US CMS Tier1 Network

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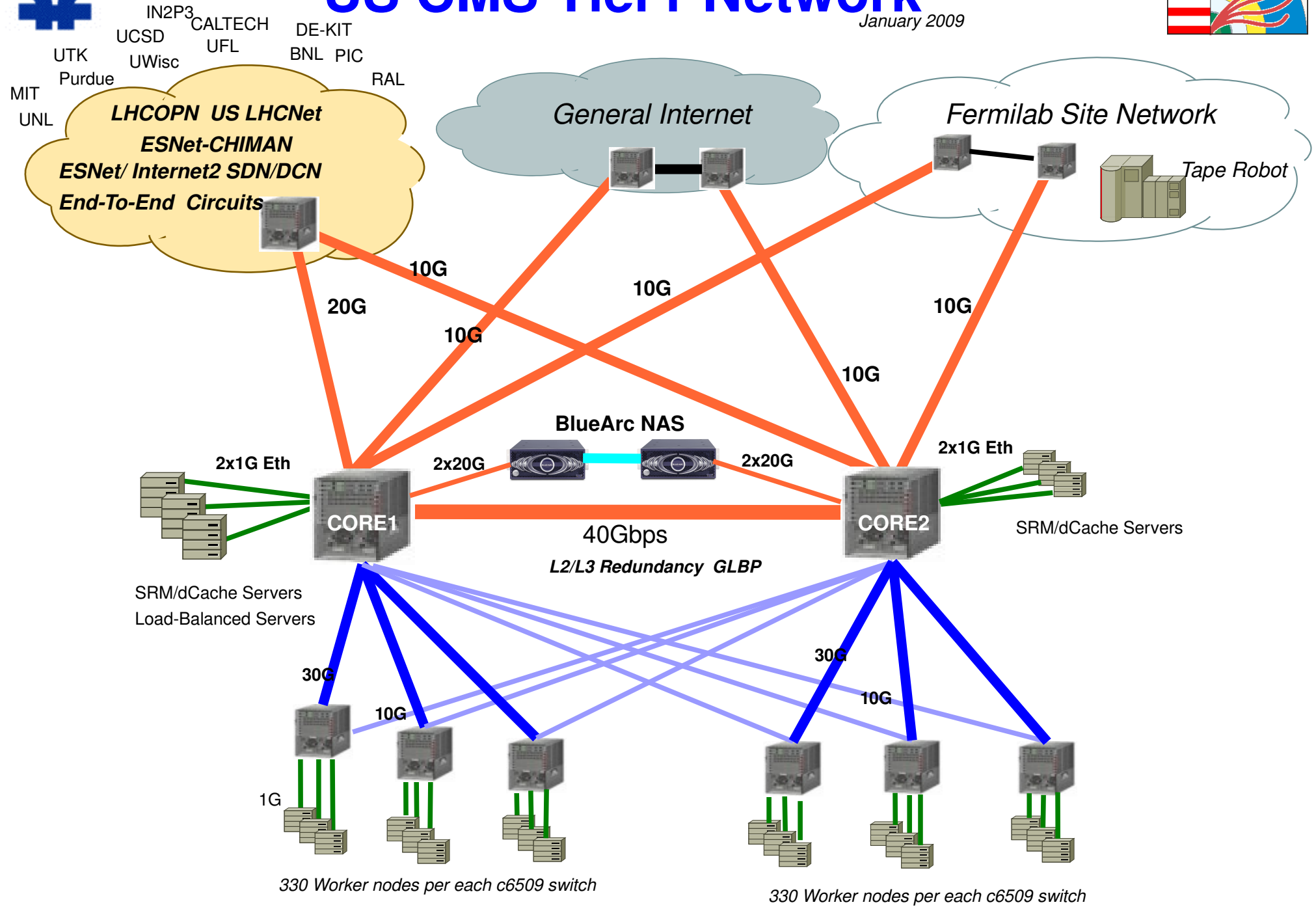
US CMS Tier1 Network

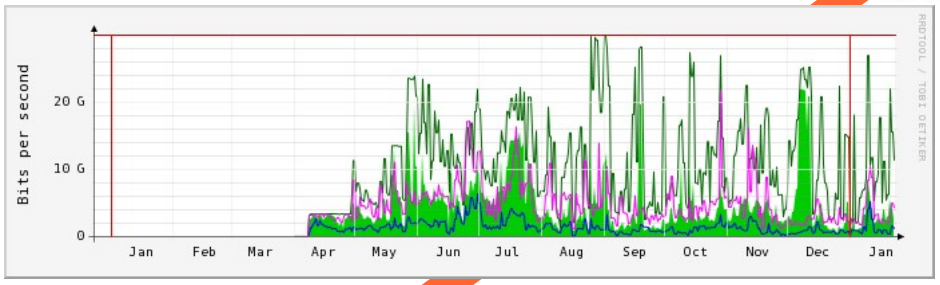
January 2009

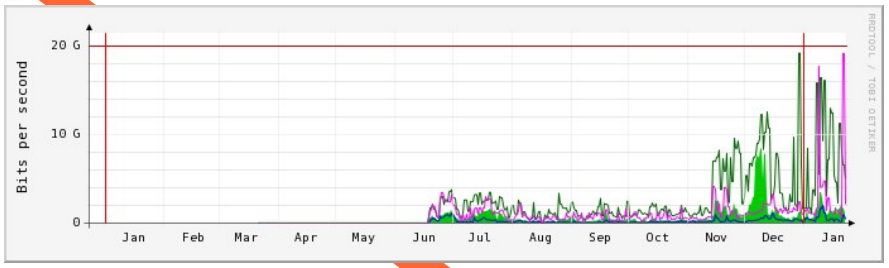


USCMS Tier1 Network

Bandwidth Utilization at the core

R-CMS-FCC2-3



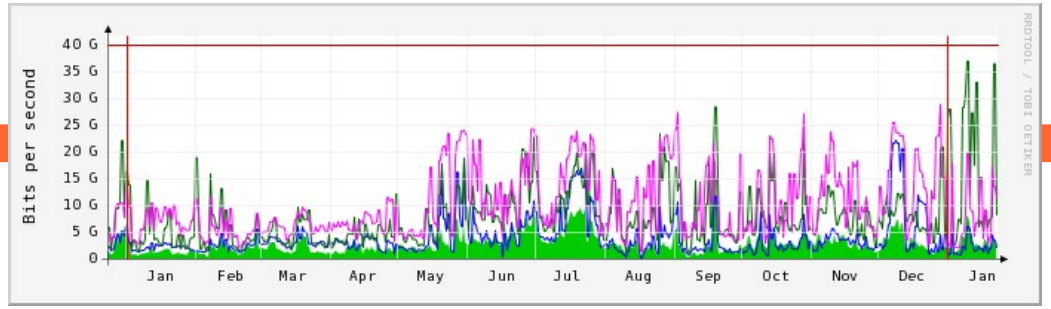


EtherChannels

30Gbps

20Gbps

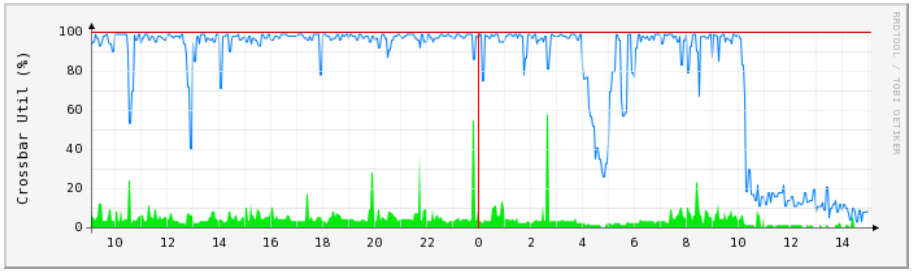
40Gbps



R-CMS-FCC2

R-CMS-FCC2-2

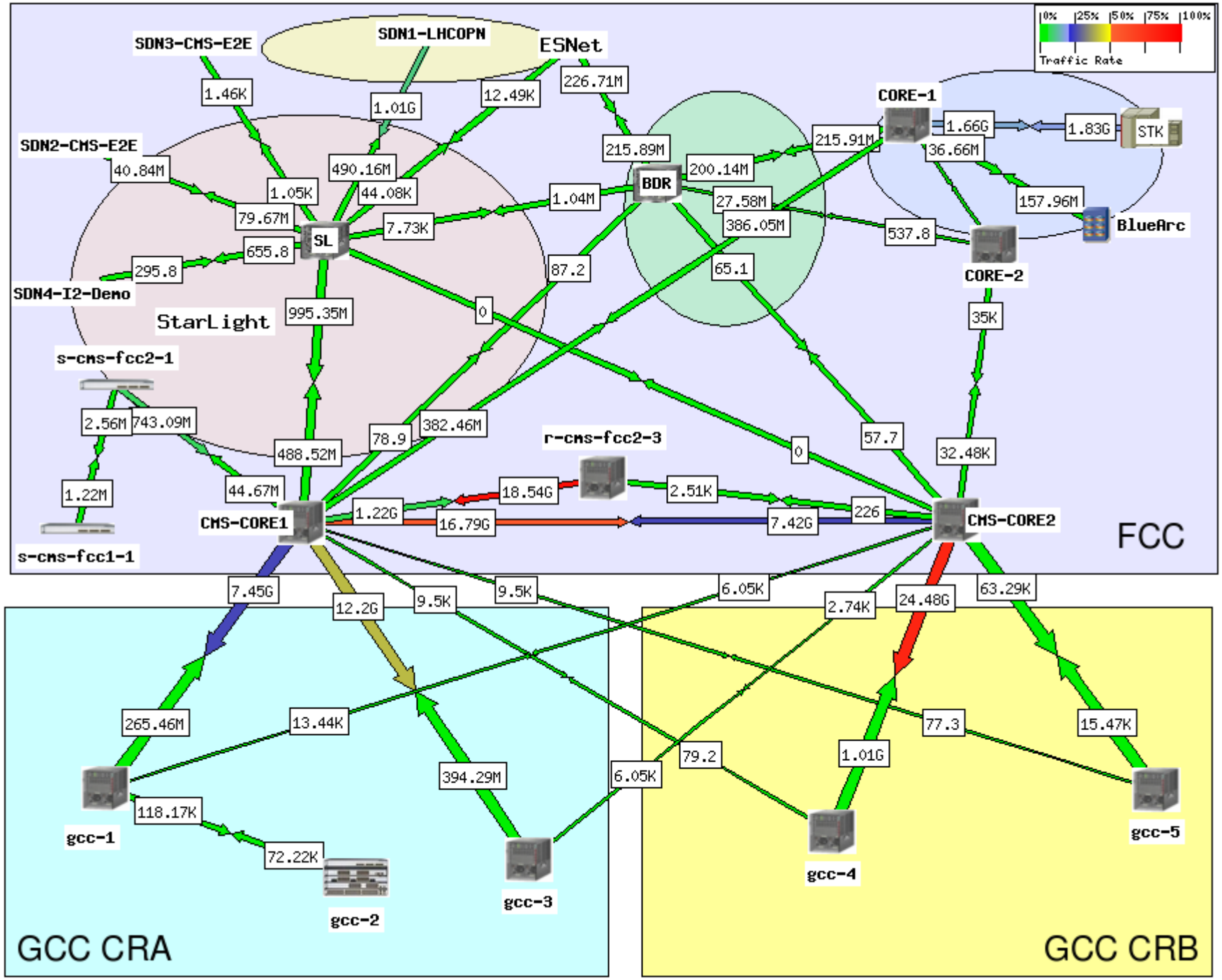
Crossbar Utilization



Highlights of current status

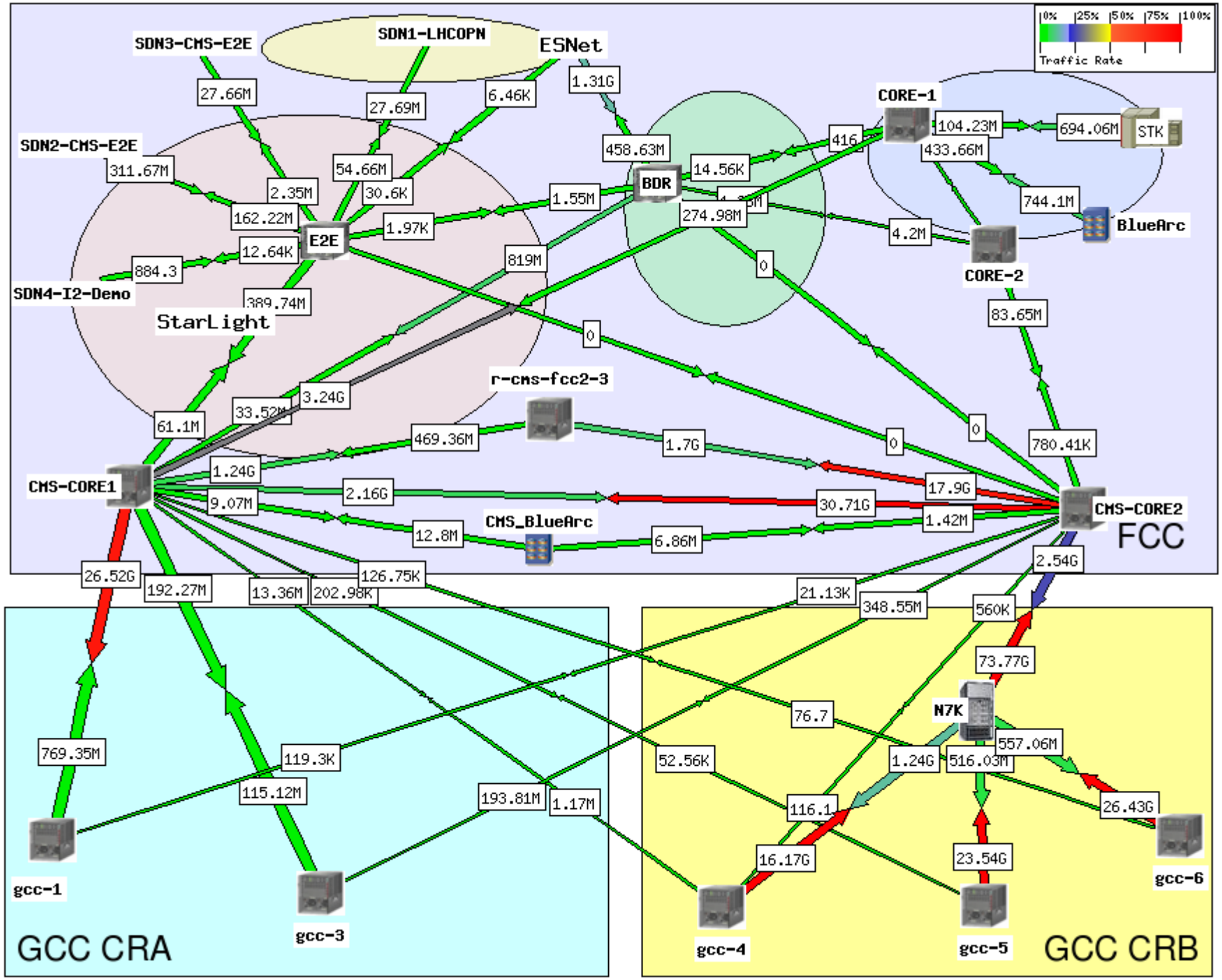
- Two core C6509 switches for 10G aggregation, interconnected by 40Gbps
- 2 x10G to the Site Network
- 2 x 10G to the Border Router
- 20G + 10G toward ESNET CHIMAN and USLHCNET, SDN/DCN/E2E circuits
- ~1600 end systems
- 2X1G for disk storage nodes
- *2X 20G for BlueArc storage*
- Satellite c6509 switches connected by 40G (30Gbps + 10Gbps), architected to use full 40G bandwidth
- Redundancy/loadsharing at L2 and L3 (GLBP)
- IOS based Server Load Balancing
- ~12 SDN/DCN End-To-End Circuits
- ***Very limited capabilities left to extend 10G aggregation at the core***
- ***Evaluation of Cisco Nexus 7000 is in progress***

CMS LAN Network Weather Map (5min)

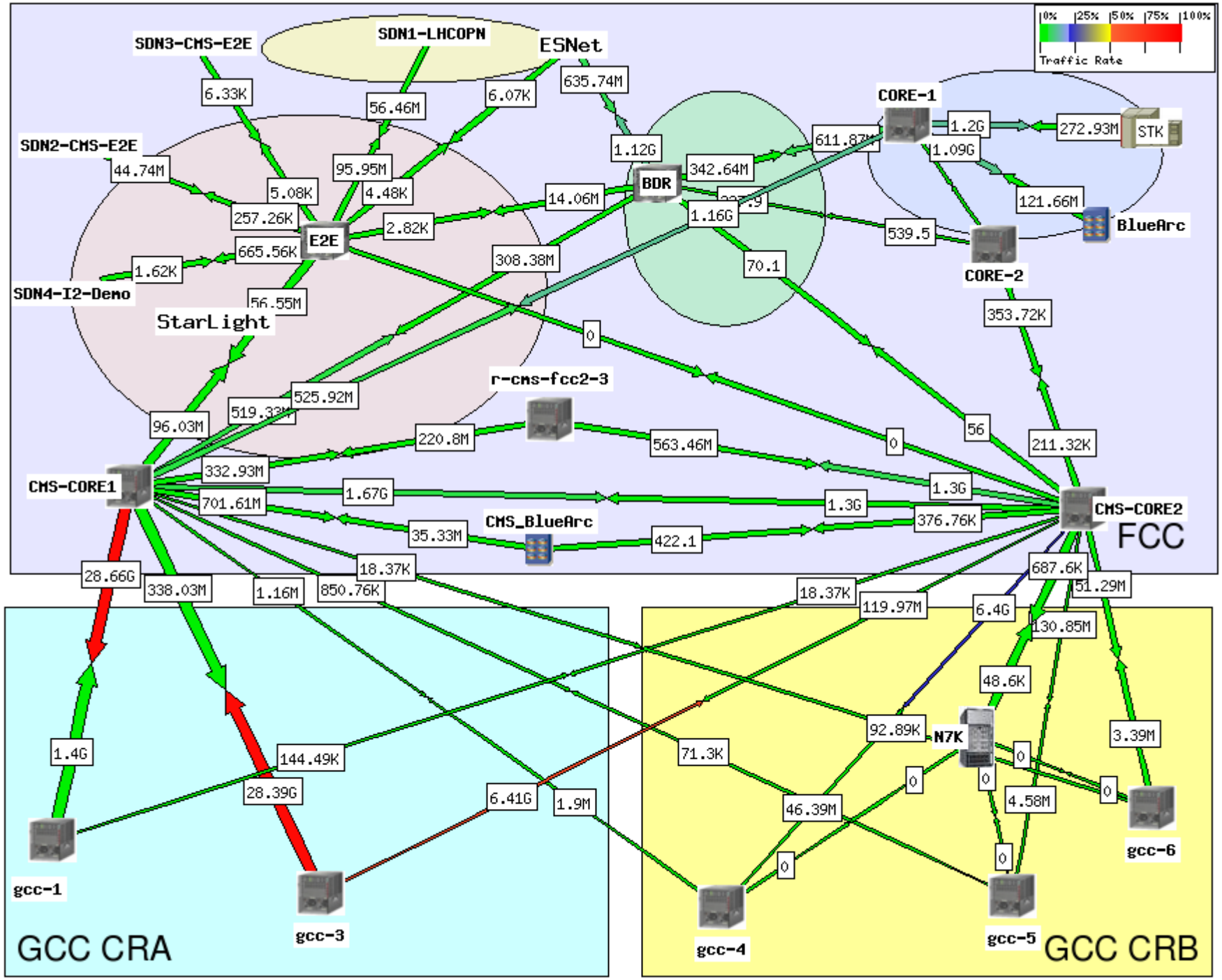


Created: May 22 2008 10:45:02

CMS LAN Network Weather Map (1min)



CMS LAN Network Weather Map (5min)



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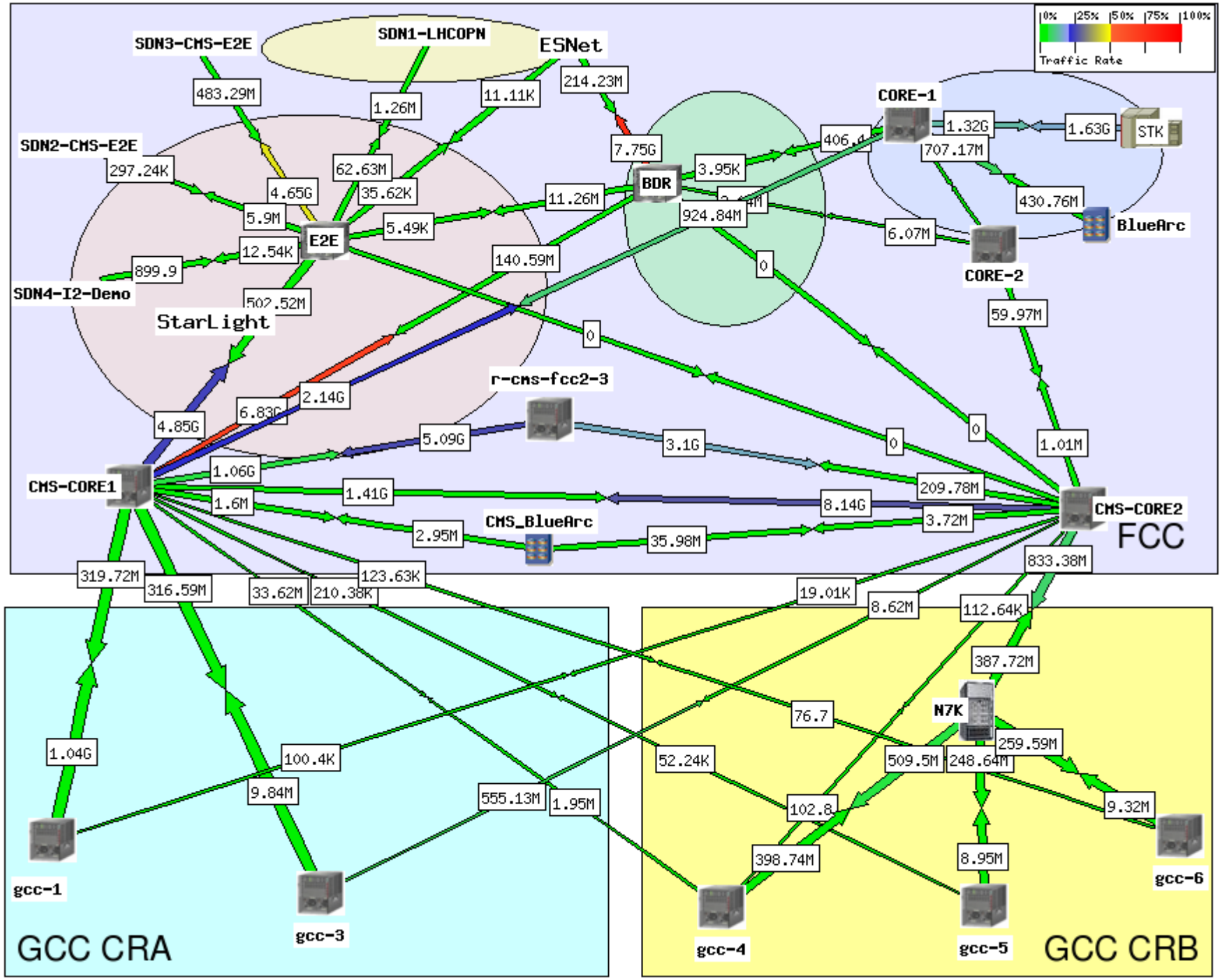
CMS LAN Network Weather Map (1min)



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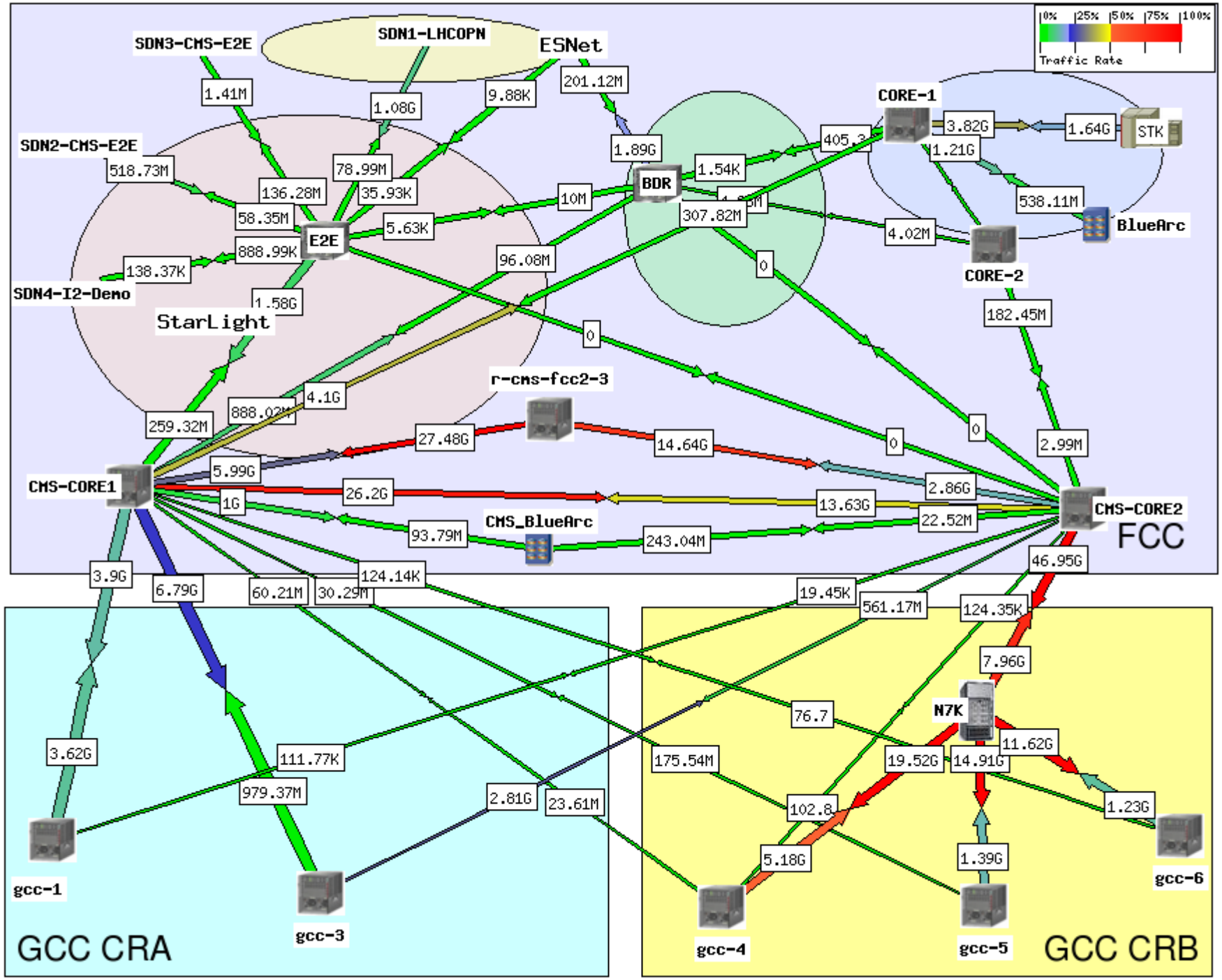
CMS LAN Network Weather Map (1min)



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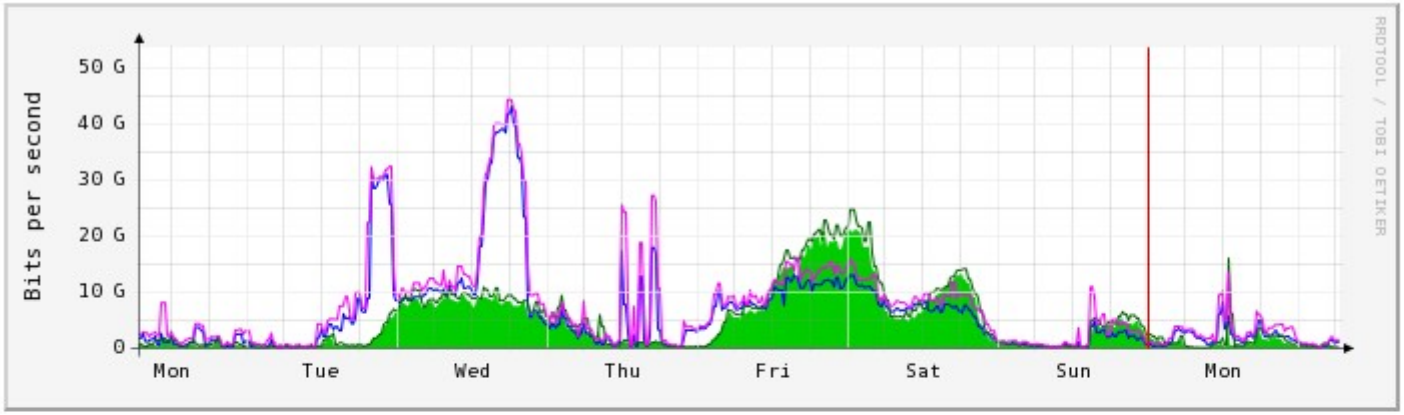
Port-channel7 N7K_Channel -- r-cms-fcc2-2.fnal.gov

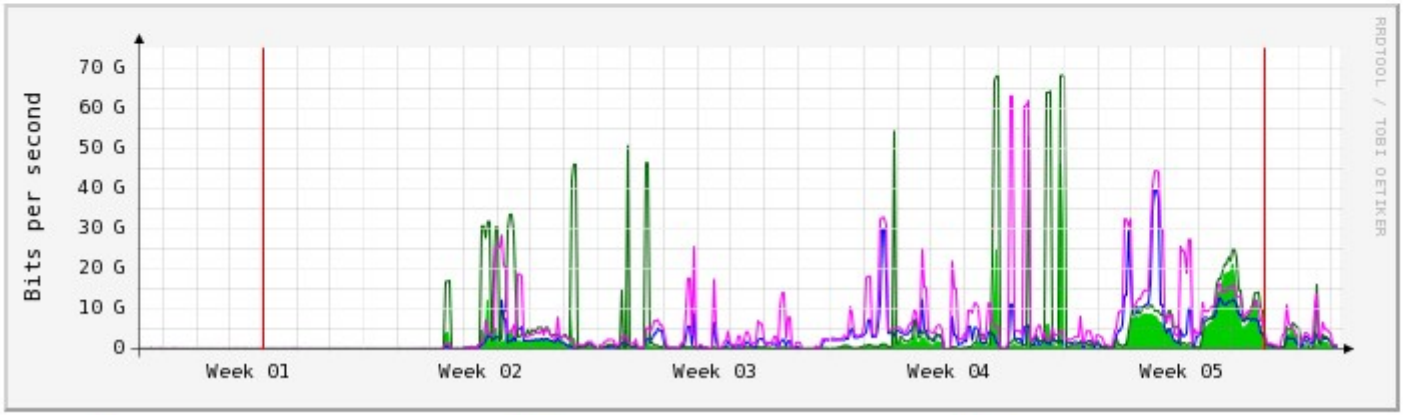
A 46.95Gbps – CMS Production traffic, 73Gbps – iperf tests

`Weekly' Graph (30 Minute Average)



Max In: 21.1 Gb/s (26.4%) Average In: 4136.2 Mb/s (5.2%) Current In: 77.2 Mb/s (0.1%)
Max Out: 43.2 Gb/s (54.0%) Average Out: 6039.3 Mb/s (7.5%) Current Out: 1188.6 Mb/s (1.5%)

`Monthly' Graph (2 Hour Average)



Max In: 46.1 Gb/s (57.6%) Average In: 1681.2 Mb/s (2.1%) Current In: 343.4 Mb/s (0.4%)
Max Out: 39.6 Gb/s (49.5%) Average Out: 2530.6 Mb/s (3.2%) Current Out: 973.0 Mb/s (1.2%)

Conclusion is on the slide 4