



U.S. Small Business  
Administration

# **Data Center Optimization Initiative Strategic Plan**

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## 1.0 Purpose

The Office of the Chief Information Officer (OCIO) of the U.S. Small Business Administration (SBA) developed this Data Center Optimization Initiative (DCOI) Strategic Plan in response to M-19-19: Update to Data Center Consolidation Initiative<sup>1</sup> (DCOI Memo) that replaces and rescinds the previous memorandum M-16-19.<sup>2</sup> The DCOI Memo does not provide OMB targets nor strict definitions for these metrics, which will enable SBA to set achievable goals and deliver consistent reporting. This plan addresses the requirements of that memorandum for SBA to develop, implement, monitor, and report on data center strategies to:

- Development Freeze for New and Current Data Centers
- Consolidation and Closure of Existing Data Centers
- Cloud and Data Center Optimization Initiative

The DCOI Memo replaces the previous requirements from M-16-19, and only requires metrics and planning for tiered data centers. Additionally, the DCOI Memo redefined tiered data centers as purpose-built physically separate and dedicated spaces which meet key criteria. The general recommendation is to focus efforts on “general compute” servers and systems – those hosting business applications that are largely hardware agnostic – rather than special purpose systems.

This FY 21 update to the strategic plan re-baselines the previous year’s report to align with the new metrics and provide achievable goals that improve communication from leadership.

### 1.1 Current Status

As the SBA is at the forefront of relief efforts for the COVID-19 emergency, the volume of processing done by loan offices has increased to an unprecedented level. To deal with this increased demand, the SBA has needed to increase, rather than decrease, its on-premise data center hardware for specific legacy systems used to manage loans and finances.

## 2.0 SBA Data Center Summary

SBA has identified a total of (8) eight tiered, open data centers per OMB’s definition in the latest DCOI Memo. Of these, six are government-owned and managed enterprise data centers that support the mission of the agency. All data centers have their own sources of power and cooling, and include physical file servers and storage arrays as the primary computing equipment. Data centers are

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<sup>1</sup>[M-19-19: Update to Data Center Optimization Initiative \(DCOI\), June 25, 2019 \(pdf\)](#)

<sup>2</sup>[M-16-19: Data Center Optimization Initiative \(DCOI\), March 21, 2019.](#)

currently operated by four offices: OCIO, the Office of Capital Access (OCA), the Office of Disaster Assistance (ODA), and the Office of the Chief Financial Officer (OCFO). To support its Cloud Smart strategies, SBA has implemented a hybrid, multi-cloud approach for its business application needs. SBA's OCIO initiative will continue to reduce the agency-managed SBA data centers and replace them with cloud or collocated data centers.

### **3.0 SBA's Data Center Optimization Initiative Objectives and Requirements**

OMB stipulated three overarching goals in the DCOI Memo: Development Freeze for New and Current Data Centers, Consolidation and Closure of Existing Data Centers, Cloud and Data Center Optimization Initiative. Pursuant to these goals, SBA established the following high-level objectives and requirements for implementing DCOI. Metrics, achievements, and challenges will be reported per OMB guidance and published on SBA.gov.<sup>3</sup>

#### **3.1 Development Freeze for New and Current Data Centers**

SBA met the requirement that it may not budget any funds or resources toward initiating a new data center or significantly expanding an existing data center without approval from OMB.<sup>4</sup> Since the memorandum was issued in 2017 and continuing with the DCOI Memo for FY 18, SBA has not expanded its data center footprint, and in fact, consolidated and reduced its data center footprint at the main HQ Data Center. This location serves as the primary data center for SBA to test and evaluate its DCOI strategies for their effectiveness and applicability to the remaining government-owned and privately-owned data centers.

#### **3.2 Goal 1: Consolidation and Closure**

As previously required by the FDCCI, agencies shall continue to principally reduce application, system, and database inventories to essential enterprise levels by increasing the use of virtualization to enable pooling of storage, network and computer resources, and dynamic allocation on-demand. Agencies shall evaluate options for the consolidation and closure of existing data centers where practical, in alignment with the Cloud Smart<sup>5</sup> strategy. The Cloud Smart strategy emphasizes the use of risk-based decision-making and service delivery as key considerations in evaluating cloud technologies. In

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<sup>3</sup>[SBA DCOI Strategic Plan, September 21, 2017](#)

<sup>4</sup>[DCOI Policy, March 21, 2019](#)

<sup>5</sup>[Federal Cloud Computing Strategy, March 21, 2019.](#)

alignment with this strategy, SBA is executing an application rationalization strategy to further reduce its data center needs and move applications to cloud technologies whenever possible.

### 3.2.1 Facility Closures

OMB has collaborated with SBA to set achievable targets since 2019. The data center implementation teams submitted these targets and the OCIO management verified them as achievable results. The OCIO submitted all required DCOI and FITARA metrics per OMB guidance.

OCIO is migrating its first two, tiered data centers to the cloud and will use that experience and lessons learned to migrate additional tiered and non-tiered data centers to the cloud. Generally, these data centers will be transitioned to appliance closets used for security, maintenance, and monitoring purposes (e.g., Microsoft System Center Configuration Manager distribution points, Nessus vulnerability scanners, switches, routers). All file and application servers will be consolidated in the cloud or hosted in other privately-managed data centers in accordance with National Archives and Records Administration guidance.<sup>6</sup> Print servers were decommissioned in FY 18, and the printing environment has been transitioned to Direct IP printing. Government-owned, on-premise data centers will only be maintained as a last resort.

<i>Name</i>	<i>Location</i>	<i>SBA Operator</i>	<i>Target Closure Date</i>	<i>Actual Closure Date</i>
Denver Finance Center	Denver, CO	OCIO	Q1 2019	Q1 2019

**Table 1: Planned Data Center Closures for FY 19 – FY 20**

SBA will continue to optimize, consolidate, and migrate applications from its data centers from government-and to privately-managed facilities and the cloud whenever practical, closing tiered data centers where that possibility exists. This effort is expected to continue beyond the length of the current DCOI Memo sunset, beginning in FY 19 and beyond, using the lessons learned to undertake this initiative throughout the enterprise and across all data center operators.

### 3.2.2 Cost Savings and Avoidance

SBA significantly exceeded the FY 19 target of \$30,000 by achieving \$171,000 in FY 19 cost savings and avoidance. Since then, SBA has not seen continued savings or large-scale closures from ongoing data center consolidation and optimization efforts. Planned and achieved cost savings and avoidance figures can be found below.

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<sup>6</sup>[NARA Bulletin 2010-05, Guidance on Managing Records in Cloud Computing Environments, September 8, 2010](#)

Year / Type of Savings	FY 17 Planned	FY 17 Achieved	FY 18 Planned	FY 18 Achieved	FY 19 Planned	FY 19 Achieved	FY 20 Planned	FY 20 Achieved	FY 21 Planned	FY 21 Achieved
Reduced Power Consumption	\$40,000	\$49,000	\$65,000	\$55,000	\$30,000	\$10,000	\$4,000	\$9,000	\$0	-
Repurposed Contracts	\$926,000	\$926,000	\$926,000	\$0	\$0	\$161,000	\$0	\$0	\$0	-
<b>TOTAL</b>	<b>\$966,000</b>	<b>\$975,000</b>	<b>\$991,000</b>	<b>\$55,000</b>	<b>\$30,000</b>	<b>\$171,000</b>	<b>\$4,000</b>	<b>\$9,000</b>	<b>\$0</b>	<b>-</b>

**Table 2: Planned and Achieved Cost Savings for FY 16 – FY 20**

### 3.3 Goal 2: Optimization

OMB calculated the performance metrics outlined in M-16-19 as averages across the entire SBA inventory of applicable data centers. Moving forward, to more accurately measure the performance of data centers, OMB will avoid using averages for metrics whenever possible or setting arbitrary goals and will instead identify metrics where the SBA can demonstrate continuous improvement beyond the performance period of the DCOI Memo.

The SBA collected metrics from the tiered data center owners as part of the data center inventory report for Information Collection Review Board (ICRB) that was established by the Office of the Federal Chief Information Officer (OFCIO).

SBA's planned and achieved optimization metrics from FY 19 to FY 20 can be found in the table below:

Year / Metric	FY 19 Planned	FY 19 Achieved	FY 20 Planned	FY 20 Achieved	FY 21 Planned	FY 21 Achieved
Energy Metering	1	1	1	1	1	-
Virtualization	204	204	50	50	55	-
Under-Utilized Servers	134	89	119	45	100	-
Availability	99.9%	99.93%	99.9%	99.96%	99.9%	-

**Table 3: Planned and Achieved Optimization Metrics for FY 19 - FY 20**

#### 3.3.1 Advanced Energy Metering Metrics

As of the end of FY 18, SBA has installed energy metering capabilities on 70% of all servers at the HQ data center. SBA will continue to improve the energy efficiency of its facilities when cost-effective to do so. To judge how efficiently a data center is using electricity, the use of metering through Data Center Infrastructure Management (DCIM) tools can help to determine where efficiencies may be found. Installing advanced energy meters in data centers, as described in M-16-19, was required by Executive Order 13693: Planning for Federal Sustainability in the Next Decade, but that order has since

been revoked by the Executive Order 13834: Efficient Federal Operations and this is not a requirement under M-19-19.

Although automated monitoring is advantageous for the SBA to gain better insight to energy usage and to drive optimization, it can also be prohibitively expensive for the SBA to purchase and install these tools. Many data center facilities already have energy metering and other measurement devices that are not specific to the data center area of the facility, and an experienced facilities manager will be able to estimate energy usage accurately. As the SBA evaluates data center modernization alternatives, the energy metering and measurement capabilities required will not be evaluated for facilities planned for closure.

OMB will continue to track the SBA's implementations of advanced energy metering by measuring the number of facilities with most of the space having this metering, rather than using a combined metric of metering and gross floor area as required under M-16-19. Furthermore, the SBA will be able to request an exemption for individual facilities where it is not cost effective to install this monitoring, or if they are planning to close the facility.

### **3.3.2 Virtualization Metrics**

Under the new DCOI Memo, the SBA is no longer required to report their cloud investments as part of their data center inventories, though this data continues to be reported through the Capital Planning and Investment Control (CPIC) reporting.

With the rapidly growing marketplace around virtualization and containerization, this remains an important area for the SBA to realize savings and optimization. The ability to assign resources dynamically based on need is key to delivering timely services and is an important concept in the Cloud Smart strategy. OMB prioritizes the increased virtualization of Federal systems as critical for IT modernization efforts, to drive efficiency and application portability. SBA expects all new hosted applications to use virtualization whenever possible and appropriate.

Due to the number of virtual client applications fluctuating based on demand, calculating these as a ratio to physical hosts, as described in M-16-19, is not ideal. Instead, OMB under M-19-19 requires the SBA to report the number of servers and mainframes that are currently serving as hosts for virtualized or containerized systems in their SBA-managed data centers.

The SBA's goal and reported totals for 2019 and 2020 for this area incorrectly included non-SBA owned facilities. This was updated in August 2020.

### **3.3.3 Server Utilization Metrics**

FITARA establishes the requirement for OMB to track data center "efficiencies, including, at a minimum, server efficiency." OMB interprets this to mean that the Federal Government should be

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identifying and reducing underutilized servers. The metric defined for Server Utilization in M-16-19 set a baseline for utilization as a calculated average, which did not aid in finding and removing underutilized servers. Moreover, this was measured as a combined metric with “automated monitoring,” making the target more difficult for the SBA to achieve.

“Server efficiency” is a relative term, depending on the nature of the hardware and applications running on the server (i.e., citizen-facing systems that may only have high utilization during peak business hours). The SBA calculates this using Microsoft Assessment Planning Tool. The MAP Tool runs performance metrics on targeted systems based on a 24-hr production day. SBA currently classifies a server as under-utilized if the server is running at less than 17% CPU time during the 24-hour monitoring period. However, as its number of underutilized servers continues to decrease, SBA expects to modify this definition in the future to meet new operational needs.

### **3.3.4 Availability Metrics**

This metric will track the data center’s availability, not individual server or application uptime or availability.

For the commercial space, the most critical element for an infrastructure provider is availability of the facility. Most service level agreements contain discussion of the availability that the service guarantees. The Federal Government should be prepared to deliver the same level of service as that provided by private sector data centers and cloud services.

OMB will require the SBA to report the planned hours of availability for each data center, as well as any unplanned outages for that data center over the reporting period, also measured in hours. Unavailability will include unplanned outages of a majority of the facility due to disaster, systems failure, cybersecurity events, or other negative events as well as any other hours that would otherwise be planned as available hours.

## **4.0 Achievements**

The SBA continues to make progress on the DCOI and related FITARA milestones showing continued commitment to meeting or exceeding data center requirements of FITARA.<sup>7</sup> The following sections highlight some of our initiatives and strategies that enable success in the areas of data center closures, data center optimizations, and Cloud Smart strategy.

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<sup>7</sup>[SBA Digital Strategy Reporting, April 5, 2019.](#)

## **4.1 Data Center Closures**

With M-19-19 redefining the definition of data centers and that definition only including tiered data centers, the SBA will continue to make progress on this initiative to comply with the changed requirements. During FY 18, the SBA was successful in vastly downsizing its HQ Data Center and later closing the tiered data center in Denver, Colorado.

## **4.2 Data Center Optimizations**

During FY 18, the SBA was successful in reaching a FITARA milestone relating to the optimization of data centers. In leading by example, the OCIO finalized the HQ data center inventory and decommissioned about 100 servers and networking equipment. This led to an overall energy savings of \$55,000, which is reported through the new DCOI metrics. Additionally, this reduced HQ floorspace by 78% and the SBA's intention is to repurpose this space as office or conference room workspaces.

The SBA continued to reduce its HQ data center inventory through FY 19 and plans to further reduce the size of this data center in the future as funding permits.

## **4.3 Cloud Smart Strategy**

The SBA is committed to adopting cloud solutions that streamline transformation and embrace modern capabilities in line with the Federal Cloud Smart strategy. Over the FYs 18-21, the OCIO has planned and invested in initiatives for cloud migrations, print server modernization, and cloud monitoring capabilities.

The HQ data center improvements have resulted in migration of over 40 servers to the cloud. The OCIO has eliminated the print servers from virtual machines and moved to a software-as-a-service model (SaaS), which is the leading industry standard. This strategy continues to evolve with industry trends, and the progress made so far serves as a basis for technology collaboration across the agency.

Cloud monitoring capabilities continue to improve as the OCIO completed the FITARA milestone to implement automated monitoring, inventory, and management tools for 70% of server hardware at the HQ data center. SBA implemented Microsoft Systems Center and Microsoft Operations Manager Suite for automated monitoring and server utilization management.

In a further attempt to streamline transformation and embrace modern capabilities, the SBA will take advantage of OMB's Technology Modernization Fund. This will enable the agency to rapidly advance and meet the DCOI strategic objectives stated in this plan. Further benefits include placing the SBA's network edge closer to cloud services and frameworks; improving energy efficiency, measurements, and predictability; and achieving the virtualization of data center network infrastructure.

## 5.0 Challenges

The SBA's OCIO leadership team is dedicated to its focus on targeted improvements in key areas where the SBA can make meaningful improvements and achieve further cost savings. The OCIO sees budget and collaboration as the biggest challenges for future goals given competing objectives. Interdepartmental collaboration efforts require enhancement in support of DCOI. A significant number of IT enhancement projects require prioritization of funding that may be competing with ongoing efforts, in particular the COVID-19 relief initiatives. The OCIO will continue interdepartmental efforts to improve the agency's implementation of the DCOI.