IST-TIS SAS ESXI/NETAPP

VMWARE DEPLOYMENT

IST ENVIRONMENT

- Production
  - Dell ESXi and Cisco UCS hosts in each of EC2 and MC
    - 8x R820, 6x R730, 2x B200-M4
    - 2x R720 for PCI
  - 6x FAS8040 heads in each of EC2 and MC
  - ~200 VMs in EC2 ~300 VMs in MC
- Development
  - ESXi hosts in MC
    - 4x R820, 1x R730
  - ~350 VMs

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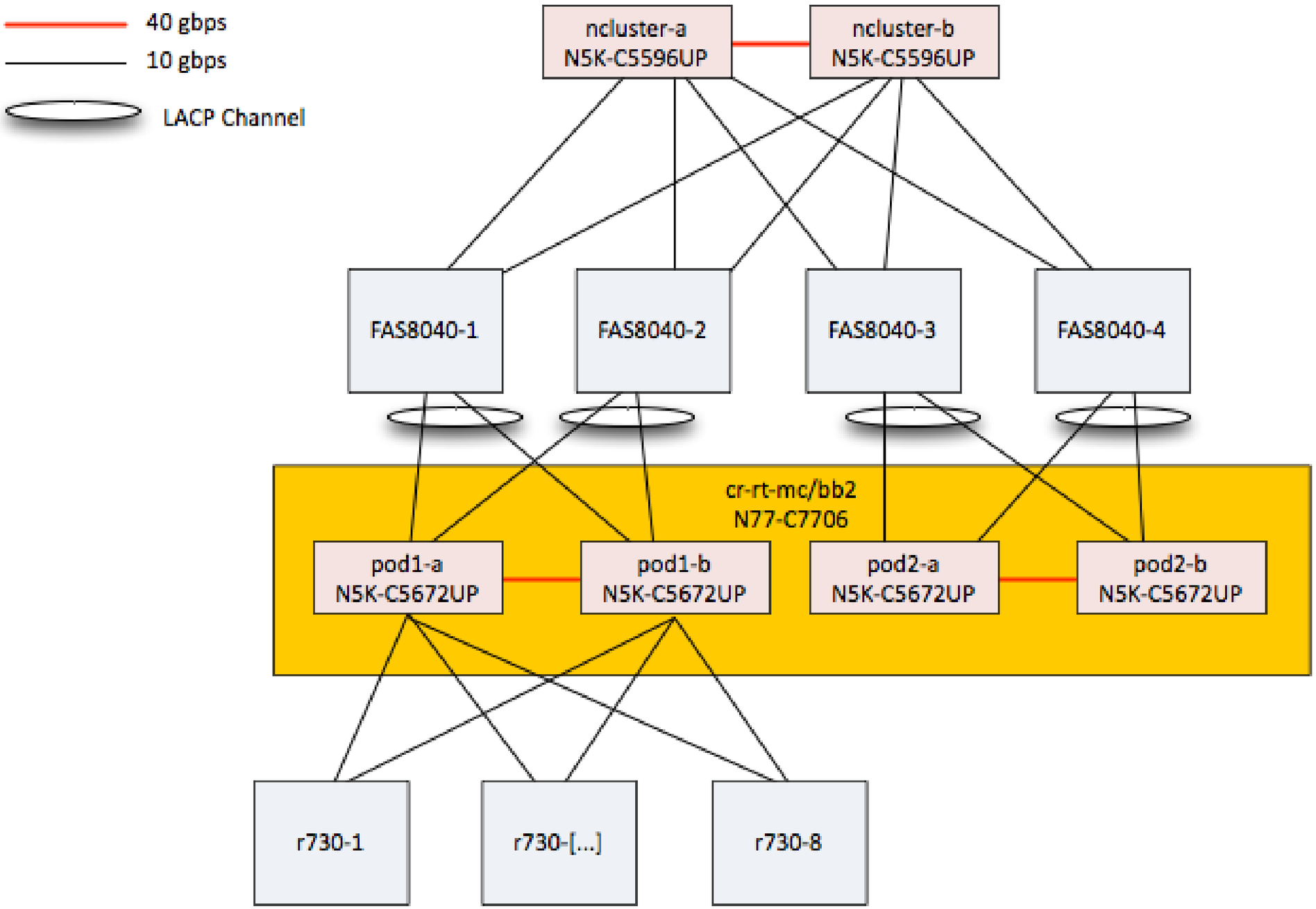
physical VM diagram

Updated: 2016-03-14 sbourque



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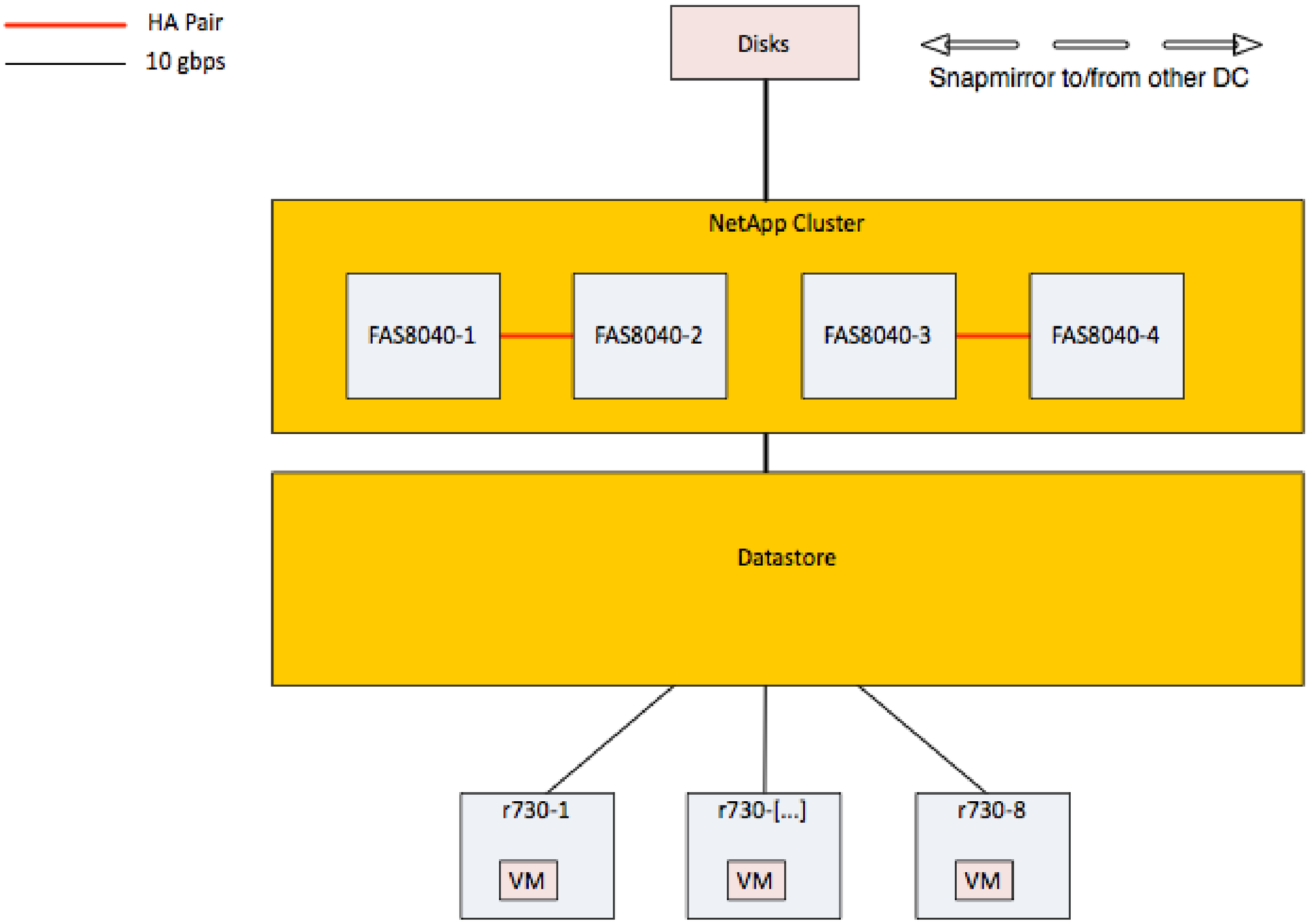
logical VM diagram

Updated: 2016-03-14 sbourque



HOUSE OF BRICK

- In partnership with VMware, IST engaged House of Brick to review best practices for running Oracle:
  - in a VMware environment
  - in a Linux environment
- Testing included benchmarking both Solaris and Linux environment for a comparison of CPU and I/O

TEST VMWARE ENVIRONMENT

- Dell R730 Server
  - 32 cores
- NetApp FAS8040
- Multiple 10Gbps connectivity

SPECINT SUMMARY

- both Specint (CINT2006) analysis and real tests performed
- SpecInt = Standard benchmark for processing power across hardware platforms
- ftp://ftp.bmc.com/ftpput/pub/perform/gfc/hardware/10.3.00/best1default.hrw103
- Sparc T5-2 = 937.5 Dell R730 = 1230
- CPU ~30% better in Dell/VMware vs Sparc T5-2

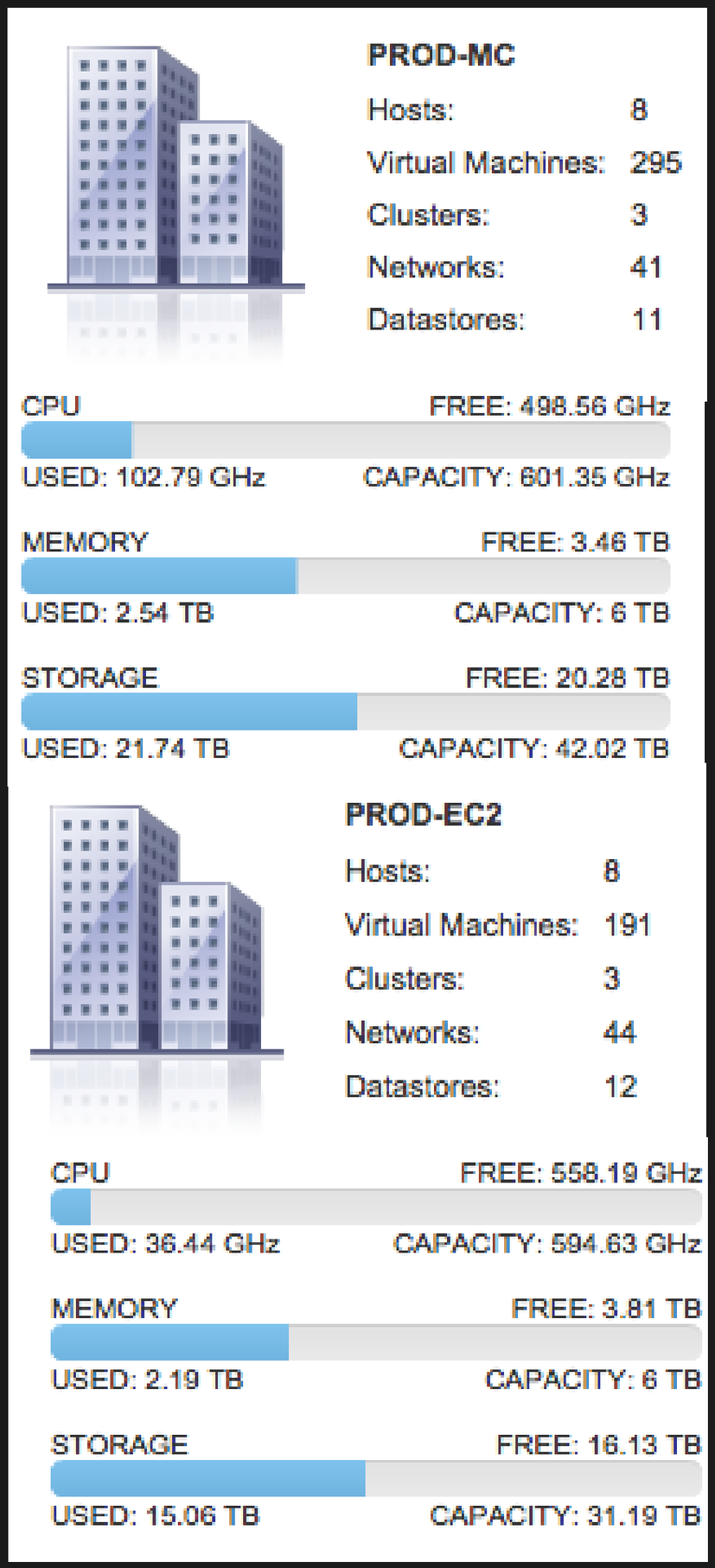
I/O SUMMARY

- Silly Little Oracle Benchmark (SLOB)
  - written by Kevin Closson for testing Oracle workloads
- Disabled caching layers of DB
- Numerous tests performed with various configuration settings
- I/O ~4,000% better in Dell/VMware vs Sparc T5-2

I/O TEST HIGHLIGHTS

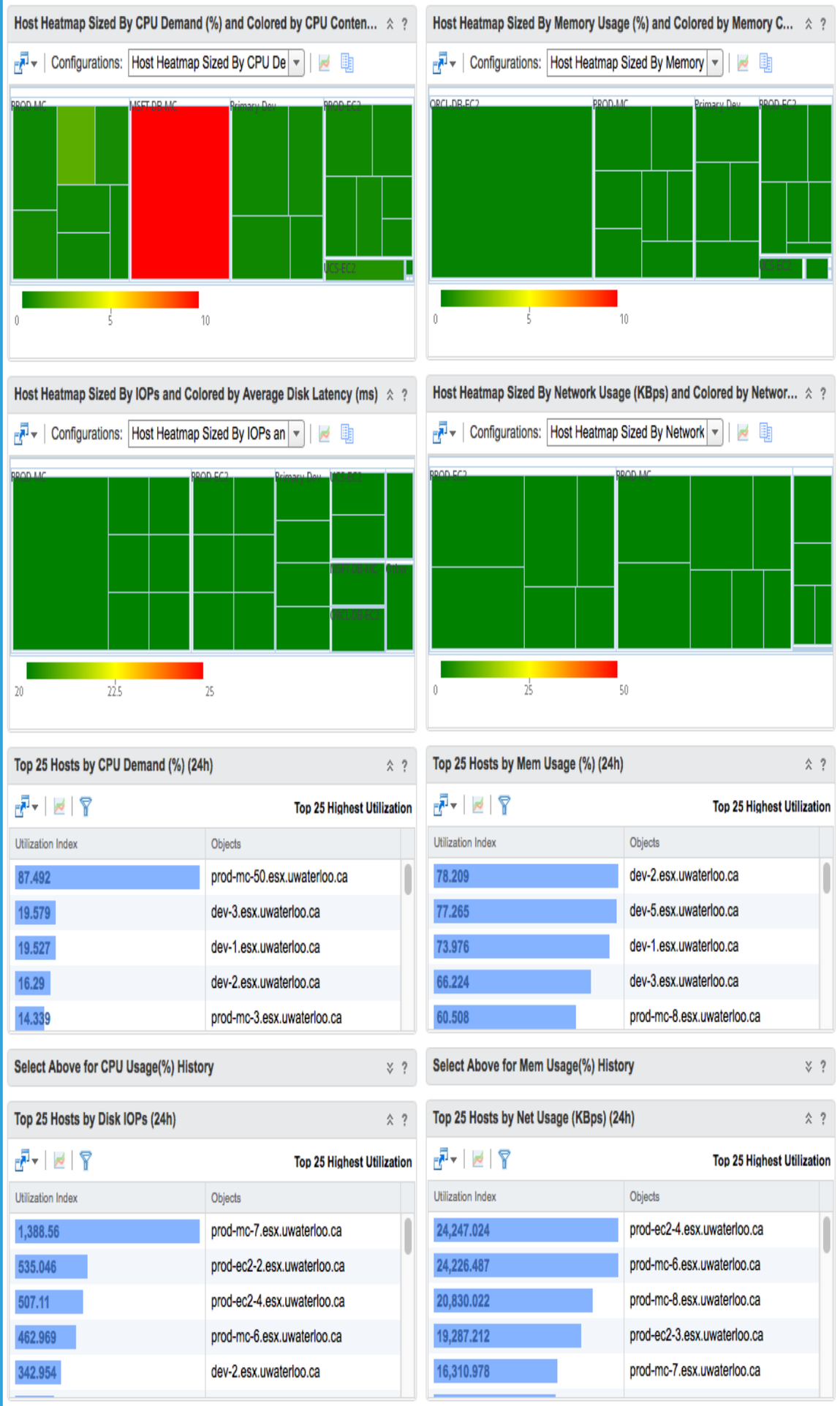
Table 1 High Points of I/O Tests

Test Number	Description	DB Users	IOPS	Throughput	Latency
1	K2	64	2,450	20 MB/sec	26 ms
2	K2	128	2,380	20 MB/sec	52 ms
3	Linux VMDK XFS	64	31,000	245 MB/sec	2 ms
4	Linux in-guest Kernel NFS	64	43,500	350 MB/sec	1 ms
5	Linux in-guest Direct NFS, routing, no Jumbo	64	93,900	750 MB/sec	1 ms
6	Linux in-guest Direct NFS optimized path, no Jumbo	64	104,866	880 MB/sec	1 ms
7	Linux in-guest Direct NFS optimized path, no Jumbo	128	109,866	900 MB/sec	1 ms
8	Linux in-guest Direct NFS optimized path Jumbo Frames	128	107,987	900 MB/sec	1 ms



"ONE VMWARE VM WAS ABLE TO PERFORM > 100,000 IOPS AND SATURATE A 10GB ETHERNET ADAPTER"

-House of Brick



“HOUSE OF BRICK HAS NOT SEEN THESE KINDS OF I/O NUMBERS EXCEPT WITH ALL-FLASH ARRAYS”

-House of Brick