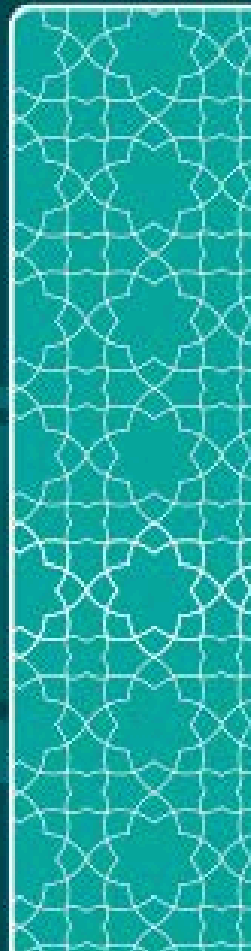


International Connectivity Update

10 Sep 2013

T. R. ELASS

KAUST IT/Network & Communications



Early History



- Graduate science & engineering university
- Constructed 2007-2009
- Students started Sep 2009
- Commodity Internet thru local ISP @ 200 Mbps
- Dedicated STM-64 (full lambda) to Amsterdam
 - Signaling bits used, carrier can't monitor
- Contract for 16 years, 99% availability, 1×10^{-12} BER, terms on chronic outages



10G Link Reliability Statistics

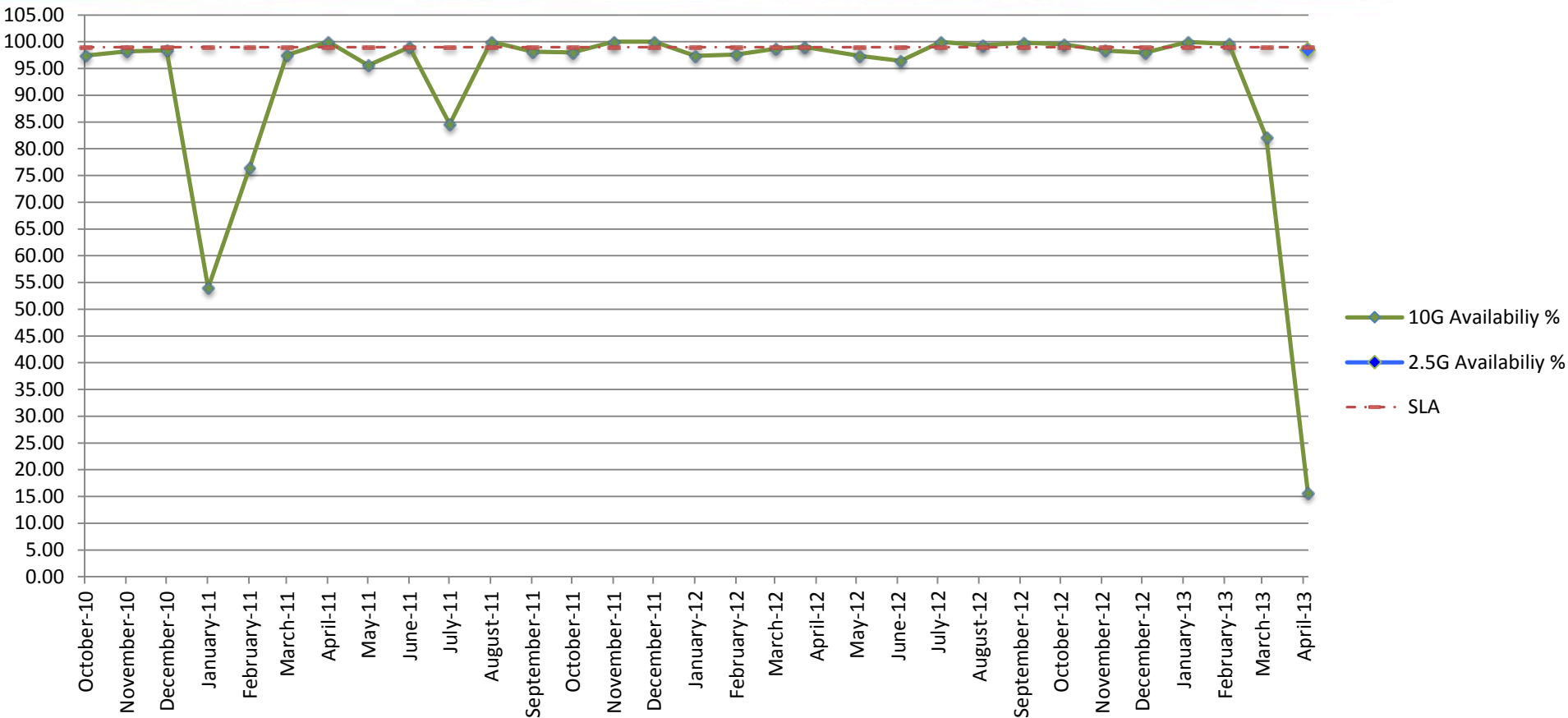
➤ **Can we receive highly reliable International connectivity through STC/Egypt?**

No (99% = 7.2 hours/month)

Why?

- SLA breached in 19 of past 32 months, excluding force majeure cut 27Mar13-26Apr13
- A backup link (2.5G) was activated on the 27th of March 2013
- The availability of the 2.5G link for the month of April 2013 is 98.41%

10G & 2.5G LINK SLA & Reliability

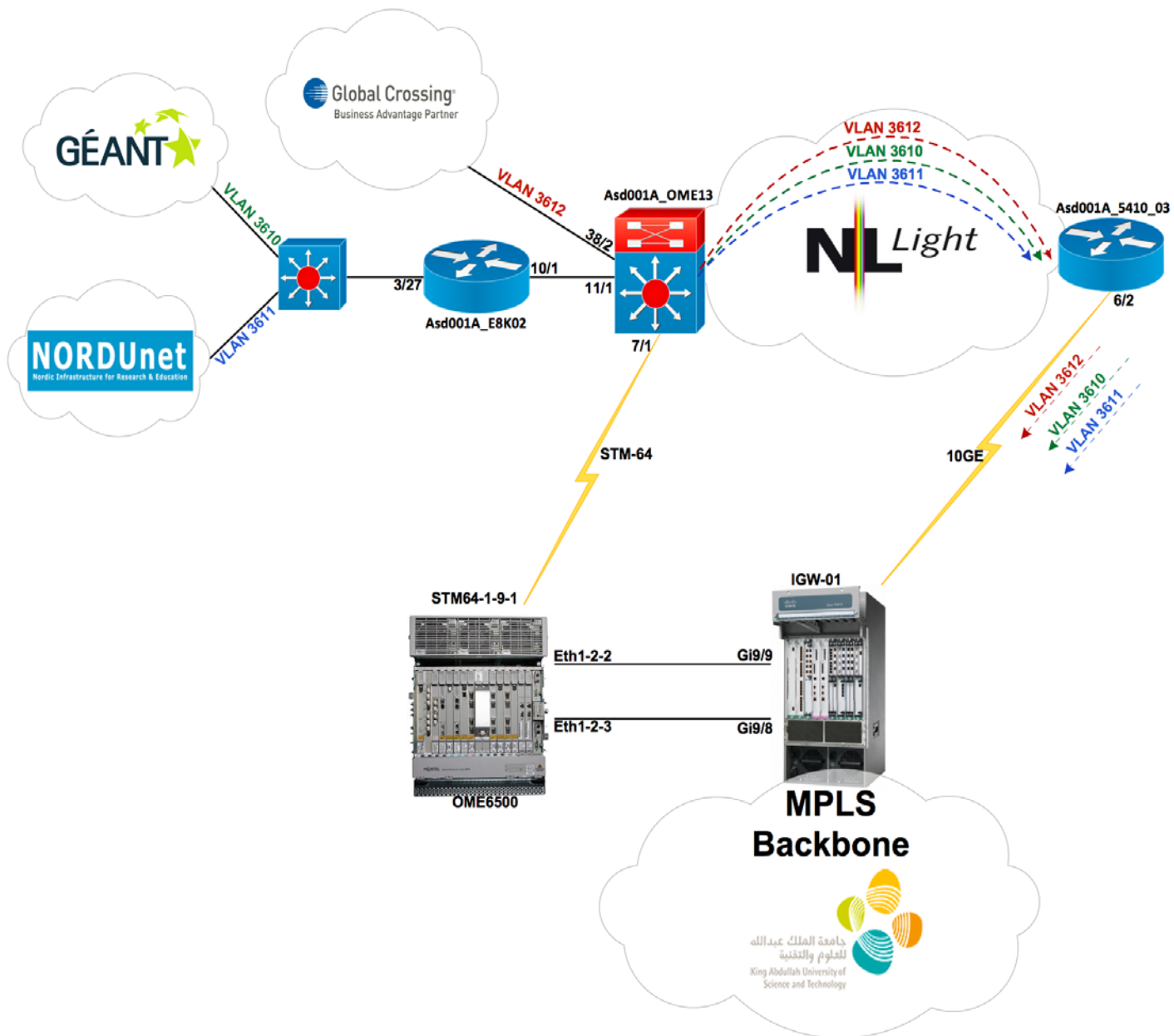


The 10G link contractual SLA with STC is **99%** per month
SLA was breached in 21 months over the past 31 months



International Connectivity Plan

Phase	Plan	Failover
Before 24.Jul.2013	<ul style="list-style-type: none">➤ Amsterdam:<ul style="list-style-type: none">- No router installed- Two International links (10G, 2.5G)- One Internet link (1x 1Gbps @ Global Crossing)- One link to Geant- One link to Internet2	<ul style="list-style-type: none">- No auto failover- One Int'l link is used (2.5G)



**International Connectivity
Before 24.July.2013**

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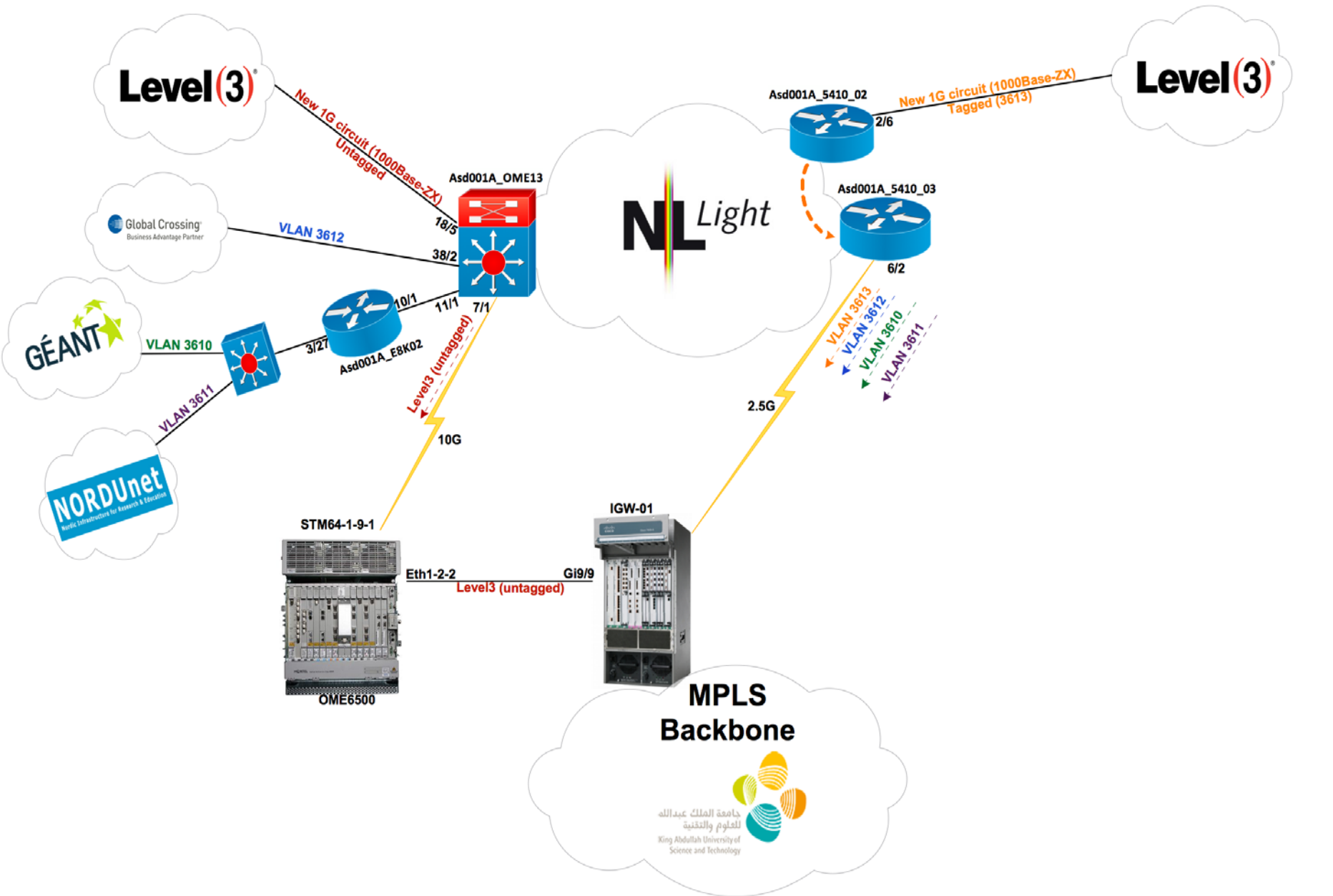
Eng./Date: Hani AlHazmi 08.Apr.13	Location: KAUST/Amsterdam	Drawing Number: ND20130408-001	Sheet No. 001	Revision No. 001
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International Connectivity Plan



Phase	Plan	Failover
I	<ul style="list-style-type: none">➤ Amsterdam (STC):<ul style="list-style-type: none">▪ No router installed▪ Two International links (10G, 2.5G)▪ Two Internet link (2x 1Gbps @ Level3)▪ One link to Geant▪ One link to Internet2 ➤ Live sine July 24th, 2013<ul style="list-style-type: none">▪ Coordination required among KAUST, NetherLight, SARA (Vancis) and Level3	<ul style="list-style-type: none">➤ Partial auto failover<ul style="list-style-type: none">▪ Internet only▪ Failover within 30 seconds ➤ Both Int'l links carry traffic ➤ 2.5G:<ul style="list-style-type: none">▪ Géant▪ Internet2▪ Backup 1Gbps Internet ➤ 10G:<ul style="list-style-type: none">▪ Primary 1Gbps Internet



**International Connectivity
Phase I (Today)**

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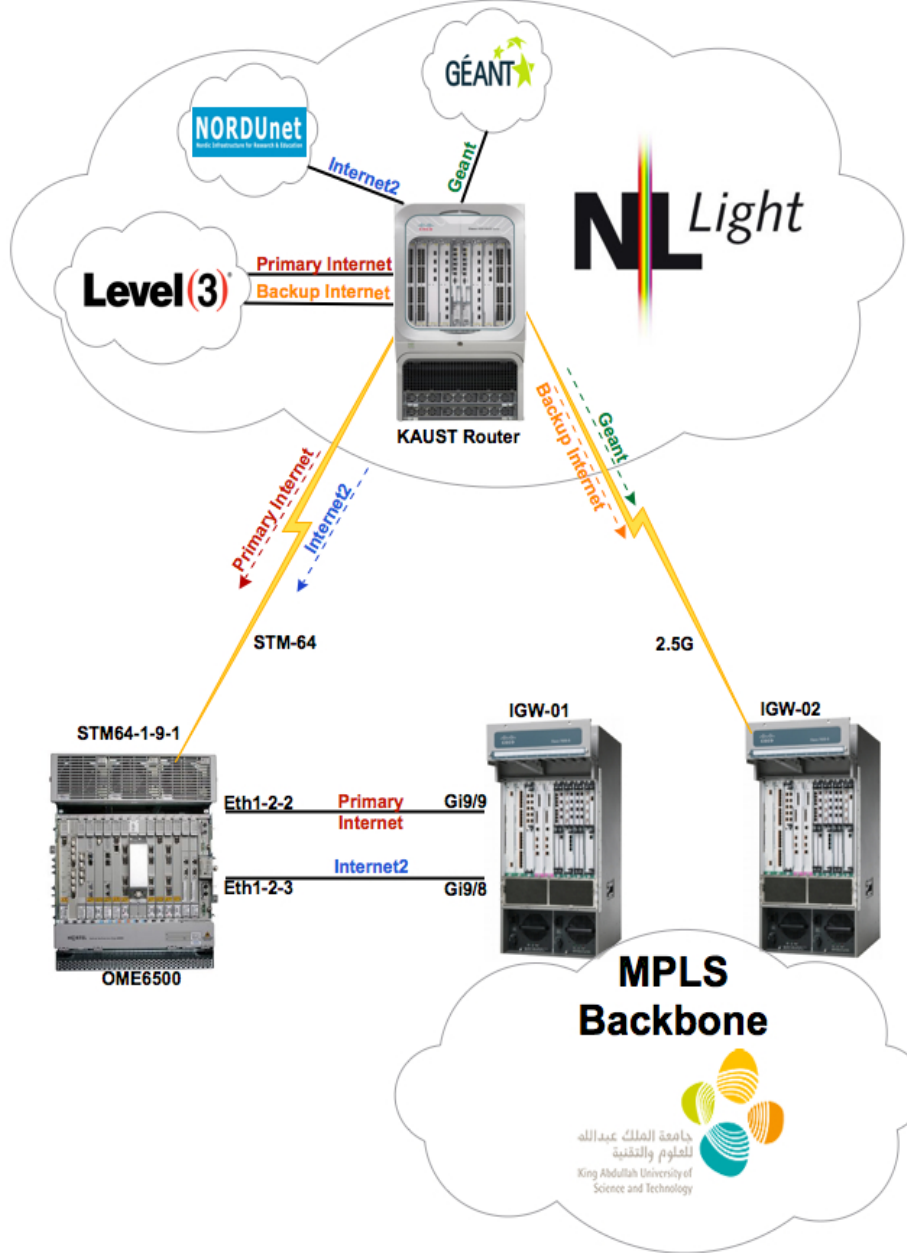
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International Connectivity Plan



Phase	Plan	Failover
II	<ul style="list-style-type: none">➤ Amsterdam (STC):<ul style="list-style-type: none">▪ Install Cisco ASR 9K router▪ Two International links (10G, 2.5G)▪ Two Internet link (2x 1Gbps @ Level3)▪ One link to Geant▪ One link to Internet2 ➤ Go-live tentatively End of Sept 2013<ul style="list-style-type: none">▪ RFQ sent to Potential Supplier May 15, 2013▪ RFQ Closed May 21, 2013▪ Review of Technical Proposals May 25, 2013▪ Review Commercial Proposals May 27, 2013▪ Notice of Award Jun 1, 2013▪ Delivery 6-8 weeks (some eqpt onsite, pending co-lo provisioning in Ams)	<ul style="list-style-type: none">➤ Full auto failover<ul style="list-style-type: none">▪ All services,▪ Failover within 30 seconds ➤ Both Int'l links will be used ➤ 2.5G:<ul style="list-style-type: none">▪ Géant▪ Internet2▪ Backup 1Gbps Internet ➤ 10G:<ul style="list-style-type: none">▪ Primary 1Gbps Internet



International Connectivity Phase II

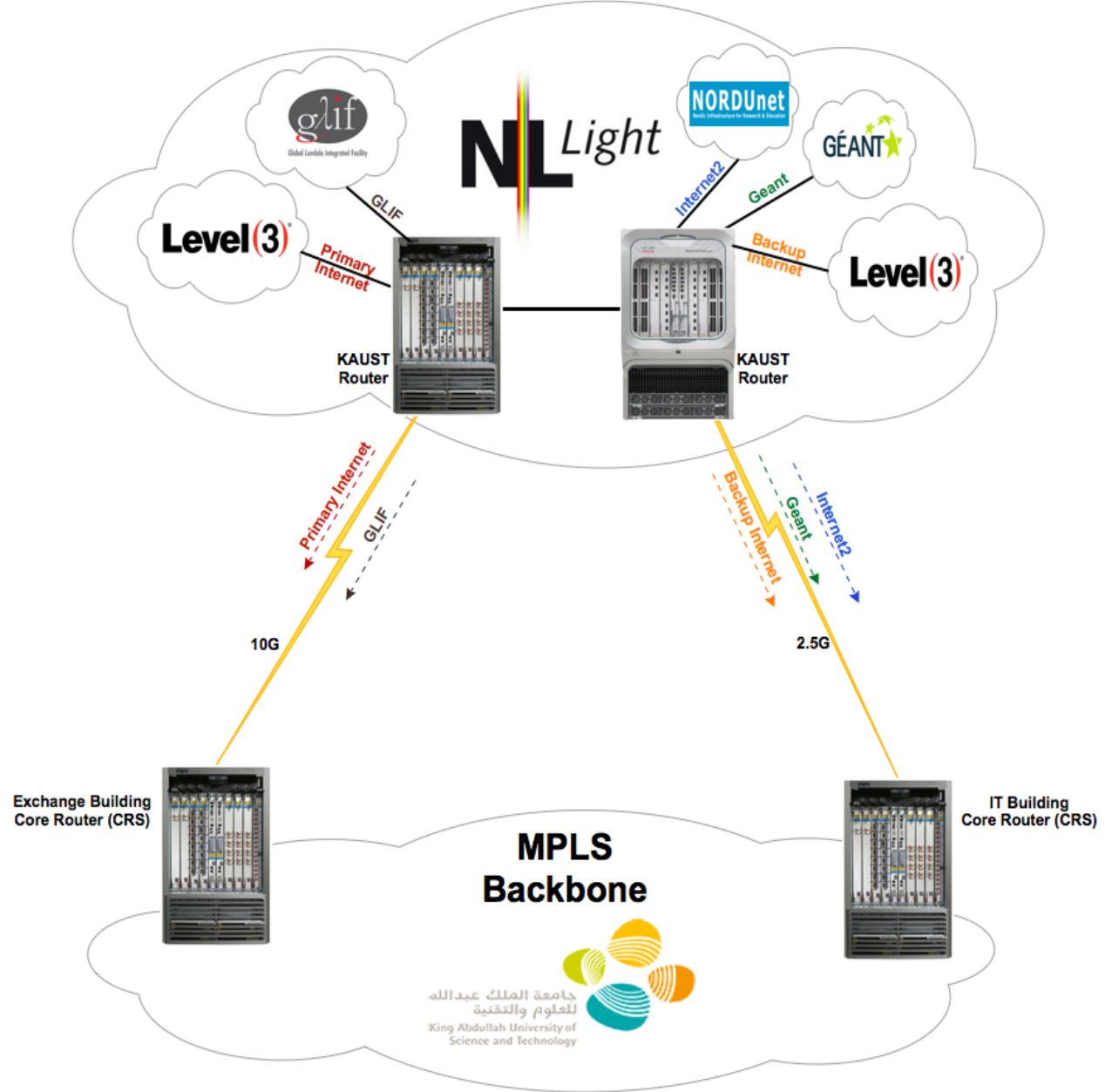
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International Connectivity Plan



Phase	Plan	Failover
III	<ul style="list-style-type: none">➤ Amsterdam (STC):<ul style="list-style-type: none">- Install CRS router- Two International links (10G, 2.5G)- Two Internet links (2x 1Gbps @ Level3)- One link to Geant- One link to Internet2- One link to GLIF (10G) ➤ Go-live tentatively Dec, 2013➤ Aramco<ul style="list-style-type: none">▪ RFP released to potential bidders▪ No estimated delivery time	<ul style="list-style-type: none">➤ Full auto failover<ul style="list-style-type: none">▪ All services,▪ Sub-second failover ➤ Both Int'l links will be used ➤ 2.5G:<ul style="list-style-type: none">▪ Geant & Internet2▪ Backup 1Gbps Internet ➤ 10G:<ul style="list-style-type: none">▪ GLIF (upon request)▪ Primary 1Gbps Internet



International Connectivity Phase III

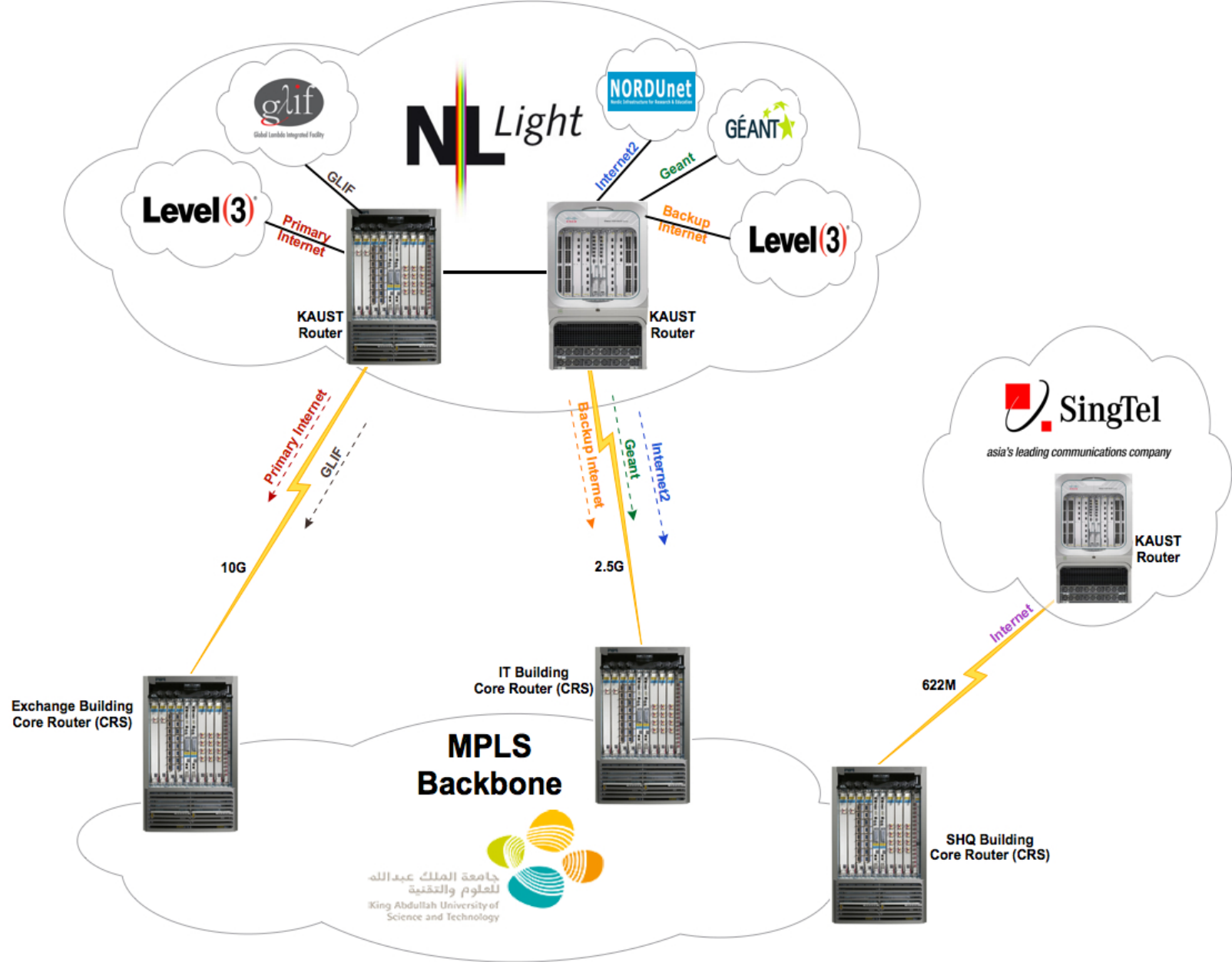
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Hani AlHazmi 08.Apr.13	KAUST/Amsterdam	ND20130408-001	001	001

International Connectivity Plan - TBA



Phase	Plan	Failover
IV	<ul style="list-style-type: none">➤ Amsterdam (STC):<ul style="list-style-type: none">- Two routers- Two International links (10G, 2.5G)- Two Internet links (2x 1Gbps @ Level3)- One link to Geant/Internet2/GLIF ➤ Singapore/India (Mobily or ITC):<ul style="list-style-type: none">- One International link (622Mbps)- One router- One Internet link➤ EPEG ? ➤ Long-term (2-3 years)➤ Link to East or EPEG not in 13-14 budget:<ul style="list-style-type: none">▪ RFI in May '13 for budgetary info	<ul style="list-style-type: none">➤ Full auto failover<ul style="list-style-type: none">▪ All services,▪ Sub-second ➤ Both Int'l links will be used ➤ 622M (STM-4):<ul style="list-style-type: none">- 500Mbps Internet ➤ 2.5G:<ul style="list-style-type: none">▪ Géant & Internet2▪ Backup 1Gbps Internet ➤ 10G:<ul style="list-style-type: none">▪ GLIF (upon request)▪ Primary 1Gbps Internet



International Connectivity Phase IV

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Network Upgrades...



Through
Inspiration,
Discovery

Thank You