

## Transmode technology expands 3 Scandinavia's mobile-backhaul capacity

### Key points

#### 3 Scandinavia's Business Challenges

- Enable higher capacity services
- Simplify mobile backhaul network to cut high operating costs
- Meet demand for high-speed broadband services
- Migration to IP with no disruption of existing services

#### Solution

- Upgraded optical infrastructure for flexible, scalable capacity
- IP/Ethernet over Intelligent WDM (iWDM™) Multiservice Muxponder from Transmode

#### Business Results

- Simplified network design for reduced operating costs
- Increased reliability of services and therefore customer satisfaction
- Simplified network OAM through widely used and deployed standard IP/Ethernet protocols

### The Challenge

Mobile services provider 3 Scandinavia, the Scandinavian arm of the 3 Group, needed to support the rapid growth in demand for mobile broadband for its customers in Denmark and Sweden.

3 Scandinavia determined that its mobile services should deliver high quality media-rich content, including audio and video, to customers' mobile handsets and laptops. With increasing numbers of customers wishing to see and hear video clips and send and receive multimedia content at broadband speeds up to 21Mbit/s, 3 Scandinavia needed to ensure the capacity of its network would meet this growing demand.

When thousands of Scandinavian mobile broadband users simultaneously access applications requiring data rates



measured in multiples of megabits, a potential bottleneck of mobile data traffic could be created as demand grows, which would have to be backhauled from the base station to the core of the network. 3 Scandinavia needed to proactively build network capacity to ensure no bottlenecks were created in the future as applications become more data hungry and more widely used.

3 Scandinavia manages its own wireless backhaul infrastructure across Denmark and Sweden comprising several interconnected optical rings. In the rural areas of Sweden 3GIS (the joint venture with Telenor) supplies the infrastructure. 3's own metro networks are also located in the main Swedish cities of Stockholm, Malmö and Gothenburg and are distributed across the whole of Denmark. The intermediate links between the radio network control points (RNCs) and the mobile switching centers of the network were where the extra network capacity was most needed.

The latest technological developments that support mobile backhaul – effectively, the intermediate links between the core or backbone of the mobile network and the small sub-networks at the edge of the network – have to meet the challenges that the ever-increasing bandwidth explosion is creating.

# Case study

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Mobile data traffic is undoubtedly growing phenomenally (some market studies suggest a 10-fold increase over the past year) but, at the same time, the older SDH/ATM networks have inherent technical limitations that prevent cost efficient capacity increases. Most industry insiders agree that IP/Ethernet is the best solution here, providing high capacity upgrades at a relatively low cost.

### Native TDM and Ethernet on one wavelength

Why would an operator wish to carry TDM traffic in a packet format? And why carry Ethernet in a TDM format or TDM over Ethernet, as some other transport technologies promote? To simply transport these types of traffic natively retains all of the native TDM and Ethernet attributes, and – at the same time – achieves the capacity and economics enabled by Ethernet. Jitter and bit-error multiplication are eliminated and so are the drawbacks of synchronization.

Transmode's Multi-Service Backhaul Solution, including its iWDM capabilities offers transparent synchronization support for native TDM and Ethernet traffic. And there is more to it: both the native TDM and Ethernet traffic can be transported using only one single wavelength.

In essence, some major challenges faced by 3 Scandinavia in developing its mobile backhaul network were:

- How could its transport network handle the increased amount of mobile data traffic – cost efficiently?
- How could the transport network simultaneously handle the legacy TDM and Ethernet transport?

### Intelligent solution

3 Scandinavia's increased network capacity had to be built without incurring high operating costs and furthermore it had to meet the demand for high-speed broadband services while migrating the infrastructure to IP without disruption of existing services. After evaluating various options the transmission team at 3 Scandinavia chose to deploy Transmode's iWDM solution.

Over the past year, 3 Scandinavia has deployed Transmode's Multiservice Muxponder across its networks in both Denmark and Sweden. The new Multi-Service Muxponder (MS-MXP), launched by Transmode in June 2008, has allowed 3 Scandinavia to deploy multiple services over a single 4 Gbit/s CWDM or DWDM wavelength. This revolutionary approach ideally suited 3 Scandinavia's "next generation network" access migration strategy using Gigabit Ethernet, while combining this with the existing 3G mobile backhaul communications based on SONET/SDH in a single backhaul solution.

Håkan Snis, 3 Scandinavia's Transmission Engineering Manager explained the significance the company's improved mobile backhaul capabilities in both countries.

"Our decision to deploy Transmode equipment was not only based on cost, although there were obvious cost benefits. 3 Scandinavia had previously had several year's successful co-operation with Transmode in the previous phases of our network development and we were pleased with the reliability of its products."

"Since January 2008, which marked the start of the latest phases of 3 Scandinavia's development, our requirements have been for significantly increased capacity as well as the technical means to cater for a smooth and cost-efficient migration from TDM-based transport to a future-proof IP transport model. The two biggest drivers for these changes are dramatic customer uptake of the latest mobile broadband services and the shift towards IP-based communications in the transport layer, which is happening worldwide.

"We have boosted our backhaul capacity to cater for the explosive growth in mobile broadband services. With the Transmode equipment we have introduced a platform that scales well beyond our traffic forecasts, and which allows us to smoothly migrate our backhaul from ATM to IP, even down to port level (granularity). This in turn makes further equipment investments redundant when moving to IP."

"We are delighted to have deployed our Multiservice Muxponder to help 3 Scandinavia greatly expand capacity in its mobile backhaul networks in a very simple way," said Sten Nordell, CTO at Transmode. "Our Multi-Service Muxponder is especially designed to fit the various traffic formats available in the mobile network. Ethernet, TDM, ATM – all these types of traffic can be aggregated and delivered over a single wavelength. This ensures capacity can grow to match future demand without requiring changes to the underlying optical infrastructure."

### Summary

So how has Transmode's equipment benefited 3 Scandinavia and its customers? Håkan Snis adds, "The Multiservice Muxponders allow us to keep ahead of the dramatic increase in customer demand while improving the flexibility of the mobile backhaul needed to maintain our market leading position for mobile broadband services in Sweden and Denmark."

The importance of Transmode's Multi-Service Muxponder in the 3 Scandinavia network is that it presents a backhaul Solution that simultaneously enables:

- Cost-efficient increase of Mobile Backhaul capacity through pushing iWDM towards the mobile access.

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- Multi-service capabilities optimized for Mobile networks.

In light of the ongoing expansion in deployment of fiber, Transmode is continuously promoting its iWDM concept towards the mobile access. Transmode's successful approach of utilizing standard WDM technology in the iWDM concept, offers mobile operators the ability to choose between multiple capacities – 1G, 2.5G, 4G or 10G – for the most optimal and cost efficient transport of both TDM and Ethernet traffic. The multiple capacity alternatives minimizes the need for "over-sizing" the networks, keeping total cost of ownership (TCO) at lowest possible level.



## Mobile backhaul market

3 Scandinavia is not alone in having to find a solution to its mobile backhaul issues as Michael Howard, principal analyst at market research company Infonetics, points out. "Data usage on mobile networks is causing a traffic explosion in backhaul networks, exacerbated by the popularity of bandwidth-hungry mobile phone applications," he said. "Carriers everywhere are increasing the bandwidth on their backhaul networks to handle this growth of IP data traffic. The most efficient, cost-effective way to achieve that is to transition from TDM to packet IP/Ethernet, which is driving the mobile equipment market." Source: Infonetics press release 27<sup>th</sup> May 2009

## About 3

3 Scandinavia's parent company, simply known as the 3 Group, is the world's leading provider of 3G and mobile broadband services with almost 20 million customers in 10 countries. 3 Scandinavia is a joint venture between Hutchison-Whampoa, headquartered in Hong Kong (60%), and Investor AB, based in Stockholm (40%). 3 Scandinavia operates comprehensive networks in Sweden and Denmark and holds a licence in Norway.

For more information, see [www.tre.se](http://www.tre.se) or [www.three.com](http://www.three.com).

## About Transmode

Transmode is a leading provider of optical networking solutions for transport of data, voice and video traffic, based on CWDM and DWDM technology (Coarse/Dense Wavelength Division Multiplexing).

Transmode's unique Intelligent WDM (iWDM™) approach has led to widespread deployment of over 10000 systems in a customer base consisting of more than 250 fixed and mobile network operators, service providers, large enterprises and public institutions across Europe, the Americas and Asia.

Transmode's comprehensive product portfolio and strong global organization enable our customers to grow the capacity and to improve service level of their regional, metro and metro access networks, on a cost-efficient basis without compromising on functionality.

For additional information about Transmode, please visit [www.transmode.com](http://www.transmode.com)