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)

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.

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.

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.

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.

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.

Specifications
Performance and Scale

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

* 40Gb ports on the VIMS 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.

- 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

WWW.EXTRMENETWORKS.COM
### External Ports/Slots

<table>
<thead>
<tr>
<th>Switch Model</th>
<th>Ports/Slots</th>
</tr>
</thead>
</table>
| **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 VIMS 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 VIMS 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 VIMS slot |
| **X465-48W**  
**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 VIMS 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 VIMS 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 VIMS 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 VIMS slot |
| **X465-24X** | 24 x 100M/1Gb/2Gb (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 VIMS slot |
### External Ports/Slots (continued)

<table>
<thead>
<tr>
<th>Model</th>
<th>Ports/Slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIMS-4X*</td>
<td>4 x 1/10GBASE-X SFP+ (unpopulated ports)</td>
</tr>
<tr>
<td>VIMS-4XE*</td>
<td>4 x 1/10GBASE-X SFP+ (unpopulated ports)</td>
</tr>
<tr>
<td></td>
<td>- LRM capable</td>
</tr>
<tr>
<td></td>
<td>- MACsec capable</td>
</tr>
<tr>
<td>VIMS-4YE**</td>
<td>4 x 10/25GBASE-X SFP28 (unpopulated ports)</td>
</tr>
<tr>
<td></td>
<td>- MACsec capable</td>
</tr>
<tr>
<td>VIMS-2G***</td>
<td>2 x 40GBASE-X QSFP+ (unpopulated ports)</td>
</tr>
</tbody>
</table>

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

### Weight and Dimensions

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Weight</th>
<th>Physical Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X465-24W</td>
<td>17.35 lb</td>
<td>17.34 in W / 1.7 in H / 19.23 in D</td>
</tr>
<tr>
<td>X465-48T</td>
<td>17.64 lb</td>
<td>17.34 in W / 1.7 in H / 19.23 in D</td>
</tr>
<tr>
<td>X465-48P</td>
<td>18.49 lb</td>
<td>17.34 in W / 1.7 in H / 19.23 in D</td>
</tr>
<tr>
<td>X465-48W</td>
<td>18.46 lb</td>
<td>17.34 in W / 1.7 in H / 19.23 in D</td>
</tr>
<tr>
<td>X465-24MU</td>
<td>17.5 lb</td>
<td>17.34 in W / 1.7 in H / 19.23 in D</td>
</tr>
<tr>
<td>X465-24MU-24W</td>
<td></td>
<td>17.34 in W / 1.7 in H / 19.23 in D</td>
</tr>
<tr>
<td>X465-24S</td>
<td>16.69 lb</td>
<td>17.34 in W / 1.7 in H / 19.23 in D</td>
</tr>
<tr>
<td>X465-24XE</td>
<td>17.13 lb</td>
<td>17.34 in W / 1.7 in H / 19.23 in D</td>
</tr>
<tr>
<td>VIM Modules</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VIMS-4X</td>
<td>0.37 lb</td>
<td>1.92 in W / 1.61 in H / 5.76 in D</td>
</tr>
<tr>
<td>VIMS-4XE</td>
<td>0.41 lb</td>
<td>1.92 in W / 1.61 in H / 5.76 in D</td>
</tr>
<tr>
<td>VIMS-2Q</td>
<td>0.37 lb</td>
<td>1.92 in W / 1.61 in H / 5.76 in D</td>
</tr>
<tr>
<td>VIMS-4YE</td>
<td>0.43 lb</td>
<td>1.92 in W / 1.61 in H / 5.76 in D</td>
</tr>
<tr>
<td>Power Supplies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10952 (350W AC)</td>
<td>2.38 lb</td>
<td>3.25 in W / 1.56 in H / 11.5 in D</td>
</tr>
<tr>
<td>10951 (715W AC)</td>
<td>2.55 lb</td>
<td>3.25 in W / 1.56 in H / 11.5 in D</td>
</tr>
<tr>
<td>10941 (1100W AC)</td>
<td>2.55 lb</td>
<td>3.25 in W / 1.56 in H / 11.5 in D</td>
</tr>
<tr>
<td>XN-ACPWR-2000W-F (2000W AC)</td>
<td>2.56 lb</td>
<td>3.25 in W / 1.56 in H / 11.5 in D</td>
</tr>
</tbody>
</table>

### Power Supply Unit Specifications

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

* 200-240 VAC is required 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

<table>
<thead>
<tr>
<th>Switch Model</th>
<th>1 x 715W</th>
<th>2 x 715W</th>
<th>1 x 1100W</th>
<th>2 x 1100W</th>
<th>1 x 2000W @ 200-240VAC</th>
<th>1 x 2000W @ 100-120VAC</th>
<th>2 x 2000W @ 200-240VAC</th>
<th>2 x 2000W @ 100-120VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>X465-24W</td>
<td>486W</td>
<td>1071W</td>
<td>871W</td>
<td>1771W</td>
<td>871W</td>
<td>1771W</td>
<td>871W</td>
<td>1771W</td>
</tr>
<tr>
<td>X465-48P</td>
<td>460W</td>
<td>1045W</td>
<td>845W</td>
<td>1440W</td>
<td>845W</td>
<td>1440W</td>
<td>845W</td>
<td>1440W</td>
</tr>
<tr>
<td>X465-24MU</td>
<td>440W</td>
<td>1025W</td>
<td>825W</td>
<td>1440W</td>
<td>825W</td>
<td>1440W</td>
<td>825W</td>
<td>1440W</td>
</tr>
<tr>
<td>X465-24MU-24W</td>
<td>383W</td>
<td>968W</td>
<td>768W</td>
<td>1668W</td>
<td>768W</td>
<td>1668W</td>
<td>768W</td>
<td>1668W</td>
</tr>
</tbody>
</table>

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

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

* Includes maximum PoE load (W) through the switch  
** Does not include PoE load heat dissipated through external electronic load

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### CPU/Memory

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

- 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

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### 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/s2 (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/s2 (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 60825-1Class 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, EMK 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, VIMS modules, additional power supplies, power cords, transceiver/optics and optional Software Feature Packs must be ordered separately.

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Name</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X465-24W</td>
<td>X465-24W (unbundled)</td>
<td>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 VIMS slot, rack-mount kit, EXOS Advanced Edge license</td>
</tr>
<tr>
<td>X465-24W-B1</td>
<td>X465-24W + 1100W PSU Bundle</td>
<td>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 VIMS slot, 1 x 1100W AC PSU FB (10941), rack-mount kit, EXOS Advanced Edge license</td>
</tr>
<tr>
<td>X465-24W-B2</td>
<td>X465-24W + 2000W PSU Bundle</td>
<td>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 VIMS slot, 1 x 2000W AC PSU FB (XN-ACPWR-2000W-F), rack-mount kit, EXOS Advanced Edge license</td>
</tr>
<tr>
<td>X465-48T</td>
<td>X465-48T (unbundled)</td>
<td>X465-48T with 48 10/100/1000Base-T full/half duplex MACsec-capable ports, includes 3 fan modules, 1 VIMS slot, rack-mount kit, EXOS Advanced Edge license</td>
</tr>
<tr>
<td>X465-48T-B3</td>
<td>X465-48T + 350W PSU Bundle</td>
<td>X465-48T with 48 10/100/1000Base-T full/half duplex MACsec-capable ports, includes 3 fan modules, 1 VIMS slot, 1 x 350W AC PSU FB (10953), rack-mount kit, EXOS Advanced Edge license</td>
</tr>
<tr>
<td>X465-48P-B1</td>
<td>X465-48P + 1100W PSU Bundle</td>
<td>X465-48P with 48 10/100/1000Base-T full/half duplex 802.3bt 30W PoE MACsec-capable ports, includes 3 fan modules, 1 VIMS slot, 1 x 1100W AC PSU FB (10941), rack-mount kit, EXOS Advanced Edge license</td>
</tr>
<tr>
<td>X465-48W</td>
<td>X465-48W (unbundled)</td>
<td>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 VIMS slot, rack-mount kit, EXOS Advanced Edge license</td>
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<tr>
<td>X465-48W-B1</td>
<td>X465-48W + 1100W PSU Bundle</td>
<td>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 VIMS slot, 1 x 1100W AC PSU FB (10941), rack-mount kit, EXOS Advanced Edge license</td>
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<tr>
<td>X465-48W-B2</td>
<td>X465-48W + 2000W PSU Bundle</td>
<td>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 VIMS slot, 1 x 2000W AC PSU FB (XN-ACPWR-2000W-F), rack-mount kit, EXOS Advanced Edge license</td>
</tr>
<tr>
<td>X465-48W-B1-S1</td>
<td>X465i-48W + 120GB SSD + 1100W PSU Bundle</td>
<td>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 VIMS slot, 1 x 1100W AC PSU FB (10941), rack-mount kit, EXOS Advanced Edge license, Insight Architecture-ready</td>
</tr>
<tr>
<td>X465i-48W</td>
<td>X465i-48W (unbundled)</td>
<td>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 VIMS slot, rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready</td>
</tr>
<tr>
<td>X465i-48W-B2-S1</td>
<td>X465i-48W + 120GB SSD + 2000W PSU Bundle</td>
<td>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 VIMS slot, 1 x 2000W AC PSU FB (XN-ACPWR-2000W-F), rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready</td>
</tr>
<tr>
<td>X465-24MU</td>
<td>X465-24MU (unbundled)</td>
<td>X465-24MU with 24 100Mb/1Gb/2.5Gb/5Gb 802.3bt Type 3 60W PoE ports, includes 2 fan modules, 1 VIMS slot, rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready</td>
</tr>
<tr>
<td>X465-24MU-B1</td>
<td>X465-24MU + 1100W PSU Bundle</td>
<td>X465-24MU with 24 100Mb/1Gb/2.5Gb/5Gb 802.3bt Type 3 60W PoE ports, includes 2 fan modules, 1 VIMS slot, 1 x 1100W AC PSU FB (10941), rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready</td>
</tr>
<tr>
<td>X465-24MU-B2</td>
<td>X465-24MU + 2000W PSU Bundle</td>
<td>X465-24MU with 24 100Mb/1Gb/2.5Gb/5Gb 802.3bt Type 3 60W PoE ports, includes 2 fan modules, 1 VIMS slot, 1 x 2000W AC PSU FB (XN-ACPWR-2000W-F), rack-mount kit, EXOS Advanced Edge license, Insight Architecture-ready</td>
</tr>
<tr>
<td>X465-24MU-24W</td>
<td>X465-24MU-24W (unbundled)</td>
<td>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 VIMS slot, rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready</td>
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<tr>
<td>X465-24MU-24W-B1</td>
<td>X465-24MU-24W + 1100W PSU Bundle</td>
<td>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 VIMS slot, 1 x 1100W AC PSU FB (10941), rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready</td>
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<td>X465-24MU-24W-B2</td>
<td>X465-24MU-24W + 2000W PSU Bundle</td>
<td>X465-24MU-24W with 24 1000Mb/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 VIMS slot, 1 x 2000W AC PSU FB (XN-ACPWR-2000W-F), rack-mount kit, EXOS Advanced Edge license, Integrated Application Hosting-ready</td>
</tr>
<tr>
<td>X465-24S</td>
<td>X465-24S (unbundled)</td>
<td>X465-24S with 24 10/1000Base-X (SFP) ports, includes 2 fan modules, 1 VIMS slot, rack-mount kit, EXOS Advanced Edge License</td>
</tr>
<tr>
<td>X465-24S-B3</td>
<td>X465-24S + 350W PSU Bundle</td>
<td>X465-24S-24S with 24 10/1000Base-X (SFP) ports, includes 2 fan modules, 1 VIMS slot, 1 x 350W AC PSU (10953), rack-mount kit, EXOS Advanced Edge License</td>
</tr>
<tr>
<td>X465-24XE</td>
<td>X465-24XE (unbundled)</td>
<td>X465-24XE with 24 1000M/1Gb/10Gb (SFP+) MACsec and LRM-capable ports, includes 2 fan modules, 1 VIMS slot, rack-mount kit, EXOS Advanced Edge License, Integrated Application Hosting-ready</td>
</tr>
<tr>
<td>X465-24XE-B3</td>
<td>X465-24XE + 350W PSU Bundle</td>
<td>X465-24XE-24XE with 24 1000M/1Gb/10Gb (SFP+) MACsec and LRM-capable ports, includes 2 fan modules, 1 VIMS slot, 1 x 350W AC PSU (10953), rack-mount kit, EXOS Advanced Edge License</td>
</tr>
<tr>
<td>VIMS-4X1</td>
<td>4-port SFP+ module</td>
<td>4 x 1G/10G SFP+ VIM supported on X465</td>
</tr>
<tr>
<td>VIMS-4XE1</td>
<td>4-port SFP+ module LRM/MACsec capable</td>
<td>4 x 1G/10G SFP+ LRM and MACsec-capable VIM supported on X465</td>
</tr>
<tr>
<td>VIMS-4YE2,4</td>
<td>4-port SFP28 module MACsec capable</td>
<td>4 x 10G/25G SFP28 MACsec-capable VIM supported on X465</td>
</tr>
<tr>
<td>VIMS-2Q3</td>
<td>2-port QSF+ module</td>
<td>2 x 10G/40G QSF+ VIM supported on X465</td>
</tr>
<tr>
<td>10953</td>
<td>350W AC PS F B</td>
<td>350W AC PSU supported on X465-48T, also used on X450-G2, X460-G2</td>
</tr>
<tr>
<td>10941</td>
<td>110W AC PS F B</td>
<td>1100W PoE PSU supported on all PoE models of X465, also used on X450-G2 and X460-G2</td>
</tr>
<tr>
<td>XN-ACPWR-2000W-F</td>
<td>2000W AC PS F B</td>
<td>2000W PoE PSU supported on all PoE models of the X465 Series</td>
</tr>
<tr>
<td>XN-ACPWR-350W-FB4</td>
<td>350W AC PS F B</td>
<td>350 Watt AC Power Supply Module - Front to Back airflow, also used on 5520 and VSP 4800</td>
</tr>
<tr>
<td>XN-ACPWR-715W-FB4</td>
<td>715W AC PS F B</td>
<td>715 Watt AC Power Supply Module - Front to Back airflow, also used on 5520 and VSP 4900</td>
</tr>
<tr>
<td>XN-ACPWR-1100W-FB4</td>
<td>110W AC PS F B</td>
<td>1100 Watt AC PoE Power Supply Module - Front to Back airflow, also used on 5520 and VSP 4900</td>
</tr>
<tr>
<td>XN-ACPWR-2000W-FB4</td>
<td>2000W AC PS F B</td>
<td>2000 Watt AC PoE Power Supply Module - Front to Back airflow, also used on 5520 and VSP 4900</td>
</tr>
<tr>
<td>XN-FAN-002-F</td>
<td>Spare Fan module</td>
<td>Spare Fan module used in X465 Series switches</td>
</tr>
<tr>
<td>XN-SSD-001-120</td>
<td>120GB SSD module</td>
<td>120GB Solid-State Drive (SSD) module for use with Integrated Application Hosting on the X465 Series</td>
</tr>
<tr>
<td>XN-4P-RKMT-001</td>
<td>Spare Four Post Rack Mount Kit</td>
<td>Spare Four Post Rack Mount Kit for use with X465 Series switches</td>
</tr>
<tr>
<td>XN-2P-RMKT-001</td>
<td>Optional Two Post Rack Mount Kit</td>
<td>Optional Two Post Rack Mount Kit for use with X465 Series switches</td>
</tr>
<tr>
<td>EXOS-CORE-FF-X465</td>
<td>X465 Core License from Advanced Edge</td>
<td>Advanced Edge to Core Feature Pack for ExtremeSwitching X465 Series (includes Integrated Application Hosting)</td>
</tr>
</tbody>
</table>

1 X465-24MU, -24MU-24W and -24XE models only support 10Gb operation (no 1Gb) on VIMS-4X and VIMS-4XE modules
2 X465-24W, -48T, -48P, -48W and -245 models are limited to 2 x 10/25Gb ports on VIMS-4YE modules
3 X465-24W, -48T, -48P, -48W and -245 models are limited to 1 x 10/40Gb port on VIMS-2Q module
4 XN-ACPWR-xxx-FB power supply units cannot be used with the 10941, 10951, 10953, or XN-ACPWR-2000W-F PSUs on the same switch. Not available for Mexico, Russia, Brazil, China, Korea, South Africa, India at present, pending certification.
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 a list of the optics/transceivers support on the X465 Series hardware, refer to our Extreme Optics Compatibility Tool at https://optics.extremenetworks.com.

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.