Cisco Application Extension Platform (AXP)

Denis Zotov, Product Manager
CISCO Access Routing Technology Group
Agenda

- Branch Optimization Drivers
- Cisco Application Extension Platform (AXP)
- Next-Gen AXP on Service Ready Engines (SRE)
- Partnership Model
- Resources
Data Center – Branch Linkages

Datacenter Consolidation

Branch Optimization

WAN

Internet

Datacenter Consolidation drives Branch Optimization
Business Drivers

**Datacenter / Cloud**

Applications are centralizing, people are decentralizing

DC Consolidation, SaaS, Cloud top CIO Priorities
Branches growing at 17% / 90% Employees work away from HQ

**Branch**

Challenges with survivability, user experience, security

Users need consistent availability, performance & security irrespective of where applications are

**Data Center/Cloud & Branch IT boundaries continue to evolve**

Applications & services continuum between centralized / decentralized models

**Current Branch Services Model is Inflexible & Expensive**

- Divide between centralized / decentralized
- Dichotomy between appliances / servers
- No intelligent linkage with DC/Cloud

**Services Need to Change Without Changing the Infrastructure**

- Evolve services while moving in decentralized-centralized continuum
- Utilize the same infrastructure
- Avoid truck rolls
Current Generation AXP
Evolving the “Network as a Platform” Vision

- Open applications platform
- Server, Application consolidation
- Increased security, and survivability
- Lowest TCO

A Few Years Ago
- Services Integration
- Survivability
- 50–70% lower Opex

Integrated Applications
- Custom Apps
- Business and Communication Apps
- Vertical Apps

Router-based Approach

Operational Efficiency

Multiple Overlay Products

Network Consolidation

Application & Server Consolidation
Application eXtension Platform

- SDK and Development Portal
- AXP Partner Program
- AXP Developer Services
- AXP Advanced Services

Complete Ecosystem

- AXP-104
  256/512MB, 1/2GB, Intel Celeron
  Light-Weight Applications

- NME-302/502/522
  512MB-2GB, 80/160GB,
  Intel Pentium M
  General-Purpose Applications

- Linux-based integration environment with downloadable SDK
- Multi-app support: segment and guarantee CPU, memory, disk
- Extensible Cisco CLI with Cisco IOS APIs
- Cisco ISR 1841, 2800, 3800 series support

www.cisco.com/go/axp
Cisco AXP—Major Solution Partners

Vertical Solutions

- Healthcare
  - Secure Healthcare Info Exchange
- Financial Services
  - VoIP Recording
- Defense
  - Communication Protocols
- Energy
  - Real-Time Information Management

Horizontal Solutions

- Infoblox
  - Core Network Services
- Sagen-Interstar
  - Fax-Over-IP
- Avocent
  - Remote Device Management
- Singlewire Software
  - IP Broadcast & Paging

Channel Partners and Reseller

“Build-your-own” or “Pre-Packaged” Applications
Services Engine Overview

Service engines enable **services integration** at the branch while preserving router CPU/memory for critical connectivity and IOS

**Router integration**
- Blade Control protocol between IOS and service module

**Hardware Efficiencies**
- eliminates separate appliance and preserves rack space
- offloads processing/memory to application-specific platform

**Lower Total Cost of Ownership**
- simplifies deployment / maintenance / management

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AXP Technical Overview

**Dedicated Application Resources**
- Dedicated CPU, memory and Disk
- Application separated from core router functionality
- Full networking

**Standards-Based Hosting Infrastructure**
- Hardened Cisco Linux OS with virtualization
- Complete install/upgrade packaging utilities
- Logging and debugging infrastructure

**Programming Support**
- Support for Native x86 C/C++
- Java support w/ optional OSGI and Tomcat
- Scripting Support (bash, perl, python)

**Value-Added Features**
- Serial tunneling providing application access to external devices
- Syslog server to store logs from router and other local devices
- Netflow collector to persist and analyze flows locally

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**Cisco IOS APIs Integrate the Application into the Network**
- Programmatically configure and monitor Cisco IOS
- React to changes in network conditions
- Programmatically Influence Routing, QoS and IP-SLA
- Monitor packets flowing through network
Development Process—Production

- SDK
- Develop
- Package
- Installation

Development Machine
- Linux (FC4)
- Tools (compiler, make, IDE)
- SDK (packaging scripts, API headers/libs for various languages)

Source Code → Compile → Binaries → Package → AXP.pkg

Auth File + Private Key

ISR AXP Blade
- CLI> Software Install Add URL ftp://.....AXP.pkg
**AXP Network Support**

**Internal Interface Connects Blade to the Router**
- Integrated-Service-Engine X/0 is the interface on Cisco IOS
- Eth0 is the interface on the Linux side

**Virtual Interfaces “Bind” to Interface**
- Flexible use of available interfaces
- Sub-interface support
- 802.1Q (VLAN) Encapsulation support
- VRF support

**External (NME only) Interface**
- Exposed to Linux as Eth1
- Virtual instances optionally bind to interface
- Externally routable interface
- Configurable as default route

**Cisco IOS**
- Integrated-Service-Engine X/0.1
- Integrated-Service-Engine X/0.2

**AXP Module**
- Eth0.1
- Eth0.2

**Cisco Linux OS**
- Eth0
- Eth1

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**Flexibility Means Usability:**
- Migrating existing applications from servers to AXP made easy
- Multiple applications benefit from single or multiple subnets
- Security provisions at blade-level or application-level
**ISR x8xx Supported Hardware**

- **AIM-APPRE-102-K9**
  - CPU: 300 Mhz
  - Memory: 256 MB
  - Compact Flash: 1 GB

- **AIM-APPRE-104-K9**
  - CPU: 600 Mhz
  - Memory: 512 MB
  - Compact Flash: 2 GB

- **NME-APPRE-302-K9**
  - CPU: 1.0 Ghz
  - Memory: 512 MB
  - Disk: 80 GB

- **NME-APPRE-502-K9**
  - CPU: 1.0 Ghz
  - Memory: 1 GB
  - Disk: 120 GB

- **NME-APPRE-522-K9**
  - CPU: 1.4 Ghz
  - Memory: 2 GB
  - Disk: 160 GB

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**ISR Router Support**

<table>
<thead>
<tr>
<th></th>
<th>*AIM 102/104</th>
<th>NME 302</th>
<th>NME 502</th>
<th>NME 522</th>
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<tbody>
<tr>
<td>1841</td>
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<td>2801</td>
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<tr>
<td>3845</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

*AIM-102 @ EOL (2 yr support/maintenance) – replaced by AIM-104*
Next-Generation AXP Platforms

*Service Ready Engines (SRE)*
Service Virtualization

Cisco Services Ready Engine
- Service modules with integrated compute & storage in small, router integrated footprint
- Range of virtualized services and applications to meet branch needs
- Centralized deployment and management of services with flexibility to change without truck rolls

Any Service, Any Branch, Any Where

Network and Collaboration Services
- Optimized Branch Experience

Network-aware Lean Applications

Server Virtualization
- Server Consolidation

Survivability for Cloud / Data Center
- Business Continuity
## Virtual Service Delivery Model

### Virtualized Services
Software can be deployed and managed remotely without truck-rolls

<table>
<thead>
<tr>
<th>Cisco Network &amp; Collaboration Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAN Optimization</td>
</tr>
<tr>
<td>Voice Mail</td>
</tr>
<tr>
<td>Video Surveillance</td>
</tr>
<tr>
<td>Network Analysis</td>
</tr>
<tr>
<td>WLAN Control</td>
</tr>
<tr>
<td>Etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compute Services &amp; Third Party Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Extension Platform (AXP)</td>
</tr>
<tr>
<td>General Purpose Server with Virtualization</td>
</tr>
<tr>
<td>Windows Services</td>
</tr>
<tr>
<td>Vertical applications</td>
</tr>
<tr>
<td>Etc.</td>
</tr>
</tbody>
</table>

### Management
Central Management for Remote Provisioning

#### Third Party* Server Management Tools
- Server Lifecycle Management
- Application Management

#### CiscoWorks Tools
- Deployment and Provisioning of virtualized services
- Domain specific management

### Integrated Compute and Storage Hardware
Services Ready Engines—ISM or SM

* Roadmap
## ISR G2 Service Modules Portfolio

<table>
<thead>
<tr>
<th>Network and Security Services</th>
<th>Collaboration Services</th>
<th>Compute Services and Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Network Services</strong></td>
<td><strong>Unified Communications</strong></td>
<td><strong>Application Infrastructure</strong></td>
</tr>
<tr>
<td><img src="image" alt="Network Services" /></td>
<td><img src="image" alt="Unified Communications" /></td>
<td><img src="image" alt="Application Infrastructure" /></td>
</tr>
<tr>
<td>Get More from the Network</td>
<td>Enable New Capabilities</td>
<td>Consolidate Branch IT</td>
</tr>
<tr>
<td>Secure, Protect, Compliance</td>
<td></td>
<td>Custom Solutions</td>
</tr>
<tr>
<td>o Wireless LAN Controller (WLC)</td>
<td>o Cisco Application Extension Platform (AXP)</td>
<td>o ICW Healthcare Connector on AXP</td>
</tr>
<tr>
<td>o Infoblox core network services (AXP)</td>
<td>o NICE Voice Recording (AXP)</td>
<td>o Tiani Medical Data Exchange on AXP</td>
</tr>
<tr>
<td>o Cisco Network Analysis (NAM)</td>
<td>o Sagem Interstar Fax over IP (AXP)</td>
<td>o Global Protocols Skipware (AXP)</td>
</tr>
<tr>
<td>o Cisco Wide Area Application Services (WAAS)</td>
<td>o SingleWire Informacast (AXP)</td>
<td>o Available</td>
</tr>
<tr>
<td><img src="image" alt="Physical Security" /></td>
<td><img src="image" alt="Collaboration Services" /></td>
<td><img src="image" alt="Industry Applications" /></td>
</tr>
<tr>
<td><img src="image" alt="Physical Security" /></td>
<td><img src="image" alt="Collaboration Services" /></td>
<td><img src="image" alt="Industry Applications" /></td>
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<tr>
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<td><img src="image" alt="Industry Applications" /></td>
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Available
Service Ready Engines (SRE)

**Internal Service Module (ISM)**
- Single Core x86
- 512MB RAM, 4GB Flash
- Available on 1941 & above—Selected Services

**Service Module (SM)**
- Dual Core High Performance x86
- 2–4GB RAM, 500GB-1TB HDD, RAID
- Available on 2911 and above—Full Range of Services

**High Performance Hardware Scales Branch Services—up to 7x of previous generation**
- Size, Weight and Power Efficient Form Factor Reduces Costs
- On Demand Services Deployment Offers Unprecedented Flexibility
- Covered with ISR G2 SMARTnet at no additional cost
- High Capacity Storage w/RAID / HW Virtualization & Crypto
- Centralized Management & Troubleshooting / On-board HW Diagnostics Tool
## SRE Ordering Guide

<table>
<thead>
<tr>
<th>Cisco SRE Module</th>
<th>Part Number</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco SRE 300 ISM</td>
<td>ISM-SRE-300-K9</td>
<td>512MB DRAM, 4GB Flash</td>
</tr>
<tr>
<td>Cisco SRE 700 SM</td>
<td>SM-SRE-700-K9</td>
<td>2GB DRAM, 2GB Flash, 500GB HDD, field-replaceable disk</td>
</tr>
<tr>
<td>Cisco SRE 900 SM</td>
<td>SM-SRE-900-K9</td>
<td>4GB DRAM, 2GB Flash, 2 x 500GB HDD (1T total storage), dedicated crypto chip, RAID 0/1 support, hot swappable and field-replaceable disk</td>
</tr>
<tr>
<td>Cisco SRE 900 Spare Disk</td>
<td>SM-DSK-SATA-500GB=</td>
<td>Spare 500GB HDD for field-replacement</td>
</tr>
<tr>
<td>Cisco NM-SM Adapter</td>
<td>SM-NM-ADPTR</td>
<td>Adapter card needed to use NM, NME modules on ISR G2</td>
</tr>
</tbody>
</table>

- Applications are ordered separately from SRE modules
- Evaluation licenses are available for applications
Solution Case Studies
Cisco AXP—Major Solution Partners

**Vertical Solutions**
- Healthcare
- Financial Services
- Defense
- Energy

**Horizontal Solutions**
- Core Network Services
- Fax-Over-IP
- Remote Device Management
- IP Broadcast & Paging

Channel Partners and Reseller

“Build-your-own” or “Pre-Packaged” Applications
AXP Solution for Voice Recording in the Branch—NICE

Problem

- Emerging compliance and corporate governance requirements and an emphasis on the branch have created a need for local recording
- Customers typically have a strong preference to the vendor they use for centralized recording

Solution

- Provide survivable recording application hosted within the ISR on AXP
- Concurrently announce and support market leading voice recording partners

Benefits

- Eliminates the need for dedicated recording equipment at each branch
Each passive VoIP logger uses packet API or local SPAN port to record local IP-phones.
AXP Solution for Branch Fax Server Sagem Interstar X-Medius

Problem

- Fax is still preferred legally binding method for transmitting critical, confidential information in the branch but lacks management and security
- Emerging compliance and corporate governance requirements and an emphasis on branch have created a need for
- Current OEM solutions use Dialogic cards and are Windows based

Solution

- Offer integrated T.38 Fax Server capabilities with Sagem; market leader in FoIP

Benefits

- Eliminates the need for extra servers; fax boards, rack space and reduces power consumption
- Real time delivery, email integration, secure, reduced operational costs
- FoIP promotes Cisco Intelligent Network infrastructure
Branch Office Fax Server

Before

After
Connected Healthcare—ICW

**Problem**
- Doctors struggle to care for patients without knowledge of past treatments / illnesses
- Dangerous medical mistakes, wrong prescriptions

**Solution**
- Healthcare Connector Application
- Cisco ISR 1841 w/ AXP AIM service-mod
- USB support for card readers
- Application controls VPN via API

**Benefits**
- Meets stringent privacy and encryption standards for health record transmission
- Fully-integrated solution (HW/SW platform) with utilization of ISR USB ports for integration of smart card readers
- Easily managed for physician’s office and health clinics
- Low-cost
Kaspersky Anti-Virus for Cisco AXP

- **Kaspersky Anti-Virus for Proxy Server** has been integrated into Cisco AXP

  Real time scanning of internet traffic (http and ftp)
  Detects and deletes all types of viruses, worms, Trojans and other malicious programs in traffic that passes through the proxy server

  Choice of filtering parameters
  IP and URL addresses, MIME types and file sizes can be used to create individual scanning rules for different user groups

  Scanning of archived files
  Supports virtually all existing archiver and packer formats

  Detection of potentially harmful programs
  Using the extended protection option, detects all entities potentially capable of harming the user’s computer.
Kaspersky Anti-Virus for Cisco AXP

- Flexible Administration
  - Remote Administration
    - The application can be administered remotely via the web interface or via a single configuration file
  - Group Security Policies
    - The administrator can set individual traffic filtering rules for each user group, defining permissions in line with the corporate security policy
- User Notifications
  - Automatically blocks any infected entity and sends the user a HTML notification created or selected by the administrator
- Reports and Statistics
  - Compiles statistical reports to help administrators track virus activity and monitor the application’s performance.
- Configurable Update Modes
  - On-demand/scheduled/automated updates are downloaded from Kaspersky Lab’s servers or your company’s own repository.
Cisco Developer Network (CDN)
How Does it Work?

Companies who meet minimum program requirements will enter at the Registered Developer participation level. Others may enter at a higher level based on past achievement, satisfaction of applicable participation level requirements, and/or participation in other Cisco programs.

Developers can take advantage of a set of program entitlements, based on their participation level and completion of applicable milestones.

Solution Developers and Preferred Solution Developers may also qualify for additional add-on go-to-market benefits and other optional benefits.

Registered Developers and Solution Developers may qualify to advance by satisfying specific participation level criteria and earning program points.
Program Requirements

Satisfaction of requirements determines participation level and access to associated entitlements and benefits

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Registered Developer</th>
<th>Solution Developer</th>
<th>Preferred Solution Developer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signed program agreement and paid participation fee</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid company, product, and supporting website (First Customer Ship (FCS) not required)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Complementary value proposition for at least one Cisco product family</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cisco Relationship Manager approval for advancement</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Support infrastructure - 24x7 TAC, with regional and escalation contacts for Cisco as appropriate to cover joint solution</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Successful completion of interoperability verification and coordinated support or completion of skills certification (for System Integrators)</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Testing/support infrastructure if applicable (i.e. Lab, test bed, demo area)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Registration of closed joint deals</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Qualified customer references</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Joint strategic planning, including roadmap &amp; resource plan</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Provide sales &amp; marketing collateral on joint solution</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Meet Channel readiness requirements</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Dedicated BD resource to manage relationship</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>If requested, participation in Cisco events and analyst joint-briefings</td>
<td></td>
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</table>

The table shows the requirements for different levels of participation, with corresponding fees for different regions.

Point system
# Program Points and Advancement

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points Earned</th>
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<tr>
<td>Establishing a development and/or testing lab</td>
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<tr>
<td>Entering closed deals (subject to verification by Cisco)</td>
<td>1 (per verified deal)</td>
</tr>
<tr>
<td>Entering customer references (subject to verification by Cisco)</td>
<td>2 (per verified reference)</td>
</tr>
</tbody>
</table>

- **Requirements for Registered Developer to Solution Developer Advancement**
  - Satisfaction of all Solution Developer level Program Requirements
  - Demonstrated, consistent, and successful Interoperability Verification Testing with at least one product
  - One verified and complimentary joint customer reference (minimum)
  - Cisco Business Unit sponsorship (determined in part on product or solution fit, revenue opportunity, Cisco resource demands, and similar business factors)
  - Attain a 10 point minimum per applicable Technology Category

- **Requirements for Solution Developer to Preferred Solution Developer advancement**
  - Satisfaction of all Solution Developer and Preferred Solution Developer level Program Requirements
  - Meet the requirements necessary to access Add-on Go-to-Market Benefits
  - Demonstrate strong customer business relevance to a key Cisco product or technology, optimal revenue opportunity, and channel readiness
  - Sponsorship from Cisco sales and/or channels management
  - Cisco resource availability to support relationship
  - 18 point minimum per applicable Technology Category
Resources

- External
  
  www.cisco.com/go/axp