Shutdown, Budget, and Funding

Xiaolei Qian
Computer Science Laboratory, SRI International
333 Ravenswood Avenue, Menlo Park, CA 94025
qian@csl.sri.com

Abstract

There are few new funding announcements and requests for proposals, mostly due to the partial government shutdown and the budget impasse. We will report on the potential impact on NSF of the government shutdown and a 7-year balanced budget. We then briefly discuss some BAAs from ARPA, Rome Laboratory, and the Air Force.

1 The Aftermath of Government Shutdown

The government shutdown and the uncertainty about FY96 budget is creating severe effects on agencies such as NSF and NASA. For NSF, the immediate impact includes more than 2,500 unprocessed proposals, up to 43 cancelled or postponed review panels, and over 400 delayed continuing increments. These imply delayed funding decisions on new and renewal proposals, and delayed announcements for newly-planned competitions. For post-shutdown related information and deadline extensions, browse the NSF web site at URL http://stis.nsf.gov/nsf/homepage/shutdown/.

2 Science Funding Outlook

In a recent speech titled "Thin Ice Over Deep Water: Science and Technology in a Seven Year Downsizing" delivered at a meeting of the American Astronomical Society, the NSF director Neal Lane painted a gloomy picture of science funding in the process of balancing the Federal budget in 7 years. According to him, the federal investment in non-defense R&D is projected to decline by one-third by the year 2002, and the cuts in education are even larger. To NSF, a one-third cut translates to $1B per year, which would mean granting 6,000 fewer awards and supporting 8,000 fewer scientists, 1,500 fewer postdocs, and 7,000 fewer graduate students.

Neal Lane expressed great concern about "the perceived stony silence of the science and technology community [on the proposed cuts] - the universities, where most of the fundamental research is done, and with a few exceptions, business and industry, which depend on the knowledge and technologies research provides." He also challenged the science and technology community to seize the "opportunity to work together in ways we have never done before, to raise our voices, together, to send out a clear and coherent message. This is not the time to plead for biology vs. chemistry or astronomy vs. engineering, or even basic vs. applied research or technology. It's a time to speak out about the importance of the Federal investment in science and technology, in research and education, in universities, in national laboratories and other institutions - and in the partnerships that have been formed with industry and other sectors that use the knowledge and technologies for the public good...."

3 ARPA's Program on Survivability of Information Systems

ARPA is soliciting proposals for a research and development program related to the security, robustness, and survivability of critical infrastructure systems. These systems "may be regional, national, or global in scale and are those whose continuous operation is critical to the defense and well-being

of the nation. Technologies to improve the survivability of such systems will allow them to be designed and deployed to afford continued correct operation despite intentional penetration and attempts to disrupt, manipulate, or deny service." ARPA is interested in proposals that address problems in three areas.

1. **Composition of survivable systems nonrobust components.** "Very large scale critical information systems are complex and often poorly structured. Practical technology is sought that will allow such systems to be selectively hardened for security and robustness. Approaches should: allow selected system components to be 'wrapped' to realize security and robustness properties, provide a means to specify assumptions, guarantees, constraints, and properties (in addition to functionality) of components, and allow system-wide security and robustness properties to be inferred from the locally-specified properties of components and wrappers. Component 'wrappers' may perform functions such as filtering and access control, authentication, integrity checking, encryption, behavior checking, negotiation of security association, redundancy or replication for fault tolerance, transactional infrastructure for correctness, or secure reliable group communications protocols."

2. **Survival with correlated and malicious faults.** "Proposals are sought for technologies to allow systems to survive correlated and malicious faults as can be expected to occur from information warfare threat. These technologies should be insertable into wrapper frameworks developed in (1) above so as to allow migration of existing system architectures to include defensive capabilities (e.g., threat containment and fault tolerance). Proposals are sought for innovative techniques and algorithms to address a variety of fault/threat models and for their implementation and evaluation in experimental systems."

3. **Intrusion detection.** "The threat of information warfare raises the need for the ability to detect and appropriately respond to an adversary's penetration or manipulation of critical elements of the national or defense information infrastructure. Analytical, heuristic, or knowledge based detection methods are needed that scale to regional and national infrastructure systems, can be applied to current, emerging networking and computing technologies, do not require massive amounts of data collection, can provide usable results from analysis of incomplete information, are highly believable in terms of error rates, allow estimation of the source of penetration, and allow appropriate automated response. Detection methods should have a very high success rate against known patterns of attack and have reasonably high success rates against unanticipated methods of attack. These methods should also permit estimation of the degree of suspicion to be accorded to observed sequences of events. The types of attacks which are of concern range from the individual hacker to coordinated information warfare attacks by adversary nations or non-national groups."

Proposal abstracts were due 12/18/95, and full proposals are due 3/1/96. More information can be obtained by sending email to baa9603@arpa.mil or browsing ARPA/ITO web site at http://www.ito.arpa.mil/Solicitations.html.

4 NSF's Computational Infrastructure Solicitation

NSF has announced a solicitation for a Partnerships for Advanced Computational Infrastructure program as a follow on to its ten-year old Supercomputer Centers program. The focus of the program is on the exploitation of newly emerging opportunities in high performance computing and communications and is designed both to adapt to rapidly evolving circumstances and to meet the need for high-end computation, in order to enable continued world leadership in computational science and engineering.

NSF envisions an Advanced Computational Infrastructure consisting of one or more leading-edge

sites together with cooperating partners. Leading-edge sites are expected to maintain high-end hardware systems that are one to two orders of magnitude more capable than those typically available at a major research university. The partners will

- facilitate research and experimentation with new hardware and software,
- provide scalable resources for applications and applications development,
- provide access to unique experimental systems and facilities, and
- promote education and training.

Partners can be universities, NSF-funded centers and facilities, research and educational consortia, regional and state-supported high-performance computing centers, private sector organizations, and national laboratories.

Details of the solicitation are available on the World Wide Web at URL http://www.cise.nsf.gov/cise/ASC/.

5 Rome Labs Interested in Engineering of Intelligent Systems

Rome Laboratory has announced a program in the design and engineering of intelligent systems. White papers are solicited for research and development to provide "integrated access and cooperation among functionally independent intelligent systems and information bases". The goal of the program is "to enable the development of large-scale, intelligent systems by providing the technology to transform multiple independent intelligent agents, potentially consisting of heterogeneous data sources, into virtual systems capable of providing integrated support to end-user applications."

Total funding for this program is estimated at $1.5M for 2 years, starting in the 4th quarter of FY96. The cutoff date for FY96 white paper submission is 2/17/96, and the BAA is open until 4/30/98. A copy of the BAA can be obtained from http://www.rl.af.mil:8001/Lab/PK/pk.main.html.

6 Update Analysis in Heterogeneous Databases

Rome Laboratory is soliciting white papers in the area of automated and simultaneous update of heterogeneous databases. Innovative research and development solutions are sought in the development of an integrated tool set with the following requirements:

- maximum utilization of Commercial-off-the-Shelf (COTS) and public domain software;
- a computerized database description methodology that combines data modeling techniques with process modeling techniques and captures history of transaction performance;
- a mechanism to use the database description to generate transaction strategies and database access/update software;
- a mechanism to automatically extract data and process definitions from operational systems;
- mechanisms to translate physical database formats to other physical database formats;
- mechanisms to translate units of measure to other units of measure with specified precision;
- mechanisms to automatically identify synonyms (same type of data, different data element names) and homonyms (different types of data having the same or similar names);
- a test, evaluation and demonstration environment consisting of operational databases in an unclassified product evaluation facility, a classified testing facility (IIPF) and at an operational site;
- an ad-hoc user interface that guides the user in developing meaningful information transactions, storing, printing and reporting information transaction results;
- a peer-to-peer, inter-process communication mechanism with deadlock avoidance to support multi-database transactions;

- transition planning that addresses costs, schedule, and DOD requirements in the areas of security, logistics, training, and operations and maintenance;
- software reuse library populated with relevant modules from Generic Intelligence Processor Extensions (GIPE), Database Query Support Processor (QSP) and other relevant Government developments.

White papers are due on 12/15/95 and 12/15/96. Total funding is estimated at $476K for 2.5 years. More information regarding the proposal can be found at http://www.rl.af.mil:8001/Lab/PK/pk-main.html.

7 Reannouncement from Rome Laboratory

Rome Laboratory has reannounced a 3-year old program on heterogeneous multimedia databases, with increased funding of $5M to a total funding level of $10M. The announcement was discussed in the March 1994 issue of this column. The BAA will remain open till 11/30/98.

8 Integrated Maintenance Data Systems for the US Air Force

The US Air Force has recently announced a 6-year $100M effort, encompassing over 100 Air Force installations worldwide, to develop Integrated Maintenance Data Systems (IMDS). IMDS will integrate current and emerging maintenance related automated information systems into a single, open architecture, client/server system to satisfy Air Force maintenance information requirements. IMDS will incrementally subsume legacy information systems for maintenance data, and improve data and transaction flows from the point of maintenance in order to provide decision support to Air Force maintainers worldwide. Proposals are sought to develop an IMDS that supports

- geographically dispersed clients for multiple organizations,
- enterprise-wide databases with transparent data access,
- deployable clients with local database servers,
- concurrent operation with existing legacy system,
- operable with existing systems at local and remote locations,
- security measures for user authentication and access, data management, and communications, and
- standards based using COTS software and hardware products.

Funding will be available in the 4th quarter of FY96.
Proposals were due 12/15/95. IMDS program information is available from the World Wide Web at URL: http://lgm.ssc.af.mil/IMDS/IMDS.HTM.