TOOLS FOR TRACKING AND MANAGING INVENTORY:
INCREASING EFFICIENCY, ACCURACY AND ASSET TRANSPARENCY WITH HERCULES

Introduction

With new hardware and applications regularly being added and removed, data centers are constantly changing. In the absence of well-enforced change management procedures, coupled with an advanced system to track those changes, your data center's contents can quickly become a mystery — and performance and efficiency will inevitably slip. Maintaining a current and detailed understanding of your data center's assets and applications is critical to ensuring its optimal performance and efficient running. When you know exactly what you have, you can prevent the addition o redundant equipment, readily replace outdated or inefficient equipment and utilize virtualization and cloud solutions to their fullest extent.

To empower you to effectively manage your data center, Knight Point Systems offers Active Asset Management, an end-to-end service. We work with you to improve and standardize your change management procedures. Then we map your data center using our proprietary mapping and optimization tool, Hercules. By utilizing Hercules, we can rapidly map the assets, applications, people and facilities that constitute your data center, as well as all the complex physical and logical interdependencies among them. Hercules will create a complete picture of your data center, unmatched for depth and detail. Depending on your need, we will refresh your mappings at set intervals and provide customized management reports.

Active Asset Management results in seamless and transparent management of your data center, providing you with a clear line of sight into your IT infrastructure. With this perspective, you are empowered to make informed decisions as your environment changes. This allows you to readily identify and capitalize upon opportunities to improve your IT infrastructure. Active Asset Management also ensures and enforces effective change management procedures, simplifying the often-complicated task of inventory management.

Description of Problem and Goals

Linden Labs, creators of Second Life (www.secondlife.com) and a market leading commercial Internet Services Company, wanted to develop a new IT strategy to improve business performance and profitability, but they didn't know what assets resided in their IT infrastructure or how efficiently they were being used compared to industry standards. Knight Point Systems (KPS) was contracted by Linden Lab to perform a datacenter infrastructure audit, an assessment of the current state of the technical environment, develop a Request for Proposal (RFP) for a Washington D.C. Metropolitan area datacenter, and the recommendation for a datacenter hosting facility in the Washington D.C. Metropolitan area. This audit and assessment included in excess of 7,400 hardware devices at datacenters located in Dallas, TX, Phoenix, AZ, and San Francisco, CA.

Within the prior eighteen months Linden Lab had experienced performance issues and outages within various parts of the technology infrastructure. In order to develop a comprehensive technology strategy to address the performance issues Linden Lab senior technical management determined an assessment by an independent, third party expert of the current infrastructure was needed.

Upon beginning the engagement, we quickly learned that asset management was non-existent, and Linden Labs was operating a much larger infrastructure than they even realized.

Description of Approach, Rationale, Results, and Timeline

Knight Point's first task of the engagement with Linden Lab was to understand the hardware environment of the organization and complete a detailed inventory of the three (3) data centers. Subject matter experts (SMEs) collected, validated, and centralized all IT asset data through the use of industry best practices. To ensure data accuracy, each KPS personnel utilized a barcode scanner to accurately record each device's ID tag and serial number.

Upon completion of the inventory, the KPS team performed a detailed data analysis and cleansing process. All data collected was entered into the Knight Point Systems' asset management tool, Hercules, providing an accurate and detailed asset inventory

to the client. In total, these datacenters hosted in excess of 7,400 computational and rendering systems, supporting databases, network infrastructure, and data storage systems.

The infrastructure assessment focused on four (4) primary areas:

- Current Operations,
- Datacenter / Hosting Environments,
- Network Scalability, and
- Storage Architectures.

The assessment presented an overview of the current state, technical risk areas, recommendations for mitigation of identified risk areas, and a high level technical roadmap to support projected growth estimates. Each of these elements was

analyzed independently to develop baseline architecture. Once the baseline was determined, each element was viewed as part of the larger integrated environment to determine the optimal unified architecture as well as identify risk areas.

Hercules is a data center migration and asset management tool developed to facilitate the collection and analysis of Data Center assets and physical and logical mapping between the assets and applications. Hercules offers more functionality than a traditional asset management system since it is used to aid in the data collection process for data critical to the relocation effort including: asset data, business process data, application data, core infrastructure data, cost data, and staff support data. Hercules provides a single repository with migration specific data that eliminates the need for multiple spreadsheets of information.
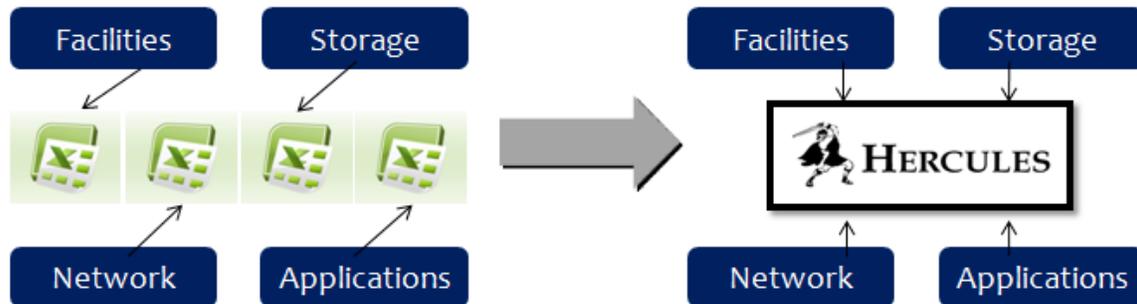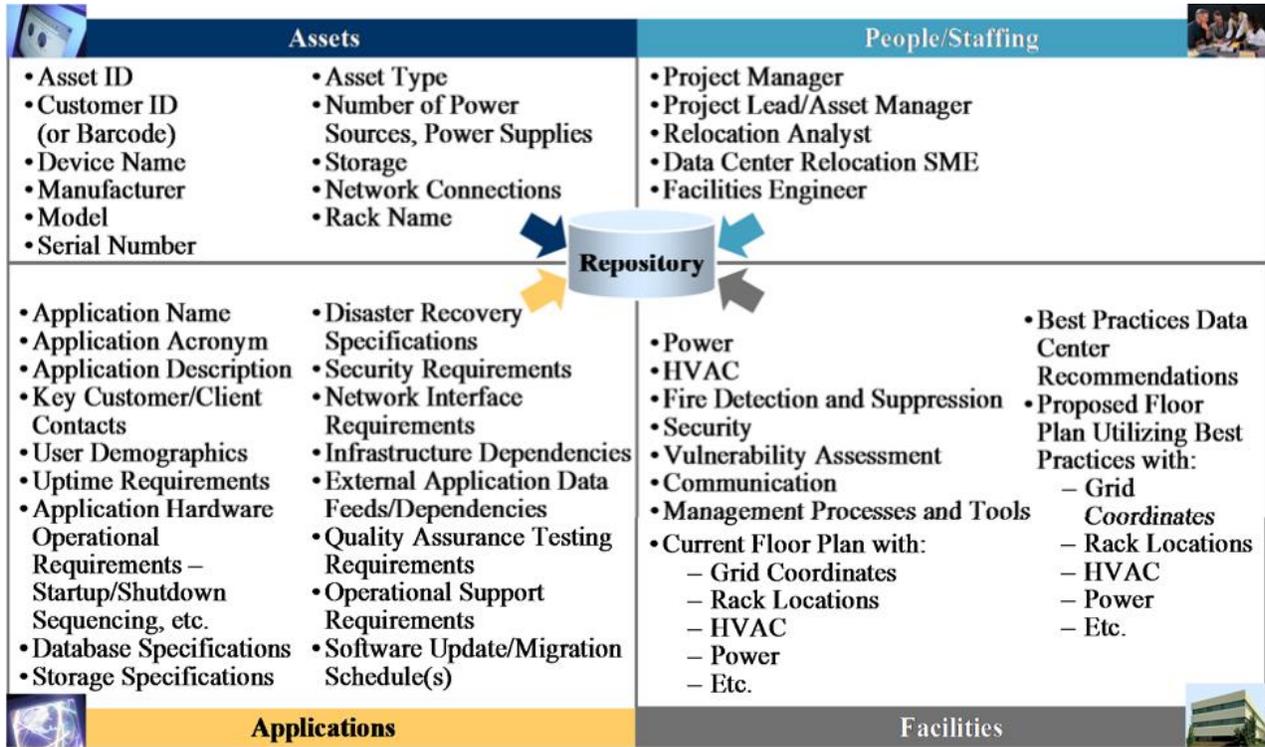

Hercules employs what we refer to as "active asset management." Active asset management is the process where asset management data is blended with the business drivers in a live time manner, enabling key decision makers to drive the organization mission forward in accordance with the migration effort. Active asset management and transparency in one's actual IT environment is a driving force behind the data center migration. Utilizing the principles and components of active asset management, Linden Labs was able to:

- Understand its key drivers for the initiative
- Define the requirements and goals
- Ease the execution of the project
- Install controls to manage and monitor the process
- Maintain an accurate dataset that is ready to facilitate the organization into its new operational parameters

When deployed, Hercules was used to aid in the data collection process for all data critical to the effort, including: asset data, business process data, mission application data, core infrastructure data, costs data, and staff support data, as well as all of the relationships and interdependencies among data. Through a series of standard reports, as well as ad-hoc reporting functionality, critical information is always at the fingertips of

stakeholders and dramatically eased the data analysis effort, while also providing project transparency to all Linden Labs executives and technical resources. The right information is available to decision makers at every step of the process early in the migration process, eliminating the need for estimation and guesswork when driving decisions in addition to saving valuable time in the latter stages of migration activities.

	Assets		People/Staffing	
• Asset ID • Customer ID 　(or Barcode) • Device Name • Manufacturer • Model • Serial Number	• Asset Type • Number of Power 　Sources, Power Supplies • Storage • Network Connections • Rack Name		• Project Manager • Project Lead/Asset Manager • Relocation Analyst • Data Center Relocation SME • Facilities Engineer	

Repository

	Applications		Facilities	
• Application Name • Application Acronym • Application Description • Key Customer/Client 　Contacts • User Demographics • Uptime Requirements • Application Hardware 　Operational 　Requirements – 　Startup/Shutdown 　Sequencing, etc. • Database Specifications • Storage Specifications	• Disaster Recovery 　Specifications • Security Requirements • Network Interface 　Requirements • Infrastructure Dependencies • External Application Data 　Feeds/Dependencies • Quality Assurance Testing 　Requirements • Operational Support 　Requirements • Software Update/Migration 　Schedule(s)	• Power • HVAC • Fire Detection and Suppression • Security • Vulnerability Assessment • Communication • Management Processes and Tools • Current Floor Plan with: 　– Grid Coordinates 　– Rack Locations 　– HVAC 　– Power 　– Etc.	• Best Practices Data 　Center 　Recommendations • Proposed Floor 　Plan Utilizing Best 　Practices with: 　– Grid 　　Coordinates 　– Rack Locations 　– HVAC 　– Power 　– Etc.	

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Device	Manufacturer	Model	Name	Serial	UHt	UPos	Watts	Amps	Wt
Chassis	HP	C7000	Chassis4	SG540SJ0ET	10	11	100.000	21.800	150.000
Blade Server	HP	BL20P G3	Chassis4-01	D324JQ91H068	1	11	300.000	6.250	18.000
Blade Server	HP	BL20P G3	Chassis4-02	D324JQ91H073	1	11	300.000	6.250	18.000
Blade Server	HP	BL20P G3	Chassis4-03	D324JQ91H070	1	11	300.000	6.250	18.000
Blade Server	HP	BL20P G3	Chassis4-04	D324LK62H030	1	11	300.000	6.250	18.000
Blade Server	HP	BL20P G3	Chassis4-05	D324LK62H031	1	11	300.000	6.250	18.000
Blade Server	HP	BL20P G3	Chassis4-06	D324LA62H032	1	11	300.000	6.250	18.000
Blade Server	HP	BL20P G3	Chassis4-07	D324LK62H035	1	11	300.000	6.250	18.000
Blade Server	HP	BL20P G3	Chassis4-08	D324JQ91H075	1	11	300.000	6.250	18.000
Chassis	HP	C7000	Chassis3	6J35KZR2Y02L	10	21	100.000	21.800	150.000
Blade Server	HP	BL20P G3	Chassis3-01	EAF6LDN42N	1	21	300.000	6.250	18.000
Blade Server	HP	BL20P G3	Chassis3-02	D228JZG2D273	1	21	300.000	6.250	18.000
Blade Server	HP	BL20P G3	Chassis3-03	9X51JTJ87259	1	21	300.000	6.250	18.000
							10,770.000	287.200	1,579.400

Hercules allows users to capture specific data about each asset (tag number, name, location, type, model, etc.) Hercules will then load model specific specifications from a database currently containing over 1500 unique pieces of hardware. The user is then able to run reports that provide vital, quick, and accurate information to the management team regarding total power consumption, costs, and overall increased electricity savings of the Data Center. The figure below depicts a report of a sample rack with the total power consumption for the equipment within the rack.

Using the reporting feature, users are able to calculate the total power consumption and associated costs for the new data center environment.

Hercules captures all of the data required to complete a logical migration. During the discovery period, CSC will capture the build requirements for completing the new environment build out including all hardware, software, infrastructure, and applications. Throughout the Migration Planning period, the Team will use the tool to build out the Move Waves and ensure compatibility for all migrations. Hercules will become ICE's asset management system throughout the

HERCULES INCLUDES PRE-LOADED ASSET SPECIFICATIONS

Extensive data collection efforts at the Dept. of Labor, the Dept. of Homeland Security, and the Dept. of Treasury, yielded data on over 2000 unique pieces of hardware. The Hercules database includes all of the manufacturer specifications for each of these unique assets including size, weight, power consumption, processor capacity, etc. and enables reporting on this full range of data as soon as inventory data is imported.

migration execution. Following the migration effort, data can be downloaded to other asset management and configuration management tools in support of dat center operations, including Remedy. As with any project, there were unknowns that require adaptations by the project team to ensure success of the project. To ensure data accuracy, KPS utilized barcode scanners to help facilitate the data collection process. Both the asset tag and serial number are in a barcode format on all of the equipment present in the Linden Lab hosting facilities. The use of the barcode scanners has since become a requirement for all future datacenter audits/inventories.

As part of the datacenter audit, the Knight Point subject matter experts (SMEs) collected and validated all required data elements by physically looking through each rack on the datacenter floors. It was brought to the attention of the KPS team that many of the devices did not have any asset tags. To ensure data accuracy, Knight Point Systems created asset tags with unique barcodes that were readable from the barcode scanners. After tagging all of the hardware, the information was collected and entered into the KPS asset management tool, Hercules.

Due to the unique technical infrastructure of the Linden Lab environment, it was determined that collecting the inventory using customized COTS software was the most effective and efficient approach. In order to transfer the data from the initial repository to Hercules, KPS wrote Linden Lab specific code to manage the import of data from the initial repository to Hercules. The import tool is available for all future datacenter audits/inventories.

For Linden Labs, Active Asset Management was successfully leveraged to realize a total combined expense savings of nearly $1.5M per year resulting from the network scalability and hosting infrastructure assessment. Knight Point continued to work with Linden Labs to identify, evaluate, and select a collocation facility and managed the migration of all assets. None of this would have been possible without the asset visibility provided by Hercules and the mapping of all technical and logical dependencies among physical assets and applications.