Infrastructure Optimization Center of Excellence

Playbook

IT MODERNIZATION
Centers of Excellence

Introduction

As the public sector continues to modernize its technology, agencies continue to increase demand on their IT infrastructures. Rather than rely on meeting this new demand in the face of flat or reduced budgets, the pace of innovation has created opportunities to optimize infrastructure and create better service, while improving efficiency and generating savings simultaneously.

The Infrastructure Optimization Center of Excellence (CoE) helps optimize data centers and reduce infrastructure costs. We developed this 10-play Playbook for federal government agencies who are looking for help as they develop and implement infrastructure optimization, integrated cloud computing, and data center consolidation strategies.

While not every play will apply to your agency, these plays can help you position your agency for future infrastructure improvements. The Infrastructure Optimization CoE developed this Playbook in accordance with relevant laws, policies, and guidance.
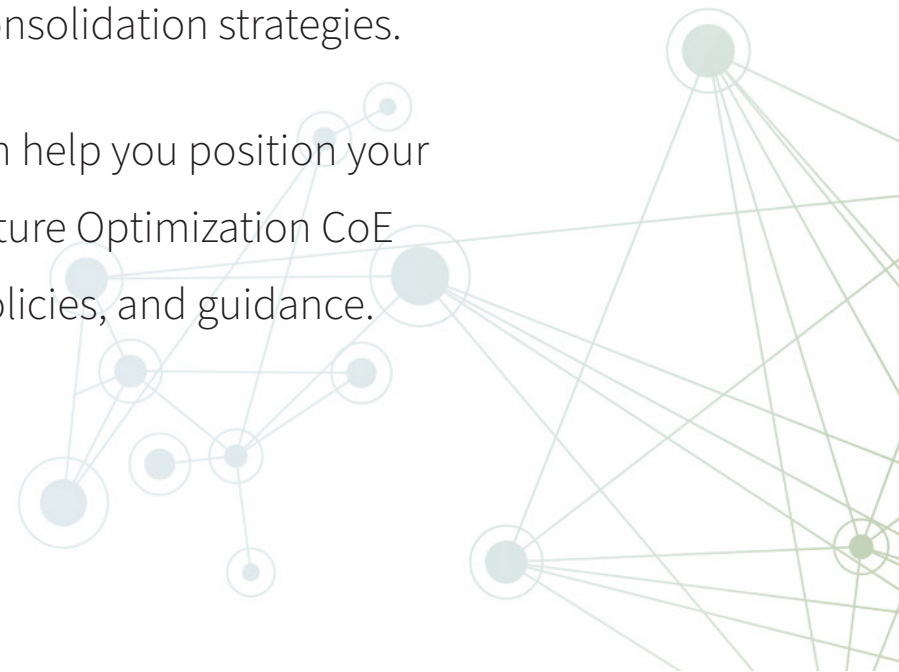
Key Concepts

Throughout this document, we will refer to the following key concepts:

- **A&A** – Assessment and Authorization, a two-step process that ensures the security of information systems.

- **Application disposition** – The placement in a particular output quadrant (tolerated, invested, migrated or eliminated) of the application rationalization analysis.

- **Application rationalization** – The practice of strategically identifying business applications across an organization to determine which applications should be kept, replaced, retired or consolidated.

- **KPI** – Key Performance Indicator, a measurable value that demonstrates how effectively a company is achieving key business objectives.

- **Landing zone** – A configured environment with a standard set of secured cloud infrastructure, policies, best practices, guidelines and centrally managed services.

Infrastructure Optimization Plays

PLAY

1   **Define the Objectives, Roles, and Responsibilities for Infrastructure Optimization**

2   **Conduct a Data Center Discovery Assessment**

3   **Conduct Application Rationalization**

4   **Consolidate Data Centers**

5   **Obtain Authority to Test/Operate**

6   **Achieve Operational Excellence**

7   **Create an Agile Infrastructure**

8   **Implement Automation**

9   **Develop a Communication Plan**

10   **Ensure Ongoing Executive Reporting and Interaction**

Define the Objectives, Roles and Responsibilities for Infrastructure Optimization

To successfully optimize an agency's infrastructure portfolio, start by prioritizing the process objectives such as: reducing costs, building IT capabilities, improving customer satisfaction, and mitigating risk. These objectives will help guide the optimization initiatives and the messages communicated to the broader organization.

The agency should then define the roles and responsibilities of all stakeholders who will be involved in planning and executing the initiatives. Use a RACI (Responsible, Accountable, Consulted, Informed) diagram, which defines the exact roles and responsibilities of stakeholders against the planning activities to be supported. Without such an analysis, there is no clear delineation of responsibilities. Aligning objectives, roles, and responsibilities will form the foundation of an optimization initiative to enable agencies to move on to subsequent plays.

CHECKLIST

- ☐ Determine each objective's criteria for success.
- ☐ Prioritize the optimization objectives.
- ☐ Define roles that are distinct and exhaustive.
- ☐ Describe activities at a granular level to clearly delineate responsibilities.
- ☐ Ensure there is a single party responsible for a given activity, although multiple individuals may be consulted or informed of decisions.

KEY QUESTIONS

- **What are the objectives of the agency?**
- **How do these objectives overlap with the optimization initiative?**
- **What qualifies as success?**
- **What are the high-level activities needed to begin the optimization process?**
- **Who will be involved?**
- **Who will be responsible for each activity?**

Conduct a Data Center Discovery Assessment

One data center discovery assessment objective is to compile an IT asset inventory that includes an exhaustive list of applications hosted in the agency's data centers that may need to be optimized and migrated.

From this list, you can gather enough information to enable application rationalization and determine configurations for future hosting solutions.

Do an IT asset inventory to track progress, and to estimate savings and workload during and after the optimization process.

Develop a complete inventory by compiling information from pre-existing inventories, lists, and records. For example, server inventories provide lists of physical and virtual servers to determine space requirements for co-location solutions and instance requirements for service solutions.

You probably already have a software inventory so you can categorize current software licenses and determine abilities to migrate to a new hosting solution.

Finally, a physical asset inventory will help determine the amount of racks and equipment that may need to be transported or disposed of during a migration.

Conduct a Data Center Discovery Assessment

CHECKLIST

☐ Compile a complete inventory of all applications, servers, software licenses, data sources, and their dependencies.

☐ Provide a tool to enable automated collection of network data about application/server communication.

☐ Build a cost baseline for each data center that includes all of its asset categories (e.g., rent, power, operations, and maintenance (O&M), server labor, server hardware, server software, storage, data center labor, hosting infrastructure, and hosting services).

☐ Validate the collected data with data center managers and other key stakeholders.

KEY QUESTIONS

• **How can you standardize the data collection process to ensure consistency and quality across the organization?**

• **How can your agency ensure that it has a comprehensive list of its physical and virtual assets?**

• **How does the portfolio optimization "bottoms-up" figure compare with the "top-down" cost summary?**

• **If the costs of optimizing your portfolio are drastically different, how will you reconcile the differences?**

• **What strategies can you use in the future to automatically collect and maintain inventories?**

Conduct Application Rationalization

Application rationalization seeks to eliminate applications that are no longer needed and those that provide low value relative to their cost. Applications that you keep can be disposed of based on their capability and fit for a given environment (e.g., dedicated hosting, commercial cloud).

Reducing the portfolio gives the agency a plan for its existing IT inventory and savings and cost avoidance opportunities. It also identifies applications to invest in and potential candidates to migrate to the cloud.

KEY QUESTIONS

- **Have both the business and IT organizations had a chance to weigh in on the application rationalization?**

- **How can you standardize the process to ensure consistent criteria are applied to evaluate applications?**

- **Has the agency attempted to map applications against a cross-agency functional map to identify overlaps?**

- **Of the applications to eliminate, how can you capture value? Where will they be hosted? Is there an opportunity to use network and compute statistics to visualize application dependencies and enable fact-based discussions?**

CHECKLIST

- ☐ Involve the business and application owners in the rationalization process.

- ☐ Rationalize applications through an objective and structured framework, which has a repeatable process and allows the agency to conduct application disposition.

- ☐ Determine potential solutions for applications with high hosting costs (e.g., a simple lift-and-shift to a cloud environment).

- ☐ Identify alternative hosting solutions if a cloud migration is not possible (e.g., local data center).

- ☐ Determine which applications to evaluate for cloud readiness planning and assessment.

- ☐ Run technical assessments to identify landing zone (Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).

- ☐ Explore commercial-off-the-shelf (COTS) or government-off-the-shelf (GOTS) software solutions that could provide similar functionality.

Consolidate Data Centers

By reducing the number of data centers via consolidations, agencies can reduce costs due to a smaller network and application infrastructure. The consolidation increases the control as it promotes optimization through transport, architecture, and options to deploy more advanced protocols, and uses management strategies that maximize bandwidth utilization and network performance.

The consolidation also reduces the number of physical sites and assets to manage. A smaller number of sites is easier to physically secure, and enterprise initiatives become far easier, less costly, and require fewer resources. The disaster recovery solutions are also less daunting due to all the vital components residing in one place, easing replication and failover initiation.

Data center consolidation supports compliance efforts by promoting process and system automation and standardization. The standardization captures the procedures and functions that are executed, and ensures compliance with relevant policies, regulations, standards, and quality-of-service metrics.

Consolidate Data Centers

CHECKLIST

☐ Identify the objectives for consolidation (e.g., cost reduction, process standardization, increased security).

☐ Create a baseline of the existing data centers and inventory their physical and virtual assets (see Play 2).

☐ Identify the right number of end-state centers and disaster-recovery solutions.

☐ Identify opportunities for shared services and resources.

☐ Request data center consolidation plans from each facility to be closedDevelop a framework to assess migration plans and provide feedback to improve execution.

☐ Test applications to ensure continuity of service.

☐ Install and configure the applications while accounting for changes to the network or environment.

☐ Close facilities and reclaim expenditures (e.g., rent, power).

KEY QUESTIONS

- **Have you identified migration scenarios, their potential tradeoffs, and any necessary requirements?**

- **Does each migration scenario evaluation include a cost-benefit analysis and risk assessment?**

- **What is the timeline for the consolidation?**

- **Are there other or ongoing initiatives that may simplify or complicate the consolidation?**

- **How will you evaluate migration plans?**

- **What will serve as a forcing function to ensure closure?**

- **How will you capture cost savings?**

Obtain Authority to Test/Operate

As a prerequisite to Authority to Operate (ATO), organizations are better served by following documented procedures for securing an Authority to Test (ATT), where applicable.

The ATO represents management's formal approval to place a system into operation. An ATO shall be granted by an Authorizing Official (AO) after the IT system fully complies with the Assessment and Authorization (A&A) process. The process must comply with the regulations specified in the A&A process. The A&A process contains these modules: security certification, security accreditation, e-authentication, and business continuity planning.

KEY QUESTIONS

- **Which services do you currently operate that will require an ATT or ATO?**

- **Does your organization's ATO process contain a repeatable process with an acceptable time frame?**

- **Does the ATO process allow for inheritable controls from an enterprise level?**

CHECKLIST

- ☐ Inform the organization's security team of your intentions.

- ☐ Determine the requirements and compile the appropriate documentation for an ATT.

- ☐ Update the systems to be used for the ATT and ensure they comply with security policies.

- ☐ Work within the organization's security team to meet other policy requirements.

- ☐ Prepare your team to begin testing immediately in order to maximize the ATT duration.

- ☐ Obtain approval from the Chief Information Security Officer (CISO).

- ☐ Proactively work to overcome common barriers such as two-factor authentication, risk remediation, boundary protections, and safeguarding unauthorized shared usages and cryptographic safeguards to preserve confidentiality and data integrity.

Achieve Operational Excellence

Achieving operational excellence means improving the performance or cost-efficiency of your agency's IT operations. In the context of IT infrastructure, this often requires an agency to more efficiently manage its resources, processes, and procurement. Determine whether your staff has the skills necessary to implement its strategic vision. Create strategies to address any talent gaps.

Furthermore, agencies should look to centralize or pool similar roles at the appropriate organization level to match labor supply and incoming demand. Try to eliminate burdensome or low-value steps in your core IT processes (e.g., manual patching or server provisioning).

Finally, practice demand management: only purchase what you need (e.g., don't overspec on servers). Optimize your sourcing process, acknowledge areas to optimize, rationalize, or reduce your financial spend based on target benchmarks.

KEY QUESTIONS

- **How will you measure improvements to customer satisfaction, quality, and consistency in response to customers?**

- **Have you centralized similar roles and matched labor supply to identify anticipated demand?**

- **Have you established guidelines to procure the right quantities at the right organization to purchase IT more efficiently?**

- **What are the main processes involved in operating the IT infrastructure?**

- **What manual steps could you automate or streamline?**

CHECKLIST

- ☐ Conduct a user-backed operational assessment to identify customer pain points and opportunities to improve.

- ☐ Right size business and technical operations support functions to remove roles that don't add value.

- ☐ Streamline processes to cut out unnecessary steps, thereby reducing labor requirements.

- ☐ Increase system usage, efficiency, and virtualization.

- ☐ Adopt a mindset of waste reduction and continuous improvement.

- ☐ Optimize hardware and software procurement.

- ☐ Track operational efficiency rigorously through Key Performance Indicators (KPIs).

- ☐ Redesign, reimage, and standardize processes to reduce resourcing levels.

- ☐ Identify necessary skills and assess current staff to create a strategy for training.

Create an Agile Infrastructure

To make your infrastructure agile, your agency needs to make major shifts. Cross-functional product teams must own and specifically define items from the infrastructure-provided service catalog. These teams must fulfill service requests and improve service delivery by streamlining processes and engineering automated solutions. Cultivating the engineering talent will provide well-rounded engineers who can focus on constantly learning new skills and developing infrastructure products.

Redesigning products using an agile approach eliminates unnecessary steps and streamlining the process, making it more effective. Redesigning also ensures minimal system waste.

Creating end-to-end automation requires the IT infrastructure to focus on developing standard consumable infrastructure products. Application Programming Interface (API) driven automated provisioning of standardized products should ensure configuration scalability.

CHECKLIST

- ☐ Create a cross-functional team of analysts, user experience designers, testers, developers, and product owners.

- ☐ Adopt agile processes through structured backlog, daily scrums, weekly sprints, and regular retrospectives.

- ☐ Use existing automation to get faster service delivery.

- ☐ Scale pilot to launch new transformations.

KEY QUESTIONS

- **Does the agency's culture want to undergo this type of transformation?**

- **Where will you start? (e.g., a specific agency or with a pilot team)**

- **Are the agencies willing to engage in this type of transformation, particularly by bringing in the product teams?**

- **Are the organizational team leads willing to set priorities and controls for budgeting based on targeted Key Performance Indicators (KPIs) related to an agile infrastructure?**

- **Are the product owners driving product vision and strategy for the teams?**

- **Do team leads ensure consistency and governance across cross-cutting areas?**

Implement Automation

Faced with increasing demands for faster service, IT modernization struggles to scale and meet business needs. Many tools and processes make modernization even more complex, intensifying compliance and ongoing security risks. These factors all lead to unwelcome consequences: high-stakes vulnerability and security exposure, inefficient IT, and slow infrastructure service delivery.

Automation implementation allows the organization to enable continuous delivery of efficient services. Achieving automation often decreases costs, increases speed and efficiency, and improves security.

KEY QUESTIONS

- **What are your IT operation's core processes?**

- **How do you currently measure your core processes' performance?**

- **Where are your current processes' pain points?**

- **Where can you use technology to free up resources for more activities?**

- **Are your digital leaders taking an end-to-end approach to automation across the entire IT value chain?**

- **Has the organization become agile and enabled continuous delivery from code check-in to production in a standard, minimal timeframe?**

CHECKLIST

- ☐ Identify the objectives and processes to automate.

- ☐ Decide how to measure progress (e.g., which KPIs or metrics to use).

- ☐ Analyze infrastructure processes and tasks to focus the automation efforts (e.g., incident response, provisioning).

- ☐ Identify the best solution (e.g., robotic process automation (RPA), Interactive Voice Response (IVR).

- ☐ Build appropriate toolsets and processes.

- ☐ Establish a governance structure to capture value.

- ☐ Determine how to best use spare capacity from existing resources.

- ☐ Drive change management through stakeholder communication.

Develop a Communications Plan

A well-defined communications plan aids change management and ensures team members understand optimization. Tailor the communications strategy to the agency.

Leadership needs to decide:

- What needs to be communicated?
- Who needs to receive it?
- When to communicate and how frequently?
- What format to use for communications?

The goal of communicating is to have employees feel connected to the planned change and have them understand the strategy. Agencies should also provide a means to gather feedback and start discussions.

KEY QUESTIONS

- **What are the main points that you need to communicate to all team members so they support the initiatives?**
- **When should communications be issued to each level of the organization?**
- **What communications type does the organization best respond to?**
- **What is the best way to respond to questions or inquiries?**

CHECKLIST

- ☐ Identify communication objectives and key stories to share.
- ☐ Determine the sequence of communication and the right stakeholders to share the communications with.
- ☐ Identify the best formats for the different types of communication.
- ☐ Draft the communications strategy so it is documented.
- ☐ Provide important updates.
- ☐ Determine if there is a need for a town hall or all-hands meeting.

Ensure Ongoing Executive Reporting and Interaction

Regularly reporting the optimization efforts' current progress will ensure leadership and the agency are aligned. Reporting will also enable agencies to identify any issues or risks, and rapidly escalate them to the right resolution source.

Agencies need to identify the most relevant metrics and build a tracking dashboard.

Most importantly, the metrics need to be chosen and structured in a way that allows the team to make decisions and take actions. Don't report for reporting's sake.

KEY QUESTIONS

- **What are the key objectives?**
- **What are the best ways to measure progress?**
- **Who should be responsible for reporting and managing data?**
- **Where will the data come from?**
- **Who should see the report?**
- **How frequently should you share the reports?**
- **Is there a path for escalating key risks or issues?**
- **What is that path?**
- **What types of actions can be taken if the progress report is behind schedule?**

CHECKLIST

- ☐ Identify the main objectives to track.
- ☐ Determine the best metrics to measure progress.
- ☐ Identify a consistent source of data to use for reporting.
- ☐ Determine a cadence for reporting to key stakeholders.
- ☐ Build a path for escalating key risks or issues.
- ☐ Use the reporting as a method to build extra accountability into an organization.

Additional Resources

→ [Infrastructure Optimization Service Catalog (PDF)](#)

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