UILA- POWERING APPLICATION-CENTRIC IT

APPLICATION & INFRASTRUCTURE PERFORMANCE ASSESSMENT

PREPARED FOR SAMPLE CUSTOMER

I. Executive Summary and Key Recommendations

Uila's application-centric infrastructure monitoring solution analyzes and monitors the datacenters application, network and infrastructure performance. The solution has been deployed at "Sample Customers" site for over 1 month since 12/26/2017. This report is intended to provide information on "Sample Customers" datacenter performance issues and recommend ways to optimize the data center.

Based on the input provided by the "Sample Customer" team, the database servers and the WebLogic servers are the most critical.

- **Application Performance** -
  - The **Oracle** servers experience high application response times(ART) periodically. The high ART can be **correlated to the Storage health**.
  - The **WebLogic server depends on the database servers**, so it experiences delays when the database has high ART.
  - **Transactions** –
    - Uila **detects problematic SQL queries**, with ART approximately 52 seconds.
    - The HTTP queries are processed fast by the WebLogic servers and do not experience any application issues.
- **Network** –
  - The overall health of network in the datacenter is healthy with occasionally high latency and virtual packet drops.
- **Infrastructure** –
  - **Storage –**
    - The Kernel read latency on **esxhost4 and esxhost5 are high**. This causes high Application response times on the database servers and affects the entire datacenter.
  - **CPU** –
    - The CPU performance is healthy.
  - **Memory –**
    - The overall memory performance is healthy
    - The **MySQL-_MGT** server experiences high swap wait time.
  - **VM Resource Utilization and Provisioning**–
    - The hosts have adequate CPU and memory resources based on the utilization patterns. Most VM's within the host underutilize the provisioned CPU and memory, thereby allowing for more VM's per host.
- **End user Experience** –
  - Uila has monitored the end-user experience of 2 sites, the Taiwan and San Francisco. The **Taiwan site experiences higher network latency**, however the application response times and data process time are the same for both.

A. Key Recommendations –

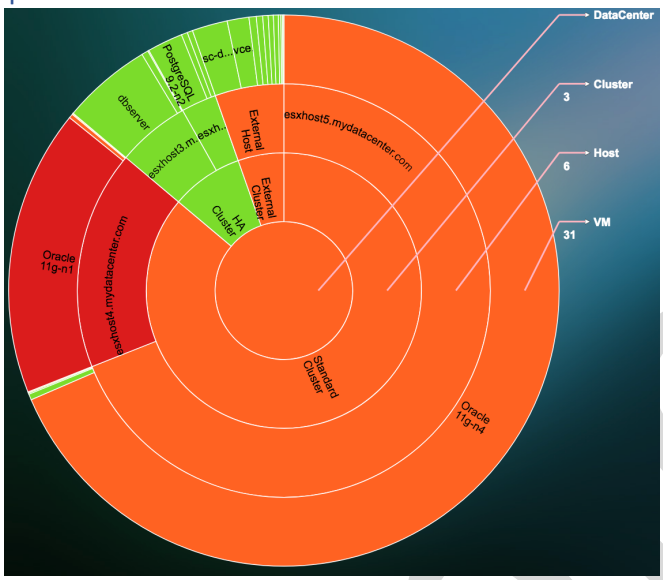
The high application response time on the Oracle servers can be correlated to the storage devices.

- **Storage –**
  - The Kernel Read Latency on the **esxhost4** is close to 83ms. This can be attributed to the storage IOPS being shared with multiple database servers. In this case, the storage devices need to be **urgently upgraded** to be able to ensure normal performance.

The high CPU swap wait time on MySQL-_MGT can cause problems for multiple VM's on the same host.

- **Memory** –
  - CPU swap wait is the time a VM spends for memory to be swapped in. When the VM is waiting for memory, it's not doing work. The **MySQL-_MGT** server experiences CPU swap wait time of 30 seconds. This server must be **migrated from the busy esxhost4 to the less busy esxhost3**.

II. Application performance

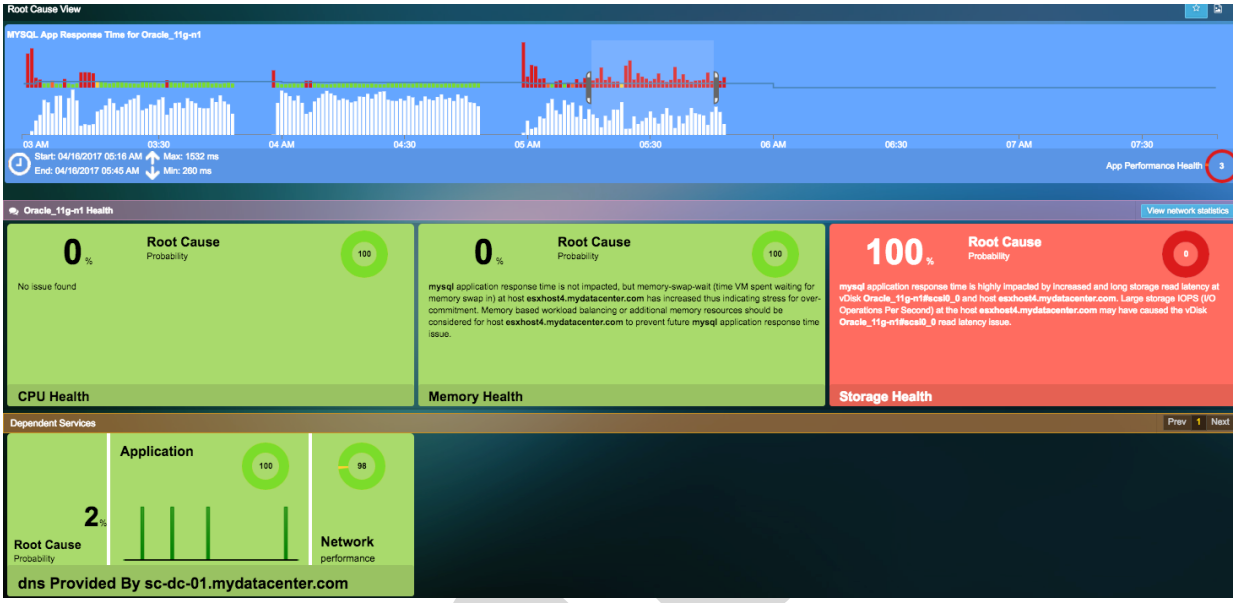


These are the top 10 worst performing virtual machines based on application health score –

VM	Health	ART	Transactions/m	Traffic/s	Packets/s
Oracle_11g-n1	10	547 ms	5.1 K	38.90 KB	240
Oracle_11g-n2	27	1735 ms	60	86.18 KB	428
Oracle_11g-n4	35	283 ms	12.5 K	13.20 MB	13.8 K
192.168.0.221	65	146923 ms	2	174 B	1
Weblogic_11g-s1	75	313 ms	19	42.47 KB	246
Weblogic_11g-s2	81	189 ms	17	13.11 MB	13.4 K
APP-LB-002	85	6975 ms	1	7.01 KB	11
VIC	99	173 ms	18	32.31 KB	50
esxhost4.mydatacenter.com	99	68 ms	85	9.31 KB	13
192.168.0.218	99	160 ms	25	997 B	2

A. Oracle 11g-n1, Oracle_11g-n2 –

The high ART on Oracle_11g-n1 and Oracle11g-n2 server is correlated to the Storage Health.



Digging in further, we discover the read latency to be very high. The IOPS is also being shared between multiple VM's on the same host. This can cause high latency on a single service.

Uila Recommendation – The storage device must be upgraded to prevent system slowdowns and ensuring normal performance.

B. Oracle_11g-n2 –

The high ART on Oracle_11g-n4 server is correlated to the Storage and CPU Health.

Digging in further, we discover the read latency to be very high. The IOPS is also being shared between multiple VM's on the same host. This can cause high latency on a single service.

On the CPU side, we discover very high CPU utilization on the host and VM level.

Uila Recommendation – This VM must be migrated to a host with more resources.

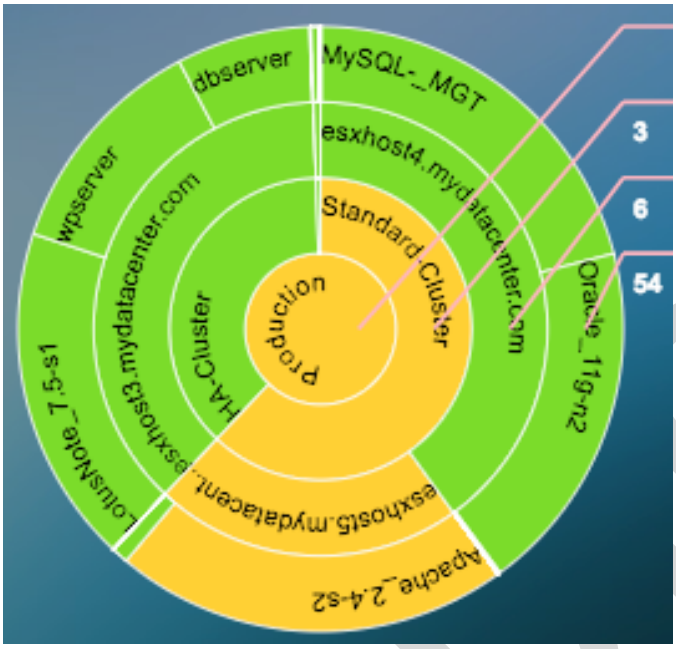
C. Weblogic_11g-s1, Weblogic_11g-s2 –

The high application response time on the Weblogic_11g-s1 server is due to its dependency with the Oracle_11g-n1 server.

Below is the dependency map of the multi-tiered application.

Uila Recommendation – If the storage latency issue on the Oracle11g server is resolved, the high ART on the Weblogic server will be resolved.

III. Network Performance

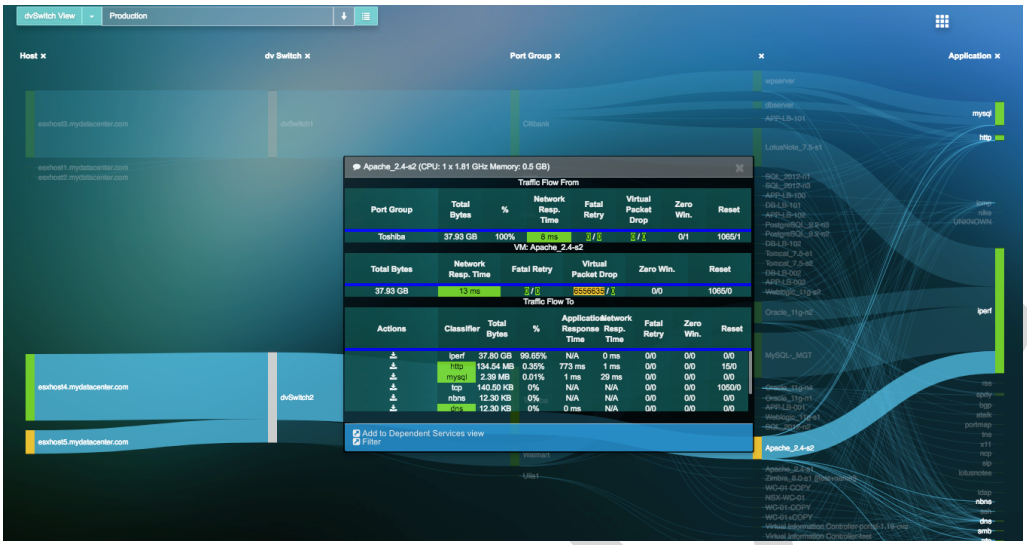


Following are the details on the top 10 worst performing VM's in your datacenter, along with its Round-trip time, virtual packet drops and transmission retries.

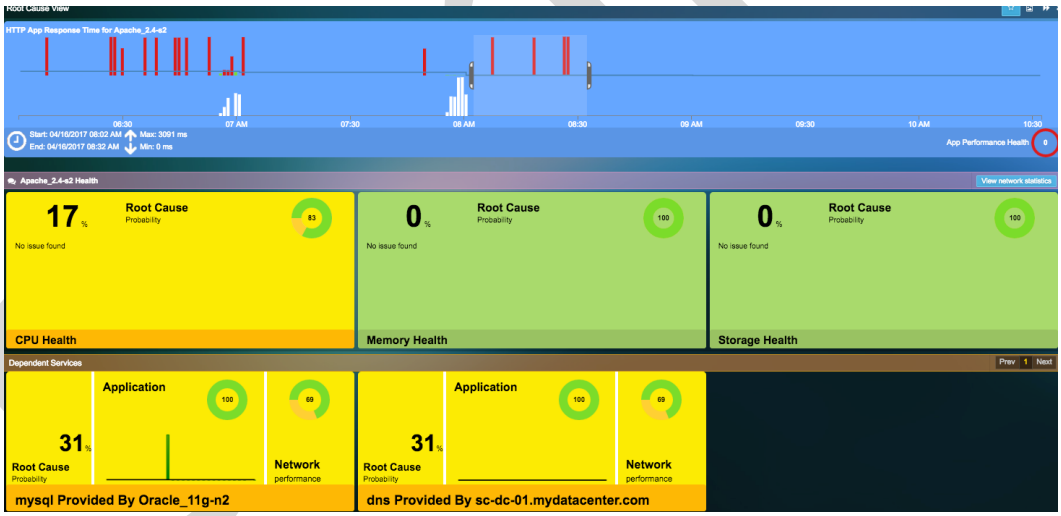
VM	Health	ART	RTT	TCP Fatal Retry	Virtual Packet Drop
Apache_2.4-s2	84	773 ms	13 ms	0/0	6556635/0
PostgreSQL_9.2-n3	92	N/A	12 ms	0/0	0/0
PostgreSQL_9.2-n2	92	90 ms	11 ms	0/0	0/0
APP-LB-100	100	N/A	0 ms	0/0	0/0
APP-LB-102	100	N/A	0 ms	0/0	0/0
SQL_2012-n1	100	1554 ms	3 ms	0/0	0/0
APP-LB-101	100	N/A	0 ms	0/0	0/0
WC-01 COPY	100	N/A	N/A	0/0	0/0
DB-LB-101	100	N/A	0 ms	0/0	0/0
Tomcat_7.5-s1	100	N/A	N/A	0/0	0/0

A. Apache_2.4-s2

The Apache server experiences high Virtual Packet drops.



The rootcause view correlates this to the CPU usage.



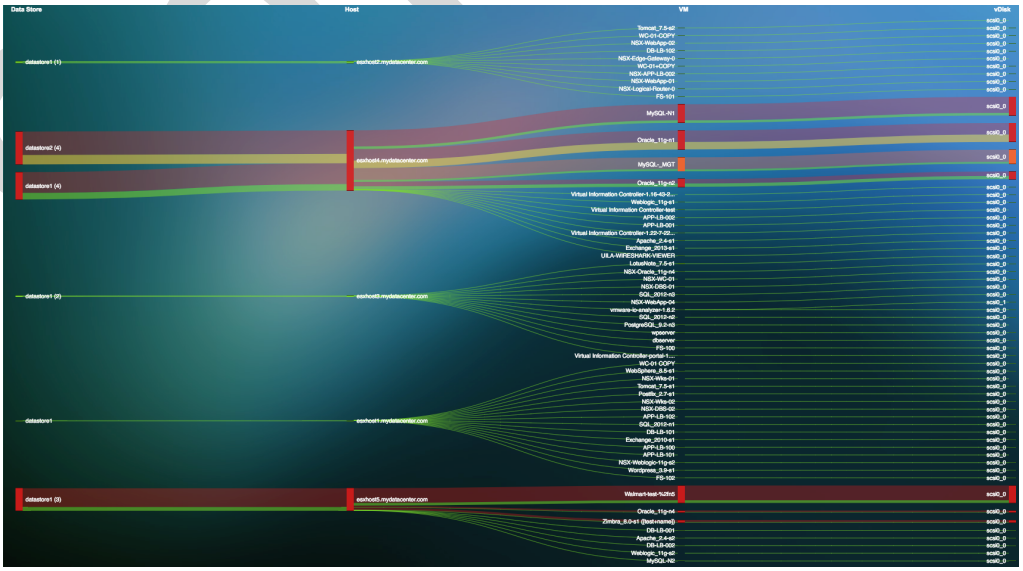
As we dig in, we can see the high CPU ready to be the root cause. The CPU ready time is about 44%.

Uila Recommendation – If the storage latency issue on the Oracle11g server is resolved, the high ART on the WebLogic server will be resolved.

IV. Infrastructure

A. Storage –

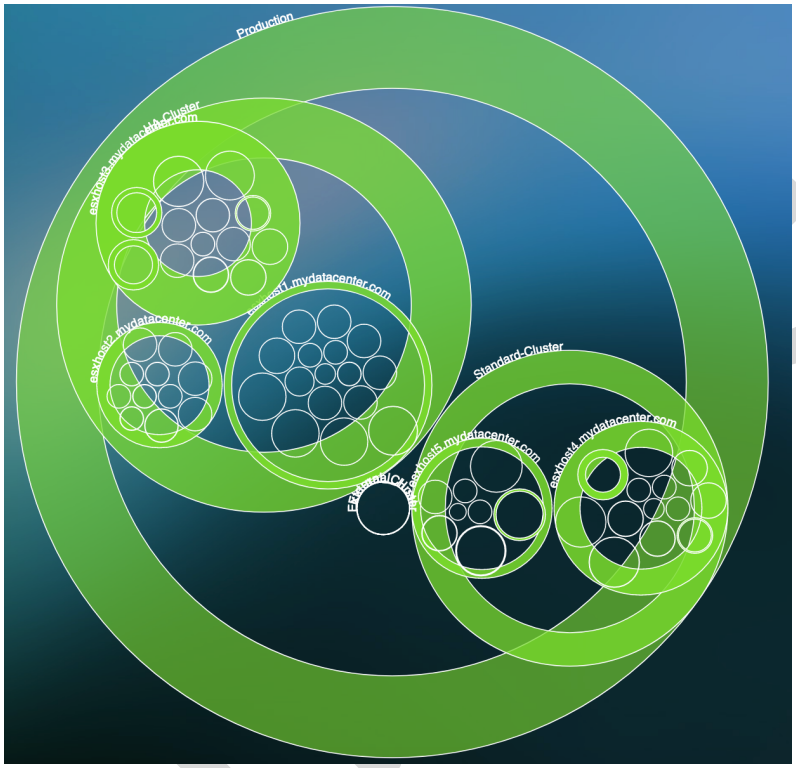
The storage devices in your environment experience very high read/write latency. As it can be seen from the storage flow view map, the poor performance of the vDisks can be attributed to the datastores.



Uila Recommendation – There are 3 datastores with very high read/write latency. These datastore need to be replaced urgently to avoid application long term application issues.

B. CPU –

The average CPU utilization is 20% throughout the datacenter. The CPU ready time is also very low at 0.03%.



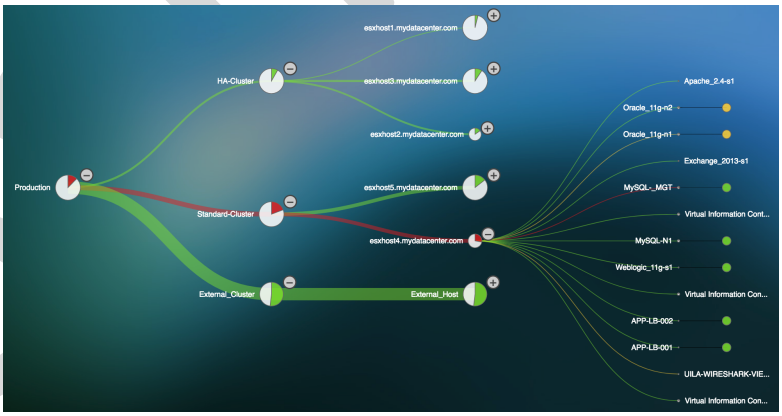
Uila Recommendation – CPU is healthy based on the utilization and the CPU ready time. VM's do not face high utilization or high CPU ready time.

C. Memory –

High CPU swap wait time of 36 seconds is observed on the MySQL-_MGT server. This causes the performance of the host, cluster and the datacenter as a whole to degrade.

The CPU swap wait time 36 ms for the MySQL-_MGT server. If the problem is let to persist, it will cause major application issues.

The tree-view below shows the effect of the MySQL-_MGT server on the host, cluster and the datacenter.



Uila Recommendation – The MySQL-_MGT is currently on the busy esx4host. The MySQL server must be migrated to the esx3host which has more resources to handle the memory requirements of the MySQL-_MGT server.

D. Resource Provisioning Summary –

	CPU				Memory			
VM Name	Capacity	Avg Usage(%)	Peak Usage(%)	Over Provision	Capacity	Avg Usage(%)	Peak Usage(%)	Over Provision
WC-01-COPY	1716Mhz	0.9	1		1024MB	7.7	11.3	
SQL_2012-n1	6864Mhz	0.8	0.8		2048MB	1.2	2.1	
APP-LB-102	1716Mhz	0.3	0.3		256MB	6.2	8.9	
DB-LB-101	1716Mhz	0.3	0.3		256MB	6.3	8.8	
DB-LB-102	1716Mhz	0.3	0.3		256MB	6.4	8.9	
Prod-NFS	3622Mhz	0.2	0.3		2048MB	1	1.9	
Nike-mail-01	6864Mhz	0.1	0.1		4096MB	0	0	
APP-LB-101	1716Mhz	0.3	0.4		256MB	6.6	9.9	
WC-01+COPY	1716Mhz	0.7	0.8		1024MB	4	6.1	
APP_Load-Balancer	6864Mhz	0.1	0.1		2048MB	0.5	1.5	
PostgreSQL_9.2-n3	3622Mhz	0.2	0.3		512MB	4.7	6.3	
dbserver	7244Mhz	27.1	77.5		1024MB	13.3	24.2	
NFS-Storage-101	3432Mhz	0.2	0.3		1024MB	2.2	3	
Citibank-web-01	3432Mhz	0.1	0.1		1024MB	0.9	1.4	
ws-01	1716Mhz	0.9	0.9		512MB	3.1	5.5	
Horizon-Client	1716Mhz	0.9	1.1		1024MB	8.9	13.5	
mysqlc1-n1	3622Mhz	1.7	2		2048MB	1.5	2.7	
mysqlc1-n2	3622Mhz	1.1	1.2		2048MB	1.1	2.2	
Sony-Mail-01	6864Mhz	0.1	0.1		4096MB	0	0	
vic-1.16-roger	3622Mhz	1.7	1.9		4096MB	16.1	18.8	
Mssql-Server	1716Mhz	3	3.1		2048MB	7.4	8.8	
wpserver	7244Mhz	1.2	3.3		1024MB	7.8	11.1	
Wordpress_3.9-s1	3432Mhz	0.1	0.1		512MB	1.7	2.8	
Vst-pf_ring	1716Mhz	0.1	0.1		1024MB	0	0.2	
FS-102	3432Mhz	0.2	0.3		1024MB	2.1	3.4	
LotusNote_7.5-s1	3622Mhz	8	43.5		2048MB	19.2	43	

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	CPU				Memory			
VM Name	Capacity	Avg Usage(%)	Peak Usage(%)	Over Provision	Capacity	Avg Usage(%)	Peak Usage(%)	Over Provision
View-AD	1716Mhz	0.9	1		1024MB	10	14	
Nike-web-02	3432Mhz	0.1	0.1		512MB	2.3	3.4	
Nike-web-01	3432Mhz	0.1	0.1		512MB	2.3	4.2	
Vst-pktgen	1716Mhz	0.1	0.1		1024MB	0	0.2	
DEV-UMAS-VIC	3432Mhz	1.7	2.1		8912MB	11.6	14.7	
View-v5	1716Mhz	3.4	3.5		1024MB	21.4	24.2	
Horizon-Agent	1716Mhz	1	2.8		1024MB	9.1	13.3	
Virtual Information Controller-portal-1.19-ova	3622Mhz	2.9	3.1		4096MB	20.7	24.1	
Oracle_11g-n4	7244Mhz	24.4	65.1		3080MB	7.3	17.9	
Apache_2.4-s2	1811Mhz	2	15.3		512MB	12	19.5	
Oracle_11g-n3	7244Mhz	2.6	7.8		3028MB	8.5	15.9	
Apache_2.4-s1	1811Mhz	0.3	0.5		512MB	8.3	15.7	
Oracle_11g-n2	7244Mhz	23.6	94.5		4096MB	2.3	6.1	
Oracle_11g-n1	7244Mhz	1.2	2.1		4096MB	4.8	8	
Weblogic_11g-s2	3622Mhz	1.3	5.4		512MB	11.6	23.6	
MySQL-N2	3622Mhz	7.2	89.9		2048MB	8.2	89.1	
Weblogic_11g-s1	3622Mhz	20.6	69.4		512MB	18.6	29.2	
MySQL-N1	7244Mhz	4	87		3660MB	4.5	60.7	
VIC-Adi	3622Mhz	0.9	1.1		4096MB	4.5	6.1	
DB-LB-001	1811Mhz	0.1	0.1		64MB	4.4	9.3	
DB-LB-002	1811Mhz	1.2	3.5		512MB	3	4.1	
Walmart-test-%2fn5	7244Mhz	25.4	26.3		4080MB	0.1	0.5	
Exchange_2013-s1	3622Mhz	2.1	6.8		2048MB	14.9	30.8	
PDOCKER-05 (Block)	1811Mhz	3.6	5.5		4096MB	7.3	9.2	
APP-LB-	1811Mhz	0.8	2.2		256MB	7.2	9.5	

Uila Recommendation – Based on the VM resource provisioning summary report, it can be inferred that majority of the VM's are overprovisioned (shown in red). The average CPU and memory usage is less than 20%.

Sample customer need not purchase any more hosts for additional VM deployment. They can utilize their current resources to spin multiple VM's.

V. Next Steps

Uila encourage sample customer to review the findings of this report to determine the appropriate strategy to address potential weak spots in the data center. Using a 24/7 monitoring solution such as Uila will help the identify these potential issues before they become problems.

VI. Uila Contact

Uila Technical Contact: _____

Uila Sales Contact: _____

VII. About Uila

Uila gives IT infrastructure teams x-ray vision for their data center operations and end user experience. Designed for Private, Public and Hybrid Cloud environments, Uila's Application-Centric Data Center Infrastructure Monitoring and Analytics provide instant visibility into hotspots and bottlenecks in any data center. Uila provides service dependency mapping, full stack correlation with 1-click root cause analysis and patented deep packet inspection technology that understands over 2,700 application protocols for transactional meta data analysis. Businesses use Uila to align themselves with their IT Operations team and cut time to resolution from days to minutes, keep their application at peak performance at all time and ensure end-user satisfaction to the fullest.