National Aeronautics and Space Administration

IT Talk

January - March 2017 Volume 7 • Issue 1

THE MOST IMPORTANT TECHNOLOGY TRENDS

Those That Evolve How We Work

In this Issue

IT Talk

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Message from the NASA CIO

No New Year's celebration would be complete without thanking the people who worked very hard on one of last year's resolutions: the IT Business Services Assessment (BSA). It was truly teamwork, communication, and collaboration that steered us in the right direction. We took a hard look at how we manage IT and outlined a series of steps the Agency should take—and is taking—to optimize and protect our IT assets. The BSA results ensure that IT is seen as a strategic Agency resource, establishing clear direction for the NASA CIO to approve the Agency's IT spending plan for non-highly specialized and oversight of highly specialized IT investments. In my personal opinion, the BSA will help us move from an "okay" to a "great" state.

In 2017, it is also critical that IT security remain a top priority at NASA! We have some serious challenges ahead of us. Our IT Security Division (ITSD) is working constantly to identify and counter attacks by implementing proactive and adaptable security measures. We are also working closely with the Department of Homeland Security (DHS) and other Federal agencies to implement new technologies and share best security practices—partnerships that have improved NASA's security posture.

Our values will help guide our behavior to achieve NASA's vision. It's important for us to be responsive, customer-driven, transparent, accountable, and a trusted partner. Strengthening our IT services means adopting high-level performance goals and key priorities. So here are some 2017 New Year's resolutions I would like our team to embrace:

1. Protect and effectively manage NASA's IT as a strategic resource. (This is a top priority.)
2. Safeguard NASA's information and IT assets to ensure mission safety and integrity.
3. Deliver excellence and delight our customers.
4. Optimize IT investments to achieve Agency priorities.
5. Capitalize on innovation to advance NASA's capabilities.
6. Be flexible and willing to accept change.
7. Hold more skip-level meetings.
8. Show IT's value.
9. Increase productivity.
10. Enjoy the job!

I look forward to this new year and know that there are great things ahead for our OCIO team!

~Renee

New Deputy CIO for Glenn Research Center Named

By Kristin Ratino, Communications Specialist, Glenn Research Center

Louise Moroney was selected as the new Deputy Chief Information Officer (DCIO) for NASA Glenn Research Center (GRC) effective November 27, 2016.

Moroney has more than 25 years of progressive leadership experience across IT strategy, IT operations, and cyberdefense. Prior to joining NASA, Moroney served as the Deputy for the Chief Strategy Office (CSO) of the Defense Information Systems Agency (DISA), where she was part of a leadership team that led strategic goal and objective development, along with the associated measures of performance that were used to assess goal and objective achievement. She also was responsible for the internal growth, development, and management of the Chief Strategy Office team.

Prior to her civilian role at DISA as Deputy for the CSO, Moroney served the organization in a military capacity in roles such as the Director of the DISA Command Center, Director for DISA Cyber Command Field Office, Director of Global Data Center Operations, and Vice Director of Operations for the Joint Task Force Global Network Operations. Throughout her military career in the U.S. Army, she held a variety of leadership and staff positions across the information technology and cyber mission areas in both Army tactical and strategic/installation levels and in the joint operating environment.

Moroney stated, "I am excited to be a member of the NASA team. I believe my skills and 25-plus years of experience, as both a customer-/mission-oriented IT service provider and a people-focused leader, will be a positive benefit to NASA GRC's OCIO customer and team members." Welcome aboard, Louise!

A Reminder From The NASA Privacy Office

By Bryan McCall, NASA Privacy Manager

[NASA Privacy Policy (NPD 1382.17J)]
NASA's policy is to protect all forms of sensitive unclassified information, including personal information.

Federal law and regulations require that all personal information collected, used, maintained, and disseminated by or on behalf of this Agency be protected, whether in electronic or non-electronic form.

Therefore, NASA policy requires that

1. All collections of sensitive unclassified information (including personally identifiable information [PII]) will be assessed for applicability under, managed under, and appropriately protected in compliance with Federal laws, regulations, and Government-wide policies;

2. An Initial Privacy Threshold Analysis (IPTA) for any new, or significantly changed, applications, Web sites, information systems (including third-party applications, information systems, and collections of information provided by external service providers who are collecting information on behalf of NASA), and all non-electronic information collections will be accomplished to determine/identify regulatory compliance requirements; and

3. When initial assessments via the IPTA process call for the completion of a full Privacy Impact Assessment (PIA), one must be completed prior to actively collecting any information.

All collections of PII gathered by or on behalf of NASA will leverage Agency-specific individual identifiers. Use of Social Security Numbers (SSNs) will be avoided to the greatest extent possible. In instances where SSNs are already in use, collections will be reviewed annually for removal or replacement using other Agency individual identifiers, such as the Universal Uniform Personal Identification Code (UUPIC). The use of SSNs is authorized only when mandated by external or statutory requirements and justified in writing within the associated IPTA or PIA.

Information owners, custodians, and managers are responsible for maintaining heightened awareness of their responsibility to protect privacy information. Even potential compromises or loss of control over information is costly to individuals, the Agency, and the Federal Government. Encrypt it at rest. Do not store it on shared folders or other resources that do not have the appropriate protection ratings and mechanisms in place. We are accountable!

If you have questions, please contact Agency or NASA Center Privacy Offices. Contact information is available on the Agency Privacy Information Resource Web site (available at *https://inside.nasa.gov/ocio/it-security/privacy-management*).

Security Tips

- Think Before You Click: Any misspelled URLs, hidden links, poor grammar, unknown senders, suspicious attachments, or requests for personal information?
- Be aware of your information's classification and where you send it.
- SBU, PII, and ITAR data cannot be freely shared or stored everywhere.
- Secure and protect sensitive information at your desk, in the hallway, and online.
- Set strong passwords and don't reuse them for other accounts.
- Lock your computer when away from your desk.

For more information, visit: *https://inside.nasa.gov/itsd/reporting-incidents*

NASA SOC (OCIO Security Operations Center)
1-877-627-2732
soc@nasa.gov, available 24/7

NASA CIO Executive Council (CEC) Face to Face

Nov 29 - Dec 1, 2016

Back: Keith Bluestein, Kofi Burney, Sean Gallagher, Jeff Seaton, John Sprague, Danny Harvill, Jerry Davis

Front: Neil Rodgers, Mag Powell-Meeks, Sean McMorrow, Dinna Cottrell, Renee Wynn, Vanessa Stromer, Dennis Vandertuig, Robert Powell

JarMarcus King, ARIO provides an augmented reality demo for Jennifer Knight, NASA LaRC OCIO.

NASA Langley Looks Toward a Future with Augmented and Virtual Reality

By Vince Whitfield, Communications Specialist & Sean Sullivan, Marketing Manager, NASA Langley Research Center

Employees at NASA Langley Research Center (LaRC) are investigating how augmented and virtual reality (AR/VR) could assist research and development, educational outreach, and communication to help achieve the Agency's mission. The terms "AR" and "VR" cover a range of emerging information technology fields that have gained recent popularity in consumer gaming applications. AR integrates digital information with a user's environment in real time. In contrast, VR replaces the real world with a simulated one. The International Data Corporation projects that the AR/VR industry will grow to be worth more than $160 billion annually by the year 2020.

Teams at multiple NASA Centers are exploring the possibilities of AR/VR technology, and the NASA LaRC Office of the Chief Information Officer (OCIO) is keen to discover ways to share knowledge and coordinate AR/VR efforts across the Agency. "Augmented and virtual reality technologies hold the potential to shape the future of research and collaboration at NASA," said Ed McLarney, Associate Chief Information Officer for Technology and Innovation at NASA LaRC. "As a Center, we're making efforts to figure out how these technologies can become tools to help us achieve the NASA mission."

As part of that effort, the Center recently hosted Joseph Weaver, CEO of ARIO in Newport News, VA, who gave a presentation about AR/VR technologies. The event was organized by NASA LaRC's Multimedia League, a self-organized group of multimedia professionals who work on the Langley Administrative, Media, and Professional Services (LAMPS) contract. The presentation was attended by more than 50 Center employees, as well as a remote audience from NASA Marshall Space Flight Center (MSFC).

ARIO specializes in AR, VR, and mobile application development. While ARIO is a relatively new company, Weaver has over a decade's worth of experience leading and working on projects that bring new and emerging technologies to the field. The presentation covered an array of topics, including an overview of AR and VR, ARIO's role and goals in the industry, and the potential effects that these emerging technologies could have in business and academia. During the presentation, he passionately described the grand potential of AR/VR technologies for solving complex problems. A lively Q&A session with the audience followed.

After the presentation, Weaver and his team demonstrated two software applications developed by ARIO. The first demonstrated how AR could be used to walk someone through a maintenance check of a water pump system with little training or knowledge of the system itself. The second demonstration showed how AR could be used in the inspection and repair of a military vehicle. After the demonstrations, NASA LaRC employees were invited to try the software themselves. Overall, the event gave attendees a glimpse into the future and the potential effects AR/VR technologies will have on both their work and their world.

The Most Important Technology Trends: Those That Evolve How We Work

By Tom Soderstrom, Chief Technology & Innovation Officer, Jet Propulsion Laboratory, California Institute of Technology

As we look at the exciting technology trends of the Next IT Decade (the next three years), one mega trend stands out: We will work very differently.

Why? Because we will need to work faster and more effectively with fewer wait-states (aka "bureaucracy"). Consumer technologies are evolving very quickly and have made us highly productive at home. However, these trends are slower to adopt for an enterprise, largely because there are legacy technologies and the cost of switching is higher and more time-consuming.

So, because Jet Propulsion Laboratory (JPL) and NASA are made up of IT consumers, a key disrupter is the adoption of the most meaningful emerging consumer capabilities in the enterprise. If JPL and NASA can do this, our employees will be more productive and more satisfied and we can deliver the NASA mission more quickly, more securely, and at lower cost.

But, which technologies and capabilities will matter and how can we use them? The answer is to predict the Human Behavior trends as Human Behavior affects IT, which affects Human Behavior, which affects IT, … you get the point. Simply put, they help us select which technologies are worth prototyping in the near-term, as they are the most likely ones to be adopted in the enterprise.

From our research, the key Human Behavior traits for the next few years are the following:

WHO will do the work? Entrepreneurs will come up with ideas. Makers will use 3D printing, Arduinos, Raspberry Pis etc. to prototype a solution. Crowdsourcing will help us find specific expertise and new, non-traditional, partners who will work from anywhere to accomplish the NASA and JPL missions (this will include public hackathons).

HOW will they work? They will use an Agile approach and Open Source and consumer technologies in the cloud to rapidly prototype a minimum viable product (MVP) and pivot quickly when needed. They will use crowdsourcing in creation of these MVPs, both internally to the enterprise, through internal hackathons and internal Kickstarters, and externally by using the NASA Open Innovation contracts and other approaches.

WHAT technologies and tools will they work on? They will apply advanced analytics and deep learning to make Smart Data from the current Big Data. They will evolve the cloud as the default development and operations platform, with rapid course corrections when needed. DevOps will be the expected way to work. The key enablers will be Internet of Things, Wearables, Natural User Interfaces, and Conversation as a Platform.

Which are the key CHALLENGES they will face? We will no longer be able to lay out a long-term, fixed architecture. Instead, we will need to create a chaotic architecture, where frequent changes with effective and automated analytics is the new normal. Because of the size, scale, and speed of continuous development / continuous integration (CD/CI), manual operations will be replaced with automation and this change can be difficult both technically and culturally. Cyber Security becomes ever more important and needs to be built into all the solutions and automated with advanced visual and predictive analytics. Luckily, these challenges are not unique to our enterprise, and by collaborating with others, we can meet them more quickly.

By paying attention to the Human Behavior trends, we will evolve the way we work to adopt new technologies faster, create automated and fully scalable solutions, and get effective help from new and varied partners.

Most importantly, this will help us use new techniques to answer the big questions more quickly, such as: Is there life in Space? How can we put humans on Mars? How can we redirect an asteroid? Where is Earth 2.0? How can we help protect Mother Earth? And that's what it's all about. An exciting future indeed!

What's New in 2017: Top IT Trends

By John Sprague, Associate CIO, Technology & Innovation Division (Acting), and James B. McClellan, Tech Infusion Branch Manager, Office of the Chief Information Officer.

Information Technology analysts name virtual/augmented reality, intelligent applications, and customer journey analytics among the top trends for 2017 and beyond. What's next for NASA Innovation?

» **Data Centric Model (DCM):** The DCM is a strategic vision for NASA to incorporate the latest trends in twenty-first century computing and simultaneously provide a more secure system than we are operating today. Using only a modern browser, data content is delivered to the screen but not stored on the device, exemplifying the Any Device, Any Network challenge.

» **Collaboration:** The Chief Technology Officers (CTOs) for IT, in conjunction with the OCIO Collaboration Team, have been working on a federally-approved solution for Enterprise File Sync and Share (EFSS). This tool, coming in 2017, will provide cloud-based storage and sharing across the Agency. It opens the door to achieving several tenants of the DCM, while increasing security and lowering the risk of data loss.

» **Internet of Things (IoT) Lab:** Now entering Phase III, the physical lab is located at Johnson Space Center (JSC) in the 1958 Co-working Space, but the IoT team spans the Agency. In Phase III we will be developing the NASA IoT policy and look towards operationalizing the IoT environment across all of NASA.

» **NASATube:** Hosted on the Amazon GovCloud, NASATube will provide an internal-only, Agency-wide repository for NASA videos that are Americans with Disabilities Act (ADA) 508-compliant and a secure location for subject matter. It allows any NASA employee to easily submit and post their videos, enabling collaboration and sharing on a whole new level.

» **T&I Labs Innovation Challenge:** Our 5th Annual Challenge showcased many interesting and exciting projects. Appearing again, a mind-controlled drone prototype has advanced algorithms that can now control elements in the International Space Station virtual environment with only a thought! The 6th Annual Challenge begins January 9, 2017; start planning your entry today!

» **World Wind:** A free, open-source Application Programming Interface for a virtual globe (spatial data) allowing developers to quickly and easily create interactive visualizations of 3D globe, map, and geographical information. Organizations across the world use World Wind to monitor weather patterns; visualize cities and terrain; track the movement of planes, vehicles, and ships; analyze geospatial data; and educate people about the Earth. New capabilities are expected in 2017.

» **NEW Open Gov Plan:** The plan offers new pathways for public involvement, employee collaboration, and provides a roadmap to track past performance from the 2010 Open Government Plan through today. We've embraced these principles and built upon the initial activities by leveraging these early learnings and best practices.

» **NASA Federal Source Code Framework:** We are ensuring new custom-developed federal source code is made broadly available across the federal government. This approach meets the Digital Government Strategy "Shared Platform" approach to enable federal employee collaboration—within and across agencies—to reduce costs, streamline development, apply uniform standards, and have consistency in creating and delivering information.

» **Conversational Systems:** Today we have automated phone interactions like Siri, but soon consumer digital platforms will use artificial intelligence and machine learning. Natural-language recognition and voice synthesis will make it difficult to distinguish between humans and machines. The T&I Data Analytics team is developing several advanced concepts related to this work, such as predictive analytics to help mission partners make real-time decisions based on mission data.

As we continue to innovate and work on solutions to solve or mitigate problems, we appreciate you telling us your challenges and headaches. We hear you and are actively addressing your frustrations to make it easier, efficient, and more enjoyable to do your job. We look forward to what 2017 has to offer!

Innovation at Goddard Space Flight Center (GSFC)

By Keith Keller, Associate Director for Innovation & Chief Technology Officer for Information Technology, Goddard Space Flight Center

Although the term "innovation" has many meanings in different contexts, innovation is a necessary part of any successful IT service organization. To innovate means to create something new and to incorporate this new thing into an organization in order to make the organization more effective, more efficient, and, ultimately, more competitive.

There is an interplay between IT technology, processes, and business models that drives innovation. For example, a new device may offer capabilities that allow a new, more efficient process. This new process could then be incorporated into a more efficient and competitive business model. An innovative "feedback loop" then occurs when the new business model spurs the development of more improved technology. NASA is benefiting from this innovative IT spiral.

New IT capabilities are being explored at NASA Goddard Space Flight Center (GSFC) through prototyping activities in cloud computing, virtual desktop infrastructure (VDI), and—with new human-machine interfaces—virtual reality and augmented reality (VR/AR). The GSFC IT and Communications Directorate (ITCD) has assisted GSFC users in prototyping new capabilities such as avionics component modeling and simulation, along with cloud-based storage using NASA's Enterprise-managed cloud services, i.e., Amazon Web Services (AWS). VDI solutions are being evaluated as a Center capability for on-demand, accessible, standardized, and secure computing. ITCD has partnered with its engineering community to develop a VR/AR pilot roadmap and to ensure secure and adequate network access for this innovative technology.

When combined with other innovative technology areas, such as additive manufacturing (e.g., 3D printing), IT innovations will fundamentally change engineering and science. These new capabilities will drive further innovation in engineering and science to ensure that NASA remains a world-class science and engineering organization. Innovation is part of NASA's DNA, so innovation in IT should be a matter of course.

Contact Keith Keller at keith.l.keller@nasa.gov with any questions.

Coming Soon – Mobile Device Management (MDM)

By Kellie White, Communications Specialist, Marshall Space Flight Center

The Center for Internal Mobile Applications (CIMA) has partnered with the Identity Credential and Access Management (ICAM) team and the End User Services Office (EUSO) to provide users with increased security and greater ease of use on their NASA-issued iOS and Android mobile devices. Given all of the recent cybersecurity threats seen within the Federal sector, the new technology being introduced by these three teams could not have come at a better time.

The new technology, which is being implemented in three distinct phases, will reach full benefits in late 2017. The first phase, completed in 2016, introduced the use of mobile device management (MDM) to the NASA community. Users can now successfully register their NASA mobile devices at *mdr.nasa.gov*. With this rollout, users who have registered their NASA mobile devices no longer have to worry about placing the Agency at risk if those devices are lost or stolen. Once reported as lost or stolen, a device is "wiped" and all NASA data are removed, thereby securing NASA's information.

The second phase will consist of the derived credential certificate and the NASA secure container for mobile devices. This phase will begin in 2017 and will eliminate the use of passwords for authentication on NASA-provided mobile devices and will give users the ability to send and receive encrypted e-mails for iOS and Android mobile devices. The implementation of the secure container to access NASA e-mail, contacts, and calendars will further the efforts to improve NASA's security posture by protecting NASA data and services on any Android or iOS device.

The third and last phase will begin rollout later in calendar year 2017 or in early 2018. This phase will provide NASA with the ability to fully manage the life cycle of NASA applications and services being accessed from a NASA-provided mobile device. Once this phase is completed, users will access NASA mobile applications from the secure container via their Android or iOS device.

Be sure to look for Center and Agency announcements and opportunities to learn more starting in 2017. Until then, if you have questions or suggestions, send us an e-mail at *msfc-cima@mail.nasa.gov*.

Agency Applications Office to Configure Enterprise Applications/Systems for Two-Factor Authentication

By Kellie White, Communications Specialist, Marshall Space Flight Center

The Agency Applications Office (AAO) will be configuring two-factor authentication for all AAO Enterprise Applications integrated with Launchpad (SiteMinder) and the SAP Suite (Core Financial, Procurement for Public Sector, and Business Warehouse). The planned release for this change is currently scheduled for Release 17.2, which will occur in late March 2017. This configuration change is being implemented to meet the OMB M-11-11 Federal Mandate, which increases security and eliminates the use of username and password. After the systems and applications have been configured for two-factor authentication, all users will need a Personal Identity Verification (PIV) Smartcard or RSA SecurID token to access the systems and applications. Users of AAO applications will need to be aware of the following items:

1. All users will need a PIV Smartcard or RSA token to access all applications configured for two-factor authentication.
2. Users who do not currently have a two-factor credential will need to obtain one through their home Center.
3. PIV-ineligible workers may authenticate using RSA tokens until the NASA Smartcard is available to them.
4. Individuals who frequently telework will need to check their Center policy regarding the use of VPN and RSA tokens. As a reminder, users should not be storing NASA data on non-NASA computers per security guidelines.

The change to two-factor authentication will result in increased security measures for both the user and the Agency. To view a list of AAO applications being configured for two-factor authentication, please visit *https://epss.nasa.gov* and look for the link labeled "Two-Factor Authentication."

If you have questions or require additional information related to this upcoming change, please e-mail the AAO at *MSFC-CC-BR-Team@mail.nasa.gov*.

BSA Corner

By Meredith Isaacs, OCIO Communications Specialist, NASA Headquarters

As the implementation of IT Business Services Assessment Decisions marches along, much progress has been made. As of December 15, 56 percent of IT BSA tasks are fulfilled (up from 34 percent last quarter); another 4 percent are almost finished! So far, a lot of important work has been completed by OCIO staff across all Centers. Some highlights include the following:

- ***Roles and responsibilities:*** Naming program executives for the Applications, Communications, Computing Services, End User Services, Information Management, and IT Security Programs and defining Level 0–3 roles.
- ***Governance:*** Redefining governance boards (IT Council, IT Project Management Board, CIO Leadership Team) and conducting the first Center Functional Review (CFR).
- ***Computing services:*** Drafting a program plan and defining data center elements for reporting.
- ***Communications:*** Completing the communications domain architecture and writing the communications program plan.
- ***Workstations:*** Measuring Agency Consolidated End-User Services (ACES) usage at each Center and designing a waiver for non-ACES workstations.
- ***Collaboration:*** Outlining evaluation criteria for a Core Suite of Collaboration Tools and establishing a tool portal (available at *https://inside.nasa.gov/ecs/approved-collaboration-tools*), currently being populated.
- ***IT Security:*** Conducting a zero-base review of security spending and deploying the Continuous Diagnostics and Mitigation (CDM) tools.

As actions add up, new programs and assets will bring benefits to the OCIO community and information technology customers. These advantages allow the OCIO to assist customers, capitalize on innovation, safeguard NASA's information, and optimize IT investments.

- ***Customer Service:*** For IT customers, new program offices will present "front offices" for enterprise OCIO services while updated strategic sourcing guidelines instruct in the use of existing contracts and the procuring of new contracts. For data owners, monthly Cloud Community of Interest Forums share best practices and feature guest speakers.
- ***Innovation:*** By embracing new ways of handling information, IT is evolving. With the cloud, concentrated data centers are more efficient and cloud options offer new (and cost-effective) means for "big data" processing. The OCIO is also developing a Core Suite of Collaboration Tools to meet most needs while eliminating duplication and providing one-stop access.
- ***Security:*** New firewalls will unite Centers behind a shield while easing collaboration. Security tools, like CDM, amplify the Agency's knowledge of devices and software on the network and allow for greater threat assessment.
- ***Savings:*** By becoming more efficient in services, the OCIO has begun to save while recognizing other areas in which to uncover more savings. Reserves gathered through contracts, strategic sourcing, operations, and data center consolidation will be reinvested into services and the mission.

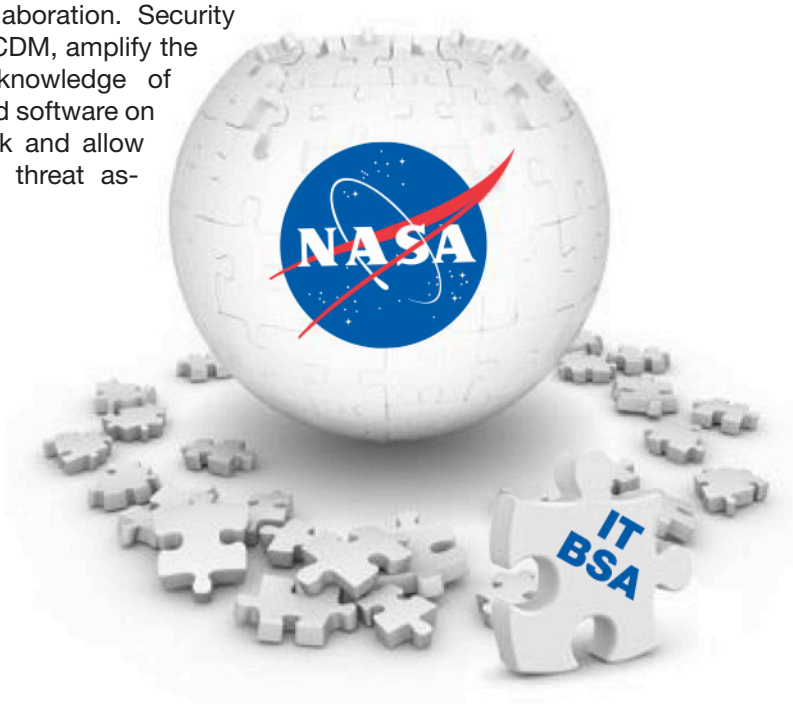
Through the hard work across the Centers, the OCIO is bringing benefits to the IT community and customers.

Questions about the IT BSA?

Read more:
https://inside.nasa.gov/ocio/bsa

Save The Date!

Join us for the IT BSA Ask-Me-Anything Webinar with CIO Renee Wynn on January 18, 2017, 11:30 a.m.–12:30 p.m. ET. This will be an event open internally to NASA employees. Submit questions to *HQ-ASK-BSA-IT@mail.nasa.gov*. More details to come.



2016 Headquarters Honor Awards
Team Excellence Award, Internatioinal Space Apps Challenge, Beth Beck; Customer Service Award, Joe Gomes; Exceptional Service Medal, Jason Duley; Team Excellence Award, Datanauts Team. *Photo Credit: (NASA/Aubrey Gemignani);* Not pictured: Customer Service Award, Dana Mellerio.

NASA Deputy Chief Information Officer Face to Face, December 6-8, 2016 - Washington, D.C.

(l-r): Faith Chandler, Catherine Prohaska, Terry Jackson, Grace DeLeon, Dan Conway, Beth Beck, Dennis Groth, Dwaine Kronser, Steve Guy, Jeanne O'Bryan, John McDougle, David Walters, Russell Leonardo

NASA Technology & Innovation Face to Face, December 6-8, 2016 - Washington, D.C.

(l-r): Travis Kantz, Nick Skytland, Brian Thomas, Andrew Adrian, John Sprague, James McClellan, Jason Duley, Veronica Phillips, Beth Beck

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