



**Information Technology**  
**OFFICE OF THE CHIEF**  
**INFORMATION OFFICER**









**Information Technology (IT)**

# **Annual Key Insights Report**

**Fiscal Year 2021 Successes and Accomplishments**



# TABLE OF CONTENTS

<b>LETTER FROM THE CIO</b>	<b>3</b>		
<b>INTRODUCTION</b>	<b>4</b>		
<b>FY 2021 HIGHLIGHTS</b>	<b>5</b>		
Goal 1: Customer Experience	5		
Goal 2: Applications & Services	5		
Goal 3: Data & Analytics	6		
Goal 4: Platforms & Infrastructure	6		
Goal 5: Security	6		
Goal 6: Workforce	7		
Goal 7: Technology Management	7		
Goal 8: Innovation	7		
<b>FY 2021 SUCCESSES</b>	<b>8</b>		
 <b>Goal 1: Customer Experience</b>	<b>8</b>		
Delivering an Extended Filing Season and Economic Relief	8		
Enhancing IRS Online Account and Launching Tax Pro Account	9		
Deploying New Online Tools in Support of the American Rescue Plan	10		
Expanding Customer Callback and Integrating New Technologies	10		
 <b>Goal 2: Apps &amp; Services</b>	<b>11</b>		
Modernizing Case Management to Better Serve Taxpayers	11		
Reducing Legacy Code to Modernize Core Tax Processing Capabilities	12		
Processing Information Returns Data in Near Real Time	12		
Improving Data Access through APIs	12		
 <b>Goal 3: Data &amp; Analytics</b>	<b>13</b>		
Enhancing Cybersecurity Analytics	13		
Expanding the Return Review Program for Fraud Detection	14		
Enabling End-to-End Performance Monitoring for IRS Online Tools	14		
		 <b>Goal 4: Platforms &amp; Infrastructure</b>	<b>15</b>
		Adopting Industry-Leading Cloud Technology	15
		Building a Modern Infrastructure	16
		Modernizing the IRS Technology Environment	16
		 <b>Goal 5: Security</b>	<b>17</b>
		Improving Vulnerability and Threat Management	17
		Strengthening Identity and Access Management	18
		Enhancing Security Operations and Management	19
		 <b>Goal 6: Workforce</b>	<b>20</b>
		Supporting a Hybrid Workplace	20
		Cultivating the IT Workforce of the Future	21
		 <b>Goal 7: Technology Management</b>	<b>22</b>
		Enhancing Robotics Automation	22
		Improving the 2022 Target Enterprise Architecture	22
		Completing the Individual Master File Retirement Plan	23
		Accelerating the Delivery of Java-Based Applications	23
		Implementing the Taxpayer First Act to Better Manage Information Technology	23
		 <b>Goal 8: Innovation</b>	<b>24</b>
		Helping Taxpayers Resolve Issues More Quickly Through Digitalization	24
		Increasing “Always On” System Availability	25
		Encouraging Innovation through Collaborative Competition	25
		<b>MEASURING PERFORMANCE</b>	<b>26</b>
		<b>LOOKING TO THE FUTURE</b>	<b>27</b>

# Letter from the CIO



*Nancy A. Sieger*

**Nancy A. Sieger**  
Chief Information Officer  
Internal Revenue Service

Since the initial release of the IRS Integrated Modernization Business Plan in 2019, our operations and infrastructure have changed significantly. With the close of fiscal year (FY) 2021, we have now reached the halfway point in our six-year modernization journey to improve how the agency interacts with taxpayers and the tax community, while continuing to strengthen cybersecurity protections and information technology systems.

We have delivered significant technology improvements and responded to unprecedented demand due to the pandemic. We accelerated the development of our digital services. We expanded customer callback availability on our toll-free telephone lines. We created new web applications like “Get My Payment” to track Economic Impact Payments and the “Child Tax Credit Update Portal” to help people manage advance payments of the Child Tax Credit, a first-of-its-kind endeavor. We also achieved the long-time goal of making it possible to e-file your amended tax return. As the FY 2021 Annual Key Insights Report illustrates, we

rapidly delivered new services and payments, while simultaneously continuing to support the planning and execution of a historically long tax filing season. Considering the new responsibilities of the IRS, additional funding provided by the American Rescue Plan and the mandate to deliver on the promises of the Taxpayer First Act, we’re embracing the opportunity to reset. In the next year, we’ll update our multiyear modernization plan to reflect these new dynamics. Our team is experienced and ready to deliver, and once again, we have ambitious goals in the year ahead.

As I reflect on what we did for the country in 2021, I am so excited that the IRS is being recognized as a world-class technology organization and being given the opportunity to deliver even more for our country. Modernization improves the taxpayer experience. It opens the door to providing more digital services, and by improving access to operational data, we are protecting and preserving the integrity of the federal tax system.



# INTRODUCTION

The Internal Revenue Service (IRS) balances multiple priorities throughout the year including annual tax law changes, legislative mandates, evolving security and fraud threats, and modernizing the technology services and solutions that power taxpayer service and enforcement activities. The IRS has completed the third year of implementing the **IRS Integrated Modernization Business Plan**. Our FY 2021 Annual Key Insights Report summarizes major accomplishments in delivering on these priorities and previews the agency's broader modernization journey in the years ahead.

We delivered on our modernization commitments in the multiyear Business Systems Modernization account, in addition to taking on new responsibilities since the onset of the SARS-Cov-2 (COVID-19) pandemic to deliver a total of more than \$1 trillion in tax refunds and economic relief. In FY 2021, we moved quickly to implement the American Rescue Plan, which included a new round of Economic Impact Payments and advance payments of the Child Tax Credit. We simultaneously delivered another extended tax filing season and provided the virtual services and online tools needed to ensure the critical work of the IRS could continue throughout the pandemic.

## IRS MISSION

Provide America's taxpayers top-quality service by helping them understand and meet their tax responsibilities and enforce the law with integrity and fairness to all

## IRS IT MISSION

To deliver transformational IT services that drive effective tax administration and ensure public confidence

## IRS IT VISION

IRS's technology provider of choice delivering secure and innovative solutions



The IRS Integrated Modernization Business Plan was organized around four pillars: Taxpayer Experience, Core Taxpayer Services & Enforcement, Modernized IRS Operations and Cybersecurity & Data Protection. Together, these pillars trace to the eight goals of the IT Strategic Plan (ITSP), align with the agency's mission and represent a strategic view of our technology work. Highlights of each program's accomplishments are listed on the following pages, in addition to highlights of other achievements delivered as part of the broader IRS technology portfolio.

# FY 2021 HIGHLIGHTS



## IT Strategic Goal 1 Customer Experience

- Ensured the successful processing of more than 135 million federal individual tax returns throughout the 2021 filing season and the issuance of more than \$270 billion in refunds, while also delivering a new round of Economic Impact Payments and advance payments of the Child Tax Credit.
- Launched two online applications—Tax Pro Account and Child Tax Credit Update Portal (CTCUP), expanded services in taxpayer’s Online Account (OLA), allowed taxpayers to create a short-term payment plan and improved our service availability and page load times by 7% and 20%, respectively.
- Reduced the volume and associated costs of IRS notices sent via mail by making 11 types of IRS notices available to taxpayers online through their IRS Online Account, representing 44% of notices.
- Strengthened IRS customer service phone operations, one of the largest in the world, and handled unprecedented demand by expanding customer callback availability to 16 toll-free telephone applications, accounting for approximately 40% of demand.

**1** Enhance the experience for taxpayers, third parties and IRS employees through omnichannel solutions that are transparent, easy to use and secure.



## IT Strategic Goal 2 Applications & Services

- Established the new, cloud-based Enterprise Case Management (ECM) platform and successfully migrated legacy functions for four programs, leading to additional releases in the ongoing effort to modernize and consolidate legacy systems.
- Completed nearly 70% of code conversion aimed to retire legacy code and reengineer the most complex aspects of the Individual Master File as part of the CADE 2 program, which simplifies the IT environment and enables faster responses to new legislation.
- Took the first steps to modernizing information returns processing with the successful launch of a new document database that ingests data in near real time, which helps compliance teams who rely on the data for audits and other enforcement work.

**2** Design modular and reusable technology solutions to speed up “time to market” and deliver the services taxpayers need to fulfill their tax obligations.

## Under the American Rescue Plan

**\$400 billion**  
In Economic Impact Payments  
delivered to taxpayers



**\$46 billion**  
In Child Tax Credits Payments  
impacting 60 million children

# FY 2021 HIGHLIGHTS

Continued



## IT Strategic Goal 3 Data & Analytics

- Enhanced cybersecurity analytics with the addition of new external threat intelligence data and a mechanism to better visualize data across technology environments and platforms for early detection and response.
- Strengthened the ability to monitor for unauthorized data access and detect potential insider threats through data visualization and advanced behavioral analytics.
- Enhanced enforcement activities by adding more types of incoming data for analytics and fraud modeling to the industry-leading, cloud-based system powering the Return Review Program (RRP).



## IT Strategic Goal 4 Platforms & Infrastructure

- Leveraged the Enterprise Container Platform (ECP) to migrate IRS technology applications more seamlessly to cloud environments, and successfully moved the first IRS-built application to cloud, which positions the IRS to accelerate cloud migrations and continue increasing operational efficiency.
- Transitioned to a new subscription-based managed service as part of the Managed Infrastructure Data Service (MIDS) program to support the need for efficient, secure and highly reliable storage and computational services.
- Improved the currency of the agency's technology environment by reducing the percentage of aged hardware from 16% to 9.5%.



## IT Strategic Goal 5 Security

- Protected the integrity of the nation's tax system by mitigating more than 1.4 billion unauthorized access attempts annually using layered controls and a robust incident response capability that performs around-the-clock intrusion and fraud analytics.
- Strengthened identity and access management for internal and external applications, including delivering a modernized secure access and digital identity solution that will meet federal mandates, improve the user experience, enable shared costs and help the IRS stay current and ahead of the cybersecurity threat landscape.
- Enhanced security operations and management with improved testing and new automation that reduces the time to review programming code by over 85% and helps ensure more rapid delivery of secure taxpayer services.
- Through network segmentation, secured five high value assets (HVAs), which contain the agency's most valuable data assets and are critical to essential tax administration functions.



**3** Advance data quality, access, usability and analytics to inform decision-making and improve tax administration.

**4** Increase the efficiency and currency of technology investments through the reuse of common enterprise services on resilient, scalable and open platforms.

**5** Protect the security and integrity of the tax system.

# FY 2021 HIGHLIGHTS

Continued



## IT Strategic Goal 6 Workforce

- Supported the hybrid workplace environment by providing the network infrastructure and technology equipment for a largely telework workforce while simultaneously providing on-site support in IRS offices.
- Built the infrastructure and provided the technology needed to establish a new IRS call center in Puerto Rico.
- Delivered advanced cybersecurity training on enterprise systems testing and process automation to enhance our team's abilities to run more efficient code scans, understand and triage findings, and help developers remediate security issues during development.



## IT Strategic Goal 7 Technology Management

- Completed a detailed, multiyear plan for the retirement of the Individual Master File, incorporating the results of an evaluation by an independent reviewer to enhance the plan's strengths and address any weaknesses to better ensure success.
- Accelerated the delivery of Java-based applications to improve response time to new service rollouts, expanded collaboration efforts to improve strategic planning and deployment-to-production timelines.
- Improved the Enterprise Architecture to better align with the IRS's long-term goals, including key topics such as taxpayer experience, digitalization, IRS modernization, enterprise data platform, legacy decommissioning analysis and suspicious filings.



## IT Strategic Goal 8 Innovation

- Created and launched the Documentation Upload Tool available at IRS.gov/reply in response to emerging pandemic-related business needs to resolve certain tax issues by submitting documentation online.
- Inspired ingenuity and innovation across the IRS IT organization by hosting the first-ever Hackathon event, which resulted in delivery of several prototypes for solutions related to digitalization, legacy systems decommission and taxpayer experience.
- Recognized for success by both industry and government groups for outstanding progress not only cultivating innovation but also delivering services that impact people's lives.



**6** Cultivate a well-equipped, knowledgeable, diverse, flexible and engaged workforce.

**7** Adopt and embrace industry-leading technology management practices that deliver rapid and iterative improvements to the taxpayer experience.

**8** Continually innovate operations and learn from industry standards.





# Goal 1

## CUSTOMER EXPERIENCE

**Enhance the experience for taxpayers, third parties and IRS employees through omnichannel solutions that are transparent, easy to use and secure.**

**T**echnology remains a critical part of providing taxpayers a more positive and simplified experience and upholding the integrity of the nation's tax system. In another historic year, our focus on the customer experience resulted in a series of significant and record-breaking achievements. We delivered economic relief to the American public quickly and expanded service options in response to customers' expectations. The IRS continued to provide service to the American taxpayers through the pandemic, providing the much needed services in times of crisis.

### **Delivering an Extended Filing Season and Economic Relief**

Following an unpredictable year with many changes and challenges, the IRS IT organization supported another historic tax filing season in 2021. The nation's tax season started on February 12, 2021, when the IRS began accepting and processing 2020 tax year returns. The later start date for individual tax return filers allowed the IRS time to ready our technology systems following the tax law changes in December 2020 that provided a second round of Economic Impact Payments and other benefits.

Leading up to opening day, the IRS IT organization updated and tested systems to factor in the tax law changes to help ensure proper processing of tax returns and refunds. On opening day, the IRS successfully processed more than 12.1 million e-filed returns. These returns, along with

extensions, resulted in a processing rate of 355 submissions per second. On May 17, 2021, the extended filing deadline, more than 135 million tax returns were processed, a 13.4% increase from the year before.

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***The IRS, in collaboration with the U.S. Department of the Treasury and the Bureau of the Fiscal Service, successfully disbursed a third round of over 163 million Economic Impact Payments worth over \$390 billion under the American Rescue Plan in FY 2021.***

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# Goal 1

## Customer Experience

### Continued

Filing Season Statistics	2020	2021	% Change
Individual Income Tax Returns Processed	119,722,000	135,773,000	+ 13.4%
Percent of Returns e-Filed	90.3%	93.6%	+ 3.6%
Visits to IRS.gov	1,198,616,000	1,372,697,000	+ 14.5%
Number Refunds Issued	89,840,000	95,632,000	+ 6.4%
Refunds Amount Issued (in Billions)	\$249.041	\$270.345	+ 8.6%
Average Refund Amount	\$2,772	\$2,827	+ 2.0%

Table 1: Filing Season Statistics (FS 2020 and FS 2021)

[Money amounts are in US dollars]

[1] Cumulative statistics comparing data at the official end of the filing season

With passage of the American Rescue Plan in March 2021, IRS IT stepped up to deliver a third round of Economic Impact Payments in addition to the expanded and newly advanceable Child Tax Credit (CTC) payments. The first monthly payment of the CTC was made on July 15 with \$15 billion in first payments made to families of nearly 60 million children without any further action required from households. The IRS sent CTC payments to eligible families on July 15, August 13 and September 15 in FY 2021. Since September 2021, over 106 million payments totaling nearly \$46 billion have been paid directly to families and households. The IRS continues to improve the Child Tax Credit Update Portal and deliver payments on time.

### Enhancing IRS Online Account and Launching Tax Pro Account

Since the initial launch of IRS Online Account in 2016, we helped taxpayers securely access the information and services they need, with more than 23 million sessions and 8.37 million new users in FY 2021. By expanding the electronic options available to taxpayers and the number of task-based tools available 24/7/365 through the IRS.gov website, we continue to help people manage their taxes.

In FY 2021, we enhanced IRS Online Account by adding several new features. For example, people can now check the amounts of their Economic Impact Payments using the “Get My Payment” web application to help them accurately calculate any Recovery Rebate Credit they may be eligible for on their 2020 tax return. Additionally, taxpayers can view balance details, payment plan and history, and digital copies of select notices or letters from the IRS in the Message Center. They can also make a payment online, request a plan via Online Payment Agreement and access their tax records via Get Transcript.

Later in 2021, we enabled taxpayers to digitally sign certain authorization forms, such as a Power of Attorney (POA), initiated by their tax professional. The new feature was a groundbreaking new step in the ongoing expansion of electronic options

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***This year we reduced the volume of IRS notices that need to be mailed and the associated costs for those mailings by making 11 more types of IRS notices available to taxpayers through their IRS Online Account, representing 44% of notices delivered to taxpayers.***

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for taxpayers and tax professionals, such as digitally initiating a POA or Tax Information Authorization (TIA) on IRS.gov. These digital authorization requests are simpler versions of Forms 2848 and 8821. A key benefit is the completed digital authorization will go directly to the Centralized Authorization File (CAF) database and will not require manual processing. Most requests will be immediately recorded and appear on the list of approved authorizations in the taxpayer’s Online Account and the tax professional’s Tax Pro Account, resulting in a much faster process compared to processing requests received via fax or mail.

# Goal 1

## Customer Experience

### Continued

#### Deploying New Online Tools in Support of the American Rescue Plan

In FY 2021, the IRS launched two new online tools designed to help families manage and monitor the advance monthly payments of Child Tax Credit under the American Rescue Plan. These two new tools were in addition to the nonfiler sign-up tool, which helps families not normally required to file an income tax return to quickly sign up for the Child Tax Credit payments.

- **The Child Tax Credit Eligibility Assistant** allows families to answer a series of questions to quickly determine whether they qualify for the advance credit. The Assistant has been used over 5.1 million times to help taxpayers determine their eligibility for the advance Child Tax Credit.
- **The Child Tax Credit Update Portal** allows families to verify their eligibility for the payments and, if they choose, opt out from receiving the monthly payments. The IRS successfully delivered six releases to the Child Tax Credit Update Portal in six months. These releases provided enhancements such as reporting a significant change in income, changing bank account or address, and accessing CTCUP features in Spanish. More than 7 million people successfully used the tool to manage their payments in FY 2021.

Identity verification is an important safeguard we use to protect taxpayers using our online tools from identity theft. The Child Tax Credit Update Portal was the first online tool we provided using the new identity verification process that will replace Secure Access in FY 2022.

#### Expanding Customer Callback and Integrating New Technologies

Customer callback enables taxpayers to elect an agent callback instead of waiting on hold for service. In FY 2021, we made customer led callback available to 16 toll-free telephone applications, including two dedicated Spanish-language lines, accounting for approximately 40% of demand. Expanding to 16 applications

in FY 2021 saved taxpayers approximately 2.2 million hours of hold time. We offered the callback feature to 7.3 million taxpayers, and we achieved a 91% success rate. This allowed taxpayers to leave a callback number, disconnect and await their reconnect call with an available agent.

To improve operational efficiencies, we also continued to innovate and make new technologies available to IRS customer service and compliance agents by enabling the use of voicebots, chatbots and text chat features that make the IRS more accessible and responsive to taxpayer needs. For example, in FY 2021, we launched a new voicebot to act as the first responder for customers inquiring about Economic Impact Payments (EIPs). This solution reduced call center agents' time to service, responds to frequently asked questions and leverages automated speech recognition in natural language. The Spanish version launched in September 2021.

From May 5 through the end of the fiscal year, the EIP FAQ voicebot answered nearly 42% of taxpayer calls, freeing up IRS representatives to handle more complex issues. Since the Spanish deployment in September 2021, the Spanish EIP FAQ voicebot also answered 42% of taxpayer inquiries - the equivalent of 100,000 calls. Combined English and Spanish EIP voicebots handled over five million total calls in the last five months of the fiscal year.

**New Voicebot for Economic Impact Payments handled over 5 million calls in English & Spanish**



# Goal 2

## APPLICATIONS & SERVICES

**Design modular and reusable technology solutions to speed up “time to market” and deliver the services taxpayers need to fulfill their tax obligations.**

Improving technology applications and services directly benefits taxpayers and the tax community. This focus is leading the IRS to create, iterate and release applications to taxpayers more quickly than it takes with traditional methods, sometimes in just weeks as with the Documentation Upload Tool. We are applying modern design principles for more uniform and aesthetically pleasing digital services, and we continue to leverage reusable technology solutions that lead to the incremental phasing out of legacy systems and legacy code.

### **Modernizing Case Management to Better Service Taxpayers**

This year, we migrated the first case management system to the new, cloud-based Enterprise Case Management (ECM) platform, successfully transitioning paper-based processes to digital for the Tax Exempt & Government Entities Exempt Organizations Correspondence Unit customers. The IRS typically manages more than 30,000 letters and forms annually as part of this program. We auto-generated prepopulated letter templates. Other business processes that were successfully migrated to the new ECM platform in FY 2021 include casework for the IRS Office of Equity, Diversity and Inclusion (EDI), W&I External Referrals, and grants management for the IRS Volunteer Income Tax Assistance (VITA) and Tax Counseling for the Elderly (TCE) programs. These initial deployments on the ECM platform

pave the way for eliminating redundancies, automating manual processes and reducing multiple handoffs among disconnected systems.

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***Enterprise Case Management now supports VITA & TCE program casework, increasing the efficiency of the program to award VITA & TCE grants to organizations that provide free tax return preparation services for communities in need.***

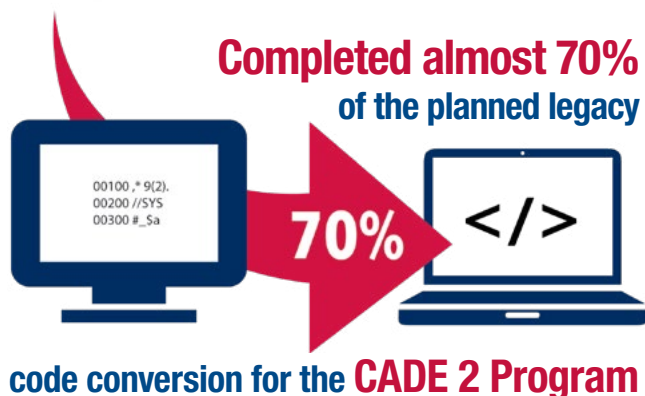
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## Goal 2 Apps & Services Continued

### Reducing Legacy Code to Modernize Core Tax Processing Capabilities

Customer Account Data Engine 2 (CADE 2) is the agency's modernized core tax processing system that provides daily processing of taxpayer accounts to enable faster processing of tax refunds and more efficient operations. CADE 2 leverages modern-day database technology, programming languages and principles to determine refunds, penalty and interest calculations, monitor compliance, and track historical data for individual taxpayer accounts.



Long considered a high-risk technology program due to its overwhelming complexity, the IRS continued making significant progress in FY 2021. As part of the Individual Tax Processing Engine (ITPE) project, we converted nearly 70% of the legacy code into a modern programming language, in addition to technical work in areas such as report generation. Completion of the ITPE will reengineer the most complex aspects of the Individual Master File by retiring antiquated legacy code, simplifying the IT ecosystem and enabling the IRS to respond to tax code changes more quickly.

### Improving Data Access through APIs

Application Programming Interfaces (APIs) create a way for authorized programs and systems to access IRS data in a secure environment. This year, we defined the product architecture and standards for external APIs. This included defining multiple policy and standard artifacts and developing cloud target architectures.

Cloud integration ensures the framework and operating model follow consistent API development, standards and best practices, helping ensure reusable solutions reduce workload and costs.

### Processing Information Returns Data in Near Real Time

The IRS receives billions of information returns (IR) each year to help ensure the fairness of the tax system and conduct compliance activities. Current IR processing systems are built on legacy technologies. In FY 2021, we took the first steps to modernizing access to IR data with the successful launch of a new document database that ingests data in near real time. By ingesting IR data in near real time, we can provide our compliance teams access to the data they need for audits and enforcement activities without lengthy delays for information return processing.

More broadly, the IR modernization strategy is a four-phased approach, with the first phase designed to meet the requirements of the Taxpayer First Act in January 2023, by developing an Internet portal to e-file Forms 1099. Completion of all four phases of IR modernization will enable the retirement of eight intake and auxiliary systems and help to reduce the current IRS technology footprint, increase resiliency, enhance security and align with the IT strategic goals.

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***The portal will provide taxpayers an avenue to prepare, file and distribute Form 1099, and create and maintain tax records. Modernization will support improved compliance while reducing administrative burden.***

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# Goal 3

## DATA & ANALYTICS

**Advance data quality, access, usability and analytics to inform decision-making and improve tax administration.**

**D**ata continues to be one of the most important assets for identifying and mitigating potential noncompliance, improving how we provide a timely and personalized taxpayer experience and keeping our systems and employees online. Building on last year's success, we hit new milestones again this year in deploying technology and enhancing capabilities that bring new levels of sophistication to tax administration operations. Many accomplishments highlighted throughout this report demonstrate how we are using data. In this section, we focus on data-related achievements in the areas of cybersecurity, fraud detection and performance monitoring.

### Enhancing Cybersecurity Analytics

We continue to enhance our cybersecurity threat detection capabilities with tools that allow for real-time analytics on data streaming from our applications, sensors, devices and online services. These technologies enable the analysis of current and in-motion data triggered by a specific event, like a website click.

- **Enhanced User Behavior Analytics:** We improved the identification of emerging insider threats using real-time intelligence information and analytics, enabling us to detect threats against the IRS and its personnel. We also implemented 11 new fraud detection use cases that will help the IRS further detect unauthorized changes to taxpayer data.
- **Enhanced Fraud Analytics:** We developed a new threat intelligence feed that gathers and leverages externally available information to further improve vulnerability and threat management.

This capability strengthens the agency's ability to identify and address potential fraud and protect taxpayer data and IRS systems.

### Implemented 11 new fraud detection use cases and enhanced



### intelligence for fraud analytics

Read more about data-driven cybersecurity achievements in [Goal 5: Security](#).

# Goal 3 Data & Analytics Continued



## Expanding the Return Review Program for Fraud Detection

The Return Review Program (RRP) uses cutting-edge machine-learning technologies to detect, resolve, and prevent criminal and civil tax refund fraud and noncompliance. Using an industry-leading, cloud-based system known internally as Selection and Analytical Platform (SNAP), we further strengthened RRP by adding data from other return types. In effect, we further improved the agency's ability to pursue significant areas of tax noncompliance. Since the initial investment for RRP began in 2015, RRP systemically detected almost \$13 billion of pre-refund fraud and has achieved a return on investment of \$139 to \$1 spent, or 13,900%.

## Enabling End-to-End Performance Monitoring for IRS Online Tools

End-to-end monitoring of IRS online tools can help improve the taxpayer experience by enabling the IRS to expeditiously triage and troubleshoot any potential issues, such as when there may be a spike in conditions that indicate a potential problem. To help ensure a smooth 2021 tax filing season, we developed and deployed a new monitoring tool to deliver end-to-end application performance monitoring for certain IRS online tools using application performance monitoring technology. This monitoring tool is now in use for six applications and enables the IRS to detect issues that may prevent users from successfully completing transactions.

Since 2015, RRP detected  
**\$13 billion** pre-refund  
fraud, a return on investment of  
**\$139 to \$1 spent.**





# Goal 4

## PLATFORMS & INFRASTRUCTURE

**Increase the efficiency and currency of technology investments through the reuse of common enterprise services on resilient, scalable and open platforms.**

IRS platforms and infrastructure play a critical role in protecting and delivering technology services that support U.S. government operations. While much work remains to fully mature and modernize our tax administration infrastructure, we are updating and fortifying the agency's technology using industry leading practices in areas such as IT operations and cloud technology. This year, we continued adopting industry-leading cloud technology and building a Next Generation infrastructure (NGI).

### **Adopting Industry-Leading Cloud Technology**

We have made significant progress on developing a hybrid multicloud ecosystem since the development of the IRS Cloud Target State Plan in FY 2018. We now have 64 systems and applications leveraging cloud services, including the IRS.gov infrastructure and applications such as the search function, lookup tools and certain calculators on the [IRS.gov website](https://www.irs.gov).

- **Creating a Path to Seamlessly Migrate to Cloud Environments:** In FY 2021, we successfully migrated an additional five applications to the Enterprise Container Platform built in FY 2020 enabling more seamless migrations to cloud environments. Additionally, for the first time, we migrated an IRS-developed application from an on-prem to a cloud-based solution. With extensive

collaboration across IRS IT, the planning and migration was completed in approximately six months and opens new possibilities for accelerating the agency's adoption of cloud technology. With this success, we're positioned to not only harness the power of cloud computing but also continue increasing the skills and expertise of our federal workforce.

**64 systems and applications are now leveraging cloud services**



# Goal 4 Platforms & Infrastructure Continued



## Building a Modernized Infrastructure

We are modernizing our infrastructure to adopt efficient, scalable and flexible architectures by using advanced tools and technologies for computing, network and storage activities.

- **Transforming the Storage and Computing Infrastructure:** This year we acquired the Managed Infrastructure and Data Services (MIDS), a managed service that provides foundational infrastructure for the majority of IRS computer systems. The underlying architecture consists of a software-defined, unified system that integrates all the computing elements of a traditional data center in an easily managed platform. As a managed service, this infrastructure can easily

scale out to match computing and storage resource needs. The transition also ensures we can more seamlessly provide efficient, cost effective, secure and highly reliable storage (server and mainframe) and computational infrastructure services for all IRS business entities and taxpayers.

## Modernizing the IRS Technology Environment:

We also succeeded in keeping the IRS technology environment current and in line with industry standards. In FY 2021, we reduced IRS aged hardware from 16% to 9.5%, reducing aged hardware by nearly 55% in the last 5 years. Overall, these changes strengthen our security posture, increase our efficiency and reduce the risks of hardware failure.

# Goal 5



## Protect the security and integrity of the tax system.

Protecting our systems and taxpayer information against cyber threats remains a top priority for the IRS. The IRS observes and mitigates millions of unauthorized access attempts per day (over one billion per year), including denial-of-service attacks, unsuccessful intrusion attempts, probes or scans and other unauthorized connectivity attempts, in addition to blocking approximately 140 million malicious email attempts per year. To that end, we have used funding provided by Congress to increase our monitoring, detection and analytical capabilities to identify suspicious activity within our systems. These improvements have helped us reduce risk, but we still need to do more. In FY 2021, we delivered several key initiatives to strengthen security and further protect taxpayer data.

### Improving Vulnerability and Threat Management

The modernization plan initiatives, focused on improving vulnerability and threat management, are designed to enhance the IRS's ability to secure taxpayer data and systems. This requires increased vigilance, proactive monitoring and full visibility across the IRS network, including the technology to enhance incident response and threat detection capabilities.

- **Data at Rest Encryption (DARE):** DARE provides cryptographic protection to the confidentiality and integrity of data in the event of unauthorized access or theft. We built on the success achieved last year in deploying a solution for encrypting data at rest on IRS application environments, paving the way to integrate more applications in future years. In FY 2021, we deployed the solution on additional application environments.
- **Enhanced Security Testing:** We automated processes that deliver improved security testing and source code scans with the potential to reduce code vulnerabilities by 80% and code review time by 85%. We are more equipped to remedy critical vulnerabilities as soon as alerted.

Reference [IT Strategic Goal 3: Data & Analytics](#) for additional achievements in FY 2021 to enhance our vulnerability and threat management capabilities.



# Goal 5 Security

## Continued

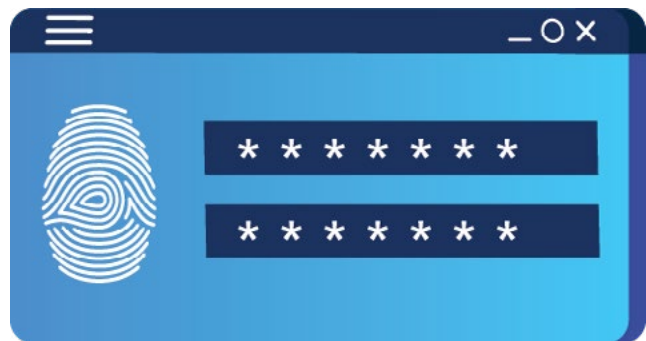
### Strengthening Identity and Access Management

The combination of identity and access management capabilities is helping prevent malicious and unintended access and disclosure of taxpayer data and other sensitive information. Key capabilities delivered this year include:

- **Advancing Continuous Diagnostics and Mitigation (CDM):** CDM is a multiphase deployment of commercial-off-the-shelf capabilities to improve situational awareness and the agency's cybersecurity posture. We automated the provisioning and deprovisioning of devices to ensure full visibility of who is on the network. This work included completing the migration to a new internal system, the Business Entitlement Access Request System (BEARS), which is used to manage basic entitlements and application access across the IRS and protect against unauthorized access.
- **Physical Access Controls at IRS Facilities:** The IRS is upgrading equipment at IRS facilities to strengthen our physical access security in alignment with Federal guidelines. We completed additional work as part of this multiyear initiative by upgrading equipment at six IRS facilities, making measurable progress toward the goal of fully transitioning to the modernized Enterprise Physical Access Control System by FY 2025.
- **Protecting the Integrity of IRS Online Services:** The agency's goal is to make the identity verification process for using

IRS online tools as simple, safe and secure as possible for all taxpayers. To protect taxpayer information, all taxpayers must verify their identities to access IRS self-help online tools, such as Get Transcript, Online Account and Online Payment Agreement.

### Implemented our new Identity Verification Process



### with the Child Tax Credit Update Portal

The IRS aims to balance the right level of security and access, while meeting National Institute of Standards and Technology (NIST) guidelines for identity verification. With security and taxpayer access at the forefront and to meet NIST requirements, we are improving identity verification by relying on a trusted third party, known as credential service providers (CSP), to verify individuals' identities. This year, we used a CSP, ID.me, for the first time to support identity verification for access to the Child Tax Credit Update Portal.

# Goal 5 Security

## Continued



### Enhancing Security Operations & Management

Fully protecting taxpayer data and the systems that handle or store that data requires full visibility of hardware and software on the network as well as enhanced incident response and detection of internal threats to data and systems. Key capabilities delivered this year include:

- **Security of High Value Assets:** The Office of Management and Budget defines High Value Assets as “those assets, systems, facilities, data and datasets that are of particular interest to potential adversaries.” We continue to ensure that only authorized users have access to critical IRS systems. This year we completed network segmentation, which fully blocks network access for unauthorized users, on an additional five High Value Assets supporting several critical systems.
- **Cyber Security Assessment and Management Tool:** We successfully transitioned the IRS to the Cyber Security Assessment and Management tool, which automates the Federal Information Security Management Act of 2002 (FISMA) assessment process and enables the IRS to have real-time data on the status of NIST security controls and more timely reports. FISMA is a federal law designed to increase the security posture of government agency federal systems. Agencies must prove through an annual assessment that they meet the FISMA requirements and NIST security controls, including producing several deliverables and reports. Automation with the Cyber Security Assessment and Management Tool facilitates a more efficient assessment process.

# Goal 6

## WORKFORCE

### **Cultivate a well-equipped, knowledgeable, diverse, flexible and engaged workforce.**

**T**his year we demonstrated that the IRS is ready and highly capable of adapting to the changing environment and supporting IRS employees. As the agency shifted to a hybrid work environment, with some employees returning to work in IRS facilities, we ramped up to provide the technology infrastructure, services and solutions needed to keep the IRS online and available for taxpayers navigating this new era. We remained focused on building and maintaining a pipeline of top technology talent. We had several successes this year with succession planning, knowledge management and cybersecurity training.

#### **Supporting the Hybrid Workplace**

We supported the hybrid workplace environment by providing the network infrastructure and technology equipment for a majority telework workforce while simultaneously providing on-site support in IRS offices. We also provisioned the technology infrastructure needed to establish a new IRS call center in Puerto Rico.





# Goal 6 Workforce

## Continued

### Cultivating the IT Workforce of the Future

In a workforce of more than 7,000, approximately 26% will be eligible for retirement in the next 5 years. We are faced with the potential loss of skills in legacy technologies and languages supporting critical IRS systems. We launched several initiatives to mitigate these risks, focusing on our cybersecurity workforce and preserving valuable technical knowledge.

- **Advanced Cybersecurity Training:** A key part of modernizing IRS operations is ensuring we have a well-trained workforce with the requisite skills and knowledge. In conjunction with the enhancement and automation of security testing used when we deploy new online services, we delivered advanced cybersecurity training to enhance our teams' abilities to run more efficient code scans, understand and triage findings and help developers remediate security issues during development. Other cybersecurity-focused development programs launched in FY 2020, such as the Cyber Skill Enhancement and Employee Development (SEED) Program, continued to foster employees' professional growth and training.
- **Knowledge Management:** Our goal is to ensure that all employees have continued and tailored access to learning opportunities for both leadership and technical skills and remain prepared to effectively fill mission critical positions. Using workforce data analytics and organizational needs, we have reduced the number of single points of dependency throughout the IT organization and identified subject matter experts with institutional knowledge critical for business continuity. We expanded our library of self-help online tutorials and developed the Cybersecurity Analytics Knowledge Base (CAKB). We also identified candidates for both knowledge capture and transfer

opportunities across 27% of our workforce, training over 2,000 employees to date.

To continue this momentum and expand knowledge management resources, we will continue leveraging paired programming, communities of practice and virtual libraries.

- **Leveraging Streamlined Critical Pay Authority:** Since its inception under the Restructuring and Reform Act of 1998, the IRS found the streamlined critical pay authority to be an enormously valuable tool in recruiting top tier talent from private industry. After a lapse in authority in 2013, the Taxpayer First Act restored the agency's hiring authority in FY 2019, allowing the IRS to recruit top talent to lead us into the future. In FY 2021, we hired six individuals specializing in emerging technology integration, cybersecurity and threat remediation, engineering and architecture.



# Goal 7

## TECHNOLOGY MANAGEMENT

### **Adopt and embrace industry-leading technology management practices that deliver rapid and iterative improvements to the taxpayer experience.**

**A**s taxpayer needs evolve and technology advances, we have adopted modern technology management practices that position us to usher in a new age for the IRS. This year we revised the Target Enterprise Architecture (EA) and completed a detailed, multiyear IMF Retirement Plan, which has the potential to completely transform and enhance customer service, compliance and fraud detection. We also successfully implemented the components of the Taxpayer First Act designed to improve the management of IRS IT. With the Continuous Integration/Continuous Delivery (CI/CD) pipeline, we delivered products, features, fixes and services to our customers more rapidly and efficiently. CI/CD is a process that implements Development, Security and Operations (DevSecOps) principles to automate development, testing, security and deployments in a fast, secure and reliable way.

#### **Enhancing Robotics Process Automation**

Robotics process automation has the potential to significantly relieve administrative burdens for taxpayers and employees whose time may be dedicated to complex work or areas where human intervention is indispensable. After implementing several automations last year, we continued on a successful path in FY 2021 by developing and testing eight more automations to assist in areas such as financial management, customer service, human capital and procurement. In addition to those eight automations, we launched three new automations for the IRS Research, Applied Analytics & Statistics (RAAS) organization. Overall, these new automations enhanced employee experience, increased productivity when compared to manual execution and improved accuracy due to standardization and consistency.

#### **The three new automations for the IRS RAAS Organization include:**

- **Certified Professional Employer Organization (CPEO) Tax Compliance Check:** Automates a labor-intensive financial compliance check of CPEOs, Related Entities and Responsible Individuals. This automation covers 100% of compliance checks and reduces processing time from 1 hour per check to less than 9 minutes.
- **Status 001 Nonfiler Check:** Automates the manual workload of tax examiners to determine whether a nonfiler business owes employment taxes, calculating the assessed tax due. This automation reduces processing time from 22 minutes per module to less than 4 minutes.
- **Nonfiler Expedited Combined Annual Wage Reporting (CAWR):** Uses data-informed logic to automate the removal of unproductive nonfiler cases and processing of productive nonfiler cases, freeing up capacity for the organization to work nonfiler cases. In total, this automation saves the IRS approximately \$7.5 million per year by preventing time and resources being spent on these cases.

# Goal 7 Technology Management

## Continued

### Improving the 2022 Target Enterprise Architecture

The 2022 Target Enterprise Architecture (EA) is the latest IRS annual document published in accordance with the Office of Management and Budget Circular A-130. Guided by the agency's strategic direction and vision for information technology, the Target EA describes the five-year target state for the agency's business and technical areas, as well as key technologies that the IRS must put into place to support its long-term goals. This year, we successfully updated the EA with the benefit of input from across the IRS and captured a host of key topics including the taxpayer experience, digitalization, IRS modernization, enterprise data platform, legacy decommissioning analysis and suspicious filings. The architecture paves the way for existing and future projects to leverage the power of this solution.

### Completing the Individual Master File Retirement Plan

The CADE 2 program has made significant progress modernizing key components of the Individual Master File system, which processes individual taxpayer returns, maintains accounts for all individual taxpayers, and provides data for refunds, notices and transcripts.

This year, we completed a detailed, multiyear plan to fully modernize the IMF and, with funding from the American Rescue Plan, we have begun to make demonstrable progress

in conjunction with the ongoing CADE 2 program. The dedicated funding enables the IRS to initiate the delivery of incremental benefits each year until IMF is fully retired, including decommissioning legacy systems and modernizing the highly complex ecosystem that feeds over 250

systems. The first set of data access services is scheduled for completion by the end of FY 2022.

### Accelerating the Delivery of Java-Based Applications

To be agile and deliver solutions quickly, it is imperative to implement modern DevSecOps processes. The Continuous Integration/Continuous Delivery (CICD) pipeline is a leading industry practice to automate testing and deploy software upgrades and code changes. After successfully onboarding 30 applications to the pipeline last year, we onboarded nearly 100 Java-based

applications to the CICD pipeline in FY 2021, saving up to 22 hours per delivery. Rapid deliveries and migrations allow us to be faster to market with new solutions.

### Implementing the Taxpayer First Act to Enhance the Management of Information Technology

Section 2101 of the Taxpayer First Act (TFA) is a multifaceted directive with various implementation dates that require the appointment of a Chief

Information Officer (CIO) with control over the IRS's information technology. The TFA also requires the CIO to have control over the development and implementation of a multiyear information technology strategic plan, and the verification and validation of the implementation plans for two significant information technology

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***The IMF is relatively low cost to operate, but technology limitations have resulted in many systems built on top of the IMF that, in totality, are costly to maintain. Modernization will simplify the IT operating environment and enable better taxpayer service.***

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applications (the retirement of the Individual Master File and completion of the CADE 2 program). The IRS has successfully implemented these TFA provisions. The CIO's roles and responsibilities have been defined, and the IRS Commissioner appointed a permanent CIO in February 2021. We have an established policy regarding the consultation and notification processes required for significant IT acquisitions. We issued a new IT Strategic Plan (FY 2020-FY 2024), and we secured an independent verification and validation of plans for the completion of IMF and CADE 2 Target State modernization efforts.



# Goal 8

## INNOVATION

### Continually innovate operations and learn from past experiences.

The IRS is constantly pursuing new and innovative ways of delivering technology to make the IRS more accessible, efficient and effective. The IRS looks at everything we do through the customer lens to make the technology experience a positive one. This year, we made additional strides in moving the IRS forward with technology as the nation continued to navigate pandemic-related challenges. IRS IT earned recognition for operational, technical and leadership excellence in serving the public and transforming government for the better.

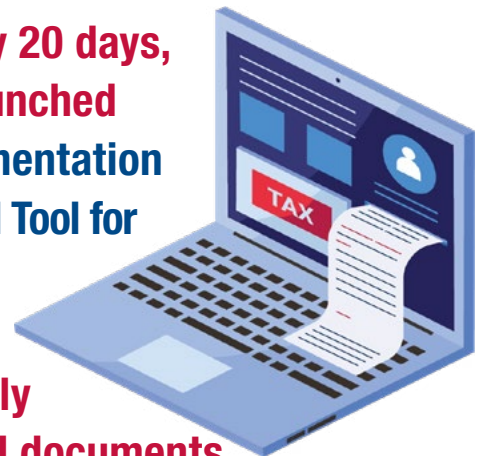
#### Helping Taxpayers Resolve Issues More Quickly through [IRS.gov/reply](https://www.irs.gov/reply)

The Documentation Upload Tool—now available at [IRS.gov/reply](https://www.irs.gov/reply)—is a new way for taxpayers to submit documentation to the IRS online to resolve certain tax issues. A taxpayer can upload images, PDFs and scanned documents for the IRS to access and quickly continue working the case. This accomplishment, which we delivered in less than 20 days by leveraging our cloud technology platform, helps the IRS address a growing paper backlog and significantly improves the taxpayer experience relative to the traditional approach of interacting through the mail. Users get near-instant confirmation that their documentation was received, and by reducing the inventory of paper correspondence, the IRS saves thousands of hours traditionally spent opening, sorting, scanning and filing paper.

Equipped with an antivirus scan, the tool uses optical character recognition to convert and extract multiple file formats into readable text. Because this tool does not require an account, anyone can send the IRS a form digitally instead of by mail, making the IRS accessible to anyone with a smart phone or computer. Taxpayers must also submit a copy of the IRS notice received to identify the case in which they are responding. Internally, this tool enables IRS employees to work remotely and efficiently, streamline processes and reduce errors since manual data extraction and entry are no longer necessary.

With this innovation, it will be easier than ever to provide documentation to the IRS. If you can take a picture of a paper check and make a mobile deposit with your bank, why can't you do something similar with the IRS? Looking ahead, we plan to add features and expand to other IRS programs.

**In only 20 days,  
we launched  
Documentation  
Upload Tool for  
users  
to  
digitally  
upload documents**



# Goal 8 Innovation

## Continued

### **Moving Towards “Always On” System Availability**

To mitigate the risk of any downtime when we migrate and update applications, we successfully initiated the “blue-green” deployment model. In effect, we maintain two or more separate but identical production environments so when an application is released, we gradually transfer user traffic from one environment to the other. The blue version is the currently running copy of the application, and the green version is the new version. When the updated application in the green environment is ready, traffic is rerouted seamlessly without impacting the customer. This new model applies to all new deployments moving to the cloud, helping improve customer service and ensuring high service availability.

### **Encouraging Innovation through Collaborative Competition**

In keeping with our role as technology innovators, more than 150 IT technologists on 25 teams competed in the first-ever Hackathon on in January 2021. The event followed a “make-a-thon” model by creating prototypes for solutions to enhance digitalization, legacy decommission and taxpayer experience. Each team built and presented solutions for automating and digitizing various IRS business services and capabilities, such as reducing paper return volumes, digitizing hard copy returns, converting legacy code, onboarding new employees, launching new robotics process automations and enhancing existing services like IRS2Go. Teams were evaluated on factors such as their level of team innovation, the potential impact of their solution and the path to production. The event showcased the talent and ingenuity of IRS IT employees dedicated to delivering 21st century technology that improves the taxpayer experience.

Throughout the year, IRS IT was recognized for success by both industry and government groups for outstanding progress not only cultivating innovation but also delivering services that impact people’s lives.

### **Service to the Citizen™ Awards**

Recognizes those public servants and their industry partners who demonstrate excellence in their delivery of services that impact the people’s lives.

IRS IT employees were recognized for filing season integration services, for the leadership response to the COVID-19 pandemic, for the delivery of Payments and for Taxpayer Digital Communications.

### **FedScoop 50 Awards**

Honors the most impactful leaders in the federal government who strive each day to leverage technology to transform government.

Chief Information Officer Nancy Sieger was recognized for outstanding leadership, earning a FedScoop 50 Golden Gov Award as Executive of Year, which is the most prestigious award offered by FedScoop that “recognizes visionary leaders who implement innovative ideas and inspire others to get on board.”

### **Government Innovation Awards**

Celebrates government IT disruptors, innovators and emerging leaders.

IRS IT was recognized for innovating IRS IT services through Robotics Process Automation and Artificial Intelligence-based operations.

# MEASURING PERFORMANCE

The IRS measured progress in FY 2021 by leveraging ten performance measures. Moving forward in FY 2022, the focus is on continuing to find new ways of measuring progress and adopting measurements for key performance areas such as Customer Experience.

IT Strategic Goal Area	Performance Measure	FY 2021 Target	FY 2021 Actual	Met/Not Met	FY 2022 Target
Customer Experience	New: To be developed	To be Baselined in Q2 FY 2022			
Applications & Services	<b>Reduction of Selected Legacy Code</b> (via multiple methods: Retire, Re-write, Replace and Refactor)	8.0%	6.8% <sup>1</sup>	Not Met	N/A <sup>2</sup>
Data	<b>Application Program Interface</b> Number of data sources accessible via Application Program Interface (API)	95	92 <sup>3</sup>	Not Met	105
Platforms & Infrastructure	<b>Aged Hardware</b> Measures the quantity of IT hardware	<20%	9.3%	Exceeded	<20%
	<b>Aged Software</b> Measures the quantity of IT software	<20%	18.41%	Exceeded	<20%
Security	Percent of applications at the assessed level of risk or mitigated with compensating controls	100%	100%	Met	100%
	Percent of Treasury approved IRS High Value Assets (HVAs) compliant with documented IT security standards	To be Baselined in Q2 FY 2022			
Workforce	<b>Workforce Mobility</b> Percentage of workforce that can execute daily functions remotely	99.5%	98%	Not Met	99.5%
	<b>New Hire Retention Service</b> Rate of retention for employees who have worked for IRS less than 12 months	96%	96.4%	Met	96%
Technology Management	Service availability of critical systems at the appropriate level of redundancy	85%	85%	Met	95%
Innovation	<b>Achieve Efficiency</b> gains on work processes where robotic process automation is applied	50%	87%	Exceeded	50%
	<b>Stabilize Cost</b> stabilize the cost of operations and maintenance	<82%	79.8%	Exceeded	<77.8%

<sup>1</sup>FY 2021 delivery was below the target of 961.6K lines of code due to two projects shifting to FY 2022.

<sup>2</sup>IT will no longer track or report on this metric beyond FY 2021.

<sup>3</sup>IT has delivered 92 APIs to date, below the target of 95, due to resource constraints.



# LOOK AHEAD



The IRS has experienced seismic shifts in our operations since we first embarked on our modernization journey in 2019 to remake the IRS IT organization and its technological infrastructure. While the IRS did not receive the full amount of funding requested for modernization for the first three years of our modernization journey, we replanned and delivered on the commitments in the IRS Integrated Modernization Business Plan. We are at an inflection point having concluded the first phase of this six-year IRS Integrated Modernization Business Plan. We are prepared to adapt and expand our thinking as we embrace industry-leading technology and meet taxpayer needs in an ever-evolving digital world.

As change agents, we are moving the IRS into the future by incorporating modernized technology into the work we do throughout the year. The additional funding provided by the American Rescue Plan enables the IRS to potentially double the number of modernization programs we can deliver beginning in FY 2022 and to accelerate major efforts such as the complete modernization of the Individual Master File.

In FY 2022, we will publish an updated IRS Integrated Modernization Business Plan (updated as “Mod Plan 2.0”), illustrating the new Modernization Portfolio. The Mod Plan 2.0 will introduce a long-term approach to technological advances while incorporating our lessons learned from the last three years of our modernization journey. Our delivery of this strategic direction will transform the taxpayer experience by making our services simpler, quicker, and more responsive.

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***With limited funding, we replanned and delivered more than 80 new capabilities and enhancements in the first 3 years of implementing the IRS Integrated Modernization Business Plan that collectively improved the efficiency and security of our technology environment.***

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# Look Ahead

## Continued

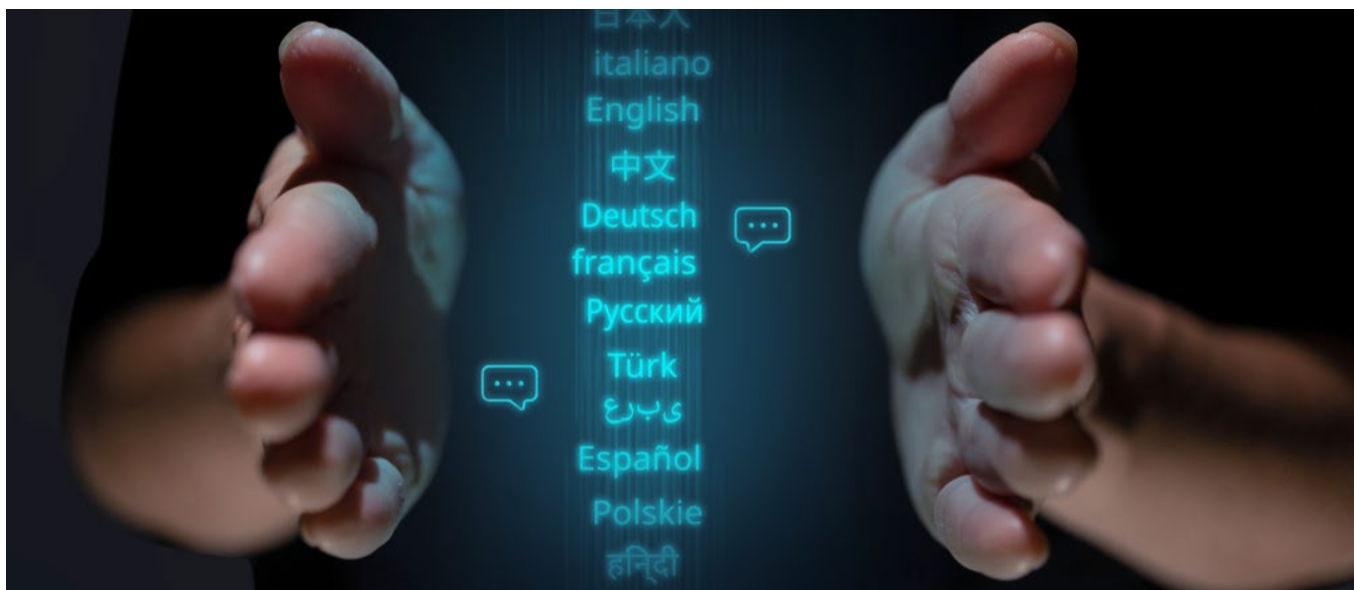
To achieve the vision of our new Modernization Portfolio and provide meaningful improvements for taxpayers, the IRS will deliver an expanded set of programs and initiatives that keeps pace with an evolving technological landscape and private-sector standards. While the Modernization Portfolio follows the alignment of the four modernization pillars, the updated plan re-envisioned and expands current efforts by organizing new and existing programs into streamlined Program Groupings that deliver real value to taxpayers and the IRS workforce.



### Taxpayer Experience

*Provide taxpayers a wide range of modern options for interacting with the IRS to answer questions and resolve tax issues. Deliver real benefits for taxpayers, tax professionals and the tax community, while allowing IRS employees to operate more efficiently and effectively.*

- **Digital Services:** Expand digital tools and online accounts that allow taxpayers, businesses and tax professionals to resolve most needs through self-service with seamless virtual assistance when needed. We will expand digital notices and letters, payment options, tax law assistance and income verification services. Taxpayers and businesses will be able to access more data, perform services on their IRS Online Account and interface with their tax professionals who will use an expanded Tax Pro Account.
- **Seamless Experience:** Continue to expand technologies that enable taxpayers to seek service and information through new, improved and more efficient channels to resolve needs. We will nearly double customer callback functionality for taxpayer-facing applications to encompass 70% of call volume. We will improve and expand secure messaging and omnichannel chat capabilities, including improvements and additional coverage for voicebots and chatbots.
- **Modernized Filing and Intake:** Provide new direct free file capabilities, expand e-filing and develop flexible tools to submit tax-related information. We will reuse and scale our technology solutions, such as the Documentation Upload Tool, to satisfy needs in other areas of business and make interfacing with the IRS easier for taxpayers.
- **Taxpayer Accessibility:** Expand tools and services to make IRS programs accessible to multilingual taxpayers, including providing multilingual forms and notices and refactoring and developing applications to support multilingual functionality. We will continue making strides toward Servicewide artificial intelligence that powers translation capabilities.



# Look Ahead

## Continued



### Core Taxpayer Services & Enforcement

*Evolve core tax systems through data-driven operations and decision-making, real-time tax processing and core tax administration systems integration. Use technology to enhance identification of noncompliance and fraud while reducing processing delays for taxpayers. Improve compliance through earlier intervention, easier (self) correction options and powerful enterprise platforms.*

- **Modernized Tax Account Information:** We aim to develop modern data distribution solutions, which will enable the IRS to send individual taxpayer data to multiple internal and external customers. We will modernize the Individual Master File (including CADE 2), Business Master File and perfection processes to provide common services and data to the enterprise. With modern data solutions, we will be able to give taxpayers access to additional digital services and up-to-the-minute account information. Modernizing tax account information also allows the IRS to implement legislation more effectively and strengthens the integrity of our tax system.
- **Information Return (IR) Modernization:** Modernize IR processing through adding new customer service components, replacing legacy IR systems and integrating with data matching and issue detection systems. We will expand information return intake to include cryptocurrency reporting. By 2023, we will perform data certification processing using refactored services on all 1099 forms, equating to more than 3 billion per tax year.
- **Case Management:** Consolidate case management processes and systems to drive consistency, visibility and efficiencies, with the end goal of nearly every IRS business unit using the Enterprise Case Management platform. We will incrementally deliver additional case management functionality and wider integration with data and common services across the IRS.
- **Analytics for Anomaly Detection:** Use advanced analytics to detect anomalies, match data, select productive cases and assign optimized treatments to systematically combat fraud and noncompliance.



### Modernized IRS Operations

*Improve underlying system infrastructure by reducing the complexity of the agency's technical environment, improving and expanding workforce support technologies, and adopting leading industry practices and technologies that deliver new and sustained efficiencies such as cloud and robotic process automation.*

- **Digitalization:** Enable access to data in a digital format, moving the IRS towards paperless operations. We will scale and expand the use of existing digital solutions, while also exploring options for new solutions that enhance the taxpayer and end user experience. Taxpayers will increasingly be able to interface with IRS digitally which increases accessibility while also allowing the IRS to reduce operating costs for paper processing and on-site services.
- **Hybrid and Multi-Cloud:** Deliver a robust and secure ecosystem of native cloud-based services, with emphasis on Platform as a Service (PaaS) and Software as a Service (SaaS), that enable acceleration of cloud migration and modernization. We will establish a hybrid and multi-cloud environment to operate a portfolio of IRS applications for delivering a secure and scalable IT infrastructure. This will allow us to reduce our current technology footprint and associated costs while increasing the agility for more rapid deliveries.
- **Network:** Provide a secure, resilient and high performance network (serving voice, data and video) in support of all IRS operations. We will modernize our network to efficiently operate with expanding volumes of data and increasingly complex network security threats. Additionally, the network will scale to meet our growing workforce.



# Look Ahead

## Continued

### Modernized IRS Operations *(continued from previous page)*

- **IT Management:** Modernize IT operations through adoption of service management leading practices by leveraging SaaS platforms to automate, provision and deliver services. By FY 2023, the IRS aims to deploy a new and modern IT services platform that ultimately provides both internal and external stakeholders with a more reliable, accurate and better experience. Our SaaS implementation will enable informed decision-making, quicker service restoration and improved efficiency, scalability and adaptability. This modernization for agile applications will allow us to respond rapidly to ever-evolving legislation and taxpayer needs, while reducing operating costs.
- **Platforms and Applications:** Adopt future-proofed services on standard cloud-native, low-code and customer-off-the-shelf (COTS) platforms in a manner that maximizes automation and simplifies the portfolio. We will provide foundational technologies and common platforms leverageable across the enterprise for application development.
- **Data and Analytics:** Establish state-of-the-art data management and data distribution platforms that empower business users, developers, data scientists and leaders with rapid and secure access to data.
- **Artificial Intelligence and Machine Learning:** Deliver artificial intelligence and machine learning capabilities to drive improved anomaly detection, generate business insights and recommend actions to improve operations. The IRS aims to enhance anomaly detection capabilities for post-refund use, further improving the agency's ability to pursue significant areas of tax noncompliance using leading-edge, machine learning technologies. Overall, this technology will help us increase fraud detection, empower our workforce to perform their responsibilities more efficiently, and automate compliance for data-driven decision making.
- **Robotics Process Automation (RPA) / Intelligent Automation:** Establish enterprise platform by integrating intelligent automation, artificial intelligence, machine learning and process automation. We will build an enterprise RPA platform and complete additional automations, aiming for all IRS business units to have automated processes by 2023. This will allow us to automate business processes and reduce the burden on our workforce so that their time is spent on more high-value tasks. Ultimately, this allows our agency to operate more efficiently and deliver more value.
- **Mission Support Systems:** Modernize technologies that are key to enabling mission support functions such as human resources and financial systems. We will provide employees a unified experience, streamline processes through automation and synthesize fragmented and siloed activities.
- **Workforce of the Future:** Empower IRS employees with collaboration tools, learning platforms and other systems to make them more effective and efficient. After a year of implementing the IRS IT Workforce Strategy, our analytics from the Career Summits and Flash Mentoring Series will help shape our approach for the future. We will continue to focus on reducing single points of dependency, identifying backups and providing growth opportunities based on employee interest and demand.

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***By FY 2023, the IRS aims to deploy a new and modern IT services platform that ultimately provides both internal and external stakeholders with a more reliable, accurate and better experience. Our SaaS implementation will enable informed decision-making, quicker service restoration and improved efficiency, scalability and adaptability.***

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# Look Ahead

## Continued



### Cybersecurity & Data Protection

*Protect IRS systems and taxpayer information against cyber threats (such as service attacks, intrusion attempts, scans and other unauthorized connectivity attempts).*

*Increase monitoring, detection and analytical capabilities to identify suspicious activity within our network.*

- **Security and Operations Management:** Provide full visibility of hardware and software capabilities to develop threat detection analytics and continuous threat automation. We will have greater insight into Computer Security Incident Response Center's capabilities and tools through an independent third party analysis.
- **Vulnerability and Threat Management:** Provide full visibility into servers and data endpoints to enable developers to identify or prevent threats. We will continue to implement a multiyear plan to better monitor workstations and proactively address poor application performance.
- **Identity and Access Management:** Modernize processes, technologies and policies for managing users' digital identities and access controls, including Secure Access Digital Identity (SADI) and Zero Trust initiatives. We will continue integrating all remaining customer-facing web applications through FY 2022 and in the future as we deploy other digital and online capabilities.



These program groupings are underpinned and depend on all seven of the technology focus areas that serve as the foundation for modernization, including Hybrid and Multi-cloud, Platforms and Applications, Data and Analytics, Artificial Intelligence and Machine Learning, IT Service Management, Network and Security. Security technologies and practices underpin and intersect with all the other technology focus areas. This enables secure delivery of all internal and external facing services. Each technology focus area includes key IT capabilities and concepts that enable delivery of efficient, integrated programs in support of the IRS mission.

Most of these foundational Technology Focus Areas are delivered under the Modernized IRS Operations pillar to enable implementation of modernized capabilities in other pillars. For example, Hybrid and Multi-cloud technology enables individual, business and tax professional accounts that will be delivered under the Taxpayer Experience pillar. Similarly, the Artificial Intelligence and Machine Learning technology supports voicebots and chatbots for taxpayer assistance within the Taxpayer Experience Pillar and improves anomaly detection within the Core Taxpayer Services & Enforcement pillar.

# Look Ahead

Continued

## Foundational Technology Focus Areas

Technology Focus Areas	Description
<b>Hybrid &amp; Multi Cloud</b>	Ecosystem of native cloud-based services, with emphasis on PaaS and SaaS that enable acceleration of cloud migration and modernization. A hybrid and multi-cloud environment that allows the IRS to operate a portfolio of applications for delivering a secure and scalable IT infrastructure
<b>Platforms &amp; Applications</b>	Services built on standard cloud-native, low-code, and COTS platforms in a manner that maximizes automation, promotes reuse, and simplifies the portfolio
<b>Data &amp; Analytics</b>	Data Management and Data Distribution platforms that provide IRS with rapid, secure access to data
<b>AI &amp; Machine Learning</b>	Technology that provides the ability to achieve better business outcomes, solve new challenges, reduce speed for issue resolution, improve operational efficiencies while meeting strong ethical standards
<b>IT Management</b>	Modernized practices for service management leveraging SaaS platforms to automate, provision, and deliver services
<b>Network</b>	Secure, resilient and highly-performant network (serving voice, data, and video)
<b>Security</b>	Comprehensive security practices to secure a complex, distributed, network-connected ecosystem that protects taxpayer data and tax administration services against sophisticated, persistent, and often novel threats

Our strides in FY 2022 mark the beginning of a new modernization era. The IRS Integrated Modernization Business Plan 2.0 defines our long-term vision and structures our approach to implement, monitor and adjust as taxpayers' needs and legislation evolve. We are reimagining our modernized future to accelerate the second phase of our initial modernization plan, begin work on previously unfunded initiatives, expand existing programs and build a strategic plan flexible enough to serve us far into the future. The IRS will remain dedicated to transforming the Service to better serve the American people.





