Cisco and Citrix: Building Application Centric, ADC-enabled Data Centers

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.
New paradigm shifts are re-defining IT, as the web economy shifts to a mobile and application centric economy. IT consumption models are increasingly becoming cloud based, with a “DIY” approach, with increasing focus on Dev/Ops integration and the concept of anything as a service. The changing landscape of applications, and the evolving requirements for the development and management of these applications is leading Enterprise and Service Provider IT leaders to expect 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 the Application Centric Infrastructure. With tight integration between physical and virtual elements, an open ecosystem model, and innovation spanning ASICs, hardware and software, Cisco’s Application Centric Infrastructure takes a holistic system-based approach. This unique approach leverages a common policy-based operational model across ACI-ready network, compute, storage and security elements, overcoming silos and drastically reducing cost and complexity.

With Cisco ACI, applications drive networking behavior, not the other way around. This redefines the power of IT to be 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 believe in an app-centric approach that will help solve key customer pain points in both traditional and next-gen datacenters. The benefits Cisco ACI can provide to a customer’s environment are greatly amplified by leveraging the L4–L7 services between the network and the application. Citrix NetScaler integration truly enhances Cisco ACI by enabling best-in-class leverage of ADC services with the network in a tightly coupled fashion.

**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
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 the business decision is made to use an application firewall found in a modern ADC as a cost-effective way of achieving PCI compliance, administrators would simply need to redefine the policy for the services that should be used for the related applications. The 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 the Cisco APIC controller and the NetScaler® ADC is achieved through REST-based open APIs. A NetScaler “Device Package” imported by the APIC controller enables it to perform detailed feature level configuration of the NetScaler, spanning the extensive set of ADC services offered by the NetScaler. Citrix NetScaler ADC provides Layer 4 through 7 services such as load balancing, application acceleration, and application security. The NetScaler has the most comprehensive set of ADC features offered by any ADC vendor in the ACI ecosystem. The list of NetScaler features that can be automated by the Cisco APIC controller include:

- AAA
- Application Firewall
- Cache Redirection
- Content Acceleration
- Content Switching
- DataStream
- Domain Name Service
- Global Server Load Balancing
- Integrated Caching
- Load Balancing
- SSL Offload
- SSL VPN
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 enables L4-L7 resources to be dynamically provisioned and configured according to application requirements on a per tenant basis.

The Cisco APIC offers a graphical drag and drop GUI to easily create L4-L7 Service Graphs that specify network traffic routing; all of the L4-L7 ADC features available in the NetScaler device package can be included in a Service Graph definition, allowing comprehensive NetScaler integration with the Cisco APIC.

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

**Solution Benefits**

The unique joint Cisco ACI and Citrix NetScaler solution improves data center operations and application deployment, using the 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:

1. **Investment Protection**: Cisco ACI integrates with all form factors of NetScaler including NetScaler SDX™, NetScaler MPX™ and NetScaler VPX™. Moreover, NetScaler integrates with the Cisco virtual switch Nexus 1000v, Nexus 7000 Series and Nexus 9000 Series. This brings about tremendous investment protection for customers in both preserving existing infrastructure and implementing new policy changes. It can transition to a next-gen datacenter without disrupting applications.

2. **Business Agility**: NetScaler is a key component of the Cisco ACI ecosystem, integrated via the APIC, enabling consistent automation and orchestration of critical services required to bring up applications in a fast, secure and reliable manner. Moreover, these applications can run on any device type and anywhere in the customer’s environment without causing disruption to the network.

3. **Significant cost savings**: Customers can realize significant cost savings due to overhead reduction in moving from manual operations to an automated and orchestrated datacenter. Further, automation helps reduce downtime caused due to errors or misconfigurations as well as due to 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.

4. Consistent policy framework: NetScaler and ACI ensure a consistent policy framework is maintained regardless of whether the application is deployed on-premise or in the cloud.

5. Seamless Experiences: Citrix solutions are built around the needs of our customers eliminating complexity at every level to ensure a consistent experience. Cisco ACI and Citrix NetScaler ensure continued ease of use and seamless continuity of content and context across any combination of devices, locations and networks, across the entire Citrix product portfolio.

Summary
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 the Cisco APIC though deep integration.

For More Information
Cisco ACI strategy: http://www.cisco.com/go/aci
Citrix: http://www.citrix.com/netscaler/Cisco