

GLOBAL SOFTWARE DEFINED WIDE AREA NETWORKING (SD-WAN)

An Introductory Assessment



INTRODUCTION

The landscape of networking requirements in the business world is undergoing significant changes, primarily driven by the increasing adoption of cloud technology and the escalating consumption of bandwidth. As these evolving business conditions unfold, organizations are finding themselves in need of new and modernized networking models to effectively manage the surging demand for network resources, facilitate seamless business operations in the cloud, optimize efficiency, and exercise control over costs.

However, the existing legacy networks are plagued by limitations. They heavily rely on hardware, have rigid and inflexible configurations, and require the manual deployment of routers in the field. This process is not only time-consuming but also labor-intensive, as engineers are compelled to enter complex command line interface (CLI) commands at each branch router to set up the network. This traditional approach to networking is proving to be inefficient and cumbersome, hindering organizations from keeping pace with the rapidly evolving business landscape.

To address these challenges, the promise of Software-defined wide area networking (SD-WAN) emerges. SD-WAN leverages software and cloud-based technologies to simplify the delivery of Wide Area Network (WAN) services to branch offices. By harnessing the power of software and the cloud, SD-WAN enables businesses to easily and rapidly utilize multiple WAN connections. This newfound flexibility offers improved quality, reliability, and security, while also providing enhanced visibility and analytics capabilities.

With SD-WAN, organizations can seamlessly adapt to the changing networking requirements brought about by cloud adoption and bandwidth consumption. By embracing this innovative approach, businesses can achieve greater operational efficiency, better manage network demand, enable smooth operations in the cloud, and effectively control costs. SD-WAN represents a paradigm shift in networking, empowering organizations to stay ahead in an ever-evolving digital landscape.





PRODUCT DESCRIPTION

The GLOBAL SD-WAN Service is a comprehensive managed network solution provided by Nokia Nuage and managed by Batelco. It involves the installation and management of hardware and software on the Customer's premises. This service creates a secure overlay network that allows enterprises and their branch locations to have full control over the configuration and management of application flows.

With GLOBAL SD-WAN, businesses can bring together a variety of connectivity options, including MPLS, DIA, DSL, and LTE, to effectively manage their applications and establish a virtual private network. This means that enterprises can leverage different types of connections to optimize their network performance and meet their specific requirements.

One of the key features of GLOBAL SD-WAN is its ability to provide business customers with visibility into the performance of their applications. This allows them to monitor and analyze the performance of their applications in real-time, enabling them to make informed decisions and take appropriate actions to optimize their network resources.

Another important aspect of GLOBAL SD-WAN is its automatic routing and optimization capabilities. The service intelligently routes network traffic to ensure the most efficient and optimal paths are used, resulting in improved application performance and reduced latency. It also optimizes the utilization of available bandwidth, ensuring that applications receive the necessary resources for smooth and uninterrupted operation.

GLOBAL SD-WAN offers several advantages, including speed, ease of use, security, and centralized manageability. With its fast deployment and configuration capabilities, businesses can quickly set up and start utilizing the service. The user-friendly interface and intuitive controls make it easy for enterprises to manage their network and application flows. Additionally, the service prioritizes security, ensuring that data and communications are protected against unauthorized access and threats.

Furthermore, GLOBAL SD-WAN provides centralized management, allowing businesses to have a unified view and control over their network infrastructure. This simplifies the management process, reduces complexity, and enables efficient monitoring and troubleshooting.

Overall, GLOBAL SD-WAN is a powerful and innovative service that empowers businesses to optimize their network performance, enhance application delivery, and streamline their operations. It offers a comprehensive suite of features and benefits that cater to the specific needs of enterprises, enabling them to stay ahead in today's highly connected and competitive business landscape.



SERVICE BENEFITS

Customers can derive various advantages from a multitude of service features offered by our platform. These features cater to different aspects of networking and provide benefits in terms of management, security, performance, cloud connectivity, and cost-effectiveness.

In terms of management, our platform allows customers to simplify the task of overseeing their Wide Area Network (WAN). Through our userfriendly portal, customers gain real-time control over their network, enabling them to define network rules and prioritize traffic from critical applications using Application-Aware Routing (AAR). The best part is that all these management capabilities can be accessed within minutes, without the need for on-site technicians.

When it comes to security, we prioritize the protection of our customers' data. Our GLOBAL SD-WAN is hosted in a secure platform within Batelco DC, ensuring that sensitive information remains safeguarded. To add an extra layer of security, our Network Security Gateway (NSG) is embedded with built-in IPsec tunneling. Additionally, customers have the option to enhance security by integrating with cloud-hosted security platforms or adding Virtual Network Functions (VNFs). These measures guarantee the integrity of your business operations and ensure business continuity.

Our platform also focuses on enhancing network performance. Adding new locations to the network is made easy and quick, allowing for seamless expansion. Furthermore, customers can utilize our portal to control and optimize network performance during peak productivity times, ensuring that their operations run smoothly and efficiently.

In today's digital age, the cloud plays a significant role in business operations. Our platform enables customers to unlock the full potential of the cloud by providing direct and secure access to Software-as-a-Service (SaaS) applications and a wide range of cloud service providers. By eliminating delays and reducing network congestion, our platform maximizes application performance and supports your organization's digital transformation efforts.

Lastly, we understand the importance of cost-effectiveness for our customers. By entrusting us with the responsibility of managing a large routed network, customers can offload the operational burden and focus on their core business. Our team will orchestrate, operate, and optimize your network, resulting in reduced operational costs.

In conclusion, our platform offers a comprehensive range of service features that bring about simplified network management, enhanced security, improved performance, increased cloud connectivity, and cost-effectiveness. We aim to provide our customers with a seamless and efficient networking experience that supports their business objectives.



TECHNICAL FEATURES

Technical Features	GLOBAL SD-WAN
Multi-underlay	 MPLS / Internet / LTE Active- active load balance and utilise all WAN connections App-specific failover
Centralized Management from Portal	 Zero Touch Provisioning for CPE Support for full mesh, partial mesh, hub and spoke topologies Self-service portal Centralized controller for policy management Fast addition of a new branch due to reliance on Internet and virtualized services Visibility, control & reporting overall customer NW Minimize Human errors, due to central controller configuration
Cloud Support	 Cloud-friendly breakout (AWS / Azure) Easy to enable virtual branches over cloud. Access to Cloud Hosted Security Brokers (Zscaler)
Applications Visibility	 Detailed application utilization and performance reporting Monitor, control and improve business critical application performance Smart Application Awareness Routing (AAR) - Traffic routing based on defined application and site profile (Packet Loss, Link Utilization, Latency, Jitter) Application based QoS Overlay SLA Service Chaining
Security	 SSL Encryption/Decryption Access to SECaaS (Zscaler) Virtual FW Built in IPsec tunneling in CPE
Cost Effectiveness	 Cost effective, by relying mostly on low-cost Internet. Virtual services (vCPE, vFirewall, etc.) Making the network smarter, reducing complexity which will help the users to ensure that no wastage in the connectivity resources. Lowering the admin & maintenance cost.



MANAGEMENT TYPES

GLOBAL SD-WAN Management is a secure solution that enhances the efficiency and reliability of the Wide Area Network (WAN) by dynamically selecting the most optimal paths and reducing costs by diverting non-essential traffic over the Internet.

In the Managed GLOBAL SD-WAN option, Batelco takes on the responsibility of monitoring and controlling the implementation and changes of policies, which are agreed upon in advance with the customer. Batelco also proactively identifies and troubleshoots any faults that may arise and provides periodic performance reports to ensure smooth operation.

On the other hand, in the Self-Managed GLOBAL SD-WAN option, the customer retains the control over managing policy changes. This includes tasks such as adjusting application routing and quality of service parameters, which can be done through the Batelco VNS customer portal. This option allows the customer to have more direct involvement and flexibility in managing their own network policies.





TECHNICAL DESCRIPTION

Software-Defined Networking (SDN) is a network concept that involves the separation and abstraction of two main elements in a network: the Control Plane and the Data Plane. The Control Plane handles signaling and control functions, while the Data Plane is responsible for the forwarding and routing of payload packets. In Bahrain, there are two primary sites, namely TPH and SEF, that host the SDN components. Let's take a closer look at the various network components:

- VSD + VSC The VSD, or Virtualized Services Database, serves as a repository for policies, business logic, and analytics related to network services. It allows administrators to define and refine service designs and incorporate enterprise policies through RESTful APIs. On the other hand, the VSC, or Virtualized Services Controller, acts as the SDN controller and controls the network services. It maintains a comprehensive view of the network and service topologies. The VSC uses the OpenFlow[™] protocol to establish virtual routing and switching constructs, enabling efficient programming of the network-forwarding plane. In Batelco, four VSCs are deployed to support up to 500 uplinks each.
- NSG The NSG, or Network Services Gateway, serves as the network-forwarding plane for customers' network services at both central and remote business locations.
- ES Elastic Search is a third-party distributed search and analytical engine provided by Nokia. It stores detailed information about deep packet inspection (DPI) and customer usage.
- Gateways The NSG UBR, or Universal Border Router, is deployed specifically to bridge connectivity between different underlays. This feature allows customers to mix and match non-SDWAN sites with Global SD-WAN sites, providing flexibility in network configuration.

- VNS Portal This active cluster serves as a custom portal for customers to monitor and manage their sites. It offers quick and secure site connections, allowing customers to easily connect new sites as needed.
- NAPP The NAPP, or Notification Application, is an essential part of the NSG bootstrapping process. It contains configuration details and is integrated with the Batelco email system to provide notification functionality.
- F5 proxy Load balancers play a crucial role in the SDN platform. They are used to balance the load and act as SSL proxies for communication between the NSG and VSD.
- US The US, or upgrade server, is a virtual server that hosts CPE Software Images. It ensures that the customer premises equipment (CPE) is updated with the latest software version during booting.
- VSAP The VSAP, or virtualized services assurance platform, is a monitoring tool used by the Network Operations Center (NOC) and Service Management Center (SMC) to monitor the SD-WAN service. It helps ensure the performance and reliability of the network service.

These network components work together to provide efficient and reliable software-defined networking services in Bahrain.

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