IPv6 only, or …

- Pro-Active initiative for communication evaluation
- for enabling IPv4 free WorkerNode environment

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detailed monitoring of process intercomunication at DE-KIT (GridKa)

- Monitor all communications between WorkerNodes and
  - administration
  - job submission
  - Storage
  - ...

  with packetbeat collecting network data
  logstach pushing the data to elastic search (opensearch) (storing the data)
  kibana for visualizing (no elastic search – only easy search requests)
    - started with a small set of workernodes (storing the data over 4 weeks)
    - while enlarging the set of workernodes gradually the data keeping time had to be limited to
      one week only (for not exceeding the storage size 0.5 Tbyte)

- Find where still protocol ipv4 is taken/preferred
  - Where a migration to IPv6 is still pending
Closer look at DNS

- GridKa DNS (Port 53):
  - IPv4 only count: 4,259,378 (24 hours)
  - DNS (Bind) Server is already dual-stack
  - As well as the WN
  - at WN resolve.conf first lines IPv4:
    - Make sure IPv6 DNS server addresses listed and
    - place it before IPv4
Details of Squid

- **SQUIDS:**
  - some SQUIDS still IPv4 only (migration to dualstack in process)
  - Significant part of connections via public IPv4
  - => to check: if CVMFS can prefer IPv6?
    - CVMFS sending via http request to squid
    - CVMFS has DN configuriert that needs to be resolved
      \(\rightarrow\) default chooses IPv4 address
    - **Solution** => `cvmfs_ipfamily_prefer=6` \(\rightarrow\) not tested yet
Details of Alice VOBoxen:

- ALICE VOBoxen:
  - Client to VOBox prefers IPv4 (ALICE Monitoring (UDP))
  - => to check the possibility of IPv6 migration with ALICE (still ongoing)
    - dual-stack enabling works and
    - if Preference towards IPv6 is possible
    - ALICE is constrained by IPv6 unavailability on other sites

- XRootD:
  - via public IPv4 (ALICE)
  - All ALICE XRootD SE are dual-stack deployed
  - older version of XRootD → upgrade to current XRootD should improve, is still pending
Many NTP / port 123 connections

- During 24 hours approx. 210,000
- NTP → IPv4 only (depending on dualstack enabling of rack-manager (40,000 internal))
- Monitoring was first pointing especially 10.1.12 and 10.1.18 → later check showed that much more racks running ntp check via private addr. (NAT)
- 160,000 external communications → some of the destination server have quite dubious „names”

process-tracking → still in progress

- The numbers of NTP communication process and matched process is not matching yet
additional services

- **LRMS** (Local Resource Management System):
  - => old LRMS either add IPv6 or disable machine during downtime
  - => add AAAA record for new LRMS
  - → enable dualstack at downtime (20./21. June)

- **Logstash**:
  - needs AAAA records
General WN Infrastructure

- Satellite Capsule: No IPv6 address
  - evaluate possibility to enable IPv6 protocol
  - process of dual-stack deployment started

- Rack manager: No AAAA name or no IPv6 address
  - enable IPv6 Address of Rack-manager → in progress

- WN communicating with local host on highports
  - WN speaking e.g. 10.1.18.119 (no very much 72 per day)
  - investigation ongoing

- Batch-Farm (HTCondor)
  - Scheduling of jobs via IPv6 now enabled
Future Work / Conclusion

• Work still ongoing (even while already 80mil.-ipv4 to 31mil.-ipv6)
  • WNs are still resolving DNS via IPv4 → investigation not resolved
    IPv6 addresses are now included in resolve.con, but still in the wrong order
    • still above 20million-ipv4 and only 315-ipv6
  • NTP – destinations are changing constantly, but with not less dubious names
    • hc.gommels-bienen.de.
    • alpha.rueckgr.at.
  • LRMS (Local Resource Management System):
    • Ratio increased toward IPv6 → IPv4: 895k to IPv6: 255k

• Looking closer is required
  • Deep dive to discover the details
  • Interesting yes, but time consuming (and manpower)
  • And a pretty long journey (with hardly any shortcut)