

GN3+ Update

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NORDUnet Operations Forum

Copenhagen, 03-04-2013



- The Facts
 - Duration: 24 months
 - Effort: 333 person-years
 - Budget: 72.5 M€ (39 M€ from EU)
- Status
 - Proposal approved by EC, contract negotiations ongoing
 - Project started as of 1 April 2013
 - Includes Open Calls for JRA's
- Objectives
 - Get us to the start of Horizon2020
 - prepare the next project
 - Deliver on results from GN3 – focus on operations
 - Improved project management
 - Leverage new network

JRA1: Network Architectures for Horizon 2020

SA1: Core Backbone Services

SA2: Testbeds as a Service

JRA2: Technology Testing for Specific Service Applications

SA3: Network Service Delivery

SA4: Network Support Services

JRA3: Identity & Trust Technologies for GÉANT Services

SA5: Application Services

SA7: Support to Clouds

SA6: Service Management & Operation

NA1:
Management

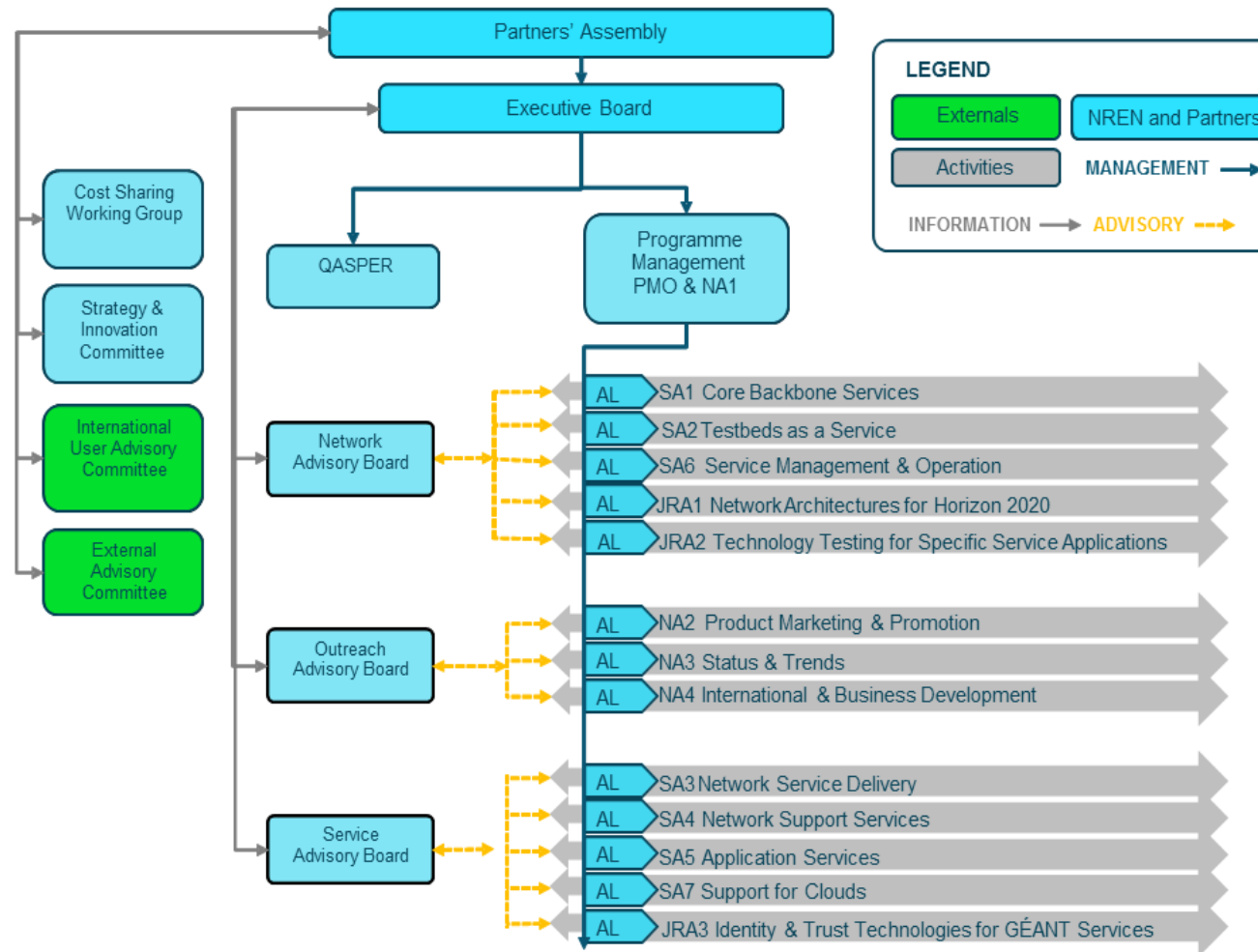
NA2:
Communications
& Promotion

NA3: Status &
Trends

NA4:
International &
Business Devpt



	Strategy	Design	Pilot	Production ¹
SA1 Core Backbone Services	<ul style="list-style-type: none"> Carrier ETH Photonic 		<ul style="list-style-type: none"> OTN 	<ul style="list-style-type: none"> GÉANT Open GÉANT VPN GÉANT Peering GMPLS
SA2 Testbeds as a Service		Capability to Pilot ->• Capability to Pilot ->• Capability to Pilot ->•	<ul style="list-style-type: none"> OpenFlow SDN virtualisation 	<ul style="list-style-type: none"> TaaS Service V1, 2, 3
SA3 Network Service Delivery		<ul style="list-style-type: none"> cNIS 		<ul style="list-style-type: none"> MD BoD MD Wave MD VPN
SA4 Network Support Services		<ul style="list-style-type: none"> e2e nma perFONAR integration 	<ul style="list-style-type: none"> pS NC BSS 	<ul style="list-style-type: none"> perFONAR in-life enhancement MDSS GEMbus
SA5 Application Services	<ul style="list-style-type: none"> eduGAIN consultancy for service growth 	<ul style="list-style-type: none"> eduCONF VoIP Convergence 	<ul style="list-style-type: none"> USSO FaaS EduGAIN consultancy for AAI pilots 	<ul style="list-style-type: none"> eduCONF & eduroam user driven enhancements
SA7 Support to Clouds	<ul style="list-style-type: none"> Cloud Architecture Standardisation 			<ul style="list-style-type: none"> Mobile Data Service Brokered Cloud Services



€000	Manpower	Equipment	Network Costs	Travel	Other Subcontracting	TOTAL	EC Funding Requested	Open Call Funding	Total EC Funding
SA1	4,881	6,763	25,370	323	158	37,494	13,889		13,889
SA2	1,998	480		246	90	2,814	1,930		1,930
SA3	2,472	-		198	110	2,780	1,835		1,835
SA4	2,790	5		56	10	2,861	1,819		1,819
SA5	3,702	25		173	50	3,949	2,850		2,850
SA6	2,541	13	772	9	88	3,423	702		702
SA7	1,704	-		19	236	1,959	1,435		1,435
JRA1	1,484	-		120	90	1,694	1,253	1,253	2,507
JRA2	1,481	-		36	0	1,517	1,052	1,052	2,103
JRA3	1,273	-		56	-	1,328	945	945	1,889
NA1	4,361	-		281	1,775	6,416	4,625		4,625
NA2	772	-		55	649	1,476	836		836
NA3	2,107	-		162	268	2,537	1,839		1,839
NA4	2,069	-		260	131	2,460	731		731
Total	33,637	7,286	26,142	1,993	3,654	72,711	35,740	3,250	38,989
EC funding requested	17,180	3,093	10,874	1,650	2,942	35,740			

average funding rate

per cost category

51%

42%

42%

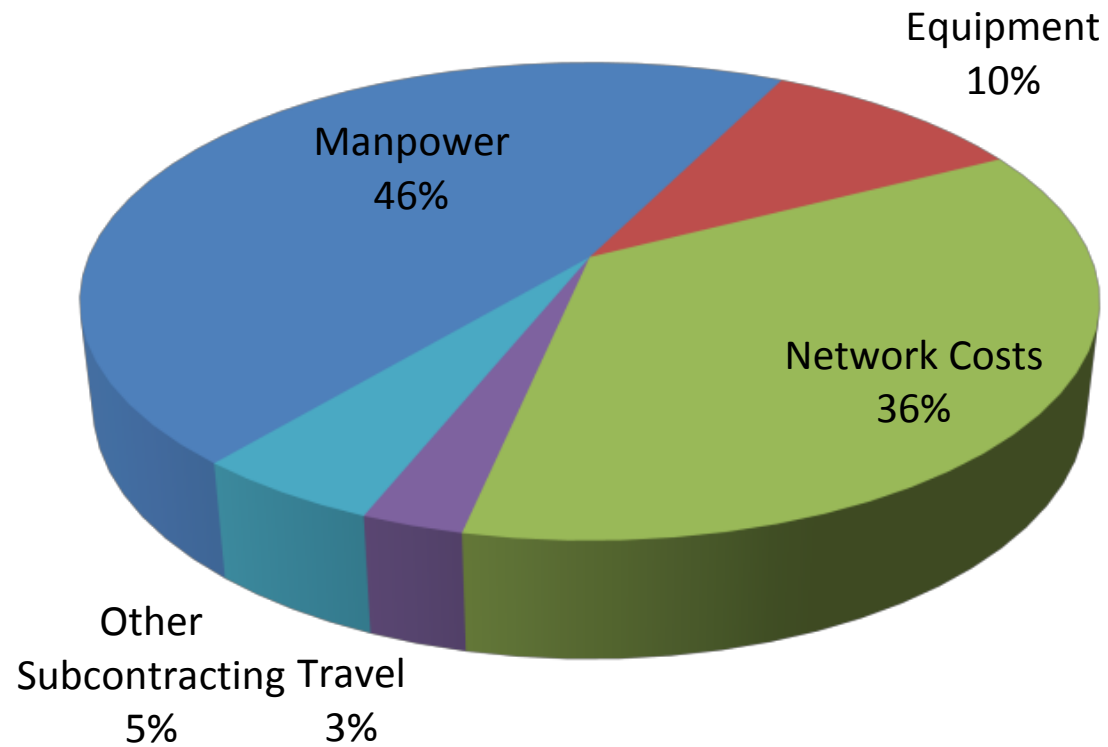
83%

81%

49%



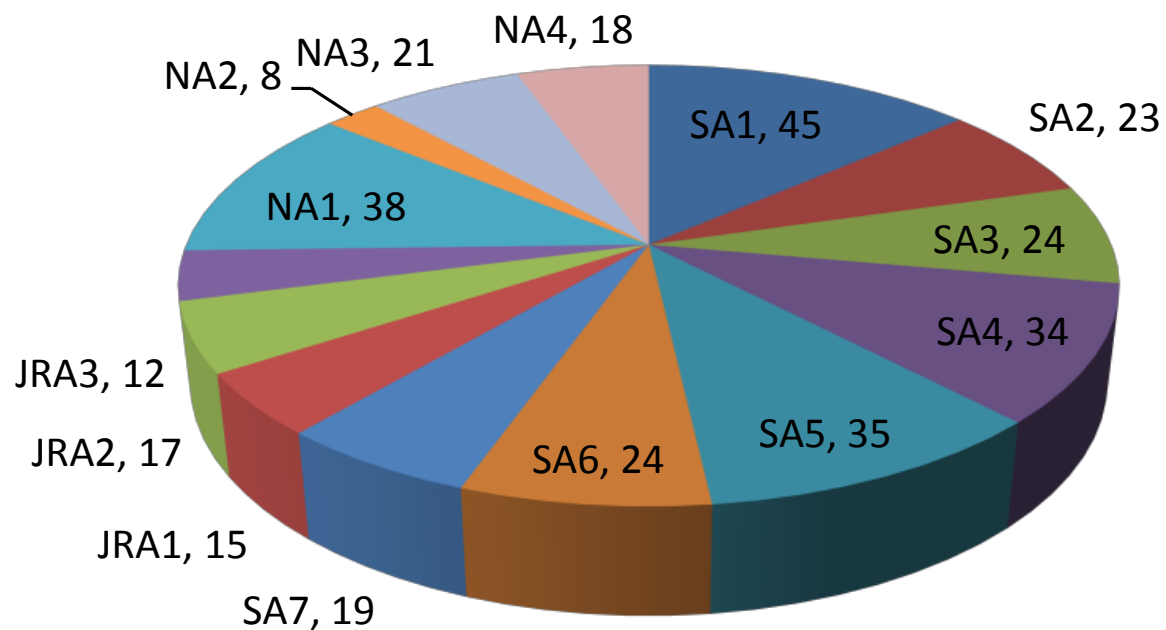
Distribution of Costs



			Total 15 months from 1/10/13 to 31/12/12 €000s
Projected GEANT network costs			
lit fibre			10,013
leased circuits			11,853
switched layer			2,502
IP layer			2,282
equip't housing (incl rent & power)			2,744
other network costs			2,768
contingency			1,266
			33,427



Manpower Distribution per Activity (Man-years)



- DANTE: 1445
- TERENA: 238
- AMRES: 140
- CARNET: 152
- CSNET: 121
- DFN: 179
- GRNET: 186
- JANET: 93
- NORDUnet: 345
- PSNC: 297
- RedIRIS: 119
- RENATER: 77
- SURFnet: 100
- SWITCH: 128



- Key Activities
 - Future network architecture
 - Testbed-as-a-Service
 - Bandwidth-on-Demand / NSI
 - PerfSONAR
 - eduroam / mobility
 - eduGAIN / Identity management
- Governance and Management
 - Allow activities to do real work
 - Continue push for common sense, global infrastructure collaboration
 - Extend partnerships with key partners (SURFnet, JANET, DFN, SWITCH)
 - Contain the DANTE empire
- Nordic Partners, Nordic technology, Nordic perspective
- **Deliver!**

- Optical
 - Infinera DTN-X
 - 10G / 100G client side
 - Proprietary 500G line side
 - All nodes OEO
 - All nodes a OTM switch
- Switching / MPLS
 - Juniper MX-series (with 100G line side)
- IP
 - Juniper T-series (100G line side)
- Switching and IP (slowly) being merged

XTC10 (Part of the DTN-X)



- Yellow 10G Client Fibres
- Blue 100G Client Fibres
- Red 500G Line Fibres



← Close Up

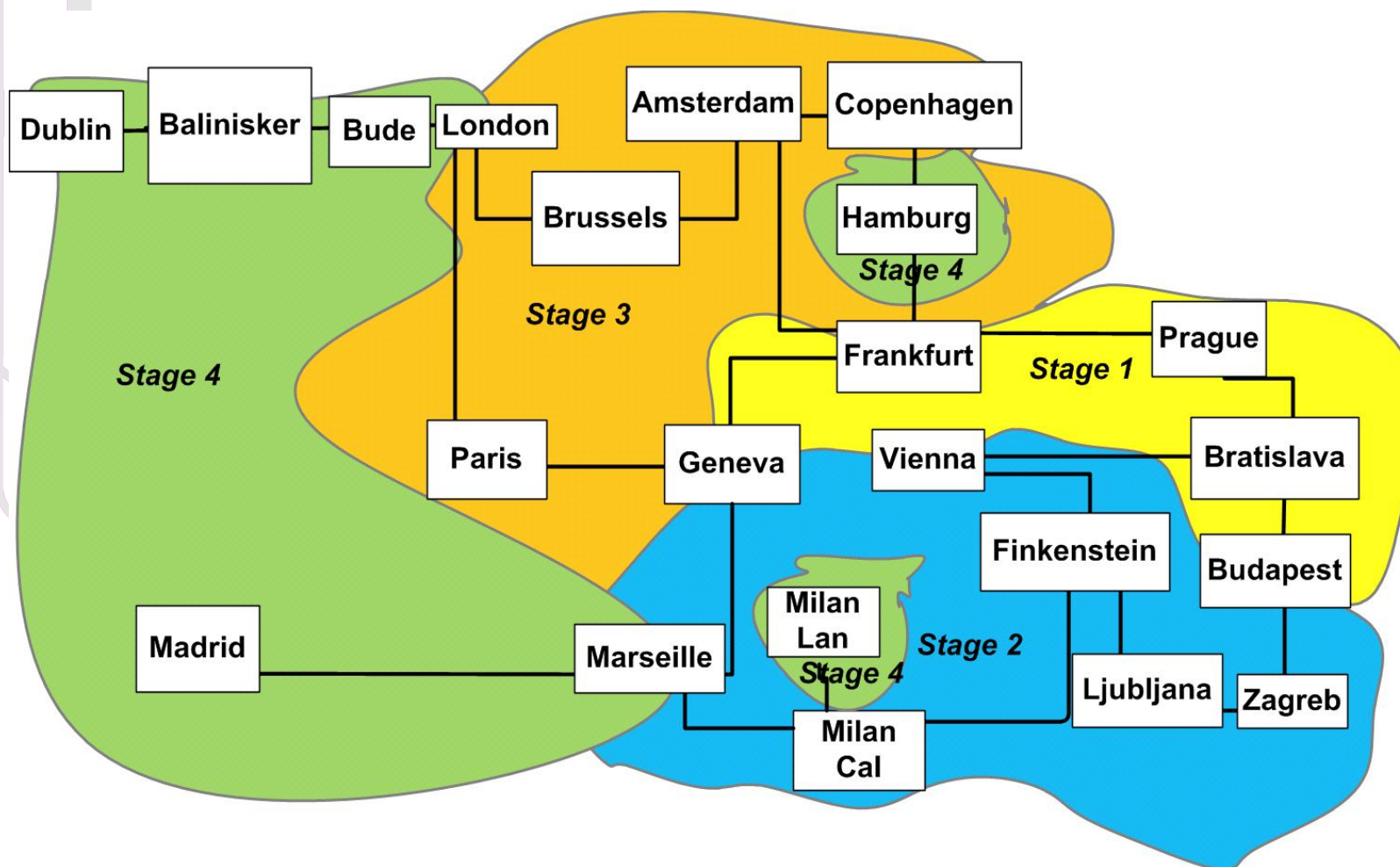


High density client interfaces
50 x 10Gb per OTM card
(Yellow Fibre)

500G Line Fibres (Red)



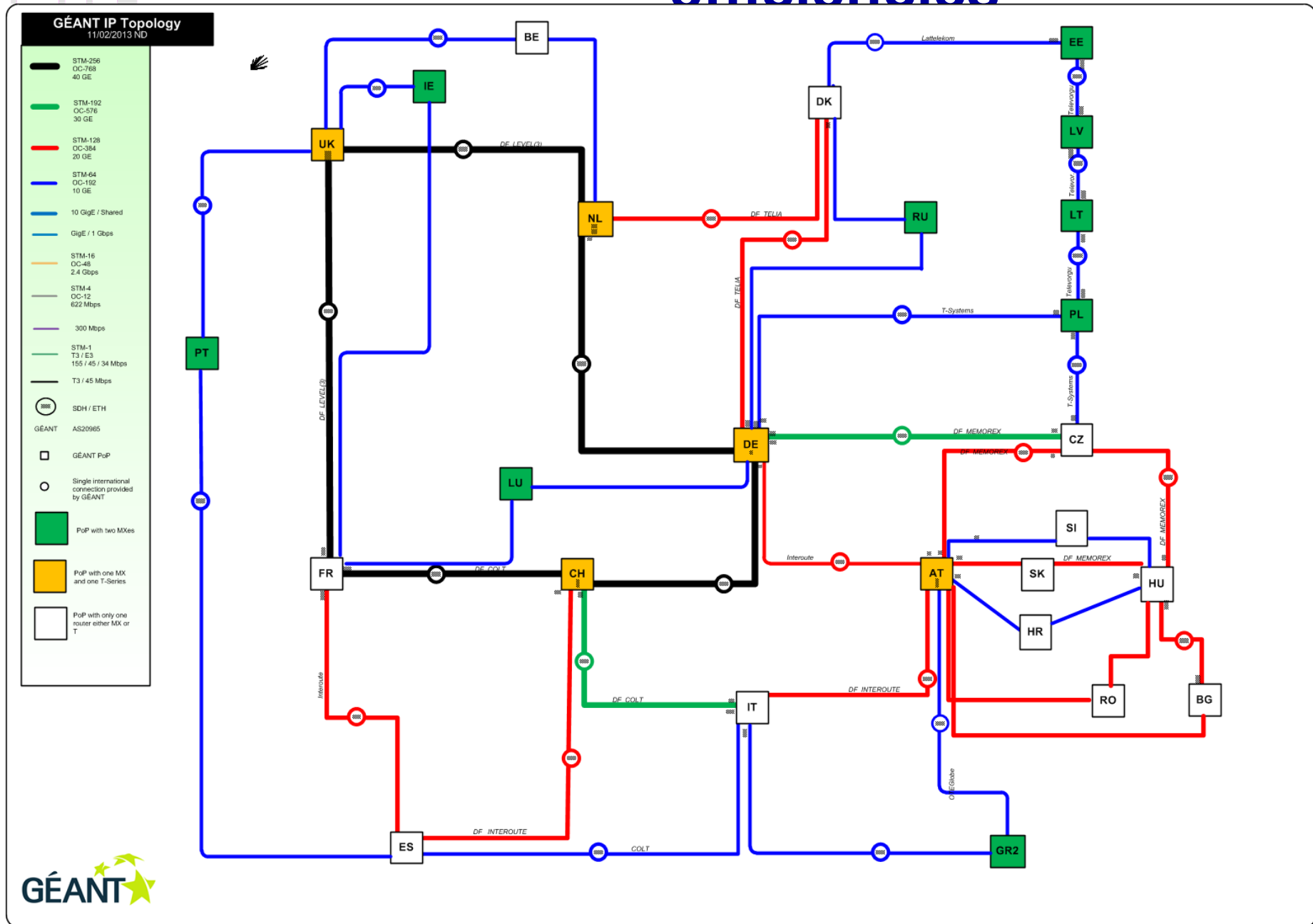
- 1 x 1626 Main Shelf = 8x10Gbs
- 1 x Card on DTNX= 50x10Gbs



NORDUnet

Nordic infrastructure for Research & Education

Potential for operational efficiencies



- Largely unchanged
- Introducing “Additional Access PoP”
 - i.e., multiple PoPs in a country
 - First: Milan (done)
 - Second: Hamburg (in progress)
- NORDUnet to connect at Hamburg
 - Future of GÉANT Copenhagen POP?

- GN3+ is important to Nordic NREN's
 - Direction of European networking
 - Partnerships
 - Resources for doing fun stuff
 - Building community
 - Maintain Nordic leadership

