

# ERICSSON'S SMARTEDGE MULTI-SERVICE EDGE ROUTER DELIVERS MULTIPLE CARRIER BUSINESS SERVICES AND SIMPLIFIES CUSTOMER NETWORK

EMEA



The SmartEdge Multi-Service Edge Router consolidated disparate networks and reduced multiple network layers. In one location, the customer was able to replace 200 routers with a single SmartEdge Router, significantly lowering operational expenses related to hosting, power, and technician training.

The customer is a managed service provider that provides end-to-end global VPN services to their customers with very tightly defined service level agreements (SLA). Since the customer guarantees end to end connectivity and latency for an MPLS VPN, the only way the customer was able to monitor and to deliver the VPN service was to build out a separate physical network for each individual customer. The traditional approach of managing VPN routing and forwarding (VRF) tables was insufficient for the stringent SLAs the customer offered. The SmartEdge® Multi-Service Edge Router (MSER) context capability and border gateway protocol (BGP) scalability allowed the customer to support multiple customers on a single router by creating multiple instances of a virtual router. With this new approach, the customer was able to eliminate hundreds of network elements without compromising its SLA agreements.

## Situation

Technologies such as MPLS allow networks to provide any-to-any connectivity without having to provision individual point-to-point connections. The customer recognized the value of this technology and realized that an MPLS service offering would be attractive to the multinational corporations that made up its customer base. The challenge to offering this type of service would be to integrate the MPLS services of regional carriers to create a global, end-to-end connection service.

Despite the standardization of MPLS (IETF RFC 2547bis), each carrier's implementation in the network and the services offered were often incompatible. For example, a packet that was marked as high priority in one carrier's network might be treated as a medium priority packet depending on how the carriers mapped class of service to the packet markings. In addition, using a VRF was insufficient since end-to-end connectivity and latency could not be monitored.

To overcome these challenges, the customer initially set up separate physical networks for each customer. They leased regional MPLS network capacity from the appropriate carrier and interconnected the carriers with a dedicated set of routers from a leading networking vendor. The dedicated set of equipment allowed the customer to offer the highest level of SLA to its customer base and ensure that end-to-end connectivity and latency were guaranteed. This approach also provided protection against service interruptions caused by configuration mistakes to provision new or existing customers on a single router.

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As the service grew in popularity, the customer quickly realized that the approach of creating separate physical networks for each customer was not a sustainable model for long term growth. The company was incurring very high data center costs due to the large number of routers they needed to provide the MPLS VPN service. Operationally, this was becoming a huge burden, and the customer had reached the point where they literally managed hundreds of routers to provide this service.

## Solution

To build a network with carrier class reliability with all of the service capabilities required, the customer selected the Ericsson's SmartEdge MSER. In addition to its service creation capabilities and reliability, the SmartEdge platform provided the interface diversity and capacity to consolidate multiple layers of their existing network resulting in significant operational savings.

In one location, the customer was able to replace 200 routers with a single SmartEdge platform. As a result, they have significantly reduced their operating expenses by reducing the number of network elements resulting in further savings related to hosting, power, and technician training. Prior to this solution, when they added a new customer, they would need to purchase new routers and find a place to host them. Now they are able to add a new customer by just creating a virtual routing instance on the SmartEdge platform.

### MPLS VPN Capability

The flexibility of the SmartEdge platform in MPLS VPN networks appealed to the customer tremendously. The platform is fully compliant with MPLS VPN standard IETF RFC 2547bis, and the customer deployed it as both a Provider Edge (PE) router and a Provider (P) router. The customer was very impressed with the SmartEdge platform's BGP scalability. Through their intensive testing, they found it to be highly scalable and resilient. The ability to maintain traffic forwarding during a failure drastically improved their ability to provide industry leading service level agreements.

The product's architecture also has resulted in a platform that is extremely reliable with its modular operating system, graceful restart, and separation of label distribution and traffic forwarding. In addition to the MPLS VPN capability, the high level of resiliency provided the customer the assurance it needed to collapse its disparate network approach and service multiple customers on a single device.

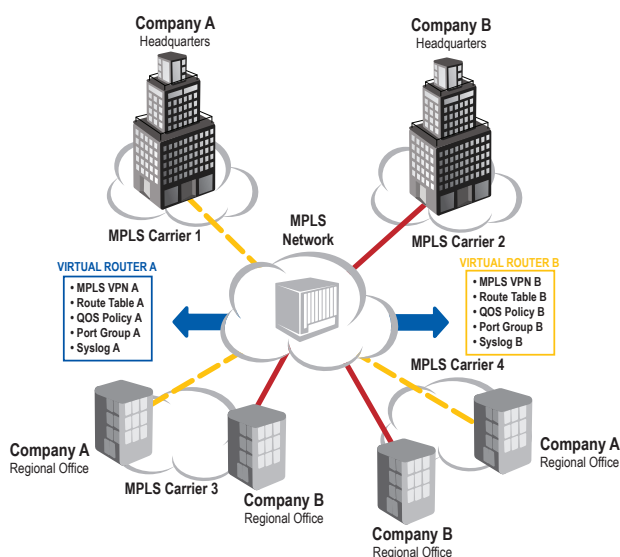
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The SmartEdge Operating System (SEOS) separates out the routing and label distribution into separate processes. The advantage with this type of architecture is that a failure in one process, e.g., the Label Distribution Protocol, does not cause the entire system to fail. Rather, only the process that failed is restarted and the entire system continues to operate. The SEOS can actually stop, restart, or upgrade each individual routing process whether it is related to MPLS or other key protocols.

When a process needs to restart, the SmartEdge platform helps prevent potential routing processor overload with its graceful restart capability. A routing processor overload on neighboring routers can cause them to malfunction, potentially causing instability in the network. Unlike other less sophisticated routers, the SmartEdge platform will continue to forward traffic while it reestablishes its routing or label distribution sessions.

### Virtual Routing through Multiple Contexts

The customer overcame the challenges of isolating failures to a single customer and measuring end to end QoS and latency through virtual routing, which is enabled by the SmartEdge platform's multiple context feature. This feature allowed the customer to create hundreds of virtual routers on a single SmartEdge MSER. Each virtual router has all of the functionality that is available from an actual physical router. Each virtual router has its own route tables, IP address space, and routing protocol processes.



Operationally this provided tremendous advantages. From a configuration perspective, the customer no longer needed to worry about overlapping IP addresses among customers on the same physical router. Configuration mistakes or network instability caused by one customer was isolated to that single customer's virtual router. Even management and trouble-shooting features such as ping and traceroute are still available for each virtual router making troubleshooting easier. Previously, the customer needed to deploy physically separate routers to have these capabilities.

With virtual routing, the customer was able to offer a higher level of visibility into a customer's VPN than with equipment from other vendors. The virtual router actually provides connectivity information which can be monitored. The equipment from other vendors could only establish a VRF for a customer's VPN and not provide any VPN information since a VRF is just a route table and not a full-featured router.

### Benefits

The SmartEdge platform provided the customer with a Smart Broadband Network for all of its MPLS VPN services. The carrier class reliability that comes from a purpose built router allows the customer to offer a service that is extremely reliable. This was important to the customer given that they differentiate themselves by automatically refunding fees when an SLA is not met.

The customer also benefited tremendously operationally. The virtual routing capability allowed the customer to literally replace hundreds of routers with a single SmartEdge MSER. Aside from the capital expenditure savings, they have also realized savings in hosting, power, and technician training. The ongoing savings from these operational costs have resulted in a significant scaling benefit as their MPLS service revenue grows.

The SmartEdge MSER's diversity of interfaces and service creation capabilities has allowed the customer to design and deploy a network that can scale both technically and operationally. Whether a customer needs to migrate from a legacy ATM or Frame Relay service or expand its network to cover a new geography, the SmartEdge platform now provides the customer the capabilities and reliability required to be a successfully managed service provider.

# Highlights

## Customer

Based in the United Kingdom, the customer provides solutions that help companies design, implement, and securely manage global corporate networks with strict, proactive service level agreements.

## Customer Objective

A growing customer base required a network upgrade that allowed the customer to scale its services and operations and continue to offer the end-to-end performance monitoring and service level guarantees for its MPLS VPN services.

## Ericsson Solution

The customer selected the SmartEdge MSER for its reliability, MPLS edge routing capabilities, and the ability to offer each customer their own virtual router from a single network device.

## Customer Benefits

Reduced the number of network elements and increased service availability by supporting multiple customers on a single SmartEdge platform.

## Applications

MPLS Managed Service Provider