

SOLUTION BRIEF

Delivering Performance-Optimized SD-WAN Connectivity

Ipanema SD-WAN, Application Intelligence for the WAN Edge



Introduction: The Digital Era Has Arrived

In today's increasingly mobile and interconnected world, IT departments are experiencing an application revolution that demands less expensive and more reliable bandwidth. In fact, companies are tapping into benefits brought by Unified Communications (UC), personalized devices, SaaS applications, private and public clouds, social media and virtual desktops. In this context, combining traditional MPLS networks with Direct Internet access, into a hybrid WAN, is a highly cost-effective alternative.

The CIO needs to guarantee the performance, security, and success of the organization's entire application portfolio. After all, who wants to ensure recreational Internet quality if the cost is a shaky SAP experience? A CIO shouldn't have to make this choice. ERP, unified communications, cloud applications, virtual desktops, social media, video, database transfers, mobility and BYOD are all critical applications that are part of the digital enterprise and must deliver an optimal user experience, securely.

Infovista's Ipanema SD-WAN solves the challenges of delivering cost effective bandwidth while guaranteeing that both critical business applications and other applications coexist efficiently and securely, even during network congestion. Ipanema simultaneously and automatically monitors, controls, accelerates and selects the best path for all applications across two or more available networks based on business objectives.

WITH IPANEMA SD-WAN, ENTERPRISES CAN:

- Protect business productivity
- Select the best WAN connection in real-time
- Optimize cloud-based user experience
- Increase bandwidth available
- Secure direct Internet connections
- Improve IT agility

Dynamic WAN Selection (DWS)

Dynamic WAN Selection (DWS) is a main component of Ipanema's SD-WAN functionality and provides a user-centric, dynamic path selection. It automatically chooses the best WAN connection for each application flow, taking into account the end-to-end performance of all available links. Metrics that include capacity, availability and quality are used to maximize the end-user experience and optimize the usage of all network resources.

Next generation Hybrid WAN deployments use DWS to distribute upstream/downstream traffic over two or more network accesses. DWS allocates bandwidth for every single flow, given its priority and the performance state of every available link on the network path. It supports multiple WAN access combinations, such as multiple MPLS access, dual or triple service providers, MPLS and Ethernet, MPLS and Internet, dual Internet, and combinations with LTE and more.

When DWS decides to send traffic directly to an untrusted Internet link, secure local exceptions can allow or deny the traffic. The traffic can also be encapsulated over IPsec or Generic Routing Encapsulation (GRE) VPNs and the service chained to a specialized Secure Web Gateway, which will protect the broader connection to the Internet (for web browsing, SaaS, cloud traffic, etc).

How it Works

Ipanema SD-WAN identifies all application flows that cross the network. Contrary to other mechanisms that are limited to Layers 3 and 4 inspection, such as Policy-Based Routing (PBR), Ipanema's Deep Packet Inspection analyzes traffic up to Layer 7 to identify the patterns of applications flows. Then, flows are continuously classified based on their Application Performance Objectives (APO), which are strategically defined by the enterprise via the web-based management console.

Measuring bandwidth availability requires knowing the current network performance. Unlike other technologies, (e.g. Path Controllers), DWS not only considers the local availability of links, but also end-to-end performance metrics, such as available bandwidth, delay, jitter and packet loss. This is possible because all Ipanema appliances are cooperative and share information, which is centrally aggregated.

IPANEMA SD-WAN'S ECOSYSTEM

- Selected by worldwide enterprises across all industry sectors
- One of the largest customer bases in the industry (nearly 300,000 managed sites from over 44,000 appliances)
- Named an Evolutionary Disruptor by Gartner in the 2017 WAN Edge Competitive Landscape Report
- Positioned as a Visionary in Gartner's Magic Quadrant for WAN Optimization for 6 consecutive years
- Deployed by leading CSPs (BT, Orange, Vodafone, KDDI, KPN, Swisscom, Telecom Italia, Telefónica, Easynet) as their application intelligent network solution



Thanks to Infovista, our network is totally aligned with our business requirements. With the flexible application-based managed service delivered by e-Qual, we can guarantee the performance of our business-critical applications, including our ERP and MS Lync, anytime, anywhere while reducing our IT costs



Philippe Faure,
Chief Information Officer,
Gemalto

Based on the global knowledge of application usage and bandwidth availability, the Ipanema appliances select the best path for each flow to match its Performance Objectives. For example, real-time flows are usually allocated on the fastest path, while email can be allocated to the largest path. DWS works simultaneously with the Application Control feature to enforce QoS priorities and avoid traffic congestion.

Options for network path preference allow for a variety of strategies – from fully automated, to partially constrained or fully constrained – adapting to various enterprise user experience & application performance policies.

Zero Touch Installation

Improving IT agility at branch locations begins with the deployment of Ipanema appliances using zero touch installation (ZTI). ZTI simplifies the process by allowing new appliances to be installed by powering up and requesting the site configuration from a centrally located server (data center or cloud-based). Once downloaded, the appliance is fully operational without any IT staff onsite and the branch location is immediately added to the enterprise SD-WAN. This automated process is illustrated in the diagram.

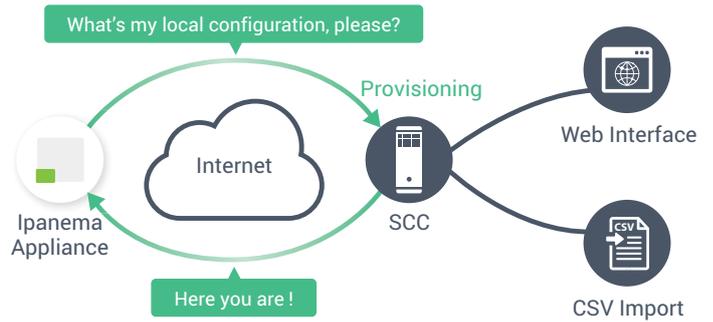
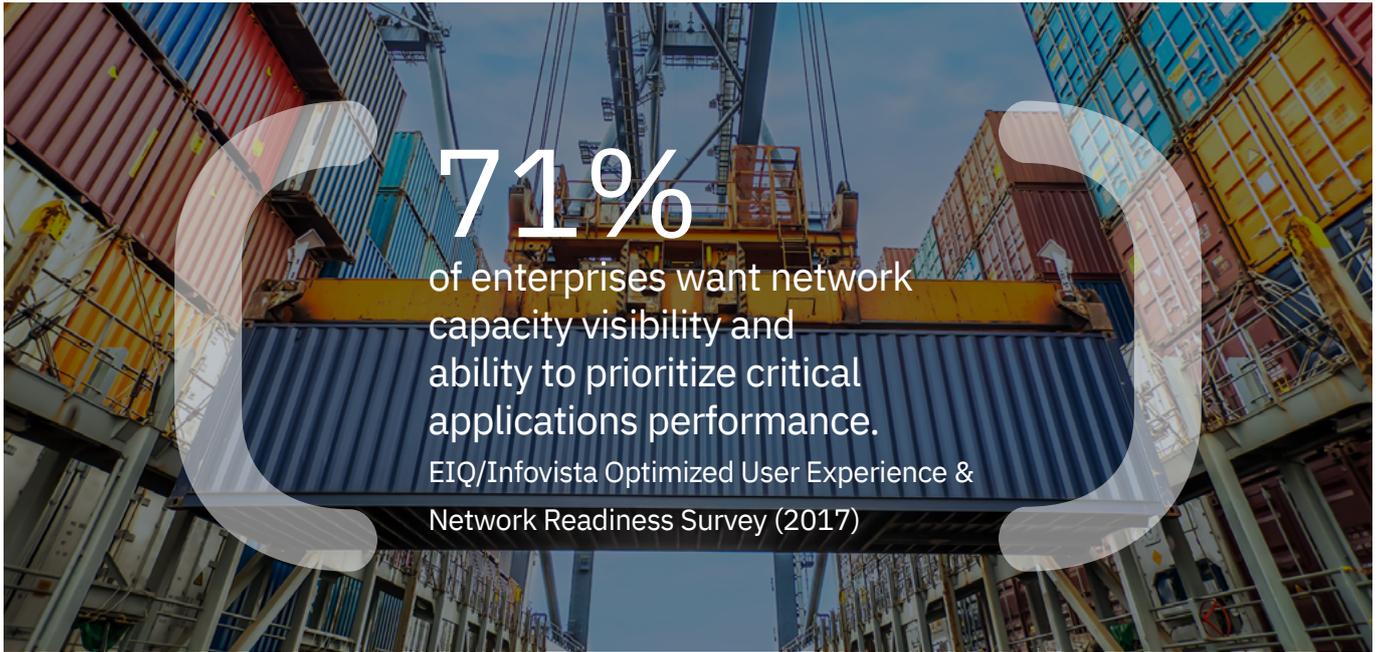


Figure 1. Zero-Touch Installation Process

80% of enterprises moving to cloud platforms using Hybrid IT architectures, Software-centric, application intelligent networking is part of the enterprise digital transformation, by Ovum Research, 2016.

40% reduction in TCO possible for enterprise networks deploying SD-WAN, Application Intelligent SD-WAN is a Key Enabler of the Digital Enterprise by ZK Research, 2017.





SD-WAN Security

SD-WAN security is configured in conjunction with Dynamic WAN Selection (DWS). MPLS and other WAN links (e.g. Internet, LTE) can be configured in Full Dynamic mode or Primary/Backup mode. Full Dynamic mode means that Ipanema SD-WAN will measure the current performance of each WAN connection and will forward the traffic flows over the WAN connection that matches the predefined Application Performance Objective delivering an active/active configuration. Primary/Backup can be also configured when the enterprise has specific resource policies that require the use of one link instead of another, such as for pure fail-over scenarios, supporting traditional active/backup configuration scenarios.

There are multiple options for securing the branch. The Ipanema appliance, acting as the Internet router, terminates IPsec tunnels to the data center. The native firewall is used to secure local Internet connectivity. Configuring Internet access involves the following easy steps:

Activate IPsec concentrators, which includes the IP address encryption and authentication parameters of the concentrator to which the branch will be connected.

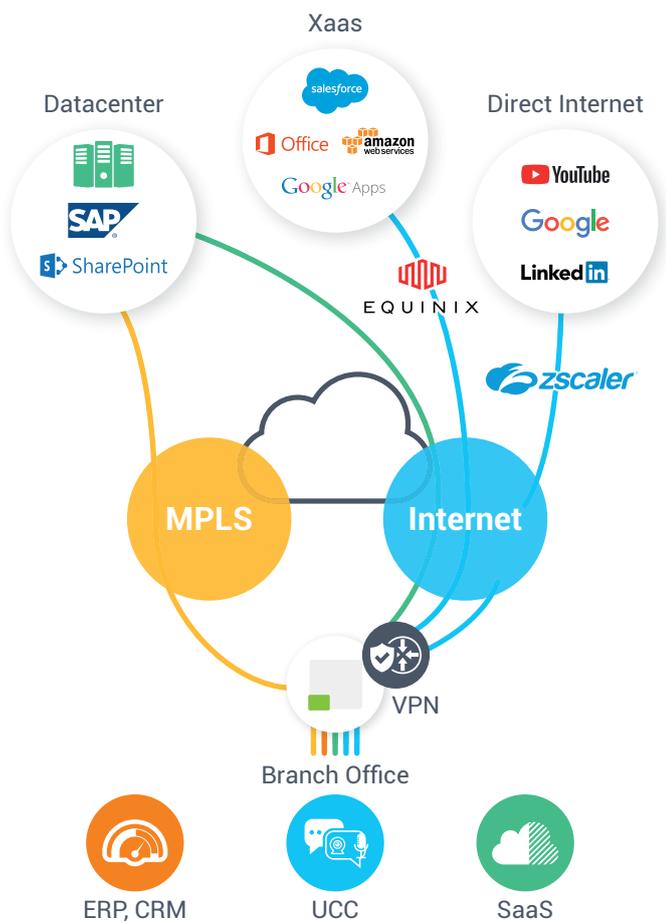


Figure 2. Ipanema SD-WAN Hybrid WAN Security

Activate local firewall, to secure direct Internet link access.

Set the Internet access parameters, by associating the preconfigured IPsec concentrators, Internet access, local firewall and security exceptions.

Infovista’s Ipanema SD-WAN also supports integration with Zscaler’s Security as a Service platform to address the challenges of local Internet breakout when native firewall implementations are not desired or sufficient for all traffic types. Together they enable companies to enjoy unprecedented application performance with powerful cloud-based security over hybrid networks (MPLS, Intranet and Internet) along with significant network cost savings. Through this combination, organizations looking to roll out hybrid networks to take advantage of consumer, public and private cloud computing will no longer need to

deploy expensive security appliances to protect their employees and will be able to dynamically select the best path in order to guarantee business applications performance for each application on a session by session basis.

With secure web gateways such as ZScaler, enterprises can:

- Deploy unified, dynamic and inline security that can inspect all employee traffic to and from the Internet
- Provide Advanced Persistent Threat (APT) protection to block the most dangerous threats before they reach the network
- Use Internet backup links to offload non-critical applications
- Granularly define which applications, by user session, should be tunneled to the secure web gateway or be given direct access to Internet connectivity

Protecting Quality of Experience for Users – Application Intelligent SD-WAN

Ipanema SD-WAN is application intelligent because it delivers the following additional functionality to protect user experience:

- Application Visibility provides full understanding of application usage and performance over the global network – from the smallest detail up to SLA-based application performance management;
- Application Control dynamically adjusts network behavior and resources to the exact application traffic demand – guaranteeing critical application performance in the most complex and changing traffic situations;
- WAN Optimization accelerates application response times and offers additional virtual bandwidth to the network;

Configuration Management, Orchestration, and Reporting

The central management software component is called the Scalable Application-Level Service Architecture (SALSA®). SALSA- automatically manages all Ipanema components in a full multi-tenant environment, providing a central and unified management interface to obtain the full visibility and control of application performance over the global enterprise network

SALSA- provides the following capabilities:

- Provisioning of global application performance objectives

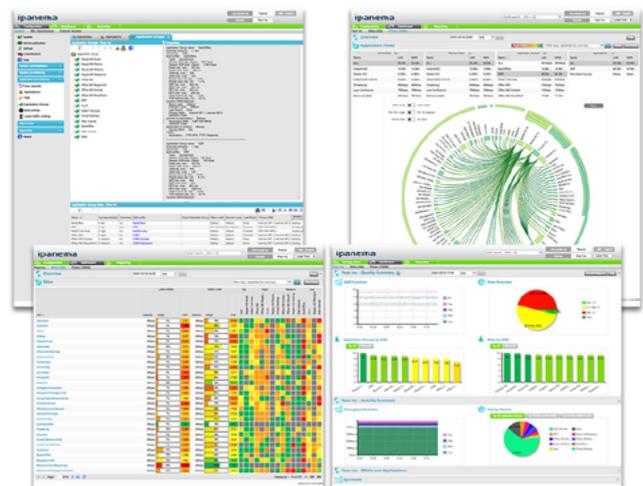


Figure 3. SALSA Orchestration

- Activation of Application Intelligent SD-WAN services across global enterprise networks
- Asset management of Ipanema components
- Real-time view of traffic for trouble-shooting applications and networks
- Flexible reporting of application usage and performance
- High level KPIs (AQS, MOS) that support application SLAs
- Event generation and interfaces to OSS/BSS systems
- DWS cord diagrams to show site to site connectivity/ stability and easy Zscaler configuration for UDP/TCP traffic redirection

SALSA periodically collects usage and performance information from Application Intelligent SD-WAN devices. This information is consolidated into a synchronous multi-dimensional table that contains details such as application identity, volume, source, destination and quality.

The information is delivered to real-time monitoring, network troubleshooting and alarming tools. Historical views of applications, sites, etc. can be produced for any time period – from minutes to months over a year. Custom reports can focus on specific areas of the network, from a global network view down to any application on a specific site, providing a flexible and complete visibility on applications behavior over the entire network.

SALSA-Enterprise operates through a simple Web interface. An iPhone application is available for anywhere anytime access to customers’ business application performance.

SD-WAN Architecture Evolution

Infovista continues to evolve how Ipanema SD-WAN supports additional connectivity solutions for enterprise networks. Building on Ipanema SD-WAN 9.1 release, Ipanema SD-WAN 9.2 release adds the capability for Ipanema SD-WAN appliance to be the CPE device for Internet-only connected sites as part of an MPLS network. With Ipanema SD-WAN 9.2, we add the capability to connect Internet-only sites with no MPLS at that site.

Ipanema SD-WAN now supports customers planning to migrate from MPLS to MPLS + Internet with the option to ultimately migrate to Internet + Internet. With this architecture, Ipanema SD-WAN also supports the hybrid datacenter concept for customers who retain the on-premise datacenter connected via MPLS and also Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS) for customers who access applications from the public cloud/Internet. This offers the agility and flexibility that customers are looking for with SD-WAN solutions both today and into the future.

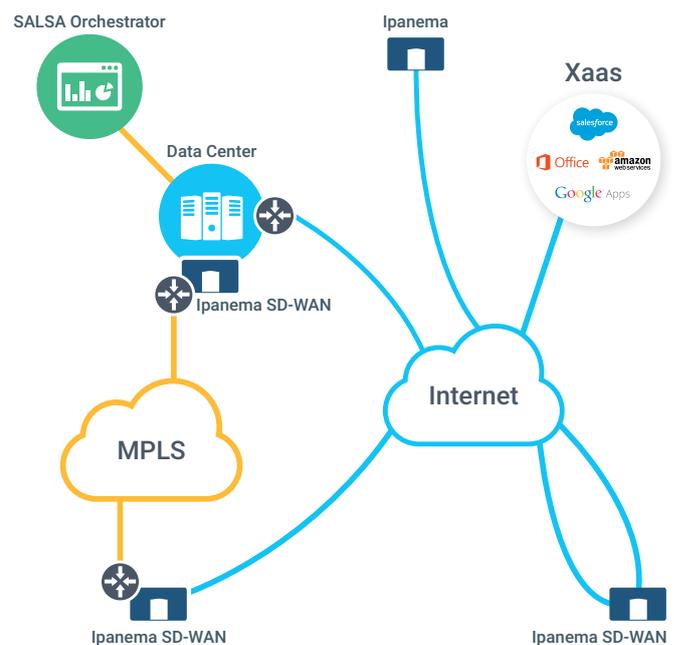


Figure 4. Ipanema SD-WAN Architecture

About Infovista

Infovista, the leader in modern network performance, provides complete visibility and unprecedented control to deliver brilliant experiences and maximum value with your network and applications. At the core of our approach are data and analytics, to give you real-time insights and make critical business decisions. Infovista offers a comprehensive line of solutions from radio network to enterprise to device throughout the lifecycle of your network. No other provider has this completeness of vision. Network operators worldwide depend on Infovista to deliver on the potential of their networks and applications to exceed user expectations every day. Know your network with Infovista.

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