Fact sheet

HP Ethernet Virtual Interconnect and Multitenant Device Context

Enable Cloud Computing with multi-tenancy and simple Data Center Interconnection
Overview

Cloud computing is a vehicle for delivering IT infrastructure as a service to an ever increasing number of mobile users with unlimited appetite for information around the globe. In order to support the requirements of Clouds, enterprise data centers must be virtualized to have all network, storage and compute resources available to be dynamically allocated to applications. Today, IT professionals also have to find ways to interconnect geographically dispersed data centers and make them work as a unified enterprise with appropriate capacity and resiliency.

Today, it takes months of manual configuration tasks and redesign of networks to connect data centers in order to achieve higher reliability and agility for disaster recovery and business continuity. The complexity and labor intensive labor of the involved effort, cries for solutions that simplify and automate the processes of setting up private clouds and connecting distant data centers so as to facilitate and accelerate the movement of virtual machines workloads in environments that are secure, uniformly managed and orchestrated. The ever increasing customer needs for applications that meet changing business needs while maximizing return on investment necessitates the move towards multi-tenancy in data centers. New business and technology environments call for adaptive solutions that respond in time for changing business requirements.

HP Ethernet Virtual Interconnect (EVI) and Multitenant Device Context (MDC) are new solutions that are aimed at interconnecting geographically dispersed data centers, enabling multi-tenancy and private clouds easily, quickly, securely and reliably.

Ethernet Virtual Interconnect

HP Ethernet Virtual Interconnect (EVI), a new HP Virtual Application Network innovation and component of the HP Data Center Interconnect (DCI) solution, enables IT staff to simplify the interconnectivity of up to eight geographically disperse data centers. As a result, clients improve disaster recovery capabilities and can quickly respond to changing market conditions by easily moving virtual machines in minutes without network delay to any interconnected data center.

As enterprises race to adopt virtualized environments and Cloud computing, they need to deliver infrastructure as a service and to connect geographically dispersed data center to meet rising customer expectations. Unfortunately, many interconnect methods suffer from limitations, including transport dependency, complexity and lack of resiliency. HP Ethernet Virtual Interconnect is designed to address these limitations by delivering responsive, efficient and resilient data center interconnect solution.

HP EVI runs over Internet Protocol (IP) transport and extends layer 2 domains across the networks of the connected data centers. By virtualizing and automating a layer 2 domain across data centers, HP EVI delivers the elements necessary to enable a software-defined networking (SDN) data center infrastructure. It enables several data centers to work as one that is more responsive, with higher efficiency and solid high availability for business resiliency. With EVI, enterprises are able to accelerate the delivery workload mobility with remote vMotion, increase applications performance with load balancing, and achieve optimum degrees of high availability and disaster recovery for valuable data. When used along with HP’s IRF switch virtualization technology, EVI delivers greatly enhanced reliability, resilience and faster remote vMotion capabilities. The combination of EVI and HP MDC brings multi-tenancy to Cloud-ready and remotely connected data centers.

Features and Benefits Highlights

- Ground breaking DCI solution that can setup new data centers in minutes using five (5) simple steps. That reduces labor intensive setup times from weeks on legacy systems to few minutes
- Simplified data center connectivity with the industry’s only (1) DCI overlay technology to provide “single touch” connection of up to eight data centers around the world. Customers can optimize server and storage resources by using the HP EVI links between data centers to move virtual machines, such as Microsoft Exchange or Instant Messaging workloads, between data centers
- Innovative IP transport solution that can be deployed without requiring changes in existing networking infrastructure. This simplifies deployment and allows EVI to be added to data centers seamlessly and without disruptions
• HP EVI extends Layer 2 connectivity across networks eliminating the need to deal with Layer 3 interconnect dependencies. EVI also makes it possible to implement loop isolation and prevent undesirable failures

• HP EVI enables reliable vMotion support for mobile workloads that are necessary for virtualized and Cloud computing environments. When coupled with HP IRF, the combination gives enterprises a reliable means for remote vMotion and increased available network bandwidth

• HP EVI solution is designed to enable a real world multi-tenant environment with MDC which can scales to 128 EVI networks for different sites and applications

• HP EVI solution offers greater scalability as it supports up to eight data centers, which is more than competing solutions

• HP EVI scales to support up to 4096 VLANs

• HP EVI also delivers automatic high availability and load balancing when used with LACP and HP IRF

• HP EVI will be initially supported on the HP 12500 Series data center switches

Diverse Data Center Interconnect Solution

• **Simplified setup in minutes:** HP EVI can be deployed using five simple commands, which gives customers the ability to connect new data centers in minutes rather than in months

• **Mobile Workloads and long distance vMotion:** HP EVI establishes reliable DCI connections that serve as a platform for fast and reliable vMotion between distant data centers. The added speeds of up to 80% improvement of vMotion enhance the value of workload mobility and make applications more available to users

• **Flexible Deployment:** HP EVI extends layer 2 network domains across remote networks and is deployed using customers’ existing IP infrastructure

• **Simplified DCI management:** with HP Intelligent Management Center (IMC), a single pane-of-glass management platform across virtual and physical networking environments

• **Investment Protection:** HP EVI is an IP transport solution that works with customers’ existing IP networking infrastructure without requiring changes. This protects networking investments and allows easy and seamless deployment and expansion

• **Enhanced network resiliency:** by combining HP EVI with the capabilities of HP Intelligent Resilient Framework (IRF), an HP innovation that allows multiple switches to be virtualized and operated as a single switch
Enabling Business Resiliency

- **High Availability:** The HP EVI solution establishes active/active links between data centers. Along with HP IRF, EVI establishes reliable links with link aggregation and failover capabilities giving users uninterrupted access to applications in the event of disruption of service at one data center.

- **Disaster Recovery and Data Replication:** Data and workloads can be replicated, or moved across data centers using EVI. In the event of failure, EVI provides the means to quickly recover data from remote data centers and ensures business continuity. Workloads and users can utilize resources in remote data centers without disruption to applications or users’ work.

- **Resiliency:** In addition to the reliability and resilience provided by IRF, EVI uses L2 MAC routing mechanisms to further enhance data center resiliency. EVI features multi-homing, prevents loops from forming on the network, and provides multiple redundant links between data centers.

- **Responsiveness and High Performance:** As an STP-free implementation, EVI frees network bandwidth for applications and enhances performance with faster re-convergence time. HP tests show that EVI improves long distance vMotion performance by up to 80% over STP solutions when combined with HP IRF solution.

Features and Benefits Highlights

- Up to 75% reduction in physical devices. The most obvious benefit of MDC is the dramatic reduction of physical devices that enterprises need to deploy. With up to 75% reduction in the number of deployed platforms, enterprises realize unprecedented simplification of data center setup, management and of course better utilization of space and lower CapEx and operation costs; OpEx.

- Complete and secure isolation of tenants. Each tenant has its own dedicated resources and its own EVI interconnects. The total separation of tenants protects the privacy of each tenant and gives them their own secure environment.

- Higher vMotion capacity. The combination of MDC and EVI enables more efficient use of physical networking platforms to deliver higher density of EVI links for rapid and reliable vMotion support of mobile workloads that are necessary for virtualized and Cloud computing environments. When coupled with HP IRF, the combination gives enterprises a reliable means for remote vMotion and increased available network bandwidth.

- Higher scalability. With HP MDC, data centers DCI links become more productive and more easily scalable. Each MDC can have its own EVI links forming up to 32 EVI networks. That translates into an amazing scale of 128 EVI networks for different sites and applications.

Multitenant Device Context

HP Multitenant Device Context (MDC) is an innovative data center virtualization software solution that is part of the HP Virtual Application Network architecture. MDC enables multi-tenancy on networking platforms for Cloud-ready data center environments. With MDC, customers can virtualize physical networking platforms, such as HP 12500, and segment them into up to four virtual switches. In other words, MDC gives customers the ability to virtualize one physical switch into up to four logical devices, with each logical switch having its own tenants. HP MDC provides complete and secure separation of logical switches between the multiple tenants residing on the same physical switching platform. With MDC, there is complete separation of control planes, data planes and forwarding capabilities of logical tenants. In addition to that, each tenant can take advantage of its own up to 4k VLANs, its own IRF configurations and its own EVI networks.
• When used with HP Intelligent Resilient Framework (IRF) technology, MDC provides simplified management and enhanced resiliency by extending the control and management planes across two MDCs running on two different physical switches.

• Simplified management. With HP Intelligent Management Center (IMC), a single pane-of-glass offering consistent management platform across all virtual tenants that are managed as part of the entire enterprise covering virtual and physical networking environments.

• HP MDC and EVI solution offers customers lower cost of ownership in the areas of cost of acquisition and licensing. Our research has shown a 56% lower cost of the HP solution as opposed to comparable Cisco one.

• Enhanced resiliency of network platforms. By combining HP MDC complete and secure separation of tenants with the capabilities of HP EVI remote data centers interconnect, and the reliability and performance of HP Intelligent Resilient Framework (IRF), customers enhance the resiliency of their physical networking platforms while improving the productivity of these platforms.

Figure 1. HP EVI TCO vs. Cisco OTV

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<th>HP 12500 Base System</th>
<th>Cisco Nexus 7000 Base System</th>
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**EVI and MDC Use Models**

- The HP Ethernet Virtual Interconnect extends Layer 2 across geographically dispersed data centers delivering high availability and business resiliency. HP EVI can be deployed over any IP based infrastructures. Shown below is an example of EVI deployment.

- HP EVI and MDC work together offering customers potent solutions for virtualized data centers and private clouds. With both technologies customers can deploy multitenant, long-distance data and workload mobility along with disaster recovery solutions that ensure business resilience and continuity. HP EVI gives customers the ability to configure data centers for long distance connectivity and cloud support in minutes.

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**Figure 2.** IP-based Data Center Interconnect

- Control plane Mac learning
- Automatic SPT isolation
- Built-in HA redundancy
- Scalable architect
- Scalable to all VLAN
- Simplified deployment and management
Figure 3. EVI use cases for Virtualized Data Center

- Long-distance workload mobility
- Long-distance data mobility
- Disaster recovery
- Business continuity

Virtualized data center 1

- Deploy over existing network
- No redesign required
- Five configuration steps per site
- Automatic fault isolation

Virtualized data center 2

- Ethernet extension any transport
Figure 4. EVI & MDC use case for Private Cloud Data Center

- **Cloud bursting**
- **Long-distance workload & data mobility**
- **Disaster recovery & business continuity**

- 75% reduction of devices lowers cost
- DCI in minutes from months
- 80% faster vMotion with IRF*
- 500X faster vMotion failover with IRF*

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