

IMPLEMENTING A METRO ETHERNET SOLUTION FOR WiMAX

Divona Telecom Utilizes Juniper Networks Solutions to Optimize Radio Access Network Bandwidth Response Times

Summary

Industry: Wireless Service Provider

Challenge: With WiMAX, as with most wireless systems, available bandwidth is shared between users in a given radio sector, so performance may deteriorate when there are many active users in a single sector. In order to manage bandwidth properly and increase response times (ultimately leading to a better, more reliable customer experience), extra bandwidth must be provisioned or intelligent traffic management and bandwidth control must occur across the radio sector.

Selection Criteria: Divona Telecom sought a network solution that provided superior quality of service (QoS) with enhanced queuing capabilities to reduce costs and enable the company to ensure the appropriate level of service regardless of traffic conditions.

Network Solution: After considering a range of technologies from various vendors, Divona Telecom selected the MX240 3D Universal Edge Router as the platform of choice for consolidating and expanding its WiMAX network.

Results: High availability, service flexibility, and advanced QoS features provided by MX Series routers has enabled Divona Telecom to ensure critical applications at the edge, guaranteeing customer satisfaction and maximizing revenues.

Divona Telecom is Africa's leading satellite and WiMAX telecom operator. Licensed by the Tunisian government in 2003, Divona Telecom connects five major cities in Tunisia, including Tunis, Nabeul, Sousse, Monastir, and Sfax. The company is owned by Planet Tunisie, the first Internet service provider (ISP) in Tunisia, and Monaco Telecom, a cable and wireless subsidiary with operations in Monaco, Algeria, sub-Saharan Africa, Kosovo, and Afghanistan.

Divona Telecom provides integrated end-to-end solutions for the region's premium corporate customers. Several hundred corporations are already live on the Divona Telecom WiMAX network. The company expects to double its subscriber base every quarter for the next four years.

Divona Telecom offers several levels of service within its framework of activity, intended mainly for companies in search of improvement in and optimization of their telecom infrastructure. Divona Telecom has developed a set of services including VPN offerings, IP telephony, high-speed Internet, distance learning, video conferencing, multimedia distribution, international leased lines, and call center solutions.

Challenges

Divona Telecom's challenge focused on servicing its customers with an end-to-end offering. This included managed services, service continuity, diversity, adaptability, strict service-level agreements (SLAs), and dedicated customer service.

Divona Telecom's WiMAX broadband services, aided by enhanced air interface technologies, fueled demand for data traffic and packet-based services. However, limited capacity at existing cell sites was expensive to upgrade, affecting the evolution of broadband services.

The company also wished to leverage the MPLS backhauling ability to support converged services over a single packet-based radio access network (RAN). MPLS backhauling enables CapEx protection using pseudowire technology and supports dynamic sharing of RAN capacity. Using the same MPLS-based backhaul networks, one can offer additional services such as L3 VPNs.

Selection Criteria

The Metro Ethernet project commenced in 2007 when Divona Telecom started looking at various options to optimize its radio network usage. The company also sought a new platform to deliver a number of new services at greater capacity while increasing the capacity of its current edge platform.

In the face of fierce competition from the other major network equipment suppliers, Juniper Networks® eventually won the contract. Juniper's winning proposal was based on its next-generation MX240 3D Universal Edge Router, coupled with Juniper Networks IDP Series Intrusion Detection and Prevention Appliances for traffic control and bandwidth management.

There were a number of key factors in Divona Telecom's decision, including Juniper's market reputation for product excellence, proven equipment reliability, and return on investment. Juniper's existing relationship with Divona Telecom, earned over a number of years, was also a key factor.

Divona Telecom's confidence in existing Juniper Networks M Series Multiservice Edge Routers and Juniper Networks J Series Services Routers enabled the company to implement a combined MPLS provider and provider edge capability on the same MX Series platform on the edge points of presence (POPs)—an efficient and cost-effective solution.

Juniper's solution, based on DPCE-Q, provided enhanced queuing capabilities important to Divona Telecom, because a key business requirement from the Metro Ethernet project was to achieve cost-effective, full service port costs on Ethernet.

On the other hand, the use of the IDP Series appliances not only helps protect networks against attacks but also provides Differentiated Services (DiffServ) markings to allow the upstream router to enforce bandwidth limitations on nonessential applications. Not only can administrators control the access of specific applications, but they can ensure that business-critical applications receive a predictable quality of service.

Solution

The completion of the Metro Ethernet project involved the installation of the MX240 in the major POPs. The implementation of the project using the MX240 solution enables the following service applications for Divona Telecom:

- Implement traffic management and bandwidth allocation at the access layer
- Honor bandwidth constraints for every customer
- Protect network resources from nonessential "best effort" applications
- Address scaling demands for the growth of data traffic
- Achieve desired hierarchical QoS and honor SLAs
- Implement high availability (HA) features and MPLS feature richness

Using MPLS at the Metro access, traffic engineering is combined with a rich service set to allow the transport of a wide range of Layer 2 and Layer 3 traffic. Extending MPLS to the Metro access also brings benefits such as Operations, Administration, and Maintenance (OAM) diagnostic capabilities, and QoS support for services that are sensitive to delay and delay variation.

Additionally, the MX Series is designed to lead the industry in the following areas:

- **Interface Scalability**—The MX240 3D Universal Edge Router's design delivers increased port density over traditional carrier Ethernet platforms, as well as performance of 200+ Gbps throughput, scalability, and reliability in a space-efficient package. The MX240 offers fully redundant hardware that includes a Switch Control Board (SCB) and Routing Engines (REs) to increase system availability.
- **Advanced Packet Processing Performance**—Each MX Series slot provides 40 Gbps line-rate packet forwarding.
- **Service Flexibility**—Juniper Networks is an industry leader in both MPLS and virtual private LAN service (VPLS), and MX Series routers leverage Juniper Networks Junos® operating system that has powered more than 35,000 M Series Multiservice Edge Routers shipped since inception. The field-proven Junos OS provides the MX Series feature richness, stability, and service breadth not typically found in Carrier Ethernet platforms.
- **Advanced QoS**—The MX Series features superior QoS at the interface level, which improves port density, can reduce costs, and enables service providers to ensure that services receive the appropriate level of service regardless of traffic conditions. This enables providers to offer a variety of Layer 2 and Layer 3 services over Ethernet, such as VLAN/transparent LAN, L2/L3 VPNs, voice over IP (VoIP), and video over IP, with guaranteed SLAs.
- **Simple, Non-Disruptive Deployment**—Because the MX Series uses the same Junos OS that the world's largest service providers have relied on for more than a decade, service providers can immediately take advantage of the latest Ethernet technology without the costs and risks associated with introducing a new operating system to the network. Service providers' familiarity, knowledge, and integration of Junos OS into existing back-office systems allows them to drive down capital expenditure costs while rapidly rolling out Ethernet access networks and services.

On the other hand, using the IDP Series for DiffServ marking allows the upstream router to enforce bandwidth limitations on nonessential applications. In this application, the IDP Series will optimize network resources and ensure necessary bandwidth for business-critical applications.

Results

Divona Telecom is one of the first WiMAX carriers to implement an MPLS access network for backhauling data traffic. Divona Telecom's network benefits from the superior performance of the MX240, one of the industry's most scalable, secure, and reliable routers. For Divona Telecom, this represents a strategic investment that supports current and emerging Metro Ethernet services including E-Line, E-LAN, and E-Tree.

The MX240 helps service providers migrate from Internet to infranet by consolidating all services to a single IP/MPLS network. Infranets enable any customer application to automatically request the level of security, quality, and bandwidth it requires from the network.

The MX240 platform has enough reserve processing power to perform all of the cross-network setup needed to establish and revolutionize rich Metro Ethernet networks by applying the concept of MPLS Plug-and-Play, a technology developed by Juniper Networks.

MPLS Plug-and-Play offers carriers a way to reduce the operating expense associated with deploying and managing MPLS-based Metro Ethernet networks, while still enabling these operators to offer all of the cutting-edge services that their customers increasingly expect. With MPLS Plug-and-Play from Juniper Networks, carriers such as Divona Telecom can significantly reduce network operations by automating certain time-consuming tasks to significantly lower operating costs by dramatically reducing the complexities of setting up and maintaining their Metro Ethernet networks. MPLS Plug-and-Play is an excellent cost-reduction option for access networks, especially considering that there are so many more access networks than core networks.

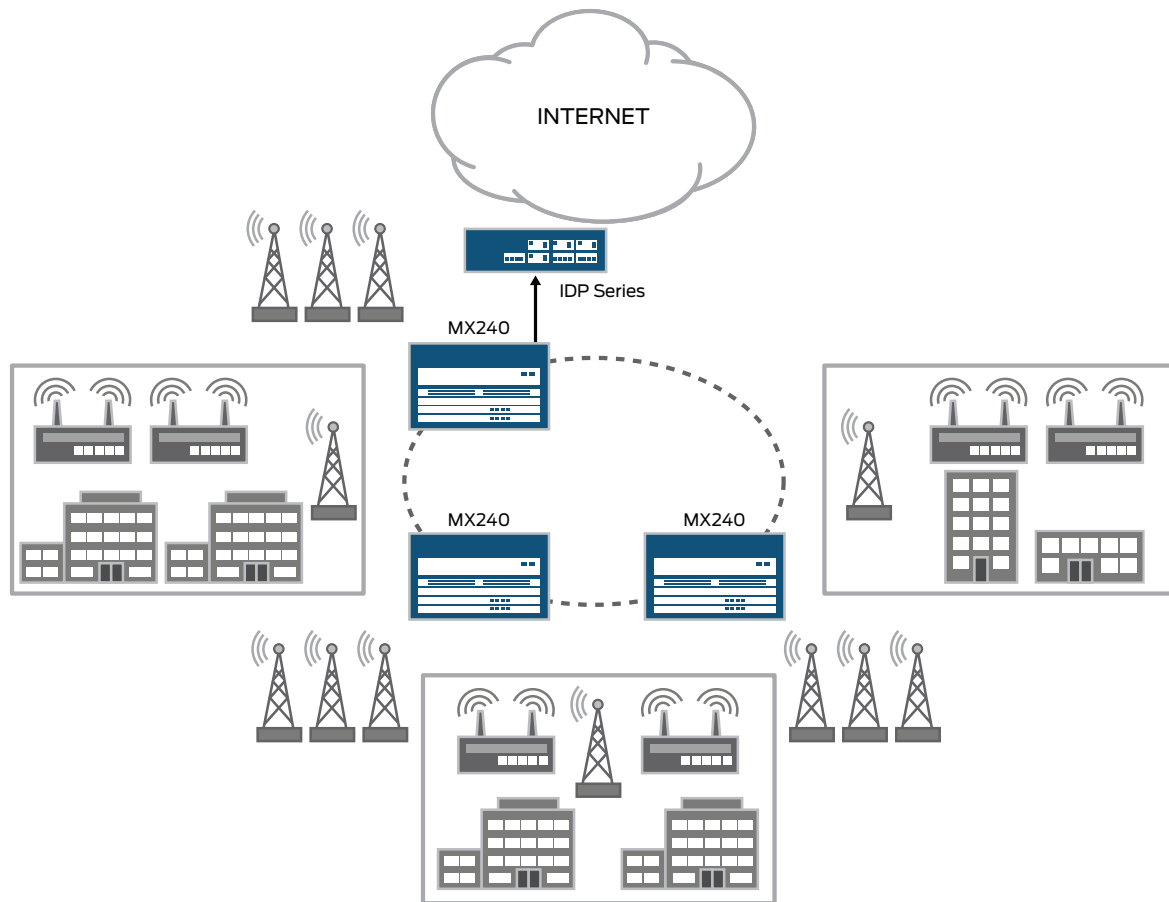


Figure 1: MPLS backhauling for WiMAX service providers

Next Steps and Lessons Learned

The completion of the Metro Ethernet project enabled Divona Telecom to implement a future-proof, highly scalable solution, offering high availability and strict SLAs that will effectively grow with its service needs as the company expands. In a nutshell, this project gave Divona Telecom a scalable access network with intelligent bandwidth management at the access layer, high capacity links between all access POPs, and plug-and-play features to significantly lower operating costs and dramatically reduce the complexities of setting up and maintaining the network.

Looking to the future, it is important to reduce the volume of disparate technologies and simplify the network over time in order to deliver the next-generation services that customers are looking for, while at the same time maintaining high performance levels and holding operation costs to a minimum. Whether a carrier is looking for an easier way to extend VPNs, leverage MPLS in the access network, or build a more resilient network, Juniper Networks provides the answer with one set of solutions for all parts of the network. By simplifying the set of protocols used in the carrier network and reducing the operational complexity of a new deployment, Juniper Networks allows carriers to spend their valuable time and resources focused on revenue-generating services, not just connectivity technologies.

About Juniper Networks

Juniper Networks, Inc. is the leader in high-performance networking. Juniper offers a high-performance network infrastructure that creates a responsive and trusted environment for accelerating the deployment of services and applications over a single network. This fuels high-performance businesses. Additional information can be found at www.juniper.net.

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