NSF Program (either CC or CICI): CC

Program Area: Integration   Award Number: 1659174

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Project Title: Enhancement and deployment of LDM7 for scientific data distribution

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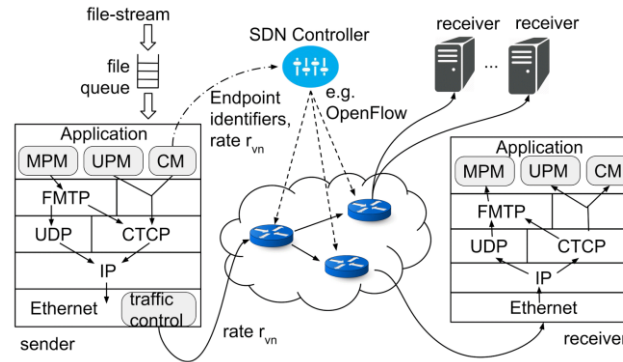*emmerson@ucar.edu*

Quad Chart for: Reliable file-stream multicast of real-time data

Challenges:

- Orig: LDMv6 uses unicast TCP to push real-time file streams to 250 receivers; As number of receivers ↑, traffic volume ↑, UCAR needs higher-speed WAN access, and larger sender clusters
- We implemented LDM7 (see solution)
- LDM7: Provisioning and trouble-shooting VLAN paths; Rollout of LDM7 deployment to other universities; Automate control plane; security

Solution:

- Setup Multipoint VLAN across Internet2 AL2S using OESS; created P2P VLANs from LDM hosts to AL2S switch ports
- Designed a reliable multicast transport protocol to run over VLANs called File Multicast Transport Protocol :
- Integrated FMTP into LDM6 to create LDM7
- Tested LDM7 on 5-point multidomain VLAN
- Quantified gains; cost: VLANs!

Malathi Veeraraghavan, U. Virginia
Steve Emmerson, UCAR
Steve Decker, Rutgers U
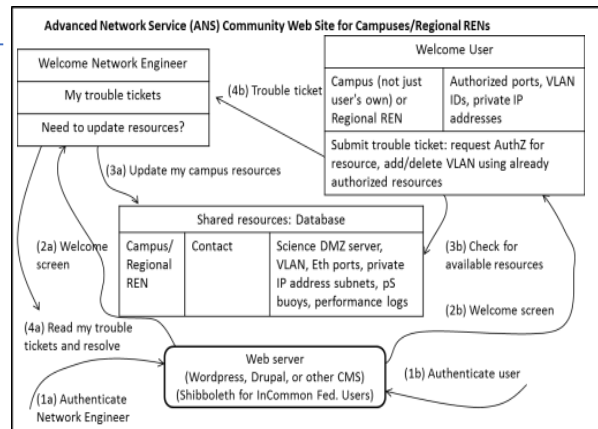Jerrold Robaidek, U. Wisconsin

Broader Impact:

- Broad deployed base of LDM in US government agencies, US military, commercial entities and international users could benefit from the more-efficient data-distribution solution offered by LDM7 relative to LDM6
- VLAN service improvements will help other projects that use VLANs, GENI, Chattanooga, DISA
- Education: UG & Graduate Students

Metadata tag:

- *https://github.com/Unidata/LDM*
- *Yes: ready for transition to practice*
- *IEEE COMPSAC papers (2015, 2016)*
- *Seeking collaborators: VLAN users, and streaming application users*
- *New CC* grant: NSF ACI-1659174*
- *Thanks to NSF for ACI-1340910*
- *Five UG research assistants*
- *Two MS thesis graduated*
- *New PhD student, Yuanlong Tan*