

Overview

Cisco® Application Control Engine (ACE), integrated with Cisco Nexus® 7000 Series Switches and VMware vCenter, delivers dynamic workload scaling to enable faster and more efficient deployment of distributed data centers. This integration is an integral component of the Cisco ACE the Virtual Data Center (AVDC) solution that enables the latest innovations in virtualized and cloud computing technologies.

The Cisco ACE product family addresses many of the core challenges facing the virtual data center. These products provide an application delivery solution that improves application scale and availability while enabling better utilization of infrastructure resources through offloading and compression technologies.

Cisco ACE Dynamic Workload Scaling (DWS) integrates Cisco ACE load-balancing technology with Nexus 7000 Overlay Transport Virtualization (OTV) technology and VMware virtualization to deliver application resiliency and flexible workload mobility in distributed environments. This integration expands Cisco ACE products to include the following capabilities that integrate into today's virtual data center:

- **Virtual machine intelligence:** Greater visibility into the state of virtual machines, applications, and the underlying support infrastructure.
- **Automation:** Enhanced coordination and integration with third-party products (such as VMware vCenter), allowing Cisco ACE to respond dynamically to changes in the network and share network events.
- **Performance and scalability:** Hardware enhancements that address the increased scalability requirements demanded by large enterprise and service provider customers
- **Flexibility:** Capability to deploy and dynamically scale application services in distributed data centers using virtualization technology

What Does Cisco ACE Dynamic Workload Scaling Do??

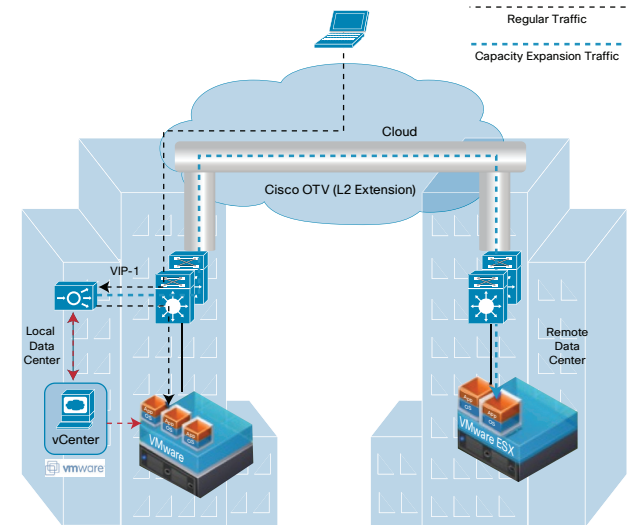
Virtualization technology is gaining momentum in enterprise data centers; Enterprises are adopting this technology to increase compute resource utilization and obtain cost savings and operational benefits. In virtualized environments, virtual machines can move anywhere in geographically distributed data centers to provide added application resiliency and flexible workload mobility.

To enable all the benefits of distributed environments, Local Area Networks (LAN) must extend across diverse locations. Cisco OTV provides an optimized solution for Layer 2 connectivity extension across any transport. ACE leverages this technology to deliver application resiliency and flexible workload mobility.

Cisco ACE integrates with Cisco Nexus 7000 and VMware vCenter to deliver intelligent load-balancing in distributed data centers. Cisco ACE queries Cisco Nexus 7000 to obtain the virtual machine locality information and actively monitors the CPU and memory utilization of the local virtual machines to determine when local resources are scarce.

With virtual machine locality and resource utilization information, Cisco ACE is now able to make dynamic load-balancing decisions based on user configurations. During normal operations when local resources are sufficient, ACE load-balances the incoming traffic to only the local virtual machines. When local resources become scarce due to increased workload, ACE dynamically adds more compute resources to service the increased load by leveraging OTV to direct traffic to additional servers in a remote data center.

Figure 1. Cisco ACE Dynamic Workload Scaling Capability



Customer Challenges Addressed by Cisco Dynamic Workload Scaling

Data centers are evolving from a hierarchical architectural model to a flatter geographically distributed model that uses Layer 2 LAN extension technology to increase the availability of application services while optimizing compute resource capacity. One of the main factors accelerating these changes is the rapid adoption of server virtualization technology in data centers. In virtualized data center environments, virtual machines can move anywhere in the geographically dispersed data centers to provide higher application scalability. Customers gain the following benefits when transitioning to a distributed infrastructure:

- Increased utilization of available capacity
- Flexible application mobility
- Increased application resiliency



- Scalability of applications
- Preparation for cloud migration

While many benefits are gained by migrating to geographically dispersed data centers, challenges are encountered when a distributed infrastructure is deployed. Load balancing traffic to remote data centers can add latency because of the round trip to remote data centers, leading the IT department to want to increase the local computing resources before distributing the workload to remote data centers.

Increasing the local compute resources introduces the need for virtual machine intelligence. Otherwise, services cannot be delivered with optimal response times, resulting in suboptimal use of the distributed infrastructure. Cisco ACE dynamic workload scaling addresses these challenges:

- Virtual machine visibility: Integration with VMware vCenter enables ACE to actively monitor the current resource utilization of the local virtual machines to make an intelligent decision regarding whether to distribute workload locally or send it to the remote data center.
- Service latency: Cisco ACE enables customers to efficiently use the local compute resources before distributing workload to a remote data center. When the compute resources of the local virtual machines are fully used, ACE distributes the workload to a remote data center to service the increased load.

- Limited scalability: Integration with OTV provides increased capacity to scale an application across geographically dispersed data centers without compromising the autonomy of the data centers or the stability of the overall network. ACE dynamically adds remote compute resources to service increased workload when local resources become scarce.
- Complex deployments: Integration with Nexus 7000 and VMware vCenter enable ACE to service increased workload faster and simpler while preserving existing network design. As a result, businesses gain increased application resiliency while keep operating expenses low.

Business Reasons for Deploying Cisco ACE Dynamical Workload Scaling

- Increased application resiliency: DWS enables effective disaster-recovery mechanisms that increase availability of the applications through flexible workload mobility.
- Flexibility: DWS extends ACE intelligence to achieve greater virtual data center resilience, performance, and flexibility.
- Greater scalability: As data centers evolve from a hierarchical architectural model to a flatter Layer 2-based distributed model, DWS enables businesses to scale applications and the infrastructure without increasing the costs and resources needed for administration and management.

- Optimal hardware resource utilization: By distributing workload to a remote data center only when local compute resources have been fully utilized, Cisco ACE offers significant cost saving benefits and operational benefits.

For More Information

For more information about Cisco ACE The Virtual Data Center solution, visit www.cisco.com/go/ace