



OneConnect OCe11102

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OneConnect OCe11102

1. What is the OneConnect OCe11102?

The OneConnect OCe11102 is a product family of 10Gigabit Ethernet (10GbE) adapters based on the BladeEngine 3 (BE3) controller. The OCe11102 is the third generation of Emulex 10GbE adapters and includes support for high-performance Fibre Channel over Ethernet (FCoE) and iSCSI protocol offloads.

2. What are the specific OneConnect OCe11102 adapter models?

Short-Range Optical:

- OCe11102-NM Network Adapter (or Network Interface Card)
- OCe11102-IM iSCSI Adapter
- OCe11102-FM FCoE CNA and iSCSI Adapter

Direct Attach Copper (DAC):

- OCe11102-NX Network Adapter
- OCe11102-IX iSCSI Adapter
- OCe11102-FX FCoE CNA and iSCSI Adapter

Twisted Pair (10GBASE-T):

- OCe11102-NT Network Adapter
- OCe11102-IT iSCSI Adapter

3. Can optical transceivers be added to OCe11102-xX adapters?

Yes. The OCe10100-OPT kit includes two short-range optical transceivers to enable 10Gb Ethernet optical network connectivity for Emulex OneConnect OCe11102-xX and OCe10102-xX dual port adapters. With this kit, an OCe11102-xX or OCe10102-xX adapter can be converted to a OCe11102-xM or OCe10102-xM adapter.



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4. Do OneConnect 10GBASE-T adapters support FCoE?

FCoE is currently not support with 10GBASE-T adapters. An OCe11102-FT adapter with FCoE support will be released when switches are available that support FCoE with 10GBASE-T.

5. What are cable options for OCe11102-xT adapters?

OCe11102-xT adapters can be used with Category 6A or Category 6 twisted pair cables (or better). Category 6A cables can be used for distances up to 100 meters (330 feet). Category 6 cables can be used for distances up to 55 meters (181 feet). RJ45 connectors, also known as 8P8C (8 Position 8 Contact), should be used.

6. What are the OCe11102 enhancements relative to the OCe10102?

- 20% improvement in power efficiency resulting from:
- Integrated Network Controller Sideband Interface (NC-SI)
- Integrated 10GbaseSR (SFP+) Physical Interface (PHY)
- Support for Single Root I/O Virtualization
- Support for Windows Virtual Machine Queue
- Support for iSCSI over DCB
- Support for Universal Multi-Channel

7. What operating systems are supported with OCe11102 adapters?

- Windows Server 2003 and 2003 R2
- Windows Server 2008, 2008 R2 and 2008 R2 SP1
- Windows 7 (OCe11000 adapters only)
- VMware ESX/ESXi 4.0, 4.1 and 5.0
- Red Hat Enterprise Linux (RHEL) 5.5, 5.6, 5.7, 6.0 and 6.1
- SUSE Linux Enterprise Server (SLES) 10 SP3 and SP4, 11 SP 1
- XenServer 5.6, 6.0
- CentOS 5.5, 5.6, 5.7, 6.0 and 6.1
- Ubuntu 11.04, 11.10 (OCe11100-N adapters only)
- FreeBSD 8.1, 8.2, 9.0 (OCe11100-N adapters only)
- Oracle Linux 5.5, 5.6, 6.0
- Solaris 10, Solaris 11 Express

8. Do OCe10102 and OCe11102 adapters use the same firmware and drivers?

OneConnect OCe10102 and OCe11102 adapters share a common install package with the same drivers, but different firmware.



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9. What protocols are supported by OneConnect adapters?

OneConnect adapters provide offload support for the following protocols:

- TCP/IP (stateless offload)
- TOE
- FCoE
- iSCSI

10. Can more than one protocol be run per channel?

Yes. OneConnect supports offload for TCP/IP (and TOE) plus one block-mode storage protocol per channel. Examples would be TCP/IP plus FCoE or TCP/IP plus iSCSI.

11. Do OneConnect OCe11102 adapters support concurrent iSCSI and FCoE offload?

While BE3 architecturally can support concurrent offload, OCe11102 adapters support offload for TCP/IP (and TOE) plus one block-mode storage (iSCSI or FCoE) protocol per adapter.

12. How is the storage protocol selected?

One Command Manager provides the capability to choose FCoE or iSCSI offload for adapters that support storage protocols.

13. Can the adapter protocol supported be changed remotely?

Yes. IT administrators can change the protocol support on OneConnect adapters installed in remote hosts. This process is done one server at a time.

14. What is Data Center Bridging?

Data Center Bridging (DCB) encompasses a set of IEEE standards that enable a Converged Ethernet, often referred to as lossless Ethernet. DCB standards include:

- Priority-based Flow Control (PFC) - Manages I/O between initiator and target on a multi-protocol Ethernet link to insure a consistent stream of data, eliminates retransmission of lost packets.
- Enhanced Transmission Selection (ETS) - Allows bandwidth allocation based on protocol
- Congestion Notification (CN) - Transmission of congestion information end-to-end per traffic flow



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- Data Center Bridging Capability Exchange (DCBX) - Exchange of Ethernet parameters between DCB-enabled switches

15. Is DCB required for FCoE?

Yes

16. Is DCB required for iSCSI?

No. Conventional iSCSI over standard Ethernet is supported for OCe10102-I (and -F) and OCe11102-I (and -F) adapters. iSCSI over DCB is only supported with OCe11102-I (and -F) adapters

17. What is Single Root I/O Virtualization (SR-IOV)?

The PCI-SIG SR-IOV specification defines a standard way for a single root function, such as NIC port, to be divided into multiple virtual functions. SR-IOV supports two function types:

- Physical function (PF) – Full PCIe function that includes the SR-IOV Extended Capability used to configure and manage SR-IOV functionality.
- Virtual function (VF) - Streamlined PCIe function that supports data movement using a minimal set of configuration resources.

When functioning as an SR-IOV device, an OCe11102 adapter presents single or multiple PFs. Each PF can have zero or more VFs.

One of the primary goals of SR-IOV is to provide a way for virtual machines (VMs) to interface directly to a virtual function on an adapter, eliminating the overhead of device emulation by the hypervisor as part of the data path. The key benefit is improved performance resulting from the offload of I/O functions from the hypervisor to an I/O controller.

18. Do OCe11102 adapters support SR-IOV?

Yes. OCe11102 adapters are SR-IOV capable.

19. How many virtual functions (VFs) do OCe11102 adapters support?

With appropriate operating system support, up to 32 VFs per physical function, up to 128 VFs total per two-port adapter.



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20. Are there any x86-based hypervisors that support SR-IOV today?

Red Hat supports SR-IOV on an experimental basis with Kernel Virtual Machine (KVM) as of RHEL 6.0.

21. What is Virtual Edge Bridging (VEB)?

VEB standards are being developed by the IEEE 802.1Qbg working group. VEB provides local bridging between virtual machines (VMs) running on a virtualized server and external bridging to physical switches. The key benefit is I/O traffic between VMs does not leave the physical server. There are two types of VEB solutions:

- Software VEB - Virtual switch (vSwitch) that is included in the hypervisor. Host CPU resources are used by the vSwitch, leaving fewer CPU resources for VMS.
- Hardware VEB – Layer 2 switch is embedded in the Network Interface Controller (NIC). SR-IOV based VFs are used to support traffic between VMs. Networking is offloaded from the host, conserving CPU resources.

22. Do OneConnect OCe11102 adapters support VEB?

OneConnect OCe11102 adapters are capable of supporting VEB.

23. What is a Virtual Ethernet Port Aggregator (VEPA)?

With a VEPA, all I/O from VMs is routed to an external physical switch. As a result, the external switch can apply filtering and forwarding rules for network traffic based on individual VMs. VEPA also enables administration of security and priorities with well-Which NIC Teaming release is compatible with Version 3.0?.

OneConnect Version 3.0 Software Release

24. What is the Version 3.0 software release?

The Version 3.0 (V3.0) software release is an update to drivers and firmware for Emulex LightPulse® HBAs and OneConnect™ 10GbE adapters. It also includes an update to the OneCommand™ Manager management application.

25. What are the key new features?

- Universal Multi-Channel
- Support for iSCSI over DCB
- Support for Windows Virtual Machine Queue (VMQ)



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26. What version of OneCommand Manager is included?

OneCommand Manger Version 5.2

27. What operating system support is new with the V3.0 release?

- Windows Server 2008 R2 SP1
- Windows 7
- VMware ESX 5.0
- RHEL 5.7 and 6.1
- SLES 10 SP4
- XenServer 6.0
- Solaris 11 Express

28. What version of the NIC Teaming driver for Windows is supported?

NIC Teaming Driver Version 2.5.

29. What are the new features in NIC Teaming 2.5?

- Link Aggregation Control Protocol (LACP) support - switch-based dynamic load balancing
- 8-port host load balancing
- Increased scalability - 16 VLANs per server, 4 VLANs per individual adapter or team
- Windows Server 2008 R2 Hyper-V support with LACP and failover teams. Note: host load balancing and VLANs are not supported in the Hyper-V environment
- Command-Line interface

NIC Teaming 2.5 is compatible with Version 3.0 (and Version 2.3).

30. Which switches are supported with iSCSI over DCB?

iSCSI over DCB is initially supported with the Brocade 8000 10GbE converged switch and the corresponding Dell-branded PowerConnect B-8000e 10GbE switch. Support for more converged switches will be added in the future.

31. How are DCB settings coordinated between OCe11102 adapters and the switch?

The switch has the master configuration for DCB settings and communicates them on the network. The OCe11102 adapter uses these values to automatically set itself to be compatible with the switch.



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32. Does iSCSI over DCB require a DCB-enabled iSCSI array?

Yes. The array must be DCB-enabled. Similar to our OCe11102 adapter, the array automatically configures itself to be compatible with settings that are saved in the switch. For the EqualLogic array, there's a DCB checkbox that must be enabled and the VLAN id must be set for a complete DCB connection.

33. Which storage arrays are supported with iSCSI over DCB?

iSCSI over DCB is initially supported with the Dell EqualLogic PS6010XVS iSCSI storage array. Support for more storage arrays will be added in the future.

34. What are key benefits with iSCSI over DCB?

- Performance - iSCSI over DCB insures a consistent stream of data for deterministic performance and eliminates loss packets that can cause high latency.
- Quality of Service - iSCSI over DCB supports bandwidth allocation per protocol for better control of service levels with a converged network.

35. What is Universal Multi-Channel?

Universal Multi-Channel (UMC) allows multiple PCI functions to be created on each adapter port. The V3.0 implementation enables four functions per port for OCe11102 adapters. Each port can support four NIC functions or three NIC functions plus an iSCSI or FCoE function.

NIC functions are presented to the operating system or hypervisor as a physical port with a separate MAC address and assigned bandwidth. This enables a single adapter port to support different uses, such as payload traffic, guest migration and console management for virtualized servers.

36. How is UMC enabled?

UMC is enabled at boot time using the UEFI or x86 boot program.

37. How is bandwidth allocated to individual functions?

Bandwidth is allocated at boot time using the PXESelect or UEFI boot utilities. Bandwidth is allocated to each function as a percentage of the total 10 Gigabit bandwidth. The total percentage bandwidth for a physical port must equal 100%.



OneConnect Pay-As-You-Go

38. What is OneConnect “Pay-As-You-Go”?

The Pay-as-You-Go option allows OneConnect network adapters to be enabled to support iSCSI or FCoE storage using high-performance hardware offload.

39. What is an entitlement?

An entitlement is used to acquire a license that enables additional functionality. With OneConnect, the entitlement enables use of iSCSI and FCoE protocol offloads. Entitlements are purchased through Emulex channel sales distribution and are delivered as a paper license with an entitlement code.

40. What are the part numbers for Pay-As-You-Go license entitlements?

- OC-Storage-01A - 1 license entitlement
- OC-Storage-10A - 10 license entitlements

41. Are there different entitlements to enable iSCSI and FCoE for OneConnect NICs?

No. There is only one entitlement option and it enables both FCoE and iSCSI offload. Only one of the storage offloads can be activated or used at a time.

42. Is an entitlement required to use iSCSI with OneConnect FCoE adapters?

No. With the requisite versions of firmware, driver and OneCommand Manager, OneConnect FCoE CNAs can run either iSCSI or FCoE protocol offloads.

43. Is an entitlement required to use FCoE with OneConnect iSCSI adapters?

Yes. OneConnect iSCSI adapters as shipped from the factory do not support FCoE

44. Does the entitlement apply to both ports of the OneConnect adapter?

Yes.

45. Can the enablement license be transferred to a different adapter?

Yes. Enablement licenses can be reassigned (or “rehosted”) to a different adapter. The primary use is to support field replacements and warranty advancement replacements. When possible, Emulex will verify that the originally licensed adapter is returned.



Frequently Asked Questions (FAQs)

46. Will the enablement license be active if adapter is moved to another server?

Yes.

47. Is there a batch process to acquire and install multiple license keys?

Yes. Multiple license key support is done using the EixLE volume licensing software utility that works with the OneCommand Manager command line interface.

48. Can entitlements purchased through distribution be used with OEM OneConnect NICs?

No. Entitlements purchased through distribution channels can only be used with OneConnect adapters that were also purchased through distribution channels.

