-point connectivity, many Metro service providers chose to build Layer 2 Ethernet networks for simplicity, low-cost and VLAN-based security. Foundry's Global Ethernet metro solutions offer robust scalability and SONET like resiliency and offer a range of metro network design choices with or without Spanning Tree. Foundry's Spanning Tree based Metro solution includes SuperSpan™, Rapid STP based on 802.1w, Per VLAN Group Spanning Tree (PVGST) based on 802.1s and SAV for STP and VLAN scalability. As an alternative to Spanning Tree, BigIron systems feature Metro Ring Protocol (MRP) for sub-second fail over in ring topologies and VSRP for sub-second fail over in mesh topologies allowing SONET like protection in Metro Ethernet networks.

Dynamic bandwidth provisioning makes it possible for providers to control the amount of bandwidth consumed by any individual customer and manage bandwidth as a commodity. Properly monitoring and accounting the bandwidth is equally important to ensure customer satisfaction with the service. Using sFlow based on RFC 3176, the service provider can accurately monitor the network activity for a given customer and proactively recommend additional bandwidth as needed. Detailed information provided by the built-in per port sFlow collector allows in-depth network analysis.

Industry Leading Solutions For Internet Data Centers

BigIron systems equipped with JetCore modules provide an ideal choice for Internet data centers because of the 10/100, Gigabit and 10 Gigabit Ethernet port density, superior serviceability, high availability, security and advanced Layer 2/3 feature sets. With wire-speed, granular rate limiting, service providers can meter bandwidth and use Foundry's sFlow based on RFC 3176 to provide wire-speed traffic accounting for accurate end-user billing. The BigIron 4000, 8000 and 15000 systems provide an array of purpose-built advanced Layer 2 and Layer 3 features such as Private VLANs, SuperSpan, VRRP, OSPF, IS-IS and a robust feature-rich BGP implementation that



scales to hundreds of peers. With the new 16-port Gigabit modules, fiber and 100/1000 Copper module, BigIron systems can offer an unprecedented Gigabit port density of up to 232 Gigabit ports in a single system that consumes just 17 rack units enabling cost-effective, high performance Gigabit services and server connectivity. With Foundry's standards-based 10 Gigabit Ethernet modules, service providers can immediately scale the data center backbone and offer 10 Gigabit uplinks from Gigabit aggregation switches connecting to server farms. Foundry BigIron can support a number of different optics for its 10 Gigabit Ethernet module to allow high performance connectivity between Internet data centers in different parts of a city up to 40 kilometers apart.

Foundry Voice over IP Solutions

Today's networks are providing services thought impossible just a few years ago. Internet, e-mail, voice and video conferencing are just a few of the business applications that are placing higher demands upon the network Infrastructure. The standards and demands for the network infrastructure have never been higher. Delivering voice solutions requires more than just connectivity. Issues such as call quality, reliability, availability, security and manageability are paramount in the complete voice solution. Most of all, the solutions should be able to deliver answers to these issues all while saving scarce budget dollars or enabling new business possibilities. Foundry Networks believes that the customer should be able to choose the tools that are right for their business and strives to build solutions that will enable any telephony vendor's solutions to interoperate with Foundry's superior network infrastructure equipment.

Foundry Power over Ethernet Solutions

Whether your Voice over IP requirements are large or small, Foundry Networks has the right solution for your business. Layer 2 and Layer 3—802.3af compliant powered Ethernet switches are available in a variety of form factors including 24 and 48 port stackable switches as well as in chassis form factors for maximum flexibility. Foundry is well known for building solutions that enable performance in every aspect. Fully featured quality of service functionality guarantees that the most important traffic gets through in the LAN. MAN and WAN. Foundry has enabled the ability to recognize and prioritize Voice traffic without sacrificing the performance or best in class low latency.

Network managers do not want any complexity surrounding the delivery of power in the network and to that end; Foundry has engineered specific features that reduce complexity of powering remote equipment.

- *802.3af compliant powered ports*

- *Power support for legacy non-802.3af compliant devices*
- *Configurable power on a per-port basis*
- *"Smart" ports that delivers the proper wattage even if manually mis-configured*
- *Redundant power supplies even with a fully powered chassis*
- *Full 15.4 watts per port on a fully populated chassis*
- *Three RU high Power Shelf for up to 14 fully POE powered modules*

- *Power across modules in one or multiple chassis in a rack*

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
- 802.3af Power over Ethernet
- 802.3x Flow Control
- 802.3ad Link Aggregation
- 802.1d Bridging
- 802.1p/qVLAN Tagging
- 802.1w Rapid STP
- 802.1x user authentication
- 802.3 Ethernet Like MIB
- Repeater MIB
- Ethernet Interface MIB
- SNMPV1,V2c andV3
- SNMP MIB II

RFC Compliance

BGPv4

- RFC 1269, 1657 BGP3 and BGP4 MIBs
- RFC 1745 OSPF interactions
- RFC 1771 BGPv4
- RFC 1965 BGP4 confederations
- RFC 1997 Communities & Attributes
- RFC 2385 MD5 Authentication of BGP Session
- RFC 2439 route flap dampening
- RFC 2796 route reflection
- RFC 2842 BGP4 capabilities

OSPF

- RFC 1583 and 2328 OSPF v2
- RFC 1587 OSPF NSSA
- RFC 1745 OSPF Interactions
- RFC 1765 OSPF Database Overflow
- RFC 1850 OSPF Traps
- RFC 1850 OSPF v2 MIB
- RFC 1997 Communities Attributes
- RFC 2154 OSPF w/Digital Signatures (Password, MD-5)
- RFC 2178 OSPF
- RFC 2328 OSPF v2
- RFC 2370 OSPF Opaque LSA Option
- RFC 2385 TCP MD5
- RFC 2439 Route Flap Damping
- RFC 2842 Capabilities Advertisement
- RFC 2918 Route Refresh Capability

IS-IS

- RFC 1195 Routing in TCP/IP and Dual Environments
- RFC 1377 PPP
- RFC 2763 Dynamic Host Name Exchange
- RFC 2966 Domain-wide Prefix Distribution

RIP

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

IP Multicast

- DVMRP v3-07
- PIM-DM v1
- RFC 1112 IGMP
- RFC 1122 DVMRP Host Requirements
- RFC 1122 Host Extensions
- RFC 1256 ICMP Router Discovery Protocol
- RFC 2236 IGMP v2
- RFC 2283 MBGP
- RFC 2362 PIM-SM
- RFC 3618 MSDP

General Routing Protocols

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

Others

- RFC 1157 SNMPv1
- RFC 1191 Path MTU discovery
- RFC 1215 SNMP generic traps
- RFC 1354 IP Forwarding MIB
- RFC 1573 SNMP MIB II
- RFC 1757 RMON Groups 1,2,3,9
- RFC 1905, 1906 SNMPv2c
- RFC 2030 SNTP
- RFC 2068 HTTP
- RFC 2138 RADIUS
- RFC 3176 sFlow
- RFC 3411 SNMPv3 framework
- RFC 3412 SNMPv3 processing
- RFC 3414 SNMPv3 USM
- RFC 3415 SNMPv3VACM
- TACACS+ v1.78

Network Management

- IronView Network Manager (INM) Web based graphical user interface
- Integrated Standard based Command Line Interface (CLI)
- sFlow (RFC 3176)
- Telnet and SSHv1
- SNMP
- HTTP and HTTPS
- RMON HP OpenView for Sun Solaris, HP-UX, IBM's AIX, and Windows NT

Element Security Options

- AAA
- RADIUS
- Secure Shell (SSH v2.0)
- Secure Copy (SCP)
- TACACS/TACACS+
- Username/Password (Challenge and Response)
- FI-level Access Mode (Standard and EXEC Level)
- Protection for Denial of Service attacks, such as TCP SYN or Smurf Attacks

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

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

Warranty

- 1-year hardware
- 90-day software

Mounting Options

- 19" Universal EIA (Telco) Rack or Tabletop

BigIron System Power Specifications

Platform	BigIron 4000	BigIron 8000	BigIron 8000	BigIron 15000
Power Supply(s)	1	1	2	2
-60 to -36VDD Consumption (Amps)	17A	17A	33A	58A
100-120VAC Consumption (Amps)	8A	8A	15A	30A
200-240VAC 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)	1,877	1,877	3,753	7,508
Max Watts (fully populated)	550	550	1100	2200

BigIron System Physical Specifications

Platform	BigIron 4000	BigIron 8000	BigIron 15000
Dimensions	9"h x 17.5"w x 15"d (22.86 x 44.5 x 38.1 cm)	23"h x 17.5"w x 15"d (58.4 x 44.5 x 38.1 cm)	29.75"h x 17.5"w x 15"d (75.68 x 44.5 x 38.1 cm)
Weight (fully loaded)	47.7 lbs (21.5kg)	69.1 lbs (31.1 kg)	170 lbs (76.5 kg)

Ordering Information

Part Number	Description
BI4000	4-slot BigIron 4000 Chassis
BI8000	8-slot BigIron 8000 Chassis
BI15000	15-slot BigIron 15000 Chassis
RPS3	90-220VAC Power Supply for BigIron 4000 & BigIron 8000
RPS3DC	48VDC Power Supply for BigIron 4000 & BigIron 8000
RPS4	90-220VAC Power Supply for BigIron 15000 only
RPS4DC	48VDC Power Supply for BigIron 15000 only
RPS6	90-220VAC Power Supply for RPS-POE Shelf
J-BxGMR4	8-port mini-GBIC based Gigabit management module
J-B2GMR4	2-port mini-GBIC based Gigabit management module
J-B48E	48-port 10/100BaseT RJ-45 interface module (double-wide module)
J-B48T	48-port 10/100BaseT RJ-21 Telco interface module
J-B24FX	24-port 100Base-FX (MTRJ) for 50 or 62.5µm MMF interface module
J-B24FX-SR	24-port 100Base-FX (MTRJ) for 9 or 10µm SMF interface module (15km)
J-B24FX-IR	24-port 100Base-FX (MTRJ) for 9 or 10µm SMF interface module (40km)
J-F24FX-IR	24-port 100Base-FX (MTRJ) for 9 or 10µm SMF interface module (40km)
J-BxG	8-port mini-GBIC based Gigabit interface module
J-B16Gx	16-port mini-GBIC based Gigabit interface module
J-B16GC	16-port 100/1000BaseT interface module
J-F24E-POE	24-port 10/100Base-T 802.3af POE compliant interface module
RPS-POE Shelf	POE Power Supply Shelf, supports 14 POE cards with n+1 Power redundancy
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 150 km maximum reach
E1MG-TX	1000Base-TX mini-GBIC Copper, RJ-45 connector
E1MG-CWDM80-xxxx	CWDM mini-GBIC optics, 80 km SMF, LC connector where xxxx corresponds to the nm wavelengths of the optics, values are 1470, 1490, 1510, 1530, 1550, 1570, 1590 and 1610
	10 GbE
B10Gx1	1-port 10 Gigabit Ethernet module with 850nm LAN Optics (up to 300 meters on MMF)
B10Gx2	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
10G-XNPK-SR	850nm serial pluggable Xenpak optic only (SC) for up to 300 m over MMF
10G-XNPK-LX4	1310nm parallel pluggable Xenpak optic for 300m over FDDI-grade MMF or 10km over SMF
10G-XNPK-CX4	Copper parallel pluggable Xenpak media for 15m over Infiniband cable
10G-XNPK-LW	1310nm WAN PHY pluggable Xenpak optic for OC-192 SONET connection of 10 km over SMF

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