



Cisco Application Control Engine and Cisco Nexus 7000 Series Multi-Tenancy Architecture

Overview

Cisco® Application Control Engine (ACE) and the Cisco Nexus® Family of switches (Cisco Nexus 7000 Series Switches) offer features tailored to virtual environments, allowing consistent visibility, control, and isolation of applications in a multi-tenant architecture. The unique multi-tenancy capabilities of Cisco ACE and the Cisco Nexus 7000 Series are part of the Cisco ACE the Virtual Data Center (AVDC) solution, further accelerating application rollout while reducing consumption and costs in virtual environments.

Cisco ACE is the industry's only fully virtualized application delivery solution designed to meet the today's requirements for application delivery. ACE is a state-of-the-art virtualized load balancer and an application delivery solution that improves application scalability and availability while improving the utilization of infrastructure resources by delivering offloading and compression technologies.

The Cisco Nexus 7000 Series offers unique virtualization features that enable greater flexibility in network design to fully use existing or new data center space. The virtual devices on the Cisco Nexus 7000 Series Switch segregate different service groups inside the same physical Cisco Nexus 7000 Series Switch, consolidating the aggregation layer while preserving operations and service delivery organizational structure.

Cisco ACE and Cisco Nexus 7000 Series multi-tenancy provide scalable, reliable, and cost-effective application delivery and infrastructure services in the virtual data center. These virtualization capabilities provide secure isolation of application environments while delivering the following capabilities:

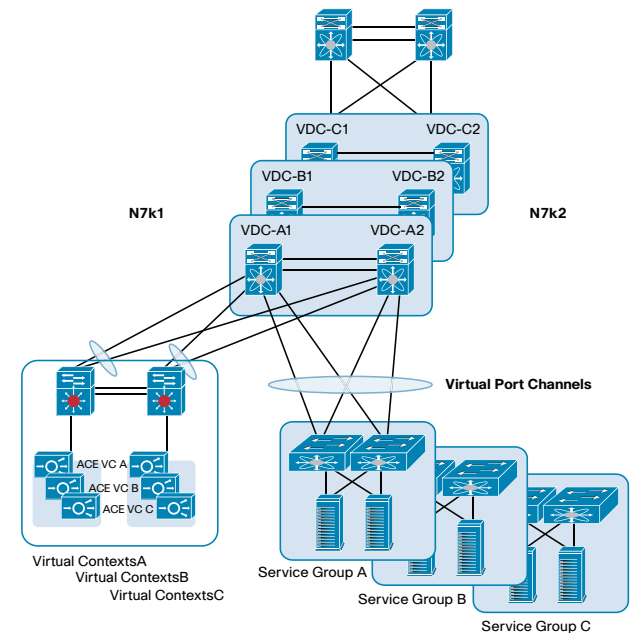
- **Performance and scale:** Unique virtualization capabilities add new dimensions to application delivery to deliver guaranteed resources to applications.
- **Simplification:** Deployment and ongoing maintenance of application services are streamlined through the virtualization capabilities of the Cisco ACE and Cisco Nexus 7000 Series.
- **Flexibility:** Multitenant architecture allows flexibility in overall network design to improve application delivery response time.

What Does Multi-Tenancy with the Cisco ACE and Cisco Nexus 7000 Series Do?

Cisco multi-tenancy enables a single physical device to be logically partitioned into many virtual devices. Each virtual device has all the capabilities of the actual physical device, and each virtual device is independent and isolated so that it appears to be a unique physical device from the viewpoint of the network and the network administrator. With virtualization, each virtual device can be allocated its own resources and quality of service (QoS). Each virtual device can also be assigned its own configuration files, management interfaces, and access-control policies in which access control privileges are assigned to users based on their administrative roles.

Multi-tenancy with Cisco ACE and Cisco Nexus 7000 Series enables faster rollout of applications. Adding new application support simply requires the addition of a new virtual partition to create a new virtual device within the existing physical device. The virtual devices are completely isolated from each other, allowing IT administrators to closely and efficiently manage system resources, application users, and services. In addition, the strength and security of ACE role-based access control (RBAC) can be used to restrict individual users to see only servers that they have rights to manage and to perform only those ACE tasks for which they are authorized.

Figure 1. Cisco ACE and Cisco Nexus 7000 Series Multi-Tenancy Capabilities



Customer Challenges Addressed by Cisco Multi-Tenancy

Data centers are evolving from a physical device model that uses dedicated hardware to support a given application or customer to a model that uses virtualization to abstract the underlying data center hardware. Some of the main customer benefits of the transition to a virtual infrastructure include:

- Increased hardware resource utilization
- Application deployment flexibility
- Rapid deployment and tear-down of services
- Scalability of applications and infrastructure
- Preparation for cloud migration



Although many benefits are gained by migrating to a virtual data center, challenges are encountered when enabling enterprises and service providers to migrate to a multi-tenant architecture. Cisco ACE and Cisco Nexus 7000 Series multi-tenancy capabilities address these challenges:

- High OPEX costs: The unique multi-tenancy capabilities of the Cisco ACE and Cisco Nexus 7000 Series deliver faster server provisioning while also enabling faster application deployment. As a result, organizations can save across the whole environment in power and cooling costs.
- Slow application rollout: Rolling out a new application or adding new application support for a department simply requires the creation of a new virtual device within the existing physical device, enabling faster provisioning and management of applications.
- Limited scale: Cisco multi-tenancy allows easy scaling of applications and infrastructure to address the dynamic nature of the data center while meeting demands of customers to keep costs down.
- Complex deployments: Simplified network infrastructure associated with application delivery reduces network sprawl and enables efficient provisioning and management of application servers.

Business Reasons for Deploying Multi-Tenancy with Cisco ACE and Cisco Nexus 7000 Series

- Accelerated and lower-cost application rollout: Organizations with Cisco multi-tenancy capabilities can deploy applications faster while eliminating provisioning and management overhead due to additional hardware. Rolling out additional applications and network aggregation switches simply requires the configuration of additional virtual devices within the same physical device.
- Data center transition to virtualization: The Cisco ACE and Cisco Nexus 7000 Series directly support the transition from physical to virtual servers. Cisco ACE is the only application delivery solution on the market today that provides full virtualization capabilities. Along with the Cisco Nexus 7000 Series' unique virtualization capabilities, Cisco ACE offers flexibility in network design that make the most of data center facility resources while preserving optimal operations and service delivery infrastructure.
- Significant cost savings: Cisco multi-tenancy enables significant reduction in both physical and environmental data center resources, resulting in major overall cost savings associated with application delivery.
- Greater scalability: The Cisco ACE and Cisco Nexus 7000 Series enable organizations to scale applications and overall network designs associated with application delivery without increasing the costs and resources needed for administration and management.

- Regulatory compliance: Cisco multi-tenancy capabilities deliver secure separation of applications, departments, and customers while continuing to provide the management and flexibility benefits of shared resources. This enables organizations to meet compliance requirements by offering consistent visibility, control, and isolation of application environments.
- Risk reduction: Cisco ACE and Cisco Nexus 7000 Series virtual devices are completely isolated from each other regardless of how resources are allocated. By making the relevant portions of the virtualized application delivery services available to authorized application owners and network administrators, the Cisco ACE and Cisco Nexus 7000 Series reduce the risk in provisioning and maintenance change control. Management security is extensive because Cisco ACE enables granular levels of access for support by various staff members. Configurations in one virtual device do not affect configurations in other virtual devices. As a result, virtual partitioning provides a novel way of protecting a set of services configured in several virtual devices from accidental mistakes and from malicious configurations made in another virtual device.

For More Information

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