EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
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M-19-19

MEMORANDUM FOR CHIEF INFORMATION OFFICERS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: Suzette Kent
Federal Chief Information Officer

SUBJECT: Update to Data Center Optimization Initiative (DCOI)

The Federal Information Technology Acquisition Reform Act (FITARA)[1] required the Federal Government to consolidate and optimize agencies' data centers by October 1, 2018. The Office of Management and Budget (OMB) responded by issuing M-16-19, Data Center Optimization Initiative (DCOI),[2] which set priorities for data center closures and efficiency improvements through the end of Fiscal Year 2018. The FITARA Enhancement Act of 2017[3] extended the data center requirements of FITARA until October 1, 2020. As a result, OMB is updating and extending the Data Center Optimization Initiative.

This Memorandum contains requirements for the consolidation and optimization of Federal data centers in accordance with FITARA. It establishes consolidation and optimization targets and metrics for Federal agencies, as well as requirements for reporting on their progress.

Background

The Federal Government has made great strides in consolidating and optimizing Federal data centers since 2010, when the Office of Management and Budget (OMB) launched the initial Federal Data Center Consolidation Initiative (FDCCI).[4] Since then, agencies have achieved significant cost savings, have improved their understanding of energy efficiency technologies, and have begun implementing cloud-based and hybrid environments.

After eight years of work in consolidating and closing Federal data centers, OMB has seen diminishing returns from agency data center closures. The Government has picked off much of the "low-hanging" fruit of easily-consolidated infrastructure. OMB now will focus on targeted improvements in key areas where agencies can make meaningful improvements and

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[1] Title VIII, Subtitle D of the National Defense Authorization Act (NDAA) for Fiscal Year 2015, Pub. L. No. 113-291, available at https://www.congress.gov/113/plaws/publ291/PLAW-113publ291.pdf

[2] https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2016/m_16_19_1.pdf

[3] FITARA Enhancement Act of 2017, Pub. L. No. 115-88, https://www.congress.gov/115/plaws/publ88/PLAW-115publ88.pdf

[4] FDCCI was established by OMB "Memo for CIOs: Federal Data Center Consolidation Initiative," issued on February 26, 2010, and modified by subsequent memoranda. https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/assets/egov_docs/federal_data_center_consolidation_initiative_02-26-2010.pdf

achieve further cost savings through optimization and closures, as well as driving further maturity in IT modernization.

As agencies gain greater IT spending transparency through Capital Planning and Investment Control (CPIC) and Technology Business Management (TBM), the resulting data will support and enable their ability to rationalize their application portfolios to find greater return on investment, in alignment with the 2018 Federal Cloud Computing Strategy ("Cloud Smart").[5] Rather than focusing on infrastructure alone, agencies must consider what applications are running in their data centers to facilitate further consolidation and optimization. This will frequently require updating legacy applications to take advantage of modern technologies such as APIs, microservices, and cloud, as well as replacing bespoke systems with commercial offerings when cost-effective. Agencies should consider carefully the Total Cost of Ownership (TCO) when making such determinations, not just licensing and hosting costs.

Authority

The requirements in this Memorandum apply to the 24 Federal agencies covered by the Chief Financial Officers (CFO) Act of 1990,[6] including the Department of Defense.[7] The head of each covered agency, assisted by the Chief Information Officer (CIO) of the agency, is required to submit to OMB annually 1) a comprehensive inventory of the data centers owned, operated, or maintained by or on behalf of the agency, and 2) a multi-year strategy to achieve the consolidation and optimization of these data centers. Each agency, under the direction of its CIO, must submit quarterly updates on their progress towards activity completion, consolidation & optimization metrics, and cost savings realized through the implementation of their strategy.

OMB is required to establish the deadlines, requirements, metrics for agencies' reports, and must review the reports and progress of agencies towards consolidation and optimization.

Policy

This Memorandum establishes a new Data Center Optimization Initiative (DCOI), which replaces the previous DCOI articulated in OMB Memorandum M-16-19, *Data Center Optimization Initiative Memorandum* (August 1, 2016) (M-16-19). Effective immediately, OMB rescinds OMB Memorandum M-16-19.

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[5] https://cloud.cio.gov

[6] Chief Financial Officers Act of 1990, 31 U.S.C. § 901.

[7] Pursuant to Sec. 834(b)(1)(C) of the FY2015 NDAA, the Department of Defense may submit to OMB, in lieu of the Strategic Plan described in this Memorandum, the defense-wide plan and cost savings report required under sections 2867(b)(2) and 2867(d), respectively, of the FY2012 NDAA. If submitting such plans and reports in lieu of the Strategic Plan, DOD shall ensure all information required by the Strategic Plan is included in the submitted plans and reports.

Development Freeze for New and Current Data Centers

Agencies may not budget any funds or resources toward initiating a new agency-owned data center or significantly expanding an existing agency-owned data center without approval from OMB. To request such approval, agencies must submit a written justification that includes an analysis of alternatives, including opportunities for cloud services, shared services, and third party colocation. This justification must include an explanation of the net reduction in the agency's data center inventory that will be facilitated by the new or expanded data center (such as through consolidation of multiple existing data centers into a single new data center).

This development freeze shall not apply to critical agency facilities as described under the "Key Mission Facilities for Data Management" section below. However, agencies are strongly encouraged to discuss with OMB in advance of any planned expansions or new construction of data center facilities.

Consolidation and Closure of Existing Data Centers

As previously required by the FDCCI, agencies shall continue to 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. Thereafter, agencies shall evaluate options for the consolidation and closure of existing data centers, where practical, in alignment with the **Cloud Smart**[8] strategy. The Cloud Smart strategy emphasizes the use of risk-based decision-making and service delivery as key considerations in evaluating cloud technologies. Potential options for migration include:

- Transitioning to provisioned services, including cloud technologies, to the furthest extent practical;
- Migrating to inter-agency shared services, intra-agency shared services, or colocated data centers; and
- Migrating to more optimized data centers within the agency's data center inventory.

Shared Services Managing Partner

OMB still considers shared services to be a cornerstone of data center consolidation. As such, the General Services Administration (GSA) Office of Government-wide Policy (OGP) shall continue to act as the data center Shared Services Managing Partner, the Managing Partner of the Federal Government's Data Center Line of Business (LoB), as well as the Data Center and Cloud Optimization Initiative Program Management Office (DCCOI PMO). In this role, OGP will continue to serve as a trusted agent, information broker, and subject matter expert to assist data center providers and consumers of data center services by providing guidance on technology advancements, innovation, cybersecurity, acquisition, and best practices. However, OMB will no longer expect GSA to establish and maintain a data center shared services marketplace.

[8] Cloud Smart encourages agencies to consider vendor-based solutions, agency-hosted solutions, inter- and intra-agency shared services, multi-cloud, and hybrid solutions as appropriate for mission and security. https://cloud.cio.gov.

OMB tasks the DCCOI PMO, in consultation with the Office of Shared Services and Performance Improvement (OSSPI), and the Technology Transformation Service (TTS), with the following actions:

- Coordinating with OMB to develop resources and guidance on data center and cloud implementation and optimization;
- Coordinating with the government-wide IT Category Manager and other key GSA components to create and maintain an inventory of acquisition tools, contract requirements language, and products specific to the technology and services surrounding data center optimization, including procurement vehicles for the acquisition of automated infrastructure management and monitoring tools;
- Developing, implementing, and maintaining financial and service models pertaining to cloud and data center procurement with customer/partner agencies and shared service providers; and
- Providing a forum for participating and interested agencies to discuss cloud and data center implementation and optimization.

Alignment to the President's Management Agenda

Over the past two years, the Office of Management and Budget has received extensive feedback from agencies as they implemented the Data Center Optimization Initiative, identifying areas where agencies were able to achieve the greatest improvements and savings, as well as those that did not yield a positive return on investment. In alignment with the Administration's directive of shifting from low-value to high-value work,[9] and removing unnecessarily burdensome reporting,[10] OMB revises its focus from M-16-19 as follows.

Agencies have seen the greatest gains in cost savings and optimization in their larger, dedicated data centers providing general compute resources to the enterprise. However, the previous definition of a "tiered" data center resulted in spaces reported as server closets simply due to not having a backup generator or other hardware but that operated as a data center in all other regards. The intent, instead, should be to treat these facilities as full-fledged data centers. Therefore, for the purposes of this Memorandum, agencies shall report purpose-built physically separate and dedicated spaces as tiered data centers when they appropriately meet key criteria.[11] Agencies should focus their efforts on "general compute" data centers for their rationalization efforts – those that host business applications that are largely hardware-agnostic – rather than on special purpose data centers. These will be key targets for application rationalization, leading to greater consolidation and optimization outcomes.

On the other hand, agencies have seen little real savings from the consolidation of non-tiered facilities, small server closets, telecom closets, individual print and file servers, and single computers acting as servers. Optimizing and consolidating these spaces not designed to be data

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[9] President's Management Agenda, *Shifting From Low-Value to High-Value Work*, available at: https://www.performance.gov/CAP/CAP_goal_6.html

[10] *Reducing Burden for Federal Agencies by Rescinding and Modifying OMB Memoranda*: https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2017/M-17-26.pdf

[11] These key criteria can be found in the most current Integrated Data Collection instructions provided to agencies each quarter.

centers generally incurs large costs for agencies, with little or no benefit from efficiencies gained. This often introduces additional hurdles in the form of increased latency and other performance detriments that unfavorably affect agency mission delivery. As a result, OMB will no longer require agencies to consolidate these server closets, meet optimization targets, or include them in their inventory submissions. However, agencies should consolidate any business applications hosted in non-tiered data centers and closets when cost-effective and as appropriate for accomplishing the agency mission and enhancing system security or information privacy.[12]

Private sector-provided cloud services are not data centers for the purposes of this Memorandum. Agencies are no longer required to report their cloud investments as part of their data center inventories, as this information is already collected through the Capital Planning and Investment Control (CPIC) process.

As OMB's understanding of the Federal data center portfolio has evolved, it has become clear that prior OMB DCOI guidance on this topic inflated the apparent number of Government data centers. The apparent increase did not reflect the actual number of dedicated Government data centers because there was no dramatic increase in new facilities during that time. OMB will continue to refine the agency reporting requirements to make this portfolio information more transparent for oversight purposes.

Key Mission Facilities for Data Management

In the original M-16-19 Memorandum, OMB created an exemption for some data centers from closures:

> *data centers that are physically inseparable from non-IT hardware (e.g. simulation and modeling devices, sensors, etc.) and that perform a specific, non-standard set of tasks (e.g. do not provide general purpose computing or storage services to Federal facilities).*[13]

However, in practice, agencies have many types of mission-critical or non-severable systems and services that do not fit into this definition. These include MRI machines, weather stations, air traffic control systems, supervisory control and data acquisition (SCADA) systems, and other uses where separation of data collection, storage, and processing is technically possible but increases latency beyond a reasonable limit. Agencies cannot consolidate many types of systems in remote locations without detriment to the agency mission; these range from embassy file servers in foreign countries to dam floodgate controls. Furthermore, numerous Federal labs and research facilities have data centers that cannot be consolidated without an unacceptably negative impact on performance; these include special-purpose processing nodes (SPPNs), high-performance computing (HPC) nodes, and other similar systems. Finally, numerous data centers will continue to be required for legal or logistical reasons.

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[12] In accordance with OMB Circular A-130, *Managing Information as a Strategic Resource*, CIOs should work with Senior Agency Officials for Privacy (SAOPs) to ensure compliance with applicable privacy requirements and to manage privacy risk when considering the consolidation of data centers that process personally identifiable information.

[13] M-16-19, at 9. Available at: https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2016/m_16_19_1.pdf

As a result, for individual tiered data centers that fall within these categories, agencies may request an exemption from closure targets with justification. While these data centers may be exempt from closure requirements, agencies should optimize them for energy and operational efficiency where practical. In rare cases where further optimization may negatively impact performance of critical systems, agencies may request a supplemental exemption from optimization targets.

Exemptions will be provisionally applied by OMB, but may be overturned at a later date based on further review or a future change in requirements.

Closures and Cost Savings

The amount of information gathered and processed by the Federal Government continues to increase, especially with the rise of the "Internet of Things," artificial intelligence (AI) mobile computing, and digital service delivery. This has resulted in increasing agency compute needs to keep up with demand. Although vendor-provided services such as cloud technologies are potential solutions, they are not always more cost-effective alternatives to agency-hosted services. As a result of work that has occurred over the past years there will be continuous improvements, but the Federal Government should not expect to see continued dramatic savings or large-scale closures from ongoing data center consolidation and optimization efforts as agency needs grow.

Agencies should consider opportunities for investments that may yield long-term savings through energy efficiency. For instance, refreshing inefficient hardware may lead to long-term savings, especially where legacy systems past their end-of-life incur large costs for support. Agencies should also consider EPEAT-registered[14] servers when upgrading or replacing hardware to maximize energy efficiency. The standard used by EPEAT requires registered servers to be ENERGY STAR certified and support American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Class A2 or higher allowable environmental operating range, and further incentivizes efficiency levels beyond ENERGY STAR for power supplies and active/inactive power states. Agencies are also encouraged to use performance contracting including Energy Savings Performance Contracts[15] and Utility Energy Service Contracts[16] to finance energy improvements when cost-effective.

OMB will continue to work with agencies to set agency-specific goals for data center closures and cost savings that are appropriate to the mission and budget of each agency. OMB will update these targets from those set for M-16-19 to match agencies' current status and progress.

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[14] Electronic Product Environmental Assessment Tool, available at: https://www.epa.gov/greenerproducts/electronic-product-environmental-assessment-tool-epeat

[15] *See* 42 U.S.C. §§ 8287, 8287a-d.

[16] *See* 42 U.S.C. § 8256, 10 U.S.C. § 2913, and 10 U.S.C. § 2866.

Automated Infrastructure Management

Agencies should continue to replace manual collections and reporting of operational data as well as systems, software, and hardware inventory housed within data centers with automated monitoring, inventory, and management tools (e.g. Data Center Infrastructure Management (DCIM). Agencies will need to update these tools to match the performance metrics defined in this memorandum.

Any data center initiation, significant expansion, or migration project that received Development, Modernization, and Enhancement (DM&E) funds in fiscal year 2017 or later must implement automated monitoring and management tools. However, agencies are strongly encouraged to implement automated monitoring and management tools throughout their data centers especially those in excess of 100 kW.

To the extent permissible under the Federal Acquisition Regulation (FAR), agencies must include standard automated infrastructure management requirements for all new data center service contracts or procurement vehicles. Further, any new data center contractor procurement vehicle must require the contractor to report to the contracting agency whether the contracted facility utilizes automated infrastructure management, except where such data is already reported directly to OMB or GSA through participation in a multi-agency service program. To ensure consistency of requirements among agencies, the CIO Council, with support from the GSA IT category manager and other appropriate stakeholders, will develop standard language as needed.

Performance Metrics

Previously, OMB calculated the performance metrics outlined in M-16-19 as averages across an agency's entire inventory of applicable data centers. These calculations resulted in a lack of clarity around specific successes and failures across an agency's inventory, and a few low-performing data centers would dramatically impact the average efficiency of an entire agency. This would result in data centers scheduled for closure – which would not be cost-effective for optimization – negatively affecting the overall average. Several of the metrics were nearly impossible for agencies to meet, and the only success criteria was whether the average did or did not meet the given target. As a result, these averages do not yield transparency into how effectively or efficiently an agency is running data centers, or whether the agency is improving over time.

Moving forward, to obtain more accurate measure of data centers performance, OMB will avoid using averages for metrics whenever possible and will instead identify metrics where agencies can demonstrate continuous improvement beyond the performance period of this memorandum. OMB will recommend guidelines for reasonable performance on these metrics, when appropriate, across the entire Federal enterprise, based on real, collected data baselines.

Per the classifications above, OMB will focus these measurements on the remaining open, agency-owned, tiered facilities. As indicated previously, enterprise-focused oversight metrics are not generally appropriate or useful for non-tiered server closets, and improving efficiencies in these areas can cost many times more than any savings gained. As a result,

agencies should only consider making these improvements to these smaller facilities if cost-effective and in alignment with their mission.

Updated Metric: Virtualization

Portability, scalability, and elasticity are key measures for long-term savings and optimization, and are important concepts in the **Cloud Smart** strategy. As such, OMB prioritizes the increased virtualization and containerization of Federal systems as critical for IT modernization efforts, to drive efficiency and application portability. OMB expects all new agency applications to use virtualization or containerization whenever possible and appropriate.

However, 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. The former policy also did not include mainframes that can support virtualization, or include servers that host containers through popular tools. Instead, OMB will require agencies to report the number of servers and mainframes that are currently serving as hosts for *virtualized or containerized systems* in their agency-managed data centers.

Agencies are no longer required to report their cloud investments as part of their data center inventories because this information is already collected through Capital Planning and Investment Control (CPIC) process. Given that transitioning applications to the cloud may reduce the count of virtual hosts in their data centers, and given that cloud providers use virtualized systems by definition, agencies *may* report systems under their cloud investments towards this total count to more accurately reflect the state of their virtualized portfolio.

Updated Metric: Advanced Energy Metering

Advanced metering and management tools such as DCIM systems are essential to track performance in a continuous improvement process. Tools like DCIM systems are used to identify specific opportunities and best practices, identify stranded capacity, and optimize operational parameters such as environmental conditions including temperature and humidity. Furthermore, advanced monitoring systems contribute to enhanced reliability and resiliency of data centers by providing early warning of potential problems (e.g., hot spots and problems with the power distribution system, cooling system, and cooling plant), fault detection and alarms, predictive maintenance, as well as energy and demand savings and optimization opportunities (e.g. load scheduling and power capping). 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.[17]

Although automated monitoring is advantageous for agencies to gain better insight to energy usage and to drive optimization, it can also be prohibitively expensive for agencies to purchase and install these tools. Many facilities already have energy metering and other measurement devices that are not specific to the data center area of the facility, and with a

[17] https://www.whitehouse.gov/presidential-actions/executive-order-regarding-efficient-federal-operations/

limited amount of sub-metering an experienced facilities manager will be able to estimate energy usage accurately. Moreover, it is not useful for agencies to install these tools in a facility they are planning on closing. Therefore, agencies will be expected to have advanced energy metering and sub-metering, sufficient to accurately estimate Power Usage Effectiveness (PUE), for all remaining data centers over 100 kW that they are planning to keep open.

OMB will continue to track agencies' implementations of advanced energy metering by measuring the number of facilities with a majority 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, agencies will be able to request an exemption for individual facilities where it is too costly to install this monitoring, or if they are planning to close the facility.

Removed Metric: Energy Efficiency

M-16-19 required agencies to report the energy efficiency of data centers using PUE, the proportion of energy used by IT equipment compared to the total energy used by the data center. That memorandum set a target goal of PUE of 1.5 for existing data centers, and 1.4 for new data centers, as defined in Executive Order 13693 – which, as mentioned previously, was revoked by Executive Order 13834.

The PUE metric is not always appropriate for comparison across multiple facilities or agencies. Differences in factors such as level of redundancy, geographic location, weather, time of year, and even building construction can have an impact on the measured PUE of a facility. For instance, an extremely efficient data center in a warmer part of the country can easily register a higher PUE than a less efficient data center in a colder climate, but agency mission may determine the location of that facility. Improvement in PUE over time should be included in the agencies' approach to their data center management, and best practices for both measurement and optimization should be pursued.

OMB will continue to collect PUE as part of the inventory reporting for statistical purposes, but it will no longer set an overall target for PUE or use this metric in isolation as an indicator of good management practices. The intent of energy efficiency initiatives under DCOI is to drive savings through lowered energy usage, but there is an upper bound on the return on investment gained through this optimization. Instead, agencies are encouraged, but not required, to report cost savings and avoidance through efficient energy usage and improvements as part of their data center strategic plans.

Updated Metric: Server Utilization

FITARA establishes the requirement for OMB to track data center "efficiencies, including, at a minimum, server efficiency."[18] However, the concept of server efficiency is widely misunderstood. As early as 2009, OMB reported that Federal servers generally had very low server utilization rates – however, this was absent a more sophisticated analysis of expected usage, and without properly taking into account hours of business, backups, redundant systems

[18] 44 U.S.C. § 3601 note.b.2.G.ii.

for unexpected load and failover, and other practices common in both the Federal and Commercial sectors. It is also important to note that the frequency of hardware refresh is one of the key components of server efficiency, but counterintuitively newer hardware usually will reflect lower utilization due to gained efficiency in processing power, storage, and other performance indicators versus the workload the server supports.

"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). Agency mission may also determine whether a server is running efficiently or not – possessing many redundant systems may be inefficient for one agency, but necessary for another to be able to respond to critical emergencies and security incidents. Servers may become over-utilized without proper monitoring or redundancy, leading to unexpected failure and data loss. A server running at the target utilization as described in M-16-19 under traditional practices would more likely be an indicator of a system that may fail due to over-utilization, rather than one that is well-optimized.

Higher utilization is best achieved through agile system management practices generally referred to as DevOps or DevSecOps, which include containerization (as measured above under Virtualization), as well as dynamically and rapidly assigning resources based on measured usage and projected need. These same practices also enable a higher return on investment in the adoption of cloud technologies. However, as these practices are largely a function of application management and not data center management, they may not be in the purview of the data center facilities teams. Therefore, a coordinated effort across agency software engineering, facilities, and security teams will be required to improve the maturity of practices, as described in the **Cloud Smart** strategy.

The Federal Government should be 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 agencies to achieve.

To improve this methodology, OMB will task agencies with identifying and reporting the number of underutilized production servers in each data center, with the expectation that agencies should reduce the number of these servers over time. Because backups, standbys, development, and test servers are all critical to a well-functioning enterprise information system, they will not be included in this measurement – but agencies must count and report these servers as part of their data center inventories for transparency.

Due to mission-specific, hardware-specific, and application-specific requirements that may influence efficient operations, OMB will not establish a specific methodology for determining server utilization evaluation for each agency. However, OMB expects agencies to consider CPU usage and storage space at a minimum. Agencies should evaluate their portfolio regularly as part of the Application Rationalization set forth in the **Cloud Smart** strategy, to identify applications that require large amounts of resources seasonally or infrequently which may be ideal candidates to shut down or move to cloud technologies

In reporting the number of underutilized servers, agencies should use automated monitoring software to measure application usage to accurately determine needs, such as storage space, CPU, memory, and redundancy. However, OMB will no longer include automated monitoring as part of this metric, as it is largely duplicative of the metering under the Automated Infrastructure Management requirement and Advanced Energy Metering metric, and a combined metric would dilute the key information.

Removed Metric: Facility Utilization

In the process of consolidating data centers, OMB expects agencies to find opportunities to move existing server inventory to other facilities, resulting in greater density at the destination facility. However, OMB has determined via agency input that in practice Facility Utilization as a metric may conflict with other, more impactful priorities. For instance, increasing facility utilization can negatively affect energy efficiency; meanwhile, improved virtualization generally reduces facility utilization as agencies consolidate their systems.

Moreover, the method of calculating utilization outlined in M-16-19 uses an idealized average for the floor space usage of server racks, without taking into account elements such as mainframes, vertical designs not requiring raised floors, or planning for future expansion. Because facility utilization is largely redundant with accounting for progress towards the overall consolidation effort, OMB will no longer track agencies performance in this area.

New Metric: Availability

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

OMB will require agencies 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.

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

Clarification on the Prioritization of Concerns

With numerous metrics and possible methods to optimize a data center, agencies could select a variety of solutions and ways to invest in this process. However, not all of these methods will yield the same level of impact. Moreover, after so many years of optimizing data centers, many agencies have already created long-term plans for their investments in these areas.

OMB prioritizes the effort to consolidate and optimize data centers in the following hierarchy, to maximize the return on investment and based on the level of impact for the effort. When considering the allocation of limited resources or conflicting priorities, agencies should consider their mission goals first, and this prioritization second, in the following descending order of importance:

1) Consolidation and Closure
2) Optimization
   i) Virtualization
   ii) Availability
   iii) Energy Metering
   iv) Server Utilization

Reporting

OMB will collect data on an agency-by-agency basis through the Integrated Data Collection (IDC), as follows:

1. Agencies must continue to maintain complete inventories of all data center facilities, closure/consolidation plans, and properties of each facility owned, operated, or maintained by or on behalf of the agency. Agencies must update these inventories at least annually, but agencies may optionally submit a quarterly update to improve the accuracy of the data.
2. Agencies must annually evaluate the costs of operating and maintaining current facilities, and develop year-by-year targets for cost savings and cost avoidance due to consolidation and optimization through the sunset of this policy. Agencies shall report all realized cost savings and cost avoidance under the DCOI as part of their DCOI Strategic Plan (see below).
3. Agencies must report quarterly progress toward meeting their closures & metric target values. Agencies may submit this information as a separate narrative document.

Agencies participating as a tenant in an inter-agency shared services provider data center are not required to report metric values to OMB. The provider will report this data to OMB.

DCOI Strategic Plan

In accordance with FITARA,[19] each agency head shall annually publish a Strategic Plan to describe the agency's consolidation and optimization strategy until the date this policy will sunset. The DCOI Strategic Plan and milestones described below replace existing requirements for data center consolidation plans.

Agencies' DCOI Strategic Plans must include, at a minimum, the following:

1. Planned and achieved performance levels for each optimization metric, by year;

[19] *See* FITARA Section 834(b)(1)(A)-(E).

2. Planned and achieved closures, by year;
3. An explanation for any optimization metrics and closures for which the agency did not meet the planned level in a previous Strategic Plan;
4. Year-by-year calculations of target and actual agency-wide spending and cost savings on data centers through the sunset of this policy, including:
    a. A description of any initial costs for data center consolidation and optimization; and
    b. Life cycle cost savings and other improvements (including those beyond the sunset of this policy, if applicable).
5. Historical costs, cost savings, and cost avoidances due to data center consolidation and optimization; and
6. A statement from the agency CIO stating whether the agency has complied with all reporting requirements in this memorandum and the data center requirements of FITARA. If the agency has not complied with all reporting requirements, the agency must provide a statement describing the reasons for not complying.

Agencies are required to publish their Strategic Plans at [agency].gov/digitalstrategy under a section entitled, "Data Center Optimization Initiative Strategic Plans." Agencies shall also make their strategic plans available in a machine-readable format. OMB will provide instructions to agencies, including a schema, 30 days of the issuance of this memorandum.

Agencies shall update agency digital milestones files, also posted on their websites, to identify at a minimum five milestones per fiscal year to be achieved through the DCOI. Agencies should update their DCOI milestones quarterly as they progress. OMB will review these milestones with the agencies in quarterly PortfolioStat[20] sessions.

Effective Date and Sunset

This Memorandum is effective immediately, and will automatically sunset on September 30, 2020.

[20] OMB Memorandum M-12-10, *Implementing PortfolioStat* (March 30, 2012), available at: https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2012/m-12-10_1.pdf