

Cisco Application Centric Infrastructure Ecosystem: Choice Within an Open Policy Framework

Cisco® Application Centric Infrastructure (Cisco ACI™) removes complexity at the network layer by implementing application, tenant, security, and connectivity policies automatically in multivendor infrastructure deployments.

Cisco ACI also offers open, Representational State Transfer (REST) APIs that enable an ecosystem of partners to expand these policies. Currently, Cisco has more than 40 ecosystem partners in areas that include application delivery control, security, integrated infrastructure, enterprise applications, cloud management platforms, analytics, and system management.

The Need for an Open Framework

IT is increasingly challenged to reduce the time required to deliver optimally configured, shared-resource pools of networking, computing, and storage services. And although IT may be able to provision virtual machine workloads in minutes, the organization may need months to design an on-demand, multitier, multitenant application environment that meets specific requirements for availability, scalability, security, and performance. In addition, continuous monitoring, troubleshooting, and adjustments are necessary to help guarantee service levels in an environment with dynamic demand.

Companies must also enable IT agility for Lines of Business (LOBs) by combining efficiency, speed, and security at scale. Doing so reduces the number of resources required to support bimodal IT and the risk of data breaches and compliance violations caused by rogue LOB public cloud activities.

To meet these two fundamental challenges, IT must standardize on an open platform, reducing the risk of vendor lock-in, and integrate a comprehensive ecosystem of solution partners supported by a flexible common policy framework. Ecosystem partners' offerings allow IT to both protect existing investments and better balance its offering to LOBs.



Comprehensive and Growing Ecosystem of Cisco ACI Partners

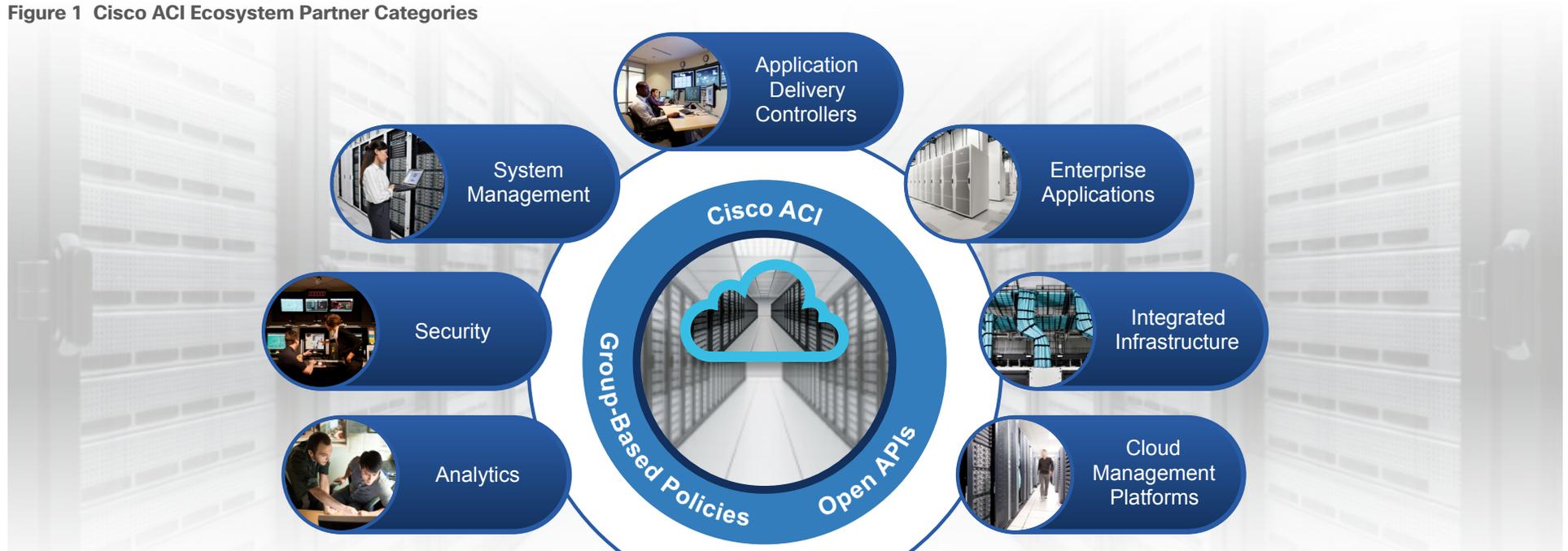
Cisco ACI eliminates application provisioning complexity at the network layer, introducing a simple, application-level, policy-based approach. After application requirements are summarized in the Cisco Application Policy Infrastructure Controller (APIC), Cisco ACI automatically provisions the correct network topology all the way to the endpoints and Layer 4 through 7 services. The result is networking behavior that is guided by applications, not the other way around.

In addition, Cisco ACI open APIs allow support by a comprehensive and growing set of ecosystem partners. Together, these partners and Cisco ACI:

- Reduce the time IT takes to deliver optimally configured, shared-resource pools of networking, computing, and storage services and to address fluctuations in application requirements
- Enable internal organizations to reach agreement on an infrastructure configuration that meets all application requirements
- Offer a choice of solutions that best meet application delivery control, security, and system management requirements, while also protecting existing investments
- Provide consistency with ecosystem partner deployments in the creation of application profiles, making cloud administration and operations management teams much more efficient
- Deliver policy-based compliance with industry regulations such as the Payment Card Industry (PCI) standard and the Health Insurance Portability and Accountability Act (HIPAA)

Figure 1 illustrates the range of Cisco ACI ecosystem partner solutions.

Figure 1 Cisco ACI Ecosystem Partner Categories



Application Delivery Controllers

Cisco ACI partners with providers of a range of market-leading Application-Delivery Controller (ADC) solutions.

A10 Networks Thunder

The A10 Networks and Cisco ACI joint solution integrates the A10 Thunder physical and virtual appliances and Cisco ACI. The integrated solution automates a wide range of network service functions, including advanced Distributed Denial-of-Service (DDoS) mitigation, SSL offloading, Web Application Firewall (WAF) provisioning, load balancing, and traffic filtering. The Cisco ACI and A10 Networks joint solution can help customers accelerate, protect, and optimize the performance of their data center applications and networks and reduce TCO.

For more information, visit [link](#).

Citrix NetScaler

Citrix NetScaler ADC delivers application insight to the network. The Cisco ACI and Citrix NetScaler integrated solution enables applications to dynamically scale on demand and migrate throughout data centers with an automated approach based on application-specific policies. Citrix NetScaler provides Layer 4 through 7 services such as load balancing, application acceleration, and application security. The unique 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.

For more information, visit [link](#).

F5 Networks Secure Data Center Portfolio

F5 Networks Synthesis delivers and orchestrates F5 Software-Defined Application Services (SDAS) through a high-performance application fabric. The F5 Device Package for Cisco APIC makes it easy to combine F5's Layer 4 through 7 application fabric with Cisco's Layer 2 and 3 network fabric. The F5 device package provides a single workflow for policy configuration and provisioning. Customers can choose between two integration models for provisioning Layer 4 through 7 services: integrating the APIC with either F5 BIG-IP or BIG-IQ as the applications or F5 customized configurations require.

For more information, visit [link](#).

Radware Alteon Application-Centric Data Centers

Cisco ACI integrates with the Radware service fabric to provide the benefits of Cisco ACI deployed as a dynamic and automated service-aware data center infrastructure, while delivering applications without adversely affecting Service-Level Agreements (SLAs). Regardless of the location of an application or the form factor chosen to deploy Radware services—physical, virtual, or cloud—the solution makes highly specific application delivery and security services available, while automating application delivery functions throughout the application lifecycle.

For more information, visit [link](#).

AVI Networks ADC

Both Cisco ACI with APIC and the Avi ADC have controller-based architectures. The Avi controller integrates directly with the APIC to provide application delivery (load balancing) and monitoring as a service. The single point of integration helps ensure quick initial deployment of the Avi Networks ADC in an APIC environment, as well as a smooth day-to-day provisioning experience.

The Cisco and Avi Networks integrated solution automates and simplifies the insertion, provisioning, and scaling of critical network services into a Cisco ACI fabric. The solution also delivers end-to-end visibility and analytics that provide actionable insights into application performance and an enhanced end-user experience.

For more information, visit [link](#).



Security

Cisco FirePOWER™

Cisco ACI integrates industry-leading threat protection through the Cisco FirePOWER™ Next-Generation Intrusion Prevention System (NGIPS), along with the Cisco FireSIGHT® security management center. Cisco ACI brings IT automation to the software-defined data center, including insertion of Cisco FirePOWER™ security services into application network policies to accelerate deployments and reduce operating costs.

For more information, visit [link](#).

Check Point Secure Web Gateway

Cisco ACI integrates with Check Point Secure Web Gateway to incorporate a broad range of security protections. Cisco ACI can automatically configure the Gateway and service routing paths between workloads, protecting and accelerating application deployments with the latest security technology, reducing management complexity, and inserting security into scalable multitenant data centers.

For more information, visit [link](#).

Infoblox Domain Name System Firewall

Infoblox Domain Name System (DNS) Firewall is the industry's first true DNS-based network security solution. It protects against advanced persistent threats and malware by stopping infected devices from communicating with command-and-control sites and botnets, preventing exfiltration of information. Infoblox DNS Firewall monitors Cisco ACI endpoints to determine whether they are under DNS attack and dynamically quarantines any compromised endpoint or moves it away from applications.

For more information, visit [link](#).

Fortinet FortiGate Firewall Solution

The Fortinet FortiGate firewall solution integrates into the Cisco APIC to deliver application-centric security automation in modern data centers. The solution provides automated and predefined policy-based security provisioning for next-generation firewall services.

The integration of Cisco ACI and the Fortinet FortiGate firewall solution offers consistent and transparent deployment of workload security across physical and virtual application environments and single-pane management through the APIC with full visibility into security policy enforcement.

For more information, visit [link](#).

Cisco Adaptive Security Appliance Firewall Security

Integrating the Cisco ACI architecture with Cisco Adaptive Security Appliance (ASA) solutions provides automated, policy-based security provisioning, management, and security policy updates to firewall, intrusion prevention, virtual private network (VPN) services, and more. Cisco ASA and Cisco ACI jointly enable transparent security services insertion anywhere in the network fabric, as well as centralized management, automated security policy lifecycle management, and scaling of Cisco ASA services for high-performance and on-demand provisioning.

For more information, visit [link](#).

Radware Attack Mitigation System

The Cisco ACI and Radware Attack Mitigation System (AMS) joint solution provides automated, policy-based security provisioning, management, and security policy updates for denial-of-service (DoS) and distributed DoS (DDoS) attack protection services. Together, Radware AMS and Cisco ACI enable transparent security services insertion anywhere in the network fabric, centralized management and monitoring, and per-application or per-tenant reporting.

For more information, click [link](#).

Integrated Infrastructure

VCE Vblock Systems

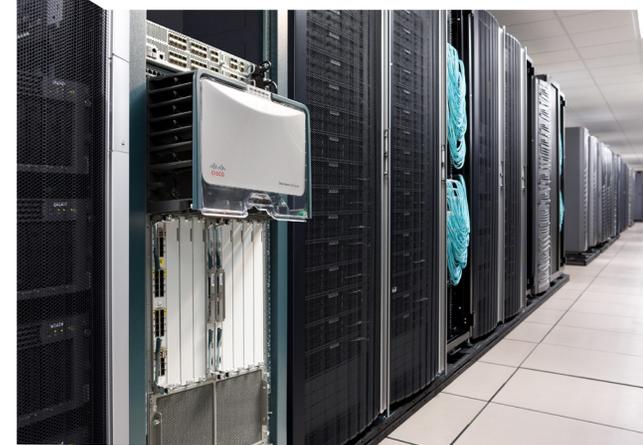
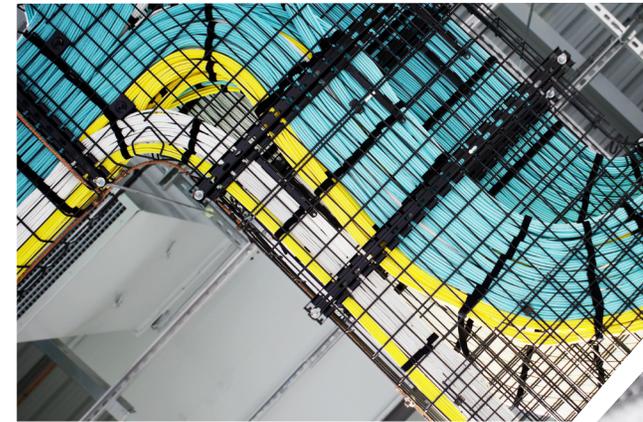
Cisco and VCE have partnered to deliver the next generation of policy-based converged infrastructure with Cisco ACI on Vblock Systems. With Cisco ACI on Vblock Systems, IT can define a policy based on the requirements of the application, such as adherence to security and data government mandates. And IT can continue to enforce that policy even as the application scales up and scales out, with the solution maintaining a superior experience for end users. Cisco ACI on Vblock Systems provides consistent control across virtual, physical, and container-based workloads while simultaneously providing visibility into application and multitenant health through comprehensive and deep telemetry. Cisco ACI provides the physical infrastructure to support multiple VCE converged-infrastructure systems, and Vblock Vscale Architecture allows the physical and logical networks that Cisco ACI provides to enable multiple VCE systems to operate as a single policy-automated pool of system resources. Vblock Systems can come integrated with Cisco data center products, including Cisco Nexus® 9000 Series Switches, Cisco Unified Computing System™ (Cisco UCS®), and Cisco MDS 9000 Series Multilayer Switches.

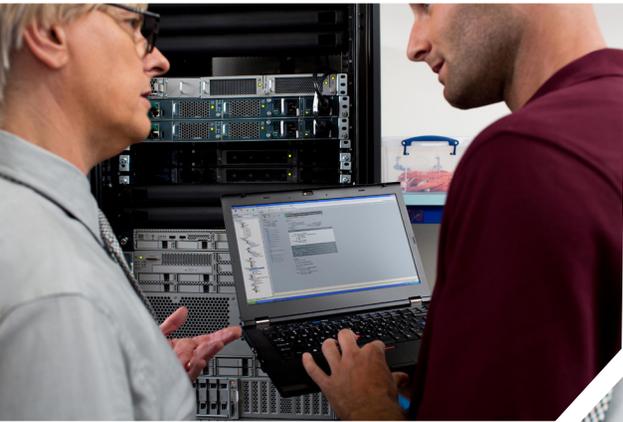
For more information, visit [link](#).

NetApp FlexPod

Cisco and NetApp offer a Cisco ACI solution consisting of Cisco APIC, Cisco Nexus 9000 Series Switches, Cisco UCS, Cisco UCS Director, and NetApp Clustered Data ONTAP. The joint Cisco and NetApp solution for Cisco ACI delivers numerous benefits, including rapid and scalable application provisioning, infrastructure that supports multiple hypervisors and bare-metal systems, secure multitenancy, scalable infrastructure, and unified infrastructure management.

For more information, visit [link](#).





Enterprise Applications

SAP HANA, SAP HANA Vora, and SAP Applications with Vnomic

To get agile decisions from a torrent of new data, enterprises must build digital leadership that automates application security and governance through awareness of the application and changing business requirements. Cisco and SAP are helping our customers reduce risk and achieve transformational agility with Project Benjamin, a reference architecture for policy-based automation of the entire SAP HANA stack. Project Benjamin uses Vnomic automation and Cisco ACI to translate business requirements and policies across SAP Business Warehouse, S/4HANA, and HANA Vora, and Hadoop, to a secure, certified cluster with Cisco UCS Integrated Infrastructure and SAP certified storage. This solution is extremely simple to deploy, secure, govern, and audit. This innovation enables large SAP landscapes for Business Warehouse, S/4HANA, and HANA Vora to be deployed in hours and governed continuously with high fidelity to changing business requirements.

For more information, visit [link](#).

Big Data for Enterprise Application

Cisco Big Data Solution for Enterprise Applications

With Cisco ACI, Cisco UCS, and Cisco Nexus 9000 Series Switches, MapR Hadoop can instantly and cost-effectively scale capacity and deliver exceptional performance to meet the growing demands of big data processing, analytics, and storage workflows. MapR Hadoop offers an enterprise-class, high-performance solution that can be quickly developed and easily administered. With significant investments in architectural innovation, the MapR Hadoop distribution delivers more than a dozen tested and validated Hadoop software modules over a fortified data platform.

For more information, visit [link](#).

Cloud Management Platforms

CliQr

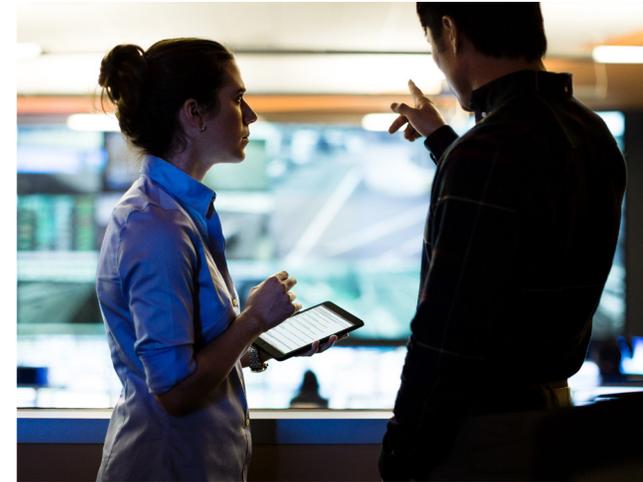
Together with Cisco ACI, CliQr CloudCenter Platform delivers end-to-end application-defined management. Instead of forcing an application to conform to each unique environment, this solution uses an application profile to automate the provisioning of infrastructure resources. Each application profile is based on specific characteristics and needs. The solution handles Cisco ACI network configurations and policies, plus deployment and management of the application and its components in any physical, virtual, or cloud environment. The CliQr application-defined platform and the Cisco ACI networking solution offer an innovative, infrastructure-independent way to simplify modeling, migration, and optimal management of applications across agile pools of IT resources.

For more information, visit [link](#).

VMware vRealize Suite

The Cisco ACI plug-in for VMware vRealize Suite expands the existing integration with the VMware virtualization platform, delivering cloud automation capabilities through an application-centric, policy-based framework. The plug-in offers vRealize blueprints that allow provisioning and management of core Cisco ACI constructs: for instance, creation of application profiles, services insertion and chaining, troubleshooting, and monitoring. This solution enables enterprise and service provider administrators to offer self-service capabilities that allow tenants to bring their own address space for their virtual private cloud environment and to provide and consume shared Layer 4 through Layer 7 services.

For more information, visit [link](#).





Platform as a Service

Apprenda Platform as a Service

The Apprenda platform-as-a-service (PaaS) solution transforms traditional, hosted applications into cloud applications, providing an abstraction layer that allows developers to use underlying network infrastructure without networking expertise through the northbound API exposed by the APIC. The Apprenda cloud enables developers to focus on their core competency—programming—and not infrastructure or policy. The abstraction of network policies by Cisco ACI enables the Apprenda platform to incorporate these rules automatically into its own policy model.

For more information, visit [link](#).

Big Data Analytics

DataTorrent Real-Time Streaming

DataTorrent allows enterprises to experience the business impact of big data by enabling them to process, analyze, and make decisions in real time. Cisco ACI and DataTorrent Real-Time Streaming (RTS) pave the way for a transformative solution with numerous benefits. This joint solution provides the flexibility to optimize Hadoop resources as application demand increases. In addition, it optimizes network traffic for high throughput and low latency with DataTorrent and Hadoop distributed in-memory computation. It allows you to automatically provision custom network deployments with every application.

For more information, visit [link](#).

Analytics

Splunk Enterprise

Cisco ACI for Splunk Enterprise offers a flexible approach to monitoring Cisco ACI and all other elements of your technology stack. Splunk Enterprise is a scalable, versatile platform for searching, monitoring, and analyzing device data such as logs, events, and performance and configuration metrics. Splunk Enterprise centrally monitors and analyzes performance metrics and events in real time across your physical and virtual environments, including applications, operating systems, storage resources, and network infrastructure such as Cisco ACI.

You can extract Splunk Enterprise integration information—security plug-in, computing, and storage information, for example—from the Cisco ACI northbound API and display it in a central management console, enabling you to efficiently perform deduplication and other functions across these elements.

For more information, visit [link](#).

System Management

Zenoss Service Dynamics 5

Zenoss, a systems management software company, focuses on the challenges of helping ensure the delivery and operation of large-scale IT services. Zenoss Service Dynamics 5 replaces a patchwork of traditional management frameworks and custom-built solutions, bringing highly scalable, unified monitoring and operations management to Cisco ACI. This powerful combination is well suited to a new class of IT demands, including IT-as-a-Service (ITaaS), automated operations, and hybrid cloud infrastructure.

For more information, visit [link](#).

Why Cisco ACI?

Cisco ACI simplifies and accelerates the application deployment and production lifecycle, while also optimizing underlying infrastructure to meet your ever-changing application requirements. The growing Cisco ACI partner ecosystem is available to further enhance production environments, simplifying cloud administration and operations management workloads.

For More Information

If you are an independent software vendor, consider becoming part of the Cisco ACI partner ecosystem by joining the [Cisco Solution Partner Program](#). After you have joined, you can quickly gain access to specific resources and core Cisco ACI documentation. In addition, you can join [Cisco DevNet](#), the complete Cisco developer resource for technical information, and can download the Cisco ACI toolkit.

For better-running infrastructure, please contact your Cisco representative for more information about how you can put Cisco ACI and the partner ecosystem to work in your environment.

