



PCTY2011



Pulse Comes to You

Optimising the World's Infrastructure

Infrastructure and Application Performance Architecture at BT



Phill Radley
Chief Architect – Network Performance Reporting
BT Innovate and Design

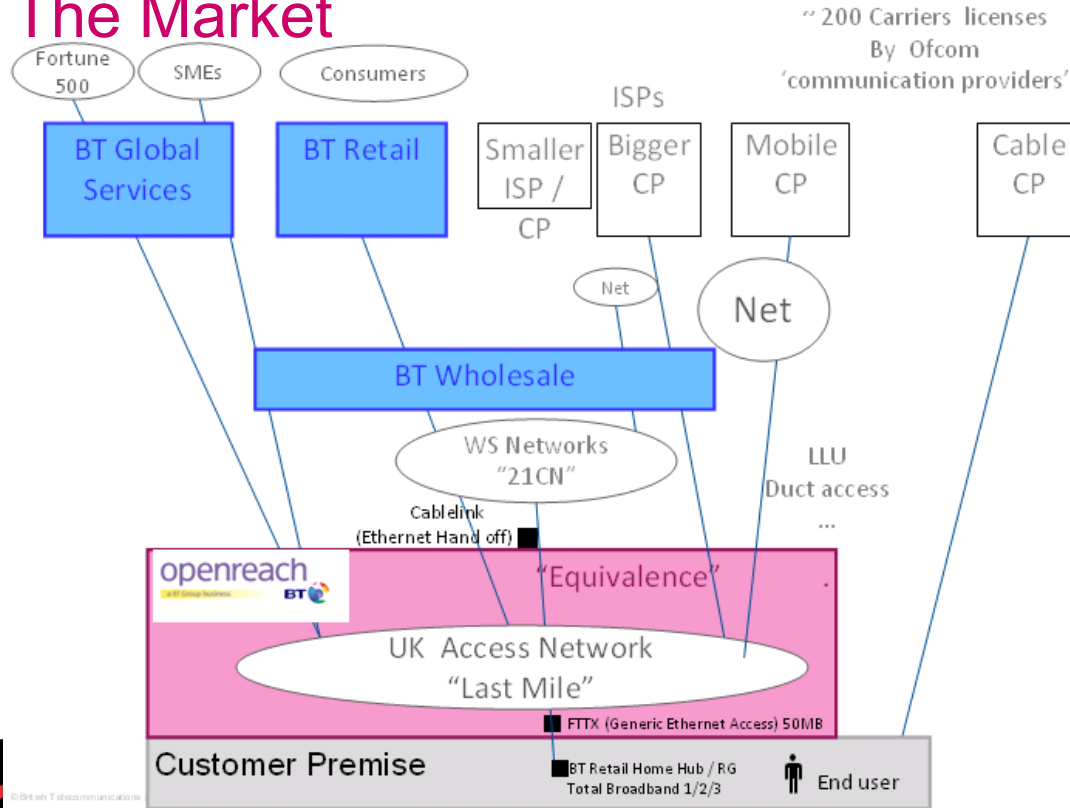




Agenda

- BT (organisation & architecture)
- BT Infrastructure
- BT Applications and TNPM/Proviso
 - Overview of Deployments

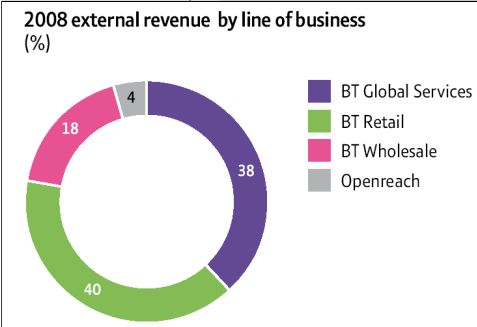
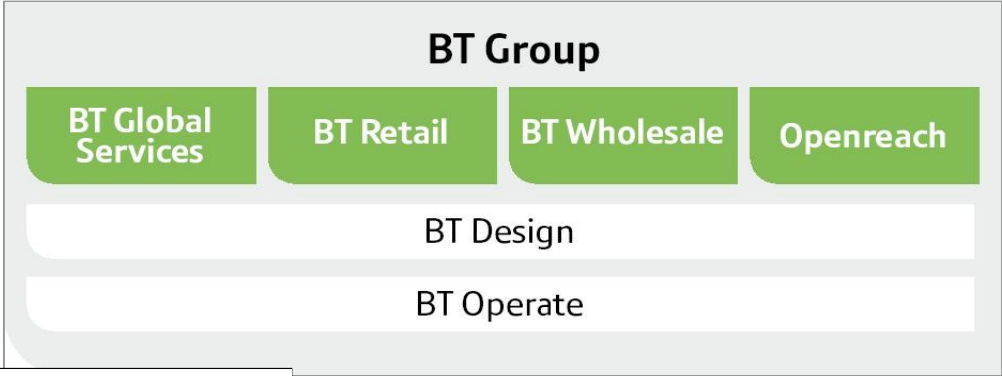
About BT – The Market





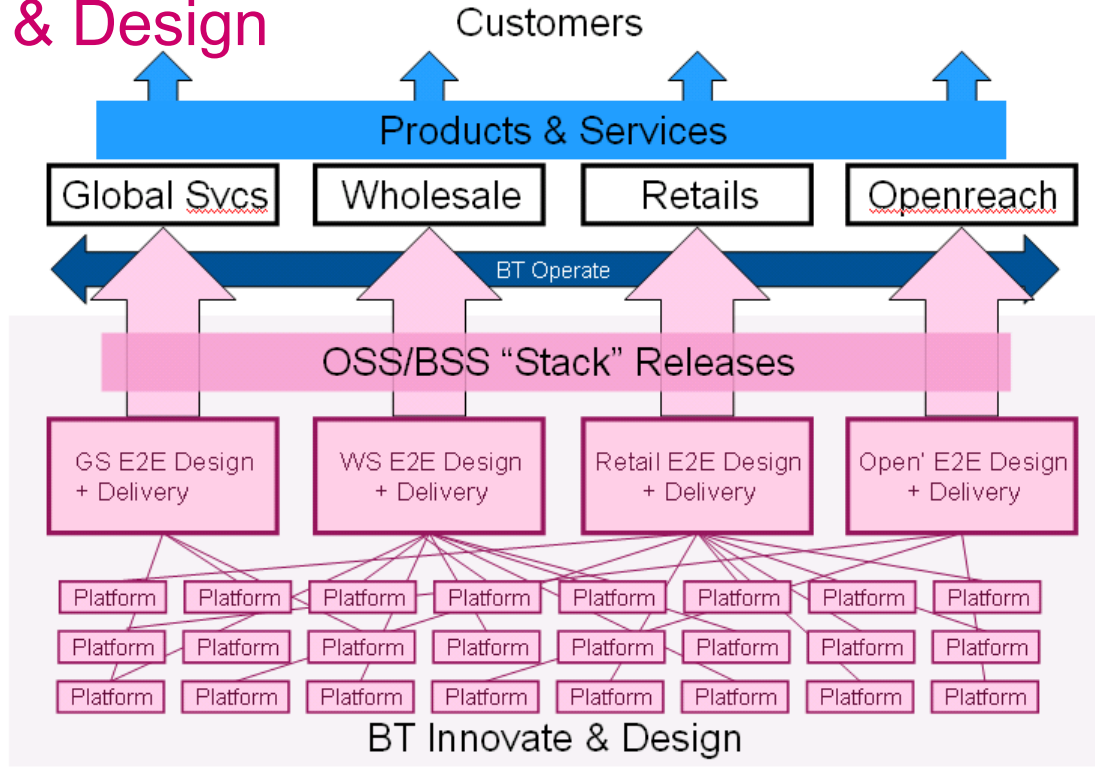
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- Lines of Business “ 6 **LoBs**”
- Market Facing Units “ 4 **MFUs**”

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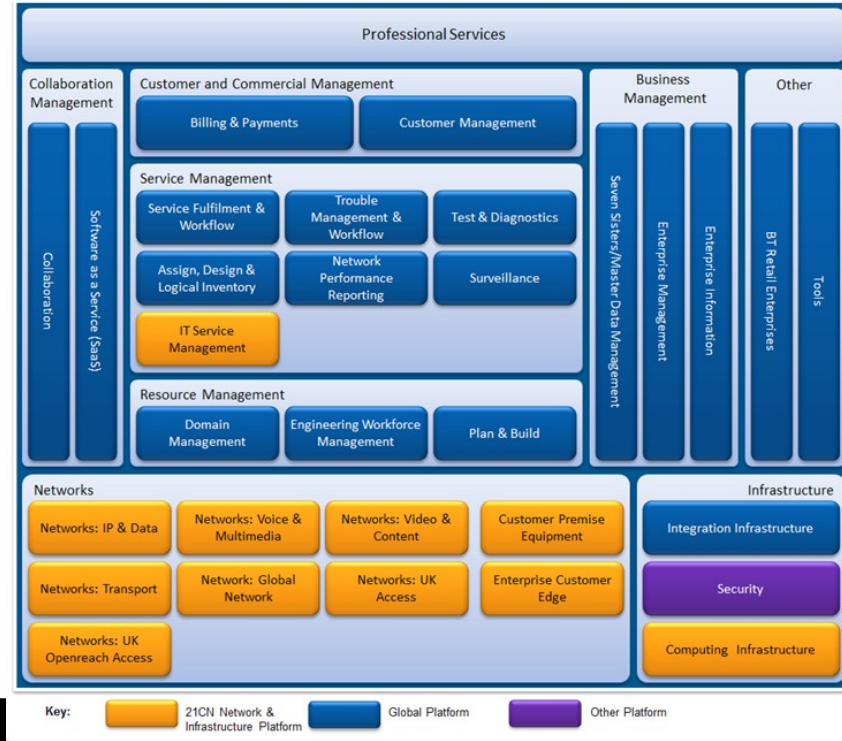
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BT Innovate & Design – Platform Architecture



Platforms Contain

- All relevant systems
- All “experts”
- Communicate using SOA + EDM



Physical Infrastructure

4 Million poles
~ 25,000 p.a.
120M KM of
copper



200,000
'person'-holes

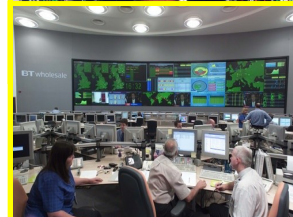
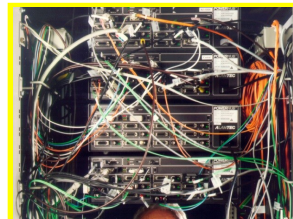


80,000 cabinets
as in 'FTTC'



56,000 vehicles

Every day 25,000 engineers visit 11,000 homes and offices
and climb the height of Everest up telegraph poles !

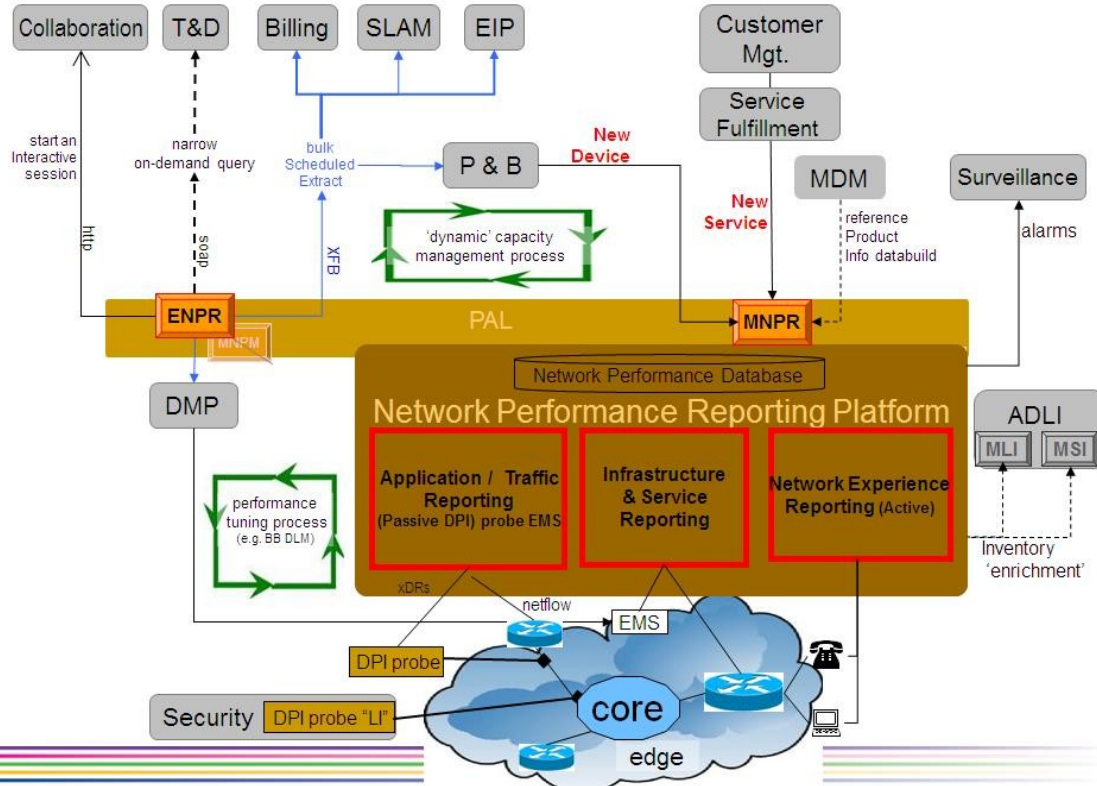


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Network Performance Reporting Reference Architecture (Logical)



Architecture Implementation Strategy....

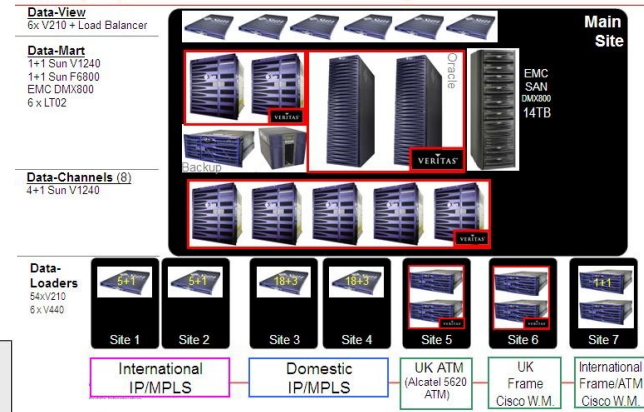
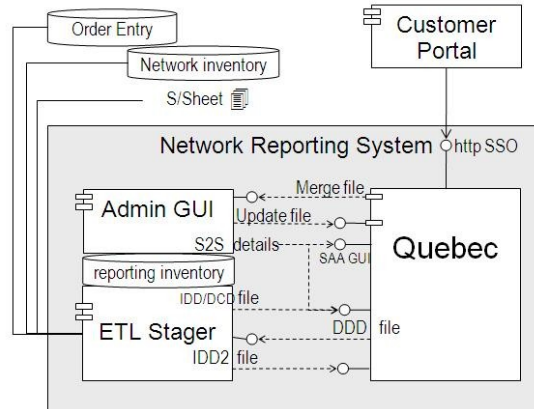
- NFM Platform owns ~ 100 PM systems which go back 15+ years these are a mix of in-house, open source and COTS
- Current BT Strategy for Network Infrastructure Reporting is to use to IBM Tivoli Network Performance Manager as the rule of one
- Aging systems are migrated to TNFM as part of system rationalisation roadmaps, sometimes a small legacy SNMP system can be hosted on a much larger Proviso, other times a large migration project is needed (eg to avoid maintenance or upgrade charges from another COTS vendor)
- New business needs (NGA/FTTC) are delivered using TNFM
-
-



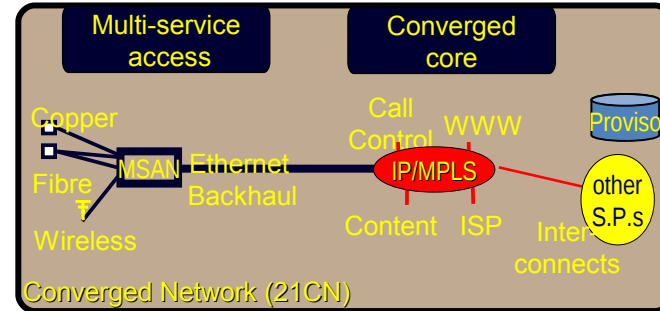
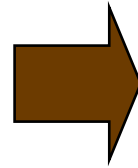
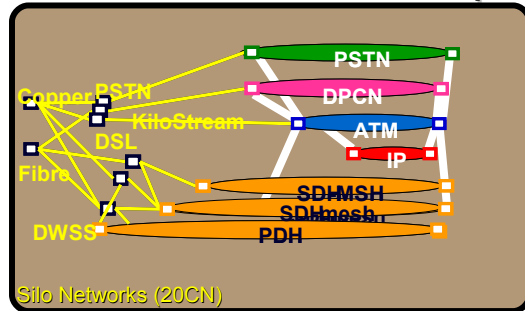
#1. "Quebec" Application=GS MPLS, UK Frame/ATM



- Go-Live April 2004
- 'bolt-on' to legacy OSS stacks using an ETL to collate inventory from relevant systems
- Apx 1.4M resources
- 90 day RAW
- Inventory provides device and interface, filtered discovery used for COS (apx 0.5M cos ques)



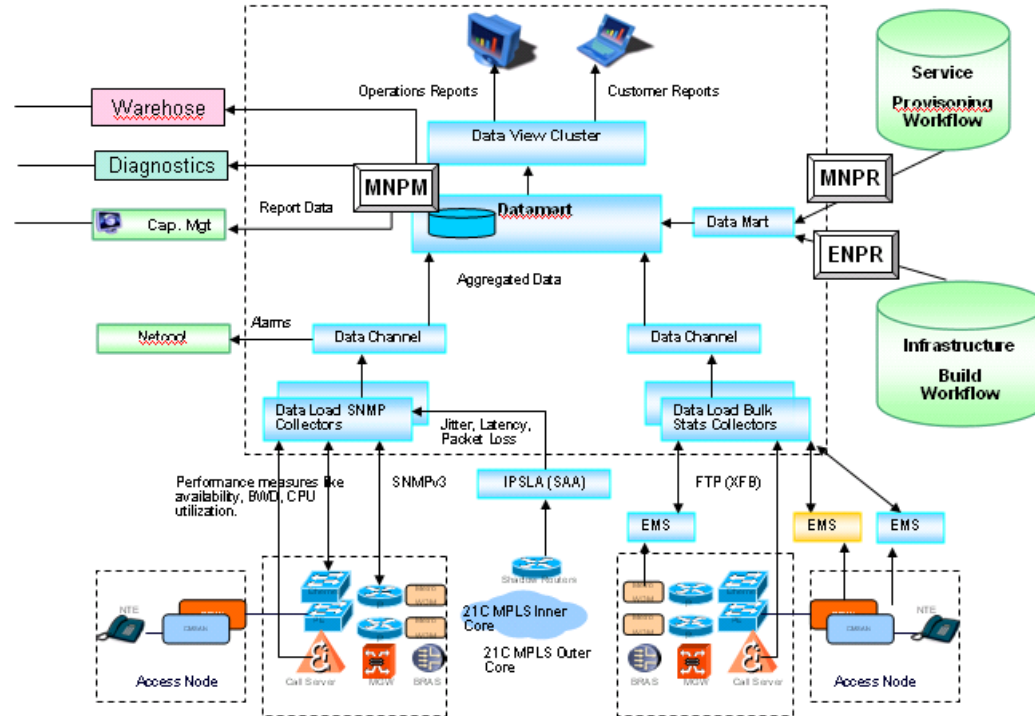
20CN Separate networks for each service



- "21st Century Network": converged core with many applications overlaid
- - Voice (PSTN & VoIP)
- - Data (MPLS, DSL/Broadband)
- - Carrier Ethernet (esp. Mobile Backhaul)
- - VoD (Cisco CDN)
- - IPTV – Multicast IP (BT Vision / Canvas / Youview)

#2 "Net.Health 21" Application= WS 21st Century Network

- Go Live 2006
- Multiple OSS feeds
- First use of SOA wrappers





#2 "Net.Health 21" Application= WS 21st Century Network

Processor Occupancy View

Name T	SNE_ID	U11	Last Time	Last Value	Dir	Max	Max Time
18728_aheth11ub_aheth11skt1	187286	BNPE	17/09/09 12:30	0	-	1	17/09/09 08:00
18728_aheth11ub_aheth11skt2	187286	BNPE	17/09/09 12:30	3	--	6	17/09/09 02:30
18728_aheth11ub_aheth11skt3	187286	BNPE	17/09/09 12:30	9	--	11	17/09/09 12:16
18728_aheth11ub_aheth11skt4	187286	BNPE	17/09/09 12:30	0	--	1	17/09/09 05:00
18728_aheth11ub_aheth11skt5	187286	BNPE	17/09/09 12:30	0	--	1	17/09/09 02:45
18728_aheth11ub_aheth11skt6	187286	BNPE	17/09/09 12:30	1	--	1	17/09/09 06:00
18729_aheth11ub_aheth11skt1	187729	NEA	17/09/09 14:00	0	●	2	17/09/09 08:00
18729_aheth11ub_aheth11skt2	187729	NEA	17/09/09 14:00	0	●	1	17/09/09 03:45
18729_aheth11ub_aheth11skt3	187746	SDX	17/09/09 14:00	3	●	1	17/09/09 07:45
18729_aheth11ub_aheth11skt4	187746	SDX	17/09/09 14:00	0	●	1	17/09/09 06:45
18729_aheth11ub_aheth11skt5	187746	SDX	17/09/09 14:00	1	●	2	17/09/09 00:00
18729_aheth11ub_aheth11skt6	187746	SDX	17/09/09 14:00	0	●	2	17/09/09 07:30
18729_aheth11ub_aheth11skt7	187746	SDX	17/09/09 14:00	8	●	6	17/09/09 10:30
18729_aheth11ub_aheth11skt8	187746	SDX	17/09/09 14:00	0	●	1	17/09/09 00:00
18729_aheth11ub_aheth11skt9	187923	BVC	17/09/09 14:00	0	●	5	17/09/09 00:45
18729_aheth11ub_aheth11skt10	187923	BVC	17/09/09 14:00	0	●	3	17/09/09 08:15
18729_aheth11ub_aheth11skt11	187929	MLZA	17/09/09 14:00	0	●	3	17/09/09 04:00
18729_aheth11ub_aheth11skt12	187929	MLZA	17/09/09 14:00	0	●	1	17/09/09 00:45
18730_aheth11ub_aheth11skt1	187939	AAZ	17/09/09 14:00	0	●	6	17/09/09 00:15
18730_aheth11ub_aheth11skt2	187939	AAZ	17/09/09 14:00	0	●	2	17/09/09 05:45
18730_aheth11ub_aheth11skt3	187939	AAZ	17/09/09 14:00	0	●	6	17/09/09 00:15
18730_aheth11ub_aheth11skt4	187939	AAZ	17/09/09 14:00	0	●	1	17/09/09 10:45
18731_aheth11ub_aheth11skt1	187941	OCE	17/09/09 14:00	0	●	2	17/09/09 01:00
18731_aheth11ub_aheth11skt2	187941	OCE	17/09/09 14:00	0	●	2	17/09/09 03:45
18802_aheth11ub_aheth11skt1	188024	LJZA	17/09/09 14:00	0	●	1	17/09/09 07:30
18802_aheth11ub_aheth11skt2	188024	LJZA	17/09/09 14:00	0	●	2	17/09/09 03:45
18802_aheth11ub_aheth11skt3	188024	LJZA	17/09/09 14:00	0	●	1	17/09/09 01:00
18802_aheth11ub_aheth11skt4	188024	LJZA	17/09/09 14:00	5	●	1	17/09/09 06:45

Performance Management Reporting

[HOME]

Calendar: February 2009

Processor Occupancy View Resource Summary Report
Date: 17 Sep 09
Period: Daily

Network Diagram: Shows a central MPLS Inner Core and MPLS Outer Core connected to various nodes including Edge WDM, Core DWDM, P-Routers, PE Routers, SDXC, MGW, Call Server, SBR, and I-Node. Access nodes like FMSAN, AMSAN, and NTE are also shown.

Technology	Ethernet Technology	MPLS Technology	System Technology	SDH/SONET Technology	IP Technology
			Reports Available		
			Device View - System Summary		
			Device View - BRAS Subscriber Report		
			Device View - Environmental Stats		
			Device View - Disk Storage Utilization		
			1st Drill Down Level		



Info

#2 "Net.Health 21" Application= WS 21st Century Network

Name ^	Device Availability (Percent)		CPU Utilization (Percent)		Memory Utilization (Percent)		NVRAM Utilization (Percent)		Temperature (Celsius)		Voltage Level	
	avg		max	avg	max	avg	max	avg	max	avg	max	avg
BRAS	99.839	●	73.000	4.305	53.000	27.150	--	--	57.00	32.88	9.99	2.47
Broadband Ethernet Aggregator	100.000	●	7.000	0.817	24.000	19.457	2.15	1.89	51.00	25.12	0.00	0.00
Call Server	--	--	--	--	--	--	--	--	--	--	--	--
CMSANs	--	--	57.000	23.438	68.000	55.319	--	--	59.00	46.31	--	--
Edge Ethernet Switch	--	--	--	--	--	--	--	--	--	--	--	--
Ethernet Aggregators	100.000	●	100.000	5.102	8.000	3.583	61.00	16.96	46.00	20.63	--	--
FER	100.000	●	5.000	1.027	24.000	18.849	3.59	2.11	46.00	22.56	0.00	0.00
FMSANs	--	--	--	--	--	--	--	--	--	--	--	--
FSP 150CCf-825	--	--	--	--	--	--	--	--	--	--	--	--
FSP 150CM 4U	--	--	--	--	--	--	--	--	--	--	--	--
FSP 150CPMR	--	--	--	--	--	--	--	--	--	--	--	--
Infrastructure Ethernet	99.015	●	17.000	1.203	28.000	18.802	4.39	1.49	124.90	23.13	0.02	0.00
Infrastructure Ethernet Aggregator	100.000	●	99.000	4.833	7.000	3.480	54.00	18.56	51.00	19.44	--	--
LNS	--	--	--	--	--	--	--	--	--	--	--	--
Media Gateways	100.000	●	11.000	2.321	89.000	33.526	--	--	38.00	25.95	3.34	1.68
P Routers	99.994	●	100.000	1.767	75.000	27.650	75.00	16.72	12.05k	810.36	12.08	2.57
PE Routers	99.983	●	72.000	2.071	100.000	25.368	21.00	14.05	39.00	13.30	12.04	2.45
PMR	100.000	●	--	--	34.000	27.875	34.00	24.45	51.00	26.71	5.32	3.07
SDH	--	--	--	--	--	--	--	--	--	--	--	--
WDM	--	--	--	--	--	--	--	--	--	--	--	--

Export CSV

#3 – “Yukon” Application = Openreach NGA/FTTC Broadband



- Go Live 2008 (actually started on NH21)
- Simpler network MSANs (Huawei/ECI)
- Simpler OSS integration
- Forecast to grow 5M+
- Proviso 4.4.3
- Full Sun Blade Deployment (T6340 + Sol 10containers)
- PM data used to tune the DSL profiles every day DV-API !!
- First Entirely BT deployment, offshore dev.

The screenshot shows the 'YUKON NGA Performance Monitoring' application. The main interface includes a calendar for July 2010, a navigation pane, and a central network diagram. The diagram shows a 'Welcome Router' connected to a 'VDSL2 Modem' (TR-069), which is connected to 'NH21' (SNMP) and 'CP CPE'. A 'FTTC cab' is also shown. A secondary window displays a 'System Utilization Report' for 'DSLAM MA5603T_NAAAM'. The report includes a table for 'CPU and Memory Utilization'.

Device	max	avg	Reported	max	avg	Reported
6113121401_0004CPE_4-4_3800300E	21.00	17.00	OK	36.00	36.00	OK
6113121401_0004CPE_4-4_3800300E	22.00	17.00	OK	36.00	36.00	OK

#4 – Ontario (GS Managed Services)



- Go Live 16/Feb/2011 !!
- First TNPM 1.3 (offshore dev team)
- Expanded use of self-service (e.g. for threshold setting with properties)
- Sun/Solaris for DC/DM and Intel/Linux for SNMP Pollers

The screenshot displays the 'Probe Admin Report' interface. At the top, it says 'Welcome TEST_UAT' and 'Reporting Daily: Feb 24, 2011'. There are navigation links for 'Probe Summary Report', 'Probe Advanced Search Report', and 'Probe Threshold Report'. A 'Check' button is visible. Below these is a search filter area with a text input and a 'Filter Results' button. A table lists configuration items with columns: Name, Site Name, Class Name, Threshold Enable, Trap Enable, Jitter Threshold, Round Trip Delay Threshold, Packet Delivery (%) Threshold, and N/A. The table contains five rows of data for the TECHMAHINDRA site.

Name	Site Name	Class Name	Threshold Enable	Trap Enable	Jitter Threshold	Round Trip Delay Threshold	Packet Delivery (%) Threshold	N/A
PROBE-bog3-r-techmahind-01_10.80.161.2_20_jitter	TECHMAHINDRA	20	YES		500	500	90	--
PROBE-bog3-r-techmahind-01_10.80.161.2_22_jitter	TECHMAHINDRA	22	YES	YES	500	500	90	--
PROBE-bog3-r-techmahind-01_10.80.161.2_23_jitter	TECHMAHINDRA	23	YES		500	500	90	--
PROBE-bog3-r-techmahind-01_10.80.161.2_24_jitter	TECHMAHINDRA	24	YES		500	500	90	--
PROBE-bog3-r-techmahind-01_10.80.161.2_25_jitter	TECHMAHINDRA	25	YES		500	500	90	--

Export CSV



Questions?



Bringing it all together