

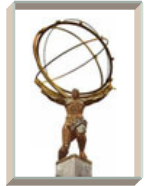


***TeraPaths*: Configuring End-to-End Virtual Network Paths With QoS Guarantees**

Presented by

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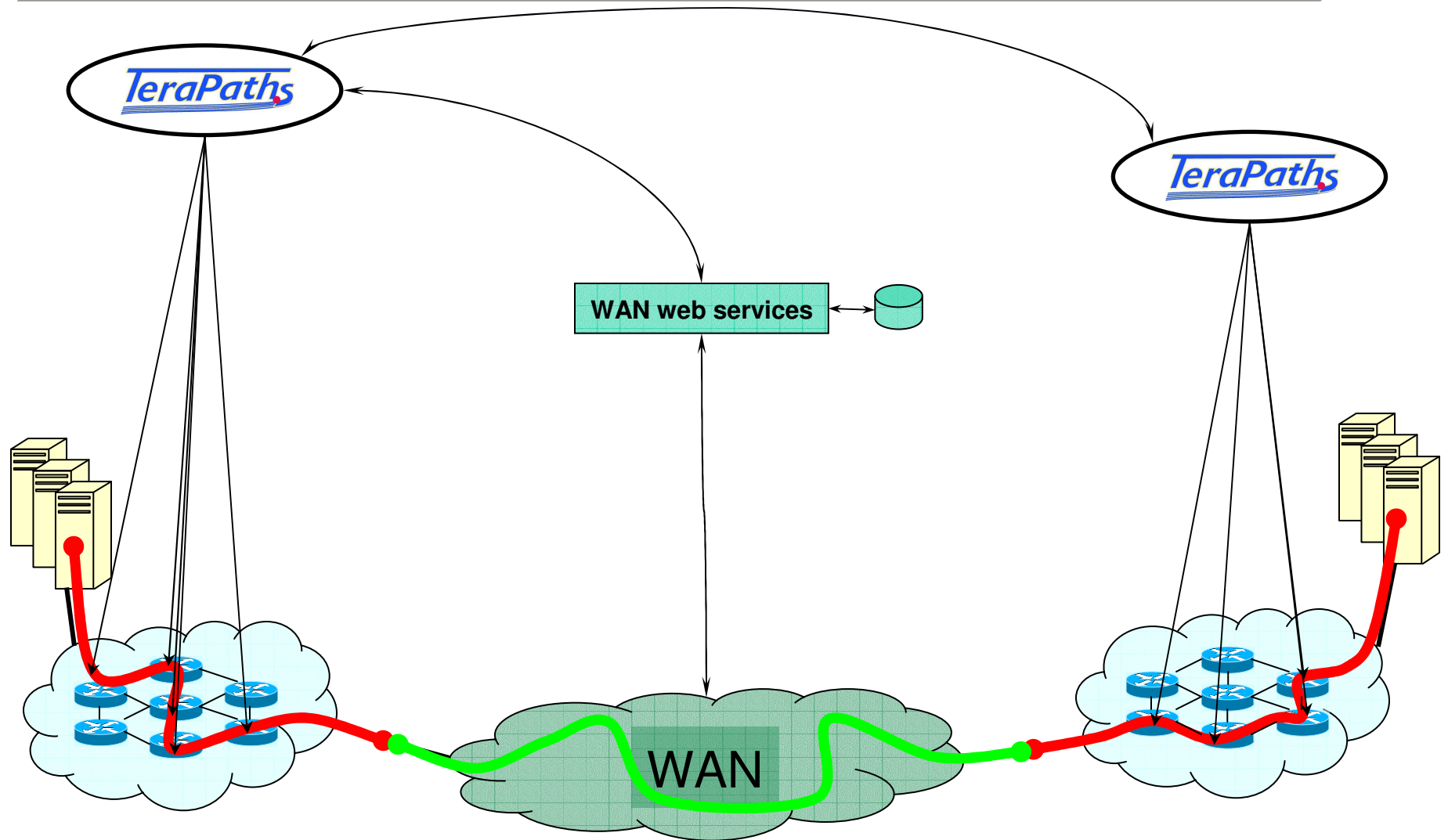
Introduction



- ❄ **The problem:** support efficient/reliable/predictable peta-scale data movement in modern high-speed networks
 - ❑ Multiple data flows with varying priority
 - ❑ Default “best effort” network behavior can cause performance and service disruption problems

- ❄ **Solution:** enhance network functionality with QoS features to allow prioritization and protection of data flows
 - ❑ Treat network as a valuable resource
 - ❑ Schedule network usage (how much bandwidth and when)

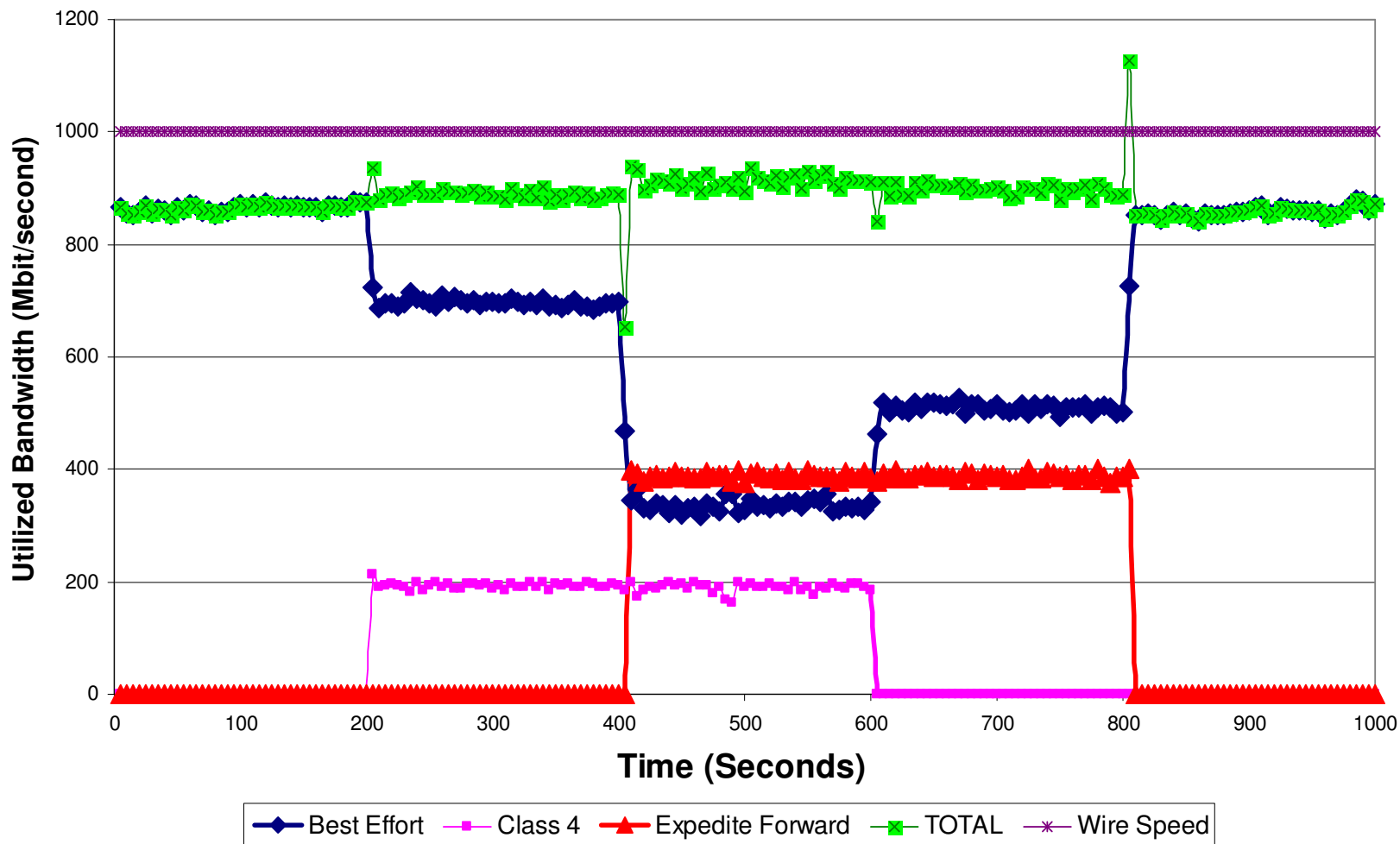
The *TeraPaths* Service: Reserve End-to-End Paths with Guaranteed Bandwidth



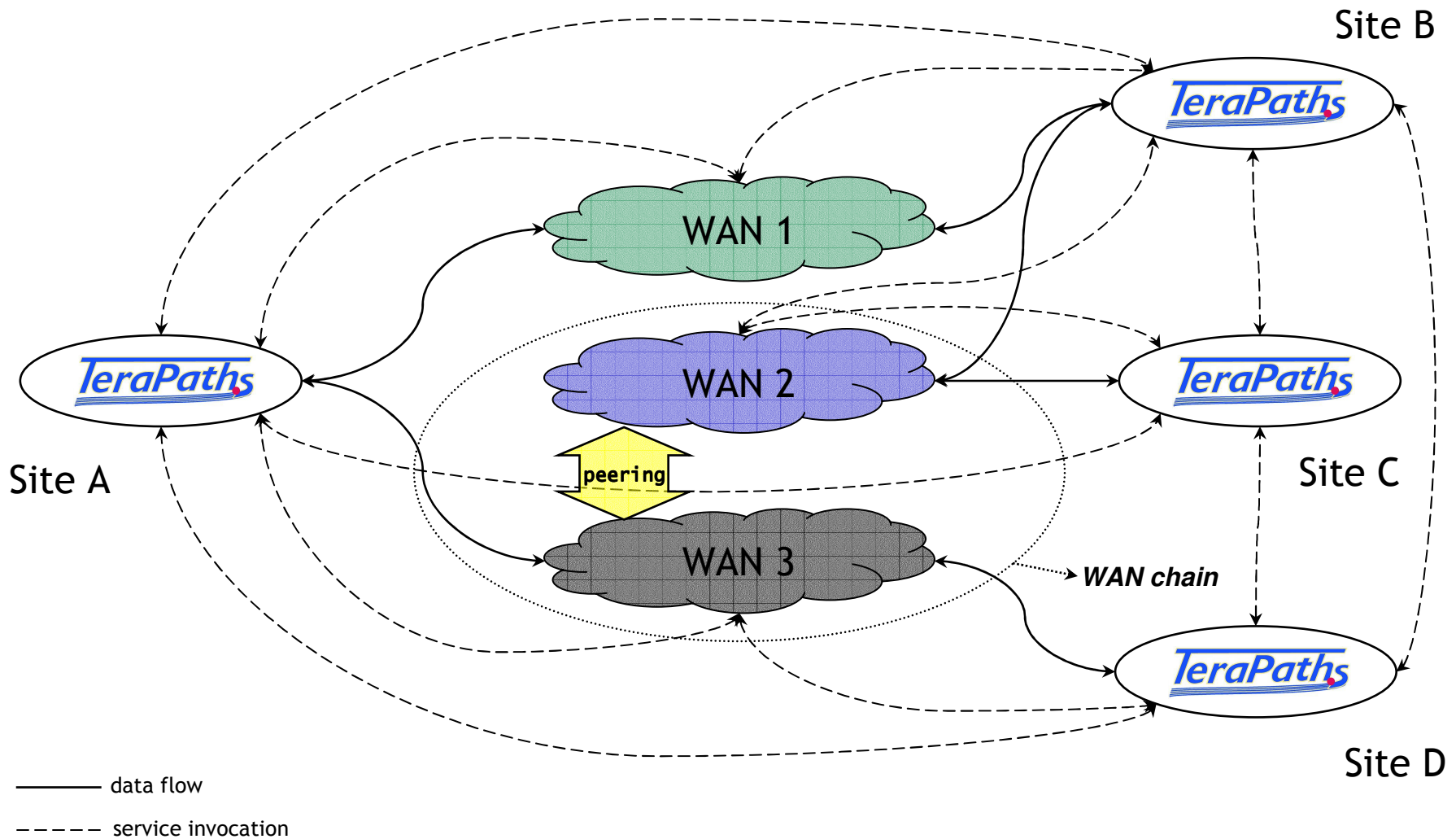
Prioritized vs. Best Effort Traffic



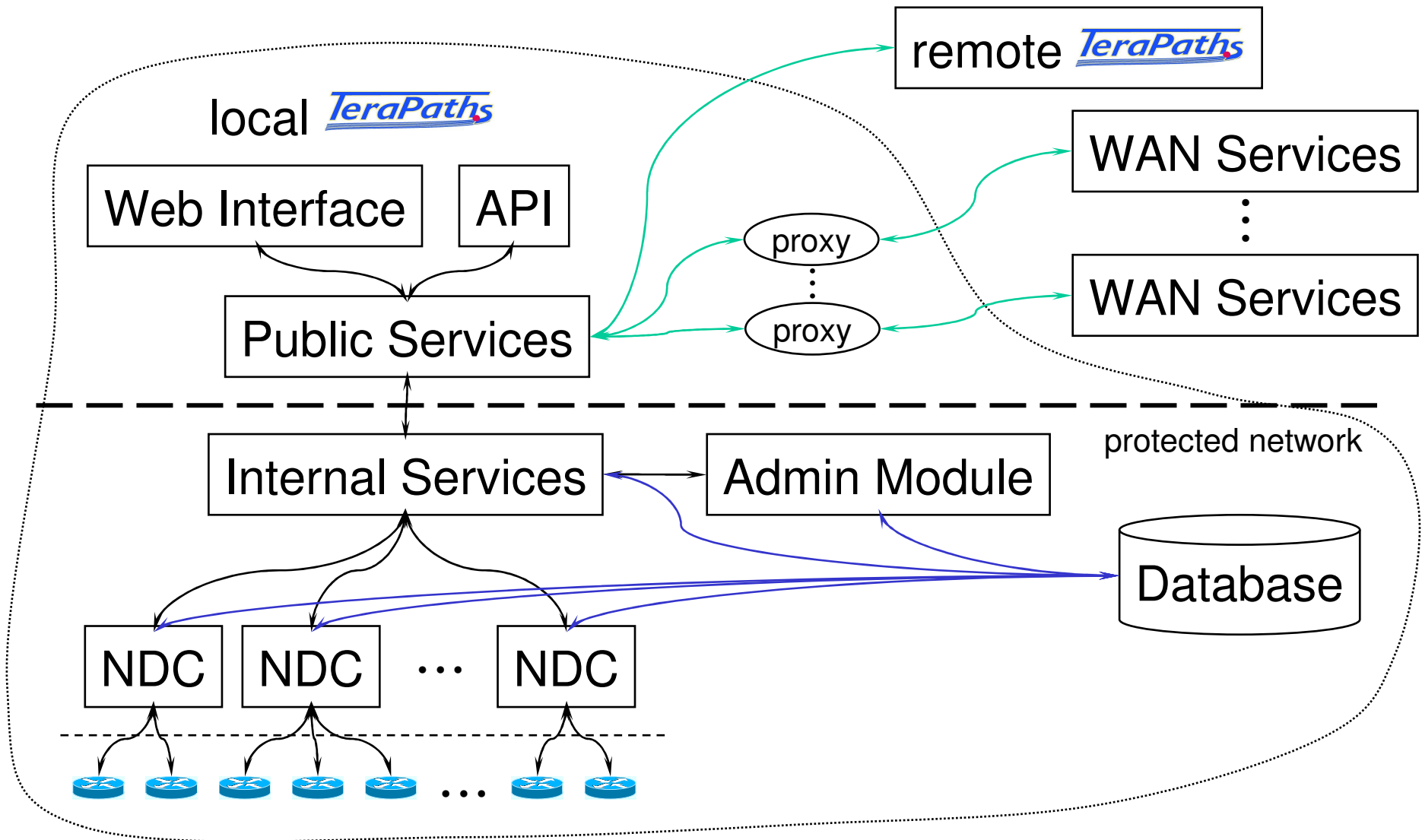
Network QoS with Three Classes: Best Effort, Class 4, and EF



Conceptual View of the Network



TeraPaths Web Services Architecture



TeraPaths Web Interface



TERAPATHS WEB INTERFACE

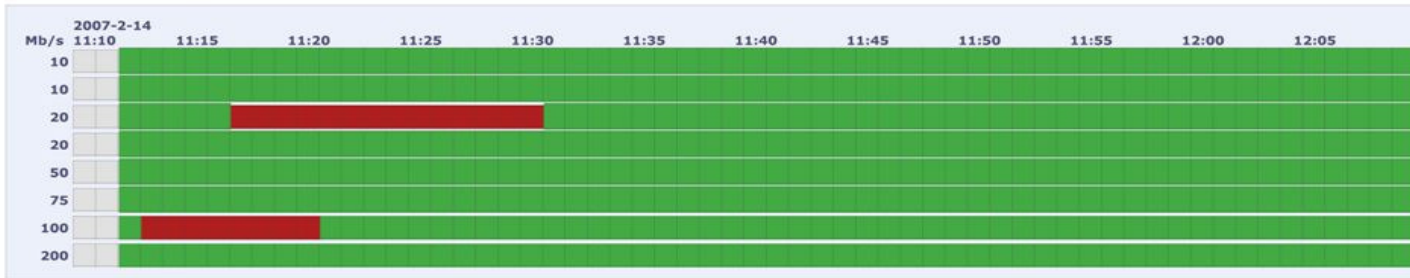
[Main Schedule](#) [Create Reservation](#) [Cancel Reservation](#)

Quality of Service Reservations

Reservation Information

Source IP: 198.124.220.134
Destination IP: 192.84.86.28
Direction type: bidirectional

[Update Schedule](#)



Schedule Controls

GREEN = available, **ORANGE** = partially reserved, **RED** = reserved
GREY = past, **VIOLET** = past partially reserved, **PURPLE** = past reserved
Click a column header to zoom in, double-click a cell to reserve, or click two cells in the same row to reserve a range.

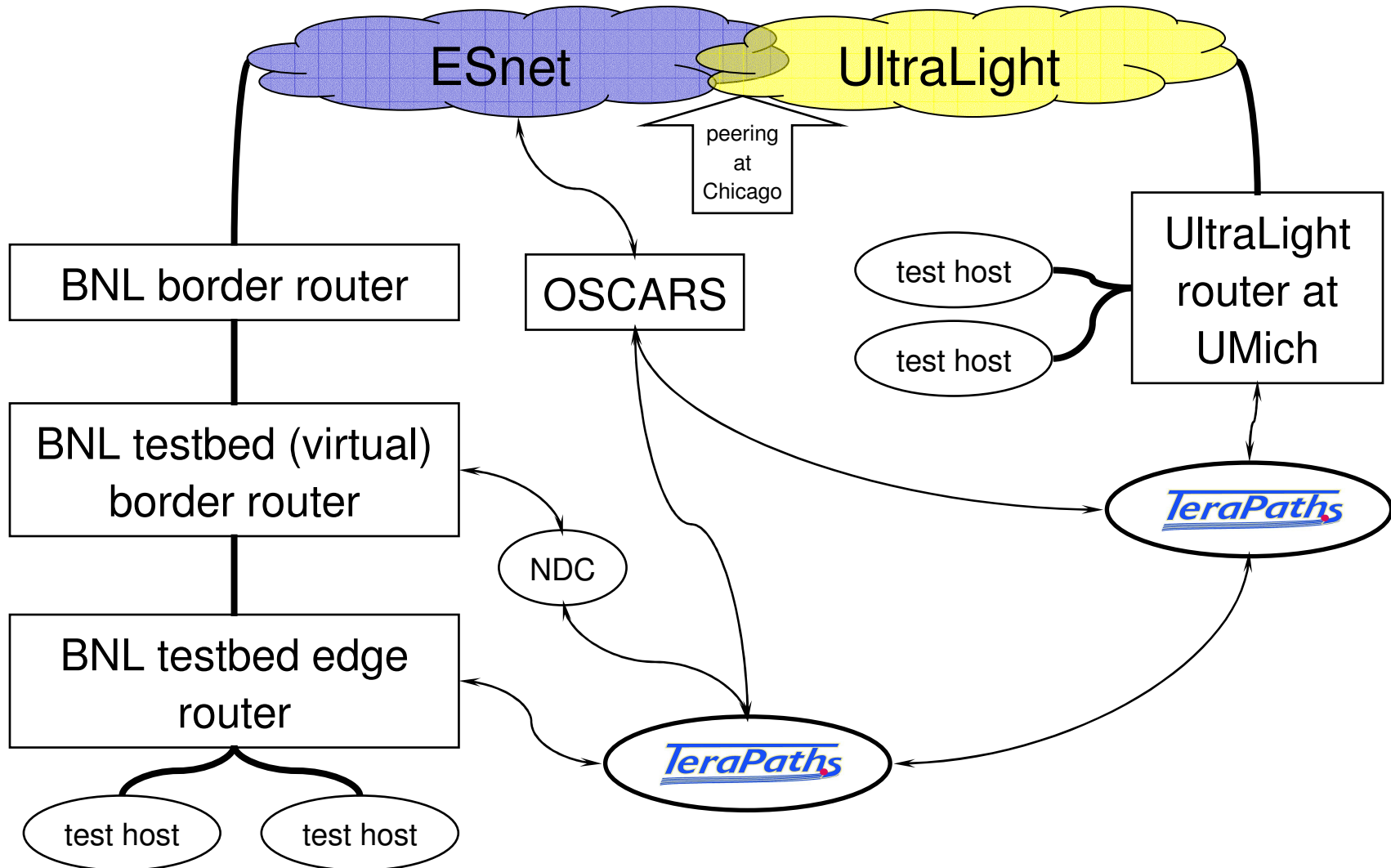
[Previous hour](#) [Zoom out to larger time interval](#) [Next hour](#)

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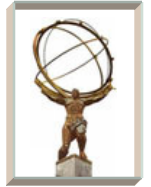
Current *TeraPaths* Testbed (end-to-end)



1st end-to-end fully automated route setup BNL-ESnet-Umich on 8/17/06 @ 1:41pm EST



Testbed Expansion Plans



- ❄ Candidate Tier 2 sites for 2007 expansion:
 - ❑ SLAC
 - ❑ University of Chicago / Indiana University
 - ❑ University of Oklahoma / University of Texas at Arlington
 - ❑ More?

- ❄ Further expand to more Tier 2 and lower tier sites

- ❄ Web Page: www.atlasgrid.bnl.gov/terapaths