PXD Slow Control Status

Report on Power Supply Developments

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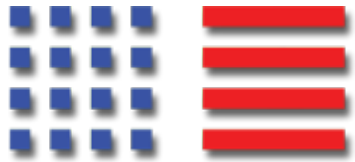

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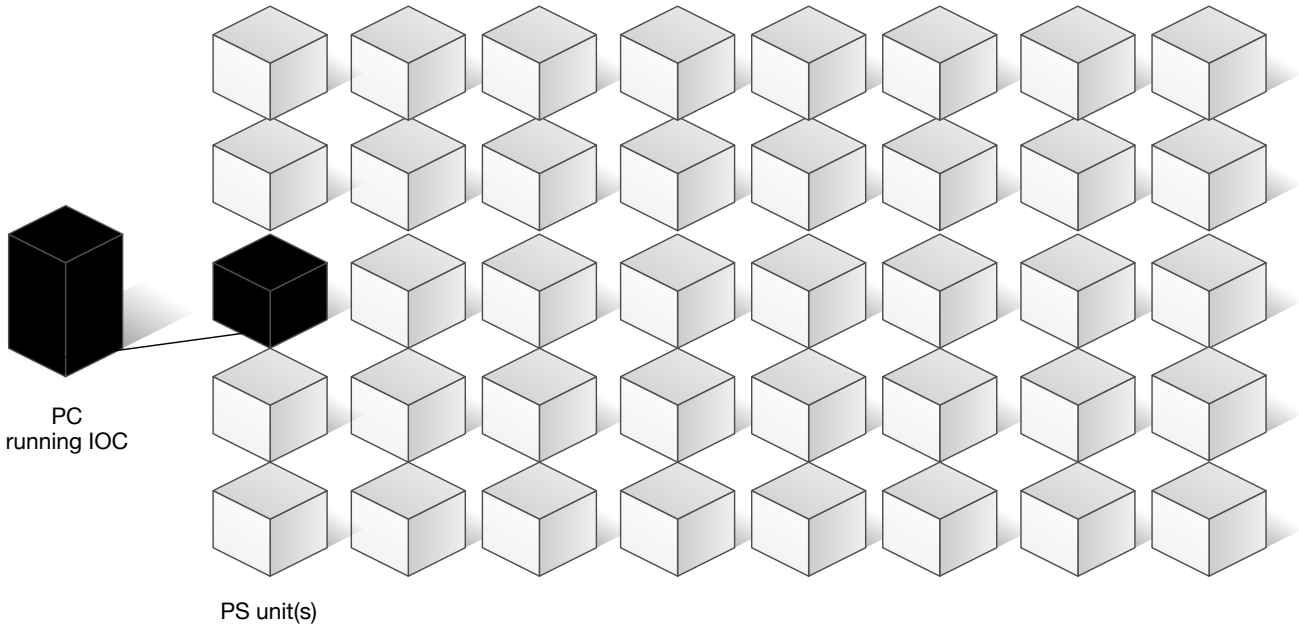
Current Status

- A handful PS units are being used in lab tests
- So far the feedback is positive – stable operation, no major showstoppers
- Use case today: 1 PC controls 1 power supply

Currently 1:1 vs. Final 1:40 Communication



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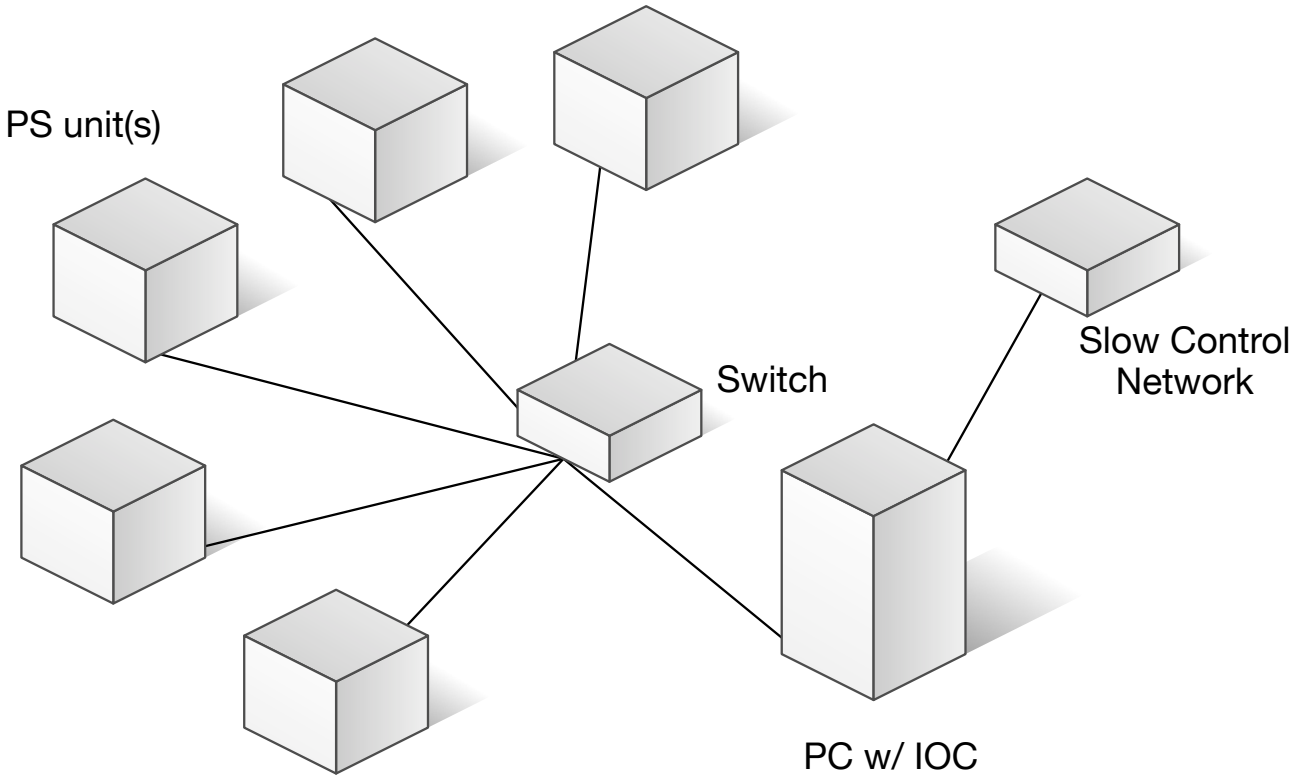
Q: Does the Implementation scale up to 40 units?

- $\approx$ 100 PVs per unit per update over the wire, plus PVs for management
- Architecture and network topology should support it
- Identify superfluous overhead and optimize communication
- Test networking and architecture, design and implementation (driver & middleware)
- Verify that it scales as it was designed – now that we soon[1] have enough PS units available

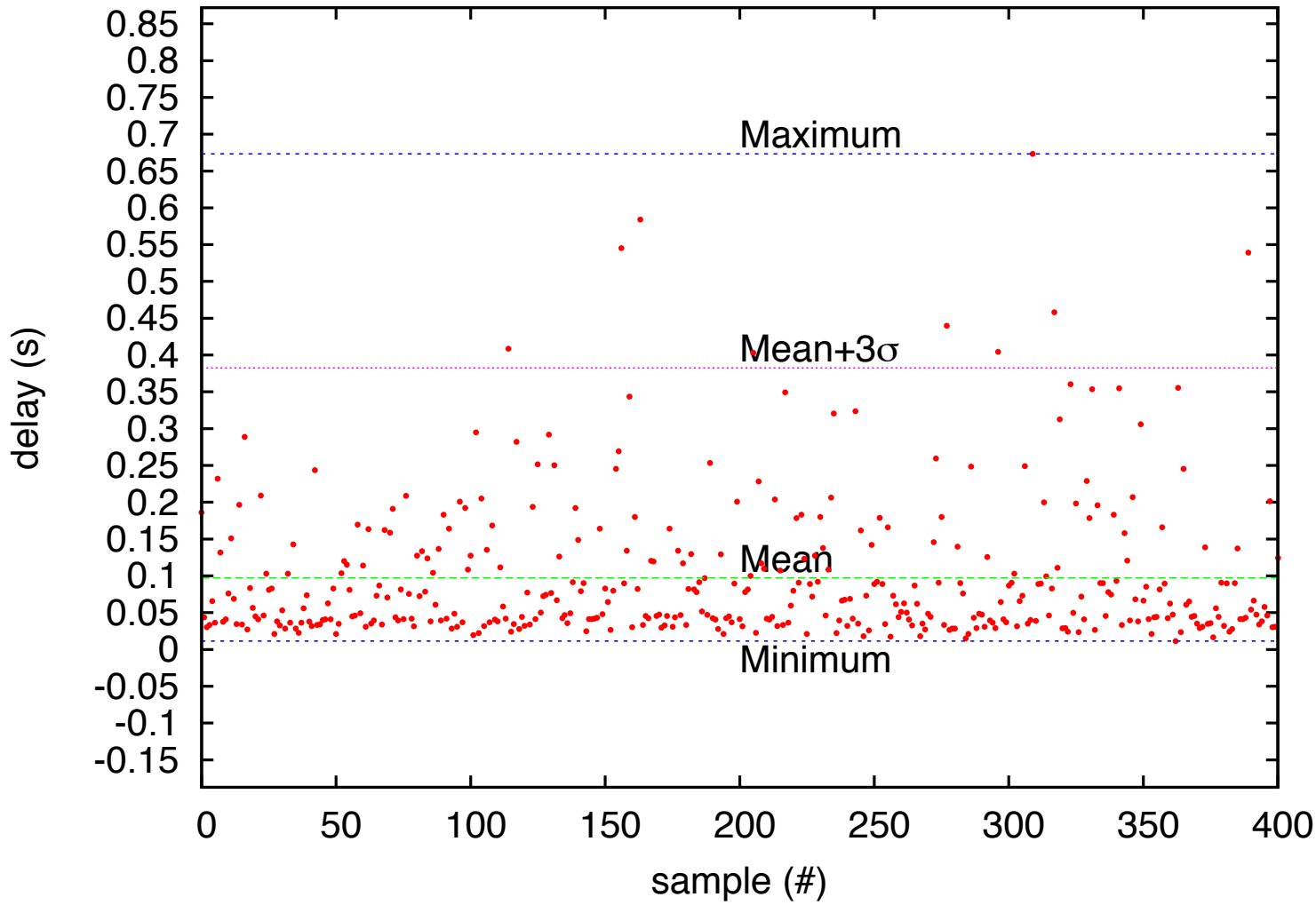
[1] Early 2016

Review: Network Architecture



Power Supply Control – Communication Interval

Measuring the inter-arrival delay between subsequent packets.



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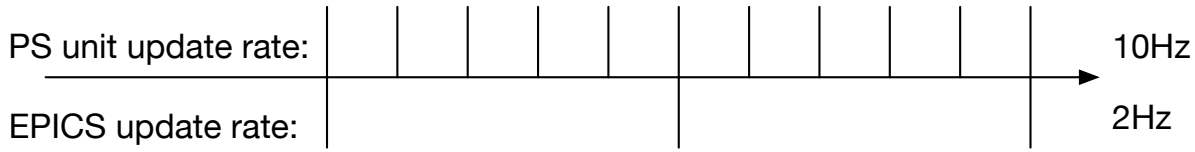
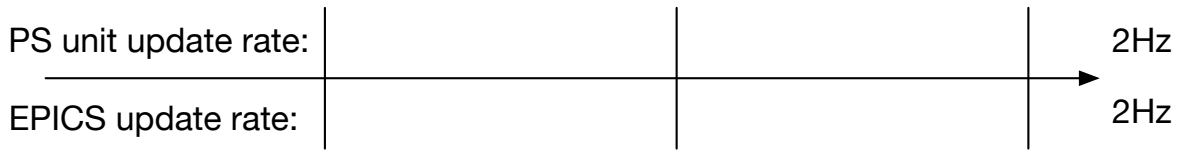
Power Supply Control – Changes to Default Update Rate

Previous Update Rates:



New Update Rates:



- Reduce I/O communication processing
  ((100 + x) PVs × 40 units × 2 Hz)
- Unified update interval: every 500 ms
- Immediate update triggered after each command request

Power Supply Control – Improvements

- Support Polling and Pushing, switch by default to pushing in the next SW version
- Conservative update rate: at least every 500 ms for each unit
- Improvements to PS firmware (faster command processing, batch command processing of the internal queue). Needs further testing before next release. Needs power supply unit re-flashed
- Since yesterday: Improvements to PowerUp Sequence: 3.5s per channel now $\approx$ 1s. Needs further testing before release.

Power Supply Control – Next Steps

- Test recent optimizations (with Stefan and Felix)
- Validation and testing as soon as a substantial amount of spare PS are available
- Profiling code to identify potential bottlenecks
- Testing and rollout of updated EPICS IOC (driver) and PS firmware

Thank you!

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