Virtual Edge Platform (VEP) 1405 Series

Technology Guide

Abstract

This document provides an overview of the systems that are offered as part of the VEP1405 series of systems.

Dell Networking Solutions

February 2023
Rev. A05

DELL EMC

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

Contents

1

Product description

The Dell EMC Virtual Edge Platform (VEP) 1405 is a next-generation access platform family. The products within the VEP1405 line are built for edge compute, such as uCPE, SD-WAN, and ROBO. The VEP1405 product line consists of the five models that are described in the table below.

The VEP1405 is the second product that is launched in the VEP family. The VEP1405 line is a cost-optimized platform with a lower performance level than the previously released VEP4600 platform. The VEP1405 platform is built for various edge use cases with the first proof point being an SD-WAN appliance for Versa, followed by the universal CPE use case with ADVA, OneAccess, VMware vSphere, and RAD vCPE operating systems.

The Dell EMC SD-WAN appliances support VeloCloud, however, the VEP1405 platform line does not support VeloCloud.

The VEP1405 is built around the Intel Denverton set of processors as defined in the following table:

Table 1. Dell EMC Virtual Edge Platform (VEP) 1405 model descriptions

Model	SKU	CPU	Description
VEP1425	210-AREH	4-core	• 8 GB DDR4 • 16 GB eMMC • 120 GB SSD • 2x 2 Wi-Fi • 6x 1 GB Copper RJ45 • 2x 10 GB SFP+ • Versa software installed • Trusted Platform Module (TPM) 2.0 - World-wide except China • 2x USB 3.0 • Low-energy Bluetooth (BLE) • One fan
VEP1425N	210-BCBE	4-core	• 8 GB DDR4 • 16 GB eMMC • 120 GB SSD • 6x 1 GB Copper RJ45 • 2x 10 GB SFP+ • Versa software installed • Trusted Platform Module (TPM) 2.0 - World-wide except China • 2x USB 3.0 • One fan
VEP1445	210-ASHR	8-core	• 16 GB DDR4 • 16 GB eMMC • 240 GB SSD • 2x 2 Wi-Fi • 6x 1 GB Copper RJ45 • 2x 10 GB SFP+ • Versa software installed • Trusted Platform Module (TPM) 2.0 - World-wide except China • 2x USB 3.0 • Low-energy Bluetooth (BLE) • Two fans
VEP1445	210-AWIP	8-core	• 32 GB DDR4 • 16 GB eMMC • 960 GB SSD

Table 1. Dell EMC Virtual Edge Platform (VEP) 1405 model descriptions (continued)

Model	SKU	CPU	Description
			• 2x 2 Wi-Fi • 6x 1 GB Copper RJ45 • 2x 10 GB SFP+ • ADVA software installed • Trusted Platform Module (TPM) 2.0 - World-wide except China • 2x USB 3.0 • Low-energy Bluetooth (BLE) • Two fans
VEP1445N	210-BBZZ	8-core	• 16 GB DDR4 • 16 GB eMMC • 240 GB SSD • 6x 1 GB Copper RJ45 • 2x 10 GB SFP+ • Versa software installed • Trusted Platform Module (TPM) 2.0 - World-wide except China • 2x USB 3.0 • Two fans
VEP1485	210-ASHK	16-core	• 32 GB DDR4 • 16 GB eMMC • 240 G SSD • 2x 2 Wi-Fi • 6x 1 GB Copper RJ45 • 2x 10 GB SFP+ • Versa software installed • Trusted Platform Module (TPM) 2.0 - World-wide except China • 2x USB 3.0 • Low-energy Bluetooth (BLE) • Two fans
VEP1485	210-AWIQ	16-core	• 64 GB DDR4 • 16 GB eMMC • 2 TB SSD • 2x 2 Wi-Fi • 6x 1 GB Copper RJ45 • 2x 10 GB SFP+ • ADVA software installed • Trusted Platform Module (TPM) 2.0 - World-wide except China • 2x USB 3.0 • Low-energy Bluetooth (BLE) • Two fans
VEP1485N	210-BCBB	16-core	• 32 GB DDR4 • 16 GB eMMC • 240 G SSD • 6x 1 GB Copper RJ45 • 2x 10 GB SFP+ • Versa software installed • Trusted Platform Module (TPM) 2.0 - World-wide except China • 2x USB 3.0 • Two fans

Wireless bands

NOTE: Only certain VEP1405 series models have Wi-Fi capabilities. See the Dell EMC Virtual Edge Platform (VEP) 1405 model descriptions table above for a complete list of systems that include the Wi-Fi functionality.

The wireless bands that are supported for Wi-Fi are as follows:

This module has the Qualcomm Atheros Peregrine chipset QCA9882-BR4B that is often used in high-performance Wi-Fi access points.

- **Wi-Fi**
  - 2.4 GHz: 2412 MHz – 2462 MHz
  - 5 GHz: 5180 MHz – 5825 MHz
- **Manufacturer**
  - Compex
- **Model**
  - WLE600VX Compex

2

Product positioning and key marketing messages

The VEP family targets two main use cases:

- Software-defined wide area network (SD-WAN) appliance market
- Universal CPE (uCPE) market

The uCPE market is a superset of the SD-WAN use case that unites multiple software functions onto a single hardware device through virtualization.

uCPE and SD-WAN are estimated to grow at ~60% CAGR and with a projected TAM of $8.05 billion by 2021. The platform targets both service providers (Managed and Telecom) and enterprise markets. Enterprises are considering SD-WAN as a cost-effective alternative and supplement to MPLS only transport. Also, Enterprises see virtualization as a way to combat appliance sprawl, consolidate hardware, simplify, and accelerate application roll-outs. Communication service providers view this as a new revenue opportunity that augments MPLS as a capacity expansion and VPN solution. Managed service providers can now offer network as a service, provide over-the-top network service using SD-WAN, and offer universal CPE as a service.

Service providers see the benefit of being able to offer orchestration and application management services that they were previously unable to offer. This offsets the lost MPLS transport revenues.

Product positioning is similar to that of physical customer premise equipment as it is primarily positioned as a device to provide virtual functions at the service provider edge or access. The value of VEP becomes the universal hardware regardless of software solution, or combination of solutions required at a specific site. The primary goal of introducing this product as an x86 based networking platform is to provide a solution for hosting CPE functions. Finally, this product is positioned for service providers and enterprises of all sizes who want to use NFV and SD-WAN to offer new services.

The key value proposition for the VEP1405 is that it brings high performance x86 processing to the CPE market at a price and performance level. Previous generations of Intel processors available at this price point cannot keep up with the demands of SD-WAN and other uCPE applications. With full QAT, SR-IOV, and DPDK support, the VEP1405 brings the right features, performance, and price to the bulk of the UCPE market.

Dell differs in this market as it is the only global vendor with a trusted brand to adopt and embrace the desegregation of hardware and software that is required by the open computing movement. Traditional vendors such as Cisco and Juniper maintain closed proprietary solutions, while smaller open vendors such as Lanner and Super Micro, do not have the scale or global reach that the Enterprise market demands for service and support.

The Deployment Guides that are available on the sales portal, outline the performance envelope for the VEP1405 line of systems, and the various software applications that the line of systems, supports. The VEP1405 systems are value option systems that provide high-end computing in a value-optimized package. The VEP1405 systems enable you to deploy SD-WAN and multiple VNFs at a lower cost than the systems in the VEP4600.

Product overview

The Virtual Edge Platform 1405, or VEP1405, is a universal customer premise equipment (uCPE) device. The VEP1405 series connects the service provider edge or small to medium branch locations to the cloud, to host virtual network functions.

The VEP1405 series is a single-socket, 1RU platform that offers hosted virtualized network functionality, with applicability for the Service Provider Edge and Enterprise Branch. The VEP1405 series uses the Intel Denverton-NS (Atom processor, C3000 family).

The VEP1405 series features:

- Intel processor product family—4-, 8-, and 16-core
- Onboard or SO-DIMM DDR4 with ECC up to 64 GB
- One M.2 solid-state drive (SSD) slot up to 2 TB
- Two 10G small form-factor pluggable plus (SFP+) network ports

Product specifications

Table 2. Key features

Feature	Overview
Processor	Intel Denverton-NS (Atom processor, C3000 family)
Intel CPU SKU	C3558 (4-core), C3758 (8-core), C3958 (16-core)
Chipset	North and south bridge that is built into the CPU/SOC
Memory	DDR4 with ECC
Out of band management	Micro-USB console
Mounting options	Desktop, wall mount, or rack mount (1.5 RU, dual unit tray)
Dimension	208 mm (8.18 in) x 52 mm (2.04 in) x 200 mm (7.87 in) (W x H x D)
Weight	1.3 kg to 1.4 kg
Power consumption	1425 20 W typical, 30 W max 1445 35 W typical, 45 W max 1485 40 W typical, 50 W max
Airflow	All models have one or two fan inlets at the bottom, with the exhaust ports on the sides and on the back
Power supply	External AC/DC power adapter, 65W 100-240 V AC, 50/60Hz, 12V DC
TPM 2.0	Chip onboard supports TPM 2.0, Infineon P/N SLB9665VQ2.0 (firmware version 5.63)
Serviceability	No field upgradable components
USB	2x Superspeed USB 3.0 ports on sides of the enclosure
BIOS	AMI BIOS
BMC	No BMC
Hypervisor	Certification available for: ● VMWare ESXi ● Ekinops OneAccess ● RAD vCPE operating system ● ADVA Ensemble The platform runs CENTOS and Debian with community support

Versa performance figures

The following VEP1405 series performance information was published by Versa:

Table 3. Versa performance information

Features	Dell VEP1425	Dell VEP1445	Dell VEP1485	V910 (VEP4600 hardware)	V930 (VEP4600 hardware)
Throughput without UTM enabled	800 Mbps	2 Gbps	3 Gbps	5 Gbps	14 Gbps
AV + NGFW	200+ Mbps	600+ Mbps	900+ Mbps	1.8 Gbps	2 Gbps
IPS + NGFW	150+ Mbps	350+ Mbps	500+ Mbps	500 Mbps	1 Gbps
AV + IPS + NGFW	120+ Mbps	250+ Mbps	350+ Mbps	400 Mbps	750 Mbps

Third-party software

The eco-system in which the VEP1405 series of systems participates, includes Versa, ADVA, OneAccess, ESXi, and RAD active, with the inclusion of other partners later. Except for ESXI, which is the OEM software, all eco-system partners are on EI, which means that licenses are a sell through and that Dell does not offer support for the software. RFP questions that are related to the software are handled by the software vendor directly.

NOTE: For a list of partners that are part of the ecosystem, see the *Virtual Edge Platform, SD-WAN, and uCPE Solutions Architecture Guide* in the Attachment section of this document.

Device management

The VEP1405 series of systems has 16G of eMMC storage where full diagnostics are stored. Basic diagnostics exist in BIOS, however full diagnostics requires a reboot into the diagnostic image that is housed in eMMC storage. For information on booting into the diagnostic image, see uCPE Diagnostics Guide.

The VEP1405 series of systems have a Kensington K-Lock slot that acts as a security anchor point with an appropriate cable.

Table 4. Reset button behavior

Status	Action
The VEP1405 series system is in a powered off state	• Press the **Reset** button for **1 to 2 seconds** to power on the unit
The VEP1405 series system is in a powered on state	• Press the **Reset** button to perform a cold reset of the system **NOTE:** The BIOS distinguishes a long push as lasting **more** than 5 seconds, and a short push as lasting **less** than 5 seconds. **NOTE:** Pressing the **Reset** button for more than 5 seconds enables the factory reset functionality. • BIOS sets a flag in CMOS RAM address 0x5a to indicate "factory-reset-pending" indication • The data at 0x5a will have bit-1 set to 1 for long push and set to 0 for short push • When long-push indication is present, BIOS also lights up system LED blue • When long-push indication is not present, BIOS lights up system LED white The operating system must look at CMOS flag and take appropriate action (if factory reset functionality is wanted), and then clear the flag **NOTE:** After upgrading to UFW 2.2, the system response when you push the Reset button on a running VEP14xx switch is determined by the operating system that the switch is currently running.

3

System overview

Front and rear view

Front view

Figure 1. Front system view - VEP1425 model

1. Security lock port
2. USB port
3. System status indicator LED

NOTE: The VEP1405 models do not have external antennas. Wi-Fi antennas are housed fully within the chassis (in select models only).

Rear view

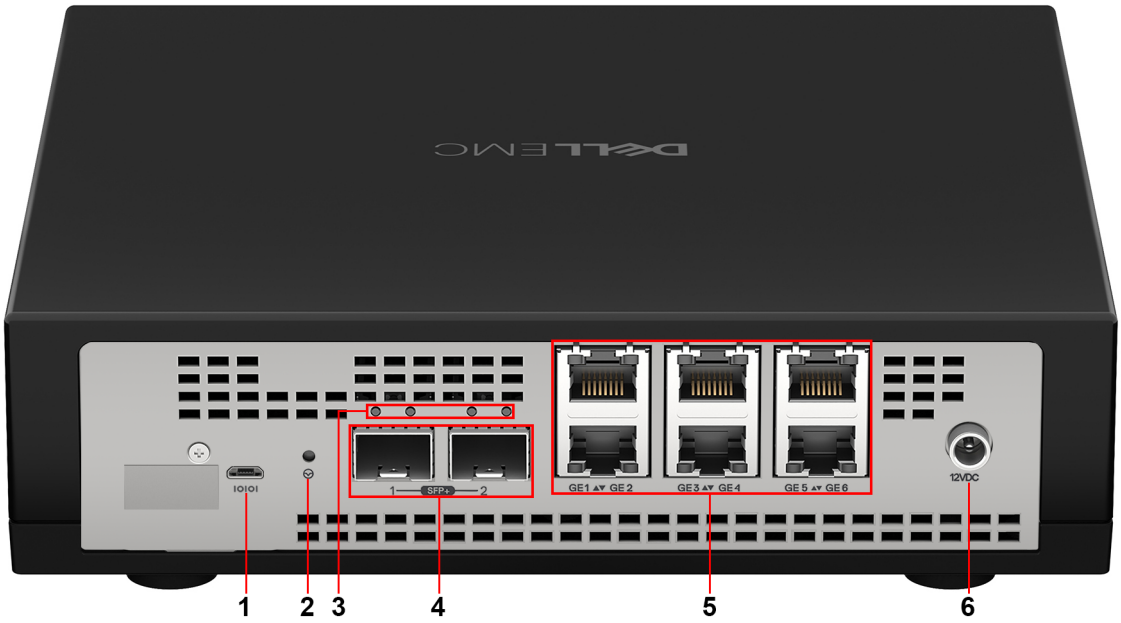

Figure 2. Rear system view - VEP1405 series model

1. Micro USB port
2. Reset button
3. LED status lights for SFP+ ports
4. SFP+ ports
5. Ethernet ports and LED status lights
6. Power connection port

NOTE: To prevent the VEP1405 series system console port from being accessed in a nonsecure location, the system ships from the factory with a plate covering the micro USB port. To uncover the port, use a #0 (2.5 mm) Phillips head screwdriver to loosen or remove the screw that holds the plate in place.

Architecture overview

The VEP1405 series of systems consist of an Intel processor complex with these high-level features:

Table 5. Architecture overview

Component	Description
Storage:	One M.2 SATA SSD with capacity of 120 GB (VEP1425), 240 GB (VEP1445 and VEP1485), 960 GB (VEP1445), and 2 TB (VEP1485) based on SKU. For both 128 GB and 256 GB M.2 SSDs: • Compliant with ATA revision 3.1 • SATA speed: 6 Gbps • Interface burst read/write: 600 MB/s • Sustained read: 525 MB/s • Sustained write: 355 MB/s • Random read 4K: 76,000 IOPs • Flash drive type: MLC (multilevel cell) • Endurance:

Table 5. Architecture overview (continued)

Component	Description
	○ 3000 PE cycles The VEP1445 system is available with 960GB SSD, and the VEP1485 system is available with 2TB SSD. The specifications for these drives are as follows: ● Compliance: SATA Gen3 - 6 Gbit/s (Gen2 - 3 Gbit/s and Gen1 - 1.5 Gbit/s backward compatible) ● Command Sets: Supports ATA/ATAPI-8 and ACS-2 ● Performance: ○ Burst Transfer Rate: Up to 600 MBytes/s in SATA Gen3 - 6.0 Gbit/s ○ Read Performance: Sequential Read up to 565 MBytes/s, Random Read 4K up to 73,600 IOPS ○ Write Performance: Sequential Write up to 495 MBytes/s, Random Write 4K up to 68,000 IOPS ● Commercial Operating Temperature Range1: 0 °C to 70 °C ● Storage Temperature Range: -40 °C to 85 °C ● Operating Voltage: 3.3 V ± 5% ● Power (Max): ○ Read (Active): 1.8 W ○ Write (Active): 2.9 W ○ Idle: 396 mW ○ Partial: 132 mW ● Data Retention: 10 Years @ Life Begin / 1 Year @ Life End ● Endurance in TeraBytes Written (TBW) @ Max Capacity: ○ 3000 PE cycles ○ Enterprise Workload ≥ 940 ● Shock/Vibration: 1,500 g / 50 g ● High-Performance 32-Bit Processor with Integrated, Parallel Flash Interface Engines: ○ Triple-Level Cell (TLC) 3D NAND Flash ○ LDPC ECC with up to 165 bit correction per 1 KByte page (BCH equivalent) ● High Reliability: ○ Mean Time Between Failure (MTBF): > 2,000,000 hours ○ Data Reliability: < 1 non-recoverable error per 10^16 bits read ● Dynamic and Static Wear Leveling ● Subpage Mode Flash Translation Layer (FTL) ● Active Data Care Management: Adaptive Read Refresh ● Lifetime Enhancements: ○ Dynamic Bad Block Remapping ○ Write Amplification Reduction ● UBER is less than 10^-16
Primary management ports:	Out-of-band management using mini-USB 2.0 console port
Memory:	DDR4 with ECC. 1425 has 8 GB onboard, with SO-DIMM available for expansion. 1445 has 16 GB on board with one SO-DIMM available for expansion. 1485 has 32 GB total, 16 GB onboard, and 16 GB using SO-DIMM.
USB ports:	● Two USB type-A receptacle (female) ports supporting a mass storage device (USB flash drive) or external LTE modem. The port supports USB 3.0 with maximum data rates of 640 Mbps. ● Micro-USB port (receptacle) used as a console port for management. A typical scenario would be to connect a laptop personal computer to this port using a standard male USB Type-A plug to micro-USB cable.
Console port:	The VEP1405 has a dedicated management console on micro-USB port. Configure USB serial console to 115200 baud, N, 8, 1 **NOTE:** To download the console port driver, see Console port driver.
Power supply:	The power supply connector is on the same side as the I/O. The VEP1405 ships with one external AC/DC power supply

Table 5. Architecture overview (continued)

Component	Description
Wi-Fi :	• 802.11 b/g/n/ac, 2x2 MIMO • The VEP1405 models do not have external antennas. Wi-Fi antennas are housed fully within the chassis.
Mean Time Between Failure (MTBF)	• VEP1425: 830,000 hours • VEP1445: 802,317 hours • VEP1485: 800,000 hours

Optics support

The following optics guidelines apply to the VEP1405:

- Both SFP+ ports support 10 GbE using 10GBase-SR, LR, ER, 10 Gbps optics
- Both SFP+ ports support any optics 1/10G/dual-speed compliant with SFF-8431 standard
- DAC twin-ax cables that comply with SFF-8431 v4.1 and SFF-8472 v10.4 specifications
  - 10 Gbps only, no 1 Gbps support
- SFP+ AOC cables (10 Gbps only, no 1 Gbps support)
- SFP+ active copper modules
- 1000Base-SX/LX optical modules that comply with SFF-8431 v4.1

NOTE: Contact your Dell EMC Sales representative for more information about the available SFP+ port cables and optics.

Chassis mechanical

The following table provides the chassis physical dimensions and characteristics for the VEP1405 series of systems:

Table 6. Mechanical specifications

Dimension		Inches	Centimeters	
-	Product	Width	8.1	20.8
Depth		7.9	20.0	
Height		2.0	5.2	
Height of rack		1.5 RU	1.5 RU	
Rack clearance required (Front)		N/A	N/A	
Rack clearance required (Rear)		N/A	N/A	
Product weight (without PSU)		1.3 kg to 1.4 kg		
Shipping weight		4.9 kg (10.9 lbs)		
Chassis mounting options		VEP1405 supports desktop placement (rubber feet), wall mount (using brackets), and rack mount using the optional dual-unit tray		

Acoustic noise and vibration report

ISO 7779 A-weighted sound pressure level: 20 dBA at 73.4oF (23oC).

Table 7. Acoustic noise and vibration information

Acoustic noise (db)	-	-
Non-Operational Random Vibration 10~500 HZ(G2/HZ=0.13-0.0018), 1.88 Grms RHS 15 Minutes for each side	-	(See information below this table)

Table 7. Acoustic noise and vibration information (continued)

Acoustic noise (db)	-	-
Operation Random Vibration 5~350 HZ(G2/HZ=0.0002-0.0002), 0.26 Grms, RHS 15 Minutes for each side Shock non-op. 2 ms half-Sine Wave 71 g, 1 shock for each side Shock op 2.6 ms half-sine wave 31 g, 4 shock on x, y, z axis Shock non-op 1 ms square wave 32 g 270 in/sec		

- 1-fan SKUs (4-core, one 5000 RPM fan)
- 2-fan SKUs (8 and 16-core, two 8000 RPM fans)
- Fan noise:
  - 4-core SKUs (1-fan):
    - 100% speed: 34.8 dBA
    - 50% speed: 22.2 dBA
    - 30% speed: 16.4 dBA
  - 8-core SKUs (2 fans):
    - 100% speed: 48.4 dBA
    - 50% speed: 37.9 dBA
    - 30% speed: 28.7 dBA
  - 16-core SKUs (2-fans):
    - 100% speed: 48.4 dBA
    - 50% speed: 37.9 dBA
    - 30% speed: 28.7 dBA

VEP1405 series rack mount kit

The rack mount kit that is available for the VEP1405 series, allows for two 1405 series of systems to be mounted in one 19-inch rack mount tray. The units sit side by side within the tray. When the tray is populated with 1405 units, two RU should be allocated to each tray mounted in a standard rack. For installation setup information, see the Rack mounted installation section

Table 8. Rack mount kit

SKU	Description
770-BCZE	Rack mount kit

Table 9. Rack mount kit dimensions

Dell part number	DNI part number	Device (width PSU)		Carton or outer box				
		Dim (L x D x H)	Weight	Carton length	Carton width	Carton height	Units/ Carton	Weights
V7XX7	VEP1400-BKT1	479.43 x 203.2 x 87.31 mm (18.87 x 8 x 3.43 in)	0.91 kg (2.0 lbs)	600 mm (2.59 in)	309 mm (12.16 in)	183 mm (7.20 in)	1	2.35 kg (5.18 lbs)

Electrical, power, and cooling

Power supplies

The VEP1405 supports one external AC/DC power supply with secure locking thread.

Table 10. Power specifications

Parameter	Specification
Power input	AC: 100 VAC–240 VAC, 50/60 Hz
Max current draw per system - AC	• 100 VAC: 2.0A • 240 VAC: 1.0A
Power output	12 V DC, 5.4A (65 W)
Power consumption	• 1425 20 W typical, 30 W max • 1445 35 W typical, 45 W max • 1485 40 W typical, 50 W max
Power availability for optics	Power per SFP+ Port 1 W

Cooling

Table 11. Cooling specifications

Parameter	Specification
Thermal dissipation	See the Power consumption information in the Product specifications section
Number of fixed fans	1 (1425) or 2 (1445 and 1485)
Minimum CFM	5.6 (one fan)
Maximum CFM	10 (two fans)

NOTE: For thermal considerations, do not stack the VEP1405 platforms on top of each other. Stacking of the platforms impairs cooling and places the external power supply on top of the unit.

Environmental

Table 12. Environmental specifications

Parameter	Specifications
Operating temperature	0°C-40°C (32°F-104°F)
Storage temperature	-40°C to 70°C (-40°F to 158°F)
Operating relative humidity	• 5% to 85% (RH), noncondensing continuously • 5% to 90% (RH), noncondensing Short term (< 1% of operational hour per year)
Storage relative humidity	5% to 90% (RH), noncondensing
Operating altitude	Maximum Operating altitude: 10,000 ft Temperature and performance derating above 950 m (3,117 ft) per Dell Enterprise Reliability Engineering (A09) specification
Storage altitude	10,668 m (35,000 ft)

LED behavior

Status LED behavior

Table 13. Status LED behavior

Class	Behavior
Status LED (Red/Green/Blue)	• Depends on partner operating system

Port LED behavior

Table 14. Port LED behavior

Class	Behavior

1000M Base-T LED	• Link LED - Green or amber
	  ○ Solid green - Port is linked and running at maximum 1000M speed on 1000Base-T port
	  ○ Solid amber - Port is linked and running at lower 100M or 10M speed on 1000Base-T port
	  ○ Off - No link
	• Activity LED - Green
	  ○ Flashing green indicates port activity
	  ○ Off - no port activity

SFP+ LED	• Link LED - Green or amber
	  ○ Solid green - Port is linked and running at 10G speed
	  ○ Solid amber - Port is linked and running at 1G speed
	  ○ Off - No link
	• Activity LED - Green
	  ○ Flashing green - Indicates port activity
	  ○ Off - No port activity

Chassis mounting

The VEP1405 series supports the following mounting options:

- Desktop placement (rubber feet)
- Wall mount placement
- Rack-mounted using the optional rack mount tray

Desktop placement

The VEP1405 series includes four rubber feet that provide secure and stable placement of the unit on a flat surface.

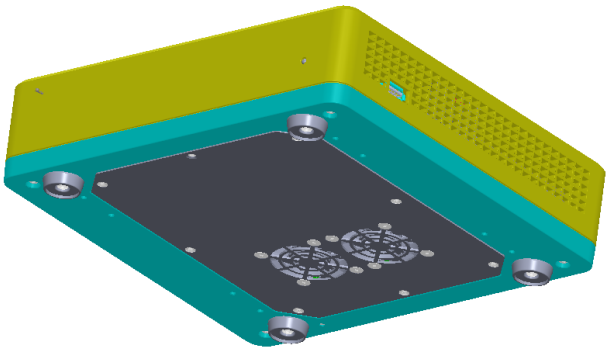

Figure 3. VEP1405 series desktop placement

Wall mount installation

The VEP1405 series includes the hardware that is required for wall mount installation. Using a torque screwdriver, affix the wall mount brackets to the VEP1405 series using the four M3 screws included.

NOTE: When driving the screws into the bracket and VEP1405 series unit, verify that **5 lb-in** is the achieved torque setting.

NOTE: If mounting the VEP1405 series to the wall using the wall mount bracket provided, removal of the rubber feet from the bottom of the VEP1405 series unit is not necessary.

The VEP1405 series of systems include a wall mount bracket with cross-shaped cutout for the mounting screws. The wall mount bracket includes cross-shaped cutouts for the mounting screws.

Wall mount bracket with cross-shaped cutout for the mounting screws

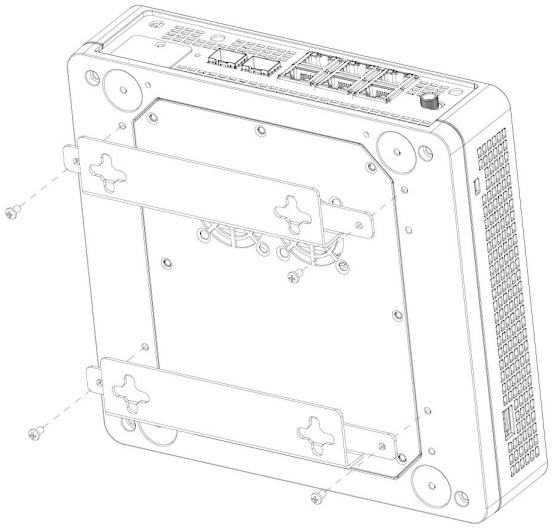

Figure 4. VEP1405 series wall mount installation - cross-shaped cutout

To mount the VEP1405 series unit to the wall using the wall mount bracket provided, you must first anchor the screws into the wall surface. Depending on the type of wall surface, use the M3 screw and anchor to ensure a secure installation. The recommended M3 screw dimensions are as follows:

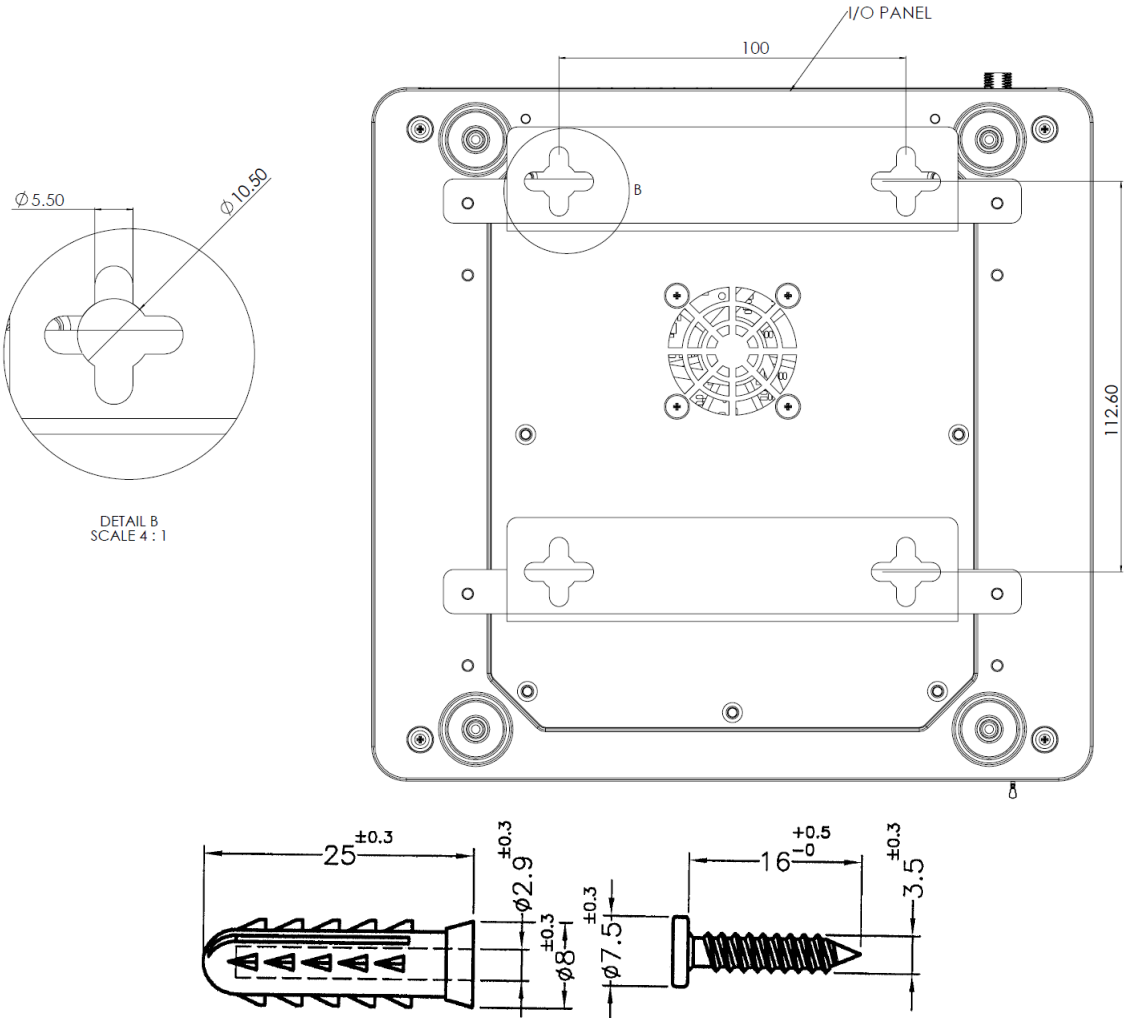

Figure 5. VEP1405 series wall mount, installation anchor, and screw dimensions

NOTE: Before mounting the VEP1405 series to the wall, verify that the wall surface is strong enough to support a firm installation of the unit and can withstand the weight of the unit, power cable, and network cabling.

Using the measurements provided in the following diagram, use the measurement in the red box to mark the distance between the two installation points:

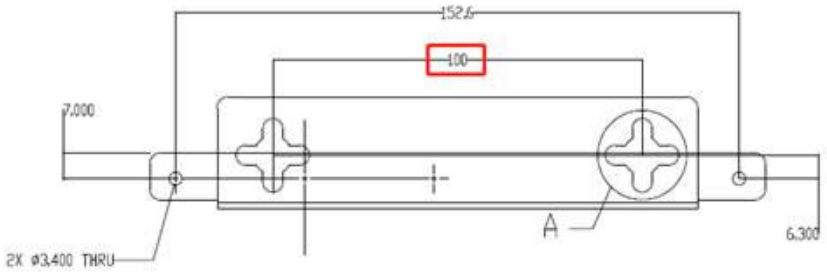

Figure 6. VEP1405 series M3 screw installation points

After the brackets have been attached to the VEP1405 series unit and the screws that are mounted into the wall, place the brackets over the screws and slide the unit to one side to secure the unit in place.

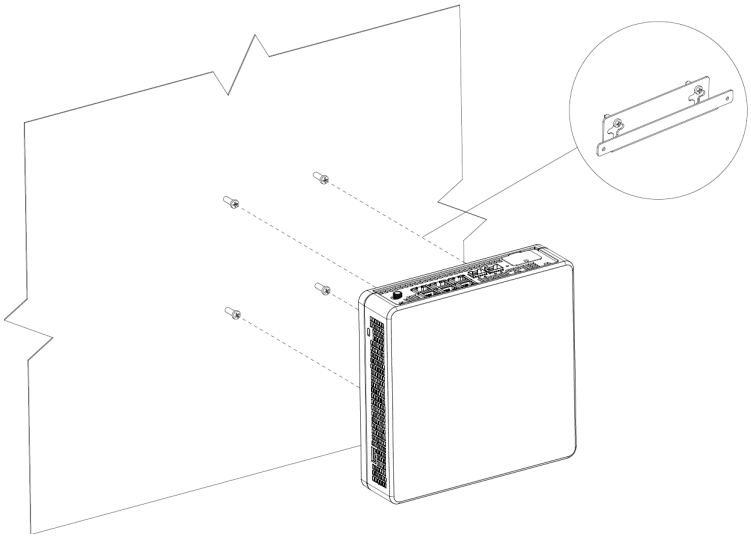

Figure 7. VEP1405 series wall mount bracket installation - cross-shaped cutout

Rack-mounted installation

As an option, the VEP1405 series can be mounted to a dual rack mount tray. Purchased separately, you can install the VEP1405 series to the dual rack mount tray using a torque screwdriver and the eight M3 screws included.

NOTE: When driving the screws into the bracket and VEP1405 series unit, verify that **5 lb-in** is the achieved torque setting.

NOTE: If mounting the VEP1405 series to a dual rack mount tray, removal of the rubber feet from the bottom of the VEP1405 series unit is not necessary.

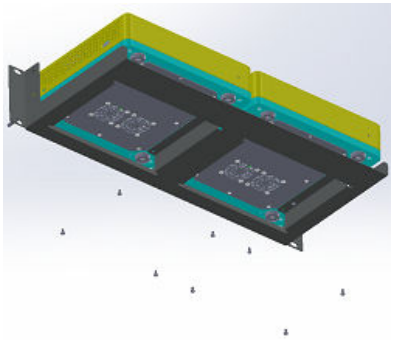

Figure 8. VEP1405 series rack mount installation

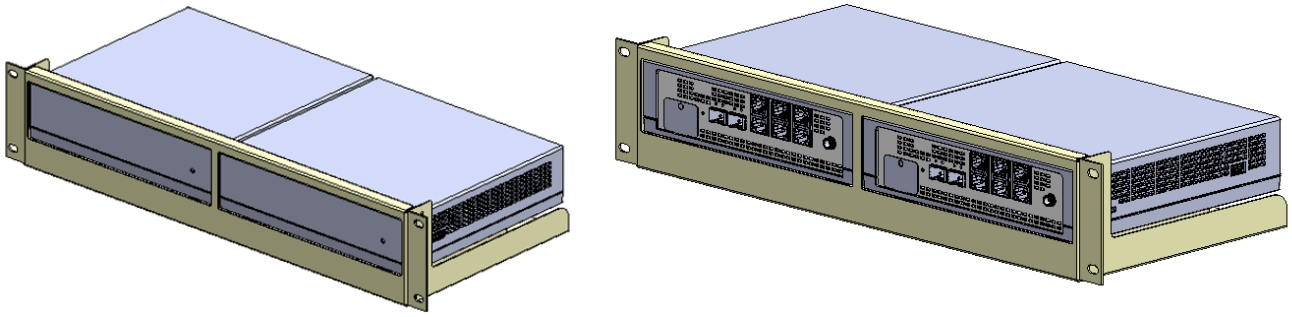

Figure 9. VEP1405 series rack installation - front and back view

Rack mount kit

Table 15. Rack mount kit SKU

SKU	Description
770-BCZE	Rack mount kit

Regulatory

Compliance

Safety
- UL/CSA 60950 - 1, Second Edition
- EN 60950 - 1, Second Edition
- EC 60950 - 1, Second Edition Including all National Deviations and Group Differences
- IEC 62368-1
- EN 60825 - 1 Safety of Laser Products Part 1: *Equipment Classification Requirements and Users Guide*
- EN 60825 -2 Safety of Laser Products Part 2: Safety of Optical Fiber Communication Systems FDA Regulation 21 CFR 1040.10 and 1040.11

Emissions
- Australia/New Zealand: AS/NZS CISPR 32, Class A
- Canada: ICES - 3/NMB-3, Class A
- Europe: EN 55024 (CISPR 24), Class A
- Japan: VCCI Class A
- USA: FCC CFR 47 Part 15, Subpart B, Class A

Immunity
- EN 300 386 EMC for Network Equipment
- EN 55024
- EN 61000 - 3-2: Harmonic Current Emissions
- EN 61000 - 3-3: Voltage Fluctuations and Flicker
- EN 61000-4-2: ESD
- EN 61000-4-3: Radiated Immunity
- EN 61000-4-4: EFT
- EN 61000-4-5: Surge
- EN 61000-4-6: Low Frequency Conducted Immunity

RoHS
- EN 50581:2012 All S9999 components are EU RoHS compliant

Other
- Safety: IEC62368-1
- AS/NZS 60950
- EN 60950-1 Safety of Information Technology Equipment
- EMC compliance
- ICES-003 (Canada) Class A
- EN55032:2015 (Europe) Class A
- CISPR32 (International) Class A
- AS/NZS CISPR32 (Australia and New Zealand) Class A
- taiwanKN32 (Korea) Class A
- CNS13438 (Taiwan) Class A
- CISPR24
- EN300 386

Reliability
- Enterprise Operational Random Vibration – SV0105

- Enterprise Operational Half-Sine Shock – SV0107
- Enterprise Non-Operational Random Vibration – SV0102
- Enterprise Non-Operational Half-Sine Shock – SV0106
- Enterprise Non-Operational Square Wave Shock – SV0108
- Enterprise Rack and Stack Vibration Test – SV0114

Country of origin

Made in Taiwan.

4

Sales information

Products being replaced

Not applicable.

Accessories

The VEP1405 ships with the following accessories:

- AC/DC power supply and AC power cable
- Wall mount hardware
- Micro-USB console cable

The following optional accessories can also be ordered:

- 19-inch Rack-mount dual-unit tray
- Dell-qualified SFP optical modules
- Dell-qualified SFP+ optical modules
- Dell-qualified direct-attach copper cable (DAC) and active optical cable (AOC)

NOTE: Standard USB LTE dongles can be connected to the VEP1405.

Power supply

The VEP1405 family uses an external power supply, identified in the following table:

Table 16. Power supply SKUs

SKU	Description
492-BCOJ	Dell Networking Power Supply, AC, 65 W, 12V DC (ships with all SKUs)

Services

The following services portfolio is applicable to VEP1405:

Table 17. Services offerings

Category	Description
Warranty	Base Warranty/Accounting Std - 1 yr NBD
ProSupport	• Basic Support - NBD parts response • ProSupport- NBD or Mission Critical with 2/4/8 hour response options • ProSupport Plus - NBD, or Mission Critical with 2/4/8 hour response options • ProSupport for Flex Data Center/Multi Vendor HW Support • ** Marketing Default 3Yr ProSupport Plus, MC 4hr
Deployment	• Basic deployment under investigation • Custom deployment

Table 17. Services offerings (continued)

Category	Description
Technical support	A collaborative support agreement is performed for all software partners. Per the agreement, when a customer calls Dell for support, a hardware validation check is performed. If the validation determines that the issue is software related, a warm transfer to the software vendor is initiated.

A

MTBF disclaimer

Disclaimer

THE DELL INFORMATION OR THIRD PARTY VENDOR DATA CONTAINED HEREIN IS PROVIDED STRICTLY "AS IS", WITHOUT WARRANTY, AND DELL EXPRESSLY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY, TITLE OR FITNESS FOR A PARTICULAR PURPOSE REGARDING SAID INFORMATION OR DATA, EVEN IN THE EVENT DELL HAS KNOWLEDGE OF DEFICIENCIES IN SAID INFORMATION OR DATA. DELL DOES NOT ENSURE OR GUARANTEE THE ACCURACY OF ANY SUCH DELL INFORMATION OR THIRD PARTY VENDOR DATA AND SUCH INFORMATION AND/OR DATA IS UTILIZED BY PARTICIPANT SOLELY AT ITS OWN RISK AND EXPENSE. DELL DISCLAIMS LIABILITY FOR ANY AND ALL CLAIMS, DAMAGES , COSTS OR EXPENSES, INCLUDING SPECIFICALLY BUT WITHOUT LIMITATION, LOST PROFITS, LOST DATA OR LOST BUSINESS EXPECTANCY, COMPENSATORY, INCIDENTAL AND OTHER CONSEQUENTIAL DAMAGES, ARISING OUT OF OR IN ANY WAY RELATING TO PARTICIPANT'S RECEIPT, USE OF, RELIANCE OR ALLEGED RELIANCE UPON THE INFORMATION OR DATA, OR DELL'S ACTS OR OMISSIONS REGARDING SUCH INFORMATION OR DATA, EVEN IF PARTICIPANT INFORMS DELL, WHETHER EXPRESSLY OR BY IMPLICATION, OF ITS RECEIPT, USE OR RELIANCE UPON SUCH INFORMATION, AND EVEN IF SUCH LOSSES ARE DUE OR ALLEGED TO BE DUE IN WHOLE OR IN PART TO DELL'S NEGLIGENCE, CONCURRENT NEGLIGENCE OR OTHER FAULT, BREACH OF CONTRACT OR WARRANTY, VIOLATION OF TEXAS DECEPTIVE TRADE PRACTICES ACT OR STRICT LIABILITY WITHOUT REGARD TO FAULT. RECEIPT OF THE INFORMATION HEREIN IS DEEMED ACCEPTANCE OF THE TERMS HEREOF.

Limitations of reliability prediction models

Reliability prediction models provide MTBF point estimates. Model inputs include base component failure rates, environmental, quality, and stress factors. Base failure rates use failure data from multiple sources, including industry field data, research lab test results, and government labs.

Environmental, quality, and stress factors may differ from field conditions. Predictions assume a constant failure rate which does not account for failures due to early life quality issues or wearout phenomena.

General prediction methodology

Dell uses the default prediction methodology, Telcordia SR332, Reliability Prediction Procedure for Electronic Equipment. Other methods may be used to estimate the reliability of certain products and/or subsystems. System reliability predictions take into account the impact of redundant components.

Component parameters and assumptions

The default methodology for MTBF predictions is Telcordia method 1, case 3. Assumptions include 25oC system inlet air temperature, quality level II components, ground-based, fixed, controlled environment, and 100% duty cycle. Components internal to the system are assumed to be operating at 40oC ambient and 50% electrical stress.

Dell does not provide MTBF data below the system level.

Supplier MTBF data

In developing system MTBF predictions, Dell uses subsystem MTBF data that is provided by suppliers.

Apart from the use of industry standard prediction methodologies, suppliers may derive MTBF data from reliability demonstration testing, life testing, actual field failure rate, or specification/datasheets.

Supplier data is provided as is to Dell, and Dell generally does not verify the accuracy of supplier data.

Subsystem MTBF data release policy

Dell does not release MTBF data below the system level. The reasons for this policy are:

- Dell considers internally designed subsystem MTBF data to be confidential intellectual property.
- Dell obtains supplier subsystem MTBF data under NDA and is prohibited from releasing it.