

SOLUTION BRIEF

Ipanema SD-WAN Product Overview

Application Intelligence for the WAN Edge



Enterprise Digital Transformation – IT Enters the Application Era

Influx of Enterprise Applications

Enterprises are going through exponential digital and business transformation to become cutting edge digital enterprises. Applications are leading enterprises into the next generation of competitive services and products.

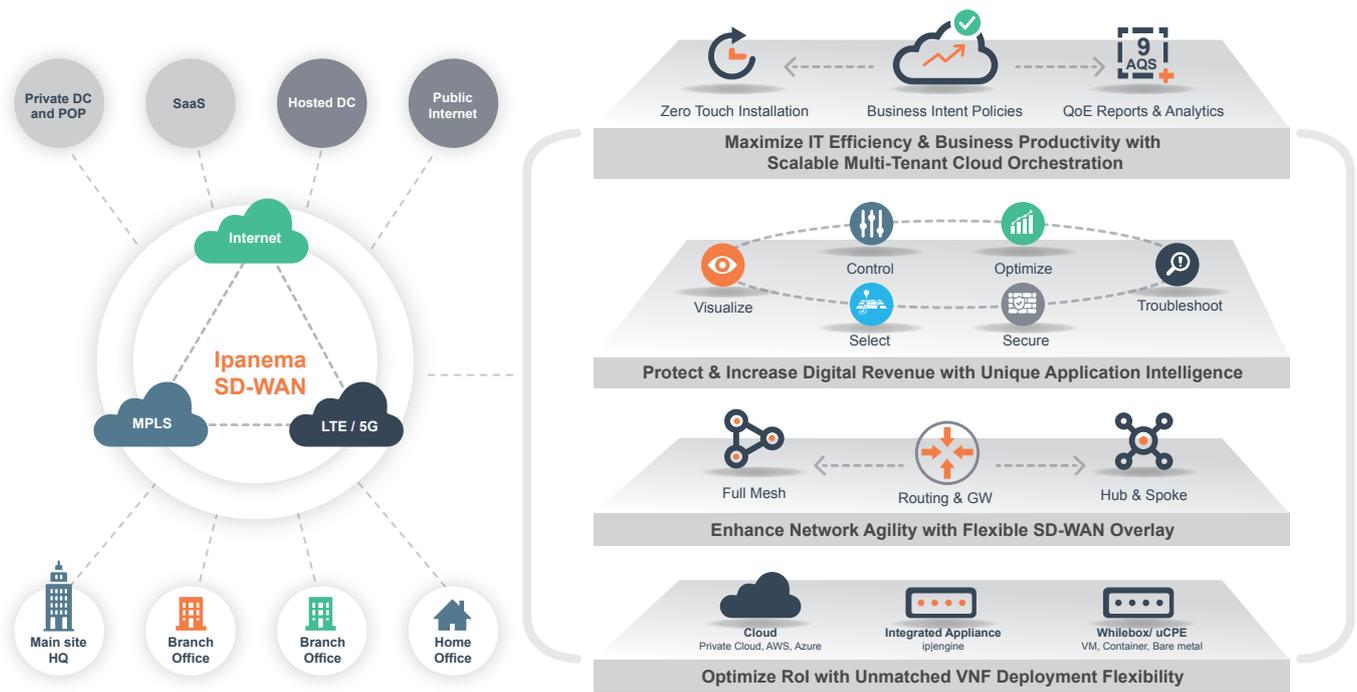
Application performance across hybrid networks has become critical in assuring success of enterprise digital transformation

As enterprises deploy several applications, they have sought to deploy hybrid transport networks beyond their existing MPLS transport to manage increasing bandwidth requirements. However, a new requirement to effectively manage this increasing network traffic has emerged to ensure application performance. Guaranteed availability of mission-critical applications while ensuring their optimized performance to satisfy business intent has become a cornerstone for enterprise digital transformation the success.

A Key Challenge for Enterprise CIOs and IT managers is to ALIGN their network and cloud investments with their business application requirements. Poor performance of business applications has dramatic business impact such as:

- Unexpected revenue loss
- Increased cost of operations
- Loss of business productivity
- Stagnant or reduced lifetime value of customers

Ipanema SD-WAN provides unique capabilities to protect application performance and enable enterprises to maximize the returns on their digital investments



SCALABLE AND MODULAR SOFTWARE BASED ARCHITECTURE

Ipanema SD-WAN uses a multi-layered software-based scalable and modular architecture to help enterprises meet their business objectives to ensure digital customer experience, increase business agility and productivity, and maximize profitability.

The overall solution is built on four key components:

- Unique Application Intelligence Microservices:** Ipanema SD-WAN’s software provides a set of micro-services that combines the unique values of deep packet inspection (DPI) based application visibility, dynamic bandwidth optimization, per session adaptive QoE controls, dynamic path selection based on real-time quality assessment and business policies, built in application-aware cloud security, and proactive trouble shooting - to guarantee application performance, enabling enterprises to protect and increase their digital revenue.
- SD-WAN Overlay Routing and Tunneling Microservice:** The secure routing and gateway overlay over any kind of underlay connectivity provides enterprises the flexibility of a full branch-to-branch mesh or branch-to-cloud hub & spoke VPN tunneling options, enabling IT managers to customize their SD-WAN transformation plans according to their network and business needs.

Ipanema SD-WAN supports pre-integrated SD-WAN routing and gateway microservices or can integrate with 3rd party VNF and uCPE solutions.

- Flexible Edge & Cloud Devices:** Ipanema SD-WAN Virtual Network Function (VNF) provides an unmatched flexibility in edge deployment giving enterprises and service providers the option of deploying Ipanema SD-WAN software functions (micro-services) in a cloud, on integrated Infovista appliances, on a white-box bare metal appliance, or on NFV orchestrated universal customer premise equipment (uCPE) solutions – enabling the most choices of any SD-WAN solution to accelerate time to market and optimize RoI.
- Scalable Multi-tenant Cloud Orchestration:** Ipanema’s scalable cloud orchestration enables enterprises to maximize IT efficiency and business productivity by leveraging zero-touch provisioning across all sites, central multi-tenant management, business intent policy enforcement, monitoring local and global application quality score (AQS) and other critical KPIs via granular per session reports, proactively troubleshoot and isolate issues, and use APIs to integrate with Business Intelligence tools to create integrated dashboards for tracking business-level KPIs.

Ipanema SD-WAN’s Full Suite of Innovative Application Intelligence Microservices Protect and Increase Business Revenue

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. The solution supports a full set of application performance software capabilities that can be deployed as individual microservices or an integrated solution.



APPLICATION VISIBILITY

AN ECOSYSTEM THAT EMPOWERS THE COMBINATION OF SD-WAN AND DEEP APPLICATION VISIBILITY

Know your network by understanding what applications are running on it and how they perform. To guarantee the performance of business applications requires full visibility on application usage and level of performance, and the ability to communicate outcomes to internal stakeholders during all steps of implementation and running modes.

Ipanema Application Visibility is fully integrated with other Ipanema system features as the first step for enterprises to regain control over their network. It enables IT organizations to establish application performance baselines and verify the benefits of each Ipanema features. Application Visibility provides full understanding of application usage and performance over the global network, delivering an SLA-based application performance management.



HOW IS IT DONE?

Ipanema’s integrated Application Visibility identifies applications and computing metrics for all IP packets to provide –

- **Highly granular and aggregated data views and reports:** analyze data based on the whole organization, business lines, geographies, sites, applications or group of applications.
- **Application Quality Score (AQS):** unique scoring as a common KPI applicable to all applications to align to business objectives and user experience.
- **Cost-effective:** Ipanema system views application usage and performance over types of network sites. Smaller sites can be “tele-managed”.

Application Visibility provides full understanding of application usage and performance over the global network, delivering an SLA-based application performance management.



APPLICATION PERFORMANCE TROUBLESHOOTING

Application Performance Troubleshooting simplifies the management of the digital user experience by accelerating troubleshooting and streamlining trends analysis of network and applications performance. This is supported by collecting rich set of flow metrics, leveraging Netflow data, from network devices of the LAN and WAN, enabling the detection and location of the source of network and application performance issues. Ipanema’s application performance troubleshooting ensures IT organizations an in-depth understanding of their application ecosystem, allowing both network and applications teams to jointly solve performance problems using a single interface.

Ipanema SD-WAN provides this troubleshooting capability to all the applications in the ecosystem, while also providing highly granular analysis across

HOW IS IT DONE?

Ipanema SD-WAN’s built in components, such as **Deep Packet Inspection, Application Quality Score, Application Flow Details** support the application performance troubleshooting function.

Deep Diagnostic Tools visualize the real-time connectivity status of any paths between sites in the networks.

Troubleshooting Tools expedite incident resolution via drilldown from application Flows to NetFlow Application Conversations detailing all Application performance metrics between pairs of end-points for a given application.

all organizational levels, including business units, geographies, sites and application groups, to troubleshoot and address any performance issue.



APPLICATION QOE CONTROL

Ipanema SD-WAN’s Application QoE Control is recognized as the leading solution for bandwidth management and traffic prioritization. The solution is built around user-centric and business-intent oriented performance objectives, which are enforced by cooperative appliances. Ipanema SD-WAN work per application session, by using dynamic bandwidth allocation and priority queuing in an end-to-end overlay QoS. Application QoE Control handles both inbound and outbound traffic and it is fully integrated with other Ipanema features. Ipanema applies end-to-end QoS regardless of the connectivity link to the most complex and challenging traffic flowing through them.

Ipanema’s 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.

HOW IS IT DONE?

Ipanema SD-WAN’s patented dynamic-bandwidth allocation and queuing algorithms regulate traffic flows over the enterprise WAN to maximize all available link capacity.

Ipanema monitors performance across the entire enterprise network and computes the total bandwidth availability and application demand in real time.

Ipanema appliances regulate and restrict the application flows of the lowest criticality, and then continue up to the applications with highest criticality as necessary for ensuring the minimum guaranteed bandwidth requirement.

Several criteria drive the queuing of flows, including the nature of applications (real-time, transactional or background) and the actual bandwidth behavior of the flows (constant, variable, elastic) as well as real-time network conditions.



DYNAMIC WAN SELECTION

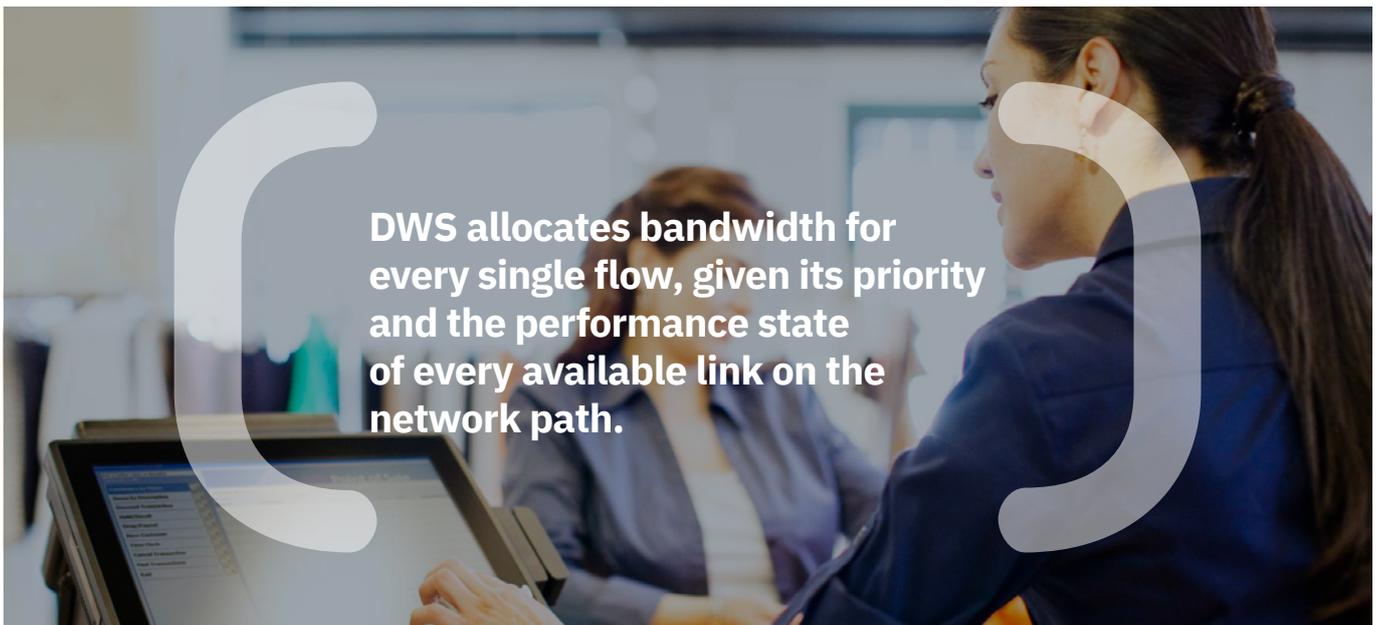
Dynamic WAN Selection (DWS) is a key component of Ipanema SD-WAN. Ipanema selects the best path for each application session in real time. It automatically and dynamically chooses the best WAN connection for each application flow, considering the end-to-end performance of all available paths. Metrics that include capacity, availability and quality are used to maximize the end-user experience and optimize the usage of all network resources. DWS allocates bandwidth for every single flow, given its priority and the performance state of every available link on the network path.

Dynamic WAN Selection enables dynamic hybrid networking for multi-networked branch offices, based on actual performance and application traffic characteristics, supporting 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.

HOW IS IT DONE?

- **Deep Packet Inspection analyzes traffic up to Layer 7** to identify and classify the patterns of application flows based on their defined Application Performance Objectives.
- **DWS considers end-to-end performance metrics** such as available bandwidth, delay, jitter and packet loss, beyond the local availability of links.
- **Global knowledge and analysis** of application usage and bandwidth availability allows Ipanema to select the best path for each flow. For example, real-time flows are usually allocated on the fastest path, while email can be allocated to the largest path.

DWS automatically and dynamically chooses the best WAN connection for each application flow, considering the end-to-end performance of all available links.



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APPLICATION AND WAN SECURITY

Ipanema SD-WAN Security function simplifies hybrid WAN deployments and protects your branch Internet connections from threats, without additional security in the branch. VPNs on IPsec or Generic Routing Encapsulation (GRE) tunnels can be terminated at the Ipanema to forward and encrypt traffic which traverses the Internet. The Ipanema appliance can be easily configured to apply local “allows/denies” to the Web traffic. Additionally, these flows can be directed either through an access tunnel and secured by an external Secure Web Gateway (e.g. Zscaler before and after traversing the Internet backbone) or through a cloud hub exchange to accelerate SaaS applications.

By coupling WAN Security to Application Visibility, Application QoE Control and Dynamic WAN Selection, the hybrid WAN becomes a Next Generation WAN, one that is secure, user-centric, scalable and offers dynamic path selection and control with full secure control over the Quality of Experience per user.

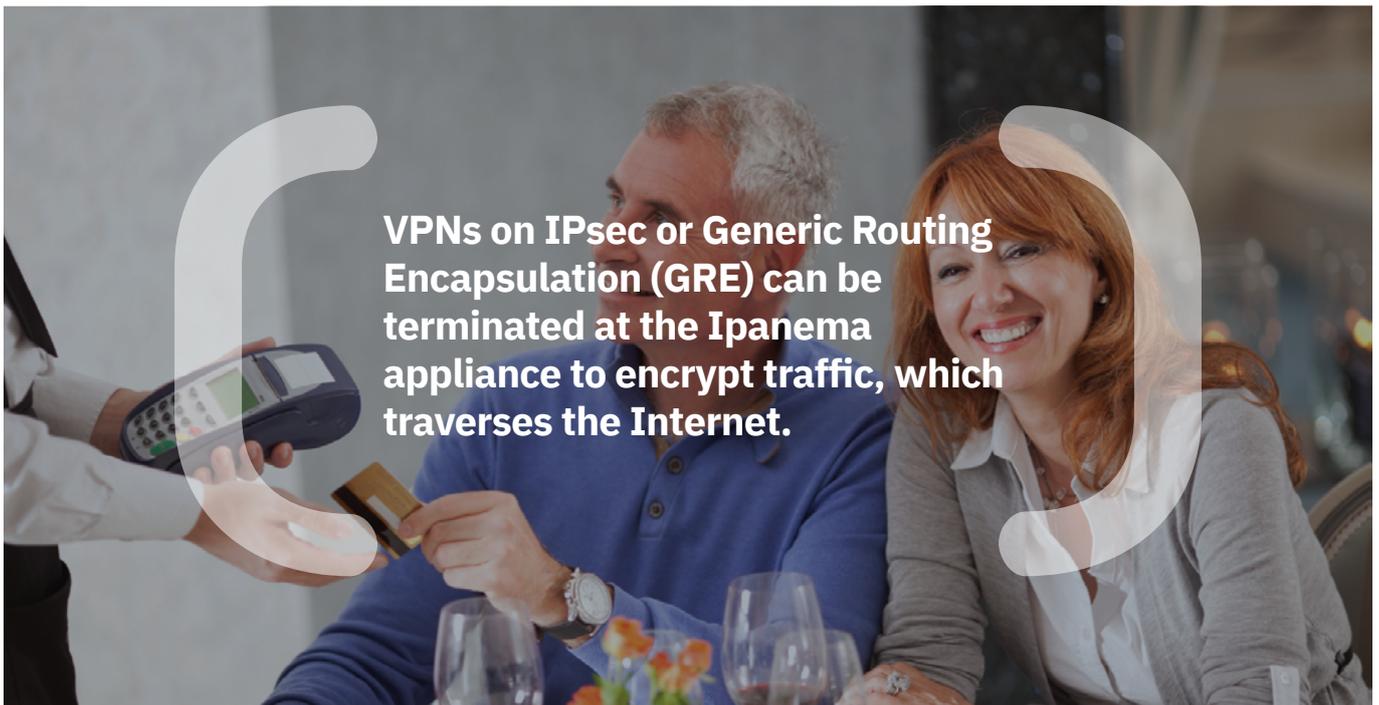
HOW IS IT DONE?

The customer flows are encrypted (AES 128, 256 or triple des) on IPsec VPN tunnels over direct Internet links, in addition to MPLS or other WAN links.

Direct-to-Internet rule exceptions can be defined as part of the security and policy strategy of the network, to deny all in/out traffic to traverse the Ipanema appliances toward untrusted WAN interfaces.

Ipanema SD-WAN security is configured in conjunction with Dynamic WAN Selection. where traffic flows are forwarded over the WAN connection that matches the predefined business intent objective.

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WAN OPTIMIZATION

Ipanema WAN Optimization accelerates application response times and offers additional virtual bandwidth to the network where connectivity constraints would otherwise impair performance.

Ipanema SD-WAN builds an ecosystem of both Application Intelligence and WAN Optimization. The comprehensive solution delivers a dynamic Quality of Service (QoS) that is required to maximize business productivity from all applications on the enterprise network.

HOW IS IT DONE?

- **Deduplication and Redundancy Elimination** to reduce the amount of data transferred.
 - **TCP Acceleration** to overcome the limitations of TCP protocol.
 - **WAN optimization for data-centers** with several network links to provide high availability — allowing IP sessions to go out on one link and come back on another — are fully supported.
 - **SSL certificates** are handled in a way that removes the requirement to propagate them throughout the network. This is a significant advantage over other mechanisms on the market.
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Ipanema’s Flexible SD-WAN Overlay Enhances Network Agility

Ipanema SD-WAN is deployed as a secure overlay network model, connecting a combination of both physical and virtual appliances through the site/branch network. This provides enterprises with the agility to deploy and connect branch sites in an agile manner, while also extend the flexibility of application-based QoS to the overlay. Multiple overlays can be executed, in a hub & spoke topology, over the underlying transport layer, with each connected to a different transport link and applications. Applications can be mapped to different overlays based on business intent and policy application.

Ipanema SD-WAN provides one of the **most advanced application performance based adaptive routing overlay**. Once the packets are processed by all application intelligence microservices, ensuring global end-to-end application QoE, packets are routed toward the selected path either across a IPsec tunnel for edge-site to edge-site connectivity, or a GRE tunnel toward a Secure Web Gateway or directly to Internet using the integrated firewall.

HOW IS IT DONE?

Ipanema SD-WAN supports **flexible SD-WAN gateway deployment options** to establish secure tunnels between sites, datacenter, and cloud using full mesh or hub & spoke architecture. Ipanema SD-WAN supports multiple tunneling overlay use cases - enabling enterprises a choice to gradually migrate from MPLS to SD-WAN on site-to-site basis (hybrid and/ or Internet sites only); or migrate to a completely access-agnostic solution by creating an over-the-top SD-WAN tunneling overlay across all sites (MPLS, Hybrid, Internet only).

Ipanema multi-tenant **SD-WAN gateway can also be deployed at service provider point of presence** – enabling Network Service Providers (NSPs) to extend their MPLS service with SD-WAN overlay; and enabling Managed Service Providers (MSPs) or System Integrators (SIs) to offer access network independent SD-WAN over the top service.

SD-WAN gateway software can either co-exist with Ipanema SD-WAN edge appliance, or can be deployed on a separate appliance or as a VNF on uCPE at the data center or at point of presence (POP).



Ipanema's SD-WAN Unmatched VNF Deployment Flexibility Accelerates Time to Market and Optimizes RoI

With Ipanema SD-WAN enterprises have a choice of deployment based on their network preference – either as a fully integrated physical appliance provided by Infovista, or as a virtual network function (VNF) on a whitebox bare metal appliance or Universal CPE (uCPE).

Ipanema VNF is certified across the largest number of uCPE platforms in the market including Cisco, Juniper, Fortinet, Nuage, netElastic, Adva, OneAccess, Huawei, ZTE, and many more.

Easy and Simple Integration with Your Existing Hybrid Network Deployments and Third-Party VNFs...

Enterprises are not required to make any major changes to the existing hybrid network deployments to configure Ipanema SD-WAN - allowing a zero-touch easy and simple deployment. This allows enterprises to go on with business as usual, while starting to realize the rich benefits of having an agile SD-WAN solution, with in-depth application intelligence.

Ipanema SD-WAN is the only solution in the market that integrates all necessary network functions (Application Visibility, Troubleshooting, QoE Control, Dynamic WAN Selection, Security, WAN Optimization, and SD-WAN Routing Overlay) into a single virtual network function (VNF) while providing flexibility to procure, deploy, scale, and manage each individual function independently. Business driven, automated and fully cloud orchestrated Ipanema SD-WAN gives enterprises all the features they need to guarantee business application performance to every user session, across all business sites and remote offices, and for a large number of applications regardless of network conditions.

In addition, Infovista's unique teleengine Ipanema software – an edge less SD-WAN solution - allows enterprises to get deep application visibility and enforce QoE controls at the remote sites without

HOW IS IT DONE?

Application Intelligence for Traditional Hybrid WAN Deployments

Ipanema's advanced solution provides the flexibility of an overlay VNF solution or a single box multi-function solution, to extend enhanced application intelligence. Enterprises can augment their existing routing infrastructure and increase the shelf life of their enterprise infrastructure and drive application performance.

Application Intelligence for 3rd Party SD-WAN Solutions

The choice of Ipanema's advanced application intelligence VNFs or a one-box multi-functional solution allows enterprises a new best-of-breed uCPE based services using the Ipanema VNF integrated with 3rd party SD-WAN platforms.

Turnkey SD-WAN Solution with Application Intelligence for WAN Edge

A comprehensive multi- function WAN Edge VNF or the choice of deploying a single box multi-function solution. This solution will accelerate your time to market, while providing ease of deployment, integration with 3rd party VNFs, ease of management and most importantly, significantly reduced costs.

deploying any physical appliances or software agents. This provides a very cost-effective manner to deploy QoS overlays from a central point in the network – a hosted private or cloud datacenter. Ipanema's virtual engine can be easily deployed in countries with custom-clearance issues, and in sites with limited space or constrained environments.

Ipanema SD-WAN is the only solution in the market that all necessary functions into a single virtual network function while providing flexibility to procure, deploy, scale, and manage each individual function independently.



Ipanema's SD-WAN Scalable Cloud Orchestration Maximizes IT Efficiency and Business Productivity

CENTRALIZED ORCHESTRATION AND ZERO-TOUCH INSTALLATION

Improving IT agility at branch locations begins with the deployment of Ipanema appliances or VNFs 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).

Along with the ease of deployment, Ipanema SD-WAN promises an ease of management for IT managers. This is delivered using the central management software component called 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.

Within its multi-tenant cloud orchestration capabilities, SALSA provides IT managers the ability to set and execute policies that are driven by business intent, thereby allowing the Ipanema ecosystem to deliver true business objectives and ROI. The IT organization

HOW IS IT DONE?

SALSA periodically collects usage and performance information from Ipanema SD-WAN devices. This is further segmented based on application identity, volume, source, destination and quality.

The information from SALSA is collaborated with other components of the solution, such as real-time monitoring, network troubleshooting and alarming tools.

Custom and historical 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, for any time period desired.

can ensure this through the reported Application Quality Score (AQS) which enables enterprises to see how application performance is experienced by end users and how it is aligned with business objectives. AQS generates detailed reporting and analytics that provides a dashboard view on specific applications and their performance health through the network.



Ipanema SD-WAN multi-tenant cloud orchestration empowers IT managers to maximize IT efficiency and business productivity.

SUMMARY

Ipanema SD-WAN, Application Intelligence for the WAN edge, provides a market proven solution that guarantees the performance, security, and success of the organization’s entire digital application portfolio under any network conditions; and empowers enterprise CIOs to maximize their returns from the digital investments. The integrated solution enables enterprises to:

Protect Revenue Loss, by

- Preventing poor customer experience due to suboptimal network performance
- Preventing operational errors through IT automation
- Ensuring end to end network and application security

Enhance Business Productivity in a Cost-Effective Way, by

- Optimizing network and bandwidth investments
- Simplifying Hybrid WAN and SD-WAN deployments at global branch offices by automating IT processes via scalable cloud automation and integrated application solutions
- Empowering IT operations team with deep application insights to predict and act quickly
- Reducing the number of calls to service desks by automatically removing all application performance brownouts before users feel the pain

Increase the Life Time Value of Customers, by

- Maximizing end user satisfaction and digital engagement experience
- Personalizing offers and services
- Proactively identifying opportunities to upsell



IPANEMA SD-WAN

- Selected by worldwide enterprises across all industry sectors
- One of the largest customer bases in the industry (nearly 300,000 managed sites)
- Top 5 SD-WAN Vendor in IHS Markit quarterly market share report
- Positioned as a Visionary in Gartner’s Magic Quadrant for WAN Optimization for six consecutive years and named an Evolutionary Disruptor in the WAN Edge
- Deployed by leading CSPs (BT, Orange, Vodafone, KDDI, KPN, Swisscom, Telecom Italia, Telefónica, Easynet) as part of their application aware network and application performance guarantee solutions
- Tolly Certified Application Performance



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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KNOW YOUR NETWORK™