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# Nextgov

# Replacing Legacy IT Systems

They don't make the Veterans Affairs Department's 50-year-old systems like they used to.

AUGUST 2017 **SPECIAL REPORT**

# Replacing Legacy IT Systems

**BY FRANK KONKEL**

**THE DEPARTMENT OF VETERANS AFFAIRS** mission statement—"To care for him who shall have borne the battle, and for his widow, and his orphan"—harkens back to days of President Abraham Lincoln's Second Inaugural Address in 1864.

So too do some of the mission-critical information technology systems, applications and software the VA relies upon in executing its mission to care for 20-plus million veterans across the country.

Well, not quite.

But two of VA's mission critical IT systems, the Personnel and Accounting Integrated Data and the Benefits Delivery Network, were built in the 1960s, when Lyndon Johnson was the president and the Beatles were all the rage.

If it was a person, the programming language that powers both systems would qualify for senior citizen benefits. Common Business-Oriented Language, or COBOL as it's better known, was developed in the late 1950s and usually

## The Oldest of the Old

Millions of Americans interact with the federal government every day, but it might surprise many to learn the systems through which agencies deliver benefits, process taxes and deliver myriad other services are often very old.

In 2016, the Government Accountability Office, at the behest of the House Oversight and Government Reform Committee, found at least ten critical IT systems across the government that were more than 40 years old.

These systems are several generations behind today's technologies, and they exemplify both the government's need to modernize and the challenges inherent in doing so. These are important systems that can't be sidelined for upgrades or rebuilds, so modernizing them would likely mean building entirely new systems based on today's technologies.

Throughout this article is the list of the 10 oldest critical IT systems in government, based on research from Congress and the Government Accountability Office, originally reported by *Nextgov*'s Jack Moore.

requires specialized personnel to modify it because the language is rarely taught in universities anymore.

Times have changed, but the PAID and BDN systems didn't change much with them, and that's in large part because they performed well over the decades, according to Tim Cox, spokesperson for VA's Office of Information Technology.

Yet the systems' ages and "obsolete" platforms have finally caught up with them. VA began retiring its PAID system in 2016 and will phase out BDN in the coming years.

## 57

**AGENCY**
Treasury Department/Internal Revenue Service

**SYSTEM**
Individual Master File

**REPORTED AGE**
Approximately 57 years old

**WHAT IS IT?**
The massive application that receives taxpayer data and dispenses refunds. "This investment is written in assembly language code—a low-level computer code that is difficult to write and maintain —and operates on an IBM mainframe," GAO notes.

**57**

**AGENCY**
Treasury Department/Internal Revenue Service
**SYSTEM**
Individual Master File
**REPORTED AGE**
Approximately 57 years old
**WHAT IS IT?**
The companion system that maintains data on business income. The system also runs on assembly language code and operates on an IBM mainframe.

"COBOL-based systems are difficult to maintain and keep current with new security requirements," Cox said in an email. "It is also extremely difficult and complex to integrate new capabilities. Thus, the issue is really about ensuring we have a platform that can effectively and efficiently leverage new technologies and capabilities."

There won't be a eulogy for either system, but the critical responsibilities entrusted to each for decades bear mentioning.

PAID served as the VA's system of record for human resources information from 1963 to 2016. The automated time-and-attendance tracker is housed at the Austin Information Technology Center in Austin, Texas, and runs on an IBM mainframe. The mainframe runs on zOS 2.2 and the application itself is written in COBOL.

The PAID system cost an average of about $6.5 million annually during the time it was in full production, according to VA spending data dating back to 1999. The vast majority of that spend was in operations and maintenance, indicative of a larger problem at VA and the federal government at large.

In total, agencies spend an average of 75 percent of their IT budgets on operations and maintenance, leaving

**54**

**AGENCY**
Defense Department
**SYSTEM**
Strategic Automated Command and Control System
**REPORTED AGE**
54 years old
**WHAT IS IT?**
The system coordinates U.S. nuclear forces. It runs on 1970s-era IBM computer systems and uses 8-inch floppy disks. Each disk holds 80 kilobytes of data—meaning it would take more than 3.2 million floppy disks to equal the storage power of a "single modern flash drive," GAO noted. The good news? The Pentagon is planning for upgrades, including updated data storage and desktop terminals by the end of 2017.

fewer dollars for the development and implementation of emerging technologies, according to the Government Accountability Office. VA is an above average offender in this regard.

In February, House Veterans' Affairs Committee Phil Roe, R-Tenn., **chastised**

**VA officials** after learning 86 percent of the $4 billion the department spends on IT annually "is used for maintaining systems."

The target of Roe's ire, VA Chief Information Officer Rob Thomas, admitted the department's numbers were "out of kilter" from industry best practices.

"We'd like to see 60 percent on maintenance and 40 percent on development," Thomas said. "Right now, we're turning at 85 to 90 percent sustainment, and we have to shrink that."

Replacing systems like PAID move the department toward emerging technologies and away from legacy. Yet PAID was replaced by HR Smart in response to an Office of Personnel Office mandate, according to Cox, not because it couldn't do the job or was too expensive.

**47**

**AGENCY**
Transportation Department
**SYSTEM**
Hazardous Materials Information System
**REPORTED AGE**
47 years old
**WHAT IS IT?**
The system is used to track incidents involving hazardous materials. The system uses Classic Active Server Pages and the Microsoft.NET software framework—both late 1990s innovations—that have "become outdated and costly to maintain," GAO reports. Transportation says all legacy components within the system are scheduled to be replaced by 2018.

**53**

**AGENCY**
Defense Department
**SYSTEM**
COMPASS
**REPORTED AGE**
53 years old
**WHAT IS IT?**
The Computerized Movement Planning and Status System is used to help determine when Army equipment should be removed, replaced, replaced or discarded. The system currently runs on a Windows 2008 server and uses a 2009 Oracle 11g database.

"VA had not experienced any reduction in performance for the years PAID had been in production," Cox said. "During those years of operation, new releases of operating systems and enhanced mainframe toolsets resulted in an increase in overall system performance."

While PAID is no longer used "for processing personnel transactions," it isn't exactly put out to pasture.

Thus far, 3,200 administration and office staff, including fiscal analysts, managers and payroll administrators, still have access to PAID tools and reports, though users can only review past data and are unable to change data sets.

PAID is not connected to the internet, Cox said, but is available to select users via VA's internal network.

Similarly, BDN is an internally facing, back-office processing system. It does not interact with veterans directly, but interacts with systems that do, Cox said.

BDN is more than 50 years old and resides on an emulated Honeywell-BULL mainframe environment. Its home is the Hines Information Technology Center in Chicago, and—like its older sibling application—was written in COBOL.

COBOL is historically revered as a revolutionary programming language that helped make computers societally relevant, yet Congressmen like tech-savvy Will Hurd, R-Texas, **weren't thrilled to learn last year** that hundreds of millions of lines of the old code still flow through myriad federal IT systems.

COBOL is still in government

**47**

**AGENCY**
Commerce Department/National Oceanic and Atmospheric Administration
**SYSTEM**
National Weather Service Dissemination Systems
**REPORTED AGE**
47 years old
**WHAT IS IT?**
The investment is made up of three different systems used to provide warnings about severe weather to the public and emergency managers. They run on a number of different operating systems and software, including Windows Server 2003, which the company no longers supports. Some of the systems are powered by Fortran, the programming language originally developed in the 1950s. NOAA doesn't have any plans for a major overhaul, instead opting for continuous updates to system components, GAO said.

**47**

**AGENCY**
Commerce Department/National Oceanic and Atmospheric Administration
**SYSTEM**
National Data Buoy Center Ocean Observing System of Systems
**REPORTED AGE**
47 years old
**WHAT IS IT?**
These systems—NOAA's "eyes on the oceans"—provide continuously updated ocean data to observe trends in sea-level heights and to forecast hazards, such as tsunamis. They run on both Windows and Linux operating systems, including an unsupported version of Microsoft server software.

technology's DNA, and that could pose security issues, Hurd said. It also prohibits integrating modern tools and platforms that don't support COBOL.

"Federal legacy IT investments are becoming increasingly obsolete. Many use outdated software languages and hardware parts that are unsupported," Dave Powner, GAO's director of IT management issues, explained to lawmakers.

BDN's reliance on COBOL is one of the reasons VA plans to retire it. VA Secretary David Shulkin has made reducing the number of legacy systems within VA a major priority, **beginning with electronic health records systems** that affect its 9 million beneficiaries and flowing inward.

VA plans to migrate its functions "into other, more modern VA benefits

platforms," Cox said.

The plan is for BDN's functions to spread across at least three modern applications—though the timeline for doing so is unclear.

In any case, those modern applications will have big shoes to fill because BDN is still a workhorse application.

Annually, it provides than 40 million benefits payments to veterans, and last year processed and paid $13 billion in education benefits checks. BDN also assists in other back-office financial accounting and claims processing, processing 300 million transactions per year from more than 12,000 users in regional offices and facilities nationwide. Finally, BDN facilitates the direct correspondence of 10 million letters to 3.3 million veterans and their families.

Cox said BDN costs about $7 million a year to sustain and classified the application as "relatively inexpensive" given its impact. That will make it tough, at least early on, for VA to realize a return on investment. But over time after the retirement, Cox said VA's ability to integrate other aspects of its benefits delivery environment will pay off.

"This is a first step in modernizing the entire environment which will result in consolidation of numerous systems and processes over time and eventually provide efficiency gains in incorporating new features and capabilities," Cox said.

"It also allows VA to devote larger portions of its IT budget on developing new capabilities."

Cox added that if the retirement of BDN is successful, "it will serve as template for future efforts." If it doesn't, VA might well miss its two old reliables. ∎

## 40

**AGENCY**
Homeland Security Department/Immigration and Customs Enforcement

**SYSTEM**
Hiring Tracking Systems

**REPORTED AGE**
40 years old

**WHAT IS IT?**
The system, which is used to track hiring decisions at the agency, functions using COBOL and is run on a 2008 IBM z10 mainframe. The agency plans to replace the mainframe with a service-oriented architecture beginning this year—if the agency receives enough funding, GAO noted.

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# Is Help on the Way for Agencies?

BY FRANK KONKEL

**FORMER U.S. CHIEF INFORMATION OFFICER** Tony Scott made IT modernization his personal crusade and top tech priority during the final two years of the Obama administration, equating the government's reliance on legacy IT as something akin to the Y2K problem.

The government spends approximately 80 percent of its $90-plus billion IT budget on operating and maintaining legacy systems, leaving precious few dollars for developing new technologies and systems.

Congress took note during President Barack Obama's final year in office, crafting bipartisan legislation that—though it ultimately stalled in the Senate during the lame duck session—linked IT modernization to important federal issues, including service delivery and

preventing breaches of the nation's computer networks.

The momentum continued after the swearing of the 115th Congress, led by Rep. Will Hurd, R-Texas. Hurd, with co-sponsors Robin Kelly, D-Ill., and Gerry Connolly, D- Va., introduced the Modernizing Government Technology Act in April. The bill was crafted with guidance from the White House Office of American Innovation and the Congressional Budget Office, and cleared the House in early April.

It does two important things.

First, it enables CFO Act agencies to create working IT capital funds, which Hurd has repeatedly called "the meat" of the bill. Agencies that modernize systems, such as by moving data to the cloud, could

recoup savings they reap rather than giving the cash back to the Treasury Department. Agencies could hold onto savings for up to three years, so long as it uses those savings for modernization efforts.

In addition, the MGT Act calls for the creation of a central modernization fund through which agencies could borrow money to modernize certain systems. An independent board would oversee the modernization fund, choosing which agency business plans receive funding. MGT would also authorize appropriators to fund the modernization fund with up to $250 million per year for two years.

In a show of the administration's support, President Donald Trump's budget proposal including $228 million in funding for the modernization fund,

while increasing overall IT funding across government 1.7 percent, up to $95.7 billion.

However, early language in House funding bills would not include funding for the modernization fund. Rich Beutel, a former senior advisor to the House Oversight and Government Reform committee, told *Nextgov* in July that the news wasn't that surprising given that the Senate still hasn't passed the MGT Act.

Appropriators, he said, still need to be persuaded before they'll appropriate IT modernization money. The best way to do that would be the Senate sending a bill to Trump's desk.

Sen. Jerry Moran, R-Kan., with cosponsors Sens. Tom Udall, D-N.M., Mark Warner, D-Va., and Steve Daines, R-Mont., introduced their version of the MGT Act in the Senate in April. The bill received a favorable CBO score and has support from the Government Accountability Office, the White House and bipartisan

## "We've been fighting to get this bill signed into law because the American people deserve better from their government. A move towards modern technologies can keep our information and digital infrastructure secure from cyberattacks, while saving billions of taxpayer dollars."

REP. WILL HURD

Congressional leaders on both sides, but the bill has yet to make it out of the Senate Homeland Security and Governmental Affairs Committee.

Hill sources tell *Nextgov* they expect movement on the Senate side bill before the end of the calendar year.

Expect CIOs, chief information security officers, chief technology officers and program managers across government to keep a watchful eye on any movement in the coming months. The MGT Act represents the most promising opportunity to modernize old systems they've ever had. ∎

# About the Author

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Frank Konkel is the editorial events editor for Government Executive Media Group and a technology journalist for its publications. He writes about emerging technologies, privacy, cybersecurity, policy and other issues at the intersection of government and technology. Frank also runs *Nextgov*'s Emerging Tech blog. He began writing about technology at *Federal Computer Week* and previously reported on local and state issues at daily newspapers in his home state of Michigan. Frank was born and raised on a dairy farm and graduated from Michigan State University.