

The following are projects that illustrates :

Design, Implementation, Deployment, Collaboration, Mentoring, SAN/NAS configurations, AI/ML Infrastructure support/maintenance

How to rack and stack and cable and layout data centers
How to NOT layout data centers

Rebuild of the Arista/Cisco Network Learning Lab

Keeping the Electrical and Computer Engineering Department's AI/ML infrastructure alive

Custom built storage server, refreshed storage server migration

Solaris storage multi-host backups

NFS lab and troubleshooting

Sample rack layout drawings

Examples of HOW TO data center!

Examples of standard cabling dressing/management.

Examples of standard tile space utilization for optimal functionality.

Examples of standard air flow ventilation racking.

Examples of standard utilized cable tray installation.

Examples of proper cabling procurement/utilization.

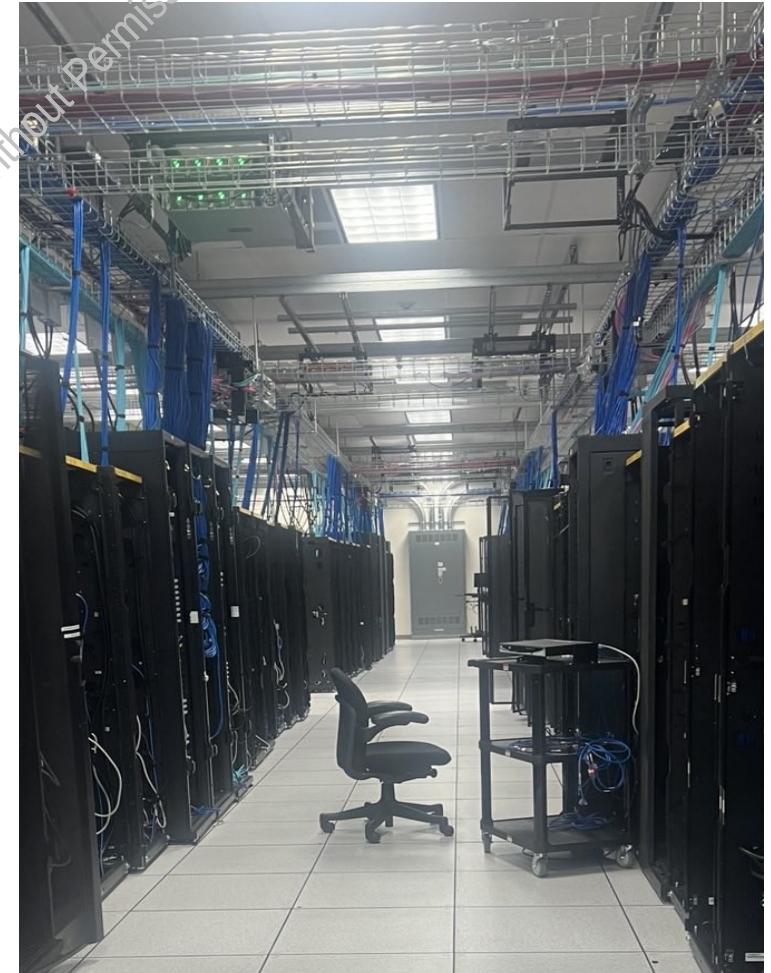
Functional tile space layout complementary to running infrastructure cables.

*Please disregard vendor branded rack/cabinets, this is not an indicator of the vendor, as all data center environments may have any combinations of racks/cabinets ;-)

Proper/appropriate cable length procurement for use.
Standard cable dressing/management.
Good spacing for equipment airflow, no hot zones.



Minimum 3 tile spaces between rows of racks/cabinets to allow for maneuvering of rolling cabinets and racks into place, or staging equipment for installation, or having crash carts to work on systems.



Good spacing between equipment for airflow.



Standard 4 tile spaces between the aisles for the rows of racks/cabinets to allow for pallet jacks and boxes of equipment for staging purposes.

Clean layout and utilization of cable trays.

Racks/cabinets actually aligned and flushed with tile spaces



Proper tile space design, rack/cabinet layout allows for proper cabling utilization, such as pre-running cables, or isolation for later removal/cleanup



No obstruction of aisle with cabling protruding from the rack/cabinet, all cables within the enclosure



Examples of how to NOT data center!

Examples of just bad cabling dressing/management

Examples of bad tile space utilization for optimal functionality

Examples of bad air flow ventilation racking

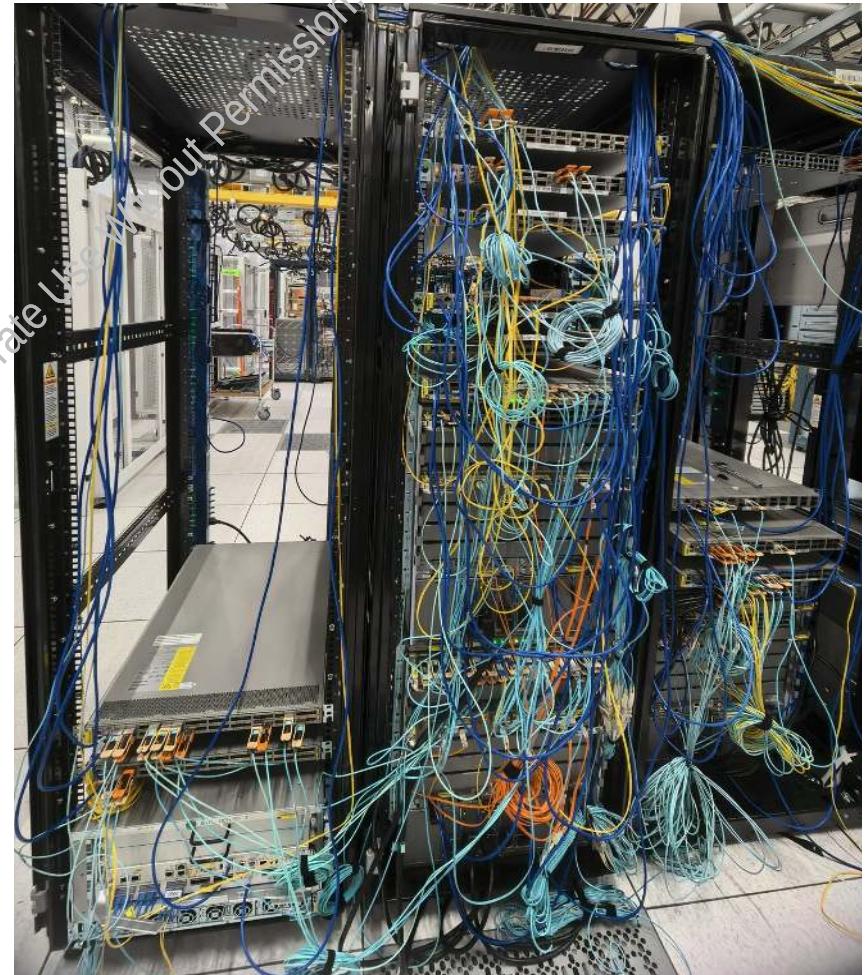
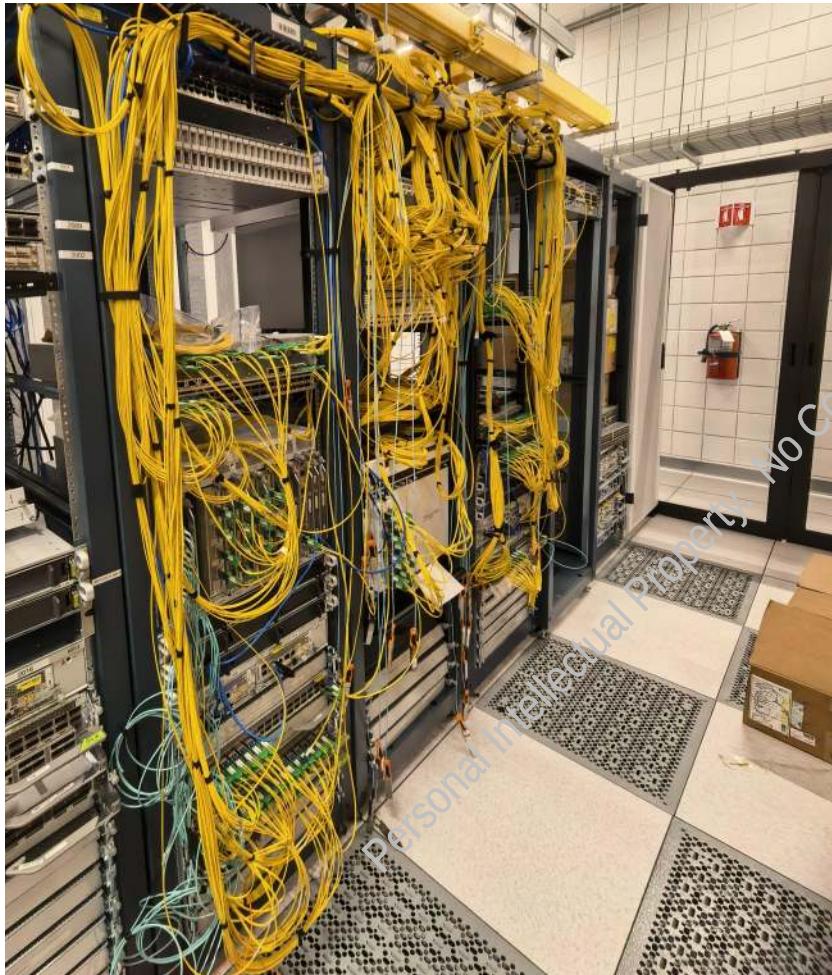
Examples of non-utilized cable tray installation

Examples of improper cabling procurement/utilization

A nightmare to run cables. Unreliable source/destination port mappings. Longer troubleshooting efforts. Nightmare environment to attempt to manage.

*Please disregard vendor branded rack/cabinets, this is not an indicator of the vendor, as all data center environments may have any combinations of racks/cabinets ;-)

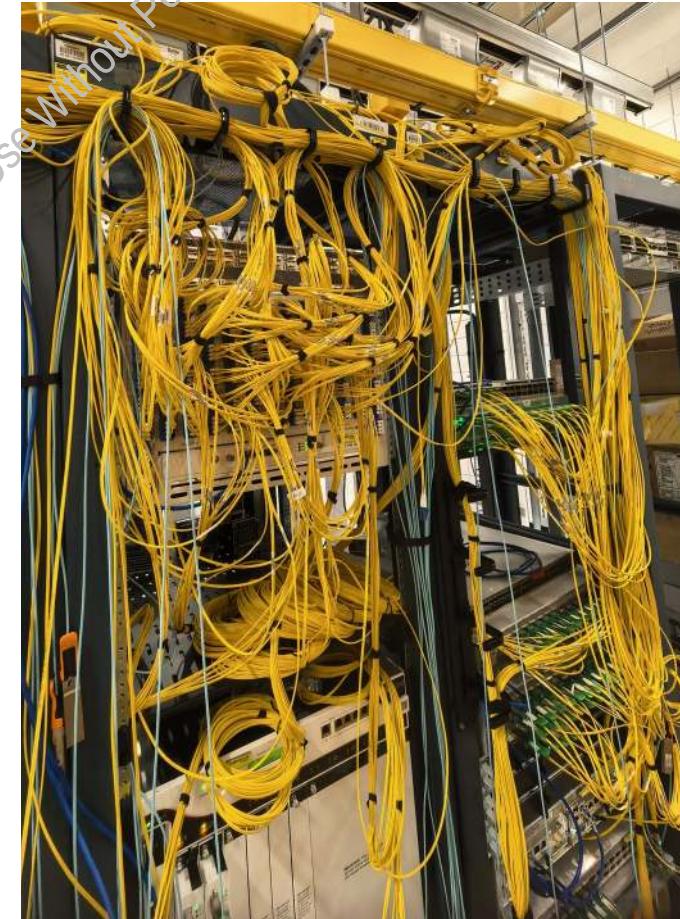
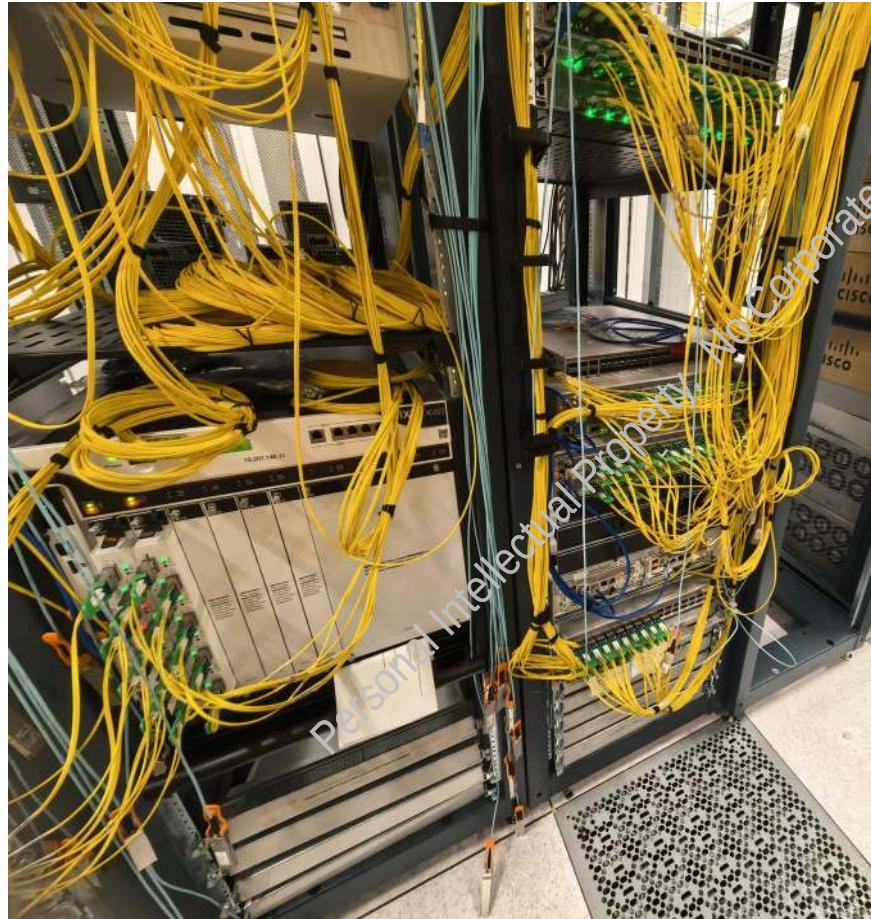
Just bad cabling management
No Use of cable management trays
Inappropriate cable length procurement for use



Just bad cabling management

Inappropriate cable length procurement for use

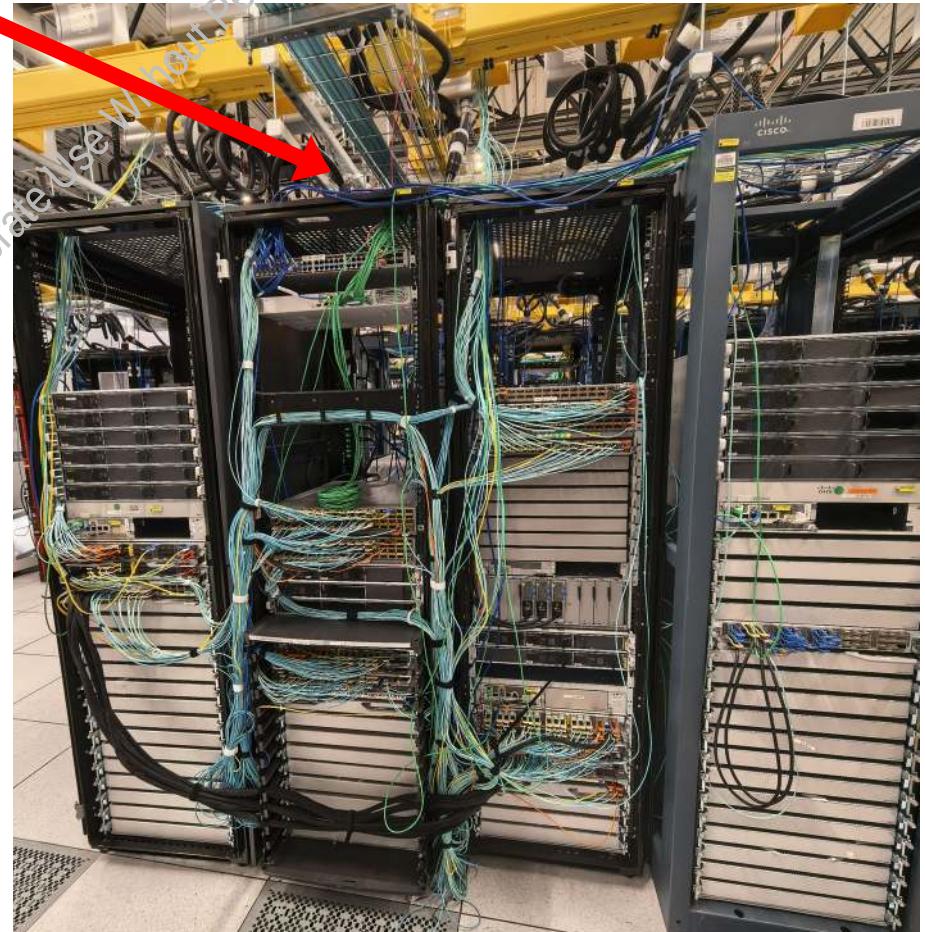
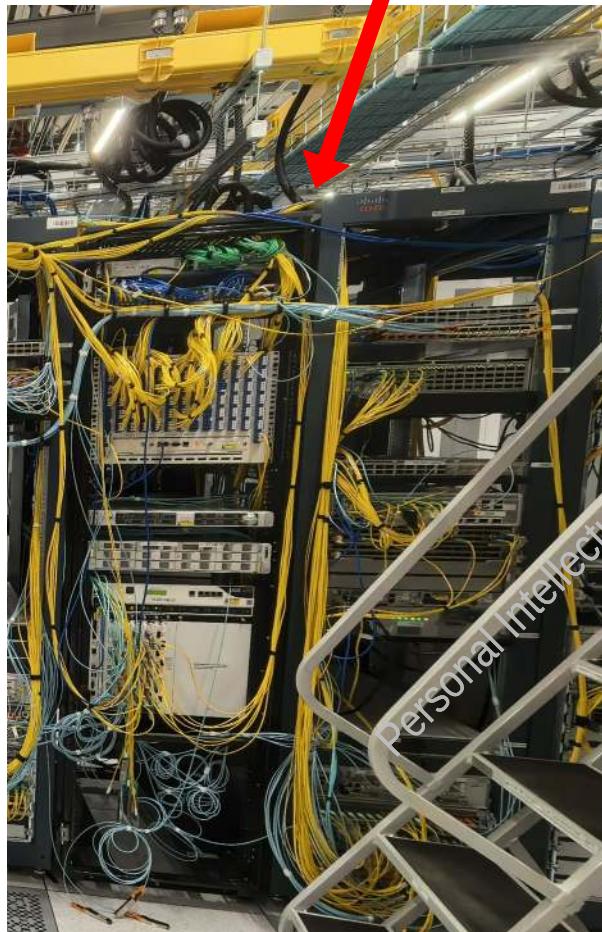
Inappropriate rack/cabinet/equipment combination/configuration, it should be flushed to the front or back or receded to allow for the cabling or utilization of management trays



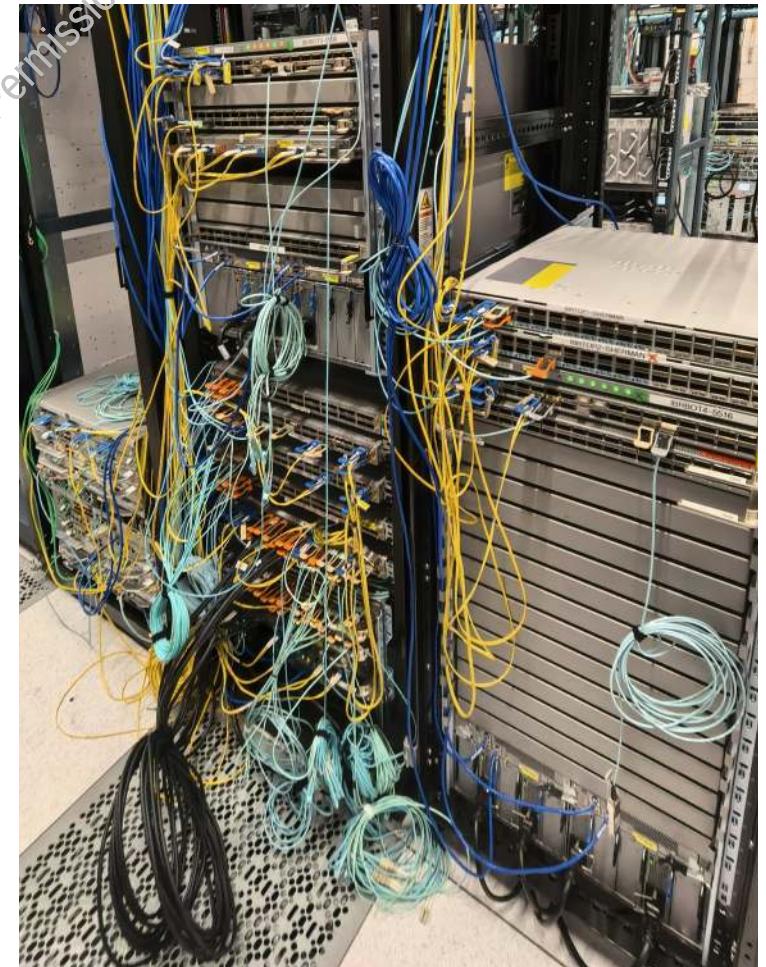
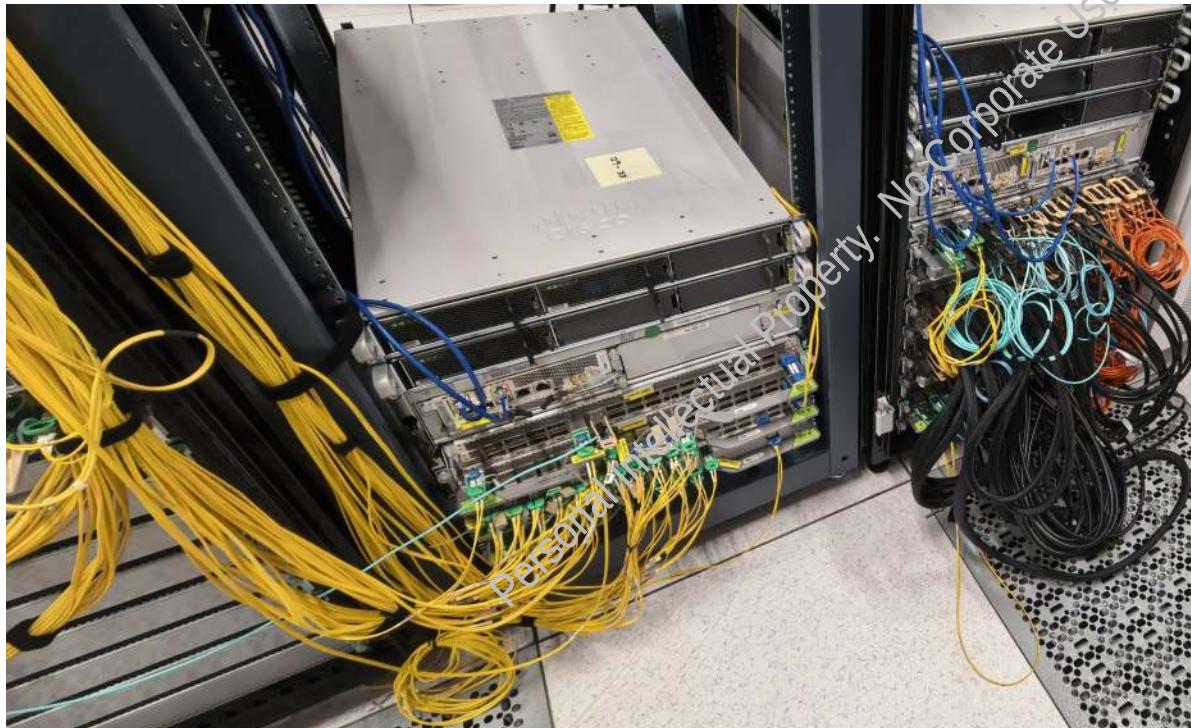
Just bad cabling management
No Use of cable management trays

Inappropriate cable length procurement for use

Obstruction (cabinet) to cable tray access (NIGHTMARE for running cables)



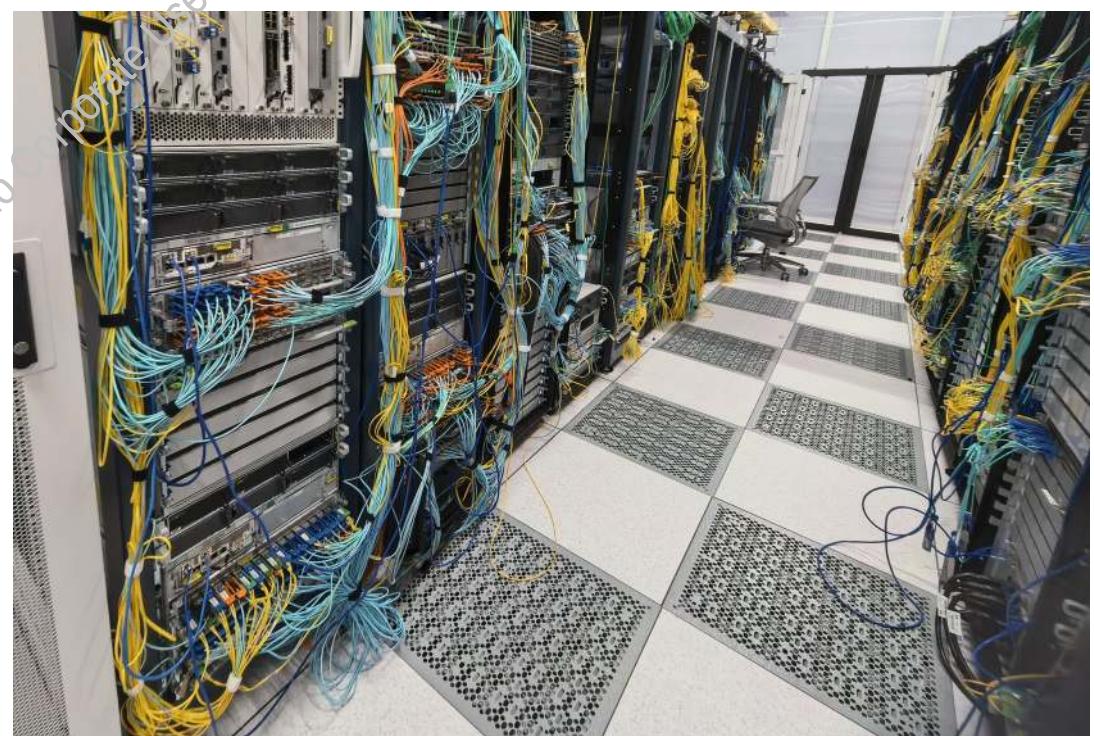
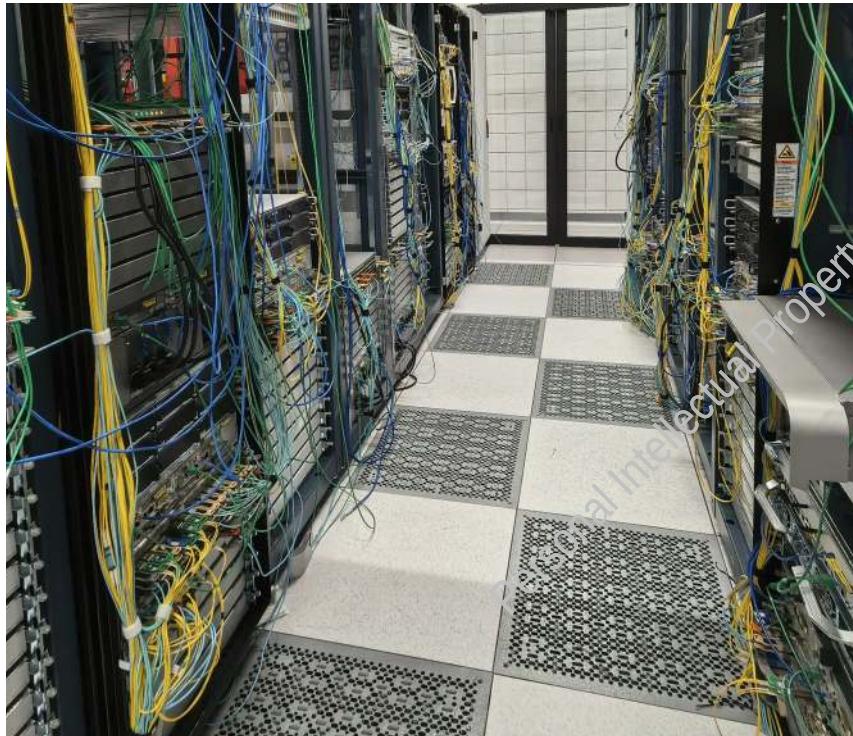
Just bad cabling management
No Use of cable management trays
Inappropriate cable length procurement for use
Obstruction of already limited – only 2 tile space, BAD design practice



Just bad cabling management
No Use of cable management trays
Inappropriate cable length procurement for use

BAD design practice – only 2 tile space:

barely any room for maneuvering crash carts, equipment pallet jacks, etc...
checkered perforated airflow tiles, budget constraints approach for equipment airflow utilization rather than full solid rows of perforated tiles for adequate airflow/cooling



This particular environment seemed to intentionally break every data center best practices.

The massive patching panel row of fiber and copper was just dysfunctional, all the cable trays above was for this patching to every tile space for cabinets with a mini 8 port panel and every mid row was a fiber patch, that at most would run uplinks maybe up to 4 ports out of 16 available. There was no room for actual cables needed to be run to connect systems in the racks/cabinets.

The fiber patch that was supposed to repeat the signal, just blocked the signal due to the patch reversing the optical laser polarity (tx/rx) so at one end of the patching, you would need to manually reverse the polarity on the fiber cable.

Running infrastructure cabling of fiber and copper was double the effort of the mini patch panel of the copper at ever tile space back to the uplinks patch panel row.

The tile naming convention was dysfunctional because they couldn't be on the same page, they would name the tiles 1-8 in one direction, then renamed those same tiles 1-8 in the opposite direction. Any comprehensive understanding of the port mappings was olympic level mental gymnastics

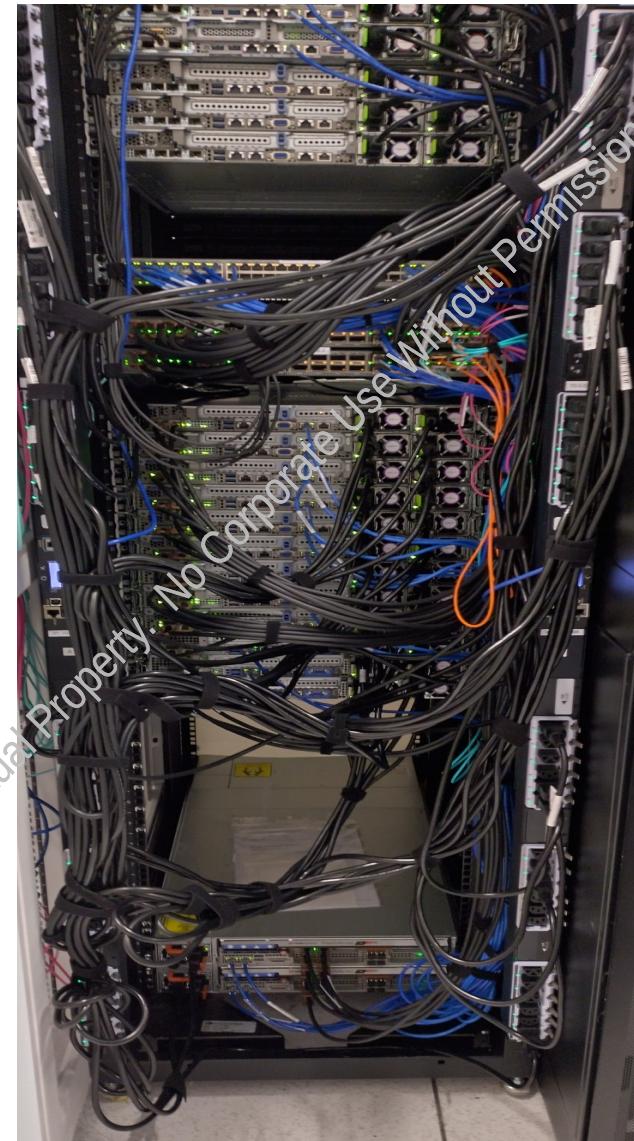
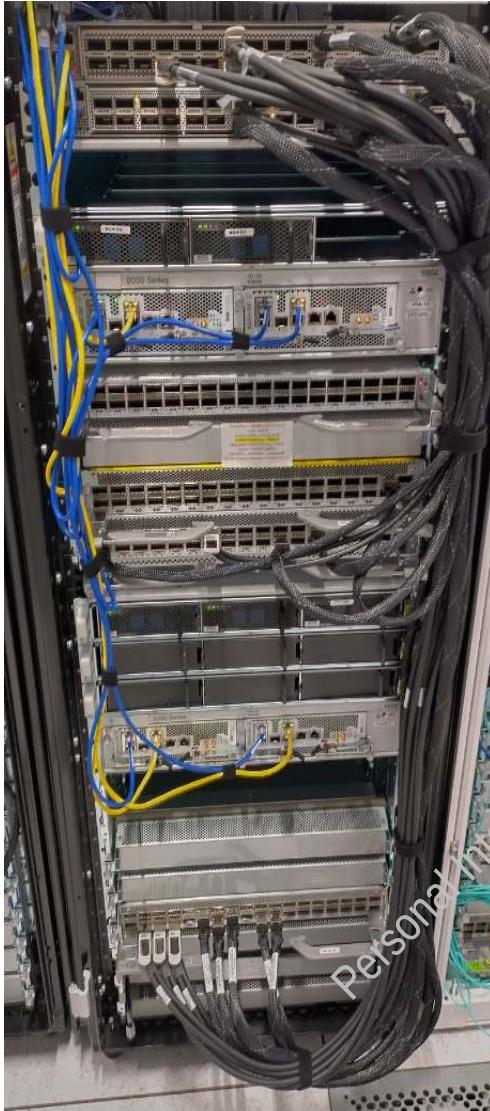
Every 'client' had access to just do 'whatever' rather than standardized lab tech/engineering hands on support that was 'dedicated' for such purposes.

The rack/cabinets were not aligned/flushed to the tile space, there was barely 1.5 tile space width between lab double doors/entry to where the 'rows' of racks/cabinets started and end...aka no aisles, it was barely enough to pass fire code inspections like ~50" or so...

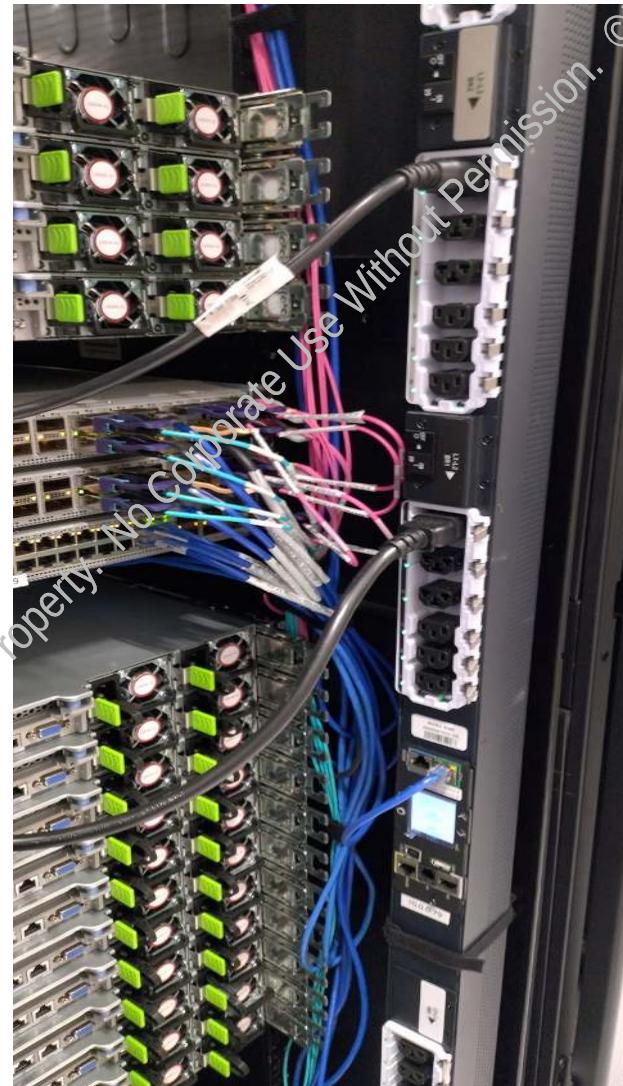
Combination of tile spaces to call it a row or a location, but no racks or cabinets aligned to a tile space, so poor rack/cabinet to tile space environment mapping.

This environment was a nightmare to manage and support.

Amongst this chaos, I do what I can and my work ethics and integrity speaks for itself

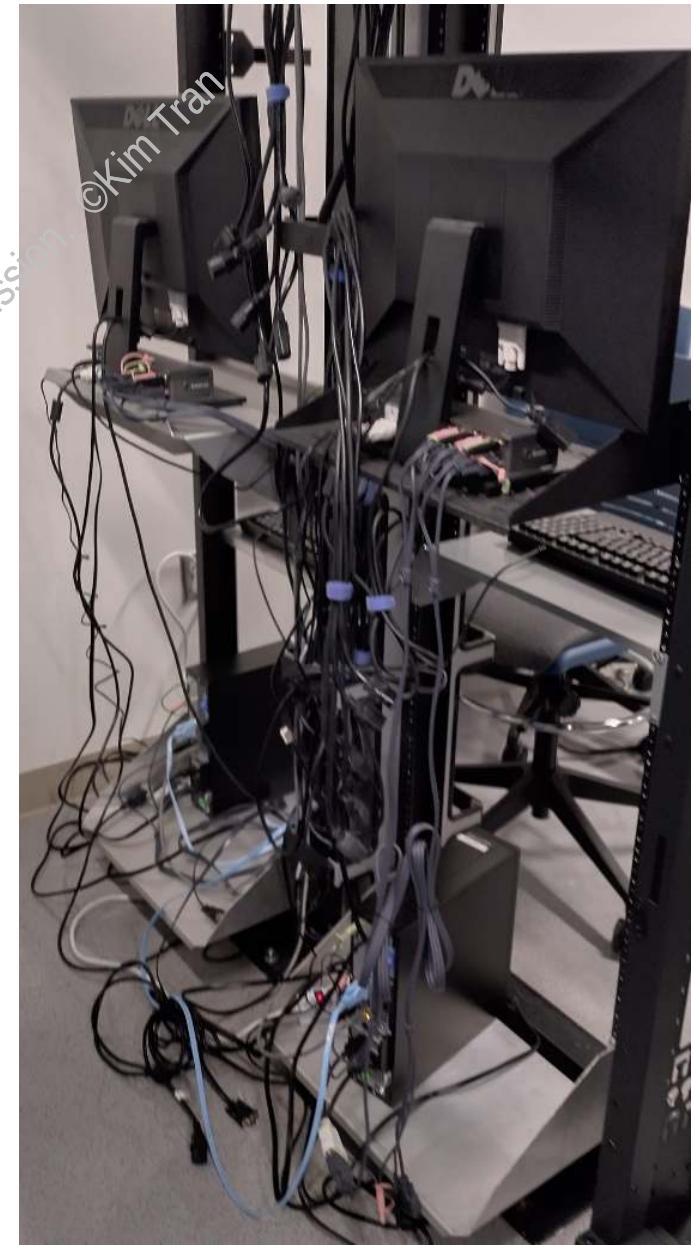
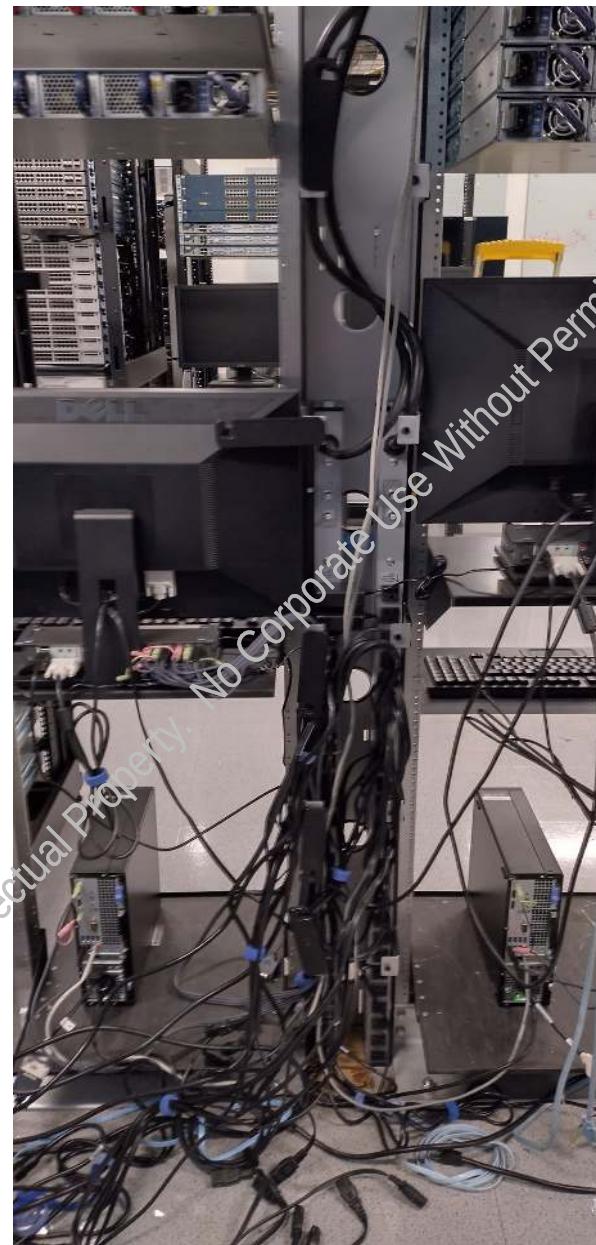
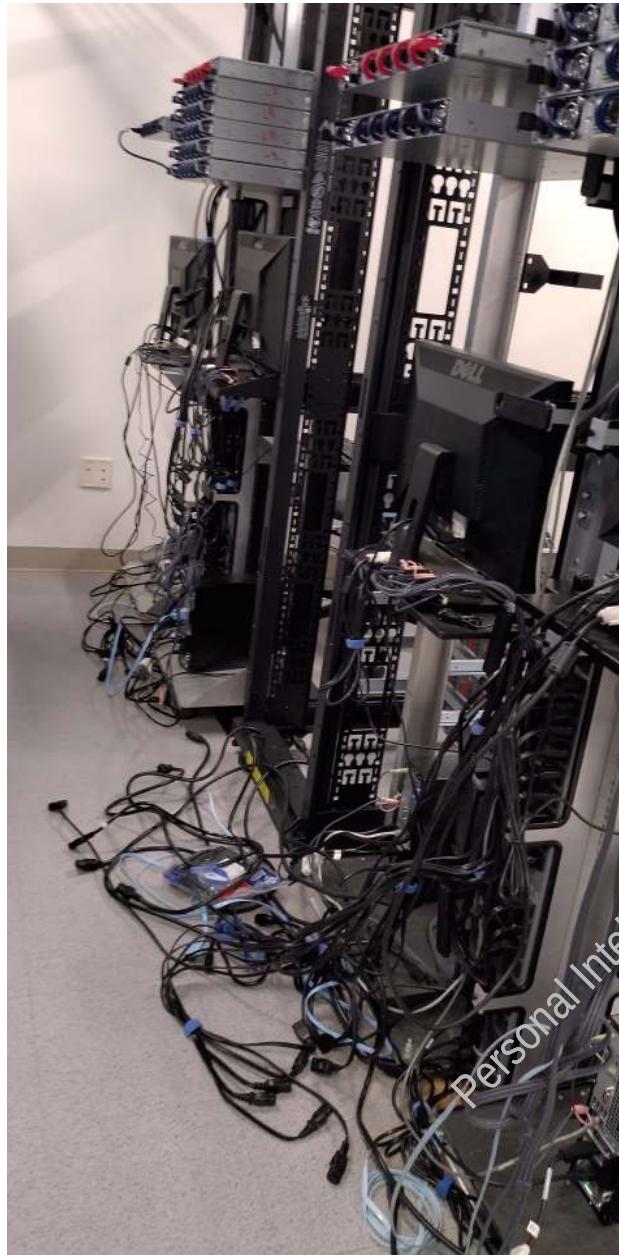


I can only control what's in my power to control...the quality of my work



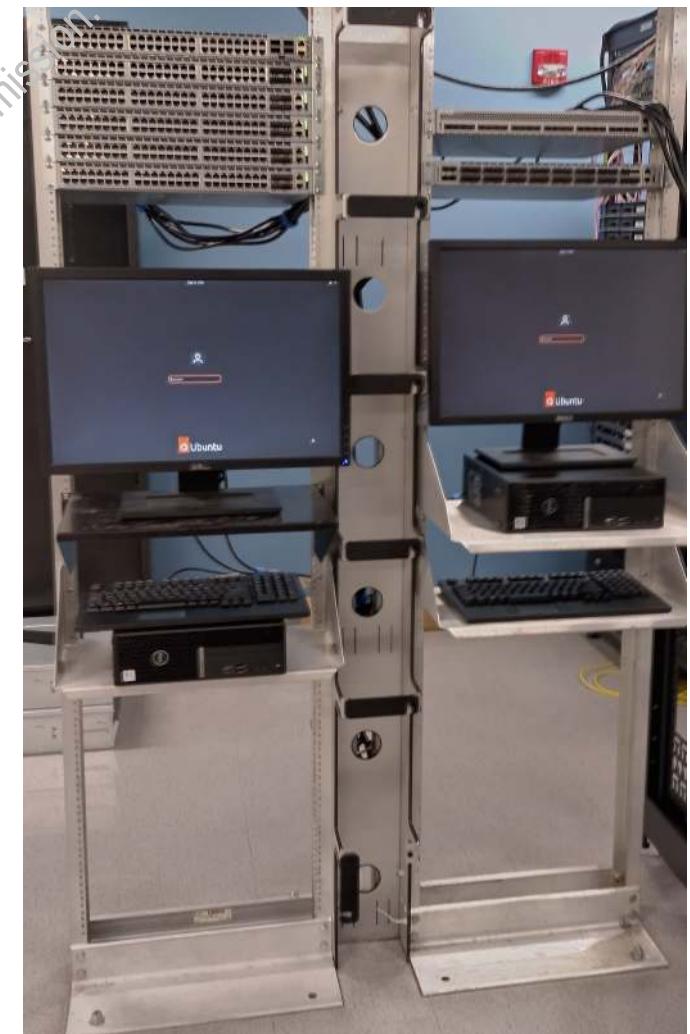
Redesign and rebuild of the Arista/Cisco network learning lab for the department of Electrical and Computer Engineering at NC State University.

Creating the stable, usable environments for learning.



Researched the appropriate L5/6 connector, ran cabling, cleaned up existing setup and configuration that was utilizing 2 post telco racks, incorporated proper rack/cabinet for infrastructure equipment refresh and rebuild.





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Resolving Linux issues, kernel panics, patching/updating systems, restoring AI/ML compute nodes.
In no particular order or groupings, just proof of my day to day :-)

// reviewing/editing ssh configurations

```
# cat /etc/ssh/moduli
# cat /etc/ssh/ssh_config
root@henry:~# cat /etc/ssh/sshd_config
# File is managed by Puppet
Port 22

AcceptEnv LANG LC_*
AllowUsers
AllowUsers
AllowUsers
AllowUsers
ChallengeResponseAuthentication yes
Ciphers aes128-ctr,aes192-ctr,aes256-ctr
ClientAliveCountMax 2
ClientAliveInterval 20
GSSAPIAuthentication yes
GSSAPICleanupCredentials yes
HostKey /etc/ssh/ssh_host_rsa_key
HostKey /etc/ssh/ssh_host_ecdsa_key
HostKey /etc/ssh/ssh_host_ed25519_key
KerberosAuthentication no
KexAlgorithms diffie-hellman-group-exchange-sha256,diffie-hellman-group16-sha512,diffie-hellman-group18-sha512
MACs hmac-sha2-512,hmac-sha2-256-etc@openssh.com,hmac-sha2-512-etc@openssh.com
MaxAuthTries 3
PermitRootLogin no
PrintMotd yes
Subsystem sftp internal-sftp
UseDNS no
UsePAM yes
X11Forwarding yes
root@henry:~#
```

// looks like setup of linux for a compute stick, checking the ip routes

```
root@ikcstick1:~$ ip route show
1: lo          proto kernel scope host link
              link-layer brd 0x0
              metric 0
2: enp2s0      proto kernel scope global enp2s0
              link-layer brd 0x0
              metric 100
3: wlp3s0      proto kernel scope global dynamic noprefixroute
              link-layer brd ff:ff:ff:ff:ff:ff
              metric 100
4: 10.153.0.1  proto kernel dev wlp3s0 metric 600
              link-layer brd ff:ff:ff:ff:ff:ff
              metric 100
root@ikcstick1:~$
```

// looks like provisioning system output

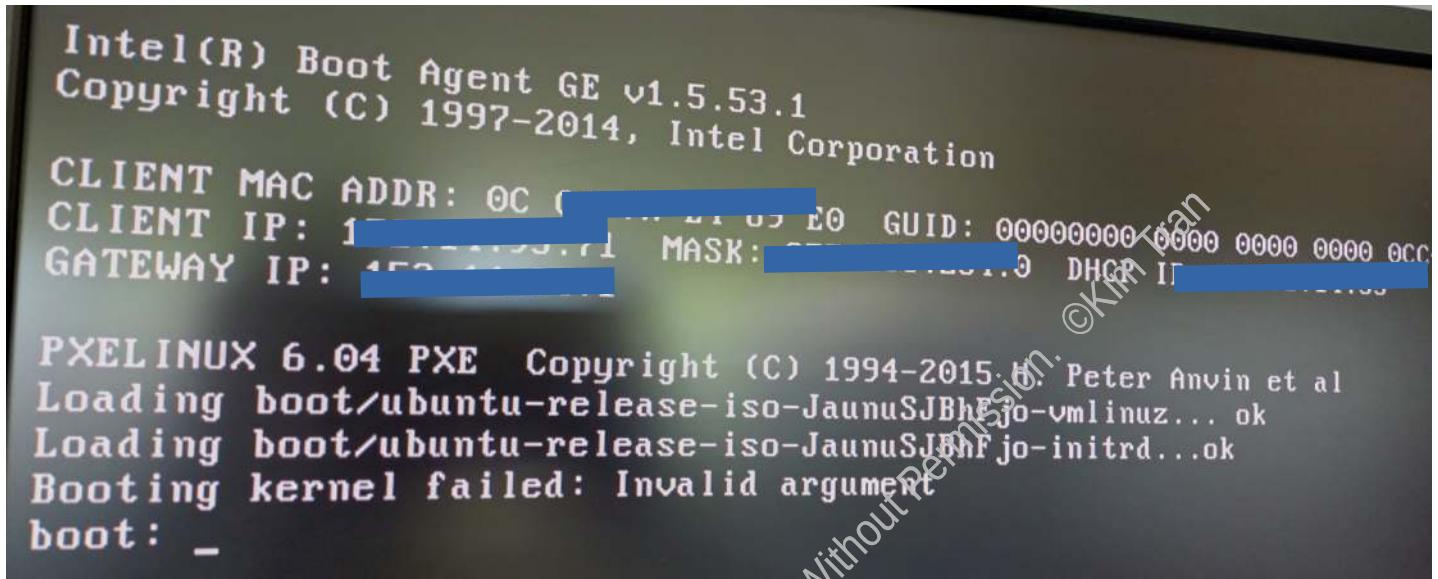
```
tended/provision?token=54acd330-3928-4430-a5a0-a019028bcbb3
1545.5748541 IPo6: ADDRCONF(NETDEV_UP): enp4s0f1: link is not ready
1552.6696601 IPo6: ADDRCONF(NETDEV_UP): enp4s0f1: link is not ready
1559.2084051 dracut-initqueue[180391]: % Total    % Received % Xferd  Average Speed   Time   Time
1559.2091151 dracut-initqueue[180391]: Dload Upload Total Spent
0    0     0      0      0      0  --::--  --::--  --::-- 0
1559.2957811 dracut-initqueue[180391]: curl: (22) The requested URL returned error: 404 Not Found
1559.3008181 dracut-initqueue[31791]: Warning: anaconda: failed to fetch kickstart from http://provis
ended/provision?token=54acd330-3928-4430-a5a0-a819028bcbb3
1560.0383601 IPo6: ADDRCONF(NETDEV_UP): enp4s0f1: link is not ready
1567.1450011 IPo6: ADDRCONF(NETDEV_UP): enp4s0f1: link is not ready
1573.6657311 dracut-initqueue[181771]: % Total    % Received % Xferd  Average Speed   Time   Time
1573.6664131 dracut-initqueue[181771]: Dload Upload Total Spent
0    0     0      0      0      0  --::--  --::--  --::-- 0
1573.7238751 dracut-initqueue[181771]: curl: (22) The requested URL returned error: 404 Not Found
1573.7288391 dracut-initqueue[31791]: Warning: anaconda: failed to fetch kickstart from http://provi
ended/provision?token=54acd330-3928-4430-a5a0-a819028bcbb3
1574.4659641 IPo6: ADDRCONF(NETDEV_UP): enp4s0f1: link is not ready
1581.5684891 IPo6: ADDRCONF(NETDEV_UP): enp4s0f1: link is not ready
1588.0064721 dracut-initqueue[183151]: % Total    % Received % Xferd  Average Speed   Time   Time
1588.0073351 dracut-initqueue[183151]: Dload Upload Total Spent
0    0     0      0      0      0  --::--  --::--  --::-- 0
1588.1764361 dracut-initqueue[183151]: curl: (22) The requested URL returned error: 404 Not Found
1588.1802141 dracut-initqueue[31791]: Warning: anaconda: failed to fetch kickstart from http://provi
ended/provision?token=54acd330-3928-4430-a5a0-a819028bcbb3
1588.9231451 IPo6: ADDRCONF(NETDEV_UP): enp4s0f1: link is not ready
1596.0298401 IPo6: ADDRCONF(NETDEV_UP): enp4s0f1: link is not ready
1602.5534271 dracut-initqueue[184541]: % Total    % Received % Xferd  Average Speed   Time   Ti
1602.5543091 dracut-initqueue[184541]: Dload Upload Total Spent
0    0     0      0      0      0  --::--  --::--  --::-- 0
1602.5543091 dracut-initqueue[184541]: curl: (22) The requested URL returned error: 404 Not Found
```

```
Setting up iptables (1.6.1-2ubuntu2.1) ...
Setting up nplan (0.99-0ubuntu3~18.04.5) ...
Setting up ubuntu-minimal (1.417.5) ...
Setting up ubuntu-standard (1.417.5) ...
Setting up ufw (0.36-0ubuntu0.18.04.2) ...
Setting up liblxc1 (3.0.3-0ubuntu1~18.04.3) ...
Setting up liblxc-common (3.0.3-0ubuntu1~18.04.3) ...
Setting up lxd (3.0.3-0ubuntu1~18.04.4) ...
Processing triggers for libc-bin (2.27-3ubuntu1.6) ...
Processing triggers for systemd (2.39-3ubuntu10.57) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for dbus (1.12.2-1ubuntu1.4) ...
Processing triggers for rsyslog (8.32.0-1ubuntu4.2) ...
Processing triggers for ureadahead (0.100.0-21) ...
ureadahead will be reinstalled on next reboot
Processing triggers for initramfs-tools (0.130ubuntu3.13) ...
update-initramfs: Generating /boot/initrd.img-4.15.0-213-generic
W: Possible missing firmware /lib/firmware/ast_dp501_fw.bin for module ast
root@nps6: ~#
```

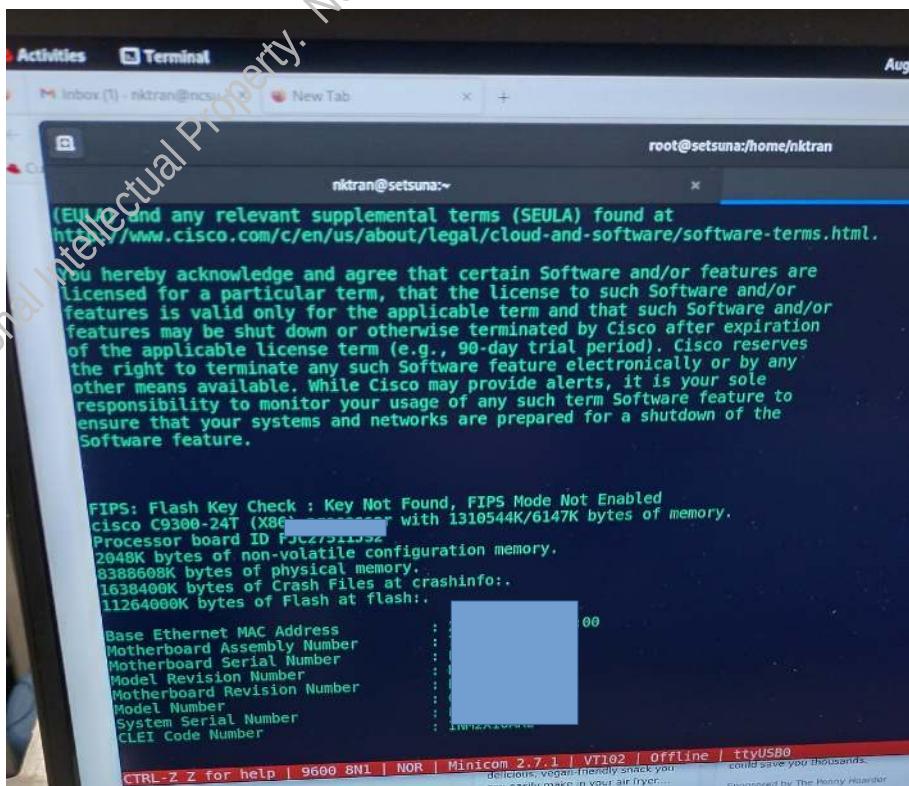
ubuntu-22.04-live-se	82%	1647M	0:00:08	ETA
ubuntu-22.04-live-se	84%	*****..... 	1688M	0:00:07	ETA
ubuntu-22.04-live-se	86%	*****..... 	1730M	0:00:06	ETA
ubuntu-22.04-live-se	88%	*****..... 	1772M	0:00:05	ETA
ubuntu-22.04-live-se	90%	*****..... 	1814M	0:00:04	ETA
ubuntu-22.04-live-se	92%	*****..... 	1856M	0:00:03	ETA
ubuntu-22.04-live-se	94%	*****..... 	1897M	0:00:02	ETA
ubuntu-22.04-live-se	96%	*****..... 	1939M	0:00:01	ETA
[70.638817] loop0: detected capacity change from 0 to 4110172					
ubuntu-22.04-live-se	98%	*****..... 	1981M	0:00:00	ETA
ubuntu-22.04-live-se	100%	*****..... 	2006M	0:00:00	ETA

```
BusyBox v1.30.1 (Ubuntu 1:1.30.1-7ubuntu3) built-in shell (ash)
Enter 'help' for a list of built-in commands.
```

```
(initramfs) done.
Unable to find a live file system on the network
```



// looks like a login to a cisco switch/router for configuration



// looks like an upgrade installation of ubuntu

```
If you continue, an additional ssh daemon will be started at port
'1022'.
Do you want to continue?

Continue [yN] y

Starting additional sshd

To make recovery in case of failure easier, an additional sshd will
be started on port '1022'. If anything goes wrong with the running
ssh you can still connect to the additional one.
If you run a firewall, you may need to temporarily open this port. As
this is potentially dangerous it's not done automatically. You can
open the port with e.g.:
'iptables -I INPUT -p tcp --dport 1022 -j ACCEPT'

To continue please press [ENTER]

Reading package lists... Done
Building dependency tree
Reading state information... Done
```

// looks like pre-upgrade check for rhel 7/8

```
Check all generated results messages and notify user about them.
Debug output written to /var/log/leapp/leapp-preupgrade.log
=====
REPORT OVERVIEW
=====

Upgrade has been inhibited due to the following problems:
 1. Leapp detected a processor which is no longer supported in RHEL 8. Upgrade cannot proceed.

HIGH and MEDIUM severity reports:
 1. Packages not signed by Red Hat found on the system
 2. Difference in Python versions and support in RHEL 8
 3. SSSD Domain "ncsu.edu": sudo rules containing wildcards will stop working.
 4. Upgrade can be performed, but KDE will be uninstalled.
 5. Upgrade can be performed, but KDE/Qt apps will be uninstalled.
 6. Module pam_pkcs11 will be removed from PAM configuration.

Reports summary:
 Errors:          0
 Inhibitors:      1
 HIGH severity reports:   3
 MEDIUM severity reports: 3
 LOW severity reports:    8
 INFO severity reports:   3

Before continuing consult the full report:
 A report has been generated at /var/log/leapp/leapp-report.json
 A report has been generated at /var/log/leapp/leapp-report.txt
=====
END OF REPORT OVERVIEW
=====
```

// looks like more upgrade checks complaining about nfs being on and active

```
h exit code 32.
May 09 16:33:39 localhost upgrade[1390]: CalledProcessError: Command '['/bin/mount', '-a'] failed with
amStart: Actor remove_upgrade_boot_entry has crashed: Traceback (most recent call last):
May 09 16:33:39 localhost upgrade[1390]:   File "/usr/lib/python2.7/site-packages/leapp/repository/ac
May 09 16:33:39 localhost upgrade[1390]:       tor_definition.py", line 74, in _do_run
May 09 16:33:39 localhost upgrade[1390]:           actor_instance.run(*args, **kwargs)
May 09 16:33:39 localhost upgrade[1390]:       File "/usr/lib/python2.7/site-packages/leapp/actors/_init
_.py", line 289, in run
May 09 16:33:39 localhost upgrade[1390]:           self._process(*args)
May 09 16:33:39 localhost upgrade[1390]:       File "/usr/share/leapp-repository/repositories/system_upgr
ade/common/actors/removeupgradebootentry/actor.py", line 20, in process
May 09 16:33:39 localhost upgrade[1390]:           remove_boot_entry()
May 09 16:33:39 localhost upgrade[1390]:       File "/usr/share/leapp-repository/repositories/system_upgr
ade/common/actors/removeupgradebootentry/libraries/removeupgradebootentry.py", line 41, in remove_bo
ot_entry
May 09 16:33:39 localhost upgrade[1390]:           '/bin/mount', '-a'
May 09 16:33:39 localhost upgrade[1390]:       File "/usr/lib/python2.7/site-packages/leapp/libraries/std
lib/_init_.py", line 192, in run
May 09 16:33:39 localhost upgrade[1390]:           result=result
May 09 16:33:39 localhost upgrade[1390]:       result=result
May 09 16:33:39 localhost upgrade[1390]: CalledProcessError: Command '['/bin/mount', '-a'] failed with
May 09 16:33:39 localhost upgrade[1390]: exit code 32.
May 09 16:33:39 localhost upgrade[1390]: =====
May 09 16:33:39 localhost upgrade[1390]: terminated with
```

```
=====
May 09 15:07:35 localhost upgrade[887]:     '/bin/mount', '-a'
lib/_init_.py", line 192, in run
May 09 15:07:35 localhost upgrade[887]:           result=result
May 09 15:07:35 localhost upgrade[887]:       result=result
May 09 15:07:35 localhost upgrade[887]: CalledProcessError: Command '['/bin/mount', '-a'] failed with
May 09 15:07:35 localhost upgrade[887]: =====
=====
May 09 15:07:35 localhost upgrade[887]: Actor remove_upgrade_boot_entry unexpectedly terminated with
exit code: 1 - Please check the above details
May 09 15:07:35 localhost upgrade[887]: =====
=====
May 09 15:07:36 localhost upgrade[887]: Debug output written to /var/log/leapp/leapp-upgrade.log
May 09 15:07:36 localhost upgrade[887]: =====
May 09 15:07:36 localhost upgrade[887]: REPORT OVERVIEW
May 09 15:07:36 localhost upgrade[887]: =====
May 09 15:07:36 localhost upgrade[887]: HIGH and MEDIUM severity reports:
May 09 15:07:36 localhost upgrade[887]: 1. Packages not signed by Red Hat found on the system
May 09 15:07:36 localhost upgrade[887]: 2. Difference in Python versions and support in RHEL 8
May 09 15:07:36 localhost upgrade[887]: 3. SSSD Domain "ncsu.edu": sudo rules containing wildcar
ds will stop working.
May 09 15:07:36 localhost upgrade[887]: 4. Module pam_pkcs11 will be removed from PAM configurat
ion
May 09 15:07:36 localhost upgrade[887]: 5. Upgrade can be performed, but KDE will be uninstalled
May 09 15:07:36 localhost upgrade[887]: 6. Upgrade can be performed, but KDE/Qt apps will be uni
stalled.
May 09 15:07:36 localhost upgrade[887]: Reports summary:
May 09 15:07:36 localhost upgrade[887]: Errors: 1
May 09 15:07:36 localhost upgrade[887]: Inhibitors: 0
May 09 15:07:36 localhost upgrade[887]: HIGH severity reports: 3
May 09 15:07:36 localhost upgrade[887]: MEDIUM severity reports: 3
```

// fixing intermittent network gremlins :-)

```
-- 
-- The start-up result is done.
[root@localhost ~]# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
        inet6 ::1/128 scope host
            valid_lft forever preferred_lft forever
2: enp3s0f0: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN group default qlen 1000
    link/ether ac:1f:6b:02:7d:b6 brd ff:ff:ff:ff:ff:ff
3: enp3s0f1: <NO-CARRIER,BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN group default qlen
    link/ether 00:0c:29:4e:46:4a brd ff:ff:ff:ff:ff:ff
```

// looks like fixing missing/corrupt system libraries/modules

```
no file '/usr/lib64/lua/5.1 posix.lua'  
no file '/usr/lib64/lua/5.1 posix/init.lua'  
no file '/usr/lib64/lua/5.1 posix.so'  
no file '/usr/lib64/lua/5.1 loadall.so'  
stack traceback:  
[C]: in function 'require'  
/usr/share/lmod/lmod/libexec/addto:65: in main chunk  
[C]: in ?  
/usr/bin/lua: /usr/share/lmod/lmod/libexec/addto:65: module 'posix' not found:  
no field package.preload['posix']  
no file '/usr/share/lua/5.1 posix.lua'  
no file '/usr/share/lua/5.1 posix/init.lua'  
no file '/usr/lib64/lua/5.1 posix.lua'  
no file '/usr/lib64/lua/5.1 posix/init.lua'  
no file '/usr/lib64/lua/5.1 posix.so'  
no file '/usr/lib64/lua/5.1 loadall.so'  
stack traceback:  
[C]: in function 'require'  
/usr/share/lmod/lmod/libexec/addto:65: in main chunk  
[C]: in ?  
/usr/bin/lua: /usr/share/lmod/lmod/libexec/addto:65: module 'posix' not found:  
no field package.preload['posix']  
no file '/usr/share/lua/5.1 posix.lua'  
no file '/usr/share/lua/5.1 posix/init.lua'  
no file '/usr/lib64/lua/5.1 posix.lua'
```

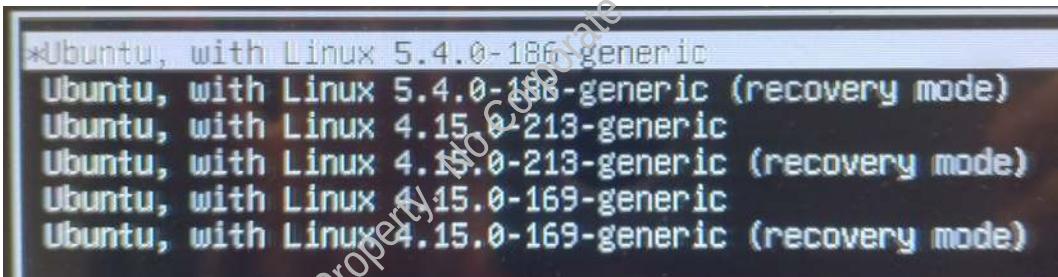
// looks like fixing a kernel panic preventing bootup and normal startup

```
[ 8.550151] md: warning: all devices to be autoRAID before autoRAID  
[ 8.554832] md: If you don't use raid, use raid=noautodetect  
[ 8.572991] md: Autodetecting RAID arrays.  
[ 8.590269] md: autorun ...  
[ 8.606587] md: ... autorun DONE.  
[ 8.622594] VFS: Cannot open root device "nume0n1p1" or unknown-block(0,0): error -6  
[ 8.656152] Please append a correct "root=" boot option; here are the available partitions:  
[ 8.691325] Kernel panic - not syncing: VFS: Unable to mount root fs on unknown-block(0,0)  
[ 8.728307] CPU: 1 PID: 1 Comm: swapper/0 Not tainted 5.4.0-186-generic #206-Ubuntu  
[ 8.766496] Hardware name: Supermicro SYS-40296P-TURIX11DGO-T, BIOS 2.0b 04/16/2018  
[ 8.806758] Call Trace:  
[ 8.826566] dump_stack+0x6d/0x8b  
[ 8.846723] panic+0x114/0x2f6  
[ 8.867061] mount_block_root+0x23f/0x2e8  
[ 8.887840] mount_root+0x38/0x3a  
[ 8.908668] prepare_namespace+0x13f/0x194  
[ 8.929928] kernel_init_freeable+0x265/0x289  
[ 8.951723] ? rest_init+0xb0/0xb0  
[ 8.973427] kernel_init+0xe/0x10  
[ 8.994986] ret_from_fork+0x1f/0x40  
[ 9.016635] Kernel Offset: 0x0c80000 from 0xffffffff81000000 (relocation ran)
```

8.806758] Call Trace:

```
8.826566] dump_stack+0x6d/0x8b
8.846723] panic+0x114/0x2f6
8.867061] mount_block_root+0x23f/0x2e8
8.887840] mount_root+0x38/0x3a
8.908668] prepare_namespace+0x13f/0x194
8.929928] kernel_init_freeable+0x265/0x289
8.951723] ? rest_init+0xb0/0xb0
8.973427] kernel_init+0xe/0x110
8.994986] ret_from_fork+0x1f/0x40
9.016635] Kernel Offset: 0xec00000 from 0xffffffff81000000
:: 0xffffffff80000000-0xfffffffffbffffff)
[ 9.068766] ---[ end Kernel panic - not syncing: VFS: Unable to
on unknown-block(0,0) ]---
```

// looks like normal bootup post kernel panic resolution :-)



// restoring/fixing a redbarn hpc compute node



// restoring a nvidia/gpu compute node in the AI/ML learning lab



// As to that \$70k+ Nvidia DGX workstation, AI/ML deep learning supercomputer rebuild?
Well, that's in the NCSU / ECU servicenow helpdesk ticket system. Just look up my worked ticket history :-)

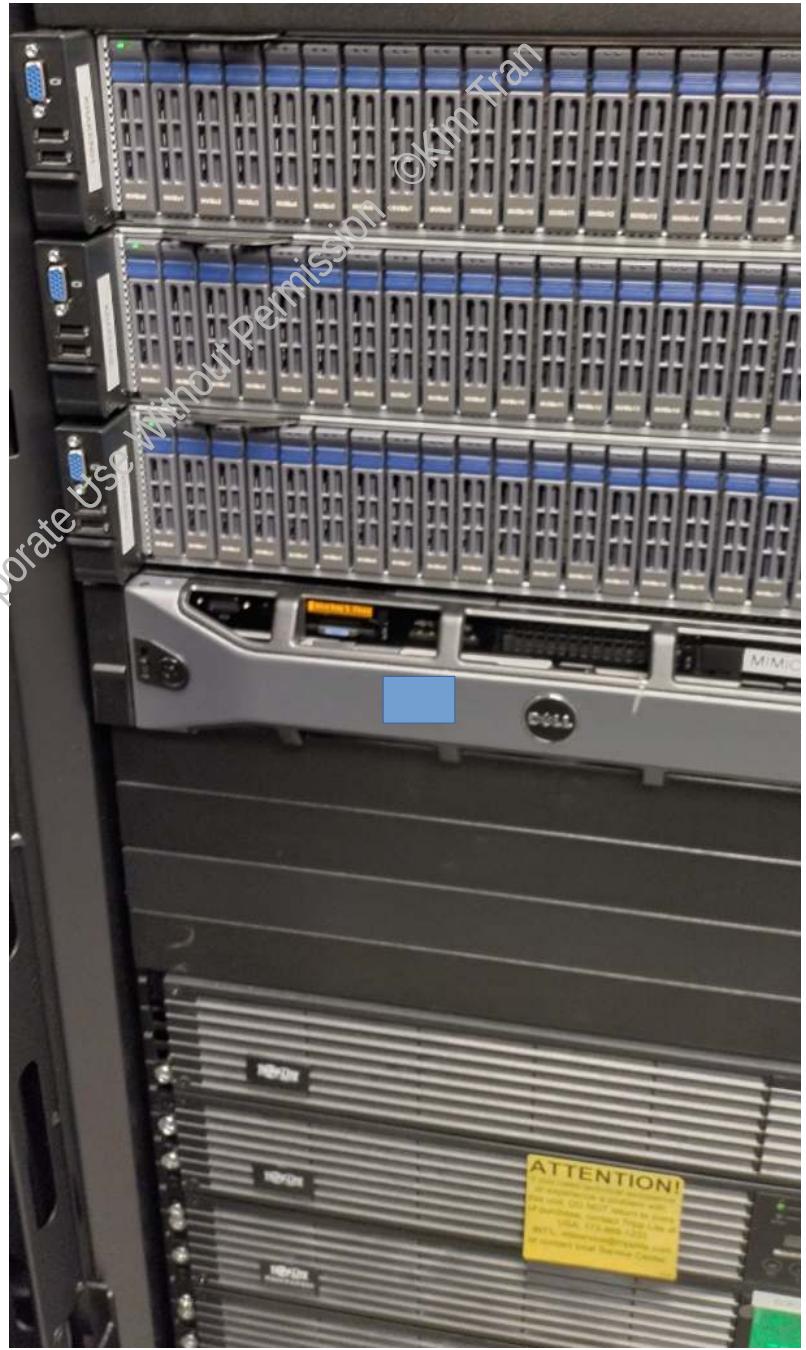
When I performed a bare metal restore and rebuild of that \$70K+ deep learning AI/ML supercomputer, Nvidia DGXworkstation out of vendor contract support, reinstalled vanilla base os, system drivers and firmware, gpu cuda and toolkit drivers, management and utility layer api's, restoring the system back to the DGX platform configuration, verified and addressed all system issues and placed back into production use...

That was just another day, just another linux system that was down and needed to be brought back to life :-D

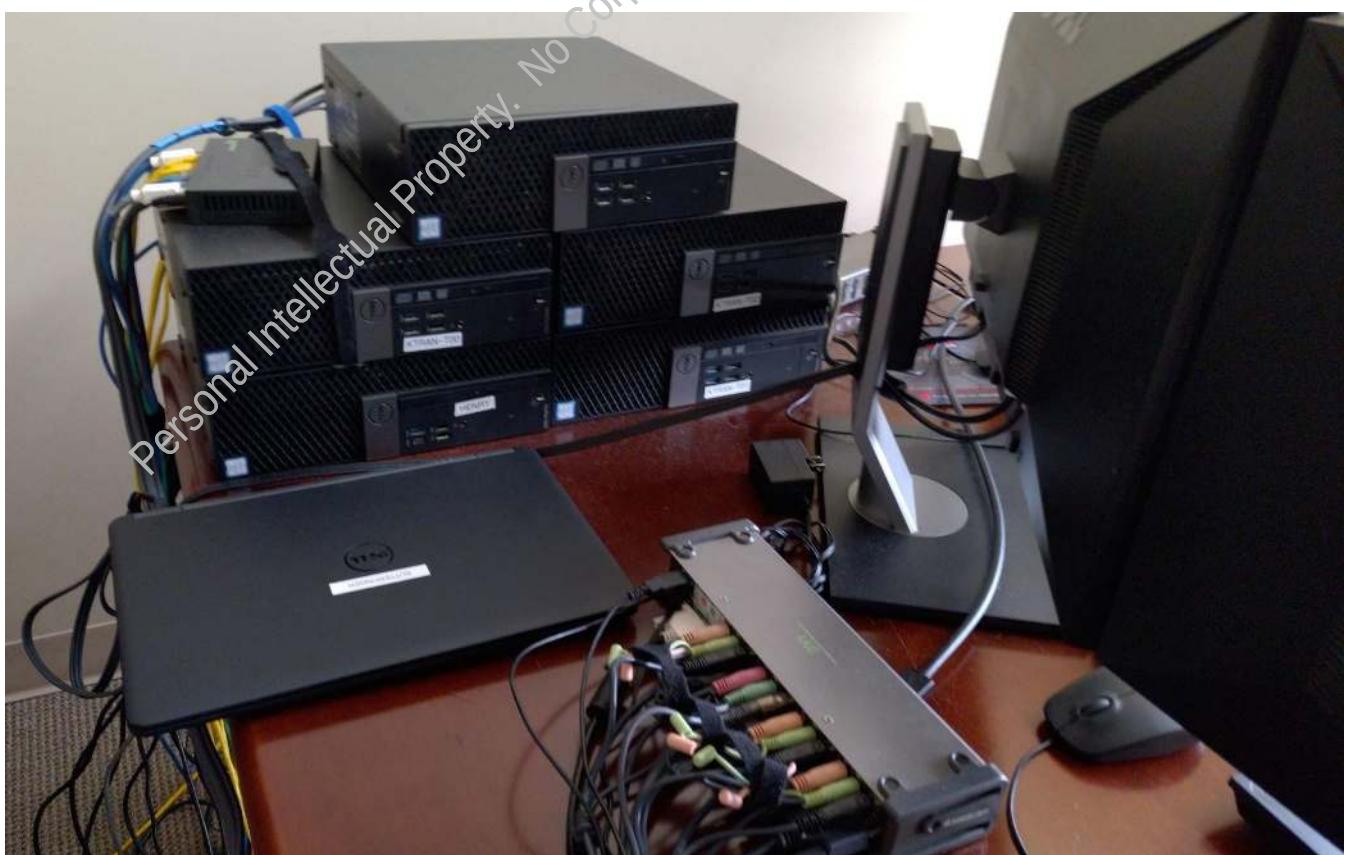
// Working in the server room for the AI/ML gpu compute nodes, server farms/clusters



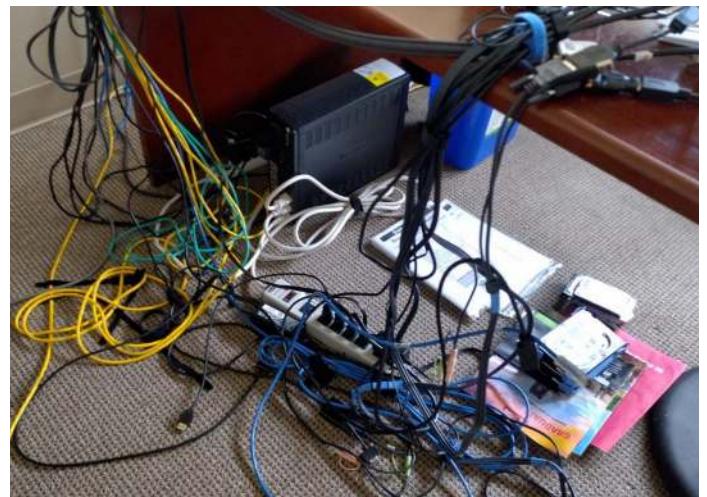
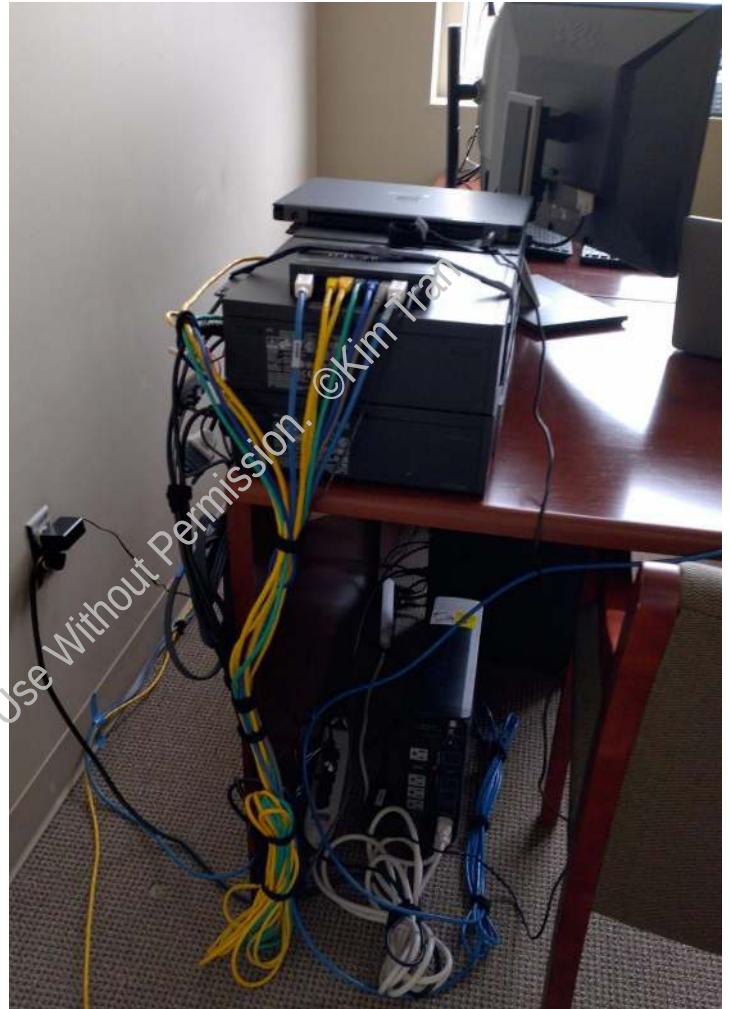
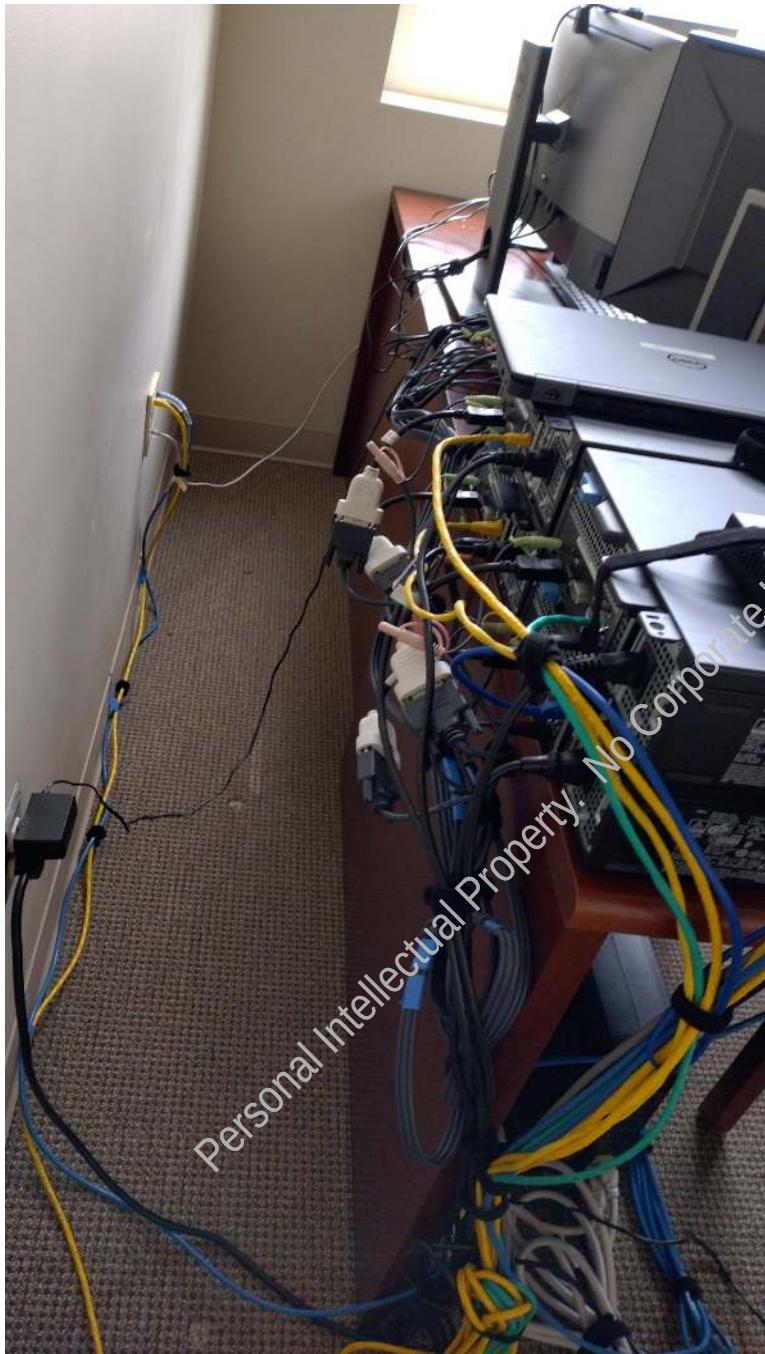
// AI/ML gpu server farms/clusters compute nodes : Keeping these workloads backbone up and alive :-)



// My workstation setup to support the AI/ML/Linux server farms/compute nodes :-)

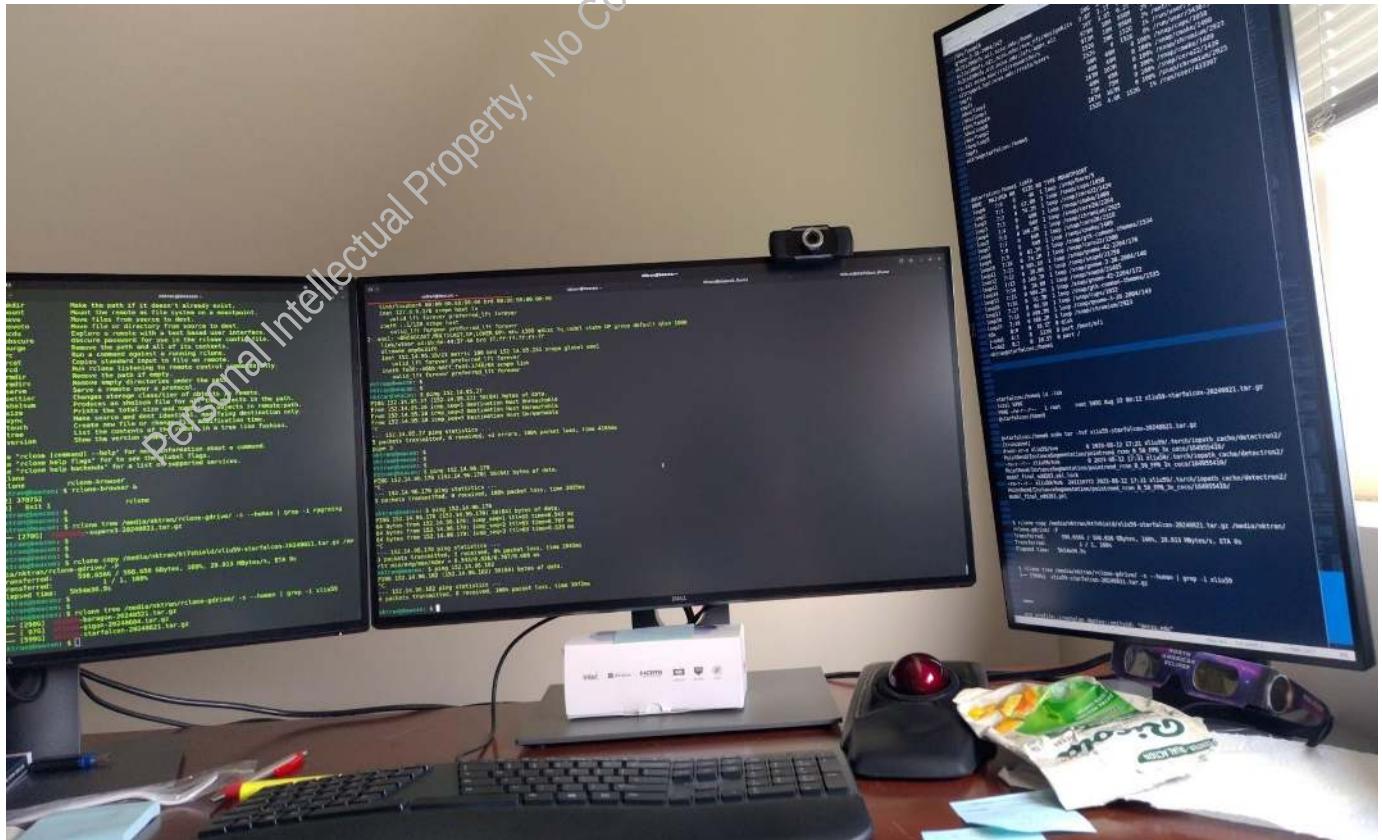


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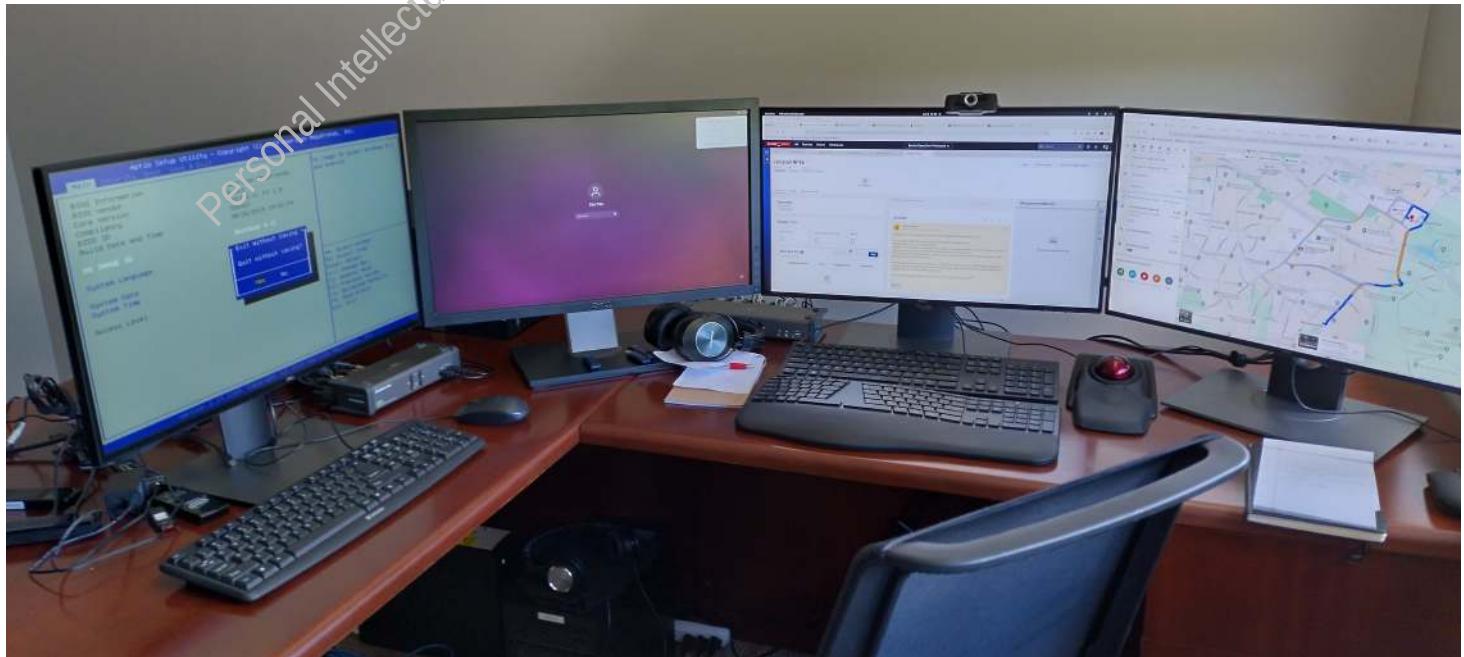
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// Is this enough proof of systems utilization and multitasking? :-)



// The question was, do I need all these monitors and systems?

The answer is YES :-)



Home Setup (always working progress)

Setup of iscsi san

Creating block/luns
(parity, non-parity)

Assigning luns to windows/mac host

Creating Shares

Storage stats

personally crimped cables

```
root@      solaris11      /zstor2tb# stmfadm list-hg  
Host Group: mac-group  
Host Group: win-group  
root@      solaris11      /zstor2tb# stmfadm list-hg -v  
Host Group: mac-group  
    Member: iqn.2003-12.com.small-tree:expensive-rotten-fruit  
Host Group: win-group  
    Member: iqn.1991-05.com.microsoft:[REDACTED]
```

©Kim Tran

```
root@      debian:# vi /etc/fstab  
root@      debian:# mount -a  
root@      debian:# ls /mnt/zstor/  
data-vol1  data-vol2  data-vol3  data-vol4  data-vol-temp
```

LU Name: 600144F012F08A00000055396F84001B
Operational State : Online
Provider Name : sbd
Alias : mac-v000-no-chap-auth
View Entry Count : 1
Data File : /dev/zvol/rdsck/zstor2tb/iscsi-san/mac-vols/vol-000
Meta File : not set
Size : 107374182400
Block Size : 4096
Management URL : not set
Vendor ID : SUN
Product ID : COMSTAR
Serial Num : not set
Write Protect : Disabled
Write Cache Mode Select: Enabled
Writeback Cache : Enabled
Access State : Active

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// list the created iscsi block level luns
you can see the lun mappings / correlations

```
root@ solaris11: /zstor2tb# sbdadm list-lu
```

Found 20 LU(s)

GUID	DATA SIZE	SOURCE
600144f012f08a0000005533024a0001	10737418240	/dev/zvol/rdsk/zstor2tb/iscsi-san/mac-vols/vol-005
600144f012f08a000000553302610002	10737418240	/dev/zvol/rdsk/zstor2tb/iscsi-san/mac-vols/vol-006
600144f012f08a000000553302740003	10737418240	/dev/zvol/rdsk/zstor2tb/iscsi-san/mac-vols/vol-007
600144f012f08a000000553302830004	10737418240	/dev/zvol/rdsk/zstor2tb/iscsi-san/mac-vols/vol-008
600144f012f08a0000005533028f0005	10737418240	/dev/zvol/rdsk/zstor2tb/iscsi-san/mac-vols/vol-009
600144f012f08a00000055331a880006	10737418240	/dev/zvol/rdsk/zstor2tb/iscsi-san/win-vols/vol-005
600144f012f08a00000055331afe0007	10737418240	/dev/zvol/rdsk/zstor2tb/iscsi-san/win-vols/vol-006
600144f012f08a00000055331b1e0008	10737418240	/dev/zvol/rdsk/zstor2tb/iscsi-san/win-vols/vol-007
600144f012f08a00000055331b3f0009	10737418240	/dev/zvol/rdsk/zstor2tb/iscsi-san/win-vols/vol-008
600144f012f08a00000055331b74000a	10737418240	/dev/zvol/rdsk/zstor2tb/iscsi-san/win-vols/vol-009
600144f012f08a000000553371be0011	107374182400	/dev/zvol/rdsk/zstor2tb/iscsi-san/mac-vols/vol-001
600144f012f08a000000553371cd0012	107374182400	/dev/zvol/rdsk/zstor2tb/iscsi-san/mac-vols/vol-002
600144f012f08a000000553371d90013	107374182400	/dev/zvol/rdsk/zstor2tb/iscsi-san/mac-vols/vol-003
600144f012f08a000000553371e50014	107374182400	/dev/zvol/rdsk/zstor2tb/iscsi-san/mac-vols/vol-004
600144f012f08a0000005533ca8a0015	107374182400	/dev/zvol/rdsk/zstor2tb/iscsi-san/win-vols/vol-000
600144f012f08a0000005533ca980016	107374182400	/dev/zvol/rdsk/zstor2tb/iscsi-san/win-vols/vol-001
600144f012f08a0000005533caa20017	107374182400	/dev/zvol/rdsk/zstor2tb/iscsi-san/win-vols/vol-002
600144f012f08a0000005533caae0018	107374182400	/dev/zvol/rdsk/zstor2tb/iscsi-san/win-vols/vol-003
600144f012f08a0000005533cab90019	107374182400	/dev/zvol/rdsk/zstor2tb/iscsi-san/win-vols/vol-004
600144f012f08a00000055396f84001b	107374182400	/dev/zvol/rdsk/zstor2tb/iscsi-san/mac-vols/vol-000

```
root@ -solaris11: /zstor2tb# stmfadm list-lu
```

```
LU Name: 600144F012F08A0000005533024A0001
LU Name: 600144F012F08A000000553302610002
LU Name: 600144F012F08A000000553302740003
LU Name: 600144F012F08A000000553302830004
LU Name: 600144F012F08A0000005533028F0005
LU Name: 600144F012F08A00000055331A880006
LU Name: 600144F012F08A00000055331AFE0007
LU Name: 600144F012F08A00000055331B1E0008
LU Name: 600144F012F08A00000055331B3F0009
LU Name: 600144F012F08A00000055331B74000A
LU Name: 600144F012F08A000000553371BE0011
LU Name: 600144F012F08A000000553371CD0012
LU Name: 600144F012F08A000000553371D90013
LU Name: 600144F012F08A000000553371E50014
LU Name: 600144F012F08A0000005533CA8A0015
LU Name: 600144F012F08A0000005533CA980016
LU Name: 600144F012F08A0000005533CAA20017
LU Name: 600144F012F08A0000005533CAAE0018
LU Name: 600144F012F08A0000005533CAB90019
LU Name: 600144F012F08A00000055396F84001B
```

```
root@ solaris11 :/zstor2tb# zfs list zstor2tb
NAME      USED  AVAIL  REFER  MOUNTPOINT
zstor2tb  3.85T  5.01T   104K  /zstor2tb
root@ solaris11 :/zstor2tb# zfs list zstor320gb
NAME      USED  AVAIL  REFER  MOUNTPOINT
zstor320gb  728G  1.00T   140K  /zstor320gb
```

```
pool: zstor2tb
state: ONLINE
  scan: none requested
config:

  NAME          STATE    READ WRITE CKSUM
  zstor2tb      ONLINE    0     0     0
    raidz3-0    ONLINE    0     0     0
      c0t5000CCA221E7E1DBd0  ONLINE    0     0     0
      c0t5000CCA221E77A36d0  ONLINE    0     0     0
      c0t5000CCA222D2930Fd0  ONLINE    0     0     0
      c0t5000CCA229C2152Ed0  ONLINE    0     0     0
      c0t5000CCA229DDFB3Cd0  ONLINE    0     0     0
      c0t5000CCA369F456E6d0  ONLINE    0     0     0
      c0t50014EE25DB0C362d0  ONLINE    0     0     0
      c0t50014EE2085B9A64d0  ONLINE    0     0     0
  spares
    c0t5000CCA222D22B8E2d0  UNAVAIL
    c0t5000CCA222D6243d0  UNAVAIL

errors: No known data errors
```

```
pool: zstor320gb
state: ONLINE
  scan: resilvered 126G in 1h28m with 0 errors on Sun Apr  5 23:36:32 2015
config:

  NAME          STATE    READ WRITE CKSUM
  zstor320gb    ONLINE    0     0     0
    raidz2-0    ONLINE    0     0     0
      c9t5001E678B0589FE1d0  ONLINE    0     0     0
      c9t5001E678B0589FE2d0  ONLINE    0     0     0
      c9t5001E678B0589FE3d0  ONLINE    0     0     0
      c0t50014EE0AB52FCF5d0  ONLINE    0     0     0
      c0t50014EE156F34C8Bd0  ONLINE    0     0     0
      c0t50014EE1029F6FA5d0  ONLINE    0     0     0
      c0t50014EE1591D38AFd0  ONLINE    0     0     0
      c0t50014EE2B15A5E1Cd0  ONLINE    0     0     0
  spares
    c0t50014EE25C049A06d0  UNAVAIL
    c0t50014EE1591F92C7d0  UNAVAIL
```

// data transfer in progress

zstor2tb/pool-fs-backup	1.43T	5.01T	122K
zstor2tb/pool-fs-backup/data-vol-temp	512G	5.01T	512G
zstor2tb/pool-fs-backup/data-vol1	249G	5.01T	249G
zstor2tb/pool-fs-backup/data-vol2	99.4K	5.01T	99.4K
zstor2tb/pool-fs-backup/data-vol3	705G	5.01T	705G
zstor2tb/pool-fs-backup/data-vol4	99.4K	5.01T	99.4K
zstor320gb	728G	1.00T	140K
zstor320gb/data-vol-temp	104K	1.00T	104K
zstor320gb/data-vol1	104K	1.00T	104K
zstor320gb/data-vol2	104K	1.00T	104K
zstor320gb/data-vol3	722G	1.00T	722G
zstor320gb/data-vol4	104K	1.00T	104K

zstor2tb	1.85T	5.01T	104K
zstor2tb/iscsi-san	2.41T	5.01T	114K
zstor2tb/iscsi-san/mac-vols	552G	5.01T	94.4K
zstor2tb/iscsi-san/mac-vols/vol-000	100G	5.08T	34.1G
zstor2tb/iscsi-san/mac-vols/vol-001	100G	5.09T	22.6G
zstor2tb/iscsi-san/mac-vols/vol-002	100G	5.09T	22.6G
zstor2tb/iscsi-san/mac-vols/vol-003	100G	5.11T	134M
zstor2tb/iscsi-san/mac-vols/vol-004	100G	5.11T	134M
zstor2tb/iscsi-san/mac-vols/vol-005	10.3G	5.02T	44.0M
zstor2tb/iscsi-san/mac-vols/vol-006	10.3G	5.02T	39.8K
zstor2tb/iscsi-san/mac-vols/vol-007	10.3G	5.02T	39.8K
zstor2tb/iscsi-san/mac-vols/vol-008	10.3G	5.02T	39.8K
zstor2tb/iscsi-san/mac-vols/vol-009	10.3G	5.02T	39.8K
zstor2tb/iscsi-san/nix-vols	103G	5.01T	94.4K
zstor2tb/iscsi-san/nix-vols/vol-001	103G	5.11T	39.8K
zstor2tb/iscsi-san/test-vols	1.23T	5.01T	94.4K
zstor2tb/iscsi-san/test-vols/vol-001	103G	5.11T	39.8K
zstor2tb/iscsi-san/test-vols/vol-002	1.03T	6.04T	39.8K
zstor2tb/iscsi-san/test-vols/vol-003	1.03G	5.01T	39.8K
zstor2tb/iscsi-san/test-vols/vol-004	103G	5.11T	39.8K
zstor2tb/iscsi-san/win-vols	552G	5.01T	94.4K
zstor2tb/iscsi-san/win-vols/vol-000	100G	5.11T	41.3M
zstor2tb/iscsi-san/win-vols/vol-001	100G	5.11T	43.7M
zstor2tb/iscsi-san/win-vols/vol-002	100G	5.11T	51.0M
zstor2tb/iscsi-san/win-vols/vol-003	100G	5.11T	43.0M
zstor2tb/iscsi-san/win-vols/vol-004	100G	5.11T	52.0M
zstor2tb/iscsi-san/win-vols/vol-005	10.3G	5.02T	614K
zstor2tb/iscsi-san/win-vols/vol-006	10.3G	5.02T	605K
zstor2tb/iscsi-san/win-vols/vol-007	10.3G	5.02T	723K
zstor2tb/iscsi-san/win-vols/vol-008	10.3G	5.02T	538K
zstor2tb/iscsi-san/win-vols/vol-009	10.3G	5.02T	12.0M

```
root@      solaris11    :/zstor2tb# stmfadm list-state
Operational Status: online
Config Status     : initialized
ALUA Status       : disabled
ALUA Node         : 0
```

```
root@      solaris11    :/zstor2tb# stmfadm list-target
Target: iqn.1986-03.com.sun:02:target-chap-authentication
Target: iqn.1986-03.com.sun:01:target-no-chap-authentication
root@      solaris11    :/zstor2tb# stmfadm list-target -v
Target: iqn.1986-03.com.sun:02:target-chap-authentication
    Operational Status      : Online
    Provider Name          : iscsit
    Alias                  : -
    Protocol               : iSCSI
    Sessions               : 2
        Initiator: iqn.1991-05.com.microsoft: [REDACTED]
            Alias: -
            Logged in since: Thu Apr 23 23:40:41 2015
        Initiator: iqn.2003-12.com.small-tree:expensive-rotten-fruit
            Alias: -
            Logged in since: Thu Apr 23 22:51:18 2015
Target: iqn.1986-03.com.sun:01:target-no-chap-authentication
    Operational Status      : Online
    Provider Name          : iscsit
    Alias                  : -
    Protocol               : iSCSI
    Sessions               : 2
        Initiator: iqn.1991-05.com.microsoft: [REDACTED]
            Alias: -
            Logged in since: Thu Apr 23 23:40:39 2015
        Initiator: iqn.2003-12.com.small-tree:expensive-rotten-fruit
            Alias: -
            Logged in since: Thu Apr 23 22:18:45 2015
```

```
root@      solaris11    :/zstor2tb# stmfadm list-tg
Target Group: test-tg
Target Group: test-tg1
root@      solaris11    :/zstor2tb# stmfadm list-tg -v
Target Group: test-tg
    Member: iqn.1986-03.com.sun:01:target-no-chap-authentication
Target Group: test-tg1
    Member: iqn.1986-03.com.sun:02:target-chap-authentication
```

```

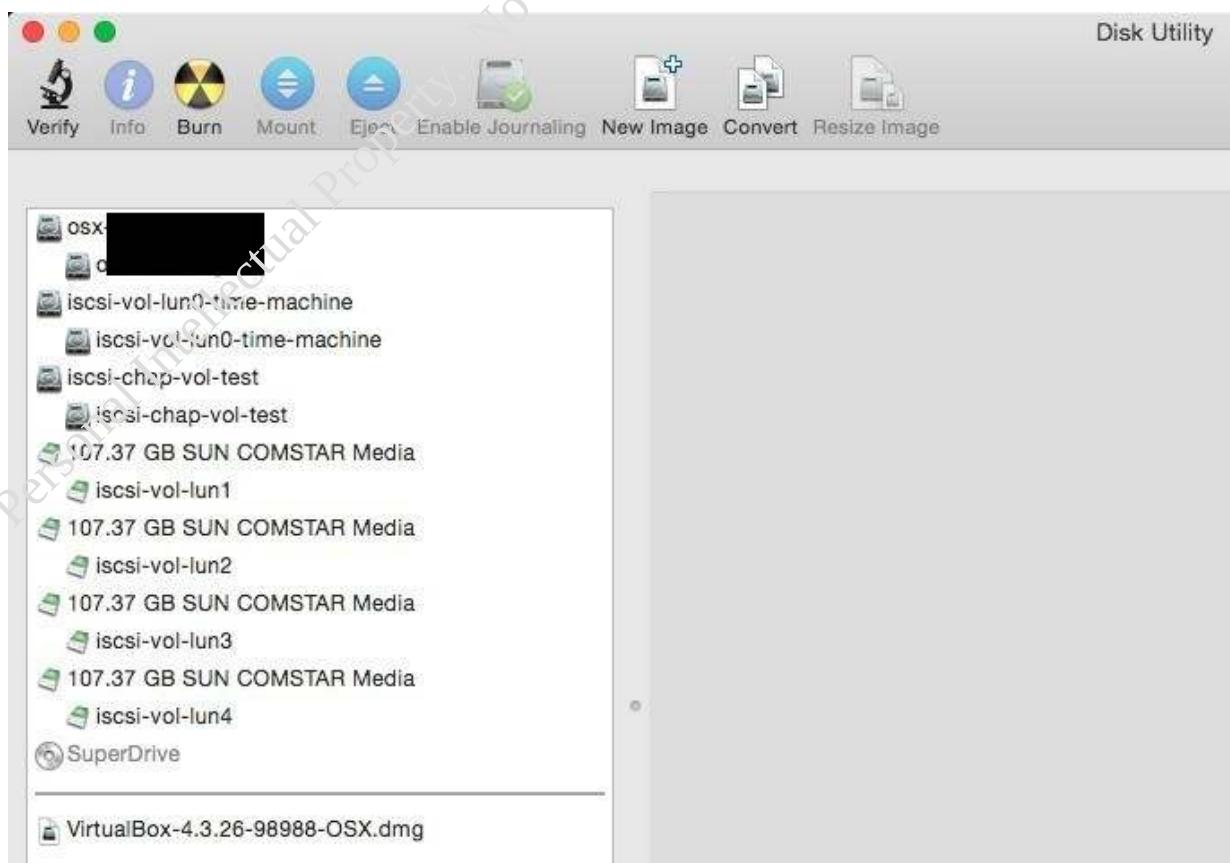
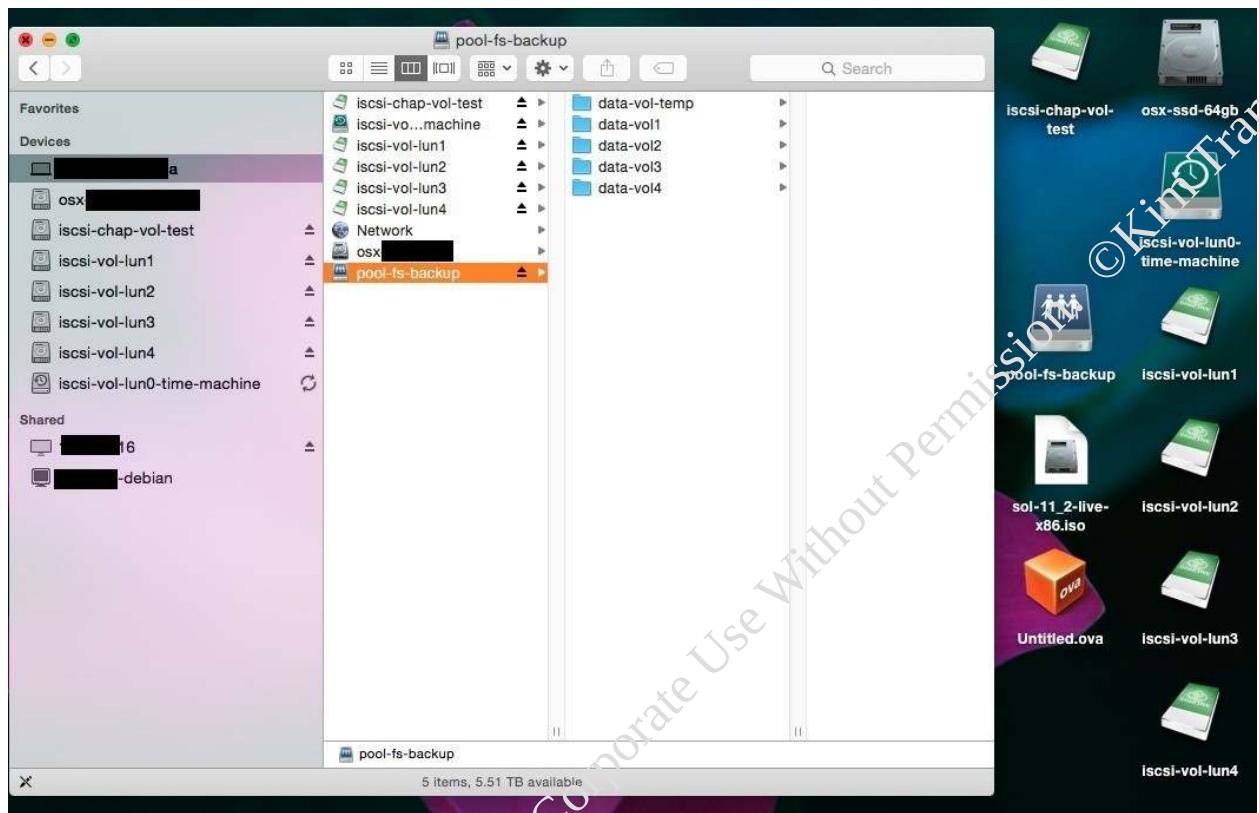
root@      -solaris11      :/zstor2tb# itadm list-target
TARGET NAME                                     STATE   SESSIONS
iqn.1986-03.com.sun:02:target-chap-authentication    online   1
iqn.1986-03.com.sun:01:target-no-chap-authentication   online   1
root@      -solaris11      :/zstor2tb# itadm list-target -v
TARGET NAME                                     STATE   SESSIONS
iqn.1986-03.com.sun:02:target-chap-authentication    online   1
    alias:          -
    auth:           chap
    targetchapuser: test-chap-user
    targetchapsecret: set
    tpg-tags:       test-tpg1 = 2
iqn.1986-03.com.sun:01:target-no-chap-authentication   online   1
    alias:          testing-with-no-chap-authentication
    auth:           none
    targetchapuser: -
    targetchapsecret: unset
    tpg-tags:       default

```

zstor2tb	1.20T	13.3T	66	89.5K	70.0M
zstor2tb	1.20T	13.3T	49	1.16K	66.5K
zstor2tb	1.20T	13.3T	72	84	98.0K
zstor2tb	1.20T	13.3T	65	270	87.9K
zstor2tb	1.20T	13.3T	5	2.38K	7.89K
zstor2tb	1.20T	13.3T	1	2.54K	3.00K
zstor2tb	1.20T	13.3T	4	2.53K	5.01K
zstor2tb	1.20T	13.3T	38	1.51K	53.5K
zstor2tb	1.20T	13.3T	61	74	87.0K
zstor2tb	1.20T	13.3T	43	1.18K	56.5K
zstor2tb	1.20T	13.3T	68	78	91.0K
zstor2tb	1.20T	13.3T	68	87	91.5K
zstor2tb	1.20T	13.3T	69	87	95.0K
zstor2tb	1.20T	13.3T	60	72	84.0K
zstor2tb	1.20T	13.3T	39	1.20K	54.0K
zstor2tb	1.20T	13.3T	72	75	96.5K
zstor2tb	1.20T	13.3T	70	90	98.0K
zstor2tb	1.20T	13.3T	70	87	97.0K

zstor2tb	1.23T	13.3T	0	201	0	25.2M
zstor2tb	1.23T	13.3T	23	1.66K	33.0K	233M
zstor2tb	1.23T	13.3T	70	82	98.5K	63.5M
zstor2tb	1.23T	13.3T	52	704	74.0K	116M
zstor2tb	1.23T	13.3T	64	897	90.0K	61.5M
zstor2tb	1.23T	13.3T	0	171	0	21.5M
zstor2tb	1.23T	13.3T	24	27	32.5K	19.4M
zstor2tb	1.23T	13.3T	56	556	77.5K	41.6M
zstor2tb	1.23T	13.3T	0	206	0	24.0M

// provisioned iscsi luns to macbook pro to add additional storage



Small Tree iSCSI Manager

Discover Connect & Mount Disconnect Session Parameters Initiator Options

Targets Sessions

Target	Mount At Boot?
iqn.1986-03.com.sun:01:target-no-chap-authentication-[REDACTED]:3260	<input checked="" type="checkbox"/>
iqn.1986-03.com.sun:02:target-chap-authentication-[REDACTED]:3261	<input checked="" type="checkbox"/>

Small Tree iSCSI Manager

Discover Connect & Mount Disconnect Session Parameters Initiator Options

Targets Sessions

Target
▼iqn.1986-03.com.sun:01:target-no-chap-authentication [REDACTED] 6:3260
▼iqn.1986-03.com.sun:02:target-chap-authentication [REDACTED] 6:3261

// connection to windows host, with and without CHAP authentication

iSCSI Initiator Properties

Targets Discovery Favorite Targets Volumes and Devices RADIUS Configuration

Quick Connect
To discover and log on to a target using a basic connection, type the IP address or DNS name of the target and then click Quick Connect.

Target: [REDACTED] Quick Connect...

Discovered targets Refresh

Name	Status
iqn.1986-03.com.sun:01:target-no-chap-authentication	Connected
iqn.1986-03.com.sun:02:target-chap-authentication	Connected

// provisioned iscsi luns to a windows laptop,
disks are recognized by the system

The screenshot shows the Windows Disk Management interface. On the left, a navigation pane lists 'Computer Management (Local)', 'System Tools' (Task Scheduler, Event Viewer, Shared Folders, Performance, Device Manager), 'Storage' (Disk Management), and 'Services and Application'. The main area displays disk details in a table:

Volume	Layout	Type	File System	Status	Capacity	Free Space	% Free
OS (C:)	Simple	Basic	NTFS	Healthy (Primary Partition)	100 MB	100 MB	100 %
10g-disks (E:)	Simple	Basic	NTFS	Healthy (Primary Partition)	8.00 GB	8.00 GB	100 %
100g-disks (D:)	Simple	Basic	NTFS	Healthy (Primary Partition)	44.87 GB	44.78 GB	100 %
Disk 0	Simple	Basic	NTFS	Healthy (EFI System)	29.00 GB	8.00 GB	100 %
OS (C:)	Simple	Basic	NTFS	Healthy (Boot, Page File, Crash Dump, Wim Boot, Primary Partition)	20.90 GB	5.13 GB	25 %

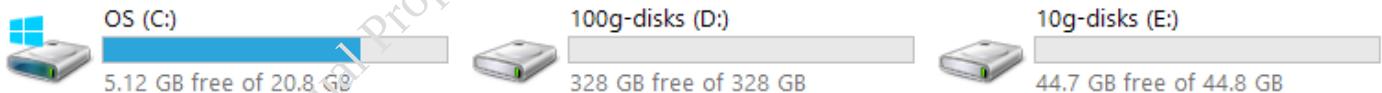
Below the table, a detailed view of the disks is shown:

- Disk 0:** Basic, 29.00 GB, Online. Contains:
 - 100 MB Healthy (EFI System)
 - OS (C): 20.90 GB NTFS, Healthy (Boot, Page File, Crash Dump, Wim Boot, Primary Partition)
 - 8.00 GB Healthy (Recovery Partition)
- Disk 11:** Basic, 328.88 GB, Online. Contains:
 - 100g-disks (D): 328.87 GB NTFS, Healthy (Primary Partition)
- Disk 12:** Basic, 44.88 GB, Online. Contains:
 - 10g-disks (E): 44.87 GB NTFS, Healthy (Primary Partition)

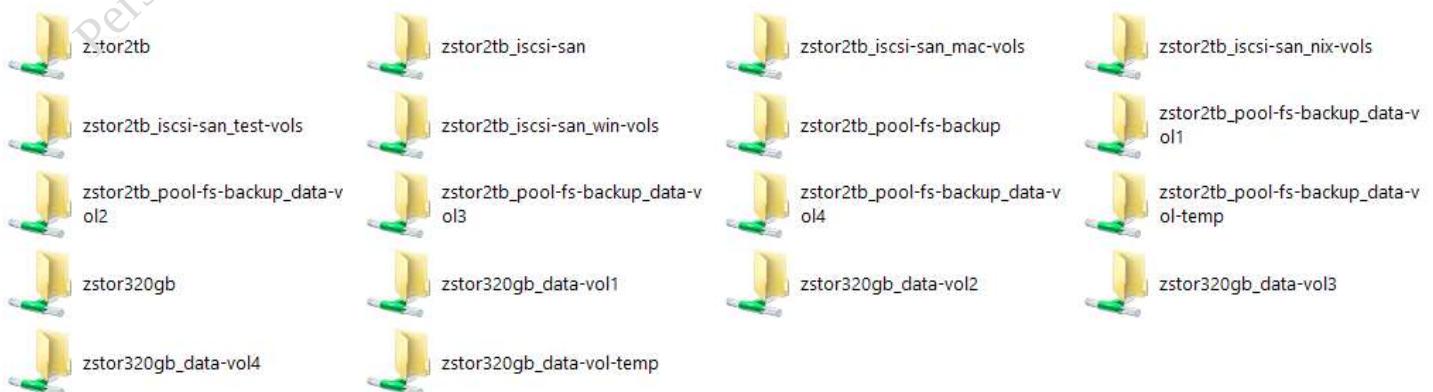
At the bottom, a legend indicates: Unallocated (black square) and Primary partition (blue square).

This PC

- ▶ Folders (6)
- ◀ Devices and drives (3)



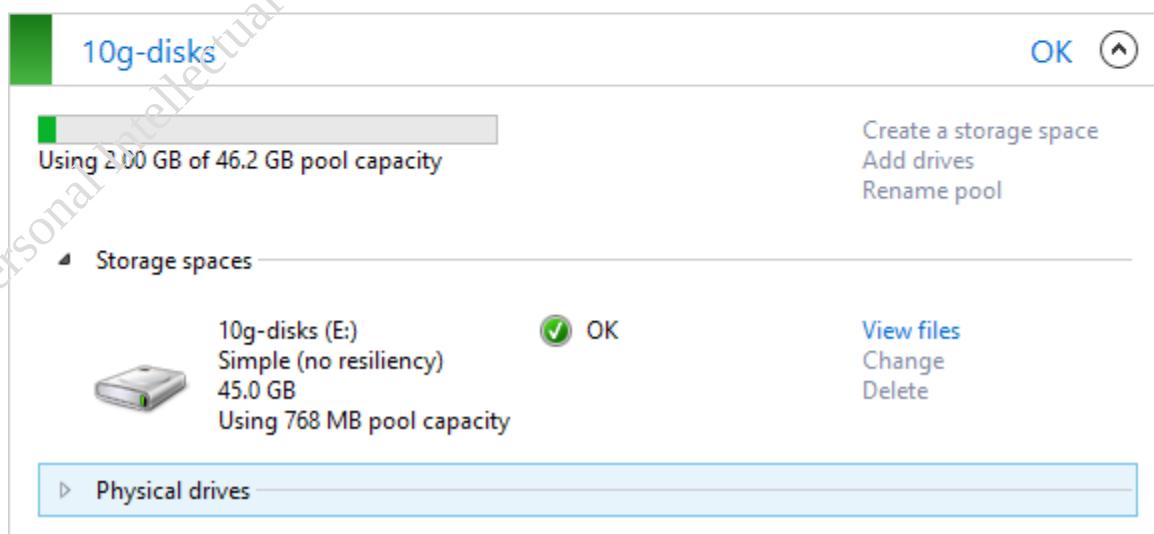
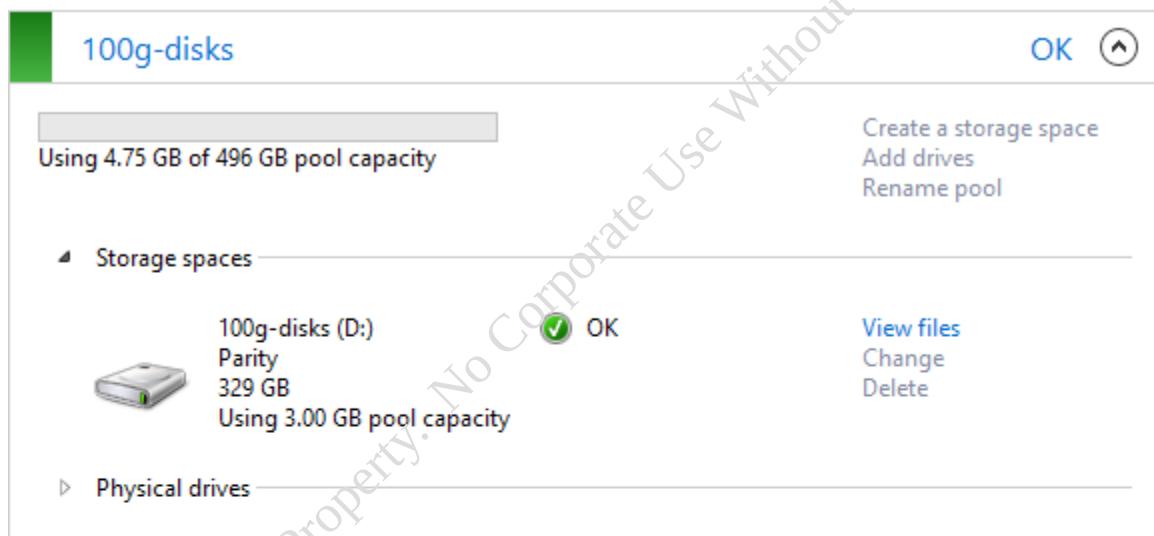
// shares, exported via smb/cifs, recognized by the system



// windows laptop only had ~20gb of system storage hdd space,
no room for updates or local storage

added the provisioned iscsi luns to overcome laptop limitations

// provisioned iscsi luns to windows laptop
Configured for parity and no parity (no resiliency)



// configured provisioned iscsi luns in a concatenate non raid set

10g-disks

Using 2.00 GB of 46.2 GB pool capacity

Create a storage space
Add drives
Rename pool

OK

Storage spaces

10g-disks (E:) Simple (no resiliency) 45.0 GB Using 768 MB pool capacity

View files
Change
Delete

Physical drives

SUN COMSTAR SCSI Disk ...	Attached via iSCSI	2.70 % used	Providing 9.25 GB pool capacity	OK	Rename Remove
SUN COMSTAR SCSI Disk ...	Attached via iSCSI	5.40 % used	Providing 9.25 GB pool capacity	OK	Rename
SUN COMSTAR SCSI Disk ...	Attached via iSCSI	2.70 % used	Providing 9.25 GB pool capacity	OK	Rename Remove
SUN COMSTAR SCSI Disk ...	Attached via iSCSI	8.10 % used	Providing 9.25 GB pool capacity	OK	Rename
SUN COMSTAR SCSI Disk ...	Attached via iSCSI	2.70 % used	Providing 9.25 GB pool capacity	OK	Rename Remove

// configured provisioned iscsi luns in a raid 5 or 6 set

100g-disks

Using 4.75 GB of 496 GB pool capacity

OK ⌂

Create a storage space
Add drives
Rename pool

Storage spaces

100g-disks (D:) Parity OK View tiles
329 GB Change
Using 3.00 GB pool capacity Delete

Physical drives

SUN COMSTAR SCSI Disk ... OK Rename
Attached via iSCSI
0.75 % used
Providing 99.2 GB pool capacity

SUN COMSTAR SCSI Disk ... OK Rename
Attached via iSCSI
1.00 % used
Providing 99.2 GB pool capacity

SUN COMSTAR SCSI Disk ... OK Rename
Attached via iSCSI
1.00 % used
Providing 99.2 GB pool capacity

SUN COMSTAR SCSI Disk ... OK Rename
Attached via iSCSI
1.00 % used
Providing 99.2 GB pool capacity

SUN COMSTAR SCSI Disk ... OK Rename
Attached via iSCSI
1.00 % used
Providing 99.2 GB pool capacity

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// updated the original half rack setup to include
refreshed/rebuild of new equipment/storage server and network layout
still a working progress :-)

old custom built storage server : 6U near bottom
new rebuilt storage server 1U beneath keyboard
new system environment to build : proxmox vm/container clusters :-)



// likely isn't she :-)



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Old custom built storage server data migration to new storage server

//old storage pool

```
pool: zstor
state: ONLINE
scan: scrub in progress since Sun Nov 30 14:47:24 2025
  1 scanned out of 18.5T at 1/s, (scan is slow, no estimated time)
  0 repaired, 0.00% done
config:

      NAME            STATE   READ WRITE CKSUM
      zstor           ONLINE  0     0     0
      raidz3-0        ONLINE  0     0     0
      c0t5000CCA222D22B8Ed0  ONLINE  0     0     0
      c0t50014EE0028EA60Ed0  ONLINE  0     0     0
      c0t5000CCA229C2152Ed0  ONLINE  0     0     0
      c0t5000CCA229DDFB3Cd0  ONLINE  0     0     0
      c0t5000CCA221E7E1DBd0  ONLINE  0     0     0
      c0t5000CCA22DCC0F0Bd0  ONLINE  0     0     0
      c0t5000CCA22DDA19EEd0  ONLINE  0     0     0
      c0t5000CCA22DC7F85Dd0  ONLINE  0     0     0
      c0t5000CCA22DD6DFD2d0  ONLINE  0     0     0
      c0t5000CCA22DEF0C3Ad0  ONLINE  0     0     0
      c0t5000CCA22DDA3EC3d0  ONLINE  0     0     0
      c0t5000CCA22DF65FF5d0  ONLINE  0     0     0
      c0t5000CCA22DD9DA72d0  ONLINE  0     0     0
      c0t5000CCA222D2930Fd0  ONLINE  0     0     0
      c0t50014EE25DB0C362d0  ONLINE  0     0     0
      c0t50014EE2085B9A64d0  ONLINE  0     0     0
      c0t5000CCA369F456E6d0  ONLINE  0     0     0
      c0t5000CCA221E77A36d0  ONLINE  0     0     0
spares
      c0t5000CCA22DD9ABA1d0  AVAIL

errors: No known data errors
root@sanjiyan-zstor:~#
```

zstor	16.4T	6.81T	1.08M	/zstor
zstor/archive-scans	744K	6.81T	744K	/zstor/archive-scans
zstor/isan	1.32M	6.81T	674K	/zstor/isan
zstor/iscsi-san	5.41T	6.81T	860K	/zstor/iscsi-san
zstor/iscsi-san/mac-vols	3.07T	6.81T	674K	/zstor/iscsi-san/mac-vols
zstor/iscsi-san/mac-vols/vol-000	188G	6.84T	73.4G	-
zstor/iscsi-san/mac-vols/vol-001	121G	6.86T	55.8G	-
zstor/iscsi-san/mac-vols/vol-002	121G	6.86T	55.8G	-
zstor/iscsi-san/mac-vols/vol-003	113G	6.86T	49.9G	-
zstor/iscsi-san/mac-vols/vol-004	113G	6.86T	49.9G	-
zstor/iscsi-san/mac-vols/vol-005	10.5G	6.82T	184M	-
zstor/iscsi-san/mac-vols/vol-006	10.3G	6.82T	209K	-
zstor/iscsi-san/mac-vols/vol-007	10.3G	6.82T	209K	-
zstor/iscsi-san/mac-vols/vol-008	10.3G	6.82T	209K	-
zstor/iscsi-san/mac-vols/vol-009	10.3G	6.82T	209K	-
zstor/iscsi-san/mac-vols/vol-010	672G	6.81T	672G	-
zstor/iscsi-san/mac-vols/vol-011	516G	7.06T	267G	-
zstor/iscsi-san/mac-vols/vol-012	516G	7.06T	267G	-
zstor/iscsi-san/mac-vols/vol-013	516G	7.06T	267G	-
zstor/iscsi-san/mac-vols/vol-test1	106G	6.92T	209K	-
zstor/iscsi-san/mac-vols/vol-test2	106G	6.92T	209K	-

zstor/iscsi-san/nix-vols	1.56T	6.81T	636K	/zstor/iscsi-san/nix-vols
zstor/iscsi-san/nix-vols/vol-000	213G	6.99T	35.1G	-
zstor/iscsi-san/nix-vols/vol-001	213G	6.99T	34.8G	-
zstor/iscsi-san/nix-vols/vol-002	213G	6.99T	34.5G	-
zstor/iscsi-san/nix-vols/vol-003	213G	6.99T	34.6G	-
zstor/iscsi-san/nix-vols/vol-004	213G	6.99T	34.4G	-
zstor/iscsi-san/nix-vols/vol-005	106G	6.92T	209K	-
zstor/iscsi-san/nix-vols/vol-006	106G	6.92T	209K	-
zstor/iscsi-san/nix-vols/vol-007	106G	6.92T	209K	-
zstor/iscsi-san/nix-vols/vol-008	106G	6.92T	209K	-
zstor/iscsi-san/nix-vols/vol-009	106G	6.92T	209K	-
zstor/iscsi-san/win-vols	802G	6.81T	674K	/zstor/iscsi-san/win-vols
zstor/iscsi-san/win-vols/vol-000	151G	6.89T	77.0G	-
zstor/iscsi-san/win-vols/vol-001	151G	6.89T	75.7G	-
zstor/iscsi-san/win-vols/vol-002	149G	6.89T	75.3G	-
zstor/iscsi-san/win-vols/vol-003	150G	6.89T	75.6G	-
zstor/iscsi-san/win-vols/vol-004	149G	6.89T	74.7G	-
zstor/iscsi-san/win-vols/vol-005	10.3G	6.82T	2.44M	-
zstor/iscsi-san/win-vols/vol-006	10.3G	6.82T	368M	-
zstor/iscsi-san/win-vols/vol-007	10.3G	6.82T	1.12G	-
zstor/iscsi-san/win-vols/vol-008	10.3G	6.82T	2.20M	-
zstor/iscsi-san/win-vols/vol-009	10.4G	6.82T	993M	-
zstor/naspool	10.8T	6.81T	2.46T	/zstor/naspool
zstor/naspool/1	2.97T	6.81T	2.43T	/zstor/naspool/1
zstor/naspool/2	4.75T	6.81T	2.92T	/zstor/naspool/2
zstor/naspool/3	596G	6.81T	930K	/zstor/naspool/3

root@sanjiyan-zstor:~# █

// sent - migration in progress

root@sanjiyan-zstor:~# zpool iostat zstor 1							
pool	capacity		operations		bandwidth		
	alloc	free	read	write	read	write	
zstor	18.5T	14.0T	98	9	5.03M	45.1K	
zstor	18.5T	14.0T	256	0	1.08M	0	
zstor	18.5T	14.0T	230	0	970K	0	
zstor	18.5T	14.0T	249	0	997K	0	
zstor	18.5T	14.0T	238	126	954K	563K	
zstor	18.5T	14.0T	270	0	1.06M	0	
zstor	18.5T	14.0T	281	0	1.21M	0	
zstor	18.5T	14.0T	260	0	1.06M	0	
zstor	18.5T	14.0T	237	0	1.03M	0	

zstor	18.5T	14.0T	699	19	84.9M	83.8K
zstor	18.5T	14.0T	497	2	61.5M	12.0K
zstor	18.5T	14.0T	774	0	89.1M	0
zstor	18.5T	14.0T	661	0	69.2M	0
zstor	18.5T	14.0T	712	0	80.3M	0
zstor	18.5T	14.0T	787	0	94.8M	0
zstor	18.5T	14.0T	766	15	93.8M	63.9K
zstor	18.5T	14.0T	737	2	85.8M	12.0K
zstor	18.5T	14.0T	712	0	82.9M	0
zstor	18.5T	14.0T	825	0	96.0M	0
zstor	18.5T	14.0T	761	0	86.4M	0
zstor	18.5T	14.0T	773	0	94.2M	0

// new storage pool for receiving storage migration

```
r630-suse:/home/onemantech # zpool status
  pool: zstor
    state: ONLINE
  config:

              NAME                                     STATE    READ WRITE CKSUM
  zstor                    raidz3-0
                            raidz3-0
                            wwn-0x58ce38ee2033a941  ONLINE     0      0      0
                            wwn-0x58ce38ee2033a011  ONLINE     0      0      0
                            wwn-0x58ce38ee20333a11  ONLINE     0      0      0
                            wwn-0x58ce38ee20320b05  ONLINE     0      0      0
                            wwn-0x58ce38ee2032b4a5  ONLINE     0      0      0
                            wwn-0x58ce38ee2032b12d  ONLINE     0      0      0
                            wwn-0x58ce38ee2033a015  ONLINE     0      0      0
                            wwn-0x58ce38ee20333a0d  ONLINE     0      0      0

errors: No known data errors
r630-suse:/home/onemantech #
r630-suse:/home/onemantech #
r630-suse:/home/onemantech #
r630-suse:/home/onemantech #
r630-suse:/home/onemantech # zfs list
NAME   USED   AVAIL   REFER  MOUNTPOINT
zstor  793G  15.0T   793G  /zstor
r630-suse:/home/onemantech #
```

// received – migration in progress

pool	capacity		operations		bandwidth	
	alloc	free	read	write	read	write
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	3.87K	0	716M
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	2.60K	0	456M
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	2.72K	0	482M
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	1.57K	0	324M
zstor	1.38T	26.6T	0	1.72K	0	276M
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	2.76K	0	493M
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	0	0	0
zstor	1.38T	26.6T	0	4.16K	0	782M
zstor	1.38T	26.6T	0	0	0	0

// new storage server network configuration with nic bonding / lacp configurations

```
10: bond0: <BROADCAST,MULTICAST,MASTER,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether 24:6e:... brd ff:ff:ff:ff:ff:ff
      inet 172.1.../16 brd 172.17.0.1 scope global bond0
        valid_lft forever preferred_lft forever
      inet6 fe80::246e:...%bond0 brd ff:ff:ff:ff:ff:ff scope link proto kernel ll
        valid_lft forever preferred_lft forever
11: bond0.10@bond0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether 24:6... brd ff:ff:ff:ff:ff:ff
      inet 172.1.../16 brd 172.17.0.1 scope global bond0.10
        valid_lft forever preferred_lft forever
      inet6 fe80::246...%bond0.10 brd ff:ff:ff:ff:ff:ff scope link proto kernel ll
        valid_lft forever preferred_lft forever
12: bond0.12@bond0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether 24:6... brd ff:ff:ff:ff:ff:ff
      inet 172.16.../16 brd 172.17.0.1 scope global bond0.12
        valid_lft forever preferred_lft forever
      inet6 fe80::246...%bond0.12 brd ff:ff:ff:ff:ff:ff scope link proto kernel ll
        valid_lft forever preferred_lft forever
r630-suse:/home/onemantech #
```

```
Bonding Mode: IEEE 802.3ad Dynamic link aggregation
Transmit Hash Policy: layer2+3 (2)
MII Status: up
MII Polling Interval (ms): 100
Up Delay (ms): 0
Down Delay (ms): 0
Peer Notification Delay (ms): 0

802.3ad info
LACP active: on
LACP rate: slow
Min links: 0
Aggregator selection policy (ad_select): stable
System priority: 65535
System MAC address: 24:6...:58
Active Aggregator Info:
  Aggregator ID: 1
  Number of ports: 2
  Actor Key: 9
  Partner Key: 3614
  Partner Mac Address: 30:b...:21:25:15:3b
```

```
Slave Interface: em3
MII Status: up
Speed: 1000 Mbps
Duplex: full
Link Failure Count: 0
Permanent HW addr: 24:00:00:00:00:58
Slave queue ID: 0
Aggregator ID: 1
Actor Churn State: none
Partner Churn State: none
Actor Churned Count: 0
Partner Churned Count: 0
details actor lacp pdu:
    system priority: 65535
```

```
Slave Interface: em4
MII Status: up
Speed: 1000 Mbps
Duplex: full
Link Failure Count: 0
Permanent HW addr: 24:00:00:01:00:59
Slave queue ID: 0
Aggregator ID: 1
Actor Churn State: none
Partner Churn State: none
Actor Churned Count: 0
Partner Churned Count: 0
details actor lacp pdu:
    system priority: 65535
```

// switch network configurations for the lacp/bonding in addition to the switch ISL trunking

```
#  
interface gigabitEthernet 1/0/15  
    switchport mode general  
    switchport general allowed vlan 11 untagged  
    switchport general allowed vlan 10,12 tagged  
    switchport pvid 11  
    channel-group 2 mode active  
#  
interface gigabitEthernet 1/0/16  
    switchport mode general  
    switchport general allowed vlan 11 untagged  
    switchport general allowed vlan 10,12 tagged  
    switchport pvid 11  
    channel-group 2 mode active
```

```
#  
interface gigabitEthernet 1/0/21  
    switchport mode trunk  
    switchport trunk allowed vlan 10-12  
    switchport pvid 11  
    channel-group 1 mode active  
#  
interface gigabitEthernet 1/0/22  
    switchport mode trunk  
    switchport trunk allowed vlan 10-12  
    switchport pvid 11  
    channel-group 1 mode active  
#  
interface gigabitEthernet 1/0/23  
    switchport mode trunk  
    switchport trunk allowed vlan 10-12  
    switchport pvid 11  
    channel-group 1 mode active  
#  
interface gigabitEthernet 1/0/24  
    switchport mode trunk  
    switchport trunk allowed vlan 10-12  
    switchport pvid 11  
    channel-group 1 mode active
```

// lacp – bonding configurations for ports 21-24 ISL, and the lacp bond for new storage server ports 15,16



// redesigned home lab network for vlans and better traffic segmentation implementation

TL-SGC3424-V2-SW1#show vlan			
VLAN	Name	Status	Ports
1	Default VLAN	active	Gi1/0/1, Gi1/0/15, Gi1/0/16, Gi1/0/20 Gi1/0/21, Gi1/0/22, Gi1/0/23, Gi1/0/24
10	device-mgmt	active	Gi1/0/1, Gi1/0/15, Gi1/0/16, Gi1/0/20 Gi1/0/21, Gi1/0/22, Gi1/0/23, Gi1/0/24
11	general-data	active	Gi1/0/1, Gi1/0/2, Gi1/0/3, Gi1/0/4 Gi1/0/5, Gi1/0/6, Gi1/0/7, Gi1/0/8 Gi1/0/9, Gi1/0/10, Gi1/0/11, Gi1/0/12 Gi1/0/13, Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19, Gi1/0/20 Gi1/0/21, Gi1/0/22, Gi1/0/23, Gi1/0/24
12	port-channel-isl	active	Gi1/0/1, Gi1/0/15, Gi1/0/16, Gi1/0/20 Gi1/0/21, Gi1/0/22, Gi1/0/23, Gi1/0/24

// port channel – lacp configurations

```
TL-SGC3424-V2-SW1#show etherchannel
    Channel-group listing:
    -----
    Group: 1
    -----
    Group state = L2
    Ports: 4 MaxPorts = 16
    Protocol: LACP

    Group: 2
    -----
    Group state = L2
    Ports: 2 MaxPorts = 16
    Protocol: LACP
```

```
Group: 1
-----
Group state = L2
Ports: 4 MaxPorts = 16
Protocol: LACP
    Ports in the group:
    -----
Flags: S - Device is sending Slow LACPDUs  F - Device is sending fast LACPDUs.
      A - Device is in active mode.          P - Device is in passive mode.

Local information:
    Port      Flags     State        LACP port      Admin      Oper      Port
    Port      Flags     State        Priority       Key        Key       State
Gi1/0/21   SA        Up         32768        0x1        0xfb3    0x3d
Gi1/0/22   SA        Up         32768        0x1        0xfb3    0x3d
Gi1/0/23   SA        Up         32768        0x1        0xfb3    0x3d
Gi1/0/24   SA        Up         32768        0x1        0xfb3    0x3d

Group: 2
-----
Group state = L2
Ports: 2 MaxPorts = 16
Protocol: LACP
    Ports in the group:
    -----
Flags: S - Device is sending Slow LACPDUs  F - Device is sending fast LACPDUs.
      A - Device is in active mode.          P - Device is in passive mode.

Local information:
    Port      Flags     State        LACP port      Admin      Oper      Port
    Port      Flags     State        Priority       Key        Key       State
Gi1/0/15   SA        Up         32768        0x2        0xe1e    0x3d
Gi1/0/16   SA        Up         32768        0x2        0xe1e    0x3d
```

// pfsense firewall-router configs for implementation

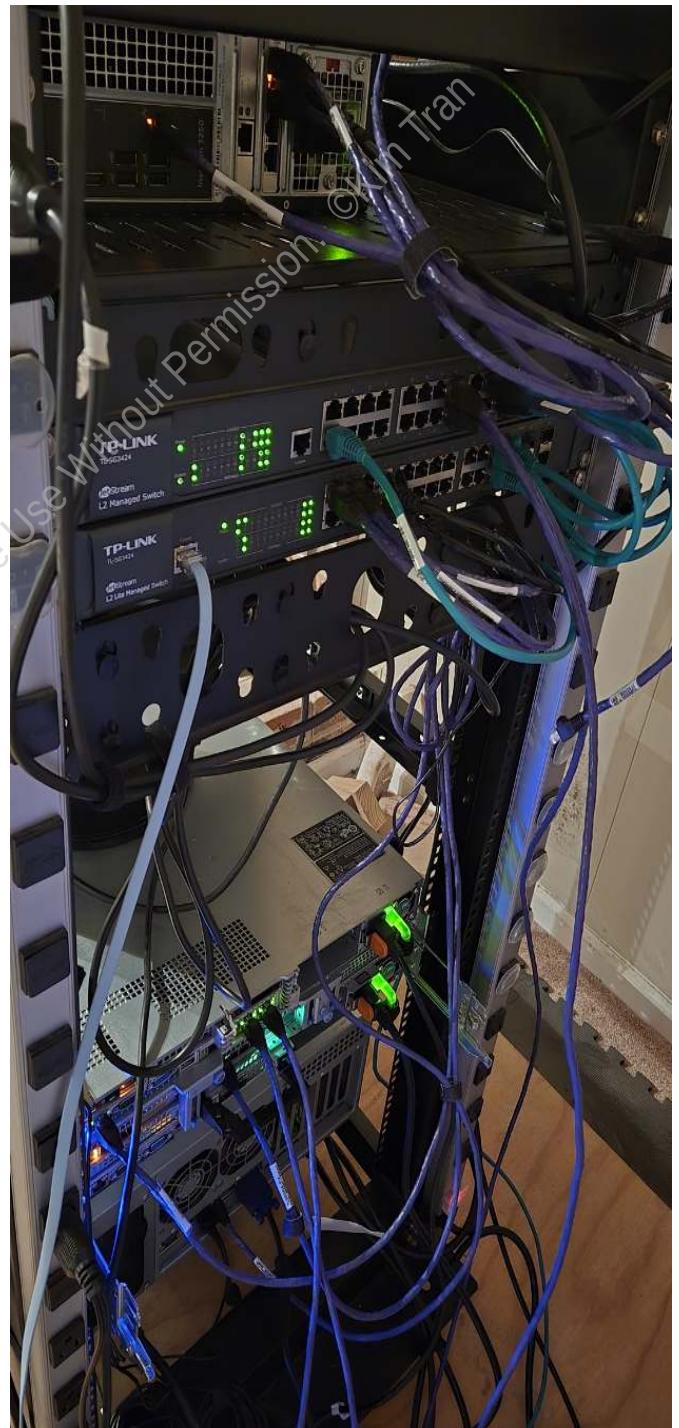
Interface	Network port
WAN	re0 (f4: [REDACTED])
LAN	em0 (00:11:22:33:44:55)
vlan10_device_management	VLAN 10 on em0 - lan (device-management)
vlan12_io_traffic	VLAN 12 on em0 - lan (io_traffic)

Interface Assignments	Interface Groups	Wireless	VLANs	QinQs	PPPs	GREs
VLAN Interfaces						
Interface	VLAN tag		Priority		Description	
em0 (lan)	10				device-management	
em0 (lan)	12				io_traffic	

// general – broad firewall rules to test functionality before secured traffic rules, still in progress

Firewall / Rules / VLAN10_DEVICE_MANAGEMENT							
Floating	WAN	LAN	VLAN10_DEVICE_MANAGEMENT	VLAN12_IO_TRAFFIC			
Rules (Drag to Change Order)							
□	States	Protocol	Source	Port	Destination	Port	Gateway
<input type="checkbox"/>	✓ 0 /19 KiB	IPv4 *	VLAN10_DEVICE_MANAGEMENT net	*	*	*	*
<input type="checkbox"/>	✓ 0 /0 B	IPv4 *	VLAN10_DEVICE_MANAGEMENT net	*	*	*	*

// cable dressing – management still in progress :-)



// she's a beauty isn't she :-)



2 solaris hosts serving as backup for each other, in addition to one iscsi san allocating block storage (win/nix) and smb/nfs shares 😊

```
root@vnx-solaris-storage:~# zpool status
pool: rpool
state: ONLINE
scan: none requested
config:
```

NAME	STATE	READ	WRITE	CKSUM
rpool	ONLINE	0	0	0
c1t0d0	ONLINE	0	0	0

errors: No known data errors

```
pool: stor-pool
state: ONLINE
scan: none requested
config:
```

NAME	STATE	READ	WRITE	CKSUM
stor-pool	ONLINE	0	0	0
raidz1-0	ONLINE	0	0	0
c3t0d0	ONLINE	0	0	0
c3t1d0	ONLINE	0	0	0
c3t2d0	ONLINE	0	0	0
c3t3d0	ONLINE	0	0	0

errors: No known data errors

← // raid 5 equivalent

```
root@vnx-solaris-storage:~# zfs list -rH stor-pool
stor-pool 592G 2.09T 68.8K /stor-pool
stor-pool/iscsi-san 578G 2.09T 62.8K /stor-pool/iscsi-san
stor-pool/iscsi-san/zvols 578G 2.09T 65.8K /stor-pool/iscsi-san/zvols
stor-pool/iscsi-san/zvols/nix 413G 2.09T 59.8K /stor-pool/iscsi-san/zvols/nix
stor-pool/iscsi-san/zvols/nix/v1 103G 2.19T 6.93G -
stor-pool/iscsi-san/zvols/nix/v2 103G 2.18T 7.02G -
stor-pool/iscsi-san/zvols/nix/v3 103G 2.18T 7.02G -
stor-pool/iscsi-san/zvols/nix/v4 103G 2.19T 6.93G -
stor-pool/iscsi-san/zvols/win 165G 2.09T 59.8K /stor-pool/iscsi-san/zvols/win
stor-pool/iscsi-san/zvols/win/v1 20.6G 2.11T 4.94G -
stor-pool/iscsi-san/zvols/win/v2 20.6G 2.11T 694M -
stor-pool/iscsi-san/zvols/win/v3 20.6G 2.11T 4.94G -
stor-pool/iscsi-san/zvols/win/v4 20.6G 2.11T 4.94G -
stor-pool/iscsi-san/zvols/win/v5 20.6G 2.11T 4.45M -
stor-pool/iscsi-san/zvols/win/v6 20.6G 2.11T 4.38M -
stor-pool/iscsi-san/zvols/win/v7 20.6G 2.11T 4.53M -
stor-pool/iscsi-san/zvols/win/v8 20.6G 2.11T 4.52M -
stor-pool/shares 12.7G 2.09T 12.7G /stor-pool/shares
stor-pool/vm-datastore 74.1K 2.09T 74.1K /stor-pool/vm-datastore
```

// block level luns created for
linux/unix and windows os



// general storage pool



// vmware datastore

```
root@vnx-solaris-storage:~# stmfadm list-hg -v
Host Group: nix-solaris
Member: iqn.1986-03.com.sun:01:k-vnx-solaris
Host Group: win-w2k12r2
Member: iqn.1991-05.com.microsoft:vnx-win-host
```

// Iscsi san equivalent of fc san lun masking



```
root@vnx-solaris-storage:~# stmfadm list-state
Operational Status: online
Config Status   : initialized
ALUA Status    : disabled
ALUA Node      : 0

root@vnx-solaris-storage:~# stmfadm list-target -v
Target: iqn.1986-03.com.sun:02:storpool-target
  Operational Status  : Online
  Provider Name     : iscsit
  Alias             : -
  Protocol          : iSCSI
  Sessions          : 2
  Initiator: iqn.1991-05.com.microsoft:vnx-win-host
    Alias: -
    Logged in since: Fri Jul 15 10:31:03 2016
  Initiator: iqn.1986-03.com.sun:01:k-vnx-solaris
    Alias: -
    Logged in since: Thu Jun 30 16:42:31 2016
```

```
root@vnx-solaris-storage:~# stmfadm list-tg -v
Target Group: storpool-tg
  Member: iqn.1986-03.com.sun:02:storpool-target
```

INITIATOR NAME	CHAPUSER	SECRET
iqn.1991-05.com.microsoft:vnx-win-host	chap	set
iqn.1986-03.com.sun:01:k-vnx-solaris	chap	set

// initiator to target
authentication via CHAP

```
root@vnx-solaris-storage:~# itadm list-target -v
TARGET NAME           STATE SESSIONS
iqn.1986-03.com.sun:02:storpool-target      online  2
alias:          -
auth:           chap
targetchapuser:   chap
targetchapsecret: set
tpg-tags:        default
```

```
root@vnx-solaris-storage:~# iscsiadm list initiator-node
Initiator node name: iqn.1986-03.com.sun:01:e00000000000.5765b11a
Initiator node alias: vnx-solaris-storage
Login Parameters (Default/Configured):
  Header Digest: NONE/-
  Data Digest: NONE/-
  Max Connections: 65535/-
Authentication Type: NONE
RADIUS Server: NONE
RADIUS Access: disabled
Tunable Parameters (Default/Configured):
  Session Login Response Time: 60/-
  Maximum Connection Retry Time: 180/-
  Login Retry Time Interval: 60/-
Configured Sessions: 1
```

```
root@vnx-solaris-storage:~# cat /etc/dfs/sharetab
/var/smb/cvol c$    smb   -  Default Share
-  IPC$  smb   -  Remote IPC
/stor-pool stor-pool  nfs  sec=sys,rw
/stor-pool stor-pool  smb   -
/stor-pool/iscsi-san stor-pool_iscsi-san  nfs  sec=sys,rw
/stor-pool/iscsi-san stor-pool_iscsi-san  smb   -
/stor-pool/iscsi-san/zvols stor-pool_iscsi-san_zvols  nfs  sec=sys,rw
/stor-pool/iscsi-san/zvols stor-pool_iscsi-san_zvols  smb   -
/stor-pool/iscsi-san/zvols/nix stor-pool_iscsi-san_zvols_nix  nfs  sec=sys,rw
/stor-pool/iscsi-san/zvols/nix stor-pool_iscsi-san_zvols_nix  smb   -
/stor-pool/iscsi-san/zvols/win stor-pool_iscsi-san_zvols_win  nfs  sec=sys,rw
/stor-pool/iscsi-san/zvols/win stor-pool_iscsi-san_zvols_win  smb   -
/stor-pool/shares  stor-pool_shares  nfs  sec=sys,rw
/stor-pool/shares  stor-pool_shares  smb   -
/stor-pool/vm-datastore stor-pool_vm-datastore  nfs  sec=sys,rw
/stor-pool/vm-datastore stor-pool_vm-datastore  smb   -
```

// system verification of storage pools/shares being shared out / exported via smb/nfs

```
root@vnx-solaris-storage:~# stmfadm list-lu
LU Name: 600144F03E9782000000574FD81B0001
LU Name: 600144F03E9782000000574FD81F0002
LU Name: 600144F03E9782000000574FD8210003
LU Name: 600144F03E9782000000574FD8250004
LU Name: 600144F03E9782000000574FD82C0005
LU Name: 600144F03E9782000000574FD82F0006
LU Name: 600144F03E9782000000574FD8320007
LU Name: 600144F03E9782000000574FD8350008
LU Name: 600144F03E9782000000574FD8410009
LU Name: 600144F03E9782000000574FD843000A
LU Name: 600144F03E9782000000574FD847000B
LU Name: 600144F03E9782000000574FD849000C
```

// block level luns created and listed

root@vnx-solaris-storage:~# stmfadm list-lu -v

LU Name: 600144F03E9782000000574FD81B0001

 Operational Status : Online

 Provider Name : sbd

 Alias : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v1

 View Entry Count : 1

 Data File : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v1

 Meta File : not set

 Size : 21474836480

 Block Size : 512

 Management URL : not set

 Vendor ID : SUN

 Product ID : COMSTAR

 Serial Num : not set

 Write Protect : Disabled

 Write Cache Mode Select: Enabled

 Writeback Cache : Enabled

 Access State : Active

LU Name: 600144F03E9782000000574FD81F0002

 Operational Status : Online

 Provider Name : sbd

 Alias : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v2

 View Entry Count : 1

 Data File : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v2

 Meta File : not set

 Size : 21474836480

 Block Size : 512

 Management URL : not set

 Vendor ID : SUN

 Product ID : COMSTAR

 Serial Num : not set

 Write Protect : Disabled

 Write Cache Mode Select: Enabled

 Writeback Cache : Enabled

 Access State : Active



// lun details, os, size, alias, state, etc

LU Name: 600144F03E9782000000574FD8210003
Operational Status : Online
Provider Name : sbd
Alias : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v3
View Entry Count : 1
Data File : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v3
Meta File : not set
Size : 21474836480
Block Size : 512
Management URL : not set
Vendor ID : SUN
Product ID : COMSTAR
Serial Num : not set
Write Protect : Disabled
Write Cache Mode Select: Enabled
Writeback Cache : Enabled
Access State : Active

LU Name: 600144F03E9782000000574FD8250004
Operational Status : Online
Provider Name : sbd
Alias : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v4
View Entry Count : 1
Data File : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v4
Meta File : not set
Size : 21474836480
Block Size : 512
Management URL : not set
Vendor ID : SUN
Product ID : COMSTAR
Serial Num : not set
Write Protect : Disabled
Write Cache Mode Select: Enabled
Writeback Cache : Enabled
Access State : Active

LU Name: 600144F03E9782000000574FD82C0005
Operational Status : Online
Provider Name : sbd
Alias : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v5
View Entry Count : 0
Data File : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v5
Meta File : not set
Size : 21474836480
Block Size : 512
Management URL : not set
Vendor ID : SUN
Product ID : COMSTAR
Serial Num : not set
Write Protect : Disabled
Write Cache Mode Select: Enabled
Writeback Cache : Enabled
Access State : Active

LU Name: 600144F03E9782000000574FD82F0006
Operational Status : Online
Provider Name : sbd
Alias : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v6
View Entry Count : 0
Data File : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v6
Meta File : not set
Size : 21474836480
Block Size : 512
Management URL : not set
Vendor ID : SUN
Product ID : COMSTAR
Serial Num : not set
Write Protect : Disabled
Write Cache Mode Select: Enabled
Writeback Cache : Enabled
Access State : Active

LU Name: 600144F03E9782000000574FD8320007

Operational Status : Online
Provider Name : sbd
Alias : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v7
View Entry Count : 0
Data File : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v7
Meta File : not set
Size : 21474836480
Block Size : 512
Management URL : not set
Vendor ID : SUN
Product ID : COMSTAR
Serial Num : not set
Write Protect : Disabled
Write Cache Mode Select: Enabled
Writeback Cache : Enabled
Access State : Active

LU Name: 600144F03E9782000000574FD8350008

Operational Status : Online
Provider Name : sbd
Alias : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v8
View Entry Count : 0
Data File : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v8
Meta File : not set
Size : 21474836480
Block Size : 512
Management URL : not set
Vendor ID : SUN
Product ID : COMSTAR
Serial Num : not set
Write Protect : Disabled
Write Cache Mode Select: Enabled
Writeback Cache : Enabled
Access State : Active

LU Name: 600144F03E9782000000574FD8410009

Operational Status : Online
Provider Name : sbd
Alias : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/nix/v1
View Entry Count : 1
Data File : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/nix/v1
Meta File : not set
Size : 107374182400
Block Size : 512
Management URL : not set
Vendor ID : SUN
Product ID : COMSTAR
Serial Num : not set
Write Protect : Disabled
Write Cache Mode Select: Enabled
Writeback Cache : Enabled
Access State : Active

LU Name: 600144F03E9782000000574FD843000A

Operational Status : Online
Provider Name : sbd
Alias : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/nix/v2
View Entry Count : 1
Data File : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/nix/v2
Meta File : not set
Size : 107374182400
Block Size : 512
Management URL : not set
Vendor ID : SUN
Product ID : COMSTAR
Serial Num : not set
Write Protect : Disabled
Write Cache Mode Select: Enabled
Writeback Cache : Enabled
Access State : Active

LU Name: 600144F03E9782000000574FD847000B

Operational Status : Online
Provider Name : sbd
Alias : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/nix/v3
View Entry Count : 1
Data File : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/nix/v3
Meta File : not set
Size : 107374182400
Block Size : 512
Management URL : not set
Vendor ID : SUN
Product ID : COMSTAR
Serial Num : not set
Write Protect : Disabled
Write Cache Mode Select: Enabled
Writeback Cache : Enabled
Access State : Active

LU Name: 600144F03E9782000000574FD849000C

Operational Status : Online
Provider Name : sbd
Alias : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/nix/v4
View Entry Count : 1
Data File : /dev/zvol/rdsk/stor-pool/iscsi-san/zvols/nix/v4
Meta File : not set
Size : 107374182400
Block Size : 512
Management URL : not set
Vendor ID : SUN
Product ID : COMSTAR
Serial Num : not set
Write Protect : Disabled
Write Cache Mode Select: Enabled
Writeback Cache : Enabled
Access State : Active

```
root@vnx-solaris-storage:~# sbdadm list-lu
```

Found 12 LU(s)

GUID	DATA SIZE	SOURCE
600144f03e9782000000574fd81b0001	21474836480	/dev/zvol/rdsk/stor-pool/iscsi-san/zvcis/win/v1
600144f03e9782000000574fd81f0002	21474836480	/dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v2
600144f03e9782000000574fd8210003	21474836480	/dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v3
600144f03e9782000000574fd8250004	21474836480	/dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v4
600144f03e9782000000574fd82c0005	21474836480	/dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v5
600144f03e9782000000574fd82f0006	21474836480	/dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v6
600144f03e9782000000574fd8320007	21474836480	/dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v7
600144f03e9782000000574fd8350008	21474836480	/dev/zvol/rdsk/stor-pool/iscsi-san/zvols/win/v8
600144f03e9782000000574fd8410009	107374182400	/dev/zvol/rdsk/stor-pool/iscsi-san/zvols/nix/v1
600144f03e9782000000574fd843000a	107374182400	/dev/zvol/rdsk/stor-pool/iscsi-san/zvols/nix/v2
600144f03e9782000000574fd847000b	107374182400	/dev/zvol/rdsk/stor-pool/iscsi-san/zvols/nix/v3
600144f03e9782000000574fd849000c	107374182400	/dev/zvol/rdsk/stor-pool/iscsi-san/zvols/nix/v4

// lun mapping details

```
root@vnx-solaris-storage:~# ls /mnt/  
r610-shares-backup
```

```
root@vnx-solaris-storage:~# ls /mnt/r610-shares-backup/  
solaris-test-file-for-mounts.txt test2 test4  
test1 test3 test5
```

```
root@k-vnx-solaris-mobile-cart:~# zpool status
pool: r610p-146gb
state: ONLINE
scan: none requested
config:
```

NAME	STATE	READ	WRITE	CKSUM
r610p-146gb	ONLINE	0	0	0
raidz1-0	ONLINE	0	0	0
c2t2d0	ONLINE	0	0	0
c2t3d0	ONLINE	0	0	0
c2t4d0	ONLINE	0	0	0
c2t5d0	ONLINE	0	0	0

errors: No known data errors

```
pool: rpool
state: ONLINE
scan: none requested
config:
```

NAME	STATE	READ	WRITE	CKSUM
rpool	ONLINE	0	0	0
c2t0d0	ONLINE	0	0	0

errors: No known data errors

← // storage pools health status

```
pool: storpool-zvol
state: ONLINE
scan: none requested
config:
```

NAME	STATE	READ	WRITE	CKSUM
storpool-zvol	ONLINE	0	0	0
mirror-0	ONLINE	0	0	0
c0t600144F03E9782000000574FD843000Ad0	ONLINE	0	0	0
c0t600144F03E9782000000574FD847000Bd0	ONLINE	0	0	0
mirror-1	ONLINE	0	0	0
c0t600144F03E9782000000574FD849000Cd0	ONLINE	0	0	0
c0t600144F03E9782000000574FD8410009d0	ONLINE	0	0	0

```
errors: No known data errors
```

```
root@k-vnx-solaris-mobile-cart:~# zfs list -rH r610p-146gb
r610p-146gb 214K 401G 62.8K /r610p-146gb
r610p-146gb/storpool-shares-backup 70.3K 400G 70.3K /r610p-146gb/storpool-shares-backup
```

```
root@k-vnx-solaris-mobile-cart:~# ls /r610p-146gb/storpool-shares-backup/
solaris-test-file-for-mounts.txt test2 test4
test1 test3 test5
```

```
root@k-vnx-solaris-mobile-cart:~# zfs list -rH storpool-zvol
storpool-zvol 12.8G 183G 12.7G /storpool-zvol
```

```
root@k-vnx-solaris-mobile-cart:~# ls /mnt/
stor-pool vm-datastore
```

// raid 10 equivalent,
mirrored configuration

```
root@k-vnx-solaris-mobile-cart:~# ls -ls /mnt/stor-pool/
total 26591631
858 -rwxrwxrwx 1 nobody staff 427680 Aug 22 2013 bootmgr
4 -rwxrwxrwx 1 nobody staff 1 Jun 18 2013 BOOTNXT
632181 -rw-r--r-- 1 nobody nobody 330301440 Jun 22 13:31 debian-8.2.0-i386-netinst.iso
7750575 -rw-r--r-- 1 nobody nobody 3994091520 Jun 22 13:34 debian-8.4.0-amd64-DVD-1.iso
9113654 -rw-r--r-- 1 nobody nobody 4674091008 Jun 22 13:39 debian-8.4.0-amd64-DVD-2.iso
9094305 -rw-r--r-- 1 nobody nobody 4663099392 Jun 22 13:43 debian-8.4.0-amd64-DVD-3.iso
5 -rwxrwxrwx 1 nobody staff 479 Jul 14 11:00 drive-scans.txt
11 -rwxrwxrwx 1 nobody staff 8371 Jun 30 20:04 jf-d1689-post-ica.txt
11 -rwxrwxrwx 1 nobody staff 8866 Jun 30 21:46 jf-d1689-post-nas.txt
5 -rwxrwxrwx 1 nobody staff 459 Apr 14 02:33 post-nas-install-commands.txt
4 -rwxrwxrwx 1 root root 0 Jun 20 16:00 solaris-storage-text-file-for-mounts.txt
7 drwxr-xr-x 2 nobody nobody 7 Jun 20 22:25 test-folder
4 -rwxrwxrwx 1 nobody staff 5242880000 Jul 15 09:54 test1
7 drwxrwxrwx+ 2 nobody staff 6 Jun 21 23:27 testing-windows
```

```
root@k-vnx-solaris-mobile-cart:~# ls -ls /mnt/vm-datastore/
total 3
3 drwxr-xr-x 5 vnxadmin staff 5 Jun 30 15:09 vms
```

```
root@k-vnx-solaris-mobile-cart:~# ls -ls /mnt/vm-datastore/vms/
total 9
3 drwxr-xr-x 3 vnxadmin staff 6 Jun 30 14:06 debian-v8x64
3 drwxr-xr-x 2 vnxadmin staff 5 Jun 30 14:01 test
3 drwxr-xr-x 3 vnxadmin staff 5 Jul 11 16:07 test2
```

```
root@k-vnx-solaris-mobile-cart:~# iscsiadadm list target -v
Target: iqn.1986-03.com.sun:02:storpool-target
  Alias: -
  TPGT: 1
  ISID: 4000002a0000
  Connections: 1
    CID: 0
      IP address (Local): 172.16.100.3:36702
      IP address (Peer): 172.16.100.4:3260
      Transport Type: socket
      Discovery Method: SendTargets
      Login Parameters (Negotiated):
        Data Sequence In Order: yes
        Data PDU In Order: yes
        Default Time To Retain: 20
        Default Time To Wait: 2
        Error Recovery Level: 0
        First Burst Length: 65536
        Immediate Data: yes
        Initial Ready To Transfer (R2T): yes
        Max Burst Length: 262144
        Max Outstanding R2T: 1
        Max Receive Data Segment Length: 32768
        Max Connections: 32
        Header Digest: NONE
        Data Digest: NONE
```

← // iscsi storage target details

```
root@k-vnx-solaris-mobile-cart:~# iscsiadadm list initiator-node
Initiator node name: iqn.1986-03.com.sun:01:k-vnx-solaris
Initiator node alias: k-vnx-solaris-mobile-cart
    Login Parameters (Default/Configured):
        Header Digest: NONE/-
        Data Digest: NONE/-
        Max Connections: 65535/-
    Authentication Type: CHAP
        CHAP Name: chap
    RADIUS Server: NONE
    RADIUS Access: disabled
    Tunable Parameters (Default/Configured):
        Session Login Response Time: 60/-
        Maximum Connection Retry Time: 180/-
        Login Retry Time Interval: 60/-
    Configured Sessions: 1
```

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NFS lab setup/troubleshooting

//checking for the nfs server service

```
d17-suse:/home/onemantech # systemctl status nfs-server.service
● nfs-server.service - NFS server and services
  Loaded: loaded (/usr/lib/systemd/system/nfs-server.service; enabled; vendor preset: disabled)
  Drop-In: /usr/lib/systemd/system/nfs-server.service.d
            └─10-options.conf, nfsserver.conf
              /run/systemd/generator/nfs-server.service.d
                  └─order-with-mounts.conf
  Active: active (exited) since Wed 2025-10-15 17:40:11 EDT; 22h ago
    Process: 1185 ExecStartPre=/usr/sbin/exportfs -r (code=exited, status=0/SUCCESS)
    Process: 1187 ExecStart=/usr/sbin/rpc.nfsd $NFSD_OPTIONS (code=exited, status=0/SUCCESS)
   Main PID: 1187 (code=exited, status=0/SUCCESS)

Oct 15 17:40:09 d17-suse systemd[1]: Starting NFS server and services...
Oct 15 17:40:11 d17-suse systemd[1]: Finished NFS server and services.
d17-suse:/home/onemantech #
```

//listing created shares for nfs exports on the server

```
d17-suse:/home/onemantech # ls -lsht /nfstest/
total 0
0 drwxr-xr-x 1 onemantech users 28 Oct 15 21:13 nfs2
0 drwxr-xr-x 1 onemantech users 28 Oct 15 21:12 nfs1
0 drwxrwxrwx 1 onemantech users 28 Oct 14 21:00 nfs3
d17-suse:/home/onemantech #
```

//premount checking

```
d17-suse:/home/onemantech # ls -lsht /mnt/nfs{1,2,3}
/mnt/nfs1:
total 0

/mnt/nfs2:
total 0

/mnt/nfs3:
total 0
d17-suse:/home/onemantech #
```

//premount checking of /etc/exports , ‘no_root_squash’ intentionally omitted

```
d17-suse:/home/onemanotech # cat /etc/exports
# See the exports(5) manpage for a description of the syntax of this file.
# This file contains a list of all directories that are to be exported to
# other computers via NFS (Network File System).
# This file used by rpc.nfsd and rpc.mountd. See their manpages for details
# on how make changes in this file effective.

/nfstest/nfs1    172.16.10.103(rw,no_subtree_check,sync)
/nfstest/nfs2    172.16.10.103(rw,no_subtree_check,sync)
/nfstest/nfs3    172.16.10.103(rw,no_subtree_check,sync)
d17-suse:/home/onemanotech #
```

//premount checking of /etc/fstab, ‘user’ parameter intentional to allow local user mounts

```
d17-suse:/home/onemanotech # cat /etc/fstab
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67   /
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67   /var          btrfs defaults          0  0
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67   /usr/local      btrfs subvol=@/var        0  0
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67   /tmp           btrfs subvol=@/usr/local  0  0
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67   /srv            btrfs subvol=@/tmp       0  0
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67   /root           btrfs subvol=@/srv       0  0
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67   /opt            btrfs subvol=@/root     0  0
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67   /home           btrfs subvol=@/opt      0  0
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67   /boot/grub2/x86_64-efi btrfs subvol=@/home      0  0
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67   /boot/grub2/i386-pc  btrfs subvol=@/boot/grub2/x86_64-efi 0  0
UUID=06F4-C67F                                /boot/efi        vfat  subvol=@/boot/grub2/i386-pc  0  0
UUID=9ebce4c0-4338-46a4-a324-595c2d067637   swap            swap  defaults          0  2
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67   /.snapshots      btrfs subvol=@/.snapshots  0  0
172.16.10.103:/zstor/naspool                 /mnt/zstor      nfs   rw,user,defaults,noauto 0  0
172.16.10.103:/nfstest/nfs1                  /mnt/nfs1       nfs   user,defaults,noauto  0  0
172.16.10.103:/nfstest/nfs2                  /mnt/nfs2       nfs   user,defaults,noauto  0  0
172.16.10.103:/nfstest/nfs3                  /mnt/nfs3       nfs   user,defaults,noauto  0  0
d17-suse:/home/onemanotech #
```

//system re-reading the fstab file and exporting the file system

```
d17-suse:/home/onemanotech # mount -a
d17-suse:/home/onemanotech #
d17-suse:/home/onemanotech # exportfs -rav
exporting 172.16.10.103:/nfstest/nfs3
exporting 172.16.10.103:/nfstest/nfs2
exporting 172.16.10.103:/nfstest/nfs1
d17-suse:/home/onemanotech #
```

//mounting of the shares

```
d17-suse:/home/onemantech # mount -v -t nfs 172.16.10.103:/nfstest/nfs1 /mnt/nfs1
mount.nfs: timeout set for Thu Oct 16 16:19:25 2025
mount.nfs: trying text-based options 'vers=4.2,addr=172.16.10.103,clientaddr=172.16.10.103'
d17-suse:/home/onemantech #
d17-suse:/home/onemantech # mount -v -t nfs 172.16.10.103:/nfstest/nfs2 /mnt/nfs2
mount.nfs: timeout set for Thu Oct 16 16:19:33 2025
mount.nfs: trying text-based options 'vers=4.2,addr=172.16.10.103,clientaddr=172.16.10.103'
d17-suse:/home/onemantech #
d17-suse:/home/onemantech # mount -v -t nfs 172.16.10.103:/nfstest/nfs3 /mnt/nfs3
mount.nfs: timeout set for Thu Oct 16 16:19:41 2025
mount.nfs: trying text-based options 'vers=4.2,addr=172.16.10.103,clientaddr=172.16.10.103'
d17-suse:/home/onemantech #
```

//post mount checking

```
172.16.10.103:/nfstest/nfs1 on /mnt/nfs1 type nfs4 (rw,relatime,vers=4.2,rsize=1048576,wsize=1048576,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=172.1
6.10.103,local_lock=none,addr=172.16.10.103)
172.16.10.103:/nfstest/nfs2 on /mnt/nfs2 type nfs4 (rw,relatime,vers=4.2,rsize=1048576,wsize=1048576,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=172.1
6.10.103,local_lock=none,addr=172.16.10.103)
172.16.10.103:/nfstest/nfs3 on /mnt/nfs3 type nfs4 (rw,relatime,vers=4.2,rsize=1048576,wsize=1048576,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=172.1
6.10.103,local_lock=none,addr=172.16.10.103)
d17-suse:/home/onemantech #
```

//enlarged view

```
172.16.10.103:/nfstest/nfs1 on /mnt/nfs1 type nfs4 (rw,relatime,vers=4.2,rsize=1048576,wsize=1048576,
6.10.103,local_lock=none,addr=172.16.10.103)
172.16.10.103:/nfstest/nfs2 on /mnt/nfs2 type nfs4 (rw,relatime,vers=4.2,rsize=1048576,wsize=1048576,
6.10.103,local_lock=none,addr=172.16.10.103)
172.16.10.103:/nfstest/nfs3 on /mnt/nfs3 type nfs4 (rw,relatime,vers=4.2,rsize=1048576,wsize=1048576,
6.10.103,local_lock=none,addr=172.16.10.103)
d17-suse:/home/onemantech #
```

```
d17-suse:/home/onemantech # ls -lsht /mnt/nfs{1,2,3}
/mnt/nfs2:
total 0
0 -rw-r--r-- 1 root root 0 Oct 14 20:48 localtestfile2

/mnt/nfs1:
total 0
0 -rw-r--r-- 1 root root 0 Oct 14 20:48 localtestfile1

/mnt/nfs3:
total 0
0 -rw-r--r-- 1 root root 0 Oct 14 20:48 localtestfile3
d17-suse:/home/onemantech #
```

//showing exports on local/specified server

```
d17-suse:/home/onemantech # showmount -e 172.16.10.103
Export list for 172.16.10.103:
/nfstest/nfs3 172.16.10.103
/nfstest/nfs2 172.16.10.103
/nfstest/nfs1 172.16.10.103
d17-suse:/home/onemantech #
```

//showing rpcinfo [truncated output]

program	version	netid	address	service	owner
100000	4	tcp6	::.0.111	portmapper	superuser
100000	3	tcp6	::.0.111	portmapper	superuser
100000	4	udp6	::.0.111	portmapper	superuser
100000	3	udp6	::.0.111	portmapper	superuser
100000	4	tcp	0.0.0.0.0.111	portmapper	superuser
100000	3	tcp	0.0.0.0.0.111	portmapper	superuser
100000	2	tcp	0.0.0.0.0.111	portmapper	superuser
100000	4	udp	0.0.0.0.0.111	portmapper	superuser
100000	3	udp	0.0.0.0.0.111	portmapper	superuser
100000	2	udp	0.0.0.0.0.111	portmapper	superuser
100000	4	local	/run/rpcbind.sock	portmapper	superuser
100000	3	local	/run/rpcbind.sock	portmapper	superuser
100005	1	udp	0.0.0.0.78.80	mountd	superuser
100005	1	tcp	0.0.0.0.78.80	mountd	superuser
100005	1	udp6	::.78.80	mountd	superuser
100005	1	tcp6	::.78.80	mountd	superuser
100005	2	udp	0.0.0.0.78.80	mountd	superuser
100005	2	tcp	0.0.0.0.78.80	mountd	superuser
100005	2	udp6	::.78.80	mountd	superuser
100005	2	tcp6	::.78.80	mountd	superuser
100005	3	udp	0.0.0.0.78.80	mountd	superuser
100005	3	tcp	0.0.0.0.78.80	mountd	superuser
100005	3	udp6	::.78.80	mountd	superuser
100005	3	tcp6	::.78.80	mountd	superuser
100024	1	udp	0.0.0.0.194.65	status	479
100024	1	tcp	0.0.0.0.230.97	status	479

//testing creation of new file on shares, nfs1 and nfs2 will have permission denied as expected due to 'no_root_squash' parameter, while nfs3 will write the file, also due to share permissions of nfs3

```
d17-suse:/home/onemanotech # cat /etc/exports
# See the exports(5) manpage for a description of the syntax of this file.
# This file contains a list of all directories that are to be exported to
# other computers via NFS (Network File System).
# This file used by rpc.nfsd and rpc.mountd. See their manpages for details
# on how make changes in this file effective.

/nfstest/nfs1    172.16.10.103(rw,no_root_squash,no_subtree_check,sync)
/nfstest/nfs2    172.16.10.103(rw,no_root_squash,no_subtree_check,sync)
/nfstest/nfs3    172.16.10.103(rw,no_subtree_check,sync)

d17-suse:/home/onemanotech #
d17-suse:/home/onemanotech # exportfs -rav
exporting 172.16.10.103:/nfstest/nfs3
exporting 172.16.10.103:/nfstest/nfs2
exporting 172.16.10.103:/nfstest/nfs1
d17-suse:/home/onemanotech #
```

//reconfigured the /etc/exports file with the correct parameter, re-exported the share and tested the write to the share, executed as expected

```
d17-suse:/home/onemanotech# touch /mnt/nfs1/newtestfile
touch: cannot touch '/mnt/nfs1/newtestfile': Permission denied
d17-suse:/home/onemanotech #
d17-suse:/home/onemanotech # touch /mnt/nfs2/newtestfile
touch: cannot touch '/mnt/nfs2/newtestfile': Permission denied
d17-suse:/home/onemanotech #
d17-suse:/home/onemanotech # touch /mnt/nfs3/newtestfile
d17-suse:/home/onemanotech #
d17-suse:/home/onemanotech #
d17-suse:/home/onemanotech # ls -lsht /mnt/nfs3
total 0
0 -rw-r--r-- 1 nobody nobody 0 Oct 16 16:25 newtestfile
0 -rw-r--r-- 1 root root 0 Oct 14 20:48 localtestfile3
d17-suse:/home/onemanotech #
```

```
d17-suse:/home/onemanotech # touch /mnt/nfs1/newtestfile
d17-suse:/home/onemanotech #
d17-suse:/home/onemanotech # touch /mnt/nfs2/newtestfile
d17-suse:/home/onemanotech #
d17-suse:/home/onemanotech # ls -lsht /mnt/nfs{1,2,3}
/mnt/nfs2:
total 0
0 -rw-r--r-- 1 root root 0 Oct 16 16:30 newtestfile
0 -rw-r--r-- 1 root root 0 Oct 14 20:48 localtestfile2

/mnt/nfs1:
total 0
0 -rw-r--r-- 1 root root 0 Oct 16 16:30 newtestfile
0 -rw-r--r-- 1 root root 0 Oct 14 20:48 localtestfile1

/mnt/nfs3:
total 0
0 -rw-r--r-- 1 nobody nobody 0 Oct 16 16:25 newtestfile
0 -rw-r--r-- 1 root root 0 Oct 14 20:48 localtestfile3
d17-suse:/home/onemanotech # █
```

//unmounted the shares

```
d17-suse:/home/onemanotech # umount -v /mnt/nfs1
/mnt/nfs1: nfs4 mount point detected
/mnt/nfs1: unmounted
d17-suse:/home/onemanotech # umount -v /mnt/nfs2
/mnt/nfs2: nfs4 mount point detected
/mnt/nfs2: unmounted
d17-suse:/home/onemanotech # umount -v /mnt/nfs3
/mnt/nfs3: nfs4 mount point detected
/mnt/nfs3: unmounted
d17-suse:/home/onemanotech # █
```

//showing local user mounting without escalated privileges

```
onemantech@d17-suse:~> mount -v -t nfs 172.16.10.103:/nfstest/nfs1 /mnt/nfs1
mount.nfs: timeout set for Thu Oct 16 16:38:35 2025
mount.nfs: trying text-based options 'vers=4.2,addr=172.16.10.103,clientaddr=172.16.10.103'
onemantech@d17-suse:~>
onemantech@d17-suse:~> mount -v -t nfs 172.16.10.103:/nfstest/nfs2 /mnt/nfs2
mount.nfs: timeout set for Thu Oct 16 16:38:49 2025
mount.nfs: trying text-based options 'vers=4.2,addr=172.16.10.103,clientaddr=172.16.10.103'
onemantech@d17-suse:~>
onemantech@d17-suse:~> mount -v -t nfs 172.16.10.103:/nfstest/nfs3 /mnt/nfs3
mount.nfs: timeout set for Thu Oct 16 16:38:55 2025
mount.nfs: trying text-based options 'vers=4.2,addr=172.16.10.103,clientaddr=172.16.10.103'
onemantech@d17-suse:~> █
```

```
172.16.10.103:/nfstest/nfs1 on /mnt/nfs1 type nfs4 (rw,nosuid,nodev,noexec,relatime,vers=4.2,rsize=1048576,wsize=1048576,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=172.16.10.103,local_lock=none,addr=172.16.10.103,user=onemantech)
172.16.10.103:/nfstest/nfs2 on /mnt/nfs2 type nfs4 (rw,nosuid,nodev,noexec,relatime,vers=4.2,rsize=1048576,wsize=1048576,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=172.16.10.103,local_lock=none,addr=172.16.10.103,user=onemantech)
172.16.10.103:/nfstest/nfs3 on /mnt/nfs3 type nfs4 (rw,nosuid,nodev,noexec,relatime,vers=4.2,rsize=1048576,wsize=1048576,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=172.16.10.103,local_lock=none,addr=172.16.10.103,user=onemantech)
onemantech@d17-suse:~> █
```

//enlarged

```
172.16.10.103:/nfstest/nfs1 on /mnt/nfs1 type nfs4 (rw,nosuid,nodev,noexec,relatime,
sys,clientaddr=172.16.10.103,local_lock=none,addr=172.16.10.103,user=onemantech)
172.16.10.103:/nfstest/nfs2 on /mnt/nfs2 type nfs4 (rw,nosuid,nodev,noexec,relatime,
sys,clientaddr=172.16.10.103,local_lock=none,addr=172.16.10.103,user=onemantech)
172.16.10.103:/nfstest/nfs3 on /mnt/nfs3 type nfs4 (rw,nosuid,nodev,noexec,relatime,
sys,clientaddr=172.16.10.103,local_lock=none,addr=172.16.10.103,user=onemantech)
onemantech@d17-suse:~> █
```

```
onemantech@d17-suse:~> ls -lsht /mnt/nfs{1,2,3}
/mnt/nfs2:
total 0
0 -rw-r--r-- 1 root root 0 Oct 16 16:30 newtestfile
0 -rw-r--r-- 1 root root 0 Oct 14 20:48 localtestfile2

/mnt/nfs1:
total 0
0 -rw-r--r-- 1 root root 0 Oct 16 16:30 newtestfile
0 -rw-r--r-- 1 root root 0 Oct 14 20:48 localtestfile1

/mnt/nfs3:
total 0
0 -rw-r--r-- 1 nobody nobody 0 Oct 16 16:25 newtestfile
0 -rw-r--r-- 1 root root 0 Oct 14 20:48 localtestfile3
onemantech@d17-suse:~> █
```

//local server/client packet capture of loopback interface of nfs traffic of writing to the share and the nfsiostat capture

```
d17-suse:/home/onemantech # tcpdump -G 60 -W 1 -i lo 'tcp port 2049' -w /mnt/nfs1/tcpdump-pcap
tcpdump: listening on lo, link-type EN10MB (Ethernet), snapshot length 262144 bytes
Maximum file limit reached: 1
19907 packets captured
57930 packets received by filter
16598 packets dropped by kernel
d17-suse:/home/onemantech #
```

```
d17-suse:/home/onemantech # ls -lsht /mnt/nfs1
total 1.5G
1.1G -rw-r--r-- 1 root      root  1.1G Oct 16 16:51 tcpdump-pcap
500M -rw-r--r-- 1 onemantech users 500M Oct 16 16:50 testfile500m
    0 -rw-r--r-- 1 root      root   0 Oct 16 16:30 newtestfile
    0 -rw-r--r-- 1 root      root   0 Oct 14 20:48 localtestfile1
d17-suse:/home/onemantech #
```

```
onemantech@d17-suse:~> dd if=/dev/zero of=/mnt/nfs1/testfile500m bs=1M count=500
500+0 records in
500+0 records out
524288000 bytes (524 MB, 500 MiB) copied, 10.4369 s, 50.2 MB/s
onemantech@d17-suse:~>
```

```
172.16.10.103:/nfstest/nfs1 mounted on /mnt/nfs1:
          ops/s    rpc backlog
            396.000        0.000

read:      ops/s      kB/s      kB/op      retrans    avg RTT (ms)    avg exe (ms)
          0.000      0.000      0.000        0 (0.0%)      0.000        0.000
write:     ops/s      kB/s      kB/op      retrans    avg RTT (ms)    avg exe (ms)
          382.000  391321.539    1024.402        0 (0.0%)      9.565       92.482

172.16.10.103:/nfstest/nfs1 mounted on /mnt/nfs1:
          ops/s    rpc backlog
            107.000        0.000

read:      ops/s      kB/s      kB/op      retrans    avg RTT (ms)    avg exe (ms)
          0.000      0.000      0.000        0 (0.0%)      0.000        0.000
write:     ops/s      kB/s      kB/op      retrans    avg RTT (ms)    avg exe (ms)
          118.000  120879.703    1024.404        0 (0.0%)      8.949       206.932
```

//reading of the pcap file from the cli [truncated]

```
d17-suse:/home/oneman tech # tcpdump -r /mnt/nfs1/tcpdump-pcap | less
```

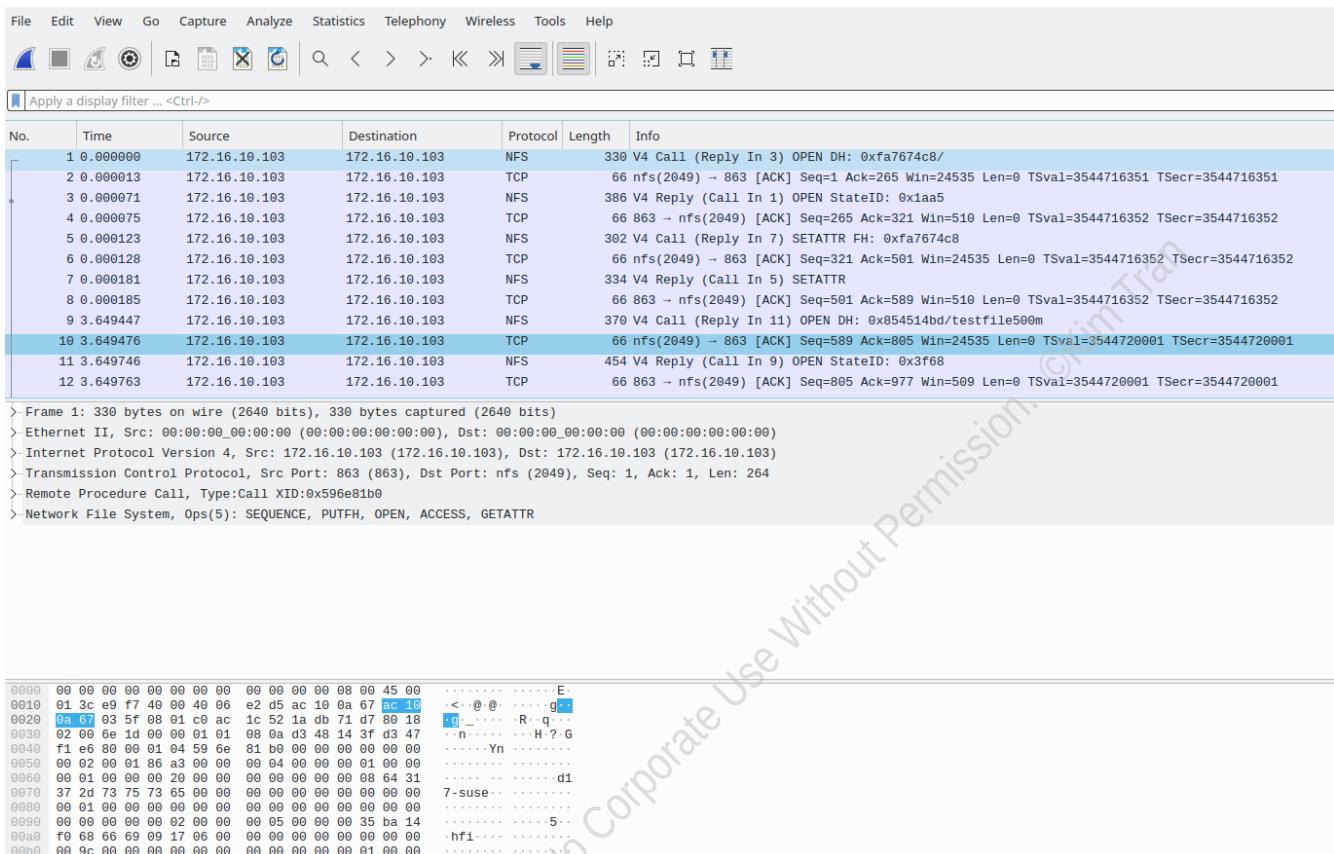
```
16:50:40.304277 IP 172.16.10.103.863 > 172.16.10.103.nfs: Flags [P.], seq 3232504914:3232505178, ack 450589143, win 512, options [nop,nop,TS val 3544716351 ecr 3544707558], length 264: NFS request xid 1500414384 260 getattr fh 0,2/53
16:50:40.304290 IP 172.16.10.103.nfs > 172.16.10.103.863: Flags [.], ack 264, win 24535, options [nop,nop,TS val 3544716351 ecr 3544716351], length 0
16:50:40.304348 IP 172.16.10.103.nfs > 172.16.10.103.863: Flags [P.], seq 1:321, ack 264, win 24535, options [nop,nop,TS val 3544716352 ecr 3544716351], length 320: NFS reply xid 1500414384 reply ok 316 getattr NON 5 ids 0/-1173032856 sz 1718159639
16:50:40.304352 IP 172.16.10.103.863 > 172.16.10.103.nfs: Flags [.], ack 321, win 510, options [nop,nop,TS val 3544716352 ecr 3544716352], length 0
16:50:40.304400 IP 172.16.10.103.863 > 172.16.10.103.nfs: Flags [P.], seq 264:500, ack 321, win 512, options [nop,nop,TS val 3544716352 ecr 3544716352], length 236: NFS request xid 1517191600 232 getattr fh 0,2/53
16:50:40.304405 IP 172.16.10.103.nfs > 172.16.10.103.863: Flags [.], ack 500, win 24535, options [nop,nop,TS val 3544716352 ecr 3544716352], length 0
16:50:40.304458 IP 172.16.10.103.863 > 172.16.10.103.863: Flags [P.], seq 321:589, ack 500, win 24535, options [nop,nop,TS val 3544716352 ecr 3544716352], length 268: NFS reply xid 1517191600 reply ok 264 getattr NON 4 ids 0/-1173032856 sz 1718159639
```

//enlarged

```
16:50:40.304277 IP 172.16.10.103.863 > 172.16.10.103.nfs: Flags [P.], seq 3232504914:3232505178, ack 450589143, win 512, options [nop,nop,TS val 3544716351 ecr 3544707558], length 264: NFS request xid 1500414384 260 getattr fh 0,2/53
16:50:40.304290 IP 172.16.10.103.nfs > 172.16.10.103.863: Flags [.], ack 264, win 24535, options [nop,nop,TS val 3544716351 ecr 3544716351], length 0
16:50:40.304348 IP 172.16.10.103.nfs > 172.16.10.103.863: Flags [P.], seq 1:321, ack 264, win 24535, options [nop,nop,TS val 3544716352 ecr 3544716351], length 320: NFS reply xid 1500414384 reply ok 316 getattr NON 5 ids 0/-1173032856 sz 1718159639
16:50:40.304352 IP 172.16.10.103.863 > 172.16.10.103.nfs: Flags [.], ack 321, win 510, options [nop,nop,TS val 3544716352 ecr 3544716352], length 0
16:50:40.304400 IP 172.16.10.103.863 > 172.16.10.103.nfs: Flags [P.], seq 264:500, ack 321, win 512, options [nop,nop,TS val 3544716352 ecr 3544716352], length 236: NFS request xid 1517191600 232 getattr fh 0,2/53
```

```
ack 450589143, win 512, options [nop,nop,TS val 3544716351 ecr 3544707558]
[nop,nop,TS val 3544716351 ecr 3544716351], length 0
35, options [nop,nop,TS val 3544716352 ecr 3544716351], length 320: NFS re
nop,nop,TS val 3544716352 ecr 3544716352], length 0
512, options [nop,nop,TS val 3544716352 ecr 3544716352], length 236: NFS re
[nop,nop,TS val 3544716352 ecr 3544716352], length 0
24535, options [nop,nop,TS val 3544716352 ecr 3544716352], length 268: NFS
[TS val 3544716352 ecr 3544716352], length 0
```

//reading output of same file through the wireshark gui



//similar packet capture with tcpdump equivalent of tshark

```

d17-suse:/home/onemanotech # tshark -i lo -a duration:60 -f 'tcp port 2049' -w /mnt/nfs2/tsharkdump-pcap
Running as user "root" and group "root". This could be dangerous.
Capturing on 'Loopback: lo'
** (tshark:17364) 17:01:31.784756 [Main MESSAGE] -- Capture started.
** (tshark:17364) 17:01:31.784823 [Main MESSAGE] -- File: "/mnt/nfs2/tsharkdump-pcap"
7234
17188 packets dropped from lo
d17-suse:/home/onemanotech #

```

```

d17-suse:/home/onemanotech # ls -lsht /mnt/nfs2
total 373M
373M -rw----- 1 root root 373M Oct 16 17:02 tsharkdump-pcap
  0 -rw-r--r-- 1 root root    0 Oct 16 16:30 newtestfile
  0 -rw-r--r-- 1 root root    0 Oct 14 20:48 localtestfile2
d17-suse:/home/onemanotech #

```

//commenting out the /etc/exports, setting the fstab for user mount with protocol udp and version 3 of nfs for the share mounts

```
d17-suse:/home/oneman tech # cat /etc/exports
# See the exports(5) manpage for a description of the syntax of this file.
# This file contains a list of all directories that are to be exported to
# other computers via NFS (Network File System).
# This file used by rpc.nfsd and rpc.mountd. See their manpages for details
# on how make changes in this file effective.

#/nfstest/nfs1 172.16.10.103(rw,no_subtree_check,sync)
#/nfstest/nfs2 172.16.10.103(rw,no_subtree_check,sync)
#/nfstest/nfs3 172.16.10.103(rw,no_subtree_check,sync)

d17-suse:/home/oneman tech #
d17-suse:/home/oneman tech # exportfs -rav
exportfs: No file systems exported!
d17-suse:/home/oneman tech #
```

```
d17-suse:/home/oneman tech # cat /etc/fstab
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67 /
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67 /var
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67 /usr/local
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67 /tmp
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67 /srv
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67 /root
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67 /opt
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67 /home
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67 /boot/grub2/x86_64-efi
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67 /boot/grub2/i386-pc
UUID=06F4-C67F /boot/efi
UUID=9ebce4c0-4338-46a4-a324-595c0d067637 swap
UUID=47c1c763-2b1c-41b9-8c06-463f3a53ff67 /.snapshots
172.16.10.103:/zstor/naspool /mnt/zstor
172.16.10.103:/nfstest/nfs1 /mnt/nfs1
172.16.10.103:/nfstest/nfs2 /mnt/nfs2
172.16.10.103:/nfstest/nfs3 /mnt/nfs3

d17-suse:/home/oneman tech #
```

```
d17-suse:/home/oneman tech # showmount -e 172.16.10.103
Export list for 172.16.10.103:
d17-suse:/home/oneman tech #
```

//manual export of shares and mounting, confirmation of version 3 and protocol udp

```
d17-suse:/home/onemantech # exportfs -v -o rw,sync,no_subtree_check 172.16.10.103:/nfstest/nfs1
exportfs: No file systems exported!
exporting 172.16.10.103:/nfstest/nfs1
d17-suse:/home/onemantech #
d17-suse:/home/onemantech # exportfs -v -o rw,sync,no_subtree_check 172.16.10.103:/nfstest/nfs2
exportfs: No file systems exported!
exporting 172.16.10.103:/nfstest/nfs2
d17-suse:/home/onemantech #
d17-suse:/home/onemantech # exportfs -v -o rw,sync,no_subtree_check 172.16.10.103:/nfstest/nfs3
exportfs: No file systems exported!
exporting 172.16.10.103:/nfstest/nfs3
d17-suse:/home/onemantech #
```

```
onemantech@d17-suse:~> mount -v -t nfs 172.16.10.103:/nfstest/nfs1 /mnt/nfs1
mount.nfs: timeout set for Thu Oct 16 17:25:46 2025
mount.nfs: trying text-based options 'proto=udp,vers=3,addr=172.16.10.103'
mount.nfs: prog 100003, trying vers=3, prot=17
mount.nfs: trying 172.16.10.103 prog 100003 vers 3 prot UDP port 2049
mount.nfs: prog 100005, trying vers=3, prot=17
mount.nfs: trying 172.16.10.103 prog 100005 vers 3 prot UDP port 20048
onemantech@d17-suse:~>
onemantech@d17-suse:~> mount -v -t nfs 172.16.10.103:/nfstest/nfs2 /mnt/nfs2
mount.nfs: timeout set for Thu Oct 16 17:25:53 2025
mount.nfs: trying text-based options 'proto=udp,vers=3,addr=172.16.10.103'
mount.nfs: prog 100003, trying vers=3, prot=17
mount.nfs: trying 172.16.10.103 prog 100003 vers 3 prot UDP port 2049
mount.nfs: prog 100005, trying vers=3, prot=17
mount.nfs: trying 172.16.10.103 prog 100005 vers 3 prot UDP port 20048
onemantech@d17-suse:~>
onemantech@d17-suse:~> mount -v -t nfs 172.16.10.103:/nfstest/nfs3 /mnt/nfs3
mount.nfs: timeout set for Thu Oct 16 17:25:59 2025
mount.nfs: trying text-based options 'proto=udp,vers=3,addr=172.16.10.103'
mount.nfs: prog 100003, trying vers=3, prot=17
mount.nfs: trying 172.16.10.103 prog 100003 vers 3 prot UDP port 2049
mount.nfs: prog 100005, trying vers=3, prot=17
mount.nfs: trying 172.16.10.103 prog 100005 vers 3 prot UDP port 20048
onemantech@d17-suse:~>
```

```
172.16.10.103:/nfstest/nfs1 on /mnt/nfs1 type nfs (rw,nosuid,nodev,noexec,relatime,vers=3,rsize=32768,wsIZE=32768,namLEN=255,hard,proto=udp,timeo=11,retrans=3,sec=sys,mounTaddr=172.16.10.103,mountvers=3,mountport=20048,mountproto=udp,local_lock=none,addr=172.16.10.103,user=onemantech)
172.16.10.103:/nfstest/nfs2 on /mnt/nfs2 type nfs (rw,nosuid,nodev,noexec,relatime,vers=3,rsize=32768,wsIZE=32768,namLEN=255,hard,proto=udp,timeo=11,retrans=3,sec=sys,mounTaddr=172.16.10.103,mountvers=3,mountport=20048,mountproto=udp,local_lock=none,addr=172.16.10.103,user=onemantech)
172.16.10.103:/nfstest/nfs3 on /mnt/nfs3 type nfs (rw,nosuid,nodev,noexec,relatime,vers=3,rsize=32768,wsIZE=32768,namLEN=255,hard,proto=udp,timeo=11,retrans=3,sec=sys,mounTaddr=172.16.10.103,mountvers=3,mountport=20048,mountproto=udp,local_lock=none,addr=172.16.10.103,user=onemantech)
onemantech@d17-suse:~>
```

//enlarged

```
172.16.10.103:/nfstest/nfs1 on /mnt/nfs1 type nfs (rw,nosuid,no  
taddr=172.16.10.103,mountvers=3,mountport=20048,mountproto=udp,  
172.16.10.103:/nfstest/nfs2 on /mnt/nfs2 type nfs (rw,nosuid,no  
taddr=172.16.10.103,mountvers=3,mountport=20048,mountproto=udp,  
172.16.10.103:/nfstest/nfs3 on /mnt/nfs3 type nfs (rw,nosuid,no  
taddr=172.16.10.103,mountvers=3,mountport=20048,mountproto=udp,  
oneman tech@d17-suse:~> █
```

```
d17-suse:/home/oneman tech # mount -v -t nfs -o vers=3,proto=udp 172.16.10.103:/nfstest/nfs1 /mnt/nfs1  
mount.nfs: timeout set for Thu Oct 16 17:42:06 2025  
mount.nfs: trying text-based options 'vers=3,proto=udp,addr=172.16.10.103'  
mount.nfs: prog 100003, trying vers=3, prot=17  
mount.nfs: trying 172.16.10.103 prog 100003 vers 3 prot UDP port 2049  
mount.nfs: prog 100005, trying vers=3, prot=17  
mount.nfs: trying 172.16.10.103 prog 100005 vers 3 prot UDP port 20048  
d17-suse:/home/oneman tech #  
d17-suse:/home/oneman tech # █
```

A01

VISUAL REPRESENTATION ONLY

NOT TO SCALE

42	1U: 9336C FX2	▶ RF: 0511343 / SN: FD████████JX2 / A-EOR1
41	1U: 9336C FX2	▶ RF: 0511346 / SN: FD████████GPG / A-EOR2
40	2U: ASR 1002 HX	▶ RF: 01█████D / SN: FX████████0AM
39	2U: ASR 1002 HX	▶ RF: 01█████8 / SN: FX████████930
38	1U: N9K C93108 TC-FX	▶ RF: 02█████E / SN: FD████████1PW / SIDE BAND OOB
37	1U: N9K C93180 YC-EX	A01
36	1U: N9K C93180 LC-EX	▶ RF: 02█████B / SN: F████████UNC
35	1U: ASR 1001 X	▶ RF: 02█████C / SN: FX████████3NE
34	1U: ISR 4331	▶ RF: 0████████4 / SN: FL████████MA
33	5U: FLASHBLADE // S	▶ RF: N/A – ABSENT / SN: PCH████████0062
32		
31		NOTES: MISSING BOTH PSU'S
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2		
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A02

45	1U: SWITCH
44	
43	
42	
41	→ RF: N/A – ABSENT / SN: FOC[REDACTED]Q6 → NOTES: 48 PORTS/COPPER, NOT PLUGGED IN
40	
39	
38	
37	
36	
35	
34	
33	
32	
31	
30	1U: N9K C93108 TC-FX 1U: N9K C9336 C-FX2 1U: N9K C9336 C-FX2
29	
28	
27	
26	1U: UCS C220 M5 1U: UCS C220 M4 1U: UCS C220 M4 1U: UCS C220 M4
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4	
3	3U: FLASHARRAY X50R3 → RF: 02[REDACTED]5 / SN: PCH[REDACTED]0047
2	
1	

NOTES: 1-48 COPPER/49-54 QSFP
SN TAG BROKEN
REVERSE SN LOOKUP FOR RF ID

→ RF: 02[REDACTED]B / SN: FL[REDACTED]4SR

→ RF: 02[REDACTED]A / SN: F[REDACTED]OK8H

→ RF: 02[REDACTED]C / SN: FDC[REDACTED]7N

→ NOTES: 1-36 QSFP

→ RF: 02[REDACTED]9 / SN: WZ[REDACTED]2NA

→ RF: 02[REDACTED]BA / SN: WZ[REDACTED]2NV

→ RF: 02[REDACTED]02 / SN: W[REDACTED]02NZ

→ RF: 02[REDACTED]7 / SN: WZ[REDACTED]FXS

→ RF: 02[REDACTED]7 / SN: FCH[REDACTED]WQ

→ RF: 02[REDACTED]2 / SN: FCH[REDACTED]PF

→ RF: 02[REDACTED]5 / SN: WZR[REDACTED]ND

→ RF: 02[REDACTED]5 / SN: WZF[REDACTED]Y2

→ RF: 02[REDACTED]C / SN: WZ[REDACTED]2P3

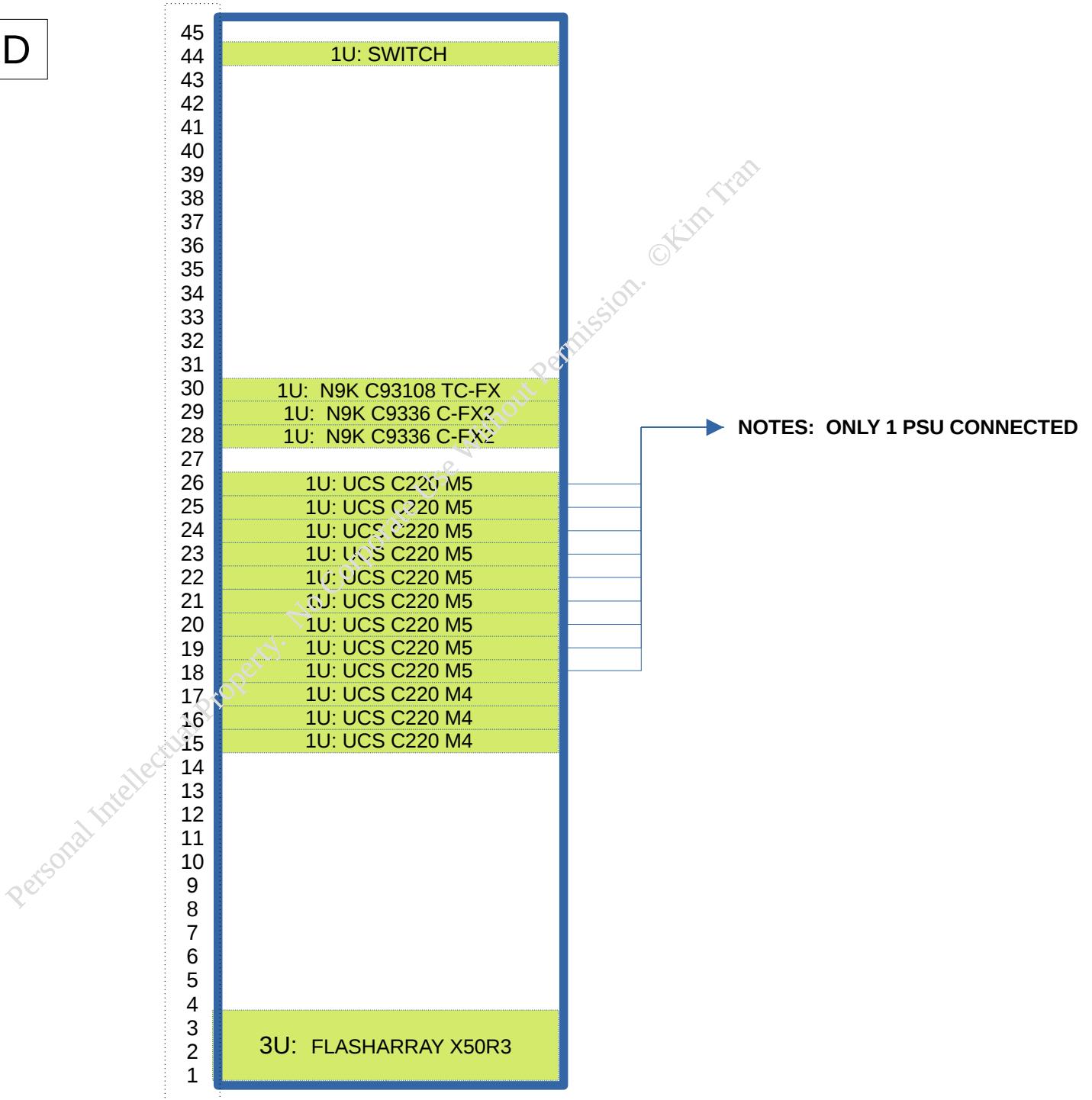
→ RF: 02[REDACTED]1 / SN: WZ[REDACTED]NR

→ RF: 02[REDACTED]1 / SN: WZ[REDACTED]NN

→ RF: 02[REDACTED]6 / SN: FCH19[REDACTED]0

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A02 - EXTENDED



A 03

RF: 0155555 / SN: 105487552

42	1U: N9K C9372 TX
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30	1U: UCS C220 M6
29	1U: UCS C220 M6
28	1U: UCS C220 M6
27	1U: UCS C220 M6
26	
25	1U: N9K C93180 LC-EX
24	1U: N9K C93180 LC-EX
23	1U: UCS C220 M6
22	1U: UCS C220 M6
21	1U: UCS C220 M6
20	
19	2U: UCS C240 M5
18	2U: UCS C240 M5
17	2U: UCS C240 M5
16	2U: UCS C240 M5
15	2U: UCS C240 M5
14	2U: UCS C240 M5
13	2U: UCS C240 M5
12	2U: UCS C240 M5
11	2U: UCS C240 M5
10	2U: UCS C240 M5
9	2U: UCS C240 M5
8	2U: UCS C240 M5
7	2U: UCS C240 M5
6	2U: UCS C240 M5
5	2U: UCS C240 M5
4	2U: UCS C240 M5
3	2U: UCS C240 M5
2	2U: UCS C240 M5
1	2U: UCS C240 M5

→ RF: 0055555 / SN: SA155554LR → NOTES: 1-48C 49-54 QSFP

- ▶ RF: 0255555 / SN: wzp155551e
- ▶ RF: 0255551 / SN: wzp155559h
- ▶ RF: 0255553 / SN: wzp155551p
- ▶ RF: 0255554 / SN: wzp1555536

NOTES: 1-48 SFP 49-54 QSFP

- ▶ RF: 025555b / SN: fl155554pd
- ▶ RF: 025555f / SN: wzp155550cc
- ▶ RF: 0255555 / SN: wzp155553g
- ▶ RF: 0255557 / SN: wzp155558jg
- ▶ RF: 0255558 / SN: wzp155558jj
- ▶ RF: 0255555 / SN: WZ15555N2
- ▶ RF: 0255558 / SN: wzp155559d
- ▶ RF: 0255558 / SN: WZ155558JL
- ▶ RF: 025555B / SN: WZ155558K0
- ▶ RF: 0255555 / SN: wzp155558jt
- ▶ RF: 025555B / SN: wzp15555jp
- ▶ RF: 0255554 / SN: WZ155558KG
- ▶ RF: 025555A / SN: WZ155558JH

→ RF ID
REVERSE LOOKUP
FROM SN

RF: 0210001 / SN: ON1515130002

A 04

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2
1

1U: N9K C93108 TC-FX
1U: N9K C93180 YC-EX
1U: N9K C93180 YC-EX

1U: UCS C220 M7
1U: UCS C220 M7

RF: 021000f / SN: fln0000un
RF: 0210004 / SN: fln0000g9j

1-48 C 49-54 QSFP

1-48 SFP 49-54 QSFP

RF: 032000c / SN: WZP0000002X

RF: 0320004 / SN: ecf10-701425

RF: 0320006 / SN: wzp0000004u

RF: 0320009 / SN: wzp000000gnj

RF: 0320010a / SN: ecf10-701b0d

RF: 0320010e / SN: wzp000000gps

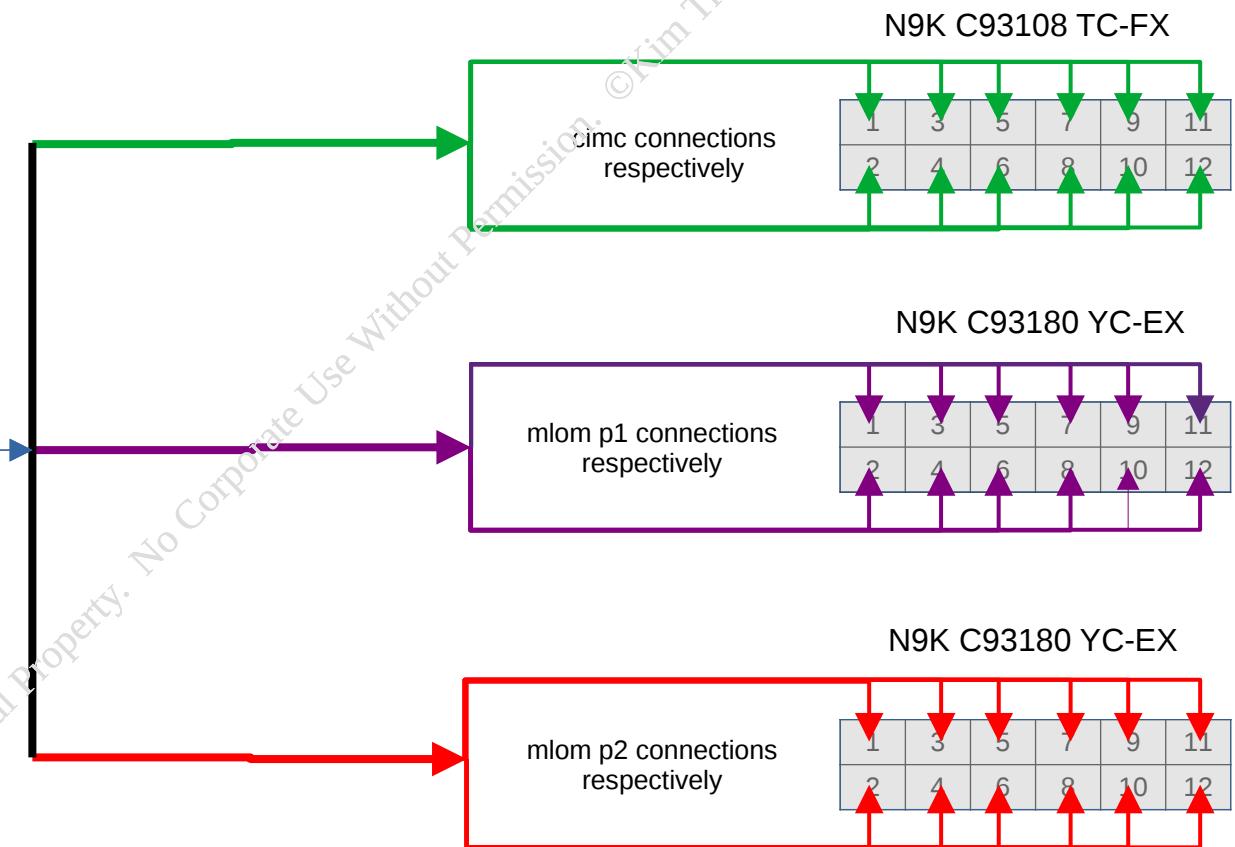
RF: 0320010f / SN: wzp000000nh

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RF: 025551 / SN: 0N10100002

A 04 – Extended 1

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26	1U: N9K C93108 TC-FX
25	1U: N9K C93180 YC-EX
24	1U: N9K C93180 YC-EX
23	
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13	
12	1U: UCS C220 M7
11	1U: UCS C220 M7
10	1U: UCS C220 M7
9	1U: UCS C220 M7
8	1U: UCS C220 M7
7	1U: UCS C220 M7
6	1U: UCS C220 M7
5	1U: UCS C220 M7
4	1U: UCS C220 M7
3	1U: UCS C220 M7
2	1U: UCS C220 M7
1	1U: UCS C220 M7

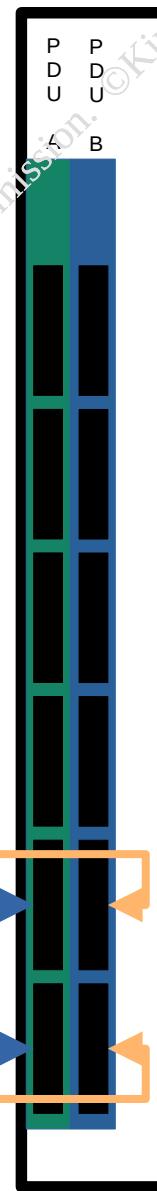


RF: 015551 / SN: 0N1555002

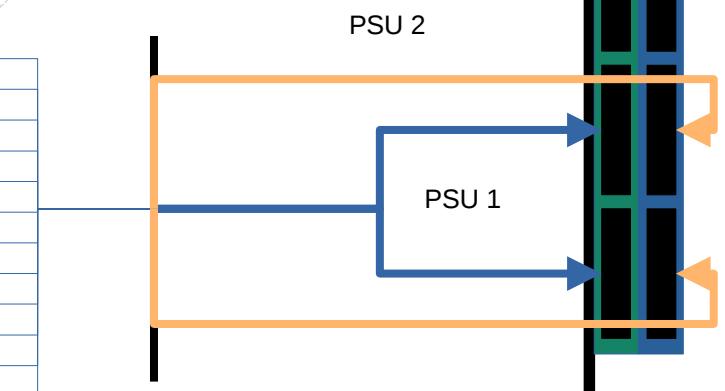
A 04 -EXTENDED 2

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26	1U: N9K C93108 TC-FX
25	1U: N9K C93180 YC-EX
24	1U: N9K C93180 YC-EX
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13	
12	1U: UCS C220 M7
11	1U: UCS C220 M7
10	1U: UCS C220 M7
9	1U: UCS C220 M7
8	1U: UCS C220 M7
7	1U: UCS C220 M7
6	1U: UCS C220 M7
5	1U: UCS C220 M7
4	1U: UCS C220 M7
3	1U: UCS C220 M7
2	1U: UCS C220 M7
1	1U: UCS C220 M7

BACK LEFT
SIDE VIEW
2 PDU



Bank of 6 outlets
1-6, Bottom to Top



r1-12, psu 1 connected to pdu a, and psu2 connected to pdu b respectively, 1-6, 7-12

A 05

45 1U: 2811
44 1U: 3750 E SERIES.

→ RF: 0██████E / SN: 10██████6

→ RF: 00██████1 / SN: ft████████tu → 2811

→ SN: itm01779846
NOTES: CATALYST 3750 E SERIES
NO RF ID FOUND IN
REVERSE SN LOOKUP

19
18 1U: UCS C220 M7
17 1U: UCS C220 M7
16 1U: UCS C220 M7
15 1U: UCS C220 M7
14 1U: UCS C220 M7
13 1U: UCS C220 M7
12 1U: UCS C220 M7
11 1U: UCS C220 M7
10 1U: UCS C220 M7
9 1U: UCS C220 M7
8 1U: UCS C220 M7
7 1U: UCS C220 M7
6 1U: UCS C220 M7
5 1U: UCS C220 M7
4 1U: UCS C220 M7
3 1U: UCS C220 M7
2 1U: UCS C220 M7
1 1U: UCS C220 M7

→ RF: 0██████1 / SN: WZ████████BR8
→ RF: 0██████A / SN: WZ████████RR
→ RF: 03██████ / SN: W████████GQJ
→ RF: 03██████A / SN: W████████CAU
→ RF: 03██████ / SN: W████████C9B
→ RF: 03██████2 / SN: W████████CB5
→ RF: 03██████C / SN: W████████7G6
→ RF: 03██████6C / SN: W████████GN
→ RF: 0██████A / SN: W████████93G4
→ RF: 0██████C / SN: W████████93GT

A 06

RF: 0211051 / SN: R01100000P

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25	1U: N9K C93180 YC-FX
24	1U: N9K C9372 TX
23	1U: UCS FI 6454
22	1U: UCS FI 6454
21	
20	1U: N9K 9396 PX
19	
18	
17	1U: N9K C93180 YC-FX
16	1U: UCS C220 M5
15	1U: UCS C220 M5
14	1U: UCS C220 M5
13	1U: UCS C220 M5
12	1U: UCS C220 M5
11	1U: UCS C220 M5
10	1U: UCS C220 M5
9	1U: UCS C220 M5
8	1U: UCS C220 M5
7	1U: UCS C220 M5
6	1U: UCS C220 M5
5	1U: UCS C220 M5
4	1U: UCS C220 M5
3	1U: UCS C220 M5
2	1U: UCS C220 M5
1	1U: UCS C220 M5

1-48 SFP 49-54 QSFP

1-48 C 49-54 QSFP

RF: 02110c / SN: fd01111s

RF: 02110a / SN: fd01111f

RF: 02110c / SN: wmp2400j8

RF: 021104 / SN: wmp2400je

RF: 021101 / SN: wzp2600sp2

RF: 02110a / SN: wzp2600zm

RF: 02110 / SN: wzp2600pd

RF: 02111 / SN: wzp2600q1z

RF: 02110b / SN: wzp2600pyu

RF: 02110b / SN: wmp2400yc

RF: 02110 / SN: wzp2600et

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A 07

RF: 0██████ / SN: LM████████0052

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1

1U: N9K C93180 YC-FX
1U: N9K C9372 TX
1U: N9K C93180 YC-FX

→ RF: 0██████ / SN: fd████████
→ RF: 0██████ / SN: fd████████bf

1-48 SFP 49-54 QSFP

1-48 C 49-54 QSFP

→ RF: 0██████ / SN: fd████████9e

1U: UCS C220 M7
1U: UCS C220 M7

→ RF: 0██████ / SN: WZ████████K02
→ RF: 0██████ / SN: WZ████████K07
→ RF: 0██████ / SN: W████████K30
→ RF: 0██████ / SN: W████████K32
→ RF: 0██████ / SN: W████████K35
→ RF: 0██████ / SN: W████████K3F
→ RF: 0██████ / SN: WZ████████K3T
→ RF: 0██████ / SN: WZ████████B0

→ RF: 0██████ / SN: WZ████████3U

→ RF: 0██████ / SN: WZ████████31

→ RF: 0██████ / SN: WZ████████33

→ RF: 0██████ / SN: WZ████████36

→ RF: 0██████ / SN: WZ████████3L

1U: UCS 6248 UP
1U: UCS 6248 UP
1U: UCS C220 M5
1U: UCS C220 M5

→ RF: 1██████ / SN: ss████████s5
→ RF: 0██████ / SN: wz████████m1
→ RF: 0██████ / SN: wz████████y8
→ RF: 0██████ / SN: wz████████zg

→ RF: 0██████ / SN: s████████9x

→ RF: 0██████ / SN: wz████████7r

→ RF: 0██████ / SN: wz████████8e

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A 08

RF: 0██████E / SN: LN1████████258

42	
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30	1U: UCS FI 6536
29	1U: UCS FI 6332
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27	1U: UCS FI 6332
26	1U: N9K C93108 TC-FX
25	1U: N9K C93180 YC-FX
24	
23	
22	1U: UCS FI 6454
21	1U: UCS FI 6454
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19	
18	1U: UCS C220 M7
17	1U: UCS C220 M7
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7U:	UCS C 9508

1-36 QSFP

1-32 QSFP

1-48 SFP 49-54 QSFP

1-48 C 49-54 QSFP

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► RF: 0██████f / SN: fd████████34g

► RF: 0██████d / SN: fd████████13

► RF: 0██████c / SN: fd████████tlz

► RF: 0██████e / SN: fd████████02b3

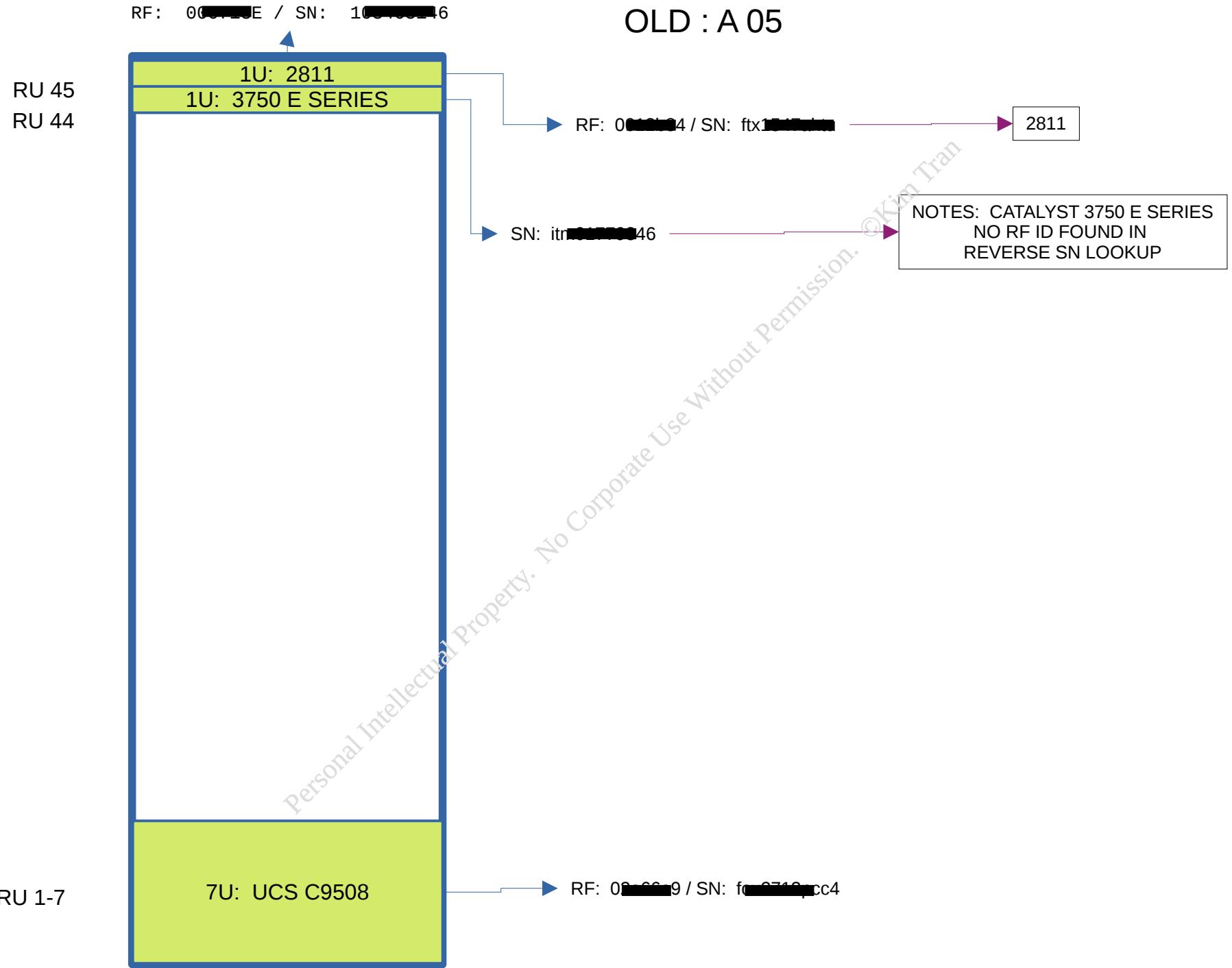
► RF: 03█████a / SN: fd████████ad

► RF: 0██████8 / SN: fd████████du

► RF: 0██████3 / SN: w████████34z

► RF: 0██████1 / SN: ec████████7d <== doublecheck this sn

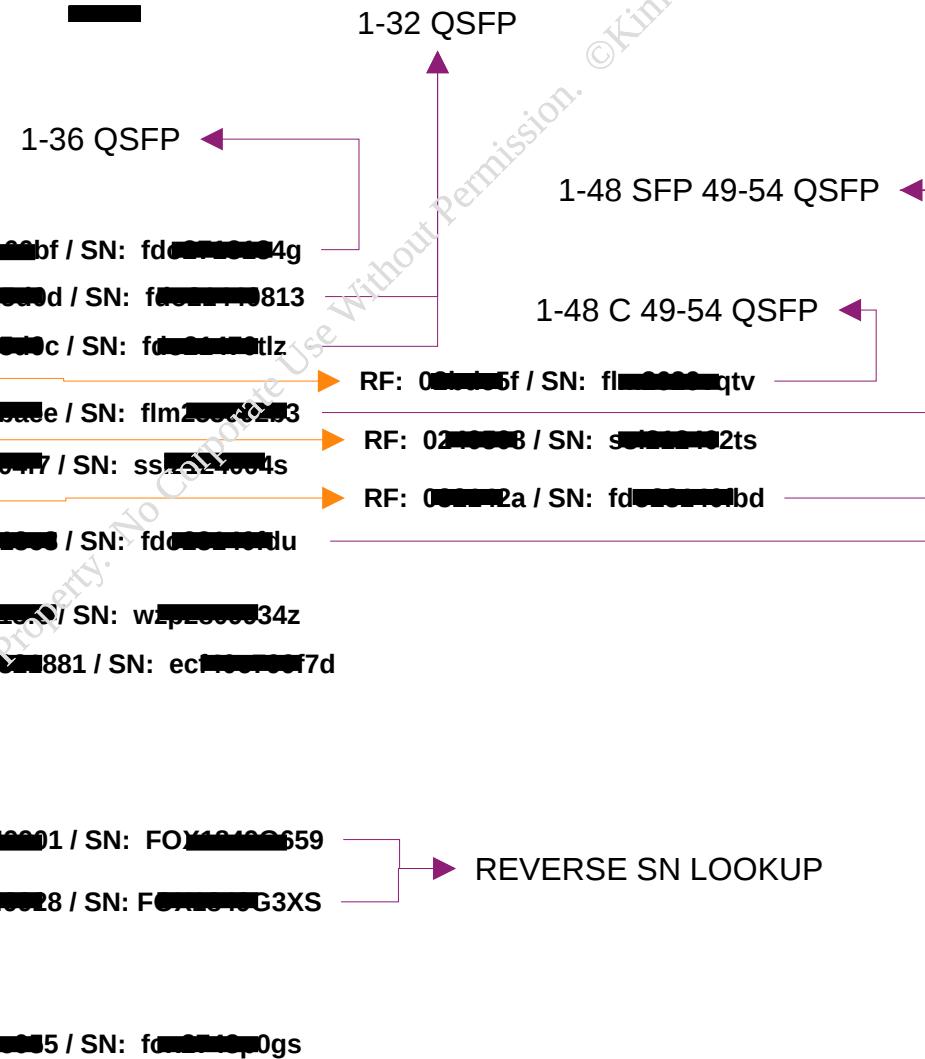
► RF: 0██████5 / SN: fo████████gs



OLD - A 08

RF: 02XXXX / SN: LNXXXX0258

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30	1U: UCS FI 6536
29	1U: UCS FI 6332
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27	1U: UCS FI 6332
26	1U: N9K C93108 TC-FX
25	1U: N9K C93180 YC-FX
24	1U: N2K 2232 TM-E
23	1U: N2K 2232 TM-E
22	1U: UCS FI 6454
21	1U: UCS FI 6454
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18	1U: UCS C220 M7
17	1U: UCS C220 M7
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11	2U: ASR 1002 X
10	2U: ASR 1002 X
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42 1U: UCS C220 M7
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4 1U: UCS C220 M7
3 1U: UCS C220 M7
2 1U: UCS C220 M7
1 1U: UCS C220 M7

The following are projects that illustrates :

Design, Implementation, Deployment, Collaboration, Mentoring, and Stakeholders communications regarding setups of Test bed / QA environments for internal teams within the organization.

Performance QA Testbed

Densification and Relocation of 17 arrays/cabinets including all infrastructure backend reconfigurations

Additional QA Testbed environments

3D modeling and lab/rack layouts drafts

Tivoli Storage Manager internal projects

Test environment re-design and implementation/deployment

Existing test array environment was not properly scoped and designed for requested functional performance

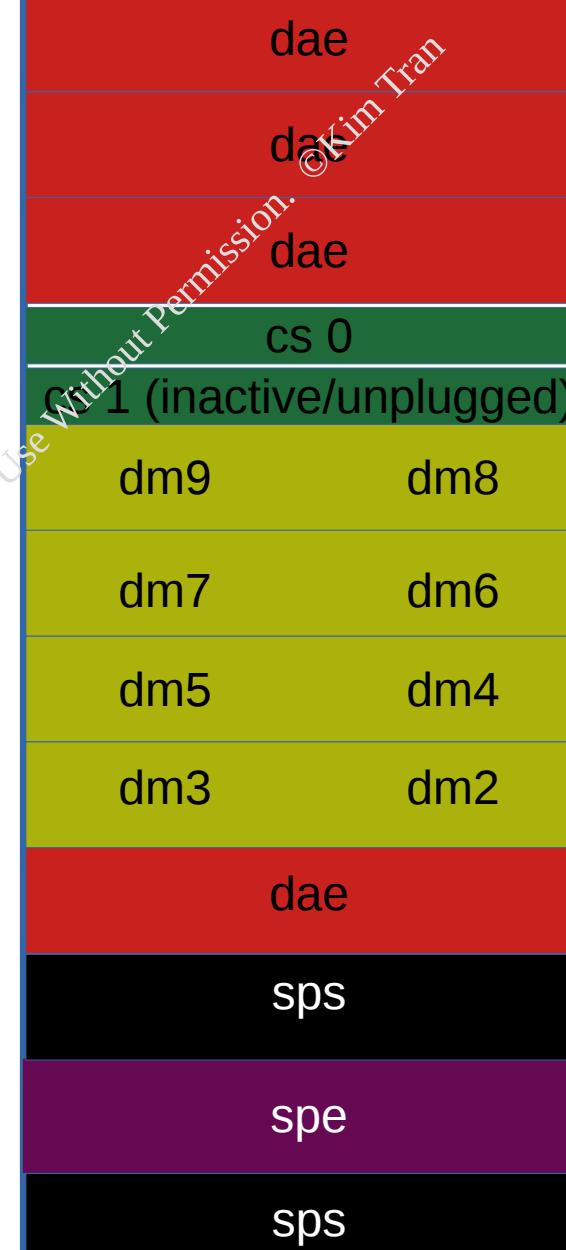
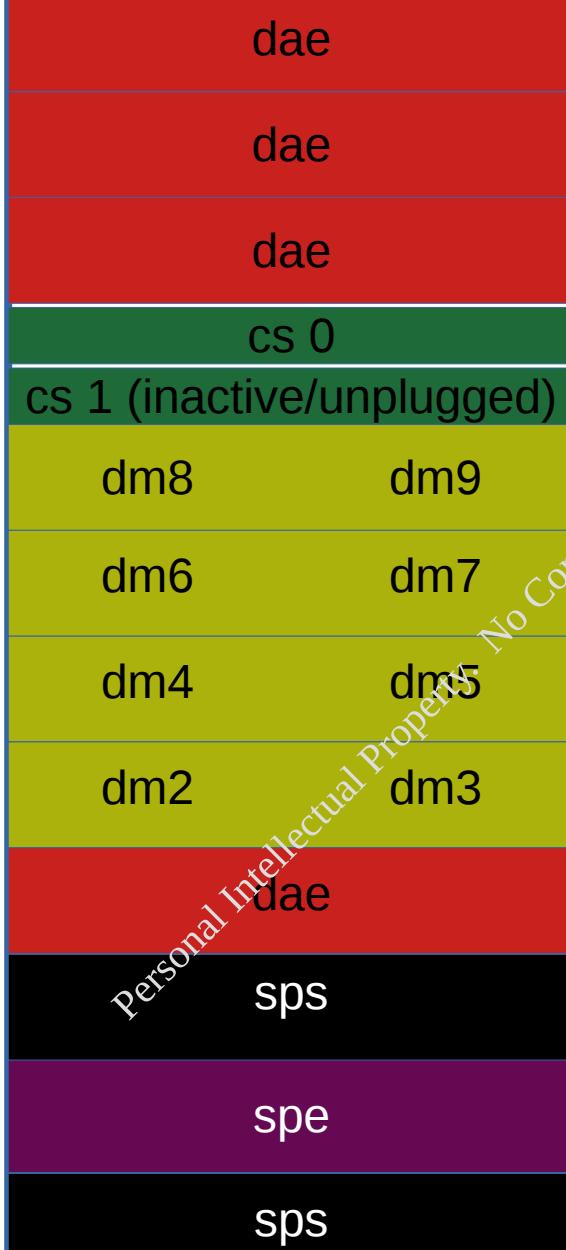
Re-evaluated stakeholder criteria for test environment
Audited existing setup

Redesigned backend infrastructure io cablings
Corrected the infrastructure optical and copper connections to the requested performance io networks

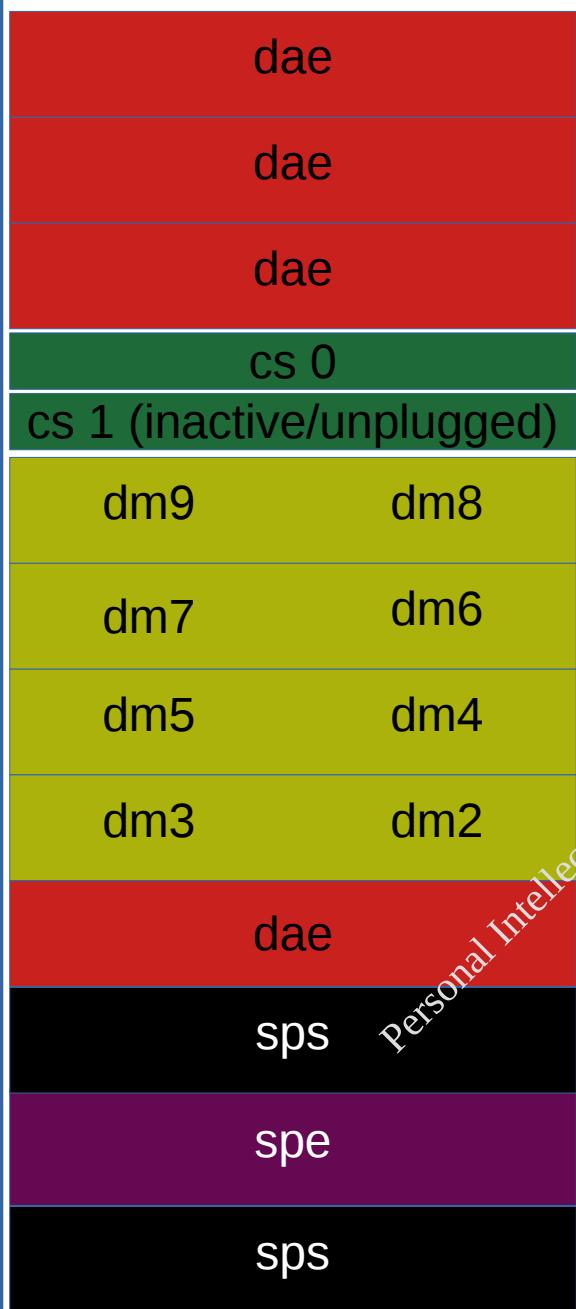
Reconfigured all switch port configurations
Reconfigured all back end and front end configurations

front

back



back / existing spe slices



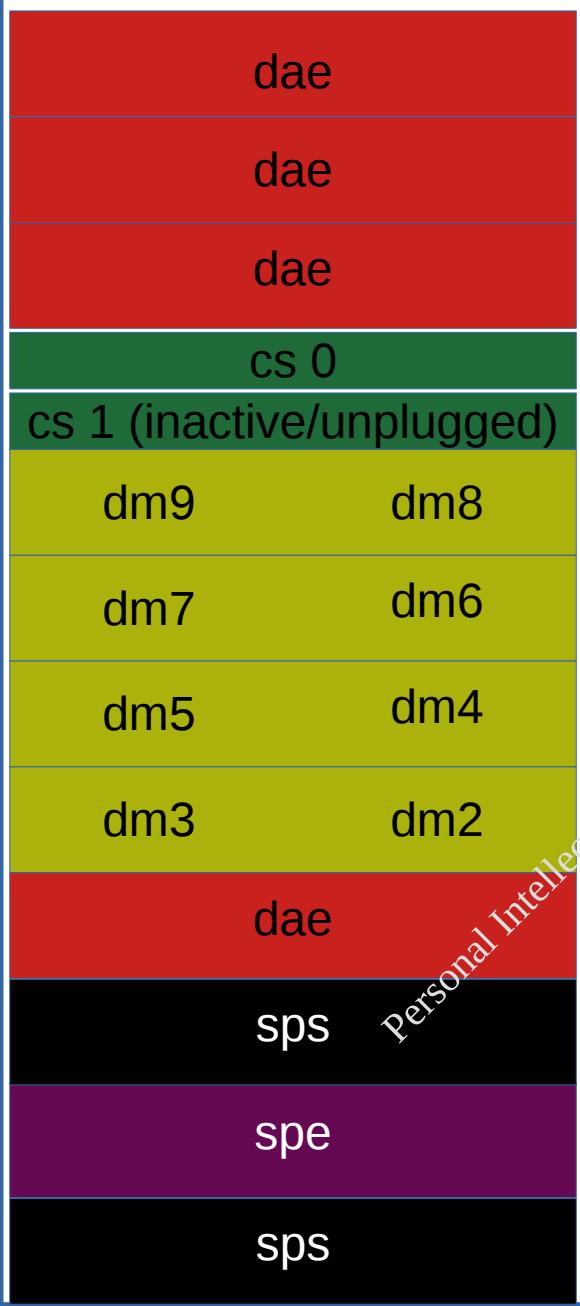
Slices on A and B

	Slic slot#, speed, protocol, port count, medium (optical/copper)										
M	0	1	2	3	4	5	6	7	8	9	10
G	16	8	10	1	6	6	6	1	8	10	6
M	gb	gb	gb	gb	gb	gb	gb	gb	gb	gb	gb
T	fc	fc	eth	eth	sas	sas	sas	eth	fc	eth	sas
	4p	4p	2p	4p	4p	4p	4p	4p	4p	2p	4p
	o	o	o	c				c	o	c	

multiple slices unused – non-inserted

swapped out slice positions for cleaner configuration

back / new spe slices



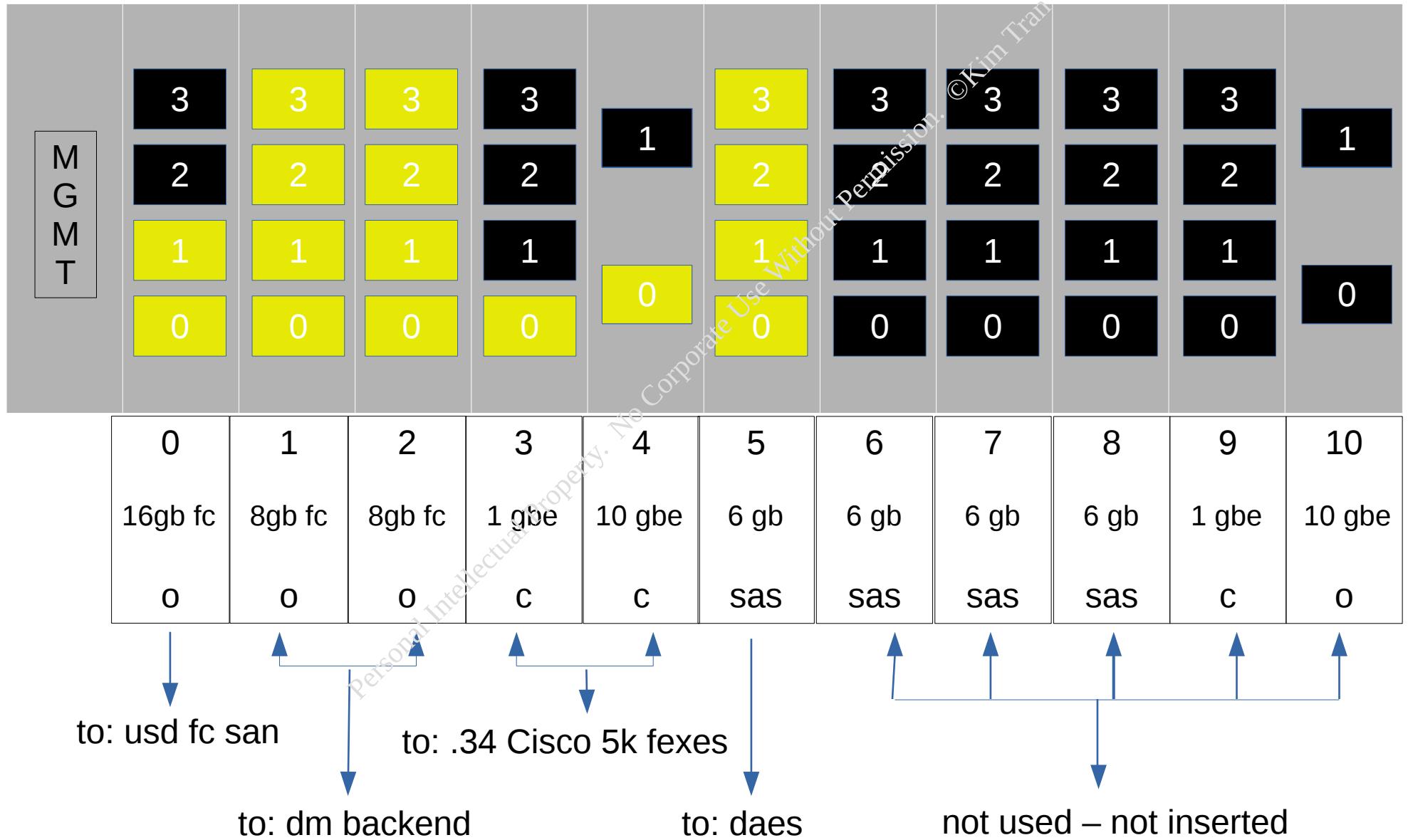
Slices on A and B

	Slic slot#, speed, protocol, port count, medium (optical/copper)										
M	0	1	2	3	4	5	6	7	8	9	10
G											
M	16	8	8	1	10	6	6	6	6	1	10
T	gb	gb	gb	gb	gb	gb	gb	gb	gb	gb	gb
	fc	fc	fc	eth	eth	sas	sas	sas	sas	eth	eth
	4p	4p	4p	4p	2p	4p	4p	4p	4p	4p	2p
	o	o	o	c	c					c	c

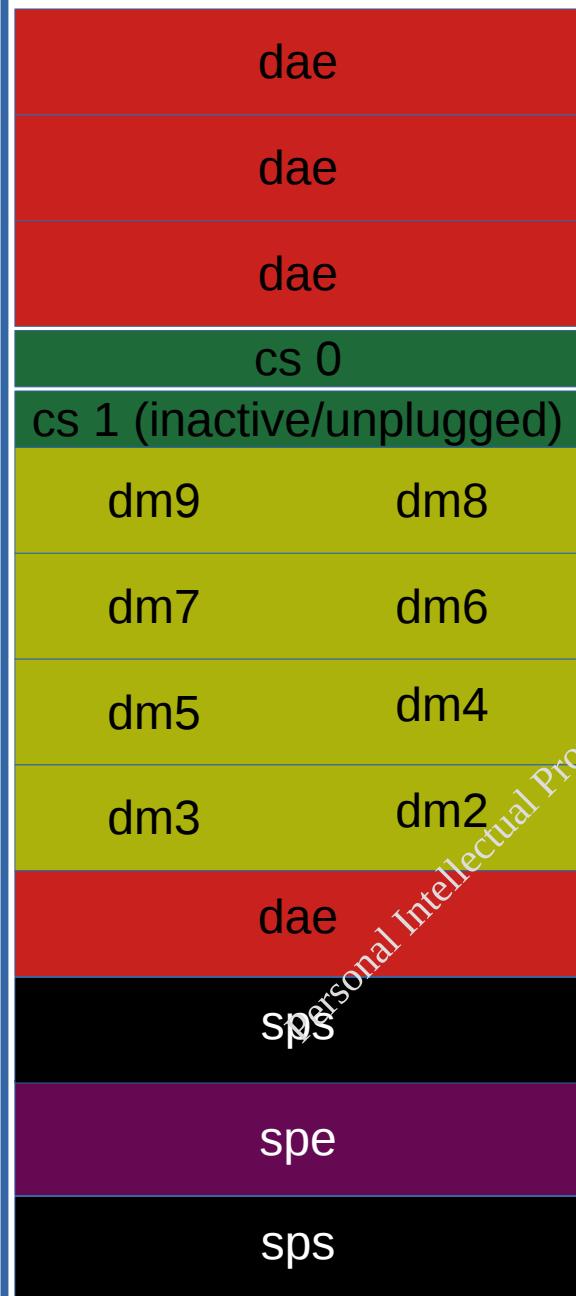
slices 6-10 unused – non-inserted

swapped out slice positions for cleaner configuration

New SPE Slic configuration placement on A and B



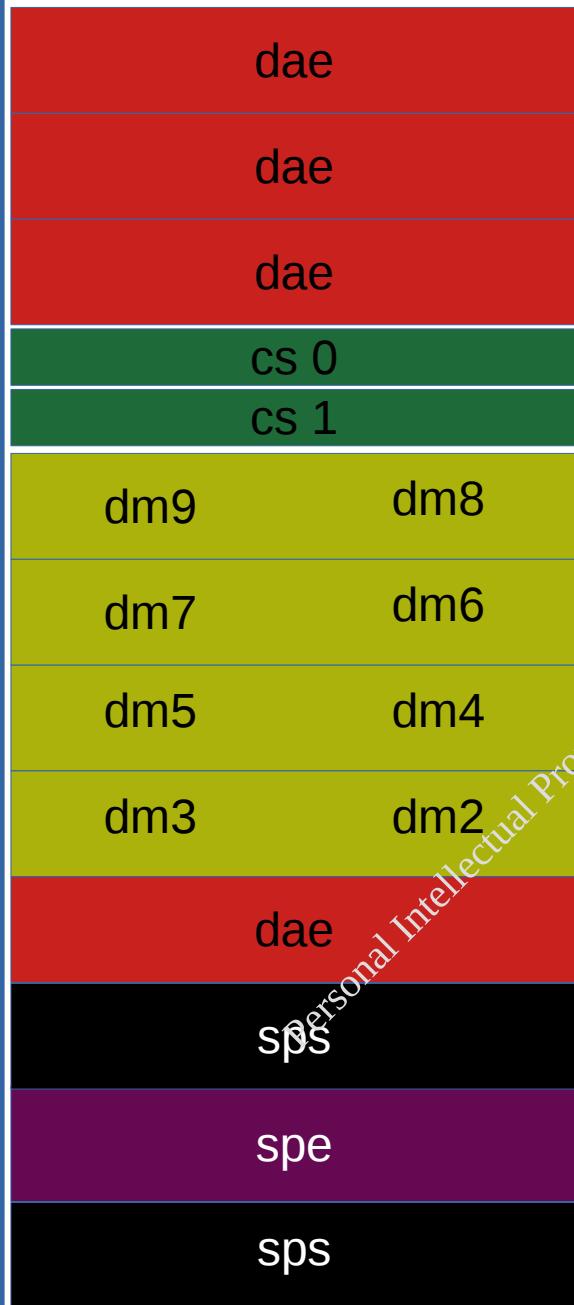
back / existing dm slices



Slices on A and B

Slice	slot#, speed, protocol, port count, medium (optical/copper)					
M	0	1	2	3	4	
G	8 gb	10 gb	10 gb	10 gb	1 gb	
M	fc	eth	eth	eth	eth	
T	4p	2p	2p	2p	4p	
	o	o	o	c	c	

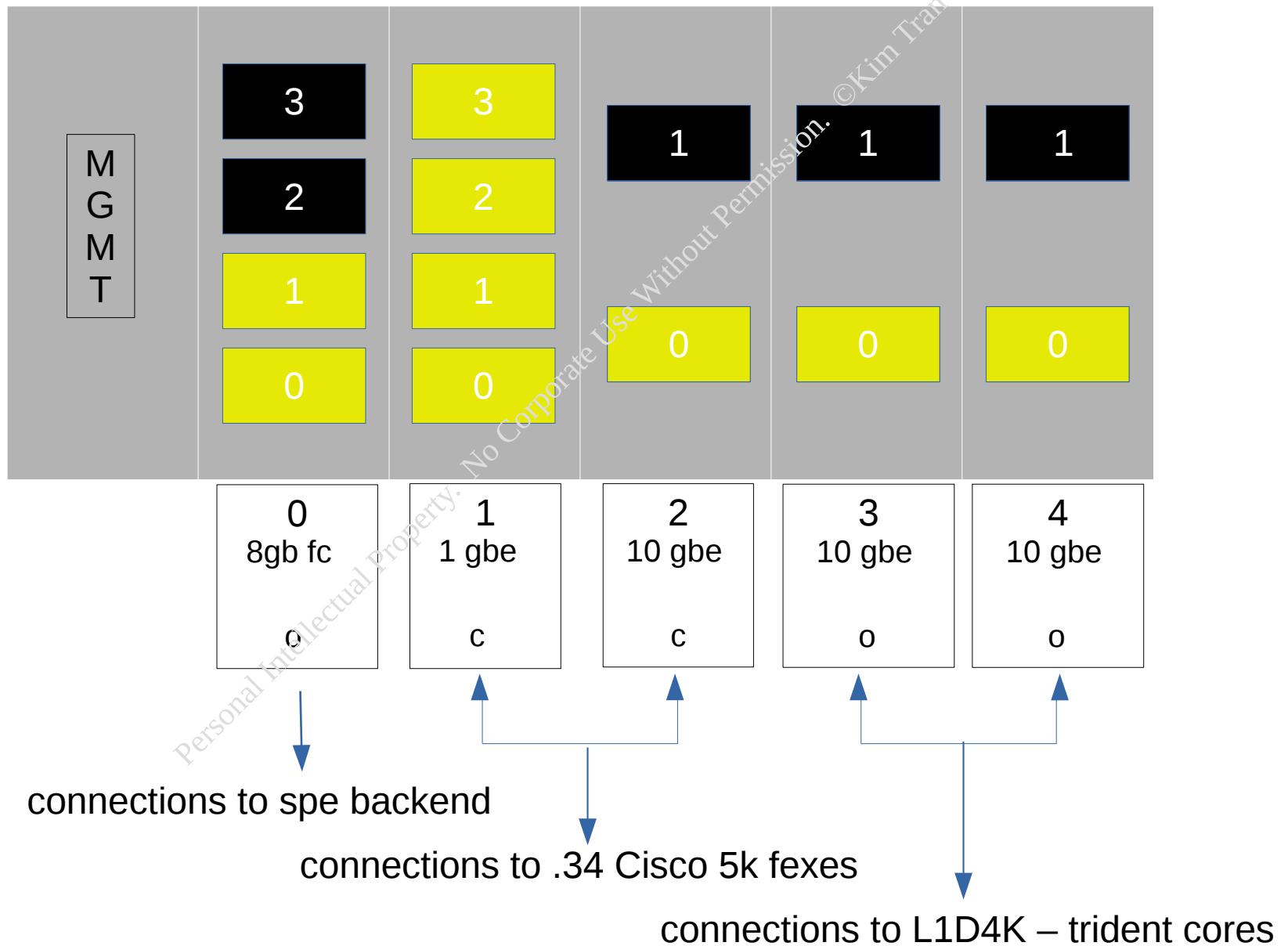
back / new dm slices



Slices on A and B

Slic slot#, speed, protocol, port count, medium (optical/copper)						
M	0	1	2	3	4	
G	8	1	10	10	10	
M	gb	gb	gb	gb	gb	
T	fc	eth	eth	eth	eth	
	4p	4p	2p	2p	2p	
	o	c	c	o	o	

New DM Slic configuration placement on A and B



Existing cable labels and connections are wrong due to number of ports to be connected and number of labels that are duplicates, or hanging and disconnected due to destination ports not available (fex doesn't exists, ports already utilized by another system, wrong port connection types, etc..., in addition to the new matrix that was ran for the trident cores at row 62 – wrong ports specified, wrong port type specified

Please review the following pages for audit details

MT-D1096 12Z

MT-D1096	CS0	12Z	.34 FEX 111	1	12AD	COPPER	
MT-D1096	DM9-1-0	12Z	.34 FEX 105	30	12AD	FIBER	
MT-D1096	DM9-1-1	12Z	.34 FEX 105	31	12AD	FIBER	
MT-D1096	DM9-2-0	12Z	.34 FEX 105	32	12AD	FIBER	
MT-D1096	DM9-2-1	12Z	.34 FEX 106	1	12AD	FIBER	
MT-D1096	DM9-3-0	12Z	.34 FEX 110	6	12AD	COPPER	
MT-D1096	DM9-3-1	12Z	.34 FEX 110	7	12AD	COPPER	
MT-D1096	DM9-4-0	12Z	.34 FEX 111	32	12AD	COPPER	
MT-D1096	DM9-4-1	12Z	.34 FEX 111	33	12AD	COPPER	
MT-D1096	DM9-4-2	12Z	.34 FEX 111	34	12AD	COPPER	
MT-D1096	DM9-4-3	12Z	.34 FEX 111	35	12AD	COPPER	
<	<	<	<	<	<	<	
MT-D1096	DM8-4-2	12Z	L1D4K-	6	62AM	FIBER	LABEL
MT-D1096	DM8-0-2	12Z	L1D4K-	6	62AM	FIBER	PORT
MT-D1096	DM8-3-0	12Z	L1D4K-	41	62AM	FIBER	LABEL
MT-D1096	DM8-1-0	12Z	L1D4K-	41	62AM	FIBER	PORT
MT-D1096	DM8-1-0	12Z	.34	26	12AD	FIBER	Cable was hanging
MT-D1096	DM8-3-1	12Z	L1D4K-	42	62AM	FIBER	LABEL
MT-D1096	DM8-1-1	12Z	L1D4K-62AM-3W02	42	62AM	FIBER	PORT
MT-D1096	DM8-1-1	12Z	.34 FEX 105	27	12AD	FIBER	Cable was hanging
MT-D1096	DM8-2-0	12Z	.34 FEX 105	28	12AD	FIBER	
MT-D1096	DM8-2-1	12Z	.34 FEX 105	29	12AD	FIBER	
MT-D1096	DM8-3-0	12Z	.34 FEX 113	31	12AM	COPPER	
MT-D1096	DM8-3-1	12Z	.34 FEX 113	32	12AM	COPPER	
MT-D1096	DM8-4-0	12Z	.34 FEX 111	28	12AD	COPPER	
MT-D1096	DM8-4-1	12Z	.34 FEX 111	29	12AD	COPPER	

MT-D1096	DM8-4-1	12Z	L1D4K		5	62AM	FIBER	Cable was hanging
MT-D1096	DM8-4-2	12Z	.34 FEX 111		30	12AD	COPPER	
MT-D1096	DM8-4-3	12Z	.34 FEX 111		31	12AD	COPPER	
<	<	<	<		<	<	<	
MT-D1096	DM7-0-1	12Z	L1D4K		13	62AM	FIBER	42AN-JF-D1368:DM5-3-0
								Ports used
MT-D1096	DM7-0-2	12Z	L1D4K		14	62AM	FIBER	42AN-JF-D1368:DM5-3-1
								Ports used
MT-D1096	DM7-3-0	12Z	L1D4		39	62AM	FIBER	LABEL
MT-D1096	DM7-1-0	12Z	L1D4		39	62AM	FIBER	PORT
MT-D1096	DM7-1-1	12Z	.3		23	12AD	FIBER	Cable was hanging
MT-D1096	DM7-3-1	12Z	L1D4		40	62AM	FIBER	LABEL
MT-D1096	DM7-1-1	12Z	L1D4		40	62AM	FIBER	PORT
MT-D1096	DM7-1-0	12Z	.34 FEX 105		22	12AD	FIBER	Cable was hanging
MT-D1096	DM7-2-0	12Z	.34 FEX 105		24	12AD	FIBER	
MT-D1096	DM7-2-1	12Z	.34 FEX 105		25	12AD	FIBER	
MT-D1096	DM7-3-0	12Z	.34 FEX 113		29	12AM	COPPER	
MT-D1096	DM7-3-1	12Z	.34 FEX 113		30	12AM	COPPER	
MT-D1096	DM7-4-0	12Z	.34 FEX 111		24	12AD	COPPER	
MT-D1096	DM7-4-1	12Z	.34 FEX 111		25	12AD	COPPER	
MT-D1096	DM7-4-1	12Z	L1D4		3	62AM	FIBER	
MT-D1096	DM7-4-2	12Z	L1D4		4	62AM	FIBER	
MT-D1096	DM7-4-2	12Z	.34 FEX 111		26	12AD	COPPER	
MT-D1096	DM7-4-3	12Z	.34 FEX 111		27	12AD	COPPER	
<	<	<	<		<	<	<	
MT-D1096	DM6-4-2	12Z	L1D4		2	62AM	FIBER	LABEL
MT-D1096	DM6-4-2	12Z	L1D4		2	62AM	FIBER	PORT
MT-D1096	DM6-1-0	12Z	.34 FEX 105		17	12AD	FIBER	
MT-D1096	DM6-1-1	12Z	.34 FEX 105		18	12AD	FIBER	TWINS
								Was plugged in
MT-D1096	DM6-1-1	12Z	.34 FEX 105		19	12AD	FIBER	TWINS
								Was unplugged

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MT-D1096	DM6-2-0	12Z	.34 FEX 105	20	12AD	FIBER	
MT-D1096	DM6-2-1	12Z	.34 FEX 105	21	12AD	FIBER	
MT-D1096	DM6-3-0	12Z	.34 FEX 113	27	12AM	COPPER	
MT-D1096	DM6-3-1	12Z	.34 FEX 113	28	12AM	COPPER	
MT-D1096	DM6-4-0	12Z	.34 FEX 111	20	12AD	COPPER	
MT-D1096	DM6-4-1	12Z	.34 FEX 111	21	12AD	COPPER	
MT-D1096	DM6-4-1	12Z	L1D4K-62AM-SW01	1	62AM	FIBER	Cable was hanging
MT-D1096	DM6-4-2	12Z	.34 FEX 111	22	12AD	COPPER	
MT-D1096	DM6-4-3	12Z	.34 FEX 111	23	12AD	COPPER	
<	<	<	<	<	<	<	
MT-D1096	DM5-4-2	12Z	L1D4K-62AM-SW01	50	62AM	FIBER	LABEL
MT-D1096	DM5-0-2	12Z	L1D4K-62AM-SW01	50	62AM	FIBER	PORT
MT-D1096	DM6-3-0	12Z	L1D4K-62AM-SW01	39	62AM	FIBER	LABEL
MT-D1096	DM5-1-0	12Z	L1D4K-62AM-SW01	37	62AM	FIBER	PORT
MT-D1096	DM5-1-0	12Z		13	12AD	FIBER	Cable was hanging
MT-D1096	DM5-3-0	12Z	L1D4K-62AM-SW01	35	62AM	FIBER	LABEL
MT-D1096	DM5-1-1	12Z	L1D4K-62AM-SW01	35	62AM	FIBER	PORT
MT-D1096	DM5-1-1	12Z	.34 FEX 105	14	12AD	FIBER	Cable was hanging
MT-D1096	DM5-2-0	12Z	.34 FEX 105	15	12AD	FIBER	
MT-D1096	DM5-2-1	12Z	.34 FEX 105	16	12AD	FIBER	
MT-D1096	DM5-3-0	12Z	.34 FEX 113	25	12AM	COPPER	
MT-D1096	DM5-3-1	12Z	.34 FEX 113	26	12AM	COPPER	
MT-D1096	DM5-4-0	12Z	.34 FEX 111	16	12AD	COPPER	
MT-D1096	DM5-4-1	12Z	.34 FEX 111	17	12AD	COPPER	
MT-D1096	DM5-4-1	12Z	L1D4K-62AM-SW01	49	62AM	FIBER	Cable was hanging
MT-D1096	DM5-4-2	12Z	.34 FEX 111	18	12AD	COPPER	
MT-D1096	DM5-4-3	12Z	.34 FEX 111	19	12AD	COPPER	
<	<	<	<	<	<	<	
MT-D1096	DM4-4-2	12Z	L1D4K-62AM-SW01	48	62AM	FIBER	LABEL

MT-D1096	DM4-0-2	12Z	L1D4		48	62AM	FIBER	PORT
MT-D1096	DM4-3-0	12Z	L1D4		33	62AM	FIBER	LABEL
MT-D1096	DM4-1-0	12Z	L1D4		33	62AM	FIBER	PORT
MT-D1096	DM4-1-0	12Z	L1D4		9	12AD	FIBER	Cable was hanging
MT-D1096	DM4-3-1	12Z	L1D4		34	62AM	FIBER	LABEL
MT-D1096	DM4-1-1	12Z	L1D4	.34 FEX 105	34	62AM	FIBER	PORT
MT-D1096	DM4-1-1	12Z	L1D4	.34 FEX 105	10	12AD	FIBER	Cable was hanging
MT-D1096	DM4-2-0	12Z		.34 FEX 105	11	12AD	FIBER	
MT-D1096	DM4-2-1	12Z		.34 FEX 105	12	12AD	FIBER	
MT-D1096	DM4-3-0	12Z		.34 FEX 113	23	12AM	COPPER	
MT-D1096	DM4-3-1	12Z		.34 FEX 113	24	12AM	COPPER	
MT-D1096	DM4-4-0	12Z		.34 FEX 111	12	12AD	COPPER	
MT-D1096	DM4-4-1	12Z		.34 FEX 111	13	12AD	COPPER	
MT-D1096	DM4-4-1	12Z	L1D4		47	62AM	FIBER	Cable was hanging
MT-D1096	DM4-4-2	12Z		.34 FEX 111	14	12AD	COPPER	
MT-D1096	DM4-4-3	12Z		.34 FEX 111	15	12AD	COPPER	
<	<	<		<	<	<	<	
MT-D1096	DM3-4-2	12Z	L1D4		46	62AM	FIBER	LABEL
MT-D1096	DM3-0-2	12Z	L1D4		46	62AM	FIBER	PORT
MT-D1096	DM3-3-0	12Z	L1D4		31	62AM	FIBER	LABEL
MT-D1096	DM3-1-0	12Z	L1D4		31	62AM	FIBER	PORT
MT-D1096	DM3-1-0	12Z	L1D4	.3	5	12AD	FIBER	Cable was hanging
MT-D1096	DM6-3-1	12Z	L1D4		38	62AM	FIBER	LABEL
MT-D1096	DM3-1-1	12Z	L1D4		38	62AM	FIBER	PORT
MT-D1096	DM3-1-1	12Z	L1D4	.3	6	12AD	FIBER	Cable was hanging
MT-D1096	DM3-3-1	12Z	L1D4		32	62AM	FIBER	LABEL
MT-D1096	DM3-2-0	12Z	L1D4		32	62AM	FIBER	PORT
MT-D1096	DM3-2-0	12Z	L1D4	.3	7	12AD	FIBER	Cable was hanging
MT-D1096	DM5-3-1	12Z	L1D4		36	62AM	FIBER	LABEL

MT-D1096	DM3-2-1	12Z	L1D4K-62AM-SW02	36	62AM	FIBER	PORT
MT-D1096	DM3-2-1	12Z	.34 FEX 105	8	12AD	FIBER	Cable was hanging
MT-D1096	DM3-3-0	12Z	.34 FEX 113	21	12AM	COPPER	
MT-D1096	DM3-3-1	12Z	.34 FEX 113	22	12AM	COPPER	
MT-D1096	DM3-4-0	12Z	.34 FEX 111	8	12AD	COPPER	
MT-D1096	DM3-4-1	12Z	.34 FEX 111	9	12AD	COPPER	
MT-D1096	DM3-4-1	12Z	L1D4K-62AM-SW02	45	62AM	FIBER	Cable was hanging
							Port taken on SW side
MT-D1096	DM3-4-2	12Z	.34 FEX 111	10	12AD	COPPER	
MT-D1096	DM3-4-3	12Z	.34 FEX 111	11	12AD	COPPER	
<	<	<	<	<	<	<	
MT-D1096	DM2-2-2	12Z	L1D4K-62AM-SW02	44	62AM	FIBER	LABEL
							Port taken on SW side
MT-D1096	DM2-0-2	12Z	L1D4K-62AM-SW02	44	62AM	FIBER	PORT
							Port taken on SW side
MT-D1096	DM2-3-0	12Z	L1D4K-62AM-SW02	23	62AM	FIBER	LABEL
MT-D1096	DM2-1-0	12Z	L1D4K-62AM-SW02	23	62AM	FIBER	PORT
MT-D1096	DM2-1-0	12Z	.34 FEX 105	1	12AD	FIBER	Cable was hanging
MT-D1096	DM2-3-1	12Z	L1D4K-62AM-SW02	24	62AM	FIBER	LABEL
MT-D1096	DM2-1-1	12Z	L1D4K-62AM-SW02	24	62AM	FIBER	PORT
MT-D1096	DM2-1-1	12Z	.34 FEX 105	2	12AD	FIBER	Cable was hanging
MT-D1096	DM2-2-0	12Z	.34 FEX 105	3	12AD	FIBER	
MT-D1096	DM2-2-1	12Z	.34 FEX 105	4	12AD	FIBER	
MT-D1096	DM2-3-0	12Z	.34 FEX 113	19	12AM	COPPER	
MT-D1096	DM2-3-1	12Z	.34 FEX 113	20	12AM	COPPER	
MT-D1096	DM2-4-0	12Z	.34 FEX 111	4	12AD	COPPER	
MT-D1096	DM2-4-1	12Z	.34 FEX 111	5	12AD	COPPER	
MT-D1096	DM2-4-1	12Z	L1D4K-62AM-SW02	43	62AM	FIBER	Cable was hanging
MT-D1096	DM2-4-2	12Z	.34 FEX 111	6	12AD	COPPER	
MT-D1096	DM2-4-3	12Z	.34 FEX 111	7	12AD	COPPER	

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MT-D1096	SPA-0-1	12Z	USD-		9	12AD	FIBER
MT-D1096	SPA-0-1	12Z	USD-		5	12AD	FIBER
MT-D1096	SPB-0-1	12Z	USD-		7	12AD	FIBER
MT-D1096	SPB-0-0	12Z	USD-		6	12AD	FIBER
MT-D1096	SPA-0-0	12Z	USD-		8	12AD	FIBER
MT-D1096	SPA-0-0	12Z	USD-		4	12AD	FIBER
MT-D1096	SPB-0-0	12Z	USD-		10	12AD	FIBER
MT-D1096	SPB-0-1	12Z	USD-		11	12AD	FIBER
MT-D1096	SPB-0-0	12Z	USD		7	12AD	FIBER
MT-D1096	SPB-0-1	12Z	USD		8	12AD	FIBER
MT-D1096	SPA-0-1	12Z	USD		6	12AD	FIBER
MT-D1096	SPA-0-0	12Z	USD		5	12AD	FIBER
MT-D1096	SPA-2-0	12Z	L15K-		45	26AM	FIBER
MT-D1096	SPA-2-1	12Z	L15K-		46	26AM	FIBER
MT-D1096	SPB-2-0	12Z	L15K-		47	26AM	FIBER
MT-D1096	SPB-2-1	12Z	L15K-		48	26AM	FIBER
MT-D1096	ISCIS-SPA	12Z	.		2	12AD	COPPER
MT-D1096	SPA-ISCIS-P1	12Z	.		36	12AD	COPPER
MT-D1096	SPB-ISCIS-P1	12Z	.		1	12AD	COPPER
MT-D1096	ISCIS-SPB	12Z	.		3	12AD	COPPER

Old cable matrix before rebuild

<u>Source Hostname</u>	<u>Source Port</u>	<u>Source Tile</u>		<u>Destination Hostname</u>	<u>Destination Port</u>	<u>Destination Tile</u>	<u>Cable Type</u>	<u>Notes</u>	<u>Notes</u>
MT-D1096	DM2-3 0	12Z		L1D	29	62AL	Fiber	10Gb	FN 8
MT-D1096	DM2-3 1	12Z		L1D	30	62AL	Fiber	10Gb	
MT-D1096	DM3-3 0	12Z		L1D	31	62AL	Fiber	10Gb	
MT-D1096	DM3-3 1	12Z		L1D	32	62AL	Fiber	10Gb	
MT-D1096	DM4-3 0	12Z		L1D	33	62AL	Fiber	10Gb	
MT-D1096	DM4-3 1	12Z		L1D	34	62AL	Fiber	10Gb	
MT-D1096	DM5-3 0	12Z		L1D	35	62AL	Fiber	10Gb	
MT-D1096	DM5-3 1	12Z		L1D	36	62AL	Fiber	10Gb	
MT-D1096	DM6-3 0	12Z		L1D	37	62AL	Fiber	10Gb	
MT-D1096	DM6-3 1	12Z		L1D	38	62AL	Fiber	10Gb	
MT-D1096	DM7-3 0	12Z		L1D	39	62AL	Fiber	10Gb	
MT-D1096	DM7-3 1	12Z		L1D	40	62AL	Fiber	10Gb	
MT-D1096	DM8-3 0	12Z		L1D	41	62AL	Fiber	10Gb	
MT-D1096	DM8-3 1	12Z		L1D	42	62AL	Fiber	10Gb	
MT-D1096	DM2-4 1	12Z		L1D	43	62AL	Fiber	10Gb	
MT-D1096	DM2-4 2	12Z		L1D	44	62AL	Fiber	10Gb	
MT-D1096	DM3-4 1	12Z		L1D	45	62AL	Fiber	10Gb	
MT-D1096	DM3-4 2	12Z		L1D	46	62AL	Fiber	10Gb	
MT-D1096	DM4-4 1	12Z		L1D	47	62AL	Fiber	10Gb	
MT-D1096	DM4-4 2	12Z		L1D	48	62AL	Fiber	10Gb	
MT-D1096	DM5-4 1	12Z		L1D	49	62AL	Fiber	10Gb	
MT-D1096	DM5-4 2	12Z		L1D	50	62AL	Fiber	10Gb	
MT-D1096	DM6-4 1	12Z		L1D	1	62AL	Fiber	10Gb	
MT-D1096	DM6-4 2	12Z		L1D	2	62AL	Fiber	10Gb	
MT-D1096	DM7-4 1	12Z		L1D	3	62AL	Fiber	10Gb	
MT-D1096	DM7-4 2	12Z		L1D	4	62AL	Fiber	10Gb	
MT-D1096	DM8-4 1	12Z		L1D	5	62AL	Fiber	10Gb	
MT-D1096	DM8-4 2	12Z		L1D	6	62AL	Fiber	10Gb	

New cable matrix for rebuild

12AD .34/110	16	12AD	mt-d1096	spa 4:0	12Z	copper	10gbe copper
12AD .34/110	17	12AD	mt-d1096	spb 4:0	12Z	copper	10gbe copper
12AD .34/110	18	12AD	mt-d1096	dm2 2:0	12Z	copper	10gbe copper
12AD .34/110	19	12AD	mt-d1096	dm3 2:0	12Z	copper	10gbe copper
12AD .34/110	20	12AD	mt-d1096	dm4 2:0	12Z	copper	10gbe copper
12AD .34/110	21	12AD	mt-d1096	dm5 2:0	12Z	copper	10gbe copper
12AD .34/110	22	12AD	mt-d1096	dm6 2:0	12Z	copper	10gbe copper
12AD .34/110	23	12AD	mt-d1096	dm7 2:0	12Z	copper	10gbe copper
12AD .34/110	24	12AD	mt-d1096	dm8 2:0	12Z	copper	10gbe copper
12AD .34/110	25	12AD	mt-d1096	dm9 2:0	12Z	copper	10gbe copper
12AD .34/111	1	12AD	mt-d1096	cs0	12Z	copper	1gbe copper
12AD .34/111	2	12AD	mt-d1096	spa 3:0	12Z	copper	1gbe copper
12AD .34/111	3	12AD	mt-d1096	spb 3:0	12Z	copper	1gbe copper
12AD .34/111	4	12AD	mt-d1096	dm2 1:0	12Z	copper	1gbe copper
12AD .34/111	5	12AD	mt-d1096	dm2 1:1	12Z	copper	1gbe copper
12AD .34/111	6	12AD	mt-d1096	dm2 1:2	12Z	copper	1gbe copper
12AD .34/111	7	12AD	mt-d1096	dm2 1:3	12Z	copper	1gbe copper
12AD .34/111	8	12AD	mt-d1096	dm3 1:0	12Z	copper	1gbe copper
12AD .34/111	9	12AD	mt-d1096	dm3 1:1	12Z	copper	1gbe copper
12AD .34/111	10	12AD	mt-d1096	dm3 1:2	12Z	copper	1gbe copper
12AD .34/111	11	12AD	mt-d1096	dm3 1:3	12Z	copper	1gbe copper
12AD .34/111	12	12AD	mt-d1096	dm4 1:0	12Z	copper	1gbe copper
12AD .34/111	13	12AD	mt-d1096	dm4 1:1	12Z	copper	1gbe copper
12AD .34/111	14	12AD	mt-d1096	dm4 1:2	12Z	copper	1gbe copper
12AD .34/111	15	12AD	mt-d1096	dm4 1:3	12Z	copper	1gbe copper
12AD .34/111	16	12AD	mt-d1096	dm5 1:0	12Z	copper	1gbe copper
12AD .34/111	17	12AD	mt-d1096	dm5 1:1	12Z	copper	1gbe copper
12AD .34/111	18	12AD	mt-d1096	dm5 1:2	12Z	copper	1gbe copper
12AD .34/111	19	12AD	mt-d1096	dm5 1:3	12Z	copper	1gbe copper
12AD .34/111	20	12AD	mt-d1096	dm6 1:0	12Z	copper	1gbe copper
12AD .34/111	21	12AD	mt-d1096	dm6 1:1	12Z	copper	1gbe copper
12AD .34/111	22	12AD	mt-d1096	dm6 1:2	12Z	copper	1gbe copper
12AD .34/111	23	12AD	mt-d1096	dm6 1:3	12Z	copper	1gbe copper
12AD .34/111	24	12AD	mt-d1096	dm7 1:0	12Z	copper	1gbe copper

New cable matrix for rebuild

12AD .34/111	25	12AD	mt-d1096	dm7 1:1	12Z	copper	1gbe copper
12AD .34/111	26	12AD	mt-d1096	dm7 1:2	12Z	copper	1gbe copper
12AD .34/111	27	12AD	mt-d1096	dm7 1:3	12Z	copper	1gbe copper
12AD .34/111	28	12AD	mt-d1096	dm8 1:0	12Z	copper	1gbe copper
12AD .34/111	29	12AD	mt-d1096	dm8 1:1	12Z	copper	1gbe copper
12AD .34/111	30	12AD	mt-d1096	dm8 1:2	12Z	copper	1gbe copper
12AD .34/111	31	12AD	mt-d1096	dm8 1:3	12Z	copper	1gbe copper
12AD .34/111	32	12AD	mt-d1096	dm9 1:0	12Z	copper	1gbe copper
12AD .34/111	33	12AD	mt-d1096	dm9 1:1	12Z	copper	1gbe copper
12AD .34/111	34	12AD	mt-d1096	dm9 1:2	12Z	copper	1gbe copper
12AD .34/111	35	12AD	mt-d1096	dm9 1:3	12Z	copper	1gbe copper
<hr/>							
L1D4K-62AL-SW02	31	62AL	mt-d1096	dm2 3:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	32	62AL	mt-d1096	dm2 4:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	33	62AL	mt-d1096	dm3 3:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	34	62AL	mt-d1096	dm3 4:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	35	62AL	mt-d1096	dm4 3:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	36	62AL	mt-d1096	dm4 4:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	37	62AL	mt-d1096	dm5 3:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	38	62AL	mt-d1096	dm5 4:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	39	62AL	mt-d1096	dm6 3:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	40	62AL	mt-d1096	dm6 4:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	41	62AL	mt-d1096	dm7 3:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	42	62AL	mt-d1096	dm7 4:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	47	62AL	mt-d1096	dm8 3:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	48	62AL	mt-d1096	dm8 4:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	49	62AL	mt-d1096	dm9 3:0	12Z	optical	10gbe optical
L1D4K-62AL-SW02	50	62AL	mt-d1096	dm9 4:0	12Z	optical	10gbe optical
<hr/>							
USD30_40_VF12AD	4	12AD	mt-d1096	spa 0:0	12Z	optical	16gb fc
USD30_40_VF12AD	5	12AD	mt-d1096	spa 0:1	12Z	optical	16gb fc
USD30_40_VF12AD	6	12AD	mt-d1096	spb 0:0	12Z	optical	16gb fc
USD30_40_VF12AD	7	12AD	mt-d1096	spc 0:1	12Z	optical	16gb fc

Old switch port configurations found and cleanup

```
interface Ethernet1/44
description 1/44 mt-d1096 spa-2:0
switchport access vlan 820
```

```
interface Ethernet1/46
description 1/46 mt-d1096 spa-2:1
switchport access vlan 820
```

```
interface Ethernet1/47
description 1/47 mt-d1096 spb-2:0
switchport access vlan 820
```

```
interface Ethernet1/48
description 1/48 mt-d1096 spb-2:1
switchport access vlan 820
```

```
interface Ethernet108/1/1
description 108/1/1 mt-d1096-spb-3:0
switchport access vlan 820
```

```
interface Ethernet111/1/1
description 111/1/1 mt-d1096-cs0
switchport access vlan 820
```

```
interface Ethernet111/1/2
description 111/1/2 mt-d1096-iscis-spa
switchport access vlan 820
```

```
interface Ethernet111/1/3
description 111/1/3 mt-d1096-iscis-spb
switchport access vlan 820
```

```
interface Ethernet111/1/4
description 111/1/4 mt-d1096-dm2-4.0
switchport mode trunk
switchport trunk allowed vlan 712,820
```

```
interface Ethernet111/1/5
description 111/1/5 mt-d1096-dm2-4.1
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/6
description 111/1/6 mt-d1096-dm2-4.2
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/7
description 111/1/7 mt-d1096-dm2-4.3
switchport mode trunk
switchport trunk allowed vlan 712,820
```

```
interface Ethernet111/1/8
description 111/1/8 mt-d1096-dm3-4.0
switchport mode trunk
switchport trunk allowed vlan 712,820
```

```
interface Ethernet111/1/9
description 111/1/9 mt-d1096-dm3-4.1
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/10
description 111/1/10 mt-d1096-dm3-4.2
switchport mode trunk
```

```
interface Ethernet111/1/11
description 111/1/11 mt-d1096-dm3-4.3
switchport access vlan 820
```

```
interface Ethernet111/1/12
description 111/1/12 mt-d1096-dm4-4.0
switchport mode trunk
switchport trunk allowed vlan 712,820
```

```
interface Ethernet111/1/13
description 111/1/13 mt-d1096-dm4-4.1
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/14
description 111/1/14 mt-d1096-dm4-4.2
switchport mode trunk
```

```
interface Ethernet111/1/15
description 111/1/15 mt-d1096-dm4-4.3
switchport access vlan 820
```

```
interface Ethernet111/1/16
description 111/1/16 mt-d1096-dm5-4.0
switchport mode trunk
switchport trunk allowed vlan 712,820
```

Old switch port configurations found and cleanup

interface Ethernet111/1/17
description 111/1/17 mt-d1096-dm5-4.1
switchport mode trunk
switchport trunk allowed vlan 432,712,820

interface Ethernet111/1/18
description 111/1/18 mt-d1096-dm5-4.2
switchport mode trunk
switchport trunk allowed vlan 432,712,820

interface Ethernet111/1/19
description 111/1/19 mt-d1096-dm5-4.3
switchport access vlan 820

interface Ethernet111/1/20
description 111/1/20 mt-d1096-dm6-4.0
switchport mode trunk
switchport trunk allowed vlan 712,820

interface Ethernet111/1/21
description 111/1/21 mt-d1096-dm6-4.1
switchport mode trunk
switchport trunk allowed vlan 432,712,820

interface Ethernet111/1/22
description 111/1/22 mt-d1096-dm6-4.2
switchport mode trunk
switchport trunk allowed vlan 432,712,820

interface Ethernet111/1/23
description 111/1/23 mt-d1096-dm6-4.3
switchport access vlan 820

interface Ethernet111/1/24
description 111/1/24 mt-d1096-dm7-4.0
switchport mode trunk
switchport trunk allowed vlan 712,820

interface Ethernet111/1/25
description 111/1/25 mt-d1096-dm7-4.1
switchport mode trunk
switchport trunk allowed vlan 432,712,820

interface Ethernet111/1/26
description 111/1/26 mt-d1096-dm7-4.2
switchport mode trunk

interface Ethernet111/1/27
description 111/1/27 mt-d1096-dm7-4.3
switchport access vlan 820

interface Ethernet111/1/28
description 111/1/28 mt-d1096-dm8-4.0
switchport mode trunk
switchport trunk allowed vlan 712,820

interface Ethernet111/1/29
description 111/1/29 mt-d1096-dm8-4.1
switchport mode trunk
switchport trunk allowed vlan 432,712,820

interface Ethernet111/1/30
description 111/1/30 mt-d1096-dm8-4.2
switchport mode trunk
switchport trunk allowed vlan 432,712,820

interface Ethernet111/1/31
description 111/1/31 mt-d1096-dm8-4.3
switchport access vlan 820

interface Ethernet111/1/32
description 111/1/32 mt-d1096-dm9-4.0
switchport access vlan 820

interface Ethernet111/1/33
description 111/1/33 mt-d1096-dm9-4.1
switchport access vlan 820

interface Ethernet111/1/34
description 111/1/34 mt-d1096-dm9-4.2
switchport access vlan 820

interface Ethernet111/1/35
description 111/1/35 mt-d1096-dm9-4.3
switchport access vlan 820

interface Ethernet111/1/36
description 111/1/36 mt-d1096-spa-3:0
switchport access vlan 820

interface Ethernet113/1/19
description 113/1/19 mt-d1096-dm2-3:0
switchport mode trunk
switchport trunk allowed vlan 432,712,820

interface Ethernet113/1/20
description 113/1/20 mt-d1096-dm2-3:1
switchport mode trunk
switchport trunk allowed vlan 432,712,820

New switch port configurations

```
interface Ethernet110/1/16
description 110/1/16 mt-d1096 spa 4-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet110/1/17
description 110/1/17 mt-d1096 spb 4-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet110/1/18
description 110/1/18 mt-d1096 dm2 2-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet110/1/19
description 110/1/19 mt-d1096 dm3 2-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet110/1/20
description 110/1/20 mt-d1096 dm4 2-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet110/1/21
description 110/1/21 mt-d1096 dm5 2-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet110/1/22
description 110/1/22 mt-d1096 dm6 2-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet110/1/23
description 110/1/23 mt-d1096 dm7 2-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet110/1/24
description 110/1/24 mt-d1096 dm8 2-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet110/1/25
description 110/1/25 mt-d1096 dm9 2-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/1
description 111/1/1 mt-d1096 cs0
switchport access vlan 820
```

```
interface Ethernet111/1/2
description 111/1/2 mt-d1096 spa 3-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/3
description 111/1/3 mt-d1096 spb 3-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/4
description 111/1/4 mt-d1096 dm2 1-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/5
description 111/1/5 mt-d1096 dm2 1-1
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/6
description 111/1/6 mt-d1096 dm2 1-2
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/7
description 111/1/7 mt-d1096 dm2 1-3
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/8
description 111/1/8 mt-d1096 dm3 1-0
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/9
description 111/1/9 mt-d1096 dm3 1-1
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/10
description 111/1/10 mt-d1096 dm3 1-2
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet111/1/11
description 111/1/11 mt-d1096 dm3 1-3
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

New switch port configurations

interface Ethernet111/1/12 description 111/1/12 mt-d1096 dm4 1-0 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/19 description 111/1/19 mt-d1096 dm5 1-3 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/26 description 111/1/26 mt-d1096 dm7 1-2 switchport mode trunk switchport trunk allowed vlan 432,712,820
interface Ethernet111/1/13 description 111/1/13 mt-d1096 dm4 1-1 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/20 description 111/1/20 mt-d1096 dm6 1-0 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/27 description 111/1/27 mt-d1096 dm7 1-3 switchport mode trunk switchport trunk allowed vlan 432,712,820
interface Ethernet111/1/14 description 111/1/14 mt-d1096 dm4 1-2 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/21 description 111/1/21 mt-d1096 dm6 1-1 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/28 description 111/1/28 mt-d1096 dm8 1-0 switchport mode trunk switchport trunk allowed vlan 432,712,820
interface Ethernet111/1/15 description 111/1/15 mt-d1096 dm4 1-3 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/22 description 111/1/22 mt-d1096 dm6 1-2 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/29 description 111/1/29 mt-d1096 dm8 1-1 switchport mode trunk switchport trunk allowed vlan 432,712,820
interface Ethernet111/1/16 description 111/1/16 mt-d1096 dm5 1-0 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/23 description 111/1/23 mt-d1096 dm6 1-3 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/30 description 111/1/30 mt-d1096 dm8 1-2 switchport mode trunk switchport trunk allowed vlan 432,712,820
interface Ethernet111/1/17 description 111/1/17 mt-d1096 dm5 1-1 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/24 description 111/1/24 mt-d1096 dm7 1-0 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/31 description 111/1/31 mt-d1096 dm8 1-3 switchport mode trunk switchport trunk allowed vlan 432,712,820
interface Ethernet111/1/18 description 111/1/18 mt-d1096 dm5 1-2 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/25 description 111/1/25 mt-d1096 dm7 1-1 switchport mode trunk switchport trunk allowed vlan 432,712,820	interface Ethernet111/1/32 description 111/1/32 mt-d1096 dm9 1-0 switchport mode trunk switchport trunk allowed vlan 432,712,820

New switch port configurations

```
interface Ethernet1/1/33
description 111/1/33 mt-d1096 dm9 1-1
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet1/1/34
description 111/1/34 mt-d1096 dm9 1-2
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface Ethernet1/1/35
description 111/1/35 mt-d1096 dm9 1-3
switchport mode trunk
switchport trunk allowed vlan 432,712,820
```

```
interface ethernet1/1/31
description "1/1/31 mt-d1096 dm2 3-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/32
description "1/1/32 mt-d1096 dm2 4-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/33
description "1/1/33 mt-d1096 dm3 3-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/34
description "1/1/34 mt-d1096 dm3 4-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/35
description "1/1/35 mt-d1096 dm4 3-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

New switch port configurations

```
interface ethernet1/1/36
description "1/1/36 mt-d1096 dm4 4-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/37
description "1/1/37 mt-d1096 dm5 3-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/38
description "1/1/38 mt-d1096 dm5 4-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/39
description "1/1/39 mt-d1096 dm6 3-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/40
description "1/1/40 mt-d1096 dm6 4-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/41
description "1/1/41 mt-d1096 dm7 3-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

New switch port configurations

```
interface ethernet1/1/42
description "1/1/42 mt-d1096 dm7 4-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/47
description "1/1/47 mt-d1096 dm8 3-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/48
description "1/1/48 mt-d1096 dm8 4-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/49
description "1/1/49 mt-d1096 dm9 3-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
interface ethernet1/1/50
description "1/1/50 mt-d1096 dm9 4-0"
no shutdown
switchport mode trunk
switchport trunk allowed vlan
420,428,432,436,1660,1696,1714,1718-
1720
mtu 9214
flowcontrol receive off
spanning-tree bpduguard enable
spanning-tree guard root
spanning-tree port type edge
```

```
fc san
USD30_40_VF12AD : 4
12AD mt-d1096 spa 0:0

USD30_40_VF12AD : 5
12AD mt-d1096 spa 0:1

USD30_40_VF12AD : 6
12AD mt-d1096 spb 0:0

USD30_40_VF12AD : 7
12AD mt-d1096 spb 0:1
```

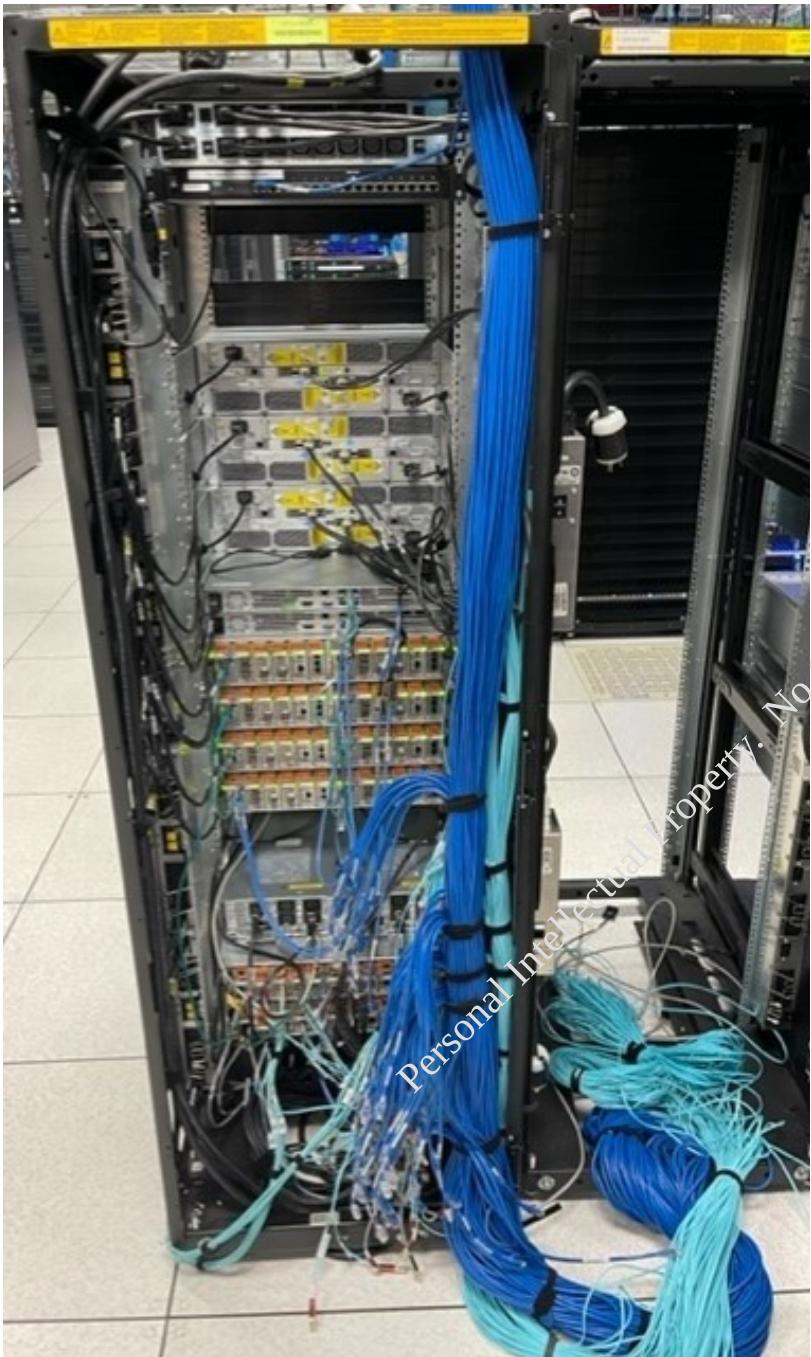
New switch port configurations

Eth110/1/16	Up	Po110	Eth111/1/7	Up	Po111	Eth111/1/17	Up	Po111
Eth110/1/17	Up	Po110	Eth111/1/8	Up	Po111	Eth111/1/18	Up	Po111
Eth110/1/18	Up	Po110	Eth111/1/9	Up	Po111	Eth111/1/19	Up	Po111
Eth110/1/19	Up	Po110	Eth111/1/10	Up	Po111	Eth111/1/20	Up	Po111
Eth110/1/20	Up	Po110	Eth111/1/11	Up	Po111	Eth111/1/21	Up	Po111
Eth110/1/21	Up	Po110	Eth111/1/12	Up	Po111	Eth111/1/22	Up	Po111
Eth110/1/22	Up	Po110	Eth111/1/13	Up	Po111	Eth111/1/23	Up	Po111
Eth110/1/23	Up	Po110	Eth111/1/14	Up	Po111	Eth111/1/24	Up	Po111
Eth110/1/24	Up	Po110	Eth111/1/15	Up	Po111	Eth111/1/25	Up	Po111
Eth110/1/25	Up	Po110	Eth111/1/16	Up	Po111	Eth111/1/26	Up	Po111

New switch port configurations

Eth 1/1/31	1/1/31 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/32	1/1/32 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/33	1/1/33 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/34	1/1/34 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/35	1/1/35 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/36	1/1/36 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/37	1/1/37 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/38	1/1/38 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/39	1/1/39 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/40	1/1/40 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/41	1/1/41 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/42	1/1/42 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/47	1/1/47 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/48	1/1/48 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/49	1/1/49 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720
Eth 1/1/50	1/1/50 mt-d10.. up	10G	full	T	420,428,432,436,1660,1696,1714,1718-1720

BEFORE



AFTER



Oberon Densification and Relocation

17 arrays to be consolidated and relocated with new infrastructure cabling and reconfigurations

Design of rack and row layout

Physical rack and stack and cabling

Infrastructure cabinet switches reconfigurations

Mentoring of jr. members for implementation

Back end reconfigurations and front end reconfigurations

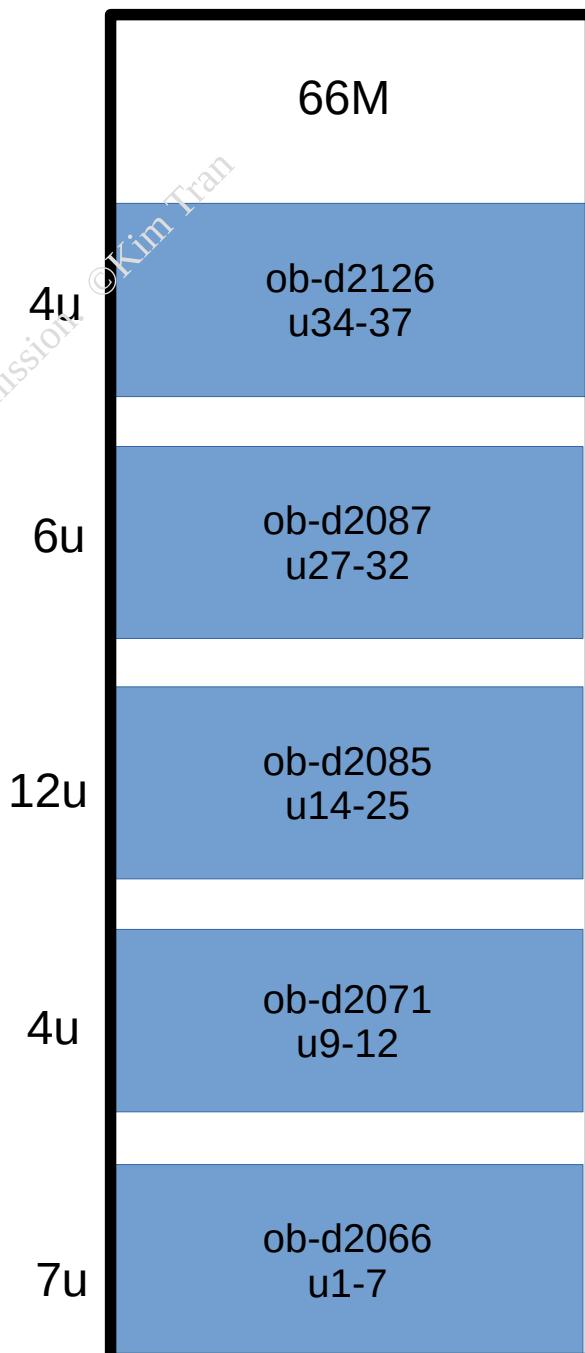
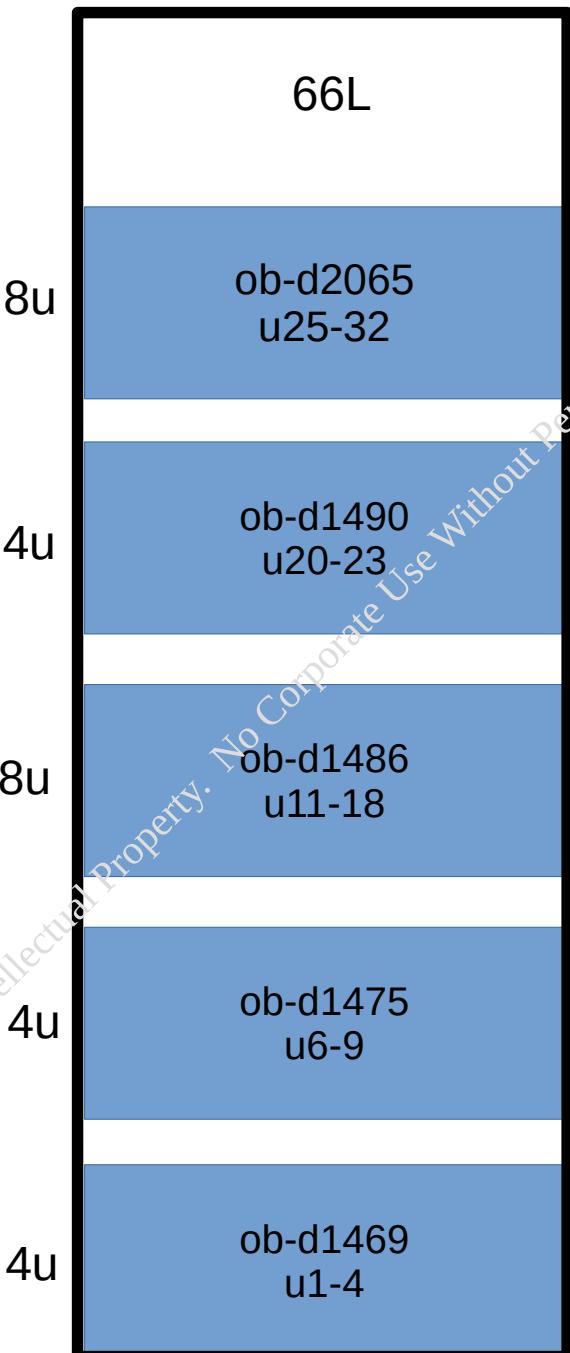
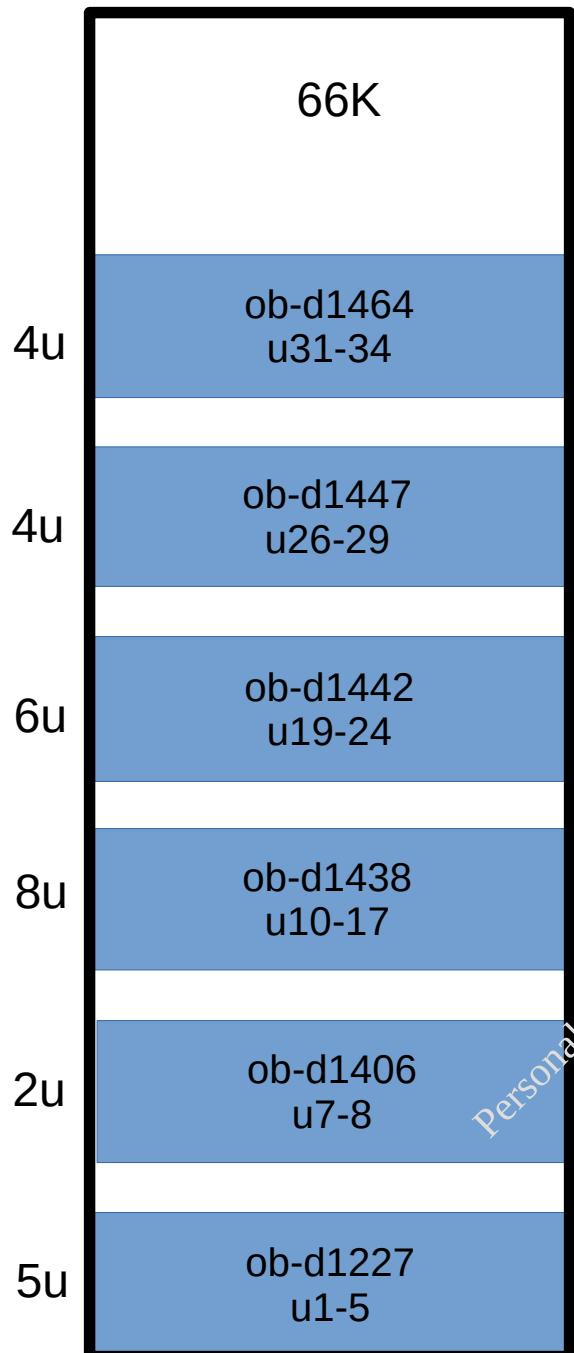
Consolidation of 17 oberons spreadout through rows 82 and 86 column one

Rack layout to maximize densification to 4 racks

Please ensure that all racks have WTI pdu's.

OB-D2105 to be re-racked to remove existing rack U gaps, and to re-cable backend connections of the cnaga daes to ensure proper dae slack and no - snag functionality when pulling out the enclosure to replace and verify drives.

*Re-racking of the cnaga daes should be done one at a time, and after racking, test to ensure that removal and closure of the dae is clean, meaning dae can be fully extended without snagging and trapping any backend cabling and can be closed without snagging and trapping any backend cabling.



66R

20u

ob-d2105
u4-23

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Sheet1

<u>Source Hostname</u>	<u>Source Port</u>	<u>Source Tile</u>	<u>Destination Hostname</u>	<u>Destination Port</u>	<u>Destination Tile</u>	<u>Cable Type</u>	<u>Notes</u>		
L1D4K	3	66H	OB-D1227	SPA-MGMT	66K	COPPER	10gbe copper	10.228	-SW3
L1D4K	4	66H	OB-D1227	SPB-MGMT	66K	COPPER	10gbe copper	10.228	-SW5
L1D4K	5	66H	OB-D1406	SPA-MGMT	66K	COPPER	10gbe copper	10.228	-SW6
L1D4K	6	66H	OB-D1406	SPB-MGMT	66K	COPPER	10gbe copper	10.228	-SW7
L1D4K	7	66H	OB-D1438	SPA-MGMT	66K	COPPER	10gbe copper	10.228	VF66H
L1D4K	8	66H	OB-D1438	SPB-MGMT	66K	COPPER	10gbe copper		
L1D4K	9	66H	OB-D1442	SPA-MGMT	66K	COPPER	10gbe copper		
L1D4K	10	66H	OB-D1442	SPB-MGMT	66K	COPPER	10gbe copper		
L1D4K	11	66H	OB-D1447	SPA-MGMT	66K	COPPER	10gbe copper		
L1D4K	12	66H	OB-D1447	SPB-MGMT	66K	COPPER	10gbe copper		
L1D4K	13	66H	OB-D1464	SPA-MGMT	66K	COPPER	10gbe copper		
L1D4K	14	66H	OB-D1464	SPB-MGMT	66K	COPPER	10gbe copper		
L1D4K	15	66H	OB-D1469	SPA-MGMT	66L	COPPER	10gbe copper		
L1D4K	16	66H	OB-D1469	SPB-MGMT	66L	COPPER	10gbe copper		
L1D4K	17	66H	OB-D1475	SPA-MGMT	66L	COPPER	10gbe copper		
L1D4K	18	66H	OB-D1475	SPB-MGMT	66L	COPPER	10gbe copper		
L1D4K	19	66H	OB-D1486	SPA-MGMT	66L	COPPER	10gbe copper		
L1D4K	20	66H	OB-D1486	SPB-MGMT	66L	COPPER	10gbe copper		
L1D4K	21	66H	OB-D1490	SPA-MGMT	66L	COPPER	10gbe copper		
L1D4K	22	66H	OB-D1490	SPB-MGMT	66L	COPPER	10gbe copper		
L1D4K	23	66H	OB-D2065	SPA-MGMT	66L	COPPER	10gbe copper		
L1D4K	24	66H	OB-D2065	SPB-MGMT	66L	COPPER	10gbe copper		
L1D4K	31	66H	OB-D2066	SPA-MGMT	66M	COPPER	10gbe copper		
L1D4K	32	66H	OB-D2066	SPB-MGMT	66M	COPPER	10gbe copper		
L1D4K	33	66H	OB-D2071	SPA-MGMT	66M	COPPER	10gbe copper		
L1D4K	34	66H	OB-D2071	SPB-MGMT	66M	COPPER	10gbe copper		
L1D4K	35	66H	OB-D2085	SPA-MGMT	66M	COPPER	10gbe copper		
L1D4K	36	66H	OB-D2085	SPB-MGMT	66M	COPPER	10gbe copper		
L1D4K	37	66H	OB-D2087	SPA-MGMT	66M	COPPER	10gbe copper		
L1D4K	38	66H	OB-D2087	SPB-MGMT	66M	COPPER	10gbe copper		
L1D4K	39	66H	OB-D2105	SPA-MGMT	66R	COPPER	10gbe copper		
L1D4K	40	66H	OB-D2105	SPB-MGMT	66R	COPPER	10gbe copper		
L1D4K	41	66H	OB-D2126	SPA-MGMT	66M	COPPER	10gbe copper		
L1D4K	42	66H	OB-D2126	SPB-MGMT	66M	COPPER	10gbe copper		
L1D4K	43	66H	OB-D2087	SPB-ETH2	66M	COPPER	10gbe copper		
L1D4K	44	66H	OB-D2087	SPB-ETH3	66M	COPPER	10gbe copper		
L1D4K	45	66H	OB-D2105	SPA-ETH2	66R	COPPER	10gbe copper		
L1D4K	46	66H	OB-D2105	SPA-ETH3	66R	COPPER	10gbe copper		

L1D4K	47	66H	OB-D2105	SPB-ETH2	66R	COPPER	10gbe copper		
L1D4K	48	66H	OB-D2105	SPB-ETH3	66R	COPPER	10gbe copper		
L1D4K	49	66H	OB-D2126	SPA-ETH2	66M	COPPER	10gbe copper		
L1D4K	50	66H	OB-D2126	SPA-ETH3	66M	COPPER	10gbe copper		
L1D4K	51	66H	OB-D2126	SPB-ETH2	66M	COPPER	10gbe copper		
L1D4K	52	66H	OB-D2126	SPB-ETH3	66M	COPPER	10gbe copper		
<hr/>									
L1D4K	1	66H	OB-D1227	SPA-ETH2	66K	COPPER	10gbe copper		
L1D4K	2	66H	OB-D1227	SPB-ETH2	66K	COPPER	10gbe copper		
L1D4K	3	66H	OB-D1406	SPA-ETH2	66K	COPPER	10gbe copper		
L1D4K	4	66H	OB-D1406	SPA-ETH3	66K	COPPER	10gbe copper		
L1D4K	5	66H	OB-D1406	SPB-ETH2	66K	COPPER	10gbe copper		
L1D4K	6	66H	OB-D1406	SPB-ETH3	66K	COPPER	10gbe copper		
L1D4K	7	66H	OB-D1438	SPA-ETH2	66K	COPPER	10gbe copper		
L1D4K	8	66H	OB-D1438	SPA-ETH3	66K	COPPER	10gbe copper		
L1D4K	9	66H	OB-D1438	SPB-ETH2	66K	COPPER	10gbe copper		
L1D4K	10	66H	OB-D1438	SPB-ETH3	66K	COPPER	10gbe copper		
L1D4K	11	66H	OB-D1442	SPA-ETH2	66K	COPPER	10gbe copper		
L1D4K	12	66H	OB-D1442	SPB-ETH2	66K	COPPER	10gbe copper		
L1D4K	13	66H	OB-D1447	SPA-ETH2	66K	COPPER	10gbe copper		
L1D4K	14	66H	OB-D1447	SPB-ETH2	66K	COPPER	10gbe copper		
L1D4K	15	66H	OB-D1464	SPA-ETH2	66K	COPPER	10gbe copper		
L1D4K	16	66H	OB-D1464	SPA-ETH3	66K	COPPER	10gbe copper		
L1D4K	17	66H	OB-D1464	SPB-ETH2	66K	COPPER	10gbe copper		
L1D4K	18	66H	OB-D1464	SPB-ETH3	66K	COPPER	10gbe copper		
L1D4K	19	66H	OB-D1469	SPA-ETH2	66L	COPPER	10gbe copper		
L1D4K	20	66H	OB-D1469	SPA-ETH3	66L	COPPER	10gbe copper		
L1D4K	21	66H	OB-D1469	SPB-ETH2	66L	COPPER	10gbe copper		
L1D4K	22	66H	OB-D1469	SPB-ETH3	66L	COPPER	10gbe copper		
L1D4K	23	66H	OB-D1475	SPA-ETH2	66L	COPPER	10gbe copper		
L1D4K	24	66H	OB-D1475	SPB-ETH2	66L	COPPER	10gbe copper		
L1D4K	31	66H	OB-D1486	SPA-ETH2	66L	COPPER	10gbe copper		
L1D4K	32	66H	OB-D1486	SPA-ETH3	66L	COPPER	10gbe copper		
L1D4K	33	66H	OB-D1486	SPB-ETH2	66L	COPPER	10gbe copper		
L1D4K	34	66H	OB-D1486	SPB-ETH3	66L	COPPER	10gbe copper		
L1D4K	35	66H	OB-D1490	SPA-ETH2	66L	COPPER	10gbe copper		
L1D4K	36	66H	OB-D1490	SPA-ETH3	66L	COPPER	10gbe copper		
L1D4K	37	66H	OB-D1490	SPB-ETH2	66L	COPPER	10gbe copper		
L1D4K	38	66H	OB-D1490	SPB-ETH3	66L	COPPER	10gbe copper		
L1D4K	39	66H	OB-D2065	SPA-ETH2	66L	COPPER	10gbe copper		

L1D4K	40	66H	OB-D2065	SPA-ETH3	66L	COPPER	10gbe copper		
L1D4K	41	66H	OB-D2065	SPB-ETH2	66L	COPPER	10gbe copper		
L1D4K	42	66H	OB-D2065	SPB-ETH3	66L	COPPER	10gbe copper		
L1D4K	43	66H	OB-D2066	SPA-ETH2	66M	COPPER	10gbe copper		
L1D4K	44	66H	OB-D2066	SPA-ETH3	66M	COPPER	10gbe copper		
L1D4K	45	66H	OB-D2066	SPB-ETH2	66M	COPPER	10gbe copper		
L1D4K	46	66H	OB-D2066	SPB-ETH3	66M	COPPER	10gbe copper		
L1D4K	47	66H	OB-D2071	SPA-ETH2	66M	COPPER	10gbe copper		
L1D4K	48	66H	OB-D2071	SPB-ETH2	66M	COPPER	10gbe copper		
L1D4K	49	66H	OB-D2085	SPA-ETH2	66M	COPPER	10gbe copper		
L1D4K	50	66H	OB-D2085	SPA-ETH3	66M	COPPER	10gbe copper		
L1D4K	51	66H	OB-D2085	SPB-ETH2	66M	COPPER	10gbe copper		
L1D4K	52	66H	OB-D2085	SPB-ETH3	66M	COPPER	10gbe copper		
L1D4K	53	66H	OB-D2087	SPA-ETH2	66M	COPPER	10gbe copper		
L1D4K	54	66H	OB-D2087	SPA-ETH3	66M	COPPER	10gbe copper		
<hr/>									
<hr/>									
L1D4K	1	66H	OB-D2105	SPA-1:0	66R	COPPER	10gbe copper		
L1D4K	2	66H	OB-D2105	SPA-1:1	66R	COPPER	10gbe copper		
L1D4K	3	66H	OB-D2105	SPA-1:2	66R	COPPER	10gbe copper		
L1D4K	4	66H	OB-D2105	SPA-1:3	66R	COPPER	10gbe copper		
L1D4K	5	66H	OB-D2105	SPB-1:0	66R	COPPER	10gbe copper		
L1D4K	6	66H	OB-D2105	SPB-1:1	66R	COPPER	10gbe copper		
L1D4K	7	66H	OB-D2105	SPB-1:2	66R	COPPER	10gbe copper		
L1D4K	8	66H	OB-D2105	SPB-1:3	66R	COPPER	10gbe copper		
L1D4K	9	66H	OB-D2071	SPA-1:0	66M	COPPER	10gbe copper		
L1D4K	10	66H	OB-D2071	SPA-1:1	66M	COPPER	10gbe copper		
L1D4K	11	66H	OB-D2071	SPB-1:0	66M	COPPER	10gbe copper		
L1D4K	12	66H	OB-D2071	SPB-1:1	66M	COPPER	10gbe copper		
L1D4K	13	66H	WTI-66K	MGMT	66K	COPPER	10gbe copper		
<hr/>									
<hr/>									
Ports 1									
L1D4K	1	66H	OB-D1475	SPA-CNA4	66L	FIBER	10gbe optical		
L1D4K	2	66H	OB-D1475	SPB-CNA4	66L	FIBER	10gbe optical		
L1D4K	3	66H	OB-D2087	SPA-CNA4	66M	FIBER	10gbe optical		
L1D4K	4	66H	OB-D2087	SPA-CNA5	66M	FIBER	10gbe optical		
L1D4K	5	66H	OB-D2087	SPB-CNA4	66M	FIBER	10gbe optical		
L1D4K	6	66H	OB-D2087	SPB-CNA5	66M	FIBER	10gbe optical		
L1D4K	7	66H	OB-D1442	SPA-1:0	66K	FIBER	10gbe optical		
L1D4K	8	66H	OB-D1442	SPA-1:1	66K	FIBER	10gbe optical		

L1D4K	9	66H	OB-D1442	SPB-1:0	66K	FIBER	10gbe optical		
L1D4K	10	66H	OB-D1442	SPB-1:1	66K	FIBER	10gbe optical		
L1D4K	11	66H	OB-D1447	SPA-0:0	66K	FIBER	10gbe optical		
L1D4K	12	66H	OB-D1447	SPB-0:0	66K	FIBER	10gbe optical		
L1D4K	13	66H	OB-D1469	SPA-0:0	66L	FIBER	10gbe optical		
L1D4K	14	66H	OB-D1469	SPA-0:1	66L	FIBER	10gbe optical		
L1D4K	15	66H	OB-D1469	SPB-0:0	66L	FIBER	10gbe optical		
L1D4K	16	66H	OB-D1469	SPB-0:1	66L	FIBER	10gbe optical		
L1D4K	21	66H	OB-D2085	SPA-1:0	66M	FIBER	10gbe optical		
L1D4K	22	66H	OB-D2085	SPA-1:1	66M	FIBER	10gbe optical		
L1D4K	23	66H	OB-D2085	SPB-1:0	66M	FIBER	10gbe optical		
L1D4K	24	66H	OB-D2085	SPB-1:1	66M	FIBER	10gbe optical		
L1D4K	31	66H	OB-D2105	SPA-0:0	66R	FIBER	10gbe optical		
L1D4K	32	66H	OB-D2105	SPA-0:1	66R	FIBER	10gbe optical		
L1D4K	33	66H	OB-D2105	SPA-0:2	66R	FIBER	10gbe optical		
L1D4K	34	66H	OB-D2105	SPA-0:3	66R	FIBER	10gbe optical		
L1D4K	35	66H	OB-D2105	SPB-0:0	66R	FIBER	10gbe optical		
L1D4K	36	66H	OB-D2105	SPB-0:1	66R	FIBER	10gbe optical		
L1D4K	37	66H	OB-D2105	SPB-0:2	66R	FIBER	10gbe optical		
L1D4K	38	66H	OB-D2105	SPB-0:3	66R	FIBER	10gbe optical		
USD-									
USD-	2	66H	OB-D1227	SPA-CNA4	66K	FIBER	16gbe optical – fc san		
USD-	3	66H	OB-D1227	SPB-CNA4	66K	FIBER	16gbe optical – fc san		
USD-	4	66H	OB-D1442	SPA-CNA4	66K	FIBER	16gbe optical – fc san		
USD-	5	66H	OB-D1442	SPA-CNA5	66K	FIBER	16gbe optical – fc san		
USD-	6	66H	OB-D1442	SPB-CNA4	66K	FIBER	16gbe optical – fc san		
USD-	7	66H	OB-D1442	SPB-CNA5	66K	FIBER	16gbe optical – fc san		
USD-	8	66H	OB-D1447	SPA-CNA4	66K	FIBER	16gbe optical – fc san		
USD-	9	66H	OB-D1447	SPA-CNA5	66K	FIBER	16gbe optical – fc san		
USD-	10	66H	OB-D1447	SPB-CNA4	66K	FIBER	16gbe optical – fc san		
USD-	11	66H	OB-D1447	SPB-CNA5	66K	FIBER	16gbe optical – fc san		
USD-	12	66H	OB-D1464	SPA-CNA4	66K	FIBER	16gbe optical – fc san		
USD-	13	66H	OB-D1464	SPA-CNA5	66K	FIBER	16gbe optical – fc san		
USD-	14	66H	OB-D1464	SPB-CNA4	66K	FIBER	16gbe optical – fc san		
USD-	15	66H	OB-D1464	SPB-CNA5	66K	FIBER	16gbe optical – fc san		
USD-	16	66H	OB-D1469	SPA-CNA4	66L	FIBER	16gbe optical – fc san		
USD-	17	66H	OB-D1469	SPA-CNA5	66L	FIBER	16gbe optical – fc san		
USD-	18	66H	OB-D1469	SPB-CNA4	66L	FIBER	16gbe optical – fc san		
USD-	19	66H	OB-D1469	SPB-CNA5	66L	FIBER	16gbe optical – fc san		
USD-	20	66H	OB-D1486	SPA-CNA4	66L	FIBER	16gbe optical – fc san		

USD	21	66H	OB-D1486	SPB-CNA4	66L	FIBER	16gbe optical – fc san		
USD	22	66H	OB-D1490	SPA-CNA4	66L	FIBER	16gbe optical – fc san		
USD	23	66H	OB-D1490	SPA-CNA5	66L	FIBER	16gbe optical – fc san		
USD	26	66H	OB-D1490	SPB-CNA4	66L	FIBER	16gbe optical – fc san		
USD	27	66H	OB-D1490	SPB-CNA5	66L	FIBER	16gbe optical – fc san		
USD	28	66H	OB-D2065	SPA-CNA4	66L	FIBER	16gbe optical – fc san		
USD	29	66H	OB-D2065	SPA-CNA5	66L	FIBER	16gbe optical – fc san		
USD	30	66H	OB-D2065	SPB-CNA4	66L	FIBER	16gbe optical – fc san		
USD	31	66H	OB-D2065	SPB-CNA5	66L	FIBER	16gbe optical – fc san		
USD	32	66H	OB-D2066	SPA-CNA4	66M	FIBER	16gbe optical – fc san		
USD	33	66H	OB-D2066	SPA-CNA5	66M	FIBER	16gbe optical – fc san		
USD	34	66H	OB-D2066	SPB-CNA4	66M	FIBER	16gbe optical – fc san		
USD	35	66H	OB-D2066	SPB-CNA5	66M	FIBER	16gbe optical – fc san		
USD	36	66H	OB-D2071	SPA-CNA4	66M	FIBER	16gbe optical – fc san		
USD	37	66H	OB-D2071	SPB-CNA4	66M	FIBER	16gbe optical – fc san		
USD	38	66H	OB-D2085	SPA-CNA4	66M	FIBER	16gbe optical – fc san		
USD	39	66H	OB-D2085	SPA-CNA5	66M	FIBER	16gbe optical – fc san		
USD	40	66H	OB-D2085	SPB-CNA4	66M	FIBER	16gbe optical – fc san		
USD	41	66H	OB-D2085	SPB-CNA5	66M	FIBER	16gbe optical – fc san		
USD	42	66H	OB-D2105	SPA-CNA4	66R	FIBER	16gbe optical – fc san		
USD	43	66H	OB-D2105	SPA-CNA5	66R	FIBER	16gbe optical – fc san		
USD	44	66H	OB-D2105	SPB-CNA4	66R	FIBER	16gbe optical – fc san		
USD	45	66H	OB-D2105	SPB-CNA5	66R	FIBER	16gbe optical – fc san		
USD	46	66H	OB-D2126	SPA-CNA4	66M	FIBER	16gbe optical – fc san		
USD	47	66H	OB-D2126	SPB-CNA4	66M	FIBER	16gbe optical – fc san		
USD	50	66H	OB-D1406	SPA-1:1	66K	FIBER	16gbe optical – fc san		
USD	51	66H	OB-D1406	SPA-1:2	66K	FIBER	16gbe optical – fc san		
USD	52	66H	OB-D1406	SPB-1:1	66K	FIBER	16gbe optical – fc san		
USD	53	66H	OB-D1406	SPB-1:2	66K	FIBER	16gbe optical – fc san		
USD	54	66H	OB-D1475	SPA-0:0	66L	FIBER	16gbe optical – fc san		
USD	55	66H	OB-D1475	SPA-0:1	66L	FIBER	16gbe optical – fc san		
USD	56	66H	OB-D1475	SPB-0:0	66L	FIBER	16gbe optical – fc san		
USD	57	66H	OB-D1475	SPB-0:1	66L	FIBER	16gbe optical – fc san		
USD	58	66H	OB-D2071	SPA-0:0	66M	FIBER	16gbe optical – fc san		
USD	59	66H	OB-D2071	SPB-0:0	66M	FIBER	16gbe optical – fc san		
USD	60	66H	OB-D2085	SPA-0:0	66M	FIBER	16gbe optical – fc san		
USD	61	66H	OB-D2085	SPA-0:1	66M	FIBER	16gbe optical – fc san		
USD	62	66H	OB-D2085	SPA-0:2	66M	FIBER	16gbe optical – fc san		
USD	63	66H	OB-D2085	SPB-0:0	66M	FIBER	16gbe optical – fc san		
USD	64	66H	OB-D2085	SPB-0:1	66M	FIBER	16gbe optical – fc san		
USD	65	66H	OB-D2085	SPB-0:2	66M	FIBER	16gbe optical – fc san		

Sheet1

USD		66	66H	OB-D2087	SPA-0:0	66M	FIBER	16gbe optical – fc san		
USD		67	66H	OB-D2087	SPA-0:1	66M	FIBER	16gbe optical – fc san		
USD		68	66H	OB-D2087	SPB-0:0	66M	FIBER	16gbe optical – fc san		
USD		69	66H	OB-D2087	SPB-0:1	66M	FIBER	16gbe optical – fc san		

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Lead Engineer on project to consolidate and relocate 17 storage arrays for QA team in China

Assisted by junior team members for rack/stack and network configurations.

Inventory, Plan, Design new infrastructure rack cabling of Dell 4k switches and configurations, array rack layouts, pre-relocation healthcheck and post-relocation health verification.

Joseph [REDACTED] awarded You

Winning Together
July 6, 2021

Durham Lab 1 Oberon Consolidation

I would like to thank Kim and Drew for the extra effort that went into relocating 17 Capitalized arrays that were scattered in different rows in Durham Lab 1. They planned the move in advance including the consolidation plan, executed the pre-cabling required for move and switch setups. Additionally, they executed the relocations ahead of scheduled timeline. This project helped to free up two rows in Durham Lab 1 that included 36 tile spaces for New Product additions to the lab. Excellent work guys. Through your extra efforts Durham IEO LabOps was able to exceed customer expectations with no impact to their schedules.

Bravo Award

1500 Points

From: Tran, Kim <Ngoc.Tran@dell.com>
Sent: Thursday, June 24, 2021 2:16 PM
To: [REDACTED]
Subject: Re: Oberon Consolidation Starting 6.17.21 - Please review

Folks,

ob-d1438 and ob-d1442 verification complete and ready for hand off.

That should do it for the oberons in this consolidation/relocation effort.

Special thanks to Drew [REDACTED] for the heavy lifting and sanity checking the layouts while in motion.
Also, to Jim [REDACTED] for the on demand network configurations.

please submit a ticket for any further issues.

Kim Tran
Lab Systems Engineer
Infrastructure Solutions Group
Dell EMC | IEO Cloud Operations

From: Tran, Kim <Ngoc.Tran@dell.com>
Sent: Wednesday, June 23, 2021 3:42 PM
To: <undisclosed>
Subject: Re: Oberon Consolidation Starting 6.17.21 - Please review

Folks,

ob-d2105 verification complete and ready for hand off

customer needs to submit ticket for drive failures and to verify their replication/fs status

ob-d2071 verification complete and ready for hand off

ob-d1438, ob-d1442, has issues being addressed for final verification and hand off

From: [REDACTED]
Sent: Tuesday, June 22, 2021 4:50 PM
To: <undisclosed>
Subject: RE: Oberon Consolidation Starting 6.17.21 - Please review

Thanks for the updates Kim.

Best practice would be to include a reservation name associated with the arrays. J

From: Tran, Kim <Ngoc.Tran@dell.com>
Sent: Tuesday, June 22, 2021 3:39 PM
To: <undisclosed>
Subject: Re: Oberon Consolidation Starting 6.17.21 - Please review

Cab 66R has been racked and stacked, cabled, and powered on
Verification is in progress

ob-d2105 in progress

Kim Tran
Lab Systems Engineer

From: Tran, Kim <Ngoc.Tran@dell.com>
Sent: Tuesday, June 22, 2021 2:52 PM
To: <undisclosed>
Subject: Re: Oberon Consolidation Starting 6.17.21 - Please review

ob-d2126 verification complete

ready for hand off

From: Tran, Kim <Ngoc.Tran@dell.com>
Sent: Tuesday, June 22, 2021 2:38 PM
To: <undisclosed>
Subject: Re: Oberon Consolidation Starting 6.17.21 - Please review

Folks,

ob-d2066	verification complete
ob-d1490	verification complete
ob-d1406	verification complete
ob-d2065	verification complete
ob-d1438	in progress
ob-d2105	rack in progress
ob-d2126	in progress
ob-d1469	verification complete
ob-d1486	verification complete
ob-d1464	verification complete
ob-d1475	verification complete
ob-d2071	in progress
ob-d1447	verification complete
ob-d2085	verification complete
ob-d2087	verification complete
ob-d1227	verification complete
ob-d1442	in progress

ob-d1486 will be handed off, though ticket needed for drive failure replacement
ob-d1464 and ob-d1475 will be handed off, users will need to verify their replication/fs configurations

ob-d1438, ob-d1442, ob-d2071, ob-d2126 has issues being addressed for final verification and hand off

Kim Tran
Lab Systems Engineer
Infrastructure Solutions Group
Dell EMC | IEO Cloud Operations
office: +1 919 767-0885
ngoc.tran@dell.com

From: Tran, Kim <Ngoc.Tran@dell.com>
Sent: Tuesday, June 22, 2021 9:14 AM
To: <undisclosed>
Subject: Re: Oberon Consolidation Starting 6.17.21 - Please review

Morning Sandy,

ob-d2066 in progress
ob-d1490 in progress
ob-d1406 in progress
ob-d2065 in progress
ob-
d1438 in progress
ob- rack in
d2105 progress
ob-
d2126 in progress
ob-
d1469 in progress

ob-d1486 in progress
ob-d1464 in progress
ob-d1475 in progress
ob-d2071 in progress
ob-d1447 in progress
ob-d2085 in progress
ob-d2087 in progress
ob-d1227 in progress
ob-d1442 in progress

There should be another update by end of day, and some arrays should be ready for handoff.

thanks,

Kim Tran
Lab Systems Engineer

From: [REDACTED]
Sent: Monday, June 21, 2021 9:43 AM
To: Tran, Kim <Ngoc.Tran@dell.com><undisclosed>
Subject: RE: Oberon Consolidation Starting 6.17.21 - Please review

Hi Kim,

Can you provide one overall list of the status of verifications?

Thanks.

Sandy

From: Tran, Kim <Ngoc.Tran@dell.com>

Sent: Friday, June 18, 2021 3:33 PM

To: <undisclosed>

Subject: Re: Oberon Consolidation Starting 6.17.21 - Please review

Folks,

Cab 66L has been racked and stacked, cabled, and powered on.
Verifications are still in progress to address any issues found.

Notifications will be sent out after verification of arrays done and ready for handover.

Cab 66M is on scheduled to be worked 6/21.

Arrays in cab 66L:

ob-d1469
ob-d1475
ob-d1486
ob-d1490
ob-d2065

thanks,

Kim Tran
Lab Systems Engineer
Infrastructure Solutions Group
Dell EMC | IEO Cloud Operations

office: +1 919 767-0885
ngoc.tran@dell.com

From: Tran, Kim <Ngoc.Tran@dell.com>
Sent: Thursday, June 17, 2021 3:24 PM
To: <undisclosed>
Subject: Re: Oberon Consolidation Starting 6.17.21 - Please review

Folks,

Cab 66K has been racked and stacked, cabled, and powered on.
Verification will be done tomorrow to address any issues found.

Cab 66L is on scheduled to be worked tomorrow 6/18.

Arrays in cab 66K:

ob-d1227
ob-d1406
ob-d1438
ob-d1442
ob-d1447
ob-d1464

thanks,

Kim Tran
Lab Systems Engineer
I
From: [REDACTED]

Subject: RE: Oberon Consolidation Starting 6.17.21 - Please review

Thanks Sandy.

And thanks to all for your help in this effort.

Cheers,

Joey

From: [REDACTED]

Subject: Oberon Consolidation Starting 6.17.21 - Please review -

All,

Note that the arrays below are scheduled to start relocation on 6.17.21. To expedite readiness the new locations have been pre-cabled and network setups preconfigured. Daily emails will be sent to track progress, arrays that are ready for use and any issues. It is important to note that all IPs and equipment names will remain the same.

Cheers,

Joey

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] Tran, Kim;

Subject: RE: Oberon Consolidation - Please Review and Reply

Yes mam.

Are we OK to start the 17th?

Joey

[REDACTED] Tran, Kim

Subject: RE: Oberon Consolidation - Please Review and Reply

Okay, so do I assume that as of 6/17 all will be offline until you notify all are back online?

[REDACTED] Tran, Kim

Subject: RE: Oberon Consolidation - Please Review and Reply

Sandy,

The 17th is still our target if all testing is done. We will be moving all arrays over a week long period and will notify all once they are back online.

Cheers,

Joey

[REDACTED] Tran, Kim

Subject: RE: Oberon Consolidation - Please Review and Reply

Hi Joey,

Just wanted to follow up on this.

Is the plan to still start relocations this Thursday, 6/17?

Any way you can tell me when my array (OB-D1227) will be moved?

I just want to notify John [REDACTED]. He's the primary user of the array.

Thanks.

Sandy

[REDACTED] Tran, Kim

Subject: RE: Oberon Consolidation - Please Review and Reply

Please see below.

Name	SPE Chassis SN	PSNT	Model	Tile	Owner	Reserved By	Reservation Made By	Reservation Purpose
OB-D1227	FNM0015350043 8	FNM0015350044 6	Unity 500	82J	[REDACTED]	[REDACTED]	[REDACTED]	Code Deployment
OB-D1438	APM0018270158 4	APM0018281513 1	Unity 450F	82K P	[REDACTED]	[REDACTED]	[REDACTED]	CTA testing
OB-D1442	APM0018232419 7	APM0018280790 7	Unity 550F	82T P	[REDACTED]	[REDACTED]	[REDACTED]	test
OB-D1469	APM0018260820 8	APM0018282007 9	Unity 450F	82U P	[REDACTED]	[REDACTED]	[REDACTED]	I&C
OB-D1486	APM0018254293 2	APM0018301899 0	Unity 550	82U	[REDACTED]	[REDACTED]	[REDACTED]	CTA testing
OB-D1490	APM0018254113 0	APM0018281545 5	Unity 450F	82I	[REDACTED]	[REDACTED]	[REDACTED]	test
OB-D2065	APM0019012011	APM0019062000	Unity	82J	[REDACTED]	[REDACTED]	[REDACTED]	Reserve CFT Unity

	7	8	600							
OB-D2066	6	APM0018511882	APM0019062000	Unity 600	82F					SP Testing
OB-D2105	2	APM0018493009	APM0019112403	Unity 500	82N					TEST
OB-D2126	3	APM0019201819	APM0019210176	Unity 300	82S					SP Testing
OB-D1406	8	APM0017070685	APM0017070685	Unity 300	86G					Share to VSA team
OB-D1447	2	APM0018232419	APM0018280286	Unity 550F	86N					CTA testing
OB-D1464	1	APM0018242384	APM0018280813	Unity 450F	86F					It is reserved in Go project.
OB-D1475	2	APM0018254905	APM0018280285	Unity 450F	86F					CTA testing
OB-D2071	0	APM0019100382	APM0019100856	Unity 650F	86K					Reserve CFT Unity
OB-D2085	2	APM0019061733	APM0019090771	Unity 500	86N					I&C
OB-D2087	9	APM0018471588	APM0019090771	Unity 400	86U					vc_hyperv_warnad

Joe

Tran, Kim

Subject: RE: Oberon Consolidation - Please Review and Reply

OK. All in Swarm. Will pull

Joe

[REDACTED] Tran, Kim

Subject: RE: Oberon Consolidation - Please Review and Reply

Hi Joey,

Can you provide names of who has the equipment reserved and also the Responsible Manager?

Thanks.

[REDACTED] Tran, Kim

Subject: RE: Oberon Consolidation - Please Review and Reply

All,

Just wanted to check back that we are OK to start array relocation starting on 6.17.21 for all of Oberon's below. Please note that we are in the process of pre-cabling all arrays for the new locations along with the addition of new Dell Infrastructure. It is important to note that all array names, IPs and Vlans will stay the same post relocation. The moves will be executed from 6.17 - 6.25 and we will notify all as the arrays come back online in the new location. Please ensure all users are aware.

ob-d2066
ob-d1490
ob-d1406
ob-d2065
ob-d1438
ob-d2105
ob-d2126
ob-d1469

ob-d1486

ob-d1464

ob-d1475

ob-d2071

ob-d1447

ob-d2085

ob-d2087

ob-d1227

ob-d1442

Cheers,

Joey

Tran, Kim

Subject: RE: Oberon Consolidation - Please Review and Reply

Hi Joey,

So far, no one object to do move on June 17th.

One question is OB-D1406 is listed both in Row 86 and Row 82. From Swarm information, it is located in 86G.
Could you please double check?

Thanks!

Thanks,
Jennifer

[REDACTED]; Tran, Kim

Subject: RE: Oberon Consolidation - Please Review and Reply

Many thanks!

Joey

[REDACTED] Tran, Kim

Subject: RE: Oberon Consolidation - Please Review and Reply

Hi Joey,

Sorry for not replying in time.

If Goshawk will be RTS on June 9th as planned. June 17th to start relocation should be fine.
I am checking with related managers to get their feedback. I will reply to you for their feedback.
And I will inform you around June 10th to see if there is any change for Goshawk Golden Run test.

Thanks,
Jennifer

[REDACTED] Tran, Kim

Subject: RE: Oberon Consolidation - Please Review and Reply

All,
Reminder. Please advise.

Joe

[REDACTED] Tran, Kim

Subject: Oberon Consolidation - Please Review and Reply

Jennifer,

Wanted to circle back once more on the plans to consolidate all Oberon's into one area. We currently have a consolidation plan and cable Matrix for the arrays below to relocate from row 82 & 86 to row 66. **As agreed we are targeting work to start 6.17.21** Please let us know if this date is OK. As I recall you all are still executing Goshhawk test. It is important to note that we have or will:

- Pre-cable new row
- Add additional Network and Fiber Switches for array moves
- No IPs or Equip. Names will change and access will remain the same

We will manage the Hosts moves for this area as a separate effort.

ob-d2066

ob-d1490

ob-d1406

ob-d2065

ob-d1438

ob-d2105

ob-d2126

ob-d1469

ob-d1486

ob-d1464

ob-d1475

ob-d2071

ob-d1447

ob-d2085

ob-d2087

ob-d1227

ob-d1442

Joe

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France Unity / Oberon Project

Setup of 4 Unity arrays for France Customer's Metrosync Dev Environment

Setup of arrays that were procured for the project

Solo design to implementation to delivery

Design of rack and row layout

Physical rack and stack and cabling

Design of Infrastructure cabinet cabling and ip scheme

Back end reconfigurations and front end reconfigurations

From: excellence@emc.com <excellence@emc.com>
Sent: Tuesday, April 4, 2017 7:42 AM
To: Tran, Ngoc
Subject: Congratulations, you've received an Excellence@Dell Award!

Hi Ngoc K Tran,

Congratulations !

I am pleased to notify you that you have been approved for an Excellence@Dell Bronze level award! Thank you for your continued contributions, which drive our culture of innovation, passion, and success.

Simply click the link below to view your award certificate.

<http://excellenceatemc.emc.com/mr/nominations/96461251/present>

For more information about Excellence@Dell, [click here](#).

From: [REDACTED]
Sent: Thursday, March 30, 2017 8:13 AM
To: Tran, Ngoc
Subject: RE: Hardware in Durham (4 Oberon's) - Status update 3.29.17

Nice work and communication Kim.
jc

From: Tran, Ngoc
Sent: Wednesday, March 29, 2017 11:30 PM
To: [REDACTED]

Cc: [REDACTED]

Subject: RE: Hardware in Durham (4 Oberon's) - Status update 3.29.17

Folks,

Ready to handover

The 4 arrays are cabled, have been pxe/reinit with the merlin code (4.2.xxx)

Basic configuration have been performed and verified

Please reference RITM0227272 for more details on work/tasks done.

Array sp's management/unisphere and ssh connectivity have been verified

To my knowledge and understanding of original request:

==

deployed as FC connected pairs for synchronous replication (mirror view).

This means we must have pairs of arrays directly connected through the
SRM FC port (SPA of array1 to SPA of array2 and SPB or array1 connected to SPB of array2)

We need IP's and cabling to access subnets 10.109.165 and 10.109.173

We need to have FTP/http/cifs ports open for each ip

We need to have ssh port open for the system management

==

So connections were for sp's management (cooper).

Two 16gb fc connections per sp per array.

FC connection for array pairs (spa/spb) for 2 pairs of ob-d1404/ob-d1405 and ob-d1406/ob-d1407.

Connectivity to the 10.109.165 and 10.109.173 has been tested with ob-d1404:

PING 10.109.165.1 (10.109.165.1) from 10.109.17.35 : 56(84) bytes of data.

64 bytes from 10.109.165.1: icmp_seq=1 ttl=255 time=1.44 ms

64 bytes from 10.109.165.1: icmp_seq=2 ttl=255 time=1.25 ms

64 bytes from 10.109.165.1: icmp_seq=3 ttl=255 time=1.44 ms

-- 10.109.165.1 ping statistics --

3 packets transmitted, 3 received, 0% packet loss, time 2002ms
rtt min/avg/max/mdev = 1.254/1.381/1.447/0.099 ms

```
02:55:56 root@OB-D1404-spb spb:~> ping 10.109.173.1
PING 10.109.173.1 (10.109.173.1) from 10.109.17.35 : 56(84) bytes of data.
64 bytes from 10.109.173.1: icmp_seq=1 ttl=255 time=0.842 ms
64 bytes from 10.109.173.1: icmp_seq=2 ttl=255 time=1.07 ms
```

-- 10.109.173.1 ping statistics --

2 packets transmitted, 2 received, 0% packet loss, time 999ms
rtt min/avg/max/mdev = 0.842/0.957/1.073/0.119 ms
02:56:04 root@OB-D1404-spb spb:~>

Pings to the requested networks' gateway confirmed.

Presumptions would be similar results for the other arrays as they were configured the same, excluding any specific cases with network/vlan/configuration issues, for other protocols, please verify and open ticket as necessary to correct or as required with any additional cables or ip's requested.

Thanks,

Kim Tran
Lab Systems Engineer
Infrastructure Solutions Group
Dell EMC | EOS² Cloud Operations
(919) 767-0885
ngoc.tran@dell.com

From:

Sent: Wednesday, March 29, 2017 8:24 PM

To: [REDACTED] Tran, Ngoc <Ngoc.Tran@emc.com> [REDACTED]

Subject: RE: Hardware in Durham (4 Oberon's) - Status update 3.28.17

Hello,

Please note the 4 arrays are still being set up, target EOD 3.30.17 to complete. Once Tran has all arrays in-service you can open request for additional IPs and or I can work with networking to obtain the required IPs. From what I recall these will be used to test Harrier?

Cheers,
Joey

From: [REDACTED]
Sent: Wednesday, March 29, 2017 3:39 AM
To: Tran, Ngoc <Ngoc.Tran@emc.com>
[REDACTED]
Subject: RE: Hardware in Durham (4 Oberon's) - Status update 3.28.17

Thank You for the update! Please let us know when it's all set!

I still have a question. When I swarm ob-d1404 I do not see any IO IPs assigned to the array, is it something that we've forgot to ask or is it still on-going?

If I remember correctly I think we've asked for connection to the 10.109.72.x subnet but did we ask for IO IP addresses? Anyway, we will need 8 IO IPs for each array (that means 4*8 IPs in total)

Thanks!

--
Michel.

From: Tran, Ngoc
Sent: mercredi 29 mars 2017 03:05
[REDACTED]
Subject: RE: Hardware in Durham (4 Oberon's) - Status update 3.28.17

Folks,

The first pair of arrays, ob-d1404 and ob-d1405 are currently being pxe reinit now, along with verification.
The second pair of arrays ob-d1406 and ob-d1407 are scheduled for bmc/network connectivity and pxe reinit/verification for tomorrow.
Estimate turnover for all arrays is for Thursday, without further delays or complications expected.

Thanks,

Kim Tran
Lab Systems Engineer
Infrastructure Solutions Group
Dell EMC | EOS² Cloud Operations
(919) 767-0885
ngoc.tran@dell.com

From: Tran, Ngoc
Sent: Monday, March 27, 2017 5:00 PM
To: [REDACTED]
<sy> [REDACTED]
Cc: [REDACTED]
<Ch> [REDACTED]
Subject: RE: Hardware in Durham (4 Oberon's) - Status update 3.27.17

Folks,

-Cable matrix done
-Cable run done {2 fc connections / sp, in addition to fc connection for replication: ob-d1404/ob-d1405 and ob-d1406 /ob-d1407 pairs)
-zoning, may be required – PLEASE CONFIRM IF THIS IS THE CASE
-ip's for interfaces have been configured

Please see attached matrix for details

-Currently working through issues with networking team, on resolving the bmc/mgmt interfaces and attaining the dhcp reserved ip's
-this is holding up the rest of the process of initializing arrays with latest array code and verification

Kim Tran
Lab Systems Engineer
Infrastructure Solutions Group
Dell EMC | EOS² Cloud Operations
(919) 767-0885
ngoc.tran@dell.com

From: [REDACTED]
Sent: [REDACTED]
To: [REDACTED]
Go: [REDACTED]
Cc: [REDACTED]
<Ngoc.Tran@emc.com>
Subject: RE: Hardware in Durham (4 Oberon's) - Status update 3.24.17

Tran, Ngoc

Thank you to keep us updated.

Regards
Fred

From: [REDACTED]
Sent: [REDACTED]
To: [REDACTED]
Cc: [REDACTED] Tran, Ngoc
Subject: RE: Hardware in Durham (4 Oberon's) - Status update 3.24.17

All,
Please see below for an update on your hardware setup.

IP's have been requested, Swarm names assigned and the cable matrix is complete. Cabling will commence today and conclude Monday, followed by final configurations. Target Readiness will be EOD 3.28.17 EST.
Arrays Names will be.

OB-D1404
OB-D1405
OB-D1406
OB-D1407

RITM0227272

Cheers,
Joey [REDACTED]

From:

Sent:

To: R

Cc: C

Frederic <[f](#)>; Tran, Ngoc <Ngoc.Tran@emc.com>

Subject: RE: Hardware in Durham (4 Oberon's)

All,

Please see below for a status update on the 4 Oberon's listed.

As of 3.21.17 the arrays have been racked and powered and we have fulfilled the infrastructure needs. Work has started on the cable Matrix and general setup. As requested we

Will provide 2 16GB FC connections per SP (4 per array) and will load all arrays with latest Merlin code and assign all arrays to the 10.109.xx.xx subnet.

One RITM will be created for all associated task and the target for readiness is Friday 3.24.17 PM EST.

REQ0192398

Install - physical setup of EMC Unity 300 - APM00170709445
Install - physical setup of EMC Unity 300 - APM00170706848
Install - physical setup of EMC Unity 300 - APM00170706850
Install - physical setup of EMC Unity 300 - APM00170709441

Cheers,

Joey

From: [REDACTED]
Sent: [REDACTED]
To: [REDACTED]
Cc: [REDACTED]
Fred [REDACTED]
Subject: RE: Hardware in Durham

+FredC

Joe plans to provide an update soon.

-Sylvia

From: [REDACTED]
Sent: [REDACTED]
To: [REDACTED]
Cc: [REDACTED]
<[fran](#)>
Subject: RE: Hardware in Durham

Hi Joseph

Having discussed with Alain, here are our needs (added to Michel mail)

We need IP's and cabling to access subnets 10.109.165 and 10.109.173

We need to have FTP/http/cifs ports open for each ip
We need to have ssh port open for the system management

Thanks for your help

Regards

Fred

From: [REDACTED]
Sent: [REDACTED]
To: C [REDACTED]
Cc: C [REDACTED]
Subject: RE: Hardware in Durham

Hi Joseph,

As far as I know, there's no requirement for specific zoning on these arrays.

On my side the only requirement I have is to that they must be deployed as FC connected pairs for synchronous replication (mirror view). This means we must have pairs of arrays directly connected through the SRM FC port (SPA of array1 to SPA of array2 and SPB or array1 connected to SPB of array2)

Ideally we would have the following pairs set for synchronous replication: bc-h1404 with bc-h1405 and bc-h1564 with bc-h1254.

For Ethernet connectivity, Alain may confirm but I believe it would be good to have the arrays file Ethernet ports connected to the 10.109.165.x network (please alain correct me if I'm wrong)

Thanks for your support!

--

Michel.

From: [REDACTED]
Sent: [REDACTED]
To: L [REDACTED]
Cc: C [REDACTED]
Subject: RE: Hardware in Durham

All
Any input on the query below?

Cheers,
Joey

From: [REDACTED]
Sent: [REDACTED]
To: [REDACTED]
Cc: [REDACTED]
<[sy](#)>
Subject: RE: Hardware in Durham

Hi Joseph

+Alain Ledouaron that drives the Dur LAB1 test setups for protocol area,
+ Michel Gosse that works closely on sync replication
+ Sylvia, because this is Sylvia ☺

Alain, Michel, , we have these two pairs of hdw to conduct metrosync test and dev, we need to be able to execute regression test ops 'as usual'
Alain, please indicate the connectivity requirements to address functional testing , Michel, please follow the replication aspects.

Thanks All

Regards

Fred

From: [REDACTED]
Sent: [REDACTED]
To: [REDACTED]
Cc: [REDACTED]
Subject: FW: Hardware in Durham

Fred,

Need your help sir. As noted below the 4 Oberon's listed are for your use as part of "US protocol lab (Durham lab 1)" and should beaded to SWARM in the CPO Office Restricted and CI-Client Interoperability Pools? As of today I have found a location in the Oberon area (Durham Lab 1) to locate the 4 arrays, however we need to gather what your setup requirements are for these units. i.e. code, connectivity, any zoning etc... Any help much appreciated.

REQ0192398

Install - physical setup of EMC Unity 300 - APM00170709445
Install - physical setup of EMC Unity 300 - APM00170706848
Install - physical setup of EMC Unity 300 - APM00170706850
Install - physical setup of EMC Unity 300 - APM00170709441

Cheers,
Joey Chippewa

From: [REDACTED]
Sent: [REDACTED]
To: [REDACTED]
Cc: [REDACTED]
<[fr](#)>
Subject: RE: Hardware in Durham

Hi Joey,

These systems should be installed in Fred [REDACTED] lab. This should be US protocol lab (Durham lab 1).

They do need to be deployed as FC connected pairs for Sync (Mirrorview) replication testing).

Currently Lab 2 in Hopkinton should have SC-H1404 and BC-H1405 in this configuration. LAB 1 in Hopkinton has BC-H1564 and BC-H1254. I can follow up with DM team if more info is needed. Also John [REDACTED] team in Hopkinton is setting up sync replication pairs as well so they should have info to shared.

The systems in SWARM should be in CPO Office Restricted and CI-Client Interoperability Pools.

Thanks,
--Julie

From: [REDACTED]
Sent: [REDACTED]
To: Name [REDACTED]
Cc: Work [REDACTED]
Subject: Hardware in Durham

Hello,

We have received the following hardware in Durham and I was informed that you might be able to provide the requirements. Any help much appreciated.

REQ0192398

Work in Progress	Joseph [REDACTED]	Install - physical setup of EMC Unity 300 - APM00170709445
Work in Progress	Joseph [REDACTED]	Install - physical setup of EMC Unity 300 - APM00170706848
Work in Progress	Joseph [REDACTED]	Install - physical setup of EMC Unity 300 - APM00170706850
Work in Progress	Joseph [REDACTED]	Install - physical setup of EMC Unity 300 - APM00170709441

Cheers,
Joey

Joe[REDACTED]
Sr. Pro[REDACTED]
Dell [REDACTED]
(919)7[REDACTED]
Joseph[REDACTED]



South Plainfield Project

Setup of 4 VNX2 arrays for Customer Test Environment

Setup of arrays that arrived out of state

Design of rack and row layout

Physical rack and stack and cabling

Design of Infrastructure cabinet cabling and ip scheme

Mentoring of jr. members for implementation

Back end reconfigurations and front end reconfigurations

From: excellence@emc.com <excellence@emc.com>
Sent: Friday, February 24, 2017 2:54 PM
To: Tran, Ngoc
Subject: Congratulations, you've received an Excellence@Dell Award!

Hi Ngoc K Tran,

Congratulations !

I am pleased to notify you that you have been approved for an Excellence@Dell Bronze level award! Thank you for your continued contributions, which drive our culture of innovation, passion, and success.

Simply click the link below to view your award certificate.

<http://excellenceatemc.emc.com/rnr/nominations/90082500/present>

For more information about Excellence@Dell, [click here](#).

[REDACTED]
Sent: Tuesday, February 7, 2017 7:25 AM

[REDACTED]
Subject: RE: South PlainField - hand off

Good work Kim, Bryan and Ed.

From: Tran, Ngoc
[REDACTED]

[REDACTED]

Subject: RE: South PlainField - hand off

Chris,

Here's an update on the progress:

The arrays and hosts have been racked/stacked.

Cabling and switch ports, network/connectivity ran and configured.

Arrays and hosts have been powered on and configured with requested (or latest stable available) os/image

Connectivity/access as applicable validated (bmc/solmux[terminal-console]/ssh, etc...)

Attached is the cable matrix / ip information

Environment is ready for hand off/returned.

Please reach out to Joey [REDACTED] for further issues.

I would like to take a moment to **THANK EVERYONE** involved. Meeting the delivery timeline would not have been possible without your efforts. A very special **THANK YOU** goes out to **DAN** [REDACTED] for on the spot assistance with hiccups and roadblocks that were encountered throughout the progress at multiple levels of the effort.

Kim Tran
Lab Systems Engineer
Dell EMC | EOS² Cloud Operations
(919) 767-0885
ngoc.tran@dell.com

[REDACTED]
Sent: Thursday, February 02, 2017 10:06 AM
[REDACTED]

Subject: Re: South PlainField Syncup Part Deux Update 1.31.17 |

Hi Guys-

I'm looking over the cable matrix and IP plan, currently the Lenovo boxes are IPd as such:

nc8020090	MJ00P726	10.228.20.90
nc8020091	MJ00P72A	10.228.20.91
nc8020092	MJ00P729	10.228.20.92
nc8020093	MJ00P723	10.228.20.93
nc8020094	MJ00P725	10.228.20.94
nc8020095	MJ00V2VA	10.228.20.95

Can this be modified as follows:

MJ00V2VA	10.228.20.90
MJ00P72A	10.228.20.91
MJ00P729	10.228.20.92
MJ00P725	10.228.20.93
MJ00P726	10.228.20.94
MJ00P723	10.228.20.95

It's somewhat important that these remain in the same order that they were in before they left, meaning ...2VA is the 1st one of the group as it is the master for the rest of them.

Thanks!

Chris

[REDACTED]
Date: Tuesday, January 31, 2017 at 3:42 PM

[REDACTED] "Tran, Ngoc" <Ngoc.Tran@emc.com>, [REDACTED]

[REDACTED]>
Subject: RE: South PlainField Syncup Part Deux Update 1.31.17

Chris,

Work is proceeding to plan ! The team is making excellent progress on all fronts. See action update below.

Actions:

*** The following actions were taken in support of the next steps in this effort. Please provide any updates by replying to all on this email thread.

#	Action	Owner	Opened	Forecast	Actual	Status/Comment
1	Provide additional server requirements for review	[REDACTED]	1.26.17	1.31.17	1.30.17	
2	Scrap old Servers (Dells)	[REDACTED]	1.26.17	1.31.17	1.31.17	
3	Set up SharePoint site for project	[REDACTED]	1.26.17	1.26.17	1.26.17	
4	Develop Rack Layout for (4) Jetfires /(2) BC's. Utilizing existing space on Row 12	Kim Tran	1.26.17	1.27.16	1.27.17	
5	Reinstall all Array hardware in new locations	Kim Tran / [REDACTED]	1.26.17	1.30.17	1.30.17	
6	Develop new IP scheme for new hardware South Plainfield hardware	[REDACTED]	1.30.17	1.31.17	1.31.17	
7	IP Plan for all of existing South Plainfield hardware in Durham	[REDACTED]				TBD
8	Relocate (6) Lenovo servers & 2 supermicro to 12AE server rack	[REDACTED]	1.26.17	1.27.16	1.30.17	
9	Develop Cable Matrix for Arrays and Hosts additions	Kim Tran	1.26.17	1.30.17	1.31.17	
10	Run all cables for new hardware additions (array/hosts)	Kim Tran / [REDACTED]	1.26.17	2.2.17		
11	Array configurations and setup	Kim Tran / [REDACTED]	1.26.17	2.7.17		
12	Host configurations	[REDACTED]	1.26.17	2.3.17		

[SharePoint Site](#) └ ----- CTRL Right click

Sent: Thursday, January 26, 2017 2:50 PM
To: [REDACTED] Tran, Ngoc; S [REDACTED]
Subject: South PlainField Syncup Part Deux 1.26.17

All,

Many thanks for your time to review & plan the re-installation of the recently relocated hardware from South Plainfield to Durham Lab 1.

Please see below for a summary of our meeting , actions planned and key data points and timeline. Also note I have created a SharePoint site(ref. below) to house all associated project data (Rack layout, Hosts data, IPS, cable matrix).

Summary

Meeting to discuss and plan the reinstallation of 4 racks of hardware from South Plainfield to Durham. Team reviewed hardware listing and setup requirements, IP changes and expectations for availability in Durham. Team agreed that all older servers (Dell 1950s and SuperMicro) can be removed from service and Chris will provide a data on additional server needs.

Timeline

Target Date to complete all work has been reset to [2.7.16](#).

Key Project Notes

- Project team defined and team kickoff held. Team and responsibilities:

• Kim Tran - Overall Prime (Planning and Arrays)

• [REDACTED] - Array Installation and Setup

• [REDACTED] - Lenovo Server Setup

• [REDACTED] - Archi - Networking Prime

**** Please note that all ESM tickets to transfer and install hardware for this effort has been closed. The project lead will open a Generic project RITM and the team will open tasks as required to execute the re-installation and configuration.

- Chris [REDACTED] - Single Point of Contact for all requirements gathering and liaison into Engineering team
- **Hardware shipment** – All hardware arrived in Durham on 1.23.17 and has been located in Row 12 column 2 Lab 1.

- Hardware listed on the attached excel. Includes: 4-Jetfires, 2- beachcombers and 5 – Lenovo's. All array hardware will be relocated to available space within the existing racks in row 12 (plan TBD) and all hosts will be placed in the infrastructure rack located at 12AE.
- **IP Addressing** – All new installations will be assigned IP addressing using the new Durham IP Scheme (i.e. 10.228.xx.xx) All non-Firewall
- Additional Work will be required to transition the remainder of the environment to the new IP Scheme (Phase 2) The primary short term goal is to get the new hardware operational on new IP's.
- **Virtual Resource Requirements** – N/A at this time
- **Fibre Requirements** - N/A at this time
- **No plans for future growth**

Hardware Setup

- **Lenovo's** – (5) Lenovo's require only ISCSI connectivity and no OS change. Only need to connect and change IP address and hostname if required.
- **Array Setup** - 4 Jetfires (NAS) require two 1 interface per DM and ISCSI interfaces; Load latest image available
- **BC's** – Setup BC (each BC has one associated DAE). Requires 1 interface per SP (ISCSI); Load latest image available
- **Infrastructure** – Existing hardware has room to accommodate the new
- **2248** – Repurpose to Network team
-

Actions:

*** The following actions were taken in support of the next steps in this effort. Please provide any updates by replying to all on this email thread.

#	Action	Owner	Opened	Forecast	Actual	Status/Comment
1	Provide additional server requirements for review	[REDACTED]	1.26.17	1.31.17		
2	Scrap old Servers (Dell & SuperMicro)	[REDACTED]	1.26.17	1.31.17		
3	Set up SharePoint site for project	Kim Tran	1.26.17	1.26.17	1.26.17	
4	Develop Rack Layout for (4) Jetfires /(2) BC's. Utilizing existing space on Row 12	Kim Tran / [REDACTED]	1.26.17	1.27.16		
5	Reinstall all Array hardware in new locations	[REDACTED]	1.26.17	1.30.17		
6	Develop new IP scheme for new hardware South Plainfield hardware			TBD		
7	IP Plan for all of existing South Plainfield hardware in Durham	[REDACTED]			TBD	

8 Relocate (5) Lenovo servers to 12AE server rack	[REDACTED]	1.26.17	1.27.16
9 Develop Cable Matrix for Arrays and Hosts additions	Kim Tran	1.26.17	1.30.17
10 Run all cables for new hardware additions (array/hosts)	Kim Tran / [REDACTED]	1.26.17	2.2.17
11 Array configurations and setup	Kim Tran / [REDACTED]	1.26.17	2.7.17
12 Host configurations	[REDACTED]	1.26.17	2.3.17

[SharePoint Site](#) └ ----- CTRL Right click

<< File: SouthPlainfieldHW_List.xls >>

Cheers,
Joey

Kim Tran
Lab Systems Engineer
Infrastructure Solutions Group
Dell EMC | IEO Cloud Operations
office: +1 919 767-0885
ngoc.tran@dell.com

From: [REDACTED]

Sent: Saturday, January 28, 2017 10:49 AM

To: Tran, Ngoc; [REDACTED]

Subject: RE: south plainfield - arrays

Tran,

Good work. I will take care of the empty racks and server Scrap. Overall goal is as agreed. Thanks all!!!

Please note handover date to customer. If we could better that by a couple days it would be great😊

#	Action	Owner	Opened	Forecast	Actual	Status/Comment
1	Provide additional server requirements for review	[REDACTED]	1.26.17	1.31.17		
2	Scrap old Servers (Dell & SuperMicro)	[REDACTED]	1.26.17	1.31.17		
3	Set up SharePoint site for project	[REDACTED]	1.26.17	1.26.17	1.26.17	
4	Develop Rack Layout for (4) Jetfires /(2) BC's. Utilizing existing space on Row 12	Kim Tran	1.26.17	1.27.16	1.27.16	
5	Reinstall all Array hardware in new locations	Kim Tram / [REDACTED]	1.26.17	1.31.17		
6	Develop new IP scheme for new hardware South Plainfield hardware	[REDACTED]	1.27.17	1.31.17		
7	IP Plan for all of existing South Plainfield hardware in Durham	[REDACTED]				TBD
8	Relocate (5) Lenovo servers to 12AE server rack	[REDACTED]	1.26.17	1.27.16		
9	Develop Cable Matrix for Arrays and Hosts additions	Kim Tran	1.26.17	1.30.17		
10	Run all cables for new hardware additions (array/hosts)	Kim Tran / [REDACTED]	1.26.17	2.2.17		
11	Array configurations and setup	Kim Tran / [REDACTED]	1.26.17	2.7.17		
12	Host configurations	Bryan [REDACTED]	1.26.17	2.3.17		
13	Handover relocated setups to Customer	All	1.26.17	2.7.17		

From: Tran, Ngoc

Sent: Friday, January 27, 2017 11:56 PM

To: [REDACTED]

Subject: RE: south plainfield - arrays

Ed,

Please find the rack layouts for the 4x jetfires/vnx's and 2 beachcombers/vnxe's at row12 in lab 1

==Joey, please confirm==

Racks to be cleared:

12AP (2 x beachcombers/vnx's with 2x daes); to be relocated to 12AJ; **there are 2 servers, I think these are to be scrapped/decomm?**

12AK (2 x jetfires/vnx's); should have 'deimos' and 'phobos' to be relocated to 12AH

12AI (2 x jetfires/vnx's); should have 'oberon' and 'titania' to be relocated to 12AJ and 12AF respectively

=====

These should be the corresponding sn's from a manual audit:

12AI

OBERON

VNX7600 - APM00134401843

Data Mover 2/3 - APM00134501225

Data Mover 4/5 - APM00134501226

CS - FC6NS133100054

12AI

TITANIA

VNX7600 - APM00134501934

Data Mover 2/3 - APM00134501227

Data Mover 4/5 - APM00134501957

CS - FC6NS134000456

12AK

DEIMOS

VNX7600 - APM00123700953

Data Mover 2/3 - APM00134702493

Data Mover 4/5 - APM00134702494

CS - FC6NS134500531

12AK

PHOBOS

VNX7600 - APM00134700954

Data Mover 2/3 - APM00134503282

Data Mover 4/5 - APM00134603281
CS - FC6NS134000287

12AP
VNXE - FNM00131900112
VNXE - FNM00131900114
DAE - JWXEC140701339
DAE - US1D1100601190

As mentioned, you can go ahead and relocate the beachcomber/vnxe's.

Attach the sas cables from port bus 0 of the dpe to port 1 of the dae, for spa and spb, or just leave one end of sas cable plugged in and I'll connect 😊

I will get with you on Monday to follow up and confirm the go ahead with the jetfires/vnx's - as soon as I map the existing backend connections, I should be done by the time you're in around 2pm.

Thanks,

Kim Tran
Lab Systems Engineer
Dell EMC | EOS² Cloud Operations
(919) 767-0885
ngoc.tran@dell.com

----- Original message -----

From: "Tran, Ngoc" <Ngoc.Tran@emc.com>

Date: 1/27/17 5:14 PM (GMT-05:00)

Subject: south plainfield - arrays

Hey Ed,

I should be done with the rack move layout this evening,
I can send that over when done, but just an fyi – **PLEASE DO NOT MOVE THEM YET.**
I want to finish mapping the existing backend cabling to cross-reference with the documentation.
I'll let you know when ready to do the physical move, it shouldn't be no later than Monday.

Thanks,

Kim Tran
Lab Systems Engineer
Dell EMC | EOS² Cloud Operations
(919) 767-0885
ngoc.tran@dell.com

[REDACTED]
Sent: Thursday, January 12, 2017 11:50 AM

[REDACTED]; Tran, Ngoc

Subject: RE: South Plainfield Relocation to Durham Review Part two Update 1.12.17

All,

Many thanks for your time to review the planning to relocate the attached hardware from South Plainfield to Durham Lab 1.

Please see below for a summary of our meeting and the actions planned and key activities.

Summary

Meeting to discuss and planning the reinstallation of 4 racks of hardware from South Plainfield to Durham. Team reviewed shipping status, hardware listing, IP changes and expectations for availability in Durham. As discussed we will need to look for alternatives to reinstallation of some of the older server hardware and prioritize the VNX array bring-up.

Timeline

Target Date to complete all Work 1.27.17 (Initial focus will be on all prioritized hardware - as provided by Chris [REDACTED])

Key Project Notes

- Durham project team assembled to support reinstallation and re-ip addressing effort.
 - Kim Tran - VNX; [REDACTED] - Servers/VMs; [REDACTED] - EGS
- [REDACTED] - Single Point of Contact for all requirements gathering and liaison into Engineering team.
- Hardware availability - Equipment is scheduled to be picked up from South Plainfield on 1.13.17. Expected delivery to Durham will be the week of 1.16-1.20.
- Request made to add primes to shipping tracking emails and updates.
- Additional Networking equipment will be included in the shipment for Rob Greene.
- New IP Scheme for incoming and existing South Plainfield hardware will be developed to transition area to new required IP addressing as part of this project.



SouthPlainfieldH.S.

Cheers,

Joey

---Original Appointment---

From: [REDACTED]

Sent: Friday, January 06, 2017 3:14 PM

To: [REDACTED]

[REDACTED], Ngoc

Subject: South Plainfield Relocation to Durham Review Part two

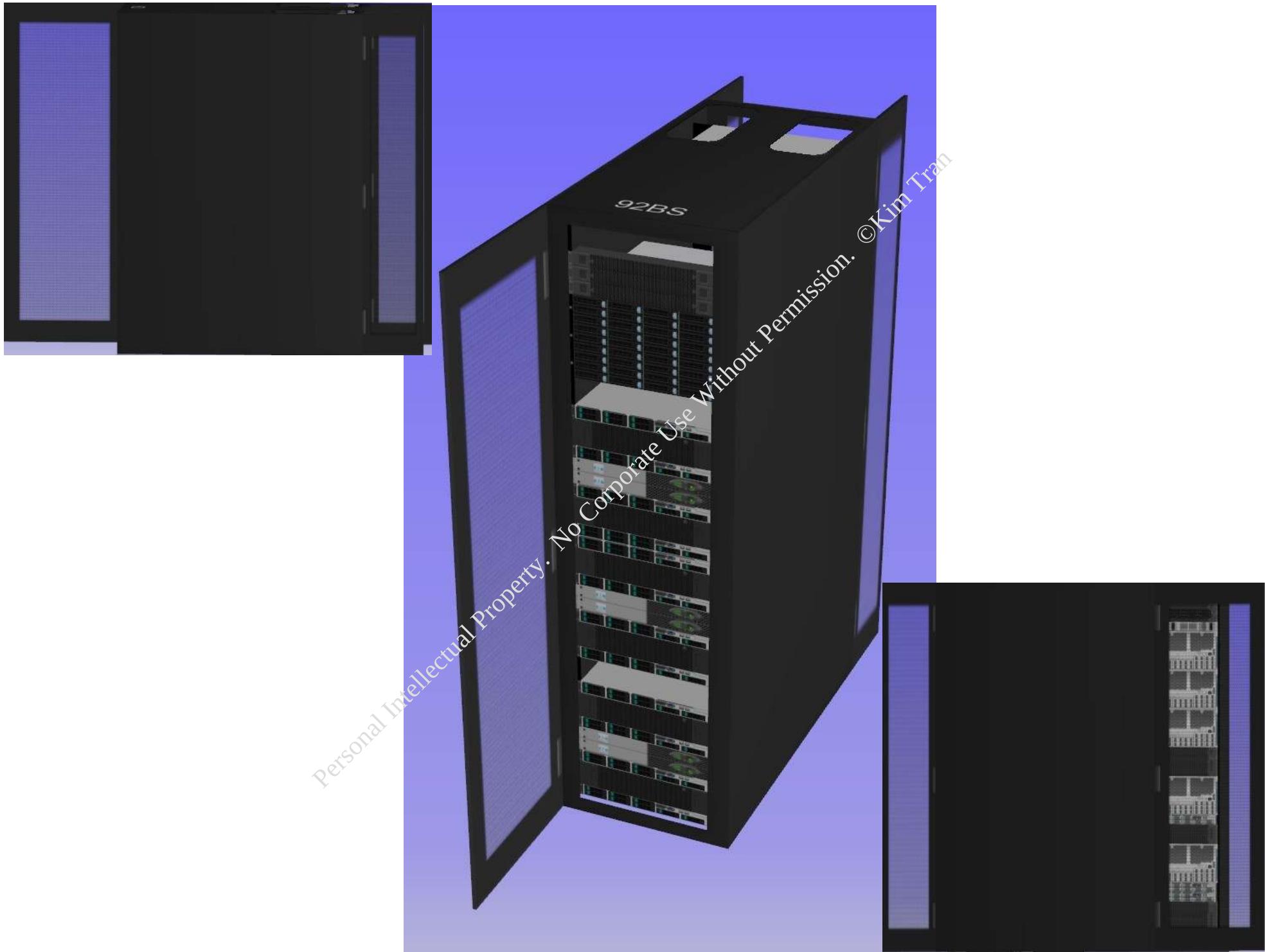
When: Thursday, January 12, 2017 10:30 AM-11:00 AM (UTC-05:00) Eastern Time (US & Canada).

Where: Conference Bridge 888.643-3084 (Toll-Free) Access Code 64852067

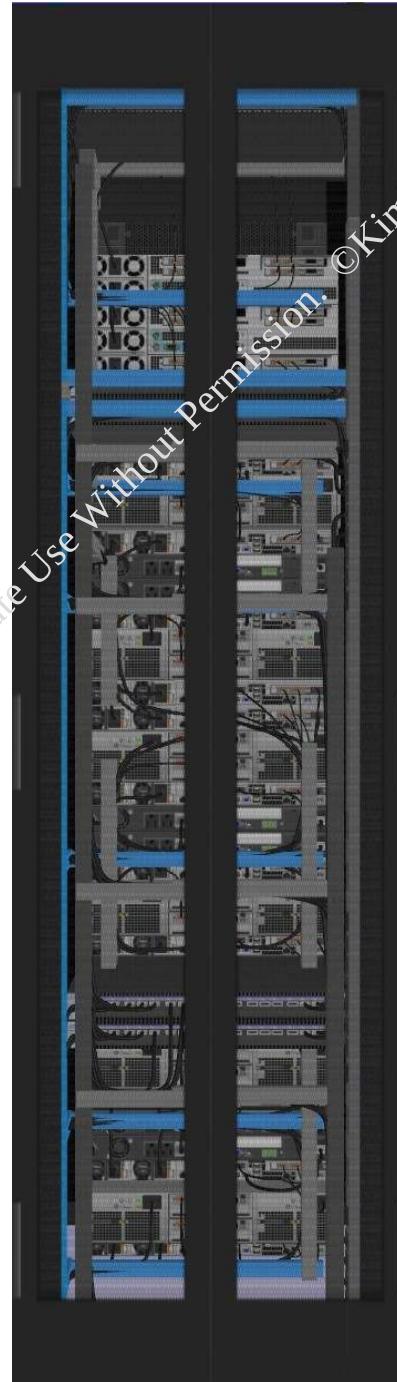
DCIM 3D INFRASTRUCTURE MODELING

Sample cabinet rack buildouts

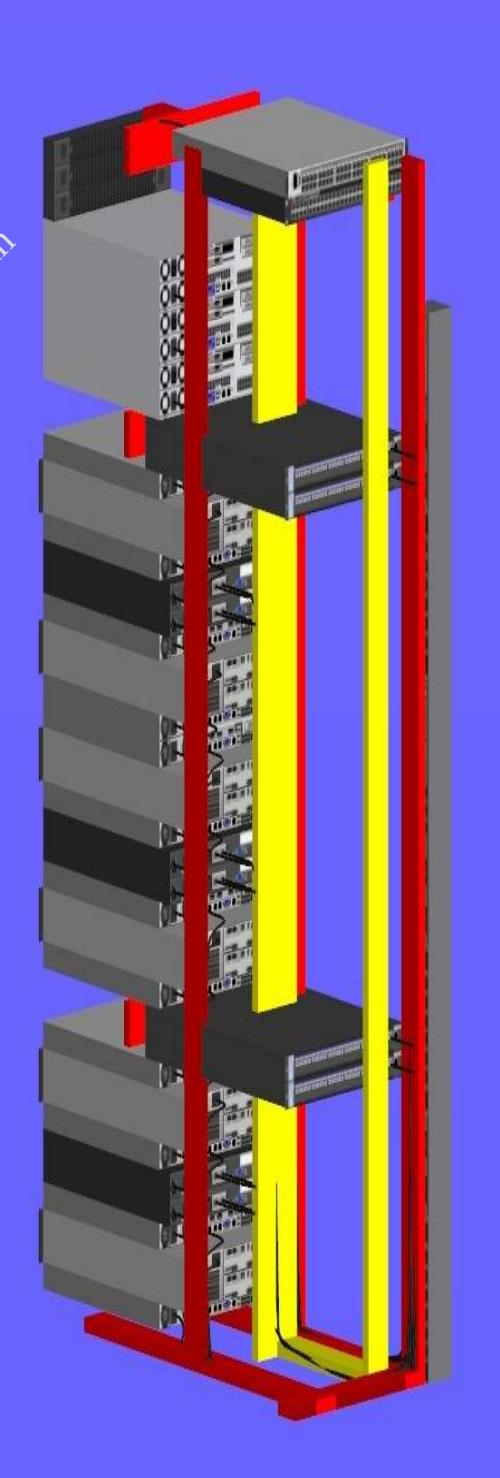
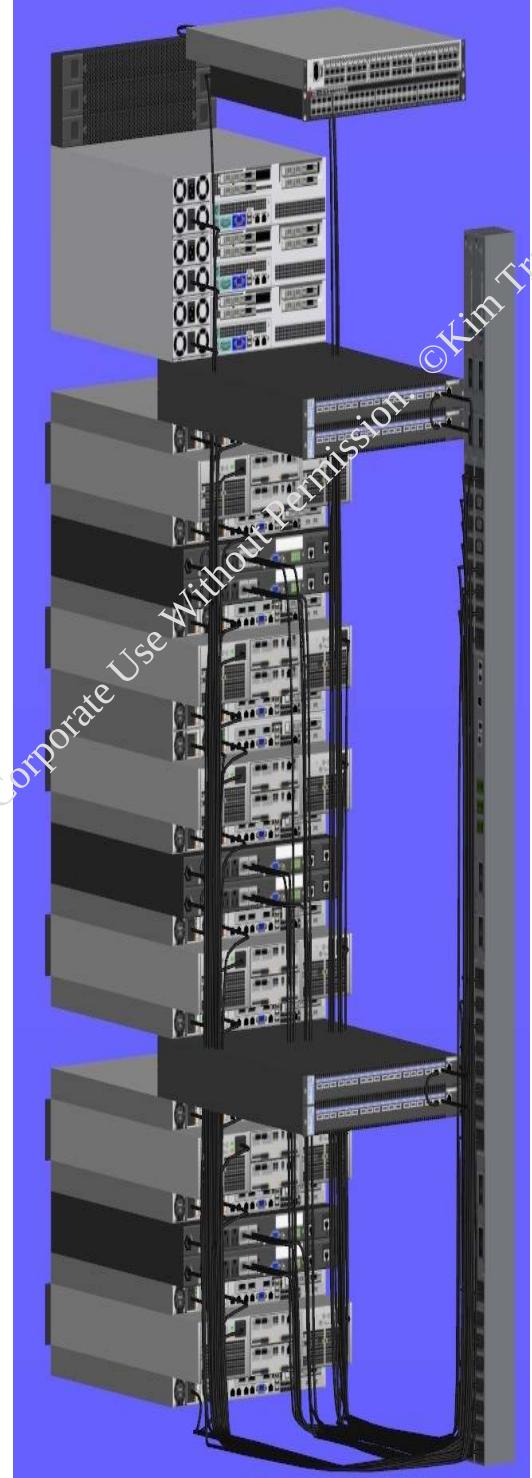
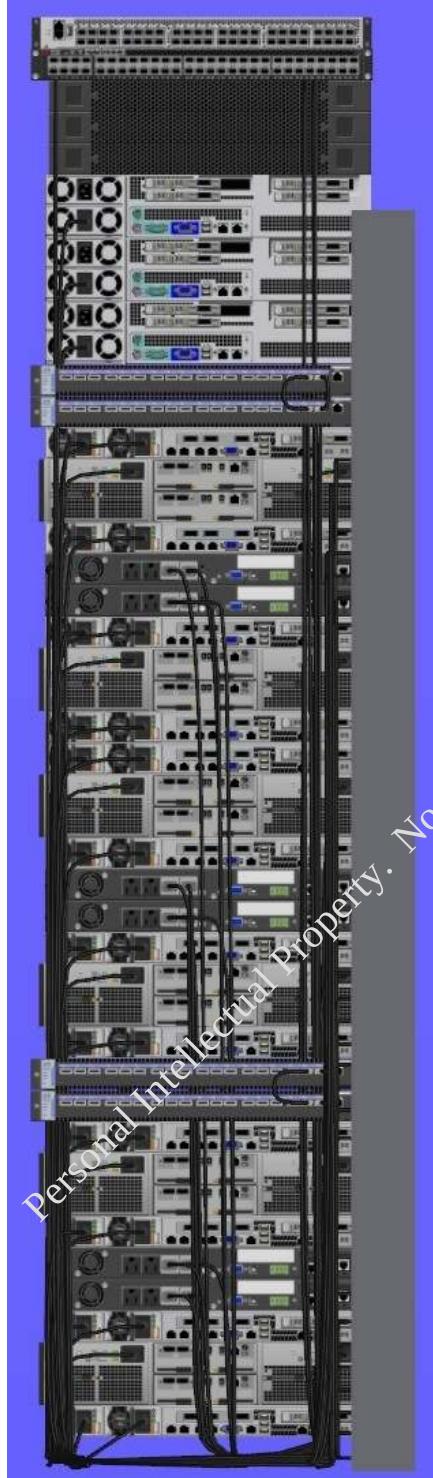
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utilizing csv template to build out 3D racks instead of manual drawing

Name	Location	Site	Floor	Equipment Room	Row	Enclosure	Parent	CreateFrom	Asset ID	Line Of Business	Data store1	Data store2
Must Be Present							Must Be Present	Must Be Present	Must Be Present	Must Be Present		
non-blank	Name	N a m e	N a m e	Name	Name	Name	name or	non-blank				
(warning only if blank)							Asset ID					
								Library Item Name (Unique in DB)				
								Template UniqueID				
								Class Name				
								Class Group				
POP.A	P H X	0 2 X	230		230		Row			DsVal 1		
CLL.06	P H X	0 3 X	330		330		Row				DsVal 2	
Orphans	P H X	0 4 X	444									

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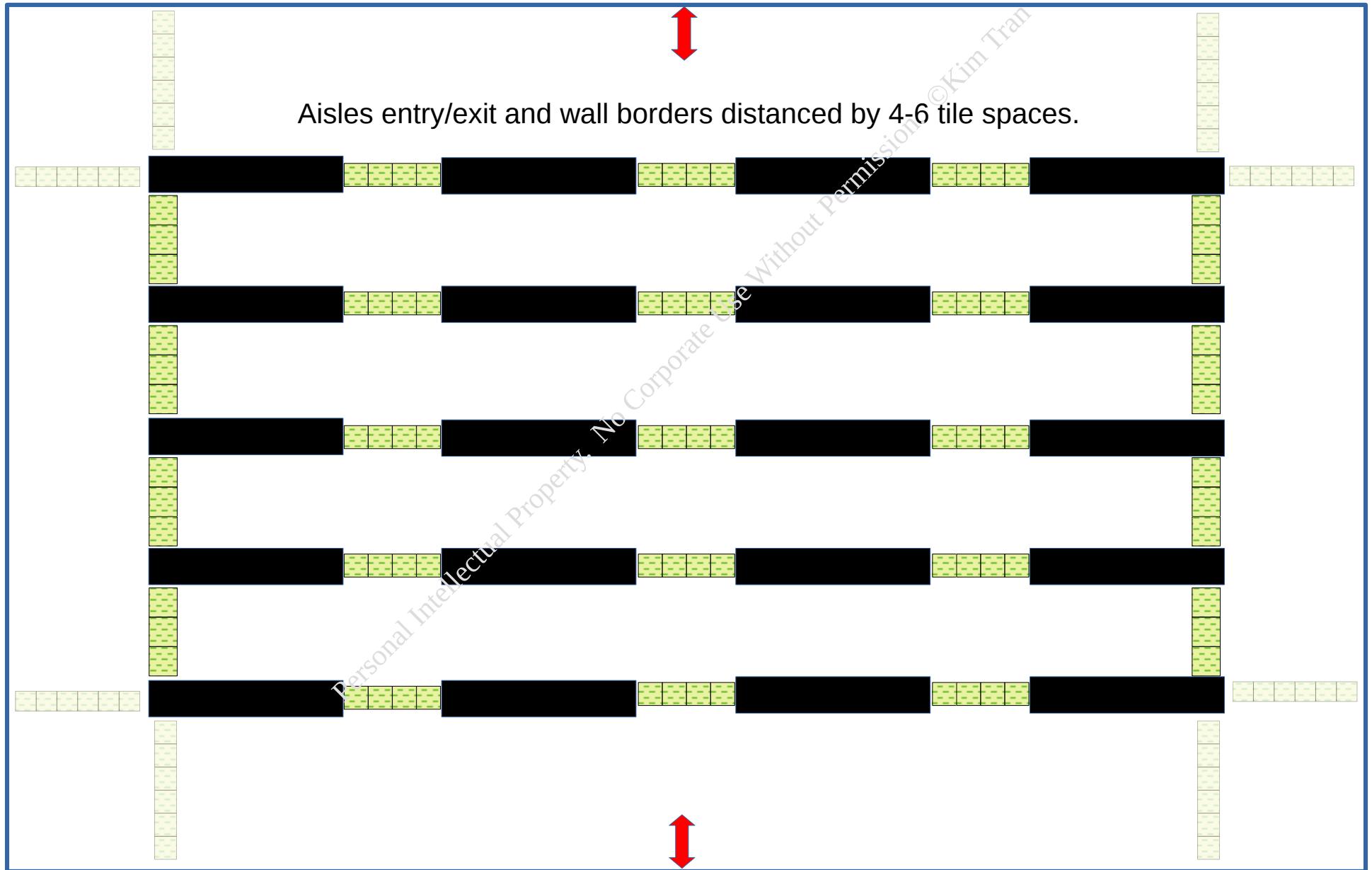
Revised Lab layout drafting of the 4 major research/development lab environments

Example of best practices standards for lab environment layout

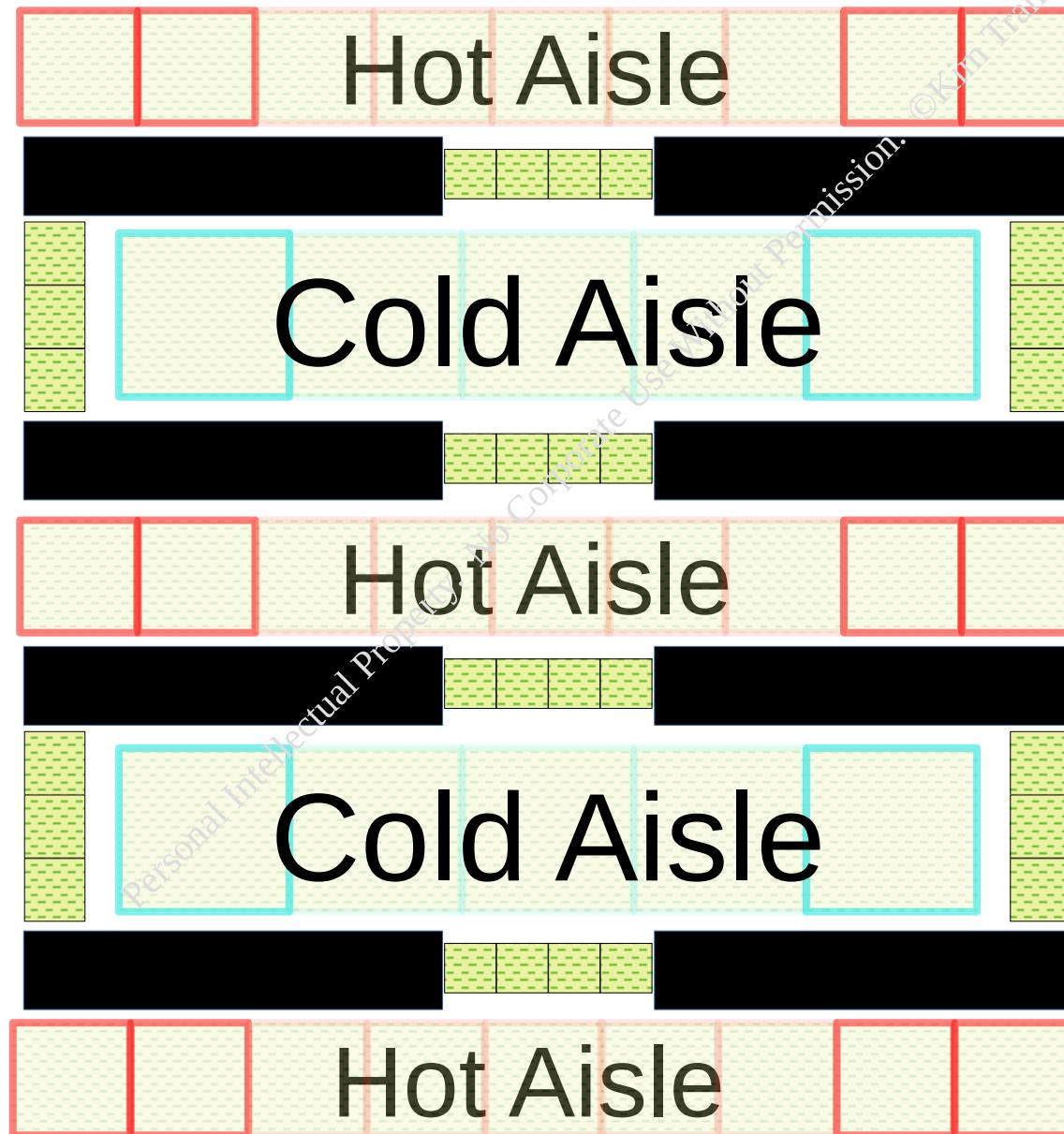
Each lab had their own business unit and their own racks of equipment and gear, i.e. ExtremeIO, ScaleIO, Vmax, Vnx/Unity, Isilon, Celerra, Data Domain, Vplex, Recoverpoint, etc...

Rows and sections of
racks/cabinets

Rows and sections of
racks/cabinets



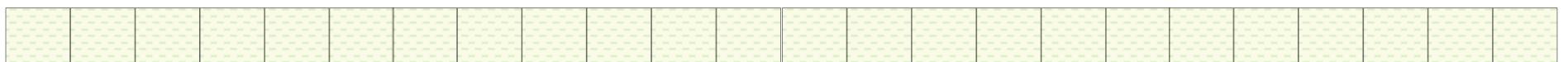
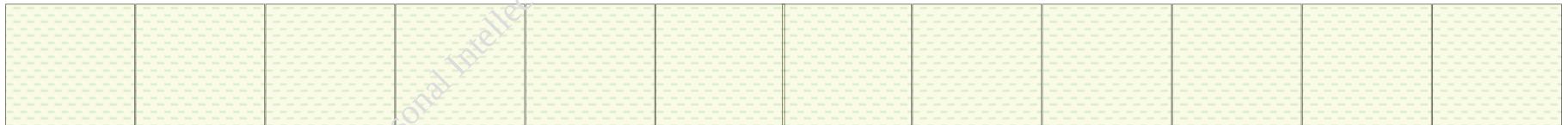
The lab rows are generally separated by 4 tile spaces, the aisles -horizontally.
The distance between each row is 3 tile spaces – vertically.



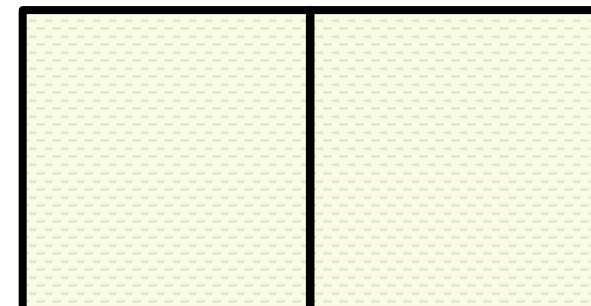
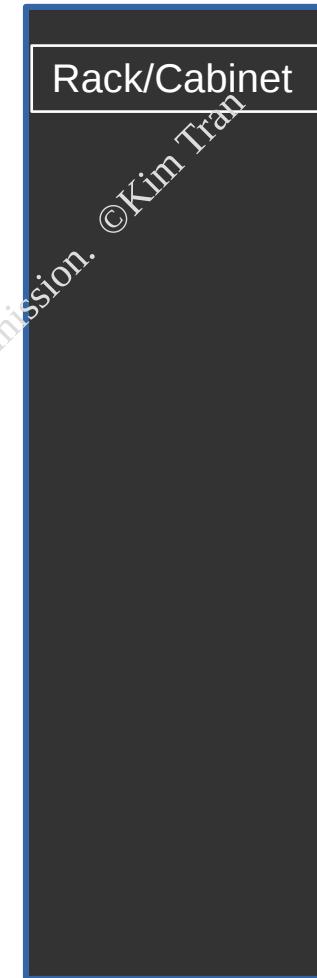
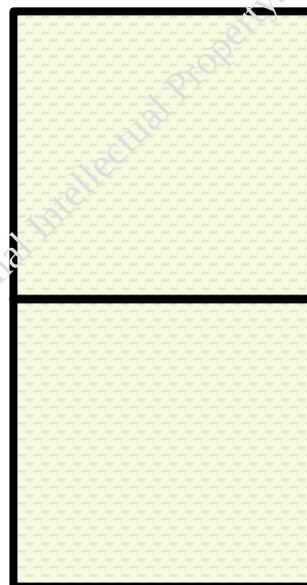
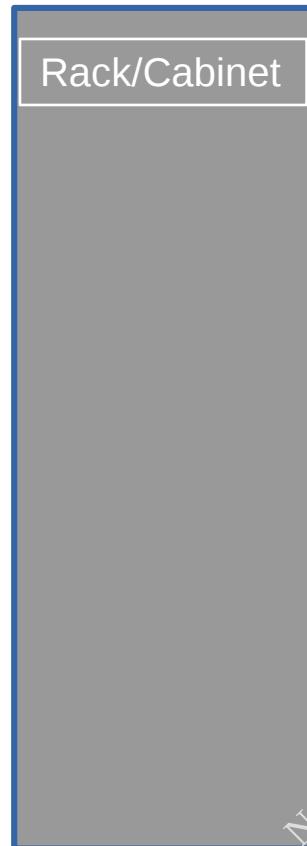
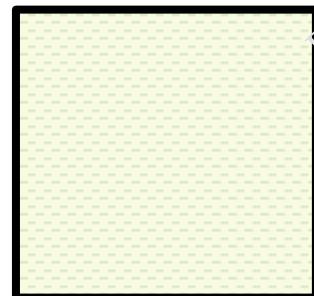
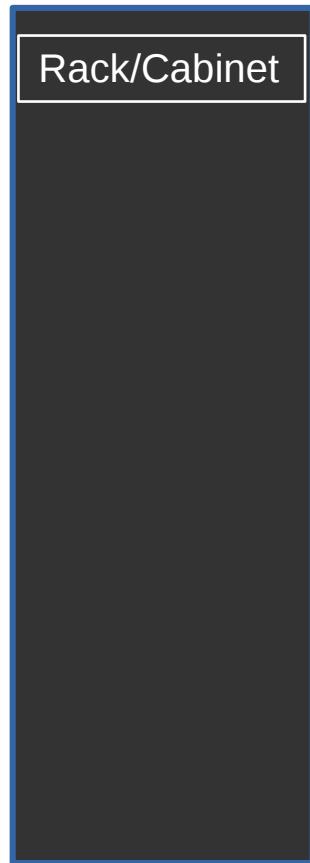
Rows and sections of racks/cabinets



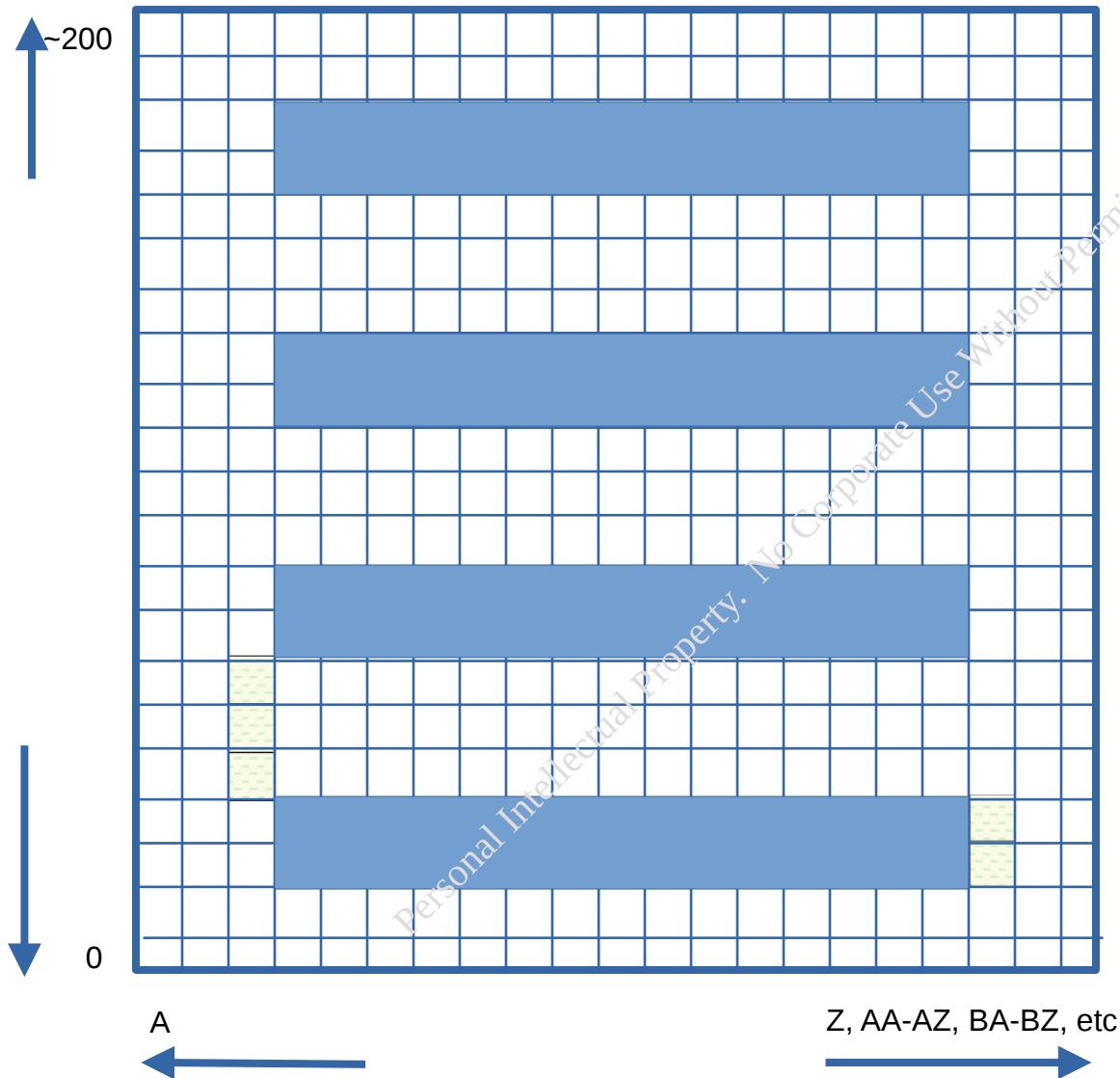
A row is occupying 1 tile space width and 2 tiles space length.
Number of racks/cabinets in each row is dependent upon layout and
capacity groupings such at 5, 10, 15, etc...



Alignment on
tile(s) depending
on rack or cabinet.



No reason for it
to not be
flushed or
aligned with
the tile width.

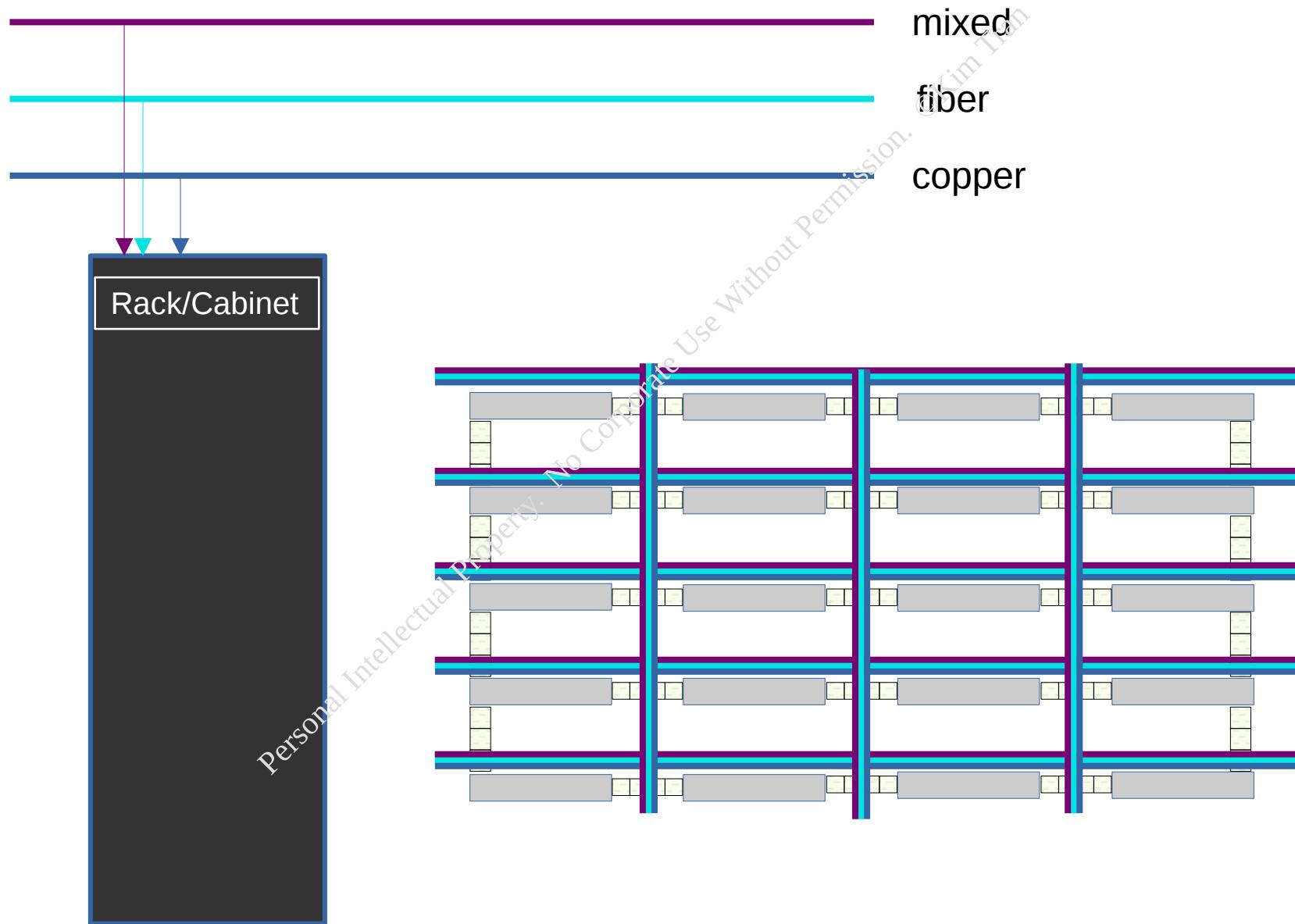


Example floor tile space grid layout, depending on which axis is chosen for numbers or letters, to have a precise grid mapping.

Easier logistics of every x row starts on a certain letter/number.

(i.e. every 5th tile space starts a row or ends on a location point, 12F, 84AP, etc...)

Cable trays elevated from the ceiling.
Ran at the intersection of the aisles and end off row tiles
to avoid cable run obstruction from the racks/cabinets.



Generalizations (lab 4):

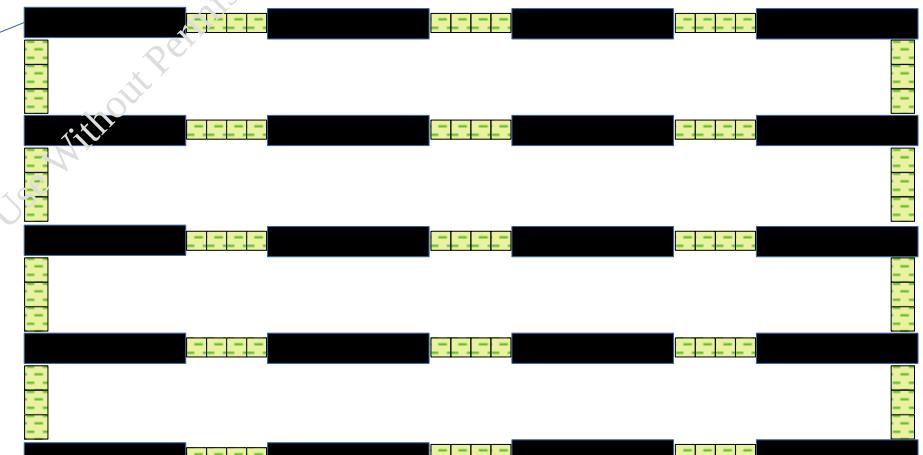
- width of room dimensions 42 tiles
(24" LxW) [41 tiles + ~1/2 tile on each end]
- length of room dimensions 151 tiles (24" LxW)
- height from floor to ceiling is ~146" / 12'2"

- cable trays distance raised from the floor:
bottom tray ~103" / 8'7" (fiber)
middle tray ~113" / 9'5" (ethernet)
top tray ~118" / 9'10" (fiber/network/inter-lab connections)
at C7, M/N7, V/W7, AF7, AO/P7

Rows : D6-T6, Y6-AM6

Rows and sections of racks/cabinets

Generalized visual representation only



Generalizations (lab 3):

- width of room dimensions 43 tiles
(24" LxW) [42 tiles + ~1/2 tile on each end]
- length of room dimensions 151 tiles (24" LxW)
- height from floor to ceiling is ~146" / 12'2" (if similar to lab 4)

-cable trays distance raised from the floor (if similar to lab 4):

bottom tray ~103" / 8'7" (fiber)
middle tray ~113" / 9'5" (ethernet)
top tray ~118" / 9'10" (fiber/network/inter-lab connections)
at B/C8, M/N8, V/W8, AE/F8, AP/Q8

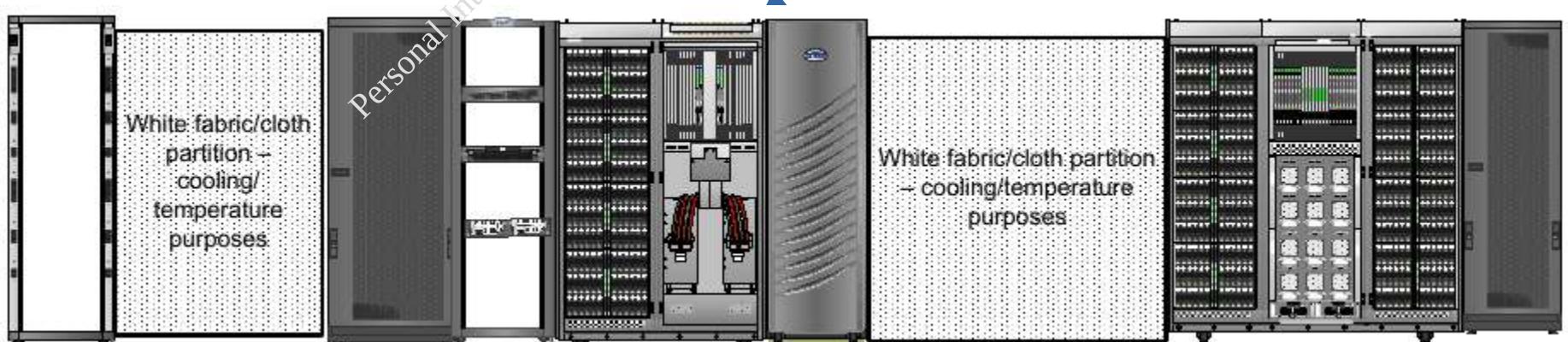
Rows : C6-T6, X6-AP6

Rows in this lab distanced by 3 tile spaces

Generalized visual representation only



Rows and sections of
racks/cabinets



Generalizations (lab 2):

- width of room dimensions 50 tiles
(24" LxW) [49 tiles + ~1/2 tile on each end]
- length of room dimensions 151 tiles (24" LxW)
- height from floor to ceiling is ~146" / 12'2" (if similar to lab 4)

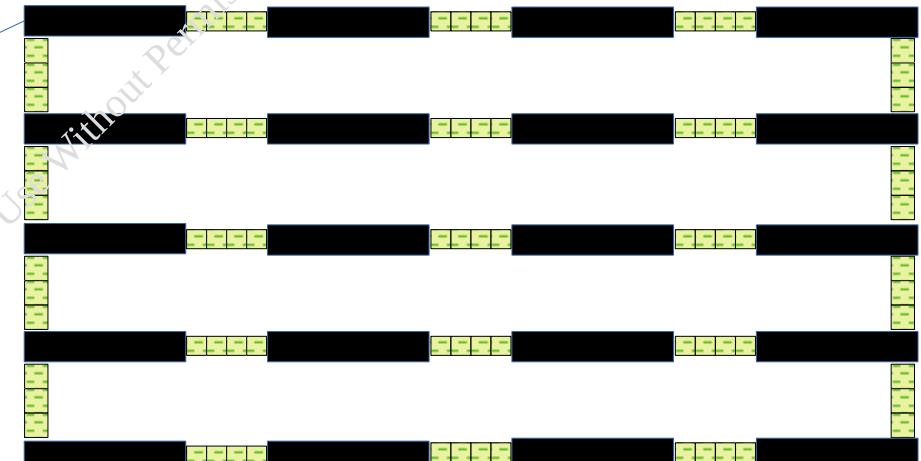
cable trays distance raised from the floor (if similar to lab 4):

bottom tray ~103" / 8'7" (fiber)
middle tray ~113" / 9'5" (ethernet)
top tray ~118" / 9'10" (fiber/network/inter-lab connections)
at C7, N7, W/X7, AJ/K7, Ax7

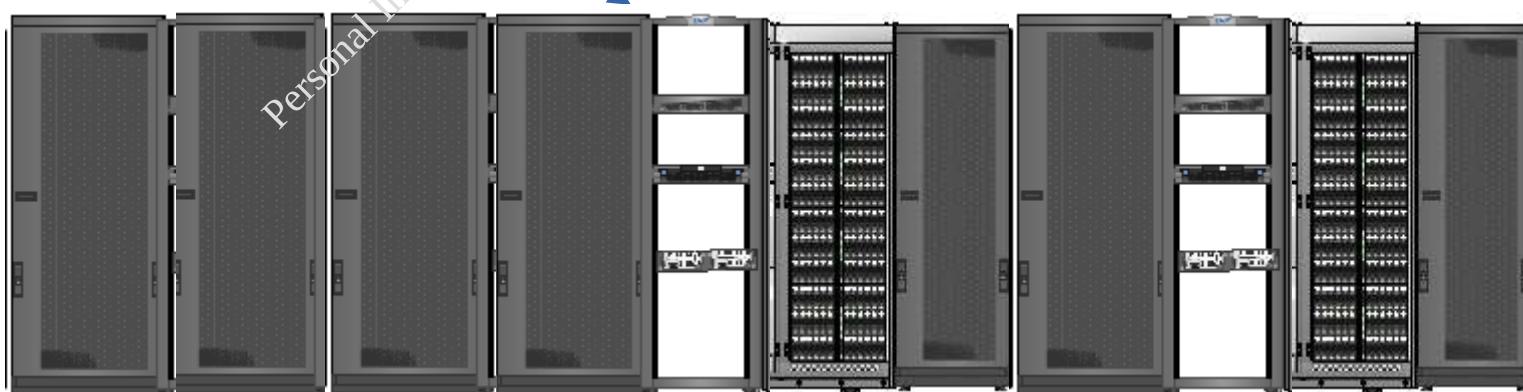
Rows : D6-U6, Z6-AU6

Rows in this lab distanced by 3 tile spaces

Generalized visual representation only



Rows and sections of
racks/cabinets



Generalizations (lab 1)

- width of room dimensions 91 tiles (24" LxW)
- length of room dimensions 152 tiles (24" LxW)
- height from floor to ceiling is ~146" / 12'2" (if similar to lab 4)

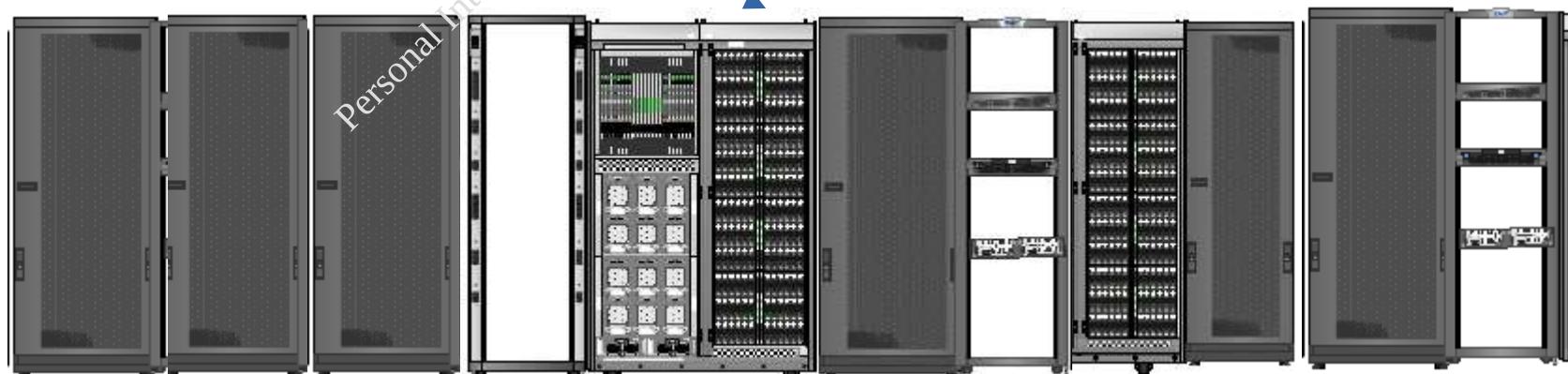
- cable trays distance raised from the floor (if similar to lab 4):

bottom tray ~103" / 8'7" (fiber)
middle tray ~113" / 9'5" (ethernet)
top tray ~118" / 9'10" (fiber/network/inter-lab connections)
at H7, Q/R7, AD7, AL/M7, AY/Z7, BH/I7, BW/X7, CF7

Rows : D6-U6, Z6-AQ6, AV6-BM6, BS6-CJ6

Rows and sections of racks/cabinets

Generalized visual representation only



Tivoli Storage Manager – Internal Projects

Internal Projects to maintain and retain
technical skillsets edge

TSM Library Sharing with
Sharepoint VM integration with peer
collaboration

TSM Server Migration



TSM Project

Library Sharing-VM SharePoint

Prepared for

Bill Horejs

Version 1.1

August 5, 2008

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Abstract

Bill Horejs assigned me (Kim Tran) with the task of building a Tivoli Storage Manager (TSM) server for various testing purposes in the BPIC. Also a SharePoint vm was to be created as part of the testing purposes.

Plan and Preparations

For this project, I approached it from the test first then implement. I spent the majority of the time on the testing, in addition to researching the complications that i encountered.

I worked on the installation/settings/configurations in a test vna to be more comfortable before ‘tampering’ with physical/live equipment/data.

I spoke with Chris Gibes, Carlo Bonura, Dan Gramza, Lisa Atarian, Dave Bach to find out the information needed to build the TSM server along with the SharePoint vm.

Chris suggested to just load Windows 2003, rather than 2008, since at the time it was still unsupported, granted the original intention was to load Windows 2008. The library sharing was not originally part of the configuration, but was an added value of learning to set it up and having access to the physical library from a secondary TSM server.

Carlo assisted with the building of the vm for the SharePoint testing. Lisa greatly assisted with the setup/configurations (with growth testing) of the Microsoft Office SharePoint Server / MS SQL Server . Dave provided specifications/sizing for the vm partitions for installation/utilization of SharePoint.

Dan provided the supplementary information on IP and other issues that I ran into. Matt Koerten graciously assisted during the testing phase when complications arose in the BPIC (down switch, cabling, assistance with troubleshooting).

Out of Scope

In depth configuration for SQL/SharePoint for “specific” testing was not specified. An environment where SQL/SharePoint was installed and “ready” for configuration specific needs at time of actual testing.

TSM

Step-by-step configuration of TSM server, storage pools, other components (devices, paths, class)

Restoration of SQL/SharePoint

Client is installed, ready for backup.

Restore process is an issue that requires more time for testing/troubleshooting

Library sharing – setup:

Defining the library, drives, paths –for the [main/manager] server. This scenario assumes the library, drives, and path to the drives and library are already defined, with the “shared” option set to “yes”

(Please see the TSM 5.x Admin / Reference Guide for syntax and examples)

TSM Server Setup/Install

The actual installation of each software itself varies from around one minute to possibly over an hour—depending on system specifications. The operating system averages around forty minutes, in addition to another one-two hours for patching the system with necessary security updates.

The TSM server/client software can be installed in two-three minutes. The Integrated Solutions Console (ISC) and the Administration Center can vary between fifteen minutes to an hour or more.

Estimated time: three-five hours (actual may vary)

TSM Server Setup/Configurations

The things that needed to be done for this part of the setup:

- Configure the TSM server instance
- Define the storage pools
- Setup the server-to-server communications with demors (bpic tsm server)
- Setup the library manager/client to share the library
- Configure the TSM backup client
- Test the configurations

Setup of the environment can be done via the command line interface (CLI) or through the administration center (GUI).

Granted no complications are encountered, estimated time: one-three hours (actual may vary)

System Setup Info

Server IP: 172.30.26.x(static)

Login: Administrator/xxx

TSM server is running Windows Server 2003 R2 Enterprise

TSM Server 5.5.1, Client 5.5.1

Local drive : 25GB

Diskpool partition: 40GB

Virtual Tape Library partition: 36GB

SharePoint IP: 172.30.92.xxx (static)

Login: Admin/xxx

SharePoint server is running Windows server 2003 Standard

TSM Client 5.5.1.1

Tivoli Data Protection for SQL 5.5.1

Microsoft Office SharePoint Server 2007

Microsoft SQL Server 2005

Local drive: 12GB

SharePoint drive (data): 20GB

Complications

The main complication that I ran into was the defining/sharing of the library on demors.

Following the syntax and instructions to setting up the library, I was able to ‘define’ the servers for server-to-server communication then define them to be the library manager and client on each server. The problem came from defining the shared library on the client. Since the library client server needed to connect with the library manager server to request the sharing privileges.

The error was an ‘authentication failure’. The majority of the research pointed to either starting over by removing then redefining the servers, passwords or to update the servers making sure the password was correct on both servers for the communication. This did not resolve the issue, a document on the IBM website pointed to a possible issue that was resolved in a fix release.

The current version of TSM on demors was 5.5.0. With assistance from Ingrid K. and Chris G. to verify that the settings were all ‘correct’, it was agreed that demors could be upgraded to 5.5.1. Following the upgrade, I redefined the server-to-server communications and when defining the shared library this time, it was successful. I strongly believe the upgrade fixed the issue/complication that was hindering me from setting up the shared library.

End of Document

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Appendix A: Server-to-Server Communication

Library Sharing Setup

Server-to-Server Communication

On the main server:

- set servername [name]
- set serverpassword [password]

define the client server on the main server

- define server [name] serverpassword [password] hladdress [ip address] lladdress [tcp port]

On the client server(s)

- set servername [name]
- set serverpassword [password]

define the main server on the client server

- define server [name] serverpassword [password] hladdress [ip address] lladdress [tcp port]

On each server, turn the crossdefine option on

- set crossdefine on

Library Sharing Setup

On the client server(s)

- define library [name] libtype=shared primarylibmanager=[main server name]

Define the all the device class associated (or to be used) with the shared library

- define devclass [class name] library [library name] devtype [type]

(parameters for device class should be same on client /manager server, using the same device class is good practice but not required)

Define a storage pool to be used with the shared library

- define stgpool [name] [device class defined] maxscratch=[number]

On the main server:

Define a path to the drive(s) from the client server that it will be allowed access to.

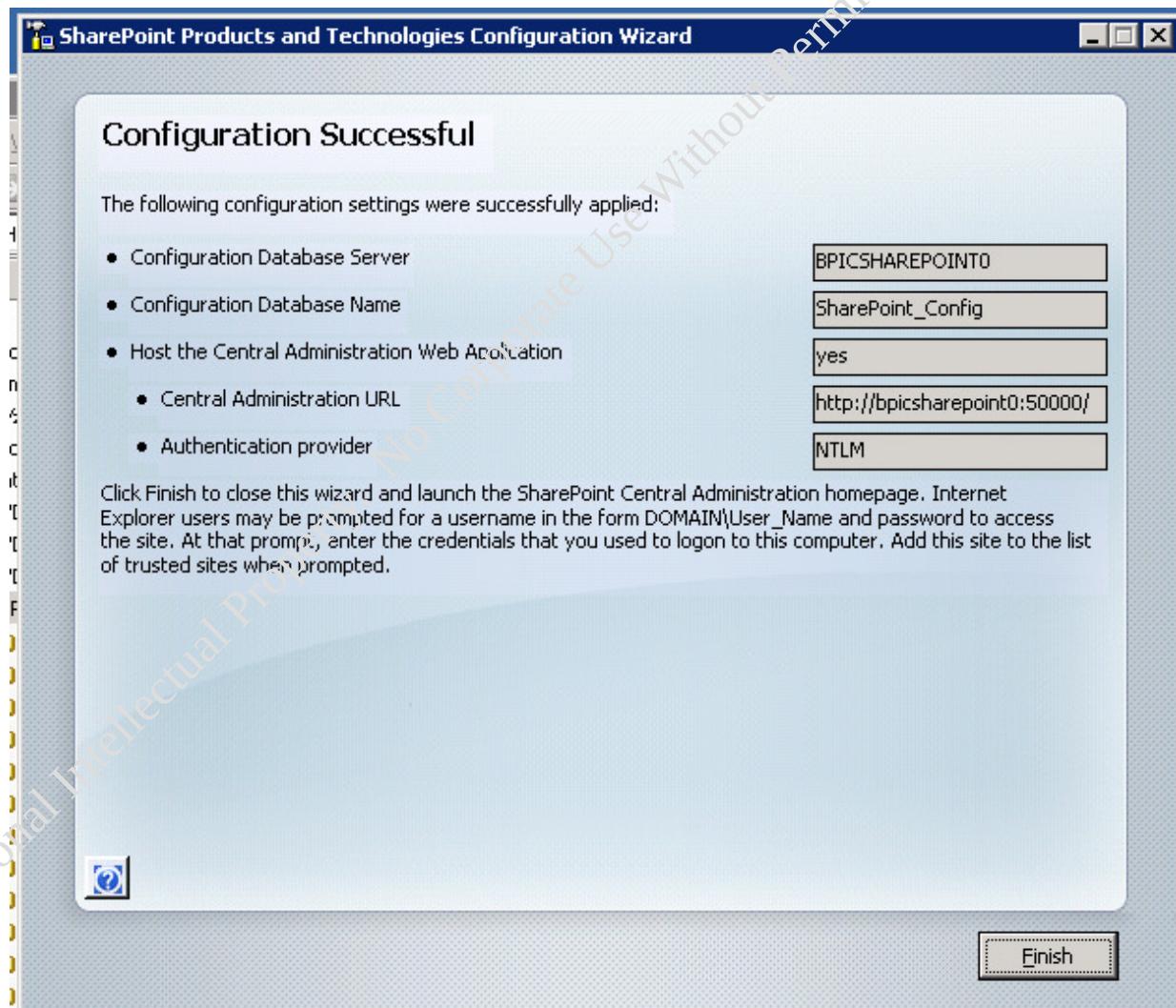
- define path [client server] [name of drive] srctype=[type "server"] desttype=[type "drive"] library=[library name] device=[device]

Appendix B: Sharepoint VM Specifications/Install Notes

By Lisa Atarian

1. Created two localhost accounts (sp_install and sp_SQL) to use for SharePoint install
2. Installed MOSS using the below specs

SharePoint Enterprise Edition, Complete Installation



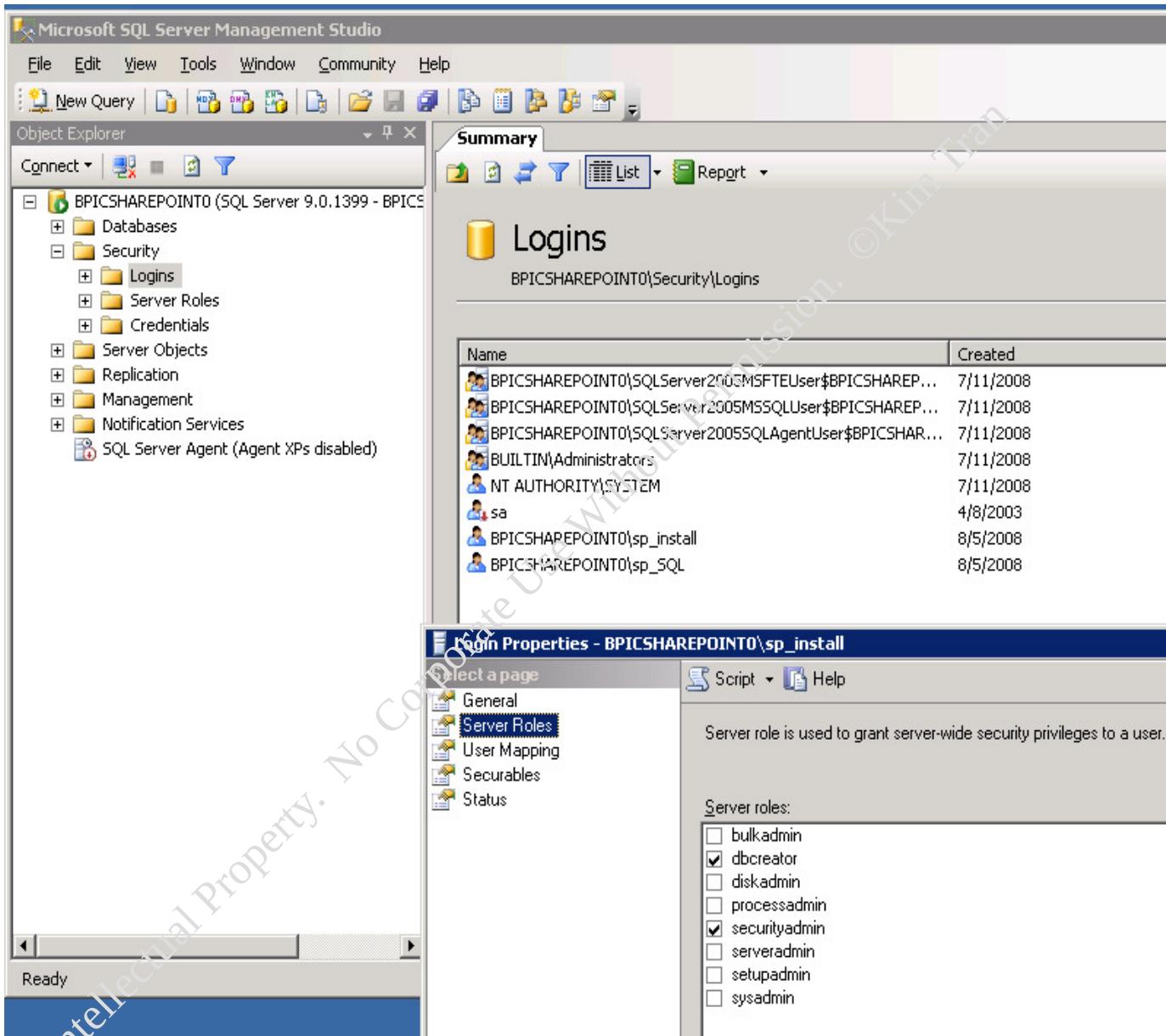
Central Administration URL is - <http://bpicssharepoint0:50000>

Log on to the Central Administration Site using sp_install/sp_install username and psswd

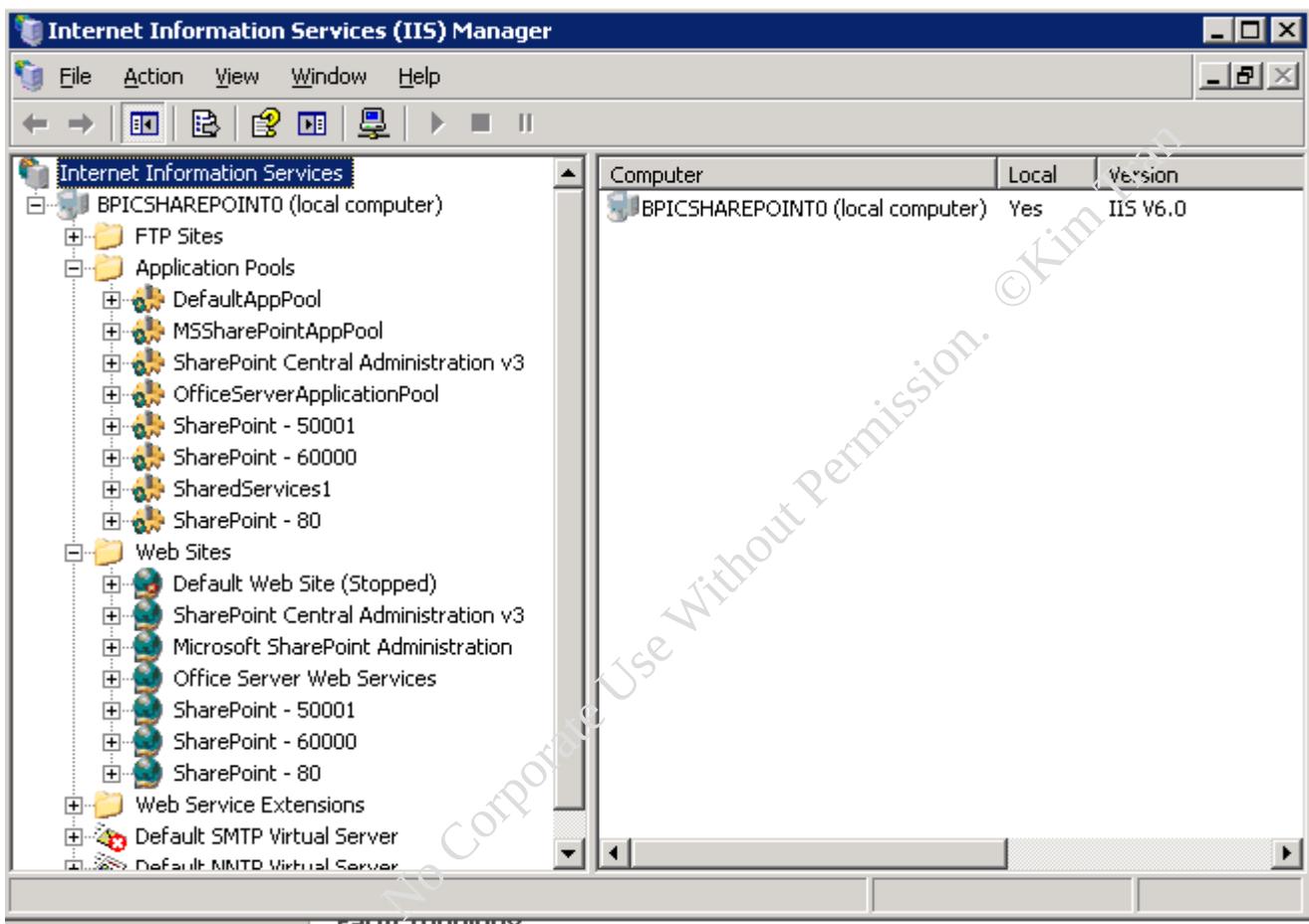
SharePoint SQL access account is: username sp_SQL, password sp_SQL

SharePoint SQL installation account is (**this is also used as the SharePoint service account**):
username sp_install, password sp_install

Both of these SQL accounts are using BPICSHAREPOINT0 SQL instance, and are given SQL
Security Administrator and SQL Database Creator rights on the SQL box



Site Collection URL is - <http://BPICSHAREPOINT0> (log on as any bpicsharepoint0 user account - for example: username bpicsharepoint0\admin, password berbee)



SharePoint - 50001 is Central Administration

SharePoint - 60000 is MySite

SharedServices1 is for Shared Services Provider

SharePoint - 80 is the Backup_Test site collection



TSM Project

Appleton TSM Server Migration

Prepared for

Gerry Thome

Version 1.0

September 29th, 2008

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Abstract

This is an internal TSM project in which I will be working with Gerry Thome to migrate the Appleton TSM server from the current physical server to a new, more reliable physical server.

Plan and Preparation

The approach was to update and prepare the newer physical server with firmware, drivers, and OS patches. Install and configure a base instance of the TSM server and client applications, followed by the migration/restoration of the current TSM server database.

TSM Server Setup/Install

The actual installation of each software itself varies from around one minute to possibly over an hour—depending on system specifications. The operating system averages around forty minutes, in addition to another one-two hours for patching the system with necessary security updates.

The TSM server/client software can be installed in two-three minutes. The Integrated Solutions Console (ISC) and the Administration Center can vary between fifteen minutes to an hour or more.

Estimated time: three-five hours (actual may vary)

TSM Server Setup/Configurations

The tasks that needed to be completed for this part of the setup:

- Configure the basic TSM server instance
- Define the basic storage pools
- Configure the TSM backup client (basic/default settings)
- Test the configurations

Setup of the environment can be done via the command line interface (CLI) or through the administration center (GUI).

Granted no complications are encountered, estimated time: one-three hours (actual may vary)

System Setup Info

Server IP: 172.30.x.x (static)

Login: Administrator/xxxxx

TSM server is running Windows Server 2003 Standard

TSM Server 5.5.1, Client 5.5.1

Local drive: 205GB (raid 5)

Diskpool dir: 50GB

Small File pool dir: 30GB

Complications

The main complication that I ran into was the current TSM server dying (no longer starting up) before the “volhist.out” and “devcnfg.out” files along with a database backup for that current point in time was done. Therefore the restoration of the TSM database took longer than anticipated, by manually searching the tapes for the type of data that equaled the database backups.

After I researched the ways to query the tapes for database backups, the database was restored.

Summary

The tasks completed to rebuild and migrate the former TSM server consisted of:

- Updating and patching of the newer TSM server machine
- Installation of TSM server and client
- Configuration of TSM server and client
- Restoration of the TSM database
- Configuration, setup, and audit of hardware (library and tape volumes)
 - The audit of the library and volumes is to correct the information that the TSM database has on record of what volumes and data is actually present.
- Creation, restoration, and audit of storage pool volumes
- Setup of ISC and Admin Center for GUI administration
- Inspection and verification of log activity, ensuring scripts and schedules are functional after the database restore

End of Document

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Appendix A: Library Setup

Library Setup

On the TSM server

- define library [name] libtype=[“scsi”]

Define a path to the library from the server that it will have access

- define path [name of server] [name of library] srctype=[type “server”] desttype=[type “library”] device=[device]

Define the drive(s)

- define drive [library name] [drive name]

Define a path to the drive(s) from the server that it will have access

- define path [server] [name of drive] srctype=[type “server”] desttype=[type “drive”] library=[library name] device=[device]

Define the all the device class associated (or to be used) with the library

- define devclass [class name] library [library name] devtype [type “lto”]

Finding the database backup volumes

On the TSM server (command prompt in the TSM “server” directory)

- dsmserv display dbbackupvolume devc=<devclass name> volumenames=<volume names, 1,2,3>

***When I entered in that command, if I was searching through multiple volumes...and for my experiences...if it didn't find the contents it was looking for on the first volume in the series, it would have an error then return you to the command prompt. I manually input the volume name one at a time:

“volumenames=vol1” then “volumenames=vol2”, and “volumenames=vol3” instead of
“volumenames=vol1,vol2,vol3”***

The other option instead of manually inputting the volumes one at a time is to create a script and a file with a list of the volumes to be searched as noted here:

http://www-01.ibm.com/support/docview.wss?rs=1019&context=SSSQWC&context=SSGSG7&q1=restore+db+volhist&uid=swg21143559&loc=en_US&cs=utf-8&lang=en

search for “swg21143559” on the IBM site if the link no longer works

The results, if a valid database backup is found should have some content similar to:

Date/Time: 09/16/2008 04:22:01

Volume Type: BACKUPFULL

Backup Series: 3,052

Backup Operation: 0

Volume Seq: 1

Device Class: LTOCLASS

Volume Name: 001373

Restoring the database from a volume with a valid database backup

Ensure that the library/drives/paths/devclass are defined, the database and recovery log from the base instance of the TSM server is at least large enough to process the restored database and recovery log data.

- Define dbvolume [volume name]
- Define logvolume [volume name]
- Extend db [size in mb]
- Extend log [size in mb]

One the valid database backup volume is found:

- dsmserv restore db volumenames=[name of volume] devc=[device class name] commit=[yes]



Appleton TSM Server Migration Project End Report

Prepared for Gerry Thome

Version 1.0

September 29, 2008

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Introduction

This is the Project End Report for the Appleton TSM Server Migration project, the recently completed effort to migrate the TSM server from an older physical machine to a newer, more powerful machine. Although the project has formally closed, Berbee believes that further benefit can accrue to Gerry Thome by analyzing the conduct of the project and its outcome.

In this document, Berbee details the overall outcome of the project:

- What went well?
- What are the lessons learned?
- What issues remain open, and how does Berbee plan for them to be resolved?
- What activities are recommended as follow-ons to Appleton TSM Server Migration project?

Additionally, the appendix of Open Issues provides detail about any pending open issues.

By providing this information, Berbee intends to help Gerry Thome gain maximum benefit from its experience with the project.

Recap

In summary, this was an internal project, in which Gerry Thome would be working with Kim Tran in order to strengthen his skills/knowledge on TSM while awaiting shadowing opportunities. The agenda was to migrate the current TSM server to a new, more reliable physical server. Due to the current server suddenly becoming out of service before some important files were readily backed up, the migration process became more complicated.

The extra steps and time to resolve the issue consisted of researching the methods to restore the TSM database without the “volhist.out” and the “devcfg.out” file in addition to searching the tape volumes for the most recent database backups. After researching the methods to restore and finding the recent backup copy, the TSM database was restored. The library volumes and storage pools were audited and recreated. The log files were checked and verified to make sure scripts and schedules were functional.

Services Completed

- Updating and patching of the newer TSM server machine
- Installation of TSM server and client
- Configuration of TSM server and client
- Restoration of the TSM database
- Configuration, setup, and audit of hardware (library and tape volumes)
- Creation, restoration, and audit of storage pool volumes
- Setup of ISC and Admin Center for GUI administration

Deliverables Completed

- Project documentation
- Post project debrief
- Project closure documentation

What Went Well

Key successes of Appleton TSM Server Migration project appear in Table 1, with notes on the lessons learned that can be applied to future projects.

TABLE 1. SUCCESS STORIES

SUCCESS AREA	NOTES
Updating and patching the physical server	I used the IBM update xpress cd 4.06 (latest) to update the latest firmware drivers for the hardwares on the eserver x346. The Windows 2003 server was also updated and patched via windows update.
Installation of TSM server and client	There were no issues with the installation of the server and client software.
Configuration of TSM server and client	There were no issues with the configuration of the server and client.
Communication	Communications to update Gerry on the status as things progress was smooth and on track.

Lessons Learned

Lessons learned throughout the Appleton TSM Server Migration appear in Table 2, with notes illustrating specifically how they can be applied to future projects.

TABLE 2. LESSONS LEARNED

ITEM/AREA	NOTES
Migration / Restore of TSM database	<p>The major problem during this step was the fact that the former TSM died (no longer starting up) before the “volhist.out” and “devcfg.out” files were backed up to a readily accessible media. Therefore extra research and steps were taken to restore the TSM database.</p> <p>In the future, the lesson learned is to immediately create readily accessible copies of the “volhist.out” and “devcfg.out” in preparation for unexpected situations, such as hardware failure. These files are needed for the restoration of the TSM database...the volhist file contains the location of the database backups to be restored, while the devcfg file has information on the library/hardware setup. Without these files, restoration becomes more complicated, by searching manually through the tapes, or to script the searching of the volumes if there are a lot of tapes.</p> <p>The process to restore the database without the files breaks down into creating a new, base install of the TSM server and client. Creating and mapping the paths for the hardware (library and drives), then searching for the database backups on the volumes available. Followed by the syntax for the commands to restore the database.</p>

Wrapping Up

Table 3 provides information on outstanding issues related to Appleton TSM Server Migration project, with notes on how Berbee plans for them to be resolved.

For a detailed Issues Log report, see the appendix of Open Issues on page 8.

TABLE 3. OUTSTANDING ISSUES

ISSUE	PLAN FOR RESOLUTION
Pending Issues	<p>After the creation of the base TSM server/client instance; creation of the library/drive paths for the hardware; search of the database backups; restoration of the database, restoration and audits of the library and volumes; successful test restores; and verifications of the log files that scripts and schedules are running...</p> <p>I am unsure of what more that needs to be done. I will continue to monitor the server, and touch base with Gerry Thome on any pending/opening issues.</p>

What's Next?

Based on the outcome of Appleton TSM Server Migration project, Berbee recommends that Gerry Thome capitalize on the benefits of the project by pursuing the initiatives outlined in Table 4.

TABLE 4. RECOMMENDED FOLLOW-ON ACTIVITIES

ACTIVITY	NOTES
Updates to the Server	Should the current server need updates or other tasks to be performed, please keep me informed and I will be willing to assist.
Migration and additions	If the TSM needs to be migrated again, or if another instance (physical) is planned. I will be willing to offer my assistance per your request.
Troubleshooting and Support	I will be ready and willing to assist with current and future support issues

Project Closure Acknowledgement

Berbee Information Networks Corporation

By: _____

Name: _____

Title: Account Manager

Name: _____

Title: Project Manager

Date: _____

[Client Representative Signature]

By: _____

Name: _____

Title: _____

Appendix. Open Issues

This appendix provides a detailed report of open issues as of 9/29/08.

The report begins on the next page.

For information on how Berbee plans for these issues to be resolved, refer to the What's Next Section on page 6.

Not Applicable

Post Project Review and Lessons Learned

This is a post project review and input on the lessons learned from the project.

General Information

Project Name	Appleton TSM Server Migration
Today's Date	March 15, 2009
Project Wrap-up Completed (Yes, No)	YES
Describe any problems being adequately prepared prior to arriving at the customer site? (Statement of Work, BEST, any other needed information)	I was adequately prepared. Although, the project would have been smoother if the TSM server didn't just die (without starting up again) leading to a loss of two files that are beneficial to the restoration of the TSM database.
Describe any customer satisfaction issues related to the deliverables or quality of deliverables.	No Issues
Describe customer satisfaction issues/concerns	No Issues
Describe any problems staying on schedule.	On Schedule
If there were change requests, was the change management process used? Describe any issues related to change management or scope containment.	Change management process not used
What 2 things could have been done to improve customer satisfaction?	<ol style="list-style-type: none"> 1. More personal client interaction time to discuss in real time issues and resolutions. 2. More prompt with the immediate backups of crucial restoration files—a lesson for future references.