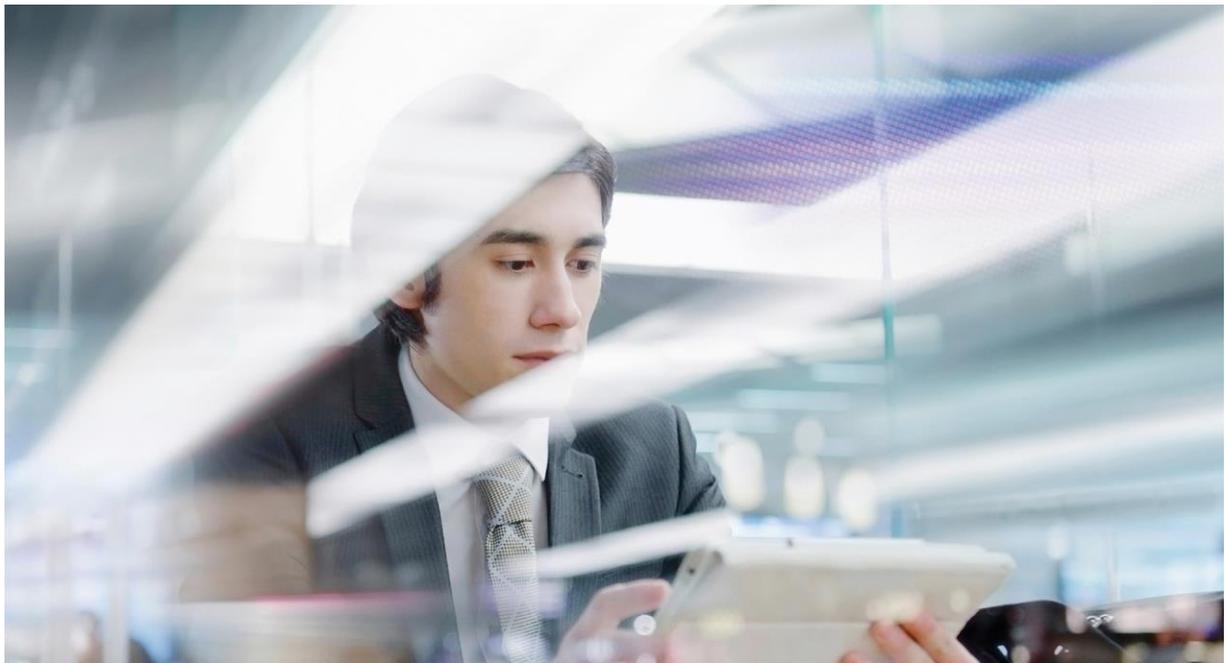# Cisco and Citrix Solution

Build Application-Centric Data Centers with Application
Delivery Controllers

What You Will Learn

Cisco® Application Centric Infrastructure (ACI) integrates Citrix NetScaler Application Delivery Controller (ADC) appliances to reduce deployment complexity and better align applications with dynamic business requirements in existing and next-generation data centers.

Challenges

New approaches are redefining IT as the web economy shifts to mobile and application-centric services. IT consumption models are increasingly becoming cloud based, with a do-it-yourself (DIY) stance, with increasing focus on development and operations (Dev/Ops) integration and the concept of anything as a service (XaaS). With the changing character of applications and the evolving requirements for the development and management of these applications, enterprise and service provider IT leaders are seeking and expecting a simple, flexible, automated, and agile infrastructure that better aligns with the needs of the entire application lifecycle from development to deployment.

To address the changing requirements in the data center, Cisco is delivering a new architecture and operation model based on application-centric infrastructure. With tight integration between physical and virtual elements, an open ecosystem model, and innovation spanning application-specific integrated circuits (ASICs), hardware, and software, Cisco ACI takes a holistic system-based approach. This unique approach uses a common policy-based operating model across network, computing, storage, and security elements ready to support Cisco ACI, overcoming isolated infrastructure and drastically reducing cost and complexity.

With Cisco ACI, applications guide networking behavior, not the other way around. This approach redefines the power of IT, making IT more responsive to changing business and application needs, enhancing agility, and adding business value.

Cisco and Citrix share a common vision for network simplification and rapid network service provisioning. Both companies support an application-centric approach that helps address critical customer challenges in both traditional and next-generation data centers. The benefits Cisco ACI can provide to a customer's environment are greatly amplified by the use of Layer 4 through 7 services between the network and the application. Citrix NetScaler integration truly enhances Cisco ACI by enabling best-in-class use of Citrix NetScaler ADC services tightly coupled with the network.

Solution Overview

Achieving the vision of a truly agile, application-based data center requires a sufficiently flexible infrastructure that can rapidly provision and configure the necessary resources independent of their location in the data center. With Cisco ACI, this is achieved with the Cisco Application Policy Infrastructure Controller (APIC), a centralized policy management and control point for the entire infrastructure (Figure 1).

Cisco APIC addresses the two main requirements for achieving the application-centric data center vision:

- Policy-based automation framework

- Policy-based service insertion technology

Figure 1: Cisco ACI and Citrix NetScaler ADC Solution
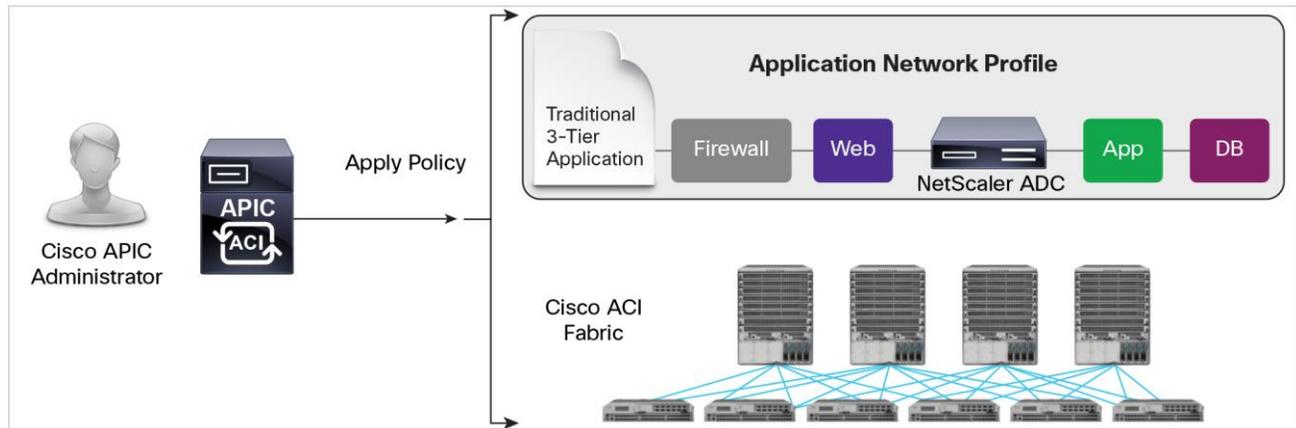
A policy-based automation framework enables resources to be dynamically provisioned and configured according to application requirements. As a result, core services such as firewalls and Layer 4 through 7 switches can be consumed by applications and made ready to use in a single automated step.

A policy-based service insertion solution automates the step of routing network traffic to the correct services based on application policies. The automated addition, removal, and reordering of services allows applications to quickly change the resources that they require without the need to rewire and reconfigure the network or relocate the services. For example, if a business decides to use an application firewall found in a modern ADC as a cost-effective way of achieving Payment Card Industry (PCI) compliance, administrators simply need to redefine the policy for the services to be used for the related applications. Cisco APIC can dynamically distribute new policies to the infrastructure and service nodes in minutes, without requiring the network be manually changed.

Device Package Integration

Integration between Cisco APIC and Citrix NetScaler ADC is achieved through Representational State Transfer (REST)-based open APIs. A Citrix NetScaler device package imported by Cisco APIC enables the controller to perform detailed feature-level configuration of Citrix NetScaler, spanning the extensive set of Citrix NetScaler ADC services that Citrix offers. Citrix NetScaler ADC provides Layer 4 through 7 services such as load balancing, application acceleration, and application security. Citrix NetScaler has the most comprehensive set of ADC features offered by any ADC vendor in the Cisco ACI ecosystem (Figure 2). The list of Citrix NetScaler features that can be automated by Cisco APIC include:

- Authentication, authorization, and accounting (AAA)

- Application firewall

- Cache redirection

- Content acceleration

- Content switching

- Citrix NetScaler DataStream

- Domain Name Service (DNS)

- Global server load balancing

- Integrated caching

- Load balancing

- SSL offload

- SSL VPN

Figure 2: Citrix NetScaler Device Package Functions
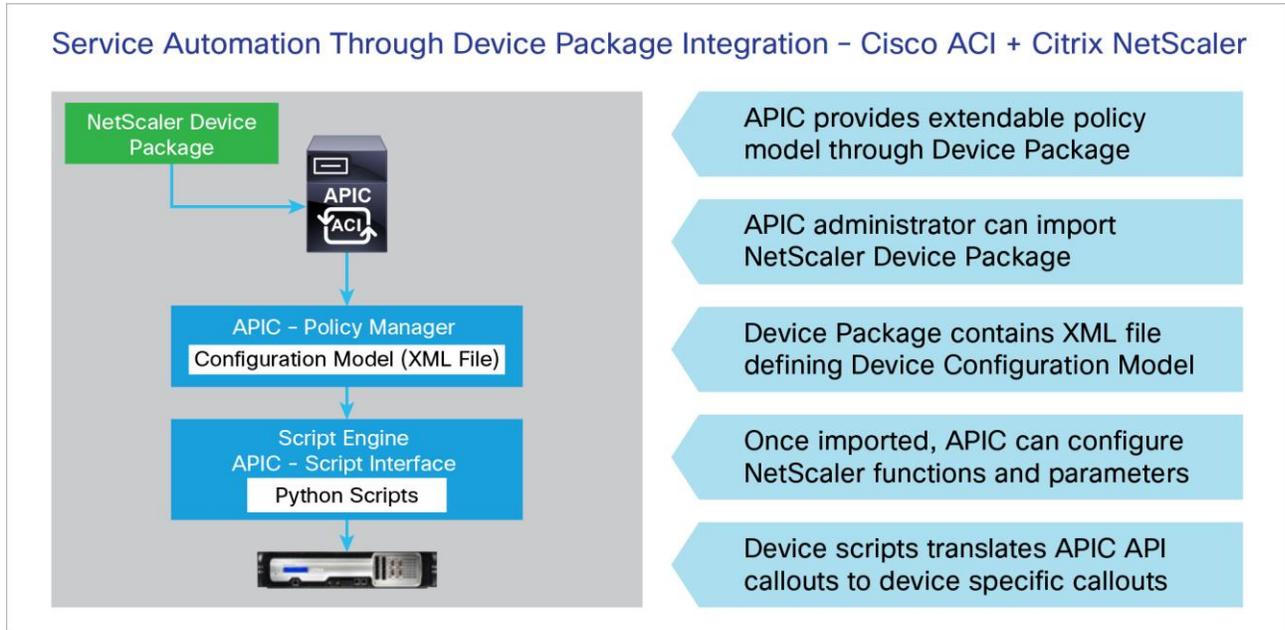

Policy-Based Service Insertion

The Cisco APIC policy-based service insertion solution automates the step of routing network traffic to the correct services based on application policies. This approach enables Layer 4 through 7 resources to be dynamically provisioned and configured according to application requirements on a per-tenant basis.

Cisco APIC offers a drag-and-drop GUI to easily create Layer 4 through 7 service graphs that specify network traffic routing. All Layer 4 through 7 ADC features available in the Citrix NetScaler device package can be included in a service graph definition, allowing comprehensive Citrix NetScaler integration with the Cisco APIC (Figure 3).

Figure 3: Cisco APIC Service Graph, with Citrix NetScaler ADC and Cisco ASA Firewall Routing
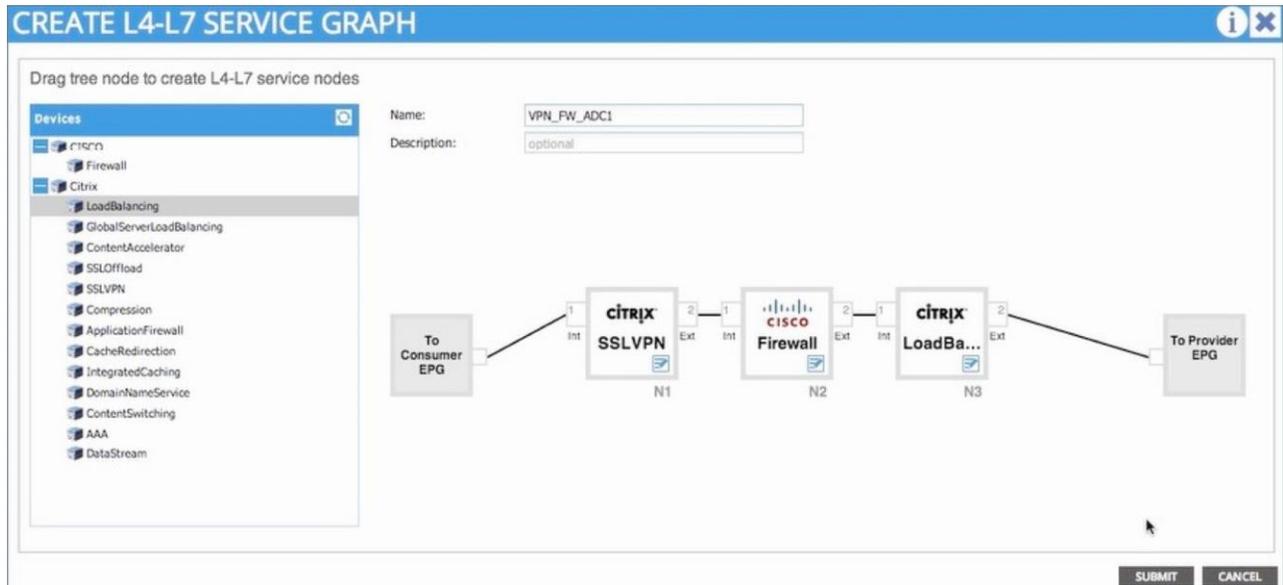
After it has been created, a service graph can be assigned to an application profile and contracted to a data center tenant, thereby defining the network traffic flow for that specific application and tenant.

Cisco's application-centric service insertion framework allows Cisco APIC to dynamically distribute new policies to the infrastructure and service nodes in minutes, without requiring the network to be manually changed (Figure 4).

Figure 4: Cisco APIC Service Graph and Application Profile for Tenant http://www.Acme.com
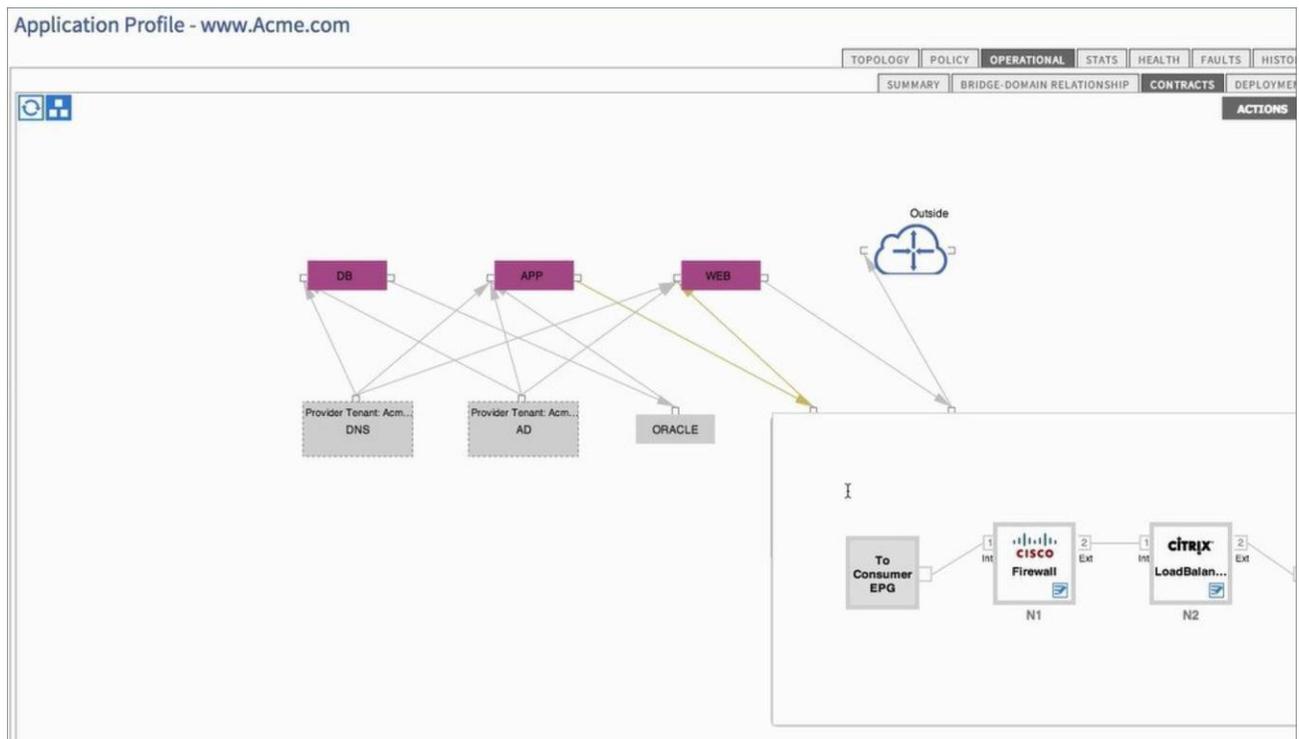
Solution Benefits

The unique joint Cisco ACI and Citrix NetScaler solution improves data center operations and application deployment, using Cisco APIC as the central policy control and management station and Cisco ACI service-insertion technology to direct traffic to the appropriate service nodes. The main benefits include:

- **Investment protection:** Cisco ACI integrates with all form factors of Citrix NetScaler, including SDX, MPX, and VPX. Moreover, Citrix NetScaler integrates with the Cisco Nexus® 1000V Switch and Cisco Nexus 7000 and 9000 Series Switches. This integration provides tremendous investment protection for customers, both preserving existing infrastructure and allowing implementation of new policy. Organizations can transition to a next-generation data center without disrupting applications.

- **Business agility:** Citrix NetScaler is a critical component of the Cisco ACI ecosystem. It is integrated through Cisco APIC and helps enable consistent automation and orchestration of the critical services required to bring up applications quickly, securely, and reliably. Moreover, these applications can run on any device type and anywhere in the customer's environment without causing disruption to the network.

- **Significant cost savings:** Customers can achieve significant cost savings through overhead reduction in moving from manual operations to an automated and orchestrated data center. Automation also helps reduce downtime that results from errors or misconfiguration and from implementation of new changes in the network.

- **Open ecosystem for service integration:** Cisco and Citrix are guiding the IETF standard for the Network Service Header (NSH) Protocol, with the promise of agile and elastic service delivery capable of supporting the movement of service functions and application workloads.

- **Consistent policy framework:** Citrix NetScaler and Cisco ACI help ensure that a consistent policy framework is maintained regardless of whether an application is deployed on premises or in the cloud.

- **Cohesive experiences:** Citrix solutions are built to meet the needs of customers and to eliminate complexity at every level to help ensure a consistent experience. Cisco ACI and Citrix NetScaler help ensure continued ease of use and continuity of content and context across any combination of devices, locations, and networks across the entire Citrix product portfolio.

Conclusion

As businesses quickly move to make the data center more agile, application-centric automation and virtualization of both hardware and software infrastructure become increasingly important. Cisco ACI builds the critical link between business-based requirements for applications and the infrastructure that supports them. Citrix NetScaler ADC connects infrastructure and applications and makes that insight available to Cisco APIC though deep integration.

For More Information

- Cisco ACI strategy: http://www.cisco.com/go/aci

- Citrix: http://www.citrix.com/netscaler/Cisco

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