Branch Optimization through Application Integration

Dave Bornstein (born@cisco.com)

Cisco Systems

Mgr, Application Extension Platform

New Enterprise Business Priorities

End user experience must be consistent regardless of physical location

"Thin" branch implies many things:

- Smaller branch application footprint
- Server consolidation both locally and in the Data-Center
- Increase in client-server traffic over the WAN
- Limited IT staff and management challenges

Energy / power consumption concerns must be considered for "green" initiatives

62% of Enterprises Adding New Branches

91% of Employees Work Away from HQ

Video and Collaboration Top Bandwidth Drivers

Source: Nemertes Research, 2008 Branch Survey

Leveraging "Network as a Platform" to Drive Application Value

Operational Efficiency

A Few Years Ago

Multiple Overlay Products

Sep 2004

Integrated Services

- Services Integration
- Survivability
- 50–70% lower Opex

Network Consolidation

Apr 2008

Integrated Applications

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

Application and Server Consolidation

Application eXtension Platform

AIM-102
256MB, 1GB, Intel Celeron
Light-Weight Applications

SDK and Development Portal

AXP Partner Program

Complete Ecosystem

AXP Developer Services

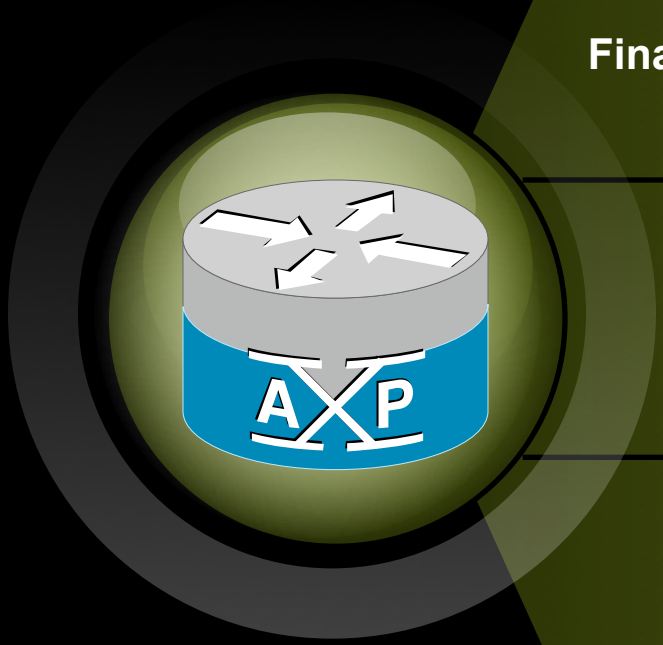
AXP Advanced Services

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

AXP Use Cases—In a Nutshell



Vertical Applications

Financial Voice Recording

Utilities Monitoring

eHealthcare Records

Horizontal Applications

Voice Recording

Fax Over IP

Desktop/Server Mgmt

Power Management

VoIP Paging

In-House and Custom Applications

Management Tools

Custom Applications

MSP Applications

Cisco Supported Services, 3rd-Party Business Applications, and Custom Applications and Utilities

Cisco AXP
Solution Partners

Vertical Solutions			Horizontal Solutions		
Healthcare	icw Technology for Health	Secure Healthcare Connector	NEW	CDW BERBEE	VoIP Paging
Financial Services	NICE	**VoIP Recording**		Sagem-Interstar SAFRAN Group	Fax-Over-IP
Energy	OSIsoft.	Real-Time Information Management		Avocent. LANDesk SOFTWARE	Remote Device Management

Technology and Specialty Partners	JBoss	NEW	Infoblox	NEW	Global Protocols	NEW
	J2EE Application Server		IPAM (IP Address Management		Space Communication Protocols
System Integrators and VARs	SISCO	DIMENSION DATA	netarx	hp invent	LOCKHEED MARTIN	

AXP Technical Overview

Dedicated Application Resources

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

Standards-Based Hosting Infrastructure

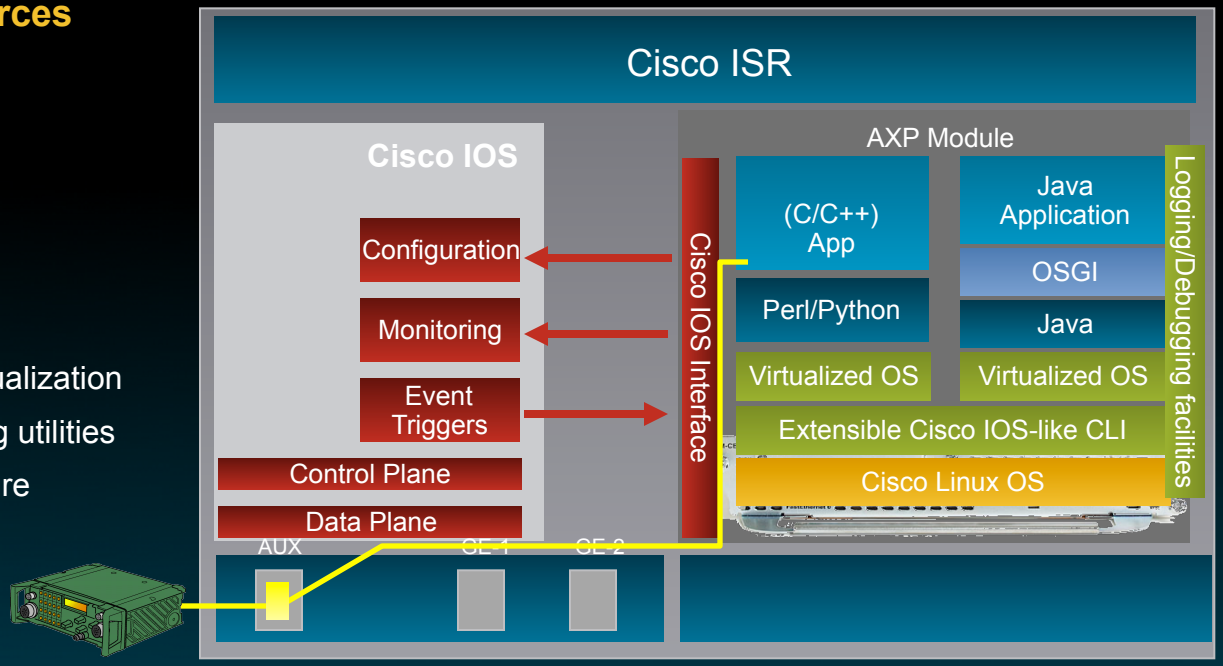
- Hardened Cisco Linux OS with virtualization
- Complete install/upgrade packaging utilities
- Logging and debugging infrastructure

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



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

IOS Integration API

Packet Monitoring API: Monitoring and Analysis; No need for complex wiring or Span ports

Information API: provides all info. available to IOS CLI and SNMP agents

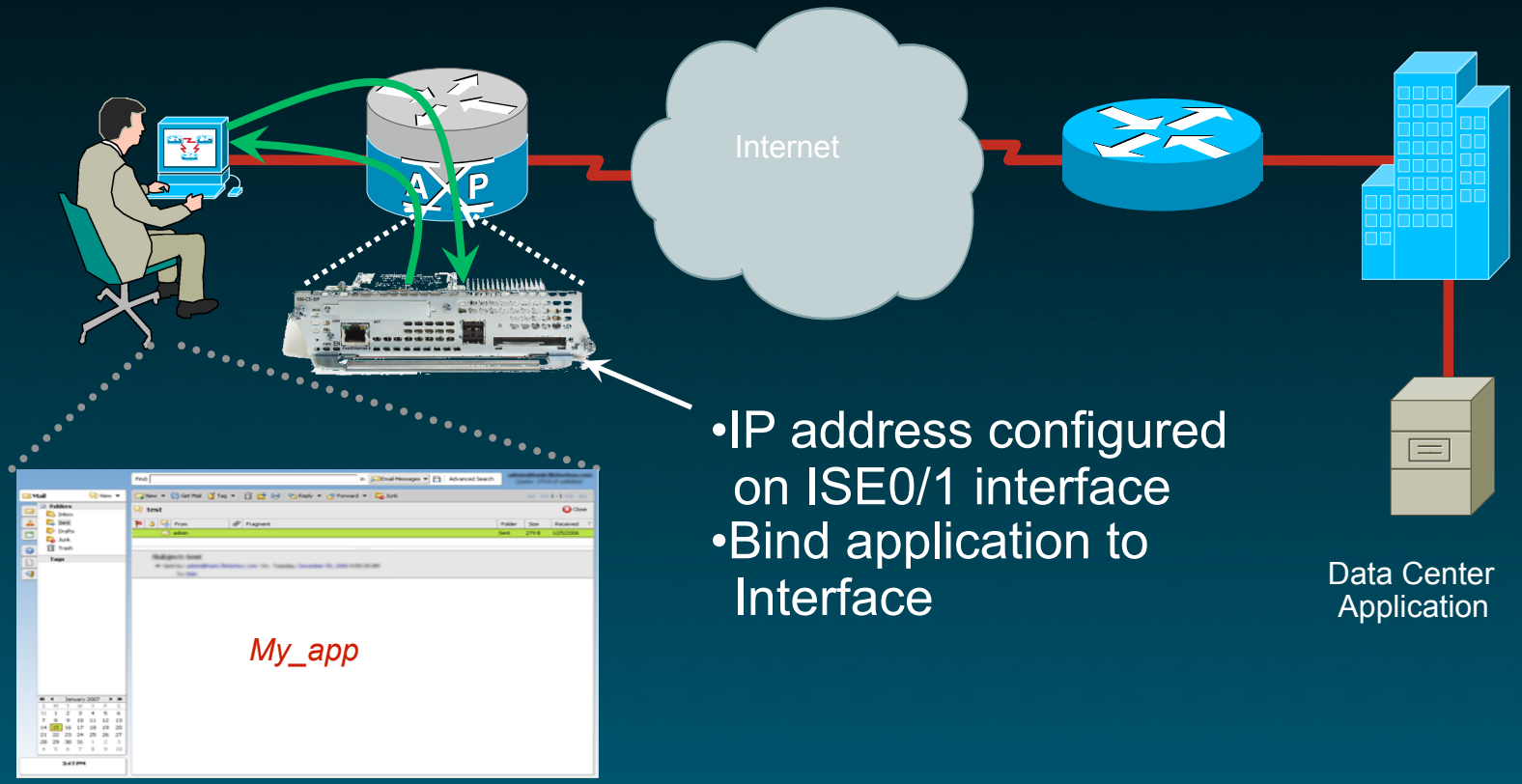
Event Trigger API: allows application to react to router events incl. interface failover, packet loss etc.

IOS config. API: allows app. to dynamically change the router config; Can change the behavior of router in real-time

Serial Device API: provides the ability to communicate directly with serial ports; Supports connectivity to legacy and non standard devices

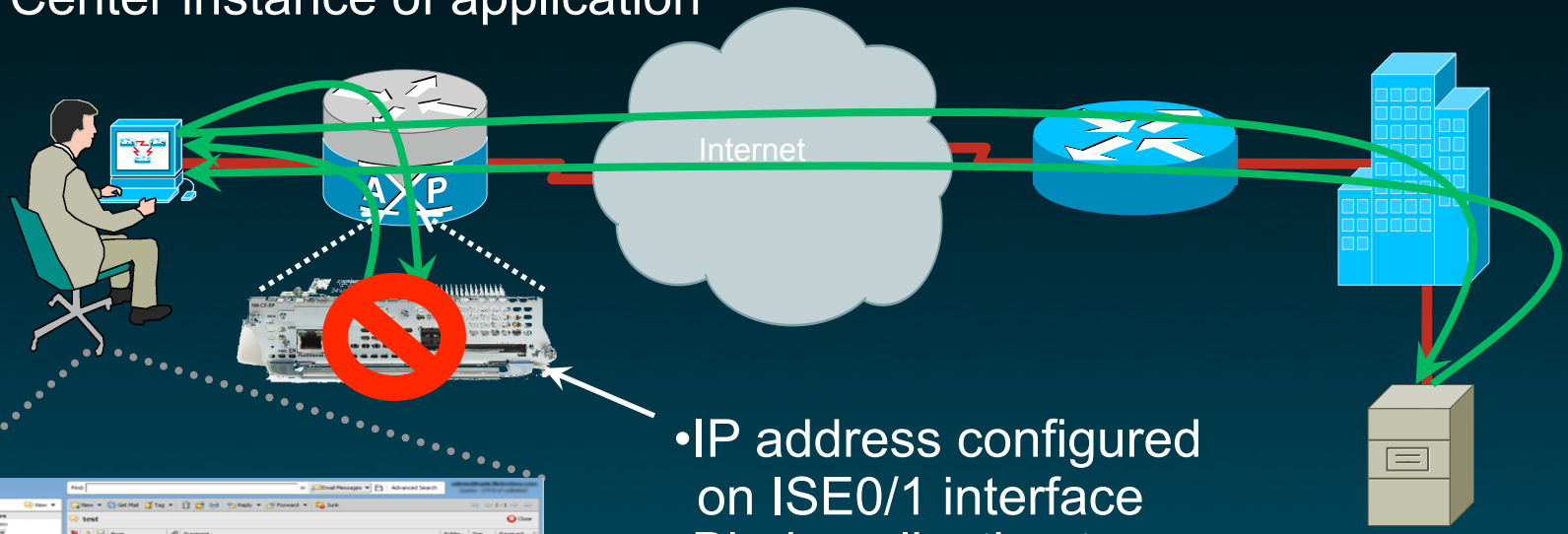
Deployment Options
Application Hosting

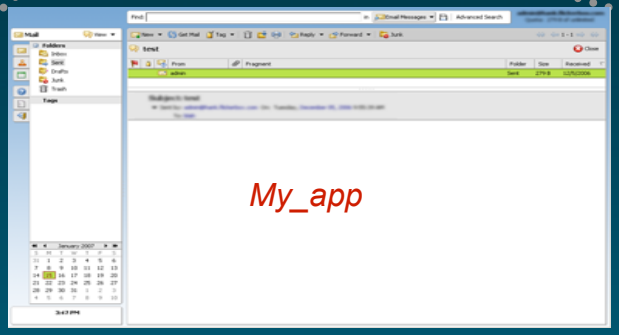
1. Client sends traffic directly to application running on AXP service-module (standard server model)
2. Application responds to client



Deployment Options
Application Transparency

1. Client sends traffic to application in Data Center
2. Cisco ISR router intercepts traffic while application is “online”
3. If application is “offline”, Cisco ISR router forwards traffic to Data Center instance of application



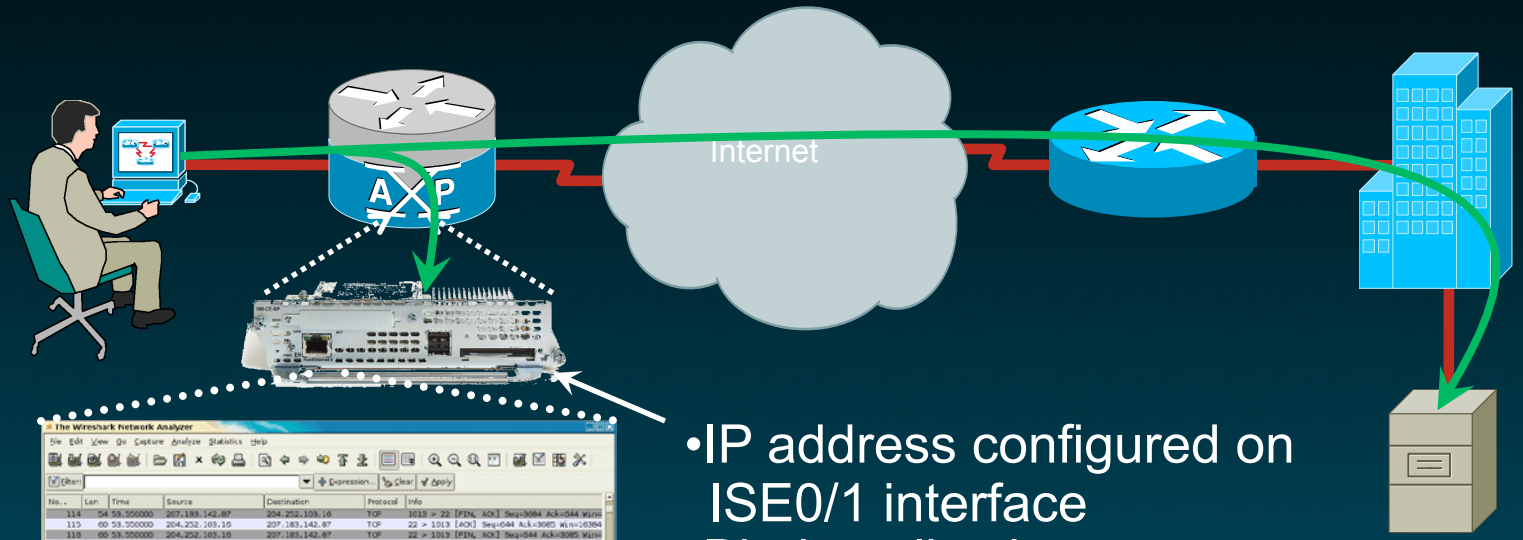


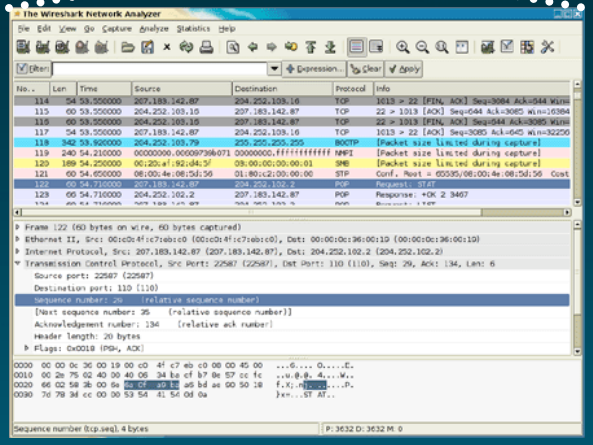
- IP address configured on ISE0/1 interface
- Bind application to Interface
- PBR configured on ISR router

Data Center Application

Deployment Options
Passive Applications

1. Client sends traffic directly to application in Data Center
2. Cisco ISR router creates and forwards copies of packets to application running on AXP service-module





- IP address configured on ISE0/1 interface
- Bind application to Interface
- RITE or NAM Packet Capture feature configured on ISR router


Payment Gateway
Branch Recorder
Health Care Router
Fax-over-IP Router
Green Router
Device Mgmt. Router
"Now, what do YOU want your router to be?"

Important Web Links

- Cisco External Site:

  http://www.cisco.com/go/axp

- BU Alias:

  Product Management: ask-axp-pm@cisco.com

Partner Structure