

## SOLUTION BRIEF

## How Ekinops helps Service Providers deliver on the promises of SD-WAN



### Introduction – The need for SD-WAN

Enterprise digital transformation is driving a new era of networking expectations, one in which the network provides the critical link between users, and objects on the one hand and computers and applications on the other. This means that enterprise networks are now transitioning from being a simple communication system to become a fundamental business enabler that, if it fails, can have serious operational consequences for the organization.

In today's rapidly developing online world, projects such as SaaS adoption, private and public cloud migration, process automation and IoT deployment can no longer be achieved with just a network bandwidth upgrade. Enterprises need to bring agility and flexibility into their networks to be able to respond and adapt to new business demands. In a fast moving, increasingly mobile user environment, applications are now at the center of the business strategy. Networks now need to be defined, deployed and managed from an application standpoint, which inevitably means new investment and careful cost control to implement the necessary changes and adaptations to the legacy network infrastructure.

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Because of this change, and to meet the need for maximum flexibility and agility, network managers, particularly in the large enterprise sector, have embraced the new SD-WAN technology that has emerged as the de facto standard for this new network world. However, for smaller enterprises that may not have the essential skills within their in-house IT department, SD-WAN is generating new and complex challenges that can prove to be difficult to resolve.

Using SD-WAN enables enterprises to "define" new networks that can be over-laid on top of others to allocate resources for applications where performance is a priority, and where flexibility and agility is achieved by being independent from the underlying network architecture (multi-technology and multi-Telcos). Up until now, organizations looking to deploy an SD-WAN solution have had limited options other than to install a dedicated appliance from one of the major network equipment vendors. ISPs and MSPs have been reluctant to add SD-WAN to their managed service offer due to the complexity and the need to skill-up across multiple vendor platforms.

The launch of the Ekinops SD-WAN technology represents a major "game-changer" for both service providers and their customers. Leveraging extensive experience working closely with the world's major Telcos and MSPs to develop a range of physical and virtualized CPE access devices, Ekinops' SD-WAN technology provides a purpose designed, ready to roll-out, platform for the delivery of a universal Managed SD-WAN service.

In addition to bridging the skills-gap and enabling any business to fully implement its digitalization strategy, a managed SD-WAN service can also address the associated cost and flexibility issues. Through support for multiple underlay options including broadband, LTE, and MPLS, SPs can offer the most cost effective solution to meet the customer's needs based on the regional variations in cost and quality of the available connections.

## SD-WAN Adoption Challenges

Although SD-WAN is an essential element of a digital transformation strategy, its adoption raises some major complex challenges, technical and operational, for any business as they transition from the old to the new.

### Enterprise Challenges

Probably the first of the challenges is how to implement the necessary changes to the network infrastructure in a “live” production environment without disrupting critical business operations. In practical terms, the answer is a carefully timetabled, staged migration in different parts of the infrastructure and different regions.

In addition, the process can often lead to the adoption of unified communication, cloud access and global network management as well as the need for new hardware capable of supporting the range of interfaces needed to stay connected to the underlay, which many SD-WAN devices do not include.

Then there are the security implications that can be a real concern, both on architectural and cost fronts.

With all these challenges and questions to deal with enterprises are typically faced with a choice between a “do-It-yourself” or a “managed service” approach and can quickly come to the conclusion that service providers that have the experience and skills needed to deliver the entire solution with contractual guarantees , offer the best route forward.

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### Service Provider Challenges

However, for service providers, selecting and offering SD-WAN solutions to their customers is also a challenge.

First, there is the question of selecting a vendor solution that can meet all the requirements of agility, flexibility, application and cost control that the enterprise customers need. However, not all SD-WAN solutions have the same level of reliability that service providers need to underpin their service commitments and SLAs that customers demand.

On-boarding new SD-WAN vendors also requires qualifying and certifying new types of hardware that often do not have the coverage and flexibility of traditional network vendors. not all SD-WAN vendor's appliances support the entire range of connectivity and routing options required for the underlay, which can mean that traditional routers need to stay in place as a two-box solution. As SD-WAN vendors frequently price their solutions ambitiously, it can mean that the overall solution pricing often does not match enterprises expectations.

From a business model perspective, letting a SD-WAN vendor control the overlay with their own hardware is not the preferred option. It can drive the service providers to choose a “VNF” approach of SD-WAN, adding a best-of-breed firewall solution, which is also a valuable but complex approach.

From a project management perspective, the service providers need to guarantee a smooth “transition” from legacy WAN underlay to a new WAN Overlay. That transition, far from being transparent, can be risky and put in danger the project timing and cost.

Taken together, this makes margin protection a definite challenge for service providers.

## Why Ekinops SD-WAN?

Ekinops is a recognized European leader in routing technology for Telcos and ISPs and is the #3 branch office network vendor in Europe (IHS Markit 2019) having shipped close to 3 million CPE devices worldwide. With a history of manufacturing stretching over 15 years and a leadership position in virtualization and NFVi solutions, it was a natural progression for Ekinops to take up the SD-WAN challenge.

To support service providers and enterprises, Ekinops has extended its widely deployed branch routing solution (OneOS6) to include SD-WAN ready functionality that:

- Offers a smooth upgrade path towards SD-WAN without changing hardware
- Leverages the routing and interface know-how and keep the solution to a single device
- Makes it extremely easy for the end enterprises to deploy
- Supports multi-tenant and multi-tier model (service providers / channels / enterprises) within the management solution
- Creates a solution for managed services, from technical and business models
- Offers the same reliability for SD-WAN as for branch routing
- Includes all features required to support various use cases from SMEs to large enterprises
- Focuses on application quality with a very simple and easy mechanism in an elegant UI
- Can be delivered at the right price point.

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## Value for Enterprises

### **Ekinops SD-WAN delivers network and application performance visibility**

Each customer has its own portal access to visualize application performance and bandwidth usage. Enterprises can set priorities for business critical applications and monitor the impact in real time.

### **Adapting application performance to the customer needs**

Ensure higher reliability by making the most of the bandwidth connections (Active / Active). More bandwidth available for applications, customers can select which applications should be prioritized.

### **More value at a better cost**

Ensure that high priority traffic does not compete with low priority traffic (e.g. conference calls vs. YouTube). With SD-WAN built in routers, enterprise can have a transition rather than a disruption of their network services at a highly competitive price point.

## Value for Service Providers

### **The Ekinops SD-WAN solution is adapted to Managed Services**

Ekinops is a technology provider and not a network provider. The Ekinops SD-WAN pricing model solution allows service provider to stay in control of their enterprise-edge solution's margin. A multi-tenant and multi-tier management solution allows service providers to host multiple enterprises and channels (if any) on the same platform.

### **The Ekinops SD-WAN solution is simple and open**

It combines a proven branch routing experience with SD-WAN functionality in a single device with multiple-interface capability. The virtualization functions included in the OneOS6 operating system enable deployment as a VNF or uCPE. The UI has been designed to be simple and easy to use providing granular visibility for both large enterprises and SMEs.

### **The Ekinops solution is a new service enabler for service providers**

Ekinops SD-WAN can be delivered in various formats to be adapted to different use cases. As an embedded feature of the OneOS6 operating system customers can begin using SD-WAN at any time just by applying an activation license. Additionally, the solution is extensible with future services.

## The Ekinops SD-WAN Solution

Ekinops' strategic focus is to keep arming service providers with a rich edge portfolio of hardware (pCPE, uCPE) and services (access, routing, SBC, WAN optimization) options, leveraging Ekinops traditional strengths of its widely deployed Multi-Service Access Router (MSAR) solutions to deliver an "SD-WAN edge capable" router.

To support SD-WAN, Ekinops has extended OneOS6 with built-in SD-WAN functions.

Ekinops customers deploying OneOS6 capable CPE devices can offer SD-WAN to their installed based through a simple license activation.

It simplifies customer deployment, spares management, hardware qualification and the overall integration within its OSS/BSS.

Ekinops leverages the latest standardized networking technology to deliver service providers with "simple" products to integrate and support within their existing portfolio, limiting the need for a complete re-certification program.

Ekinops also offers SDN/NFV-based solutions, leveraging the OneOS6-LIM as a NFVi middleware compatible with all white boxes, including built-in SD-WAN and supported on the Cloud marketplace including MS Azure, AWS and Google Cloud.

With all Ekinops functions available to be enabled on demand by activating micro-services containers via its single OS (OneOS6), the Ekinops portfolio is fully Cloud ready, cost effective and has reached new levels of flexibility.

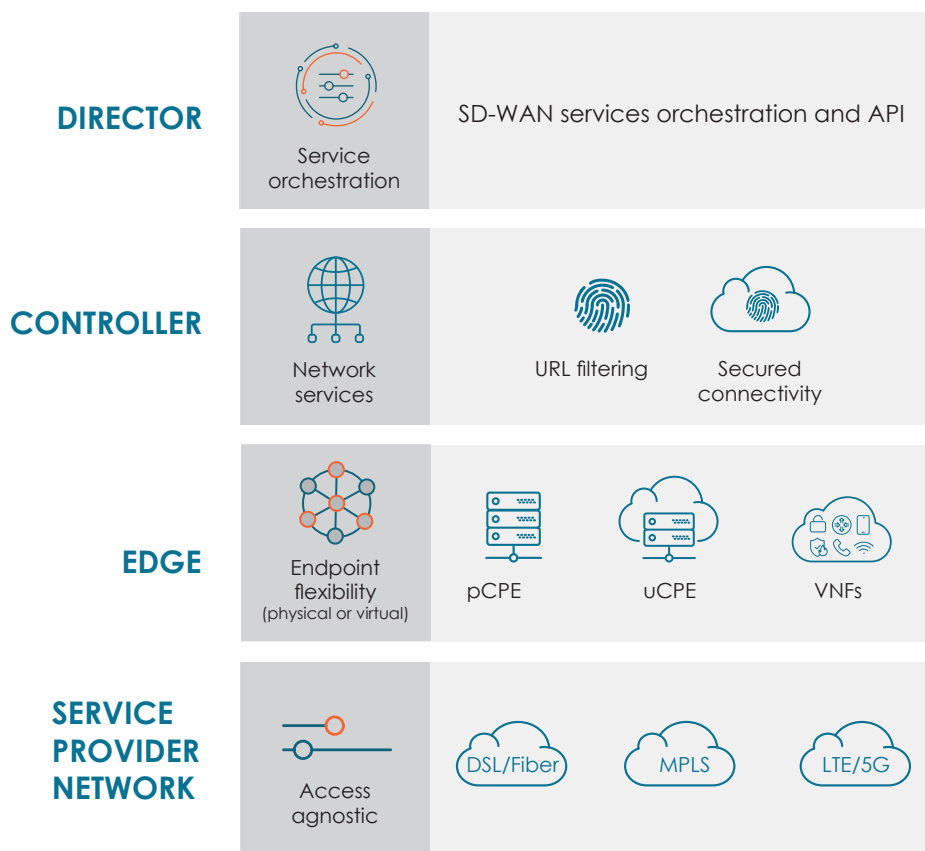


Figure 1 - Ekinops SD-WAN solution overview

## The Ekinops SD-WAN Principle

In order to better match enterprise requirements, Ekinops is offering two variants of SD-WAN out of the same infrastructure that can be deployed concurrently on a Director (see Figure 2) to offer the best cost/performance ratio and fast adoption of SD-WAN with a staged approach.

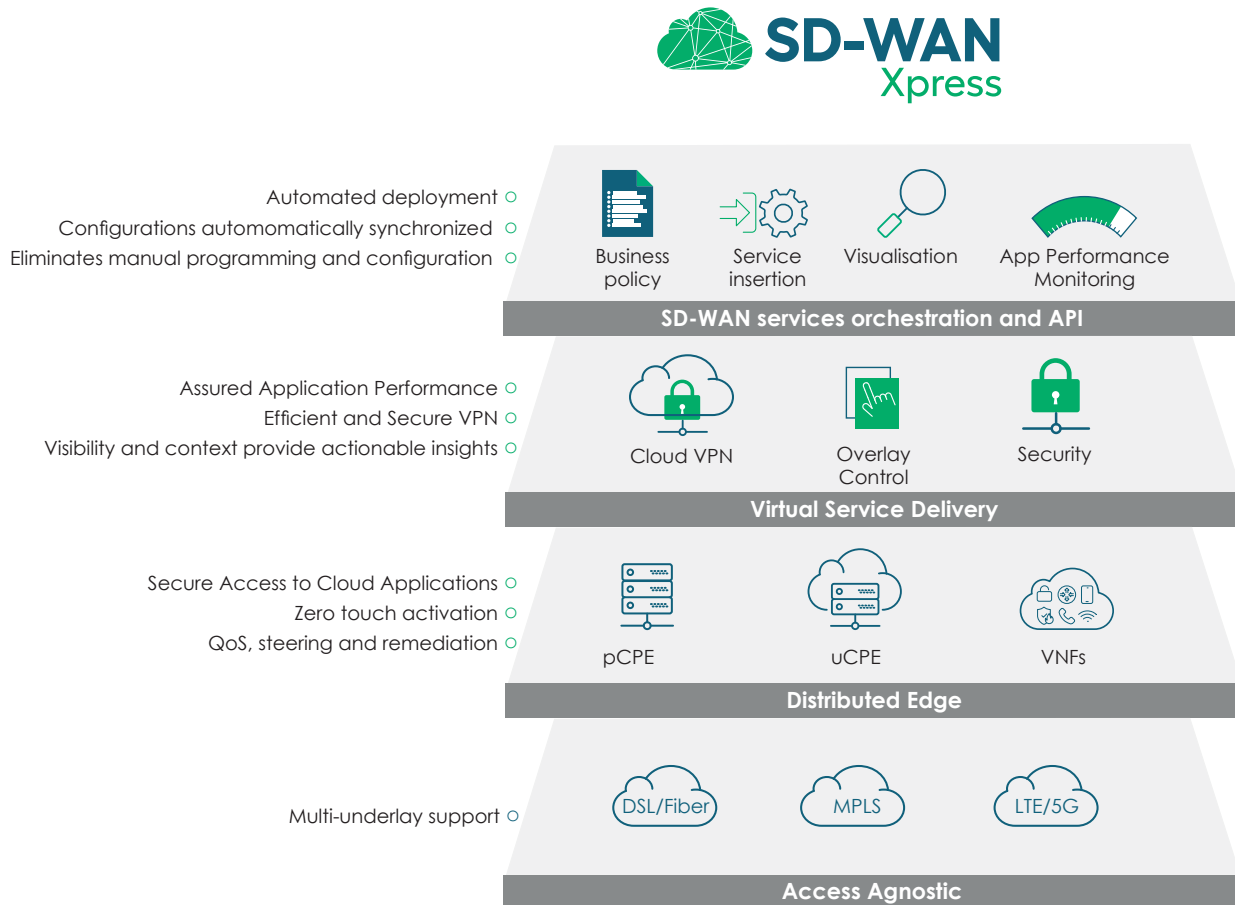


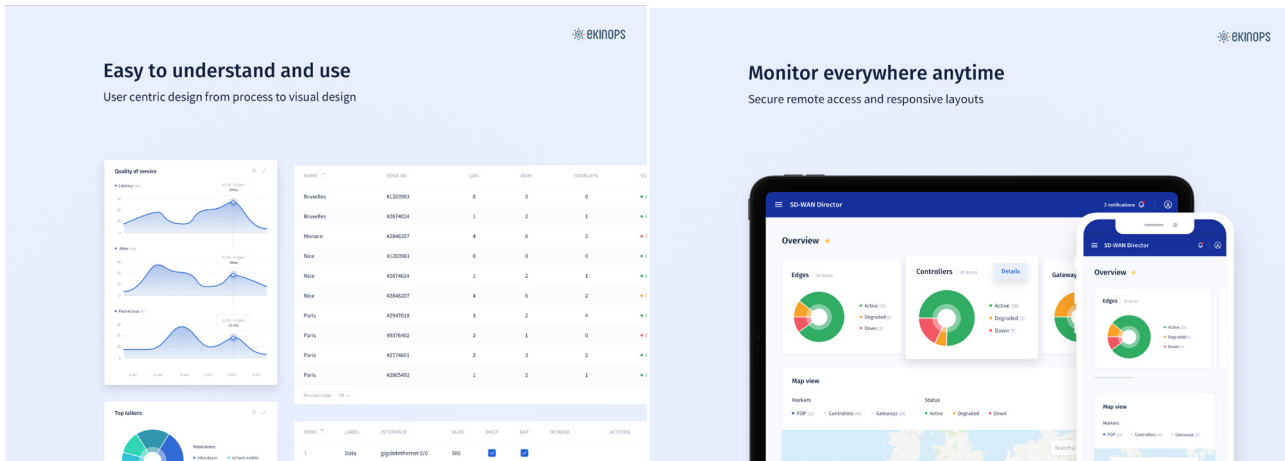
Figure 2 - Ekinops SD-WAN solution components



SD-WAN Xpress is a simple and secured SD-WAN solution designed for SMEs or small sites of large enterprises:

- Central management, through Director, ensuring simple deployment with template-based and user centric approach
- Supporting various topologies and hybrid networks to offload MPLS and/or to segregate traffic
- Simplified user experience with ability to steer traffic based on application recognition and providing related analytics
- Secured local break out to consider new network usage with trusted applications such as Office365
- Automatic failover to secure business critical applications availability





SD-WAN Xpress can operate in parallel on the same infrastructure and enable service providers to provide the appropriate SD-WAN solution to meet the customer's specific use case and requirements.

Service providers can adopt a granular approach by converting an existing business VPN based on MPLS into SD-WAN Xpress through a license upgrade, delivering higher flexibility and better reporting (and/or delegation capabilities).

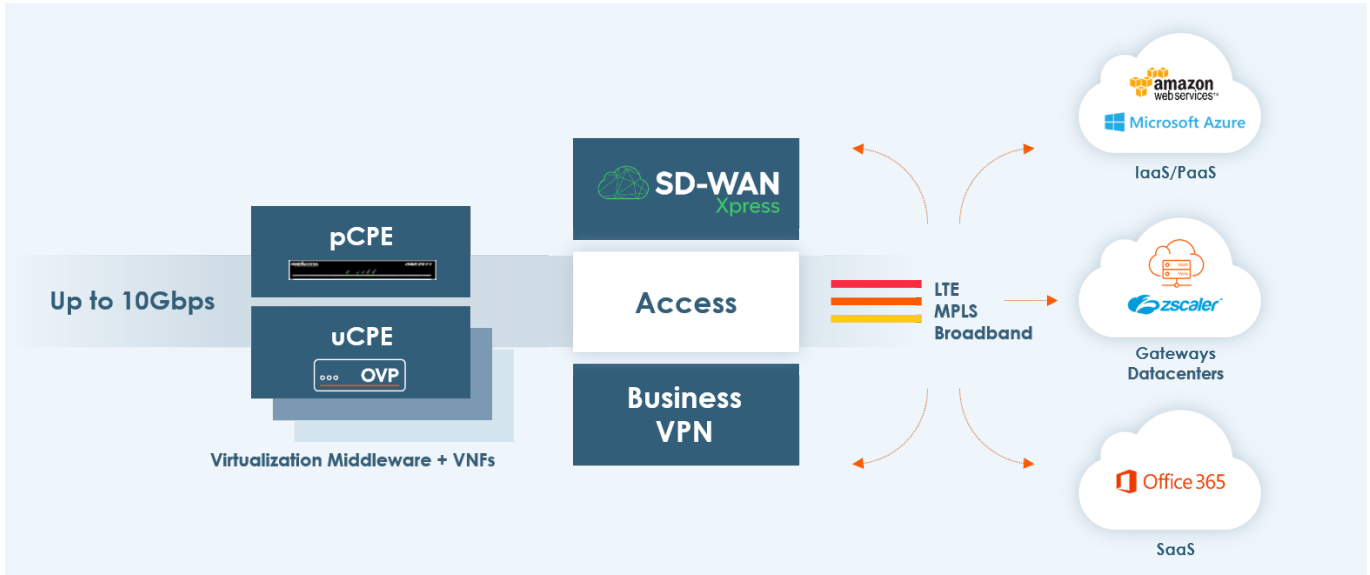


Figure 3 - The new Edge with Ekinops SD-WAN solutions

## The Ekinops SD-WAN Components

Ekinops SD-WAN incorporates the latest technology to enable service providers to offer a highly flexible solution covering a wide spectrum of use cases and deployment models, comprising of various components:

- The **SD-WAN Director** is the Ekinops SD-WAN centralized management platform.
  - Deployed on premise or from the Cloud.
  - A fully multi-tenant and multi-tier solution.
    - Each Tier have its own Role Base Access Module in order to grant different access right to users. Each Tier can be used concurrently.
    - A dedicated Web interface, for each Tier.
  - A full REST API northbound to enable integration within the service provider's existing OSS/BSS.



- The **SD-WAN Controllers** are infrastructure components allowing the overall SD-WAN solution to operate seamlessly with a high degree of scalability. The controller functions are:
  - Zero Touch services: allowing devices to be deployed securely without any site intervention.
  - Route reflectors: allowing distribution and monitoring of routes between all edges of each customer's network environment.
  - Key servers: ensuring edge authentication and providing dedicated and unique encryption key per customer or per overlay if needed.
  - Collectors: collecting alarms, measurements, and acting as a mediation with the Director.



The Controllers are Multi-tenant. The service provider may decide to dedicate Controllers to a specific partner or to a group of partners supporting multiple customers.

- **Gateways** allow customers to integrate their SD-WAN domain with third party VPN or MPLS domain or for service providers to insert value-add services such as security, express route, etc.
- **Edges** are the Customer Premises equipment (CPE) and are available in various form factors with support for multiple connectivity combinations (xDSL, 4G, Fiber), or as virtual instances on uCPE. Nevertheless, all with the same OneOS6 operating system.

All the above components are developed with a Cloud native approach, which makes them deployable within a private or public cloud or on bare metal appliances.

## Technical Highlights

The Director supports a 3-Tier business model: Service Provider, Partners and Customers addressing the various go-to-market strategies. This tiered model isolates the field of responsibilities and defines a powerful delegation mechanism matching the individual service provider's organization and processes.

Each tier has its own dashboard and set of monitoring elements focusing on its field of responsibilities to rapidly drill-down for troubleshooting in case of failure.

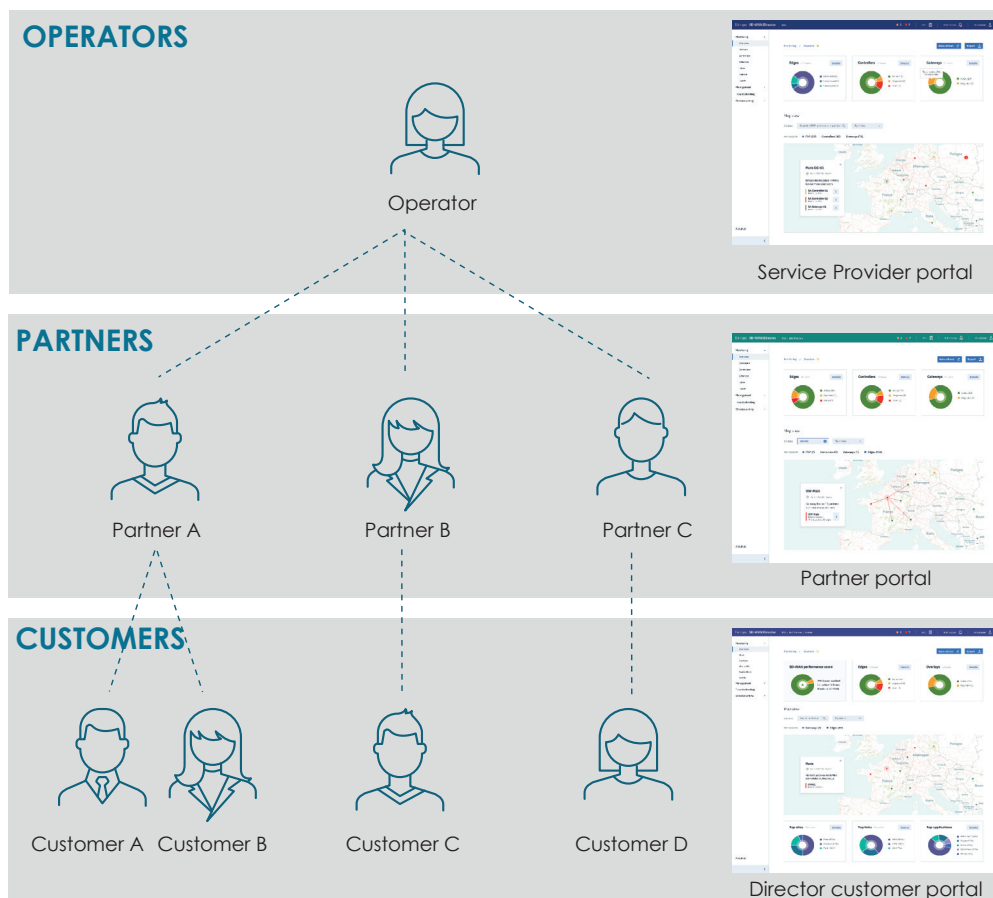


Figure 4 - Multi-tier / Multi-tenant solution

The Director logic has been designed to match mass-market requirements, allowing service providers to deploy largely the same solution for multiple customers. It lowers the need for customization on each deployment while allowing specifics to be addressed by customer-facing teams of the SP, partners and enterprise IT managers.

## Networking Layer

The Ekinops SD-WAN solutions utilize dynamic tunneling including mGRE, DVTI, IKEv2, BGP, and traffic segregation through a secured dynamic overlay mechanism. The solution supports multiple overlays per site and ensures strong traffic isolation. Each overlay has a defined topology; hub and spoke, full mesh or hybrid to appropriately steer the traffic with its own encryption. Within a given overlay, customer may decide application priorities and define priority between overlays for fine grain segregation.



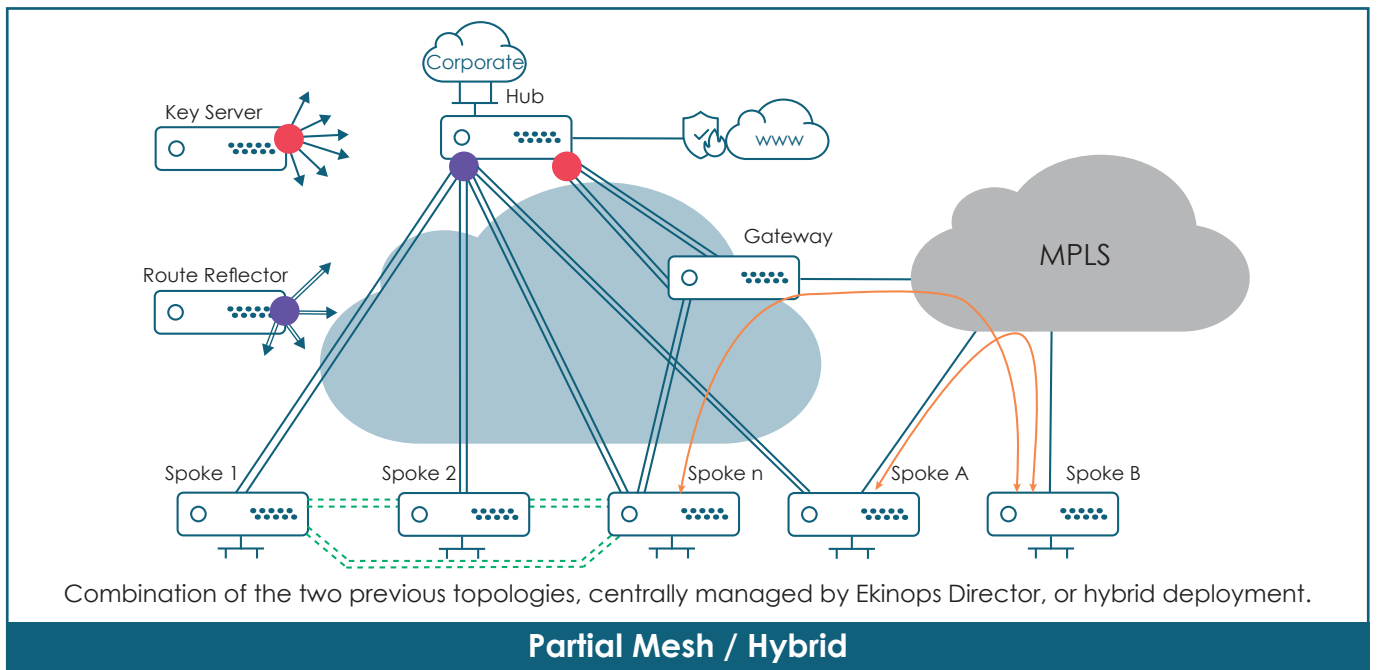
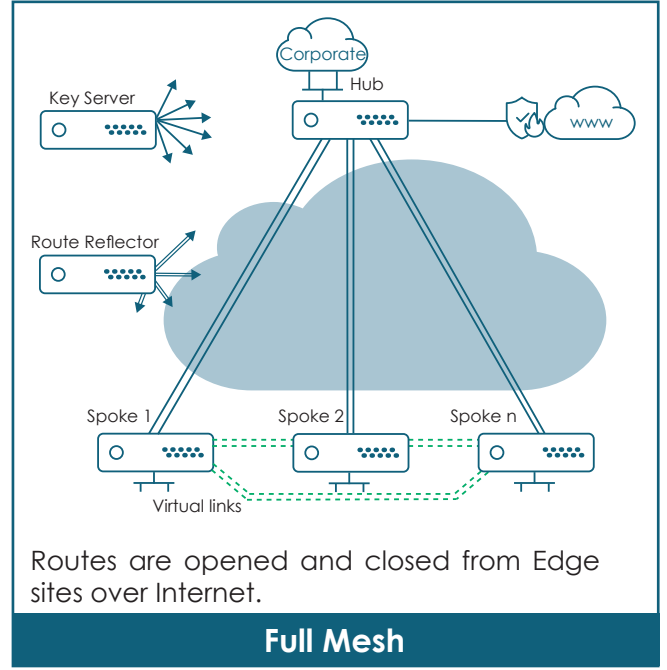
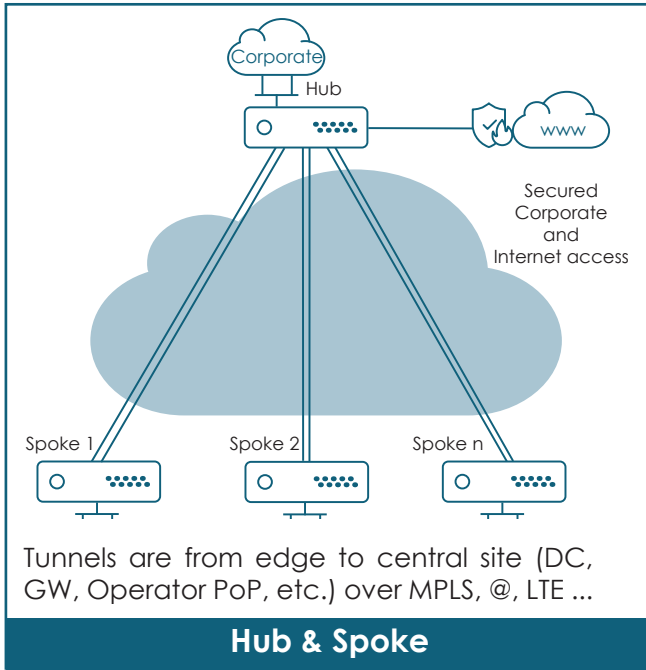


Figure 5 - Supported topologies


## Applications Classification and Services

Xpress embeds a powerful DPI solution with a pre-defined set of up to 4,500+ applications, including SaaS, with defined criteria used for steering decision prioritization.

These criteria can be customized by service providers to address specific verticals (e.g. Banking, Healthcare, etc.) thus providing a 1st level of customization for their customers.

Ekinops developed a TiC (Traffic Identification and Control) framework, enabling 1st packet identification even on SaaS application to ensure accurate steering decision at edge level.

## Features Summary

Edge Features	
	
Service Provider demarcation CPE (xDSL, Fiber, 4G, MPLS) inc. underlay config.	Yes
Dynamic Edge to Edge	Yes
Topology: Full Mesh, Hub & spoke, Hybrid	Yes
Blackout/Brownout Protection/Link Steering	Yes ~2s
Loss / Jitter Correction	No
Forward Error Correction	No
Segmentation	Yes
Aggregate Capacity for higher WAN Utilization (Local Break out)	Yes (ECMP: session, Destination, LLF)
Auto QoS—Adjusts with link & Apps	Partial
Edge H.A	Yes
Edge Cluster	No
Routing Support on LAN for Flexible Insertion	Yes (BGP, OSPF, RIP, Static)
Applications	
Application recognition and Custom defined (5 Tuples)	Yes (4,500+)
1st Packet identification	Yes (inc. SaaS)
Granular App Aware Policies QoS	at Overlay level
Application Break out: Local, Distant (DC), CLOUD service	Yes
Services	
Integrated Services— WLAN, DHCP server, port forwarding	Yes
MPLS and Service Gateway	Yes
Security	
Device Authentication (IKEv2) - configurable lifetime	Yes
VPN encryption traffic: AES, GCM, ... per tunnel	Yes
VPN Key update (per Tunnel) - configurable lifetime	Yes
Zone based Firewall, ACL, NAT, ...	Yes
DDOS protection	Roadmap
Secured Break Out to CLOUD services (AWS, Azure)	Yes
Cloud Security services with VPN monitoring (Zscaler)	Yes
URL filtering based on category	Roadmap
Management	
Delivered On Premises	Yes
Multi-Tier Management solution with Self-service GUI	Yes
Integrated Service Provider Portal with dedicated RBAC	Yes
Integrated Partner Portal with dedicated RBAC	Yes
Integrated Customer Portal with dedicated RBAC	Yes
Troubleshooting tools	Yes
Visibility	Yes
REST API Framework	Yes
PKI Support for VPN	Partial (integrated)
NFV readiness	
vCPE Ready (x86)	Yes
Third-Party Security VNF on Edge	Yes
ONEV600 on AWS, Azure, Google	Roadmap

## Conclusion

The Ekinops approach to SD-WAN offers service providers the opportunity to build fully "Managed SD-WAN" solutions that are evolutionary rather than disruptive for the enterprise. The overall solution architecture enables service providers to address the enterprise mass market adopting digital solutions with a single product to cover a wide variety of requirements, through direct touch or through partners, while focusing on quality, simplicity and cost control.

With Ekinops SD-WAN, Service providers can confidently build SD-WAN offerings that match enterprises mass-market expectations such as application quality, with a single device over multiple types of underlay technology to exact maximum value from their digital transformation investment.



# Empowering Networks

## About Ekinops

Ekinops is a leading provider of open and fully interoperable Layer 1, 2 and 3 solutions to service providers around the world. Our programmable and highly scalable solutions enable the fast, flexible and cost-effective deployment of new services for both high-speed, high-capacity optical transport networks and virtualization-enabled managed enterprise services

Our product portfolio consists of three highly complementary product and service sets: EKinops 360, OneAccess and Compose.

- EKinops 360 provides optical transport solutions for metro, regional and long-distance networks with WDM for high-capacity point-to-point, ring and optical mesh architectures, and OTN for improved bandwidth utilization and efficient multi-service aggregation.
- OneAccess offers a wide choice of physical and virtualized deployment options for Layer 2 and Layer 3 access network functions.
- Compose supports service providers in making their networks software-defined with a variety of software management tools and services, including the scalable SD-WAN Xpress.

As service providers embrace SDN and NFV deployment models, Ekinops enables future-proofed deployment today, enabling operators to seamlessly migrate to an open, virtualized delivery model at a time of their choosing.

A global organization, Ekinops (EKI) - a public company traded on the Euronext Paris exchange - operates in 4 continents.

**EKinops360**  
*Dynamic Optical Transport*

**ONEACCESS**  
*Fast Network Virtualization*

 **COMPOSE**