DUNE DAQ US Servers Specifications Planning / Status

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DUNE DAQ General Meeting

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Scope

- US DOE responsible for:
  - Data storage and (non-readout) dataflow servers
  - Data filter servers
  - General infrastructure servers

- Focus is on specifications preparations needed to support initial detector installation
  - Would procure general infrastructure and data storage servers needed for that, starting in late 2025
  - Deprioritizing specifications/procurements for data filter servers to be closer to need-by date

- Plan to use common performance test framework where possible, focusing on key functionalities and unique drivers for specifications
  - Will include development of a more specific model for server usage

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Dataflow servers

- Outlining key functionalities and developing plans for testing

  - (**red** – requires some more significant development for testing)

- Dataflow orchestration (EF)

  - Sanity-check tests with updates to remove single-point-failure completed

- **Trigger record building and writing**

  - NP04 system tests (KB, WK), developing plans for testing compression in HDF5 (AM)

- **Trigger primitive stream collection and writing**

  - Developing scale-up tests, also considering compression tests (KB, AM)

- **SNB data stream collection and writing**

  - Reviving SNB transfer work, then need to develop record-building/translation code (KB, RS)

- Data filter interfaces (orchestration, dispatch, result collection + writing)

  - Currently planning to extrapolate from other (similar) performance tests

  - Some time to revisit needs as data filter develops

- Transfer of data to offline, including metadata creation and transient data storage management

  - NP04 system tests (KB, WK)

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Infrastructure Servers

Server	Comment	location	platform to provisio	Provided by	Needed for PRF	shared by FD2	generator?
Kubernetes Services cluster	provision for FD2 detector installation first	multiple	metal	DUN…	☑	☑	☑
facilities servers	gateway, Puppet, interactive logins, IPMI	multiple	metal	DUN…	☑	☑	☑
Service	**Comment**			**Provided by**	**Needed for PRRs**		☐
home areas/central storage	Ceph from CSAID? or regular NFS servers. similar	Ross …	metal	DUN…	☑	☑	☐
code distribution	CVMFS, discussion needed on architecture & testi	Ross …	metal	DUN…	☑	☑	☑
authentication (Kerberos)		Ross …	VMWare	FNAL…	☑	☑	☑
Active Directory		Ross …	VMWare	FNAL…	☑	☑	☑
DNS		Ross …	VMWare	FNAL…	☑	☑	☑
Backups		Fermi…	VMWare	FNAL…	☑	☑	☐
Border and firewall		Ross …	TBD	FNAL…	☑	☑	☑
Logbook		TBD	TBD	FNAL…	☑	☑	☑

- Similarly outlining key services / functionalities

  - Communication with Fermilab on host-lab-provided resources and accounting for that in our plan (BK)

    - E.g. authentication, DNS, backup services, database services, etc.

  - Developing plans for code distribution and local builds (JF, AM, BK)

    - Focus first on possible implications for specifications, but then more fully develop implementation plans

  - Translating service needs back to staged deployment plan and server specification (BK)

    - Including plans for shared resources between VD and HD, hot-spares and reliability

    - Confirm needs for additional testing plans, if any (what/where/how)

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(Proposed) General timeline

- Dataflow servers:

  - Complete design/developments needed to fully test/spec systems with initial performance tests by end of September

    - Aiming for practicality, not perfection

    - Still, that may be optimistic if effort is drawn to other tasks

  - Review tests with consortium and develop more detailed server allocation plan with supporting tests (end of October?)

    - E.g., how many / which servers / what-kind-of-storage-backend for standard trigger records, trigger primitive streams, SN streams

  - Then prepare specifications documents for consortium review (end of November?)

- Infrastructure servers:

  - Develop server allocation plan / resources needs and identify any outstanding tests (end of Sep)

  - Review with consortium, including interfaces with other subsystems (end of October?) and support needs for installation

    - Relies on other subsystems / consortia to have needs prepared

  - Prepare specifications documents for consortium review (by end of November)

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