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Comparing the Efficiency of Heterogeneous and Homogeneous Data Center Workloads

Brandon Kimmons

COMPARING THE EFFICIENCY OF HETEROGENEOUS AND HOMOGENEOUS DATA CENTER WORKLOADS

by

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(Under the Direction of Christopher Kadlec)

ABSTRACT

Information Technology, as an industry, is growing very quickly to keep pace with increased data storage and computing needs. Data growth, if not planned or managed correctly, can have larger efficiency implications on your data center as a whole. The long term reduction in efficiency will increase costs over time and increase operational overhead. Similarly, increases in processor efficiency have led to increased system density in data centers. This can increase cost and operational overhead in your data center infrastructure.

This paper proposes the idea that balanced data center workloads are more efficient in comparison to similar levels of data center workloads that are not balanced across the data center facility. Identifying and documenting this effect would enable system architects to better plan data center system expansions and migrations effectively, while keeping in mind the total cost of the data center facility.

I conducted a scale experiment of data center heat job placement and collected data during multiple data runs. The scale experiment apparatus will allow the researchers to directly control the utilization of servers at all times while collecting data. Data collected will include processor utilization as well as the temperatures of both the hot and cold aisles during the entirety of the experimental procedure.

The experimental research hopes to show that the balanced workload has a positive effect on the temperature difference observed across the hot and cold aisle for the balanced workload

tests. A rise in temperature difference would support the conclusion that is proposed by this research.

INDEX WORDS: Data center, Computer cooling, Power efficiency, Job placement, Virtualization, Hypervisors, Compute load, Clustered systems, Systems automation

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CHAPTER 1: INTRODUCTION

In Information Technology, technicians are constantly having to innovate and implement new technology solutions to meet business needs. These new solutions can require special hardware or special services to be installed and supported in the organization's data center facilities. Equipment growth over time contributes to an extremely diverse data center ecosystem. Legacy compute and storage equipment will be installed concurrently with newer and more efficient server architectures creating an unbalanced data center equipment efficiency.

Data centers are defined as purpose built facilities where large amounts of computers and computer storage equipment are co-located to take advantage of shared power, cooling, network infrastructure, and physical security (Barroso and Hölzle 2009). The advantages of data center level computer systems deployment are appealing, however they come at a cost. Data centers have huge appetites for electrical power. In practice, data centers are reaching up to 500 million watts of power usage (Glanz 2012).

DATA CENTER TECHNOLOGY

Data centers house hundreds to thousands of servers in a huge facility. A data center requires several types of components to keep the servers operational:

- CRACs: Computer room air conditioners, are responsible for taking the air heated by the servers and cooling it down and managing the humidity. These devices keep the servers running cool and the humidity at a manageable level.

- Server Racks: racks are the infrastructure that simply hold the servers. They provide a structure to mount and secure your servers and, in co-location facilities, they also provide security by requiring keys or electronic security access to open.
- Network Switching Equipment: Network switches provide the communication and can use several different mediums and topologies. This is a vital component to your data center deployment and will be the lifeline from the outside world to your servers.
- Power Management Equipment: This includes all power equipment required to provide a redundant and smoothed flow of power to the servers in the racks. This includes, Transformers, Automatic Transfer Switches (ATS), Uninterruptible Power Supply (UPS) equipment, and Power Distribution Units (PDU).
- Physical Security: Physical Security is the physical gates, electronic access systems, or physical access systems as well as any security personnel employed by the site.
- Servers: Computers that are advanced and more powerful versions of a desktop computer. They usually contain multiple processors and larger amounts of system memory.

HOT AISLE AND COLD AISLE TECHNOLOGY

To improve efficiency, the industry has been interested in minimizing the cost to cool the data center facility. Need has given rise to the development of Hot Aisle and Cold Aisle containment technology. These are simply data center designs that focus on improving the efficiency of the cooling process in a data center.

Hot Aisle Containment (Figure 1.) is the act of containing the exhaust air from the servers with plenums or other types of air channels. The containment is usually accomplished by arranging the server racks into rows with the hot air output all facing the same channel forming an aisle.

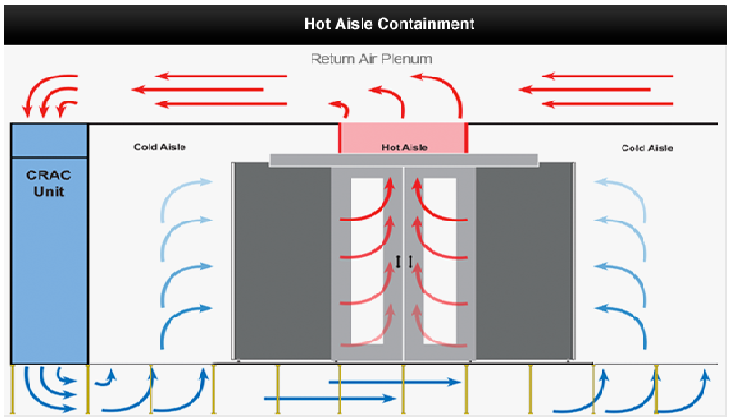

Figure 1: ("Hot Aisle Containment, Which Is Best for Your Company" 2014)

Cold Aisle Containment (Figure 2.) is the opposite of Hot Aisle Containment. Cold Aisle containment uses pathways to contain the cooled air from your CRAC's output and carry it directly to the server racks. The containment limits the mixing of hot and cold air, resulting in increased efficiency of your cooling equipment.

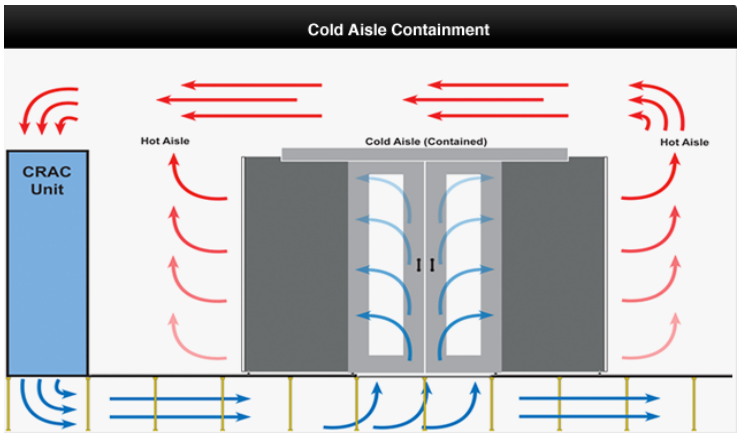

Figure 2: ("Cold Aisle Containment, Which Is Best for Your Company" 2014)

BLANKING PANELS

Blanking panels are a very simple yet, extremely important, data center tool. They attach to the data center racks where you have an empty rack slot. The panels "blank" off that portion of the data center rack and help maintain the separation between hot and cold aisles. Simply put, they keep the cold air where it should be and the hot air where it should be (Chernicoff 2009).

VIRTUALIZATION

Virtualization of server operating systems was originally developed in the early 1960's to handle multiple users on the same mainframe system. Since then, the increased power of server systems has led to the adoption of server virtualization to remove the server operating system from its dependency on hardware (IBM, The Greaves Group 2007).

The increased flexibility provided by virtualization, in the operating load of data centers allows for better efficiency by maximizing the processing load on data center servers. Server utilization rates can and should be around 80%, depending on the redundancy of the infrastructure. ("Performance Best Practices for VMware vSphere 5.5") By using virtualization to maximize the server load, the efficiency of the cooling infrastructure in the data center can be maximized.

Virtualization technology will be used to facilitate the experiment. Virtualization combined with a CPU load balancing tool will allow the replication of the various utilization states described in the methodology.

DATA CENTER EFFICIENCY (PUE)

Data centers are measured by many metrics, but PUE (Figure 3.) is a de-facto industry standard for comparing the efficiency of data center facilities. PUE or power unit effectiveness is

a ratio of the total power consumed by the data center to power consumed by the information technology equipment.

$$PUE = \frac{Total\ Facility\ Energy}{IT\ Equipment\ Energy}$$

Figure 3: PUE (Avelar, Azevedo, and French 2012)

PUE should be as close to 1.0 as possible. However, real world PUE numbers are typically much higher. The average data center has a PUE closer to 3.0. The metric indicates that there is 3 times as much energy cost for facility systems than for actual IT compute systems. Some companies have announced data center PUE numbers below 1.25 and Google has published reports showing that they have an average PUE across all data centers at 1.2.

WHY DOES THIS MATTER?

The impact of virtualization and increased density of IT workloads has created a possibility for decreased efficiency in common data centers. Business pressures to adopt more powerful systems to reduce the physical server footprint have led to the possibility of inefficient cooling systems. The inefficiency is theoretically due to the heterogeneous workloads across server racks, allowing servers that are under-utilized to contribute to lower Hot Aisle temperatures and reduced CRAC efficiency in the data center. Using test data this research hopes to prove that it is more efficient to cool homogeneous datacenter workloads than it is to cool heterogeneous data center workloads as defined by the hypothesis below.

HYPOTHESIS:

HO: It is more efficient to cool homogeneous data center workloads than it is to cool heterogeneous data center workloads using traditional Hot/Cold aisle techniques.

H!: There is no measurable difference in cooling efficiency between homogeneous and heterogeneous data center workloads using traditional Hot/Cold aisle techniques.

CHAPTER 2: LITERATURE REVIEW

Data centers around the globe have been working toward being more energy-efficient and yet, still maintaining the growth needed to keep up with demand for internet services. Newer power-hungry processors have been adopted providing increased compute capacity while adding to the power requirements and heat load generated.

There has also been governmental pressure to reduce carbon emissions due to evidence in support of global warming. The Kyoto Protocol is an international agreement between industrialized nations to reduce greenhouse emissions. It was adopted by the United Nations in 1997, however it was not ratified until 1998 by the United States due to concerns over the effect it would have on the US economy and the "common but differentiated responsibilities" placed on members who produce more greenhouse gasses (Lovett 2005).

BALANCED WORKLOADS

Warehouse-scale computing systems have been researched and optimized to reduce costs across the entire data center architecture. Google, Inc. is a leader in the technology industry and in data center design and implementation. They have documented and shared some of their findings for developing the most efficient data centers in the world. Google deploys warehouse-scale computing systems to serve out services such as Gmail and Google search. These applications are massive in scale and rely on many servers across their data center facilities to operate. It is this system similarity that gives them an advantage in cooling these systems.

Due to the large-scale operations and application of redundancy in software, Google has developed a server load that can dynamically balance itself and maintain high server utilization on a large number of systems. High server utilization helps keep the server load uniform,

improving efficiency. Google has been very successful at creating these efficiencies when working with balanced warehouse-scale loads, currently reporting a 12 month trailing average PUE of 1.12 ("Efficiency: How We Do It – Data Centers – Google" 2014). Essentially, on average, all Google data centers are only using 12% additional power for overhead and support equipment.

This research investigates the cooling efficiency of both heterogeneous and homogeneous workloads. Google has created competitive advantage by increasing efficiency in their production data centers. The efficiency is due to the balanced nature of the warehouse-scale workloads described above. Similarly, Google dedicated resources to evaluating the inefficiencies of the smaller, more heterogeneous, workloads. In this paper heterogeneous and homogeneous workloads will be replicated and evaluated as to their effects on cooling efficiency.

POWER DESIGNS FOR BALANCED SYSTEMS AT GOOGLE, INC.

Research done by Google, in the power provisioning of warehouse-scale computers, points out several key issues with the efficiency of data center power systems at warehouse-scale (Fan, Weber, and Barroso 2007).

- Staged Deployment
    - It is highly unlikely that a data center that operates at scale will be fully populated during its initial construction. The building out delay means that the power equipment in place cannot run at efficient levels until the data center facility has completed the roll out of its systems.
- Fragmentation

    - Half rack deployments may add up to a cumulative waste of power that can be substantial at the large scale deployments.
- Conservative Equipment Ratings
    - Google has found that traditionally the labels for servers and systems are overstating the power draw actually required. Manufacturers are using the maximum peak power draw of the power supply unit, instead of the actual peak power draw of the supported components.
- Variable Load
    - The load of an individual server in a data center can vary drastically as it spins up and down in response to cluster jobs.
- Statistical Effects
    - It is increasingly unlikely that all systems will be at maximum power draw at all times. This effect goes up with the number of servers (Fan, Weber, and Barroso 2007).

This research looks into the variable load and statistical effects and their effect on the cooling infrastructure. The relative imbalance of these servers, at idle, will contribute to the waste of cooled air, from the cold aisle, being cycled to the Hot Aisle, without cooling any components significantly.

UNBALANCED WORKLOADS

Smaller data centers and co-location facilities will undoubtedly have more unbalanced workloads running in their facilities. The imbalance may be due to legacy computer systems that are required for the organization. It may also be due to unstructured growth and lack of long-

term planning by data center managers. Unbalanced workloads may also be the result of physically segmenting customers into different areas of the data center. Physical separation happens frequently with data center co-location facilities where companies lease rack space to run their own equipment. When this happens, the data center manager has little control over the utilization or functionality in the leased spaces.

This research will look into the impact that unbalanced loads have on data center efficiency. This will be accomplished by analyzing unbalanced workloads and comparing them to balanced workloads while monitoring the temperatures generated under various load scenarios.

SMALLER DATA CENTER LOCATIONS AT GOOGLE, INC.

Smaller facilities often house many different systems for their owners. These systems can have a more diverse load on the data center facilities. Older legacy systems may take up large amounts of rack space, and due to their older slower processors, they will contribute less to the heat generated in the data center. These diverse loads can create cold spots in your Hot Aisle.

As smaller facilities grow, they often will purchase the most efficient hardware that is available at the time. The effect over a series of purchases is that the heat load generated by the equipment may be vary vastly.

Google, while known for their warehouse-scale data center clusters, has a network of POPs or Point of Presence. POPs are smaller scale facilities located strategically to augment the larger data center facilities in Google's network. These facilities were analyzed by Google and found to be inefficient, reporting a PUE of 2.4 (Kava 2011).

Google uses these data centers in a different way than the large warehouse-scale facilities. These POPs use commonly available industry equipment and are often located within

data centers with other customers. The variable infrastructure led them to a higher level of variability and thus a less efficient data center. Google was able to move forward with a project to overhaul the facilities where their POPs were located. Google was able to obtain a PUE of 1.4 (Kava 2011) which is a significant improvement. It is still is not as efficient as their more balanced warehouse-scale workloads.

The attention to unbalanced workloads and the impact on efficiency is similar in functionality to the research described here. However, this research will be looking at the efficiencies that are lost by loading the data center with unbalanced workloads. By determining the effect, if any, of unbalanced workloads on the hot and cold aisle temperatures, this research hopes to be able to make a statement about the efficiency of that particular workload pattern.

CO-LOCATION FACILITIES

In traditional co-location facilities, an organization will lease space in a data center that is secured and allocated to them for use, as they see fit. Co-location causes problems for data center efficiency as the equipment is functionally separated from the management of the data center facility. Co-location can result in older inefficient systems that hurt overall data center efficiency.

Co-location facilities create a scenario where the data center management may have little oversight into the actual load of each server in the co-location rack. By investigating the potential effects of this unbalanced workload this research hopes to make a prediction about the efficiency of a balanced and unbalanced workloads.

DYNAMIC THERMAL MANAGEMENT AT HEWLETT-PACKARD LABS

Some work has been done in the area of managing server loads via software. HP laboratories released a study on thermal load balancing (Sharma et al. 2005) where they

described a system that dynamically allocated new data center workload to servers that can sustain the additional workload and still satisfy the power multiplier defined for that particular machine.

The approach was successful in reducing the temperature observed by the data center while maintaining a similar workload. This research will work to confirm this theory by evaluating the temperature of the hot and cold aisle while managing the workload manually. The research apparatus is also much smaller than a full scale datacenter and will provide more flexibility in the data collection process.

DYNAMIC JOB PLACEMENT AT HEWLETT-PACKARD LABS

Hewlett-Packard conducted an experiment where they were able to isolate a complete wing of the research data center and manipulate the data center load. This gave them the ability to test the theory about moving workloads to more cooling efficient areas of the data center. (Cullen Bash 2007)

The results were skewed slightly due to the limitations of the hardware they had installed in the research data center but they did conclude that significant savings could be achieved by actively managing your job load locations. This paper will explore the same effects however, it will be on a smaller scale.

RACK LEVEL CONTAINMENT AT UNIVERSITY OF TEXAS AT ARLINGTON.

Research has also been completed on effectively containing the cold air entering the front of a data center rack (Onyiorah et al. 2014). Researchers completed a computational fluid dynamics study of a digitally modeled data center to determine the benefits of using rack chimneys to contain the cold aisle air entering the front of a server rack. It was found that usage of these chimneys to contain the hot and cold side of a server rack had a benefit over simple open

designs. These rack level systems also contributed to more favorable supply and return air temperatures. This style of containment may be beneficial for co-location facilities where traditional hot and cold aisle techniques may not be possible (Onyiorah et al. 2014).

This research will expand on the efficiencies observed by containing the cold aisle down to the rack level. The outcomes of our data collection procedures will work to confirm the efficiency benefits observed by the researchers above. This research also hopes to expand upon those findings by showing balanced workloads are more efficient without the use of rack mounted chimneys.

SERVER VIRTUALIZATION AT IBM AND VMWARE, INC.

Server virtualization is the act of abstracting the hardware into a set of software defined attributes. The development of virtualization for server technology has drastically changed how we manage our systems and infrastructure. Virtualization creates a logical representation of a computer at a software level (IBM, The Greaves Group 2007).

On the server level virtualization provides a system administrator with the ability to run multiple operating systems on one set of physical hardware. Virtualization lets the aggregate workload of all systems to be more efficient. Virtualization also allows for various types of backup and recovery systems to be implemented via the new paradigm. Servers are represented as software and may be backed up and restored similarly. This flexibility has allowed many IT consumers to reduce the physical servers needed to operate their infrastructure. However, in reducing the number of physical servers, they may have accidently created hot spots in their respective data center environments.

Virtualization is a tool that can improve efficiency in your data center when you right-size your environment to suit your actual compute needs. If the environment is not right-sized, then you may see little to no gain in efficiency in your data center environment.

Virtualization has an additional benefit toward the power efficiency of a data center. The compartmentalization of diverse operating systems, into a standardized set of files, makes it substantially easier to balance the workload from diverse systems. The result of this means that a traditionally difficult-to-balance legacy system can be easily incorporated into a balanced data center design.

This research will use virtualization to abstract the compute load for migration of systems to simulate a balanced and unbalanced load. Flexibility is a driving factor in the data center ecosystem today. Workloads can be dynamically and procedurally placed inside the facility according to the data center management's needs. This research will show that by leveraging virtualization to balance workloads across servers, data center managers could increase efficiency in the data center.

CHAPTER 3: METHODOLOGY

EXPERIMENT SETUP

The experiment requires the control of both the hot and cold aisle as well as the compute load that is operational on the system. To satisfy these requirements and maintain feasibility, a ¼ height server rack was selected. The servers were loaded with VMware ESXi 5.5 Hypervisor to facilitate the operation of a specialized Linux virtual machine. The Ubuntu 14.04 VM was modified to boot and immediately launch a CPU load testing program. The configuration allowed the management of the tests below to be administered via VMware vSphere 5.

After the installation of the VMware vSphere 5 Hypervisor, The servers were connected to the cluster utilizing VMware's PowerCLI interface to execute scripts off of the cluster as a whole. This allowed the quick deployment of the required CPU worker VMs using the script in Appendix A. PowerCLI was also used to manage the workload between data runs. By powering on the required CPU workers using the script in Appendix B. This required managing an inventory of the CPU workers and using this inventory to power on and off the VMS via the scripts located in Appendix B and C.

The mini rack was modified to have a contained air inlet and air outlet. These air inlets provided us with the measurement points while the containment mimics the real world application of Hot Aisle and cold aisle data center technology. This setup allowed us to make reasonable inferences about larger data center deployments. Figure 4. is a logical rendering to visually explain the apparatus. Figure 5. is an image of the apparatus once assembled.

DATA COLLECTION APPARATUS

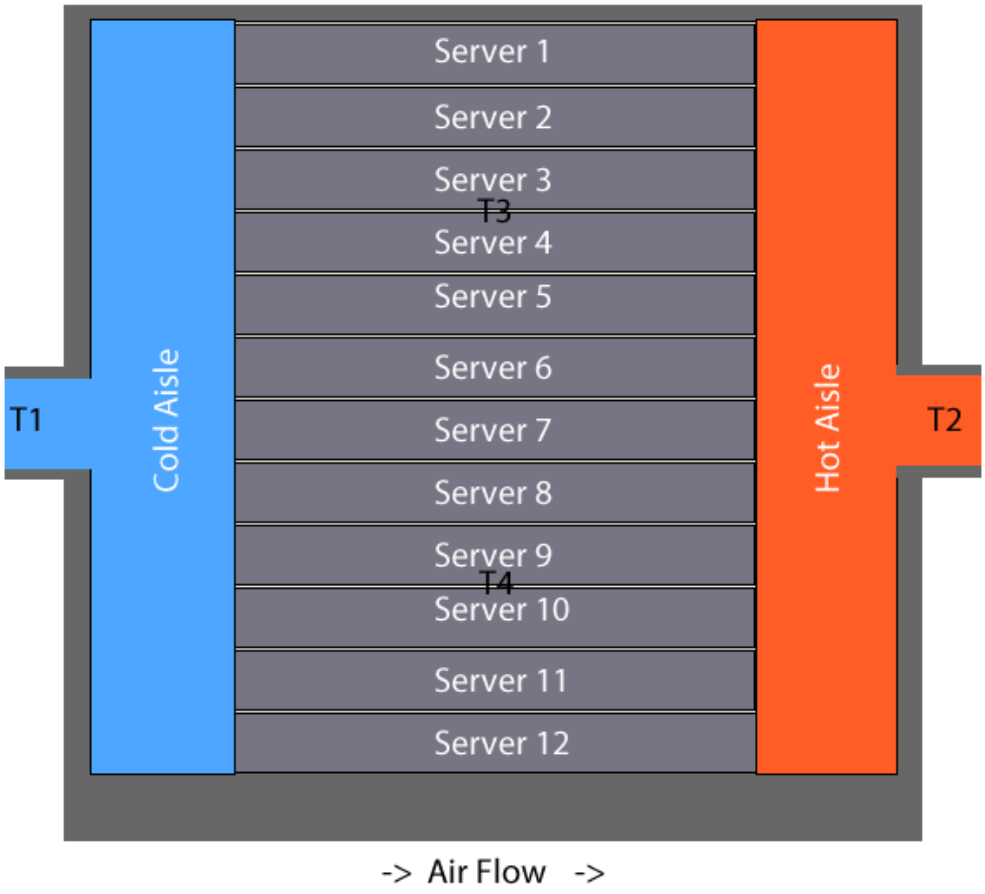

Figure 4: Test Apparatus, Temp Measuring Points Shown as T1,T2,T3, and T4

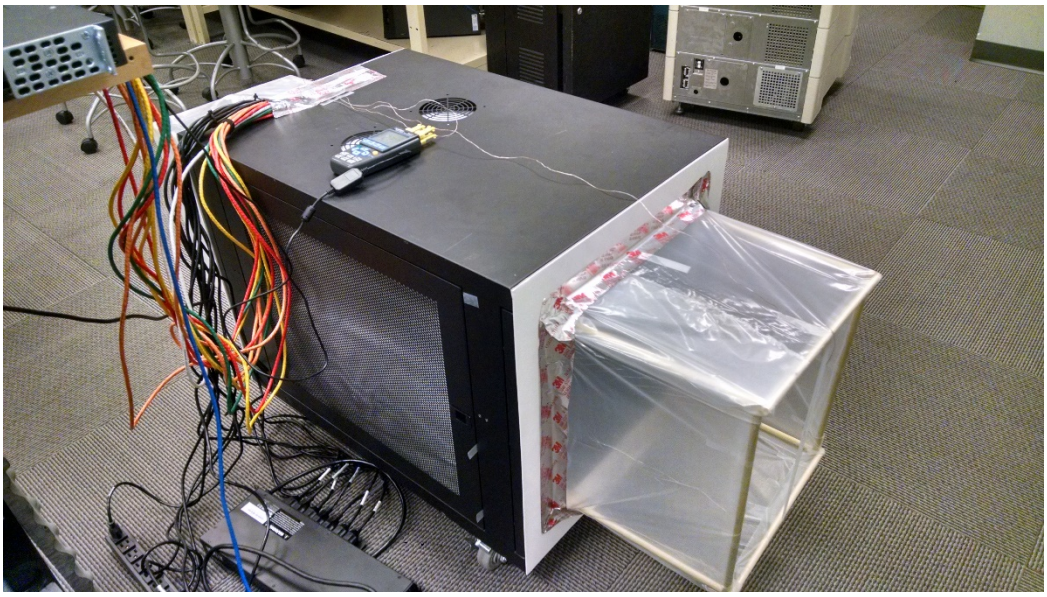

Figure 5: Test Apparatus Assembled for Data Collection

Temperature data was logged to a laptop running Temp Monitor_S2 version 1.0.19 connected to an Omega HH147U USB Data Logger Thermometer that reads 4 type K thermocouples. This device can measure temperatures between -100 degrees Celsius and 1300 degrees Celsius with an accuracy of .1% +0.7 degrees Celsius.

Figure 6: Omega HH147U Thermometer

DATA VARIABLES

The data parameters collected are listed below:

- TimeStamp: This parameter was collected to serve as a primary key for joining of the collected data for comparison.
- Input Temperature (T1): This parameter is the observed temperature on the air input or "cold aisle" as shown in Figure 4.
- Output Temperature (T2): This parameter is the observed temperature on the air output or "Hot Aisle" as shown in Figure 4.
- Core Top Temperature (T3): This parameter is the observed temperature inside the server stack between servers 3 and 4 as shown in Figure 4.
- Core Bottom Temperature (T4): This parameter is the observed temperature inside the server stack between servers 9 and 10 as shown in Figure 4.
- Server 1-12 processor utilization %: This is a measure of the processor utilization for each server included in the mini rack apparatus.
- Average Utilization: This is a calculated variable that measures the utilization of the cluster as a whole.

During each test run, the data was logged and collected then joined on the TimeStamp variable to produce a table of data for analysis.

DETERMINE RUN TIME LENGTH

The data collection process requires the apparatus to reach a stable state for both the input and output temperatures so that the measurements will be a representative of systems that are

operational 100% of the time. The time required to reach a stable state was established by running the apparatus at idle and recording the temperatures during a 4-hour period. The temperature was charted and visually analyzed. It was determined that a run time of 30 minutes provided adequate stability of temperature measurements. All temperatures were collected in degrees Celsius.

DATA COLLECTION RUNS

Six data runs were run for a 30 minute time period. After each data collection run the apparatus was allowed to cool to a stable temperature, usually around 32 degrees Celsius.

DATA COLLECTION RUN 1 (IDLE STATE)

This data collection run establishes a baseline of the change in air temperature from air pulled through servers running at idle CPU utilization. Observed values were collected and are shown in Table 1.

DATA COLLECTION RUN 2 (MAX STATE)

This data collection run establishes a baseline of the change in air temperature from air pulled through servers running at maximum CPU utilization. Observed values were collected and are shown in Table 2.

DATA COLLECTION RUN 3 (BALANCED 50% UTILIZATION)

During this data collection run, server utilization is limited to 50% utilization on all servers to produce a balanced load that is capable of being replicated in an unbalanced state. Workload was controlled by manually placing 50% loads on each server. Observed values were collected and are shown in Table 3.

DATA COLLECTION RUN 4 (UNBALANCED 50% UTILIZATION AT TOP)

During this data collection run, server utilization is limited to 50% total server utilization. This level of utilization is accomplished by 50% of servers running at 100% utilization and 50% of servers running at idle. Workload was controlled by manually placing jobs on the top 6 servers. Observed values were collected and are shown in Table 4.

DATA COLLECTION RUN 5 (UNBALANCED 50% SPLIT)

During this data collection run, server utilization is limited to 50% total server utilization. This level of utilization is accomplished by 50% of servers running at 100% utilization and 50% of servers running at idle. Workload was controlled by manually placing the jobs on the top 3 and bottom 3 servers. Observed values were collected and are shown in Table 5.

DATA COLLECTION RUN 6 (UNBALANCED 50% AT BOTTOM)

During this data collection run, server utilization is limited to 50% total server utilization. This level of utilization is accomplished by 50% of servers running at 100% utilization and 50% of servers running at idle. Work load was split by placing the workload on the bottom 6 servers. Observed values were collected and are shown in Table 6.

ANALYSIS METHODS

Once the data was collected. Using Microsoft Excel 2013, the temperature data was joined with the processor utilization table by matching the timestamps of the measurements.

Once the merged data sets were created, the data was charted to look for variance in the individual data runs. The scale and colors used in the charts were standardized for each data run

to allow quick visual analysis between the data runs. Then a difference analysis was conducted that involved comparing the Run 3 to Runs 4, 5, and 6 across all temperatures sensors.

CHAPTER 4: RESULTS AND ANALYSIS

Per the methodology, the data was collected and joined on the timestamp variable. The results of the individual runs are shown in the following Tables.

DATA COLLECTION RUN 1

Table 1: Data Collection Run 1 (Idle)

Run 1	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
9:53:40 AM	#N/A	#N/A	#N/A	#N/A	1.83	6.35	10.56	1.32	0.26	0.28	0.53	0.72	0.25	0.38	0.6	0.43	0.26
9:54:00 AM	#N/A	#N/A	#N/A	#N/A	0.46	0.45	0.76	0.72	0.45	0.54	0.36	0.53	0.44	0.26	0.25	0.51	0.25
9:54:20 AM	#N/A	#N/A	#N/A	#N/A	0.42	0.37	0.25	0.46	0.66	0.26	0.45	0.27	0.56	0.46	0.29	0.45	0.56
9:54:40 AM	#N/A	#N/A	#N/A	#N/A	0.51	0.26	0.37	0.26	0.64	0.45	0.51	0.37	0.24	0.83	0.71	0.41	1.08
9:55:00 AM	#N/A	#N/A	#N/A	#N/A	0.53	0.64	0.48	1.01	0.51	0.51	0.29	0.26	0.25	0.51	0.89	0.53	0.43
9:55:20 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.57	0.49	0.38	0.25	0.27	0.27	0.53	0.68	0.27	0.28	0.52	0.78
9:55:40 AM	#N/A	#N/A	#N/A	#N/A	0.54	0.44	0.73	0.4	0.26	0.28	0.81	0.48	0.62	0.45	0.49	1.29	0.26
9:56:00 AM	#N/A	#N/A	#N/A	#N/A	0.60	0.45	0.36	0.27	0.61	0.94	0.79	0.85	0.25	0.48	0.26	0.34	1.58
9:56:20 AM	#N/A	#N/A	#N/A	#N/A	0.41	0.25	0.25	0.37	0.9	0.57	0.27	0.26	0.48	0.25	0.42	0.55	0.38
9:56:40 AM	#N/A	#N/A	#N/A	#N/A	0.49	0.46	0.42	0.43	0.62	0.29	0.5	0.54	0.23	0.77	0.36	1.02	0.27
9:57:00 AM	#N/A	#N/A	#N/A	#N/A	0.51	0.65	0.51	0.62	0.92	0.5	0.25	0.51	0.66	0.26	0.25	0.34	0.69
9:57:20 AM	#N/A	#N/A	#N/A	#N/A	0.41	0.4	0.34	0.69	0.25	0.27	0.45	0.26	0.36	0.44	0.45	0.46	0.51
9:57:40 AM	#N/A	#N/A	#N/A	#N/A	0.45	0.74	0.65	0.41	0.43	0.44	0.38	0.37	0.37	0.36	0.49	0.36	0.44
9:58:00 AM	#N/A	#N/A	#N/A	#N/A	0.58	1.57	1.48	0.56	0.38	0.38	0.39	0.52	0.25	0.25	0.51	0.34	0.27
9:58:20 AM	#N/A	#N/A	#N/A	#N/A	0.49	0.54	0.41	0.4	0.67	0.47	0.65	0.43	0.67	0.27	0.26	0.69	0.36
9:58:40 AM	#N/A	#N/A	#N/A	#N/A	0.38	0.52	0.26	0.26	0.4	0.26	0.51	0.39	0.25	0.52	0.37	0.48	0.28
9:59:00 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.36	0.35	0.27	0.5	0.68	0.42	0.28	0.52	0.49	0.25	0.35	0.76
9:59:20 AM	#N/A	#N/A	#N/A	#N/A	0.47	0.48	0.25	0.43	0.41	0.28	0.27	0.87	0.35	0.53	0.81	0.45	0.51
9:59:40 AM	#N/A	#N/A	#N/A	#N/A	0.45	0.56	0.47	0.57	0.26	0.29	0.36	0.55	0.23	0.46	0.8	0.54	0.28
10:00:00 AM	#N/A	#N/A	#N/A	#N/A	0.52	0.36	0.52	0.27	0.39	0.37	0.25	0.99	0.76	0.69	0.68	0.76	0.25
10:00:20 AM	#N/A	#N/A	#N/A	#N/A	0.48	0.25	0.25	0.37	0.25	0.47	0.88	0.3	0.49	0.44	0.28	0.87	0.88

Run 1	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
10:00:40 AM	#N/A	#N/A	#N/A	#N/A	0.47	0.26	0.51	0.27	0.69	0.57	0.91	0.37	0.27	0.52	0.35	0.47	0.46
10:01:00 AM	#N/A	#N/A	#N/A	#N/A	0.57	0.71	0.28	0.25	0.5	1.2	0.28	0.28	0.26	1.17	0.86	0.7	0.34
10:01:20 AM	#N/A	#N/A	#N/A	#N/A	0.94	0.43	0.49	1.23	0.28	0.3	0.26	0.44	0.61	0.26	4.94	0.63	1.4
10:01:40 AM	#N/A	#N/A	#N/A	#N/A	2.83	0.91	0.45	0.66	0.66	0.27	0.79	0.45	0.24	0.39	28.49	0.36	0.33
10:02:00 AM	#N/A	#N/A	#N/A	#N/A	2.61	0.37	0.25	0.27	0.45	0.95	0.42	0.82	0.69	0.45	25.85	0.33	0.42
10:02:20 AM	#N/A	#N/A	#N/A	#N/A	2.74	0.27	0.38	0.81	0.43	0.26	0.59	0.66	0.48	0.26	27.98	0.46	0.33
10:02:40 AM	#N/A	#N/A	#N/A	#N/A	0.94	0.44	0.24	0.48	1.22	0.48	0.54	0.54	0.25	0.52	5.58	0.6	0.38
10:03:00 AM	#N/A	#N/A	#N/A	#N/A	0.49	0.44	0.42	0.27	0.6	0.52	0.25	0.59	0.74	0.27	1.02	0.47	0.26
10:03:20 AM	#N/A	#N/A	#N/A	#N/A	0.52	0.24	0.78	1.32	0.26	0.25	0.42	0.26	0.35	0.54	0.84	0.45	0.54
10:03:40 AM	#N/A	#N/A	#N/A	#N/A	0.78	1.32	0.4	0.47	0.45	0.43	0.36	0.37	0.33	0.48	3.82	0.35	0.54
10:04:00 AM	#N/A	#N/A	#N/A	#N/A	4.24	16.16	1.51	0.55	0.37	0.37	0.25	0.4	0.35	0.28	29.9	0.45	0.25
10:04:20 AM	#N/A	#N/A	#N/A	#N/A	15.55	21.19	52.8	25.67	20.02	0.92	0.26	0.9	0.5	0.26	63.18	0.64	0.27
10:04:40 AM	#N/A	#N/A	#N/A	#N/A	25.21	28.72	100	20.23	12.09	24.99	15.6	1.23	0.41	0.51	97.79	0.59	0.39
10:05:00 AM	#N/A	#N/A	#N/A	#N/A	29.57	16.98	100	32.49	18.19	16.74	30.82	12.36	11.04	0.72	100	15.1	0.37
10:05:20 AM	#N/A	#N/A	#N/A	#N/A	33.19	6.02	100	11.14	26.88	28.84	24.91	37.81	24.64	18.54	100	18.05	1.44
10:05:40 AM	#N/A	#N/A	#N/A	#N/A	29.32	1.24	100	1.82	8.28	13.76	17.91	27.05	20.6	15.56	100	20.74	24.87
10:06:00 AM	#N/A	#N/A	#N/A	#N/A	27.74	1.1	100	1	2.21	4.82	3.36	14.48	25.34	31.97	100	27.42	21.18
10:06:20 AM	#N/A	#N/A	#N/A	#N/A	23.08	10.68	100	0.99	0.93	0.88	0.98	3.56	7.08	12.68	100	7.25	31.93
10:06:40 AM	#N/A	#N/A	#N/A	#N/A	24.35	40.5	100	19.21	6.47	1.03	1.53	1.32	0.83	7.15	100	4.9	9.23
10:07:00 AM	#N/A	#N/A	#N/A	#N/A	32.82	66.76	100	49.68	37.66	22.79	9.09	3.5	1.13	0.91	100	1.38	0.94
10:07:20 AM	#N/A	#N/A	#N/A	#N/A	45.53	97.09	100	79.99	53.43	48.24	39.34	14.76	0.92	0.82	100	10.67	1.09
10:07:40 AM	#N/A	#N/A	#N/A	#N/A	56.27	100	100	100	76.65	72.26	71.36	34.11	26.86	17.95	40.98	34	1.08
10:08:00 AM	#N/A	#N/A	#N/A	#N/A	69.67	100	100	100	100	100	100	64.45	61.59	36.01	0.76	52.02	21.2
10:08:20 AM	#N/A	#N/A	#N/A	#N/A	79.32	100	100	100	100	100	100	100	84.89	57.29	0.25	58.2	51.23
10:08:40 AM	#N/A	#N/A	#N/A	#N/A	88.48	100	100	100	100	100	100	100	98.93	84.79	0.52	98.4	79.11

Run 1	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
10:09:00 AM	#N/A	#N/A	#N/A	#N/A	91.70	100	100	100	100	100	100	100	100	100	0.44	100	100
10:09:20 AM	#N/A	#N/A	#N/A	#N/A	91.69	100	100	100	100	100	100	100	100	100	0.33	100	100
10:09:40 AM	#N/A	#N/A	#N/A	#N/A	91.73	100	100	100	100	100	100	100	100	100	0.81	100	100
10:10:00 AM	#N/A	#N/A	#N/A	#N/A	91.30	94.46	100	100	100	100	100	100	100	100	1.11	100	100
10:10:20 AM	#N/A	#N/A	#N/A	#N/A	77.40	17.44	58.44	68.21	84.32	100	100	100	100	100	0.34	100	100
10:10:40 AM	#N/A	#N/A	#N/A	#N/A	53.48	0.27	1.5	1.83	8.93	48.07	86.38	100	100	100	0.26	94.52	100
10:11:00 AM	#N/A	#N/A	#N/A	#N/A	26.41	0.72	0.32	0.34	0.57	0.98	9.47	37.04	55.62	93.28	0.45	18.16	100
10:11:20 AM	#N/A	#N/A	#N/A	#N/A	5.89	0.25	0.35	0.38	0.53	0.71	0.25	0.41	0.6	19.03	0.24	0.44	47.51
10:11:40 AM	#N/A	#N/A	#N/A	#N/A	0.49	0.48	0.38	0.92	0.53	0.25	0.51	0.45	0.24	0.7	0.57	0.35	0.55
10:12:00 AM	#N/A	#N/A	#N/A	#N/A	0.51	0.6	0.42	0.76	0.52	0.51	0.3	0.81	0.66	0.38	0.43	0.52	0.26
10:12:20 AM	#N/A	#N/A	#N/A	#N/A	0.43	0.51	0.72	0.7	0.29	0.39	0.41	0.26	0.55	0.27	0.25	0.51	0.34
10:12:40 AM	#N/A	#N/A	#N/A	#N/A	0.46	0.33	0.24	0.35	0.38	0.58	0.52	0.44	0.59	0.6	0.27	0.71	0.54
10:13:00 AM	#N/A	#N/A	#N/A	#N/A	0.51	0.53	0.25	0.41	0.75	0.58	0.66	0.89	0.31	0.52	0.53	0.43	0.27
10:13:20 AM	#N/A	#N/A	#N/A	#N/A	0.49	0.43	0.73	0.64	0.38	0.54	0.32	0.5	0.49	0.41	0.26	0.64	0.54
10:13:40 AM	#N/A	#N/A	#N/A	#N/A	0.45	0.65	0.55	0.39	0.25	0.34	0.33	0.51	0.57	0.36	0.38	0.54	0.51
10:14:00 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.37	0.26	0.57	0.26	0.36	0.62	0.47	0.31	0.71	0.35	0.42	0.55
10:14:20 AM	#N/A	#N/A	#N/A	#N/A	0.42	0.32	0.34	0.37	0.52	0.43	0.24	0.25	0.48	0.35	0.74	0.46	0.51
10:14:40 AM	#N/A	#N/A	#N/A	#N/A	0.33	0.25	0.29	0.25	0.25	0.25	0.24	0.37	0.29	0.4	0.43	0.51	0.38
10:15:00 AM	#N/A	#N/A	#N/A	#N/A	0.49	0.54	0.52	0.44	0.33	0.51	0.49	0.49	0.3	0.63	0.62	0.8	0.26
10:15:20 AM	#N/A	#N/A	#N/A	#N/A	0.40	0.25	0.36	0.37	0.44	0.33	0.49	0.27	0.53	0.26	0.28	0.52	0.66
10:15:40 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.41	0.63	0.4	0.58	0.26	0.68	0.37	0.26	0.46	0.38	0.35	0.53
10:16:00 AM	#N/A	#N/A	#N/A	#N/A	0.43	0.36	0.24	0.27	0.43	0.78	0.37	0.44	0.25	0.76	0.52	0.36	0.43
10:16:20 AM	#N/A	#N/A	#N/A	#N/A	0.39	0.42	0.34	0.6	0.37	0.28	0.25	0.26	0.49	0.27	0.66	0.47	0.28
10:16:40 AM	#N/A	#N/A	#N/A	#N/A	0.41	0.32	0.45	0.25	0.51	0.25	0.25	0.53	0.41	0.41	0.25	0.94	0.36
10:17:00 AM	#N/A	#N/A	#N/A	#N/A	0.39	0.35	0.24	0.26	0.25	0.52	0.53	0.53	0.65	0.37	0.35	0.35	0.26

Run 1	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
10:17:20 AM	#N/A	#N/A	#N/A	#N/A	0.43	0.29	0.37	0.64	0.56	0.42	0.45	0.34	0.34	0.44	0.25	0.47	0.58
10:17:40 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.4	0.38	0.41	0.74	0.58	0.25	0.37	0.23	0.26	0.58	0.71	0.35
10:18:00 AM	#N/A	#N/A	#N/A	#N/A	0.39	0.54	0.4	0.43	0.25	0.37	0.35	0.57	0.24	0.43	0.36	0.54	0.25
10:18:20 AM	#N/A	#N/A	#N/A	#N/A	0.38	0.24	0.35	0.44	0.6	0.26	0.26	0.27	0.66	0.28	0.26	0.46	0.48
10:18:40 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.6	0.28	0.25	0.27	0.27	0.7	0.37	0.24	0.59	0.88	0.49	0.36
10:19:00 AM	#N/A	#N/A	#N/A	#N/A	0.41	0.36	0.24	0.26	0.45	0.72	0.49	0.26	0.55	0.36	0.36	0.36	0.51
10:19:20 AM	#N/A	#N/A	#N/A	#N/A	0.49	0.32	0.35	0.54	0.49	0.26	0.53	0.83	0.35	0.69	0.43	0.47	0.61
10:19:40 AM	#N/A	#N/A	#N/A	#N/A	0.45	0.49	0.56	0.39	0.24	0.37	0.24	0.55	0.41	0.27	0.68	0.86	0.38
10:20:00 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.37	0.25	0.27	0.78	0.38	0.36	0.39	0.24	0.72	0.61	0.61	0.25
10:20:20 AM	#N/A	#N/A	#N/A	#N/A	0.46	0.26	0.36	0.37	0.35	0.43	0.42	0.28	0.47	0.74	0.28	0.55	1.02
10:20:40 AM	21.9	32.4	33.5	33.8	0.43	0.62	0.49	0.33	0.43	0.27	0.53	0.37	0.26	0.41	0.49	0.5	0.45
10:21:00 AM	21.8	32.3	33.5	33.6	0.44	0.61	0.35	0.44	0.27	0.78	0.52	0.46	0.24	0.39	0.44	0.53	0.25
10:21:20 AM	21.9	32.5	33.3	33.4	0.46	0.61	0.54	0.36	0.51	0.71	0.24	0.35	0.8	0.26	0.28	0.47	0.36
10:21:40 AM	21.9	32.5	33.2	33.3	0.49	0.41	0.39	0.75	0.51	0.27	0.63	0.45	0.36	0.46	0.4	0.78	0.42
10:22:00 AM	21.9	32.4	33.1	33.1	0.50	0.36	0.25	0.37	0.76	1.08	0.44	0.65	0.48	0.37	0.36	0.4	0.42
10:22:20 AM	22.1	32.5	33	33	0.43	0.28	0.37	0.73	0.45	0.25	0.25	0.26	0.38	0.69	0.43	0.47	0.56
10:22:40 AM	21.8	32.4	32.9	32.9	0.45	0.42	0.43	0.63	0.26	0.25	0.24	0.53	0.52	0.4	0.64	0.67	0.36
10:23:00 AM	21.9	32.2	32.7	32.7	0.35	0.51	0.28	0.35	0.25	0.5	0.5	0.28	0.25	0.37	0.37	0.33	0.25
10:23:20 AM	21.9	32.1	32.7	32.7	0.45	0.25	0.85	0.56	0.49	0.44	0.43	0.26	0.47	0.46	0.25	0.45	0.44
10:23:40 AM	21.9	32	32.6	32.6	0.46	0.64	0.38	0.49	0.43	0.26	0.71	0.52	0.35	0.3	0.58	0.36	0.51
10:24:00 AM	22	32.1	32.4	32.3	0.47	0.45	0.24	0.53	0.87	0.64	0.36	0.67	0.25	0.37	0.35	0.62	0.25
10:24:20 AM	21.9	32	32.3	32.4	0.37	0.34	0.52	0.46	0.36	0.29	0.26	0.26	0.55	0.26	0.27	0.57	0.27
10:24:40 AM	22	31.9	32.2	32.3	0.39	0.26	0.24	0.43	0.35	0.29	0.43	0.36	0.35	0.61	0.28	0.51	0.59
10:25:00 AM	22.1	32	32.1	32.2	0.46	0.31	0.25	0.35	0.43	0.68	0.51	0.26	0.25	0.72	0.69	0.6	0.42
10:25:20 AM	22	32.1	32.1	32.1	0.38	0.36	0.49	0.46	0.5	0.25	0.25	0.27	0.27	0.27	0.45	0.46	0.51

Run 1	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
10:25:40 AM	21.9	31.7	32	32	0.50	0.56	0.8	0.66	0.25	0.27	0.52	0.6	0.65	0.27	0.39	0.53	0.5
10:26:00 AM	22	31.8	31.9	31.9	0.44	0.27	0.24	0.36	0.28	1.13	0.7	0.42	0.42	0.39	0.36	0.43	0.24
10:26:20 AM	21.9	31.8	31.8	31.8	0.39	0.38	0.35	0.46	0.55	0.3	0.42	0.27	0.38	0.45	0.25	0.46	0.43
10:26:40 AM	21.8	31.8	31.7	31.8	0.46	0.25	0.24	0.35	0.7	0.42	0.26	0.37	0.35	0.48	0.43	0.92	0.77
10:27:00 AM	21.8	31.7	31.7	31.6	0.46	0.52	0.26	0.8	0.25	0.49	0.5	0.52	0.49	0.37	0.68	0.37	0.25
10:27:20 AM	22	31.8	31.6	31.6	0.49	0.55	0.73	0.71	0.49	0.25	0.25	0.43	0.41	0.27	0.25	1.31	0.26
10:27:40 AM	21.9	31.7	31.5	31.5	0.38	0.41	0.37	0.52	0.26	0.25	0.33	0.37	0.58	0.26	0.38	0.35	0.52
10:28:00 AM	21.6	31.7	31.5	31.4	0.44	0.25	0.25	0.35	0.35	0.55	0.81	0.65	0.24	0.55	0.45	0.35	0.42
10:28:20 AM	21.8	31.6	31.4	31.4	0.38	0.36	0.34	0.46	0.78	0.32	0.26	0.26	0.37	0.27	0.44	0.5	0.24
10:28:40 AM	21.7	31.7	31.4	31.3	0.50	0.7	0.41	0.52	0.83	0.26	0.63	0.56	0.35	0.48	0.26	0.66	0.35
10:29:00 AM	21.8	31.7	31.3	31.2	0.39	0.26	0.27	0.64	0.25	0.51	0.5	0.26	0.67	0.37	0.35	0.35	0.3
10:29:20 AM	21.8	31.5	31.4	31.2	0.47	0.48	0.39	0.46	0.49	0.27	0.42	0.52	0.24	0.73	0.59	0.46	0.6
10:29:40 AM	21.7	31.6	31.3	31.1	0.45	0.39	0.38	0.58	0.42	0.44	0.26	0.37	0.7	0.27	0.55	0.38	0.7
10:30:00 AM	21.7	31.5	31.1	31	0.46	0.5	0.26	0.53	0.27	0.37	0.42	0.46	0.25	0.71	0.88	0.6	0.24
10:30:20 AM	21.8	31.5	31.1	31	0.47	0.45	0.52	0.46	0.35	0.76	0.25	0.44	0.54	0.26	0.27	0.78	0.53
10:30:40 AM	21.8	31.5	31.1	30.9	0.42	0.27	0.49	0.35	0.76	0.26	0.52	0.38	0.37	0.4	0.27	0.49	0.46
10:31:00 AM	21.9	31.5	31	30.9	0.48	0.27	0.25	0.44	0.26	0.95	0.69	0.28	0.25	0.63	0.44	0.35	1
10:31:20 AM	21.8	31.6	31	30.8	0.54	1.18	0.35	0.92	0.68	0.69	0.25	0.26	0.24	0.26	0.93	0.47	0.26
10:31:40 AM	21.8	31.5	30.9	30.8	0.48	0.56	0.66	0.93	0.51	0.25	0.26	0.65	0.43	0.28	0.25	0.52	0.5
10:32:00 AM	21.7	31.7	30.9	30.7	0.45	0.26	0.44	0.36	0.26	0.33	0.45	1.09	0.8	0.36	0.5	0.35	0.25
10:32:20 AM	21.7	31.4	30.9	30.6	0.44	0.38	0.38	0.72	0.46	0.38	0.53	0.27	0.38	0.48	0.27	0.8	0.26
10:32:40 AM	21.7	31.6	30.8	30.6	0.41	0.25	0.25	0.38	0.74	0.51	0.26	0.37	0.34	0.4	0.25	0.67	0.52
10:33:00 AM	21.7	31.2	30.6	30.6	0.37	0.25	0.24	0.35	0.26	0.41	0.5	0.27	0.24	0.6	0.53	0.36	0.42
10:33:20 AM	21.7	31.3	30.9	30.7	0.48	0.63	0.87	0.82	0.5	0.37	0.25	0.43	0.38	0.36	0.32	0.53	0.27
10:33:40 AM	21.8	31.2	30.7	30.5	0.44	1.13	0.63	0.49	0.25	0.26	0.25	0.37	0.49	0.28	0.26	0.42	0.5

Run 1	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
10:34:00 AM	21.7	31.5	30.6	30.5	0.38	0.26	0.24	0.36	0.25	0.43	0.53	0.4	0.29	0.54	0.5	0.35	0.42
10:34:20 AM	21.7	31.5	30.7	30.4	0.40	0.37	0.35	0.47	0.54	0.47	0.34	0.61	0.39	0.26	0.43	0.34	0.27
10:34:40 AM	21.6	31.4	30.6	30.4	0.47	0.43	0.24	0.52	0.33	0.86	0.25	0.53	0.34	0.43	0.25	1.12	0.39
10:35:00 AM	21.5	31.4	30.5	30.3	0.45	0.33	0.42	0.36	0.26	0.41	0.49	0.42	0.43	0.62	0.63	0.72	0.25
10:35:20 AM	21.6	31.4	30.5	30.4	0.41	0.36	0.35	0.78	0.5	0.37	0.42	0.27	0.24	0.42	0.28	0.36	0.62
10:35:40 AM	21.6	31.3	30.6	30.4	0.48	0.47	0.79	0.49	0.43	0.44	0.53	0.37	0.37	0.35	0.35	0.46	0.69
10:36:00 AM	21.8	31.4	30.6	30.4	0.38	0.26	0.28	0.37	0.36	0.53	0.38	0.43	0.25	0.39	0.66	0.36	0.25
10:36:20 AM	21.7	31.4	30.6	30.4	0.47	0.55	0.52	0.64	0.38	0.39	0.25	0.93	0.6	0.27	0.26	0.55	0.26
10:36:40 AM	21.7	31.3	30.6	30.3	0.43	0.25	0.6	0.28	0.52	0.32	0.33	0.37	0.51	0.41	0.25	0.95	0.36
10:37:00 AM	21.8	31.4	30.5	30.3	0.43	0.26	0.25	0.27	0.48	0.48	0.68	0.51	0.49	0.54	0.36	0.43	0.43
10:37:20 AM	21.6	31.2	30.6	30.3	0.43	0.39	0.38	0.64	0.67	0.55	0.26	0.26	0.24	0.64	0.43	0.35	0.32
10:37:40 AM	21.6	31.2	30.5	30.3	0.45	0.58	0.39	1.08	0.25	0.26	0.25	0.36	0.34	0.26	0.66	0.47	0.52
10:38:00 AM	21.7	31.2	30.4	30.3	0.38	0.36	0.46	0.27	0.25	0.26	0.36	0.57	0.42	0.38	0.5	0.52	0.25
10:38:20 AM	21.8	31.2	30.4	30.3	0.34	0.36	0.36	0.37	0.36	0.37	0.36	0.26	0.48	0.26	0.26	0.36	0.25
10:38:40 AM	21.7	31.2	30.4	30.3	0.50	0.51	0.24	0.26	0.63	0.43	0.91	0.74	0.35	0.59	0.27	0.59	0.53
10:39:00 AM	21.7	31.2	30.4	30.2	0.40	0.27	0.24	0.25	0.56	0.64	0.51	0.25	0.51	0.37	0.54	0.44	0.25
10:39:20 AM	21.6	31.1	30.2	30.3	0.48	0.58	0.44	0.55	0.52	0.36	0.27	0.78	0.24	0.67	0.25	0.53	0.61
10:39:40 AM	21.6	31.1	30.4	30.1	0.49	0.4	0.46	0.79	0.26	0.27	0.25	0.38	0.52	0.31	0.69	0.49	1
10:40:00 AM	21.7	31.2	30.4	30.2	0.44	0.31	0.46	0.25	0.25	0.26	0.54	0.4	0.25	0.88	0.81	0.62	0.25
10:40:20 AM	21.7	31.2	30.3	30.2	0.40	0.46	0.35	0.37	0.53	0.53	0.26	0.26	0.42	0.27	0.29	0.36	0.7
10:40:40 AM	21.7	31.1	30.3	30.2	0.43	0.36	0.5	0.43	0.28	0.26	0.59	0.43	0.37	0.4	0.43	0.69	0.45
10:41:00 AM	21.6	31.1	30.4	30.1	0.44	0.34	0.51	0.26	0.27	0.73	0.52	0.46	0.41	0.41	0.45	0.62	0.25
10:41:20 AM	21.7	31.3	30.4	30.1	0.39	0.62	0.35	0.37	0.65	0.65	0.26	0.36	0.25	0.26	0.26	0.36	0.26
10:41:40 AM	21.6	31.3	30.4	30.1	1.20	0.4	0.39	0.66	0.5	0.44	0.43	0.45	0.44	8.72	0.26	0.45	1.22
10:42:00 AM	21.6	31.1	30.3	30.1	0.44	0.64	0.26	0.34	0.43	0.26	0.45	0.66	0.48	0.37	0.74	0.36	0.25

Run 1	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
10:42:20 AM	21.7	31.2	30.4	30.1	0.42	0.55	0.42	0.8	0.45	0.45	0.26	0.42	0.36	0.27	0.25	0.53	0.26
10:42:40 AM	21.7	30.9	30.3	30.1	0.40	0.26	0.41	0.28	0.25	0.26	0.25	0.44	0.73	0.41	0.25	0.7	0.53
10:43:00 AM	21.9	31.2	30.4	30.1	0.38	0.25	0.25	0.26	0.25	0.4	1.12	0.25	0.25	0.46	0.36	0.42	0.26
10:43:20 AM	21.6	31	30.3	30	0.42	0.45	0.7	0.46	0.73	0.62	0.25	0.25	0.24	0.34	0.26	0.36	0.43
10:43:40 AM	21.6	31	30.4	30	0.43	0.64	0.39	0.39	0.26	0.26	0.25	0.35	0.36	0.37	0.44	0.46	0.93
10:44:00 AM	21.6	31	30.3	30.1	0.43	0.44	0.43	0.54	0.26	0.26	0.46	0.59	0.34	0.43	0.6	0.53	0.26
10:44:20 AM	21.9	31.1	30.3	30	0.34	0.43	0.44	0.36	0.35	0.36	0.26	0.27	0.46	0.27	0.26	0.33	0.25
10:44:40 AM	21.8	31.1	30.2	30	0.39	0.27	0.25	0.26	0.26	0.44	0.42	0.26	0.57	0.58	0.25	0.62	0.55
10:45:00 AM	21.8	31.1	30.2	30	0.50	0.26	0.35	0.25	0.43	0.39	0.87	0.83	0.25	0.61	0.79	0.63	0.28
10:45:20 AM	22	31.2	30.2	30	0.42	0.55	0.35	0.54	0.57	0.53	0.26	0.43	0.25	0.26	0.31	0.51	0.51
10:45:40 AM	21.9	31.1	30.3	30	0.42	0.4	0.81	0.4	0.26	0.26	0.52	0.26	0.54	0.28	0.25	0.54	0.5
10:46:00 AM	21.8	31.1	30.3	30	0.44	0.27	0.25	0.66	0.27	0.53	0.55	0.52	0.24	0.86	0.5	0.36	0.31
10:46:20 AM	21.6	31.1	30.3	30	0.45	1.03	0.36	0.36	0.55	0.56	0.26	0.27	0.38	0.43	0.34	0.36	0.44
10:46:40 AM	21.8	31.1	30.2	30	0.38	0.27	0.29	0.26	0.5	0.25	0.26	0.26	0.35	0.41	0.45	0.86	0.38
10:47:00 AM	22	31.4	30.2	30	0.46	0.43	0.42	0.44	0.26	0.43	0.5	0.85	0.6	0.36	0.37	0.55	0.26
10:47:20 AM	21.9	31.2	30.1	30	0.43	0.38	0.37	0.64	0.49	0.72	0.32	0.26	0.41	0.25	0.25	0.81	0.26
10:47:40 AM	21.9	31	30.2	30	0.41	0.39	0.38	0.42	0.61	0.26	0.42	0.25	0.34	0.43	0.26	0.46	0.66
10:48:00 AM	21.9	31.1	30.2	30	0.40	0.26	0.25	0.26	0.43	0.42	0.36	0.51	0.24	0.56	0.68	0.37	0.4
10:48:20 AM	21.9	31.1	30.1	30	0.39	0.53	0.37	0.62	0.37	0.37	0.27	0.26	0.39	0.4	0.45	0.36	0.27
10:48:40 AM	21.9	31.2	30	30.1	0.48	0.61	0.47	0.26	0.83	0.24	0.59	0.43	0.51	0.4	0.26	0.78	0.39
10:49:00 AM	21.7	31.1	30.1	30	0.35	0.25	0.25	0.35	0.25	0.38	0.58	0.38	0.47	0.37	0.36	0.36	0.25
10:49:20 AM	21.8	31.1	30.1	30	0.51	0.36	0.36	0.46	0.58	0.54	0.42	1.05	0.51	0.45	0.26	0.35	0.73
10:49:40 AM	21.8	31.1	30.1	30.1	0.46	0.39	0.38	0.5	0.4	0.32	0.25	0.26	0.34	0.91	0.72	0.56	0.52
10:50:00 AM	21.7	31.1	30.1	30	0.47	0.43	0.33	0.54	0.25	0.26	0.38	0.68	0.24	0.7	0.74	0.78	0.27
10:50:20 AM	21.9	31.1	30.1	30	0.42	0.35	0.35	0.81	0.36	0.37	0.28	0.27	0.55	0.38	0.28	0.36	0.69

Run 1	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
10:50:40 AM	22	31.1	30.1	30.1	0.48	0.55	0.79	0.36	0.25	0.27	0.68	0.27	0.37	0.59	0.51	0.69	0.45
10:51:00 AM	22	31.2	30	30.1	0.41	0.26	0.26	0.36	0.45	0.84	0.52	0.39	0.29	0.38	0.44	0.36	0.42
10:51:20 AM	22	31.2	30.1	30.1	0.43	0.74	0.24	0.52	0.52	0.66	0.29	0.65	0.24	0.27	0.42	0.35	0.25
10:51:40 AM	22	31.2	30.1	30.1	0.98	0.5	0.68	0.88	0.52	0.32	0.28	0.43	0.61	0.27	0.26	6.43	0.52
10:52:00 AM	22	31.2	30.1	30.1	0.44	0.28	0.26	0.36	0.32	0.26	0.45	0.84	0.49	0.37	0.5	0.93	0.25
10:52:20 AM	22	31.2	30.1	30.1	1.07	0.38	0.27	0.61	0.45	0.63	0.42	0.28	0.37	0.97	0.25	0.35	7.81
10:52:40 AM	22	31.2	30.1	30.1	1.10	0.89	0.35	0.73	0.42	0.26	0.25	0.25	0.33	0.39	7.24	0.6	1.49
10:53:00 AM	22	31.2	30.1	30.1	0.58	0.43	0.65	0.53	0.25	0.39	0.49	0.54	0.24	0.36	2.34	0.53	0.25

DATA COLLECTION RUN 2

Table 2: Data Collection Run2 (Max Load)

Run 2	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
10:47:00 AM	#N/A	#N/A	#N/A	#N/A	0.49	0.43	0.42	0.44	0.5	0.43	0.5	0.85	0.35	0.36	0.45	0.86	0.26
10:47:20 AM	#N/A	#N/A	#N/A	#N/A	0.42	0.38	0.37	0.64	0.26	0.72	0.32	0.26	0.6	0.25	0.37	0.55	0.26
10:47:40 AM	#N/A	#N/A	#N/A	#N/A	0.43	0.39	0.38	0.42	0.49	0.26	0.42	0.25	0.41	0.43	0.25	0.81	0.66
10:48:00 AM	#N/A	#N/A	#N/A	#N/A	0.39	0.26	0.25	0.26	0.61	0.42	0.36	0.51	0.34	0.56	0.26	0.46	0.4
10:48:20 AM	#N/A	#N/A	#N/A	#N/A	0.40	0.53	0.37	0.62	0.43	0.37	0.27	0.26	0.24	0.4	0.68	0.37	0.27
10:48:40 AM	#N/A	#N/A	#N/A	#N/A	0.41	0.61	0.47	0.26	0.37	0.24	0.59	0.43	0.39	0.4	0.45	0.36	0.39
10:49:00 AM	#N/A	#N/A	#N/A	#N/A	0.43	0.25	0.25	0.35	0.83	0.38	0.58	0.38	0.51	0.37	0.26	0.78	0.25

Run 2	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
10:49:20 AM	#N/A	#N/A	#N/A	#N/A	0.48	0.36	0.36	0.46	0.25	0.54	0.42	1.05	0.47	0.45	0.36	0.36	0.73
10:49:40 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.39	0.38	0.5	0.58	0.32	0.25	0.26	0.51	0.91	0.26	0.35	0.52
10:50:00 AM	#N/A	#N/A	#N/A	#N/A	0.47	0.43	0.33	0.54	0.4	0.26	0.38	0.68	0.34	0.7	0.72	0.56	0.27
10:50:20 AM	#N/A	#N/A	#N/A	#N/A	0.46	0.35	0.35	0.81	0.25	0.37	0.28	0.27	0.24	0.38	0.74	0.78	0.69
10:50:40 AM	#N/A	#N/A	#N/A	#N/A	0.46	0.55	0.79	0.36	0.36	0.27	0.68	0.27	0.55	0.59	0.28	0.36	0.45
10:51:00 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.26	0.26	0.36	0.25	0.84	0.52	0.39	0.37	0.38	0.51	0.69	0.42
10:51:20 AM	#N/A	#N/A	#N/A	#N/A	0.43	0.74	0.24	0.52	0.45	0.66	0.29	0.65	0.29	0.27	0.44	0.36	0.25
10:51:40 AM	#N/A	#N/A	#N/A	#N/A	0.45	0.5	0.68	0.88	0.52	0.32	0.28	0.43	0.24	0.27	0.42	0.35	0.52
10:52:00 AM	#N/A	#N/A	#N/A	#N/A	0.91	0.28	0.26	0.36	0.52	0.26	0.45	0.84	0.61	0.37	0.26	6.43	0.25
10:52:20 AM	#N/A	#N/A	#N/A	#N/A	1.13	0.38	0.27	0.61	0.32	0.63	0.42	0.28	0.49	0.97	0.5	0.93	7.81
10:52:40 AM	#N/A	#N/A	#N/A	#N/A	0.50	0.89	0.35	0.73	0.45	0.26	0.25	0.25	0.37	0.39	0.25	0.35	1.49
10:53:00 AM	#N/A	#N/A	#N/A	#N/A	1.02	0.43	0.65	0.53	0.42	0.39	0.49	0.54	0.33	0.36	7.24	0.6	0.25
10:53:20 AM	#N/A	#N/A	#N/A	#N/A	0.60	0.45	0.87	0.35	0.25	0.55	0.25	0.87	0.24	0.26	2.34	0.53	0.28
10:53:40 AM	#N/A	#N/A	#N/A	#N/A	2.53	0.68	1.12	1.25	0.89	0.82	9.17	6.4	7.38	0.94	0.25	0.36	1.07
10:54:00 AM	#N/A	#N/A	#N/A	#N/A	1.24	0.25	0.24	0.35	0.44	8.23	1.21	0.5	0.91	0.45	0.83	1.03	0.43
10:54:20 AM	#N/A	#N/A	#N/A	#N/A	0.99	0.36	0.24	0.34	7.92	0.37	0.26	0.27	0.25	0.27	0.53	0.72	0.34
10:54:40 AM	#N/A	#N/A	#N/A	#N/A	0.95	0.42	0.52	6.52	0.75	0.25	0.25	0.42	0.38	0.56	0.44	0.44	0.46
10:55:00 AM	#N/A	#N/A	#N/A	#N/A	1.50	8.75	4.56	0.88	0.25	0.39	0.49	0.36	0.36	0.62	0.34	0.78	0.26
10:55:20 AM	#N/A	#N/A	#N/A	#N/A	0.75	0.36	3.74	0.35	0.25	0.37	0.42	0.29	0.42	0.43	1.08	0.62	0.71
10:55:40 AM	#N/A	#N/A	#N/A	#N/A	0.49	0.4	0.73	0.6	0.5	0.44	0.6	0.71	0.32	0.26	0.44	0.35	0.51
10:56:00 AM	#N/A	#N/A	#N/A	#N/A	0.49	0.43	0.25	0.54	0.42	0.97	0.52	0.75	0.41	0.39	0.44	0.46	0.26
10:56:20 AM	#N/A	#N/A	#N/A	#N/A	0.39	0.36	0.41	0.35	0.36	0.44	0.26	0.27	0.24	0.25	0.5	0.93	0.28
10:56:40 AM	#N/A	#N/A	#N/A	#N/A	0.41	0.27	0.35	0.46	0.78	0.25	0.26	0.25	0.56	0.47	0.25	0.45	0.53
10:57:00 AM	#N/A	#N/A	#N/A	#N/A	0.47	0.34	0.27	0.42	0.51	0.57	0.66	0.65	0.34	0.55	0.26	0.59	0.43
10:57:20 AM	#N/A	#N/A	#N/A	#N/A	0.43	0.65	0.37	0.68	0.27	0.36	0.26	0.26	0.49	0.27	0.61	0.67	0.27

Run 2	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
10:57:40 AM	#N/A	#N/A	#N/A	#N/A	0.45	0.57	0.66	0.8	0.66	0.24	0.26	0.43	0.24	0.27	0.42	0.36	0.51
10:58:00 AM	#N/A	#N/A	#N/A	#N/A	0.41	0.26	0.26	0.35	0.25	0.26	0.76	0.58	0.64	0.36	0.28	0.65	0.3
10:58:20 AM	#N/A	#N/A	#N/A	#N/A	0.40	0.36	0.25	0.35	0.25	0.7	0.43	0.29	0.41	0.44	0.5	0.35	0.44
10:58:40 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.5	0.36	0.44	0.5	0.42	0.63	0.26	0.37	0.51	0.27	0.62	0.36
10:59:00 AM	#N/A	#N/A	#N/A	#N/A	0.49	0.43	0.25	0.59	0.75	0.39	0.5	0.38	0.35	0.84	0.35	0.59	0.44
10:59:20 AM	#N/A	#N/A	#N/A	#N/A	0.38	0.56	0.42	0.35	0.26	0.36	0.27	0.46	0.25	0.26	0.41	0.36	0.62
10:59:40 AM	#N/A	#N/A	#N/A	#N/A	0.50	0.39	0.54	0.69	0.5	0.26	0.25	0.56	0.81	0.65	0.35	0.51	0.53
11:00:00 AM	#N/A	#N/A	#N/A	#N/A	0.50	0.25	0.25	0.35	0.25	0.42	0.53	0.9	0.58	1.08	0.53	0.48	0.43
11:00:20 AM	#N/A	#N/A	#N/A	#N/A	0.46	0.36	0.26	0.36	0.25	0.61	0.32	0.27	0.26	0.26	1.1	0.78	0.69
11:00:40 AM	#N/A	#N/A	#N/A	#N/A	0.50	0.43	0.66	0.64	0.53	0.29	0.69	0.43	0.37	0.41	0.76	0.46	0.34
11:01:00 AM	#N/A	#N/A	#N/A	#N/A	2.78	0.26	0.37	0.44	0.42	0.84	0.54	0.39	0.36	0.82	27.62	0.85	0.45
11:01:20 AM	#N/A	#N/A	#N/A	#N/A	1.87	0.67	0.25	0.43	0.29	0.69	0.42	0.27	0.41	0.92	16.65	0.78	0.7
11:01:40 AM	#N/A	#N/A	#N/A	#N/A	3.18	0.96	0.54	0.92	0.54	0.44	0.6	0.26	0.25	0.27	32.27	0.45	0.66
11:02:00 AM	#N/A	#N/A	#N/A	#N/A	1.08	0.42	0.27	0.54	0.85	0.62	0.44	1.1	0.43	0.46	6.98	0.46	0.36
11:02:20 AM	#N/A	#N/A	#N/A	#N/A	0.54	0.47	0.44	0.78	0.25	0.46	0.75	0.42	0.78	0.26	1.16	0.35	0.34
11:02:40 AM	#N/A	#N/A	#N/A	#N/A	0.48	0.26	0.35	0.48	0.44	0.71	0.34	0.34	0.68	0.41	0.95	0.55	0.27
11:03:00 AM	#N/A	#N/A	#N/A	#N/A	1.22	8.15	0.28	0.35	0.9	0.5	0.66	0.71	0.35	0.61	0.86	0.68	0.53
11:03:20 AM	#N/A	#N/A	#N/A	#N/A	9.47	20.75	42.03	25.95	0.26	0.61	0.25	0.26	0.58	0.26	21.98	0.35	0.38
11:03:40 AM	21.70	31.20	31.20	30.10	19.45	21.09	100	16.77	14.6	19.12	7.67	0.43	0.24	0.27	52.46	0.34	0.39
11:04:00 AM	21.70	31.10	31.10	30.20	26.17	25.6	100	29.14	19.02	18.31	21.27	18.15	0.35	0.37	80.81	0.62	0.36
11:04:20 AM	21.80	31.20	31.20	30.20	30.11	4.63	100	11.83	15.71	32.55	29.69	12.31	12.27	24.07	100	13.02	5.18
11:04:40 AM	21.50	31.30	31.30	30.20	30.05	1.19	100	3.53	29.33	14.05	16.75	38.11	18.87	12.45	100	10.08	16.26
11:05:00 AM	21.30	31.40	31.40	30.30	28.25	0.92	100	0.98	6.8	4.05	6.93	10.01	19.46	28.64	100	35.76	25.39
11:05:20 AM	21.50	31.60	31.60	30.10	24.77	2.68	100	1.07	2.69	1.03	0.94	4.54	23.22	14.5	100	14.64	31.92
11:05:40 AM	21.50	31.50	31.50	30.10	22.67	33.04	100	6.49	1.16	0.79	1.2	0.85	5.25	5.38	100	11.12	6.72

Run 2	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
11:06:00 AM	21.50	31.60	31.60	30.10	28.70	59.49	100	46.14	4.71	20.74	6.42	0.91	1.14	1.17	100	2.45	1.2
11:06:20 AM	21.50	31.90	31.90	30.10	40.42	92.71	100	72.56	31.63	42.24	28.67	13.75	0.81	0.85	100	0.94	0.91
11:06:40 AM	21.70	31.90	31.90	30.20	53.72	100	100	100	49.92	66.03	56.53	40.78	2.78	13.79	100	13.41	1.45
11:07:00 AM	21.70	32.10	32.10	30.20	70.38	100	100	100	64.82	98.02	91.75	59.82	30.83	41.75	100	30.39	27.15
11:07:20 AM	21.70	32.20	32.20	30.50	84.36	100	100	100	100	100	100	97.21	59.36	58.8	100	47.16	49.77
11:07:40 AM	21.70	32.30	32.30	30.50	95.36	100	100	100	100	100	100	100	89.41	86.5	100	84.31	84.09
11:08:00 AM	21.70	32.50	32.50	30.70	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:08:20 AM	21.60	32.80	32.80	30.70	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:08:40 AM	21.80	32.90	32.90	30.80	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:09:00 AM	21.70	33.20	33.20	31.00	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:09:20 AM	21.80	33.40	33.40	31.20	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:09:40 AM	21.60	33.70	33.70	31.50	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:10:00 AM	21.70	33.90	33.90	31.90	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:10:20 AM	21.70	34.00	34.00	32.50	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:10:40 AM	21.80	34.30	34.30	32.90	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:11:00 AM	21.70	34.20	34.20	33.50	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:11:20 AM	21.80	34.50	34.50	34.40	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:11:40 AM	21.90	34.90	34.90	35.40	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:12:00 AM	21.70	35.10	35.10	36.40	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:12:20 AM	21.90	35.40	35.40	37.50	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:12:40 AM	21.80	35.30	35.30	38.50	99.62	95.43	100	100	100	100	100	100	100	100	100	100	100
11:13:00 AM	21.80	35.60	35.60	39.30	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:13:20 AM	22.00	35.90	35.90	40.10	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:13:40 AM	21.90	35.90	35.90	40.90	99.82	100	100	100	97.78	100	100	100	100	100	100	100	100
11:14:00 AM	22.10	36.20	36.20	41.60	100.00	100	100	100	100	100	100	100	100	100	100	100	100

Run 2	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
11:14:20 AM	22.00	36.40	36.40	42.40	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:14:40 AM	22.10	36.60	36.60	43.00	99.53	100	100	100	100	100	100	100	100	100	94.4	100	100
11:15:00 AM	22.10	36.80	36.80	43.50	99.98	100	100	100	100	100	100	100	100	100	99.77	100	100
11:15:20 AM	22.10	36.90	36.90	44.10	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:15:40 AM	22.10	36.80	36.80	44.70	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:16:00 AM	22.20	37.00	37.00	45.10	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:16:20 AM	22.20	37.40	37.40	45.60	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:16:40 AM	22.00	37.60	37.60	46.10	99.53	100	100	98.31	100	100	100	100	100	100	96.09	100	100
11:17:00 AM	22.10	37.60	37.60	46.50	99.75	100	100	97.31	100	100	100	100	100	100	99.74	100	100
11:17:20 AM	22.10	37.80	37.80	46.80	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:17:40 AM	22.20	37.90	37.90	47.10	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:18:00 AM	22.10	38.00	38.00	47.30	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:18:20 AM	22.20	38.40	38.40	47.60	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:18:40 AM	22.10	38.50	38.50	47.90	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:19:00 AM	22.00	38.70	38.70	48.20	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:19:20 AM	22.20	38.80	38.80	48.40	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:19:40 AM	22.10	38.80	38.80	48.70	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:20:00 AM	22.10	39.00	39.00	48.70	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:20:20 AM	22.20	38.80	38.80	48.80	99.91	100	100	100	100	100	100	100	100	98.93	100	100	100
11:20:40 AM	22.20	39.10	39.10	49.00	99.95	100	100	100	100	100	100	100	100	99.41	100	100	100
11:21:00 AM	22.10	39.30	39.30	49.00	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:21:20 AM	22.40	39.60	39.60	49.20	99.97	100	100	100	100	100	100	100	100	99.58	100	100	100
11:21:40 AM	22.30	39.80	39.80	49.20	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:22:00 AM	22.30	39.80	39.80	49.40	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:22:20 AM	22.40	39.90	39.90	49.20	100.00	100	100	100	100	100	100	100	100	100	100	100	100

Run 2	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
11:22:40 AM	22.20	40.10	40.10	49.40	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:23:00 AM	22.40	40.20	40.20	49.50	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:23:20 AM	22.20	40.20	40.20	49.60	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:23:40 AM	22.20	40.50	40.50	49.60	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:24:00 AM	22.10	40.60	40.60	49.70	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:24:20 AM	22.20	40.40	40.40	49.70	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:24:40 AM	22.20	40.40	40.40	49.80	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:25:00 AM	22.30	40.50	40.50	49.70	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:25:20 AM	22.20	40.60	40.60	49.90	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:25:40 AM	22.20	40.90	40.90	49.90	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:26:00 AM	22.00	40.90	40.90	50.00	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:26:20 AM	22.20	41.10	41.10	50.00	99.30	100	100	100	100	100	100	91.57	100	100	100	100	100
11:26:40 AM	22.10	40.90	40.90	50.20	99.31	100	100	100	100	100	100	91.66	100	100	100	100	100
11:27:00 AM	22.00	41.10	41.10	50.30	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:27:20 AM	22.10	41.10	41.10	50.20	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:27:40 AM	22.20	41.00	41.00	50.20	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:28:00 AM	22.40	41.30	41.30	50.20	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:28:20 AM	22.30	41.20	41.20	50.30	99.84	100	100	98.02	100	100	100	100	100	100	100	100	100
11:28:40 AM	22.20	41.30	41.30	50.30	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:29:00 AM	22.30	41.40	41.40	50.50	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:29:20 AM	22.30	41.20	41.20	50.40	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:29:40 AM	22.20	41.40	41.40	50.50	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:30:00 AM	22.10	41.60	41.60	50.50	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:30:20 AM	21.90	41.80	41.80	50.50	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:30:40 AM	22.20	41.60	41.60	50.60	100.00	100	100	100	100	100	100	100	100	100	100	100	100

Run 2	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
11:31:00 AM	22.20	41.80	41.80	50.60	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:31:20 AM	22.30	41.80	41.80	50.60	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:31:40 AM	22.00	41.80	41.80	50.70	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:32:00 AM	22.10	41.90	41.90	50.60	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:32:20 AM	22.10	41.90	41.90	50.80	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:32:40 AM	22.00	42.00	42.00	50.80	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:33:00 AM	22.10	41.90	41.90	50.80	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:33:20 AM	22.20	41.90	41.90	50.80	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:33:40 AM	22.10	42.00	42.00	50.80	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:34:00 AM	22.00	42.00	42.00	50.80	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:34:20 AM	22.30	42.30	42.30	51.00	99.92	100	100	100	100	100	99.03	100	100	100	100	100	100
11:34:40 AM	22.10	42.10	42.10	50.90	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:35:00 AM	22.30	42.00	42.00	51.00	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:35:20 AM	22.40	42.40	42.40	51.00	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:35:40 AM	22.20	42.60	42.60	50.90	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:36:00 AM	22.20	42.30	42.30	51.10	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:36:20 AM	22.40	42.20	42.20	51.10	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:36:40 AM	22.20	42.30	42.30	51.10	99.74	96.89	100	100	100	100	100	100	100	100	100	100	100
11:37:00 AM	22.30	42.20	42.20	51.10	99.92	99.01	100	100	100	100	100	100	100	100	100	100	100
11:37:20 AM	22.10	42.20	42.20	51.10	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:37:40 AM	22.10	42.30	42.30	51.20	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:38:00 AM	22.30	42.30	42.30	51.20	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:38:20 AM	22.30	42.30	42.30	51.20	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:38:40 AM	22.30	42.20	42.20	51.10	100.00	100	100	100	100	100	100	100	100	100	100	100	100
11:39:00 AM	22.20	42.50	42.50	51.30	100.00	100	100	100	100	100	100	100	100	100	100	100	100

Run 2	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
11:39:20 AM	22.30	42.20	42.20	51.30	98.49	100	100	100	100	100	100	100	100	100	81.89	100	100
11:39:40 AM	22.00	42.30	42.30	51.20	92.31	100	100	100	100	100	100	100	100	100	7.67	100	100
11:40:00 AM	22.30	42.40	42.40	51.30	91.72	100	100	100	100	100	100	100	100	100	0.64	100	100
11:40:20 AM	22.30	42.30	42.30	51.30	91.78	100	100	100	100	100	100	100	100	100	1.41	100	100
11:40:40 AM	22.40	42.40	42.40	51.30	91.70	100	100	100	100	100	100	100	100	100	0.41	100	100
11:41:00 AM	22.30	42.40	42.40	51.30	91.69	100	100	100	100	100	100	100	100	100	0.26	100	100
11:41:20 AM	22.40	42.60	42.60	51.40	91.69	100	100	100	100	100	100	100	100	100	0.25	100	100
11:41:40 AM	22.40	42.90	42.90	51.40	86.50	54.91	89.44	93.22	100	100	100	100	100	100	0.45	100	100
11:42:00 AM	22.60	43.30	43.30	51.40	68.20	0.54	12.72	19.54	100	85.2	100	100	100	100	0.43	100	100
11:42:20 AM	22.80	43.10	43.10	51.40	48.17	0.37	0.56	0.61	36.44	10.72	45.35	83.23	100	100	0.71	100	100
11:42:40 AM	22.50	43.00	43.00	51.40	27.33	0.37	0.32	0.56	0.33	0.7	0.6	8.82	95.52	65.19	0.36	64.49	90.75
11:43:00 AM	22.40	42.60	42.60	51.30	3.64	0.33	0.44	0.44	0.45	0.62	0.51	0.33	20.2	2.07	0.26	2.26	15.74
11:43:20 AM	22.60	42.00	42.00	51.30	0.48	0.43	0.24	0.53	0.51	0.39	0.36	0.68	0.43	0.38	0.41	0.97	0.41
11:43:40 AM	22.30	41.80	41.80	51.40	0.53	0.94	0.76	0.57	0.85	0.36	0.27	0.27	0.31	0.68	0.37	0.52	0.48
11:44:00 AM	22.40	41.80	41.80	51.50	0.38	0.27	0.57	0.54	0.36	0.27	0.45	0.26	0.42	0.43	0.25	0.34	0.36
11:44:20 AM	22.20	41.30	41.30	51.40	0.44	0.47	0.29	0.36	0.26	0.43	0.45	0.51	0.35	0.39	0.69	0.45	0.57
11:44:40 AM	22.40	41.50	41.50	51.50	0.34	0.37	0.24	0.45	0.42	0.38	0.25	0.42	0.24	0.26	0.37	0.34	0.28
11:45:00 AM	22.40	41.00	41.00	51.50	0.48	0.43	0.62	0.54	0.37	0.28	0.46	0.6	0.69	0.65	0.43	0.37	0.36
11:45:20 AM	22.40	40.80	40.80	51.20	0.48	0.27	0.25	0.36	0.26	1.04	0.37	0.36	0.4	0.37	0.52	1.02	0.52
11:45:40 AM	22.30	40.90	40.90	50.80	0.70	0.52	0.5	0.5	0.71	0.38	0.69	0.25	0.37	2.85	0.38	0.72	0.57
11:46:00 AM	22.30	40.60	40.60	50.30	0.91	0.27	0.49	0.86	0.37	0.68	0.28	0.28	0.27	5.97	0.25	0.35	0.85
11:46:20 AM	22.30	40.50	40.50	49.60	0.46	0.95	0.34	0.53	0.42	0.29	0.37	0.69	0.35	0.38	0.55	0.45	0.25

DATA COLLECTION RUN 3

Table 3: Data Collection Run 3 (Balanced)

Run 3	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
11:51:00 AM	#N/A	#N/A	#N/A	#N/A	0.45	0.43	0.4	0.64	0.34	0.59	0.41	0.45	0.7	0.42	0.25	0.35	0.46
11:51:20 AM	#N/A	#N/A	#N/A	#N/A	0.41	0.25	0.37	0.36	0.4	0.42	0.46	0.45	0.42	0.37	0.34	0.86	0.27
11:51:40 AM	#N/A	#N/A	#N/A	#N/A	0.52	0.89	0.25	0.46	1.17	0.88	0.44	0.26	0.25	0.51	0.37	0.35	0.44
11:52:00 AM	#N/A	#N/A	#N/A	#N/A	0.47	0.35	0.59	0.84	0.43	0.44	0.26	0.52	0.69	0.25	0.38	0.41	0.42
11:52:20 AM	#N/A	#N/A	#N/A	#N/A	0.46	0.47	0.27	0.87	0.25	0.27	0.45	0.61	0.25	0.54	0.43	0.47	0.68
11:52:40 AM	#N/A	#N/A	#N/A	#N/A	0.41	0.69	0.42	0.38	0.45	0.46	0.26	0.43	0.54	0.28	0.42	0.36	0.26
11:53:00 AM	#N/A	#N/A	#N/A	#N/A	0.35	0.25	0.4	0.46	0.25	0.27	0.38	0.26	0.41	0.4	0.25	0.55	0.27
11:53:20 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.26	0.25	0.35	0.37	0.56	0.54	0.79	0.26	0.53	0.26	0.6	0.56
11:53:40 AM	#N/A	#N/A	#N/A	#N/A	0.49	0.86	0.5	0.49	0.53	0.96	0.47	0.26	0.25	0.27	0.55	0.35	0.39
11:54:00 AM	#N/A	#N/A	#N/A	#N/A	0.47	0.42	0.57	0.74	0.88	0.26	0.25	0.52	0.35	0.25	0.39	0.71	0.26
11:54:20 AM	#N/A	#N/A	#N/A	#N/A	0.41	0.24	0.43	0.36	0.29	0.27	0.37	0.51	0.41	0.53	0.26	0.65	0.57
11:54:40 AM	#N/A	#N/A	#N/A	#N/A	0.42	0.37	0.25	0.42	0.43	0.4	0.4	0.25	0.38	0.45	0.96	0.44	0.28
11:55:00 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.53	0.41	0.47	0.43	0.45	0.42	0.25	0.35	0.66	0.52	0.37	0.42
11:55:20 AM	#N/A	#N/A	#N/A	#N/A	0.46	0.25	0.25	0.45	0.38	0.4	0.36	0.44	0.65	0.37	0.45	0.85	0.63
11:55:40 AM	#N/A	#N/A	#N/A	#N/A	0.48	0.68	0.66	0.59	0.37	0.37	0.68	0.72	0.27	0.26	0.36	0.35	0.39
11:56:00 AM	#N/A	#N/A	#N/A	#N/A	0.44	0.25	0.48	0.48	0.93	0.66	0.28	0.28	0.52	0.27	0.38	0.52	0.26
11:56:20 AM	#N/A	#N/A	#N/A	#N/A	0.92	0.25	0.24	0.37	0.27	0.3	0.54	0.5	0.25	0.54	0.26	7.02	0.53
11:56:40 AM	#N/A	#N/A	#N/A	#N/A	0.98	0.36	0.26	0.44	0.79	0.54	0.25	0.25	0.37	0.8	0.54	0.35	6.84
11:57:00 AM	#N/A	#N/A	#N/A	#N/A	1.06	0.57	0.71	0.66	0.26	0.26	0.4	0.67	0.6	0.39	7.6	0.36	0.26
11:57:20 AM	#N/A	#N/A	#N/A	#N/A	0.62	0.28	0.52	0.7	0.38	0.39	0.36	0.35	2.68	0.37	0.25	0.77	0.37
11:57:40 AM	#N/A	#N/A	#N/A	#N/A	1.36	0.5	0.25	0.53	0.37	0.36	0.28	8.56	3.58	0.32	0.37	0.83	0.4
11:58:00 AM	#N/A	#N/A	#N/A	#N/A	1.44	0.25	0.48	0.49	0.26	6.13	7.3	0.37	0.35	0.39	0.47	0.41	0.42
11:58:20 AM	#N/A	#N/A	#N/A	#N/A	1.38	0.25	0.25	0.35	9.72	3	0.36	0.59	0.24	0.38	0.43	0.65	0.39

Run 3	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
11:58:40 AM	#N/A	#N/A	#N/A	#N/A	0.46	0.8	0.41	0.54	0.37	0.37	0.26	0.42	0.37	0.43	0.37	0.33	0.85
11:59:00 AM	#N/A	#N/A	#N/A	#N/A	1.16	1.45	0.36	7.72	0.84	0.26	0.86	0.26	0.52	0.39	0.45	0.53	0.26
11:59:20 AM	#N/A	#N/A	#N/A	#N/A	1.59	5.95	8.69	0.35	0.38	0.4	0.58	0.38	0.24	0.54	0.29	0.61	0.63
11:59:40 AM	#N/A	#N/A	#N/A	#N/A	0.47	0.51	0.25	0.6	0.52	0.55	0.26	0.27	0.57	0.27	0.54	0.36	0.95
12:00:00 PM	#N/A	#N/A	#N/A	#N/A	0.57	0.42	0.49	0.65	0.26	0.26	0.79	1.09	0.35	0.97	0.96	0.38	0.26
12:00:20 PM	#N/A	#N/A	#N/A	#N/A	0.47	0.25	0.42	0.35	0.25	0.41	0.37	0.6	0.42	0.27	0.54	0.96	0.8
12:00:40 PM	#N/A	#N/A	#N/A	#N/A	0.44	0.37	0.49	0.36	0.44	0.38	0.76	0.25	0.39	0.45	0.49	0.58	0.26
12:01:00 PM	#N/A	#N/A	#N/A	#N/A	0.58	0.27	0.35	0.87	0.26	0.81	0.61	0.28	0.35	1.42	0.61	0.35	0.73
12:01:20 PM	#N/A	#N/A	#N/A	#N/A	0.50	0.32	0.25	0.35	0.59	0.5	0.37	0.36	0.25	0.3	0.75	1.06	0.88
12:01:40 PM	#N/A	#N/A	#N/A	#N/A	0.57	1.03	0.53	0.66	0.79	0.92	0.62	0.42	0.27	0.37	0.53	0.34	0.4
12:02:00 PM	#N/A	#N/A	#N/A	#N/A	0.55	0.26	0.76	0.85	0.26	0.66	0.25	1.04	1.11	0.25	0.39	0.53	0.25
12:02:20 PM	#N/A	#N/A	#N/A	#N/A	0.49	0.28	0.27	0.79	0.24	0.75	0.96	0.59	0.36	0.44	0.25	0.47	0.52
12:02:40 PM	#N/A	#N/A	#N/A	#N/A	0.48	0.36	0.25	0.4	1.34	0.64	0.31	0.25	0.44	0.37	0.44	0.57	0.35
12:03:00 PM	#N/A	#N/A	#N/A	#N/A	0.50	0.43	0.36	0.66	0.38	0.26	0.39	0.59	0.68	0.79	0.42	0.36	0.69
12:03:20 PM	#N/A	#N/A	#N/A	#N/A	0.46	0.25	0.41	0.78	0.4	0.39	0.26	0.54	0.52	0.36	0.65	0.6	0.38
12:03:40 PM	#N/A	#N/A	#N/A	#N/A	0.53	1.57	0.83	0.49	0.36	0.37	0.44	0.25	0.34	0.38	0.37	0.54	0.38
12:04:00 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.34	0.59	0.65	0.32	0.33	0.44	0.25	0.45	0.44	0.4	0.36	0.44
12:04:20 PM	#N/A	#N/A	#N/A	#N/A	0.41	0.25	0.25	0.35	0.41	0.52	0.65	0.57	0.35	0.26	0.43	0.47	0.38
12:04:40 PM	#N/A	#N/A	#N/A	#N/A	0.46	0.87	0.24	0.55	0.43	0.86	0.36	0.41	0.37	0.38	0.38	0.36	0.28
12:05:00 PM	#N/A	#N/A	#N/A	#N/A	0.48	0.33	0.54	0.56	0.26	0.26	0.39	0.25	0.42	1.03	0.52	0.93	0.25
12:05:20 PM	#N/A	#N/A	#N/A	#N/A	0.47	0.25	0.24	0.81	0.38	0.4	0.27	0.44	0.36	0.59	0.28	0.86	0.72
12:05:40 PM	#N/A	#N/A	#N/A	#N/A	0.50	0.71	0.5	0.51	0.29	0.55	0.79	0.25	0.26	0.37	0.85	0.34	0.56
12:06:00 PM	#N/A	#N/A	#N/A	#N/A	0.40	0.25	0.64	0.6	0.5	0.54	0.28	0.27	0.29	0.27	0.56	0.35	0.25
12:06:20 PM	#N/A	#N/A	#N/A	#N/A	0.38	0.43	0.41	0.4	0.27	0.28	0.26	0.74	0.35	0.27	0.25	0.47	0.37
12:06:40 PM	#N/A	#N/A	#N/A	#N/A	0.44	0.36	0.26	0.36	0.53	0.66	0.84	0.26	0.55	0.36	0.36	0.54	0.25
12:07:00 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.26	0.38	0.48	0.42	0.25	0.58	0.51	0.5	0.57	0.25	0.41	0.42

Run 3	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
12:07:20 PM	#N/A	#N/A	#N/A	#N/A	0.45	0.28	0.27	0.62	0.55	0.59	0.26	0.36	0.36	0.52	0.43	0.6	0.55
12:07:40 PM	#N/A	#N/A	#N/A	#N/A	0.50	0.89	0.25	1.09	0.24	0.36	0.38	0.42	0.25	0.36	0.65	0.66	0.39
12:08:00 PM	#N/A	#N/A	#N/A	#N/A	0.37	0.25	0.71	0.48	0.36	0.25	0.25	0.25	0.42	0.26	0.39	0.54	0.25
12:08:20 PM	#N/A	#N/A	#N/A	#N/A	0.39	0.25	0.26	0.36	0.26	0.25	0.26	0.98	0.59	0.35	0.26	0.47	0.37
12:08:40 PM	#N/A	#N/A	#N/A	#N/A	0.41	0.64	0.25	0.35	0.25	0.55	0.61	0.26	0.38	0.47	0.4	0.36	0.42
12:09:00 PM	#N/A	#N/A	#N/A	#N/A	0.43	0.26	0.35	0.49	0.89	0.42	0.74	0.25	0.26	0.4	0.43	0.44	0.26
12:09:20 PM	#N/A	#N/A	#N/A	#N/A	0.49	0.55	0.42	0.54	0.38	0.39	0.26	0.53	0.36	0.77	0.26	0.62	0.79
12:09:40 PM	22	32.8	32.1	32.4	0.49	0.51	0.25	1.07	0.25	0.36	0.37	0.26	0.67	0.36	0.44	0.54	0.74
12:10:00 PM	22.1	32.7	32.1	32.2	0.97	0.74	0.87	0.55	0.4	0.25	0.43	0.56	0.25	0.98	5.83	0.37	0.41
12:10:20 PM	22.1	32.6	32.2	32.2	9.31	0.26	0.25	0.37	1.41	0.66	2	5.46	15.59	16.23	27.85	18.05	23.62
12:10:40 PM	22	32.6	32.1	32.2	17.78	5.74	5.86	23.58	26.04	24.27	29.15	28.56	18.36	19.86	6	13.31	12.61
12:11:00 PM	22	32.7	32	32.1	11.99	25.58	52.47	11.65	10.55	11.84	6.87	6.43	3.94	4.25	0.58	7.77	1.91
12:11:20 PM	22.1	32.7	32	32	6.12	5.16	55.61	2.32	2.53	1.89	0.6	0.83	0.75	0.59	0.58	1.64	0.88
12:11:40 PM	21.9	32.8	32.1	32	5.46	1.18	55.44	0.95	0.92	1.36	0.94	0.59	0.55	1.26	0.8	0.68	0.89
12:12:00 PM	21.9	32.8	32.2	32	5.33	1.07	55.64	1.15	0.86	0.68	0.53	0.78	0.75	0.51	0.88	0.6	0.5
12:12:20 PM	21.9	32.9	32.2	31.9	5.62	0.71	55.48	1.12	0.49	0.51	0.5	1.08	0.75	0.51	4.77	0.79	0.71
12:12:40 PM	22	33.1	32.3	32	12.42	0.61	55.38	0.61	0.49	0.71	3.53	4.82	8.03	8	41.05	6.02	19.81
12:13:00 PM	22	32.9	32.2	31.9	35.93	4.6	55.57	17.55	19.8	23.44	33.46	33.54	46.44	43.67	55.21	43.53	54.34
12:13:20 PM	21.9	33	32.2	32	53.46	37.73	55.46	53.82	52.96	54.45	55.08	55.44	55.16	55.07	55.2	55.74	55.39
12:13:40 PM	21.9	33.2	32.4	32	55.11	55.66	55.35	55.4	55.37	55.19	55.49	55.35	55.16	52.43	55.28	55.22	55.37
12:14:00 PM	21.9	33.2	32.3	32	55.38	55.34	55.95	55.64	55.35	55.22	55.26	55.44	55.17	55.22	55.48	55.12	55.31
12:14:20 PM	21.9	33.2	32.4	32.1	55.23	55.17	54.96	55.16	55.4	55.17	55.21	55.44	55.37	55.06	55.17	55.42	55.21
12:14:40 PM	21.8	33.3	32.6	32.1	54.22	55.09	42.24	55.13	55.18	55.2	55.52	55.41	55.51	55.3	55.47	55.15	55.4
12:15:00 PM	21.9	33.3	32.7	32.1	55.41	55.42	55.5	55.44	55.39	55.5	55.72	55.47	55.07	55.43	55.69	55.18	55.13
12:15:20 PM	22	33.4	33	32.3	55.40	55.35	55.45	55.29	55.65	55.64	55.23	55.42	55.38	55.08	55.32	55.55	55.46
12:15:40 PM	21.9	33.8	33.2	32.5	55.27	55.26	55.27	55.25	55.16	55.33	55.32	55.07	55.3	55.3	55.3	55.38	55.31

Run 3	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
12:16:00 PM	21.8	33.9	33.6	32.6	54.61	55.18	55.67	55.4	54.98	46.91	55.32	55.24	55.26	55.39	55.5	55.27	55.2
12:16:20 PM	21.9	34	33.9	33	54.96	55.42	55.09	55.22	55.07	51.79	55.29	55.34	55.12	55.13	55.37	55.24	55.45
12:16:40 PM	21.9	34.1	34.2	33.2	55.36	55.15	55.87	55.29	55.39	55.26	55.32	55.3	55.74	54.97	55.32	55.38	55.27
12:17:00 PM	21.9	34.4	34.5	33.5	55.24	55.22	55.32	55.34	55.22	55.13	55.25	55.64	55.33	55.13	55.23	55.05	55.06
12:17:20 PM	22	34.7	35	34	55.29	55.12	55.12	55.56	55.38	55.55	55.42	55.17	55.26	54.98	55.25	55.48	55.19
12:17:40 PM	22	34.6	35.3	34.4	55.37	55.34	55.45	55.38	55.59	55.33	55.31	55.11	55.17	55.26	55.46	55.65	55.36
12:18:00 PM	22.1	34.8	35.7	34.8	55.36	55.3	55.33	55.36	55.15	55.56	55.27	55.4	55.39	55.48	55.35	55.28	55.42
12:18:20 PM	22	34.9	36.2	35.3	55.36	55.68	55.01	55.51	55.25	55.28	55.28	55.65	55.41	55.08	55.45	55.32	55.38
12:18:40 PM	22	35.2	36.6	35.8	55.35	55.56	55.91	55.28	55.12	55.38	55.31	55.33	55.5	55.14	55.18	55.39	55.09
12:19:00 PM	22	35.3	37.1	36.2	55.33	55.34	55.61	55.41	55.45	55.12	55.39	55.66	55.42	55.15	55.07	55.3	55.06
12:19:20 PM	21.8	35.3	37.4	36.9	55.26	55.37	55.14	55.23	55.2	55.53	55.65	55.28	54.93	55.15	54.97	55.41	55.25
12:19:40 PM	21.9	35.4	37.9	37.5	55.39	55.18	55.56	55.24	55.64	55.92	55.23	55.09	55.33	55.2	55.36	55.34	55.58
12:20:00 PM	22.1	35.5	38.6	38.1	55.40	55.26	55.89	55.68	55.25	55.35	55.12	55.52	55	55.46	55.63	55.25	55.35
12:20:20 PM	21.9	35.7	39.2	38.5	55.36	55.03	55.63	55.33	55.14	55.2	55.11	55.38	55.48	55.23	55.51	55.7	55.58
12:20:40 PM	22	35.6	39.7	39.2	55.55	55.28	55.95	55.39	55.13	55.46	55.82	55.27	55.58	55.8	55.92	55.45	55.49
12:21:00 PM	21.9	35.8	40.2	39.7	55.62	55.48	55.54	55.66	55.55	55.69	55.73	55.48	55.83	55.61	55.69	55.64	55.48
12:21:20 PM	22.1	35.9	40.7	40.3	55.66	55.46	55.58	55.75	55.61	55.56	55.83	56.09	55.49	55.58	55.59	55.82	55.53
12:21:40 PM	22.1	36.1	41	40.5	55.69	55.9	55.67	55.76	55.65	55.91	55.68	55.5	55.7	55.55	55.7	55.68	55.54
12:22:00 PM	22.2	36	41.2	41	55.68	55.76	55.8	56.08	55.84	55.64	55.57	55.82	55.49	55.29	55.69	55.83	55.34
12:22:20 PM	22	36.3	41.6	41.3	55.66	55.67	55.49	55.93	55.39	55.68	55.6	55.91	55.67	55.85	55.6	55.41	55.74
12:22:40 PM	22	36.4	41.9	41.5	55.58	55.95	55.59	55.59	55.47	55.71	55.45	55.5	55.39	55.3	55.89	55.43	55.65
12:23:00 PM	22.1	36.6	42.1	42	55.59	55.6	56.16	55.87	55.67	55.72	55.23	55.39	55.49	55.57	55.32	55.44	55.61
12:23:20 PM	21.9	36.6	42.5	42.2	55.55	55.33	55.45	55.55	55.72	55.72	55.57	55.33	55.44	55.34	55.48	55.93	55.75
12:23:40 PM	21.9	36.6	42.6	42.6	55.66	55.48	55.65	55.69	55.63	56.15	55.61	55.52	55.39	55.56	55.74	55.81	55.72
12:24:00 PM	21.9	36.7	43	42.8	55.65	55.66	55.52	55.85	55.77	55.7	55.49	55.52	55.66	55.45	55.77	55.65	55.74
12:24:20 PM	22.1	36.8	43.1	43.1	55.63	55.61	55.57	55.6	55.61	55.36	55.65	55.38	55.7	55.97	55.68	55.39	56.02

Run 3	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
12:24:40 PM	21.9	36.9	43.2	43.3	55.14	55.57	55.6	55.83	55.45	55.53	55.77	55.4	55.85	55.62	55.65	55.69	49.71
12:25:00 PM	22.1	36.9	43.5	43.6	55.49	55.51	55.68	55.55	55.43	55.75	55.72	55.32	55.48	55.77	55.92	55.57	54.14
12:25:20 PM	22.1	37.2	43.8	43.7	55.65	55.57	55.44	55.58	55.61	55.7	55.66	55.51	56.14	55.45	55.25	55.84	55.99
12:25:40 PM	22	37.4	43.9	43.9	55.70	55.55	55.81	55.59	55.65	55.74	56.1	56.02	55.66	55.45	55.7	55.44	55.7
12:26:00 PM	21.9	37.2	44.1	44	55.68	55.72	55.7	55.94	55.75	55.71	55.62	55.72	55.62	55.4	55.61	55.64	55.68
12:26:20 PM	22	37.4	44.2	44.4	55.62	55.29	55.48	55.78	55.6	55.57	55.67	55.74	55.85	55.33	55.59	55.82	55.72
12:26:40 PM	22	37.2	44.4	44.5	55.64	55.56	55.18	55.69	55.94	55.63	55.7	55.57	55.69	55.53	55.68	55.62	55.85
12:27:00 PM	22	37.6	44.6	44.8	55.65	55.78	55.61	55.84	55.58	55.76	55.55	55.77	55.75	55.37	55.7	55.63	55.4
12:27:20 PM	22	37.7	44.8	45	55.64	55.74	55.75	55.83	55.78	55.43	55.56	55.65	55.52	55.69	55.65	55.64	55.47
12:27:40 PM	22	37.6	45.1	45.1	55.54	55.56	55.76	55.49	55.51	55.27	55.56	56.08	55.23	55.23	55.61	55.51	55.65
12:28:00 PM	22.2	37.7	45.1	45.3	55.61	55.52	55.66	55.85	55.71	55.64	55.54	55.54	55.51	55.54	55.9	55.52	55.39
12:28:20 PM	22.1	37.8	45.2	45.5	55.58	55.43	55.35	55.87	55.69	55.32	55.6	55.82	55.44	55.64	55.62	55.69	55.51
12:28:40 PM	22.1	37.8	45.3	45.6	55.55	55.47	55.59	55.83	55.68	55.31	55.66	55.6	55.57	55.69	55.3	55.56	55.35
12:29:00 PM	22.1	37.9	45.5	45.8	55.56	55.81	55.47	55.91	55.82	55.47	55.82	55.71	55.59	55.62	54.29	55.64	55.54
12:29:20 PM	22.1	37.8	45.5	45.9	55.61	55.56	56.16	55.68	55.5	55.6	55.63	55.69	55.55	55.3	55.26	55.7	55.67
12:29:40 PM	22.1	38	45.6	45.9	55.58	55.42	55.38	55.77	55.55	55.37	55.76	55.86	55.58	55.46	55.58	55.43	55.77
12:30:00 PM	22.1	38	45.9	46.2	55.37	55.43	52.92	55.75	55.6	55.32	55.76	55.72	55.23	55.88	55.75	55.51	55.55
12:30:20 PM	22.2	38.3	46	46.3	55.68	55.59	55.68	55.64	55.66	55.65	55.67	55.62	55.51	55.3	55.94	56.16	55.79
12:30:40 PM	22.2	38.1	46.1	46.4	55.67	55.68	55.93	55.79	55.42	55.56	55.7	55.4	55.5	55.51	55.64	55.75	56.19
12:31:00 PM	22.2	38.2	46.2	46.6	55.65	55.75	55.54	56.1	55.53	55.55	55.88	55.61	55.32	55.54	55.55	55.82	55.6
12:31:20 PM	22.2	38.4	46.3	46.7	55.64	55.88	55.26	55.59	55.52	55.45	55.71	55.72	55.41	55.68	55.99	55.87	55.57
12:31:40 PM	22.2	38.4	46.3	46.9	55.70	55.82	55.51	55.7	55.89	55.7	55.63	55.61	56.03	55.44	55.79	55.82	55.5
12:32:00 PM	22.3	38.3	46.5	47	55.71	55.67	55.57	55.89	55.68	55.98	55.8	55.94	55.9	55.36	55.78	55.6	55.37
12:32:20 PM	22.1	38.4	46.6	47.1	55.63	55.3	55.76	56.39	55.41	55.7	55.55	55.69	55.53	55.49	55.58	55.66	55.45
12:32:40 PM	22.1	38.5	46.6	47.2	55.67	55.51	55.56	55.65	55.9	55.57	55.67	55.66	55.73	55.52	55.67	56.02	55.58
12:33:00 PM	22	38.5	46.7	47.4	55.60	55.52	54.42	55.71	55.68	55.43	55.84	55.55	55.68	56.06	55.69	55.71	55.89

Run 3	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
12:33:20 PM	22.1	38.5	46.8	47.4	55.60	55.35	55.62	55.67	55.84	55.43	55.71	55.65	55.7	55.28	55.68	55.52	55.69
12:33:40 PM	22.3	38.9	46.9	47.5	55.61	55.75	55.65	55.87	55.63	55.35	55.72	55.81	55.52	55.45	55.19	55.64	55.72
12:34:00 PM	22.4	38.8	47	47.5	55.65	55.5	55.82	55.81	55.7	55.48	55.48	55.69	55.76	55.33	55.74	55.83	55.7
12:34:20 PM	22.2	38.7	47	47.5	55.61	55.16	55.33	55.56	55.6	55.89	56.01	55.81	55.6	55.44	55.44	55.69	55.73
12:34:40 PM	22.3	38.9	47.2	47.8	55.66	55.61	55.62	55.66	55.86	55.74	55.54	55.55	55.57	55.57	55.63	55.82	55.77
12:35:00 PM	22.1	38.9	47.3	47.8	55.73	55.62	55.43	55.93	55.49	55.62	55.82	55.74	55.55	56.18	55.77	55.69	55.95
12:35:20 PM	22	38.9	47.2	47.9	54.76	55.4	55.49	55.84	55.73	55.67	44.69	55.69	55.73	55.48	55.47	56.04	55.93
12:35:40 PM	22.2	39	47.3	48	55.03	55.31	56.21	55.61	55.61	55.58	47.83	55.71	55.7	55.65	55.53	55.88	55.76
12:36:00 PM	22.3	38.8	47.3	48.1	55.71	55.79	55.65	55.76	55.61	55.94	55.68	55.7	55.95	55.63	55.52	55.71	55.61
12:36:20 PM	22.1	39.1	47.5	48.1	55.63	55.57	55.24	55.55	55.69	55.68	55.76	56.04	55.73	55.41	55.51	55.72	55.69
12:36:40 PM	22.2	39.2	47.5	48.2	55.62	55.54	55.77	55.49	55.93	55.84	55.5	55.57	55.75	55.37	55.46	55.59	55.59
12:37:00 PM	22.2	39.1	47.6	48.2	55.55	55.38	55.51	55.65	55.56	55.66	55.57	55.8	55.63	55.52	55.23	55.49	55.56
12:37:20 PM	22.2	39.1	47.6	48.3	55.64	55.48	55.56	56.18	55.74	55.63	55.62	55.56	55.41	55.69	55.45	55.44	55.97
12:37:40 PM	22.2	39	47.7	48.4	55.60	55.76	55.43	55.64	55.49	55.62	55.75	55.47	55.4	55.55	55.47	56.05	55.54
12:38:00 PM	22.2	39.2	47.8	48.4	55.24	55.57	56.02	55.64	55.56	55.25	55.57	55.72	55.81	55.53	50.95	55.64	55.64
12:38:20 PM	22.4	39.5	47.8	48.5	54.52	55.68	55.57	55.67	55.61	55.7	55.63	55.83	55.52	55.47	42.32	55.6	55.58
12:38:40 PM	22.3	39.6	47.8	48.7	55.50	55.77	55.6	55.59	55.69	55.91	56.02	55.45	55.37	55.39	53.96	55.69	55.58
12:39:00 PM	22.3	39.6	47.9	48.7	55.68	55.74	55.6	55.58	56.2	55.53	55.8	55.64	55.53	55.49	55.75	55.6	55.75
12:39:20 PM	22.3	39.4	47.9	48.7	55.68	55.48	55.61	55.74	55.79	55.84	55.77	55.62	55.7	55.24	55.66	55.68	56.04
12:39:40 PM	22.3	39.6	47.9	48.7	55.60	55.89	55.33	55.81	55.59	55.2	55.56	55.72	55.63	55.49	55.98	55.27	55.75
12:40:00 PM	22	39.6	48	48.8	55.68	55.56	55.58	55.87	55.59	55.59	55.68	55.87	55.76	55.58	55.89	55.45	55.69
12:40:20 PM	22.2	39.6	48	48.8	55.59	55.49	55.2	55.71	55.29	55.52	55.64	55.86	55.76	55.39	55.78	55.53	55.89
12:40:40 PM	22.2	39.4	48	48.9	55.65	55.73	55.86	55.71	55.38	55.14	55.77	55.88	55.73	55.52	55.54	55.77	55.72
12:41:00 PM	22.2	39.6	48.1	48.9	55.69	55.68	55.54	55.71	55.81	56.14	55.56	55.64	55.42	55.63	55.76	55.79	55.54
12:41:20 PM	22.2	39.6	48.2	48.9	55.65	55.71	55.71	55.8	55.7	55.67	55.55	55.53	55.3	55.9	55.52	55.75	55.71
12:41:40 PM	22.4	39.6	48	49	55.56	55.69	55.65	55.67	55.67	55.2	55.37	55.61	55.61	55.65	55.31	55.6	55.66

Run 3	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
12:42:00 PM	22.3	39.8	48.1	49	55.68	55.97	55.83	55.87	55.69	55.8	55.35	55.74	55.63	55.42	55.76	55.51	55.59
12:42:20 PM	22.1	39.6	48.1	49	55.55	55.61	55.6	55.8	55.69	55.74	55.25	55.72	55.26	55.28	55.6	55.47	55.58
12:42:40 PM	22.1	39.7	48.1	49	54.84	55.72	55.57	55.72	55.6	55.6	55.7	55.93	46.38	55.33	55.52	55.55	55.4
12:43:00 PM	22.2	39.5	48.1	49	55.50	55.69	55.68	55.5	55.67	55.69	55.74	55.61	54.22	55.59	55.46	55.6	55.58
12:43:20 PM	22.1	39.6	48.1	49.1	55.65	55.45	55.64	55.69	55.71	55.71	55.7	55.58	55.67	55.52	55.51	55.86	55.7
12:43:40 PM	22.1	39.6	48.1	49.1	55.73	55.89	55.46	55.74	55.48	55.74	55.77	55.59	55.64	55.76	55.72	55.77	56.24
12:44:00 PM	22.2	39.7	48.1	49.2	55.73	55.8	56.01	55.65	55.82	55.55	55.68	55.47	55.61	55.53	56.21	55.75	55.65
12:44:20 PM	22.1	39.5	48.2	49.3	55.57	55.57	55.66	55.76	55.55	55.35	55.45	55.56	55.62	55.35	55.61	55.68	55.65
12:44:40 PM	22.1	39.6	48.1	49.3	55.64	55.55	55.52	55.69	55.5	55.58	55.68	55.61	55.84	55.51	55.74	55.82	55.62
12:45:00 PM	22.1	39.8	48.1	49.3	55.70	55.52	55.77	55.64	55.69	55.92	56.18	55.36	55.55	55.76	55.8	55.61	55.62
12:45:20 PM	22	39.8	48.2	49.2	55.71	55.31	55.34	55.81	56.17	55.9	55.45	55.59	55.53	55.5	55.56	56.42	55.92
12:45:40 PM	22.1	39.6	48.2	49.2	55.67	55.67	55.59	55.74	55.62	55.62	55.82	55.69	55.34	55.59	55.58	55.77	56
12:46:00 PM	22.2	39.7	48.2	49.2	55.43	55.56	55.54	56.2	55.7	53.37	55.47	55.28	55.54	55.56	55.73	55.69	55.56
12:46:20 PM	22.1	39.8	48.2	49.2	54.68	55.72	55.77	55.39	55.45	45.21	55.56	55.46	55.4	55.49	55.65	55.66	55.38
12:46:40 PM	22.1	39.8	48.3	49.2	55.59	55.49	55.47	55.55	55.68	55.26	55.56	55.61	55.81	55.75	55.64	55.72	55.49
12:47:00 PM	22	40	48.3	49.4	54.33	55.74	55.51	55.64	55.59	55.69	55.77	56.13	55.61	55.64	40.11	55.62	54.94
12:47:20 PM	22.2	40	48.3	49.4	31.81	55.74	55.67	50.94	40.43	42.06	39.61	33.87	17.38	17.12	0.32	18.34	10.24
12:47:40 PM	22.2	39.8	48.3	49.4	4.48	23.63	21.93	3.63	0.3	0.47	0.46	0.36	0.41	0.44	0.32	1.3	0.49
12:48:00 PM	22.1	40	48.3	49.4	0.42	0.43	0.45	0.68	0.42	0.43	0.35	0.27	0.32	0.54	0.48	0.35	0.35
12:48:20 PM	22.1	39.9	48.4	49.4	0.39	0.34	0.35	0.48	0.25	0.43	0.33	0.46	0.41	0.25	0.57	0.36	0.49
12:48:40 PM	22.1	39.8	48.2	49.4	0.42	0.62	0.29	0.53	0.43	0.26	0.36	0.36	0.55	0.38	0.42	0.46	0.37
12:49:00 PM	22.1	39.8	48.1	49.4	0.40	0.46	0.41	0.36	0.36	0.35	0.39	0.84	0.28	0.41	0.36	0.35	0.24
12:49:20 PM	22	39.6	47.8	49.4	0.46	0.26	0.35	0.47	0.88	0.44	0.88	0.25	0.49	0.26	0.25	0.66	0.36
12:49:40 PM	22.1	39.6	47.4	49.4	0.45	0.34	0.24	0.35	0.33	0.26	0.54	0.38	0.66	0.53	0.37	0.73	0.7
12:50:00 PM	22.1	39.9	46.8	49.1	1.29	0.43	0.38	0.5	0.54	0.54	0.9	0.83	0.24	8.7	0.94	0.37	1.05
12:50:20 PM	22.1	39.6	46.3	48.8	0.59	0.43	0.35	0.96	0.25	0.26	0.26	0.65	0.46	1.51	0.8	0.6	0.52

DATA COLLECTION RUN 4

Table 4: Data Collection Run 4 (Top Load)

Run 4	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
12:56:20 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.5	0.35	0.64	0.68	0.28	0.27	0.29	0.24	0.39	0.59	0.42	0.34
12:56:40 PM	#N/A	#N/A	#N/A	#N/A	0.35	0.42	0.41	0.43	0.27	0.25	0.36	0.4	0.24	0.26	0.34	0.36	0.45
12:57:00 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.27	0.35	0.37	0.53	0.37	0.42	0.56	0.64	0.32	0.37	0.46	0.37
12:57:20 PM	#N/A	#N/A	#N/A	#N/A	0.51	0.96	0.43	0.82	0.38	0.39	0.44	0.52	0.5	0.52	0.36	0.53	0.25
12:57:40 PM	#N/A	#N/A	#N/A	#N/A	0.40	0.27	0.28	0.38	0.39	0.45	0.77	0.28	0.29	0.45	0.25	0.49	0.46
12:58:00 PM	#N/A	#N/A	#N/A	#N/A	0.50	0.25	0.38	0.68	0.42	0.97	0.26	0.95	0.35	0.27	0.44	0.47	0.51
12:58:20 PM	#N/A	#N/A	#N/A	#N/A	0.45	0.68	0.51	0.47	0.44	0.27	0.26	0.43	0.24	0.37	0.59	0.84	0.26
12:58:40 PM	#N/A	#N/A	#N/A	#N/A	0.37	0.25	0.25	0.44	0.25	0.26	0.53	0.39	0.42	0.28	0.26	0.86	0.27
12:59:00 PM	#N/A	#N/A	#N/A	#N/A	0.46	0.51	0.25	0.36	0.25	0.55	0.39	0.36	0.49	0.97	0.25	0.45	0.73
12:59:20 PM	#N/A	#N/A	#N/A	#N/A	0.49	0.92	0.4	0.64	0.37	0.41	0.57	0.27	0.26	0.51	0.78	0.34	0.42
12:59:40 PM	#N/A	#N/A	#N/A	#N/A	0.39	0.35	0.42	0.44	0.86	0.26	0.32	0.25	0.29	0.27	0.47	0.49	0.25
1:00:00 PM	#N/A	#N/A	#N/A	#N/A	0.41	0.36	0.38	0.5	0.25	0.43	0.35	0.77	0.36	0.27	0.25	0.46	0.55
1:00:20 PM	#N/A	#N/A	#N/A	#N/A	0.56	0.5	0.35	0.47	0.36	0.26	0.43	0.82	0.69	0.83	0.92	0.55	0.57
1:00:40 PM	#N/A	#N/A	#N/A	#N/A	1.12	0.25	0.49	0.37	0.79	0.44	0.69	0.42	0.26	0.72	0.58	7.5	0.88
1:01:00 PM	#N/A	#N/A	#N/A	#N/A	0.78	0.26	0.24	0.74	0.43	0.83	0.52	0.36	0.5	0.27	0.43	0.41	4.41
1:01:20 PM	#N/A	#N/A	#N/A	#N/A	0.90	0.54	0.58	0.48	0.27	0.42	0.26	0.45	0.24	1.1	5.86	0.35	0.25
1:01:40 PM	#N/A	#N/A	#N/A	#N/A	0.66	0.53	0.24	0.36	0.53	0.26	0.62	0.26	0.41	0.26	2.74	1	0.67
1:02:00 PM	#N/A	#N/A	#N/A	#N/A	1.72	0.26	0.41	0.5	0.68	1.34	7.31	0.37	7.88	0.45	0.25	0.54	0.59
1:02:20 PM	#N/A	#N/A	#N/A	#N/A	2.04	0.81	0.36	1.25	0.26	7.56	2.05	9.84	0.66	0.36	0.58	0.33	0.42
1:02:40 PM	#N/A	#N/A	#N/A	#N/A	0.72	0.28	0.44	0.51	4.88	0.27	0.26	0.4	0.24	0.27	0.43	0.34	0.34
1:03:00 PM	#N/A	#N/A	#N/A	#N/A	1.24	0.43	0.26	7.82	2.49	0.46	0.58	0.66	0.56	0.26	0.25	0.76	0.39

Run 4	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
1:03:20 PM	#N/A	#N/A	#N/A	#N/A	0.69	0.4	2.07	1.5	0.26	0.41	0.42	0.61	0.75	0.6	0.36	0.53	0.42
1:03:40 PM	#N/A	#N/A	#N/A	#N/A	1.40	7.8	4.61	0.35	0.58	0.44	0.25	0.25	0.25	0.55	0.75	0.49	0.44
1:04:00 PM	#N/A	#N/A	#N/A	#N/A	0.47	0.71	0.67	0.67	0.43	0.36	0.36	0.37	0.45	0.27	0.43	0.46	0.5
1:04:20 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.75	0.6	0.56	0.25	0.36	0.32	0.43	0.3	0.37	0.5	0.36	0.26
1:04:40 PM	#N/A	#N/A	#N/A	#N/A	0.40	0.27	0.24	0.36	0.36	0.75	0.25	0.9	0.42	0.26	0.26	0.44	0.27
1:05:00 PM	#N/A	#N/A	#N/A	#N/A	0.45	0.6	0.25	0.36	0.31	0.54	0.67	0.36	0.48	0.29	0.26	0.91	0.39
1:05:20 PM	#N/A	#N/A	#N/A	#N/A	0.46	0.36	0.36	0.57	0.26	0.39	0.26	0.26	0.25	1.19	0.63	0.38	0.57
1:05:40 PM	#N/A	#N/A	#N/A	#N/A	0.45	0.26	0.61	0.54	0.69	0.26	0.52	0.26	0.25	0.27	0.53	0.73	0.53
1:06:00 PM	#N/A	#N/A	#N/A	#N/A	0.44	0.51	0.56	0.5	0.25	0.63	0.39	0.53	0.38	0.26	0.26	0.46	0.52
1:06:20 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.49	0.35	0.48	0.25	0.28	0.77	0.27	0.48	0.4	0.5	0.52	0.26
1:06:40 PM	#N/A	#N/A	#N/A	#N/A	0.39	0.26	0.25	0.35	0.39	0.61	0.25	0.87	0.24	0.48	0.26	0.36	0.35
1:07:00 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.26	0.25	0.54	0.77	0.37	0.41	0.38	0.47	0.27	0.39	0.47	0.45
1:07:20 PM	#N/A	#N/A	#N/A	#N/A	0.46	0.54	0.52	0.8	0.26	0.39	0.35	0.52	0.5	0.51	0.41	0.42	0.35
1:07:40 PM	#N/A	#N/A	#N/A	#N/A	0.37	0.27	0.26	0.39	0.5	0.25	0.25	0.44	0.42	0.34	0.25	0.5	0.53
1:08:00 PM	#N/A	#N/A	#N/A	#N/A	0.46	0.39	0.68	0.51	0.27	0.38	0.53	0.36	0.35	0.28	0.65	0.64	0.48
1:08:20 PM	#N/A	#N/A	#N/A	#N/A	0.41	0.5	0.34	0.48	0.27	0.42	0.26	0.27	0.29	0.55	0.49	0.63	0.43
1:08:40 PM	#N/A	#N/A	#N/A	#N/A	0.41	0.25	0.24	0.53	0.53	0.42	0.77	0.62	0.25	0.27	0.44	0.36	0.26
1:09:00 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.83	0.44	0.37	0.25	0.37	0.36	0.54	0.48	0.27	0.27	0.48	0.36
1:09:20 PM	#N/A	#N/A	#N/A	#N/A	0.46	0.28	0.35	0.48	0.69	0.39	0.95	0.26	0.41	0.51	0.37	0.6	0.26
1:09:40 PM	#N/A	#N/A	#N/A	#N/A	0.47	0.34	0.24	0.45	1.01	0.43	0.26	0.26	0.25	0.97	0.25	0.5	0.73
1:10:00 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.27	0.43	0.67	0.29	0.37	0.36	0.37	0.35	0.27	0.49	0.45	0.7
1:10:20 PM	#N/A	#N/A	#N/A	#N/A	0.48	0.55	0.52	0.46	0.44	0.26	0.25	0.27	0.57	0.64	0.94	0.38	0.53
1:10:40 PM	#N/A	#N/A	#N/A	#N/A	0.53	0.44	0.5	0.35	0.35	0.27	0.61	1.11	0.34	0.64	0.5	0.68	0.54
1:11:00 PM	#N/A	#N/A	#N/A	#N/A	0.48	0.27	0.24	0.35	0.25	0.7	0.57	0.92	0.67	0.26	0.5	0.64	0.38
1:11:20 PM	22.00	32.90	32.00	32.60	0.41	0.26	0.35	0.46	0.32	0.6	0.39	0.3	0.24	0.8	0.37	0.42	0.43
1:11:40 PM	22.00	32.90	32.10	32.50	0.55	0.36	1.73	0.91	0.66	0.25	0.26	0.26	0.25	0.25	0.44	0.48	0.73

Run 4	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
1:12:00 PM	21.80	33.10	31.90	32.50	9.51	16.86	60.39	26.25	0.56	7.01	0.38	0.53	0.34	0.32	0.26	0.56	0.62
1:12:20 PM	21.80	32.90	31.90	32.40	17.73	22.54	100	25.87	19.13	25.03	17.22	0.52	0.66	0.36	0.66	0.53	0.28
1:12:40 PM	21.90	32.90	31.90	32.40	17.18	23.47	100	22.87	21.46	20.52	15.66	0.4	0.42	0.46	0.25	0.35	0.27
1:13:00 PM	21.80	32.80	31.90	32.30	17.12	16.23	100	11.38	15.05	23.14	36.57	0.94	0.56	0.28	0.26	0.44	0.53
1:13:20 PM	22.00	33.00	32.00	32.20	12.60	3.05	100	1.18	23.87	13.31	7.56	0.26	0.24	0.5	0.53	0.45	0.25
1:13:40 PM	22.10	33.20	31.80	32.20	9.49	1.14	100	1.02	6.77	1.23	0.96	0.43	0.93	0.26	0.29	0.55	0.25
1:14:00 PM	22.10	33.30	31.90	32.10	9.05	1.11	100	1.17	1	1.04	1.39	0.36	0.53	0.45	0.25	0.62	0.7
1:14:20 PM	21.90	33.40	32.00	32.10	10.55	8.01	100	13.02	0.91	0.96	0.81	0.28	0.26	0.54	0.96	0.35	0.45
1:14:40 PM	21.90	33.40	32.10	32.00	20.19	42.62	100	48.38	7.37	22.61	19.38	0.39	0.24	0.28	0.43	0.35	0.25
1:15:00 PM	21.90	33.30	32.20	32.00	32.32	70.6	100	81.71	35.87	52.88	44.03	0.53	0.84	0.27	0.26	0.46	0.39
1:15:20 PM	22.00	33.50	32.30	32.00	42.59	100	100	100	60.31	76.12	71.22	0.75	0.41	0.92	0.63	0.47	0.25
1:15:40 PM	21.90	33.40	32.50	32.00	48.75	100	100	100	82.05	100	100	0.27	0.25	0.26	0.28	1.32	0.54
1:16:00 PM	22.10	33.50	32.60	31.90	50.25	100	100	100	100	100	100	0.37	0.37	0.79	0.25	0.44	0.83
1:16:20 PM	22.00	33.60	32.90	31.80	50.25	100	100	100	100	100	100	0.28	0.25	0.42	1.27	0.36	0.39
1:16:40 PM	22.10	33.80	33.00	31.80	50.16	100	100	100	100	100	100	0.56	0.26	0.26	0.25	0.35	0.25
1:17:00 PM	22.20	34.00	33.40	31.80	50.23	100	100	100	100	100	100	0.37	0.88	0.25	0.26	0.63	0.36
1:17:20 PM	21.90	34.40	33.70	31.70	50.25	100	100	100	100	100	100	0.77	0.49	0.68	0.37	0.36	0.34
1:17:40 PM	21.90	34.70	34.20	31.70	50.17	100	100	100	100	100	100	0.26	0.25	0.26	0.43	0.49	0.33
1:18:00 PM	22.20	34.60	34.70	31.70	50.21	100	100	100	100	100	100	0.39	0.35	0.28	0.26	0.81	0.4
1:18:20 PM	22.20	34.90	35.50	31.60	50.29	100	100	100	100	100	100	0.44	0.41	0.88	0.38	0.63	0.69
1:18:40 PM	22.00	34.90	36.30	31.50	50.19	100	100	100	100	100	100	0.38	0.25	0.26	0.61	0.53	0.26
1:19:00 PM	22.40	35.10	37.30	31.60	50.23	100	100	100	100	100	100	0.36	0.66	0.44	0.25	0.47	0.53
1:19:20 PM	22.00	35.10	38.20	31.50	50.24	100	100	100	100	100	100	0.83	0.41	0.5	0.55	0.35	0.25
1:19:40 PM	22.10	35.50	39.20	31.50	50.17	100	100	100	100	100	100	0.47	0.24	0.26	0.25	0.49	0.27
1:20:00 PM	22.10	36.00	40.20	31.50	50.21	100	100	100	100	100	100	0.35	0.51	0.26	0.28	0.72	0.38
1:20:20 PM	22.20	36.10	41.20	31.50	50.29	100	100	100	100	100	100	0.24	0.52	0.85	0.62	0.46	0.8

Run 4	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
1:20:40 PM	22.10	35.90	42.10	31.40	50.29	100	100	100	100	100	100	0.8	0.25	0.53	0.48	0.6	0.77
1:21:00 PM	22.30	36.00	42.70	31.40	50.21	100	100	100	100	100	100	0.36	0.5	0.26	0.69	0.35	0.36
1:21:20 PM	22.20	35.70	43.40	31.50	50.20	100	100	100	100	100	100	0.44	0.29	0.62	0.36	0.45	0.25
1:21:40 PM	22.20	35.80	44.00	31.40	50.21	100	100	100	100	100	100	0.67	0.41	0.25	0.26	0.68	0.24
1:22:00 PM	22.20	36.00	44.60	31.40	50.23	100	100	100	100	100	100	0.37	0.34	0.44	0.26	0.73	0.64
1:22:20 PM	22.20	36.00	45.20	31.30	50.17	100	100	100	100	100	98.59	0.51	0.49	0.38	0.62	0.47	0.97
1:22:40 PM	22.20	36.50	45.70	31.30	50.17	100	100	100	100	100	100	0.57	0.24	0.34	0.39	0.27	0.27
1:23:00 PM	22.20	36.60	46.30	31.20	50.11	100	100	100	100	100	98.74	0.44	0.73	0.27	0.32	0.43	0.34
1:23:20 PM	22.20	36.90	46.90	31.30	49.87	100	100	100	100	100	96.04	0.25	0.42	0.7	0.36	0.37	0.25
1:23:40 PM	22.30	37.10	47.20	31.20	50.16	100	100	100	100	100	100	0.31	0.25	0.25	0.25	0.39	0.42
1:24:00 PM	22.10	37.10	47.60	31.20	50.17	100	100	100	100	100	100	0.35	0.35	0.27	0.41	0.27	0.36
1:24:20 PM	22.10	37.10	48.00	31.30	50.19	100	100	100	100	100	100	0.52	0.25	0.36	0.35	0.43	0.38
1:24:40 PM	22.10	37.40	48.40	31.30	50.22	100	100	100	100	100	100	0.39	0.43	0.32	0.39	0.43	0.73
1:25:00 PM	22.10	37.20	48.80	31.20	50.22	100	100	100	100	100	100	0.36	0.47	0.45	0.42	0.34	0.55
1:25:20 PM	22.20	37.60	49.10	31.20	50.23	100	100	100	100	100	100	0.25	0.24	0.77	0.86	0.39	0.25
1:25:40 PM	22.20	37.70	49.40	31.20	50.23	100	100	100	100	100	100	0.44	0.58	0.26	0.28	0.65	0.51
1:26:00 PM	22.10	37.90	49.70	31.10	50.21	100	100	100	100	100	100	0.63	0.54	0.28	0.25	0.41	0.37
1:26:20 PM	22.20	38.00	49.70	31.10	50.18	100	100	100	100	100	100	0.28	0.24	0.4	0.37	0.45	0.38
1:26:40 PM	22.00	38.10	50.00	31.10	50.23	100	100	100	100	100	100	0.38	0.24	0.9	0.39	0.26	0.53
1:27:00 PM	22.20	38.00	50.20	31.10	50.19	100	100	100	100	100	100	0.36	0.48	0.26	0.49	0.26	0.37
1:27:20 PM	22.10	38.10	50.30	31.00	50.22	100	100	100	100	100	100	0.69	0.49	0.51	0.35	0.37	0.25
1:27:40 PM	22.50	38.00	50.60	31.10	50.19	100	100	100	100	100	100	0.26	0.7	0.26	0.26	0.57	0.26
1:28:00 PM	22.10	38.10	50.60	31.10	50.22	100	100	100	100	100	100	0.8	0.34	0.45	0.28	0.27	0.45
1:28:20 PM	22.30	38.60	50.60	30.90	50.23	100	100	100	100	100	100	0.25	0.24	0.36	0.64	0.8	0.47
1:28:40 PM	21.90	38.70	50.80	31.00	49.89	100	96.57	100	100	100	100	0.41	0.25	0.27	0.4	0.54	0.25
1:29:00 PM	22.20	38.80	50.80	30.90	50.23	100	100	100	100	100	100	0.53	0.57	0.74	0.26	0.26	0.42

Run 4	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
1:29:20 PM	22.00	39.00	51.00	31.00	50.20	100	100	100	99.65	100	100	0.25	0.31	0.51	0.91	0.54	0.25
1:29:40 PM	22.00	39.40	51.00	30.90	49.96	97.41	100	100	100	100	100	0.25	0.32	0.43	0.27	0.4	0.44
1:30:00 PM	22.00	39.40	51.20	30.80	50.18	100	100	100	100	100	100	0.47	0.35	0.26	0.43	0.26	0.39
1:30:20 PM	22.10	39.40	51.30	30.90	50.29	100	100	100	100	100	100	0.52	0.66	0.65	0.62	0.38	0.66
1:30:40 PM	22.00	39.30	51.10	30.80	50.28	100	100	100	100	100	100	0.68	0.42	0.54	0.42	0.78	0.52
1:31:00 PM	22.00	39.30	51.30	30.80	50.23	100	100	100	100	100	100	0.25	0.5	0.52	0.65	0.26	0.52
1:31:20 PM	21.90	39.50	51.30	30.90	50.21	100	100	100	100	100	100	0.39	0.25	0.62	0.43	0.36	0.43
1:31:40 PM	22.10	39.50	51.50	30.80	50.15	100	100	100	100	100	100	0.26	0.24	0.27	0.43	0.39	0.26
1:32:00 PM	21.90	39.60	51.40	30.80	50.18	100	100	100	100	100	100	0.43	0.48	0.27	0.25	0.25	0.45
1:32:20 PM	22.00	39.50	51.50	30.80	50.27	100	100	100	100	100	100	0.69	0.66	0.36	0.45	0.62	0.4
1:32:40 PM	22.10	39.40	51.70	30.80	50.19	100	100	100	100	100	100	0.39	0.25	0.44	0.42	0.37	0.43
1:33:00 PM	22.00	39.90	51.60	30.80	50.19	100	100	100	100	100	100	0.24	0.56	0.27	0.44	0.26	0.49
1:33:20 PM	22.10	39.60	51.60	30.70	50.24	100	100	100	100	100	100	0.62	0.24	0.9	0.36	0.36	0.35
1:33:40 PM	22.10	39.80	51.60	30.80	50.17	100	99.81	100	100	100	100	0.26	0.43	0.37	0.32	0.56	0.26
1:34:00 PM	22.10	39.90	51.70	30.80	50.17	100	100	100	100	100	100	0.25	0.48	0.45	0.26	0.25	0.36
1:34:20 PM	22.10	39.90	51.70	30.70	50.21	100	100	100	100	100	100	0.62	0.25	0.37	0.36	0.37	0.56
1:34:40 PM	22.00	39.60	51.80	30.60	50.17	100	100	100	100	100	100	0.39	0.24	0.26	0.57	0.35	0.27
1:35:00 PM	22.20	39.80	51.80	30.70	50.17	100	100	100	100	100	100	0.42	0.34	0.26	0.26	0.41	0.38
1:35:20 PM	22.30	39.80	51.80	30.60	50.31	100	100	100	100	100	100	0.37	0.54	0.86	0.62	0.67	0.71
1:35:40 PM	21.80	40.10	52.00	30.60	50.25	100	100	100	100	100	100	0.27	0.25	0.46	0.63	0.74	0.69
1:36:00 PM	22.00	40.00	51.80	30.70	49.81	100	95.72	100	100	100	100	0.26	0.37	0.27	0.44	0.35	0.35
1:36:20 PM	22.00	39.90	51.80	30.70	49.94	100	100	100	100	100	96.77	0.56	0.29	0.4	0.35	0.47	0.4
1:36:40 PM	21.90	39.90	52.00	30.60	50.20	100	100	100	100	100	100	0.48	0.41	0.27	0.4	0.53	0.26
1:37:00 PM	22.00	39.60	52.00	30.50	50.16	100	100	100	100	100	100	0.27	0.35	0.26	0.25	0.43	0.36
1:37:20 PM	22.10	39.50	52.10	30.60	50.31	100	100	100	100	100	100	0.62	0.7	0.84	0.37	0.46	0.71
1:37:40 PM	22.00	39.70	52.10	30.60	50.19	100	100	100	100	100	100	0.25	0.25	0.27	0.71	0.49	0.27

Run 4	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
1:38:00 PM	22.00	39.80	52.10	30.80	50.17	100	100	100	100	100	100	0.42	0.34	0.29	0.27	0.36	0.36
1:38:20 PM	21.90	40.10	52.20	30.50	50.17	100	100	100	100	99	100	0.35	0.62	0.37	0.36	0.93	0.39
1:38:40 PM	22.00	40.00	52.20	30.60	49.65	100	100	100	100	93.49	100	0.53	0.24	0.43	0.39	0.35	0.34
1:39:00 PM	22.00	39.70	52.30	30.60	50.18	100	100	100	100	100	100	0.25	0.34	0.36	0.43	0.36	0.44
1:39:20 PM	22.00	40.00	52.20	30.50	50.21	100	100	100	100	100	100	0.36	0.38	0.51	0.36	0.64	0.25
1:39:40 PM	22.00	40.40	52.40	30.50	50.19	100	100	100	100	100	100	0.42	0.33	0.34	0.25	0.49	0.42
1:40:00 PM	22.00	40.40	52.30	30.50	50.18	100	100	100	100	100	100	0.25	0.43	0.27	0.32	0.53	0.39
1:40:20 PM	21.80	40.80	52.30	30.60	50.30	100	100	100	100	100	100	0.37	0.54	0.79	0.6	0.48	0.82
1:40:40 PM	22.00	40.50	52.30	30.50	49.98	100	100	100	95.95	100	100	1.06	0.42	0.55	0.6	0.61	0.53
1:41:00 PM	22.00	40.40	52.20	30.50	49.95	100	100	100	96.98	100	100	0.43	0.37	0.27	0.67	0.35	0.35
1:41:20 PM	21.90	40.40	52.20	30.70	50.25	100	100	100	100	100	100	0.39	0.54	0.62	0.35	0.83	0.26
1:41:40 PM	22.00	40.40	52.10	30.50	50.22	100	100	100	100	100	100	0.27	0.24	0.52	0.25	0.49	0.87
1:42:00 PM	22.00	40.30	52.10	30.50	50.21	100	100	100	100	100	100	0.25	0.34	0.26	0.73	0.36	0.56
1:42:20 PM	22.00	40.30	52.10	30.60	49.95	100	100	100	96.34	100	100	0.62	0.49	0.37	0.54	0.55	0.48
1:42:40 PM	22.00	40.60	52.00	30.50	50.26	100	100	100	100	100	100	1.22	0.53	0.27	0.49	0.35	0.27
1:43:00 PM	22.00	40.60	52.00	30.60	50.20	100	100	100	100	100	100	0.57	0.5	0.27	0.25	0.52	0.26
1:43:20 PM	22.00	40.60	52.00	30.60	50.29	100	100	100	100	100	100	0.45	0.49	0.71	0.25	1.01	0.54
1:43:40 PM	22.00	40.60	52.20	30.60	50.18	100	100	100	100	100	100	0.25	0.25	0.26	0.55	0.47	0.32
1:44:00 PM	22.00	40.60	52.10	30.60	50.20	100	100	100	100	100	100	0.42	0.25	0.84	0.26	0.36	0.27
1:44:20 PM	22.10	40.50	52.10	30.60	50.23	100	100	100	100	100	100	0.37	0.52	0.37	0.32	0.63	0.49
1:44:40 PM	22.00	40.20	52.00	30.60	50.20	100	100	100	100	100	100	0.38	0.47	0.44	0.5	0.33	0.26
1:45:00 PM	21.90	40.30	52.00	30.40	50.19	100	100	100	100	100	100	0.65	0.24	0.27	0.26	0.36	0.45
1:45:20 PM	22.00	40.60	52.00	30.60	50.09	100	97.98	100	100	100	100	0.36	0.48	0.77	0.69	0.48	0.36
1:45:40 PM	21.90	40.40	52.00	30.60	49.95	100	100	100	100	96.55	100	0.43	0.26	0.26	0.39	1	0.54
1:46:00 PM	22.00	40.30	52.00	30.60	50.19	100	100	100	100	100	100	0.25	0.44	0.48	0.26	0.52	0.36
1:46:20 PM	22.10	40.40	52.00	30.80	50.26	100	100	100	100	100	100	0.38	0.35	0.57	0.66	0.47	0.67

Run 4	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
1:46:40 PM	22.00	40.40	52.00	30.70	50.18	100	100	100	100	100	100	0.41	0.24	0.27	0.67	0.35	0.26
1:47:00 PM	22.10	40.30	51.80	30.60	50.16	100	100	100	100	100	100	0.42	0.28	0.28	0.26	0.35	0.27
1:47:20 PM	22.00	40.40	51.80	30.70	50.28	100	100	100	100	100	100	0.69	0.89	0.49	0.25	0.64	0.37
1:47:40 PM	22.00	40.40	51.70	30.70	50.17	100	100	100	100	100	100	0.28	0.25	0.27	0.36	0.56	0.26
1:48:00 PM	22.00	40.40	51.60	30.70	50.22	100	100	100	100	100	100	0.26	0.24	0.54	0.27	0.36	0.98
1:48:20 PM	22.10	40.30	51.70	30.80	50.28	100	100	100	100	100	100	0.36	0.35	0.37	0.78	0.96	0.52
1:48:40 PM	22.10	40.30	51.70	30.80	50.18	100	100	100	100	100	100	0.58	0.26	0.26	0.52	0.34	0.25
1:49:00 PM	22.20	40.50	51.60	30.70	50.18	100	100	100	100	100	100	0.25	0.53	0.27	0.26	0.53	0.27
1:49:20 PM	22.20	40.70	51.60	30.70	50.26	100	100	100	100	100	100	0.72	0.48	0.7	0.26	0.46	0.46
1:49:40 PM	21.90	40.70	51.60	30.80	50.19	100	100	100	100	100	100	0.26	0.25	0.27	0.53	0.51	0.43
1:50:00 PM	22.00	40.50	51.50	30.60	50.20	100	100	100	100	100	100	0.27	0.25	0.27	0.35	0.92	0.3
1:50:20 PM	22.20	40.30	51.60	30.60	50.31	100	100	100	100	100	100	0.53	0.78	0.68	0.51	0.49	0.78
1:50:40 PM	22.20	40.50	51.70	30.80	50.31	100	100	100	100	100	100	0.69	0.46	0.56	0.62	0.78	0.56
1:51:00 PM	22.00	40.70	51.70	30.70	50.21	100	100	100	100	100	100	0.34	0.28	0.46	0.53	0.4	0.46
1:51:20 PM	22.10	40.80	51.60	30.80	50.27	100	100	100	100	100	100	0.52	0.81	0.51	0.43	0.56	0.36
1:51:40 PM	22.00	40.90	51.60	30.80	50.18	100	100	100	100	100	100	0.43	0.25	0.37	0.36	0.49	0.26
1:52:00 PM	21.90	40.80	51.60	30.70	48.46	100	87.99	91.53	100	100	100	0.25	0.41	0.26	0.25	0.6	0.26
1:52:20 PM	22.00	40.60	51.50	30.70	30.41	47.14	12.52	17.82	100	83.92	100	0.64	0.6	0.49	0.25	0.55	0.99
1:52:40 PM	21.90	40.40	51.50	30.70	8.11	0.89	0.69	0.94	36.23	10.6	45.48	0.39	0.25	0.38	0.65	0.35	0.44
1:53:00 PM	22.10	40.50	51.40	30.70	0.40	0.68	0.56	0.51	0.52	0.33	0.38	0.25	0.24	0.28	0.42	0.36	0.26
1:53:20 PM	21.90	40.40	51.50	30.60	0.45	0.5	0.25	0.35	0.33	0.58	0.6	0.62	0.69	0.4	0.25	0.46	0.37
1:53:40 PM	22.20	39.50	51.60	30.70	0.43	0.35	0.35	0.46	0.33	0.75	0.5	0.33	0.42	0.37	0.36	0.67	0.25
1:54:00 PM	22.10	39.40	51.40	30.80	0.39	0.52	0.25	0.5	0.58	0.43	0.25	0.25	0.25	0.58	0.25	0.42	0.43
1:54:20 PM	22.00	39.30	50.80	30.70	0.45	0.39	0.65	0.59	0.42	0.37	0.5	0.46	0.35	0.26	0.42	0.46	0.57
1:54:40 PM	22.00	39.10	50.30	30.80	1.01	0.63	0.8	0.56	0.34	0.26	0.26	0.58	0.24	7.23	0.51	0.36	0.34
1:55:00 PM	21.90	39.20	49.70	30.80	0.37	0.5	0.24	0.48	0.36	0.25	0.25	0.26	0.43	0.26	0.56	0.58	0.27

Run 4	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
1:55:20 PM	22.00	39.20	49.10	30.80	0.49	0.26	0.37	0.35	0.26	0.68	0.67	0.37	0.62	0.83	0.57	0.49	0.37
1:55:40 PM	22.10	38.80	48.40	30.80	0.50	0.36	0.6	0.47	0.24	0.68	0.85	0.32	0.33	0.37	0.38	0.76	0.68

DATA COLLECTION RUN 5

Table 5: Data Collection Run 5 (Split Load)

Run 5	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
2:00:00 PM	#N/A	#N/A	#N/A	#N/A	0.48	0.25	0.25	0.49	0.81	0.25	1.21	0.64	0.24	0.44	0.36	0.34	0.42
2:00:20 PM	#N/A	#N/A	#N/A	#N/A	0.50	0.39	0.38	0.53	0.69	1.01	0.24	0.38	0.36	0.7	0.26	0.48	0.54
2:00:40 PM	#N/A	#N/A	#N/A	#N/A	0.61	0.53	0.77	0.52	0.39	0.36	0.37	0.76	0.53	0.36	0.86	0.85	0.98
2:01:00 PM	#N/A	#N/A	#N/A	#N/A	0.46	0.28	0.25	0.36	0.36	0.25	0.75	0.38	0.27	0.92	0.53	0.35	0.83
2:01:20 PM	#N/A	#N/A	#N/A	#N/A	0.51	0.47	0.48	0.35	0.26	0.7	0.4	0.39	0.66	0.8	0.55	0.63	0.37
2:01:40 PM	#N/A	#N/A	#N/A	#N/A	0.52	0.36	0.35	0.46	0.27	0.51	0.66	0.26	0.24	0.65	0.79	0.84	0.79
2:02:00 PM	#N/A	#N/A	#N/A	#N/A	0.45	0.26	0.27	0.69	1.11	0.43	0.61	0.34	0.43	0.27	0.36	0.35	0.26
2:02:20 PM	#N/A	#N/A	#N/A	#N/A	0.62	0.57	0.55	0.77	0.26	1.04	0.6	1.06	0.76	0.26	0.44	0.55	0.6
2:02:40 PM	#N/A	#N/A	#N/A	#N/A	0.48	0.65	0.38	0.8	0.32	0.67	0.37	0.41	0.41	0.38	0.25	0.82	0.27
2:03:00 PM	#N/A	#N/A	#N/A	#N/A	0.38	0.34	0.26	0.41	0.71	0.26	0.34	0.26	0.24	0.45	0.6	0.35	0.34
2:03:20 PM	#N/A	#N/A	#N/A	#N/A	0.55	0.27	0.34	0.89	0.26	0.44	0.34	0.79	0.91	0.99	0.26	0.45	0.63
2:03:40 PM	#N/A	#N/A	#N/A	#N/A	0.48	0.78	0.52	0.46	0.42	0.48	0.59	0.25	0.25	0.46	0.84	0.48	0.26
2:04:00 PM	#N/A	#N/A	#N/A	#N/A	0.46	0.98	0.25	0.5	0.58	0.36	0.26	0.43	0.68	0.3	0.54	0.36	0.26
2:04:20 PM	#N/A	#N/A	#N/A	#N/A	0.43	0.39	0.7	0.36	0.25	0.26	0.61	0.43	0.52	0.26	0.25	0.63	0.5

Run 5	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
2:04:40 PM	#N/A	#N/A	#N/A	#N/A	0.45	0.25	0.31	0.56	0.34	0.9	0.54	0.26	0.24	0.55	0.25	0.76	0.45
2:05:00 PM	#N/A	#N/A	#N/A	#N/A	1.01	0.82	0.35	0.68	0.53	0.43	0.25	0.39	0.24	0.27	0.49	5.19	2.52
2:05:20 PM	#N/A	#N/A	#N/A	#N/A	0.86	0.43	0.47	0.36	0.26	0.25	0.25	0.54	0.48	0.78	0.42	0.48	5.63
2:05:40 PM	#N/A	#N/A	#N/A	#N/A	0.45	0.33	0.49	0.46	0.26	0.35	0.5	0.27	0.42	0.39	0.5	0.89	0.53
2:06:00 PM	#N/A	#N/A	#N/A	#N/A	1.10	0.38	0.35	0.51	0.5	0.42	0.51	0.27	2.43	0.44	6.71	0.35	0.27
2:06:20 PM	#N/A	#N/A	#N/A	#N/A	1.23	0.4	0.38	0.37	0.26	0.68	0.47	5.05	5.48	0.29	0.28	0.46	0.67
2:06:40 PM	#N/A	#N/A	#N/A	#N/A	1.61	0.25	0.24	0.66	0.44	4.21	8.29	3.75	0.25	0.37	0.25	0.35	0.26
2:07:00 PM	#N/A	#N/A	#N/A	#N/A	1.15	0.53	0.53	0.35	6.48	3.01	0.25	0.57	0.26	0.26	0.69	0.63	0.26
2:07:20 PM	#N/A	#N/A	#N/A	#N/A	1.04	0.27	0.24	7.57	0.26	0.27	0.25	0.63	0.9	0.47	0.26	0.63	0.71
2:07:40 PM	#N/A	#N/A	#N/A	#N/A	1.10	1.52	7.75	0.43	0.25	0.35	0.67	0.26	0.25	0.55	0.24	0.49	0.44
2:08:00 PM	#N/A	#N/A	#N/A	#N/A	0.85	5.79	0.35	0.71	0.67	0.57	0.25	0.28	0.25	0.26	0.46	0.36	0.25
2:08:20 PM	#N/A	#N/A	#N/A	#N/A	0.41	0.57	0.54	0.36	0.27	0.26	0.25	0.55	0.46	0.25	0.43	0.46	0.5
2:08:40 PM	#N/A	#N/A	#N/A	#N/A	0.41	0.25	0.25	0.45	0.26	0.37	0.36	0.9	0.42	0.39	0.24	0.76	0.26
2:09:00 PM	#N/A	#N/A	#N/A	#N/A	0.38	0.62	0.35	0.36	0.42	0.33	0.37	0.4	0.25	0.27	0.51	0.39	0.26
2:09:20 PM	#N/A	#N/A	#N/A	#N/A	0.41	0.25	0.25	0.59	0.28	0.35	0.43	0.36	0.48	0.57	0.25	0.54	0.53
2:09:40 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.25	0.25	0.65	0.44	0.44	0.5	0.26	0.25	0.87	0.25	0.49	0.33
2:10:00 PM	#N/A	#N/A	#N/A	#N/A	0.48	0.8	0.66	0.48	0.77	0.41	0.52	0.42	0.24	0.26	0.53	0.35	0.28
2:10:20 PM	#N/A	#N/A	#N/A	#N/A	0.44	0.38	0.38	0.35	0.28	0.24	0.26	0.36	0.51	0.52	0.81	0.66	0.52
2:10:40 PM	#N/A	#N/A	#N/A	#N/A	0.51	0.35	0.49	0.46	0.25	0.24	0.54	0.53	0.62	0.55	0.52	0.61	0.93
2:11:00 PM	#N/A	#N/A	#N/A	#N/A	0.52	0.36	0.36	0.53	0.43	0.91	1.06	0.54	0.27	0.59	0.52	0.36	0.3
2:11:20 PM	#N/A	#N/A	#N/A	#N/A	0.51	0.42	0.42	0.35	0.86	0.51	0.28	0.44	0.49	0.42	0.99	0.54	0.36
2:11:40 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.25	0.25	0.55	0.28	0.28	0.5	0.38	0.25	0.7	0.25	0.5	0.79
2:12:00 PM	#N/A	#N/A	#N/A	#N/A	0.43	0.37	0.71	0.49	0.78	0.49	0.26	0.25	0.41	0.28	0.36	0.53	0.25
2:12:20 PM	#N/A	#N/A	#N/A	#N/A	0.49	0.65	0.38	0.62	0.26	0.24	0.42	0.62	0.61	0.43	0.32	0.56	0.76
2:12:40 PM	#N/A	#N/A	#N/A	#N/A	0.48	0.55	0.26	1.18	0.43	1	0.37	0.28	0.4	0.4	0.26	0.35	0.27
2:13:00 PM	#N/A	#N/A	#N/A	#N/A	0.43	0.54	0.53	0.35	0.36	0.35	0.31	0.81	0.25	0.27	0.76	0.36	0.26

Run 5	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
2:13:20 PM	#N/A	#N/A	#N/A	#N/A	0.46	0.26	0.25	0.36	0.33	0.82	0.26	0.45	0.73	0.39	0.25	1.04	0.37
2:13:40 PM	21.90	33.00	33.20	30.50	0.36	0.27	0.25	0.54	0.25	0.24	0.67	0.28	0.25	0.54	0.25	0.48	0.32
2:14:00 PM	21.90	32.90	33.30	30.50	0.45	0.63	0.35	0.66	0.59	0.74	0.35	0.25	0.24	0.43	0.37	0.34	0.45
2:14:20 PM	21.90	32.90	33.10	30.40	0.43	0.59	1.04	0.35	0.43	0.26	0.35	0.37	0.35	0.26	0.25	0.45	0.5
2:14:40 PM	21.90	32.90	33.10	30.50	0.43	0.42	0.32	0.56	0.26	0.24	0.38	0.43	0.58	0.38	0.96	0.36	0.27
2:15:00 PM	21.80	32.80	33.00	30.40	0.43	0.44	0.51	0.35	0.38	0.36	0.25	0.9	0.42	0.26	0.49	0.53	0.28
2:15:20 PM	21.80	32.70	32.80	30.50	0.40	0.25	0.24	0.36	0.26	0.38	0.48	0.37	0.49	0.76	0.25	0.48	0.53
2:15:40 PM	21.70	32.90	32.80	30.50	0.52	0.24	0.5	0.65	0.73	0.42	0.51	0.26	0.25	0.45	0.5	1.19	0.52
2:16:00 PM	21.80	32.80	32.80	30.50	1.47	0.54	0.6	0.54	0.5	0.51	0.52	0.45	0.26	0.8	8.14	4.15	0.68
2:16:20 PM	21.80	32.70	32.60	30.40	6.54	0.57	0.74	0.35	0.25	0.5	0.28	0.39	0.52	0.28	27.55	24.7	22.32
2:16:40 PM	21.80	32.70	32.60	30.40	6.44	0.25	10.03	7.42	0.3	0.27	0.36	0.26	0.31	0.55	22.91	12.73	21.9
2:17:00 PM	21.90	32.60	32.50	30.40	16.15	22.73	83.41	20.17	0.63	0.53	0.43	0.39	0.28	0.27	21.82	22.99	20.2
2:17:20 PM	21.70	32.70	32.30	30.30	15.52	20.39	100	28.57	0.43	0.24	0.71	0.97	0.73	0.26	3.06	14.03	16.9
2:17:40 PM	21.90	32.90	32.40	30.30	13.29	27.04	100	21.83	0.32	0.41	0.51	0.43	0.24	0.51	1.08	4.34	2.8
2:18:00 PM	21.80	33.00	32.40	30.30	10.25	11.51	100	5.54	0.5	0.49	0.25	0.26	0.41	0.56	0.95	1.18	1.33
2:18:20 PM	21.90	33.10	32.30	30.30	9.34	2.11	100	0.97	0.27	0.26	0.43	0.39	0.35	0.44	4.77	0.93	1.18
2:18:40 PM	21.80	33.00	32.20	30.20	14.67	0.9	100	1.16	0.41	0.43	0.37	0.26	0.25	0.39	34.21	22.27	15.33
2:19:00 PM	22.00	32.80	32.20	30.20	21.90	1.31	100	1.72	0.36	0.36	0.26	0.56	0.28	0.27	64.1	48.38	45.18
2:19:20 PM	21.80	33.00	32.00	30.20	32.81	15.16	100	34.34	0.25	0.27	0.25	0.68	0.65	0.26	100	68.25	73.63
2:19:40 PM	21.80	33.10	32.00	30.30	41.82	46.19	100	53.93	0.31	0.6	0.9	0.26	0.25	0.52	100	98.86	100
2:20:00 PM	21.60	33.10	31.90	30.30	46.90	70.9	100	88.58	1.02	0.6	0.79	0.26	0.24	0.45	100	100	100
2:20:20 PM	21.90	33.10	31.90	30.20	50.20	100	100	100	0.44	0.33	0.25	0.36	0.35	0.62	100	100	100
2:20:40 PM	21.80	33.20	31.70	30.20	50.18	100	100	100	0.25	0.26	0.36	0.44	0.51	0.38	100	100	100
2:21:00 PM	21.90	33.40	31.70	30.20	50.24	100	100	100	0.36	0.37	0.53	0.65	0.44	0.54	100	100	100
2:21:20 PM	21.70	33.50	31.70	30.20	50.22	100	100	100	0.26	0.51	0.45	0.39	0.53	0.47	100	100	100
2:21:40 PM	21.70	33.60	31.80	30.20	50.26	100	100	100	0.37	0.99	0.57	0.32	0.24	0.6	100	100	100

Run 5	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
2:22:00 PM	21.90	33.70	31.70	30.10	50.23	100	100	100	1.16	0.54	0.26	0.3	0.24	0.26	100	100	100
2:22:20 PM	21.80	33.70	31.60	30.10	50.22	100	100	100	0.27	0.26	0.25	0.79	0.6	0.52	100	100	100
2:22:40 PM	21.90	33.80	31.50	30.10	50.19	100	100	100	0.25	0.63	0.36	0.27	0.42	0.38	100	100	100
2:23:00 PM	21.80	33.80	31.40	30.10	50.19	100	100	100	0.38	0.38	0.42	0.39	0.25	0.44	100	100	100
2:23:20 PM	21.80	34.00	31.40	30.10	50.20	100	100	100	0.43	0.44	0.25	0.45	0.61	0.25	100	100	100
2:23:40 PM	21.80	34.00	31.40	30.10	50.24	100	100	100	0.26	0.25	1.14	0.5	0.26	0.51	100	100	100
2:24:00 PM	21.80	34.00	31.50	30.10	50.24	100	100	100	0.65	1.06	0.26	0.26	0.41	0.29	100	100	100
2:24:20 PM	21.80	34.10	31.30	30.10	50.18	100	100	100	0.25	0.25	0.34	0.47	0.36	0.43	100	100	100
2:24:40 PM	21.90	34.50	31.20	30.10	50.18	100	100	100	0.36	0.44	0.45	0.27	0.24	0.44	100	100	100
2:25:00 PM	21.90	34.50	31.40	30.10	50.18	100	100	100	0.54	0.38	0.26	0.46	0.25	0.27	100	100	100
2:25:20 PM	21.90	34.50	31.20	30.10	50.22	100	100	100	0.26	0.27	0.27	0.67	0.61	0.51	100	100	100
2:25:40 PM	22.00	34.50	31.10	30.10	50.20	100	100	100	0.25	0.25	0.5	0.34	0.5	0.51	100	100	100
2:26:00 PM	22.00	34.70	31.10	30.10	50.27	100	100	100	0.5	0.6	1.08	0.35	0.27	0.44	100	100	100
2:26:20 PM	22.00	34.80	31.10	30.10	50.24	100	100	100	0.87	0.79	0.28	0.28	0.35	0.29	100	100	100
2:26:40 PM	21.90	35.00	31.00	30.00	49.68	100	100	100	0.27	0.28	0.38	0.55	0.25	0.43	93.98	100	100
2:27:00 PM	21.80	34.90	31.10	30.10	50.19	100	100	100	0.61	0.38	0.25	0.4	0.42	0.26	100	100	100
2:27:20 PM	21.90	35.00	30.90	30.10	49.97	100	100	97.25	0.25	0.27	0.25	0.5	0.73	0.43	100	100	100
2:27:40 PM	22.00	34.90	31.00	30.10	49.74	100	100	94.29	0.25	0.43	0.68	0.38	0.29	0.51	100	100	100
2:28:00 PM	22.10	35.10	30.90	30.10	50.24	100	100	100	0.66	0.5	0.87	0.32	0.24	0.28	100	100	100
2:28:20 PM	21.90	35.20	30.90	30.00	50.22	100	100	100	0.63	0.73	0.26	0.44	0.37	0.25	100	100	100
2:28:40 PM	22.00	35.20	31.00	30.10	50.19	100	100	100	0.26	0.25	0.37	0.36	0.42	0.66	100	100	100
2:29:00 PM	22.00	35.40	31.00	30.10	50.03	100	100	98.09	0.35	0.36	0.44	0.39	0.25	0.44	100	100	100
2:29:20 PM	21.80	35.30	31.00	30.00	50.18	100	100	100	0.42	0.43	0.27	0.26	0.5	0.28	100	100	100
2:29:40 PM	22.00	35.50	31.00	30.00	50.20	100	100	100	0.25	0.26	0.51	0.53	0.37	0.51	100	100	100
2:30:00 PM	22.00	35.30	30.90	30.00	50.23	100	100	100	0.82	0.5	0.52	0.33	0.34	0.26	100	100	100
2:30:20 PM	22.00	35.30	31.00	30.10	49.88	100	100	100	0.54	0.77	0.66	0.25	0.44	0.53	95.34	100	100

Run 5	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
2:30:40 PM	21.90	35.50	31.00	30.10	50.22	100	100	100	0.24	0.35	0.53	0.37	0.65	0.54	100	100	100
2:31:00 PM	22.00	35.50	31.00	30.00	50.30	100	100	100	0.53	0.46	0.53	0.67	0.26	1.19	100	100	100
2:31:20 PM	21.90	35.60	30.90	30.10	50.19	100	100	100	0.25	0.52	0.27	0.45	0.48	0.28	100	100	100
2:31:40 PM	21.90	35.30	31.00	30.10	49.94	100	100	100	0.26	0.28	0.51	0.36	0.42	0.6	100	96.81	100
2:32:00 PM	21.90	35.50	31.00	30.00	49.69	100	100	100	0.76	0.5	0.43	0.26	0.62	0.44	100	93.25	100
2:32:20 PM	22.10	35.40	31.10	30.10	50.25	100	100	100	0.33	0.51	0.7	0.57	0.59	0.26	100	100	100
2:32:40 PM	22.10	35.30	31.00	30.10	50.20	100	100	100	0.4	0.57	0.37	0.44	0.24	0.39	100	100	100
2:33:00 PM	22.20	35.70	31.00	30.00	50.18	100	100	100	0.35	0.37	0.28	0.49	0.26	0.36	100	100	100
2:33:20 PM	21.90	35.60	31.00	30.10	50.16	100	100	100	0.24	0.26	0.25	0.26	0.63	0.26	100	100	100
2:33:40 PM	22.00	35.80	31.10	30.10	50.24	100	100	100	0.24	0.26	0.77	0.46	0.36	0.78	100	100	100
2:34:00 PM	21.80	35.60	31.10	30.10	50.23	100	100	100	0.75	0.76	0.26	0.25	0.51	0.27	100	100	100
2:34:20 PM	22.10	35.40	31.00	30.10	50.18	100	100	100	0.26	0.26	0.68	0.49	0.25	0.26	100	100	100
2:34:40 PM	22.00	35.30	31.10	30.10	50.28	100	100	100	0.82	0.86	0.37	0.37	0.52	0.37	100	100	100
2:35:00 PM	22.10	35.30	31.20	30.10	50.18	100	100	100	0.36	0.36	0.34	0.4	0.25	0.44	100	100	100
2:35:20 PM	22.20	35.60	31.20	30.10	50.21	100	100	100	0.25	0.43	0.33	0.26	0.39	0.87	100	100	100
2:35:40 PM	22.20	35.80	31.20	30.10	50.21	100	100	100	0.42	0.25	0.5	0.38	0.36	0.59	100	100	100
2:36:00 PM	22.10	35.70	31.20	30.10	50.21	100	100	100	0.49	0.51	0.5	0.43	0.31	0.26	100	100	100
2:36:20 PM	22.00	35.90	31.20	30.10	50.19	100	100	100	0.26	0.53	0.27	0.53	0.41	0.29	100	100	100
2:36:40 PM	22.00	35.90	31.30	30.10	49.67	100	93.29	100	0.27	0.57	0.62	0.4	0.35	0.56	100	100	100
2:37:00 PM	22.00	35.80	31.20	30.10	50.01	100	97.52	100	0.93	0.55	0.26	0.39	0.24	0.26	100	100	100
2:37:20 PM	21.90	35.90	31.20	30.10	50.24	100	100	100	0.26	0.25	0.25	0.69	0.61	0.85	100	100	100
2:37:40 PM	22.00	35.80	31.30	30.20	50.20	100	100	100	0.24	0.25	0.5	0.38	0.53	0.52	100	100	100
2:38:00 PM	22.00	35.70	31.30	30.20	50.18	100	100	100	0.48	0.5	0.27	0.25	0.25	0.45	100	100	100
2:38:20 PM	22.10	35.80	31.20	30.20	50.16	100	100	100	0.25	0.44	0.42	0.25	0.33	0.26	100	100	100
2:38:40 PM	22.10	35.90	31.40	30.30	50.20	100	100	100	0.41	0.25	0.61	0.43	0.36	0.37	100	100	100
2:39:00 PM	22.00	35.70	31.30	30.30	50.21	100	100	100	0.64	0.45	0.27	0.56	0.28	0.29	100	100	100

Run 5	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
2:39:20 PM	22.10	35.80	31.30	30.20	50.16	100	100	100	0.3	0.25	0.25	0.26	0.55	0.33	100	100	100
2:39:40 PM	22.10	35.90	31.30	30.40	50.22	100	100	100	0.24	0.25	0.68	0.39	0.35	0.7	100	100	100
2:40:00 PM	22.10	36.10	31.40	30.40	50.26	100	100	100	1.15	0.67	0.53	0.25	0.24	0.27	100	100	100
2:40:20 PM	22.00	36.10	31.30	30.40	50.18	100	100	100	0.28	0.26	0.26	0.44	0.43	0.54	100	100	100
2:40:40 PM	22.10	36.20	31.20	30.50	50.20	100	100	100	0.25	0.26	0.37	0.49	0.66	0.39	100	100	100
2:41:00 PM	21.80	36.00	31.40	30.40	50.28	100	100	100	0.41	0.77	0.59	0.65	0.39	0.54	100	100	100
2:41:20 PM	22.00	36.20	31.30	30.40	50.20	100	100	100	0.25	0.6	0.45	0.27	0.37	0.46	100	100	100
2:41:40 PM	22.10	36.00	31.30	30.30	50.23	100	100	100	0.45	0.36	0.5	0.37	0.35	0.76	100	100	100
2:42:00 PM	22.00	36.10	31.30	30.40	50.21	100	100	100	0.76	0.57	0.25	0.43	0.24	0.26	100	100	100
2:42:20 PM	22.00	36.00	31.30	30.60	50.19	100	100	100	0.25	0.37	0.25	0.51	0.68	0.25	100	100	100
2:42:40 PM	22.00	36.10	31.40	30.50	50.22	100	100	100	0.26	0.54	0.54	0.37	0.39	0.55	100	100	100
2:43:00 PM	22.10	36.00	31.30	30.50	50.26	100	100	100	0.44	0.84	0.33	0.99	0.25	0.27	100	100	100
2:43:20 PM	21.90	36.10	31.40	30.40	50.19	100	100	100	0.72	0.27	0.25	0.34	0.38	0.26	100	100	100
2:43:40 PM	22.10	36.10	31.20	30.60	50.23	100	100	100	0.25	0.26	0.59	0.55	0.43	0.62	100	100	100
2:44:00 PM	22.10	36.00	31.40	30.60	50.21	100	100	100	0.57	0.6	0.27	0.25	0.42	0.36	100	100	100
2:44:20 PM	22.10	36.10	31.40	30.60	50.17	100	100	100	0.26	0.26	0.54	0.26	0.24	0.43	100	100	100
2:44:40 PM	21.90	36.20	31.40	30.60	50.20	100	100	100	0.42	0.43	0.37	0.37	0.41	0.37	100	100	100
2:45:00 PM	22.10	36.00	31.40	30.70	50.19	100	100	100	0.36	0.36	0.37	0.63	0.24	0.27	100	100	100
2:45:20 PM	22.00	36.00	31.50	30.60	50.19	100	100	100	0.32	0.35	0.25	0.25	0.55	0.52	100	100	100
2:45:40 PM	22.00	35.90	31.40	30.60	50.21	100	100	100	0.25	0.25	0.59	0.38	0.35	0.68	100	100	100
2:46:00 PM	22.00	35.90	31.40	30.60	50.25	100	100	100	0.49	0.69	0.59	0.27	0.26	0.72	100	100	100
2:46:20 PM	22.10	35.90	31.40	30.70	50.17	100	100	100	0.44	0.52	0.27	0.29	0.24	0.28	100	100	100
2:46:40 PM	22.00	36.00	31.40	30.70	49.58	92.73	100	100	0.27	0.27	0.36	0.55	0.44	0.39	100	100	100
2:47:00 PM	22.10	36.10	31.40	30.60	50.23	100	100	100	0.64	0.38	0.25	0.78	0.42	0.26	100	100	100
2:47:20 PM	22.10	36.10	31.50	30.70	50.13	100	100	100	0.26	0.34	0.98	0.54	0.62	0.43	98.39	100	100
2:47:40 PM	22.00	36.20	31.50	30.70	50.22	100	100	100	0.5	0.43	0.49	0.39	0.35	0.52	100	100	100

Run 5	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
2:48:00 PM	21.90	36.10	31.50	30.60	50.19	100	100	100	0.51	0.5	0.26	0.43	0.25	0.38	100	100	100
2:48:20 PM	21.90	36.00	31.50	30.70	50.15	100	100	100	0.27	0.26	0.25	0.28	0.41	0.27	100	100	100
2:48:40 PM	21.90	36.00	31.60	30.90	50.18	100	100	100	0.24	0.25	0.36	0.45	0.36	0.47	100	100	100
2:49:00 PM	22.10	36.20	31.60	30.70	50.20	100	100	100	0.34	0.53	0.51	0.39	0.31	0.36	100	100	100
2:49:20 PM	22.00	36.10	31.60	30.80	50.21	100	100	100	0.43	0.27	0.31	0.83	0.38	0.24	100	100	100
2:49:40 PM	22.10	36.20	31.50	30.70	50.22	100	100	100	0.31	0.48	0.5	0.56	0.35	0.41	100	100	100
2:50:00 PM	22.00	36.20	31.50	30.90	50.24	100	100	100	0.77	0.5	0.54	0.25	0.42	0.43	100	100	100
2:50:20 PM	21.90	36.10	31.50	30.90	50.18	100	100	100	0.31	0.25	0.42	0.25	0.25	0.7	100	100	100
2:50:40 PM	22.00	36.10	31.60	30.90	50.20	100	100	100	0.41	0.44	0.33	0.37	0.61	0.25	100	100	100
2:51:00 PM	21.90	36.40	31.60	30.90	50.28	100	100	100	0.24	0.37	0.55	0.85	0.43	0.92	100	100	100
2:51:20 PM	21.90	36.20	31.60	30.80	50.20	100	100	100	0.37	0.52	0.27	0.59	0.38	0.28	100	100	100
2:51:40 PM	21.90	36.20	31.60	30.90	50.25	100	100	100	0.33	0.34	0.99	0.37	0.53	0.41	100	100	100
2:52:00 PM	22.10	36.20	31.60	30.90	50.25	100	100	100	0.64	0.6	0.61	0.25	0.24	0.64	100	100	100
2:52:20 PM	22.20	36.20	31.60	30.80	50.21	100	100	100	0.54	0.34	0.24	0.52	0.5	0.32	100	100	100
2:52:40 PM	22.00	36.40	31.70	31.00	50.17	100	100	100	0.25	0.42	0.25	0.55	0.35	0.26	100	100	100
2:53:00 PM	22.00	36.30	31.70	30.90	50.21	100	100	100	0.27	0.69	0.36	0.39	0.41	0.39	100	100	100
2:53:20 PM	22.10	36.30	31.70	30.90	50.19	100	100	100	0.37	0.29	0.42	0.26	0.49	0.44	100	100	100
2:53:40 PM	22.00	36.20	31.60	30.80	50.23	100	100	100	0.34	0.5	0.45	0.61	0.44	0.4	100	100	100
2:54:00 PM	22.00	36.30	31.60	31.00	50.25	100	100	100	0.94	0.59	0.45	0.33	0.25	0.38	100	100	100
2:54:20 PM	22.00	36.30	31.50	30.80	50.20	100	100	100	0.45	0.25	0.25	0.45	0.25	0.79	100	100	100
2:54:40 PM	22.00	36.30	31.60	31.00	50.18	100	100	100	0.36	0.27	0.25	0.45	0.52	0.26	100	100	100
2:55:00 PM	22.00	36.10	31.60	31.00	45.83	100	100	100	0.25	0.36	0.55	0.39	0.25	0.54	72.84	77.67	97.08
2:55:20 PM	22.10	36.10	31.50	30.80	27.66	100	100	100	0.54	0.42	0.26	0.26	0.42	0.55	3.09	5.44	20.98
2:55:40 PM	22.10	36.10	31.40	30.80	14.96	30.77	70.41	73.56	0.25	0.24	0.55	0.6	0.45	0.41	0.76	0.79	0.78
2:56:00 PM	22.10	36.20	31.50	30.80	0.94	0.68	2.22	4.01	0.51	0.6	0.71	0.35	0.43	0.37	0.27	0.92	0.26
2:56:20 PM	22.00	36.10	31.40	30.90	0.43	0.25	0.56	0.68	0.47	0.61	0.4	0.28	0.24	0.47	0.36	0.34	0.45

Run 5	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
2:56:40 PM	22.00	36.10	31.40	30.80	0.38	0.31	0.24	0.42	0.28	0.43	0.29	0.37	0.36	0.56	0.24	0.46	0.54
2:57:00 PM	22.20	35.90	31.50	30.80	0.40	0.62	0.3	0.38	0.69	0.38	0.36	0.4	0.24	0.37	0.4	0.34	0.26
2:57:20 PM	21.90	35.90	31.50	30.90	0.47	0.27	0.6	0.61	0.37	0.24	0.24	0.67	0.93	0.26	0.91	0.34	0.25
2:57:40 PM	22.10	35.70	31.50	30.70	0.39	0.27	0.28	0.27	0.26	0.25	0.39	0.78	0.52	0.4	0.25	0.63	0.37
2:58:00 PM	22.00	35.90	31.50	30.80	0.46	0.5	0.25	0.5	0.39	0.85	0.78	0.25	0.24	0.58	0.25	0.48	0.43
2:58:20 PM	21.90	36.30	31.50	30.80	0.42	0.43	0.49	0.42	0.62	0.43	0.24	0.26	0.24	0.26	0.37	0.88	0.39
2:58:40 PM	22.10	36.20	31.50	30.80	0.95	0.74	0.42	0.59	0.25	0.26	0.25	0.54	0.36	6.25	0.53	0.74	0.43
2:59:00 PM	22.10	36.10	31.60	30.80	0.52	0.36	0.54	0.37	0.26	0.36	0.36	0.38	0.41	2.03	0.41	0.52	0.26
2:59:20 PM	22.20	35.90	31.50	30.70	0.32	0.26	0.36	0.24	0.37	0.26	0.24	0.26	0.37	0.44	0.42	0.34	0.25

DATA COLLECTION RUN 6

Table 6: Data Collection Run 6 (Bottom Load)

Run 6	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
2:53:20 PM	#N/A	#N/A	#N/A	#N/A	50.23	100	100	100	0.34	0.5	0.45	0.61	0.44	0.4	100	100	100
2:53:40 PM	#N/A	#N/A	#N/A	#N/A	50.25	100	100	100	0.94	0.59	0.45	0.33	0.25	0.38	100	100	100
2:54:00 PM	#N/A	#N/A	#N/A	#N/A	50.20	100	100	100	0.45	0.25	0.25	0.45	0.25	0.79	100	100	100
2:54:20 PM	#N/A	#N/A	#N/A	#N/A	50.18	100	100	100	0.36	0.27	0.25	0.45	0.52	0.26	100	100	100
2:54:40 PM	#N/A	#N/A	#N/A	#N/A	46.07	100	100	100	0.25	0.36	0.55	0.39	0.25	0.54	72.84	77.67	100

Run 6	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
2:55:00 PM	#N/A	#N/A	#N/A	#N/A	34.01	100	100	100	0.54	0.42	0.26	0.26	0.42	0.55	3.09	5.44	97.08
2:55:20 PM	#N/A	#N/A	#N/A	#N/A	24.62	100	70.41	100	0.25	0.24	0.55	0.6	0.45	0.41	0.76	0.79	20.98
2:55:40 PM	#N/A	#N/A	#N/A	#N/A	9.29	30.77	2.22	73.56	0.51	0.6	0.71	0.35	0.43	0.37	0.27	0.92	0.78
2:56:00 PM	#N/A	#N/A	#N/A	#N/A	0.72	0.68	0.56	4.01	0.47	0.61	0.4	0.28	0.24	0.47	0.36	0.34	0.26
2:56:20 PM	#N/A	#N/A	#N/A	#N/A	0.38	0.25	0.24	0.68	0.28	0.43	0.29	0.37	0.36	0.56	0.24	0.46	0.45
2:56:40 PM	#N/A	#N/A	#N/A	#N/A	0.40	0.31	0.3	0.42	0.69	0.38	0.36	0.4	0.24	0.37	0.4	0.34	0.54
2:57:00 PM	#N/A	#N/A	#N/A	#N/A	0.49	0.62	0.6	0.38	0.37	0.24	0.24	0.67	0.93	0.26	0.91	0.34	0.26
2:57:20 PM	#N/A	#N/A	#N/A	#N/A	0.41	0.27	0.28	0.61	0.26	0.25	0.39	0.78	0.52	0.4	0.25	0.63	0.25
2:57:40 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.27	0.25	0.27	0.39	0.85	0.78	0.25	0.24	0.58	0.25	0.48	0.37
2:58:00 PM	#N/A	#N/A	#N/A	#N/A	0.44	0.5	0.49	0.5	0.62	0.43	0.24	0.26	0.24	0.26	0.37	0.88	0.43
2:58:20 PM	#N/A	#N/A	#N/A	#N/A	0.90	0.43	0.42	0.42	0.25	0.26	0.25	0.54	0.36	6.25	0.53	0.74	0.39
2:58:40 PM	#N/A	#N/A	#N/A	#N/A	0.59	0.74	0.54	0.59	0.26	0.36	0.36	0.38	0.41	2.03	0.41	0.52	0.43
2:59:00 PM	#N/A	#N/A	#N/A	#N/A	0.34	0.36	0.36	0.37	0.37	0.26	0.24	0.26	0.37	0.44	0.42	0.34	0.26
2:59:20 PM	#N/A	#N/A	#N/A	#N/A	0.35	0.26	0.25	0.24	0.25	0.44	0.56	0.37	0.44	0.4	0.25	0.46	0.25
2:59:40 PM	#N/A	#N/A	#N/A	#N/A	0.48	0.26	0.37	0.35	0.72	0.65	0.58	0.44	0.38	0.5	0.38	0.61	0.56
3:00:00 PM	#N/A	#N/A	#N/A	#N/A	0.61	0.68	0.66	0.77	1.6	0.34	0.54	0.42	0.24	0.67	0.54	0.45	0.42
3:00:20 PM	#N/A	#N/A	#N/A	#N/A	0.44	0.25	0.49	0.28	0.25	0.25	0.25	0.37	0.55	0.27	0.82	1.06	0.4
3:00:40 PM	#N/A	#N/A	#N/A	#N/A	0.56	0.27	0.63	0.34	0.27	0.37	0.98	0.7	0.53	0.98	0.41	0.35	0.88
3:01:00 PM	#N/A	#N/A	#N/A	#N/A	0.47	0.43	0.36	0.38	0.56	0.85	0.27	0.28	0.37	0.66	0.37	0.35	0.73
3:01:20 PM	#N/A	#N/A	#N/A	#N/A	0.54	0.42	0.41	0.42	0.26	0.27	0.38	0.55	0.4	0.4	1.9	0.78	0.25
3:01:40 PM	#N/A	#N/A	#N/A	#N/A	0.45	0.27	0.26	0.25	0.8	0.5	0.68	0.4	0.24	0.47	0.29	0.53	0.71
3:02:00 PM	#N/A	#N/A	#N/A	#N/A	0.48	0.5	0.49	0.38	0.5	0.66	0.3	0.7	0.81	0.26	0.37	0.48	0.25
3:02:20 PM	#N/A	#N/A	#N/A	#N/A	0.44	0.28	0.27	0.82	0.25	0.35	0.42	0.38	0.35	0.44	0.25	1.05	0.4
3:02:40 PM	#N/A	#N/A	#N/A	#N/A	0.49	0.54	0.24	0.66	0.76	0.83	0.38	0.39	0.24	0.44	0.4	0.36	0.64
3:03:00 PM	#N/A	#N/A	#N/A	#N/A	0.60	0.96	0.84	0.89	0.37	0.26	0.25	0.78	0.7	0.41	0.61	0.36	0.8
3:03:20 PM	#N/A	#N/A	#N/A	#N/A	0.41	0.26	0.25	0.6	0.25	0.25	0.37	0.46	0.61	0.4	0.5	0.65	0.29

Run 6	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
3:03:40 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.67	0.26	0.26	0.41	0.59	0.63	0.26	0.29	0.56	0.25	0.49	0.36
3:04:00 PM	#N/A	#N/A	#N/A	#N/A	0.40	0.49	0.48	0.37	0.54	0.51	0.62	0.33	0.24	0.26	0.36	0.35	0.3
3:04:20 PM	#N/A	#N/A	#N/A	#N/A	0.45	0.42	0.82	0.55	0.62	0.28	0.25	0.45	0.35	0.27	0.34	0.55	0.52
3:04:40 PM	#N/A	#N/A	#N/A	#N/A	0.37	0.6	0.27	0.26	0.26	0.35	0.34	0.48	0.24	0.37	0.48	0.34	0.39
3:05:00 PM	#N/A	#N/A	#N/A	#N/A	0.45	0.43	0.52	0.81	0.36	0.25	0.24	0.25	0.55	0.57	0.37	0.55	0.55
3:05:20 PM	#N/A	#N/A	#N/A	#N/A	0.46	0.39	0.5	0.25	0.27	0.25	0.56	0.38	0.35	0.6	0.93	0.72	0.26
3:05:40 PM	#N/A	#N/A	#N/A	#N/A	0.44	0.27	0.26	0.26	0.57	0.69	0.63	0.25	0.45	0.37	0.28	0.5	0.79
3:06:00 PM	#N/A	#N/A	#N/A	#N/A	0.48	0.68	0.67	0.58	0.38	0.52	0.67	0.51	0.25	0.29	0.54	0.35	0.26
3:06:20 PM	#N/A	#N/A	#N/A	#N/A	0.40	0.23	0.24	0.49	0.34	0.66	0.25	0.37	0.53	0.28	0.24	0.77	0.39
3:06:40 PM	#N/A	#N/A	#N/A	#N/A	0.38	0.25	0.26	0.34	0.52	0.33	0.54	0.4	0.24	0.55	0.38	0.35	0.37
3:07:00 PM	#N/A	#N/A	#N/A	#N/A	0.44	0.36	0.35	0.87	0.38	0.46	0.25	0.51	0.62	0.32	0.36	0.35	0.43
3:07:20 PM	#N/A	#N/A	#N/A	#N/A	0.41	0.34	0.45	0.77	0.46	0.26	0.38	0.38	0.35	0.41	0.25	0.45	0.41
3:07:40 PM	#N/A	#N/A	#N/A	#N/A	0.44	0.42	0.43	0.37	0.39	0.38	0.36	0.42	0.55	0.38	0.79	0.48	0.36
3:08:00 PM	#N/A	#N/A	#N/A	#N/A	0.42	0.49	0.49	0.63	0.38	0.37	0.24	0.49	0.53	0.26	0.35	0.53	0.27
3:08:20 PM	#N/A	#N/A	#N/A	#N/A	0.41	0.24	0.26	0.49	0.25	0.61	0.48	0.37	0.36	0.43	0.25	0.79	0.4
3:08:40 PM	#N/A	#N/A	#N/A	#N/A	0.82	0.52	0.26	0.34	0.77	0.42	0.36	0.4	0.25	0.38	0.38	5.27	0.53
3:09:00 PM	#N/A	#N/A	#N/A	#N/A	0.81	0.52	0.52	0.64	0.37	0.35	0.29	4.66	1.09	0.25	0.51	0.31	0.25
3:09:20 PM	#N/A	#N/A	#N/A	#N/A	7.00	0.46	0.28	0.88	0.25	0.25	0.39	28.63	28.24	16.5	0.24	0.55	7.35
3:09:40 PM	#N/A	#N/A	#N/A	#N/A	8.71	0.43	0.25	0.35	0.39	0.38	0.36	23.04	23.06	18.78	24.69	12.43	0.39
3:10:00 PM	21.80	33.30	31.30	31.00	10.31	0.49	0.5	0.46	0.66	0.53	0.73	24.55	28.85	19.29	26.78	19.03	1.88
3:10:20 PM	21.90	33.20	31.20	30.90	10.95	0.35	0.5	0.49	0.43	0.25	4.43	15.6	12.81	24.68	26.15	17.25	28.49
3:10:40 PM	21.90	33.20	31.20	30.90	7.05	0.42	0.42	0.53	6.42	8.3	3.13	1.42	1.14	7.38	11.78	26.66	17.05
3:11:00 PM	21.90	33.20	31.30	30.80	4.17	0.35	0.35	0.46	1.46	0.62	0.27	0.92	1.19	1.51	1.51	13.1	28.25
3:11:20 PM	22.00	33.30	31.30	31.00	1.92	0.25	1.54	6.21	0.28	0.27	0.56	1.29	0.94	1.31	1.18	2.74	6.48
3:11:40 PM	21.90	33.10	31.20	31.10	5.94	7.3	6.99	0.33	0.81	0.59	0.37	26.35	17.91	7.01	0.76	1.24	1.61
3:12:00 PM	21.90	33.00	31.20	31.20	13.51	0.7	0.71	0.62	0.38	0.36	0.25	55.45	51.22	33.57	14.11	3.93	0.84

Run 6	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
3:12:20 PM	21.90	33.00	31.20	31.20	25.69	0.27	0.27	0.75	0.25	0.25	0.26	84.27	82.85	58.57	48.16	30.96	1.47
3:12:40 PM	22.00	32.80	31.20	31.30	35.80	0.54	0.25	0.38	0.25	0.67	0.6	100	100	84.19	68.8	49.7	24.27
3:13:00 PM	22.00	33.00	31.30	31.50	44.51	0.37	0.35	0.74	0.62	0.58	0.42	100	100	100	100	75.7	55.28
3:13:20 PM	21.90	33.00	31.10	31.60	48.56	0.25	0.24	0.35	0.42	0.31	0.4	100	100	100	100	100	80.79
3:13:40 PM	21.80	32.90	31.20	31.80	50.25	0.69	0.46	0.6	0.38	0.4	0.46	100	100	100	100	100	100
3:14:00 PM	21.80	32.90	31.20	31.90	50.26	0.89	0.49	0.46	0.45	0.45	0.35	100	100	100	100	100	100
3:14:20 PM	21.90	32.80	31.20	32.10	50.18	0.27	0.5	0.49	0.25	0.26	0.43	100	100	100	100	100	100
3:14:40 PM	21.80	33.00	31.10	32.20	50.18	0.25	0.25	0.34	0.37	0.42	0.53	100	100	100	100	100	100
3:15:00 PM	21.90	33.00	31.10	32.50	50.29	0.66	0.53	0.73	0.9	0.44	0.25	100	100	100	100	100	100
3:15:20 PM	21.80	32.90	31.10	33.10	50.18	0.26	0.57	0.36	0.27	0.25	0.39	100	100	100	100	100	100
3:15:40 PM	21.90	33.00	31.00	33.60	50.20	0.26	0.24	0.42	0.39	0.41	0.63	100	100	100	100	100	100
3:16:00 PM	21.80	33.00	31.10	34.20	50.31	1.12	0.62	0.47	0.39	0.63	0.44	100	100	100	100	100	100
3:16:20 PM	21.80	32.90	31.00	35.00	49.86	0.25	0.24	0.5	0.45	0.46	0.26	100	100	100	96.14	100	100
3:16:40 PM	21.80	33.00	31.00	35.90	50.21	0.43	0.42	0.53	0.51	0.25	0.36	100	100	100	100	100	100
3:17:00 PM	21.80	33.00	31.10	36.90	50.21	0.37	0.35	0.48	0.36	0.42	0.56	100	100	100	100	100	100
3:17:20 PM	21.90	33.10	31.00	37.90	50.19	0.27	0.26	0.6	0.31	0.25	0.58	100	100	100	100	100	100
3:17:40 PM	21.90	33.10	31.00	38.90	50.18	0.25	0.25	0.38	0.39	0.57	0.37	100	100	100	100	100	100
3:18:00 PM	21.90	33.10	31.00	39.80	50.25	0.5	0.56	0.74	0.54	0.37	0.25	100	100	100	100	100	100
3:18:20 PM	21.90	33.10	30.80	40.70	50.20	0.69	0.41	0.49	0.24	0.26	0.25	100	100	100	100	100	100
3:18:40 PM	21.80	33.30	31.00	41.40	49.99	0.5	0.24	0.35	0.25	0.26	0.37	100	100	97.86	100	100	100
3:19:00 PM	21.80	33.30	31.00	42.10	50.22	0.35	0.35	0.47	0.4	0.36	0.72	100	100	100	100	100	100
3:19:20 PM	21.80	33.40	31.00	42.80	50.19	0.26	0.24	0.36	0.49	0.5	0.4	100	100	100	100	100	100
3:19:40 PM	21.90	33.40	30.90	43.30	50.22	0.43	0.51	0.52	0.4	0.4	0.36	100	100	100	100	100	100
3:20:00 PM	21.90	33.40	30.90	44.00	50.28	0.49	0.49	0.57	0.94	0.36	0.52	100	100	100	100	100	100
3:20:20 PM	21.90	33.50	31.00	44.50	50.18	0.32	0.54	0.49	0.25	0.25	0.27	100	100	100	100	100	100
3:20:40 PM	22.10	33.50	30.80	45.00	50.20	0.26	0.26	0.35	0.25	0.43	0.83	100	100	100	100	100	100

Run 6	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
3:21:00 PM	22.10	33.60	30.90	45.50	50.22	0.37	0.35	0.46	0.58	0.62	0.27	100	100	100	100	100	100
3:21:20 PM	22.00	33.40	30.90	46.00	50.22	0.42	0.42	0.52	0.28	0.5	0.45	100	100	100	100	100	100
3:21:40 PM	22.00	33.50	31.00	46.40	50.22	0.25	0.26	0.35	0.97	0.4	0.37	100	100	100	100	100	100
3:22:00 PM	22.10	33.50	30.70	46.80	50.24	0.5	0.48	0.76	0.36	0.35	0.43	100	100	100	100	100	100
3:22:20 PM	22.10	33.60	30.80	47.10	50.24	0.67	0.36	0.74	0.41	0.43	0.26	100	100	100	100	100	100
3:22:40 PM	22.00	33.70	30.80	47.50	50.27	0.96	0.42	0.52	0.26	0.71	0.36	100	100	100	100	100	100
3:23:00 PM	22.00	33.80	30.80	47.80	50.20	0.36	0.35	0.74	0.37	0.38	0.25	100	100	100	100	100	100
3:23:20 PM	22.00	33.80	30.80	48.10	50.19	0.27	0.24	0.35	0.25	0.25	0.94	100	100	100	100	100	100
3:23:40 PM	22.20	33.90	30.70	48.40	50.23	0.51	0.25	0.35	0.46	0.61	0.62	100	100	100	100	100	100
3:24:00 PM	22.20	33.90	30.70	48.60	50.23	0.49	0.48	0.47	0.64	0.48	0.24	100	100	100	100	100	100
3:24:20 PM	22.20	33.90	30.80	48.80	50.26	0.42	0.94	0.92	0.35	0.26	0.26	100	100	100	100	100	100
3:24:40 PM	22.10	33.90	30.80	49.00	50.15	0.31	0.27	0.35	0.26	0.26	0.36	100	100	100	100	100	100
3:25:00 PM	22.10	33.90	30.70	49.20	50.20	0.44	0.44	0.4	0.37	0.36	0.44	100	100	100	100	100	100
3:25:20 PM	22.10	33.90	30.70	49.40	50.25	0.25	0.49	0.49	0.36	0.43	1	100	100	100	100	100	100
3:25:40 PM	22.00	33.80	30.70	49.60	50.29	0.42	0.33	0.54	1	0.49	0.73	100	100	100	100	100	100
3:26:00 PM	22.00	34.00	30.70	49.70	50.24	0.5	0.57	0.35	0.47	0.72	0.27	100	100	100	100	100	100
3:26:20 PM	22.00	34.00	30.70	49.80	50.17	0.26	0.25	0.74	0.28	0.28	0.25	100	100	100	100	100	100
3:26:40 PM	22.30	34.20	30.70	49.80	50.22	0.33	0.61	0.35	0.52	0.27	0.53	100	100	100	100	100	100
3:27:00 PM	22.10	34.30	30.80	49.90	50.21	0.47	0.42	0.36	0.55	0.53	0.24	100	100	100	100	100	100
3:27:20 PM	22.10	34.20	30.70	50.00	50.23	0.44	0.44	0.99	0.27	0.28	0.38	100	100	100	100	100	100
3:27:40 PM	22.20	34.10	30.80	50.10	50.20	0.27	0.25	0.38	0.41	0.66	0.43	100	100	100	100	100	100
3:28:00 PM	22.20	34.00	30.70	50.10	50.24	0.49	0.48	0.35	0.75	0.37	0.43	100	100	100	100	100	100
3:28:20 PM	22.00	34.20	30.70	50.20	50.17	0.25	0.25	0.6	0.25	0.42	0.25	100	100	100	100	100	100
3:28:40 PM	22.00	34.30	30.60	50.20	50.24	0.52	0.54	0.79	0.42	0.26	0.37	100	100	100	100	100	100
3:29:00 PM	22.30	34.10	30.70	50.20	50.23	0.88	0.52	0.36	0.37	0.35	0.25	100	100	100	100	100	100
3:29:20 PM	22.20	34.30	30.60	50.40	50.15	0.24	0.24	0.45	0.25	0.26	0.39	100	100	100	100	100	100

Run 6	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
3:29:40 PM	22.00	34.40	30.70	50.40	50.20	0.25	0.25	0.44	0.4	0.4	0.61	100	100	100	100	100	100
3:30:00 PM	22.00	34.30	30.70	50.50	50.27	0.41	0.36	0.36	1.04	0.6	0.52	100	100	100	100	100	100
3:30:20 PM	22.10	34.50	30.70	50.50	50.20	0.5	0.81	0.77	0.25	0.26	0.25	100	100	100	100	100	99.59
3:30:40 PM	22.10	34.30	30.70	50.50	49.83	0.25	0.25	0.66	0.25	0.28	0.63	95.62	100	100	100	100	100
3:31:00 PM	22.20	34.30	30.70	50.60	49.82	0.6	0.39	0.36	0.37	0.63	0.27	100	100	100	95.26	100	100
3:31:20 PM	22.00	34.40	30.70	50.60	50.19	0.25	0.25	0.46	0.27	0.45	0.57	100	100	100	100	100	100
3:31:40 PM	22.30	34.40	30.90	50.70	50.22	0.24	0.25	0.35	1.01	0.39	0.37	100	100	100	100	100	100
3:32:00 PM	22.30	34.40	30.70	50.80	50.27	0.53	0.53	0.53	0.37	0.93	0.34	100	100	100	100	100	100
3:32:20 PM	22.00	34.40	30.70	50.70	50.08	0.4	0.42	0.86	0.53	0.25	0.25	100	100	98.25	100	100	100
3:32:40 PM	22.10	34.50	30.70	50.70	50.13	0.76	0.25	0.68	0.26	0.76	0.53	100	100	100	100	98.32	100
3:33:00 PM	22.10	34.60	30.80	50.80	50.16	0.78	0.52	0.63	0.55	0.55	0.25	100	100	100	100	98.64	100
3:33:20 PM	22.10	34.30	30.80	50.80	50.19	0.42	0.4	0.61	0.26	0.24	0.39	100	100	100	100	100	100
3:33:40 PM	22.10	34.50	30.80	50.90	50.20	0.5	0.25	0.35	0.4	0.4	0.44	100	100	100	100	100	100
3:34:00 PM	22.10	34.50	30.80	50.90	50.19	0.34	0.35	0.36	0.45	0.45	0.3	100	100	100	100	100	100
3:34:20 PM	22.20	34.40	30.70	51.00	50.23	0.37	0.39	0.59	0.35	0.59	0.42	100	100	100	100	100	100
3:34:40 PM	22.10	34.50	30.80	51.00	50.18	0.24	0.5	0.35	0.42	0.29	0.37	100	100	100	100	100	100
3:35:00 PM	22.10	34.40	30.80	50.90	50.29	0.61	0.97	0.88	0.37	0.37	0.24	100	100	100	100	100	100
3:35:20 PM	22.00	34.20	30.80	50.90	50.20	0.33	0.67	0.55	0.26	0.25	0.38	100	100	100	100	100	100
3:35:40 PM	22.00	34.50	30.70	51.00	49.46	0.25	0.26	0.36	0.4	0.4	0.78	100	100	91.12	100	100	100
3:36:00 PM	22.40	34.40	30.80	51.10	49.57	0.35	0.35	0.36	0.47	0.79	0.85	100	100	91.64	100	100	100
3:36:20 PM	22.20	34.60	30.80	51.10	50.29	0.55	0.73	0.77	0.75	0.46	0.26	100	100	100	100	100	100
3:36:40 PM	22.20	34.60	30.80	51.10	50.18	0.25	0.43	0.35	0.53	0.26	0.36	100	100	100	100	100	100
3:37:00 PM	22.00	34.30	30.80	51.20	50.18	0.36	0.35	0.42	0.37	0.38	0.24	100	100	100	100	100	100
3:37:20 PM	22.10	34.30	30.70	51.20	49.59	0.33	0.33	0.72	0.24	0.25	0.56	100	100	100	92.59	100	100
3:37:40 PM	22.10	34.30	30.70	51.20	49.74	0.24	0.24	0.38	0.57	0.57	0.37	100	100	100	94.54	100	100
3:38:00 PM	22.10	34.20	30.80	51.20	50.22	0.53	0.53	0.54	0.37	0.37	0.25	100	100	100	100	100	100

Run 6	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
3:38:20 PM	22.10	34.50	30.80	51.10	50.26	0.38	0.39	0.59	0.26	0.64	0.81	100	100	100	100	100	100
3:38:40 PM	22.10	34.60	30.70	51.20	50.22	0.53	0.25	0.35	0.74	0.27	0.53	100	100	100	100	100	100
3:39:00 PM	22.10	34.50	30.80	51.20	50.18	0.36	0.35	0.35	0.36	0.53	0.25	100	100	100	100	100	100
3:39:20 PM	22.10	34.30	30.70	51.40	50.23	0.24	0.65	0.78	0.42	0.26	0.4	100	100	100	100	100	100
3:39:40 PM	22.10	34.50	30.70	51.40	50.23	0.83	0.42	0.35	0.39	0.39	0.38	100	100	100	100	100	100
3:40:00 PM	22.20	34.40	30.70	51.30	49.63	0.35	0.36	0.35	0.63	0.37	0.72	92.77	100	100	100	100	100
3:40:20 PM	22.10	34.30	30.60	51.50	49.97	0.48	0.65	0.6	0.24	0.25	0.51	96.86	100	100	100	100	100
3:40:40 PM	22.20	34.50	30.70	51.50	50.20	0.24	0.26	0.35	0.48	0.6	0.62	100	100	100	100	99.79	100
3:41:00 PM	22.10	34.40	30.60	51.50	50.24	0.54	0.52	0.53	0.37	0.62	0.28	100	100	100	100	100	100
3:41:20 PM	22.10	34.50	30.60	51.50	50.22	0.24	0.43	0.97	0.26	0.28	0.41	100	100	100	100	100	100
3:41:40 PM	22.10	34.70	30.60	51.60	50.14	0.62	0.3	0.35	0.64	0.39	0.36	100	98.96	100	100	100	100
3:42:00 PM	22.40	34.60	30.50	51.60	50.20	0.38	0.35	0.37	0.36	0.53	0.42	100	100	100	100	100	100
3:42:20 PM	22.20	34.60	30.70	51.60	50.22	0.4	0.41	0.86	0.41	0.25	0.26	100	100	100	100	100	100
3:42:40 PM	22.30	34.50	30.60	51.70	50.26	0.69	0.41	0.54	0.23	0.76	0.47	100	100	100	100	100	100
3:43:00 PM	22.40	34.40	30.60	51.60	50.20	0.35	0.32	0.63	0.44	0.37	0.24	100	100	100	100	100	100
3:43:20 PM	22.20	34.50	30.50	51.60	50.19	0.24	0.28	0.68	0.25	0.25	0.56	100	100	100	100	100	100
3:43:40 PM	22.20	34.60	30.60	51.60	50.26	0.77	0.41	0.33	0.55	0.58	0.46	100	100	100	100	100	100
3:44:00 PM	22.10	34.40	30.60	51.60	50.15	0.53	0.43	0.52	0.45	0.46	0.35	100	100	100	100	99.05	100
3:44:20 PM	22.20	34.40	30.60	51.60	49.89	0.38	0.48	0.6	0.24	0.25	0.27	100	100	100	99.47	97.04	100
3:44:40 PM	22.20	34.20	30.50	51.60	50.17	0.26	0.51	0.35	0.26	0.26	0.42	100	100	100	100	100	100
3:45:00 PM	22.10	34.40	30.50	51.70	50.22	0.45	0.26	0.35	0.47	0.64	0.41	100	100	100	100	100	100
3:45:20 PM	22.20	34.60	30.70	51.60	50.21	0.25	0.69	0.54	0.42	0.28	0.38	100	100	100	100	100	100
3:45:40 PM	22.20	34.60	30.60	51.50	50.27	0.43	0.64	0.75	0.37	0.4	0.62	100	100	100	100	100	100
3:46:00 PM	22.30	34.60	30.50	51.60	50.23	0.82	0.26	0.36	0.37	0.62	0.27	100	100	100	100	100	100
3:46:20 PM	22.10	34.50	30.60	51.60	50.21	0.4	0.49	0.59	0.3	0.28	0.42	100	100	100	100	100	100
3:46:40 PM	22.10	34.50	30.50	51.60	50.21	0.27	0.25	0.36	0.64	0.43	0.51	100	100	100	100	100	100

Run 6	T1 (Cold) °C	T2 (Hot) °C	T3 (Top) °C	T4 (Bottom) °C	AVG_Util %	Usage_ESX1 %	Usage_ESX2 %	Usage_ESX3 %	Usage_ESX4 %	Usage_ESX5 %	Usage_ESX6 %	Usage_ESX7 %	Usage_ESX8 %	Usage_ESX9 %	Usage_ESX10 %	Usage_ESX11 %	Usage_ESX12 %
3:47:00 PM	22.30	34.50	30.60	51.60	50.21	0.54	0.26	0.52	0.4	0.74	0.24	99.85	100	100	100	100	100
3:47:20 PM	22.10	34.70	30.60	51.60	38.97	0.27	0.55	0.74	0.35	0.25	0.42	28.6	47.89	88.58	100	100	100
3:47:40 PM	22.10	34.60	30.60	51.60	24.88	0.25	0.26	0.6	0.39	0.39	0.3	0.43	0.6	14.46	87.42	93.51	100
3:48:00 PM	22.30	34.60	30.60	51.60	11.25	0.43	0.29	0.36	0.27	0.39	0.48	0.24	0.32	0.61	12.66	19	100
3:48:20 PM	22.10	34.70	30.60	51.60	4.29	0.39	0.49	0.6	0.53	0.43	0.24	0.33	0.25	0.34	0.62	0.43	46.81
3:48:40 PM	22.00	34.60	30.70	51.60	0.50	0.68	0.41	0.53	0.25	0.26	0.27	1.06	0.39	0.26	0.63	0.81	0.4
3:49:00 PM	22.10	34.70	30.60	51.60	0.40	0.35	0.24	0.36	0.25	0.71	0.41	0.34	0.55	0.37	0.33	0.53	0.37
3:49:20 PM	22.10	34.60	30.70	51.70	0.39	0.26	0.36	0.47	0.47	0.29	0.55	0.24	0.24	0.59	0.35	0.59	0.25
3:49:40 PM	22.30	34.40	30.60	51.60	0.44	0.26	0.35	0.35	0.39	0.59	0.26	0.36	0.5	0.68	0.27	0.75	0.47
3:50:00 PM	22.30	34.80	30.50	51.40	0.59	0.36	0.43	1.05	1.01	0.36	0.66	0.24	0.34	0.62	0.46	0.45	1.14
3:50:20 PM	22.30	34.90	30.50	51.10	0.56	1.09	0.9	0.6	0.36	0.26	0.32	0.56	0.34	0.26	1.06	0.61	0.39
3:50:40 PM	22.30	34.80	30.50	50.70	0.45	0.26	0.26	0.36	0.32	0.37	0.63	0.56	0.84	0.26	0.41	0.63	0.53
3:51:00 PM	22.00	34.60	30.50	50.10	0.52	0.36	0.25	0.36	0.4	0.73	0.82	0.84	0.38	0.89	0.24	0.33	0.63
3:51:20 PM	22.30	34.60	30.50	49.60	0.41	0.27	0.35	0.47	0.86	0.53	0.38	0.24	0.24	0.39	0.35	0.44	0.44
3:51:40 PM	22.10	34.60	30.40	49.00	0.47	0.53	0.62	0.53	0.63	0.38	0.25	0.53	0.35	0.26	0.69	0.59	0.26
3:52:00 PM	22.20	34.60	30.50	48.40	0.47	0.46	0.24	0.94	0.26	0.36	0.36	0.51	0.57	0.52	0.25	0.51	0.63
3:52:20 PM	22.20	34.60	30.50	47.90	0.42	0.67	0.56	0.85	0.37	0.26	0.26	0.26	0.34	0.36	0.36	0.35	0.41
3:52:40 PM	22.20	34.50	30.60	47.20	0.46	0.68	0.25	0.38	0.26	0.71	0.42	0.49	0.75	0.35	0.46	0.55	0.27

DATA ANALYSIS

Using the data collected, the following analyses were performed:

EQUAL UTILIZATION

The first analysis was completed to ensure the data Runs 3, Run 4, Run 5, and Run 6 were approximately equal in average CPU utilization percentage. Any significant variance in this utilization could result in an invalidation of the temperatures measured during the test run.

As shown in Figure 7 Run 3, Run 4, Run 5, and Run 6 are all at approximately 50% utilization, with Run 3 being slightly higher at an average utilization of 55% during the sampling. This is likely the result of our hypervisor layer using resources, when available, to manage its own operations. During Run 3, all of the servers had extra CPU available to contribute to the hypervisor. There is also a slight dip at the end of Run 2. This is likely due to the hypervisor layer again pulling resources from the CPU workload so that it could initiate the job shutdown sequence.

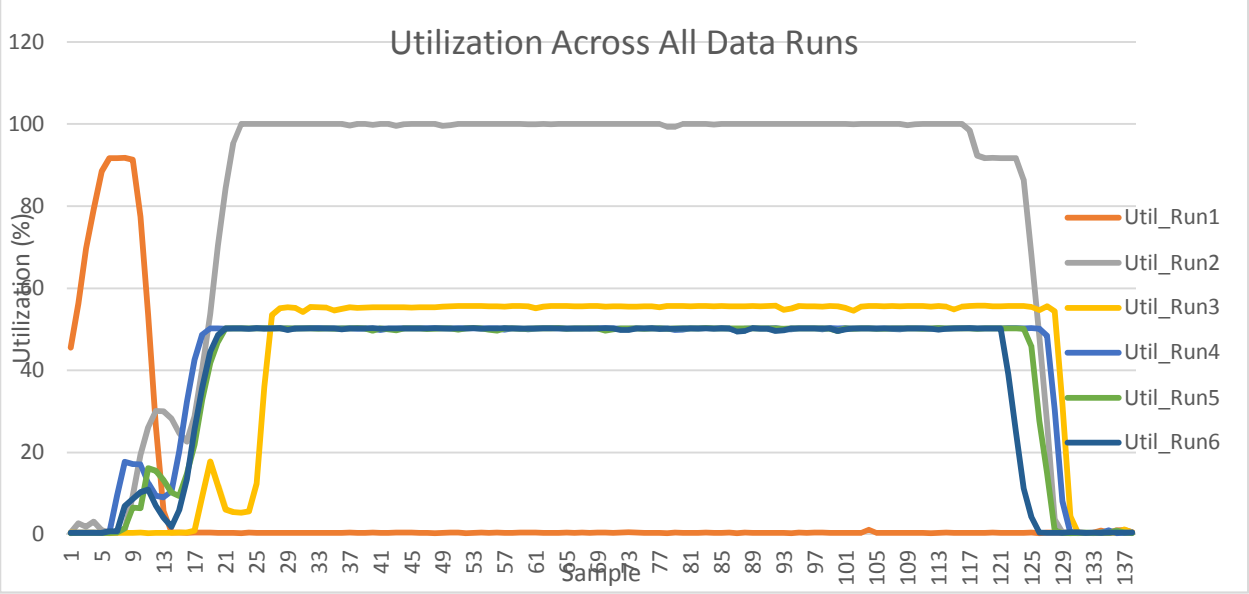

Figure 7: Utilization Comparison between Data Runs

RUN 1 TEMPERATURE RESULTS

In Figure 8 below are the results of Run 1. This was performed with the CPUs at idle and there is very little variance in the data. This is to be expected as the CPUs were not preforming any tasks.

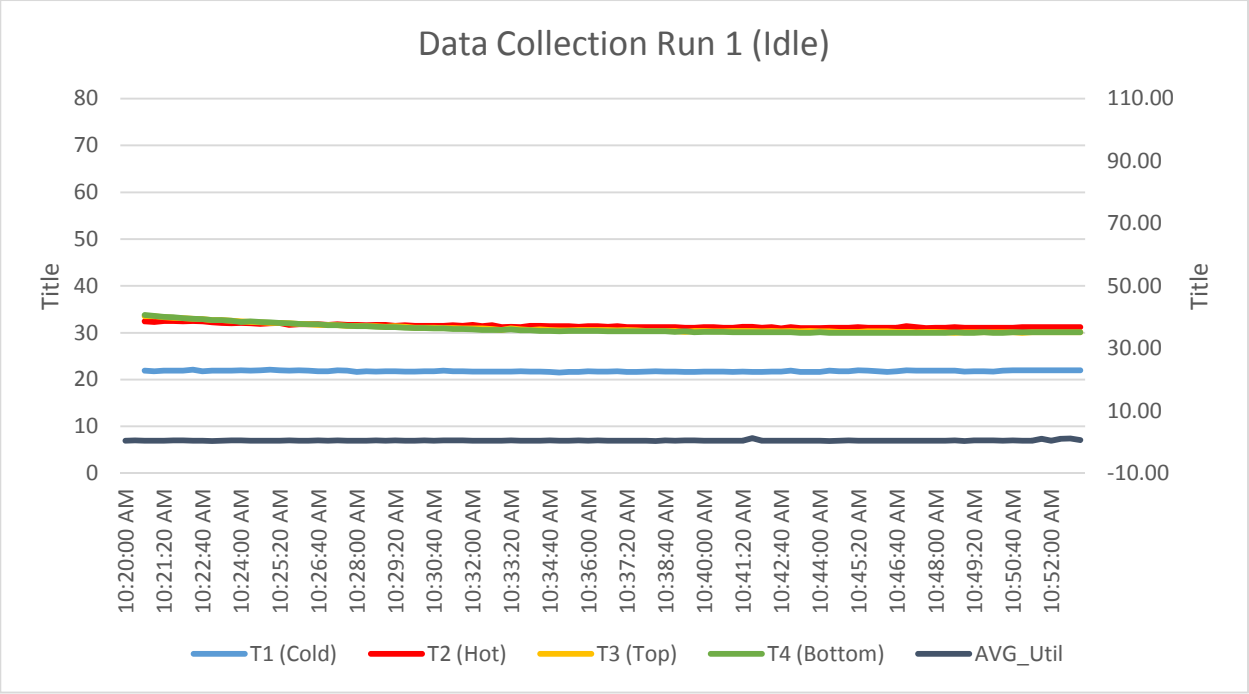

Figure 8: Data Collection Run 1 (Idle)

RUN 2 TEMPERATURE RESULTS

Below are the results of Run 2. This test required the spin up of every processor to 100% utilization. This provides the maximum for the scale and tops 50 degrees Celsius on the internal thermocouples T3 and T4.

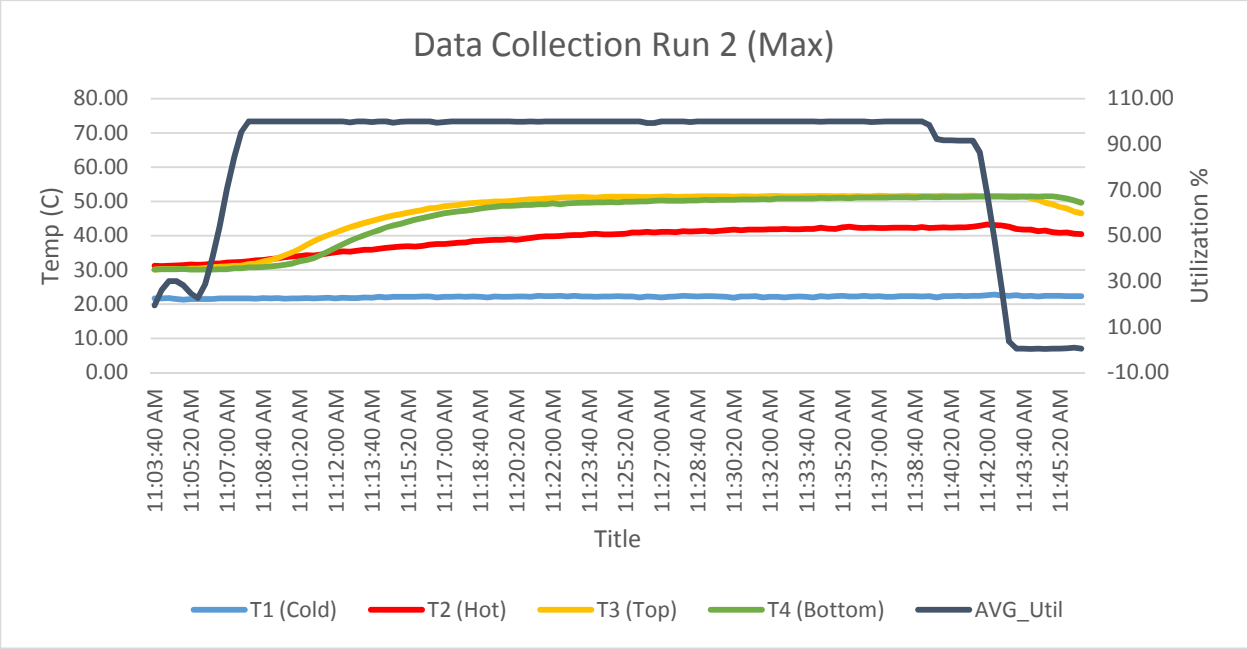

Figure 9: Data Collection Run 2 (Max) Chart

RUN 3 TEMPERATURE RESULTS

Run 3 begins the first of the balanced data runs. This is the reference run that will be used to compare Runs 4, 5, and 6 against to determine if there has been any significant change in temperature output. Notice that around 12:41:00PM, all observed values from the thermocouples smooth out and stabilize. This indicates that the system has reached equilibrium.

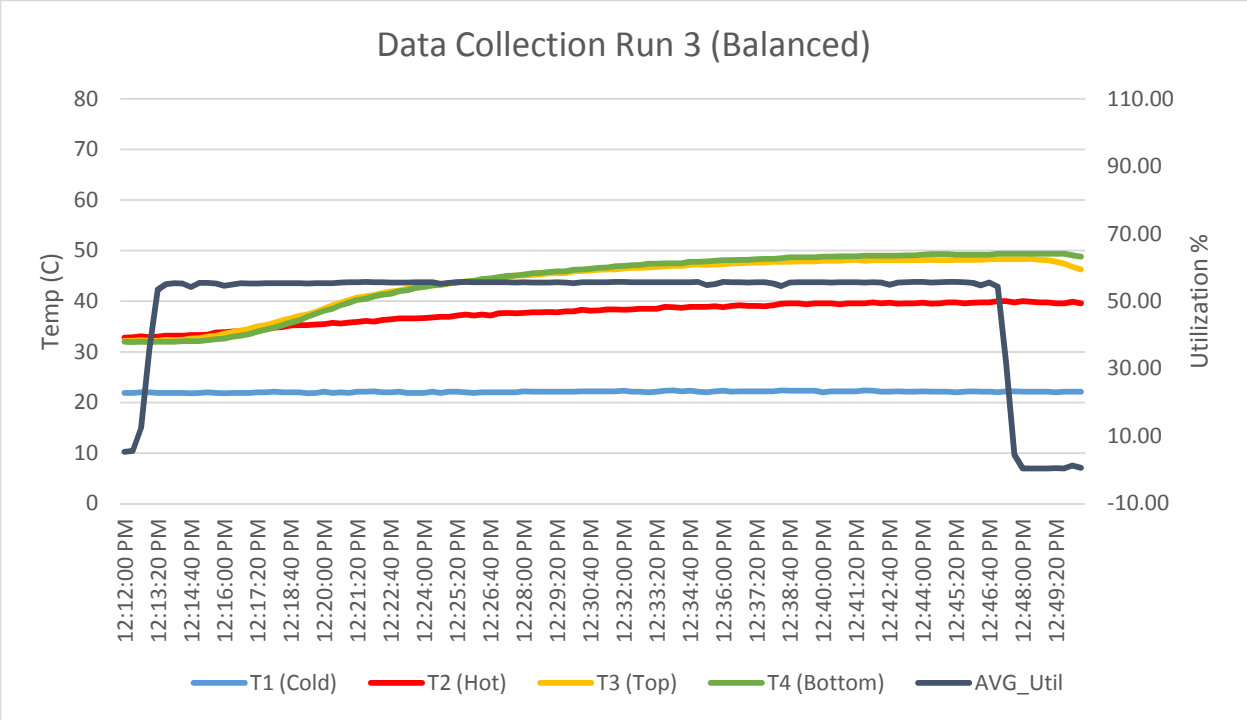

Figure 10: Data Collection Run 3 (Balanced) Chart

RUN 4 TEMPERATURE RESULTS

During Run 4 the script in Appendix B was used to power on worker VMs as a workload on servers 1-6 to create an unbalanced workload that operates at a total cluster usage of 50% The Chart below visualizes the data collected showing the internal T3 sensor raising to over 50 degrees Celsius and ultimately raising hot aisle output to approx. 40 degrees Celsius. This follows what was expected and workload remained constant during the entire data run. Interestingly, T4 did show a slight drop in temperature. This is suspected to be from increased air flow due to the elevated level of utilization in the top half of the rack. Also note that the temperature measurements level out and stabilize around 1:31:00PM. This indicates the data run had reached temperature equilibrium for the utilization level.

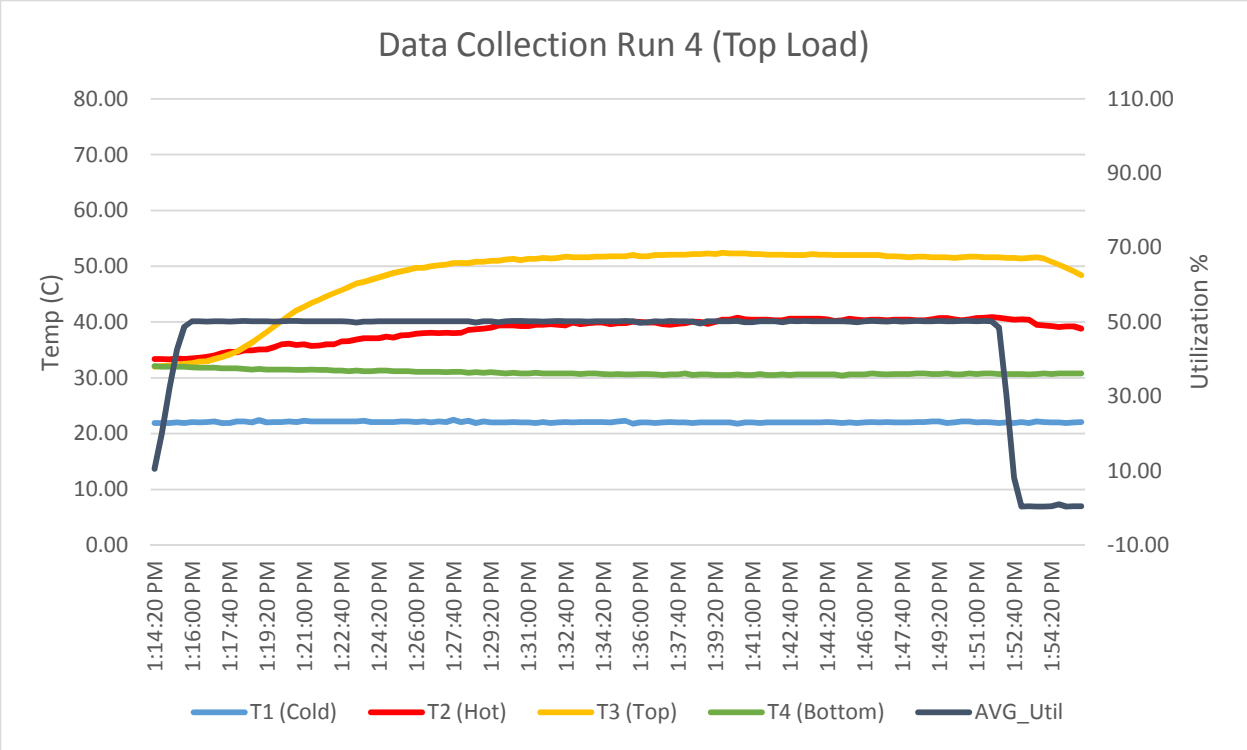

Figure 11: Data Collection Run 4 (Top load) Chart

RUN 5 TEMPERATURE RESULTS

Run 5 began by splitting the workload between servers 1-3 and servers 10-12. This provided a split unbalanced scenario. This data run provided interesting results. While maintaining the same overall level of load there were observed temperatures on the hot aisle monitor T2 that were less than previous data collection runs by 5 degrees Celsius on average.

Also notice that T3 and T4 our internal sensors stay cooler than previously measured. T3 and T4 only rise on average 1 degree over the initial data Run 1 run. This indicates that there is some passive cooling taking place between active servers and idle servers at the core of the apparatus. The data levels off around 2:31:00 PM showing that the apparatus reached equilibrium for this utilization scenario.

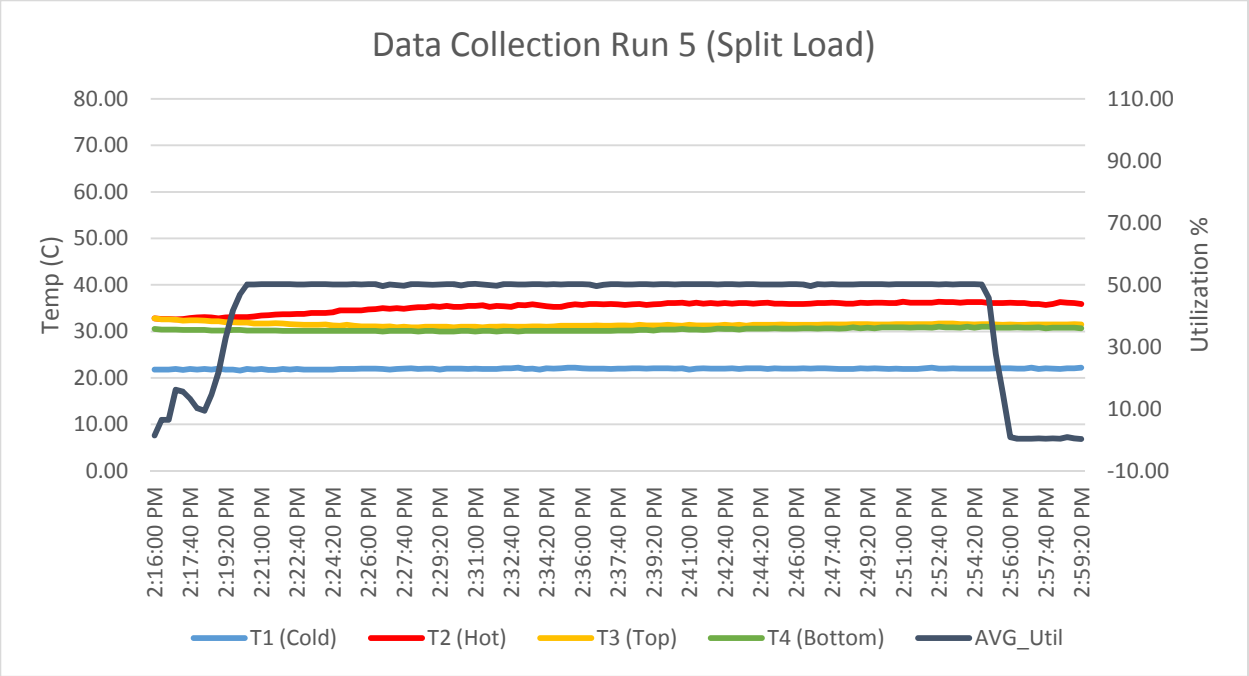

Figure 12: Data Collection Run 5 (Split Load):

RUN 6 TEMPERATURE RESULTS

Run 6 began by running the power on script in Appendix B with proper configuration to power on all worker VMs running on servers 7-12. This placed all work load on the bottom of our test apparatus.

There was a small rise in T2 and a large rise in T4. This correlates with the job placement in the server rack. The measurements for T2 and T3 level off at approx. 3:36:20PM. This indicates that the apparatus reached equilibrium for this utilization and job placement.

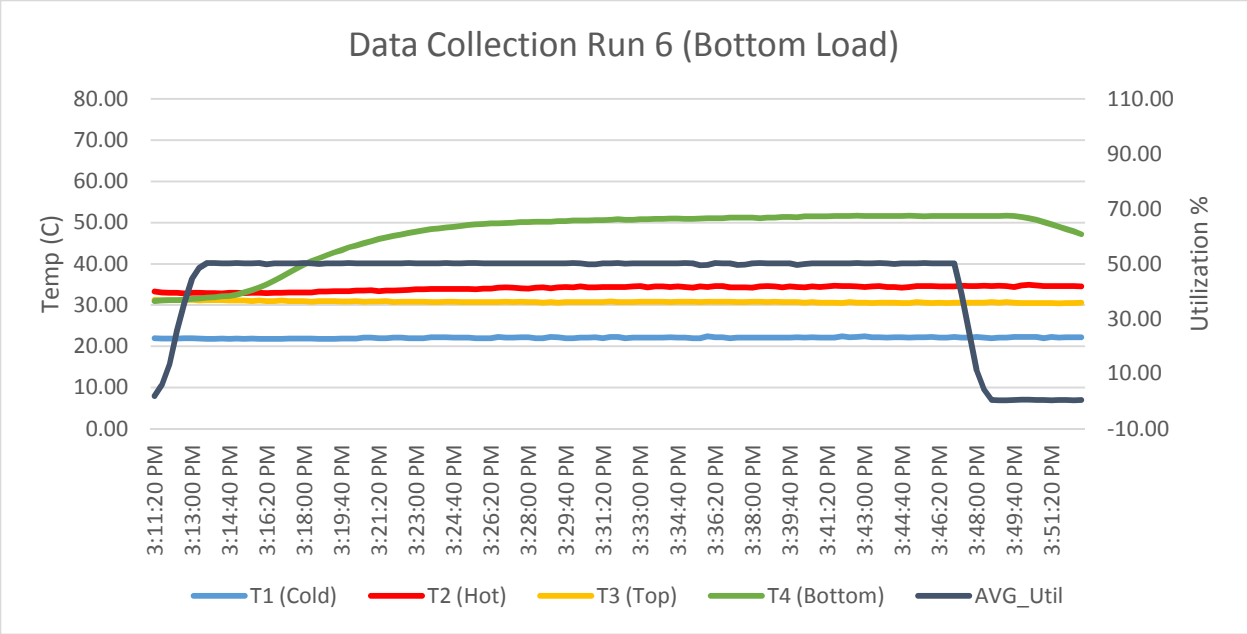

Figure 13: Data Collection Run 6 (Bottom Load)

T1 COLD SIDE COMPARISON RESULTS

Figure 14 shows the results of the difference analysis that was performed between Runs 3, 4, 5, and 6. T1 is a measurement of the Cold Aisle and was regulated by internal building HVAC systems. Figure 14 shows no significant spikes or valleys indicating that the input air was at a constant temperature across all data runs 3, 4, 5, and 6.

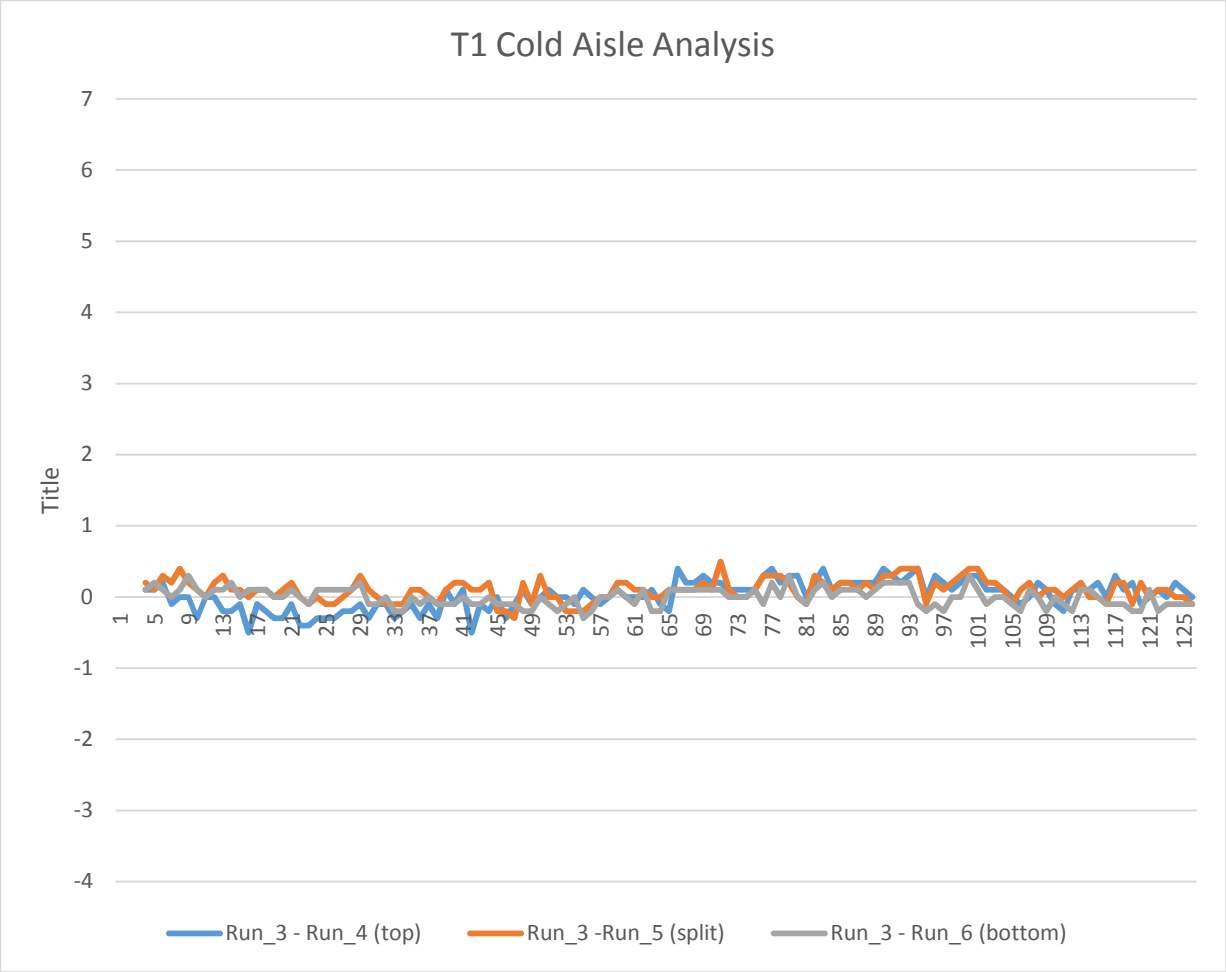

Figure 14: T1 Cold Side Analysis

T2 HOT SIDE COMPARISON RESULTS

Figure 15 shows the difference analysis run against temperature probe T2. T2 measures the apparatus exhaust temperature and represents the hot aisle. Run 5 and Run 6 show significant increases in exhaust heat vs Run 3. This signifies a decrease in efficiency vs a balanced load. Run 4 actually shows a cooling effect then ultimately the temperature begins to climb. This is likely due to the convection of the hot exhaust air away from our T2 temperature probe. However all data runs show an increase in temperature. This provides evidence that it is less efficient to operate unbalanced data center workloads.

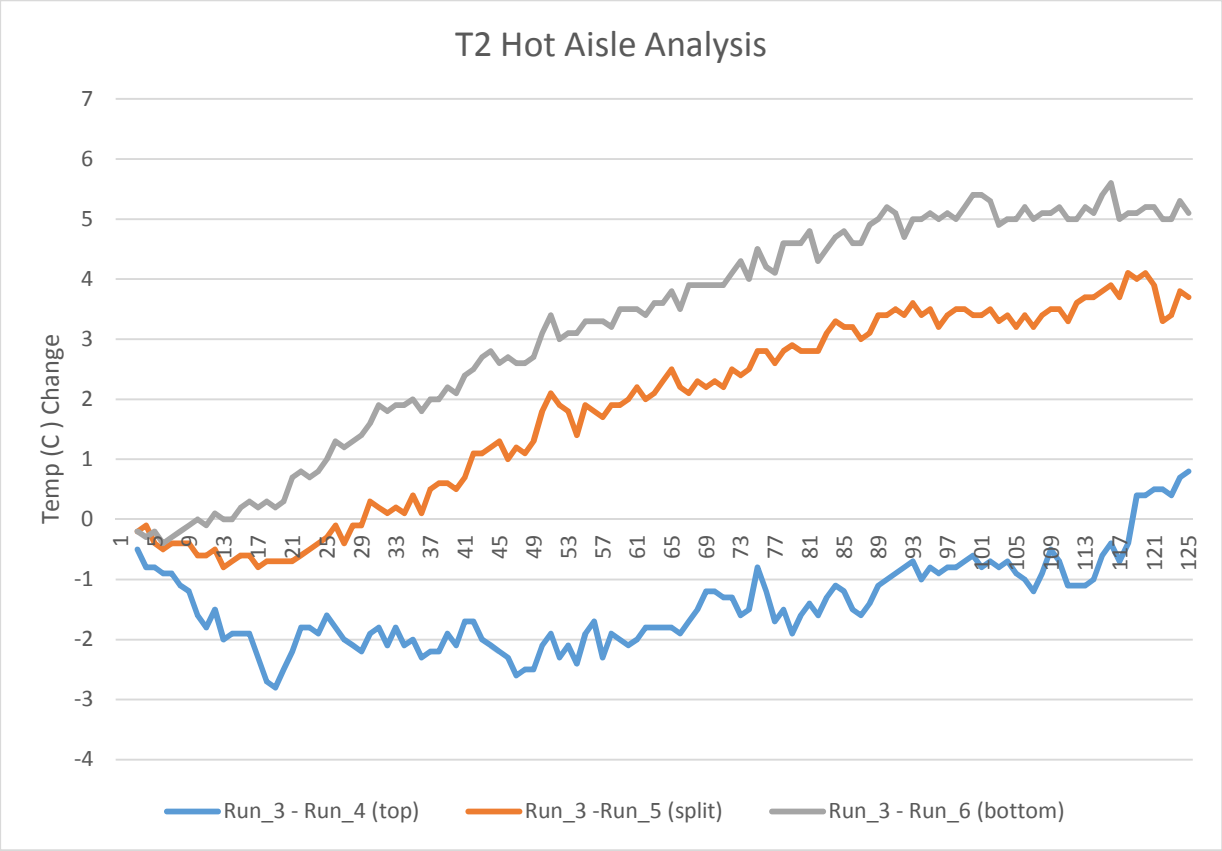

Figure 15: T2 Hot Side Analysis

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

CONCLUSION

The unbalanced loads create a variance in the heat generated by our test system while operated at a similar workload. This is supported by the evidence collected during data Runs 3, 4, 5, and 6.

This research showed that placement of systems can create hot spots in the data center environment, and can distort data by concentrating heat away from installed monitoring devices.

In conclusion, there is a measureable difference between heterogeneous and homogeneous data center workload job placement, and the research shows that it is more efficient in terms of heat generation on my test apparatus to operate homogenous workloads than rather than heterogeneous workloads. This result confirms the hypothesis stated in HO.

HO: It is more efficient to cool homogeneous data center workloads that it is to cool heterogeneous data center workloads using traditional Hot/Cold aisle techniques.

RECOMMENDATIONS

This research was limited by the scale at which it could be conducted There may be more information to be gathered and analyzed if the data collection apparatus could be expanded to include a full scale 42U server rack or possibly a full data center.

It would also be beneficial to expand the temperature measuring capabilities, having a temperature sensor at the exhaust of every server or hardware device housed in the datacenter would help eliminate the temperature created by hotspots in the datacenter.

FUTURE WORK

Future work could possibly include an expansion of the apparatus and the inclusion of other data center workloads such as storage area network disks or routing and switching equipment. It would also be interesting to use computational fluid dynamics to model the apparatus and then model the effects of job placement on temperature.

Dynamic algorithms could be developed to automatically balance workloads across server equipment. These algorithms could take into account the current heat of the data center and make intelligent placement decisions about where to allocate the workload. The logical progression of this technology would see entire campus or company environments monitored and controlled for efficiency. This could span cities, states, and ultimately continents to optimize job placement.

REFERENCES

"Aisle Containment, Which Is Best for Your Company Hot or Cold? |." 2014. Accessed November 1. http://nubissolutions.com/solutions/air-containment-solutions/.

Avelar, Editors: Victor, Schneider Electric Dan Azevedo, and Disney Alan French. 2012. "PUE™: A COMPREHENSIVE EXAMINATION OF THE METRIC." http://www.thegreengrid.org/~/media/WhitePapers/WP49-PUE%20A%20Comprehensive%20Examination%20of%20the%20Metric_v6.pdf?lang=en.

Barroso, Luiz André, and Urs Hölzle. 2009. "The Datacenter as a Computer: An Introduction to the Design of Warehouse-Scale Machines." *Synthesis Lectures on Computer Architecture* 4 (1). morganclaypool.com: 1–108.

Bash, C, and G Forman. 2007. "Cool Job Allocation: Measuring the Power Savings of Placing Jobs at Cooling-Efficient Locations in the Data Center." *Proceedings of the USENIX ... Annual Technical Conference. USENIX Technical Conference*. shiftleft.com. http://shiftleft.com/mirrors/www.hpl.hp.com/techreports/2007/HPL-2007-62.pdf.

Chernicoff, D. 2009. *The Shortcut Guide to Data Center Energy Efficiency*. Realtimepublishers.com.

"Efficiency: How We Do It – Data Centers – Google." 2014. Accessed November 2. http://www.google.com/about/datacenters/efficiency/internal/.

Fan, Xiaobo, Wolf-Dietrich Weber, and Luiz Andre Barroso. 2007. "Power Provisioning for a Warehouse-Sized Computer." In *Proceedings of the 34th Annual International Symposium on Computer Architecture*, 13–23. ISCA '07. New York, NY, USA: ACM.

Glanz, James. 2012. "Data Centers Waste Vast Amounts of Energy, Belying Industry Image." *The New York Times*, September 22. http://www.nytimes.com/2012/09/23/technology/data-centers-waste-vast-amounts-of-energy-belying-industry-image.html?pagewanted=all&_r=0.

IBM, The Greaves Group. 2007. *Virtualization in Education*.

Kava, Joe. 2011. "Google's Green Data Centers: Network POP Case Study." http://static.googleusercontent.com/external_content/untrusted_dlcp/www.google.com/en/us/corporate/datacenter/dc-best-practices-google.pdf.

Lovett, Jon C. 2005. "1997 Kyoto Protocol." *Journal of African Law* 49 (1). Cambridge University Press on behalf of the School of Oriental and African Studies: 94–96.

Onyiorah, C, R Eiland, D Agonafer, and R Schmidt. 2014. "Effectiveness of Rack-Level Containment in Removing Data Center Hot-Spots." In *Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm), 2014 IEEE Intersociety Conference on*, 798–806. ieeexplore.ieee.org.

"Performance Best Practices for VMware vSphere 5.5." http://www.vmware.com/pdf/Perf_Best_Practices_vSphere5.5.pdf.

Sharma, R K, C E Bash, C D Patel, R J Friedrich, and J S Chase. 2005. "Balance of Power: Dynamic

Thermal Management for Internet Data Centers.” *IEEE Internet Computing* 9 (1). ieeexplore.ieee.org: 42–49.

APPENDIX A VM DEPLOYMENT SCRIPT

PowerShell script to deploy worker VMs across the test apparatus.

```
#deploys 16 Worker VMS from Template on 12 hosts for 192 vms
#Brandon Kimmons
#ESX_01

$i =1;
 do {

$vmname="ESX_01_CPU_Worker_"+$i.ToString("000");

New-VM -vmhost 192.168.50.10 -Name $vmname -Location ESX_01 -DiskStorageFormat Thin -Template CPU_Worker_Template_01 -Datastore datastore10 -RunAsync

$i++
}
while ($i -le 16)

#ESX_02

$i =1;
 do {

$vmname="ESX_02_CPU_Worker_"+$i.ToString("000");

New-VM -vmhost 192.168.50.11 -Name $vmname -Location ESX_02 -DiskStorageFormat Thin -Template CPU_Worker_Template_02 -Datastore datastore11 -RunAsync

$i++
}
while ($i -le 16)

#ESX_03

$i =1;
 do {

$vmname="ESX_03_CPU_Worker_"+$i.ToString("000");

New-VM -vmhost 192.168.50.12 -Name $vmname -Location ESX_03 -DiskStorageFormat Thin -Template CPU_Worker_Template_03 -Datastore datastore12 -RunAsync

$i++
}
while ($i -le 16)

#ESX_04

$i =1;
 do {

$vmname="ESX_04_CPU_Worker_"+$i.ToString("000");
```

```
New-VM -vmhost 192.168.50.13 -Name $vmname -Location ESX_04 -DiskStorageFormat Thin -Template CPU_Worker_Template_04 -Datastore datastore13 -RunAsync

$i++
}
while ($i -le 16)

#ESX_05

$i =1;
 do {

$vmname="ESX_05_CPU_Worker_"+$i.ToString("000");

New-VM -vmhost 192.168.50.14 -Name $vmname -Location ESX_05 -DiskStorageFormat Thin -Template CPU_Worker_Template_05 -Datastore datastore14 -RunAsync

$i++
}
while ($i -le 16)

#ESX_06

$i =1;
 do {

$vmname="ESX_06_CPU_Worker_"+$i.ToString("000");

New-VM -vmhost 192.168.50.15 -Name $vmname -Location ESX_06 -DiskStorageFormat Thin -Template CPU_Worker_Template_06 -Datastore datastore15 -RunAsync

$i++
}
while ($i -le 16)

#ESX_07

$i =1;
 do {

$vmname="ESX_07_CPU_Worker_"+$i.ToString("000");

New-VM -vmhost 192.168.50.16 -Name $vmname -Location ESX_07 -DiskStorageFormat Thin -Template CPU_Worker_Template_07 -Datastore datastore16 -RunAsync

$i++
}
while ($i -le 16)

#ESX_08

$i =1;
 do {

$vmname="ESX_08_CPU_Worker_"+$i.ToString("000");
```

```
New-VM -vmhost 192.168.50.17 -Name $vmname -Location ESX_08 -DiskStorageFormat Thin -Template CPU_Worker_Template_08 -Datastore datastore17 -RunAsync

$i++
}
while ($i -le 16)

#ESX_09

$i =1;
 do {

$vmname="ESX_09_CPU_Worker_"+$i.ToString("000");

New-VM -vmhost 192.168.50.18 -Name $vmname -Location ESX_09 -DiskStorageFormat Thin -Template CPU_Worker_Template_09 -Datastore datastore18 -RunAsync

$i++
}
while ($i -le 16)

#ESX_10

$i =1;
 do {

$vmname="ESX_10_CPU_Worker_"+$i.ToString("000");

New-VM -vmhost 192.168.50.19 -Name $vmname -Location ESX_10 -DiskStorageFormat Thin -Template CPU_Worker_Template_10 -Datastore datastore19 -RunAsync

$i++
}
while ($i -le 16)

#ESX_11

$i =1;
 do {

$vmname="ESX_11_CPU_Worker_"+$i.ToString("000");

New-VM -vmhost 192.168.50.20 -Name $vmname -Location ESX_11 -DiskStorageFormat Thin -Template CPU_Worker_Template_11 -Datastore datastore20 -RunAsync

$i++
}
while ($i -le 16)

#ESX_12

$i =1;
 do {

$vmname="ESX_12_CPU_Worker_"+$i.ToString("000");
```

```
New-VM -vmhost 192.168.50.21 -Name $vmname -Location ESX_12 -DiskStorageFormat Thin -Template CPU_Worker_Template_12 -Datastore datastore21 -RunAsync

$i++
}
while ($i -le 16)
```

APPENDIX B POWER-ON SCRIPT

PowerShell script to Power on all CPU workers on the apparatus.

```
#Brandon Kimmons
#Power on all VMs
#Import vm name and ip from csv file
#
Import-Csv thesisvminventory_run2.csv |
foreach {
   $strNewVMName = $_.name
   #Generate a view for each vm to determine power state
   $vm = Get-View -ViewType VirtualMachine -Filter @{"Name" = $strNewVMName}

   if ($vm.Runtime.PowerState -ne "PoweredOn") {

        Write-Host "Powering On $strNewVMName ----"
        Get-VM $strNewVMName | Start-VM -Confirm:$false -RunAsync
        Sleep 2


    }
}
```

APPENDIX C POWER-OFF SCRIPT

```
#Brandon Kimmons
#Power off all VMs
#Import vm name and ip from csv file
Import-Csv thesisvminventory_run2.csv |
foreach {
   $strNewVMName = $_.name
   #Generate a view for each vm to determine power state
   $vm = Get-View -ViewType VirtualMachine -Filter @{"Name" = $strNewVMName}

   if ($vm.Runtime.PowerState -ne "PoweredOff") {

         Write-Host "Powering Off $strNewVMName ----"
         Get-VM $strNewVMName | Stop-VM -Confirm:$false -RunAsync
         Sleep 2


    }
}
```

APPENDIX D CPU WORKER INVENTORY

Name	Folder	Host
ESX_10_CPU_Worker_008	ESX_10	192.168.50.19
ESX_10_CPU_Worker_003	ESX_10	192.168.50.19
ESX_10_CPU_Worker_005	ESX_10	192.168.50.19
ESX_10_CPU_Worker_002	ESX_10	192.168.50.19
ESX_10_CPU_Worker_001	ESX_10	192.168.50.19
ESX_10_CPU_Worker_006	ESX_10	192.168.50.19
ESX_10_CPU_Worker_004	ESX_10	192.168.50.19
ESX_10_CPU_Worker_007	ESX_10	192.168.50.19
ESX_01_CPU_Worker_005	ESX_01	192.168.50.10
ESX_01_CPU_Worker_007	ESX_01	192.168.50.10
ESX_01_CPU_Worker_008	ESX_01	192.168.50.10
ESX_01_CPU_Worker_004	ESX_01	192.168.50.10
ESX_01_CPU_Worker_003	ESX_01	192.168.50.10
ESX_01_CPU_Worker_002	ESX_01	192.168.50.10
ESX_01_CPU_Worker_006	ESX_01	192.168.50.10
ESX_01_CPU_Worker_001	ESX_01	192.168.50.10
ESX_02_CPU_Worker_007	ESX_02	192.168.50.11
ESX_02_CPU_Worker_008	ESX_02	192.168.50.11
ESX_02_CPU_Worker_001	ESX_02	192.168.50.11
ESX_02_CPU_Worker_002	ESX_02	192.168.50.11
ESX_02_CPU_Worker_005	ESX_02	192.168.50.11
ESX_02_CPU_Worker_006	ESX_02	192.168.50.11
ESX_02_CPU_Worker_003	ESX_02	192.168.50.11
ESX_02_CPU_Worker_004	ESX_02	192.168.50.11
ESX_03_CPU_Worker_006	ESX_03	192.168.50.12
ESX_03_CPU_Worker_001	ESX_03	192.168.50.12
ESX_03_CPU_Worker_003	ESX_03	192.168.50.12
ESX_03_CPU_Worker_002	ESX_03	192.168.50.12
ESX_03_CPU_Worker_008	ESX_03	192.168.50.12
ESX_03_CPU_Worker_005	ESX_03	192.168.50.12
ESX_03_CPU_Worker_004	ESX_03	192.168.50.12
ESX_03_CPU_Worker_007	ESX_03	192.168.50.12
ESX_04_CPU_Worker_006	ESX_04	192.168.50.13
ESX_04_CPU_Worker_007	ESX_04	192.168.50.13
ESX_04_CPU_Worker_008	ESX_04	192.168.50.13
ESX_04_CPU_Worker_001	ESX_04	192.168.50.13
ESX_04_CPU_Worker_002	ESX_04	192.168.50.13
ESX_04_CPU_Worker_003	ESX_04	192.168.50.13
ESX_04_CPU_Worker_004	ESX_04	192.168.50.13

Name	Folder	Host
ESX_04_CPU_Worker_005	ESX_04	192.168.50.13
ESX_05_CPU_Worker_008	ESX_05	192.168.50.14
ESX_05_CPU_Worker_007	ESX_05	192.168.50.14
ESX_05_CPU_Worker_006	ESX_05	192.168.50.14
ESX_05_CPU_Worker_002	ESX_05	192.168.50.14
ESX_05_CPU_Worker_005	ESX_05	192.168.50.14
ESX_05_CPU_Worker_003	ESX_05	192.168.50.14
ESX_05_CPU_Worker_004	ESX_05	192.168.50.14
ESX_05_CPU_Worker_001	ESX_05	192.168.50.14
ESX_06_CPU_Worker_005	ESX_06	192.168.50.15
ESX_06_CPU_Worker_004	ESX_06	192.168.50.15
ESX_06_CPU_Worker_003	ESX_06	192.168.50.15
ESX_06_CPU_Worker_002	ESX_06	192.168.50.15
ESX_06_CPU_Worker_001	ESX_06	192.168.50.15
ESX_06_CPU_Worker_007	ESX_06	192.168.50.15
ESX_06_CPU_Worker_006	ESX_06	192.168.50.15
ESX_06_CPU_Worker_008	ESX_06	192.168.50.15
ESX_07_CPU_Worker_008	ESX_07	192.168.50.16
ESX_07_CPU_Worker_005	ESX_07	192.168.50.16
ESX_07_CPU_Worker_004	ESX_07	192.168.50.16
ESX_07_CPU_Worker_007	ESX_07	192.168.50.16
ESX_07_CPU_Worker_006	ESX_07	192.168.50.16
ESX_07_CPU_Worker_001	ESX_07	192.168.50.16
ESX_07_CPU_Worker_003	ESX_07	192.168.50.16
ESX_07_CPU_Worker_002	ESX_07	192.168.50.16
ESX_08_CPU_Worker_003	ESX_08	192.168.50.17
ESX_08_CPU_Worker_001	ESX_08	192.168.50.17
ESX_08_CPU_Worker_008	ESX_08	192.168.50.17
ESX_08_CPU_Worker_006	ESX_08	192.168.50.17
ESX_08_CPU_Worker_007	ESX_08	192.168.50.17
ESX_08_CPU_Worker_004	ESX_08	192.168.50.17
ESX_08_CPU_Worker_005	ESX_08	192.168.50.17
ESX_08_CPU_Worker_002	ESX_08	192.168.50.17
ESX_09_CPU_Worker_003	ESX_09	192.168.50.18
ESX_09_CPU_Worker_002	ESX_09	192.168.50.18
ESX_09_CPU_Worker_008	ESX_09	192.168.50.18
ESX_09_CPU_Worker_007	ESX_09	192.168.50.18
ESX_09_CPU_Worker_006	ESX_09	192.168.50.18
ESX_09_CPU_Worker_005	ESX_09	192.168.50.18
ESX_09_CPU_Worker_004	ESX_09	192.168.50.18
ESX_09_CPU_Worker_001	ESX_09	192.168.50.18
ESX_11_CPU_Worker_005	ESX_11	192.168.50.20

Name	Folder	Host
ESX_11_CPU_Worker_008	ESX_11	192.168.50.20
ESX_11_CPU_Worker_007	ESX_11	192.168.50.20
ESX_11_CPU_Worker_001	ESX_11	192.168.50.20
ESX_11_CPU_Worker_002	ESX_11	192.168.50.20
ESX_11_CPU_Worker_003	ESX_11	192.168.50.20
ESX_11_CPU_Worker_004	ESX_11	192.168.50.20
ESX_11_CPU_Worker_006	ESX_11	192.168.50.20
ESX_12_CPU_Worker_007	ESX_12	192.168.50.21
ESX_12_CPU_Worker_002	ESX_12	192.168.50.21
ESX_12_CPU_Worker_001	ESX_12	192.168.50.21
ESX_12_CPU_Worker_004	ESX_12	192.168.50.21
ESX_12_CPU_Worker_003	ESX_12	192.168.50.21
ESX_12_CPU_Worker_006	ESX_12	192.168.50.21
ESX_12_CPU_Worker_005	ESX_12	192.168.50.21
ESX_12_CPU_Worker_008	ESX_12	192.168.50.21