Future Computing Frontiers
Discussion Points

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What SLAC Focuses on

- Historically Babar!
  - Central organisation, international collaboration
- Presently a lot more emphasis on User Facility
  - LCLS, CryoEM, FACET etc.
- Also
  - Stanford Joint Institute: SUNCAT, SIMES, KAVLI
- (Large scale) Collaboration!
  - LSST, ATLAS, DUNE, CDMS, LZ, HPS

Needs

- Apt Storage
  - Archive, Analysis, Real Time
  - Local vs Global
  - Performance? Tiers?
  - Backup vs Archive
- Compute cycles
  - Low/Medium/High priorities, Real Time
  - Peak vs median vs trough
  - High Throughput vs High Performance
  - Exotic: GPU, FPGA, Neural, Quantum

Services 1

- Web services
  - Web pages
  - Wiki's / Documentation / Project
  - Logbooks
  - Construction
- Communication and Community
  - Chat, Email lists
  - Hypernews, Q&A (stackoverflow, quora, discourse)
- Software
  - Revision Control
  - Packaging and distribution
  - Containers, Registries

Services 2

- Common Software/Libraries
  - ROOT, GEANT etc.
  - FFT, BLAS, CUDA, PGAS?
- Interfaces
  - APIs (REST, libraries etc)
  - EDA (Jupyter, etc)
  - Reports
  - Object Stores vs POSIX
- Distributed Computing
  - Slurm/LSF etc
  - Dask, Hadoop, Spark
  - MP, MPI, PGAS, Grid

- Workflow Engines
  - Airflow, Pegasus, Fireworks, etc.
- Visualisation
  - ParaView, Visit
- Data Transfer Tools
  - GridFTP, etc.
  - Data Brokers (xroot, butler, etc)
- Authentication Services
  - CILogin, DoE OneID, CERN, NERSC
  - Group Management and Authorisation
- Machine Learning, Quantum Computing

Production vs Development

- What is the role of SLAC in your community?
  - Builder? Operator? Analysis? Developer?
- Distributed vs central resources
  - (WAN) Networking requirements
  - Storage model
  - Disaster recovery
  - Uptime requirements
  - Active-active sites vs Backup sites (Data+Compute?)
- Cloud/Hybrid
  - VM's, Kubernetes

Other

- Large vs Small Collaborations / Partnerships
  - What technology/processes/people can be broadly applied?
  - Inside / Outside
  - Cross Discipline
  - LSCC
- Which centers should we work closer with?
  - NERSC? Compute Canada? XSEDE? CERN?
- Real Time needs?