

# Grid High-Performance Networking Research Group

## draft-ggf-ghpn-netissues-2

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# Motivation

- **GHPN focuses on the relationship between network research and Grid application and infrastructure development**
  - Document by Jon Crowcroft: “Top Ten Things Network Engineers wish Grid Programmers knew”
    - Overview of ongoing networking efforts of interest for the Grid community
  - Document draft-ggf-ghpn-netissues-0
    - The ambitious nature of Grids stress the capabilities of the networking infrastructure
    - List experienced problems and activities
    - Identify open issues that should be addressed by a community effort



# Document Outline

- **Introduction**
- **Scope and Background**
- **Use Cases**
- **End-Systems**
- **IPv6**
- **Routing**
- **Access Domains**
- **Transport Domains**
- **General Issues**
- **Macroscopic Traffic and System Considerations**
- **Traffic Engineering**
- **Security Considerations**



# End Systems

- **Transport Protocols and their Implementations**
  - Problems caused by limitations of existing APIs
  - More API-related efforts needed
  - General Transport Protocol issues are still weakly presented
    - Need to appropriately refer to "Survey of Transport Protocols other than TCP" for Data Transport RG
    - Some relation to the section on Multicast
- **Operating System Capabilities and Configuration Issues**
  - Service impact caused by tuning parameters
  - Tuning guides (and tools) needed
- **OS and System-Level optimizations**
  - Lists potential solutions to improve the performance
    - OS-bypass, Super-NIC,...
  - Emerging Technologies (Wavelength Disk Drive, Optiputer)
- **TCP issues and Multi-Stream File Transfers**
  - Quantitative analysis on what is achievable
  - The Grid wants multi-stream file transfers
  - TCP in Wireless Networks



# Access Domains

- **Firewalls**
  - Do have an impact on the level of service (Throughput)
  - Firewalls can do better than they do
  - Notification-Callback problems
  - Do we need a “grid-ftp”-aware firewall?
- **Network Address Translators**
  - Problems caused by callbacks (exposing the IP-address)
- **Middleboxes with L4-7 impact**
  - Firewalls, intrusion detectors, SSL accelerators, Traffic Shaping
  - Resistance to use other L4-7 protocol: TCP remains
  - How to control (discover and signal) those Boxes?
- **VPNs**
  - Convenient, but not integrated into Grid Security
  - Error handling problems due to isolation of VPN console



# Transport Domains

- **Service Level Agreements**
  - **Grids and SLS**
    - Knowledge about the expectable capabilities important for Grid resource allocation strategies
    - End-to-End QoS
  - **SLS assurance**
    - Monitoring network SLS parameters by applications or RM
    - Relates to general service assurance efforts in Grids
  - **On-demand SLS**
    - We should refer to the netservices-draft here
- **Overprovisioned Networks**
  - Nice to have, but are they deployed end-to-end in the foreseen future?
  - Is the onion model still valid (10GigE)?
  - Meshing of multiple fibers might come up
  - We should refer to the optical-draft here



# The Current Version

- Merged the two documents into one reflecting the particular importance of the network for the Grid community
- Improvements based on GGF9 issues
  - Some cleaning up
  - Use cases section
  - New section about issues with connection setup and teardown
- Open issues
  - Need to appropriately refer to "Survey of Transport Protocols other than TCP" for Data Transport RG
  - Relation to other GHPN- (and other) documents
  - The document focuses on end-systems sending data, but not about other environments such as transactional data
  - The current structure is rather flat (CongDuc and Pascale volunteered to handle this)
  - Should we add clear "action items" at the end of each Chapter/Section?
  - How to get feedback from other groups?

