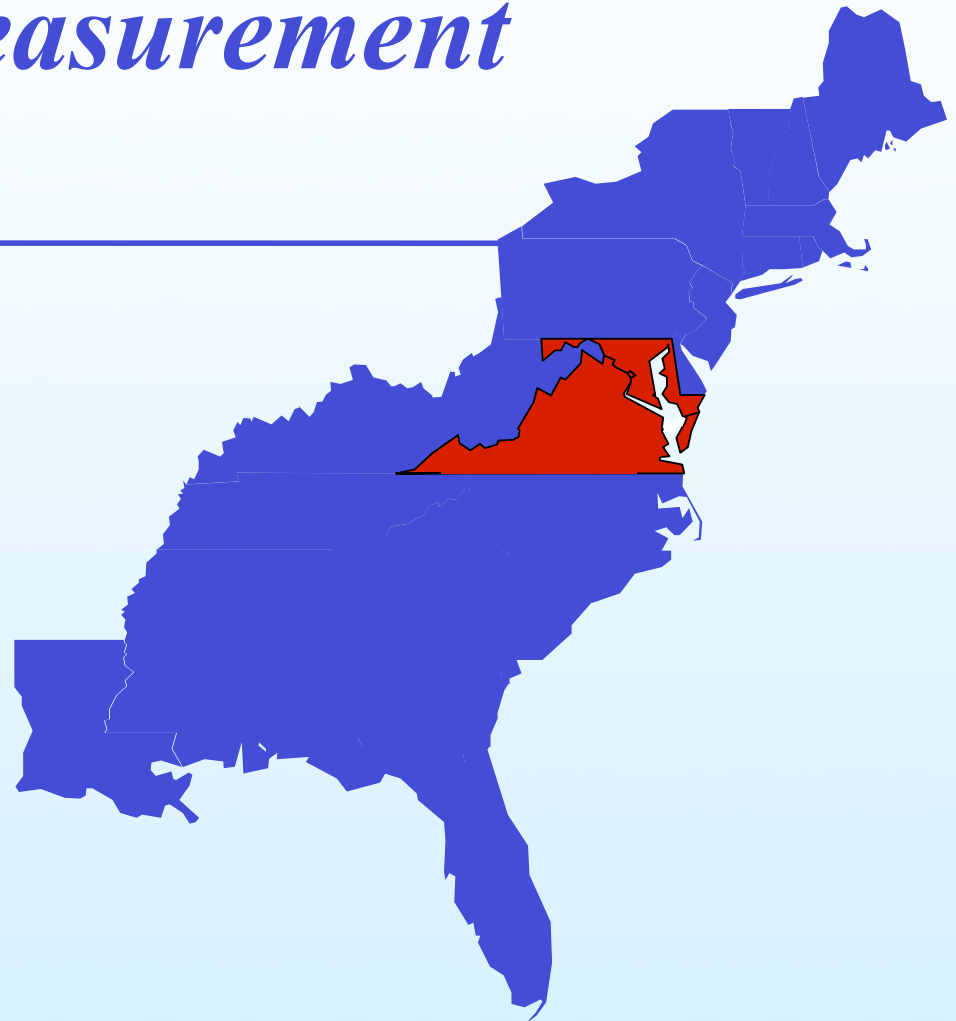


Tuning & Measurement

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Measurement & Flow Views

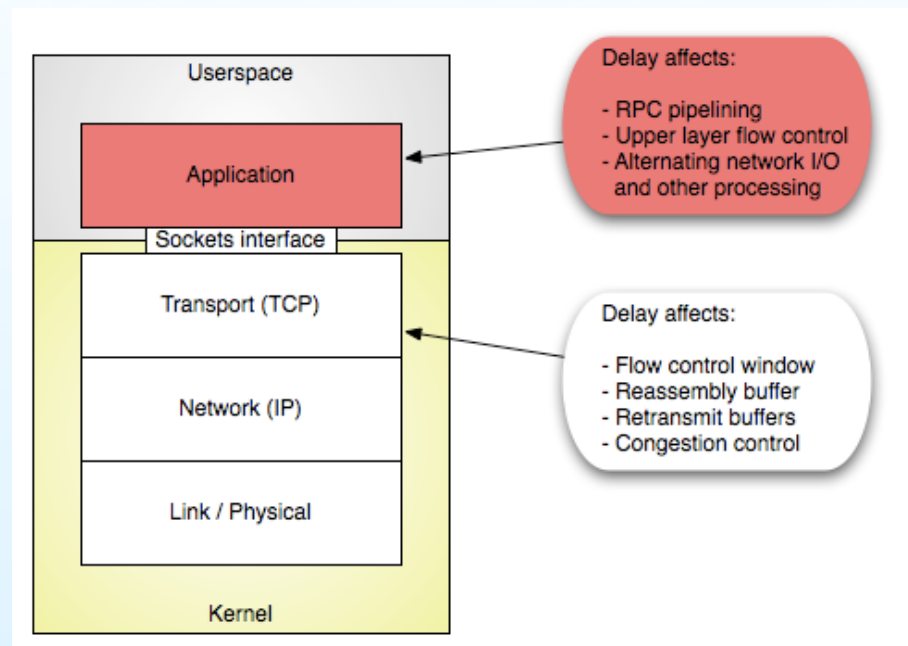
- HPN is part of our raison d'être but how do our participants benefit?
- Provide a clear baseline understanding of the throughput flows for your key mission applications - yet lots of dependencies with other RONS and campuses
- If we start working with a couple participants on increasing flows, we need way to document its value to you (and perhaps help justify new equipment)
- Aim to demonstrate enhanced throughput flow levels for key applications and improved scientific workflow outcomes; perhaps even change workflow habits
- Quest for improvement and value creation of HPN
- Helps quantify impact and value of your investment in MAX
- How do we know what the goals are for new initiatives and measure the process associated with the venture once its underway?
- Our services comprise a “portfolio” of offerings but we need to understand the risks, balance them, and hedge them as appropriate
- Treat your participant fees as comprising a “trust fund” with solid valued returns

TCP

- Supports transfer of over 90% of all traffic across the public Internet
- Performance of TCP significant part of perceived service offered
- TCP auto-magically adapts to sender, network, and receiver capabilities but hides the particular performance difficulties it works around
- Our efforts focus on building tools that uncover (discover) protocol interactions across path
- Make what is impacting flows explicit and suggest tuning improvements

Delay

- <http://www.psc.edu/networking/projects/applight/>



If the application performs well over a long path, it is more likely that some other component, such as the network itself, is the bottleneck. If there are no known examples of the application performing well over a long path, the end-user has good reason to be suspicious that the application may have a problem.

NPAD

- Single point failures are (relatively) easy to find and fix
- Remaining failures are interactive & complex involving:
 - Physical cabling plant, switches, routers
 - RTT, packet loss, and MTU size
 - RTT and application design for use of network
 - Packet rate limit and MTU size
 - Queue size buffers in routers, switches, interface cards, and burstyness due to
 - » ACK compression and cross traffic or
 - » Application design
- Short paths obscure flaws in all parts of the stack: app, TCP, IP, link
- Web100 tcp mib extensions scales to find multiple events on long paths without having to serially test each path segment