

QUESTIONS AND ANSWERS NUMBER 2

Contracting-related Questions

1. Do you expect to see funding levels for contractor support over the next 5 years continue at current levels?

Government Response: We do not anticipate dramatic changes in the funding levels for contractor support under NS3.

Contract/Business Management Questions

1. What role do you see the contractor playing during the next 5 years?

Government Response: At the Program Management level, the NAS (NASA Advanced Supercomputing Division) contractor will apply deep expertise, focused tools, and relevant best practices in supporting the Government to efficiently and effectively manage and operate a world-class high performance computing (HPC) facility. The contractor will provide and manage critical expertise in each Technical Area, commensurate with Government requirements, which may vary over time. The contractor will support the Government in acquiring and sustaining the entire lifecycle of HPC systems and related technologies.

2. How do you see your mission changing as NASA continues to evolve its mission and goals?

Government Response: HPC is a highly versatile tool. It can be applied to long-term research, development, and operations in NASA's space exploration, aeronautics, and science missions. Thus, even as NASA has evolved rapidly to focus on the Vision for Space Exploration, this transition has only highlighted the critical importance of HPC and NAS in achieving NASA's missions.

Some application workload changes that NAS already sees include increased efforts in aerospace vehicle analysis, vehicle processing and launch system development, and aerospace vehicle model development and validation. NAS also continues to see dramatic growth in data, especially for Earth and Space Science applications, such that data storage, management, analysis, and transmission are growing challenges. Another change in NAS' mission is an increased requirement for dramatically reduced time-to-solution, in support of mission safety and mishap investigations, rapid analyses for spaceport

transformations and new space exploration vehicle design, and operational weather modeling. Increased data-centric computing, analysis, and visualization is clearly an increased part of NAS' future mission for virtually all applications.

3. We understand Project Columbia funding will only continue through 2007. What are the primary drivers in determining the follow-on requirements and what do you see as the likely SGI hardware replacement?

Government Response: In late 2005, NASA established the Shared Capability Assets Program (SCAP), which is chartered to sustain the efficient and effective operation of NASA's shared, mission-critical assets. The HPC project at NAS, currently called High End Computing Columbia (HECC), was one of the initial projects selected for sustained support through SCAP. The President's FY07 budget request shows SCAP funding for HECC continuing with a small escalation through the end of the charts (FY2011). We fully expect that this world-class HPC capability, and thus the NAS HPC facility, will be needed and supported for the foreseeable future at NASA.

Regarding the follow-on to Columbia, NASA is conducting a broad market assessment and NASA requirements analysis to select the HPC system(s) that offer the best value to NASA. It is impossible to speculate what architectures or system(s) will be selected in mid-2007. The primary drivers or decision factors for the selection include NASA's projected HPC requirements (including capability applications and capacity workload), system performance and usability, system cost and available budget, power and cooling constraints, and filling NAS' role of HPC pathfinding for NASA.

4. Who do you anticipate will be the biggest users of the NAS during the next 5 years?

Government Response: NASA's Earth and Space Science researchers will continue to be major users of NAS. Aerospace vehicle modeling and analysis, including high-fidelity modeling of various critical subsystems and integrated vehicle modeling, will become an increasingly important application area. Eventually, modeling the long-term effects of the space environment on human biology and aerospace materials and systems will become important application areas.

5. What do you see as the biggest challenges facing NAS over the next 5 years?

Government Response: While sustained agency support for HECC eliminates some critical challenges for NAS, there are many others challenges in NAS' effort to maximize the NASA mission impact it enables. As world-class HPC and data systems increase in scale, there are concerns about the effort to achieve high sustained application performance across a broad set of applications, as well as about the levels of reliability, availability, and serviceability of these systems. Also a challenge is creating a software environment that makes it as easy as possible for users to conduct their work. Another challenge will be developing a NASA-wide HPC environment, potentially including load-sharing, critical backup, and fail-over with the Goddard HPC center (NCCS). Still another challenge will be in dealing with exponentially growing requirements for data storage, management, analysis, and transmission. Finding a role for NAS to make significant contributions to the HPC research community will also be important. Finally, meeting user and stakeholder expectations for quality and quantity of service while dealing with expanding Government rules for IT management, enterprise architecture, and IT security is an increasing challenge.

6. What are the most significant issues facing the NAS user community?

Government Response: The user community wants their applications to run quickly, reliably, and correctly, and they want rapid access to their output data. Achieving this is challenging for NAS, within a limited budget for an HPC facility serving hundreds of simultaneous projects on leading-edge HPC systems. Users also face the challenge of getting their complex application codes to run quickly, which is why NAS provides application porting, scaling, and optimization services. Another user challenge is exploring and understanding the vast amounts of data produced by their computations. This challenge is being mitigated by NAS' advanced data analysis and visualization service. Another user challenge is in getting the large resource allocation and fast turn-around times they need while pursuing higher modeling accuracy, whether by refining spatial or temporal grids, using a more accurate model, conducting a larger ensemble of computations, or various application-specific approaches. To meet the challenges of tomorrow's computations, NAS must aggressively upgrade its HPC and data resources, again within its constrained budget.

7. How do you see hardware procurements working on the new contract?
Contractor purchased or Government purchased?

Government Response: Hardware purchases in support of NS3 may be Contractor purchased or Government purchased, depending on regulatory constraints and best value to the Government in each case.