

A Virima Inc. White Paper

Data Center Discovery Best Practices

How Leading IT Organizations Minimize Disruptions and Maximize ROI

Executive Overview

If you were to ask CIOs and IT executives “what are your top data center challenges?” responding quickly and efficiently to shifting business priorities and elevating IT’s value to the enterprise are undoubtedly at the top of many lists. To that end, forward-thinking IT professionals are looking at initiatives to transform the data center with new technologies and practices.

What’s on the horizon for your IT organization? Cloud computing, digital transformational, virtual machines, containers, automation, software defined networking and security safeguards are frequently mentioned IT projects, according to industry surveys. Many IT professionals are considering moving to a converged infrastructure to help break down a proliferation of silos. Reducing power and cooling requirements by replacing aging equipment with energy-efficient hardware are other goals.

However, you can’t transform (consolidate, migrate, optimize, virtualize) what you don’t know.

Data center discovery – an accurate inventory of your data center ecosystem and assets -- may seem mundane, but it’s the essential linchpin to successfully implementing service improvements. Any effort to transform your data center based on incomplete information, and without paying attention to the interdependencies between hardware, software, data and users will likely threaten existing business continuity.

Additionally, many organizations have limited IT personnel resources with the expertise (or free time) necessary to conduct a thorough discovery of all IT assets, configurations, relationships and dependencies.

This white paper examines the challenges of embarking on a thorough data center discovery and offers suggestions to overcome the obstacles commonly encountered, minimize disruptions and deliver the best return on IT investment:

- The Necessary Voyage of Discovery: What Have You Got? How Do The Pieces Fit?
- Success is in the Details: What You Need to Know (Servers, Storage, Networks, Applications, Services and Middleware, Contracts)
- Getting the Discovery Job Done

The Necessary Voyage of Discovery

“Doesn’t the IT department already know what hardware and software they have, how it interacts and which users those assets support? After all, IT supports its systems every day.”

It’s a valid question, and the answer, unfortunately, is probably “no.” Or, not in the detail required to successfully complete a data center move, consolidation or cloud migration without running into serious problems.

The discovery phase is the critical first stage of a data center transformation project. In a complex environment, this phase can last months, particularly if performed manually. But businesses are not static. While the discovery phase is ongoing, new equipment may be added or decommissioned, new virtual instances created, and applications changed. Consequently, unless care is undertaken, the discovery phase deliverable may be out of date before it is completed.

What Have You Got?

Many organizations embark on major data center initiatives without first understanding what assets they have and their relationships to applications, business processes, and internal or external services. Without a comprehensive and up-to-date inventory of your IT assets, a project could result in loss of critical services because an asset, service, or dependency was overlooked.

In most data centers, technology was added piece-by-piece over the years. A new server was brought in to support a newly computerized business function. A merger or acquisition amalgamated heterogeneous hardware and software and those most familiar with the acquired systems were no longer with the company post-merger. More storage units were added to accommodate new and/or growing databases. Networking components were added to improve connectivity and/or bandwidth.

A visual inspection of hardware and a spreadsheet checklist is an error-prone exercise, particularly if equipment is spread out over multiple locations. What about virtual assets, such as data, applications and middleware? A single physical server may host multiple applications on several virtual servers, possibly running differing operating systems.

How Do The Pieces Fit?

Knowing what you have in your data center isn’t enough. You must understand how every piece interrelates and what business processes they support, essentially “what talks to what.” Consider again that if employees with critical knowledge leave your company, their knowledge may go with them if there is no up-to-date documentation.

Here are some questions to consider: Which storage units, networking gear, and physical or virtual servers support which applications? Who “owns” and uses those applications? What business processes depend on each application? What dependencies exist between applications and technologies?

Without first answering these fundamental questions, changes to IT infrastructure may result in some applications not working at all because vital components were not incorporated into the new environment or necessary linkages were broken.

Success is in the Details: What You Need to Know

It's the details that are most likely to trip up a major data center project. One piece of seemingly trivial hardware that isn't moved over to the new environment can shut down a vital system or, because of interdependencies, multiple systems.

Here is a sample data center checklist:

1. Servers

The workhorses of your data center, information collected for every physical server should include: manufacturer and model number; physical attributes (memory, CPU, storage, NICs, HBAs); firmware; location; MAC addresses; IP addresses and VLANs; configuration settings; operating systems or hypervisors; virtual servers running on each physical server; applications or services running on each physical/virtual server; and known interrelationships between servers. Keep in mind that not only are application and database servers important, but crucial infrastructure servers that support "under the hood" functionality areas are as well.

2. Storage

The cost of storage has dropped dramatically over the years, which means the cost of storing each gigabyte of critical data is a small fraction of what it once was. The downside is that low cost has encouraged data proliferation, little of which is ever deleted.

Critical data storage information that must be documented includes:

- Where are all of the storage units and what data is stored where? What makes and models are in service?
- Is the data structured or unstructured?
- Which applications will be affected if some storage units are shut down for maintenance?
- How is data backed up? Is all data backed up to the level warranted by its criticality? What, if any, archiving plans are in place?

3. Networks

Understanding your network infrastructure is a prerequisite for ensuring that vital connectivity is not disrupted. A complete inventory of all makes, models, IP addresses, and installed hardware options for a variety of devices should include routers, switches, firewalls, proxy servers, network appliances, and WAN topology. A thorough understanding of the role that each piece of equipment serves in your network architecture is also critical.

Today's networks likely include a collection of local area networks, wide area networks and the bridges, routers, and security devices between them. Note that firewalls, load balancers, proxy servers, VPN terminations, and caching appliances are often lumped in with other network components.

Physical networking infrastructure may also support multiple virtual networks that are isolated from each other, possibly for security reasons. For example, a segregated network may be necessary to comply with Payment Card Industry (PCI) standards or regulatory requirements such as those imposed by the Health Insurance Portability and Accountability Act (HIPAA) or the Sarbanes-Oxley Act (SOX).

Networks may not stop at your organization's walls. Support for third-party connectivity to credit card processors and supply chain partners, possibly through a private network or virtual private network, should also be taken into account.

4. Applications, Services and Middleware

The discovery phase must catalog applications, services and middleware, including documenting functionality and applications that depend on them. Failure to recognize and accommodate the following components when reorganizing a data center may cause critical applications to fail:

- **Applications** that share information and interact in real-time and are supported by business, core and middleware services.
- **Business services**, such as a service used to check in an airline passenger, may draw data from several databases and access the functionality of a variety of applications.
- **Core services** support business applications, technology infrastructure and/or middleware. Examples include domain name services (DNS), directory services, authentication services, and FTP services. From an end-user perspective, these services operate transparently—as long as they function properly. If a domain name server fails, every application in your organization may be impacted.
- **Middleware services** are essential elements that support business operations, including services for queuing and transaction management, transporting data, and coordinating data movement and transaction flows.

5. Contracts

Hardware and software IT assets may have associated documentation that must be tracked, including contracts, warranty protection, maintenance and service contracts. For example, Service Level Agreements often guarantee the performance, reliability and availability of an IT asset or service.

Keep in mind that a contract may be affected by a data center transformation. For example, if hardware is moved to a new geographic location to centralize operations, that move might impact service agreements. Or, virtualizing multiple servers onto one larger physical server may also affect software contracts.

Getting the Discovery Job Done

Manual discovery of all IT assets is a time-consuming, cumbersome, error-prone job. And by the time it is completed, assets may have been changed, added or removed. A tool that automates many discovery processes is necessary to make the task both cost-effective and comprehensive.

Many existing tools are good at discovering the existing technologies in your data center, but may be less efficient, or possibly ineffectual, when it comes to matching those assets with the people and business processes they serve. To achieve this objective, the tool must automate as much of the discovery as possible, but also allow for the input, mapping and organization of information gathered from those with “tribal knowledge” of how things really work. Tools that provide scanning for network and security purposes are common, but typically don’t show the big picture. Data collected by these tools must be correlated to provide a better view of the enterprise-wide infrastructure, including the interrelationships among the various components and people who use those components. And since these tools are usually deployed at the departmental level, it is often difficult for the discovery team to gain access, especially if they don’t know they exist in the first place. Unfortunately, turf wars are not uncommon in data center transformations.

Tools can also miss dependencies. Scans may occur at the wrong time to catch an occasional communication flow, so it is important to let dependency mapping scans run over long periods or at different intervals. And since an enterprise data center does not remain static during or after a discovery project, any tool should refresh the data on an ongoing basis. Likewise, the actual transformation doesn’t take place over night so it’s critical that operations and support teams are aware of changes as they occur. The initial discovery of assets and relationships should dovetail into a thorough change management program. Without a highly automated tool, a data center discovery process requires particular expertise and can consume considerable time and resources. This often results in the need for external consultants to perform the work, which can be expensive. And as with any manual/point-in-time discovery, the information is static while the data center remains dynamic. At the end of the day, IT organizations are held accountable to rapidly respond to and support the goals of the organization, delivering the best return on investment as they do so. A comprehensive, automatic discovery tool that keeps the IT inventory configuration management database (CMDB) and relationship/dependency map up-to-date should be one of the lasting deliverables of any data center discovery.

About Virima

Virima Inc. (Atlanta, GA) is an innovator of SaaS-based asset and configuration management solutions for on-premise, cloud and remote IT assets. Through advanced infrastructure discovery, machine-learned dependency mapping, Autonomic Social Discovery™ and the Virima Visual Impact Display (ViVID™) featuring service maps with ITSM and vulnerability overlays, Virima helps organizations understand the complex and dynamic connection between business services and the technology and people that support them. The result is a heads-up display for IT that streamlines many function areas such as IT service management, IT asset management, business continuity, security, risk and compliance management.

To learn more about Virima solutions including our industry unique ViVID experience, visit www.virima.com or contact us at sales@virima.com.