LHC Network Measurement

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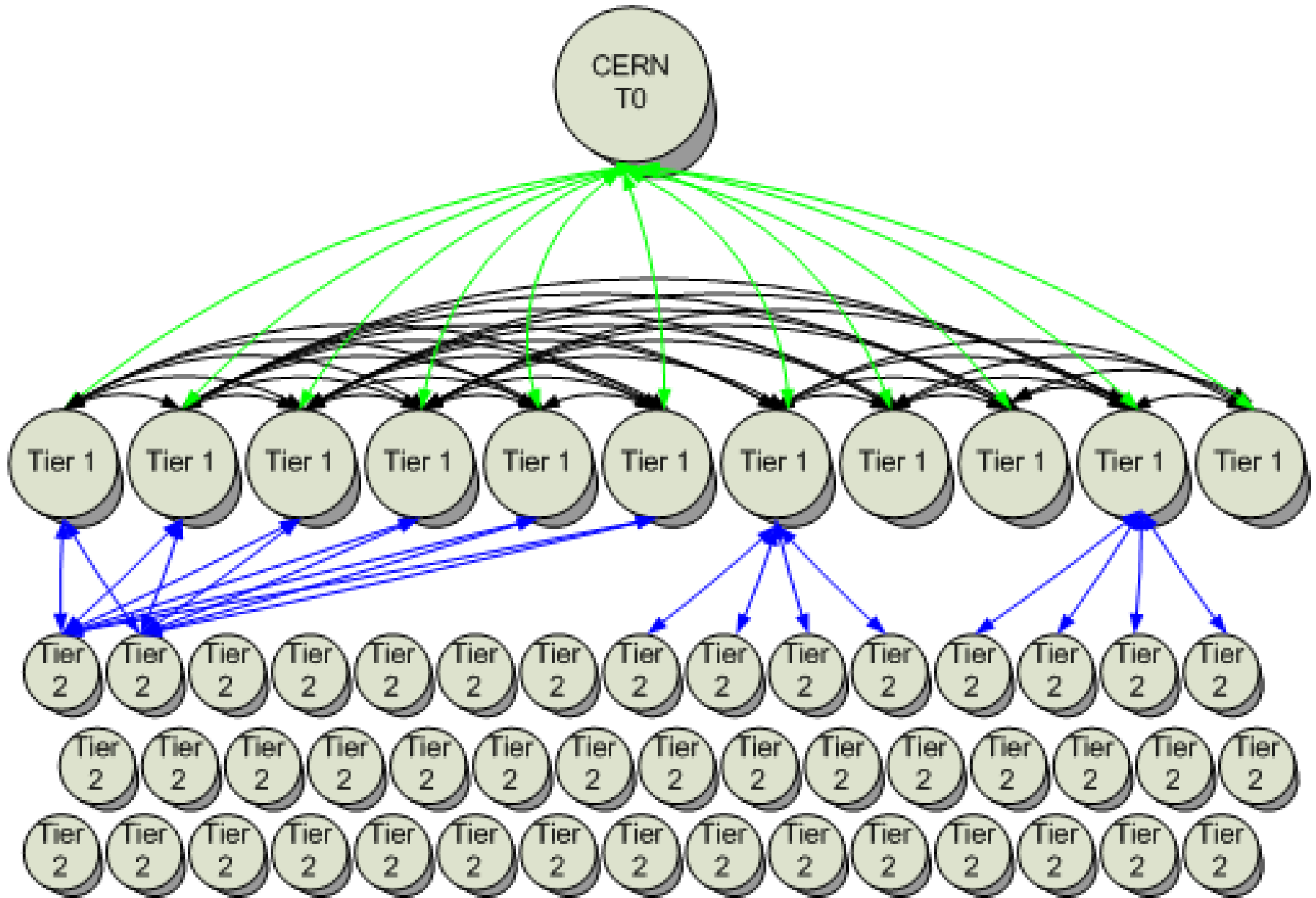
Energy Sciences Network
Lawrence Berkeley National Laboratory

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LHCOPN Meeting at CERN

Networking for the Future of Science

Network Paths Important to LHC

Measurement Infrastructure Needs

- The tools must meet the needs the whole LHC community
  - Tier 0
    - Tier 0 to Tier 1 networks (LHCOPN)
  - Tier 1s
    - Tier 0 to Tier 1 paths (LHCOPN)
    - Tier 1 to Tier 1 network (LHCOPN, Dedicated Circuits, & General IP Networks)
    - Tier 1 to Tier 2 network
  - Tier 2s
    - Tier 1 to Tier 2 network

- The tools must meet the needs of other application communities
  - The backbone networks expect to use the same tool set for other user communities.

- Not all requirements are satisfied by existing tools.
  - Additional development and a phased deployment will be necessary

Initial Active Measurements

- One Way Latency
  - To measure network Reliability & detect Congestion
  - Between
    - Tier0 to Tier1
    - Tier1 to Tier1
    - Tier1 to Advanced Tier2's

- Bandwidth
  - To detect & quantify service degradation
  - Between
    - Tier0 and Tier1
    - Tier1 to Tier1's
    - Tier1 to Advanced Tier2's

- ICMP based Latency
  - To measure Reliability & Congestion
  - Between
    - LHCOPN Edge into Tier1 facility
    - From Tier1 to Tier2s

Initial Passive Measurements

- Circuit Status where circuits are in use

- Link Utilization
  - To allow distinguishing between performance problems caused by network infrastructure errors vs symptoms caused by attempting to over drive capacity.

Next Steps

- ## Deployment Strategies In Process
  - ### MDM
    - Centralized Managed Approach
  - ### US Tier2 & Tier3
    - De-centralized Federated Approach
      - Focused effort by Internet2
      - OSG

- ## Future?
  - ### EGEE
  - ### LCG

PerfSONAR Solutions Current Status🌑🌑🌑

Attribute	Functionality	perfSONAR Tool(s)	Date
Circuit Up/Down	Measure & Archive	E2E_MP & SQLma	Deployed
	Visualize	E2Emon	Deployed
	Alarm	E2Emon	Deployed
Link Utilization, Errors & Capacity	Measure & Archive	RRDMA Utilization & Capacity RRDMA Input Errors & Output Drops PS-SNMPMA	Done ?? Beta Aug 1, Package Sep 1
	Visualize	perfSONARUI, Visual Traceroute	Done ??
	Alarm	?	?
Round Trip Delay (ICMP) & Traceroute	Measure & Archive	PingerMA Ping MP	Aug 15? Aug 15?
	Visualize	perfSONARUI Plugin?	?
	Alarm	?	?
One way Delay Tests between MPs	Schedule On-demand	AMI MA & Scheduler Hades Owamp MP	Beta Sep 15, Package Oct 1 October Done
	Archive	perfSONOBUOY	Oct 1
	Visualize	PerfSONARUI CNM (If same as HADES MA) I2 CGI (Done in Aug,packaged in OCT)	Done ?? October Beta Aug, Package Oct
	Alarm	Being worked on in Internet2. Generate a plan in December 07, implement 08	?
Bandwidth Tests between MPs	Schedule & Measure	BWCTL BWCTL_MP (DFN one) perfSONOBUOY	Done Done Beta Sep 15, Package Oct 1
	Archive	perfSONOBUOY DFN MA?	Beta Sep 15, Package Oct 1 ?
	Visualize	PerfSONAR UI Plugin Web CGI scripts	Fall? October
	Alarm	Look at it Spring 08	?