

Background and Themes (Rowley Notes V3 5/6/2015)

During the March 23rd “Next Generation Research and the University of California: Planning for the Future of UC’s Cyber Infrastructure” conference, several themes emerged that were consistent highlighted during several presentations and panel sessions.

Perhaps the most important notion is that data driven science and digital scholarship and the associated (and enabling) cyber infrastructures are core to the University of California’s collective ability to address the *grand challenges* facing California, the nation, and the entire world.

Additionally, it is essential that these cyber infrastructures, services, and support offerings are inventoried and are transparently available to faculty, whether these services and infrastructures are supplied by a campus, the UC system, or cloud providers.

The following notes summarize many of the thoughts that were repeatedly highlighted during the conference:

Common Themes – Overview

- Visionary Approach
- Measures of Success and Performance Indicators
- Shared Lexicon and Understanding of Cyber Infrastructure
- Cyber Infrastructure “Concierge” Service
- Data Access – UC and Beyond
- Policies and Ethical Considerations
- Data Management, Curation, Metadata / Interoperability
- Data Quality, Retention Plans, Measures of Use
- Federation of Facilities and Associated Support
- Federated Systems – Especially High Performance Computational Clusters
- Storage Vision and Eco-System
- Skills Development, Training, “Boot Camps”
- Centers of Excellence – Complex Approaches and Technologies
- Service Replication Strategies
- Collaboration Tools and Services

Common Themes – Details

- *Visionary Approach.* The University of California is a unique collection of faculty that lead the world in research, digital scholarship, and knowledge creation. In support of its preeminent faculty, UC must be visionary as it plans its approach to cyber infrastructure given that it has the opportunity to instantiate a new, innovative, and uniquely effective suite of research and digital scholarship technologies and support offerings.

And while UC's cyber infrastructure vision may be instantiated via series of "roadmaps" that define how UC will deploy services and support over time, but this vision must nevertheless be dramatic and serve as a catalyst for faculty who are addressing the grand challenges facing society.

- *Measures of Success and Performance Indicators.* Whatever approach UC adopts relating to the future of cyber infrastructure, tools, and support, UC must also develop associated measures of success and performance indicators. UC must be able to evaluate the efficacy of a particular approach and adopt new strategies when a particular strategy proves sub-optimal.
- *Shared Lexicon and Understanding of Cyber Infrastructure.* The University of California's understanding of cyber infrastructure is changing and will change in the years ahead. There are many tools, technologies, and approaches that have been created at UC during the past decade that are not considered core infrastructures required for modern research and digital scholarship. This may require a new lexicon (e.g. platforms versus infrastructures), and points to the need for a commonly understood suite of terms and jargon that define and place our collective efforts within a well understood context.
- *Cyber Infrastructure "Concierge" Service.* The University of California currently offers and supports a wide variety of cyber infrastructures as well as research and digital scholarship services and support offerings. However, communications and access to these services is sub-optimal. Developing a "Concierge" Service that facilitates and enables access to existing and emerging support should be a priority for UC.
- *Data Access – UC and Beyond.* The University of California generates an incredible amount of data, but access to this data is not necessarily easy or uniform. Additionally, UC must not only strive to increase access to UC data, but to information generated at other institutions, both private and public.
- *Policies and Ethical Considerations.* As access to data increases, UC must ensure appropriate policies and standards are considered and adopted relating to privacy, confidentiality, data ownership, public / private partnerships, etc.
- *Data Management, Curation, Metadata / Interoperability.* As the use of data to further UC's research mission continues, issues relating to data management (short and long term), curation, metadata structures that enable interoperability, etc. are foundational to optimizing UC's effectiveness. UC must leverage expertise within its Libraries to address this important need.
- *Data Quality, Retention Plans, Measures of Use.* As UC considers its data management strategy, it should also develop common understandings of data quality, retention practices, and measures of data utilization that in turn might influence practices relating to dissemination and communications.
- *Federation of Facilities and Associated Support.* UC must continue efforts to federate / consolidate physical facilities (e.g. one data centers serving multiple campuses) that house various cyber infrastructures (e.g. storage systems, high performance computational clusters, etc.). This consolidation will also provide opportunities to optimize the support required to operate systems located within these facilities.

- *Federated Systems – Especially High Performance Computational Clusters.* There are many opportunities to federate access to and utilization of UC's various research technologies and systems. Access to High Performance Computational Clusters and other tools can be federated, and unused capacity on one campus / system can be used by other faculty that are part of a systemwide federation. UC's should develop roadmaps and strategies to federate systems and tools as part of its overall approach to provisioning cyber infrastructures and services.
- *Storage Vision and Eco-System.* The need for storage is growing rapidly and is a shared challenge for all UC faculty engage in data driven research and digital scholarship. UC should create a shared vision for a system-wide storage eco-system that includes cloud offerings, inter-campus shared systems and support, and campus options that meet particular / unusual faculty needs.
- *Skills Development, Training, "Boot Camps."* Faculty, graduate students, researchers, and undergraduates will all benefit from enhanced efforts to develop cyber infrastructure skills and capabilities (e.g. programming skills, research methods, etc.). Opportunities exist to create these tools (e.g. training courses, boot camps, etc.) once for the benefit of many, and UC should investigate and consider acting on these opportunities.
- *Centers of Excellence – Complex Approaches and Technologies.* Cyber infrastructures and technologies involved complex technologies and approaches. UC might benefit from the development of Centers of Excellence around particular tools, and these Centers of Excellence would serve important resources for the entire system.
- *Service Replication Strategies.* With UC today, a culture of "deploying once for the benefit off many campuses" is not the norm. UC should therefore develop a series of strategies, approaches, rewards, etc. that would facilitate and enable a culture of "services shareability upon deployment."
- *Collaboration Tools and Services.* Given the emerging importance of interdisciplinary and collaborative research and scholarship, UC must investigate, adopt, and support a series of commonly used collaboration tools, including video, research portals, and other tools.