SD-WAN

Managed Services

Expereo SD-WAN Managed Services Overview

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1 SD-WAN MANAGED SERVICES DESCRIPTION

EXPEREO + SD-WAN

Expereo SD-WAN is a fully managed network service, providing end-to-end managed services supporting multiple SD-WAN vendors. The services provide complete SD-WAN lifecycle management - from design, deployment and management to 24/7 NOC + CSC operational support for day-to-day responsibility, plus security managed services.

Supported SD-WAN vendors include: Cisco/Viptela, Citrix, Nuage, SilverPeak and VeloCloud.

Expereo provides managed SD-WAN services in a modular 'building block' format, as an overlay network to Expereo managed Global Internet connectivity or as part of a managed Hybrid internet/MPLS WAN.

Customers have the flexibility to select the services defined in each block on an individual basis or to choose the full set of services. Each block (see Figure 1 below) is defined as part of this document.
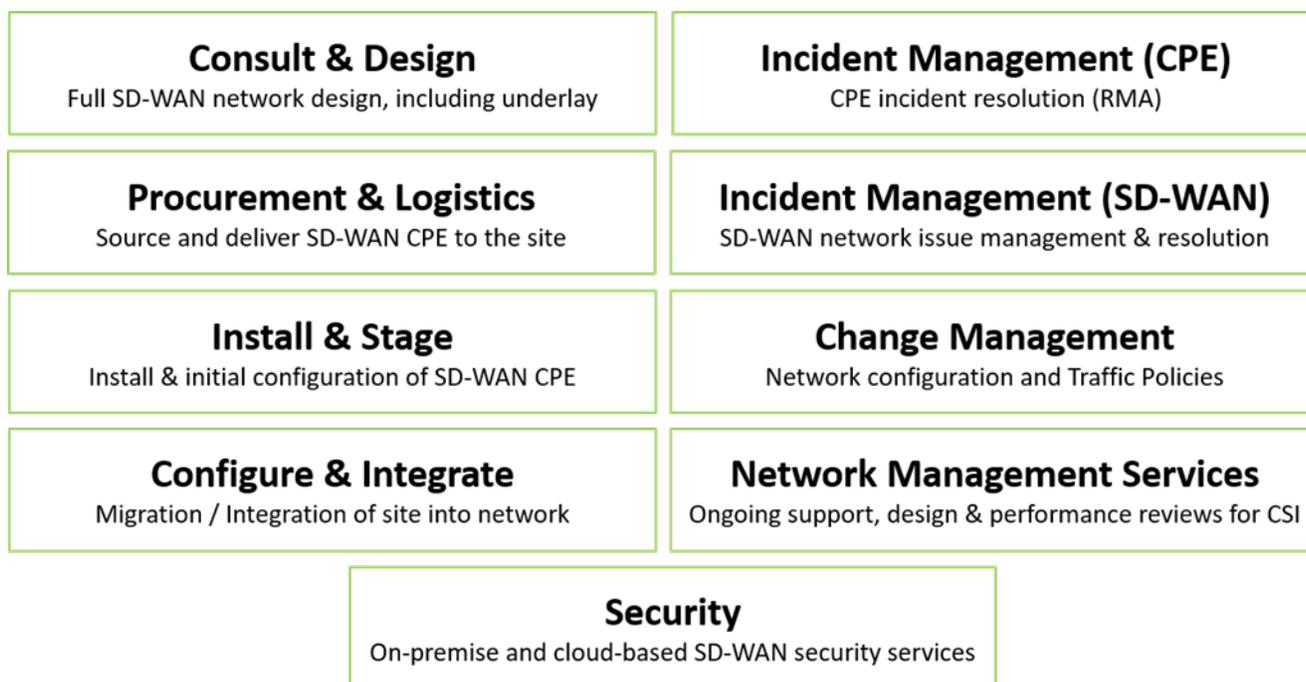
Consult & Design Full SD-WAN network design, including underlay	**Incident Management (CPE)** CPE incident resolution (RMA)
Procurement & Logistics Source and deliver SD-WAN CPE to the site	**Incident Management (SD-WAN)** SD-WAN network issue management & resolution
Install & Stage Install & initial configuration of SD-WAN CPE	**Change Management** Network configuration and Traffic Policies
Configure & Integrate Migration / Integration of site into network	**Network Management Services** Ongoing support, design & performance reviews for CSI

Security
On-premise and cloud-based SD-WAN security services

Figure 1: Expereo SD-WAN managed service building blocks

1.1 Consult & Design

Expereo Consult & Design is part of the initial phase part of any SD-WAN engagement. The purpose is to understand exactly what your requirements are and to design a solution that fits your needs. This includes the choice of appropriate Internet access connectivity, addressing any non-SD-WAN requirements, and accurately scaled SD-WAN equipment.

A) <u>Appropriate Internet access connectivity:</u>

Expereo acts as a Global ISP, having built a complete overview of internet connectivity for 190+ countries and for specific customer requirements based on multiple factors, including local supplier quality, last mile access methods, redundancy options and limitations, routing/peering options and limitations, and overall limitations of connectivity in certain geographies, to help you choose the best connectivity underlay options.

B) <u>Non-SD-WAN requirements:</u>

Expereo recognises that there are limited 'greenfield' deployments of SD-WAN networks within an enterprise environment. SD-WAN is often referred to as a 'zero-touch provisioning' plug and play solution, whereas enterprises often have pre-existing bespoke requirements that require integration into the overall design. For example, eBGP between a customer ASN and ISP ASN, statically routed public LAN subnets for DMZ / Server Hosting, Intranet LAN-side dynamic routing, bespoke backbone connectivity solutions and more.

Expereo has deep experience in integrating these types of requirements for SD-WAN.

C) <u>Accurately scaled SD-WAN equipment:</u>

Based on our experience and network analysis Expereo can advise on the best-fit SD-WAN equipment from multiple vendors for your WAN. Another aspect to consider during this phase is the geographical requirements. For example, for more remote locations and counties does your preferred equipment supplier have an adequate global supply chain in operation.

1.2 Procurement & Logistics

Expereo sources and delivers equipment to all countries in which it provides connectivity services. Depending on geographies, this process can be a blend between regionalised and centralised procurement. As an example, Cisco equipment may be procured within emerging markets from a local vendor to ensure the most rapid delivery, but at a higher price, rather than waiting for several weeks for equipment to clear customs.

Currently, not all SD-WAN vendors have their equipment available in all countries however. We expect it will take another 12-24 months for most SD-WAN equipment vendors to have these arrangements in place.

Expereo can advise customers throughout the procurement process on current availability and expected timelines.

1.3   Install & Stage

Alongside our partnerships to provide Internet access in 190+ countries, Expereo maintains an extensive network of local system integrators and vendors (our 'feet on the street') that enables us to install and stage SD-WAN equipment globally. During the installation stage, an engineer contracted by Expereo can also connect the equipment to the enterprise LAN upon request.

1.4   Configure & Integrate

Expereo has an engineering team with skill sets across various SD-WAN technologies, including Cisco/Viptela, Citrix, Nuage, SilverPeak and VeloCloud. Across these different technologies, our engineers will configure the agreed setup for each site, as well as integrate it into the overall agreed network design. This includes migration from legacy MPLS networks, coordination with Enterprise IT teams on project plans and timelines, the coordination of third parties, and more.

It is common that Configure & Integrate is carried out at a later stage and not during the physical installation, to allow enterprise IT teams to prepare for the change. On some occasions, for example when adding a new site to an existing network deployment, this step is completed together with Install & Stage.

1.5   Incident Management (CPE)

Expereo provides full Incident Management for RMA on CPE. When the deployment is part of a fully managed Expereo SD-WAN service, with Expereo owning the CPE, Incident Management is part of the service. When the equipment is owned by the customer, Expereo can act on behalf of the customer with the correct letter of authorisation. Incident Management also covers software updates and hardware replacement where necessary.

As outlined in Procurement & Logistics, Expereo recognises there is a limited SLA on RMA support for certain vendors in certain geographies. Therefore, Expereo either proposes dual equipment or cold standby based on the criticality of the site, and other factors applicable to specific geographies.

1.6 Incident Management (SD-WAN)

Expereo support engineers provide support and service assurance on the SD-WAN overlay network for all supported SD-WAN technologies. Expereo acts as a single point of contact to assess, investigate and triage any SD-WAN incident reported by Enterprise IT. This includes Incident Management related connectivity issues in the network underlay issues.

1.7 Change Management

Based on our experience, changes occur most often in three areas of SD-WAN deployments:
A) The physical layer - equipment changes, cabling changes,
B) The overlay (SD-WAN design and policies), and;
c) The underlay (WAN IP, BGP routing).

Throughout the service lifecycle, Expereo works together with the enterprise to develop and fine-tune change management scenarios that best fit the customer environment.

1.8 Network Management Services

It is very common for further network optimizations to be made as a customer's SD-WAN environment matures. For example, when an application flow is moved from MPLS to Internet-based SD-WAN, reviews of application policies might be required. Alternatively, when the customer is opening a new data centre or cloud location, the existing internet routing/peering might need to change. Expereo carries out ongoing optimization services to identify the most optimal solution to meet the enterprise requirements, supported by Expereo Professional services including project management and dedicated account management.

Network management services also include 24/7/365 NOC and CSC support, backed up by a comprehensive customer portal for complete network management visibility.

1.9 Security

Expereo provides a comprehensive suite of on-premise and cloud-based security services for enterprises to securely operate SD-WAN, and move to the cloud with confidence. For SD-WAN deployments, Expereo SecureXDN services deliver services including security infrastructure management for internet break-out services and firewall management, threat monitoring and response, and vulnerability lifecycle management.