Is Your Data Center Ready for the Application Economy?
Discover The Power of Application Centric Infrastructure
Pace of Change – Disruptions - Opportunity

“Deliver the Application Experience at Scale”
Operational Simplicity | Business Efficiency | Lower Cost

Technology Disrupters
Social
Mobile
Big Data / IoE
Fog / Cloud / Containers

Applications
Distributed
Database
Cloud

Operational Disrupters
IT
LoB

Build vs. Buy
Shadow IT
DevOps
XaaS

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Application Centric Infrastructure – A Game Changer

Rapid Deployment of Applications onto Open Networks with Scale, Security and Full Visibility

NEXUS 9500 AND 9300

APPLICATION CENTRIC POLICY

OPEN ECOSYSTEM

Industry Leading Technology Partnerships

ACI
ACI Solves Real Customer Challenges

- Greater Business Agility: 58% Reduce Network Provisioning
- Lower Capital Expenses: 25% CAPEX Reduction
- Reduced Costs / Complexity: 21% Reduce Management Costs
- Lower Operating Cost: 45% Reduce Power and Cooling Costs
- Resource Optimization: 10–20% Compute and Storage Optimization

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ACI - By the Numbers (as of Dec 2014)

1,000+ Customers Globally

200+ Customers Globally

34 Ecosystem Partners
Today’s Panelists

<table>
<thead>
<tr>
<th>CUSTOMERS</th>
<th>ECO-SYSTEM PARTNERS</th>
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</thead>
<tbody>
<tr>
<td>E*TRADE</td>
<td>A10</td>
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<tr>
<td>NetApp</td>
<td>Citrix</td>
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<td>UOL</td>
<td>Check Point</td>
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<td>QBRANCH</td>
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<td>Cisco</td>
<td>Cisco SFT</td>
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<td>Experian</td>
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<td>Symantec</td>
<td>f5</td>
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<td>Red Hat</td>
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Cisco Application Centric Infrastructure (ACI)
Data Center Demands For the Cloud-Era

“Bare Metal”
75% physical servers¹

VM Density and Server I/O
10G LAN on Motherboard²

Multi-Cloud
~45% of data center multi-hypervisor³
Linux Containers

Big Data
IP traffic 25% CAGR⁴

Lower TCO | Workload Flexibility | Agility | Compliance/Security

Application Centric Infrastructure Brings Immediate Benefits

1. AUTOMATION: APPLICATION-CENTRIC POLICY MODEL
   - Operationally Simple
   - Lowest TCO
   - Zero-touch Provisioning

2. PHYSICAL + VIRTUAL
   - Performance and Scale
   - Health Metrics
   - Visibility / Telemetry

3. OPEN AND SECURE
   - Open APIs / Open Source
   - Secure Multi-tenancy
   - Extensive Ecosystem
ACI: Giving Customers Operational Choice

- Speed and Agility
- Security and Compliance
- Common framework for a services delivery model
- Evolution and investment protection
- High availability
- Lower total cost of ownership
With the Broadest Ecosystem of Partners
New Partners Embrace Power of Open Ecosystem

34 Ecosystem Partners and Counting!

Open and Standard APIs

Published Data Model

Open Source

Open Standards

Virtualization
Automation & Orchestration
Enterprise Monitoring
System Management
L4-7 Services
Security
Storage

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Why is ACI Resonating with Customers?

<table>
<thead>
<tr>
<th>AGILITY</th>
<th>SECURITY</th>
<th>OPTIMIZATION</th>
<th>SCALE</th>
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<tbody>
<tr>
<td><img src="image1.png" alt="AGILITY Icon" /></td>
<td><img src="image2.png" alt="SECURITY Icon" /></td>
<td><img src="image3.png" alt="OPTIMIZATION Icon" /></td>
<td><img src="image4.png" alt="SCALE Icon" /></td>
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</table>

- **BROAD ECOSYSTEM**
- **OPEN ARCHITECTURE**
Symantec is a leading security solutions provider.

Key ACI Benefits

- Shared resources / multi-tenancy
- More rapid service delivery
- Operations Simplicity
Guiding Principles in Building our NGSDC – which is Foundational for All Things IT

<table>
<thead>
<tr>
<th></th>
<th>Deliver Global Exceptional Experiences for All Employees Globally</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>SPEED AND AGILITY</td>
</tr>
<tr>
<td>2</td>
<td>PERSONALIZED AND CUSTOMIZED PERFORMANCE</td>
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<tr>
<td>3</td>
<td>IMPROVED SECURITY</td>
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<tr>
<td>4</td>
<td>EFFICIENCIES AND COST SAVINGS</td>
</tr>
<tr>
<td>5</td>
<td>HIGH AVAILABILITY</td>
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Why We Chose an SDN Strategy and Cisco ACI

<table>
<thead>
<tr>
<th>SDN</th>
<th>ACI</th>
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</thead>
<tbody>
<tr>
<td><strong>Efficiency</strong></td>
<td><strong>Efficiency</strong></td>
</tr>
<tr>
<td>Smaller Real Estate Footprint</td>
<td>• <strong>Better Visibility</strong> — correlation between virtual and physical connectivity (overlay and underlay networks)</td>
</tr>
<tr>
<td>Less Hardware</td>
<td>• <strong>Reduced Management &amp; Operating Expenses</strong> — manage physical and virtual networks the same way, with the same tools and people</td>
</tr>
<tr>
<td>Highly Automated</td>
<td>• <strong>Increased Backbone Speed</strong> — east-west traffic performance needed for virtualization and storage over ethernet</td>
</tr>
<tr>
<td></td>
<td>• <strong>Leverage Cisco 9000 switch features</strong></td>
</tr>
<tr>
<td><strong>Effectiveness</strong></td>
<td><strong>Effectiveness</strong></td>
</tr>
<tr>
<td>Higher Quality of Service</td>
<td>Secure Multi-Tenancy — Business Units and Applications</td>
</tr>
<tr>
<td>Faster</td>
<td>• Ideal for the company split</td>
</tr>
<tr>
<td>More Secure</td>
<td>• Policy automation follows applications, not physical location</td>
</tr>
<tr>
<td>Fewer, Shorter Outages</td>
<td>• Re-useable but separate IP address space</td>
</tr>
<tr>
<td></td>
<td><strong>Open Architecture</strong> — allows for easy integration</td>
</tr>
</tbody>
</table>
Symantec Security Products in NGSDC

Security, Disaster Recovery, and Service Management

NGSDC Tenants
- GSL
- Customer One
- GSO
- IT Production

Next Generation Data Center Services

Virtualization and Abstraction Layer
- Cloud Management Platform
- Self Service Portal
- ITSM Platform
- Virtual Resource Mgmt
- Physical Resource Mgmt

Automation & Orchestration Layer
- Virtualization and Abstraction Layer
- Virtual NW Resources
- Storage Resource Pool
- Compute Resource Pool

Storage
- Compute

ACI Policy

ACI Network

Tucson Data Center Facility

Data Loss Protection (DLP):
- Network outgoing data monitoring

Email, Security, Cloud:
- Anti-virus / Anti-Spam for all inbound email traffic

Symantec Access Manager (In process):
- Single Sign-On (O3 replacement)

Validation and IP Protection (VIP):
- 2-factor Auth. for VPN login

Managed PKI (MPKI):
- Verifying Authenticity of Websites Encrypts Traffic

Symantec Security Products:
- Data Center Security (DCS) – replaces Critical Systems Protection: Host IDS / IPS, Virtual Machine AV
- Critical Systems Protection (SCSP): Host IDS and IPS
- Control Compliance Suite (CCS): Host Compliance Audit Scans. Managers for: Standards, Risk, Vendor, Policy, Assessment & Workflow
- Data Loss Protection (DLP):
  - At Rest data scanning
- Symantec Endpoint Protection (SEP):
  - Physical Host AV, Reputation, Network Security, Behavior, Repair

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Cisco is the worldwide leader in IT that helps companies seize the opportunities of tomorrow by proving that amazing things can happen when you connect the previously unconnected.

**Key ACI Benefits**

- OPEX savings
- Accelerated application deployment
- Simplicity of infrastructure management
ACI – IoE Enabler and Foundational Platform

**Business Benefits**

<table>
<thead>
<tr>
<th>Agility, Lower TCO</th>
<th>Integrated Security</th>
<th>E2E Infrastructure Programmability</th>
<th>Fast IT</th>
<th>Seamless Workload Mobility, Catalog Driven</th>
<th>Policy-Based Learning Network</th>
</tr>
</thead>
</table>

**Cisco Foundational Technological Evolution**

<table>
<thead>
<tr>
<th>FY 2014</th>
<th>FY 2015</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional Cloud (PaaS, IaaS)</td>
<td>Fabric Integrated Compute</td>
<td>Application-Driven Cloud Operations*</td>
</tr>
<tr>
<td>Next-Generation Fabric</td>
<td>Policy-Based Fabric Control</td>
<td>Intercloud</td>
</tr>
<tr>
<td>Fabric Integrated Storage</td>
<td>Fabric Integrated Storage</td>
<td>IoE</td>
</tr>
</tbody>
</table>

**Enabling Technologies**

- OpenStack
- Nexus 9000
- CIAC
- APIC
- OpenShift
- OPFLEX
- Cisco Intercloud
- IoX, Big Data, Analytics

**We Are Here**
ACI Simplified Operations: TCO and Cost Savings

**PROCESS SIMPLIFICATION**

**PRE-ACI**
- Network and Policy Instantiate
- Network Operations

**POST-ACI**
- Translate Setup and Policy

**COST SAVINGS**

**PRE-ACI**
- OPEX
- CAPEX

**POST-ACI**
- 41% Cost Savings

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Qatar University is a rapidly growing university in Qatar with over 16,000 students, from fifty-two nationalities.
Experian is a global information services group with operations in 40 countries. It offers a full suite of credit services, marketing services, decision analytics and consumer services.

Key ACI Benefits

- High performance 10G/40G fabric
- Lower TCO: CapEx savings and power efficiency
- DevOps friendly and easy to develop in house automation scripts
Experian
We’re a Leading Global Information Services Company…

• In top 50 of FTSE-100
• Employees: c.16,000
• Offices in 39 countries
• Largest markets: US, Brazil, UK

...helping organisations and consumers derive insights and make informed decisions that enable them to flourish
Experian Prime Data Center Architecture

- Maintain high volumes of VLAN’s
- Stretched VLAN’s across Data Centers
- Unmanageable ACL’s and Firewall policies
- Security zone tromboning
Operational Transformation

**ACI Key benefits**

- **User Community**
- **Service Catalogue**
- **Orchestration**
- **Monitoring**

- High performance 10G/40G fabric
- Lower TCO: CapEx / OpEx savings and power efficiency
- DevOps friendly with easy to develop in house automation scripts

**Customer Profile**

- Network
- Storage
- Compute
- Security

**Software Defined Networking**

- User Community
- Service Catalogue
- Orchestration
- Monitoring

**Deployment Timeline**

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NetApp creates innovative products—storage systems and software that help customers around the world store, manage, protect, and retain one of their most precious corporate assets: their data.

Key ACI Benefits

- Rapid provisioning of apps
- Integration of physical and virtual
- Operations model that maps to the shared services organization
Qbranch is a leading supplier of Hybrid IT solutions based in Sweden. Qbranch’s offering consists of four areas of solutions: Collaboration/Web, Business Application, Workplace and Infrastructure.

Key ACI Benefits

- **OPEX** savings through automation
- Integrated physical and virtual support
- Accelerated service delivery for customers
UOL is the leading Internet services company in Brazil since 1996, providing content and an extensive Web services and products portfolio. UOLDIVEO, a full IT outsourcing company within the same group, is Brazil's largest IT data and infrastructure provider.
E*TRADE is an innovative financial services company offering a full suite of easy-to-use online brokerage, investing and related banking solutions, delivered at a competitive price.

Key ACI Benefits

- Rapid deployment through automation
- Simplicity of operations model
- Secure Multi-tenancy
Ecosystem Partner Panel

Raj Jalan  
CTO

Gabi Reish  
VP Product Management

Scott Harrell  
VP Product Management

Steve Shah  
VP Product Management

Calvin Rowland  
SVP Business Development

Radhesh Balakrishnan  
GM Virtualization & Openstack Business

Colin Savage  
VP Business Development

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F5 and Cisco ACI Joint Solution Benefits

- Automated L4-L7 application service insertion
- Preserves richness of F5 Synthesis offering
- Accelerated application deployments with scalable L4-L7 services
- Existing F5 Physical & Virtual appliances, topologies integrate seamlessly with Cisco ACI
- Application agility & significant reduction in operating costs
- Maintains operational best practices & offers faster provisioning of workflows
Native VXLAN integration
Efficient deployment reduces TCO

Device Package with 13 functions
Reduce OPEX through automation

Telemetry feedback
Reduce OPEX with quick troubleshooting
A10 Networks Device Package Integration for Cisco ACI

**Benefits**

**AGILITY**
Policy based automated provisioning, dynamic response to business needs

**AUTOMATION**
Consistent L4-L7 service posture for enforcing SLA, Compliance and Security

**LOWER TCO**
Pay-as-you-go Cloud consumption model, efficient resource utilization

**Dynamic L4-L7 Services**

1. APIC Policy Manager
2. APIC Script Interface

**Cisco ACI - A10 solution**

**Devices**

- APIC Policy Manager
- APIC Script Interface

**Appliances**
Virtual, Physical or Hybrid
Cisco ACI with Red Hat Enterprise Linux OpenStack Platform

1 PHYSICAL + VIRTUAL NETWORKING
- Zero-touch operations
- Performance at scale
- Physical server, multi-hypervisor

2 APPLICATION-CENTRIC POLICY MODEL
- Easy for app developers
- Self-documenting/automation

3 TELEMETRY
- Health Metrics
- Visibility/Telemetry
- Troubleshooting

4 ADVANCED CAPABILITIES
- Service chaining
- App Acceleration

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Centralized Application Health—Cisco ACI for Splunk Enterprise

- Real-time Resolution
- Proactive Monitoring
- Performance Analytics
ACI Security Integration with Cisco ASA Firewalls

Security Expressed in Application Language

Simplified Policy-based Segmentation

L4-7 Service Automation, Open Eco-System

Visibility, Analytics, Forensics

Automate Compliance, Centralized Audit

Centralized Security Across Physical and Virtual
Next Generation Security for Next Generation Data Centers

PERIMETER SECURITY IS NO LONGER ENOUGH!
NEED FOR INTRA-DATACENTER (EAST-WEST) PROTECTION

Most Advanced Security
with Multiple Protection Layers

Programmable Security
Using SDN Service Insertion

Best in Class Security management
tightly integrated with the SDN controller
Summary

- ACI – Policy Based Automation – Application Centricity – Business Outcome
- **Customers Benefits** - Agility, Open Architecture, Security, Lower TCO
- Industry’s Most Comprehensive SDN Solution
Get Your Data Center ACI Ready

✓ GET EDUCATED: Learn more @: www.cisco.com/go/aci
✓ GET ENGAGED: Contact your Cisco rep for more info on ACI
✓ GET STARTED: Test drive an ACI Starter Kit
TOMORROW starts here.