National Aeronautics and Space Administration

IT Talk

March / April 2011 Issue 2

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March/April 2011 Issue 2

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IT Talk is an official publication of the Office of the Chief Information Officer of the National Aeronautics and Space Administration, Headquarters, Washington, D.C. It is published by the OCIO office for all NASA employees and external audiences.

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Message from the CIO

by Linda Cureton

Technological innovation is more important than ever. We saw this first hand last year with NASA's first IT Summit. Presenters from around the country shared their expertise on themes ranging from social networking and green IT to innovation, infrastructure, operations, IT security and privacy.

Things are changing at a faster pace; everything is connected; and standards are slow to emerge. Without a doubt, new tablets are hot on the list of techno innovations, but what else is on the horizon? How about a telescope that lets you see thousands of years into the past. It is also reported to have a database of over 4000 celestial bodies. Perhaps it's not as exciting when it's compared with a Hubble Telescope which can see over 13 billion years. But it does make you wonder where the technology is heading.

Another big trend is cloud delivered content. This will give consumers the ability to get to data independent of the device. Content owners will get the shakes about intellectual property rights and CIOs will get the willies about information security. Relative to what multimedia companies are facing, I feel very hopeful that the financial potential will drive some breakthroughs in the management of this content. That's good news for today's CIOs who are exploring ways to manage content in the cloud.

In this issue we'll take a closer look at where Chief Technology Officers at the centers think NASA is headed down the super highway of technology.

Teleworking—Nasa's New Way Of Doing Business More Efficiently

Tony Facca, ETADS Project Manager

Want to reduce your environmental impact and save money at the same time? Several NASA Centers recently participated in the Telework Exchange's Telework Week, February 14–18, 2011. The Emerging Technology and Desktop Standards (ETADS) group at the Glenn Research Center in Ohio fully participated by maintaining all of their normal work activities from home offices for two straight days. Tony Facca, the ETADS Project Manager, forwarded the registration information to other NASA organizations, including the NASA Office of the Chief Information Officer, and support for the idea quickly grew.

So how did teleworking impact the NASA environment? In those two days, eight members of the ETADS staff saved an estimated 662 pounds of pollutants and $498 in transportation costs. Overall, 1,751 NASA employees who pledged to support Telework Week saved an impressive 97,809 pounds (49 tons) of pollutants and $74,000. The Telework Exchange estimates a savings of more than 4 million pounds of pollutants and $3 million if these employees teleworked just once a week for a year.

Successful telecommuting does require planning. Not all services operate the same from home networks. For example, some NASA resources require authentication through a Virtual Private Network (VPN). So be sure to test remote access before you need it. Everyone in the DC area will remember Snowmageddon 2010 (February 5–6). This was the remarkable blizzard that buried the mid-Atlantic under 2 - 3 feet of snow. Effective telework practices kept vital services operating and allowed some workers to avoid a treacherous voyage. With a little advanced planning, telecommuting can help you live lightly on the Earth, save money, and live a happier, healthier life.

For more information visit https://etads.nasa.gov/teleworkweek

Where Is Technology At NASA He

Technological innovation is more important than ever. We saw this first hand last year with NASA's first IT Summit. Presenters from around the country shared their expertise on themes ranging from social networking and green IT to innovation, infrastructure, operations, IT security and privacy.

The IT Summit helped us get closer to goals through the sharing of IT innovations across the Agency while learning from the efforts of other agencies and the private sector. So IT Talk decided to ask several Chief Technology Officers at the NASA Centers where they think NASA is headed down the superhighway of technology. Many have a unique perspective on what key techno innovations are on the horizon for the Agency over the next 5 years.

Tsengdar Lee—NASA Deputy CTO for IT

A few years ago, I was managing a multi-million dollar congressional directed project (a.k.a. earmark) for the agency. A land grant university was building a computing center for their research use. I asked the vice president why he wanted to build a computing center and what was the strategic value the computing center will bring to the university. The vice president replied that a computing center would allow the university to compete in many scientific and engineering research areas with well established universities and cost less than building a wet lab or robotic lab. If you think carefully about the response, it implies (1) the computing center brings up the science and engineering competitiveness and (2) the information technology has a lower barrier to entry.

As we move toward establishing NASA computing services, we must be mindful to align with NASA's core missions. Only through a tight integration of information technology with the core science and technology activities can we build up the competitiveness of our core science and engineering. Then we will fully realize the strategic value of information technology.

Chris C. Kemp—NASA CTO for IT

Current innovations in cloud-based data processing and storage, advanced networking and increasingly powerful mobile devices will enable ubiquitous access to information, and allow us to seamlessly move and interact with data across platforms and in the places it's needed most.

Advancements in networking such as LTE, WiMAX, LTE 2, WiMAX-Advanced and up to 100-gigabit networking will push data further and faster. Cloud computing technology will enable users to place larger and more complex data sets in the cloud, accessing and interacting with data from any internet-ready device. It will also allow NASA to move increasingly voluminous datasets to different sites more easily.

16 and 11nm semiconductor manufacturing processes and the use of alternative materials will increase performance while lowering heat production and energy consumption in system-on-a-chip (SOC) processors. This will allow smaller devices such as smart phones, tablets and netbooks to fulfill a greater proportion of our computing needs.

At the same time, this increase in bandwidth and processing power makes new means of communication like HD video conferencing more practical and accessible. With gigapixel and terapixel-resolution instruments and advanced approaches to visualization such as 3D capture and projection, Computer Aided Virtual Environments and 4, 8, and 16K displays, we will be able to immerse ourselves in a world of data.

The end result is that NASA personnel will be able to accomplish more from a greater range of locations, and that these trends will continue to make the world an even smaller place.

James McClellan—JSC CTO for IT

"I don't think it's much of a leap to say that 5 years from now the average NASA employee will be using a mobile computing platform that is essentially a nice display with a browser connected to all their content and social connections through the ubiquitous 'cloud.' That cloud will be capable of housing both normal and secure content. Networks will have removed the penalty of being mobile with multi-megabit wireless connectivity virtually everywhere. Employees may even be supplying their own preferred device (Bring Your Own Device–BYOD), enabled by the ability for NASA applications to be securely used on even a personal device via mobile app management profiles. And IT as we know it will be on the way out, if not already gone, due to the consumerization of IT. We have to start positioning ourselves to become the "go to" IT consultants if we are to deliver value to our customers and the missions."

eaded Over The Next Five Years?

Ray O'Brien AMES CTO for IT

"I believe cloud technology will have a tremendously positive impact on the Agency. Having recently transitioned from managing NEBULA, NASA's cloud computing initiative, to Ames CTO, it is clear to me that NASA will realize significant savings using the shared-resource model. However, the agility cloud computing provides is the real value to NASA. It enables users' instant access to pooled computer resources, and soon many NASA prototypes, pilots, and proof-of-concept activities may be accomplished without investing in dedicated physical hardware. Projects with limited duration processing requirements, or with planned peaks, may address their requirements without investing in over-specified hardware. Other agility benefits include enabling rapid-start software development projects and the ability to dynamically scale to accommodate unexpected requirements and peak loads. As business and operations models are refined to support public and private cloud services, NASA will increasingly and enthusiastically adopt the technology. Now is a great time to start becoming familiar with cloud computing."

Tom Soderstrom—JPL CTO for IT

Tom Soderstrom serves as the IT Chief Technology Officer at NASA's Jet Propulsion Laboratory (JPL) where his mission is to identify, infuse, and adopt new IT technologies into JPL's environment. Before working at JPL, Tom led remote teams and large-scale IT best practices development and change efforts in both small startups and large commercial companies. He performed these roles in both international venues and in the U.S. commercial and Government consulting arenas. While at JPL, Tom led a collaborative, practical, and hands-on approach to investigate emerging industry IT technology trends that matter especially to JPL, NASA, and large enterprises. His research shows that the key trends for the next decade are driven by the emerging need to "work with anyone from anywhere with any data and using any device." The specific trends identified include:

- *Extreme Collaboration Made Simple—quick and simple will rule the day;*
- *The Pervasive Cloud—Cloud computing is part of every strategy;*
- *Eco Friendliest—It will be a competition to be seen as the most energy frugal;*
- *Refocused Cyber Security—IT security advises at the start of all efforts;*
- *Consumer Driven IT—The end users determine and help build the IT;*
- *You've got apps—No more large applications, but small, agile apps;*
- *Immersive Visualization and Interaction—Think Microsoft Kinect but bigger;*
- *Big Data—Huge data sets and many devices reporting all the time; and*
- *Human Behavior—How we meet the changing expectations for computing.*

Simply speaking, IT will be transformed into "Innovating Together" and the traditional IT employees will become consultants to the NASA businesses. The results will be drastically improved and relevant IT embedded in the NASA missions. The most significant improvements will be how we intelligently visualize massive amounts of data on our mobile devices and have continuous access at previously unimagined bandwidth.

David Voracek, Dryden CTO for IT

Flight test, analysis, computational fluid dynamics, and wind tunnel data is gathered, generated, and graphed on a lot of flight projects we do at NASA. There is no easy way to bring all this data together for comparison, validation, and reporting. I would love to see an innovation where we can bring this data together as easily as we can search information on the Web. I imagine a day where a student studying aeronautics or space technology could use data generated from a test stand at Glenn or Marshall, wind tunnels at Langley, flight data from Dryden, or space data from JPL or Johnson, to take the equations and apply real data to understand the physics. A person develops a new CFD program and could easily find flight data that could be used to validate their code. The data search would include images, video and audio that was generated during the project. This innovation would take a lot of coordination between all the people that generate the data on a project. NASA works with advanced technologies that may not be operational for several years. We have to be generating the data with the thought that it would be searchable 10 years after the project ended. The value of this data is immense and we need to figure out how to make it easier to access.

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Peter Hughes, GSFC CTO

It is hard to accurately predict technology innovations in the next five years, yet it is certain that space systems will become increasingly more complex and capable. One of drivers behind the increased complexity is a very clear trend toward miniaturization, especially for certain classes of scientific instruments and platforms. Continued advances in miniaturized technologies (e.g., Micro-Electro-Mechanical Systems and nanotechnology), electronics, and advanced materials are examples.

It also is certain that future missions and instruments will return greater volumes of data. In many cases, these increases will be significant. Fortunately, advances in space communications technologies, such as optical free-space communications, promise greater scientific data volume transport. Furthermore, advances in smaller and higher-performing on-board computing capabilities, such as SpaceCube and other Application Specific Integrated Circuits (ASICs) that can tolerate extreme environments, will enhance data processing. They will provide greater on-board data processing and classification, event/feature detection, product generation, and real-time distribution. The advanced onboard processing also will enable increased system autonomy and autonomous collaboration between science platforms.

With these "safe" predictions, it is perhaps more exciting to think about—but nearly impossible to forecast—the breakthrough innovations that will result from the newly created Office of the Chief Technologist's "Space Technology" program. By reinvigorating technology innovation within the Agency and throughout the space-technology community, I am quite optimistic that we will witness a strong increase in radical innovations that will overwhelm the incremental advances that our recent dry spell in Agency technology funding created.

Ed McLarney, LaRC CTO

As a brand new NASA employee, I am thrilled to join the team as CTO for the Langley OCIO, and look forward to working closely with customers and technologists, both locally and across the Agency. Over the next five years, we will relentlessly pursue the vision: "Provide anytime, anywhere access to information from any device." It sounds simple, but this onion has many layers. We will conduct collaborative, iterative customer outreach to tie technology innovation directly to mission requirements. We will continue to partner with customer technical experts to help them achieve their goals. Specific emerging technology areas will include: pervasive collaboration & telepresence tools, migrating many applications to the cloud, embracing agile deployment of web 2.0 and social media tools, enhanced decadal information archive, large-scale mobile device deployment, intelligent search & knowledge tools, automated metatagging of text & visual files, and data center optimization. These emerging technology areas will be supported by upgrading wireless networks, adopting best-of-breed new IT security tools, and numerous other infrastructure enhancements. We will complement technical developments with innovative and agile policies & procedures for IT security, licensing, intellectual property, and legal considerations. Customer focus, technical innovation, and enhanced policies and procedures form a balanced approach to work toward the technical vision.

GRC—*Courtesy of Don Sosoka – Division Chief, Mission Support Computing Office, Tony Facca – Project Manager for ETADS (Emerging Technology & Desktop Standards), and Jay Horowitz – Senior Computer Scientist*

One of the most dynamic areas of IT is mobile computing and, as such, it and related technologies provide ample innovation opportunities.

Mobile Computing: At NASA, use of smartphone technology has more than doubled during 2010 (5,300 connected devices in January 2010 to almost 11,300 in January 2011). Improvements in security will attract the more risk-averse users. Mobile device management technology will continue to improve, enabling NASA to secure, monitor, and manage corporate data on both Government-issued and employee-owned devices. Tablets will continue to gain acceptance in NASA with increased vendor diversity, though Apple will remain the leader.

Mobile Apps: Everyone is familiar with the availability of the thousands of applications for mobile devices such as smartphones, pads and tablets. The increased speed available with 4G WiMax and LTE will enable a whole new generation of mobile apps, including HD videoconferencing. NASA customers will expect more applications to provide a mobile device interface like WebTads. Opportunities exist for the development of more NASA-specific applications that take advantage of resident functionality (e.g., GPS) for increased productivity. As computing power continues to grow in mobile computing devices, NASA will increasingly have the ability to develop more direct mission-related applications for use where anywhere availability to those applications is of value.

Data Transformation: As the variety of computing platforms from which NASA users will want to access information increases, there will be a growing need to transform data (photographs, videos, spreadsheets, etc.) to fit the end-user environment. Technology to perform these transformations automatically and intelligently will become increasingly important. Use of extract, transform, and load (ETL) processes, will allow only one version of a document that can be transformed on demand and incorporated into more complex documents.

David Walters, SSC CTO for IT

Adoption of mobile technology will continue over the next 5 years to transform NASA into a mobile workforce where access to IT services is omnipresent. More powerful multi-core central processing units (CPUs) increased memory, and faster data networks will make the mobile device the preferred IT appliance for many NASA employees.

The virtual office will become commonplace with the adoption of mobile cloud technology providing remote access to the same data as available on a user's desktop PC. Utilizing the cloud, a mobile device could become a "thin client" and even function as a desktop PC through a docking station for peripheral support. Advancements in unified communication will continue to improve the integration of mobile devices with other communication services such as telephone, fax, e-mail, and instant messaging.

Current use of mobile devices has improved the way NASA communicates, but there is greater potential for mobile applications to revolutionize our IT landscape. Applications are now possible that have never been envisioned in a mobile environment, particularly with an available toolkit that includes location tracking, barcode scanning, photo capture, and credential scanning. NASA has already started the investment into mobile device application development. As a result, NASA's IT culture will shift from skepticism of mobile devices to embracement over the next 5 years.

NASA Continues to Lead a Joint IT Forum for Federal Agencies Using Systems Application Products (SAP)

Many federal agencies, including NASA, have implemented Systems Application Products (SAP) software as their enterprise financial systems. For years, each agency endeavored separately to discuss issues with the SAP vendor, and to drive solutions that would meet requirements and challenges unique to the public sector. When a major SAP upgrade raised the stakes for all agencies in that category, NASA took the initiative to form a group that could speak—and be heard—authoritatively to address public sector issues. Since its inception in 2007, the SAP Federal Forum has grown to include eight Federal agencies, some with multiple installations. The SAP software vendor provides key representation and participates in the forum's quarterly meetings.

The impetus for the creation of the forum came about as a result of NASA's SAP Version Update (SVU) project implemented by NASA's Enterprise Applications Competency Center (NEACC) at the beginning of FY07. NASA was the first U.S. Federal agency to upgrade to the current version of SAP and the NEACC quickly became a critical source of lessons learned for other federal organizations planning similar upgrade projects. The first meeting was held April 2007 at the NEACC facility in Huntsville, Alabama, and focused on NASA's upgrade experience. The relationships with SAP and the other federal organizations quickly evolved into what is now referred to as the SAP Federal Forum.

SAP feels strongly about close collaboration with Federal agencies. To maintain certified status of Federally-compliant software, they must provide system capabilities to satisfy public sector requirements. In the past, they were interpreting these requirements without direct input from agencies but the Federal Forum now allows for close collaboration prior to development efforts so that the functionality provided is what agencies truly need to fully satisfy requirements with as little custom development as possible.

Over the past couple of years, member agencies have collectively agreed to a listing of priorities to assign to working groups. These groups consist of key subject matter experts with detailed knowledge of the functionality or requirements. SAP also provides subject matter experts and developers to work with the group to address the concerns. The first working group effort addressed issues with a standard reporting shell for the Treasury Report on Receivables, requirements for which are provided by Treasury and are very complex. The mechanism SAP originally provided had performance and configuration issues. The working group successfully worked through the issues with SAP developing changes to the report and testing along the way. After months of collaboration and effort, the redesigned report was made available and implemented successfully at one agency, with several other implementations in progress. Most importantly, the functionality now meets agencies' needs.

The Federal Forum held its first annual face-to-face meeting in 2010. The meeting's stated purpose was to provide an opportunity for agencies to share their fiscal year-end-close experiences, and to discuss and prioritize challenges. At that meeting, the participating agencies agreed that future annual meetings' sole focus no longer needed to be year-end, but should expand into other topics of interest. The 2011 annual meeting was held January 25 and 26, with over 80 participants representing SAP, Federal agencies, and consultants who had all collaborated to develop an agenda tailored to deliver meaningful content to everyone. For the second year in a row, the Department of Interior hosted the meeting at their facilities in Reston, Virginia. Hot topics included Enhancement Pack 5, which is currently in ramp-up, the potential Federal requirement to withhold 3 percent of vendor payments, an upcoming Treasury change from a 9-digit general ledger account format to a 6-digit general ledger account format, and a change from Federal Agencies' Centralized Trial-Balance System (FACTS) I and II to the Governmentwide Treasury Account Symbol Adjusted Trial Balance System (GTAS), to name a few.

NASA benefits from the Federal Forum in many ways. Not only do the Agency's requirements get included in helping to guide SAP's public sector roadmap, but the insight received back helps to guide the strategic roadmap for maintaining NASA's financial systems. Information on content and timeline for SAP delivering new system capabilities allows NASA to effectively develop an implementation schedule and factor this work in with other priorities.

This year the Federal Forum will be working to increase Federal agencies' participation in the Americas' SAP Users' Group (ASUG) Public Sector Special Interest Group (SIG). Working more closely with ASUG will allow us to take greater advantage of ASUG's communication tools. It also allows us to combine our voices with other SAP customers facing similar challenges and opportunities. We will continue to hold quarterly conference calls to add or remove items on the priority list. We will be appointing customer representatives to head up the priority working groups on a variety of specific topics to address those things that are most important to Federal agencies. There is a strong need for this group to continue. Significant benefits have already been provided, and the goal is to continue to reap those benefits for NASA and all member agencies.

Federal Forum Member Agencies	
Navy ERP (NavAir, SPAWAR)	CBP
Army (GFEBS, LMP, USAMMA)	USDA
IRS	DLA
DOI	NASA

Questions about the SAP Federal Forum may be addressed to LaTonya Powell at the NASA Enterprise Applications Competency Center.

ACES 101

Agency Consolidated End-user Services (ACES) is a single award, Firm Fixed Price (FFP), Indefinite-delivery, Indefinite-quantity (IDIQ) contract with a minimum contract value of $5 million and maximum contract value of $2.5 billion. The ACES contract will provide desktop, printer, e-mail and other end-user services to the NASA community.

The Period of Performance for the contract is 10 Years (4-year base + two 3-year options):

Base: *July 1, 2011 – June 30, 2015*

**This contract is currently under protest. The start date may be adjusted.*

Option 1: *July 1, 2015 – June 30, 2018*

Option 2: *July 1, 2018 – June 30, 2021*

Programmatic direction will be provided by the Office of the CIO End-user Service Executive and oversight will be shared by the Service Executive and the NASA Shared Services Center (NSSC) CIO to the End-user Service Office, located at the NSSC.

The End-user Service Office will include: the End-user Services Manager (EUSM), Contracting Officer's Technical Representative (COTR), the Integration Lead, Service Element Managers, and Project Member Support. Centers will have Subject Matter Experts, Service Element Technical Experts, Center Integration Leads, Resource Analyst(s) and Project Member Support. All business support functions including Contracting Officer and Specialists, Cost Analysis, and Resource Analysis will be performed by the I3P Business Office at the NSSC.

The following are five main goals of ACES:

- Goal 1: Consolidate the provisioning of end-user services across all NASA Centers and Facilities using a single Agency solution
- Goal 2: Ensure NASA's mission is enabled by the Agency Consolidated End-user solution
- Goal 3: Improve the End-user IT security posture
- Goal 4: Improve the management of NASA's IT infrastructure
- Goal 5: Enable a mechanism for transformation of NASA's end-user services in support of emerging mission requirements

Specific Objectives for each Goal are detailed in the ACES Performance Work Statement.

Stay tuned for an ACES 102 article in the next edition of IT Talk. We'll cover the specifics regarding the types of computers, laptops, printers, cell phones, and services that are going to be delivered.

For more information about ACES, see: http://insidenasa.nasa.gov/ocio/i3p/i3p_aces_faq.html

Full Steam Ahead for I3P

New procurements under NASA's IT Infrastructure Integration Program (I3P) are shaping up. I3P is NASA's program to provide Agency-wide management, integration, and delivery of information technology (IT) infrastructure services to support mission success. I3P focuses on consolidating NASA's infrastructure services in the areas of Web services, Integrated network and communications services, Enterprise applications, End-user services, Enterprise data center, and Agency Service Desk. The Enterprise Applications Service Technologies (EAST) contract was awarded last October and began operations on Feb 1, 2011. The Agency Consolidated End-user Services (ACES) contract was awarded in December 2010, but is currently under protest. ACES will be the replacement for the Outsourcing Desktop Initiative for NASA (ODIN). The U.S. Government Accountability Office has 100 days to issue an opinion; an answer is expected in late April. The NASA Shared Services Center continues to set up the Enterprise Service Desk and Ordering System to serve as the consolidated help desk and self service Web site for the new contracts. The NASA Integrated Communications Services (NICS) and the Web Enterprise Service Technologies (WEST) contracts continue their work in evaluating proposals, a selection is expected in the coming months. When it is all completed, this Agency-wide effort will better enable the NASA mission, improve security, and gain efficiencies.

JPL Mission Infrastructure Service (MIS)

By Whitney Haggins, Jet Propulsion Laboratory, California Institute of Technology

JPL's Office of the Chief Information Officer has implemented an IT infrastructure that will reduce cost as well as risk while increasing the flexibility of the computing environment during the Flight Projects life cycle. The Mission Infrastructure Service (MIS) is a shared IT service infrastructure that provides high-performance hardware and dynamically provisioned IT resources on a virtual machine. By eliminating the initial hardware investment and reducing system administration costs, the total cost of ownership is sharply reduced. Projects no longer have to worry about the IT infrastructure used to support critical mission operation that requires large amount of servers and workstations, nor do they need to keep and store excess servers and workstations. Now they can subscribe to the MIS and pay for what they use only when they use it.

The MIS infrastructure provides blade server modules that can be accessed using thin-client technology.

Before: Extra workstations stored in a cubicle.

After: Workstations replaced by blade servers in racks within a secure server room.

Blade servers have been installed in a server room in the Space Flight Operation Facility (SFOF) and can support either Solaris or Linux operating systems. The SunRay thin clients and monitors have been installed in the special event Mission Support Area in the SFOF.

The MIS infrastructure has been thoroughly tested by the Office of the CIO and several flight projects including: Cassini, Dawn, Mars Exploration Rovers (MER), Mars Reconnaissance Orbiter (MRO), Mars Science Laboratory (MSL), and it was used successfully by EPOXI during their encounter with Comet Hartley on November 4, 2010.

NASA IT Summit—Save the Date!

NASA's second IT Summit will be held on August 15–17, 2011, at the Marriott Marquis in San Francisco, California. NASA Associate Administrator for IT and Chief Information Officer Linda Cureton will host the event.

The overarching goal of NASA's IT Summit is simple. It will provide an integrated forum for NASA's IT community which includes all of its working groups. And it will enable the NASA IT community to create a venue for continuous learning that provides that provides perspectives on the internal and external IT landscape.

NASA has partnered with the nonprofit National Institute of Aerospace, which acts as a liaison between NASA, industry, public partners and academia to secure resources to better promote NASA's vision and the role of IT. The partnership will also enable an open dialogue among a broader IT community.

Participants benefitting from these discussions include IT representatives from NASA Mission Directorates, NASA Mission Support organizations, academia, other Federal agencies, and Federal IT groups. The Summit will include best practices in broad IT subject areas as well as on IT mission enabling capabilities, IT security, open government, IT Enterprise Architecture, and social networking and innovation.

Collaboration will be a particular emphasis for the 2011 IT Summit, as the NASA Office of Education has become a significant partner in promoting education through IT. Together, we will explore the impact of the IT workforce pipeline through the use of instructional technology.

In addition Ames Research Center, Dryden Flight Research, Glenn Research and Langley Research Center are plugging into the IT Summit audience and venue location. The centers are co-hosting TEDx NASA. This will give IT Summit attendees the opportunity to learn, discuss, and collaborate on innovative ideas in the fields of technology, entertainment, and design. Attendees will be able to apply these ideas to their own challenges.

So make your reservations now to attend. For more information about IT Summit registration go to www.regonline.com/itsummit2011

Why We Do IT for NASA

Lynn Heimerl and Gerald Steeman, Scientific and Technical Information (STI) Program Office

Many NASA researchers are well known in their specific fields and have received numerous honors and distinctions, but they may not be a household name to you. Perhaps they have never flown a Space Shuttle, broken the sound barrier, or made headlines by diving deep into the ocean depths. However, their NASA research and contributions put them, in our minds, in the category of NASA's unsung heroes. In this article, we highlight Joel S. Levine of NASA Langley Research Center. Joel is a senior research scientist in Langley's Science Directorate, and he has been the principal investigator and chief scientist of the proposed NASA Langley ARES (Aerial Regional-scale Environmental Surveyor) Mars Airplane Mission. ARES is Langley's proposed robotic, rocket-powered Mars airplane designed to investigate the atmosphere, surface, and sub-surface of Mars. ARES was one of four finalists in the first Mars Scout Mission competition. See Joel's talk on ARES for TED (Technology, Entertainment, and Design) at http://www.ted.com/talks/lang/eng/joel_levine.html. "The discovery of life outside of the Earth," Levine says, "will be a major scientific discovery! When we discover life on Mars, how will we determine unambiguously whether it is life indigenous to Mars (life that originated and evolved on Mars) or Earth life that was inadvertently carried from Earth to Mars by earlier Mars landers and/or rovers?" Heavy stuff.

Joel Levine has put some time into the topic of Mars. He is particularly proud of two publications. The first is the 1976, A New Estimate of Volatile Outgassing on Mars, which was published as the two Viking Orbiters and Landers were en route to Mars. Levine says, "The paper presented geochemical evidence that early Mars had a very dense atmosphere (more than 100 times denser than today) and abundant and wide-spread liquid water existed on the surface of early Mars." The second, Trace Gases in the Atmosphere of Mars-An Indicator of Microbial Life, published in 1989, theorized how the trace gas composition of the atmosphere of Mars can be used to determine whether there is life on Mars today and predicted that the discovery of methane in the atmosphere of Mars would be a very strong indicator of the presence of life on Mars. "Fifteen years later, in 2004," Levine states, "methane was discovered in the atmosphere of Mars!" Imagine waiting 15 years to have your work validated.

Joel coedited a 974-page book titled, The Human Mission to Mars: Colonizing the Red Planet (Cosmology Science Publishers, Cambridge, Massachusetts) published in December 2010. See: http://journalofcosmology.com/Contents12.html.

Closer to home, Joel also has worked at the request of the National Archives and Records Administration in Washington, DC., to lead a team of NASA scientists in solving the mystery of why tiny white spots were forming in the hermetically sealed encasements containing the Declaration of Independence, the U.S. Constitution and the Bill of Rights. Why? As a science detective (is that similar to a "history detective?") to find out why, the team used noninvasive techniques that were originally developed to measure trace gases in Earth's atmosphere. To everyone's great surprise, they measured very high concentrations of water vapor in the hermetically sealed encasements. It turned out that the high concentrations of water vapor chemically reacted with the glass encasements, thus causing the leaching out of alkaline material from the glass. This resulted in the formation of the mysterious white spots. The result? Joel and his NASA team helped to preserve the founding documents of the United States of America. Now that is impressive! "I believe that all scientists have the responsibility," Joel said, "to communicate with the science community and with the public at large (who pay their salaries!)." The Scientific and Technical Information (STI) Program seeks to facilitate that communication each day. Search for Joel Levine's research (http://go.usa.gov/Y8B) on the STI Program's NASA Technical Reports Server (http://ntrs.nasa.gov/).

Joel Levine (front) and members of the ARES team posing with the full-scale drop-test airplane. (Photo credit: NASA)

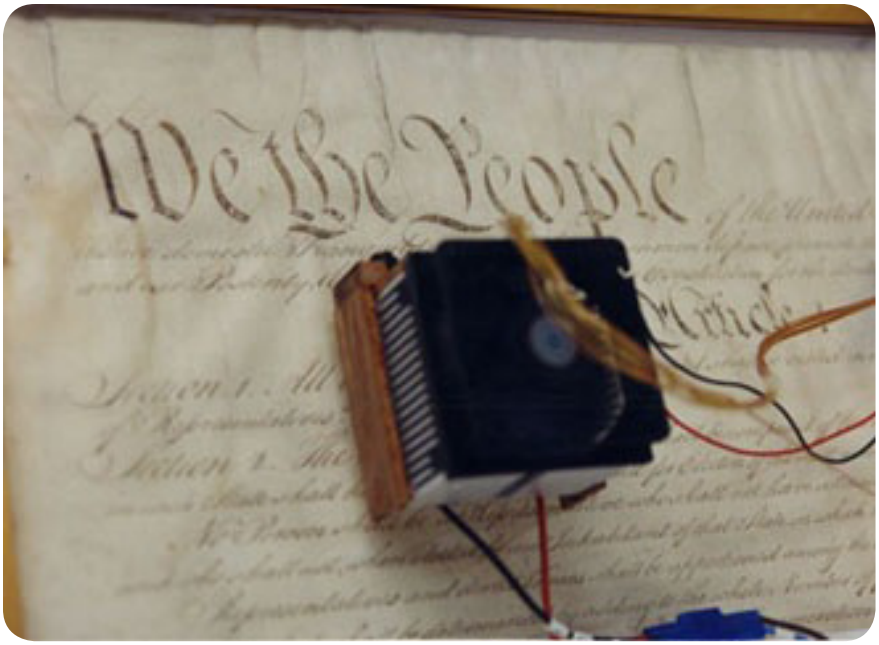

Photo credit: Joel S. Levine, NASA

NASA Langley instrumentation obtaining measurements about the composition of the atmosphere in the encasement containing the U. S. Constitution.

22nd Annual Federal 100 Award Winners Announced

THE FEDERAL 100

Congratulations to NASA Associate Administrator and CIO Linda Cureton, Marshall Computer Scientist Tim Baldridge, and JPL CIO Jim Rinaldi who have been named among the winners of the 2011 Federal 100 Awards.

The Federal 100 Awards recognize government and industry leaders who have played pivotal roles in the Federal Government IT community. These are individuals who have gone above and beyond their daily responsibilities and have made a difference in the way technology has transformed their agency or accelerated their agency's mission.

To view the complete list of all 2011 Federal 100 Award winners go to http://fcw.com/pages/fed100/2011/winners.aspx

The 2011 Federal 100 Awards Gala will be held March 28 at the Grand Hyatt Hotel in Washington, DC. For more information go to http://fcw.com/fed100

Think Before You Click: *A User Awareness Primer*

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IT Talk

This past September, e-mail users in scores of organizations and corporations, including NASA, were recipients of a malicious e-mail containing a subject line reading: "here you have." The link within these e-mails had the appearance of a PDF file. E-mails such as this rely on simple social engineering, tricking users into clicking the link, which then downloads and opens malicious files.

The attack resulted in infections to NASA systems Agency-wide. The number of messages generated caused e-mail services to become temporarily unavailable, due to the creation and sending of hundreds of thousands of malicious e-mails. Although only a small percentage of NASA users Agency-wide clicked on the link, the cost to our Agency in system infections, user downtime, remediation and loss of productivity cost NASA many hundreds of thousands of dollars.

The malware (malicious software) from this attack, in addition to burrowing into multiple locations on the users systems and changing computer settings, also shut down anti-virus and other security features, while collecting information about the system it was compromising.

Additional malicious messages were sent from the address books of users who clicked on the link. The malware wrote itself to any attached drive including thumb drives and fileserver shares, and installed a backdoor for potential remote control.

Running the malware from the "here you have" attack was preventable. The malware was only able to download and run on a system if the user clicked on the link.

Prevention of the losses impacting NASA and other organizations and companies could have been 100 percent successful had user awareness and cautionary actions been higher.

The best way to know how to prevent malicious files from running on your system is to know when not to click on a link. The "here you have" message, as well as other messages of this nature, contain several characteristics that should serve as warning signs to users that clicking on the link is a bad idea.

Aspects to watch for as "red flags" include:

- E-mails sent to a distribution list that is visible to recipients.
- Unusual or nonsensical subject line.
- Poor grammar.
- Suspicious link.
- No signature.

Before clicking on links in an e-mail, ask yourself some questions:

- Did I expect the e-mail?
- Do I know the sender? Is the source verified?
- Is the link what it appears to be? A document? A program?
- Is the Web site safe?
- Should I run a program I didn't expect?

If the answer to one or more of these questions is "no," then do not click on the link.

If you receive a message unexpectedly, or cannot verify the e-mail sender or source, some rules-of-thumb toward awareness and prevention are to:

- Check with the sender.
- Examine the link.
- Stop and re-read the message.
- Delete or report the e-mail to the NASA SOC if you are suspicious, or, if possible, send an e-mail to the SOC describing the suspicious situation accompanied by a screen shot of the e-mail in question; If possible. do not click "forward" and send a suspicious-looking e-mail to the SOC or to other users.
- Look carefully at links you are sent. Sometimes information is appended at the end of what seems to be a known e-mail address. Other times, criminals insert extra characters into viable e-mail addresses.
- Sometimes characters are replaced with numbers or similar text to fool the user.
- Rolling your cursor over the URLs shown in a link within an e-mail, hovering over the link or right-clicking on the link will enable you to see the actual URL, potentially preventing you from falling victim to cyber crime.
- When receiving a message that is unexpected or from an unverified source, examine the link, staying on guard and suspicious.
- Do not forward the message.
- Be suspicious of all links you are sent. Retype or cut and paste the URL into the browser rather than following the link.
- Report the message to the NASA SOC at 1-877-NASA SEC (1-877-627-2732) or soc@nasa.gov

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