



Virtualization: Business Agility and Resource Efficiency



Solution Brief

AX Series New Generation Application Delivery & Server Load Balancing

Virtualization adoption has increased as business requires greater flexibility. The ability to scale up resources to respond to demand, or scale down for operational efficiency, promotes business agility. AX Series Application Delivery Controller (ADC) solutions help in both scenarios, for example:

- ▶ Virtualized Management
- ▶ Virtualized Server Optimization
- ▶ Dynamic Provisioning
- ▶ Virtualized Server Acceleration

Virtualized Management

Dedicated ADC functionality is often deployed for an enterprise application or Web presence, but the ADC may not be fully utilized. Internal ADC virtualization solves this problem.

A single AX Series can fulfill requests for multiple independent Web sites with separate and distinct management capabilities, allowing the underlying platform resources to be virtualized.

This allows multiple public-facing Web sites or multiple enterprise applications to be deployed without additional expense. Administrators control resources without seeing or affecting those of other administrators, enabling a multi-tenant scenario.

Partition-based Management and Role-based Access Control (RBAC) functionality ensure each administrator can only view and manage the designated partition's ADC resources.

Virtualized Components: Partitions and Users

Flexible configuration is required, with each virtualized partition's policy elements and the corresponding access rights given to administrators. Some examples include:

- ▶ Partitions - Virtualized administration areas containing ADC configuration



Each Administrator can see only the allocated SLB resources

Virtualized Management

- » Real servers, virtual servers and service groups
- » Resource usage limits
- » Templates and health monitors
- » Certificates and keys
- » aFlex scripts and policies
- ▶ Users - Administrative users can be assigned to administer the entire AX appliance or a subset in a virtualized partition
- ▶ Roles - Privilege levels are assigned to a user granting different levels of control per user

Virtualized Server Optimization

Virtualization of server based resources behind the ADC is a growing trend. The AX Series provides complimentary services for virtualized server acceleration, and enables dynamic infrastructure support with a comprehensive and easy to implement REST-based API, aXAPI.

VMware: Dynamic Provisioning

aXAPI within AX Series interacts directly with virtualized environments to provide dynamic allocation of ADC resources based on trigger events.

Solution Brief

VMware resources can be provisioned and de-provisioned dynamically, based on configured thresholds. Working in tandem, the AX Series and the VMware vCenter can monitor server operating systems and networking device state. For example:

- ▶ CPU utilization
- ▶ Application state
- ▶ Number of connections
- ▶ Fastest responding server

The AX Series can automatically take action, by stopping connections to a virtual machine or keeping the number of connections at a set limit with connection limiting. Demonstrating true IT agility, a VMware vCenter threshold exception may be used to trigger the provisioning of VMware based servers.

Using aXAPI, the server can be created and placed within the existing virtual IP's service group to add capacity. With AX's connection rate limiting, connections can be added to the server at a predetermined rate to ensure it comes into service smoothly and is not overwhelmed by too many connections at one time.

Once the threshold on the existing real server returns to designated acceptable limits, resources can be de-provisioned and released, optimizing capacity based on demand.

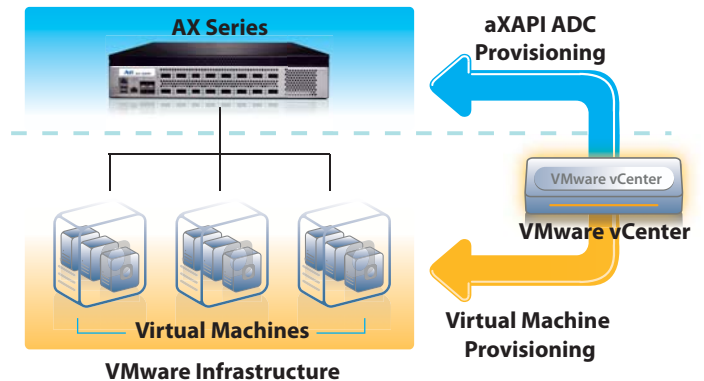
Virtualized Server Acceleration

ADC acceleration and off-load technologies help optimize and reduce computationally intensive CPU functions, leaving more processing time available for the virtualized resources.

The AX Series sits between the customer and the virtualized server farm, whether VMware or any other vendor, offering linear scalability with:

- ▶ Even traffic distribution to multiple servers
- ▶ Global Server Load Balancing (GSLB) for site failover
- ▶ SSL ASIC based bulk encryption and decryption off-load
- ▶ RAM Caching for faster response times while serving static and dynamic content
- ▶ Hardware-based HTTP Compression off-load

- ▶ TCP Optimization for all protocols
- ▶ Health Checks to ensure only valid servers issue content
- ▶ Flexible scripting for advanced layer 7 application traffic control



Dynamic Provisioning: Actions triggered on exceeded thresholds

This enables rapid scaling up of virtualized resources, for the highest performance and availability.

Summary

The AX Series virtualization solutions offer many different options for solving business issues. Whether virtualizing up or down, ultimately the end user benefits by receiving intended content as desired.