590

OPEX reduction through GMPLS/ASON
- a business case study

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Motivation

- ASON/GMPLS often promoted as a key technology to reduce OPEX and CAPEX
- Few studies on OPEX so far
- We quantify the cost reduction potential of ASON/GMPLS

Outline

- Defining OPEX
- Process-based OPEX modelling
  - Approach
  - Typical processes
  - ASON/GMPLS modified processes
- Quantitative results
  - Service provisioning
  - Overall OPEX
- Analysis and conclusions

Defining OPEX

Total expenditures of a company

- Capital expenditures: CAPEX
  - Contribute to fixed company infrastructure
  - Depreciated over time
- Operational expenditures: OPEX
  - Cost to keep company operational
  - Do not contribute to infrastructure itself, not subject to depreciation

Network operator

- Purchase of land and buildings
- Network infrastructure
- Software
- Rented and leased infrastructure
- Personnel wages

OPEX subparts

- Network operation
  - For a network which is up and running
  - Maintenance, service provisioning,etc.

⇦ *Strong impact of technology*

- Equipment installation
  - First time installation costs
  - Up-front planning
- General OPEX
  - Non-telco specific infrastructure and administration

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Approach

- Formal description of network operations
  - Identify generic processes
  - Modelling
- Changes expected with ASON/GMPLS
  - Qualitative and quantitative variation
- Relate to total OPEX
  - Network scenario
  - Relative weight of each OPEX category

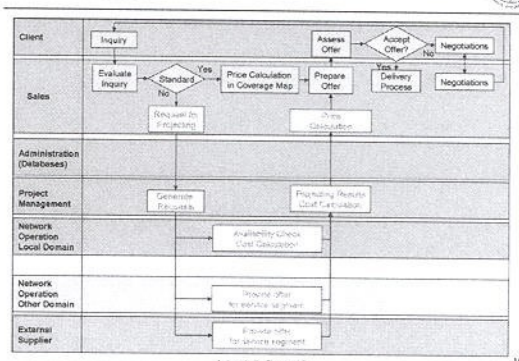
Operational processes

- Continuous and recurring processes
  - Continuous cost of infrastructure
  - Routine operations, maintenance
  - Reparation
  - Operational network planning
  - Marketing
- Service management processes
  - Service offer
  - Service provisioning
  - Service cessation
  - Service move or change

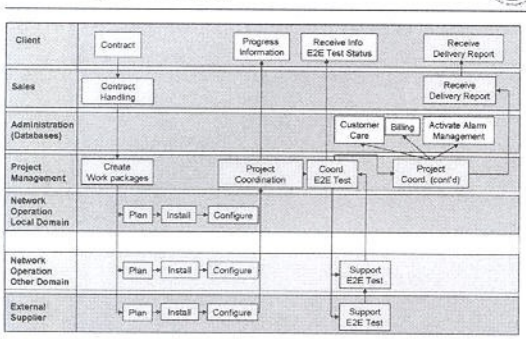
Service management processes

- Service offer
  - The operator makes an offer at the customer's request
- Service provisioning
  - According to the terms of the contract, physical delivery of the service is carried out
- Service cessation
  - Contract update, coordination between new service setup and release of the previous service.
- Service move or change
  - End of the contract, release of the connection and recovery of equipement

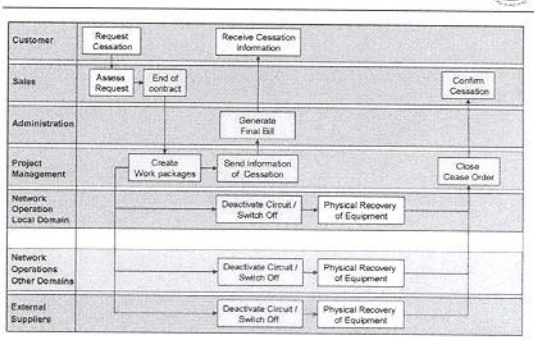
Service offer



Service provisioning



Service cessation



Service move or change

- Combination of services
  - Prepare offer for „new" service
  - provisioning of new service
  - Cessation of previous service
- Requires additionnal coordination
  - Common resources

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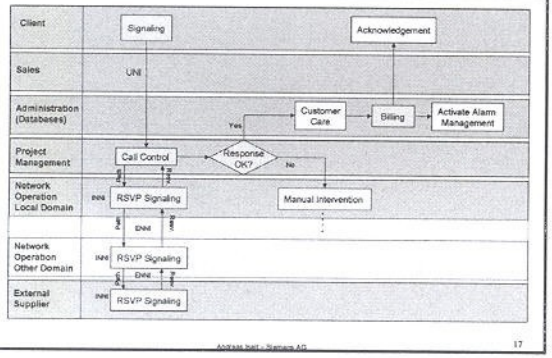
NMS: Current Limitations

- OTN currently operated by NMS
  - Administration & maintenance
  - Centralized provisioning
- NMS are widespread but
  - Manual configuration
  - Human communication
  - Limited to a domain
  - Lack of standardized interfaces

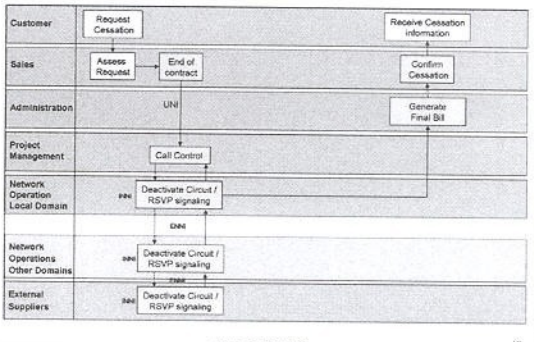
GMPLS/ASON: Expected improvements

- Compatibility between different domains
  - Standardized interfaces (UNI, NNI)
- Automatic configuration of connections
  - Call control, connection control
- Service Level Agreement (SLA)
  - Unified set of service classes

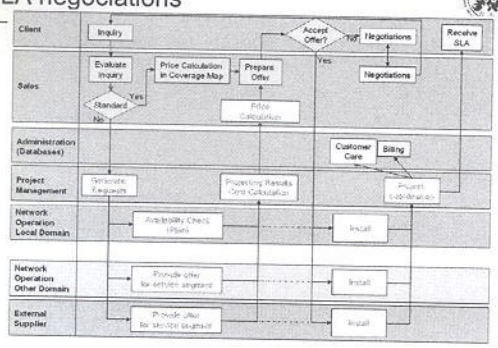
Automated service provisioning



Automated service cessation



SLA negociations



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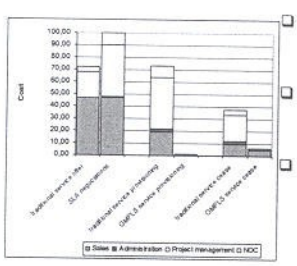
Quantitative Results

- Focus on labour costs
- Assign duration (hours) to the boxes, and probabilities to the diamonds
- Estimate hourly wages for each employee category
- Sum up costs for all steps
  - Gives an upper bound estimate of a given process
- Figures obtained by means of surveys and interviews

First analysis

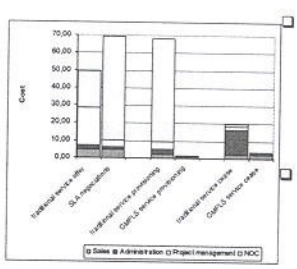
- Reveals two types of operators
  - „Incumbent"
    - More hours for sales, administration and management
  - And so called „new entrant"
    - Lower figures for these, the rest remaining in the same range
    - Due to
      - smaller network to maintain
      - Fewer types of services offered

Incumbent



- Service offer
  - Nearly as expensive as service delivery
- Service cessation
  - Less management and operations
- ASON processes
  - SLA negociations more expensive
  - Consider offer+delivery

New Entrant



- Processes are cheaper
  - Less administration and management (smaller network)
  - But less types of services
  - Need for external supplier
    - Rental costs
    - Tests at interconnection point
- ASON processes
  - Cheaper
  - In the same proportion

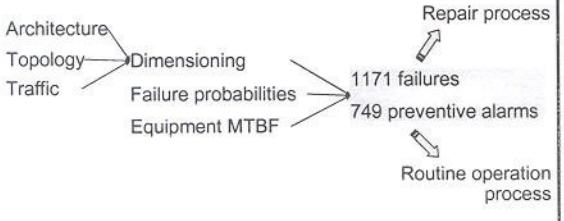
Overall OPEX

- Significant impact on OPEX related to service management
- How does it relate to other OPEX subparts?

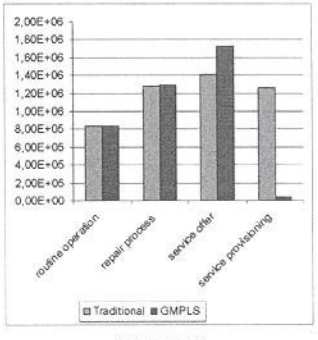
Estimating yearly OPEX – input data

- Reference network
  - WDM network
  - 2.5 Gbps leased lines
- Traffic
  - Figures of reference network for 2004
  - Leads to a total of 1214 services in one year
  - 80% of services are standard
- Equipment
  - MTBF, life time
- Failure probabilities
  - Alarm types: preventive alarms, failure alarms
  - Failure types: external, hardware, misconfiguration/software, etc.

Estimated number of failures



Yearly OPEX



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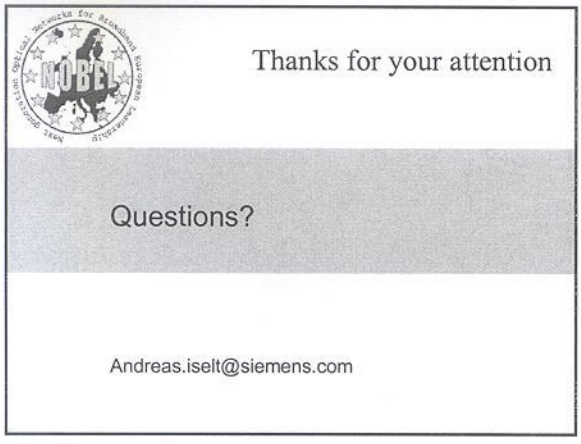
Conclusion

- Most network operator's processes are similar and can be modelled quite generically
- When looking at typical effort
  - Major differences between incumbent and „new entrants"
  - Lighter business processes, but interactions with external suppliers
- OPEX effort and cost reduction in the order of 50% for both types


Thanks for your attention
Questions?
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The 7th Annual

Next Generation Transport Network Strategies

Including 16 Fixed and Mobile Operator Transport Case Studies

Princesa Sofia Inter-Continental, Barcelona ■ 7th-11th November, 2005

EMEA's Largest Forum for Transport Professionals from both Fixed and Mobile Operators

NG-WDM
Packet Evolution
NG-SDH
Carrier Ethernet
OTN
ASTN
Protection
Convergence
GMPLS

Including:

Transport Networks for Mobile Operators
Tuesday 8th November 2005

Adapting to Customer Requirements
Next Generation Core Architecture
Wednesday 9th November 2005

Next Generation Metro Architecture
Multiservice Transport Networking
Thursday 10th November 2005

Transport for Next Generation Services
Broadband Access
Friday 11th November 2005

Plus: A Pre-Conference Seminar

Scrutinising Carrier Ethernet Transport

Led by: **SIEMENS**
Monday 7th November 2005

Case Studies from:

Andy Sutton – **3 UK**
Martin Kingston – **Orange UK**
Bob Hase – **neos Networks**
Michael Heuer – **BT Global Services**
Roberto Micali – **Telecom Italia Lab**
Nigel Stevens – **THUS**
Patrick George – **Belgacom International Carrier Services**
Alan Corfield – **Energis**
Dr. Paul Gunning – **BT**
Paul LeBel – **Bell Canada**
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The 7th Annual

Next Generation **Transport Network Strategies**

EMEA's Largest Forum for Transport Professionals from both Fixed and Mobile Operators

About Next Generation Transport Network Strategies:

Major changes are taking place in the carrier service environment and new technologies are gaining traction in carrier networks - RPR, PWE3, Carrier Ethernet, NG-SDH, MPLS. However well-informed you make yourself - by reading news-feeds and speaking with your own vendors - there is nothing to beat the benefit of spending time discussing **key developments in your industry** with 300 of your peers from network operators, vendors, associations and standards organisations.

Transport Network Strategies is an **internationally recognised forum** at which you can gain a complete and detailed view of the key trends in markets, services and technologies. The 16 network operator case studies will provide you with important information that will enable you to update your expertise and benchmark your own transport approaches, service developments and network evolution projects against those of your competitors.

Main Themes:

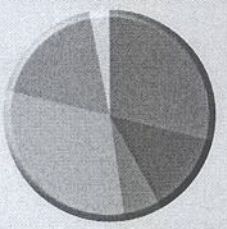
Next Generation services and technologies are becoming today's major concern. Technologies that offer new service opportunities and important **Capex and Opex savings**. As bandwidth demands grow and carrier-class data services enter the mainstream, network operators must engage with Next Generation transport networking technologies and architectures. The **IP/MPLS core** based upon intelligent optical switching – **OTN/GMPLS** - and the Convergent Packet Access **(CPA)** architecture based upon **Carrier Ethernet** and **MPLS** are key elements for future competitiveness. Change is happening rapidly and both fixed and mobile networks need to adapt in fundamental ways to remain competitive. Operators are looking for cost-effective migration strategies for both networks and customers – this is the main business under discussion at Next Generation **Transport Network Strategies**.

Key Benefits of Attending:

- Hear case study presentations from **16 senior transport professionals** from fixed and mobile service providers – gain insights into their transport strategies
- **Network with 300 senior transport networking professionals** from fixed and mobile network operators, vendors and consultants
- Tap into a wealth of technical and **commercial intelligence** – develop your understanding of the main trends and issues in Next Generation transport technology, services and market developments
- **Benchmark** your Next Generation network and service evolution strategies and technology selections against those of your competitors

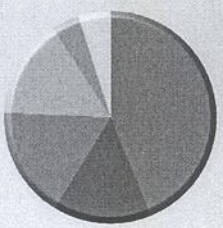
Who you will meet:

300 senior professionals attended Transport Network Strategies in 2004. The following charts indicate the predicted make-up of the audience based on data from last year's event.



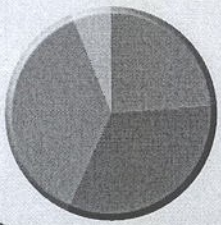
Analysis by job function:

Network Development	29%
Business Strategy	13%
Service Development	6%
Network Operations	31%
Marketing	18%
Other	3%



Analysis by region:

Western Europe	44%
Eastern Europe	15%
Scandinavia	17%
Middle East	15%
Asia	4%
RoW	5%



Analysis by industry:

Mobile Operator	24%
Fixed Operator	33%
Vendor	37%
Consultant	6%

Pre-Conference Seminar

Scrutinising Carrier Ethernet Transport

Led by **Siemens**

Princesa Sofia Inter-Continental, Barcelona 7th November 2005

09.00 Registration

09.30 **Opening remarks**

09.45 **Examining the emergence of Carrier Ethernet as a transport technology**
- Analysing and explaining the rising interest in Carrier Ethernet as a transport technology, resulting from major changes in the carrier services environment.

10.30 **Customer case study**

11.20 Refreshment break

11.45 **Understanding how Carrier Ethernet addresses the challenges of QoS and network availability**
- Explaining the technical attributes of Carrier Ethernet that can be used to sustain QoS and network availability in transport networks
- Meeting carriers' requirements as they evolve their services from point-to-point with full protection and static SLAs to new any-to-any services with flexible and more complex QoS
- Demonstrating how Carrier Ethernet supports flexible QoS, scalability and full protection

12:15 **Analysing the transport business case for broadband applications – assessing the cost benefits of Carrier Ethernet**
- Considering the growth of emerging broadband applications, for example, video and remote data storage
- Understanding the impact of emerging broadband applications on current transport networks and identifying how Carrier Ethernet may solve the financial equation, allowing carriers to maintain margins and competitive positioning

13:00 Lunch

14.20 **Determining the optimal Ethernet migration for your transport networks: MSPP or pure Ethernet?**
- Comparing Carrier Ethernet with MSPPs
- Examining the benefits and costs of the different approaches considering:
  - different applications to be supported: voice, video and data
  - Greenfield, Brownfield and overlay network

14.50 **Addressing network management challenges: Can Carrier Ethernet provide E2E management platform?**
- Examining how Carrier Ethernet copes with the challenges of End-to-End (E2E) management while maintaining its connectionless character
- Addressing the key management requirements, including service provisioning, OAM, alarms, statistics …

15.35 Refreshment break

16.00 **Customer case study**

16.40 **Final discussion and conclusions**

17.00 End of seminar

IIR's Optical Transmission Portfolio events

Over the last ten years IIR's market leading Optical Transmission industry conference portfolio has produced highly focused events that chart the development of new technologies for access, metro and backbone networks. Reflecting the evolution of networking technologies and services, IIR's conferences give delegates the opportunity to identify, examine and evaluate industry trends and understand the business context and value proposition driving investment in service provider networks.

Valuable Networking Opportunities:

Carrier Ethernet World Congress, *Berlin, 12th-16th September 2005*
www.carrierethernetworld.com

Network Convergence, *February 2006*

NG-SDH – Multiservice Transport Networking, *Vienna, 24th – 27th April, 2006*

Transport Networks for Mobile Operators (TNMO 2006), *Berlin, 8th-11th May 2006*

WDM & Next Generation Optical Networking, *Cannes, 26th – 30th June 2006*

For more details visit **www.optical-transmission.com**

To find out more details concerning sponsorship at **Next Generation Transport Network Strategies**, or any of the Optical Transmission Portfolio events, please contact

Ed Malkoun, *Business Development Director,* **IIR Telecoms – London**
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Next Generation **Transport Network Strategies**

Princesa Sofia Inter-Continental, Barcelona ■ 7th-11th November, 2005

Conference Day One – Tuesday 8th November 2005

Transport Networks for Mobile Operators

09.00 Registration

09.30 **Chair's opening remarks**

09.40 **Opening Keynote: The future of transport networks for mobile operators**

- Reviewing today's network architecture and transport technologies
- Considering the main access transport alternatives of Next Generation microwave, WiMAX, xDSL and pseudo-wire emulation techniques
- Discussing the roles of TDM, ATM & Ethernet in the access transport domain
- Understanding the needs and addressing the challenges of Frequency Synchronisation distribution
- Determining how best to optimise the collector (metro) network: star, ring or mesh?
- Examining why operators are deploying MPLS in the core network and whether this is the correct technology to push towards the edge
- Discussing high speed packet access and IP transport in UTRAN
- Evaluating the transport network drivers for an evolved UTRAN

Andy Sutton, *WAN Specialist, Network Design,* **3 UK**

10.20 **Determining a technical roadmap for the evolution from ATM to IP transport for 3G networks**

- Understanding the drive to 3G:
  - examining the challenges faced by mobile operators in backhaul and backbone transport networks
  - Examining the business case of lease versus buy alternatives
- Making the right technical choices now to smooth the evolution to 3G:
  - using NG-SDH to cost-effectively backhaul traffic and support advanced Ethernet capabilities
  - leveraging the ATM layer for multiservice delivery and to provide switching and aggregation support
  - examining the benefits of migrating 3G services into a common IP/MPLS core network
- Simplifying network operations through end-to-end management:
  - integrated management across SDH, Ethernet and ATM elements
  - examining the benefits of migrating towards a flatter, more efficient and simpler network architecture

Jose Luis Benitez, *Senior Manager, Optical Transport Systems Engineering,* **Lucent Technologies**

Including an operator customer case study to be announced at **www.optical-transmission.com/tns**

11.00 Morning coffee

11.20 **Deploying NG-SDH to support 3G and the growth in data traffic**

- Explaining the decision to deploy a national optical backbone to support 2G and 3G traffic
- Evolving the core, metro and access networks to support growing data traffic demand in both 2G and 3G services:
  - determining the role of NG-SDH in the evolution of the core network
  - examining the role of NG-SDH in the evolution of the metro / access – GMPLS, VCAT, LCAS, GFP
- Considering the business case for a lease or build approach to transport network evolution

Ehud Bejerano, *Director, Product Line Management – MSPP, Optical Networks Division,* **ECI Telecom**

12.00 **Examining the evolution of transport networks for mobile operators**

- Reviewing today's architecture and transport technologies
- Considering the main access transport alternatives – Next Generation Microwave, WiMAX, xDSL
- Discussing the roles of TDM, ATM & Ethernet in the last mile
- Addressing the challenges of Frequency Synchronisation distribution
- Understanding key trends in Metro network evolution
- Examining why operators are deploying MPLS in the core network and taking a view on how close to push this towards the edge
- Discussing GERAN (EDGE & Gb over IP) and UTRAN (HSDPA & IP transport) transport evolution features
- Evaluating the drivers for investing in an evolved UTRAN (All IP RAN)

Martin Kingston, *Senior Transmission Engineer,* **Orange UK**

12.40 Lunch

13.50 **Deploying Ethernet architecture to minimise the Opex and Capex of mobile access and backhaul networks**

- Understanding the pressures on mobile service providers' existing access and backhaul networks as demand grows for IP based services
- Understanding the role Ethernet can play in the evolution of mobile networks in the future
- Examining new ETSI and ITU standards for wireless data transmission, including new initiatives and updates on work in progress
- Developing Wireless Carrier Class Ethernet transmission:
  - explaining why and how can it be used to architect the backhaul and access for 3G services

Alain Hourtane, *Senior Director, Market Development,* **Stratex Networks**

14.30 **Building an IP / MPLS backbone to meet changing transport requirements**

- Examining the cost of implementing an IP / MPLS backbone network:
  - can these costs be justified?
- Taking a layered approach to the core network:
  - examining the benefits of combining MPLS with other technologies, for example, SDH, ATM and Ethernet
- Assessing transport of ATM on MPLS networks – do pseudowires offer robust and cost-effective transport for ATM traffic?
- Considering the benefits of converging all traffic onto an MPLS core network, compared to a multi-technology approach

Roberto Micali, *Mobile Network Engineer,* **Telecom Italia Lab**

15.10 Afternoon tea

15.30 **Cost optimising the mobile transport network – minimising the operational cost of the mobile transport network**

- Determining which technologies should be implemented in the access to optimise the cost of transport, considering:
  - copper, radio, fibre
  - PDH, SDH, ATM, IP, Ethernet
  - PNNI, MPLS
- Evaluating microwave solutions for access networks:
  - to what extent can they support current and Next Generation services
  - how do they compare on cost to alternative solutions
  - point-to-point versus point-to-multipoint
- Incremental planning for 3G
- Practical strategies for lowering costs without sacrificing quality or capacity

Ovidio Michelangeli, *Head of Wilreline and Wireless Technology Development,* **Wind Telecomunicazioni**

16.10 **Making the business case for converging GSM / GPRS, WCDMA and WiFi traffic onto a single unified access network**

- Examining the benefits of building a unified access network to carry GSM / GPRS, WCDMA and WiFi traffic
- Determining the most cost-effective and future proof technology to build upon, considering, ATM, IP, MPLS, DSL, Leased Lines and SDH
- Examining the topology options and indicating key design features
- Considering wireline / wireless convergence on the same access platform
- Building an access network to support multiple technologies and provide a seamless migration path for your network and services, considering, UMTS, R99, R5, All-IP-RAN, WiFi, WiMAX...

Kevin Evans, *Market Manager, Mobile Networks,* **Eastern Research**

16.50 **Cost-optimising the access network, migrating from leased lines to radio access and developing an efficient optimisation strategy – considering WiMAX backaul**

- Briefly introducing the services portfolio, customer profile and transport network:
  - examining the impact that changing service demands are having on transport network economics
- Making the business case for replacing leased lines with microwave point-to-point and point-to-multipoint connections:
  - comparing capex and opex costs - what, if any additional costs need to be factored into the comparison?
  - considering technical issues including management, integration with OSS, standards compliance ...
- Sharing insights into rolling out microwave point-to-point and point-to-multipoint networks:
  - what technologies are used and why were they selected?
  - addressing the integration and migration of services
- Explaining the access optimisation strategy

Morgan Zimmermann, *Vice President, Infrastructure Planning Solutions,* **CTS - Cril Telecom Software**

17.30 **Chair's closing remarks**

17.40 End of conference day one

Drinks Reception
IIR would like to you to join speakers, sponsors and supporters at an informal drinks reception, where you can discuss the issues of the day in a relaxed atmosphere

Conference Day Two – Wednesday 9th November 2005

09.00 Registration

09.30 **Chair's opening remarks**

Adapting to changing customer requirements

09.40 **Identifying service demand trends and changing customer requirements - Developing a transport network evolution strategy**

- Examining demand trends for different network services and forecasting where growth will occur over the next 12 months, considering:
  - Ethernet connectivity
  - L2 and L3 VPNs
  - Wavelength services and the carrier's carrier business
  - SAN and business continuity
  - Next Generation services, VoIP, IPTV/HDTV, video, Triple Play, PSTN migration
- Identifying areas in the network most under pressure from increasing bandwidth demands and considering different growth / evolution strategies
  - is local investment sufficient or is a network overlay necessary?
  - core transport technology upgrades, OTN, MPLS/VPLS
  - optimising metro bandwidth, Carrier Ethernet
  - 40G transmission speeds
- Discussing the role of convergence between data and optical layers:
  - how will the roles of transport and data change as IP traffic begins to dominate both traffic and revenue streams?
- Developing a network evolution strategy to meet Next Generation service requirements while meeting challenging opex reduction targets

Nigel Stevens, *Product Director,* **THUS**

10.20 **Developing a transport network strategy to meet the drive for Opex efficiency**

- Identifying realistic Opex reduction targets
- Examining different options for reducing Opex
- The importance of plug and play, or plug and pay service deployment
- Defining Key Performance Indicators to measure and manage Opex
- Developing an action plan
- Identifying key future technologies that will increase network efficiency and forecasting timescales for their availability
- How will service price move relative to cost savings – what will happen to margins?

Patrick George, *Manager of International Network Engineering and Operations, Service and Engineering,* **Belgacom International Carrier Services**

11.00 Morning coffee

11.30 **Examining alternative sourcing strategies for transport networks**

- Discussing the key drivers, feature requirements, and challenges of building 21st century networks
- Analysing telecom markets – identifying the main challenges and determining the priorities for operators
- Examining alternative strategies:
  - MPLS
  - managed services
  - alternative sourcing

Michael Heuer, *Vice President, Business Development & Consulting, Global Telecom Markets,* **BT Global Services**

12.10 **Next Generation Ethernet Product Strategy - Case Study ntl:**

- Understanding the requirements of Next Generation Ethernet services
- Examining to what market segments may be supported from a single Ethernet platform
- Developing a clear understanding of the Ethernet product proposition:
  - targeting investments in your Ethernet platform to address the requirements of key markets and sectors
  - understanding customer requirements and translating demand into strategy
- The importance of Metro Ethernet before Carrier Class Ethernet for ntl - Case study
- Shifting the balance of strategy towards Next Generation products and services:
  - fear of change - adaptation for survival
  - understanding the significance of true product marketing for successful service launches
  - the four seasons of product marketing
- Customer touch and communication
- Internal education of staff - empower and educate your staff into product champions
- Next generation technology carriers failing to employ next generation marketing

Alex Bennett, *Senior Product Manager – Data Products,* **ntl:**

12.50 Lunch

Next Generation core architecture

14.10 **OPEX reduction through GMPLS/ASON - a business case study**

- Modelling of typical operators' processes
- Survey on process costs of European operators
- Process and cost analysis
- Evaluation of reduction potential using ASON/GMPLS

Dr.-Ing Andreas Iselt, *Senior Principal Research Scientist, Competence Center High Speed Networks,* **Siemens – Representing Project NOBEL**

14.50 **Considering the evolution to an MPLS/VPLS core network to support a Next Generation services portfolio**

- Understanding the drivers for building a Next Generation MPLS/VPLS core network to support a convergent voice and data strategy:
  - meeting growing capacity demands
  - managing the increasing complexity of the network
  - resilience for carrier-class services – PSTN migration
- Identifying the requirements of guaranteeing carrier-class performance over a Next Generation MPLS/VPLS core network, considering:
  - resilience and protection
  - QoS
- Considering alternative approaches to building a Next Generation carrier-class IP/MPLS core network, including:
  - GMPLS/ASON layered approach
  - Carrier-class routers
- Considering the Opex and Capex issues of taking a network upgrade or overlay approach
- Examining the main steps and timescales for the migration to a multiservice core

Dr. Kevin Smith, *Next Generation Networks,* **BT**

15.30 Afternoon tea

16.00 **Determining the best technology mix to deliver a flexible and cost-effective Next Generation core network**

- Discussing the key drivers, goals and feature requirements for the Next Generation core network
- Considering the demands and costs of core evolution versus core replacement / stove-pipe developments
- Integrating additional / new technologies into an MPLS core to provide scalable and cost-effective multi-service networking
- Examining the role of GFP - how should this be integrated?
  - comparing the benefits of integrating MPLS into GFP nodes or integrating GFP into MPLS nodes

Bob Hase, *Stretegic Development Manager,* **neos Networks**

16.40 **Dynamic Optical Network Deployments - Case Studies and Lessons Learned**

- Explaining why carriers are investing in Automated Optical Networks, including:
  - simplified deployment & provisioning, rapid service delivery, robust, maintenance-free networks, lower total cost of ownership
- Understanding the key elements of an Automated Optical Network:
  - wavelength switched ROADMs, wideband tunability, jumper-less provisioning, variable gain, Transient Controlled Amplifiers, simple, one time network engineering, automated GMPLS control plane

- Sharing lessons learned during the operation of ROADM based DWDM systems in carrier networks, considering:
  - integrating network elements, planning, training and certification, eliminating stranded bandwidth, rapidly adding and deleting services, wavelengths and nodes, eliminating jumper requirements in WDM nodes, adapting to facility failures – slow and fast events, simplified network management, autodiscovery, inventory management and sparing

Steven Robinson, *Vice President, EMEA Market Development,* **Meriton Networks**

17.20 **Panel: Examining the Capex and Opex reducing potential of Next Generation WDM and Optical Networking**

- Discussing the key features of Next Generation WDM and explaining how they can be used to reduce Capex and Opex, considering:
  - tuneable transponders
  - automatic gain equalisation
  - provisioning costs
  - spares, space and component costs
- Flexible switching including ROADM and OXCs
- Upgrading capacity to 10G:
  - Muxponders for transparent 10G STM16 signals
  - transporting 10GigE end to end across LAN and WAN – interworking LAN/Phy and WAN/Phy
- Upgrading to 40G – when will ultra-high bandwidth core network links provide value for money?

Including:
Ehud Bejerano, *Director, Product Line Management - MSPP, Optical Networks Division,* **ECI Telecom**

Prof. Stephen Ferguson, *Photonics Strategy Director,* **Marconi**

18.00 **Chair's closing remarks**

18.10 End of conference day two

Conference Day Three – Thursday 10th November 2005

09.00 Registration

09.30 **Chair's opening remarks**
Jens Schroeder, *Senior Marketing Manager,* **Tellabs**

Next Generation metro architecture

09.40 **Examining the challenges of rolling out a NGN transport network capable of delivering a full range of services over a packet infrastructure**

- Making the business case for a step change to a NGN transport network:
  - explaining why it is time to jettison the step by step evolution strategy and commit to a thorough network upgrade
- Identifying the main elements of NGN transport:
  - upgrading the core network to MPLS/VPLS
  - aggregating traffic in the metro
  - evolving to IP access
  - the role of Ethernet and MPLS
- Explaining how to enable voice applications in the MPLS network – Considering the work of the IETF
- Addressing the particular challenges of developing a common transport network for both fixed and mobile services
- Discussing the role of standardisation in the development of NGN transport and fixed mobile convergent networks – Assessing the potential impact of the ITU's NGN Focus Group

Dr. Manfred Wiegand, *Vice President Technical Sales, Carrier Networks Division,* **Siemens**

10.20 **Developing a Multiservice Transport Networking strategy – Comparing different technology options to cost-effectively deliver TDM and packet services over a shared infrastructure**

- Drivers – capacity, packet services, Triple Play
- Technology options – NG-SDH or Carrier Ethernet
- Architecture options, considering efficiency and resilience
- Capacity / Optical layer – DWDM / CWDM, 10GigE flexibility
- Legacy migration – ATM, FR, TDM ...

Dr. Paul Gunning, *Futures Testbed,* **BT**

11.00 Morning coffee

11.30 **Considering the development of a Next Generation architecture utilising a Multiservice Edge platform (MSE) linking to an MPLS core**

- Assessing the readiness of the approach to deliver both Next Generation and TDM services
- Identifying the requirements of a Multiservice Transport Network based on MSEs in conjunction with an MPLS core:
  - investigating the QoS requirements on such a network to deliver meaningful SLAs for voice, video and data services
- Examining the effectiveness and efficiency of PWE3 at encapsulating IP, Ethernet, FR and ATM services in the MPLS core network
- Determining how VPNs, (IP, Ethernet...) membership and topology information is propagated across the MPLS core network
- Discussing strategies for interworking with existing networks and services:
  - transporting mission critical, latency sensitive TDM and public telephony traffic across the MPLS packet optimised core network

Tim Hubbard, *Director, NGN Technical Marketing,* **Nortel**

12.10 **Examining Bell Canada's converged Ethernet network evolution strategy and assessing its success at providing transport for multiple applications**

- Explaining how changing service demands and technology is driving Bell Canada's converged Ethernet network strategy:
  - supporting new applications, including: IPVPN, WiMAX, FTTN/IPTV, FTTP and cellular backhaul
- Evolving from an Ethernet services network to a multi-service Ethernet network:
  - Examining the architecture and technical approaches taken by Bell Canada
- Understanding and meeting the operational challenges:
  - interoperability, OAM, scalability, interworking Ethernet with different network devices to provide the full range of applications
- Sharing key learning points and discussing the future development of Bell Canada's converged Ethernet network

Paul LeBel, *Associate Director – Optical / Ethernet Networks, Technology Development,* **Bell Canada**

12.50 Lunch

14.10 **Analysing the development of the Ethernet marketplace, understanding the opportunities and threats to operators and developing a strategy to capitalise on Carrier Ethernet and L2 VPNs**

- Analysing the current Ethernet services marketplace:
  - what services are on offer, which service providers are offering services, which regions are most developed?
- How are Ethernet services being marketed to customers and what is the impact on competitiveness?
  - what market segments are being targeted, what pricing regimes are being adopted and what impact is this having on competition?
- Analysing the network strategies being adopted by operators to deploy Ethernet services and assessing:
  - legacy deployments
  - network upgrades – NG-SDH
  - network overlay / Greenfield deployments
- Assessing the viability of the Ethernet services marketplace – Can service providers survive in a commodity marketplace?
  - how many providers can the market sustain?
  - who is most likely to benefit from the Ethernet services market?
  - how can service providers leverage this new market opportunity to increase profitability?

Mark Lum, *Independent Consulting Analyst*

14.50 **Evolving from a data aware to a service aware transport network**

- Explaining the main features of a Next Generation multi-service transport network
- Tracking the rise in demand for IP-based services – How is this impacting transport economics and what steps do operators need to take?
  - capacity planning and meeting growing traffic demands
  - delivering end-to-end QoS, management and service differentiation
- Examining the evolution of network architectures to deliver multi-service convergence in the metro network:
  - network core layer based on ASON, optical cross-connects and meshing
  - edge layer 10Gig, MSPPs, traffic grooming and low order switching
  - MSPP access to provide differentiation and multi-service access
- Developing an end-to-end management system to provide:
  - network resource management
  - service customer management
  - SLA management
- Evolving network intelligence from the broadband edge into the metro network

Christophe de Maindreville, *SVP Network and Product, Strategy/Marketing,* **Alcatel Optical Network Division**

15.30 Afternoon tea

16.00 **Energis transport evolution case study** *Late addition case study!*

Alan Corfield, Energis

16.40 **Grasping the opportunities of Carrier Ethernet - Gaining competitive advantage in one of the fastest growing markets**

- From Ethernet to Carrier Ethernet:
  - explaining the evolution and understanding the benefits to operators
  - positioning Carrier Ethernet amongst the networking technologies available to operators
- Building carrier grade into Ethernet - Explaining how the 5 carrier-class attributes of Carrier Ethernet meet operational requirements for cost-effective service delivery, considering:
  - scalability, protection, hard QoS, service management, TDM support
- Understanding how operators can deploy Carrier Ethernet to best advantage and identifying the key success factors in deployment
- Explaining how Carrier Ethernet will develop with changing operator requirements:
  - identifying the obstacles to mainstream carrier deployment
  - providing a technology roadmap for Carrier Ethernet

Nan Chen, *President,* **Metro Ethernet Forum**

17.20 **Identifying new opportunities for WDM optical transport**

- Making the case for Metro WDM - providing one solution from access to regional networks:
  - explaining how recent advances in technology are improving the economics of WDM solutions, for example, electronic impairment mitigation, pluggable transceivers ...
  - highlighting two key aspects of the WDM value proposition: scalability and service integration
- Exploring Metro WDM network applications and their requirements:
  - DSL Backhaul: integrating the existing ATM-over-SDH infrastructure and cost-optimising Ethernet transport and aggregation
  - business continuity and storage solutions: examining current technology trends
  - wavelength services: G.709/OTH enabled features
  - regional networks for carriers and corporate customers

Dr. Lars Friedrich, *Director, Product Line Management,* **ADVA Optical Networking**

18.00 **Chair's closing remarks**

18.10 End of conference day three

Conference Day Four – Friday 11th November 2005

09.00 Registration

09.30 **Chair's opening remarks**

Transport strategies to support Next Generation services

09.40 **Strategically deploying FTTx solutions to support the delivery of Triple Play Video and IP-TV services**

- Understanding the network requirements for Video service and IP-TV delivery
- Planning network evolution to meet Triple Play deployment targets
- Spanning the last / first mile:
  - comparing FTTx solutions to xDSL, broadband satellite and broadband wireless alternatives
- Describing how the business case for FTTx can be made to work
- Determining a cost effective and future proofed access architecture for Triple Play, considering:
  - fibre to the building - fibre to the node plus ADSL2+ / VDSL / VDSL2
- Managing the Triple Play transport platform to ensure a cost-effective and high performance end-to-end solution
- Forecasting future bandwidth demand and ensuring a smooth transition for the transport network:
  - examining the role of Ethernet in the multi-service, multi-technology access network

Jörn Hiddessen, *Solution Manager Carrier Ethernet and Optical Broadband Access,* **Siemens**

10.20 **Comparing different Next Generation Triple Play architectures**

- Assessing existing broadband network architecture and service models
- Identifying the pros and cons of various Triple Play implementations
- Highlighting Ethernet edge aggregation challenges and carrier class solutions
- Examining the current state and evolution of Multi-Edge concepts to preserve service control

Matthias Fricke, *Network Development and Evolution,* **T-Com**

11.00 Morning coffee

11.20 **Protocol frameworks for Triple Play evolution**

- Network and service: integration with the intelligent Metro Ethernet edge
- Beyond Ethernet: identifying the role of MPLS in broadband aggregation
- Service survivability: high availability network architectures
- Traffic engineering and optimisation: Uni- and Multicast concepts

Jeremy Steventon-Barnes, *Director Service Development,* **Tellabs**

12.00 **Cost-Effective backhaul for Next Generation broadband services**

- Identifying the access bandwidth demands of next Generation broadband services
- Discussing the merits of Carrier Ethernet, NG-SDH, RPR and WDM
- Discussing how to combine the best of each technology to develop the optimum broadband aggregation architecture
- Examining the business case for building versus leasing the second mile infrastructure

Jon Baldry, *Technical Marketing Manager,* **Transmode**

12.40 **Examining the benefits of using point-to-multipoint fixed wireless for Next Generation mobile backhaul**

- Examining how the transmission needs of mobile operators are changing as networks evolve from 2G to 3G, considering:
  - the trend towards more data-intensive applications
  - increasing network density - the challenges of network management
- Highlighting the benefits of a point-to-multipoint fixed wireless solution for mobile backhaul:
  - comparing a point-to-multipoint solution with point-to-point solutions
  - using the network to offer additional Next Generation access services
- Sharing practical deployment experiences

Theo Wegbrans, *Executive Vice President,* **Cambridge Broadband**

13.10 Lunch

14.10 **Delivering both Triple Play and TDM services in regional backhaul networks - A techno-economic case study**

- Comparing and positioning MSP (Multi-service Platform) and Carrier Ethernet
- Analysing architecture / topology options and optimising costs
- Comparing and positioning WDM options

Blandine Rousset, *Architecture and Techno-Economics,* **France Telecom Research & Development**

14.50 **Cost-effective transport for digital broadcasters – Equipping SDH networks to carry DVB-T payloads**

- Understanding the transport requirements of broadcasters and explaining the significance for network operators
- Identifying the key elements of a broadcast network architecture
- Considering the transport of DVB-ASI signals over SDH networks using the GFP-T encapsulation
- Explaining the advantages of Transport using GFP-F encapsulation
- Proposing a cost-effective and efficient transport for digital broadcast media
- Identifying a new market opportunity for service providers

Giuseppe Abbatepaolo, *Network Architect,* **Rai Way**

Broadband access network evolution

15.30 **Extending your broadband reach, how to make rural broadband customers more profitable - Considering WiMAX**

- Making the business case for rural broadband:
  - considering different access and backhaul technologies
- Assessing where WiMAX can offer a profitable solution, considering:
  - capacities, reach, LOS, backhaul

Patrik Nord, *Director, Business Development,* **Ericsson**

16.10 **Chair's closing remarks**

16.20 End of conference

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Evolution

Next Generation
Transport Network Strategies

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Data Protection - Personal data is gathered in accordance with the Data Protection Act 1998. Your details may be passed to other companies who wish to communicate with you offers related to your business activities. If you do not wish to receive these offers, please write to the Database Manager at the above address.

What Happens If I Have to Cancel? - Confirm your cancellation in writing (letter or fax) on or before 23rd October 2005 and receive a refund less a 10% - VAT service charge. If you cancel between this date and 30th October 2005 then you will receive a 50% refund. Regrettably, no refunds can be made for cancellations received less than one week prior to the conference. A substitute delegate is welcome at no extra charge.

Incorrect Mailing - If you are receiving multiple mailings or you would like us to change any details or remove your name from our database, please contact our Database Department on +44 (0)20 7915 5135 quoting the reference number printed on your mailing label. Alternatively, fax this brochure to the mailing department on fax number +44 (0)20 7915 5679 or email: integrity@iirltd.co.uk Amendments can take up to six weeks so please accept our apologies for any inconvenience caused in the meantime.

Additional Requirements - Please notify IIR at least one month before the conference date if you have any additional requirements e.g. wheelchair access, large print etc.