

Four Missing Components that Put Your Data Center Consolidation/Migration Project at Risk

EXECUTIVE SUMMARY

Almost every organization will have to consolidate or migrate its data center(s) at some point. This is a major undertaking that consumes significant time and resources and is fraught with risk. The planning process is long, often reliant on manual processes and therefore error-prone. And it is unfortunately too common that services are restored with performance and availability problems that cause business disruptions. Current tools do not go far enough to address the risks associated with data center moves. There are four key requirements of success that are currently missing from most organizations' data center consolidation or migration projects: dependency information, actual usage information, change impact information, and proactive post-implementation problem identification.

Network Behavior Analysis (NBA) systems provide a new way of looking at the IT infrastructure by analyzing network traffic to provide valuable information about the interactions of and dependencies between users, applications, and systems. Specifically, NBA systems provide the following key capabilities organizations are missing today:

- Understand actual dependencies
- Understand actual usage
- Understand the impact of change
- Proactively identify post-implementation problems

Data Center Projects are Inevitable

If you are involved in the management of your organization's data center, you will almost certainly be involved in at least one data center consolidation or migration project at some point. There are so many diverse factors that drive such a project, including:

- Natural growth of the organization
- Mergers and acquisitions
- Cost savings of infrastructure consolidation
- Desire to "go green"
- Compliance concerns and the need to minimize audit costs

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Planning is Difficult, Long, and Error-Prone and Current Tools Fall Short

Planning for a data center consolidation or migration is a long and error-prone process. An accurate and comprehensive understanding of your infrastructure is necessary to ensure that your implementation plan is appropriate and will result in a smooth transition. Documentation and historical inventories are rarely up to date and, therefore, provide an unreliable basis for planning. The "clipboard" inventory performed just prior to a move can be costly in both time and expense and can be highly inaccurate. Organizations that have implemented data center moves based on manual inventory methods have experienced significant cost overruns, project delays, and difficulties restoring critical services in a timely manner.

There are tools available that can help automate parts of the process, but they can leave gaps and can introduce other problems such as network performance degradation and high deployment costs. For example, scanning tools can help build inventories but they don't show dependencies and they can slow down network performance. Agents can also help automate the process but only for the areas of the network where the agents are installed. The high cost of deploying agents effectively limits their scope.

The Risk is High

Today's IT infrastructure truly is the backbone of virtually any organization; most businesses cannot survive without the applications their networks deliver. Interruptions in service cause interruptions in business. Making significant changes to your data center — such as a consolidation or migration — creates a risk for interrupting service. The more errors there are in the planning and implementation processes, the higher the risk that something will "break" and disrupt business.

Errors in the planning process due to incorrect or incomplete information can cause unknown dependencies to be broken, which can create outages. Errors in the implementation process can affect or even disrupt availability and performance. Both of these can be extremely difficult to troubleshoot after the consolidation or move and the longer it takes to identify and resolve the problem, the longer the business suffers. The risk of these errors is extremely high because there are four components to data center consolidation and migration that many organizations do not currently have:

- They don't understand actual dependencies
- They don't understand actual usage
- They don't understand the impact of change
- They can't proactively identify post-implementation problems

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Network Behavior Analysis (NBA) systems can help organizations significantly reduce the risk associated with data center consolidation and migration by addressing these four components.

Improve Data Center Consolidation and Migration with Network Behavior Analysis

NBA systems provide a new way of looking at the IT infrastructure by analyzing network traffic to provide valuable information about the interactions of and dependencies between users, applications, and systems. IT personnel and management use this critical information to alert them to meaningful change and inform infrastructure optimization initiatives, enabling them to evolve the IT infrastructure to keep pace with the business.

NBA systems collect network flow data and enhance it with application and user identification and behavioral analytics to present a complex infrastructure in a business context. Pre-defined and customizable analyses enable users to identify performance, availability, and security issues before they disrupt business services. Rolebased presentations enable users across IT to access this data in a format tailored to their specific needs. Usage and dependency data enable informed optimization and change management decisions.

Four Key Components to Minimize Risk

NBA systems provide users the ability to effectively manage change in their IT infrastructures. Specifically, NBA systems provide organizations four key capabilities they need to improve data center consolidation and migration projects and minimize their risk.

- Understand actual dependencies — Even if dependencies were documented, they have likely changed over time as applications are upgraded and enhanced and as new services are deployed.
- Understand actual usage — As organizations evolve, application and service usage evolves and this information can be extremely difficult to obtain.
- Understand the impact of change — Without knowledge of dependencies and usage, there is no way to know what will happen when a change is made.
- Proactively identify post-change problems — When there is a disruption, the only way to find out about it is to wait for calls to the help desk.

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By using NBA systems to incorporate these key components into your data center consolidation or migration process, you significantly minimize your risk by:

- Automating and improving the planning process.
- Minimizing deployment disruption during implementation.

Result: Automate and Improve the Planning Process

NBA systems can help you identify all the assets and applications that are running on the infrastructure. While there are other tools that can also provide asset discovery, NBA systems do this passively and pervasively. This means that the discovery process will not adversely affect performance and will happen across the entire network (or specified segments if enterprise-wide is not required) without requiring widespread deployment of agents or probes.

Asset Inventory			
Server	Host IP	MAC	Location
Sun-server-2	172.31.0.14	00:30:48:22:73:02	rack32:05:FastEthernet0/48
Win-Exchange	172.31.0.91	00:30:48:22:80:07	rack32:05:FastEthernet0/116
HP-web-server-1	172.32.0.12	00:30:48:22:70:07	rack32:05:FastEthernet0/26
FTP-server-1	172.31.1.191	00:30:48:22:87:05	rack32:05:FastEthernet0/49
HEC-7	10.1.0.68	00:30:48:22:12:07	rack32:05:FastEthernet0/16
Unix-cluster-2	172.31.1.179	00:30:48:22:87:02	rack32:05:FastEthernet0/46
Dell-server-5	10.7.0.46	00:30:48:22:57:06	rack32:05:FastEthernet0/36
Mgt-wkst	10.9.0.1	00:30:48:22:61:05	rack32:10:FastEthernet1/12
IBM-rem-6	10.12.12.103	00:30:48:22:43:03	rack32:10:FastEthernet1/35
IBM-cluster-3	10.8.0.10	00:30:48:22:60:08	rack32:10:FastEthernet1/25
appsrv-025	172.31.0.39	00:30:48:22:78:04	rack32:10:FastEthernet1/16
LabWS-rem-4	10.12.14.100	00:30:48:22:43:06	rack32:10:FastEthernet1/38
Dell-server-9	10.7.0.42	00:30:48:22:57:03	rack32:10:FastEthernet1/33
PC-3	10.7.0.13	00:30:48:22:50:06	rack32:10:FastEthernet1/2
mail-server-1	10.100.0.2	00:30:48:22:42:04	rack35:03:FastEthernet4/17
basil-002	10.9.0.5	00:30:48:22:61:08	rack35:03:FastEthernet4/14
crm-101	10.0.0.18	00:30:48:22:11:03	rack35:03:FastEthernet4/04
crm-099	172.31.0.11	00:30:48:22:70:06	rack36:03:FastEthernet4/3
mrpsrv-01	172.31.0.88	00:30:48:22:12:06	rack36:03:FastEthernet4/2
orc-3400-01	10.0.5.124	00:30:48:22:34:12	rack36:03:FastEthernet4/15

An NBA system can automatically capture an inventory of the assets on your network passively and pervasively.

Having an inventory is not enough. You need to understand all of the user and business service dependencies on the network. This is critical for identifying the infrastructure components that need to move together to prevent disruption. NBA systems can identify:

- **User-to-service dependencies** — Which users or groups of users use which services. This information enables you to accurately plan changes based on who needs access to which services. It also helps you develop appropriate usage policies for the new environment.
- **Server-to-server dependencies** — Which servers provide or consume which services. This information enables you to accurately move servers and applications without “breaking” them. It also helps you develop appropriate firewall policies that won’t disrupt service delivery.

By understanding these dependencies, you can avoid disruptions caused by a break in dependencies.

Server Dependency					Options ▾
Server1	Server2	Protoport	Total Bytes	Total Packets	
appsrv-019	sql-2550-11	tcp/433	189,308,762 (6%)	205,230 (4%)	
appsrv-019	sql-2550-12	tcp/433	189,234,456 (6%)	205,244 (4%)	
appsrv-019	10.50.0.103	udp/53	34,067,535 (1%)	38,644 (1%)	
appsrv-019	websrv-05	tcp/2484	125,908,634 (4%)	203,300 (4%)	
appsrv-019	dns-1900-10	udp/53	70,798,645 (2%)	157,890 (3%)	
appsrv-019	orc-3400-01	tcp/1630	103,777,325 (3%)	205,230 (4%)	
appsrv-019	websrv-11	tcp/2484	56,879,834 (2%)	68,434 (1%)	
appsrv-023	sql-2550-34	tcp/433	34,442,065 (1%)	38,546 (1%)	
appsrv-023	orc-3400-05	tcp/1571	189,308,762 (6%)	205,230 (4%)	
appsrv-023	stosrv-024	tcp/433	57,009,827 (2%)	68,805 (1%)	
appsrv-025	sql-2550-12	tcp/433	189,308,456 (6%)	199,230 (4%)	
appsrv-025	orc-3400-01	tcp/1521	58,000,987 (2%)	67,234 (1%)	
appsrv-025	websrv-05	tcp/2484	189,408,345 (6%)	205,236 (4%)	
appsrv-025	dns-1900-11	udp/53	54,019,824 (2%)	69,085 (1%)	
basil-002	prn-1350-06	tcp/7000	191,098,765 (6%)	204,560 (4%)	
basil-002	stosrv-023	tcp/7002	190,307,962 (6%)	210,888 (4%)	
crm-101	orc-3400-02	tcp/7002	34,442,065 (1%)	38,626 (1%)	
crm-099	orc-3400-03	tcp/7001	189,308,762 (6%)	205,230 (4%)	
mrpsrv-01	orc-3400-08	tcp/1630	186,584,762 (6%)	205,009 (4%)	
orc-3400-01	orc-3400-08	tcp/1571	34,442,065 (1%)	38,546 (1%)	

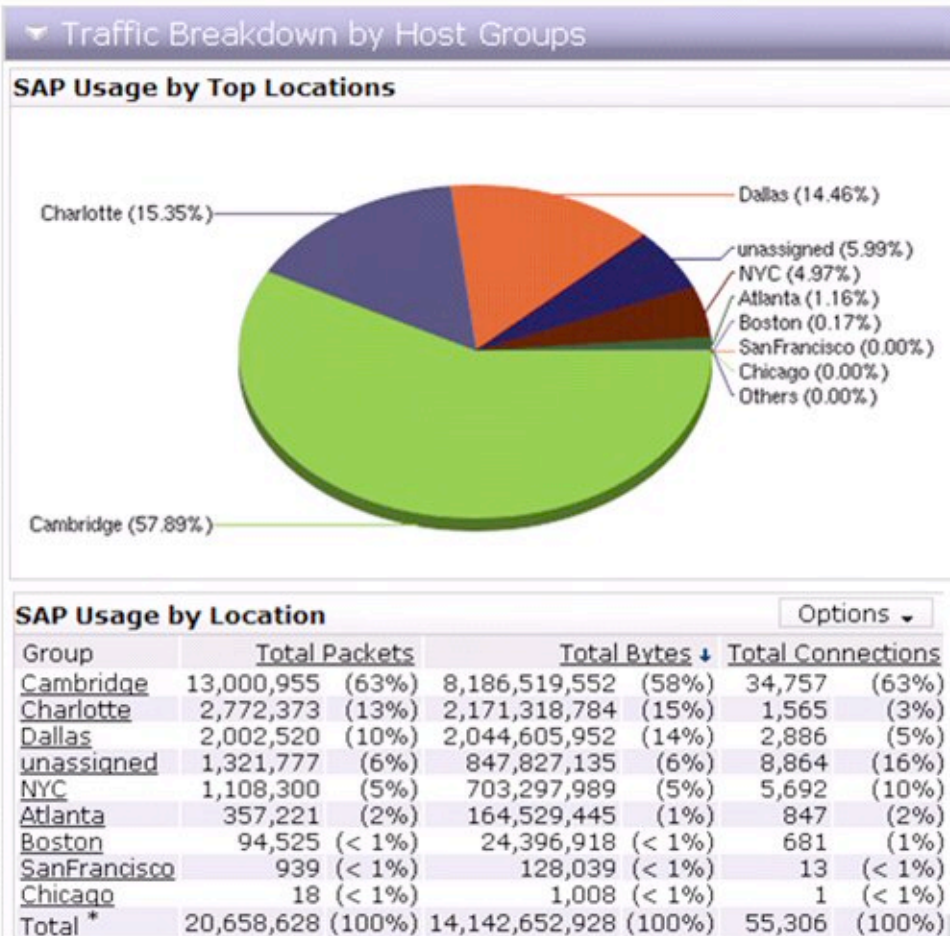
An NBA system can help you understand the server-to-service dependencies. This information is critical to preventing post-consolidation/migration disruptions.

Riverbed® Cascade™ in Action

A financial company was in the process of planning a data center migration. Cascade was implemented just prior to the move and immediately showed that there were a number of applications on the system that were either improperly documented or completely unknown to IT. Cascade also demonstrated that the number of users who were accessing data center services was significantly higher than they had accounted for. Because Cascade was not available during the planning process, the company had used incomplete application documentation and out-of-date network maps. If the migration had moved forward, a number of critical applications would have been rendered nonfunctional and the business would have suffered serious disruptions. As a result, the company postponed the migration and integrated Cascade into the planning process.

Result: Minimize Implementation Disruption

Even with the best of planning, there is still risk of disruption during the implementation phase of a data center consolidation or migration. You need to be able to verify that the implementation was successful, or quickly identify any problems that could cause performance or availability problems. Too many organizations rely on the “wait and see if anyone complains” approach. NBA systems can help you verify that all systems and services are running as expected. Problems can be detected before users complain and the NBA system can provide you the information you need to quickly identify the cause and troubleshoot the problem.



NBA systems can help you quickly identify problems post-consolidation/migration. In this example, the Chicago site is showing extremely low SAP usage. Since, in this case, the Chicago office should have SAP usage levels that are comparable to those at the Dallas and Charlotte sites, there is clearly a problem. Clicking the “Chicago” link will enable the user to drill down into more details to troubleshoot potential causes of the problem.

NBA systems continue to provide valuable capabilities to the data center on an ongoing basis after the completion of the consolidation or migration. They can monitor activity on an ongoing basis and alert the help desk when performance and availability thresholds are crossed, when services or hosts appear or disappear, or when other customizable conditions are met.

Conclusion

Data center consolidation and migration projects are fraught with risk. There are four components that organizations lack today, which significantly increase the risk of these projects: dependency information, usage information, change impact information, and post-change problem identification. NBA systems provide these four key capabilities, enabling you to significantly reduce your risk by automating and improving the planning process and minimizing disruption during implementation.

About Riverbed

Riverbed Technology is the IT infrastructure performance company. The Riverbed family of wide area network (WAN) optimization solutions liberates businesses from common IT constraints by increasing application performance, enabling consolidation, and providing enterprise-wide network and application visibility – all while eliminating the need to increase bandwidth, storage or servers. Thousands of companies with distributed operations use Riverbed to make their IT infrastructure faster, less expensive and more responsive. Additional information about Riverbed (NASDAQ: RVBD) is available at www.riverbed.com



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