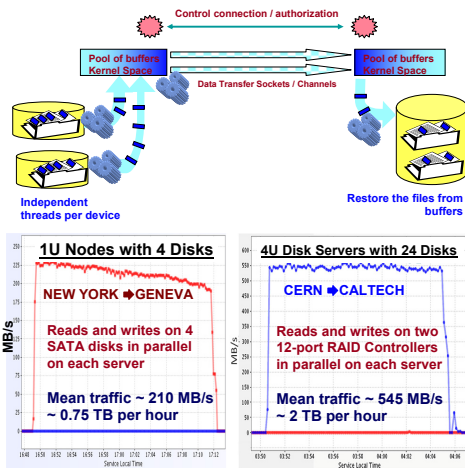


To satisfy the demands of data intensive applications it is necessary to move to far more synergetic relationships between data transfer applications and the network infrastructure. The main objective of the High Performance Data Transfer Service we present is to effectively use the available network infrastructure capacity and to coordinate, manage and control large data transfer tasks between many distributed computing centers.

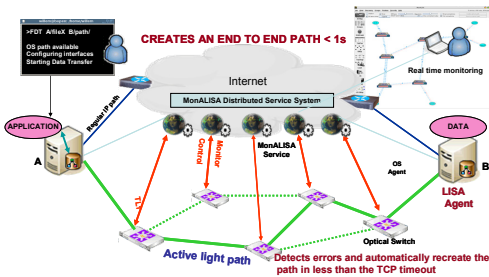
## Fast Data Transfer

The Fast Data Transfer (FDT) application is used to perform all data transfer tasks. FDT is capable of reading and writing at disk or storage speed over wide area networks using standard TCP. FDT is based on an asynchronous, flexible multithreaded system that continuously streams a dataset through one or more TCP sockets.

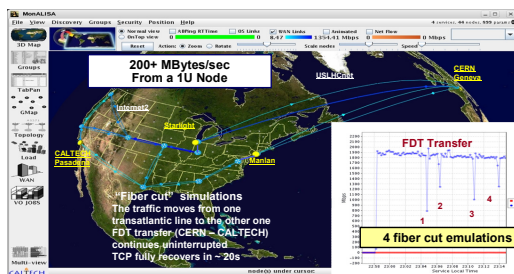


## On Demand End to End Optical Connections

In the MonALISA framework, we developed a set of collaborating agents which are used to monitor the network topology and its load, the available computing and storage resources and based on all this information to efficiently schedule and optimize many concurrent data transfer tasks (based on FDT) requested by users or production tools.

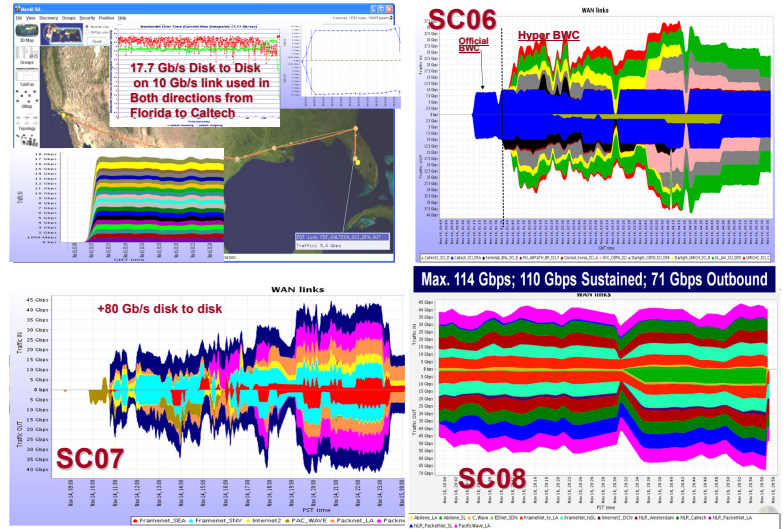


The integrated Optical Control Plane system is implemented as a distributed set of collaborating agents. It provides real-time monitoring of network topology, controls and creates on demand end to end optical paths. The distributed agents can detect partial network outages and release all allocated segments along the optical path. An alternative path might then be set up, quick enough to avoid a TCP timeout, so that the transfers can continue uninterrupted.



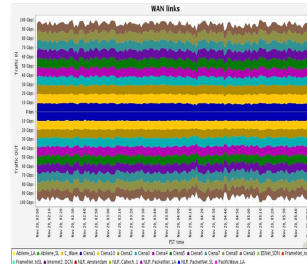
## MonALISA and FDT used at SuperComputing 2006, 2007 and 2008

Perform and coordinate large scale efficient data transfers



Caltech and CIENA: 191 Gbps Avg.,  
199.90 Gbps Max on An OTU4  
(Standard 100G) Wave at SC2008

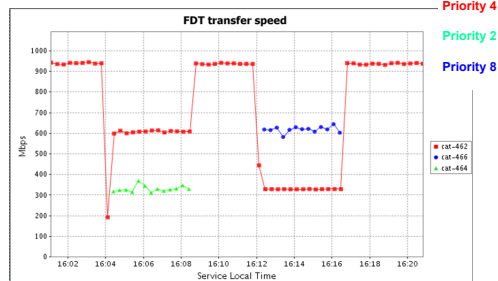
SC08



10 X 10G Waves at the  
Caltech HEP Booth  
Used Fully, in Both  
Directions with FDT

1.02 Petabytes Overnight

## Dynamic priority for data transfers



## Bandwidth Test for the Grid sites in ALICE

MonALISA services schedule periodic FDT tests among all the ALICE Grid centers. It reports all the configurations, detects the cases where nodes are not correctly configured and reports all the results.

