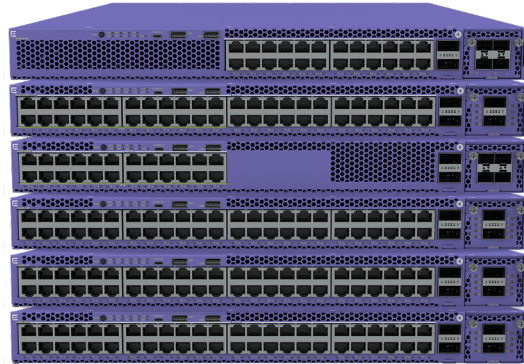


## Highlights

- Versatile fixed-form switch for advanced edge access and aggregation applications
- Range of 24- and 48-port models with Gigabit, Multi-rate and 1/10Gb Fiber Ethernet connectivity
- 10Gb/25Gb/40Gb modular uplink options
- 30W, 60W, and 90W PoE support (IEEE 802.3at / IEEE 802.3bt)
- Non-blocking, wire-speed design
- Up to 8-unit stacking with 168Gb per unit stack bandwidth
- MACsec on 10/100/1000 access and modular uplink ports for secure link encryption
- Integrated Application Hosting enables 3rd-party applications without impacting switch performance

## Smart Management Choices

- ExtremeCloud™ IQ for powerful, simple and secure public or private cloud management
- Extreme Management Center for centralized, unified management capabilities



# ExtremeSwitching™ X465 Series

Premium Stackable Edge/Aggregation Switch Platform

## Product Overview

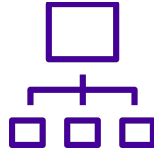
The ExtremeSwitching X465 Series is a premium stackable switch family providing high-performance, convergence-ready, resilient and secure Gigabit and multi-Gigabit Ethernet connectivity. Powered by ExtremeXOS, the X465 Series offers sophisticated routing and switching, high-speed stacking, modular uplink options, advanced PoE, and comprehensive security. This makes the X465 Series an ideal choice for high-end wiring closet and network edge deployments.

## Future-Proof Switches for Flexible Use

The X465 Series includes both 24- and 48-port 1 Gigabit models, multi-rate 1, 2.5 and 5 Gigabit models, as well as 24-port 1 and 10 Gigabit fiber models. The family also offers 30W, 60W and 90W PoE models making the X465 an ideal wired back-end for Wave 2/Wi-Fi 6 wireless APs or to power next-gen Ethernet edge devices, such as point-of-sale terminals, cameras or LED lighting displays. The X465 also supports modular uplinks at 10G, 25G and 40G for flexible linkage to other switches or devices over a range of media.

## Extended Edge Switching

All X465 models support Extended Edge Switching, an innovative solution that simplifies the deployment and operation of edge switches. As the controlling bridge of an Extended Edge solution, the X465 can be combined with Extreme's V300 and V400 Series access devices to create a single logical switch architecture. The result is a simplified operational model that reduces costs.



## Integrated Application Hosting

Select X465 Series models support Extreme's Integrated Application Hosting which leverages the switch's hardware and software design to run onboard applications without impacting switch performance. X465 models with a quad-core processor can run a Guest VM directly on the switch in support third-party or customized applications- to meet specific business or operational needs. This can provide additional network insight or enable new network applications without need for a separate hardware device. (NOTE: Requires a Core License)

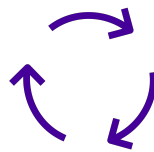
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## MACsec Link Encryption

The X465 Series supports IEEE 802.1AE MACsec on its 10/100/1000 access ports, as well as on its modular uplink ports. MACsec is a hop-by-hop security capability which encrypts/decrypts packets between connected switches or devices. As a link-only encryption, the switches can still apply services to the packet, such as policy or QoS, without compromising the security of packets across the link. With support for both 128-bit and 256-bit Advanced Encryption Standard (AES) support, the X465 provides the most secure link encryption.

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## VIM Options for Flexible Uplinks

The X465 supports Versatile Interface Modules (VIMs) for its uplink ports - in addition to its two dedicated stacking ports. Each X465 model has a single VIM slot that can be optionally used for uplinks. VIM options include both 2 and 4-port modules that support 10Gb, 25Gb and 40Gb data rates. VIM modules with LRM and/or MACsec support are also available.

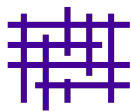
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## Role-Based Policy

The X465 supports role-based policies that can be centrally administered through the ExtremeControl policy manager. This policy framework empowers network administrators to define distinct roles or profiles to represent specific operational groups that may exist in an enterprise. Each defined role can then be granted individualized access to specific network services or applications - and these access privileges remain associated with users as they move across both wired and wireless network access points.

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## Fabric Attach

Fabric Attach on the X465 can be used to automate the connection to Extreme's campus-based Fabric Connect solution. Fabric Attach not only provides zero-touch edge provisioning, it also allows the X465 to take advantage of the virtualized services and inherent security capabilities of the Extreme Fabric Connect infrastructure.

## Management

The X465 can be managed in a variety of ways. Simple on-box management functions are delivered by a web-based GUI, and a generic CLI is available for manual configuration.

ExtremeCloud™ IQ (XIQ) along with Extreme Management Center (XMC) also provide a comprehensive unified management capability with a consolidated view of users, devices and applications for wired and wireless networks. Zero-touch provisioning lets one quickly bring

new X465 switches online and a granular view of devices, ports and users enables efficient inventory and network topology management.

Note: Please refer to the [ExtremeCloud IQ Release Notes: New Features and Enhancements](#) for latest list of XIQ-supported X465 models.

## Specifications

### Performance and Scale

Switch Model	Max Active 10/100/1000Mb ports	Max Active 100Mb/1Gb/2.5Gb/5Gb ports	Max Active 100Mb/1Gb SFP ports	Max Active 1/10Gb SFP+ ports	Max Active 25Gb SFP28 ports	Max Active 40Gb QSFP+ VIM5 ports*	Max Active QSFP+ Stacking Ports	Aggregated Switch Bandwidth	Frame Forwarding Rate
X465-24W	24	0	0	4	2	1	2	316 Gbps	235.1 Mpps
X465-48T	48	0	0	4	2	1	2	364 Gbps	270.8 Mpps
X465-48P	48	0	0	4	2	1	2	364 Gbps	270.8 Mpps
X465-48W X465i-48W	48	0	0	4	2	1	2	364 Gbps	270.8 Mpps
X465-24MU	0	24	0	4	4	2	2	648 Gbps	482.1 Mpps
X465-24MU-24W	24	24	0	4	4	2	2	696 Gbps	517.9 Mpps
X465-24S	0	0	24	4	2	1	2	316 Gbps	235.1 Mpps
X465-24XE	0	0	0	28	4	2	2	888 Gbps	660.7 Mpps

\* 40Gb ports on the VIM5 module can also be broken out individually into 4 x 10Gb ports.

- Layer 2/MAC Addresses: 272K
- IPv4 LPM Entries: 256K max w/ALPM
- IPv4 Hosts
  - With min LPM IPv4 entries: 150K
  - With max LPM IPv4 entries: 142K
- IPv6 LPM (/64) Entries: 128K max w/ ALPM
- IPv6 Hosts: 32K max
- IP Multicast Groups: 4K
- IP Multicast (s,v,g) entries – 130K max
- Flexible Universal Forwarding Tables (UFT)
- 4096 VLAN/VMANs\*
- 9216 Byte Max Packet Size (Jumbo Frame)
- 8 queues per port
- 8K ingress ACL rules
- 1K egress ACL rules

\* 2 VLANs reserved for system use.

## Location LED

A location LED on the front panel of the X465 chassis can be used to quickly identify a specific X465 switch deployed in wiring closet or a stack.

- OnePolicy Scaling
  - Up to 24,576 authenticated policy users per switch
  - Policy Profiles: 63
- Unique Permit/Deny Rules per switch: 1976
- Default OnePolicy Profile
  - MAC Rules: 512
  - IPv4 Rules: 512
  - IPv6 Rules: 512
  - L2 Rules: 400

### Key Features

- VxLAN Tunneling End Point (VTEP)
- MPLS/VPLS
- Extended Edge Switching Controlling Bridge
- Priority Flow Control (PFC)
- SummitStack-V160 stacking
  - Stacking with up to 8 X465/X590/X690 systems
  - 2 dedicated 42Gb stacking ports with 168Gb stack bandwidth per switch (full-duplex)
  - Up to 1.344Tb aggregated stacking capacity
- sFlow/Application Telemetry
- Y.1731 OAM in Hardware

## External Ports/Slots

Switch Model	Ports/Slots
X465-24W	24 x 10/100/1000BASE-T 802.3bt Type4 (90W) ports - Full / Half-Duplex - MACsec-capable 2 x 40GBASE-X QSFP+ dedicated stacking ports (unpopulated) 1 x Serial console port (RJ-45) 1 x 10/100/1000BASE-T out-of-band management port 1 x USB Micro-B console port 2 x USB A ports for external USB flash 1 x VIM5 slot
X465-48T	48 x 10/100/1000BASE-T ports - Full / Half-Duplex - MACsec-capable 2 x 40GBASE-X QSFP+ dedicated stacking ports (unpopulated) 1 x Serial console port (RJ-45) 1 x 10/100/1000BASE-T out-of-band management port 1 x USB Micro-B console port 2 x USB A ports for external USB flash 1 x VIM5 slot
X465-48P	48 x 10/100/1000BASE-T 802.3at (30W) ports - Full / Half-Duplex - MACsec-capable 2 x 40GBASE-X QSFP+ dedicated stacking ports (unpopulated) 1 x Serial console port (RJ-45) 1 x 10/100/1000BASE-T out-of-band management port 1 x USB Micro-B console port 2 x USB A ports for external USB flash 1 x VIM5 slot
X465-48W X465i-48W	48 x 10/100/1000BASE-T 802.3bt (90W) ports - Full / Half-Duplex - MACsec-capable 2 x 40GBASE-X QSFP+ dedicated stacking ports (unpopulated) 1 x Serial console port (RJ-45) 1 x 10/100/1000BASE-T out-of-band management port 1 x USB Micro-B console port 2 x USB A ports for external USB flash 1 x VIM5 slot
X465-24MU	24 x 100M/1/2.5/5GBASE-T 802.3bt Type3 (60W) ports 2 x 40GBASE-X QSFP+ dedicated stacking ports (unpopulated) 1 x Serial console port (RJ-45) 1 x 10/100/1000BASE-T out-of-band management port 1 x USB Micro-B console port 2 x USB A ports for external USB flash 1 x VIM5 slot
X465-24MU-24W	24 x 100M/1/2.5/5GBASE-T 802.3bt Type3 (60W) ports 24 x 10/100/1000BASE-T 802.3bt Type4 (90W) ports - Full Duplex on 100M/1/2.5/5GBASE-T ports - Full / Half-Duplex on 10/100/1000BASE-T ports - MACsec-capable 2 x 40GBASE-X QSFP+ dedicated stacking ports (unpopulated) 1 x Serial console port (RJ-45) 1 x 10/100/1000BASE-T out-of-band management port 1 x USB Micro-B console port 2 x USB A ports for external USB flash 1 x VIM5 slot
X465-24S	24 x 100/1000Base-X (SFP) ports (unpopulated) 2 x 40GBase-X QSFP+ dedicated stacking ports (unpopulated) 1 x Serial console port (RJ-45) 1 x 10/100/1000Base-T out-of-band management port 1 x USB Micro-B console port 2 x USB A ports for external USB flash 1 x VIM5 slot
X465-24XE	24 x 100M/1Gb/10Gb (SFP+) ports (unpopulated) - MACsec-Capable - LRM-Capable 2 x 40GBase-X QSFP+ dedicated stacking ports (unpopulated) 1 x Serial console port (RJ-45) 1 x 10/100/1000Base-T out-of-band management port 1 x USB Micro-B console port 2 x USB A ports for external USB flash 1 x VIM5 slot

## External Ports/Slots (continued)

Model	Ports/Slots
VIM5-4X*	4 x 1/10GBASE-X SFP+ (unpopulated ports)
VIM5-4XE*	4 x 1/10GBASE-X SFP+ (unpopulated ports) - LRM capable - MACsec capable
VIM5-4YE**	4 x 10/25GBASE-X SFP28 (unpopulated ports) - MACsec capable
VIM5-2Q***	2 x 40GBASE-X QSFP+ (unpopulated ports)

\* VIM5-4X and VIM5-4XE only support 10Gb operation (no 1Gb) when installed in X465-24MU, -24MU-24W and -24XE models

\* VIM5-4YE only supports 2 x 10/25Gb port operation when installed in X465-24W, -48T, -48P, -48W and -24S models

\*\* VIM5-2Q only supports 1 x 10/40Gb port when installed in X465-24W, -24S, -48T, -48P, -48W and -24S models

## Weight and Dimensions

Part Number	Weight	Physical Dimensions
<b>Switches</b>		
X465-24W	17.35 lb / 7.87 kg	17.34 in W / 1.7 in H / 19.23 in D 440mm / 43.6mm / 488mm
X465-48T	17.64 lb / 8.0 kg	
X465-48P	18.49 lb / 8.39 kg	
X465-48W	18.46 lb / 8.38 kg	
X465-24MU	17.5 lb / 7.94 kg	
X465-24MU-24W	18.45 lb / 8.37 kg	
X465-24S	16.69 lb / 7.57 kg	
X465-24XE	17.13 lb / 7.77 kg	
<b>VIM Modules</b>		
VIM5-4X	0.37 lb / 0.17 kg	1.92 in W / 1.61 in H / 5.76 in D 48.8mm / 40.8mm / 146.3mm
VIM5-4XE	0.41 lb / 0.19 kg	
VIM5-2Q	0.37 lb / 0.17 kg	
VIM5-4YE	0.43 lb / 0.19 kg	
<b>Power Supplies</b>		
10953 (350W AC)	2.38 lb / 1.08 kg	3.25 in W / 1.56 in H / 11.5 in D 40mm / 82.5mm / 287mm
10951 (715W AC)	2.55 lb / 1.16 kg	
10941 (1100W AC)	2.55 lb / 1.16 kg	
XN-ACPWR-2000W-F (2000W AC)	2.56 lb / 1.16kg	3.25 in W / 1.56 in H / 11.5 in D 40mm / 75mm / 292mm

## Power Supply Unit Specifications

	350W AC PSU	715W AC PSU	1100W AC PSU	2000W AC PSU*
Voltage Input Range (nominal)	100-127/200-240 VAC	100-127/200-240 VAC	100-127/200-240 VAC	100-127/200-240 VAC*
Line Frequency Range	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz
Power Supply Input Socket	IEC/EN 60320 C14	IEC/EN 60320 C16	IEC/EN 60320 C16	IEC/EN 60320 C16
Power Cord Input Plug	IECEN 60320 C15	IEC/EN 60320 C15	IEC/EN 60320 C15	IEC/EN 60320 C15
Operating Temperature	0° C to 50° C normal operation	0° C to 50° C normal operation	0° C to 50° C normal operation	0° C to 45° C**

\* 200-240 VAC is required to to achieve full 2000W output. If run at 100-120VAC, output is limited to 1100W

\*\* At sea-level; 0° C to 40° C at 1500m; 0° C to 35° C at 3000m

## PoE Power Budget

Switch Model	1 x 715W	2 x 715W	1 x 1100W	2 x 1100W	1 x 2000W @ 200- 240VAC	1 x 2000W @ 100- 120VAC	2 x 2000W @ 200- 240VAC	2 x 2000W @ 100- 120VAC
X465-24W	486W	1071W	871W	1771W	1771W	871W	2160W	1865W
X465-48P	460W	1045W	845W	1440W	1440W	845W	1440W	1440W
X465-48W X465i-48W	430W	1015W	815W	1715W	1715W	815W	3523W	1809W
X465-24MU	440W	1025W	825W	1440W	1440W	825W	1440W	1440W
X465-24MU-24W	383W	968W	768W	1668W	1668W	768W	3476W	1762W

Note: It's recommended that primary and secondary power supply units (PSUs) be of the same type to support optimal PoE operation.

## Minimum/Maximum Power Consumption and Heat Dissipation

Switch Model	Minimum Power Consumption (Watts)	Minimum Heat Dissipation (BTU/hr)	Maximum Power Consumption (Watts)*	Maximum Heat Dissipation (BTU/hr)**
X465-24W	61	207	2485	1110
X465-48T	73	250	176	600
X465-48P	74	254	1746	1046
X465-48W	75	255	4024	1708
X465i-48W	77	261	4032	1762
X465-24MU	68	230	1722	963
X465-24MU-24W	84	285	3941	1614
X465-24S	52	179	173	590
X465-24XE	80	271	207	707

\* Includes maximum PoE load (W) through the switch

\*\* Does not include PoE load heat dissipated through external electronic load

## CPU/Memory

### X465-24W / X465-48T / X465-48P / X465-48W / X465-24S models

- Dual Core x86 CPU
- 2GB DRAM
- 8GB eMMC NVRAM

### X465i-48W / X465-24MU / X465-24MU-24W / X465-24XE models

- Quad Core x86 CPU
- 8GB DRAM
- 8GB eMMC NVRAM

## Environmental

### Environmental Specifications

- EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage
- EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation
- EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational
- EN/ETSI 300 753 (1997-10) - Acoustic Noise
- ASTM D3580 Random Vibration Unpackaged 1.5 G

### Environmental Compliance

- EU RoHS 2011/65/EU
- EU WEEE 2012/19/EU
- China RoHS SJ/T 11363-2006
- Taiwan RoHS CNS 15663(2013.7)

### Operating Conditions

- Temp: 0° C to 45° C (32° F to 113° F)
- Humidity: 10% to 95% relative humidity, non-condensing
- Altitude: 0 to 3,000 meters (9,850 feet)
- Shock (half sine) 30m/s<sup>2</sup> (3G), 11ms, 60 shocks
- Random vibration: 3 to 500 Hz at 1.5 G rms

### Packaging and Storage Specifications

- Temp: -40° C to 70° C (-40° F to 158° F)
- Humidity: 10% to 95% relative humidity, non-condensing
- Packaged Shock (half sine): 180 m/s<sup>2</sup> (18 G), 6 ms, 600 shocks
- Packaged Vibration: 5 to 62 Hz at velocity 5 mm/s, 62 to 500 Hz at 0.2 G

- Packaged Random Vibration: 5 to 20 Hz at 1.0 ASD w/-3 dB/oct. from 20 to 200 Hz
- Packaged Drop Height: 14 drops minimum on sides and corners at 42 inches (<15 kg box)

## Regulatory and Safety

### North American ITE

- UL 60950-1
- UL 62368-1
- Complies with FCC 21CFR 1040.10 (U.S. Laser Safety)
- CDRH Letter of Approval (US FDA Approval)
- CAN/CSA 22.2 No. 60950-1
- CAN/CSA No. 22.2 62368-1-14

### European ITE

- EN 60950-1, EN 62368-1
- EN 60825-1 Class 1 (Lasers Safety)
- 2014 / 35/ EU Low Voltage Directive

### International ITE

- CB Report & Certificate per IEC 60950-1 AS/NZS 60950-1 (Australia /New Zealand)
- IEC 62368-1
- GB 4943.1-2011
- CNS 14336-1

## EMI/EMC Standards

### North American EMC for ITE

- FCC CFR 47 part 15 Class A (USA)
- ICES-003 Class A (Canada)

### European EMC Standards

- EN 55032 Class A
- EN 55024
- EN 61000-3-2,2014 (Harmonics)
- EN 61000-3-3 2013 (Flicker)
- EN 300 386 v1.6.1 (EMC Telecommunications)
- 2014/30/EU EMC Directive
- EN 55011 Class A

### International EMC Certifications

- CISPR 32, Class A (International Emissions)
- AS/NZS CISPR32
- CISPR 24 Class A (International Immunity)

### International EMC Certifications (cont.)

- IEC 61000-4-2 / EN 61000-4-2 Electrostatic Discharge, 8kV Contact, 15 kV Air, Criteria A
- IEC 61000-4-3 /EN 61000-4-3 Radiated Immunity 10V/m, Criteria A
- IEC 61000-4-4 / EN 61000-4-4 Transient Burst, 1 kV, Criteria A
- IEC 61000-4-5 /EN 61000-4-5 Surge, 2 kV L-L, 2 kV L-G, Level 3, Criteria A
- IEC 61000-4-6 Conducted Immunity, 0.15-80 MHz, 10V/m unmod. RMS, Criteria AIEC/EN 61000-4-11 Power Dips & Interruptions, >30%, 25 periods, Criteria C
- IEC 61000-4-8 / EN 61000-4-8
- CISPER 11 Class A
- GB/T 9254-2008

### Country Specific

- VCCI Class A (Japan Emissions)
- ACMA RCM (Australia Emissions)
- CCC Mark (China)
- KCC Mark, EMC Approval (Korea)
- EAC Mark (Custom Union)
- NRCS / SABS Mark (South Africa)
- BSMI Mark (Taiwan)

### Telecom Standards

- CE 2.0 Compliant

## IEEE 802.3 Media Access Standards

- IEEE 802.3ab 1000BASE-T
- IEEE 802.3bz 2.5G/5GBASE-T
- IEEE 802.3ae 10GBASE-X
- IEEE 802.3aq 10GBASE-LRM
- IEEE 802.3at PoE Plus
- IEEE 802.3bt Type3/Type4 PoE
- IEEE 802.3az Energy Efficient Ethernet
- IEEE 802.3by 25GBASE-X
- IEEE 802.3ba / 802.3bm 40GBASE-X



## Ordering Notes

X465 Series switches are available in both unbundled and bundled versions. X465 unbundled versions include the X465 system, fans, rack-mount kit and EXOS Advanced Edge license. X465 bundled versions additionally include

a designated Power Supply. With both versions, VIM5 modules, additional power supplies, power cords, transceiver/optics and optional Software Feature Packs must be ordered separately.

## Ordering Information

Part Number	Product Name	Product Description
<b>ExtremeSwitching X465 Systems</b>		
X465-24W	X465-24W (unbundled)	X465-24W with 24 10/100/1000Base-T full/half duplex 802.3bt Type 4 90W PoE MACsec-capable ports, includes 2 fan modules, 1 VIM5 slot, rack-mount kit, EXOS Advanced Edge license
X465-24W-B1	X465-24W + 1100W PSU Bundle	X465-24W with 24 10/100/1000Base-T full/half duplex 802.3bt Type 4 90W PoE MACsec-capable ports, includes 2 fan modules, 1 VIM5 slot, 1 x 1100W AC PSU FB (10941), rack-mount kit, EXOS Advanced Edge license
X465-24W-B2	X465-24W + 2000W PSU Bundle	X465-24W with 24 10/100/1000Base-T full/half duplex 802.3bt Type 4 90W PoE MACsec-capable ports, includes 2 fan modules, 1 VIM5 slot, 1 x 2000W AC PSU FB (XN-ACPWR-2000W-F), rack-mount kit, EXOS Advanced Edge license
X465-48T	X465-48T (unbundled)	X465-48T with 48 10/100/1000Base-T full/half duplex MACsec-capable ports, includes 3 fan modules, 1 VIM5 slot, rack-mount kit, EXOS Advanced Edge license
X465-48T-B3	X465-48T + 350W PSU Bundle	X465-48T with 48 10/100/1000Base-T full/half duplex MACsec-capable ports, includes 3 fan modules, 1 VIM5 slot, 1 x 350W AC PSU FB (10953), rack-mount kit, EXOS Advanced Edge license
X465-48P-B1	X465-48P + 1100W PSU Bundle	X465-48P with 48 10/100/1000Base-T full/half duplex 802.3at 30W PoE MACsec-capable ports, includes 3 fan modules, 1 VIM5 slot, 1 x 1100W AC PSU FB (10941), rack-mount kit, EXOS Advanced Edge license
X465-48W	X465-48W (unbundled)	X465-48W with 48 10/100/1000Base-T full/half duplex 802.3bt Type 4 90W PoE ports, MACsec-capable, includes 3 fan modules, 1 VIM5 slot, rack-mount kit, EXOS Advanced Edge license
X465-48W-B1	X465-48W + 1100W PSU Bundle	X465-48W with 48 10/100/1000Base-T full/half duplex 802.3bt Type 4 90W PoE ports, MACsec-capable, includes 3 fan modules, 1 VIM5 slot, 1 x 1100W AC PSU FB (10941), rack-mount kit, EXOS Advanced Edge license
X465-48W-B2	X465-48W + 2000W PSU Bundle	X465-48W with 48 10/100/1000Base-T full/half duplex 802.3bt Type 4 90W PoE ports, MACsec-capable, includes 3 fan modules, 1 VIM5 slot, 1 x 2000W AC PSU FB (XN-ACPWR-2000W-F), rack-mount kit, EXOS Advanced Edge license
X465i-48W-B1-S1	X465i-48W + 120GB SSD + 1100W PSU Bundle	X465i-48Wi with 48 10/100/1000Base-T full/half duplex 802.3bt Type 4 90W PoE ports, MACsec-capable, includes 120GB SSD, 3 fan modules, 1 VIM5 slot, 1 x 1100W AC PSU FB (10941), rack-mount kit, EXOS Advanced Edge license, Insight Architecture-ready
X465i-48W	X465i-48W (unbundled)	X465i-48Wi with 48 10/100/1000Base-T full/half duplex 802.3bt Type 4 90W PoE ports, MACsec-capable, includes 120GB SSD, 3 fan modules, 1 VIM5 slot, rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready
X465i-48W-B2-S1	X465i-48W + 120GB SSD+ 2000W PSU Bundle	X465i-48W with 48 10/100/1000Base-T full/half duplex 802.3bt Type 4 90W PoE ports, MACsec-capable, includes 120GB SSD, 3 fan modules, 1 VIM5 slot, 1 x 2000W AC PSU FB (XN-ACPWR-2000W-F), rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready
X465-24MU	X465-24MU (unbundled)	X465-24MU with 24 100Mb/1Gb/2.5Gb/5Gb 802.3bt Type 3 60W PoE ports, includes 2 fan modules, 1 VIM5 slot, rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready
X465-24MU-B1	X465-24MU + 1100W PSU Bundle	X465-24MU with 24 100Mb/1Gb/2.5Gb/5Gb 802.3bt Type 3 60W PoE ports, includes 2 fan modules, 1 VIM5 slot, 1 x 1100W AC PSU FB (10941), rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready
X465-24MU-B2	X465-24MU + 2000W PSU Bundle	X465-24MU with 24 100Mb/1Gb/2.5Gb/5Gb 802.3bt Type 3 60W PoE ports, includes 2 fan modules, 1 VIM5 slot, 1 x 2000W AC PSU FB (XN-ACPWR-2000W-F), rack-mount kit, EXOS Advanced Edge license, Insight Architecture-ready
X465-24MU-24W	X465-24MU-24W (unbundled)	X465-24MU-24W with 24 100Mb/1Gb/2.5Gb/5Gb 802.3bt Type 3 60W PoE ports and 24 10/100/1000Mb full/half-duplex 802.3 Type 4 90W MACsec-capable ports, includes 3 fan modules, 1 VIM5 slot, rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready
X465-24MU-24W-B1	X465-24MU-24W + 1100W PSU Bundle	X465-24MU-24W with 24 100Mb/1Gb/2.5Gb/5Gb 802.3bt Type 3 60W PoE ports and 24 10/100/1000Mb full/half-duplex 802.3 Type 4 90W MACsec-capable ports, includes 3 fan modules, 1 VIM5 slot, 1 x 1100W AC PSU FB (10941), rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready



## Ordering Information (cont.)

Part Number	Product Name	Product Description
<b>ExtremeSwitching X465 Systems (cont'd)</b>		
X465-24MU-24W-B2	X465-24MU-24W + 2000W PSU Bundle	X465-24MU-24W with 24 100Mb/1Gb/2.5Gb/5Gb 802.3bt Type 3 60W PoE ports and 24 10/100/1000Mb full/half-duplex 802.3 Type 4 90W MACsec-capable ports, includes 3 fan modules, 1 VIM5 slot, 1 x 2000W AC PSU FB (XN-ACPWR-2000W-F), rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready
X465-24S	X465-24S (unbundled)	X465-24S with 24 100/1000Base-X (SFP) ports, includes 2 fan modules, 1 VIM5 slot, rack-mount kit, EXOS Advanced Edge License
X465-24S-B3	X465-24S + 350W PSU Bundle	X465-24S with 24 100/1000Base-X (SFP) ports, includes 2 fan modules, 1 VIM5 slot, 1 x 350W AC PSU (10953), rack-mount kit, EXOS Advanced Edge License
X465-24XE	X465-24XE (unbundled)	X465-24XE with 24 100M/1Gb/10Gb (SFP+) MACsec and LRM-capable ports, includes 2 fan modules, 1 VIM5 slot, rack-mount kit, EXOS Advanced Edge License, Integrated Application Hosting-ready
X465-24XE-B3	X465-24XE + 350W PSU Bundle	X465-24XE with 24 100M/1Gb/10Gb (SFP+) MACsec and LRM-capable ports, includes 2 fan modules, 1 VIM5 slot, 1 x 350W AC PSU (10953), rack-mount kit, EXOS Advanced Edge License
<b>VIM5 Modules</b>		
VIM5-4X <sup>1</sup>	4-port SFP+ module	4 x 1G*/10G SFP+ VIM supported on X465
VIM5-4XE <sup>1</sup>	4-port SFP+ module LRM/MACsec capable	4 x 1G*/10G SFP+ LRM and MACsec-capable VIM supported on X465
VIM5-4YE <sup>2,4</sup>	4-port SFP28 module MACsec capable	4 x 10G/25G SFP28 MACsec-capable VIM supported on X465
VIM5-2Q <sup>3</sup>	2-port QSFP+ module	2 x 10G/40G QSFP+ VIM supported on X465
<b>Accessories</b>		
10953	350W AC PS FB	350W AC PSU supported on X465-48T, also used on X450-G2, X460-G2
10941	1100W AC PS FB	1100W PoE PSU supported on all PoE models of X465, also used on X450-G2 and X460-G2
XN-ACPWR-2000W-F	2000W AC PS FB	2000W PoE PSU supported on all PoE models of the X465 Series
XN-FAN-002-F	Spare Fan module	Spare Fan module used in X465 Series switches
XN-SSD-001-120	120GB SSD module	120GB Solid-State Drive (SSD) module for use with Integrated Application Hosting on the X465 Series
XN-4P-RKMT-001	Spare Four Post Rack Mount Kit	Spare Four Post Rack Mount Kit for use with X465 Series switches
XN-2P-RMKIT-001	Optional Two Post Rack Mount Kit	Optional Two Post Rack Mount Kit for use with X465 Series switches
EXOS-MACSEC-PP-X465	X465 MACsec Feature Pack	MACsec Feature Pack for ExtremeSwitching X465 Series
EXOS-MPLS-PP-X465	X465 MPLS Feature Pack	MPLS Feature Pack for ExtremeSwitching X465 Series
EXOS-AVB-PP-X465	X465 AVB Feature Pack	Audio Video Bridging (AVB) Feature Pack for ExtremeSwitching X465 Series
EXOS-CORE-PP-X465	X465 Core License from Advanced Edge	Advanced Edge to Core Feature Pack for ExtremeSwitching X465 Series (includes Integrated Application Hosting)
<b>40Gb Transceivers and Direct Attach Cables</b>		
10319	QSFP+ SR4 module	40Gb QSFP+ SR4 optical module, MPO connector (8 fiber), 100m MMF OM3, 140m MMF OM4
10320	QSFP+ LR4	40Gb QSFP+ LR4 optical module, LC, 10km SMF
10326	QSFP+ PSM Optical Module	40Gb QSFP+ Parallel Single Mode (PSM) LR4, MPO connector (8 fiber), SMF, 10km
10334	40Gb LM4 QSFP+	40Gb QSFP+ LM4, 140m OM3 MMF, 1km SMF, QSFP+, LC
10335	40Gb ER4 QSFP+	40Gb QSFP+ ER4, 40km SMF, QSFP+, LC
40GB-ESR4-QSFP	QSFP+ ESR4	40Gb QSFP+ Extended Reach SR4, MMF, 300m OM3, 400m OM4 MMF

<sup>1</sup> X465-24MU, -24MU-24W and -24XE models only support 10Gb operation (no 1Gb) on VIM5-4X and VIM5-4XE modules

<sup>2</sup> X465-24W, -48T, -48P, -48W and -24S models are limited to 2 x 10/25Gb ports on VIM5-4YE modules

<sup>3</sup> X465-24W, -48T, -48P, -48W and -24S models are limited to 1 x 10/40Gb port on VIM5-2Q module

<sup>4</sup> See Table on last page for supported 25Gb Transceivers

## Ordering Information (cont.)

Part Number	Product Name	Product Description
<b>40Gb Transceivers and Direct Attach Cables (Cont'd)</b>		
10311	QSFP+ passive copper cable, 0.5M	40Gb Ethernet QSFP+ passive copper cable assembly, 0.5m length
10312	QSFP+ passive copper cable, 1.0M	40Gb Ethernet QSFP+ passive copper cable assembly, 1m length
10313	QSFP+ passive copper cable, 3.0M	40Gb Ethernet QSFP+ passive copper cable assembly, 3m length
10323	QSFP+ passive copper cable, 5.0M	40Gb Ethernet QSFP+ passive copper cable assembly, 5m length
10315	10m QSFP+ Active Optical Cable	40Gb Ethernet QSFP+ active optical cable assembly, 10m length
10316	20m QSFP+ Active Optical Cable	40Gb Ethernet QSFP+ active optical cable assembly, 20m length
10202	QSFP+ - 4xSFP+ fan-out cbl, 1m	QSFP+ to 4 x SFP+ fan-out copper cable, 1m
10321	QSFP+ - 4xSFP+ fan-out cbl, 3m	QSFP+ to 4 x SFP+ fan-out copper cable, 3m
10322	QSFP+ - 4xSFP+ fan-out cbl, 5m	QSFP+ to 4 x SFP+ fan-out copper cable, 5m
<b>25Gb Transceivers and Direct Attach Cables</b>		
10501	25Gb SFP28 SR MMF	25Gb, 25GBASE-SR, 70m OM3/ 100m OM4 MMF, SFP28, duplex LC
10502	25Gb SFP28 SR-Lite MMF	25Gb, 25GBASE-SR-Lite, 30m/ 50m/ 70m OM3, 40m/ 70m/ 100m OM4 (no FEC/ BASE-R/ RS FEC), SFP28, Duplex LC
10503	25Gb SFP28 ESR MMF	25Gb, Extended SR (ESR), 200m OM3/400m OM4 MMF, SFP28, duplex LC
10504	25Gb SFP28 LR 10km	25Gb, 25GBASE-LR, 10km SMF, SFP28, LC
10520	25Gb, DAC SFP28-SFP28 1m	25Gb, SFP28-SFP28 Direct attach passive copper cable, 1m
10521	25Gb, DAC SFP28-SFP28 3m	25Gb, SFP28-SFP28 Direct attach passive copper cable, 3m
10522	25Gb, DAC SFP28-SFP28 5m	25Gb, SFP28-SFP28 Direct attach passive copper cable, 5m
10530	25Gb AOC SFP28-SFP28 10m	25Gb, SFP28-SFP28 Active optical breakout cable, 10m
10531	25Gb AOC SFP28-SFP28 20m	25Gb, SFP28-SFP28 Active optical breakout cable, 20m
<b>10Gb Transceivers and Direct Attach Cables</b>		
10301	SR SFP+ module	10GBASE-SR SFP+, 850nm, LC, 300m OM3 MMF, 400m OM4 MMF
10302	LR SFP+ module	10GBASE-LR SFP+, 1310nm, LC, 10km SMF
10303	LRM SFP+ module	LRM SFP+ Module0 Gigabit Ethernet SFP+ module, 1310nm, MMF 220m link, LC connector
10309	10GBASE-ER SFP+	10GBASE-ER SFP+, 1550nm, LC connector, transmission length of up to 40km on SMF
10310	10GBASE-ZR SFP+	10Gb, 10GBASE-ZR, SMF, 1550nm, up to 80Km, LC SFP+
10325	10Gb SFP+ DWDM Tunable	10Gb DWDM Tunable, 80km SMF, LC SFP+
10GB-BX10-U	10Gb Single Fiber SM, -U 10 KM	10Gb, Single Fiber SM, Bidirectional, 1270nm Tx / 1330nm RX, 10Km, Simplex LC SFP+ (must be paired with 10GB-BX10-D)
10GB-BX10-D	10Gb Single Fiber SM, -D 10 KM	10Gb, Single Fiber SM, Bidirectional, 1330nm Tx / 1270nm RX, 10Km, Simplex LC SFP+ (must be paired with 10GB-BX10-U)
10GB-BX40-U	10Gb Single Fiber SM, -U 40 KM	10Gb, Single Fiber SM, Bidirectional, 1330nm Tx / 1330nm RX, 40Km, Simplex LC SFP+ (must be paired with 10GB-BX40-D)
10GB-BX40-D	10Gb Single Fiber SM, -D 40 KM	10Gb, Single Fiber SM, Bidirectional, 1270nm Tx / 1270nm RX, 40Km, Simplex LC SFP+ (must be paired with 10GB-BX40-U)
10304	10GBASE-CR SFP+ 1m	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 1m
10305	10GBASE-CR SFP+ 3m	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 3m
10306	10GBASE-CR SFP+ 5m	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 5m
10307	10GBASE-CR SFP+ 10m	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 10m
10338*	10Gb SFP+ 10GBASE-T	10Gb SFP+, 10GBASE-T RJ45, 30m with Cat6a
<b>1Gb Transceivers</b>		
10051H	1000BASE-SX SFP, Hi	1000BASE-SX SFP, MMF 220 & 550 meters, LC connector, Industrial Temp
10052H	1000BASE-LX SFP, Hi	1000BASE-LX SFP, MMF 220 & 550 meters, SMF 10km, LC connector, Industrial Temp
10053H	1000BASE-ZX SFP, Hi	1000BASE-ZX SFP, SMF 70km, LC connector, Industrial Temp
MGBIC-BX40-U	1000BASE-BX-U BiDi SFP 40Km	1000BASE-BX-U SFP, single fiber, 1310-nm TX/1490-nm RX wavelength, 40Km Industrial Temp
MGBIC-BX40-D	1000BASE-BX-D BiDi SFP 40Km	1000BASE-BX-D SFP, single fiber, 1490-nm TX/1310-nm RX wavelength, 40Km Industrial Temp

\*10338 supported with configuration of every other SFP+ port in system, up to a maximum of one-half the 10Gb SFP+ ports configured with 10GBASE-T transceivers. An adjacent SFP+ port should remain unused for every 10GBASE-T SFP+ installed.

## Ordering Information (cont.)

Part Number	Product Name	Product Description
<b>1Gb Transceivers (cont'd)</b>		
MGBIC-BX120-U	1000BASE-BX-U BiDi SFP 120Km	1000BASE-BX-U SFP, single fiber, 1490-nm TX/1590-nm RX wavelength, 120Km Industrial Temp
MGBIC-BX120-D	1000BASE-BX-D BiDi SFP 120Km	1000BASE-BX-U SFP, single fiber, 1590-nm TX/1490-nm RX wavelength, 120Km Industrial Temp
10060 <sup>5</sup>	100FX/1000LX SFP	Dual-speed 100 FX / 1000 LX SFP, LC Connector
10063 <sup>5</sup>	100BASE-FX SFP (1G elec)	100BASE-FX SFP module, MMF 2km lin, LC-connector for Fast Ethernet SFP Port, 1G electrical data rate
10070H <sup>5</sup>	10/100/1000BASE-T, SFP, Hi	10/100/1000BASE-T SFP module, CAT5 cable 100m link, RJ-45 connector for Gigabit Ethernet SFP port, Industrial Temp
<b>ExtremeCloud IQ Pilot Licenses</b>		
XIQ-PIL-S-C-EW	XIQ Pilot SAAS Subscription and EW support (1 device)	ExtremeCloud IQ Pilot SaaS Subscription and EW SaaS support for one (1) device
XIQ-PIL-S-C-PWP	XIQ Pilot SAAS Subscription and PWP support (1 device)	ExtremeCloud IQ Pilot SaaS Subscription and PWP SaaS support for one (1) device
XIQ-PIL-S-OP-EW	XIQ Pilot RTU license and EW support (1 device)	ExtremeCloud IQ Pilot SW Subscription (RTU license, EW SW support for one (1) device)
XIQ-PIL-S-OP-PWP	XIQ Pilot RTU License and PWP support (1 device)	ExtremeCloud IQ Pilot SW Subscription (RTU license, PWP SW support for one (1) device)

<sup>5</sup>10060, 10063 and 10070H only supported on X465-24S and X465-24XE front panel ports. 10060 and 10070H operate at 100Mb or 1Gb. 10063 operates only at 100M.

### Supported 25Gb Transceivers

VIM Part Number	25Gb Supported Transceivers
VIM5-2Y**	10502*, 10520
VIM5-4Y**	10502*, 10520
VIM5-4YE	All

\* 10502 when used with the VIM5-2Y/4Y modules supports 30M length with OM3; 40M length with OM4

\*\* VIM5-2Y and VIM5-4Y are End of Sale effective 10/1/2020

## Warranty

All X465 Series models are covered under Extreme's Universal LLW policy. For warranty details, please visit: <http://www.extremenetworks.com/support/policies>

## Power Cords

In support of the Extreme Networks Green initiatives, power cords can be ordered separately, but need to be specified at time of ordering.

## Optics/Transceivers

For the most up-to-date list of optics/transceivers supported on this product, refer to our [Extreme Optics Compatibility Tool](#).

## Maintenance Services

Extreme's maintenance and support services with 100% in-sourced engineering experts and over 90% first-person resolution ensure efficient operations of your business-essential network. 24x7x365 phone support, advanced part replacement, and on-site support augment your staff with experienced resources that help you mitigate critical network issues fast. Visit [Extreme Maintenance Services](#) for more information.



<http://www.extremenetworks.com/contact>

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