



# Pilot: IPv6 only Grid Updates

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# Reminder (I)

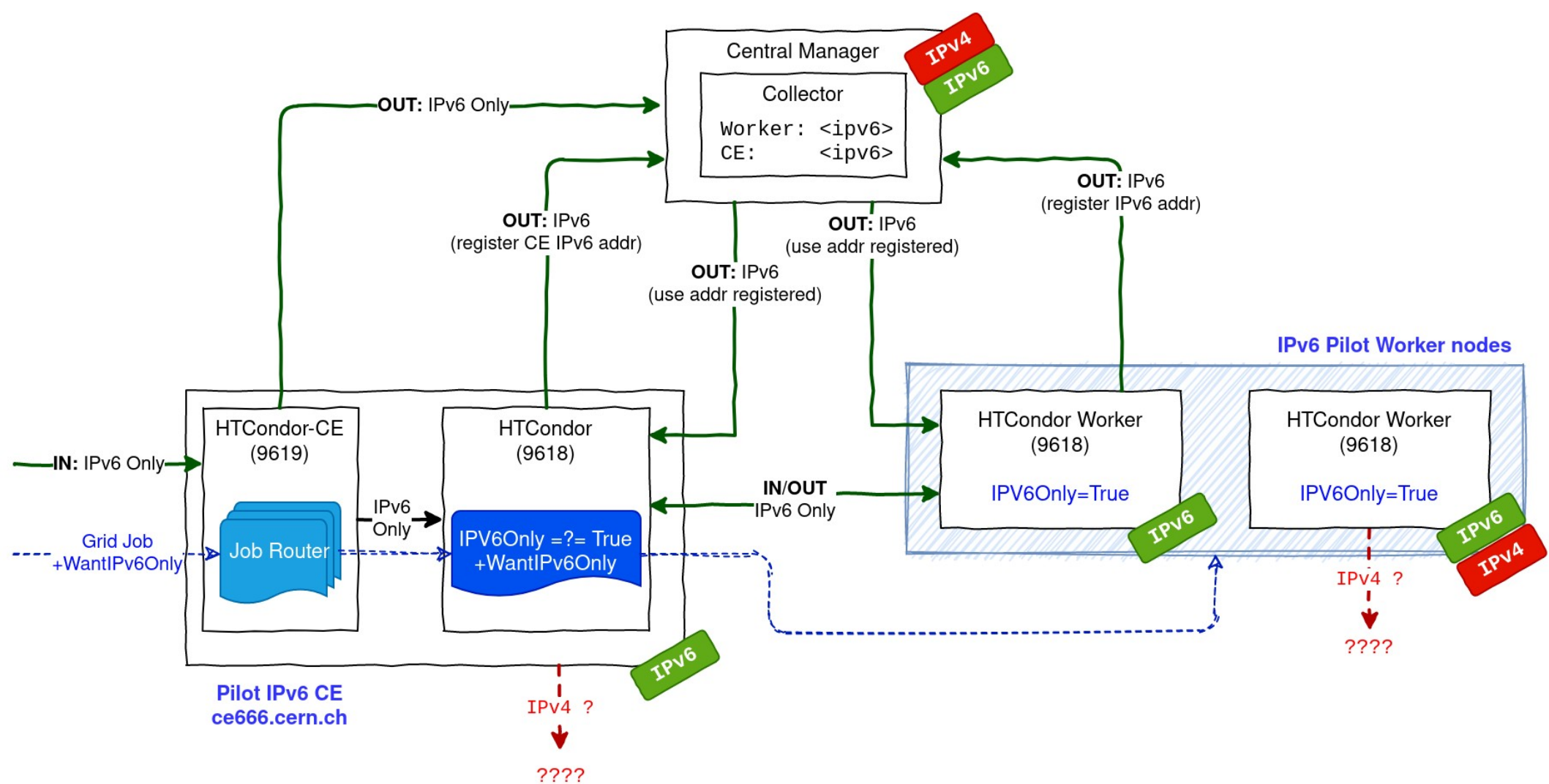
## Goals of Pilot

- Can we find current issues with IPv6?
  - We can wait until everything is fixed, or we can just see what's broken
- Gain experience running IPv6 in production
  - IPv4 pressure, can next DC be IPv6 only?
- End-to-end IPv6: submission (CE) to execution (worker nodes)
- Not necessary to wait for perfect IPv6 infra to make progress

# Reminder (II)

## Architecture & Limitations

- Dual stack: IPv6 + IPv4 blocked with iptables
- Some services require IPv4:
  - Where we can't configure to use IPv6, we allow specific IPv4 traffic.
  - Discover the limitations, but be able to run jobs.



# Updates

## Improvements on IT Services

- **Batch:** Consolidated dual-stack support on the Condor control plane and internal services
  - Identified issues in some corners (force DHCPV6\_DUID=llt on old instances, bug re-creating instances)
- **MONIT:** Enabled dual stack endpoints for default system monitoring ([MONIT-2894](#))
  - Provided Flume option to prefer IPv6 over IPv4
- **EOS:** Enable dual-stack on EOSHOME/EOSPROJECT nodes (in progress, [CERNBOX-1648](#))
- Deployed Puppet support for client side configuration to prefer IPv6 over IPv4 on sw that needs it:
  - [cvmfs](#), [fetch-crl](#), [sssd](#) and [flume](#)

# Updates

## Experiments (I)

- **ALICE:** Not interested yet on running jobs in our IPv6 Pilot
  - Difficult to restrict appropriate workloads for these resources
  - Vast majority currently rely on XrootD v3 and hence IPv4
  - To be revisited later this year
- **ATLAS:** Have started to send jobs recently
  - Work to be done on HammerCloud tests for IPv6 sites
  - Job brokerage to send software supporting IPv6 to the Pilot

# Updates

## Experiments (II)

- **CMS:** have been running jobs for a while now
  - Interest on IPv6 only worker nodes (no IPv4)
  - Concerns with SW support when IPv4 is present
- **LHCb:** Have started to send jobs recently
  - They prefer to run on IPv6 only worker nodes (no IPv4)
  - Already some endpoints reported and fixed for IPv6 support ([GGUS](#))

# Conclusions & next steps

## **Initial approach IPv6 + Blocked IPv4 not ideal**

- Software giving priority to IPv4 if present over IPv6 (getaddrinfo prefers IPv6 on nodes)
  - Effort identifying and changing those software components vs IPv6 only
- IPv6 + private IPv4 still on the radar as a potential alternative for the future PCC

## **Stay in contact with experiments**

- The pilot has already triggered some discussion and actions in the experiments which is good
- Follow their advancements/blockers in terms of IPv6 readiness

## **Follow progress on pending IT services to fully support IPv6**

- OpenStack metadata, network.cern.ch API,...





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