Contribution ID: **11** Type: **Oral Presentation**

IPv4 to IPv6 Worker Node migration in WLCG

Friday, 24 March 2023 09:00 (30 minutes)

The Worldwide Large Hadron Collider Computing Grid (WLCG) actively pursues the migration from the protocol IPv4 to IPv6. For this purpose, the HEPiX-IPv6 working group was founded during the fall HEPiX Conference in 2010. One of the first goals was to categorize the applications running in the WLCG into different groups: the first group was easy to define, because it comprised of all applications that were not IPv6 ready and would never be. The second was also easy since it covered those applications that were already working successfully with IPv6. Group number 3 consisted of applications that worked under IPv6, but not as smoothly as desired, meaning improvements were required. In 2016 the WLGC management board decided that the storage space of all LHC collaborating Tier-1 centers had to be IPv6 ready until the beginning of 2018 whereas the Tier-2 centers were given time until the end of 2018. However, this was a tight schedule and could therefore not be achieved according to plan. Yet today the storage space of all Tier-1 centers are IPV6 ready and 95% of the Tier-2 centers as well.

After the IPv6 readiness of the storage has been achieved, there are still other services needed to migrate to IPv6. This are for example middleware services like job scheduler, Advanced Resource Connector (arc-ce), HT-Condor and others.

The HEPiX-IPv6 working group pursues and concentrated the next goal on the worker nodes: setting up IPv6 only worker node testbeds. GridKa, however, tackles a bit different route here: we have started migrating IPv4 worker nodes to IPv6 worker nodes. For that purpose, we have set up a highly detailed monitoring system in order to record all inbound and outbound packages. We are using Packetbeat to absorb the packet's header information and transfer it into a Opensearch data base. We analyze the recorded data in the Opensearch Dashboard to identify the packages and that are still running under IPv4. With that information we can identify the applications that are not yet IPv6 ready and actively investigating in the IPv6 migration. Since this applies to all kind of different applications we find different kind of situations or 'pictures' and dealing with them is quite a challenge.

This presentation will show some of the steps that are necessary to implement IPv6 to different applications. The web site (url: : https://hepix-ipv6.web.cern.ch) of the HEPiX-IPv6 working group contains lots of the material brought together by the working group. At the subsection "worker-nodes-migration-ipv6" the major findings for the migration and their solution are maintained.

Primary author: HOEFT, Bruno (Karlsruhe Institute of Technology)

Co-authors: Dr PETZOLD, Andreas (Karlsruhe Institute of Technology); Dr SCHNEPF, Matthias (Karlsruhe Institute of Technology); Dr FISCHER, Max (Karlsruhe Institute of Technology)

Presenter: HOEFT, Bruno (Karlsruhe Institute of Technology)

Session Classification: Network, Security, Infrastructure & Operations

Track Classification: Track 7: Network, Security, Infrastructure & Operations