

CASE STUDY

Building High Speed UK Packet-Optical Network Using the Infinera Native Packet Optical 2.0 architecture



CUSTOMER NAME SURF TELECOMS

CHALLENGE

- Increase capacity of existing network
- Increase reach and coverage of network

SOLUTION

- The Infinera TM-Series including Multi-Service Access solution and packet optical transport switches (EMXP11)
- The Infinera Network Management platform
- Extensive services package including the Infinera Pre-Staging service

RESULTS

- Robust and scalable network
- Stable and trouble free infrastructure
- Responsive design and ability to add new services
- Speed of deployment enhanced by pre-planning and pre-testing service
- Simplified troubleshooting and network management



Surf Telecoms, a UK carrier and communications provider, has been connecting the South West and Wales since 1994. In 2012 the company implemented a long-term plan to increase the capacity of its optical fiber network to meet with increasing bandwidth demand from customers. In addition to the need for more capacity, the company planned to extend the network into the UK Midlands to support predicted traffic growth from new and existing customers nationally.

The Objectives

Surf Telecoms required the new network as shown in Figure 1 for its parent company Western Power Distribution, as well as its existing and future customers. The network needed to offer a full multi-service access solution that could combine Ethernet, synchronous digital hierarchy (SDH) and gigabit Ethernet enterprise services on the same resilient and secure infrastructure. In addition, the whole network needed to be flexible and scalable to meet the requirements of all future IP services.

The Solution

Surf Telecoms decided to install dense wavelength division multiplexing technology (DWDM), with which both the capacity of the existing optical

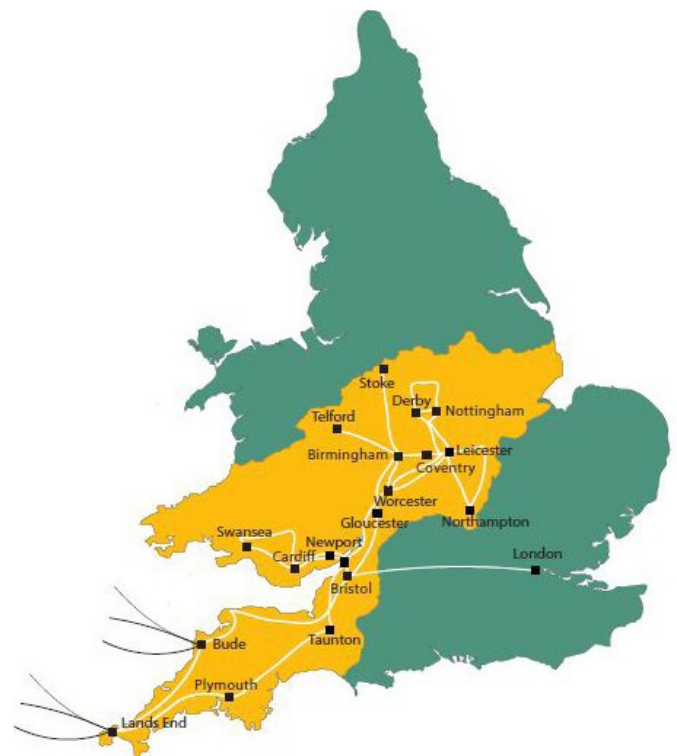


Fig 1. Surf Telecoms' UK Operating Area.

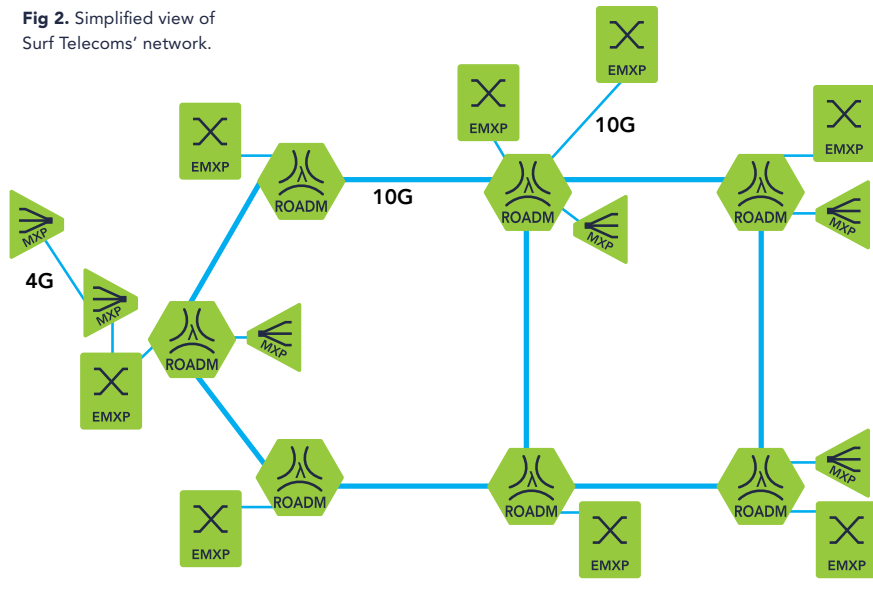
network and the transmission rates of multiple optical signals could easily be increased. After a detailed testing and selection process involving several vendors' solutions, Surf Telecoms selected the Infinera packet-optical TM-Series as its preferred solution for the contract.

Because DWDM allows dozens of different optical channels to be transmitted simultaneously over a single pair of optical fibers, it is straightforward to add additional wavelengths to increase the capacity of the network and add new services.

"The concept of a new network was to enable us to future-proof our infrastructure so that we can continue to rapidly respond to our customers' needs, provision new services and increase bandwidth on demand."

—Steve Blew, Commercial Manager at Surf Telecoms

Fig 2. Simplified view of Surf Telecoms' network.



"It was refreshing that the Infinera approach was consultative. Not only did they help design the network, they gave good advice about how to scale it without over-engineering and so kept our costs down."

—Paul Hartshorne, Surf Telecoms' Design & Policy Manager (Midlands)

The new network was jointly designed to provision a highly flexible national infrastructure at low cost. The packet-optical technology from the Infinera TM-Series is suited to this type of flexible infrastructure as it can provision a new service simply and rapidly. This in turn means the introduction of new services can be accelerated.

The first phase of the new network infrastructure was completed (in early 2013) with new protected 40-channel rings in South Wales and the Midlands. The additional deployment adds over 1100 km to Surf Telecoms' existing network infrastructure.

The optical networking equipment chosen includes: the Infinera TM-Series Multi-Service Access Solution, its packet optical transport switches (EMXP) and its reconfigurable optical add/drop multiplexers (ROADMs), to ensure that Surf Telecoms can deliver high-speed services over a state-of-the-art network without incurring long-term operational costs.

Services Were a Key Factor in the Success of the Project

Infinera provided Surf Telecoms with a comprehensive services package with the project which included:

- Project management support throughout the project

- On-site Installation and commissioning (I&C) personnel
- Network design consultancy
- Site surveys
- Detailed hands-on product training
- Pre-staging for each of 60 sites. Each site was pre-planned, pre-configured and pre-tested so the right equipment with the right functionality could be quickly deployed at the correct site.

Paul Hartshorne, Surf Telecoms' Design & Policy Manager (Midlands) on why he appreciated the level of service from Infinera: "One of the primary services Infinera offered us was pre-planning and testing the network in advance of deployment. Having the correct equipment for each site, with all cards, inter-card cabling and software pre-installed and all settings pre-configured and the whole configuration pre-tested greatly speeded up the installation process. It also greatly increased the quality of the network rollout as configuration errors were removed and we knew the network equipment had already been tested. Overall this reduced cost and helped make the project run smoothly and on track."

Key Technologies

The installation of the Infinera networking equipment as part of the Surf Telecoms network improvement enables the native transport of both E1 and Ethernet traffic with up to 4 Gb/s capacity on a single wavelength.

Existing time division multiplexing (TDM) traffic can be multiplexed and transparently transported over the same wavelength with the Ethernet signals, using the Infinera Multi-service Backhaul Access (MBA) solution in a back-to-back configuration. As the solution is purely a Layer 1, it facilitates very low latency.

The packet optical transport switch (EMXP) – the Infinera EMXP is part of the company's Native Packet Optical 2.0 architecture, which offered Surf Telecoms some unique advantages in network performance and functionality: specifically ultra-low latency and zero jitter to ensure high service performance and scalability for Layer 2 Ethernet services.

ROADM-based Flexible Optical Networking – Infinera also supplied ROADM units, that are a powerful part of its TM-Series, in Surf Telecoms' new network to support network applications. The ROADM units allow hitless wavelength allocation and will therefore future proof the provisioning of new traffic services.

Network Management – The new network is managed by the Infinera Transport Network Manager, which enables Surf Telecoms to identify any network faults faster. This means troubleshooting and resolution time is reduced significantly, enabling Surf Telecoms to continue to meet or outperform its service level agreements (SLAs).

As the network is scalable, Surf Telecoms' customers can now enjoy Ethernet bandwidth upgrades as the need arises. Furthermore, the upgrades can now be provisioned remotely – often without the need for a site visit.

Support – As part of the contract and during the building of the new infrastructure, Surf Telecoms' engineers have been empowered to support and deliver new services over the new DWDM optical network.

Highly Resilient Network Design

The network was designed to be highly resilient and this has proven to be the case with traffic on the network automatically switching and rerouting within less than 50 milliseconds – showing just how robust the performance is.

New Services

The new network can carry a variety of services and high bandwidth applications as well as voice and data traffic. It meets all current and future needs for Surf Telecoms' customers. The network's high bandwidth connectivity enables cost-effective transfer of data between two or more sites. The network is securely designed to handle data centre connectivity and suitable for companies that need a low latency solution for backup or disaster recovery.

The new roll-out has enabled Surf Telecoms to provide carrier class Ethernet services to its customers. Metro Ethernet Forum-compliant E-Line, E-LAN

and E-Tree services are also much easier to roll out and manage. Surf Telecoms says that it can continue to securely transport customers' IP-based network applications such as voice and video over IP, storage area network (SAN), as well as corporate local area network (LAN)/wide area network (WAN) traffic.

Benefits

The new network infrastructure provided by Infinera immediately provided Surf Telecoms with increased capacity on its existing optical network as well as a strong network management platform for both the existing and additional network. By using the Infinera packet-optical solutions Surf Telecoms can turn on additional capacity when needed without having to add dark fiber links. Additional capacity will provide growth opportunities for current and new applications and allow clients to purchase new services including 1 Gb/s, 10 Gb/s and even 100 Gb/s circuits.

The new network is both secure and resilient and it increases Surf Telecoms' network coverage into the East and West Midlands with the potential to link new customers in cities such as Birmingham, Stoke-On-Trent, Coventry, Northampton, Leicester and Nottingham and further across the country.

"With our low latency fiber-based core network, and the planned network expansion we are in a position to be able to offer our customers new services while helping them to migrate from E1 to Ethernet and IP services.

The network will enable Surf Telecoms to provide highly flexible Ethernet and wavelength services to customers across the South West, South Wales and now into the Midlands.

Our cooperation with Infinera assures the future delivery of communications for ourselves and our customers."

—Steve Blew, Commercial Manager at Surf Telecoms

"We have been delighted with the Infinera TM-Series packet-optical technology mainly because of its low latency, robustness and ease of deployment," added Paul Hartshorne. "The solution has proven to be scalable over a wide geographic area and when combined with the intuitive web-based management system it has provided Surf Telecoms with the flexibility to expand our network and ensure lower operating costs. Pre-staging the network allowed for faster deployment and confidence that the network would function correctly from the outset.

"Helping our customers grow has been key to our success and we have worked with Surf Telecoms to meet their expansion plans and improved service needs. The network deployed by Surf Telecoms demonstrates the flexibility of the Infinera solutions and with our pre-staging service we have once again exceeded our customer's expectations." said Mark Burton, Infinera VP Sales Europe.



Paul Hartshorne (Surf Telecoms), Kevin Biddle (Infinera), Richard Slane (Surf Telecoms), Andy Chomyn (Infinera) and Steve Blew (Surf Telecoms) Collect the Global Telecoms Business Innovation Award.

Project Recognition

In June 2013, Surf Telecom and Infinera* won the Global Telecoms Business innovation award for fixed network infrastructure innovation in recognition of the work undertaken by both companies in the project. The award was presented at a black tie event in central London by Alan Burkitt-Gray, Editor of the Global Telecom Business magazine.

When presenting the award Burkett-Gray said, "This project stood out from other nominees because of its innovative design, especially when it comes to flexibility. It is an advanced low-latency ROADM-based core network allowing Surf Telecoms' customers to migrate easily from E1 to Ethernet and IP services. At the same time it is easy to manage and future-proof. This project exemplifies the innovation we wish to applaud."

About Infinera

Infinera (NASDAQ: INFN) provides Intelligent Transport Networks, enabling carriers, cloud operators, governments and enterprises to scale network bandwidth, accelerate service innovation and simplify optical network operations. Infinera's end-to-end packet-optical portfolio is designed for long-haul, subsea, datacenter interconnect and metro applications. Infinera's unique large scale photonic integrated circuits enable innovative optical networking solutions for the most demanding networks. To learn more about Infinera visit www.infinera.com, follow us on [@Infinera](https://twitter.com/Infinera) and read our latest blog posts at blog.infinera.com.

About Surf Telecoms

Surf Telecoms delivers state of the art telecommunications services across the whole of the mainland UK. Having expanded its services from its installed base in the South West of England and Wales Surf Telecoms now offers a range of telecoms services from 2 Mb leased lines to 10 Gb optical wavelengths, dark fibre and secure colocation and site sharing facilities. Together with agreements with other communications providers Surf offers network coverage that is not limited by the geography of its own network.

Headquartered in Bristol, Surf Telecoms operates from regional offices across the Midlands, South West and

Wales offering quality, standard and bespoke communications services including Dark Fibre, Optical Wavelengths, Ethernet over MPLS, Storage Area Networks and Communications Sites with secure Colocation facilities.

For additional information about Surf Telecoms, please visit www.surftelecoms.co.uk