

## How NEXVU Supported a Large Data Center Migration Project

### Introduction:

A large European Pharmaceutical customer was migrating 200+ servers to a newly developed 6000 square foot data center to provide improved reliability and protection for their mission crucial applications and data.

A key objective of the initiative was to ensure that end-user impact was not adversely impacted by degraded performance or extended down-time as a result of the migration.

This paper discusses how the Nexvu Analyzer was used to support this migration effort and minimize associated risks.

### Background:

The servers targeted to be relocated in the Data Center Migration Project were initially located in the server rooms of four separate buildings on a main campus spanning multiple VLANS and Subnets. Connectivity between the main campus and the newly build data center included multiple high speed WAN connections with adequate bandwidth to ensure minimal congestion and network delay.

The platforms targeted for migration included 200+ Windows, Linux, and Unix based servers supporting several hundred applications. In addition, several terabytes of storage was also to be migrated. As part of this move, each of the platforms were to be re-addressed.

### Risks:

Several risks were identified during the planning and analysis phase of the project. These risks included:

#### Accurate Application Inventory

The customer needed to quickly construct accurate application server mappings that identified all of the servers that comprised an application or service.

In order to safely move the servers to the new data center it was realized that it was imperative to obtain a full understanding of the applications residing on those servers and that it should all be documented in what were called application mappings. An Application Mapping was a blueprint document that detailed inter-server dependencies, traffic patterns, and usage profiles. An Application Mapping document was needed for each host that was to move and for every discovered application.

#### Ability to Measure Application Performance post Migration

Increased latency between campus and data center may have adversely affected end-user performance, particularly for those applications that moved large amounts of data between clients and servers or were time sensitive. How was the customer to identify these high-risk applications, such that they could be tested prior to move?

#### Management of Platform Dependencies

Inter-server dependencies were unknown. How was the customer to intelligently define move groups, such that servers supporting the same application or that transferred large amounts of data amongst each other (i.e. for backups) all moved together?

### Solution 1: Application Mapping

As a result of a rapid expansion of the customer's application and client base, poor documentation existed from which to build detailed application mappings.

Additionally, many of the original architects of key applications had moved on, resulting in erroneous or partial documentation. Initially application mappings were built based on interviews with application owners and users, but confidence was low that they were complete or entirely accurate.

## Solution 1: Application Mapping (Cont.)

A method was needed to validate the mappings in order to mitigate the risks identified above. The Nexvu Analyzer was used to compliment and validate manually gathered information and to build accurate mappings of the key business applications and services.

### Methodology

Nexvu Analyzers were strategically placed within the network to capture all client-to-server and all server-to-server traffic. During interviews with application owners, the core server(s) for each application were identified. This was validated using Nexvu Analyzer functionality. A core server is identified in the Active Flows Status Panel of the Analyzer tab to quickly see “who” was talking to it (i.e. other servers and end-user clients) and over which protocols.



The screenshot shows the 'Analyzer: Active Flows' window. It has a filter set to 'Group' and 'View by: Server'. The table below shows active connections with columns for Protocols, Client, Server, Duration, Data, and Data Rate.

Protocols	Client	Server	Duration	Data	Data Rate
HTTP (1)				250.4M	139.2k
HTTP (73)				129.4M	7.1k
HTTP (1)				44.0M	620.5
HTTP (1)				22.2M	34.9k
HTTP (15)				14.9M	869.6
HTTP (2)				2.8M	4.6k
HTTP (3)				2.7M	997.4
HTTP (2)				2.7M	145.2

Figure 1: Analyzer Active Flows. This view shows all active connections to the servers listed at the left. (IP Address Information deliberately obscured.)

To obtain more historical information Nexvu Analyzer Top Talkers Per Host reports were generated for each these key hosts as depicted in Figure 2 below. These reports were used to identify host to host communications including, but not limited to data volumes and rates.

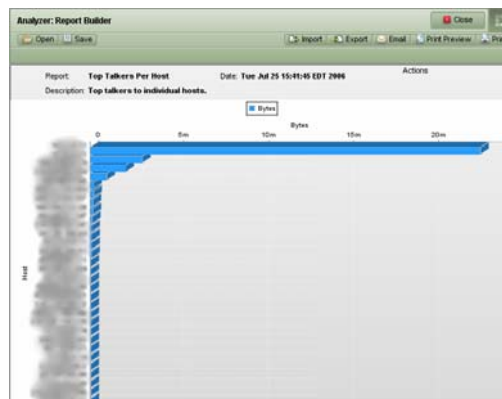


Figure 2: Top Talkers Per Host Report. This report shows all hosts communicating with chosen hosts over time. (IP Addresses/Hostnames deliberately obscured.)

The information in these reports was used to validate data collected from application owners and users to finalize the application mapping definition.

## Solution 2: Performance Measurement

As outlined above, a key objective of the initiative was to minimize end-user impact during the migration. A combination of the Analyzer rules-driven monitoring, ad-hoc reporting and packet capture features were used to baseline and analyze all dimensions of the end-user experience.

Monitors were configured on the NEXVU Analyzer to measure response times of the various applications identified for migration. As the application mappings were compiled, time sensitive applications were duplicated on similar hardware at the new

## Solution 2: Performance Measurement (Cont.)

data center where new monitors were configured to measure response times in a post migration configuration. The customer was able to determine the impact of the amount of additional latency that would be introduced by traffic between the main campus and the new data center.

The "Top Talker" reports were used to identify average (or typical) client traffic to a server and to calculate the impacts of decreased bandwidth and increased latency.

The packet capture feature was used throughout the application mapping process to capture the traffic between end-user clients and application servers. The packet traces provide detailed statistics related to bytes transmitted; bytes received; inter-packet delays; errors; and general traffic behavior. This information was used to help identify potential bandwidth or latency sensitivity within the application.

## Solution 3: Dependency Definition

Similar to the client-to-server communications risk described above, certain server-to-server communications may have been impacted by the decreased bandwidth or increased latency if they were not moved together. As a result, "Move Group" definitions were largely based on an understanding of all inter-server communications.

In order to arrive at move group definitions, historical data from the "Top Talker" reports for all servers was exported into a single Microsoft Excel spreadsheet. Through the use of Excel Pivot Tables, a server-to-server communications table was developed similar to the one shown in Figure 3.

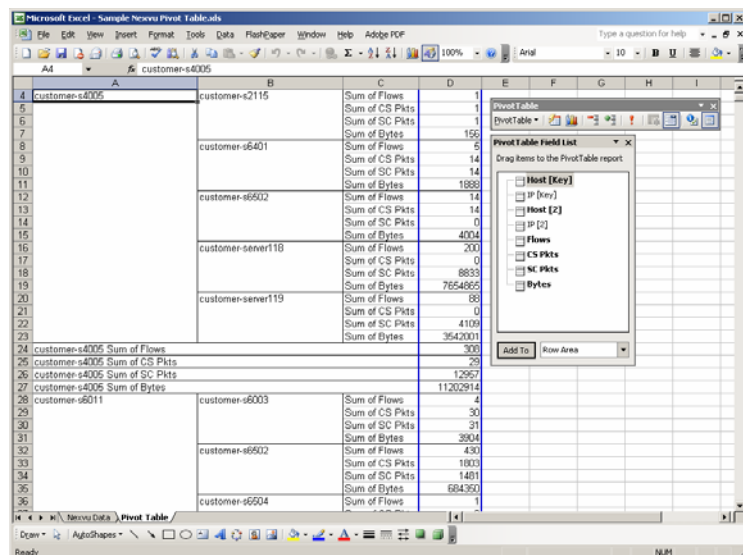


Figure 3: Excel Pivot Table populated with data from NEXVU Generated Data. (Hostnames changed for anonymity.)

This pivot table listed every server and all of the hosts that connected thereto for a specific time period. Using this information it was a simple task to view which servers intercommunicated and the process of creating the move group definitions was simplified.

## Conclusion

The use of the NEXVU Analyzers clearly smoothed the migration effort and mitigated the inherent risks of such a large undertaking. All of the critical application blueprints were compiled with ease and the customer was assured of accuracy and consistency of the data. The performance of the applications was continuously monitored throughout the migration to minimize user impact. Finally, move group dependency

definitions were created using data generated from historical data in the NEXVU Analyzer's database.

The customer's data center move project was entirely successful.

#### **About NEXVU Technologies**

NEXVU's network and application performance management solution provides insight that enables organizations to improve service, minimize risk and increase the value of their computing environments through the continuous real-time monitoring of application performance, availability and end-user experience.

#### Contact Information

NEXVU Corporate Headquarters  
50 East Commerce Drive, Suite A,  
Schaumburg, IL 60173

Tel. 630-872-5800 • Fax 630.872.5801 • [www.nexvu.com](http://www.nexvu.com)