



# CISCO BORDERLESS NETWORKS

Enabling the Borderless Organization

# Agenda

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Borderless Networks  
Performance Challenges

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Performance Optimization  
for Borderless Networks

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Cisco WAAS and WAAS  
Mobile

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# Borderless Networks

Architecture for Agile Delivery of the Borderless Experience



## Borderless End-Point/User Services



Mobility



Workplace Experience

Video



Securely, Reliably, Seamlessly: AnyConnect

## Borderless Network Services



Mobility:  
Motion

Green:  
EnergyWise

Security:  
TrustSec

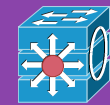
Application  
Performance

Video:  
Medianet



Borderless  
Management  
and Policy

## Infrastructure



Switching



Routing



Wireless



Security



WAAS

# Is My Network Borderless?

Do I have a consistent access policy architecture across my network for all users and devices?

Can mobile devices access my network transparently and securely?

Can my network deliver real time collaboration experience?

Am I using my network to reduce my energy cost?

Can I secure my assets on premise and in the cloud?

Can my network optimize performance of applications anywhere, anytime?

Is my network ready for current and future regulatory requirements?

# The Transformation New Borderless Enterprise

Anyone



Employee,  
Partner,  
Customer

Anything

Business and Personal Applications  
Person / Device,  
Device / Device



Borderless  
Experience



Work, Home,  
On the Go...

Always Works,  
Instant Access,  
Instant Response



Anywhere

Anytime

# “Bordered” IT Architectures Overlaid App Performance on the Infrastructure

## Business Requirements

- Basic Collaboration
- Limited Mobility
- Some apps, some locations

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## IT Architecture

- Limited centralization
- Multiple servers at branch-offices
- Basic link optimization

# Borderless IT Architectures Need App Performance Built Into the Network

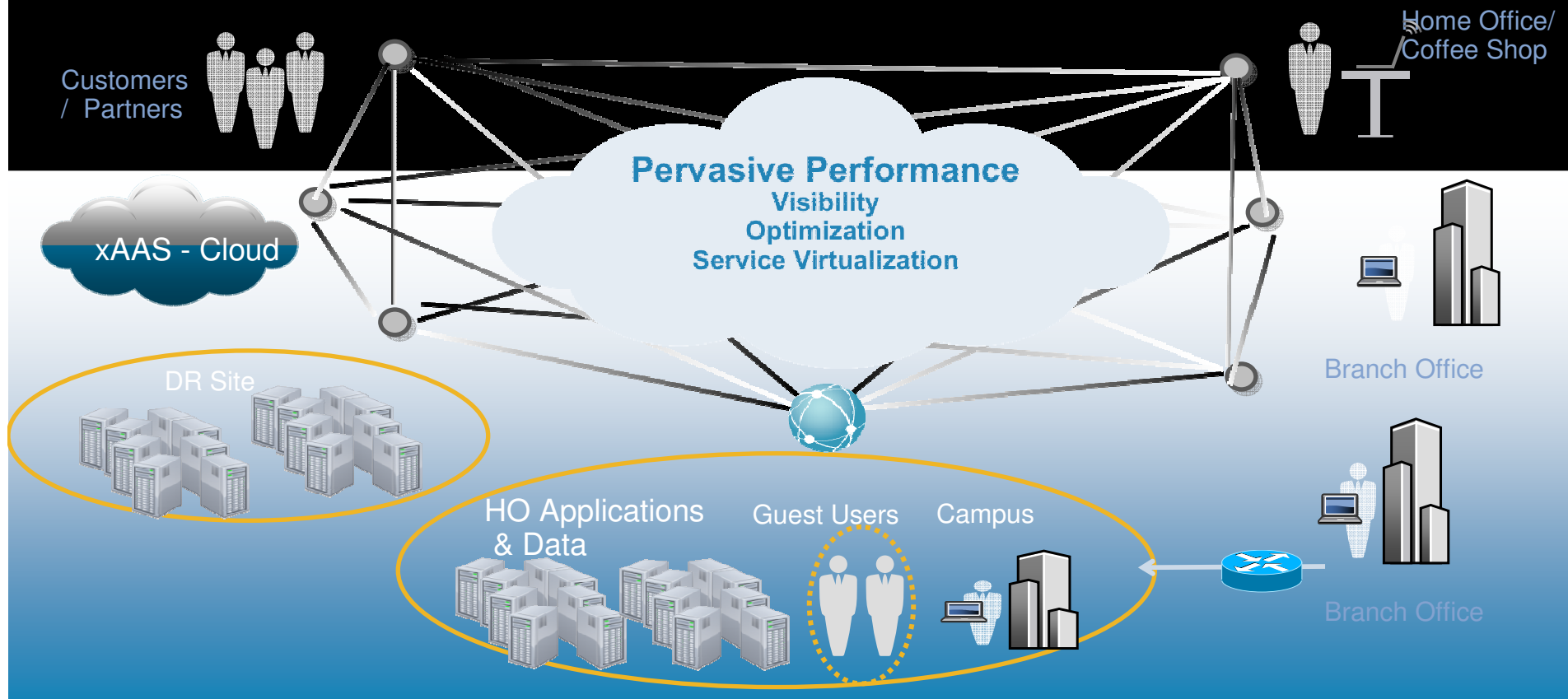
## Business Requirements

- Any-Any Collaboration
- Mobile workforce
- Any app, anywhere

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## IT Architecture

- Centralized IT
- Low-footprint branches
- All links highly optimized



# Borderless Performance: System Elements

## Visibility And Control



- Gain visibility into apps and network
- Prioritize business-critical apps
- Enable optimization decisions

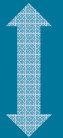


TRANSPARENCY

## Optimization And Acceleration



- Optimize network resources
- Accelerate applications
- For remote and mobile users



INTEGRATION

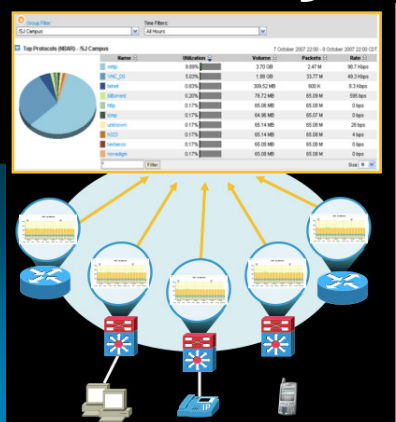
## Service Virtualization



- Network-Integrated app hosting
- Services “on-demand” – no truck-rolls
- Cloud-ready

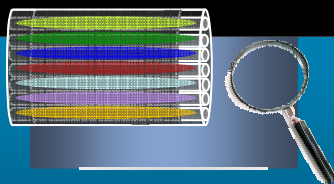


# Borderless Performance System Elements: Visibility & Control



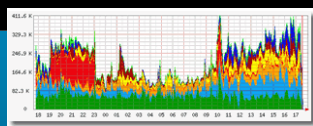
- Discover network traffic with application-level insight
- Deep packet visibility into web traffic
- Monitor application usages and anomalies
- Build reporting for capacity planning, compliance
- Prioritize business-critical apps via bandwidth prioritization, optimized routing and P2P control

## Application Visibility, Control and Reporting Across Networks



### Discover Network Applications

NBAR, SCE  
L7 visibility (Web2.0, P2P, IM...)



### Monitor Application Perf

NetFlow, IP SLA,  
NAM, Medianet  
Video monitoring



### Analyze App Trending

- QPM, Business Intelligence etc  
-WAAS CM  
-Partner Ecosystem



### Enforce Application Control

- Adv QoS  
- Perf Routing  
- P2P Control  
-Identity integration

# Borderless Performance System Elements: Optimization And Acceleration

## Policy Integration

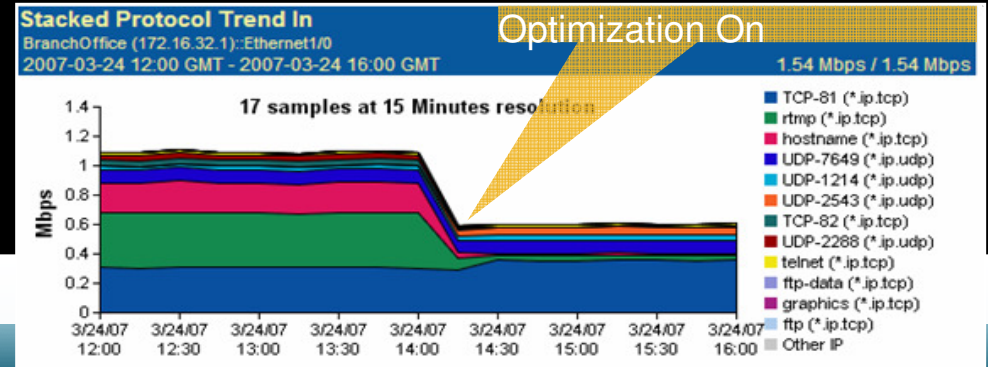
- Transparent integration w/Netflow, QoS policies

- Policy-based mobile to land N/W handoffs

- Auto-discovery of optimization peers

## Network Optimization

- Efficient WAN utilization
- Improved WAN resiliency
- Rich media ready N/W

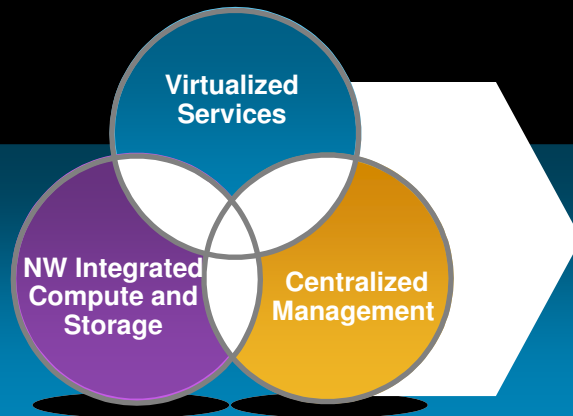


## App Acceleration

- App-fluent acceleration
- Any app
- App-vendor validated

Category	Applications	2X	5X	10X	25X	50X	100X+
File Sharing	Windows, UNIX	2-20X Avg		>100X Peak			
Email	IBM, Windows	2-5X Avg	20X Peak				
Web and Collaboration	WebSphere, APACHE, Windows	2-10X Avg		100X Peak			
Software Distribution	Windows, symantec.	2-20X Avg		>100X Peak			
Enterprise Applications	SAP, ORACLE, dows	2-5X Avg	20X Peak				
Backup Applications	EMC <sup>2</sup> , NetApp	2-10X Avg		50X Peak			

# Borderless Performance System Elements: Service Virtualization



- Centralize most IT, host select services in the branch
  - Windows services
  - Custom apps
- Gain local performance for select services
- Deploy optimization on-demand (policy-based)
- Optimize cloud applications such as Webex

Improve app performance and reliability without server-sprawl



- Virtualized Branch Services hosted in the Network



- On-demand provisioning of Performance



- Cloud Optimization
- Business Continuity

# Borderless Performance: Building the System

## Visibility And Control



Switching - Cat 3K, 4K, 6K    ISR G2



NAM

WAAS CM

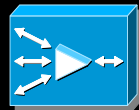
Netflow, NBAR, IP SLA

QoS, Perf Routing

ASR 1000  
SCE

Reporting and Monitoring

## Optimization & Acceleration



WAAS



WAAS Mobile



ISR G2

## Branch Service Virtualization



ISR G2 w/SRE



Webex on ASR



AXP on ISR G2

WAAS Virtual Blades

# WAAS Overview

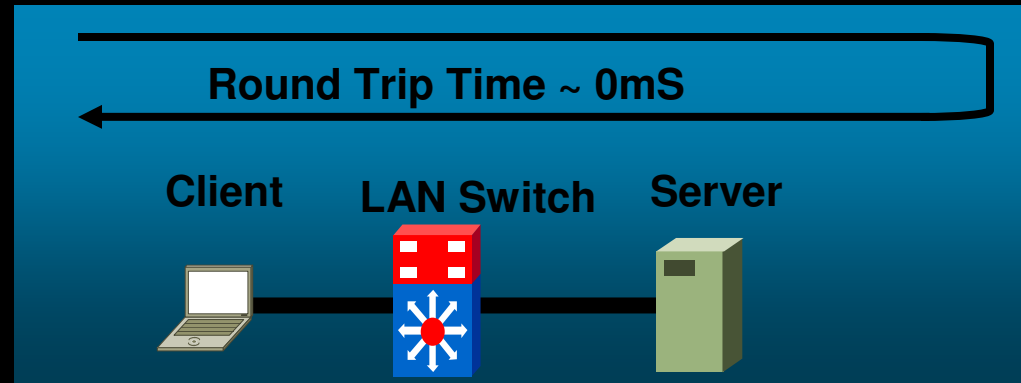
# The Root Cause: WAN Limitations

- Applications and video work well on LAN:

High bandwidth

Low latency

Reliability



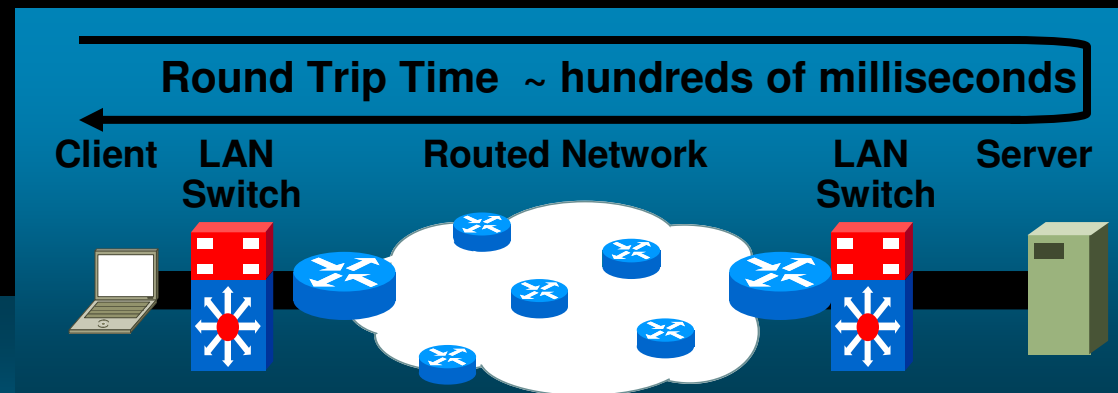
- But not on WAN:

Low bandwidth

Application chattiness

High latency

Frequent packet loss



**WAN limitations cause poor application and video performance, and keep servers and storage in branch offices**

# The Solution: Make WAN Perform Like LAN



**TCP  
Optimization**

**Accelerates TCP performance over the WAN**

**Data Redundancy  
Elimination**

**Redundant data does not need to transit the WAN – reduces overall bandwidth usage**

**App-Specific  
Acceleration**

**Optimizes application protocols, such as MAPI, CIFS, NFS, HTTP, Print – eliminates protocol inefficiencies**

**Video delivery  
optimization**

**Streamlined video delivery ensures one copy of live streaming transits the WAN**

# Cisco WAAS Solution Elements

Branch Users



Mobile Users



WAAS



Router

WAN In  
LAN Speed



Router



WAAS

Data Center Applications



## WAAS Software:

- WAN optimization for branch users
- Integrated video delivery
- Windows Server on WAAS (WoW)
- Data replication acceleration



## WAAS Mobile Software:

- WAN optimization for mobile users

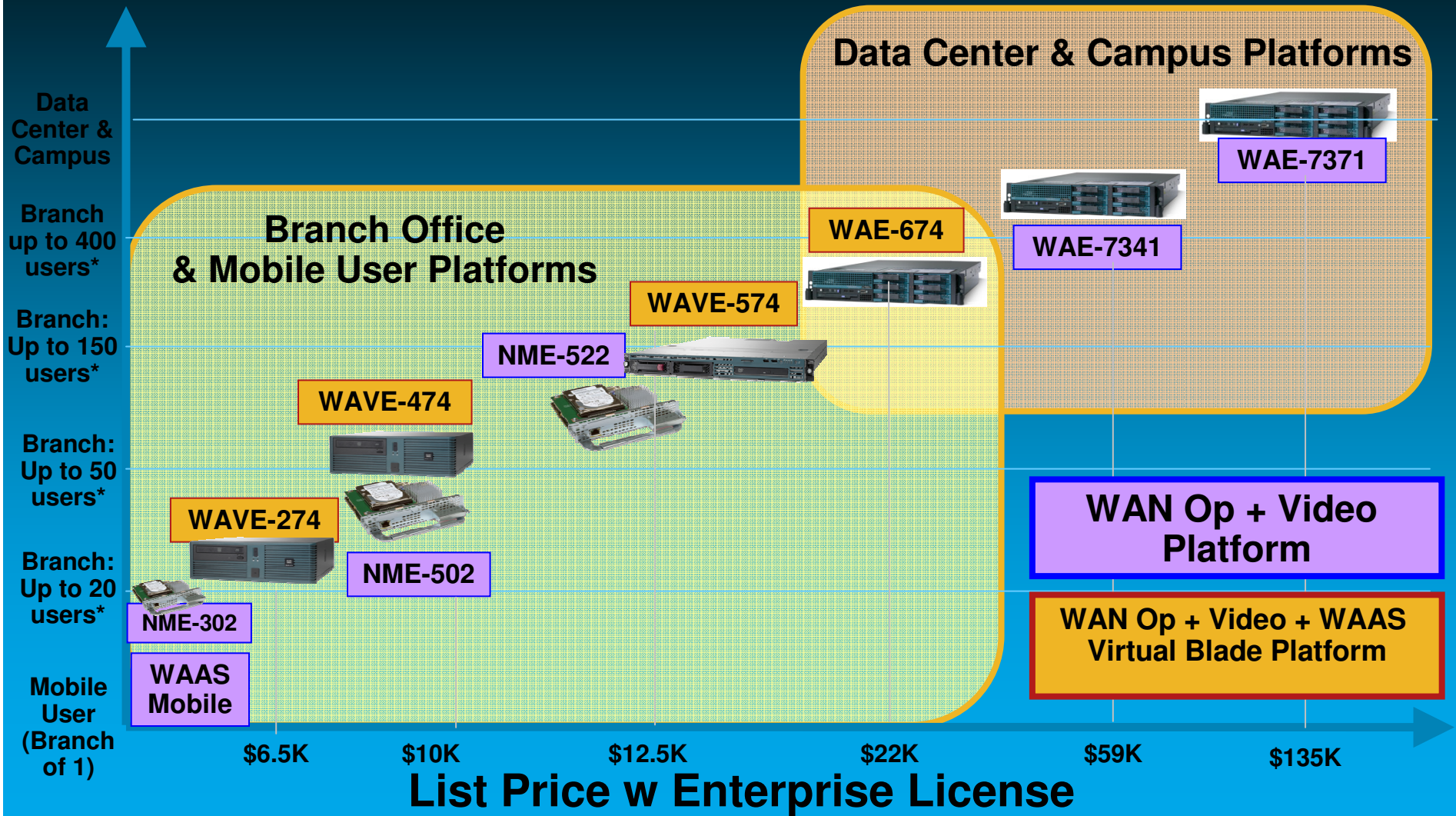
## WAAS Hardware:

- Wide Area Application Engine (WAE)
- Wide Area Virtual Engine (WAVE)
- Integrated Services Router Modules



# WAAS Product Line

Location & Size\*



\* Indicative sizing only. Please refer to WAAS sizing guidelines to size specific to customer requirements.

\* NME-302 offers TCP Optimization & Compression only. It does not support Enterprise License Features. 17

# Improve Remote User Productivity

## Application Acceleration

Applications		Response Time Reduction		
		Typical Reduction	50%	Maximum Reduction
File Sharing	CIFS NFS	20%	50%	99%
Email	Exchange Lotus			90%
Web Apps	HTTP HTTPS			80%
Software Distribution	System Center Configuration Manager			95%
Enterprise Applications	Microsoft Oracle SAP			90%
Backup Apps	System Center Data Protection Manager Legato Veritas			85%
Data Replication	EMC SRDF EMC IP Replicator NetApp SnapMirror Data Domain Double-Take Veritas Vol Replicator			99%

# Cisco WAAS Advantages

## Application Vendor Validated

- Architecture leadership and joint R&D
- Lower risks via technology licensing
- Ease of integration and support escalation

ORACLE

Microsoft

SAP

vmware

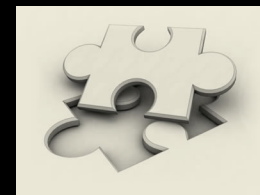
IBM

EMC<sup>2</sup>

NetApp

## Network Integrated

- Ease of operations via network transparency
- Accurate application SLA monitoring
- Secure acceleration
- Better with VoIP and video



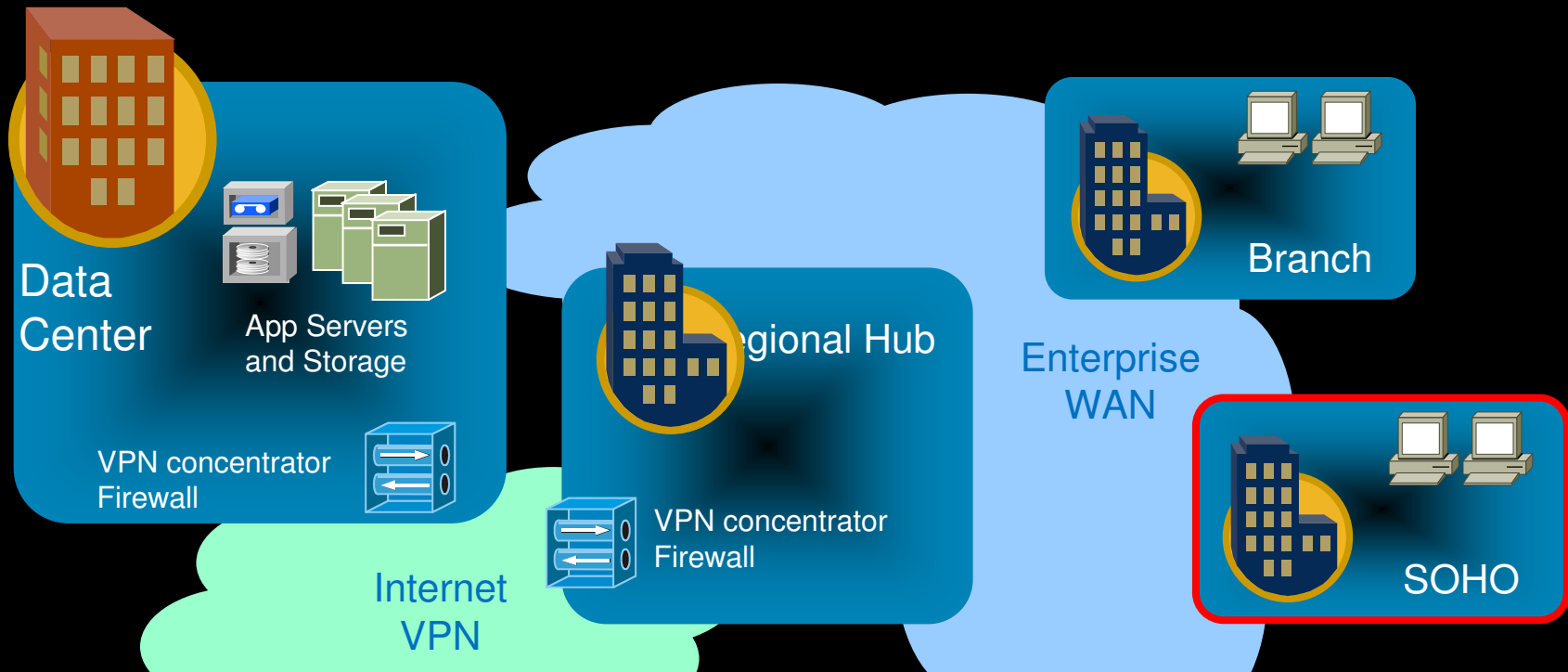
## Cost of Ownership Minimized

- Minimized device complexity via router integration
- Integrated high quality video
- Reduced data center server OpEx via offload technology



# WAAS Mobile Overview

# Fast applications required from anywhere



- Road warrior
- Field force
- Teleworker
- HQ traveler
- Home office

**Mobile Users**

**Problem:**  
Companies becoming global and distributed  
Applications and data being centralized

WAAS appliances accelerate access for branch offices

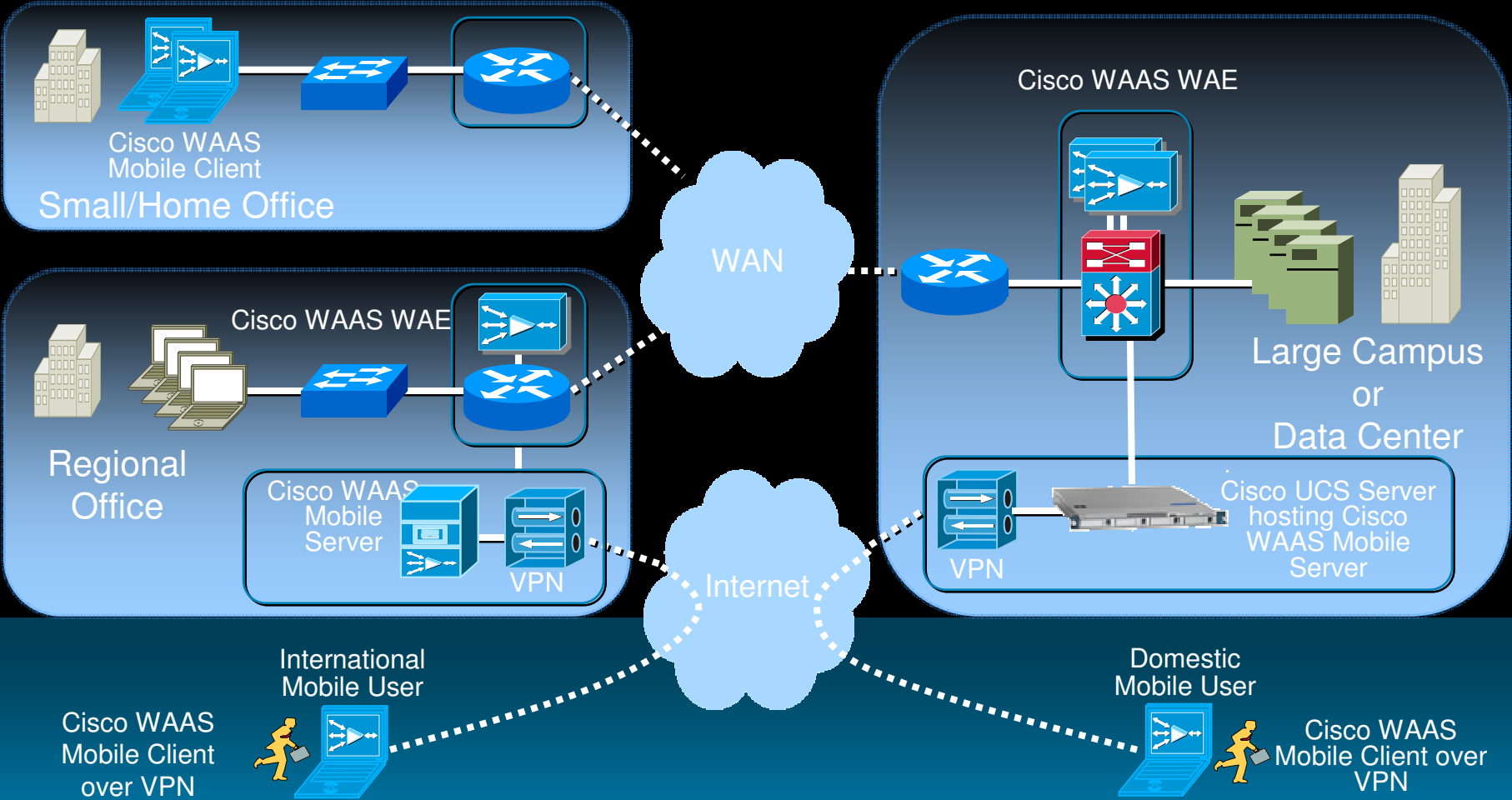
But...

Mobile and small office workers require similar solution

# Mobile Workforce Has Unique Requirements

- Must work with very wide range of hardware, OS, and app infrastructures
  - Custom-built solution needed for PCs to ensure small CPU/Memory footprint and interoperability with PC apps
- Different class of support, interoperability & management requirements
  - “Open” Windows PC versus “controlled” appliance environment
  - Limited IT support resources available
- Quality of the network connection lower than the corporate WAN
  - For connection types such as DSL, Wireless, Satellite, Dial-up, Cable, EVDO
    - Lower Bandwidth
    - Higher packet loss
    - Higher latency
  - Roaming through different network types each time you connect
  - Intermittent connectivity
- Results in worse performance for chatty enterprise applications
  - Web (HTTP and HTTPS), File Sharing (CIFS), and Email (MAPI)
  - Connections get dropped requiring login and restart of downloads

# Cisco WAAS Mobile Solution Overview



# Best of breed solution for Mobile Workers

- **Purpose-built for the PC/Laptop**
  - Results in better stability & reliability of on the Windows PC
  - Small PC footprint solution
  - Not an appliance software ported to Windows OS
  - Similar to Cisco's approach with VPN client
- **Industry leading performance**
  - Optimized for mobile workers – VoIP quality preservation, persistency while roaming, thin client (RDP/ICA) acceleration
  - Unparalleled performance for low quality, high latency networks (e.g., 3G)
  - Application protocol optimization for HTTP/S, CIFS, MAPI, FTP, SMTP, POP
  - Bi-directional, protocol independent acceleration of any size file or data object
- **Lowest TCO**
  - Deployable via standard enterprise software distribution systems
  - Centralized client configuration and software update management
  - 1-click troubleshooting

➔ Results in the best mobile users' experience

# Cisco WAAS Mobile Performance

Function	Application	1 <sup>st</sup> Time Improvement*	Subsequent Improvement*
File Shares	<ul style="list-style-type: none"> <li>Windows shares</li> <li>NAS</li> </ul>	3x-5x	5x-100x+
Email	<ul style="list-style-type: none"> <li>Outlook/Exchange</li> <li>Lotus Notes / Domino</li> <li>SMTP/POP</li> </ul>	3x-5x 2x-4x 2x-4x	2x-50x+
Web browsing	<ul style="list-style-type: none"> <li>Internet access</li> </ul>	2x-5x	2x-5x
Collaboration	<ul style="list-style-type: none"> <li>SharePoint</li> <li>Documentum</li> <li>Interwoven</li> <li>Oracle</li> </ul>	3x-5x	5x-200x+
ERP / CRM	<ul style="list-style-type: none"> <li>Oracle</li> <li>SAP</li> <li>Siebel</li> </ul>	3x-5x	3x-5x
Data Transfer	<ul style="list-style-type: none"> <li>FTP</li> </ul>	2x-4x	2x-50x+
Other	<ul style="list-style-type: none"> <li>Any TCP-based app</li> </ul>	2x-4x	2x-20x+

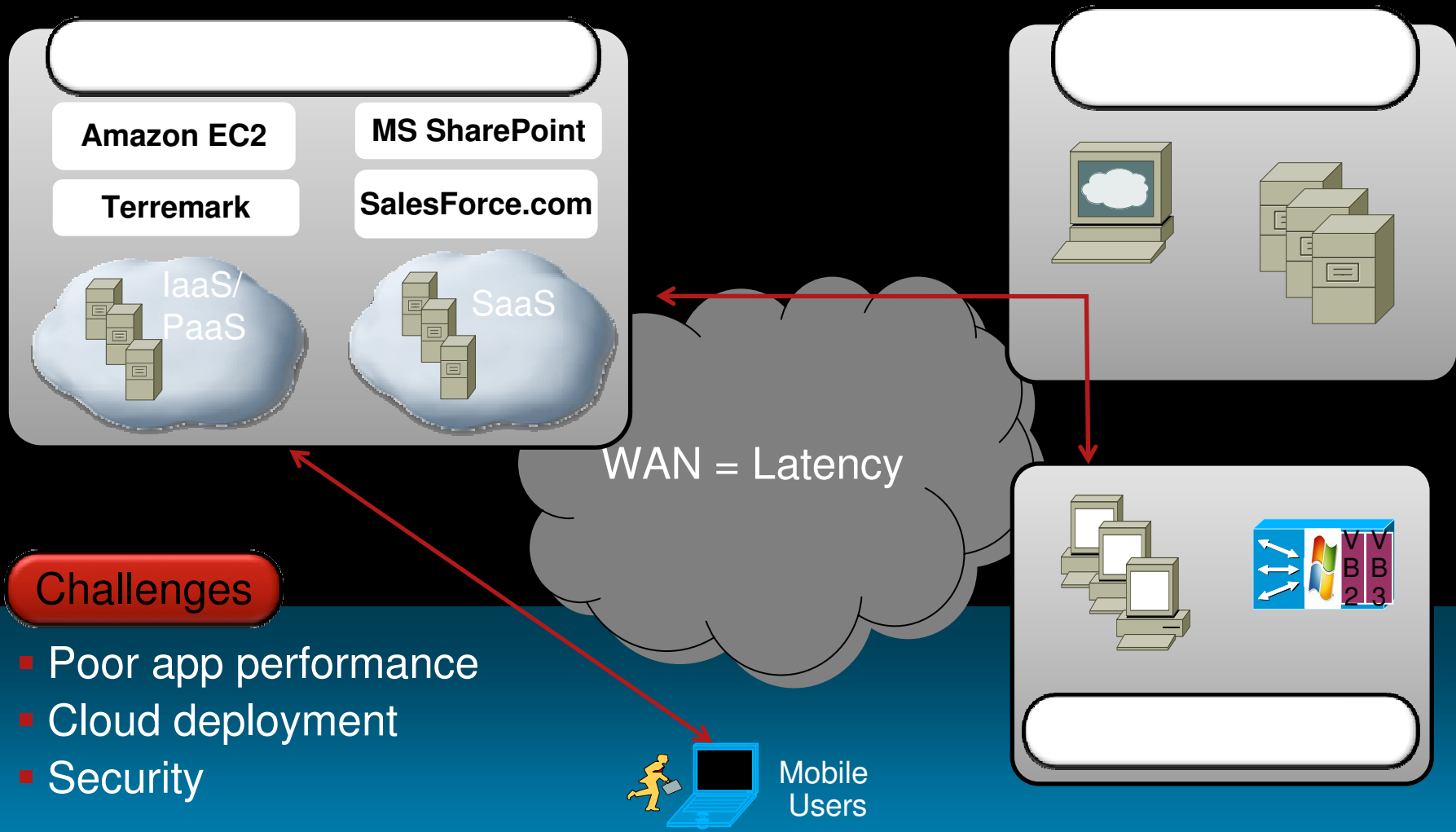
- Ensures LAN-like performance for remote file access and application use

- Purpose-built for wireless and problematic networks

- Simple network integration enables lower TCO

\* Performance results are “typical” and based on user workload, compressibility of data, WAN characteristics and utilization. Actual results are often better.

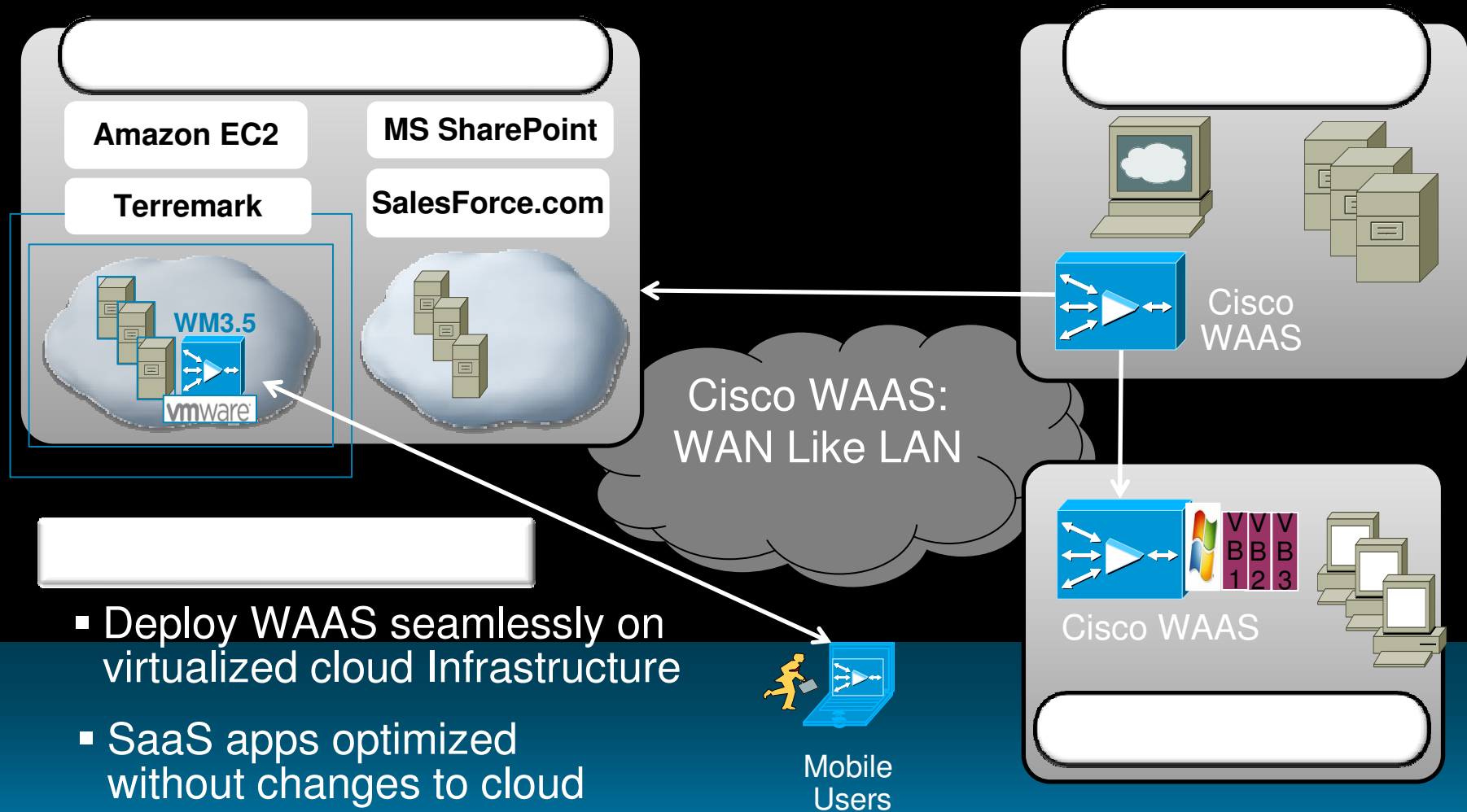
# Application Performance Can Hinder Cloud Adoption



## Challenges

- Poor app performance
- Cloud deployment
- Security

# WAAS Optimizes Cloud Access For Branch And Mobile Users

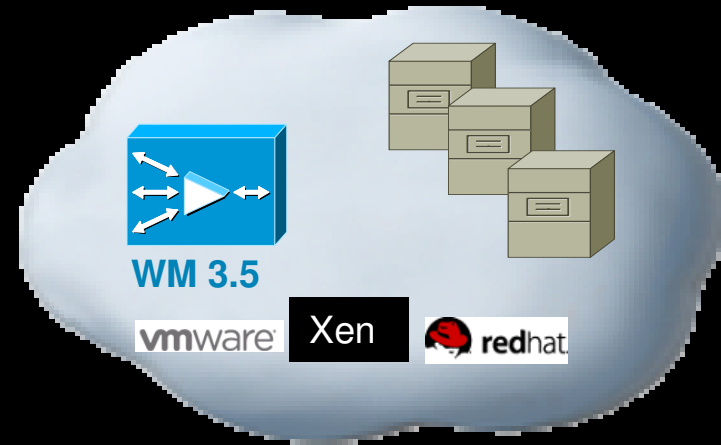


- Deploy WAAS seamlessly on virtualized cloud Infrastructure
- SaaS apps optimized without changes to cloud
- Results: Security + Optimization

# Introducing Cisco WAAS Mobile for Clouds!

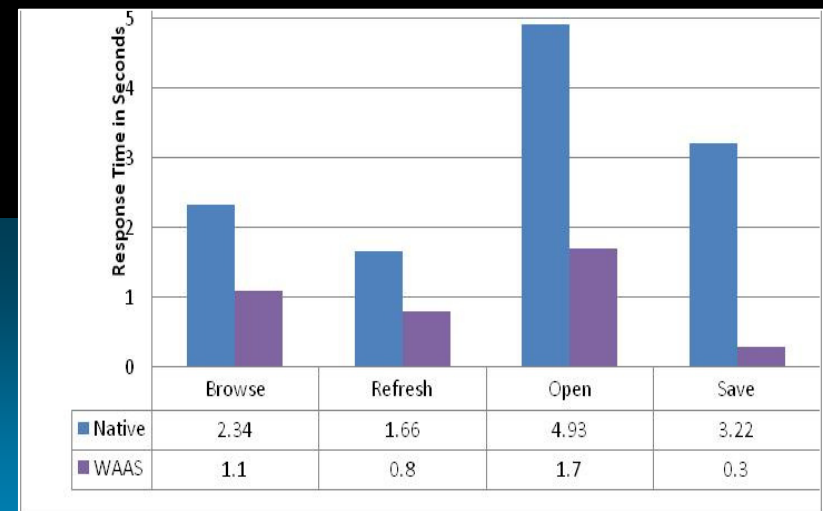
## New

- Seamless cloud acceleration
  - In virtualized infra, “cloud-ready”
- Cloud-agnostic
  - Amazon, Terremark, Force.com...
- Securely accelerate

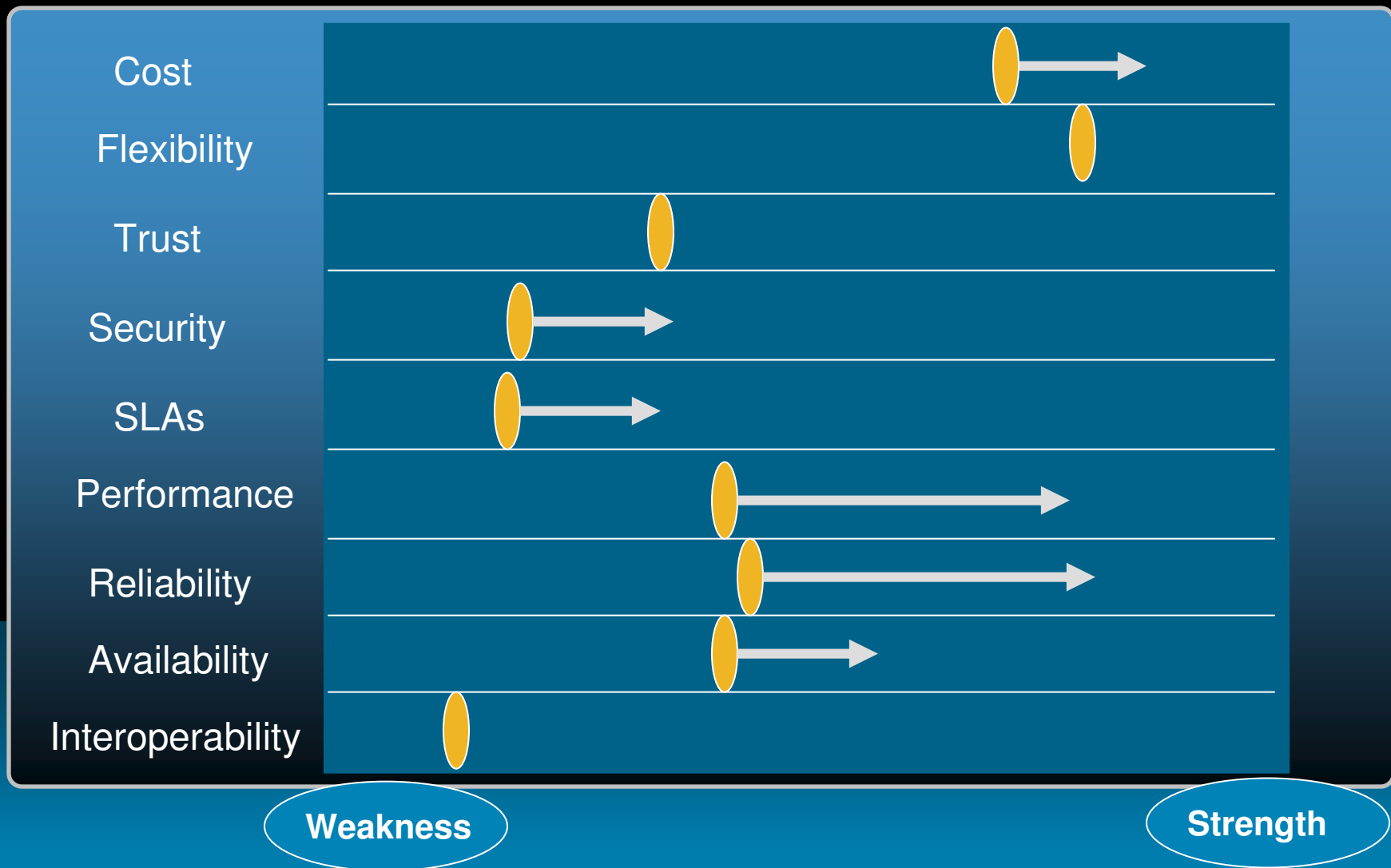


## Benefits

- Lower costs of cloud adoption
  - 70%+ bandwidth savings
- Enhance remote user productivity
  - 90%+ acceleration
- Foster green IT



# Clouds Services with Cisco WAAS Mobile



Weakness

Strength

# Summary

- **Cisco WAAS Mobile extends acceleration to public clouds**

Cloud agnostics, secure acceleration, ease and fast deployment

- **Cisco WAAS Mobile in UCS and Virtual Machine foot prints**

- **Extending Server and client OS support**

Windows 7 (32 and 64 bit), Server 2008 and R2

- **Continued investment in easy of use and management**

Universal view of users across servers

New enhanced web based client GUI

- **Flexible Deployment and network integration**

Simultaneously accelerations across multiple data centers

Client IP preservation

# Borderless Performance Integrated In the N/W

## User Productivity

- Performance consistency
- Applications anywhere
- Business apps prioritized

## IT Efficiency

- Centralized IT
- Virtualized branch services
- Optimized WAN resources

