

SPC-1 Run and Configuration DS4200

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+ HW and SW Used

- N2225 SAS HBA
- DS4200 (**10.243.177.182**) running **GT250R007**
- 12x Samsung PM1635 400GB 3DWD SAS (01DC482)
- Windows Server 2008 R2 (**10.240.43.226**)
- SPC-1 Toolkit V3.0.2 (**C:\SPC\v302**)

+ Disable Replication

- Disable all Asynchronous Replications by either removing the license with:
set defaults factory

NOTE: This will also remove system settings and reset user passwords

- Or disable the replication schedules by deleting them from the Replication tab.

+ Load Correct FW

- Download the FW to the system using either the ftp or WBI interface

Please see the CLI guide or Storage Manager guide for directions on updating the FW for the system

+ Enable Random IO Optimization

- Create new user account

create user roles diagnostic interfaces wbi,cli,ftp type diagnostic new_user

- Login with new_user account
- Enable random IO optimization

set advanced-settings random-io-performance-optimization enabled

- Disable disk groups background scrub

set advanced-settings background-scrub disabled

+ Disable Protocols

- Disable protocols during the test by using the following command:

set protocols wbi disable

(For Example)

- Repeat this by disabling all interfaces except the Secure command line interface (SSH)
- This protocols can be re-enabled when the testing is completed

+ Add Disk Groups

Total 12 SSD's (6 / pool) with RAID-10

```
add disk-group disks 0.0,0.1:0.2,0.3:0.4,0.5 level raid10 pool a type virtual
```

```
add disk-group disks 0.6,0.7:0.8,0.9:0.10,0.11 level raid10 pool b type virtual
```

+ Create Volumes

CLI commands for 12 SSDs (1200GB / pool)

```
create volume pool A size 510GB ASU1-A  
create volume pool A size 510GB ASU2-A  
create volume pool A size 114GB ASU3-A
```

```
create volume pool B size 510GB ASU1-B  
create volume pool B size 510GB ASU2-B  
create volume pool B size 114GB ASU3-B
```

	ASU1-A1	ASU2-A1	ASU3-A1	ASU1-B1	ASU2-B1	ASU3-B1
Total 4 SSDs	170GB	170GB	38GB	170GB	170GB	38GB
Total 8 SSDs	340GB	340GB	76GB	340GB	340GB	76GB
Total 12 SSDs	510GB	510GB	114GB	510GB	510GB	114GB

* ASU1=45%, ASU2=45%, ASU3=10% of total storage

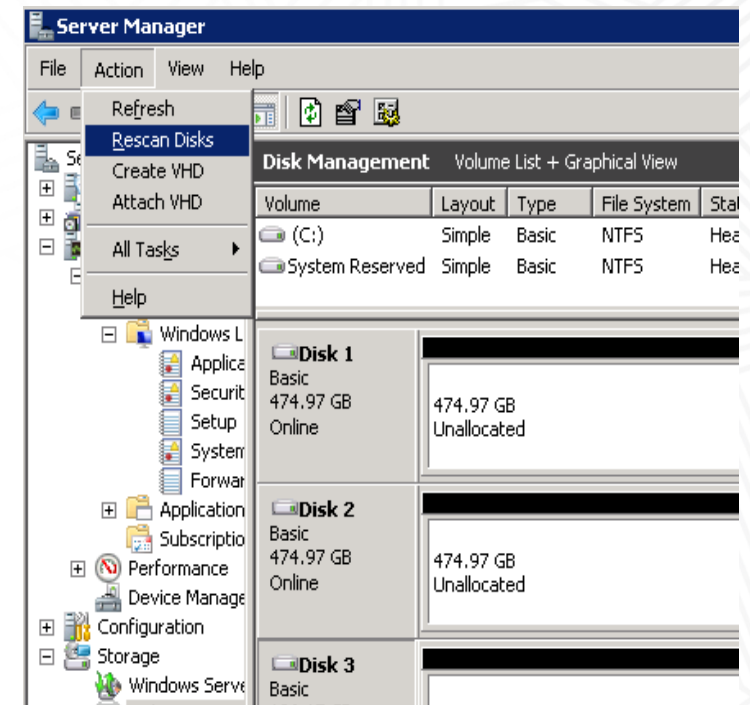
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+ Map Volumes

CLI commands

```
map volume lun 10 ports a0 ASU1-A
map volume lun 11 ports a0 ASU2-A
map volume lun 12 ports a0 ASU3-A
```

```
map volume lun 13 ports b0 ASU1-B
map volume lun 14 ports b0 ASU2-B
map volume lun 15 ports b0 ASU3-B
```



Remember to click on **Rescan Disks** in Server Manager after **each** map command, so it's easier to correlate LUN with physical Disk number

+ Map Volumes

- The Host will see the Disks after mapping
- Make the disks online and initialized

Disk 1 Basic 474.97 GB Online	474.97 GB Unallocated
Disk 2 Basic 474.97 GB Online	474.97 GB Unallocated
Disk 3 Basic 106.17 GB Online	106.17 GB Unallocated
Disk 4 Basic 474.97 GB Online	474.97 GB Unallocated
Disk 5 Basic 474.97 GB Online	474.97 GB Unallocated
Disk 6 Basic 106.17 GB Online	106.17 GB Unallocated

■ Unallocated ■ Primary partition

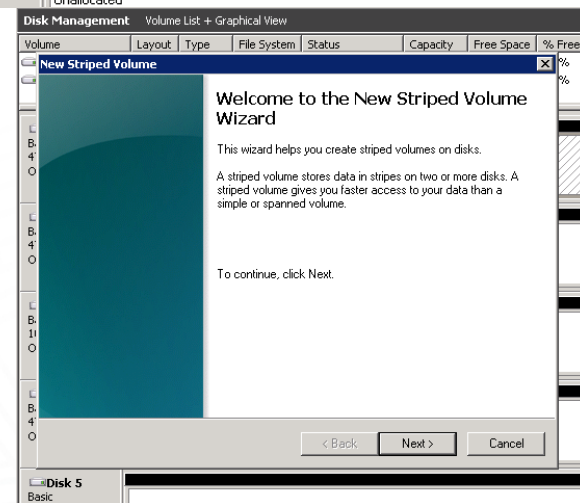
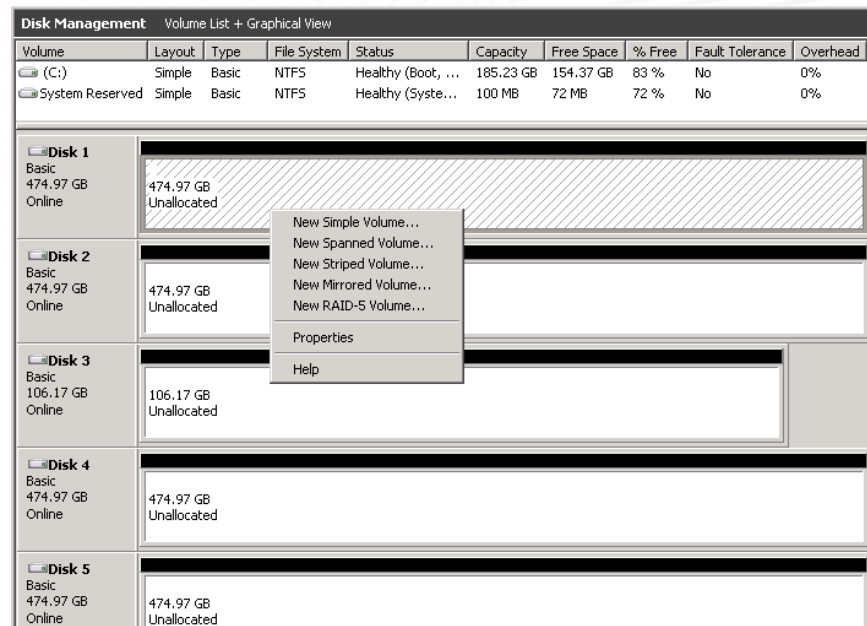
+ SPC-1 Logical Volumes

Three Striped Volumes

"Physical Disk"	LUN #	ASU	Drive Letter
1 and 4	10 and 13	ASU-1	I:
2 and 5	11 and 14	ASU-2	J:
3 and 6	12 and 15	ASU-3	K:

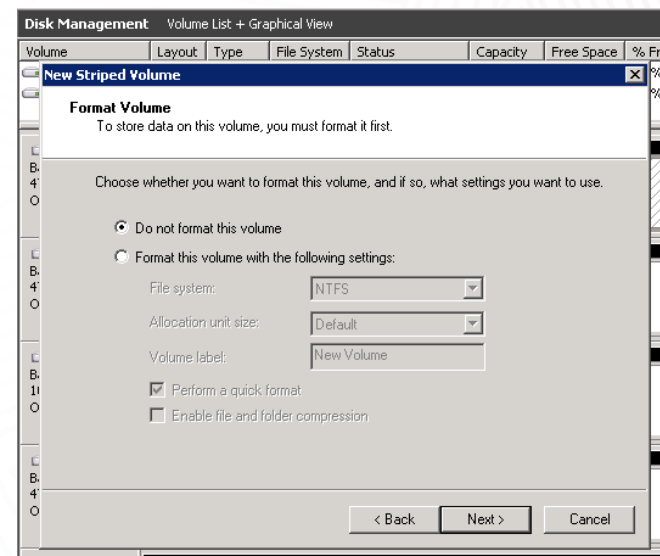
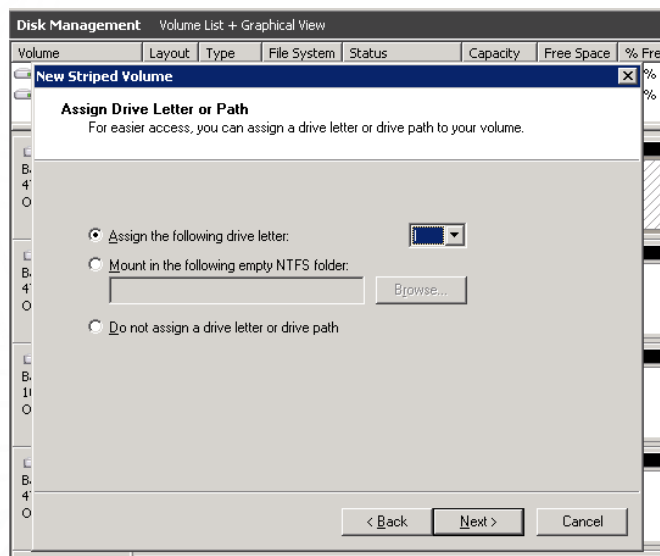
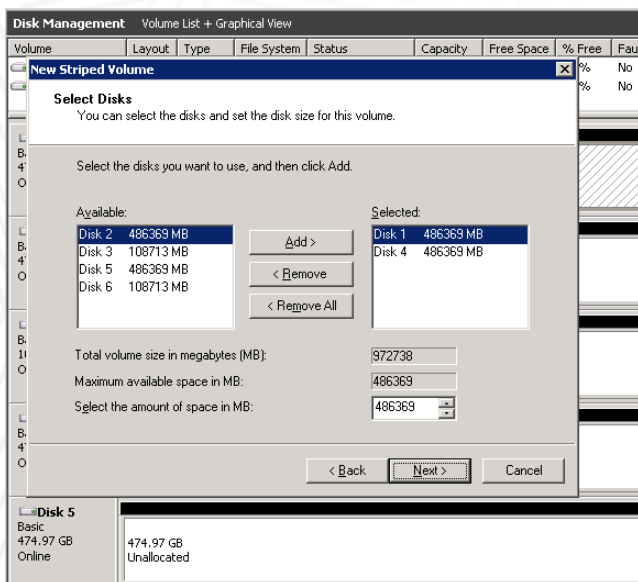
ASU-1:

1. Start Disk Management
2. Right click on Disk 1, and select **New Striped Volume...**
3. Wizard pops up. Select **Next**



+ SPC-1 Logical Volumes

4. On **New Striped Volume** window, highlight **Disk 4** and click on **Add**
5. **Disk 1** and **Disk 4** in the selected area, click **Next**
6. Click **Assign the following drive letter**, select **I**, then **Next**
7. On **Format Volume** window, select **Do not format this volume**, then **Next**



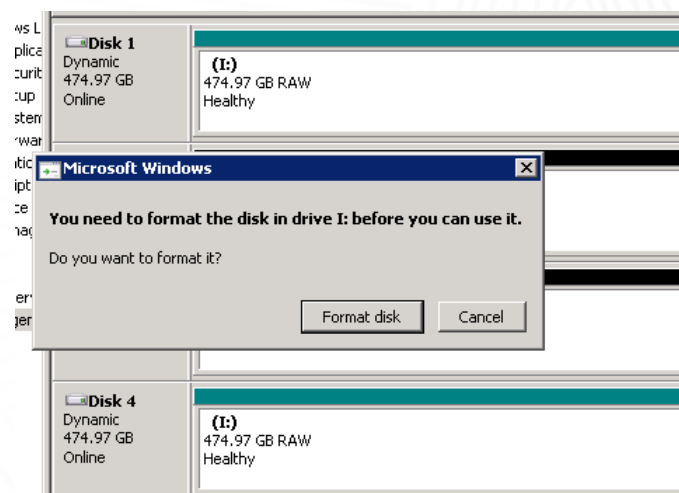
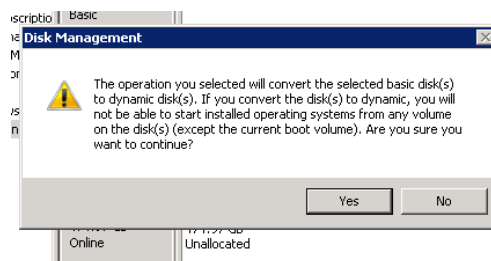
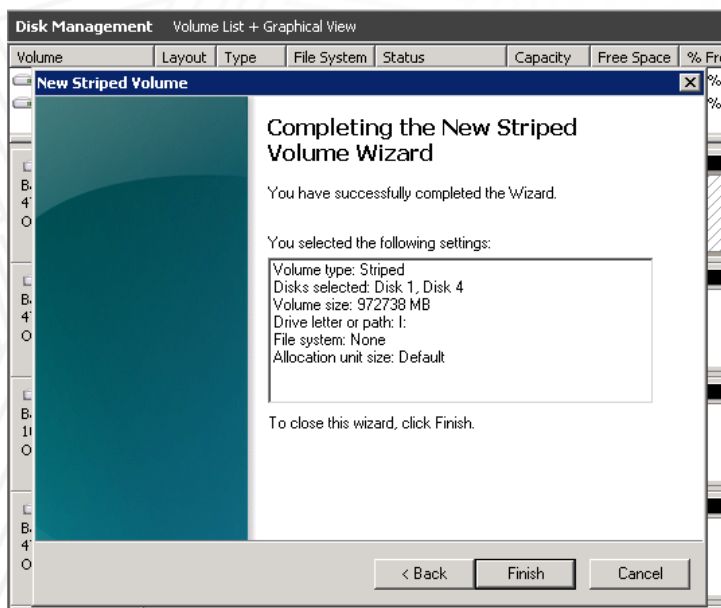
+ SPC-1 Logical Volumes

8. **Completing the New Striped Volume Wizard**, click **Finish**

9. **Disk Management** confirmation, click **Yes**

10. **Microsoft Windows** asking to format disk, click **Cancel**

11. Repeat steps 2 – 10 for drives **J** and **K**



+ SPC-1 Logical Volumes

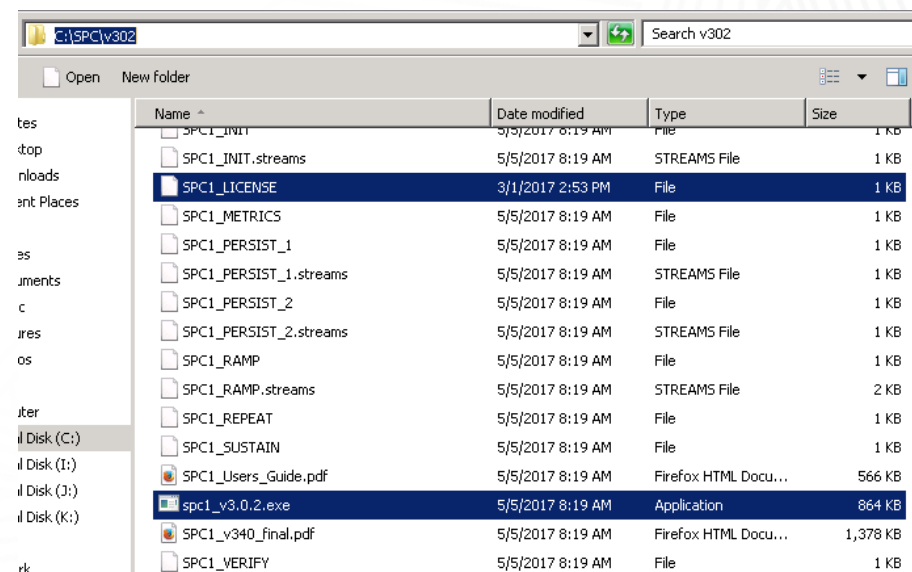
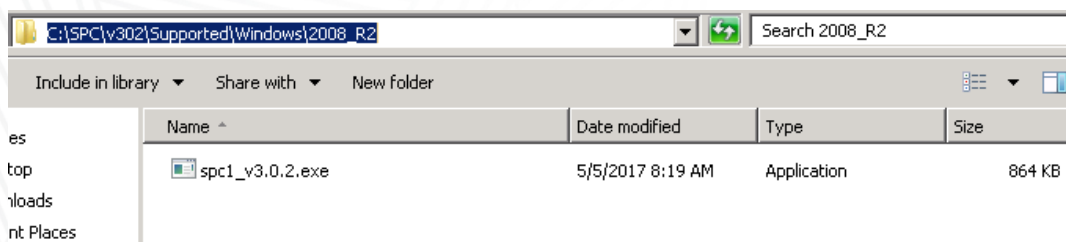
12. After all three logical volumes have been created, Disk Management will look as this:

Disk Management Volume List + Graphical View									
Volume	Layout	Type	File System	Status	Capacity	Free Space	% Free	Fault Tolerance	Overhead
(I:)	Striped	Dynamic	RAW	Healthy	949.94 GB	949.94 GB	100 %	No	0%
(J:)	Striped	Dynamic	RAW	Healthy	949.94 GB	949.94 GB	100 %	No	0%
(K:)	Striped	Dynamic	RAW	Healthy	212.33 GB	212.33 GB	100 %	No	0%
Disk 1 Dynamic 474.97 GB Online	(I:) 474.97 GB RAW Healthy								
Disk 2 Dynamic 474.97 GB Online	(J:) 474.97 GB RAW Healthy								
Disk 3 Dynamic 106.17 GB Online	(K:) 106.17 GB RAW Healthy								
Disk 4 Dynamic 474.97 GB Online	(I:) 474.97 GB RAW Healthy								
Disk 5 Dynamic 106.17 GB Online	(K:) 106.17 GB RAW Healthy								
Disk 6 Dynamic 474.97 GB Online	(J:) 474.97 GB RAW Healthy								

Do NOT format the drives

+ Setup SPC-1 Toolkit

- Copy the unzipped toolkit to **C:\SPC\v302**
- Navigate to **C:\SPC\v302\Supported\Windows\2008_R2**
- Copy **spc1_v3.0.2.exe**, and paste it to **C:\SPC\v302**
- Copy and paste **SPC1_LICENSE** to **C:\SPC\v302**



+ Storage Configuration File

Create text file **SPC1.asu** under directory **C:\SPC\v302**

OFFSET=0

SIZE=0

ASU=1

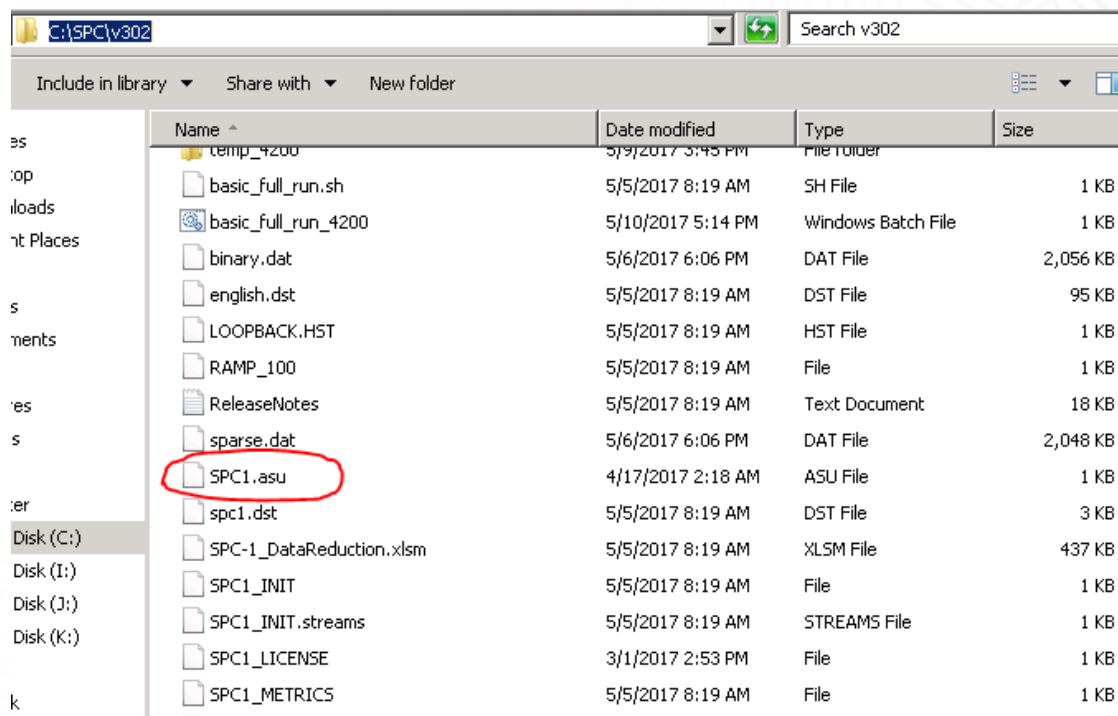
DEVICE=\\.\i:

ASU=2

DEVICE=\\.\j:

ASU=3

DEVICE=\\.\k:



+ INIT (Pre-Fill), VERIFY and RANGE

Navigate to **C:\SPC\v302**

```
> .\spc1_v3.0.2 -run SPC1_INIT -iops 600 -storage SPC1.asu
```

```
> .\spc1_v3.0.2 -run SPC1_VERIFY -iops 100 -storage SPC1.asu
```

Make sure every volume's space is fully allocated, otherwise, run INIT again

Name	Pool	Type	Size	Allocated
ASU1-A1	A	base	509.9GB	509.9GB
ASU2-A1	A	base	509.9GB	509.9GB
ASU3-A1	A	base	113.9GB	113.9GB
ASU1-B1	B	base	509.9GB	509.9GB
ASU2-B1	B	base	509.9GB	509.9GB
ASU3-B1	B	base	113.9GB	113.9GB

+ Full-Run Script

Modify **basic_full_run_4200_0712.bat**

```
set IOPS=100000      ←Highest IOPS
set INIT_IOPS=600
set PERSIST_IOPS=25000 ←PERSIST_IOPS is 25% of highest IOPS
set OUTPUT=full_run_output_S4200_0712
set STORAGE=SPC1.asu
set SPC1=spc1_v3.0.2
```

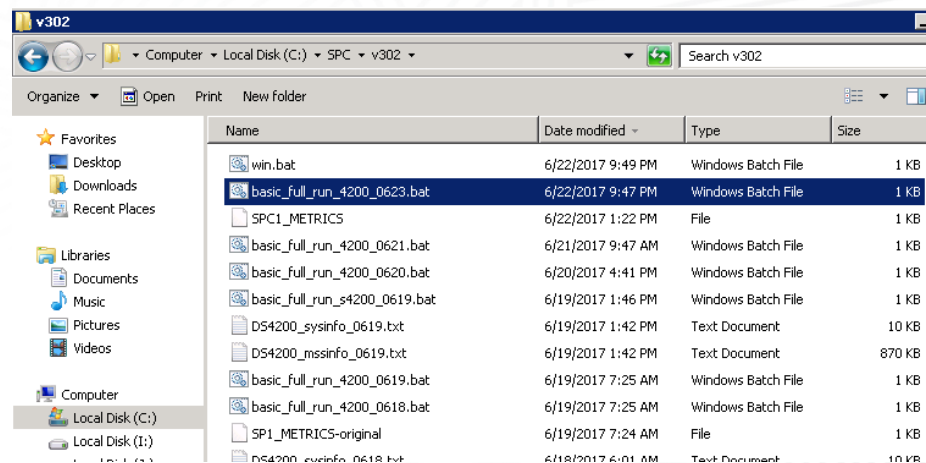
```
%SPC1% -run SPC1_INIT      -output %OUTPUT% -iops %INIT_IOPS% -storage %STORAGE%
%SPC1% -run SPC1_VERIFY    -output %OUTPUT% -iops 100      -storage %STORAGE%
%SPC1% -run SPC1_METRICS   -output %OUTPUT% -iops %IOPS%    -storage %STORAGE%
%SPC1% -run SPC1_VERIFY    -output %OUTPUT% -iops 100      -storage %STORAGE%
%SPC1% -run SPC1_PERSIST_1 -output %OUTPUT% -iops %PERSIST_IOPS% -storage %STORAGE%
```

echo "Now Restart the TSC and run:"

```
echo "4200run > .\SPC1_v3.0.2 -run SPC1_PERSIST_2 -output full_run_output_S4200_0712
-iops 25000 -storage SPC1.asu"
```

echo " with any other options you used in this run"

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+ System Info BEFORE SPC Run

Storage System – save the following outputs to a text file

```
# show system
```

```
# show controllers
```

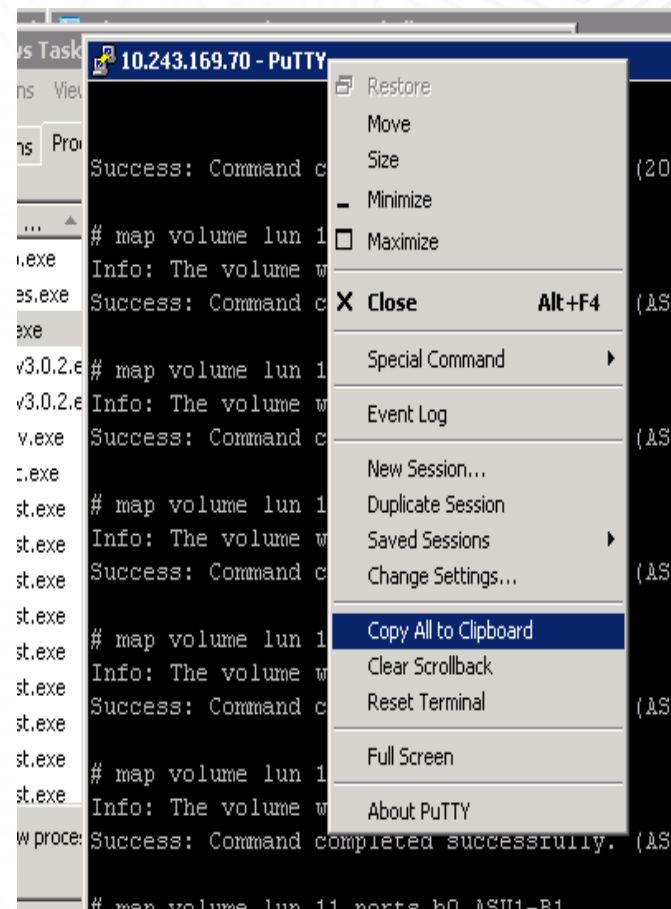
```
# show versions detail
```

```
# show ports
```

```
# show disks encl
```

```
# show volumes detail
```

```
# show disk-groups
```



+ System Info BEFORE SPC Run

Storage System – Disk Group RAID 10 Info or show disk-groups

Lenovo ThinkSystem DS4200 Storage Management Console

System: Uninitialized Name
Version: GT250R006-02

2017-06-14 10:53:12 User: manage Session: 04:20:16

Action POOLS

Showing 1 to 2 of 2 entries (2 selected)

Name	Health	Size	Avail	Volumes	Disk Groups
A	OK	1196.8GB	62.8GB	3	1
B	OK	1196.8GB	62.8GB	3	1

Related Disk Groups

Showing 1 to 2 of 2 entries (2 selected)

Name	Health	Pool	RAID	Disk Type	Size	Free	Current Job	Status	Disks
R10-A	OK	A	RAID10	sSAS (Performance)	1196.8GB	62.8GB		FTOL	6
R10-B	OK	B	RAID10	sSAS (Performance)	1196.8GB	62.8GB		FTOL	6

Related Disks

Showing 1 to 12 of 12 entries

Location	Health	Description	Size	Usage	Disk Group	Status
0.0	OK	SSD SAS	400.0GB	VIRTUAL POOL	R10-A	Up
0.1	OK	SSD SAS	400.0GB	VIRTUAL POOL	R10-A	Up
0.2	OK	SSD SAS	400.0GB	VIRTUAL POOL	R10-A	Up
0.3	OK	SSD SAS	400.0GB	VIRTUAL POOL	R10-A	Up
0.4	OK	SSD SAS	400.0GB	VIRTUAL POOL	R10-A	Up
0.5	OK	SSD SAS	400.0GB	VIRTUAL POOL	R10-A	Up
0.6	OK	SSD SAS	400.0GB	VIRTUAL POOL	R10-B	Up
0.7	OK	SSD SAS	400.0GB	VIRTUAL POOL	R10-B	Up
0.8	OK	SSD SAS	400.0GB	VIRTUAL POOL	R10-B	Up
0.9	OK	SSD SAS	400.0GB	VIRTUAL POOL	R10-B	Up
0.10	OK	SSD SAS	400.0GB	VIRTUAL POOL	R10-B	Up
0.11	OK	SSD SAS	400.0GB	VIRTUAL POOL	R10-B	Up

Home
System
Hosts
Pools
Volumes
Mapping
Replications
Performance

+ System Info BEFORE SPC Run

Host System – ASU Volume Info

Disk Management Volume List + Graphical View										
Volume	Layout	Type	File System	Status	Capacity	Free Space	% Free	Fault Tolerance	Overhead	
(I:)	Striped	Dynamic	RAW	Healthy	949.94 GB	949.94 GB	100 %	No	0%	
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(K:)	Striped	Dynamic	RAW	Healthy	212.33 GB	212.33 GB	100 %	No	0%	
Disk 1 Dynamic 474.97 GB Online	 (I:) 474.97 GB RAW Healthy									
Disk 2 Dynamic 474.97 GB Online	 (J:) 474.97 GB RAW Healthy									
Disk 3 Dynamic 106.17 GB Online	 (K:) 106.17 GB RAW Healthy									
Disk 4 Dynamic 474.97 GB Online	 (I:) 474.97 GB RAW Healthy									
Disk 5 Dynamic 106.17 GB Online	 (K:) 106.17 GB RAW Healthy									
Disk 6 Dynamic 474.97 GB Online	 (J:) 474.97 GB RAW Healthy									

+ System Info BEFORE SPC Run

Host System – save the following outputs to text files

```
> msinfo32 /report Host_msinfo_0712.txt
```

```
> systeminfo /fo list > Host_sysinfo_0712.txt
```


+ Run SPC-1

Execute Full-run Script

```
> .\basic_full_run_4200_0712.bat
```

Once the Script finishes -> **Shutdown** and **Reboot** both Storage and Host, then run PERSIST2
PERSIST2 IOPS is 25% of highest IOPS

```
> .\SPC1_v3.0.2 -run SPC1_PERSIST_2 -output full_run_output_S4200_0712 -iops 25000 -storage  
SPC1.asu
```


+ System Info AFTER SPC Run

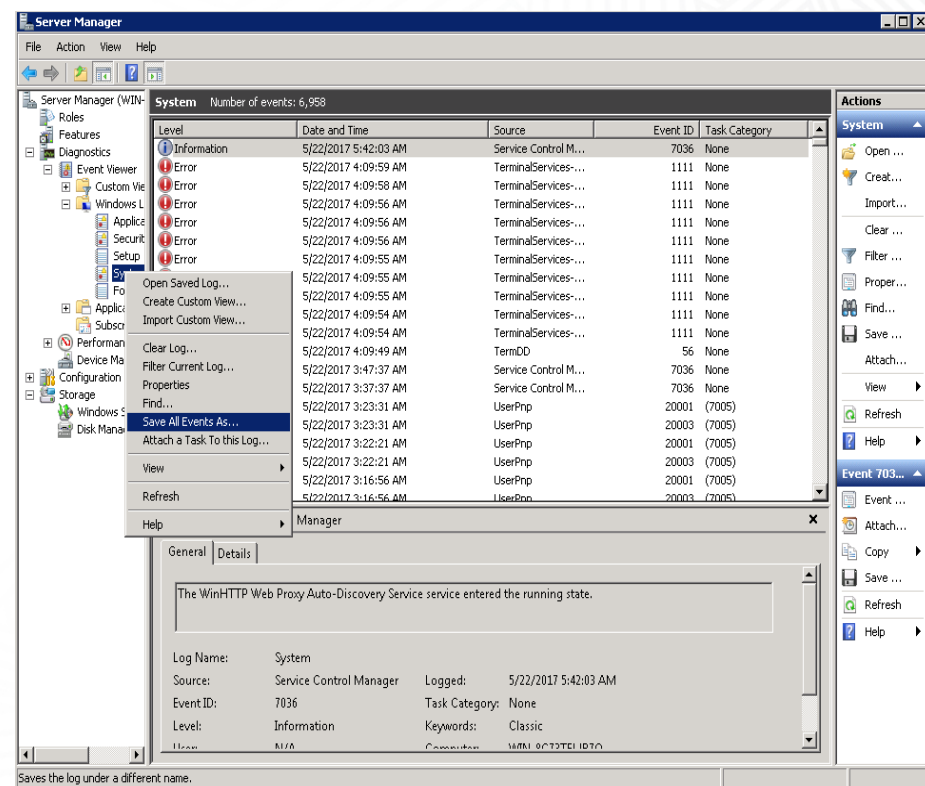
- Storage System

- Collect the same info as BEFORE SPC run
- Log showing shutdown/boot events, use command, adjust timestamp accordingly: (timestamp format *MMDDYYhhmmss*)

show events from 071217000000 to 071217173000

- Host System

- Collect the same info as BEFORE SPC run
- Log showing Windows shutdown/boot events (discard events outside of testing period); see the screenshot on the right
- Look for the key work “power off” to verify



+ Files to Submit

- Whole directory generated during SPC-1 run
- System logs BEFORE and AFTER the run
- Page 3 to 12 of this document showing steps how to setup storage system

+ Quick-Look of SPC Result

- QL report is for reference only
- Not required for auditor
- Use data reduction tool included in SPC-1 directory: **SPC-1_DataReduction.xlsm**



thanks.

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