UNIVERSITÄT
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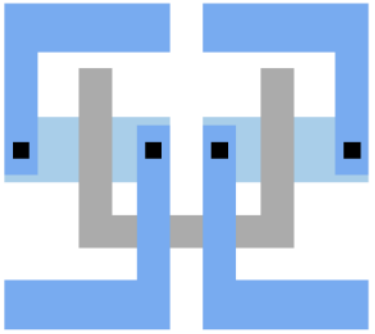
PXD Slow Control
Phase 2 / Phase 3 / PXD 2020



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Belle II PXD Workshop

DESY

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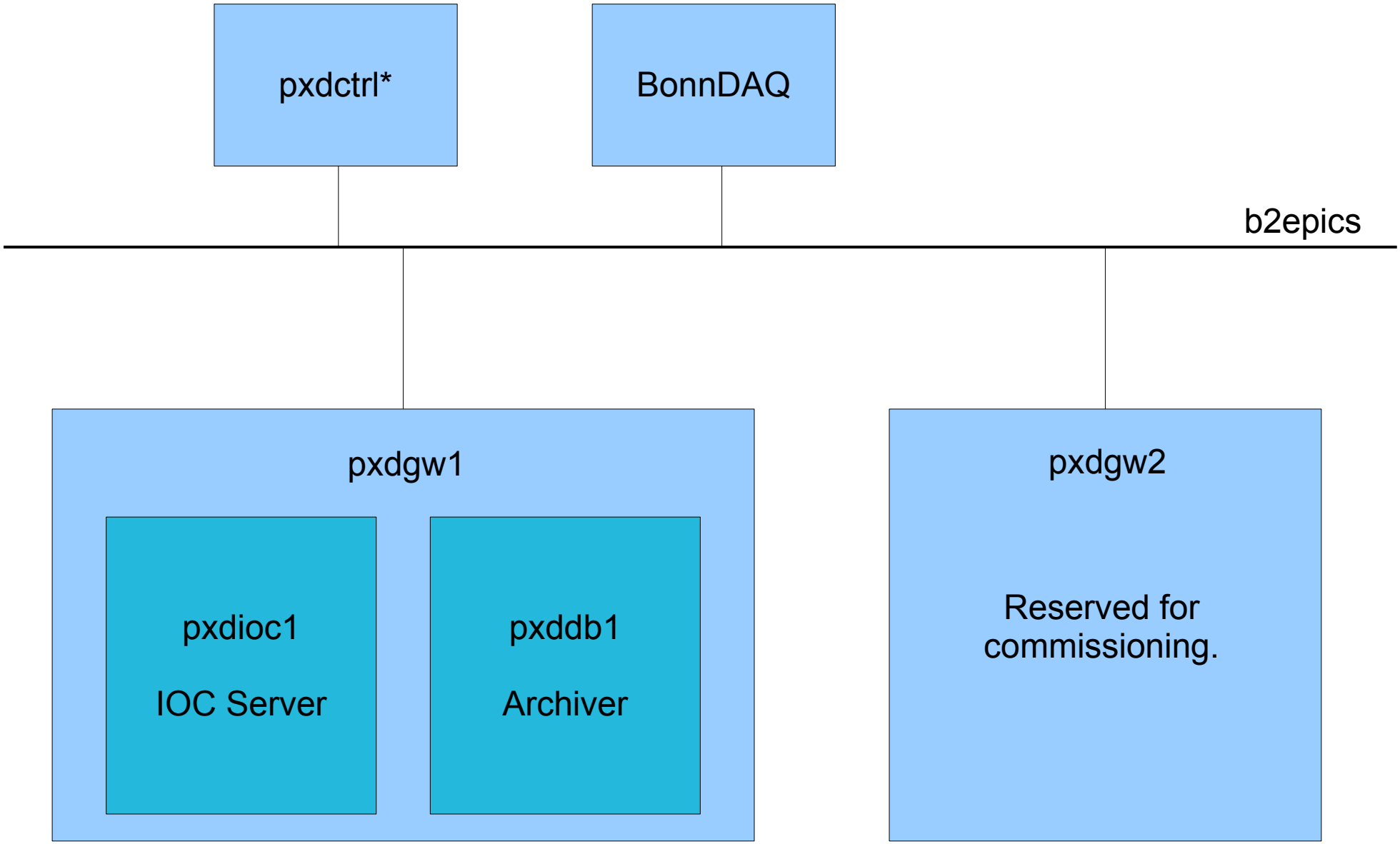
Phase 2

Setup


pxdctrl*
BonnDAQ
b2epics
pxdgw1
pxdioc1
IOC Server
pxddb1
Archiver
pxdgw2
Reserved for
commissioning.

Some Statistics

- 63 GB of archiver data.
  - Quick extrapolation:
    × 14 (½ year ⇒ 7 years)
    × 10 (4 modules ⇒ 40 modules)
    ~ 9 TB for phase 3
    Half the previous estimate.
- 570 MB of message log data.
- 200 configDB commits.
- Everything backed up to KEKCC.

PS IOC Switchover

- Start of phase 2: The shifter had to manually ramp up the PXD module by module.
  - PS firmware/IOC implementation failed with too many commands in a short time.
- PS firmware / IOC finally updated in June.
  - First attempt in February failed due to very strict interlock condition in the IOC.
  - The root problem (lost UDP packets) is still present, but now ignored until is happens too frequently.
  - Not deadly, but I'd like to understand why. Remember: It never shows up in my lab.
  - Hardware to be analyzed towards possible improvements (differences between PHY datasheet and implementation).
- Since then: Ramping all four modules in parallel.

PS IOC Instabilities

We managed to successfully test all interlocks… ;-)

- IOC to PS unit:
  - IOC doesn't send heartbeat often enough ⇒ unit shuts down.
  - Most likely reason: Overload of the pxdgw1 system (IOC + archiver)
    ⇒ PS IOC is not scheduled frequently enough by the OS.
  - Happened most frequently on Sunday mornings (RAID check creates additional load) ⇒ Supports this interpretation.
  - For commissioning: The archiver is now on pxdgw2
    ⇒ So far no reported occurence despite running more units.

- PS unit internally:
  - Firmware reported that command processing takes too long, shut down.
  - Always happened at the end of the rampdown sequence (many commands in short time).
  - Only happened on two days (in a row)!
  - Totally unclear. To be debugged if it becomes reproducible.

RC / PSC Integration

- Run Control was integrated with Belle II from the start of phase 2.
  - A few confusions generated on the NSM2 side:
    Inconsistent state displays.
  - Actual RC operation not affected.

- Power Supply Control integration happened in June.
  - New PS firmware deployed
    ⇒ modules could be ramped in parallel.
  - PXD operation by Belle II shifter possible unless
    - we went into ERROR
    - the shifter tried to go via OFF.