



FAQ Emulex OneCommand™ Vision 2.1

February 8, 2012

Frequently Asked Questions - External

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OneCommand Vision 2.1 Highlights

1. What is Emulex OneCommand Vision?

Emulex OneCommand Vision is an intelligent application that provides proactive management of I/O within data center and cloud storage environments. OneCommand Vision gives IT administrators the ability to maximize I/O resource utilization and proactively enhance performance and availability by monitoring and analyzing the I/O layers within the infrastructure. This includes the operating system (OS), adapters, network and the array end-points. OneCommand Vision's non-intrusive software architecture integrates easily into existing data center environments. Without OneCommand Vision, time to resolution can take hours or even days.

OneCommand Vision is designed for use in heterogeneous network environments, providing broad operating system support and interoperability with Emulex and non-Emulex adapters. Its distributed deployment model delivers superior scalability and a comprehensive global view of I/O performance and availability status, making it the solution of choice for IT administrators.

2. Has OneCommand Vision 2.1 been released?

Yes. OneCommand Vision 2.1 was released February 8, 2012.

3. What's new in Emulex OneCommand Vision 2.1?

OneCommand Vision 2.1 delivers support for IBM AIX Power platforms and cutting edge LUN SLA management that allows administrators to establish LUN SLAs that consider throughput, IOPS, Path Availability and I/O latency. These new LUN SLA enforcement capabilities enable monitoring and reporting services tailored for private or public cloud deployments.

Release 2.1 also improves server scalability with the ability to monitor 40 percent more virtual servers (80K I/O paths physical and 30K I/O paths virtual) and accelerated GUI performance. Key new features also include Role Based Management and GUI Data Export, allowing users to save data in PDF and CSV formats. New Intelligent Event Decoding has also been added, starting with support for SCSI Check Condition and RSCN events.



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Release 2.1 also expands OS and hypervisor support:

- AIX v6.1 - (Power)
- Linux KVM
- Solaris 10 update 10, 11 - (Sparc)
- RHEL 6.2, SLES 11

OneCommand Vision Overview

4. What problem does OneCommand Vision solve?

Typically, as a data center expands, it can become unwieldy to manage, impacting its overall efficiency and affecting production application performance and availability. Although there are monitoring tools that monitor server or storage performance, currently, there are no solutions that monitor and analyze end-to-end I/O performance. The lack of visibility into I/O performance has made the task of baselining end-to-end performance, identifying existing problems and proactively optimizing storage network performance quite difficult. OneCommand Vision was developed to help manage application I/O performance by collecting, analyzing and alerting on the I/O latency, I/O-related events and I/O profile of all monitored I/O paths in a storage area network (SAN) environment.

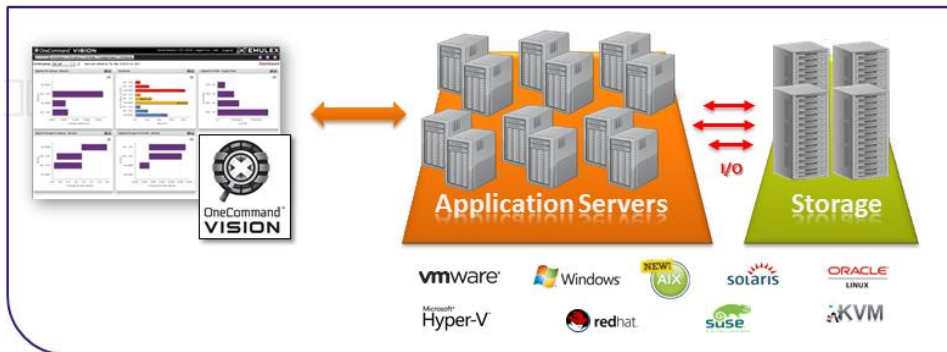
OneCommand Vision:

- Improves customer satisfaction – Helps to establish and meet service level agreement (SLA) commitments
- Improves operational expense (OpEx) – Shortens time to resolution
- Improves capital expense (CapEx) – Increases utilization of existing IT resources
- Improve Consolidation Initiatives – Better performance assessment



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5. What does a typical network topology look like with OneCommand Vision?



6. How does OneCommand Vision help IT administrators?

OneCommand Vision enables IT administrators to:

- See end-to-end I/O performance at the:
 - Application level
 - Server level
 - Storage level
 - LUN level
- Solve I/O degradation issues
 - I/O oversubscription
 - Availability issues
 - I/O infrastructure resource requirement
- Save
 - Enhance application availability
 - Improve asset utilization
 - Increase management efficiency

7. Prior to OneCommand Vision, how did IT administrators identify I/O performance and availability issues?

OneCommand Vision puts critical I/O performance and availability related information within easy reach. Prior to OneCommand Vision, IT administrators would first have to wait for performance to degrade to the point where application outages would occur, then rely on various vendor tools that helped to obtain a subset of the necessary information. More complex issues would typically require sorting through various driver level log files (i.e., system event log in Windows and message log in Solaris and Linux) or changing the environment in the middle of an issue by adding expensive and invasive



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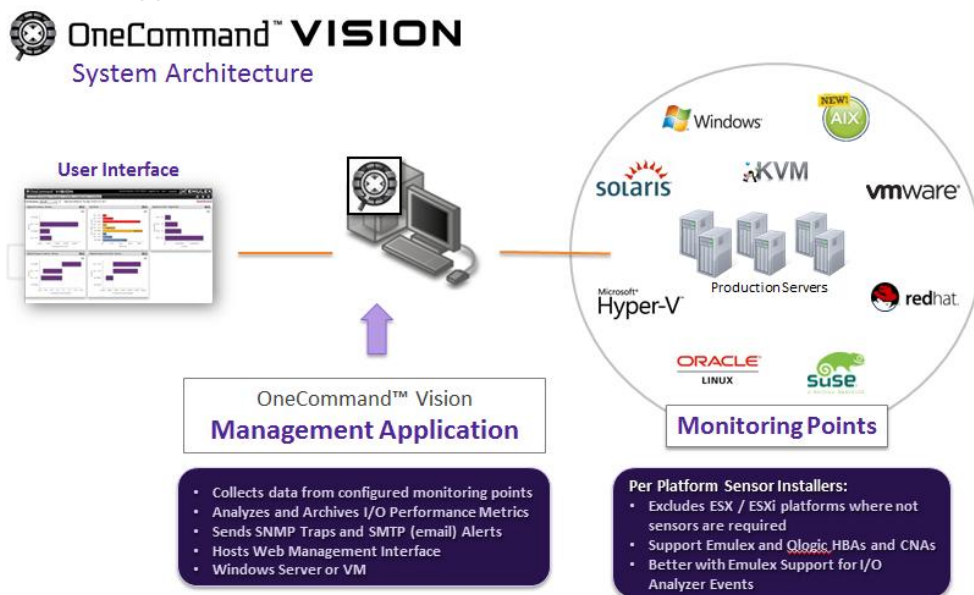
monitoring hardware. In addition, IT administrators had very little or no historical I/O performance information. While today's OS platforms provide the means to obtain I/O performance information, they lack consolidation, trending and tracking capabilities.

OneCommand Vision - Components

8. What are the “components” of OneCommand Vision?

OneCommand Vision is a simple to deploy, non-intrusive software solution, comprised of the following key components:

- Intelligent Management Application
- Monitoring points
- Web Application



9. What is the “Management Application”?

It is the intelligent software component that collects performance and availability data from the monitoring points, analyzes the data and alerts users when pre-configured performance thresholds are exceeded. The Management Application is also responsible for generating various reports.



10. What is a “monitoring point”?

A monitoring point is a SAN-attached production server that the OneCommand Vision application monitors. OneCommand Vision can monitor a broad range of OS environments (see below for supported OS environments). The monitoring points report I/O performance and availability data to OneCommand Vision’s management application.

11. What is the “Web Application”?

The Web Application is an Adobe Flash application served by the Management Application. It provides an intuitive, responsive interface into the OneCommand Vision system for configuration of system setting and alerts as well as visualization of captured performance data.

The Web Application offers several Intelligent Feature Modules (IFMs) that make up the core features of the OneCommand Vision system.

12. What are the “core” features of OneCommand Vision?

The OneCommand Vision application includes multiple feature modules which present comprehensive end-to-end I/O performance and event data helping you to maximize performance, availability and storage infrastructure utilization.

Dashboard

Using summary reports, the dashboard is a convenient way to view the system-wide data that is important to the health of a data center. At a glance, you can visually monitor servers, target ports and negative alerts using five windows that show a chart or table depending on your preference. The dashboard is automatically refreshed after each collection period. You can also manually refresh the dashboard at any time with the most current data.

I/O Latency

The I/O Latency module shows the “application” view of the time required by the network to complete I/O transactions. I/O latency is a key indicator for enabling insight into performance I/O health status for all I/O paths across the enterprise.

I/O Analyzer

The I/O Analyzer module provides deep SCSI and wire protocol analysis to highlight hidden system issues that normally go undetected until after a major outage event. The OneCommand Vision application collects and analyzes protocol events such as busy errors from the switch or storage, queue full errors from the storage or link and process-level errors, so that you are able to solve or prevent complex data center outages.



I/O Profile

The I/O Profile module shows essential characteristics of the I/O transactions and storage infrastructure configuration which can be critical in identifying I/O bottlenecks and availability issues within the storage network. This enables you to load balance the storage infrastructure. The I/O Profile module provides the following types of information:

Intelligent Alerts

The Intelligent Alerts module collects and analyzes specific conditions that occur relative to I/O latency, I/O volume and protocol errors for all I/O paths across the enterprise. Customizable thresholds with adjustable priorities enable you to identify and resolve I/O bottlenecks and availability problems.

I/O Reports

The I/O Reports module provides a data center-wide view of the network, making pertinent network information, such as size, availability, performance and utilization, accessible, enabling efficient management across the enterprise.

13. What additional benefits does OneCommand Vision provide?

OneCommand Vision captures and provides data about a system's I/O performance and availability. The data can help IT administrators predict and resolve performance, as well as availability, issues within the enterprise data center.

Using summary reports, the dashboard is a convenient way to view the system-wide data that is important to the health of a data center. At a glance, you can visually monitor servers, target ports and negative alerts using five windows that show a chart or table depending on your preference.

OneCommand Vision offers the following reports:

- Highest I/O Latency-Servers - reports the top 20 servers with the highest latency in the last collection period
- Highest Change in Latency-Servers - reports the top 20 servers with the highest % change in I/O latency
- Highest Change in # of I/Os-Servers - reports the top 20 servers with the highest % change in the total number of I/Os
- Highest # of I/Os-Target Ports - reports the top 20 target ports with the highest number of I/O operations in the last collection period



- Top Alerts - reports the top 20 servers, targets or LUNs with the highest count of triggered alerts

OneCommand Vision also helps IT administrators to quickly resolve, and even predict, complex data center performance, availability and outage issues by proactively collecting and analyzing important protocol events (SCSI and Fibre Channel). The following are examples of the protocol events that OneCommand Vision captures:

- Device Busy Errors: When storage devices can no longer process additional I/O workloads, they generate and send the OS a “busy” error, after which the OS once again resends the I/O. Multiple “busy” errors can significantly affect data center performance, as they are an indication of an overloaded network.

OneCommand Vision detects these “busy” errors and reports them, enabling IT administrators to take the necessary steps to correct the problem.

- Queue Full Errors: When LUNs can no longer process additional I/O workloads, they generate and send the OS a “queue full” error for the affected logical unit number (LUN). A high number of these events could indicate a device that is either overloaded or is experiencing some intermittent inability to effectively handle commands. The key in troubleshooting “queue full” errors is to understand application-to-LUN relationships.

OneCommand Vision is designed to proactively alert IT administrators of “queue full” errors. It maps out application-to-LUN relationships and provides diagnostic data that can then be used to determine why the application lost connectivity with a specific LUN. For the highest level of accuracy, OneCommand Vision captures data from the OS stack, adapter, switch and the storage array.

- Link-and Process-level Errors: These are errors related to the status of the physical (link) and logical (process) connections between the initiator and target device. Intermittent link and process issues are very difficult to diagnose, and OneCommand Vision’s ability to detect and alert based on these issues is a very powerful tool for today’s complex data centers.

I/O Profile: OneCommand Vision I/O Profile module shows essential characteristics of the I/O transactions and storage infrastructure configuration, which can be critical in identifying I/O bottlenecks and availability issues within the storage network. This enables IT administrators to properly load-balance their storage infrastructure. An improper server-to-storage connection ratio will cause an over-subscription condition that negatively impacts network performance and applications’ availability. The challenge resides in the fact that IT administrators cannot readily access information they need to take the guesswork out of establishing the correct server-to-storage connection ratio.



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OneCommand Vision addresses this challenge by providing performance data on the I/O traffic volume for a specific storage port. With this data, IT administrators can refine and adjust server-to-storage connection ratios, effectively avoiding over-subscription conditions. IT administrators can program OneCommand Vision to trigger alerts based on user-established I/O volume thresholds.

Here are some examples of the type of information reported:

- **I/O Volume:** Shows real-time data on the I/O traffic volume for a specific storage port. The amount of I/Os that are successfully sent to the storage is a key indicator whether there is a bottleneck within the various I/O handling layers, such as the hypervisor scheduler, SCSI stack within the host operating system or within the hypervisor layer, adapter stack, blade switch stack, front-end target storage port and back-end spindles.
- **Initiator Fan-in:** Displays the number of initiators connected to a storage port. The data can be used to identify and avert over-subscription bottlenecks. An improper initiator-to-storage connection ratio will cause an over-subscription condition that negatively impacts network performance and applications' availability.
- **Top Talkers:** Reveals which servers are sending the most amount of I/O traffic to the storage ports. This allows administrators to quickly offload overburdened storage infrastructure resulting in a more load-balanced network.

OneCommand Vision intelligently monitors incoming I/O performance data identifying trends and triggering alerts when specific conditions are detected relative to I/O latency and volume trends, I/O protocol errors and other I/O error conditions for all I/O paths across the enterprise. Customizable thresholds with adjustable priorities enable administrators to proactively identify and resolve I/O bottlenecks and availability problems. The alerts generated identify I/O bottlenecks occurring at a specific server or at a server group level. Some examples of conditions detected by OneCommand Vision include:

- Absolute Latency Alert
- Increasing Latency Alert
- Between Path Volume Variance
- Fabric busy
- Increase in I/O path latency
- Initiator to target port fan in ratio
- Path instability



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- Single path LUN alert
- Target port overload

OneCommand Vision: “What, How, Can and Does It?”

14. How does OneCommand Vision notify IT administrators of alerts?

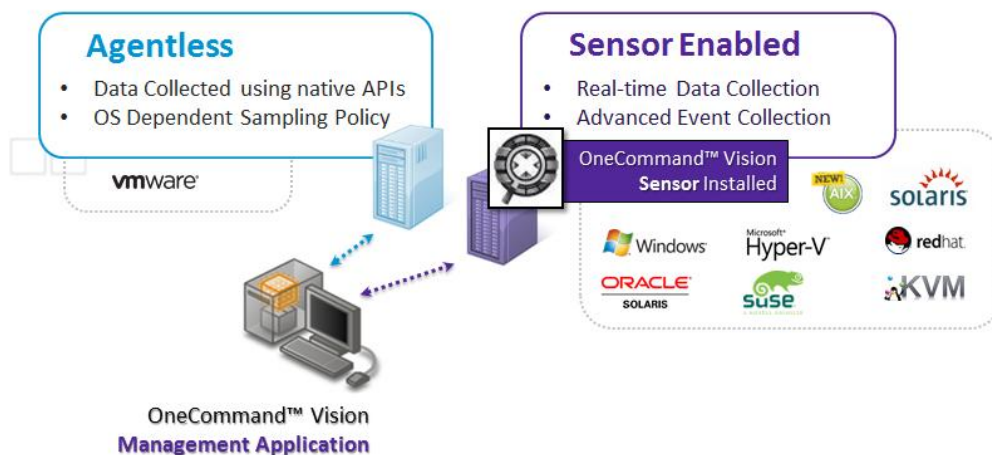
OneCommand Vision uses e-mail (SMTP) support and SNMP trap support for alert notification. SNMP traps can be easily integrated into other third-party frameworks such as HP OpenView (Operations Manager) and Microsoft System Center Operations Manager (SCOM).

15. How many ‘types’ of Monitoring Points are there?

Monitoring points are the SAN-attached production servers that OneCommand Vision monitors. The monitoring point captures real-time I/O performance related data that is collected at specified time intervals by the Management Application.

There are two types of monitoring points: agentless and sensor-enabled.

Two Kinds of Monitoring Points ...



16. What are Agentless Monitoring Points?

On some systems (currently limited to VMware ESX and vSphere servers), the Management Application can collect vital I/O performance information using existing APIs provided by the host OS. To access these systems, OneCommand Vision typically requires some form of authentication credentials



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(username and password) to gain access to the system by the API. The OneCommand Vision web application allows for the configuration of credentials that can be used by Vision to collect data.

17. What are Sensor-Enabled Monitoring Points?

Most systems do not provide I/O performance data with existing OS APIs. For those systems OneCommand Vision relies on sensor software to probe, collect, and compress real-time I/O performance information.

On systems running supported Emulex drivers and management software, sensors can collect additional events that are often not available to administrators under normal operating conditions.

18. What is a OneCommand Vision Sensor?

The OneCommand Vision Sensor is designed to collect critical I/O performance data while consuming the smallest possible production server memory and CPU footprint. Its unique data compression technique and communication protocol helps to optimize network bandwidth.

19. How much system resources does OneCommand Vision consume?

The OneCommand Vision sensors on the monitoring points (operating on production servers) use minimal system CPU, memory, and network resources; therefore, impact to server performance is practically imperceptible. In VMware environments, there is no Vision footprint on the server.

20. Which operating systems are supported by the OneCommand Vision 2.1 Management Application?

The OneCommand Vision Management Application software is available on the following Windows platforms:

- Windows Server 2008 SP2 (x86, x64) - Standard, Enterprise and Datacenter editions
- Windows Server 2008 R2, R2 SP1 (x64) - Standard, Enterprise and Datacenter editions

21. Which operating systems can be monitored by the OneCommand Vision 2.1 System?

The sensor software is available on the following platforms:



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- IBM AIX (PowerPC 64) - v6.1 (VIOS v2.1)
- Linux KVM Kernel (x86, x64) - v0.12.x
- Oracle Enterprise Linux (x86, x64) – v5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7 and 6.0
- Oracle Enterprise Linux IA64 - v5.4, and 5.5
- Red Hat Enterprise Linux (RHEL) (x86, x64, PPC) - v5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 6.0, 6.1, and 6.2
- Red Hat Enterprise Linux (RHEL) IA64 - v5.1, 5.2, 5.3, 5.4, 5.5, 5.6 and 5.7
- SUSE Linux Enterprise Server (SLES) (x86, x64, PPC, IA64) - 10 (SP1, SP2, SP3 and SP4) and 11 (SP1, SP2)
- Solaris SPARC (64-bit) – v10, v10u10, and v11
- VMware ESX/ ESXi – v3.5, v4.0, v4.1, v5.0 (x86, x64) – Normal and Lockdown mode
- Windows Server 2003 SP1, SP2 (x86, x64) - Standard, Enterprise and Datacenter editions
- Windows Server 2003 R2 SP2 (x86, x64) - Standard, Enterprise and Datacenter editions
- Windows Server 2008 SP1, SP2 (x86, x64) - Standard, Enterprise and Datacenter editions
- Windows Server 2008 R2, R2 SP1, R2 Hyper-V (x64) - Standard, Enterprise and Datacenter editions
- Windows Server Core (x86, x64) - Standard, Enterprise and Datacenter editions

22. Is additional operating system support planned for OneCommand Vision in CY2012?

Yes. IBM AIX v5.3, v7.1, Microsoft Server 8, Linux Citrix Server, and Solaris 11 updates are planned to be supported soon.

23. Is there a minimum Emulex driver version which must be in use in order to work with OneCommand Vision?

No, there are no minimum driver revision requirements. To make full use of the I/O Analyzer module, with additional protocol events, one must run at the minimum driver versions in the following table.



OS Environment	Emulex Driver Version Requirement
Windows 2003 Windows 2008	Emulex Adapters running Storport v2.20 and beyond
Linux RHEL 5 Linux SLES 10	Emulex Adapters running driver v8.2.0.33 and beyond
Solaris 10 Solaris 11	Emulex Adapters running driver v2.40 and beyond
ESX 3.5 and 4.x	Capabilities are in box for some of the I/O Analyzer protocol events for both Emulex and non-Emulex HBAs

24. Can OneCommand Vision be deployed in virtual server and virtual adapter environments?

Yes. OneCommand Vision in fact can be an invaluable diagnostic resource in virtual data center environments, where over-subscription conditions can easily occur.

25. Are there currently any hardware (adapter, server, switch or storage array) limitations?

No. OneCommand Vision captures and provides data from Emulex and non-Emulex brand of I/O connectivity adapters, switches or storage arrays. However OneCommand Vision does capture and present a richer set of I/O-related performance data when used in conjunction with Emulex solutions running the minimum driver versions above.

26. Does the firewall configuration need to be modified for communication between the OneCommand Vision components?

OneCommand Vision leverages standard SNMP ports, and as long as servers have SNMP ports open for communication, then no additional firewall configurations are required. SNMP Version 2 and 3 are supported configuration options.



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27. Can OneCommand Vision be integrated into existing enterprise management applications?

OneCommand Vision can be configured to send SNMPv2 and v3 traps when Intelligent Alerts are triggered. These SNMP trap messages provide an easy integration into third-party frameworks, such as HP OpenView (Operations Manager) and Microsoft SCOM.

For more information on specific plug-ins (licensed third-party connectors), please contact Emulex at 1-877-359-3263.

28. Can OneCommand Vision assist in managing cloud environments?

Yes. One of the biggest challenges in cloud environments is the increased sharing of infrastructure. While this increases efficiencies, the very premise of cloud architectures, the increased sharing creates inadvertent performance bottlenecks. OneCommand Vision can be applied to baseline application performance to ensure that the potential cloud migration will provide adequate I/O performance. OneCommand Vision can also be deployed at the edge, or within cloud environments, to establish and monitor availability and performance SLA's.

29. Where can I find more information about OneCommand Vision?

OneCommand Vision Product Landing Page

<http://www.emulex.com/vision/>

OneCommand Vision Product Launch Folder

<http://emuweb.emulex.com/salesmktg/Launch%20Kits/Forms/AllItems.aspx>

Partner/Channel Pages

<http://www.emulex-channel.com/>

Emulex Resource Pages

Blog

<http://www.emulex.com/blogs/labs/>

Webcast

<http://www.emulex.com/resources/webcasts.html>



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30. Who can I contact for more information on OneCommand Vision?

You can contact Emulex sales at 1-877-359-3263 or visit www.emulex.com.

