EPOC

Engagement and Performance Operations Center

Award #1826994

Newsletter | December 9, 2020

Holiday Greetings

On behalf of EPOC, we'd like to thank everyone for working with us during the last trying year of changes. The EPOC team is still adapting our activities until we can see you all in person again, and we'll be posting here in the New Year with updates. Of special note are two talks next week discussing how we can work with your teams if you're planning to submit to the NSF Campus Cyberinfrastructure (CC*) solicitation. We look forward to working with you in the New Year, and hope that everyone has a safe and restful holiday season.

-Jennifer, Jason, and Dave

Roadside Assistance and Consultations Making Sure Traffic is Taking the Best Route

Many institutions connect to a combination of regional networks, commercial networks, and national networks, which means sometimes traffic which is best suited for regional research and education (R&E) networks gets routed over commercial networks that aren't tuned for large data sets. The friction between normal internet use cases and large data transfer use cases can have a severe impact on users, and EPOC frequently works with partners to try to make sure that traffic gets mapped to the infrastructure it's best suited for.

During an onsite visit with engineers and researchers at Texas A&M University (TAMU), EPOC engineers found that traffic between TAMU and University of Lincoln Nebraska (UNL) not only was routed asymmetrically, but in one direction used a commercial network and R&E network in the other. The performance issue was discovered as part of the set up for regular performance monitoring using the perfSONAR tool. The perfSONAR graphical

Upcoming Talks and Events (EPOC and others)

- 15 December, 2020, 3pm EDT: Jennifer Schopf and Jason Zurawski, Indiana University/ESNet, "CC* and EPOC", The Quilt CC* Series.
- 16 December, 2020, 12pm EDT: Jennifer Schopf and Jason Zurawski, Indiana University and ESNet, "CC* and EPOC", CARCC Emerging Centers.
- 8 January, 2021,12pm EDT: Brian Tierney, ESNet, "bbr2 testing at ESnet", CI Engineering Brownbag Talks.
- 22 January, 2021, 12pm EDT: Jeronimo Bezerra, FIU and AMPATH, "In-band Network Telemetry @ AmLight: Lessons Learned after 2 years", CI Engineering Brownbag Talks.
- 28 January, 2021, TBD: Keith Lehigh, Indiana University Information Security and Scott Orr, OmniSOC Operations. For more information: CACR Security Speaker Series.
- 25 February, 2021, TBD: Susan Landau, Bridge Professor in Cyber Security and Policy and Professor at The Fletcher School of Law and Diplomacy/Co-hosted with the Hamilton Lugar School of Global and International Studies and the Luddy School of Informatics, Computing, and Engineering. For more information: CACR Security Speaker Series.
- 26 February, 2021, 12pm EDT: Francisco Javier Moreno Arana, NIC Mexico, de National Internet, Registry in Mexico, "FORT - Routing Security for a Free and Open Internet", CI Engineering

dashboard showed very different results depending on the direction of the test between the TAMU and UNL, and lower than expected transfer rates as well. Looking at the perfSONAR traceroute and performance results and routing tables, and further discussing this issue with engineers at both institutions confirmed the traffic asymmetry and performance problems.

Having determined the routes in both directions, the next step was to pull in engineers from along the path to help determine appropriate steps to resolve the issue. Engineers from EPOC, the Lonestar Education and Research Network (LEARN), TAMU, and Internet2 worked together and found a configuration setting on a TAMU router that directed research traffic to prefer a commercial route instead of the available R&E routes. Often, as additional capacity is added or adapted for a site, router configurations can become stale and prefer paths that are no longer the most efficient. The solution was straight forward - TAMU engineers made changes to their Border Gateway Protocol (BGP) configuration on the router to prefer R&E routes if available over commercial routes so that the paths would be symmetric and over circuits tuned for research traffic.

After these changes, perfSONAR tests showed greatly increased performance to UNL as well as other R&E destinations. This change improved the performance of the transfers not only to UNL but potentially a large number of other destinations, speeding up a variety of] existing campus use cases, many of whom were not yet aware that performance was being impacted.

EPOC appreciated the contributions from staff at LEARN, TAMU, UNL, and Internet2 for their assistance in resolving this issue. For more information about problems like this one, please see:

- https://www.perfsonar.net/
- https://fasterdata.es.net/
- Normalization of Research and Education routing: https://epoc.global/wp-content/uploads/2020/09/20200505-UofSC-Virtual-Workshop-BGP-Architectures-and-Best-Practices.pdf

Brownbag Talks.

https://epoc.global