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Performance Monitoring and Verification in the WACREN network

Summary

This presentation will showcase the different network performance monitoring tools deployed on the WACREN network and how they benefit and can be used by the West and Central Africa researchers, academics and end users. Preliminary results of network performance improvements brought by the WACREN network will be demonstrated.

Abstract

Regional Research and Education Networks (RREN), like WACREN, exist to bring together National Research and Education Networks (NREN) and make data flows take shorter, better, more reliable and less expensive routes. With the deployment of the new WACREN network comes the need to measure and verify to what extent the new network brings performance improvements.

perfSONAR is a widely-deployed test and measurement infrastructure that is used by RREN, NREN, Universities, science networks and ISP around the world to monitor and set network performance expectations. Developed by REN and Universities, it provides easy, transparent end-to-end multi-domain monitoring, giving access to network measurement data from multiple network domains. It can operate at local level or around the globe and is scalable to provide at-a-glance information about multiple network paths simultaneously. With more than 2000 measurement points across the globe, it is easy for NREN and research teams to accurately measure network performance and ensure it meets their collaboration needs.

Building on Network Measurements and Monitoring and perfSONAR workshops run by WACREN in 2015 and 2017 with support from NEAAR, IU, GÉANT and NSRC, a WACREN perfSONAR measurement mesh has been established to collect performance data about the interconnections of West and Central African NREN. For some months now, latency, packet loss, throughput and traceroute data has been collected and gives some understanding of the network performance experienced by researchers, academics and students when using the facilities provided by their Universities and campuses.

RIPE Atlas is the largest Internet measurement network ever made. It is operated by the RIPE NCC and employs a global network of probes that measure Internet connectivity and reachability, providing an unprecedented understanding of the state of the Internet in real time. WACREN, thanks to sponsorship from AFRINIC, is currently deploying a RIPE Atlas Anchor in its Lagos PoP, right in the core of the WACREN network. Multiple West and Central African NREN host one or more RIPE Atlas Probes, already measuring their connectivity to other parts of the Internet. This new Anchor will enable them to make measurements directly to the WACREN network and ensure their new uplink provides them with the connectivity quality they need.

Archipelago (Ark) Measurement Infrastructure is deployed and maintained by CAIDA and consists of hardware measurement nodes with as much geographical and topological diversity as possible to improve the view of the global Internet. The primary goals of this infrastructure are to reduce the effort needed to develop and deploy sophisticated large-scale active measurements, and provide a step toward a community-oriented measurement infrastructure by allowing collaborators to run their vetted measurement tasks on a security-hardened distributed platform. One new Ark probe is now hosted in the WACREN network while another one is hosted by a partner NREN.

During this presentation we will show these different network performance monitoring tools that exist on the new WACREN network and how they benefit the West and Central Africa researchers, academics and end users. We will show preliminary results of the performance improvements experienced by users of the WACREN connected networks as examples of what the soon-to-be-connected NREN can expect.

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