National Aeronautics and Space Administration





Humanity's Return to the Moon

Web Modernization Picks Up Speed

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Apr - Jun 2023

Volume 13 • Issue 2

Office of the CIO NASA Headquarters Mary W. Jackson Building 300 E Street SW Washington, D.C. 20546

Chief Information Officer Jeff Seaton

Editor & Publication Manager Eldora Valentine

Graphic & Web Designer Michael Porterfield

Copy Editor Meredith Isaacs Mia Roundtree

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.

For distribution questions or to suggest a story idea, email: <u>eldora.valentine-1@nasa.gov</u>

To read *IT Talk* online visit: <u>www.nasa.gov/offices/ocio/ittalk</u>

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Message from the NASA CIO

It gives me great pleasure to boast about the incredible work that occurs every day at our NASA centers. A lot of it is showcased online so millions of people around the world can learn about our accomplishments in space, science, discovery, and exploration. In this issue, we'll look at NASA's Web Modernization efforts which will improve the way we communicate to the public, minimize cyber vulnerabilities through strengthened security, and provide a better online experience for everyone.

We'll also look at how NASA and the Office of Chief Information Officer (OCIO) have taken proactive steps to promote awareness and compliance with Section 508 among the workforce. We are committed to supporting accessibility, inclusion, and equal opportunities, making certain our employees with disabilities have equal access to all digital content.



In the world of Digital Transformation, we will explore how Smart Center technology is bringing automation to space. This concept not only streamlines sustainability of NASA facilities but makes onsite work with scientists and industry partners more productive and efficient.

And we'll show you how the Mission Cloud Platform (MCP) represents a NASA-wide investment in cloud infrastructure for science acceleration. Some MCP tools are reducing onboarding time and creating efficiencies while improving general science system usability and accessibility.

This issue is filled with terrific examples of the great work happening at the agency. So, I hope you enjoy reading our stories. Sincerely,

Jeff Seaton

NASA Chief Information Officer



Workplace and Collaboration Services (WCS) News and Updates

Check out the latest news from WCS (all links are internal to NASA):

- Defender Quarantine Will Reduce the Spam, Phishing, and Spoofing Emails You Receive
- Windows 10 Version 22H2 Update
- <u>Mobile Apps That are Prohibited on Devices</u> <u>That Connect to the NASA Network</u>
- Connecting to a Printer/MFD
- New Location for Mission Freeze Information

- Shipping Costs for Hardware Sent To/From an Offsite Location
- Webex 42.10.8 Upgrade Includes 20 New Features
- macOS Ventura (13) In-Place Upgrades
- <u>New Teams Features: Meeting Co-organizers Can Manage</u> <u>Breakout Rooms; Chat Messages Can Now Be Scheduled;</u> <u>You Can Start a Chat with Distribution Groups; and More</u>
- See What's New with ICAM

Smart Centers Aim to Bring Automation to Space

By Alex H. Wagner, Communications Specialist, Digital Transformation, Headquarters

Move over, Alexa: "Smart Centers" are the latest NASA innovation that starts with fusing data from smart wireless sensors with autonomous drone facility inspections.

Much like the ubiquitous "smart home," this Digital Transformation (DT)–funded project attempts to mature and integrate digital technologies that will not only streamline sustainability of NASA facilities but make onsite work with scientists and industry partners more productive and efficient.

During the first proof-of-concept use case at a liquid nitrogen facility at Langley Research Center, members of the Smart Center team coordinated the remote piloting of a drone to survey the facility for any anomalies using infrared sensors.

Using a newly created data structure linked to a dashboard visualization of this drone flyover, the Smart Center team could quickly assess and predict when components might need maintenance, rather than relying on a physical team to conduct an inspection manually.

"You could think about it [in terms of] newer vehicles," says Rodney Martin, Deputy Discovery and Systems Health Technical Area Lead at Ames Research Center, who leads the DT Smart Centers project. "You actually have sensors embedded in newer vehicles which show what your tire pressure is." The dashboard the team created ultimately reduces the need for periodic inspections, which can be costly, time-consuming, dangerous, and sometimes even ineffective at monitoring for issues.

"If you have an inspection team go out to perform the inspection manually," says Martin, "bringing equipment with them on a periodic basis, say every month—sometimes they'll find something, sometimes they won't."

Normally, Martin says, such a manual inspection often involves erecting scaffolding, adhering to various safety protocols, and performing the inspection with handheld devices that "takes a very long time." The drone flight, meanwhile, took 15 minutes. Truncating this process will allow NASA employees to conduct more frequent inspections and cut through the growing maintenance backlog as the agency's infrastructure ages.

While the goal was never to build a Smart Center from scratch, Martin says, this prototype effort should provide a blueprint for agencywide adoption of these technologies when funds and resources align. For now, the next steps involve determining how to scale the data architecture and data collection tools like drones. Over the course of fiscal year 2023, the Smart Center team will create a repeatable playbook to enable agencywide adoption. Additionally, they will scale demos at another two centers and address cyber-physical security concerns.

"Just because we use drones for this first proof of concept use case doesn't necessarily mean that they're always going to be useful," says Martin.

Ultimately, the Smart Centers concept will grow to include feeding real-time sensor data into digital twins that can help us predict operational readiness. The team envisions Smart Centers acting as a testing ground for potential habitat management on other planetary surfaces like the Moon or Mars—an integral part of NASA's planned future missions.

"Upon setting his boots on the moon, Neil Armstrong made the historic remark, 'That's one small step for man, one giant leap for mankind,'" says Martin. "We believe that making progress with small steps in the improvement of our built infrastructure here on Earth can represent a giant leap forward in how we shape the future of sustainable lunar habitation."



Dashboard of information gathered from the remote-piloted drone survey of the liquid nitrogen facility at the Langley Research Center.



Beyond Compliance: How NASA Uses Section 508 to Promote Accessibility and Inclusion

By Courtney Ritz, Agency IT Accessibility Lead, and Hilary Gambale, Strategic Communications Specialist, Code 702, Goddard Space Flight Agency (GSFC)

Section 508 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794d), is a Federal law that ensures that all Federal employees and members of the public with disabilities have access to Information and Communication Technology (ICT). This law requires that electronic and information technology purchased, developed, maintained, or used by Federal agencies be accessible to people with disabilities. The importance of Section 508 cannot be overstated, as it ensures that everyone has equal access to information and technology. NASA and the NASA Office of Chief Information Officer (OCIO) have taken proactive steps to promote awareness and compliance with Section 508 among its workforce and is committed to supporting accessibility, inclusion, and equal opportunity, making certain its employees with disabilities have equal access to all digital content.

Since stepping into my new role as the Agency IT Accessibility Lead in OCIO in August of 2022, I have worked diligently to identify and address accessibility issues across NASA and promote best practices. Prior to my agency role, I served as backup to the Goddard Section 508 Program Manager so stepping into the agency role was a natural fit. I feel I understand the technology needs of people with disabilities, being a user of assistive technology myself and losing my eyesight at age five due to a form of eye cancer called retinoblastoma.

In the fall of 2022, I partnered with NASA's Office of Diversity and Equal Opportunity (ODEO) to distribute an agencywide Section 508 compliance memo to the NASA workforce stressing the importance of making documentation accessible and reminding employees that every NASA employee or contractor is legally responsible for creating or sharing digital content, internally or externally, that is accessible for all. I have been finalizing renewal of the agency license for Sortsite so NASA websites can be scanned for quality issues including accessibility and usability problems. I have also contributed and participated in presentations held by various organizations pertaining to the creation of accessible electronic documentation, and twice I have worked on behalf of the agency to submit Nasa's Section 508 Maturity Report to the Office of Management and Budget (OMB), a biannual requirement that indicates the effectiveness of NASA's Section 508 program. Improved auditing should make the data for these reports more accurate, so that the agency can better gauge its maturity level and know what specific areas need the most attention.

With the use of Microsoft O365, OCIO is already giving NASA computer users the technology to make their digital footprint more accessible. O365 allows employees to include closed captioning in meetings and presentations. In addition, Microsoft Teams enables the ability to record meetings with transcripts and captions, and an accessibility checker is provided in O365 applications like Word, PowerPoint, and Excel.

I'm excited about my job and exploring new and creative ways to fulfill NASA's commitment to IT accessibility within the new OCIO structure. This includes expanding training resources on the various aspects of Section 508/IT Accessibility, better tracking, and resolution of accessibility issues, and developing a centralized agency process for obtaining assistive technology, including an installation support function. Additionally, I am collaborating with Section 508 points of contacts across the ten NASA centers to know their accessibility needs and to identify and fill gaps in coverage.

At NASA, we strive to work towards creating technology that is accessible to everyone and providing a more inclusive environment where all employees can participate. I plan to continue moving forward building and strengthening our IT accessibility program so that existing and future employees can be confident that their skills and talents can be brought to the table.

If you have 508 questions, I can be reached via e-mail at *courtney.l.ritz@nasa.gov*.

Humanity's Return to the Moon

Web Modernization Picks Up Speed

Abby Bowman, NASA Web Modernization Lead, Headquarters

From scientists to school children, NASA's online visitors must navigate multiple websites with different designs and competing content to find the information they seek. This sprawling online footprint presents an opportunity for our agency to dramatically improve the user experience for our employees, partners, and the public we serve.

Seizing this opportunity, the NASA Web Modernization Team (NWMT) was established in 2019 in response to the 21st Century Integrated Digital Experience Act (IDEA), a law that tasked Federal agencies with modernizing digital experiences for the public.

Our mission is to serve the agency and the public by:

- Modernizing and improving the public's user experience (UX) on <u>www.nasa.gov</u> and other publicfacing websites,
- Meeting or exceeding accessibility requirements and best practices, to the benefit of all users,
- Improving NASA's ranking in search engine results, making it easier for users to find the information they're seeking,

- Right-sizing the agency's public web footprint to achieve an enhanced cyber-posture and improved focus for communicating our messages; and
- Improving the management and compliance of NASA's websites.

In the *April 2020 issue of IT Talk*, we shared details of the NWMT's agencywide site audit, our vision for a redesigned NASA.gov, and our plans for consolidating NASA's public web footprint. These efforts have come a long way in the last three years, and we're excited to share our progress.

User Research, Design, and CMS Selection

The initial audit of the agency's web footprint informed the next phase of our web modernization work: user research and human-centered design in collaboration with Blink UX.

To learn more about how our external audiences perceive NASA and interact with its websites, Blink conducted 53 one-on-one interviews with representative members of the public and collected survey responses from another 2,633 participants. Researchers also worked with more than 150 website owners and stakeholders from across the agency to understand NASA's mission and the many ways we communicate with the public, from highly technical content to inspiring stories and majestic imagery.

Based on these findings, the NWMT worked with Blink to create the Horizon Design System (HDS), a modular toolkit designed to unify NASA.gov. HDS was inspired by and developed in accordance with the <u>U.S. Web Design</u> <u>System</u> as required by IDEA. HDS prototypes were put through their paces by real users who tested their navigation, usability, and accessibility.

At the same time, the NWMT set out to select a new flagship Content Management System (CMS) that would meet all of NASA's requirements, including security, accessibility, search engine optimization, and collaboration capabilities. After evaluating more than 60 CMS options, the NWMT's developers tested prototypes for four CMS candidates and conducted extensive user testing with NASA content creators. In the end, the NWMT selected Word-Press as the agency's new CMS in January 2022.



A design prototype from the new Horizon Design System, built to showcase NASA's inspiring imagery on devices of every size.

(Continued from previous page)

Technical and Content Development

With the CMS determined, it was time to roll up our sleeves and start building in earnest. OCIO has been working closely with the Office of Communications and the <u>Science Mission Direc-</u> torate to implement the HDS redesign and WordPress migration of the agency's main websites (<u>www.nasa.</u> gov and <u>science.nasa.gov</u>).

Today, the NWMT has onboarded more than 250 editors in the new CMS. Supported by our web content producers, these editors are working hard to optimize migrated content, categorize information according to the new topic-based information architecture, and create new pages that take full advantage of HDS's modular designs.

Management and Governance

Although we've been focused for the last year on implementing the new <u>www.nasa.gov</u>, the NWMT continues to analyze NASA's other public websites in preparation for future consolidation into the flagship. We have partnered with OCIO's Web Managers at each Center to collect critical information on NASA's online footprint, which stands at 1,812 live external sites as of November 2022 (down 36 percent from the starting audit).

To prevent further sprawl, OCIO is establishing agencywide web governance processes, including an annual inventory of NASA's public websites, while implementing a comprehensive NASA web policy. This work will be facilitated by the newly formed Web Working Group, which brings together both IT and communication representatives from each Directorate and Center, as well as subjectmatter experts in key areas such as user experience, accessibility, and privacy.

What's Ahead

Our vision is to inspire humanity through a unified, world-class NASA web experience, while empowering all of NASA's creators to tell their stories via one cohesive platform and design. The 2023 launch of the new <u>www.nasa.</u> <u>gov</u> will be a critical step toward realizing this vision, but our web modernization work will continue for years to come as we consolidate the remaining NASA websites.

In the months ahead, the NWMT will be rolling out new digital experiences to the launchpad and completing our pre-countdown checklists. We look forward to introducing our visitors to the next era of NASA storytelling and helping them explore the vast collection of content produced by the agency.

We hope you'll join us on this journey of discovery when we launch this year.



Inspirations for the new design system that illustrate NASA's wide range of stories and digital experiences, from the technical to the majestic.



Software-Defined Access (SDA) Migrations Accelerating Across NASA Centers

By Sylvester Placid, AEGIS Communications Team Lead, Marshall Space Flight Center

Migrations to Software-Defined Access (SDA), the innovative approach to network security and automation being deployed across NASA, are accelerating.

What is SDA?

SDA enables a more secure and efficient enterprise network for NASA corporate needs with a programmable, zero-trust network architecture providing software-based policy and segmentation from the network edge to applications. SDA enables NASA to deliver a policy-driven, intent-based model for network and security operations. SDA leverages automation to save time and create efficiencies, using code to complete repeatable tasks. SDA reduces the need for human interaction and mitigates the risks of human error.

SDA enhances network security, providing authentication of who (user) and what (device) is accessing the network, as well as authorization for what can be accessed. Automated access control, group-based controls, security policies based on logical grouping using micro- and macro-segmentation, and more granular security controls improve NASA's security posture.

What can SDA do?

Once SDA is enabled across all NASA centers, users and devices can move between buildings and centers with no configuration required. When a device is powered on, the appropriate security policy, firewall rules, and network access will be applied automatically.

SDA will be transformative in supporting more connected devices for smarter capabilities across NASA centers.

Hundreds of new security cameras at Marshall Space Flight Center (MSFC) and Michoud Assembly Facility (MAF) —two centers currently migrating to SDA—will be installed and enabled with no network engineering work required. These installations would typically require the creation of trunk networks to be enabled. Recently, a group at MSFC was impressed to find that a printer that was moved from one SDA-enabled building to another was automatically connected and functional without the need for any configuration.

This capability extends to any device on an SDA-enabled network, including keycard readers, ClickShare wireless presentation devices, uninterruptable power supplies (UPSs), and even network-enabled automated external defibrillators (AEDs) which can now automatically self-diagnose, report battery status, and be located electronically in emergencies.

How is SDA deployed?

To prepare for SDA, network switches across NASA centers must be migrated to the SDA enterprise fabric network.

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Network switches connect computers, servers, printers, wireless access points (WAPs) and other devices across networks, and as these switches are migrated to SDA and interconnected to pass data to each other, they form the SDA fabric network. The SDA project team has been hard at work preparing NASA for SDA deployment, working in sprints to complete migrations.

Which centers have migrated to SDA?

Langley Research Center (LaRC) and MSFC have successfully moved moderate- to high-risk devices (known as Enhanced Operational Technology endpoints) to the SDA fabric network and have accelerated their migration schedules. The SDA project team has achieved migration of 10 percent of agency switches across five centers

(LaRC, MSFC, and MAF, as well as NASA Headquarters (HQ) and Wallops Flight Facility) with 16,000+ devices connected to those switches. That milestone includes LaRC surpassing the 80 percent mark for center switches migrated to SDA, while MSFC surpassed 50 percent in March. The migration effort at HQ continues to gain momentum, with plans to achieve nearly 30 percent in March. At Glenn Research Center (GRC) and Stennis Space Center (SSC), switch candidates for migration have been selected to present to center leadership for concurrence and to begin migration activities at both centers.

MSFC migrated 100 percent of the endpoints in building 4601 (including 30 WAPs)—this is the largest building migrated to SDA at the center, with more than 1,000 users and endpoints now on the SDA fabric. LaRC migrated 140 switches (80 percent of in-scope switches completed) over the last year, with SDA migration completion at LaRC expected in May of this year. LaRC completed 120 WAP upgrades using a new automated, streamlined SDA process also used

at Armstrong Flight Research Center (AFRC) and MSFC. This SDA process has proven to reduce lead times for WAP upgrades by 50 percent. AFRC upgraded 70 WAPs in a Center Directorate building in just one week using this process.

During the November sprint, the team successfully completed 44 migration activities across five centers, breaking the record for the number of switches migrated to SDA during a single sprint. The SDA project team is continuously improving their processes to more quickly migrate all NASA centers to SDA.

Accelerating Science Research & External Collaboration

By Catherine Tresslar, Customer Experience Lead, Joseph Foster, Program Manager/NASA Official: Cloud Computing Service Line

The Science Mission Directorate (SMD) <u>2019–</u> <u>2024 Strategy for Groundbreaking Science</u> outlines three strategic goals to enable transformational science throughout the agency:

- 1. Develop and implement capabilities to enable open science,
- 2. Continuously evolve of data and computing systems,
- And harness the community and strategic partnerships for innovation.

The Mission Cloud Platform (MCP), a NASAmanaged, security-enhanced cloud computing platform, is delivering on all three of these goals and is rapidly accelerating cloud adoption for Open Science initiatives across the agency. Open-source science is a commitment to the open sharing of software, data, and knowledge as early as possible in the scientific process. MCP enables SMD "as open as possible, as closed as necessary."

MCP supports two initiatives that directly source and promote agency goals and open science commitments: *AWS Service Workbench* and *Open Data Registry*. The Open Data Registry is a collection of datasets hosted by Amazon Web Services (AWS). MCP leverages a strategic partnership with AWS through a <u>NASA Space Act Agreement</u>, which aligns with the broader the Amazon Sustainability Data Initiative (ASDI) to help researchers, scientists, and innovators around the world advance their work on <u>sustainability-related research</u>. NASA is publishing data to the Open Data Registry to honor commitments to open science. NASA has published 15 (and counting) high-value data sets in the Open Data Registry.

MCP is building sets of tools to help NASA scientists and external research partners harness the power of the cloud to rapidly accelerate the research process and knowledge discovery and leverage the data in the Open Data Registry and other repositories. One such tool is Service Workbench, a processing platform optimized for cloud-based data that can be sourced from the Open Data Registry. Service Workbench is a cloud-native tool that enables federated access to data, tooling, and compute power across NASA. NASA researchers do not have to worry about navigating cloud infrastructure themselves and can instead focus on meaningful scientific application of SMD data in optimized research environments. Research environments can be stood up in a matter of minutes, not months, and used to conduct experiments with peers at partner institutions. Automated baseline setups configured by MCP simplify data access and provide budget transparency, allowing NASA to reinvest in cloud best practices and achieve research reproducibility. Service Workbench abstracts cloud infrastructure from the end users and allows them to focus directly on the science.

The Mission Cloud Platform represents a NASA-wide investment in cloud infrastructure for science acceleration. MCP tools such as Service Workbench and Open Data Registry are reducing onboarding time, creating efficiency, and improving general science system usability and accessibility. MCP further enables open science by offering agencywide services that provide cloud-optimized research environments for scientists who want access to data and do not want or need to know about the underlying cloud system complexity.

What's next? Stay tuned to find out!

A Face to Face Visit with Michoud Assembly Facility and Stennis Space Center

By Dinna Cottrell, Chief Information Officer and Cherie Beech, Business Relations & Outreach Manager, Stennis Space Center

The Michoud Assembly Facility (MAF) and Stennis Space Center (SSC) hosted a face to face meeting for the Office of the Chief Information Officer (OCIO) leaders. Attendees included Jeff Seaton, NASA Chief Information Officer (CIO), other agency OCIO leaders, and Center OCIO leaders.

The meeting kicked off with a visit and tour of MAF given by Lionel Dutreix, MAF Center Director. The tour included the 43-acre climate-controlled facility (2.2 million sq. ft) to view the Space Launch System (SLS) and Orion manufacturing. Currently, the core stage II, III, and IV are in various stages of manufacturing, with core stage II nearing completion and preparing for installation of the RS-25 engines. The OCIO team was able to be one of the first to see the new Boeing Exploration Upper Stage (EUS) production area, as EUS will replace the Interim Cryogenic Propulsion Stage (ICPS) for Artemis IV and beyond!

The SSC visit included a productive meeting with valuable insights along with a tour of the SSC Propulsion Test Complex, the SSC Aerojet Rocketdyne Engine Assembly facility, and the Records Retention Facility.

The SSC Propulsion Test Complex tour, given by Maury Vander, Chief of the Test Operations Division, and Jeff Lott, Mechanical Branch Chief, gave interesting facts about the facilities and the SSC Propulsion Test Program. The tour provided an opportunity for the partipants to go onto one of the test stands to obtain a close up view to gain an indepth understanding of the test stand operations.

The guided tour of the SSC Records Retention Facility, which is the only NASA National Archives and Records Administration (NARA) certified records facility, provided an overview of the records and other artifacts stored for both SSC and NASA Shared Services Center (NSSC). The facility's inventory is maintained in a custom software, called the Records Storage Inventory Database (ReSTID), which was developed locally at SSC, and is also available as a mobile application. SSC OCIO plans to send all physical permanent records to NARA this fiscal year to meet an Office of Management and Budget (OMB) deadline. This could provide opportunities to the agency with storage and digitizing services.

The tour concluded at the SSC Aeroject Rocketdyne Engine Assembly facility, as Mike McDaniel, General Manager, explained and showed the group the fascinating facility and the accomplishments made for the Space Launch System (SLS) RS-25 flight engines for future Artemis missions.





SSC Aeroject Rocketdyne Engine Assembly Facility



NASA IT SeelT

NASA IT SeeIT is an innovative, executive-level dashboard that provides full transparency into agency IT services delivered by Leidos.

A Focus On Data

There is no shortage of data at NASA—the agency collects information and makes decisions that will put humankind back on the Moon and then to Mars.

The <u>SeeIT dashboard</u> (links internal to NASA) allows NASA to see and learn from data, capitalize on synergies, and offers a collaborative platform to increase situational awareness.



Introducing NASA IT SeeIT

The goal of the NASA IT SeeIT dashboard is to bring data elements together to provide intelligence and spur action. The NASA IT SeeIT dashboard provides modules for ease of data visualization.



The Overview Module provides a quick reference for performance health statistics for NASA IT (NEST and AEGIS) and consists of a network latency map and a center detail pop out.

The NASA IT SeeIT Mission Freeze

<u>Module</u> offers an easy-to-digest, real-time view of mission freeze activity across the agency. The new <u>Mission Freeze Calendar</u> is becoming the official mission freeze record for all OCIO Service Lines and Agency-Level Offices. Uniquely designed with the customer experience in mind, the at-a-glance interface uses modern graphics and visuals for intuitive navigation.

SeelT's Purpose And Promise

SeelT delivers insightful, real-time data captured from a myriad of data sources through a thoughtful, easyto-use tool. SeelT offers an agency view and allows you to slice and dice data at a granular level. It is designed with a three-clicks-or-fewer approach, so you can get what you need, when you need it to make the best-informed decisions possible to support the mission.

For More Information

Please contact: <u>agency-nasa-it-</u> <u>enterprise-contract@mail.nasa.gov</u> IT Talk

National Aeronautics and Space Administration

Office of the Chief Information Officer Mary W. Jackson Headquarters 300 E Street SW Washington, DC 20546

www.nasa.gov

