



Increasing Workforce Productivity with Mobility



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Cisco Systems, Inc.

Agenda

Transforming the Business
Mobility Experience

Introducing the Unified
Wireless Network

Cisco Wireless
Product Portfolio

Cisco Virtual Office



Business Mobility in Transition



Capturing Market Transitions

Nomadic/
Mobile Devices



Collaboration



Wireline/
Wireless



Growth of Mobile Devices

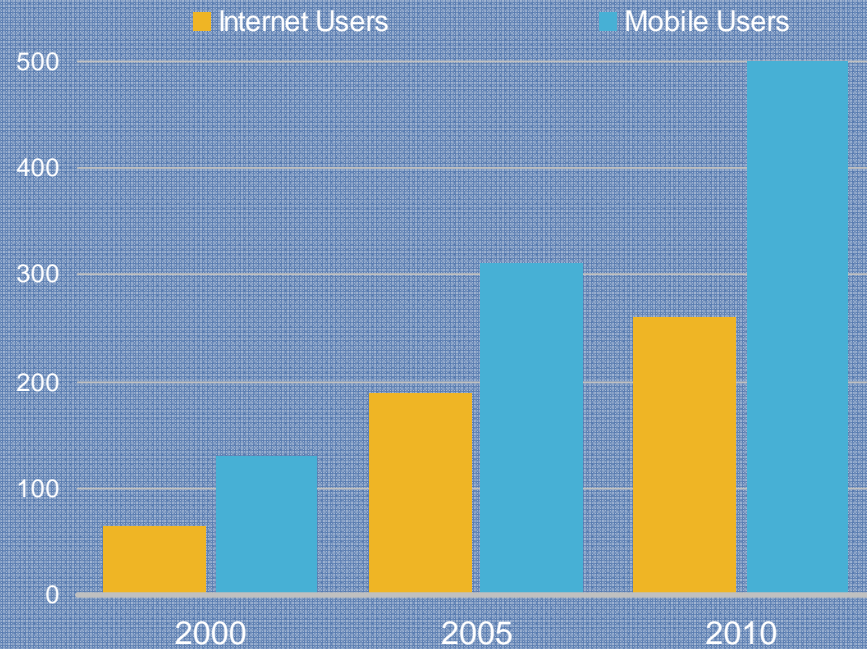


Mobile Device Growth

Create Greater IT Risks

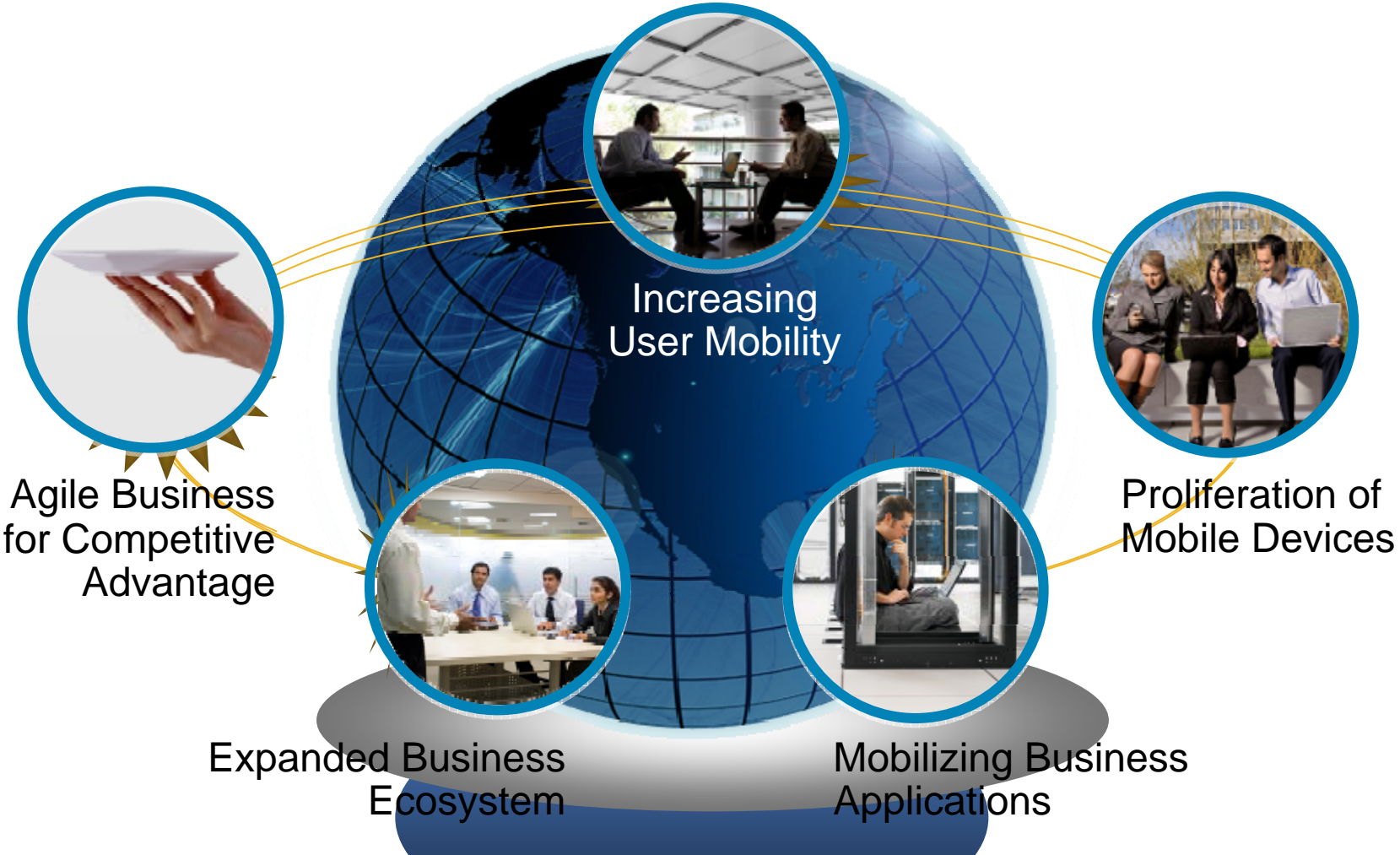
The Incoming Mobility Wave

Continued Proliferation of Number of Devices, OS, Applications, Wireless Technologies Creates a Tremendous IT Challenge



How to Manage/Operate a **Unique Secure Mobility** Experience and **Create Business Value**

Redefining the Mobile Workspace



Secure. Agile. Collaborative.

Business Mobility Requirements Differ from Consumer Mobility




Secure, Manage and Audit
Device Usage/Policies/Access

Unify Multiple **Networks** from
Personal to Private to Public

Enable **Applications** to
Securely Access Information
Across Multiple Networks

Enforce Role-Aware **User**
Experience Irrespective of
Connection

Anytime, Anywhere Over Any Network
Not Exactly—Rather Right Application, Right User, Right Policies



Tremendous Challenge to IT Staff

Disparate Networks to Operate/Manage:

Wireless LAN
Cellular/WiMAX
Ethernet

Applications, Control and Compliance:

Unified Communications
Field / Sales Service
ERP
CRM
Supply Chain
Corporate Security/Audit
PCI
HIPAA
SOX

80%+ of IT Mobility Resources: Reactive Client Management and Provisioning*

Dual Mode
Wired Phones
Wireless IP Phones
Laptops/Ultramobile PCs
Ruggedized RFID Tags

Lack of Device Profile Consistency Creates Network Complexity

Business Mobility **Must** be Easier to Implement and Manage

Addressing Business Mobility Needs



Unify Disparate Networks

Unify Personal, Private and Public Networks and Extend Mobility Applications to the Right Device/User, Via the Right Network



Address the Client "Wave"

Securing and Managing Devices and Assets with Centralized Client Provisioning, Device Certification



Mobility Applications and Solutions

Delivering the LoB/Functional Leader Requirements for Mobility Via Industry Relevant Mobility Applications

Empowering IT to Meet and Exceed Business Mobility Goals

Addressing the Business Mobility Needs



How to Address Your Mobility Needs?

The Cisco Unified Wireless Network Is a Flexible Architecture that Provides Common Services Across the Wired and Wireless Network



Integrates with the Wired Network to Ensure Performance, Preserve Investment and Decrease Complexity



Flexible Architecture that Meets Business Network Requirements



Common Management Solution that Scales Across Regions



Unified Client Solution that Simplifies Device Security and Management

Unified Wired and Wireless Network

Intelligent Network Services

2005+

- Common services platform
- Greatest efficiencies and lowest TCO
- Extensive application support common across entire network



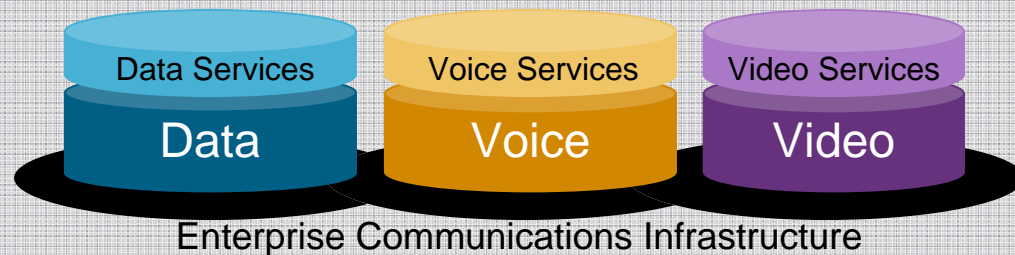
2000–2005

- Converged IP network lowers TCO
- Some application efficiencies, not optimized
- Overlay wireless support and management burden



1980s–2000

- Separate communications networks
- No common services
- High support costs and limited efficiency
- Siloed applications

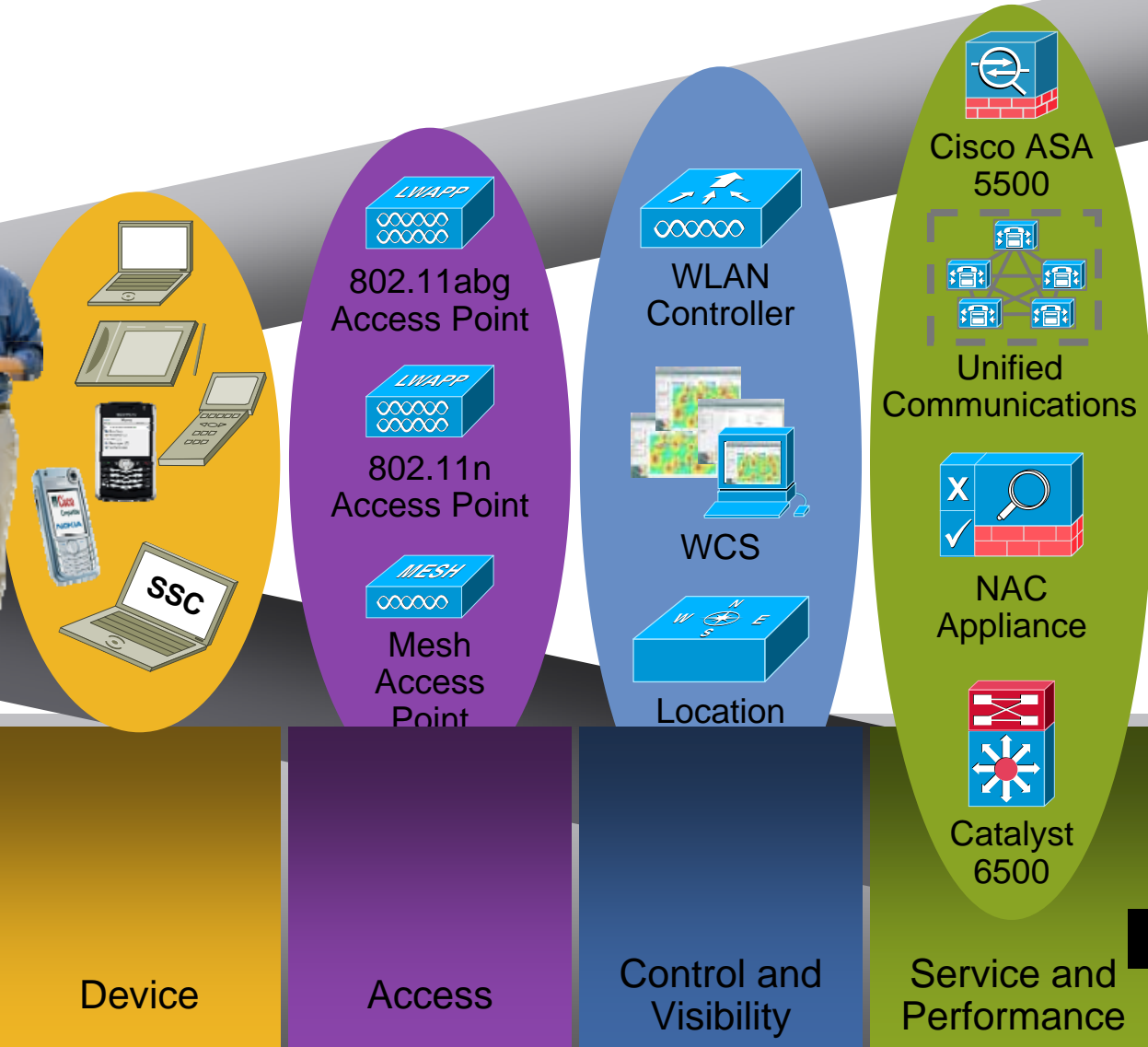


“We are at the point now that people expect wireless. When people travel between offices, we do not have to do anything to get them connected to the network; they can just get right to work ... That is a big productivity boost ... ”



Erick Doolen
CIO of PacificSource Health Plans

Building the Mobile Business



- Mobile UC:** Photo of a person using a mobile phone.
- Field Services:** Photo of a person in a uniform working on a device.
- Customer Service:** Photo of a person wearing a headset.
- Inventory Mgmt:** Photo of a person looking at a screen.
- Mobile Applications:** A solid blue bar at the bottom.

Cisco Unified Wireless Network



Client

- CCX Program—90% of laptops Cisco compatible
- Secure Services Client (CSSC)



Device

Access Points

- Indoor and Outdoor
- Modular, 802.11a/b/g/n



Access

Unified Network

Wireless LAN Controllers and Management

- Centralized management
- Flexible, scalable (1000s of APs)
- Radio resource management



Unified Wired and Wireless Network

Control and Visibility

Wired Network Services

- Unified Security and Management services
- Mobile Unified Communications



Service and Performance

Mobility Services



Security



Guest Access



Spectrum Intelligence



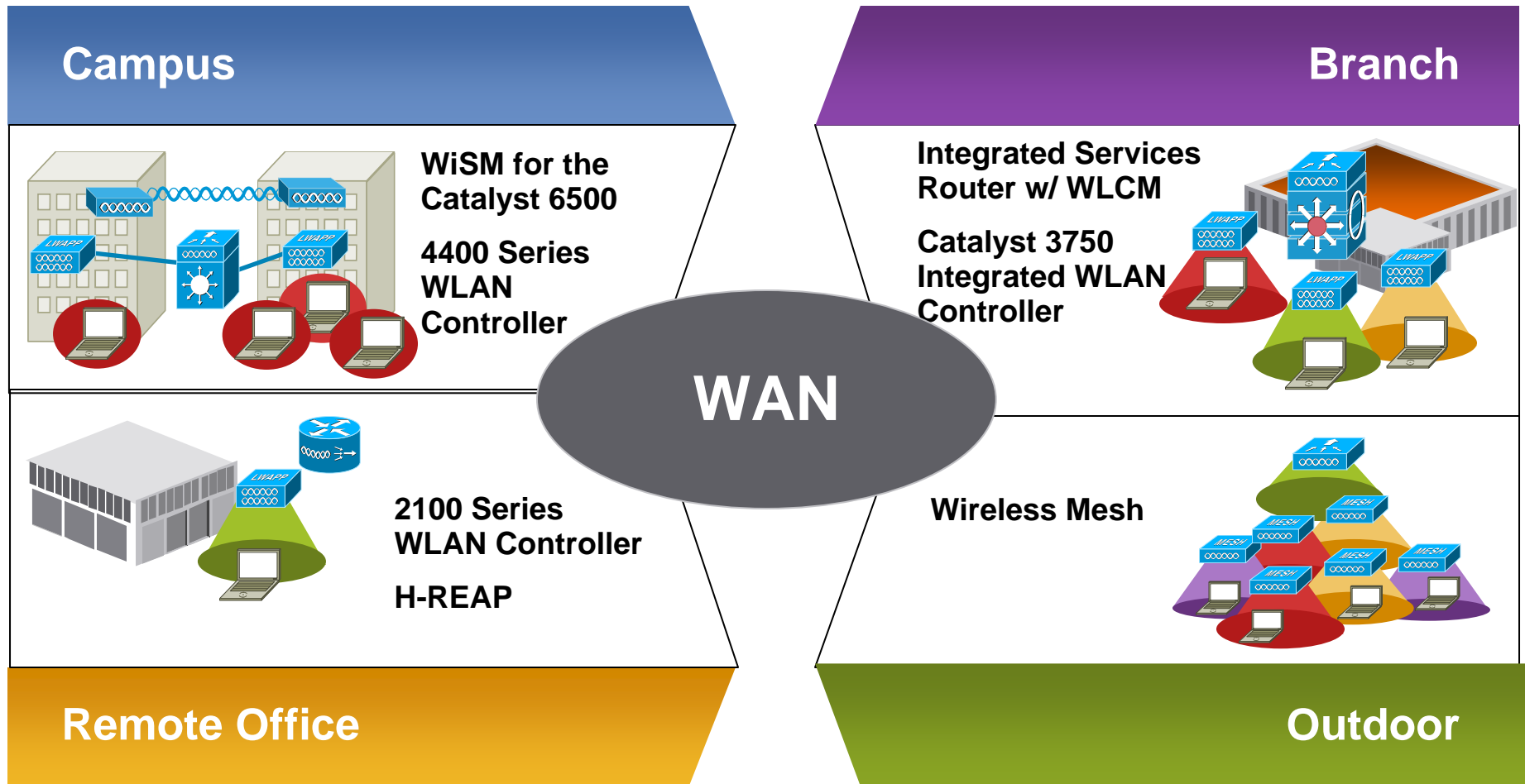
Voice



Location

Mobile Applications

Flexible Architecture: Pervasive Wireless



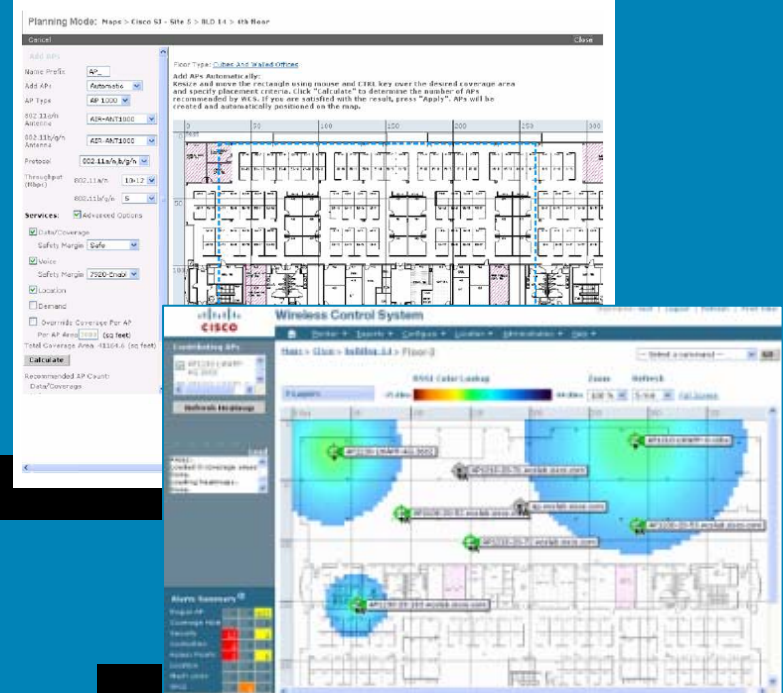
Ease of Design and Implementation

Cisco's Wireless Control System (WCS) Provides an Easy-to-Use Graphical Interface and Automates Design and Management Functions

WCS Includes RF Prediction Tools to Assist in Designing a WLAN

- Hierarchical maps—import graphic floor plans, view multiple buildings, floors, regions
- Suggested AP placement
- Interference identification
- Configuration templates
- View performance and coverage estimates

Figure 18. Planning Tool

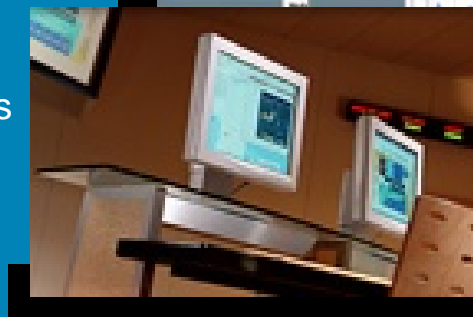
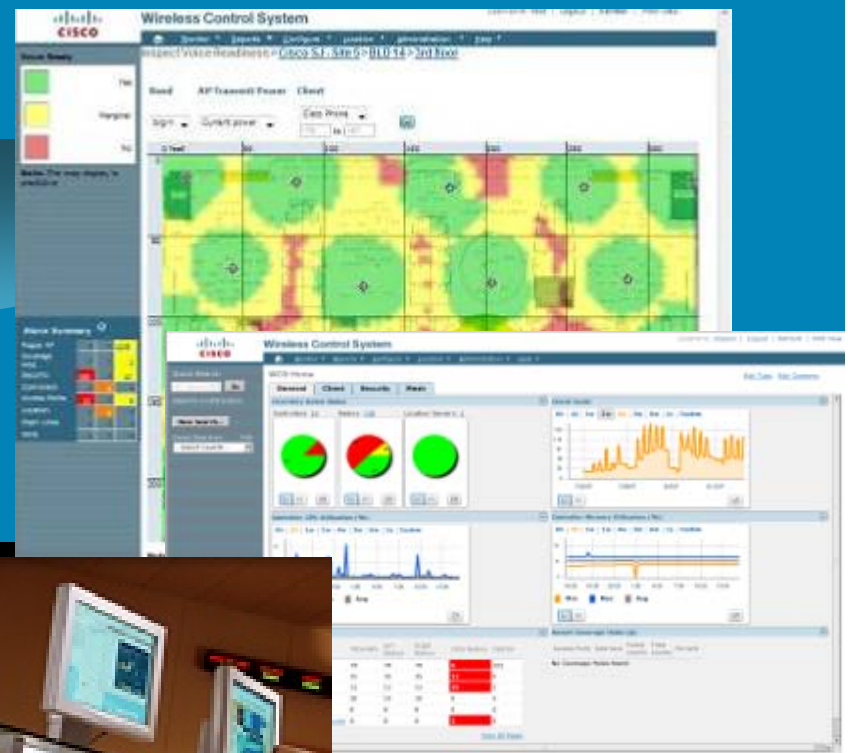


Centralized Management

Single View of up to 30,000 APs and 750 Controllers in Any Location

A Single Solution for RF Prediction, Policy Provisioning, Network Optimization, Troubleshooting, User Tracking, Security Monitoring, and Wireless LAN Systems Management

- Multiple user and device type tracking
- Integrated WIPS/IDS
- Real-time event reporting and alarms
- Interference detection
- Reporting with detailed trending and analysis
- Client and infrastructure troubleshooting with suggested actions
- RF heat maps for better visibility



Managing Wireless as a Business Asset

- The RF medium must be secured and managed
- A single rogue access point compromises security
- Employees, contractors and customers **will enter** your facilities with Wi-Fi enabled devices
- The **RF environment** is a corporate asset—**Manage and Secure Your RF Assets**

“...Failing to employ sufficient measures to detect unauthorized [wireless] access.”

Impact: Biennial Mandatory 3rd Party Security Audits for 20 Years, \$6.5–\$9.5M Bottom Line Decrease

FTC Ruling
December 1, 2005



Gain Control of Your RF Assets with the Cisco Unified Wireless Network



Wireless has Become Business Oxygen

- Business applications have gone mobile
- Wireless is evolving to meet needs for high performance, pervasive connectivity

Next Gen Wireless

- Ubiquitous mobile computing

Business Ready

- Voice, Video, Data

Mobile Data

- Email
- Web browsing

Point Applications

- Inventory Management
- Barcode Scanning



802.11n

It's About a Whole Lot More Than Speed

Throughput

5x more throughput

Enhanced file transfer and download speeds for large files

Reliability

2x more reliable

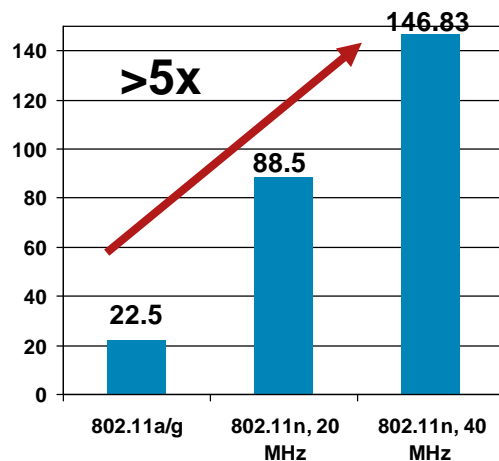
Lower latency for mobile unified communications

Predictability

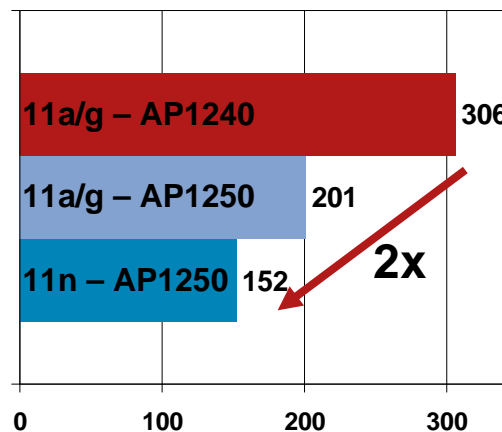
2x more predictable

More consistent coverage and throughput for mobile applications

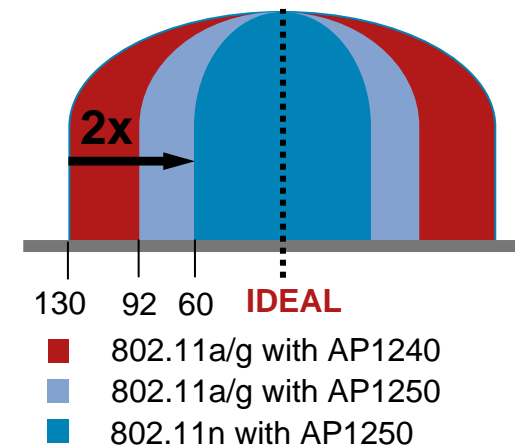
Mbps Throughput



Average Packet Retries



Predictability of Throughput
Standard Deviation of Packet Retries

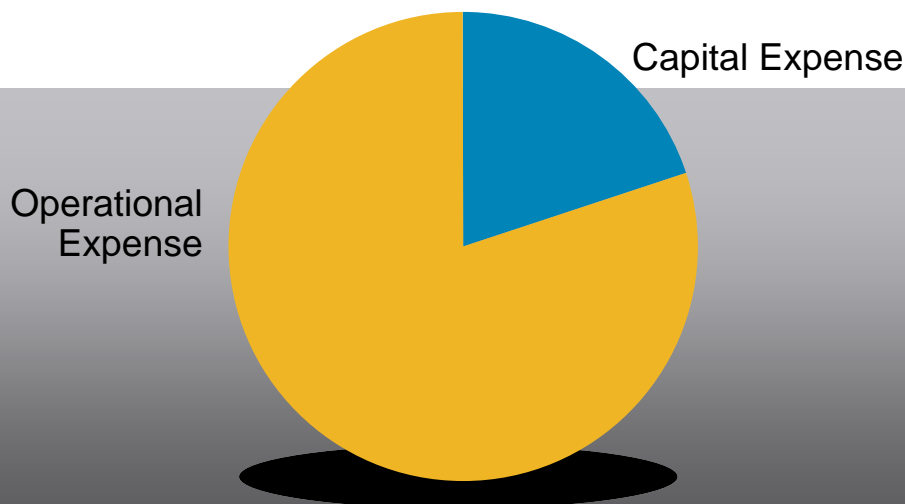


Example: Cost of Deployment

- Initial capital investment in a scalable platform design will decrease operational costs
- Security, management and upgrade potential must be factored in
- Decrease TCO with common wired and wireless infrastructure

Example WLAN Cost for
1,200 User Enterprise

| Item | Cost |
|--------------------------|-----------|
| Installation | \$44,000 |
| Infrastructure | \$90,000 |
| Support | \$28,000 |
| Total Year 1 | \$162,000 |
| Total Year 2 | \$28,000 |
| Total Year 3 | \$28,000 |
| Total 3 Years | \$218,000 |
| Amortized Monthly Charge | \$6,055 |
| Cost per User per Day | \$0.17 |



The ROI of Mobility: Cisco on Cisco

- Cisco embarked on a program to deliver pervasive wireless connectivity
- 45% of Cisco's employees use the wireless network for primary access
- First quarter the network optimization resulted in over 30% OpEx saving
- Service-impacting incidents were reduced by 90% with automated self-healing
- Additional cost decreases with improved employee productivity



Cisco Employee Productivity

95% of 7,000 Employees Surveyed Gained at Least 1 Hour per Week of Productive Time by Using the WLAN

| | |
|------------------------|------|
| Avg. Cost of Work Hour | \$75 |
|------------------------|------|

| | |
|---------------------------|-------|
| 63% of Employees Surveyed | 6,650 |
|---------------------------|-------|

| | |
|-------------------|----|
| Hours/Year Gained | 50 |
|-------------------|----|

| | |
|---------------------------------|---------------------|
| Annual Productivity Improvement | \$24,937,500 |
|---------------------------------|---------------------|

Cisco Unified Wireless Network Product Portfolio

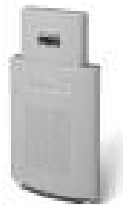


Cisco Unified Wireless Network

Product Description

Indoor Access Points

1130AG



1121BG

Indoor Rugged Access Points



1250
AGBN



1240AG

1230AG



Outdoor Access Points/Bridges



1500



1520



1400



1300

Access Points

Features

- Industry's best range and throughput
- Enterprise-class security
- Only 802.11n Draft 2 support with PoE
- Simultaneous air monitoring and traffic delivery
- Wide area networking for outdoor areas

Benefits


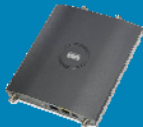

- Zero-touch management
- No dedicated air monitors
- Supports all deployment scenarios (indoor and outdoor)
- From secure coverage to advanced services

The Aironet 1250 Series Access Point

- Industry's first Wi-Fi Certified 802.11n draft 2.0 access point
- Modular platform
 - Field upgradeable radio modules/future technologies
- Higher speed WLAN technologies
 - Faster CPU to handle higher data throughput
 - Increased memory for expanded feature set
 - 10/100/1000 Ethernet port
- Available in Unified (LWAPP) and Standalone versions



Aironet Access Point Portfolio Comparison

| | AP 1130  | AP 1240  | AP 1250  |
|-----------------------------------|---|--|--|
| Modular Platform | No | No | Yes |
| Data Uplink (Mbps) | 10/100 | 10/100 | 10/100/1000 |
| Power Requirement | 802.3af (11.1 W) | 802.3af (12.95 W) | 802.3af* 802.3at* (18 W) |
| Installation | Standard | Rugged | Rugged |
| Antennas | Internal | External | External |
| Wi-Fi 802.11n draft 2.0 Certified | No | No | Yes |
| DRAM | 32 MB | 32 MB | 64 MB |
| Flash | 16 MB | 16 MB | 32 MB |

* Powers AP1250 with a single radio only, 802.3at is still a draft standard

Cisco Unified Wireless Network

Product Description

Wireless LAN Controllers



4400



2106

Catalyst 6500 Series Wireless Services Module (WiSM)



WiSM

Switch and Router Platforms



Integrated Services
Routers WLCM



Catalyst 3750G
Integrated WLC
Switch

Network Unification

Features

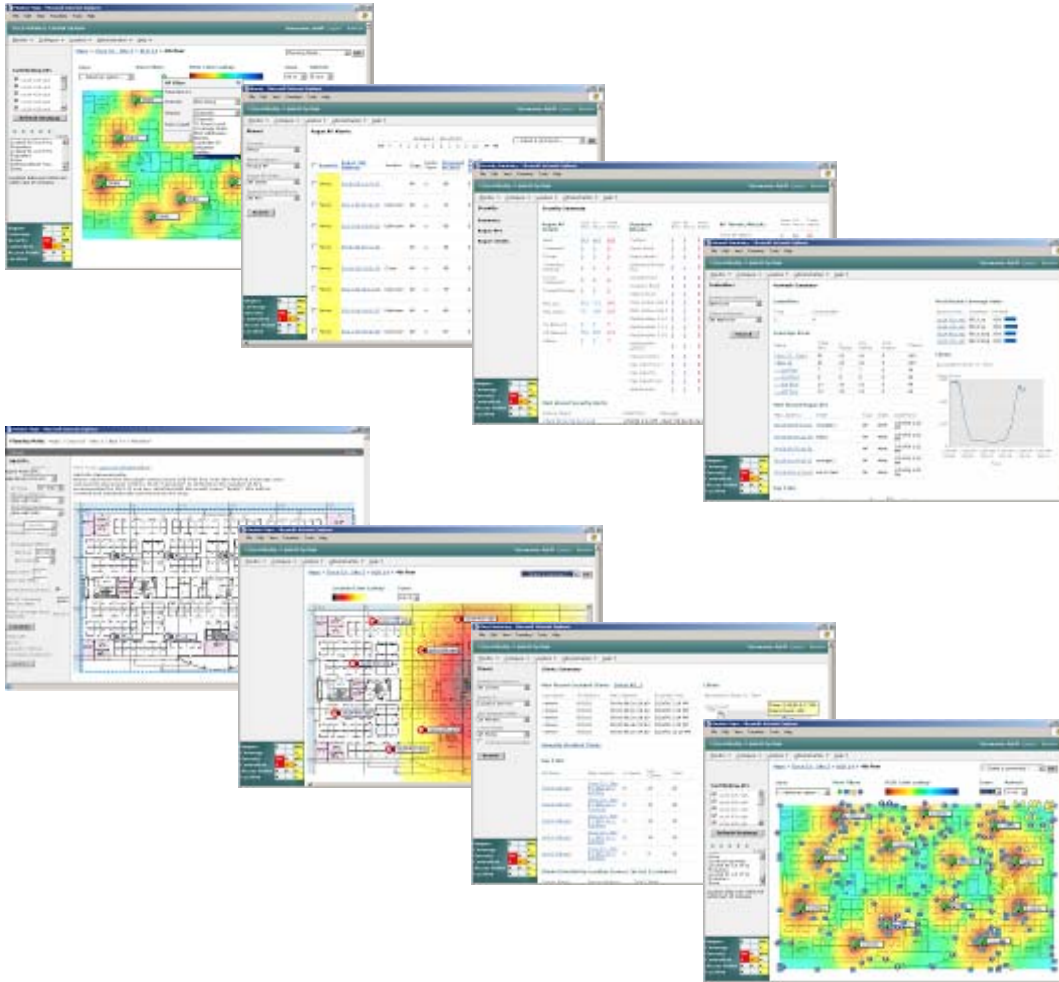
- Enterprise scalability and reliability
- Real-time RF Management
- Multi-layered security
- Mobility management
- Standalone and integrated options

Benefits

- Up to 1500 APs per Cat 6K chassis
- Cost-effective solution for main, branch, and remote campuses as well as SMB
- Ideal for data, voice, and video
- Wired and wireless integration

Cisco Unified Wireless Network

Product Description



Wireless Control System

Features

- Client troubleshooting (via Cisco Compatible Extension)
- Planning, configuration, monitoring, location, IDS/IPS, and troubleshooting
- Hierarchical maps
- Intuitive GUI and templates
- Policy based networking (QoS, security, RRM, etc.)

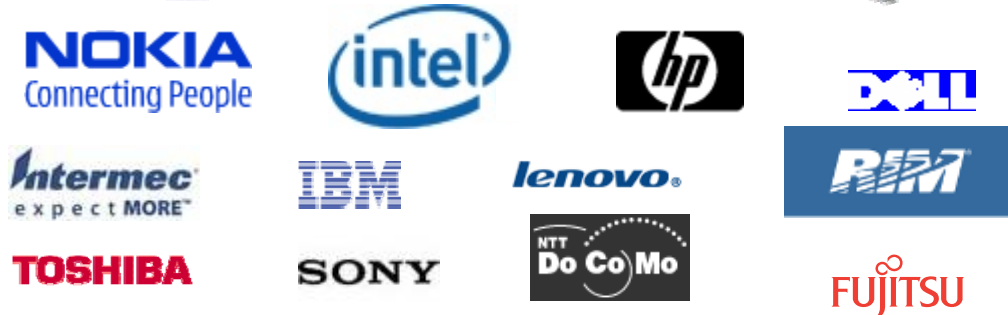
Benefits

- Lower OPEX and CAPEX
- Better visibility and control of the air space
- Consolidate functionality into a single management system
- Determines location and voice readiness

Cisco-Compatible Extensions

The Standard for Client Advancement

Over 90% of Client Devices Are
Cisco Compatible



Client Devices

Features

- Assured compatibility with 400+ devices
- Standards-based
- Enhanced security, mobility, and performance
- Supports Mobility Services, i.e. location, voice

Benefits

- Accelerates innovation
- Supports diverse enterprise applications
- Ensures multi-vendor interoperability
- Enables simplified deployment of mobile WLAN clients

<http://www.cisco.com/go/ciscocompatible/wireless>

Secure Services Client

Product Description

Key Features:

- 802.1X authentication for wired and wireless devices
- Windows XP/2000 support

EAP:

- EAP-FAST, EAP-MD5, PEAP-MSCHAP, PEAP-GTC, EAP-TLS, EAP-TTLS, Cisco LEAP

Encryption:

- WEP, Dynamic WEP, TKIP, AES

Standards:

- WPA and WPA2



Cisco Secure Services Client

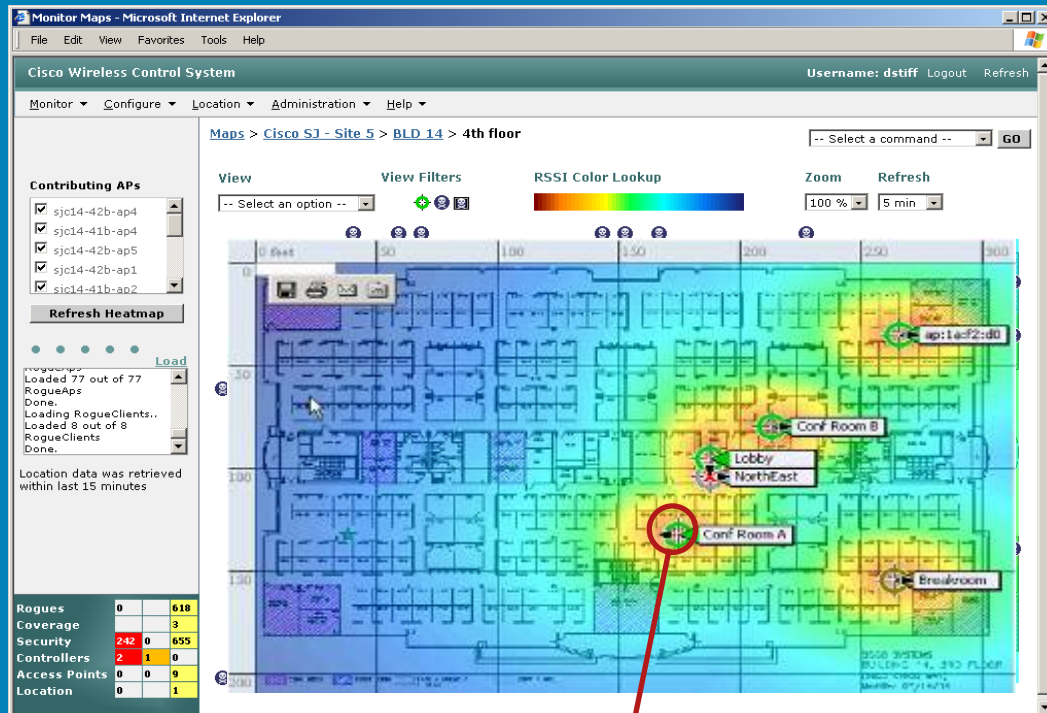
Features

- Unified wired and wireless client
- Support for industry standards
- Endpoint integrity
- Single sign-on capable
- Enabling of group policies
- Administrative control

Benefits

- Reduces client software and complexity
- Simple, secure device connectivity
- Minimizes chances of network compromise from infected devices
- Restricts unauthorized network access
- Centralized provisioning

Cisco Unified Wireless Network Location Services Solution



Cisco Location Services Solution

Features

- First integrated location solution
- Advanced RF fingerprinting for high accuracy location resolution within a few meters
- Chokepoint support
High accuracy deterministic location notifications from Cisco-compatible extension Wi-Fi tags as they enter, exit or move past a chokepoint

Benefits

- Quick location of rogue access points and other wireless threats
- Rich location information available to 3rd party applications
- E911, asset tracking, workflow automation, content distribution and retrieval

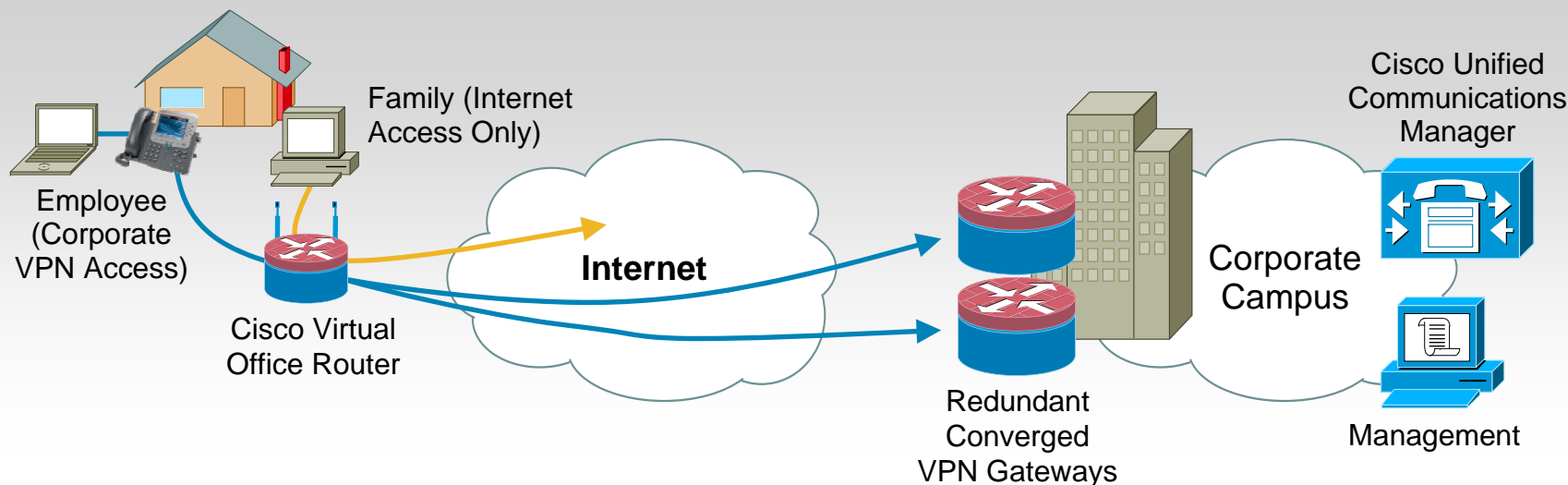


Cisco Virtual Office



What Is Cisco Virtual Office?

- Cisco Virtual Office is an end-to-end solution for employees that work in remote locations including branch and home offices
- The solution features office-caliber end-user experience with voice, video, wireless, and real-time data
- Integrated security protects the employee and the corporate network



Cisco Virtual Office

Requirements Addressed

- Decrease costs of commuting
- Facilitate employee resiliency during pandemics and disasters
- Reduce your green-house gas footprint
- Eliminate expensive dedicated lines for small offices
- Automate rollouts to sites with no IT staff: retail, gas station, etc.
- Deploy an executive small office or home office with high-quality encrypted voice and video
- Reduce real-estate costs
- Call Centers: Enable on-call employees to work from home
- Improve retention and support mergers and acquisitions (M&A)
- Extend working hours and improve employee work-life balance



Cisco Virtual Office

Technology Differentiators

- **Advanced network services and applications integration**

Voice, video, wireless, firewall, and IPS services solution-tested

Extracts full value out of powerful Cisco IOS® Software-based CPE

- **Simplified deployment and management**

Zero-touch deployment: Allows painless rapid deployment; e.g., during disasters or M&A

Efficient, automated changes: Pushes policy from central server

Enterprise-class scalable, manageable, and p

- **Converged VPN**

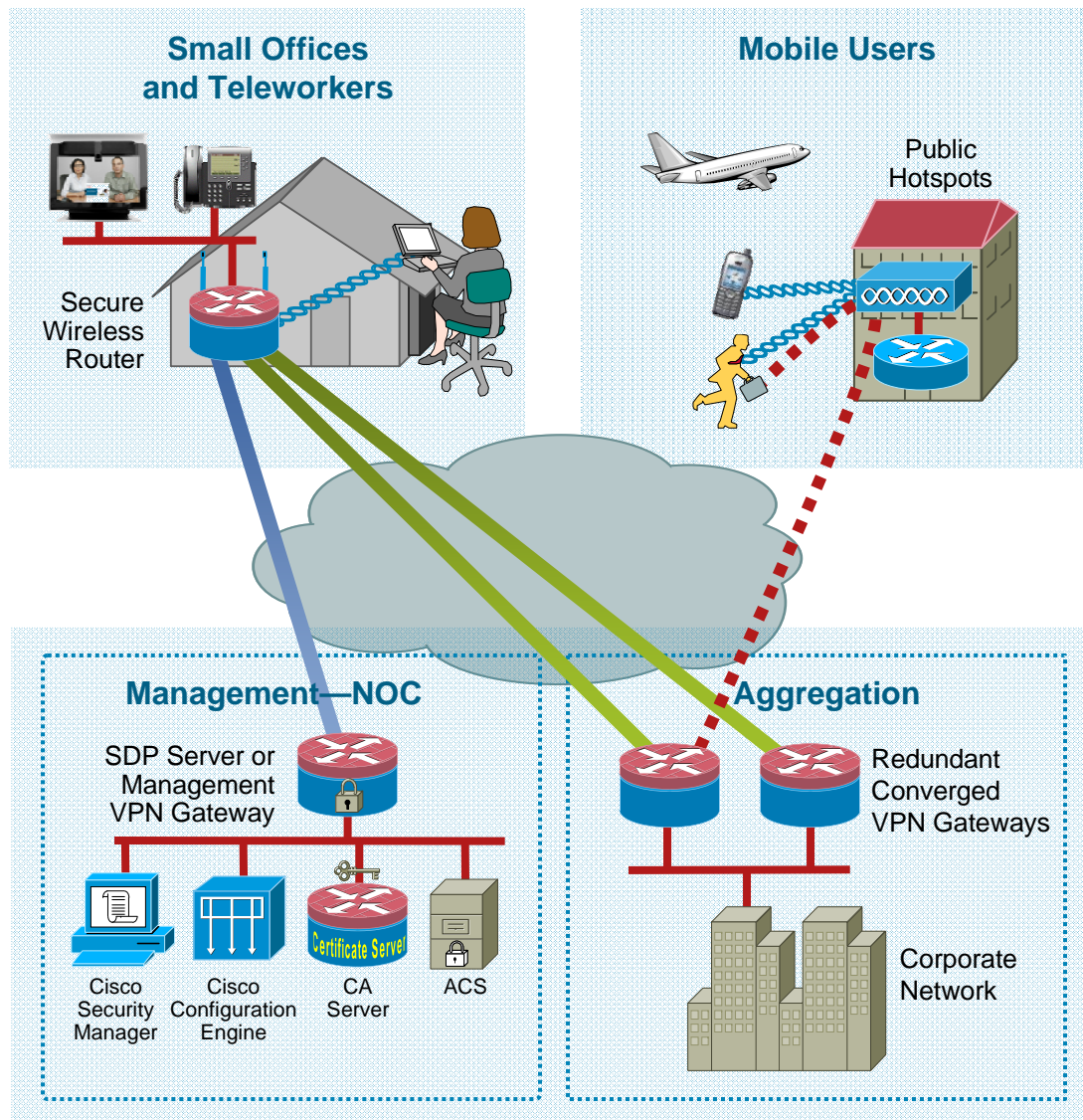
Multiple VPN designs for teleworkers, small o and mobile users consolidated into headend ; and management model

- **Layered identity**

Delivery of comprehensive user and device ic domain isolation, and lockout of stolen or hac



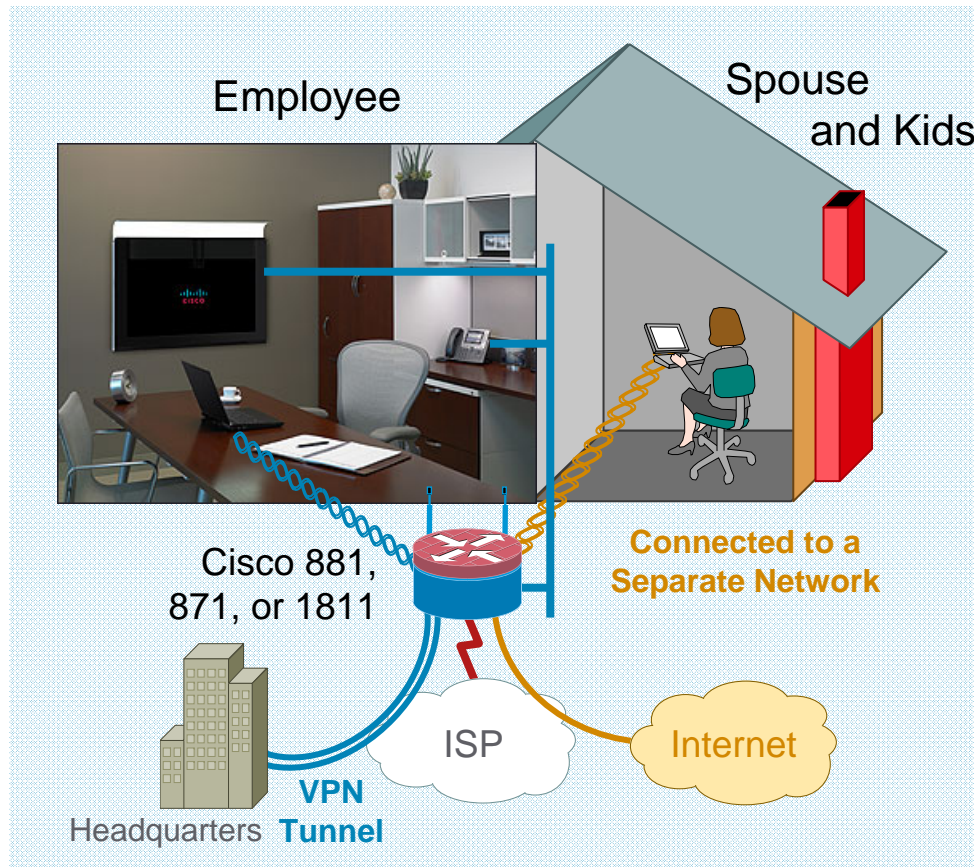
Cisco Virtual Office Architecture



- Remote routers can be shipped directly to end user with factory defaults or staged
- Strong PKI security authenticates remote devices
- RSA keys for management and converged VPN tunnels are separate
- Converged VPN to corporate network features active secondary tunnel to facilitate instant failover
- Architecture allows for outsourcing of NOC to separate IT entity
- Management tunnel stays up, allowing centralized push of policy changes
- Spouse and kids are on separate network with access only to Internet
- Mobile access is available from hotspots

Cisco Virtual Office Architecture

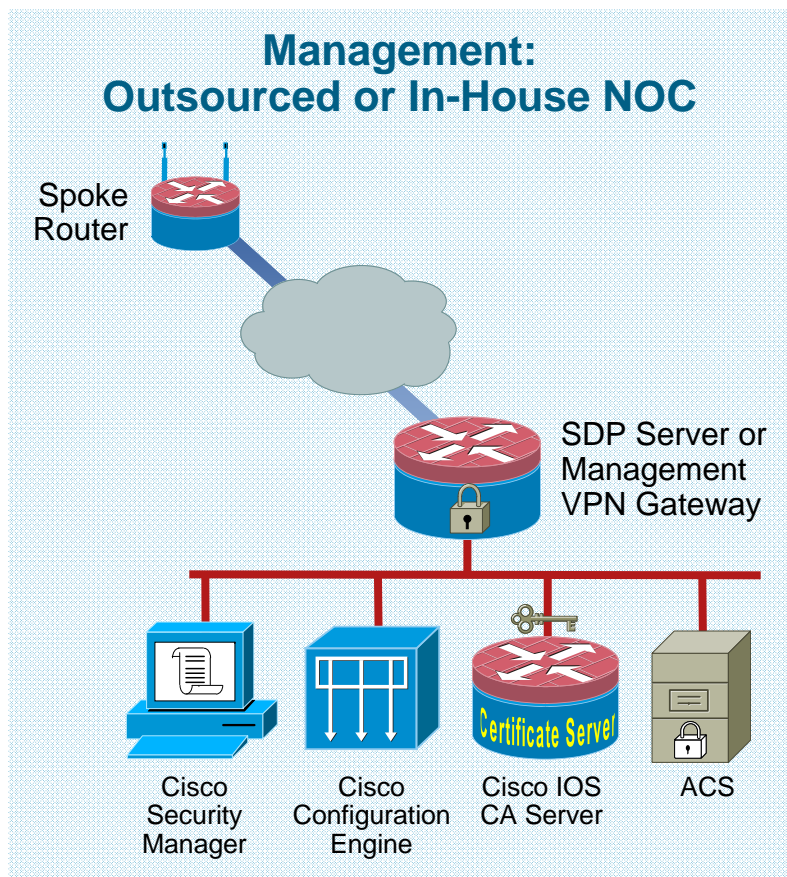
Small Offices and Teleworkers



- VLAN assignment is separate for corporate and family endpoints
 - Access to corporate tunnel is based on IEEE 802.1x authentication
 - Non-authenticated users, or those connected to non-trusted VLAN, have Internet access only
 - Voice VLAN allows IP phones to bypass 802.1x authentication
- Cisco DMVPN with advanced QoS and IP Multicast integration provides secure transport, facilitating voice and video applications
- Wi-Fi or LWAPP protocols offer EAP-FAST, PEAP, TLS, WEP, WPA, and WPA2 authentication mechanisms

Cisco Virtual Office Architecture

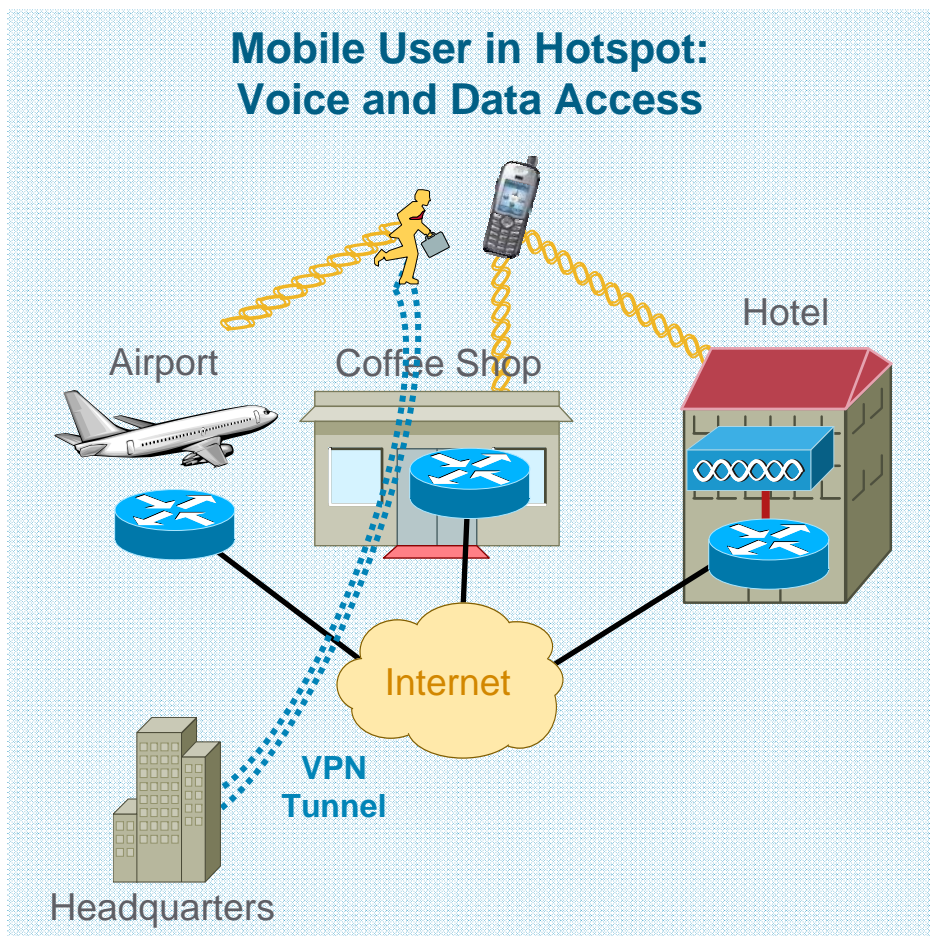
Management: Network Operations Center



- **Cisco Security Manager** is the central policy-based management application to control the Cisco Virtual Office
- **Secure device provisioning (SDP) server:**
 - Serves as the management gateway, and authenticates and registers new devices “calling home”
 - Terminates management tunnel, allowing NOC to access remote device securely
- **Cisco Configuration Engine** is always available for remote sites to pull policy updates, Cisco IOS Software upgrades, and configuration changes, as and when they come online; takes Cisco Security Manager out of the area of vulnerability
- **Cisco IOS Certificate Authority (CA) Server** reduces the need for complex management of preshared keys
- **Cisco Secure Access Control Server (ACS)** (optional) is an AAA server that authenticates and authorizes profiles based on users, hosts, routers, wireless, 802.1x, etc.

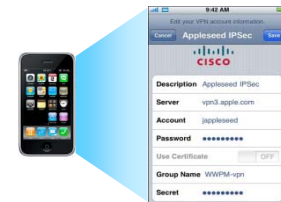
Cisco Virtual Office Architecture

Mobile Users



Voice:

- PC-based office telephony through Cisco IP Communicator (softphone)
- Dual-mode phones (SIP or Skinny Client Control Protocol): When the phone is registered with the Cisco Communications Manager, work calls ring directly at the mobile phone (no call forwarding)
- iPhone: Applications are encrypted



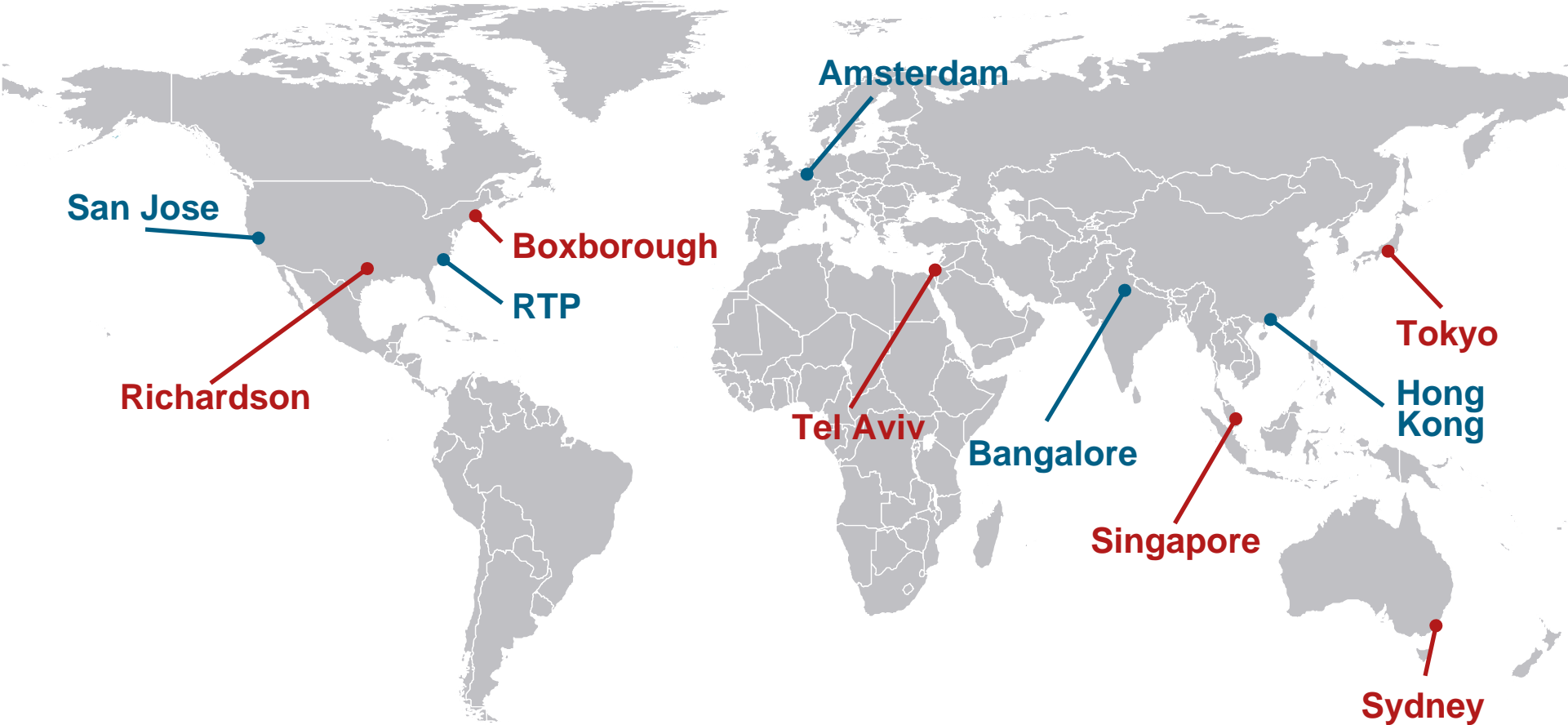
Data:

- IPSec VPN client with integrated firewall
- SSL VPN (full tunnel) with ability to restrict access to specific applications
 - Mobile workers (e.g., insurance agents) don't need to install VPN client on their laptops: AnyConnect VPN client is downloaded automatically
- Conferencing and collaboration through Cisco MeetingPlace® conferencing

Cisco Virtual Office Case Study

Cisco IT Internal Deployment

13,000 Users Expanding to 30,000+



Cisco Virtual Office

Technology at a Glance



IP Phone



Video Phone



Wireless
IP Phone



UVA



Cisco Unified Personal
Communicator

Voice and Video

- IP phones and softphone
- Dual-mode cell phones with SIP and Skinny Client Control Protocol clients
- Cisco Unified Video Advantage and Cisco Unified IP Phone 7985G
- Cisco IP/TV®, Skinny video, H.323
- QoS and IP Multicast

Wireless

- Wireless access point
- 802.11a/b/g
- WEP, WPA, and WPA2 for enterprise and personal
- Cisco Secure Services Client with 802.1x

Threat Control

- Advanced firewall
- IPS
- Content filtering
- FPM
- ACT, TMS, and mitigation rules

Zero-Touch Deployment

- ZTD for IT: Factory default to end user, automated call home, authentication and config pull
- ZTD for end user: Prestaging
- Always-on management tunnel
- Centralized policy push and software image updates
- Scalable job management

Converged VPN

- DMVPN hub-and-spoke and spoke-to-spoke
- Easy VPN (IPSec VPN software client interoperability)
- Enhanced Easy VPN with per-tunnel QoS
- SSL VPN full tunnel with Cisco Secure Desktop
- High availability and dial backup

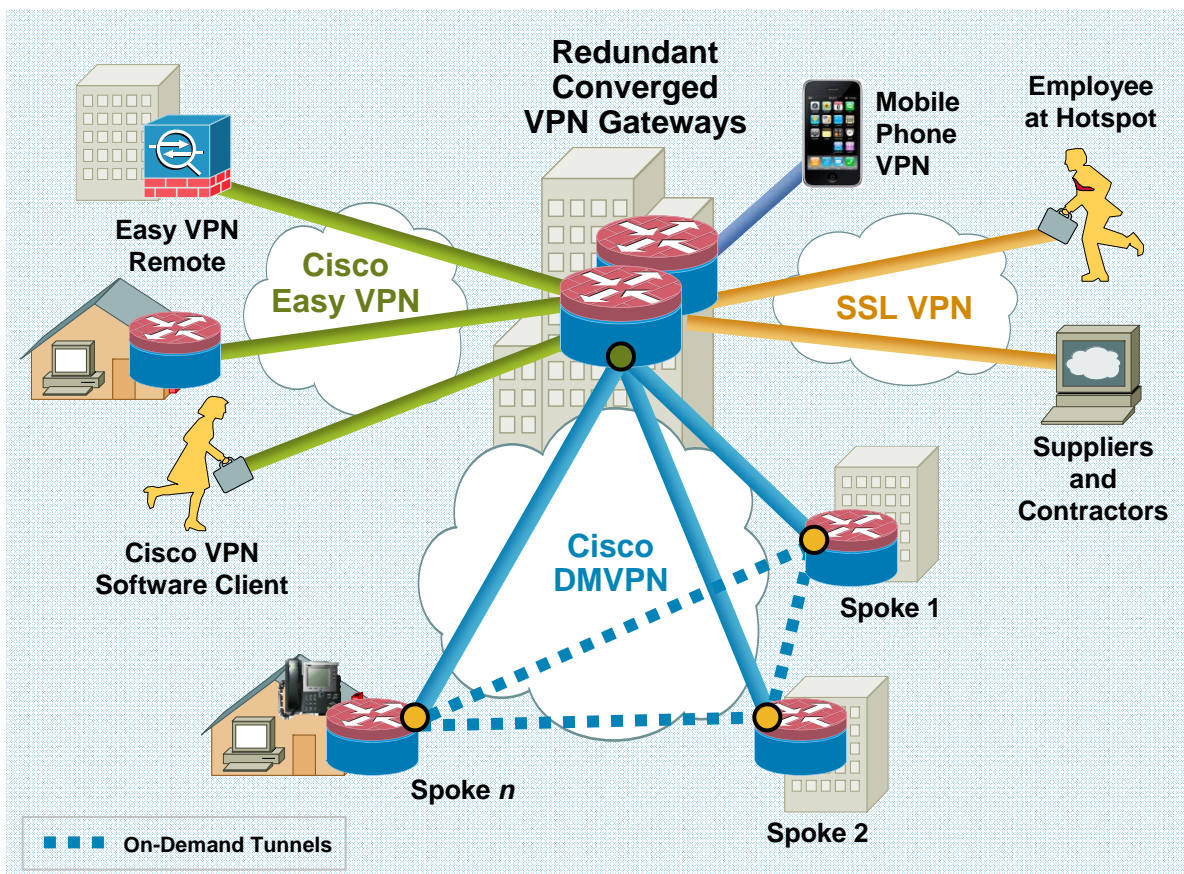
Layered Identity

- 802.1x and authentication proxy
- PKI: Router, phone, and PC certificates, eTokens
- Integrated CA with auto-enrollment and PKI-AAA
- Domain isolation (spouse and kids, phone, and employee)
- Stolen or hacked device lockout

Cisco Virtual Office

Converged VPN

Cisco Virtual Office Consolidates Multiple VPN Designs into Headend



Cisco DMVPN: Layer 3

- Scalable on-demand full mesh
- Voice, video, and QoS integration
- High availability: Always-on active-active tunnels

Cisco Easy VPN: Layer 3

- Advanced policy push, integrated firewall
- IPsec VPN software client interoperability

Cisco IOS SSL VPN: Layer 7




- Full-tunnel client downloaded automatically
- Cisco Secure Desktop for endpoint protection

Mobile Phone VPN: Layer 2/3

- iPhone and dual-mode (SIP and Skinny Client Control Protocol) phones

Cisco Virtual Office

Wireless

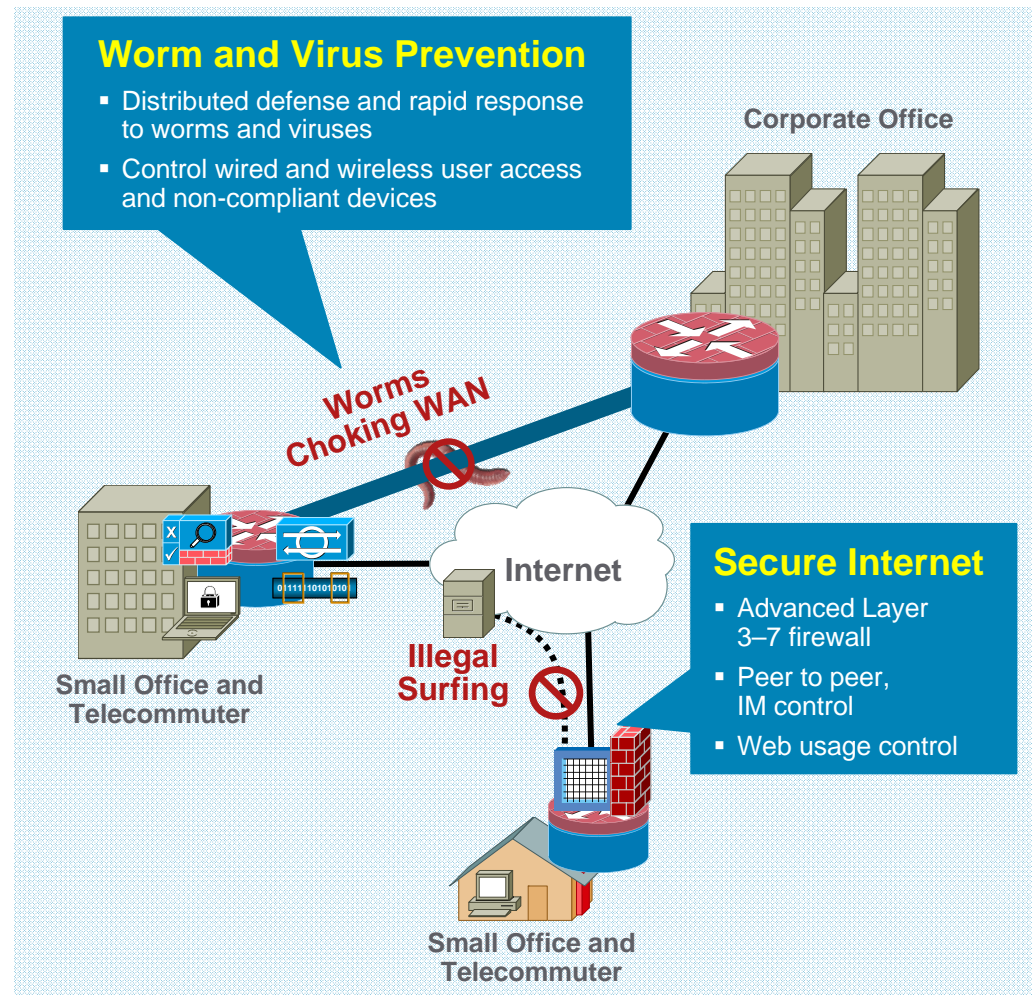
| Feature |  Cisco 881W |  Cisco 871W |  Cisco 1811W |
|--|---|--|---|
| 802.11 Modes Supported | 802.11b/g/n | 802.11b/g | 802.11a/b/g |
| Diversity Antennas | MIMO | Switched Diversity | Switched Diversity |
| Frequency Band | 2.4GHz | 2.4GHz | 2.4GHz/5GHz |
| Removable Antennas | Yes | Yes | Yes |
| AZR Support | Yes | Yes | Yes |
| Number of SSIDs and Wireless VLANs | 16 SSID 8 Wireless VLAN | 10 | 16 |
| LEAP, PEAP, EAP-TLS, 802.1x, Static and Dynamic WEP, PSK, WPA, TKIP/SSN, MAC Auth, Survivable Local Auth, and RADIUS | Yes | Yes | Yes |
| 10/100 Managed Switch | 4-Port | 4-Port | 8-Port, Internal Power Supply, Optional Internal PoE |
| WAN Options | Fast Ethernet (881), G.SHDSL (888) (Future: VDSL2) | ADSL2+ (877/876), Fast Ethernet (871), and G.SHDSL (878) | ADSL2+(1801/1802), Fast Ethernet (1811/1812), and G.SHDSL (1803) |

Cisco Virtual Office

Threat Control

Industry-Certified Security Embedded within the Network

- Offers secure Internet access at teleworker or small office, without the need for additional devices
- Controls worms, viruses, and adware and spyware right at the remote site; conserves WAN bandwidth
- Protects data, voice, and video, wired and wireless, and WAN acceleration services



Summary



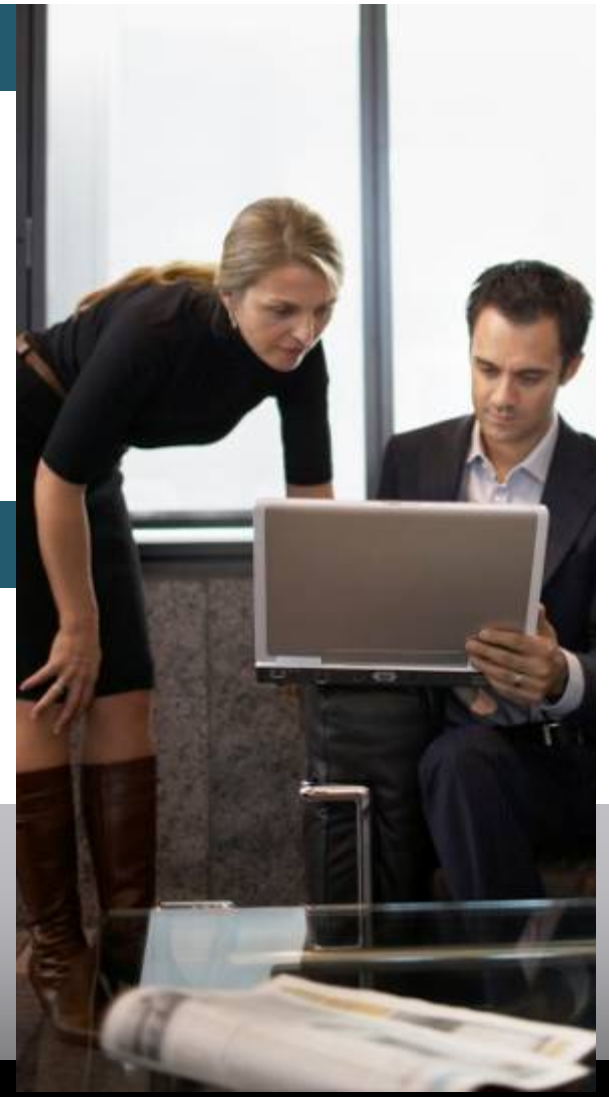
Why Now?

Clear Business Benefits

- Mobility is more than wireless data
- Mobility services enable applications that offer tangible ROI
- Wireless is changing business processes and delivering innovative applications

Technology Is Business-Ready

- Security concerns have been resolved
- Management is simplified by centralization and unification
- Mature: some of the most demanding businesses rely on wireless (stock exchanges, the US government and military, and large manufacturers)



The Best of Cisco

End-to-End Solutions

The Value of Cisco Wireless Is Realized Through Truly Integrated, End-to-End Business Mobility Solutions

Mobile Solutions
for Unified
Communications



Cisco Secure
Wireless
Solution



Highly Available
Unified Network
Access



Cisco Unified Wireless Network Mobility Services

Unified
Communications

Self-Defending
Network

Network
Systems

Why Cisco?

- Market leader
 - 63% of WLAN deployments
 - 90% device compatibility
 - 5 million access points sold
- Single provider of wired and wireless infrastructure
- Global support organization
 - 24-hour, global access to a team of expert engineers
 - 120 countries geographic coverage
- Global partnerships
 - 200,000 Worldwide Cisco-certified partners
 - IBM, Intel, HP, EDS, CG&Y, Microsoft
- 12-month deferred financing or leasing available
- Ask us now about high-value offers for a Unified Wired and Wireless Network



