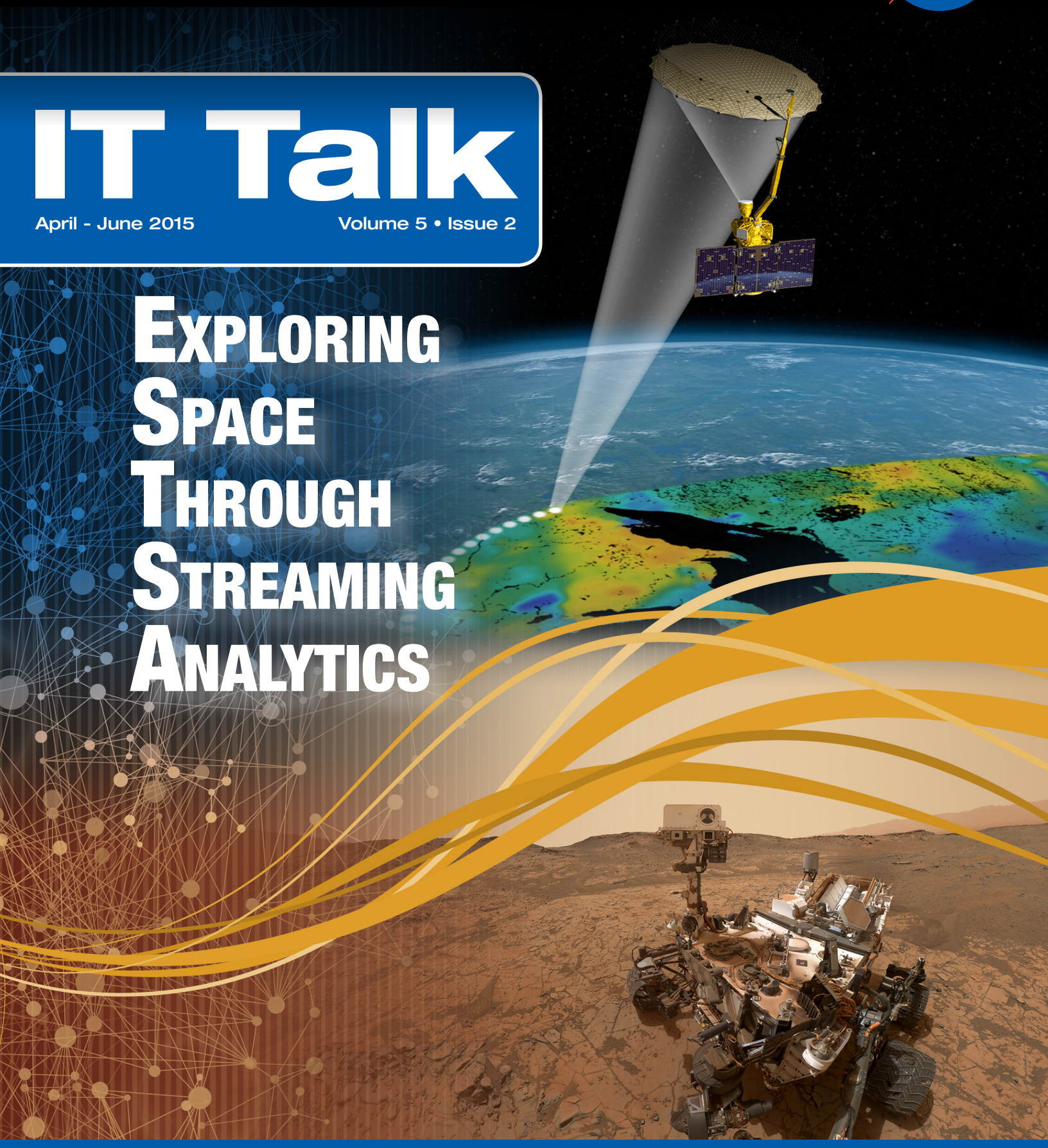
National Aeronautics and Space Administration

IT Talk

April - June 2015 Volume 5 • Issue 2



Exploring Space Through Streaming Analytics

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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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In this Issue

Message from the NASA CIO

A lot of great work is happening at the Centers right now. NASA is looking at implementing Mobile Device Management capability. Approximately 26,800 mobile devices across the Agency connect to NASA systems in order to support Agency mission and goals. These mobile devices are identified as iPhones, smartphones, iPads, BlackBerrys and tablets. Each of these mobile devices has the capability of storing NASA data on the device and accessing NASA systems. MDM will help us better protect NASA's information and assets. It will also help us support NASA's Bring Your Own Device (BYOD) activities in the future.

Cybersecurity also remains a top priority for the Agency. Some employees travel out of the country for NASA business. Did you know that the Agency has strict policies in place for taking your NASA IT devices on foreign travel, and accessing NASA services from any device abroad? In this issue we'll take a closer look at what you need to know before you head out on international travel.

And finally, Information Technology is changing at an ever increasingly rapid pace. By using rapid prototyping as an innovation tool, we have an opportunity to help NASA try out new technologies in a quick and inexpensive manner with very little risk. It also provides a powerful partnering opportunity. The only risk to rapid prototyping is to not learn something from it.

In this issue our main story will focus on rapid prototyping as a path to lasting innovation. We are highlighting several actual use cases – or stories – that show rapid iteration and lasting success.

I hope you enjoy our stories and join us on the path to help make NASA an ever more innovative place to work.

~Larry

Farewell to NASA's Deputy CIO!

Gary L. Cox retired on March 31, 2015 as NASA's Deputy Chief Information Officer. He led the implementation of NASA's information resource management strategy and IT reform initiatives which helped to strengthen the Agency's technological infrastructure. Cox retired with 29 years of federal service. We wish him well as he moves on to the next chapter of his life.

New Deputy CIO for Glenn Research Center Named

Raju Shah was selected as the new Deputy Chief Information Officer for the NASA Glenn Research Center (GRC) effective March 22, 2015.

Shah started his NASA career in April 2013, serving as the Chief of the Information and Applications Office, overseeing Information Management, Applications, Scientific Computing, and Visualization at GRC. He has over 16 years of progressive experience in Information Technology in both the public and private sectors.

Previously, he was a Director of Information Technology at the University of Maryland, College Park. During his career at the University he led a variety of projects including IT consolidation initiatives, Business Continuity, Virtualization, VoIP installations, High Performance Computing/ Research Computing, and the development of IT governance standards. Congratulations!

LET THE CIO KNOW-KNOW BEFORE YOU GO-GO — INTERNATIONAL ACCESS

By: Dave Stein, NASA SOC

Did you know there are explicit procedural directives for taking your NASA IT devices on foreign travel, and accessing NASA services from any device abroad, even personal ones (e.g., iPhones, iPads, laptops, leased desktop computer at a coffee shop), are subject to the same restrictions and procedures? There is also a policy directive, that anyone using NASA equipment (e.g., laptop, smartphones, etc.) must get written permission from the Center Chief Information Officer (CIO), before traveling abroad with them, and when accessing NASA services (e.g., webmail, VPN, chat, etc.). Having approvals, and alerting the CIO to travel, reduces reported attacks on NASA (sometimes it's hard to know if it's friend or foe accessing systems), and also eliminates IT Security or the Security Operations Center blocking or suspending your access if it appears suspicious.

The Agency has recently been the subject of especially-realistic and cleverly-crafted phishing emails, many deriving from foreign attackers. The almost daily, unsolicited attempts, try to get end-users to open an attachment, or to click on a link. Often the aim of these messages is to direct users to a very realistic copy of an Outlook, or other login page, with the sole purpose of harvesting email or NDC credentials. Once users fall prey to these seemingly-authentic phishing schemes, the attacker logs into their email using their credentials, can read and delete the end-user's messages, set up filters, and find other valid NASA email addresses to send further phishing attempts to, only this time from a genuine, and therefore trusted, NASA email address.

In addition to ongoing vigilance, and a healthy skepticism of unexpected email messages, it is crucial, and mandatory, to follow all Foreign Travel business requirements *(see link at right)*. Ideally, you should not be accessing work email while on personal travel, however, if your role requires you to check in during vacations abroad, make sure you alert your CIO and IT Security department you may be accessing from a foreign country. This way you won't appear to be a foreign attacker, and your access won't be blocked. It's a win-win for everyone, to let the CIO know-know before you go-go.

NASA Policy Directive (NPD 2540.1G) International Travel:

The employee shall use only equipment officially approved for use outside of the U.S. for international business meetings, conferences, symposia, etc. The employee must ensure that the hardware remains in their possession while outside the U.S. Any loss, damage, or tampering shall be reported immediately/ at the earliest opportunity to the Center CIO. Under no circumstances should Agency laptops or personal computers be used for official business on International trips unless written authorization is first obtained from the Center CIO.

NASA Foreign Travel Info:

https://www.nssc.nasa.gov/foreigntravel

Consider a Loaner:

NASA travelers should consult with their Center CIO, for NASA IT equipment options for overseas travel such as the use of loaner laptops and phones. Use of loaner IT equipment, and loading only essential information on the equipment needed for travel, significantly reduces the potential for exfiltration of information from IT devices while traveling overseas. It also lessens the introduction of malware, on IT devices brought back from overseas, which can put the NASA network at risk.

Leading in a World of Accelerating Change

By Kathy Y. Rice, NEACC Communications Lead /IS02

Pamela Hanes and Neil Rodgers have a shared understanding and alignment of purpose while they embrace the challenges and triumphs of leading in a world of accelerating change. They both have unique experiences culminating in their current positions at Marshall Space Flight Center (MSFC). Hanes was appointed manager of the NASA Enterprise Applications Competency Center (NEACC) in November 2014, formerly serving as NASA's Deputy Chief Financial Officer at Headquarters. The Hanes appointment, paired with the arrival of a new Enterprise Integration Office, headed by the NEACC's former manager Neil Rodgers, represents a change of top NASA IT leadership. The new office will add value throughout the OCIO and improve communications to meet Larry Sweet's top priorities for 2015. As Rodgers contemplated his leadership journey and those who influenced his career, he said, "The one characteristic I believe every leader should possess is serving others. By practicing 'Servant leadership' I can provide insight to help the people. My first branch chief gave me an appreciation for the importance of 'relationship building' and developing trust…the soft skills."

Pamela Hanes

The new EAST2 support contract begins February 1, 2016. Inclusion of MSFC Center Applications within the EAST2 contract offers opportunities to pursue similar synergies across our civil service teams. As a result, an organizational realignment is underway, guided by Hanes. "Many challenges and opportunities drive the change taking place at the NEACC, including continued pressure to increase efficiencies given the realities of today's budget climate and the opportunity to help the Agency leverage its extensive portfolio of software applications," said Hanes. The new organizational realignment features Effective Stewardship, Customer-Focused and Portfolio Management among its cornerstones. Hanes is a "change leader" who believes in the transformational magic that takes organizations from great to exceptional. When asked, "Is 'action-orientation' woven into the culture of the NEACC and does it resonate with you?" Hanes remarked, "Yes! This team is all about getting the job done!" Pamela Hanes will help set technology direction across the NEACC's $50 million annual IT budget.

Neil Rodgers

Preserving the Past for Future Generations

By: Maura White, Chair of the NASA Still Imagery Group, JSC

From the image of a single footprint in the lunar dust to the high-speed images of engineering tests, imagery captured in support of human spaceflight is an invaluable record of NASA's journey to expand the human horizon.

The whole of the human spaceflight imagery collection is housed at the Johnson Space Center and includes mission imagery shot on board every spacecraft from the Mercury Program through the International Space Station, as well as institutional images captured in support of human spaceflight. The size, content and frequency with which this collection is accessed makes it wholly unique. It contains over 4 million still images documenting every test, training, and special event since NASA's human spaceflight efforts began in 1959; over 10,000 documenting the lunar rocks. 9.5 million feet of 16mm footage comprised of ground-based testing and mission footage are stored in this collection. Images from test documentation, crew portraits, completed video productions, lunar sample documentation, files downlinked from orbit, and film shot on the lunar surface -JSC's collections are vast and continuously growing.

Engineers, scientists, and the External Relations Office continuously request older footage and still imagery from the collection for a wide range of uses. The Orion Program used hundreds of images of the Gemini hatch testing to gather data for development and testing when designing the next generation flight vehicle. Scientists often request imagery for use in research proposals, presentations, data gathering, and analysis. Using this imagery, the External Relations Office works closely with external publishers and broadcasters to convey NASA's message and tell our story. These images have helped frame what is possible in human achievement, captured the public imagination and engaged multiple generations in the quest to expand the known universe and improve life on earth.

A large percentage of the collection is not yet digitized, so work continues to migrate the full collection to a usable digital format. As it does and this invaluable resource continues to grow, its reach and impact will be expanded. It will continue to spark the imagination of people around the world and connect each coming generation with our shared past.

Exploring Space Through Streaming Analytics

By Tom Soderstrom, Chief Technology and Innovation Officer, and Dan Isla, IT Data Scientist, Office of the CIO, Jet Propulsion Laboratory, California Institute of Technology

Summary: The Streams application allows operators to do interactive, hands-on analysis of billions of data points from flying spacecraft. It was developed using a rapid prototyping methodology and uses techniques from the stock market, open source software, open and hyper-agile development, and an analytics cloud. Within weeks, JPL was able to infuse new technology into missions that used to take years to accomplish.

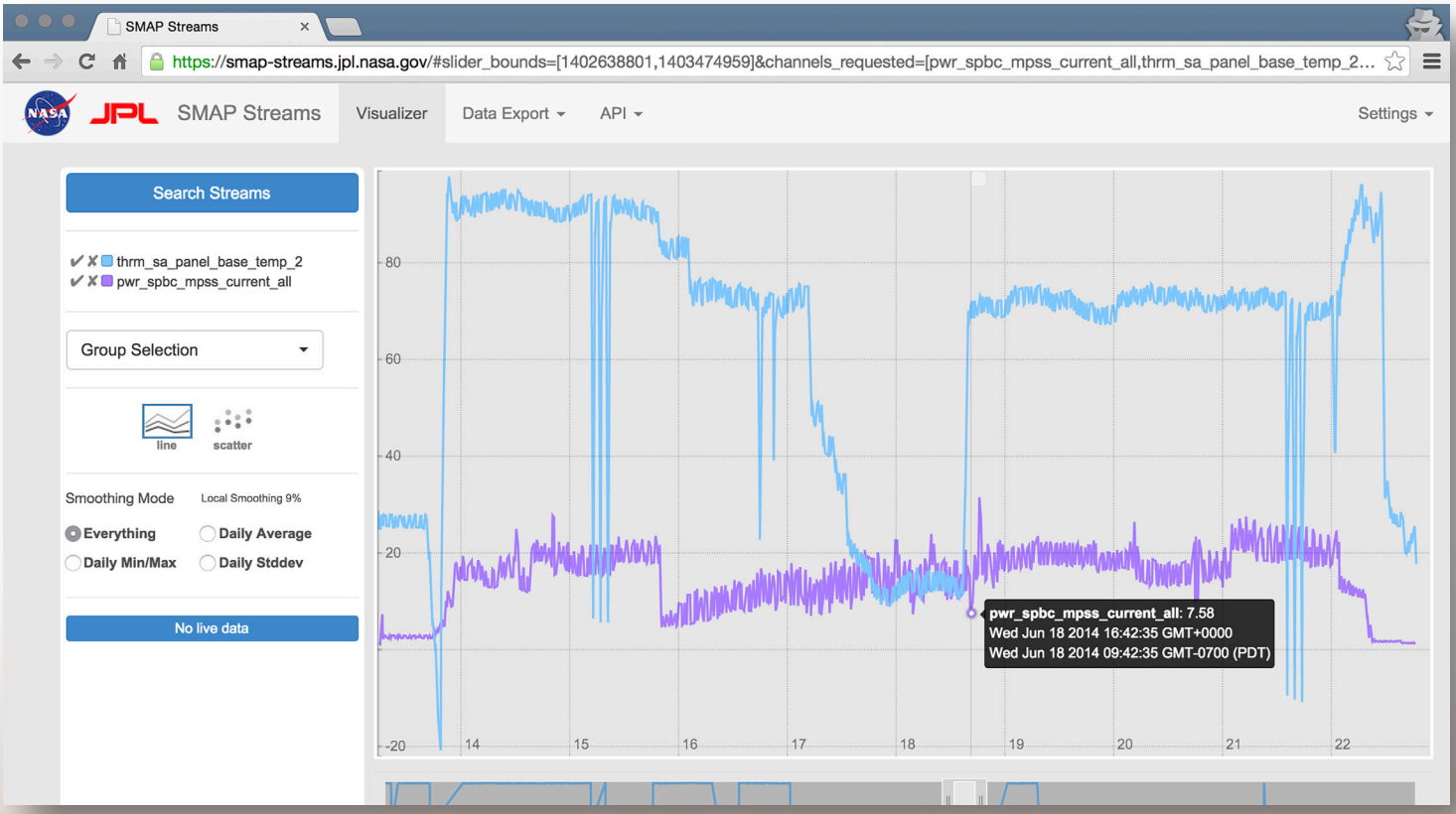
The problem: ***How could operators effectively perform real-time analytics of telemetry data from Mars.*** A crucially important problem is how to analyze telemetry data from the Curiosity rover, 150 million miles away. For example, If JPL could correctly predict thermal parameters Curiosity's drive time on Mars could increase dramatically, which could lead to new and groundbreaking discoveries. Conversely, a mistake could seriously affect the $2B mission. JPL operations personnel painstakingly collected thermal telemetry data into PowerPoint that experts later analyzed. This took weeks and did not allow for interactive analysis or comparing data from several Curiosity instruments. This added cost, risk, and led to lost opportunities. The operational system was already built and changing it was both too costly and too risky.

The solution: ***JPLIT created an Analytics Cloud where developers and end users could safely innovate together and experiment with new capabilities using actual spacecraft data. There they prototyped a new interactive real-time analytics tool called*** **Streams.** As Curiosity's data arrives from Mars into the pre-built, hardened operational system, it is copied into the agile analytics cloud, where analysts can query and interact with the data using real-time visual analytics of over one billion telemetry data points, 26 million alerts, and 100 thousand images, and it is growing daily. They can also easily collaborate with experts located anywhere in the world.

Streams ***was quickly ported to the Soil Moisture Active Passive (SMAP) project, which was in final testing.*** For the first time, operators are able to compare a flying spacecraft to how it behaved during test, leading to new insights.

(Continued on next page)

Photo courtesy of NASA/JPL-Caltech



Here are some of the key innovations that made Streams successful and their business outcomes:

1. **Rapid prototyping led to quick, meaningful progress and lasting success.** The rapid, low-cost, and low-risk approach of rapid prototyping together with end users helped create *moments of engagement* with a passionate end-user (Gordy Cucullu) and two primary developers (Rob Witoff and Dan Isla). By seeing something that was already working on mission data, mission executives and operators quickly agreed to put *Streams* into operation.
2. **The Analytics cloud enabled infusion of new technologies at low risk and scalable and affordable operations.** All the data is automatically copied into the cloud where the visual analytics and trending occur. The missions pay only for what they use and changes are easily incorporated.
3. **An open environment helped developers to bring in new technologies and share code across many missions and multiple domains where sharing was previously not done.** Using Open Source software and open development techniques in a JPL-private environment allowed developers to use new tools and to easily share code, as developers no longer needed to wait for permission to reuse code. Modern technology and practices are proliferating between groups that would otherwise not interact or share and code is reused for different purposes. A few of these included Amazon's GovCloud, GitHub Enterprise, and several Open Source tools such as ElasticSearch, Mesosphere, Rickshaw, D3, Docker, Apache, Centos, Mesos, Chronos, Marathon, and Spark. Some of the groups that began sharing code include flight systems, ground systems, business systems, Human Resource systems, and IT systems.
4. **Interactive and visual analysis of massive amounts of spacecraft data is leading to important new insights into the spacecraft.** Analysts now easily work together from remote locations and can now interact with and query all the data at once. *Streams* was used during SMAP's January 2015 launch and helped answer a question in realtime that, if left unanswered could have forced the launch to be aborted. This is the first time in JPL history that a mission has been able to compare spacecraft behavioral data during the ground testing and actual operations in a simple visual manner, with all the data at their fingertips. This will change the way missions use test and operations data in the future and Streams will be used on many new missions. For example, it could enable the Mars 2020 rover to gain significantly more drive time on Mars with no change to the rover itself.

The ITAR-certified analytics cloud (AWS GovCloud plus a hybrid cloud) coupled with the approach of open development, moments of engagement, and rapid prototyping has become an innovation factory and will pay dividends for years to come.

Langley's Records Management Initiative (RMI)

What is the RMI?

The five phase process for managing records at Langley Research Center (LaRC).

The goals behind the RMI are:

- Create an environment that fosters proper maintenance of Federal records throughout their life cycle.
- Educate LaRC organizations on proper records disposition.
- Continually improve records management across the Center.

Why RMI?

The Records Management Initiative (RMI) was created at LaRC as a result of the Presidential Memorandum on Managing Government Records. This memorandum's chief objectives are to reform records management practices, improve performance, and promote openness and accountability. RMI is designed to accomplish those objectives by better documenting agency actions and decisions.

Langley is tackling these objectives in a multiyear five-phase approach, all with a common goal: to help employees effectively and efficiently manage their records and facilitate the Center's programmatic and administrative missions.

Phases of RMI

Langley's Office of the Chief Information Officer (OCIO) implemented ***Phase 1 of the RMI—Orphaned Records.*** In this phase, a team of Records Operation Assistants (ROAs) are visiting all Langley facilities to identify and inventory abandoned and orphaned records. In this phase, the ROAs are also educating Center employees on records accountability procedures and disposition procedures. To date, 89 percent of Langley's facilities have been visited. The team has identified more than 5,000 cubic feet of orphaned documentation.

Phase 2 of the RMI—File Plans. In this phase, the ROAs will help Center organizations build and maintain file plans.

Phase 3 of the RMI—Tools & Training. In this phase, the ROAs will introduce a website and online training to assist employees with records management processes. The ROAs have initiated on-site weekly training opportunities. Module 1: Records Management Overview course, and Module 2: Records Management Basics.

Phase 4 of the RMI—Inventory and Disposition. In this phase, the ROAs will assist Center employees with maintaining proper inventory and dispositioning records.

Phase 5 of the RMI—Vital Records. In this phase, the ROAs will help organizations identify/manage vital records.

The RMI has uncovered amazing discoveries of work accomplished here at LaRC that can be shared with future generations.

Mobile Device Management

Today, approximately 26,800 NASA provided mobile devices are deployed across the Agency to users in order to support the NASA mission and goals. These mobile devices are identified as IPhones, Smartphones, iPads, Blackberrys, and Tablets. Each of these mobile devices have the capability of storing NASA data on the device and accessing NASA systems.

In order to better protect NASA's information and assets, NASA is implementing Mobile Device Management (MDM) capability. MDM provides for the administration of NASA's mobile devices to allow for better data protection, deployment of mobile applications, asset tracking and management, and better support NASA's BYOD future activities. NASA's implementation of MDM will also include encrypted email capabilities on iPhones and Android devices and ease of access to NASA systems and applications, including password simplification. While not all of these benefits will be available immediately, they will be rolled out as phases of NASA's MDM implementation.

Users with one or more of a NASA mobile devices will be required to enroll their device(s) in the MDM system. MDM includes a software service that runs on a user's mobile device. Instructions for carrying out enrollment and software installation will be provided in a later correspondence and the ESD will be prepared to assist end users who have questions. The enrollment process will be performed in "waves" with specific Centers grouped together to ensure an orderly transition into the MDM environment. If you have a NASA mobile device then you will get specific notifications and communications when it's time for enrolling your devices.

Initially, NASA's focus will be on the protection of NASA's data and assets for IPhones, Android devices, and iPads. Once a user's device has been enrolled in the MDM system and MDM is running on the user's mobile device, the Agency has the ability to remove NASA information from that that device upon notification that the mobile device is lost or stolen. MDM will also enable the Agency to improve asset management of all NASA provided mobile devices. Remember, NASA's MDM capabilities are being implemented in phases with added functions provided over the next several months.

End users of ACES-managed iPhones, Android devices, and iPads are encouraged to be on the lookout for upcoming details about MDM and the self-enrollment process.

Chief Information Officers Leadership Team

CIOs attend Face To Face Meeting at Johnson Space Center March 24-26 2015.

IT Infrastructure Integration Program (I3P) Update

Agency Consolidated End-User Services (ACES)

Like for Like Mobile Refreshes: Like-for-Like mobile refreshes are continuing on a rolling deployment schedule across NASA Centers. Like-for-Like mobile refresh is for end users who will be replacing their mobile device with the same device type they currently have (e.g., iPhone to iPhone or cell phone to cell phone), the same carrier, the same services and the same phone number. Device refreshes include the following:

Like for Like iPad Refreshes: The iPad refresh is for users with an ACES-managed iPad that is greater than 24 months old and want a replacement device with no changes to what they have today (within the same product family (iPad to iPad), the same carrier (AT&T, Verizon) and same services).

Both iPhone and iPad refreshes are included as part of the monthly service fee for ACES seats and are not an additional cost. Users scheduled to receive any refreshes will receive email notifications prior to deployment with details on schedule and actions required for refresh, including backing up data from their original device.

Java 8 Deployment – The upgrade from Java 7 to Java 8 on ACES computers is scheduled to begin March 31. Java is used for interactive graphics on Web sites. Java 8 should introduce no computer or application functionality differences, and there should be no noticeable behavior changes in the security prompts encountered after Java 8 is installed. Deployment of Java 8 by ACES will not include adware. ACES end users with a business need to continue using Java 7 were required to submit the ACES EUSO Patch and Reboot Waiver/Deviation form to ensure their computer does not receive the Java 8 upgrade.

Communications Service Office (CSO)

The Communications Service Office (CSO) has initiated two important projects in support of NASA's OCIO Network Transformation initiative: the Exterior Border Protection (EBPro) project and the Enterprise Interior Border-Network Access Control (EIB-NAC) project. The initiatives were approved by the Mission Support Council (MSC) in 2013 and funded for FY15-FY19.

The EBPro project, led by Kevin Boswell at LaRC, deploys enterprise Firewalls, Web Content Filters/Proxy servers, and Virtual Private Network/ Remote Access Services (VPN/ RAS) at NASA's Internet Peering points. The purpose of EBPro is to improve the security posture of NASA's corporate networks by moving the primary network security border to the edge of NASA's networks, thus facilitating the creation of a true NASA intranet for improved collaboration between NASA Centers. The project also reduces costs for NASA Centers by alleviating the need for Center-specific VPNs; deploying a common Agency VPN solution that services all NASA users. Further, deployment of these EBPro systems will provide compliance with the Department of Homeland Security's (DHS) Trusted Internet Connection (TIC) Reference Architecture Document Version 2.0 and create a consistent external border security perimeter for NASA.

The EIB project, led by Carlton Foster at LaRC, will implement and transition users to an Agency-wide, Enterprise managed network access control (NAC) solution that automatically places endpoints into network zones based on NASA's established authentication and authorization policies. EIB-NAC Project will enhance NASA's internal network security by deploying a common security zone architecture across the NASA enterprise and implementing a common Agency policy for network access. Common policies will be enforced for guest wireless network access, Bring Your Own Device (BYOD) access, and NASA wired and wireless intranet access. EIB-NAC will also standardize the end-user experience in terms of connectivity to network resources across the Agency. Deployment of this capability will provide compliance to the NASA Administrator's commitments to the National Academy of Public Administration (NAPA) Panel on Independent Review of NASA's Foreign National Access Management, since NAC will be able to identify foreign nationals and place these users onto a network commensurate with their security credentials.

Enterprise Service Desk (ESD)

Enterprise Service Request System (ESRS) Status Update

Effective Feb. 8, Paul Rydeen took over as the new Project

Executive for the Order-to-Pay project. Paul will continue to manage the ESD and also the ServiceNow Migration project. The Order-to-Pay project is currently 50% complete with SIT1 Testing with good participation from Centers. The project schedule has been updated to show a go-live date of June 1.

ServiceNow Migration Project Status Update

The NSSC has completed formal discovery meetings with NSSC functional areas while developing user stories for all functional areas. While in the Backlog Grooming Phase, developers and testers are collaborating with the Business Analysts and SMEs on Technical design and story sizing. The Backlog Grooming Phase is essential in order for the Scrum Teams to facilitate effective release planning, sprint planning, and sprint review activities that will run through summer. Expect multiple releases across all Lines of Business in 2015.

Enterprise Applications Service Office/NASA Enterprise Applications Competency Center (EASO/NEACC)

Business Intelligence is developing an implementation plan and approach for SAP HANA. They met with representatives from John Hopkins to discuss their experiences with SAP Web Intelligence (WEBI). Additionally, they are conducting Proof of CONCEPT (POC) for Design Studio, WEBI, and Crystal to determine their strengths and weakness in order to position the products correctly and to align with SAP's long term direction. The **NASA** Center for Internal Mobile Applications (**CIMA**) is working with several centers on apps that will ultimately be hosted by apps@NASA.

The Procurement LOB reported that Compusearch has identified June 8, 2015 as the target delivery date of PRISM 7.1 SP11 which should resolve, pending testing, the IE11 compatibility issue and POODLE vulnerability. The earliest this SP could be applied in production will be October 2015. Numerous issues exist with the PRISM 7.2 product including poor performance, funding screen failures, and data population on Forms.

Additional beta testing was performed on USASpending's new website for Federal-wide reporting of Contracts/Grants/Loans/Other Federal Assistance. The Education LOB is working the statement of work for the final EAST task order modification and identifying elements of the strategic plan to be delivered. The Financial/ACTS Line of Business (LOB) reported that User Acceptance Testing is underway of the enhanced e-Invoicing functionality. The Invoice Reconciliation Information System (IRIS) functionality is targeted for release in mid-April.

The Product Lifecycle Management / Product Data Management (PLM) LOB migrated its Integrated Collaborative Environment (ICE) suite of tools to the new Agency authentication Access Manager 3.0 infrastructure.

Web Services (Web Enterprise Systems and Technology, or WESTPrime)

WESTPrime Face-to-Face Meetings: The WESTPrime team and the Web Services Office conducted 2 Road Show presentations and Q&A sessions profiling the WESTPrime program and offerings. The first was at Stennis Space Center and the second at Kennedy Space Center as part of the Web Services Board F2F.

NASA Image and Video Library (project name - AVAIL): The development of Images.nasa.gov is moving along and is still on schedule to launch in July! The search-centric, public-facing web application will be a one-stop shop for the best-of-the-best of NASA images, videos and audio clips. The ambitious project will leverage NASA's vast multimedia library collections from all Centers and feature the latest and greatest NASA has to offer. Visitors can search, share and download directly from the site.

WESTPrime Awards: Shared Services Center (NSSC) honored WESTPrime security subcontractor MindPoint Group, LLC with the 2014 Small Business Subcontractor of the Year Award. MindPoint Group has also been announced as a candidate for the Agency Level Small Business Industry Award.

Looking Ahead: The exciting NASA.gov redesign is coming soon. Keep an eye out for news on the big reveal!

Open Data Incubator: International Space Apps Challenge

IT Talk

The Open Innovation Team, under the leadership of Deborah Diaz, CTO-IT, is pleased to announce the fourth annual International Space Apps Challenge, April 10-12. Space Apps is an innovation incubator program designed to engage global citizens in collaborative problem-solving team built around NASA's open data. Data challenges are organized in four mission priorities, each with a NASA executive as the challenge category advocate: Lawrence Friedl of the Science Mission Director for Earth and Outer Space, Chief Technologist David Miller for Robotics, and Dr. John Allen of the Human Exploration and Operations Mission Directorate for Humans.

This year, 135 cities will participate from 60 countries – spanning the globe from Katmandu to Cairo, Guatemala, New Delhi, London, Nordwijk and more. LaRC CTO-IT Ed McLarney and his team are working with local organizers in the Hampton, Virginia area to put on their first Space Apps event this year. The GRC OCIO has partnered with OHTec to host the Cleveland, Ohio area Space Apps Challenge at GRC for the first time. The main stage will be held in Manhattan for the second year.

NASA's Chief Scientist Ellen Stofan and Space Station Astronaut Cady Coleman will join Deborah Diaz as invited dignitaries in New York. US CTO Megan Smith will join on Sunday for the wrap-up and judging. The NYC team anticipates 400 participants, who can work on collaborative teams to problem-solve using NASA's open data, and/or participate in a data festival that includes a maker faire, exhibit space, and student events.

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