

## neosnetworks: Delivering “Liquid Bandwidth” Ethernet Services



Neos™ created the Ethernet Service Provider (ESP) market in the UK in October 2001 and today has 100% market share. Neos is the UK's fastest-growing service provider, having achieved a revenue growth of 250% in 2001, the most turbulent year in the history of telecommunications. Neos currently has 1,000 contracts with 270 customers in the corporate, carrier, ISP, and public sector markets.

Neos was formed in 1997 with one clear objective in mind – to provide innovative, flexible, and cost-effective communications solutions to UK carriers, enterprises, and public sector organizations. A key enabler of this vision is the ability to deliver national and metro Ethernet services, becoming the UK's first and only national ESP.

Neos chose Riverstone's Gigabit Ethernet service delivery platform over and above "legacy" systems to deliver "Liquid Bandwidth" services to carriers, ISP's, enterprises, and public sector customers across the UK. The major benefit of Riverstone's solution is that Neos can differentiate themselves from 20th Century alternate carriers that have a fundamentally flawed business model. There was no need for them to spend heavily on outmoded, 20th Century legacy technologies with the inefficiencies and expenses they represent. By being "legacy free," Neos can provide the most cost-effective bandwidth solution to their customers, with the ability to turn bandwidth on within 48 hours of ordering.

Riverstone's innovative technology allowed Neos to come to market as the UK's first Ethernet Service Provider – a completely different kind of communications company able to react quickly to customer requests to deliver cost-effective and bandwidth-efficient network solutions without delay.

### **The neosnet™ Terabit Fiber Optic Network**

Neos owns and operates a terabit fiber optic network of approximately 2,000 km around the UK called neosnet™. The network connects London to over 20 cities in England, Scotland, and Wales.

The network also has dense London and Thames Valley Metropolitan Area Networks (MANs) with over 30 Points of Presence (POPs). Neos offers a range of bandwidth-based services, ranging from complete light waves, to Ethernet Virtual Private Networks (VPNs), to around 100 carrier customers and 170 enterprises and public sector organizations.

Parallel network deployment and lack of legacy networks has given Neos a huge competitive advantage, and has enabled them to increase their business four fold and more than doubled their customer base since 2000.

● “Liquid Bandwidth services based on Gigabit Ethernet, and soon 10-Gigabit Ethernet, are clearly the way ahead in the Wide Area Network.”

**John Wheeler,**  
CEO, neosnetworks

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**Neos Challenge**

Although they have had considerable success and have grown rapidly, Neos realized that they needed to offer their customers more innovative and profitable services rather than pure connectivity and commodity bandwidth.

Neos decided to deploy a solution that would provide metro access, aggregation, and IP core connectivity, as well as metro and national long-haul Ethernet services on neosnet. Their aim was to take the lead in the UK by being the first to deliver a portfolio of value-added services both nationally and within the metro.

Neos required a solution that would allow them to offer Gigabit Ethernet services to carrier, enterprise, and public sector customers in the London and Thames Valley metro areas, as well as nationally, linking large

● “Riverstone’s technical edge, with their implementation of MPLS, enables us to leapfrog the market with high-speed Layer 2 VPN services on both our metro and national network.”

business centers throughout the UK via neosnet. They also required a solution that would allow them to protect their investment in their core network while providing a migration path to 10-Gigabit Ethernet in the future.

To provide value-added service delivery, Neos wanted a Gigabit Ethernet solution that offered dynamic bandwidth provisioning, as well as high availability and rich Class of Service and Quality of Service features to meet customer needs.

**Neil Fairbrother,**

*Product Marketing Director, neosnetworks*

**Riverstone's Solution**

Riverstone proposed a Gigabit Ethernet solution that uses Layer 2 Multi-Protocol Label Switching (MPLS) service creation routers to connect to neosnet and enables value-added Gigabit Ethernet services to be deployed to customers quickly and easily.

The neosnet design uses RS 8600 metro routers to create a backbone ring interconnecting metro and national POPs. The POPs provide the backbone access points for the Metropolitan Area Network as well as the National Long Haul Network, a clear differentiator for Neos.

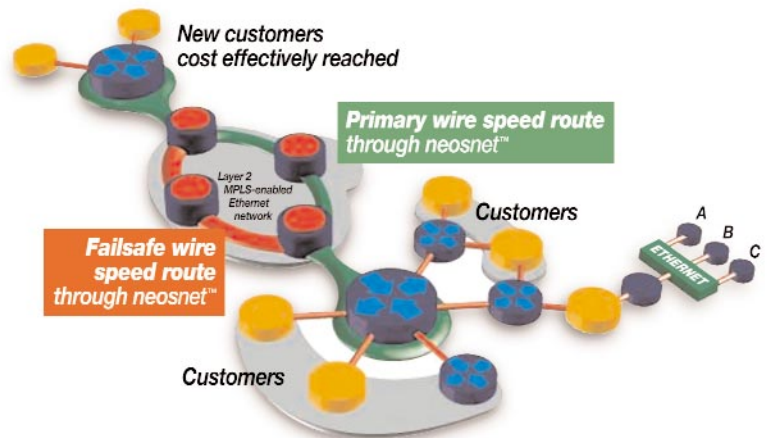


Figure 1. Point-to-Point Ethernet Transport

**Metro Routers That  
Convert Raw Bandwidth  
into Profitable Services**

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All RS 8600 metro routers are equipped with hardware-enabled MPLS Gigabit Ethernet line cards to ensure optimum performance and throughput while maintaining strict Quality of Service requirements. In the future, and as their backbone bandwidth requirements increase, Neos has the option to upgrade to RS 38000 routers to interconnect the neosnet POP sites.

Each neosnet POP site is equipped with RS 8600 metro routers, providing aggregation of Gigabit Ethernet and 10/100 customer ports. The RS 8600 aggregation routers have hardware-enabled MPLS Gigabit Ethernet line cards and provide uplinks to the RS 8600 backbone routers.

Within large multi-tenant buildings, small to medium business parks, and multi-dwelling units, Neos uses RS 3000 metro access routers as Customer Premise Equipment (CPE). Tenants within the buildings are connected via 10/100 Ethernet.

Neos uses point-to-point links between the RS 3000 routers and the RS 8600 routers in the neosnet POPs.

● “Our investment in Riverstone’s Layer 2 MPLS for Quality of Service is paying off in network performance as well as with sub 10 ms round trip times for IP packets.”

**Neil Fairbrother,**  
Product Marketing Director, neosnetworks

The network design uses the Open Shortest Path First (OSPF) routing protocol as an Interior Gateway Protocol within the network, with Multi-Protocol Label Switching (MPLS) used as an end-to-end service creation layer. Resource Reservation Protocol (RSVP) is used for tunnel label signaling, and Label Distribution Protocol (LDP) is used for MPLS virtual circuit label signaling in accordance with the MPLS Layer 2 Martini Draft.

Neos also plans to use the Lightweight Flow Accounting Protocol (LFAP) and Riverstone’s Open Source Toolkits to create an in-house Web portal for customers in the video pre- and post-production industry.

**The Benefits of the Riverstone Solution**

The new long-haul Ethernet services deployed on the optical fiber-based neosnet using Riverstone’s solution allows Neos to offer high-bandwidth services that address the issues of broadband availability and prohibitive pricing. Neos is currently offering two new distance independent services:

- Point-to-Point Ethernet  
Transport for carriers, allowing them to extend their reach quickly and cost-effectively (See figure 1 on page 2)
- Point-to-Point LAN Extension for enterprises, allowing them to link branch offices to central offices and data centers (See figure 2 at right)

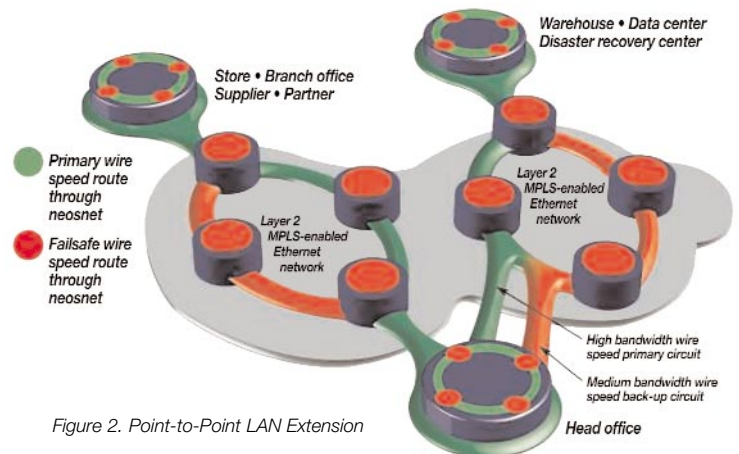


Figure 2. Point-to-Point LAN Extension



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Both services feature Quality of Service and Liquid Bandwidth that allow customers to increase bandwidth requirements in increments, from as little as 1 Mbps to as much as 1 Gbps.

One of the major benefits of the Riverstone solution is that Neos can deliver cost-effective, sophisticated network solutions to customers without delay. Neos is able to react quickly to customer requests, providing fast responses, delivery, and provisioning of services.

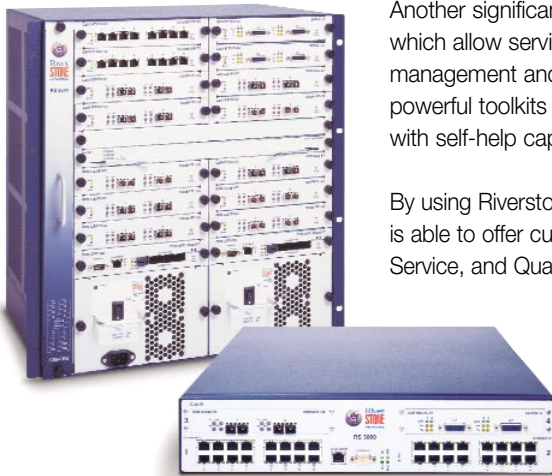
● “Riverstone’s state-of-the-art wire speed products will allow us to create the kind of flexible Ethernet networks, referred to as Liquid Bandwidth, that customers have always wanted.”

**John Wheeler,**  
CEO, neosnetworks

**Why Riverstone?**

Neos chose Riverstone primarily because of the strength of Riverstone’s MPLS implementation, which was demonstrated during extensive lab testing. A secondary consideration was Riverstone’s ability to support traditional WAN interfaces, allowing Neos to connect to legacy access infrastructure to extend their reach and addressable market.

Neos chose Gigabit Ethernet for its ability to provide dynamic bandwidth provisioning (“Liquid Bandwidth”). They also found that the cost was up to 50% less than the cost of installing legacy technology in the metropolitan and long-haul national area networks. These were two of the main driving factors in choosing Gigabit Ethernet as their future Wide Area Networking technology of choice.



RS 8600 and RS 3000

Another significant factor was the fact that Riverstone provides Open Source Toolkits, which allow service providers to integrate the Riverstone solution into their existing management and operational systems quickly and easily. Neos is using these powerful toolkits to create an in-house services Web portal to provide customers with self-help capabilities.

By using Riverstone’s hardware-enabled MPLS Gigabit Ethernet solution, neosnetworks is able to offer customers high-bandwidth services with the reliability, security, Class of Service, and Quality of Service of legacy technologies but without the prohibitive costs.

**Metro Routers That  
Convert Raw Bandwidth  
into Profitable Services**

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