

Created: Oct 23 2009 12:20:36



E2E Circuit Support at FNAL

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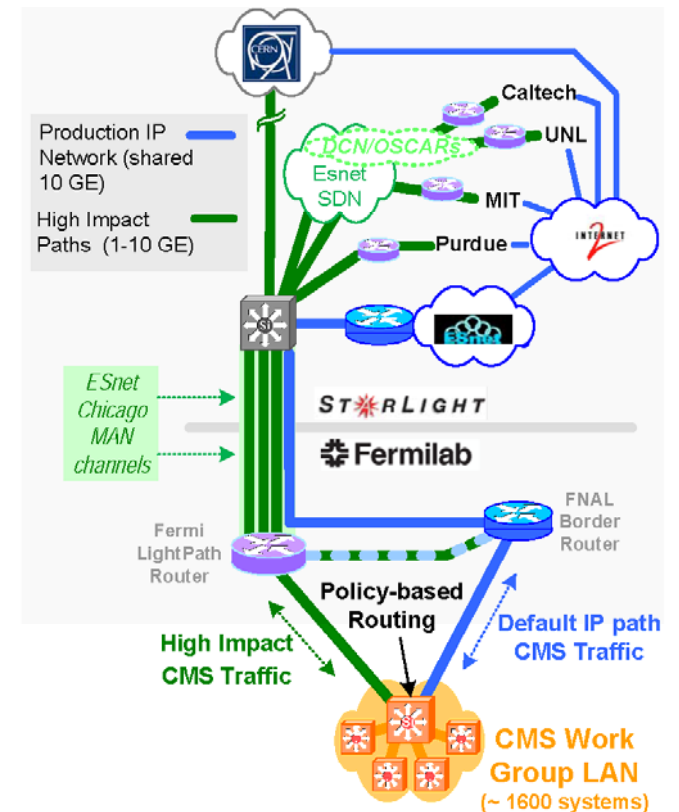
Summer ESCC Meeting

June 22, 2010



End-to-End Data Circuits at FNAL

Circuit	Country	Affiliation	BW
LHCOPN	Switzerland	T0	8.5G
LHCOPN Secondary	Switzerland	T0	8.5G
LHCOPN Backup	Switzerland	T0	3.5G
DE-KIT	Germany	T1	1G
IN2P3	France	T1	2x1G
ASNet/ASGC	Taiwan	T1	2.5G
CALTECH	USA	T2	10G
Purdue	USA	T2	10G
UWISC	USA	T2	10G
UFL	USA	T2	10G
UNL	USA	T2	10G
MIT	USA	T2	10G
UCSD	USA	T2	10G
TIFR	India	T2	1G
UTK	USA	T3	1G
McGill	Canada	CDF/D0	1G
Cesnet, Prague	Czech	D0	1G



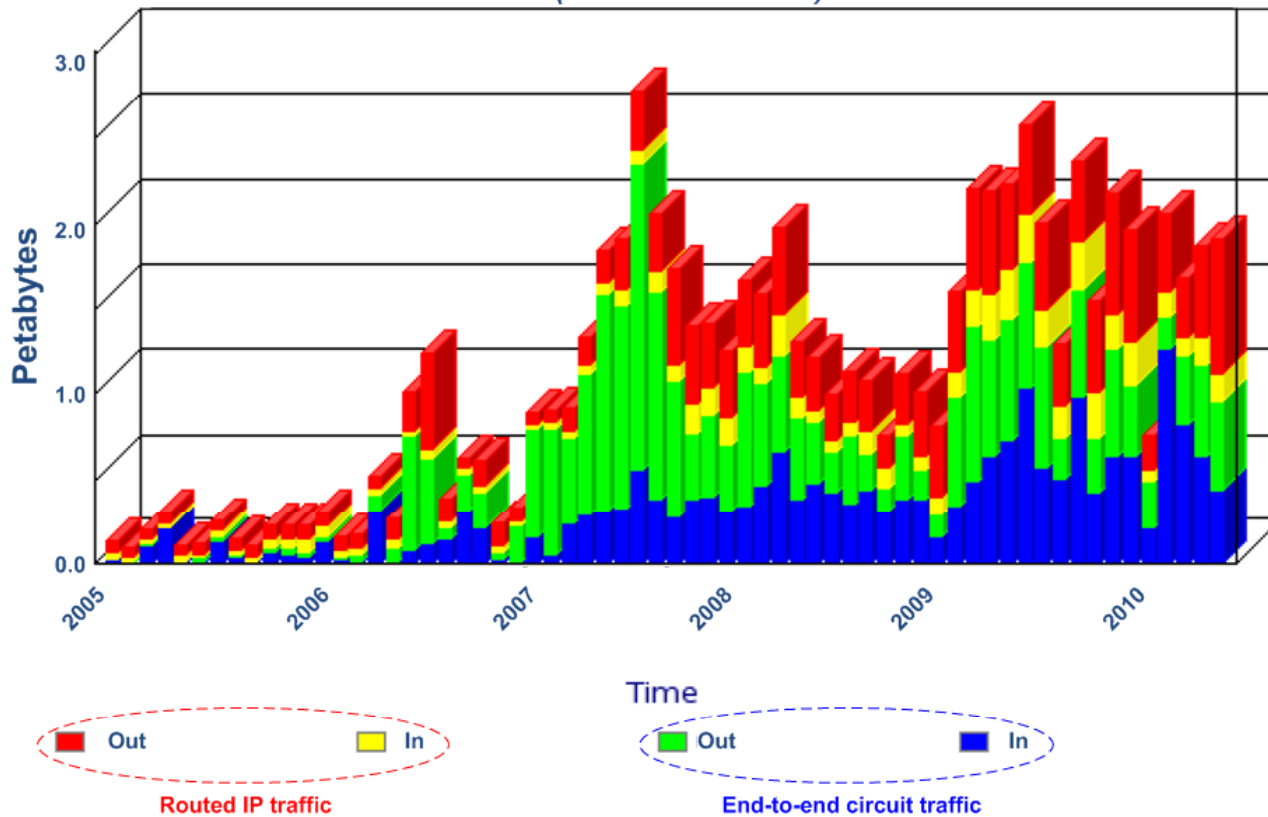
SLA monitor, IOS Track objects to automatically fail over traffic if circuit is down



Off-Site Traffic Loads: Routed IP versus Circuit-based

Fermilab Off-Site Traffic Levels

(2005 – 2010)



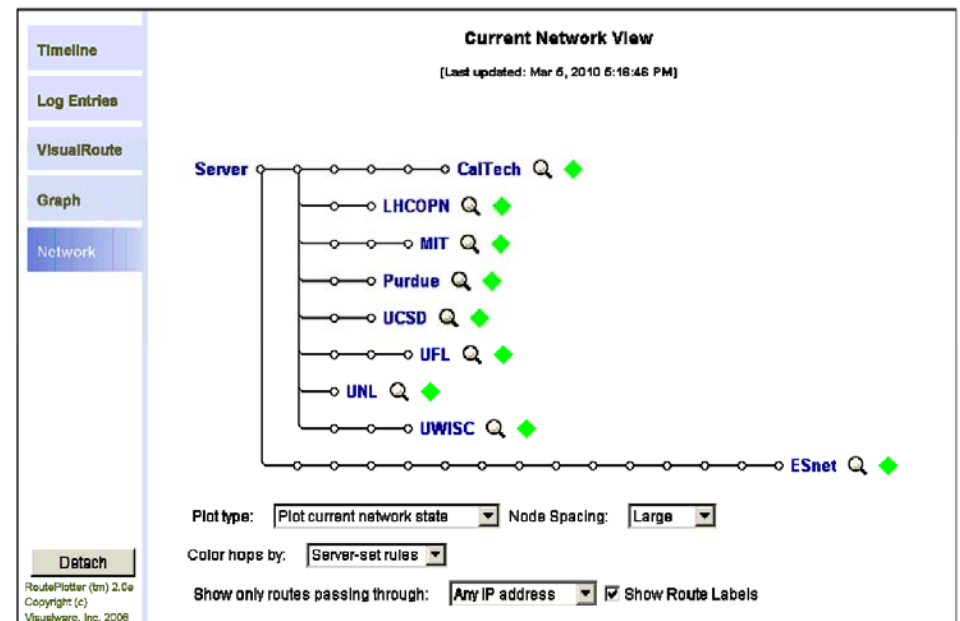


Circuit-monitoring tool: RoutePlotter

- Inexpensive traceroute-based tool
- Detects changes from pre-configured path
- Also variance in avg. RTT
 - Good for egregious fiber rerouting by carriers
- E-mail notifications
- S/N ratio is pretty good



To use the RoutePlotter applet, you must have a Java VM. If you already have one, then you will see a login screen below. Otherwise, you must go to <http://java.sun.com> to download one for free.

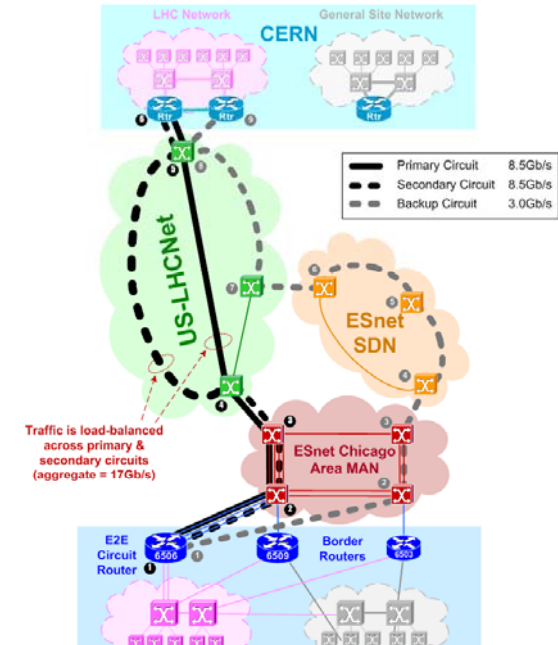




FNAL LHCOPN Circuit(s)

- E2E circuit documentation consumes effort:
 - High in detail
 - Multiple levels
 - Subject to (modestly...) frequent change

FNAL Primary, Secondary, & Backup LHCOPN Circuits (1/27/2010)



Status of E2E Link CERN-FERMI-LHCOPN-001

Oper. State: **Up**
Admin. State: **Normal Oper.**

Domain	CERN			USLHCNET				ESNET				FERMI					
Link Structure	EP	←-----	----->	DP	←-----	----->	DP	←-----	----->	DP	←-----	----->	DP	←-----	----->	DP	EP
Type	EndPoint	ID Part.Info	ID Part.Info	Demarc	Domain Link	Demarc	ID Part.Info	ID Part.Info	Demarc	Domain Link	Demarc	ID Part.Info	ID Part.Info	Demarc	Domain Link	EndPoint	
Local Name	CERN-T0	S513-C-BE1	CERN-FERMI-LHCOPN-001-GVA-CERN	USLHCNET-GEN	CERN-FERMI-LHCOPN-001-GVA-CHI	USLHCNET-CHI	CERN-FERMI-LHCOPN-001-CHI-ESNET	CERN-FERMI-LHCOPN-001-STARLIGHT-Tail	ESNET-STARLIGHT	CERN-FERMI-LHCOPN-001-FERMI-STARLIGHT	ESNET-FERMI	CERN-FERMI-LHCOPN-001-Site-Tail	rd8	FERMI-ESNET	rd2	FERMI-T1	
State Oper.	-	Up	Up	-	Up	-	Up	Up	-	Up	-	Up	Up	-	Up	-	
State Admin.	-	Normal Oper.	Normal Oper.	-	Normal Oper.	-	Normal Oper.	Normal Oper.	-	Normal Oper.	-	Normal Oper.	Normal Oper.	-	Normal Oper.	-	
Timestamp	-	2007-01-26 T13:15:22 +01:00	2007-02-08 T17:31:23 +01:00	-	2007-02-10T01:17:03 +01:00	-	2007-01-26 T13:15:19 +01:00	2007-02-10 T00:15:43.0	-	2007-02-10T00:15:43.0	-	2007-02-10 T00:15:43.0	2007-02-09 T17:00:01.0-8:00	-	2007-02-09T17:00:01.0-8:00	-	