

STRATEGIC TECHNOLOGY NEEDS FOR RESEARCH AT UC BERKELEY

PRIORITY	CRITICAL ISSUE	DESCRIPTION	EXAMPLES OF THIS ISSUE	GOAL(S) FOR THIS ISSUE	CURRENT ACTIONS TAKING PLACE TO MEET GOALS	FUTURE ACTIONS NEEDED TO MEET GOALS
1	Basic IT Resources	<p>Researcher and research support staff across disciplines require the use of common systems or technical compatibility else significant reinvestment and training is needed for each new research initiative.</p>	<p>1- Departments engaging in joint research use very different administrative and research systems and tools today slowing research and increasing costs.</p> <p>2- To reduce operating costs, personal computers and servers are often used well beyond standard three year life expectancy. This results in a vast array of aging hardware and software incompatible between departments.</p> <p>3- Shifting from one platform to another is very time intensive and costly, reducing interest in moving to standard solutions.</p>	<p>1-Publish minimum standards and baseline requirements for common computing environments in support of research.</p> <p>2-Develop lifecycle plans to annually evaluate baseline for coming year.</p> <p>3-Provide all researchers and research support staff (as appropriate) with computing device compatible with minimum standards refreshed on regular schedule. (Bronze Level)</p> <p>4 -Publish service catalog of available computing environments and standards for research computing.</p>		
2	Technical Support	<p>Campus research units have considerable hardware and software resources which often times are administered part time, poorly configured, and insecurely configured</p>	<p>1-Many grants provide for one time capital purchases but systems administration operating costs are not covered. Student labor is often used irrespective of their formal training, skills or interest.</p> <p>2-Campus models that include reoccurring charges for services (including the new data center) don't match well with grant funding (easier to use the grant's one time funds to buy our own hardware than to commit to ongoing costs for storage.)</p>	<p>1-Developed shared resource pool of complimentary skills that are dedicated to supporting researchers</p> <p>2- Provide IT "Boot Camp" training for all student IT employees supporting research</p> <p>3-Create Technical Resource Manager position to serve as a single point of contact and identify and plan use of technical resources across campus.</p> <p>4-Free up resources through resource manager to provide enhanced and custom service opportunities where required.</p>		

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3	Advanced Collaborative and Multi-site Research	Research endeavors between campus units or with private sector increasingly rely on shared resources located at multiple institutions and companies.	<p>1-Todays collaboration tools at Berkeley are extremely limited. Most collaboration consists of email based file sharing. Lack of standards or shared environments necessitates the development of costly innovation and duplication.</p> <p>2- Private sector collaboration often depends on adapting to tools and standards provided by each company that are often incompatible with</p>	<p>1-Provide open source, standard online collaboration environments accessible from multiple departments, campuses, and private enterprise.</p> <p>2-Invest in next generation tools, including real time collaboration, Croquet, Sakai, and other open source solutions.</p>		
4	Data Stewardship and Digital Asset Management	Disparate, very large data sets require are limited and often require access to systems and storage beyond	<p>1-Stewardship of research data is essential to support researchers' needs to archive, manipulate, and mine increasingly large databases</p> <p>2-Collections have critical digital asset management needs that are being individually solved by departments at great expense.</p> <p>3-Database management is often left to students or other non professional management resulting in considerable performance and security weaknesses.</p> <p>4-Backups for protection of digital assets are often done locally due to operational cost constraints.</p>	<p>1-Provide options for storing very large data sets that can be actively accesses by multiple groups</p> <p>2- Provide backup and archive solutions to all research projects.</p> <p>3-Provide comprehensive digital asset management solutions, including application archiving, to all researchers.</p> <p>4-Participate and or lead in national efforts to develop metadata standards for core research areas.</p>		

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5	High Performance computing, simulation, and visualization environments	Computing power and research needs double on average every 18 months with requirement for increased capacity of networks, storage, and visualization tools growing even faster.	<p>1-Increasingly traditional research techniques are augmented by replaced with technology based tools, methods and simulations. Aging computer systems prevent timely research and use of newest generation tools.</p> <p>2- Cross discipline research often requires high speed computing. Many of the building on campus do not have sufficient physical infrastructure for standard networking, much less research level bandwidth.</p> <p>3-Shared research tools between campuses or companies require substantial bandwidth often in access of what is available.</p> <p>4-Ultra-high performance computing is needed to support researchers' demands for high-throughput and high-bandwidth networked computing, and sophisticated visualization, simulation, and modeling software.</p>	<p>1-Provide sufficient networking and computing resources to enable access to remote high performance computing environments</p> <p>2-Regularly tested and verified access to remotely based supercomputing, high performance computing, storage, visualization, and simulation environments.</p> <p>3-Publish inventory of campus and system wide research environments, computing infrastructure, research tools, and applications available.</p>		