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Level 3 Communications The Network Partner You Can Rely Onsm

JET Roadmap Workshop Jefferson Lab, Newport News, Virginia April 13-15, 2004





- Level 3 is a facilities-owned, communications and information services company offering world-class services in North America and Europe
- The company has offered wholesale communications services since inception:
 - Wholesale Internet access services
 - Managed modem dial-up services
 - Broadband transport
 - IP-centric voice services

- Private data services
- DSL Aggregation
- Colocation & Power
- Metropolitan and intercity dark fiber
- The company also offers enterprise and information services:
 - Level 3 offers enterprise companies dedicated Internet access (domestic and international), remote dial-up access, managed Internet security, and virtual private networks
 - (i)Structure (a wholly owned subsidiary of Level 3) provides managed IT infrastructure services and enables businesses to outsource IT operations
 - Software Spectrum (a wholly owned subsidiary of Level 3) is the world's largest reseller and license manager of Microsoft products.



Over 30 Years Internet Experience

1884 Founding of the Peter Kiewit Sons' construction Level 3 is inducted into the Smithsonian 2000 4/2000 company (which later forms Level 3) Institution's National Museum of American History Level 3 engineers develop the 8/2000 1953 BBN incorporated "Martini Draft" 1963 BBN designs first modem 1968 BBN wins contract to develop ARPANET, 1/2001 Level 3 commissions its international 2001 IP network, the first international the forerunner of today's Internet fiber-optic network completely 1968 BBN develops packet-switching protocols optimized for Internet technology Level 3 introduces its ONTAPSM 3/2001 1972 BBN sends the first e-mail message bandwidth provisioning system and introduces the @ sign 1976 First Internet routers developed 1/2002 Frost & Sullivan recognizes 2002 impact by BBN ONTAPSM with its 2002 Market Engineering award 8/1996 MFS buys UUNet Genuity announces enhanced 3/2002 MFS acquired by WorldCom 12/1996 managed security and virtual 1/1998 KDG becomes private network (VPN) services Level 3 Communications Construction of Level 3's 2/1998 1/2003 Level 3 recognized by European network begins Frost & Sulivan as the the largest project of its kind "Next Generation Service

in Europe

Provider of the Year"

Level 3 completes Genuity transaction

2/2003





Level 3 is Financially Stable

- Level 3 is EBITDA positive \$116 million for third quarter 2003 (3Q03)
- Level 3 achieved positive free cash flow in 3Q03
- Level 3 had \$874 million in consolidated revenue for 3Q03
- In February 2003, Level 3 completed its acquisition of Genuity, a Tier 1 IP communications company



Intercity and Transoceanic Networks



- High-capacity intercity network (approximately 22,500 terrestrial route miles of Level 3operated fiber across North America and Europe)
- Approximately 19,600 of these route miles were constructed from the ground up by Level 3 using multiple conduits for maximum upgradeability (solely owned and operated by Level 3)
- 87 markets in service: 68 in North America, 19 in Europe
- Substantial multi-terabit transoceanic capacity, plus additional wavelength-based terrestrial mileage extending Level 3's European network





Level 3 Network and Services

- Intercity backbone utilizes Corning LEAF fiber
- 3000 mile metro network
- Fiber, facilities and equipment directly maintained by Level 3
 - Some retained Genuity routes vary from standards
- Transport and Infrastructure Services
 - Dark Fiber
 - Colocation and power
 - Remote Hands support service
 - Point to point wavelength services
 - 2.5Gb and 10Gb
 - Private Line
 - Trans-Atlantic





Current Optical Networks

- Most current optical networks utilize 2nd generation DWDM equipment
 - 2.5 Gb and 10 Gb interfaces
 - Fixed frequency optics
 - 100s of km between regeneration points
- Deployed intercity fiber is capable of meeting requirements for foreseeable future (Post 1995 fiber)
- High capacity wavelength services are predominantly unprotected
- New wavelength installations take weeks
- Wavelength services can not be easily reconfigured in a timely fashion
- Industry is still consuming capacity installed in the bubble years





New Optical Developments

- 10 GE LAN PHY
- Ultra Long Reach
- RAMAN Amplification
- High Channel Counts
- OOB FEC
- 40 Gb
- Wavelength Switching
- Electronic Dispersion Compensation
- New Fiber Types
 - Medium Dispersion
 - Dispersion Managed
- Metro WDM systems
- GMPLS





Future Network Plans

- Economics will drive all technology decisions
 - Lower costs for existing services
 - Open new revenue streams
- High startup costs will limit new system deployments
 - Spares, IT development, training, etc
 - Startup costs must be recouped in a reasonable timeframe
 - Unclear service demand complicates the business case
- New system deployments will be limited to specific areas of need
- New technologies will continue to lower costs but sufficient demand is required reap full cost benefits





Deployment Opportunities

- 10 GE LAN PHY
 - Standard in new optical systems
 - Wide deployment by 2005
- Ultra Long Reach
 - Deployments driven by each carriers specific network and economic drivers
- RAMAN Amplification
 - Will have limited deployments within EDFA networks
- High Channel Counts
 - Deployments driven by each carriers specific network and economic drivers
- OOB FEC
 - Will be standard on all new optical systems
- 40 Gb
 - On hold waiting customer or economic drivers





New Optical Developments

- Wavelength Switching
 - Will see limited deployments due to high cost and lack of new service demand
- Electronic Dispersion Compensation
 - Should start appearing in 2005
 - Likely required for fully transparent reconfigurable optical services
- New Fiber Types
 - No wide scale new fiber deployments
 - Economic justification of dispersion managed fiber unclear
- Metro WDM systems
 - Will be used for regional applications
- GMPLS
 - Will be widely deployed in new systems
 - Carriers will only use for intra vendor applications only





Summary

- Built it and they will come days are gone
- New technologies will start appearing in networks but only where it makes economic sense
- Consumers will need to interconnect with network providers using standard 10Gb SONET/SDH framed and 10GE LAN PHY interfaces
- Customers can drive the deployment of new technologies and the development of new services but only where new demand can drive a business case
- Further shake out is expected in network provider space