White Paper

Right-Size Your Network Without Compromise

Regardless of your branch size, your remote offices now require the same network performance as the headquarters.

Applications are lifting to the cloud, the Internet edge is shifting to the branch, and new business requirements are swiftly straining both the corporate LAN and WAN. It's time to rethink your Branch-WAN strategy – simultaneously increasing productivity, reducing costs, and helping your business grow.

Enabling "full service" branch capabilities across all of your remote sites is now more essential than ever. Historically, many branch offices were treated like second-class citizens, receiving less-sophisticated and lower-performance network technology and IT services than the more prestigious headquarters. Only a few years ago, applications were centralized with data center consolidation—all tightly controlled and secure, but inherently slower and more latency-prone than local hosting on the LAN.

But the application landscape is changing with the consumerization of IT and the rise of user expectations. Almost overnight, businesses now expect every branch to keep pace with the service and performance at the headquarters. The IT department is migrating applications into the public or private cloud to promote efficiencies. In addition, the Internet edge is moving to the branch office with the growth of Software as a Service (SaaS) applications such as Cisco WebEx® meeting applications, Microsoft 365, and Google Docs. The IT organization is now under tremendous pressure to meet the growing bandwidth demands of cloud traffic, the proliferation of mobile devices, the adoption of the bring-your-own-device (BYOD) trend, and high-bandwidth applications such as video. The result is frustration for the users from the strain on the WAN bandwidth – at a time when three out of four organizations have no additional WAN budget[1].

Per a Forrester survey[2], 86% of businesses have been unable to provision new services or support business demands because the network wasn't up to the task. Adding Internet as part of your WAN aggregation strategy appears to be a low-cost, viable alternative to address both the IT budget and capacity challenges. Over the past decade the Internet has become a much more stable platform, and as WAN bandwidth demands increase, the price-to-performance gains become appealing. With this new trend, already 46% of businesses are in the process of – or are planning to – migrate their WANs to the Internet . Some are already running the Internet as a WAN at their smaller sites. As a result of this shift, commoditized WAN is less expensive and is gaining stability.

However, using the Internet-as-WAN is not without its own challenges. With no SLA and no redundancy, a business using the Internet[3] as a WAN is looking at nearly nine hours of potential downtime a year – which, at peak seasons can be devastating.

[1] Nemertes Research, Benchmark 2012-13 Emerging WAN Trends

[2] "Building for the Next Billion; What the New World of Business Means for the Network", Forrester Consulting October 2012

[3] Nemertes Research, Benchmark 2012-13 Emerging WAN Trends

Lowering Costs with Internet as WAN

With the increased demand upon networks to support multiple services and technologies such as big data, cloud computing, mobility, virtualization, and social networking, traditional network designs have not been able to keep pace with the performance, security, and scalability required to deliver a superior end-user experience. However, the Internet has become an increasingly stable platform for running business transactions.

The Cisco® Intelligent WAN (IWAN) is able to keep pace with these requirements by enabling the IT organization to successfully transition from premium WAN bandwidth to a less expensive Internet transport without compromising business compliance or the user experience. Cisco IWAN addresses the shortcomings of the Internet as WAN by combining intelligent networking, integrated security, and end-to-end application service delivery across the network via the features outlined in Table 1.

Table 1. Key Features of Cisco IWAN powered by ISR-AX

IWAN Feature	How it helps the IT organization
Transport Independence	Provides the flexibility to move to less expensive Internet transport options without compromising performance, reliability, or security. Through IPsec VPN technologies, IT can seamlessly distribute branch traffic over any WAN transport, including the Internet, private MPLS WANs, Cellular 3G/4G, and others, while reducing complexity.
Secure Internet Connectivity	Enables direct Internet access using the Cloud Web Security [CWS] Connector for better SaaS application performance, protecting distributed branch endpoints, while maintaining a centralized infosec policy management paradigm.
Intelligent Path Control	Enables full utilization of WAN bandwidth while protecting applications from temporary WAN oversubscription. Through Intelligent Path Control, applications are forwarded over the best performaning path(s) based upon policy and adjusted dynamically when congestion or other problems degrade out of policy for an application. Advanced load balancing distributes traffic efficiently to maximize expensive WAN bandwidth.
Application Optimization	Gives fully visibility and control at the application level (Layer 7) through AVC technologies such as NBAR2, IPFIX (Netflow), and QoS. This provides a view of the traffic running across the network, and enables IT to tune the network for business. Wide Area Application Services (WAAS) applies advanced compression and de-duplication to help applications perform better with the smallest load possible.

An IWAN empowers the business to realize the cost benefits of provider flexibility and deploy new services faster over a variety of transport models. A proven solution with rich application and security services on a single platform, IWAN can scale to thousands of sites. And, IT can maintain granular control – from the branch office to the data center, and out to the public cloud, by:

1. Augmenting or replacing premium WAN bandwidth with low-cost Internet transport and high reliability
2. Simplifiying the network with transport independence for flexibility in choosing WAN circuits and quicker deployment
3. Offloading guest and public cloud directly to Internet with secure and efficient transport (avoiding hairpin)
4. Providing a high quality experience to any device, regardless of where the application resides
5. Quickly delivering innovative services efficiently to employees, customers, and guests
6. Prioritizing applications with granular control for growth in cloud traffic, device proliferation, and video
7. Lowering the operational complexity with IT consolidation and a smaller branch footprint

Particularly well-suited for the branch office, the Cisco IWAN is a cost-effective, performance-enhancing solution. It allows a smooth transition from premium WAN connections to the less expensive Internet transport, and enables the IT organization to deliver up to five-nines reliability over any transport: Multiprotocol Label Switching (MPLS), the Internet, or hybrid WAN (MPLS+Internet) deployments.

Paving the Way to Branch Empowerment

Cisco IWAN dynamically routes the traffic based upon application, endpoint, and network conditions to help ensure the best user experience. With Cisco IWAN, the IT organization can roll out critical business services such as guest Wi-Fi, SaaS, and video – without overwhelming the WAN. Cisco IWAN helps decrease operational costs and free IT organization budgets to promote more strategic initiatives within the business (see Table 2).

Table 2. Estimated Annual Savings for WAN Migration to the Internet for 100 Branch Offices in Major Cities[4]

	MPLS* Monthly Cost	Business Internet ** Monthly Cost	Estimated Annual Savings (USD$
6/30/2013 snapshot	MPLS VPN Cost with 10Mbps and 1.5Mbps	Total Internet Cost with 10Mbps and 1.5Mbps	Total Broadband Internet Costs with 10 Mbps and 3Mbps
Americas			
New York	$1,175	$643	$638,400
Los Angeles	$1,141	$698	$531,600
Dallas	$1,191	$691	$600,000
San Francisco	$1,159	$737	$506,400
Atlanta	$1,178	$682	$595,200
Chicago	$1,226	$682	$652,800
Toronto	$1,748	$602	$1,375,200
Mexico City	$2,824	$1,778	$1,255,200
Europe			
London	$1,126	$545	$697,200
Frankfurt	$1,220	$577	$771,600
Paris	$1,251	$686	$678,000
Madrid	$1,324	$658	$799,200
Milan	$1,302	$580	$866,400
Brussels	$1,259	$689	$684,000
Asia Pacific			
Hong Kong	$1,793	$894	$1,078,800
Beijing	$6,018	$3,173	$3,414,000
Tokyo	$2,101	$976	$1,350,000
Sydney	$3,140	$2,424	$859,200
Melbourne	$3,259	$2,711	$657,600
Auckland	$3,768	$2,968	$960,000
Mumbai	$5,342	$3,204	$2,565,600

* MPLS is for CoS2, VPN services providing real time data and middle priority

** Internet is CDR10 refers to 10Mbps and 1.5 committed data rate

*** Assumes migration from dual MPLS VPN to dual Business Internet

Cisco IWAN provides an uncompromised experience over any connection via the Cisco® ISR-AX and Cisco® ASR1000-AX – and Cisco® CSR1000V for the cloud. All are operationally scalable, attractively priced solutions that include security, policy, and application services necessary to deliver a high quality experience. These router upgrades help the IT organization to right-size its network by augmenting premium WAN connections to the low-cost Internet, and more effectively utilize its WAN investments. The typical savings for a 100-site enterprise is between $500K and $3M annually, and some regions, it can go up to $7M annually.

[4] Telegeography Data assumptions, June, 2013

Table 3. Cisco IWAN Differentiators

Differentiator	Cisco is the only vendor that offers	Benefit
Operational Simplicity	▪ A single integration platform, which includes advanced routing, WAN Path selection, application visibility and control, WAN optimization, the firewall, and the IPsec VPN gateway.	▪ Savings of up to 72% ▪ Ease of management
Pervasive Services	▪ Consistent services and granular control pervasively across the network ▪ The Cisco ISR-AX (for the branch office), the ASR1000-AX (for the data center), and, as the business moves to become cloud-enabled, the Cisco CSR1000V (for the cloud).	▪ Consistent management and service delivery at all locations
Security at Scale	▪ Any-to-any security with a fully meshed network ▪ Threat defense services protect the branch resources without managing client agents on endpoints	▪ Supports thousands of sites ▪ Secure direct Internet access against threats
Context-based Routing	▪ Application-aware, endpoint aware, and network-aware context-based routing. E.g., the router understands that a smart phone is on a web conference, and if there is network congestion, it can re-route to ensure business continuity and a high quality experience.	▪ Dynamic, real-time decisions can be made

All of this adds up to significant cost savings without compromising performance, reliability, or security. Cisco ISR-AX is the only router refresh that pays for itself, and many businesses receive a return on investment in less than a year.

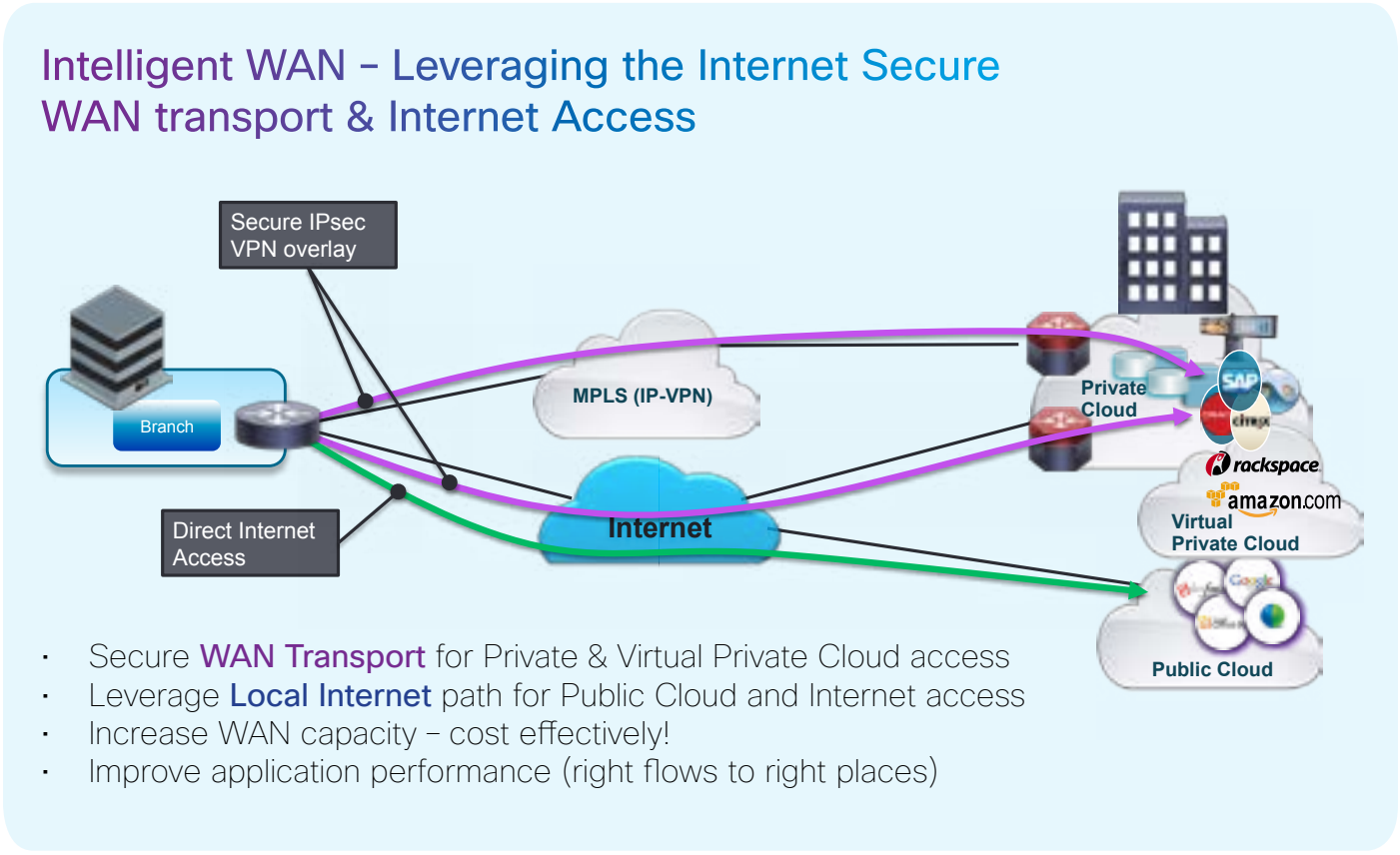
How to Deploy Cisco IWAN

Businesses can use IWAN to leverage the Internet without compromise for accessing Private, Virtual Private, and Public Clouds, independently or together (see Figure 1).

1. **For Private and Virtual Private Cloud access:** Secure IPsec Virtual Private Network (VPN) is used, leveraging the Internet as WAN transport for a highly reliable solution while protecting application performance.

2. **For Public Cloud and Internet access:** User traffic is directed to the local Internet connection for a more efficient path to a Public Cloud and secure Internet services.

Figure 1. Cisco IWAN works with both private and public clouds



Private and Virtual Private Cloud Access

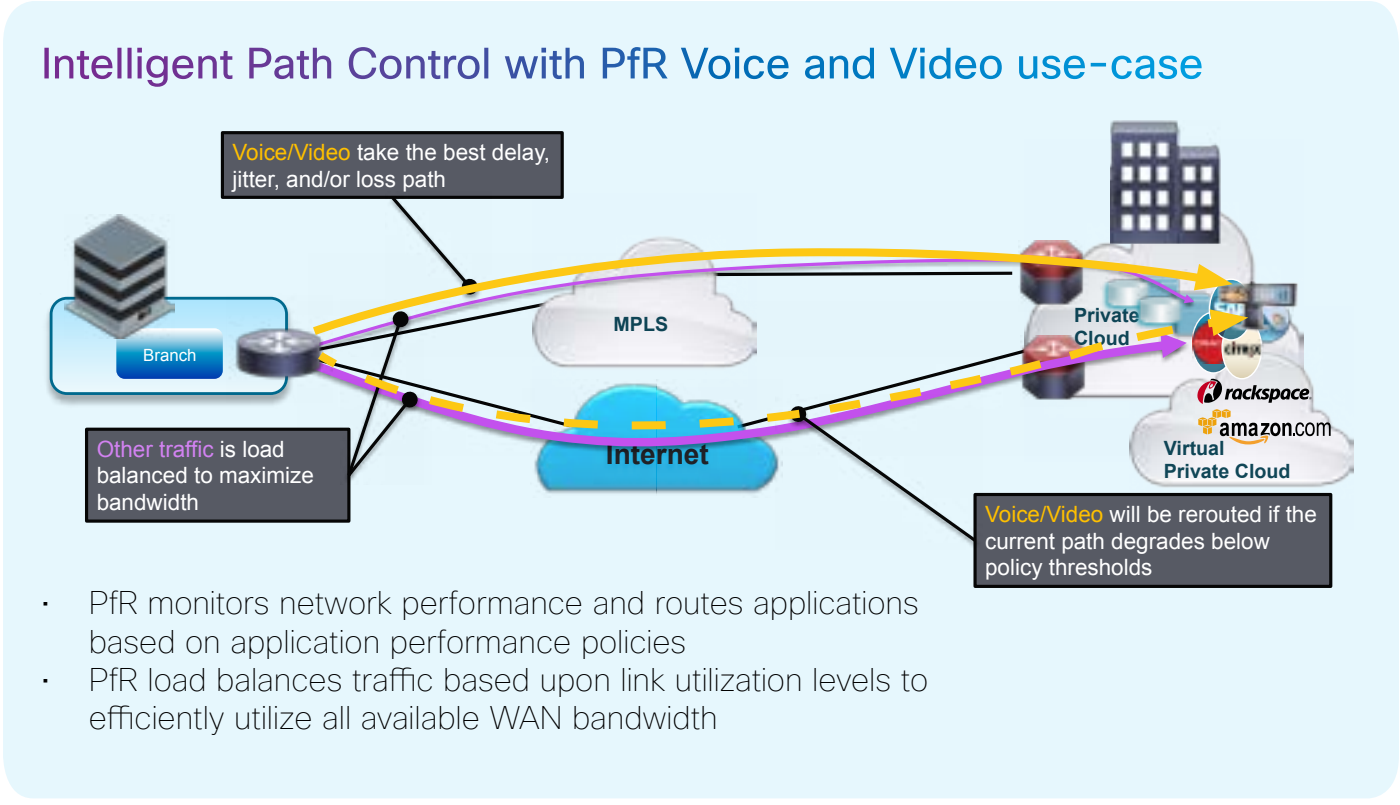
Cisco IWAN for private and virtual private cloud access consists of:

1. Transport-Independent Design
2. Security at Scale
3. Intelligent Path Control
4. Application Performance Optimization

Transport-Independent Design simplifies the WAN design by using an IPsec VPN overlay over all WAN transport options including MPLS, Internet, and Cellular (3G/4G). The single VPN overlay reduces routing and security complexity, and provides flexibility in choosing providers and transport options. Cisco Dynamic Multipoint VPN (DMVPN) provides the IWAN IPsec overlay. Two or more WAN transport providers are recommended to increase network availability up to 99.999%.

Intelligent Path Control with Cisco Performance Routing (PfR) improves application delivery and WAN efficiency. PfR protects business applications from fluctuating WAN performance while intelligently load balancing traffic over all WAN paths. PfR monitors the network performance to forward critical applications over the best performing paths based on the application policy for delay, jitter, and packet loss. PfR's advanced load balancing evenly distributes traffic to maintain equivalent link utilization levels – even over links with differing bandwidth capabilities. IWAN Intelligent Path Control is key to providing a business-class WAN over Internet transports (see Figure 2).

Figure 2. Cisco IWAN Intelligent Path Control.



Application Performance Optimization is provided by Cisco Application Visibility and Control (AVC) and Cisco Wide Area Application Services (WAAS). With applications becoming increasingly "opaque" (due to increased use of HTTP-based applications), static port classification no longer suffices. Optimizing application performance is accomplished by making the IWAN application-aware. Cisco IWAN does this with deep packet inspection of traffic to identify and monitor application performance. With increased visibility into the applications on the network, better Quality of Service (QoS) policies can be enabled and fine-tuned to ensure that critical applications are properly prioritized across the network. Cisco WAAS provides application-specific acceleration capabilities that improve response times while reducing WAN bandwidth requirements.

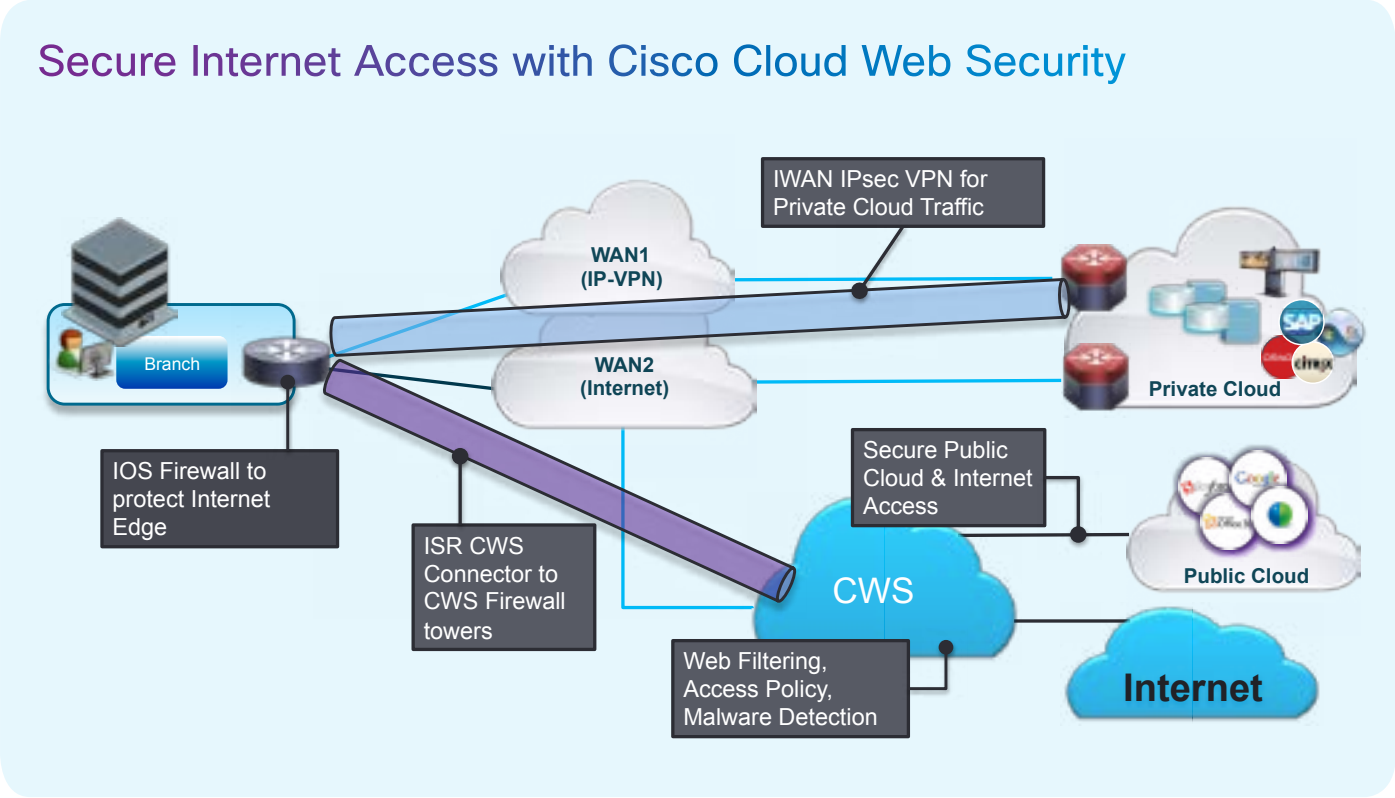
Public Cloud and Internet Access

Public Clouds are delivering business applications which are accessible through the Internet. Direct Internet Access is used to offload the WAN of Internet traffic to more efficiently access Public Cloud and Internet resources. The process involves:

1. Securing the perimeter of the corporate network from Internet threats with local firewalls and intrusion prevention systems at the Branch location.
2. Securing user traffic with Cisco Cloud Web Security (CWS). The CWS connector – available in the Cisco ISR-AX router – enables businesses to split security services between on-premise and the cloud. It acts as an HTTP proxy to complete requests, scan for Malware, and allows, blocks, or warns based upon the user's, group's, or business's policy. These policies are centrally managed in the cloud"

Combining these elements improves application performance securely by directing the right flows to the right places (see figure 3).

Figure 3. Securing Internet Access by Appropriate Flow Direction



Cisco IWAN provides granular control - everywhere, proven security at scale, unmatched context-based routing, and quick ROI. Cisco ISR-AX provides industry leading routing and security with a comprehensive suite of application services that provides visibility, control and optimization.

Conclusion

The Internet edge is moving to the branch as a result of changing user requirements and price/performance economics. IT is faced with greater challenges, as a result of applications moving to the cloud, the onset of business mobile devices, BYOD, and Guest Access and high bandwidth video applications which strain the corporate Wi-Fi and WAN resources. Cisco IWAN delivers an uncompromised user experience over any connection, allowing the business to right-size its network with operational simplicity and lower costs. Now, IT can fully utilize its WAN investments with highest performance, reliability, and security, implementing IWAN via Cisco ISR-AX, ASR1000-AX, and CSR1000V, in the branch, data center, and cloud respectively.

More Information

Read about IWAN at www.Cisco.com/go/iwan or contact your local Cisco account representative.

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