

Pro-active IPv6 Monitoring at DE-KIT

→ DE-KIT – workernode migration towards IPv6

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WAN Interfaces

Down time



Graph over 90 days

r-ig-II (DE-KIT Border Router):

Left two Interfaces

- Ethernet 1/1 (Internet + LHCONE)
- Ethernet 1/4 (LHCOPN)

r-ig-I (DE-KIT second Border Router):

Right two Interfaces

- Ethernet 3/1 (Internet + LHCONE)
- Ethernet 3/2 (LHCOPN)

r-ig-II r-ig-I
Vlan 703 + 704 – IPv4
Vlan 708 + 705 – IPv6

Down time



Graph over 90 days
Traffic of LHCONE
moved from the IPv4 vlans
after the downtime to the IPv6 Vlans

r-ig-II r-ig-I
Vlan 3516 + 3512 – IPv4
Vlan 3529 + 3530 – IPv6

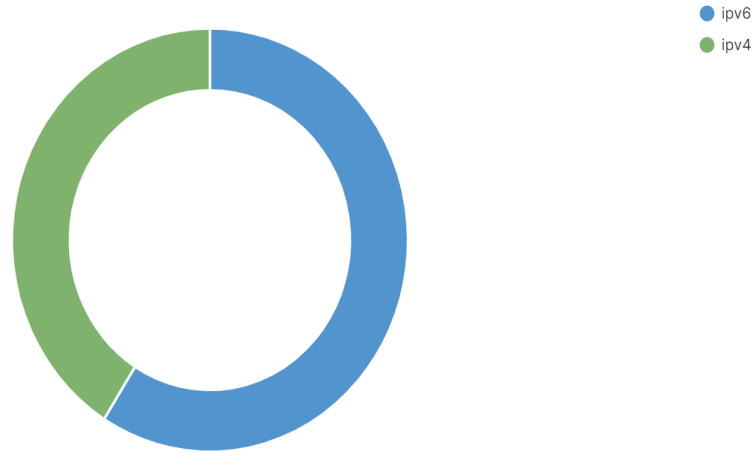
Down time



Graph over 90 days
Traffic of LHCOPN
moved from the IPv4 vlans
after the downtime to the IPv6 Vlans

08.09.22

IPv4/IPv6 Packages

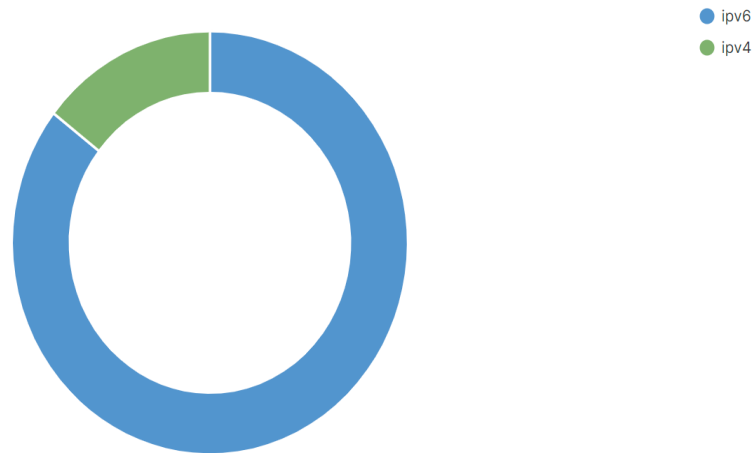


Most active IP address

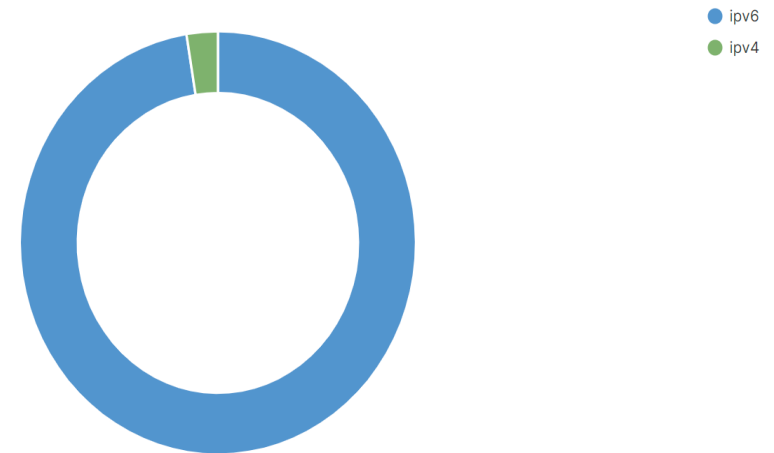
destination.ip: Descending	Count
::1	609,635,082
127.0.0.1	177,217,814
10.97.1.193	160,989,293
10.97.210.116	83,975,904
10.97.210.124	82,348,395
10.97.13.139	18,057,292
192.108.45.53	16,278,663
2a00:139c:3:2e5:0:61:6a:a4	12,125,456
2a00:139c:3:2e5:0:61:4:a5	11,734,767
2a00:139c:3:2e5:0:61:4:73	11,716,657

Export: [Raw](#) [Formatted](#)

IPv4/IPv6 Incoming traffic

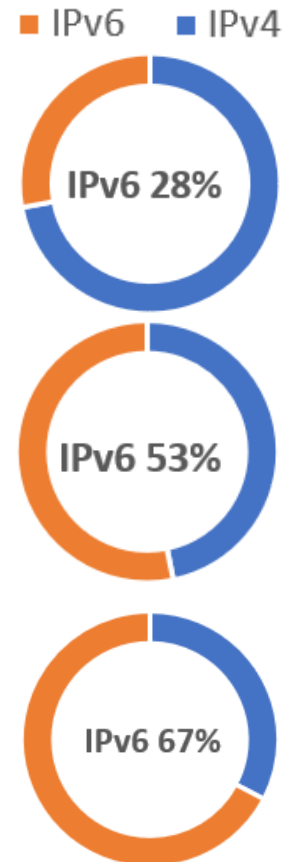


IPv4/IPv6 outgoing traffic



A view statistics

- 20220415:
 - IPv4: → 80 Mio
 - IPv6: → 31 Mio
- 20220726:
 - Ipv4 → 44 Mio
 - Ipv6 → 50 Mio
- 20221023:
 - IPv4 → 69 Mio
 - IPv6 → 142 Mio



*# of WorkerNodes (packets in 24 hours)
included in the statistic expanded*

CVMFS

CVMFS → mainly IPv6 but:

CVMFS on WorkerNodes uses IPv6 (with deployed flag: CVMFS_IPFAMILY_PREFER=6)

CVMFS frontier uses still IPv4 even while both systems dual-stack

switching of IPv4 → frontiers will operate over IPv6

20220726 : Ipv4 : 1,25 mio. IPv6: 9,6 mio. (tcp port 3128, 3401)

20221023 : Ipv4 : 4,44 mio. IPv6: 18 mio. (tcp port 3128, 3401)

(packets in 24 hours)

of WorkerNodes included in the statistic expanded

Rackmanager, LRMS

- Rack manager: some AAAA name / IPv6 address set
 - But not all → still in progress
- **LRMS (Local Resource Management System)** (port 9618):
 - Ratio increased toward IPv6 at 20220628 → IPv4: 895k to IPv6: **255k**
 - Ratio today 20220728 → IPv4: 27k, IPv6: 2,17 mio. (per 24 hour)
 - **Ratio today 20221023 → IPv4: 10k, IPv6: 3,38 mio.** (per 24 hour)

Less than 20% of IPv4 is internal traffic

(packets in 24 hours)

of WorkerNodes included in the statistic expanded

Resolve.conf

```
nameserver 2a00:139c:address  
nameserver 2a00:139c:address  
nameserver 10.privat-address  
nameserver 10.privat-address
```

WNs are resolving DNS via IPv4

→ migration towards IPv6 in progress

- every new deployed host:

the first lines are IPv6 addresses of the resolve.conf file followed by the IPv4 addresses)

→ still above 23million-ipv4 and only 13k-ipv6 packets

(packets in 24 hours)

of WorkerNodes included in the statistic expanded

Puppet → IPv6

Puppet Deployment process of WN

→ now running via IPv6

network PXE boot still via IPv4

Logstach → is now IPv6

Logstach → dual-stack deepdeployed

Ratio **20220728** → IPv4 385k – IPv6 1,41M

Ratio today **20221023** → IPv4 476k – IPv6 1,39M

migration still in progress
(24 hours) (Port 5047)

SQUIDS

all SQUID Server

→ migrated to dual-stack

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
 - → advice of Alice : switch of IPv4 at VO-BOX (the none monitoring VO-BOX)
 - Timing still under discussion
- 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
 - → advice of Alice : get IPv6 ready – but wait for switching it on till complete Alice is IPv6 ready
- Dest port 1094 –Ipv4/ipv6 → XRootD (alice, belle2, atlas, cms)

Belle2

FileServer – External:

IPv4 110k IPv6 520k (7 days)

Next steps

- migration of Rackmanager – work in progress
- Narrow down the still IPv4 communication
 - packet monitoring configured
 - to list all unhandled IPv4 packets
 - 8884 – Alice: operation report
 - 2049 – NFS
 - 8649 – Ganglia gmond
 - 1094 – XrootD
 - 4080 – HTCondor
 - PXE – Boot + DHCPv6 (first boot add. Distribution)
- Identify the next service for IPv6 migration tasks

Ports

IPv4
Addresses

Thx for your attention

