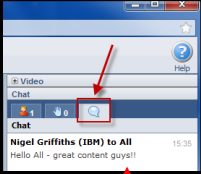


**Power Systems Virtualisation from IBM  
- Technical Webinar User Group**

**Today**

**VIOS Shared Storage Pools 4**  
Starting at 10:00 am UK time by Nigel Griffiths



Smart Meeting → Put questions into the Chat box or AT&T Toll Free phone for better audio


- 0800-368-0638 = UK Toll Free
- 0203-059-6451 = UK but you pay for the call
- The Participant Code is in the Chat box
- Other countries see Chat box for the website
- Please Mute with \*6

**Previous Sessions:**


- Electric Server Agent
- RDX Removable disks
- Dynamic Platform Optimiser
- PowerSC
- POWER Advisors
- POWER7 Affinity and Perf.
- Updating Power, I/O & HMC
- VPM for IBM i
- ISD VMControl
- Capture & Deploy
- SSP3


**Future Sessions →**  
<http://tinyurl.com/PowerSystemsTechnicalWebinars>

- PowerVP - wow! - February 5<sup>th</sup> Gareth Coates
- PowerVC - cool! - March 5<sup>th</sup> Nigel Griffiths
- **Suggestions Welcome**




Twitter:  
Nigel Griffiths @mr\_nmon  
Jyoti Dodhia @JyotiDodhia  
Gareth Coates @Power\_gaz








# VIOS Shared Storage Pools 4

- SSP Phase 3 Reminder,
- Advanced Features &
- New functions in SSP4



**Nigel Griffiths**  
IBM Power Systems  
Advanced Technology Support, Europe



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Version 4

## Are my disks supported by SSP?

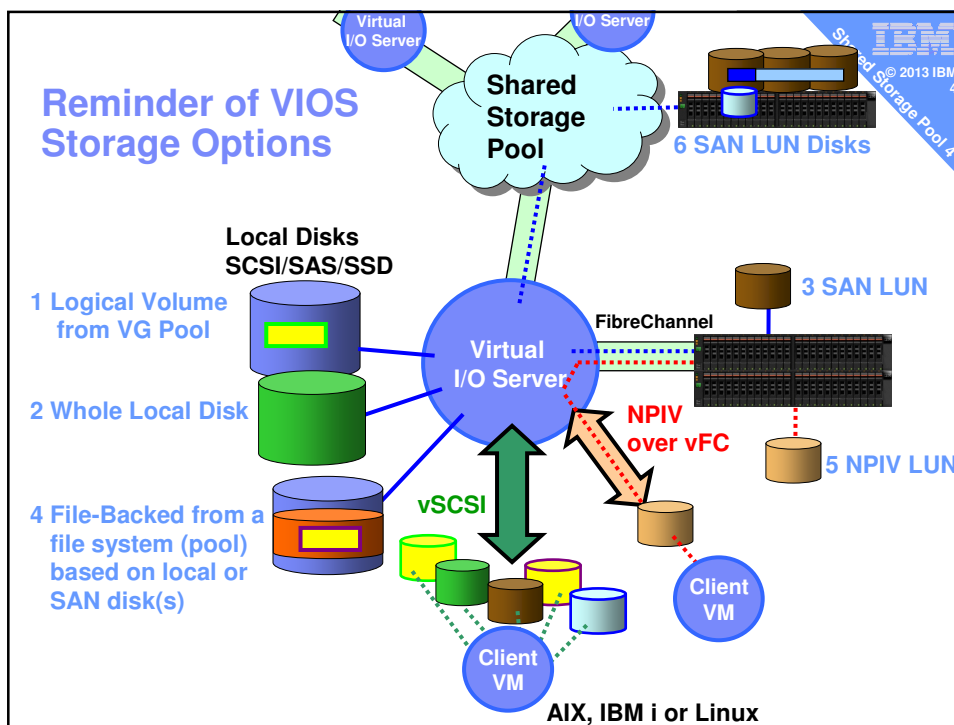
- If supported by VIOS then they are good for SSP
  - <http://www14.software.ibm.com/webapp/set2/sas/f/vios/documentation/datasheet.html>

## How do I get SSP4? 29<sup>th</sup> Nov 2013

- SSP4 delivered as VIOS 2.2.3 + fix packs
  - So just upgrade your VIOS or start on VIOS 2.2.3+

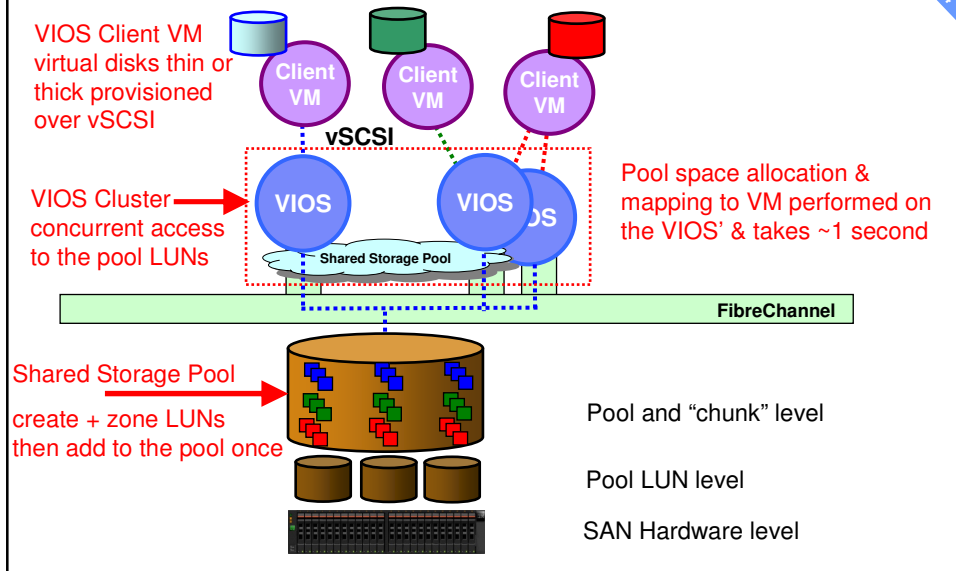
## Does SSP support NPIV?

- No it does not, never will and it is impossible!



## SSP3 - Disk Management

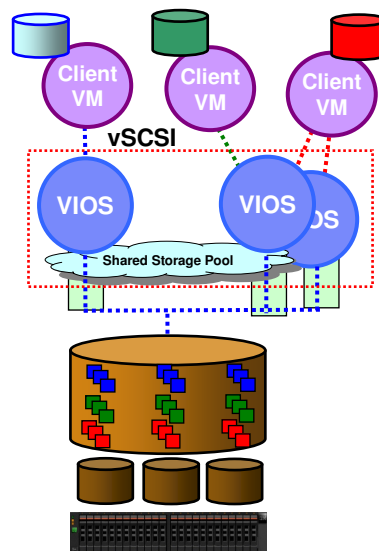
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Shared Storage Pool 4



## Advanced Functions 1: Live Partition Mobility

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Shared Storage Pool 4

- SSP VIOSes already have the LUNs online  
→ no SAN zoning issues
- Provided you have Virtual Ethernet & no physical adapters  
→ you are LPM ready  
→ default is LPM ready  
→ no additional work
- Assuming your machines have PowerVM Enterprise



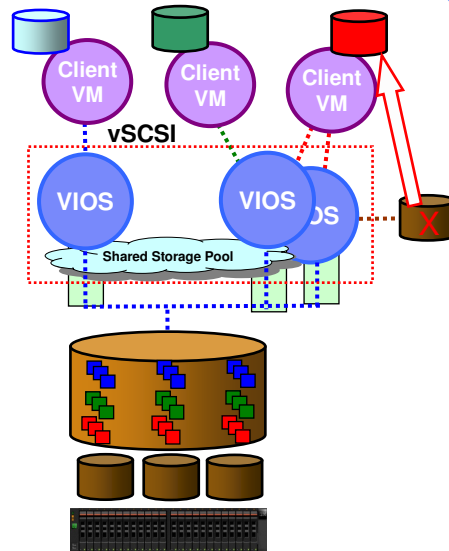
## Advanced Functions 2: Migrating to SSP

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Shared Storage Pool 4

Got old local disks, VIOS LV or hdisk via vSCSI, NPIV but want to use SSP !!!

Actions:

- Add VIOS to SSP
- Add LU disks
- With AIX
  - migratepv live to SSP
  - bosboot
  - bootlist
  - Remove old disks/adapters
  - and you are LPM ready



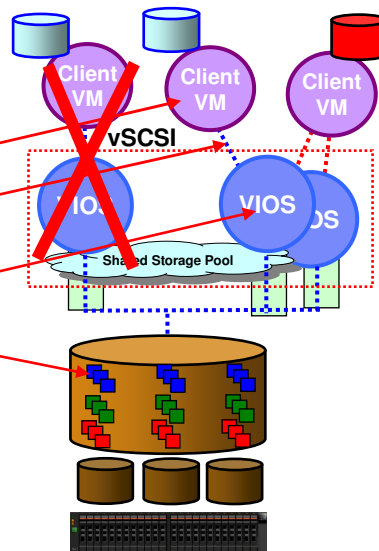
## Advanced Functions 3: Box Crash Recovery

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Shared Storage Pool 4

- Total box lost!
  - SSP will disks survive

Actions:

- Make a new LPAR
- Map in the SSP LU
- Connect to right network
- Set the bootlist
- Reboot
- and you are running again in, say, 2 minutes!



## This session assumes attended Shared Storage Pools (phase 3)

- If new to VIOS Shared Storage Pools watch these on [YouTube](#)

### 1. SSP2 Getting Started

– <https://www.youtube.com/watch?v=RgEmJfEFJRQ>



### 2. Shared Storage Pool phase 3 (SSP3) New Features

– <https://www.youtube.com/watch?v=BJtd6ej4iU0>



### 3. Looking Around a Shared Storage Pool SSP3

– <https://www.youtube.com/watch?v=Ma62HmtVckM>



### 4. Live Partition Mobility (LPM) with Shared Storage Pool

– <https://www.youtube.com/watch?v=R78RWNQRTzI>



### 5. Migrating to SSP and then use LPM

– <https://www.youtube.com/watch?v=Y4GsYwyikaU>

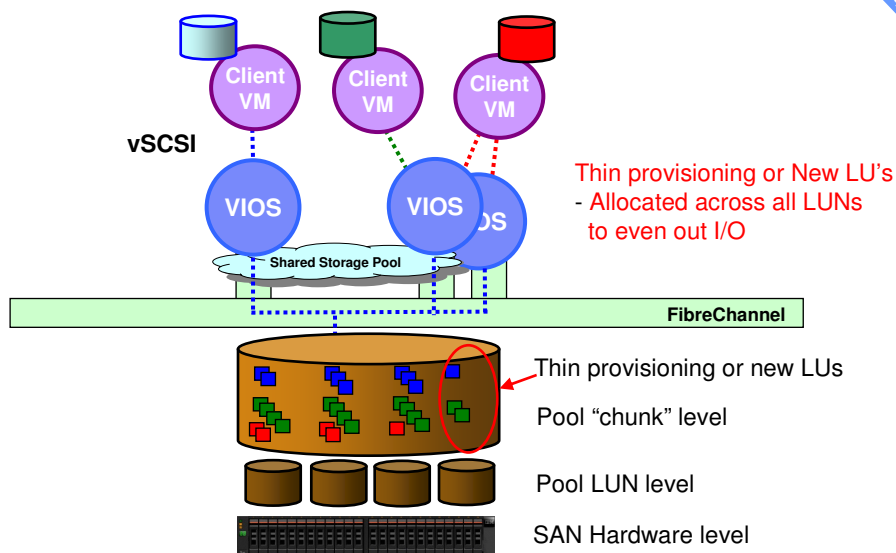


### 6. SSP3 Recover a Crashed LPAR to Another Machine

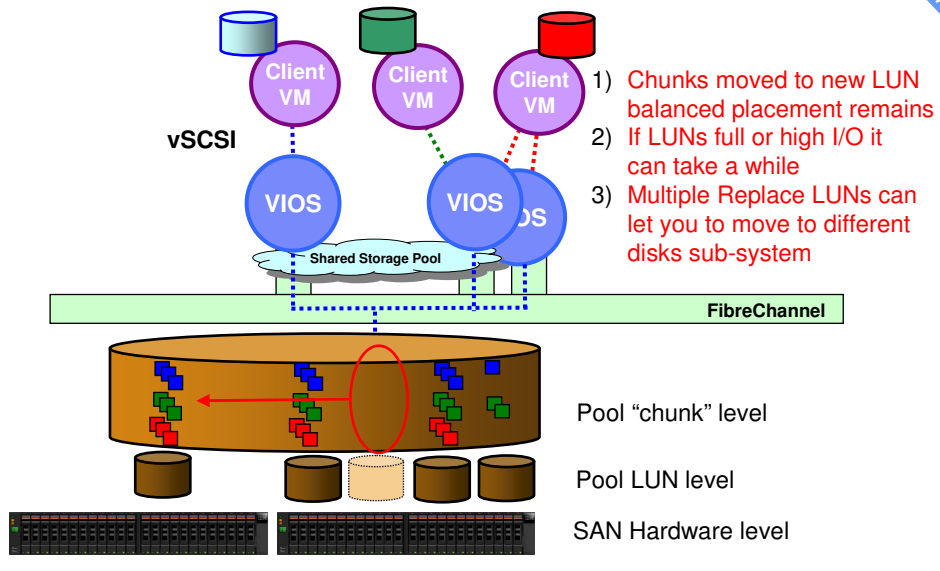
– <https://www.youtube.com/watch?v=qwqC70zFe18>



## SSP3 – Add LUN to make Pool Larger



## SSP3 – Replace LUN

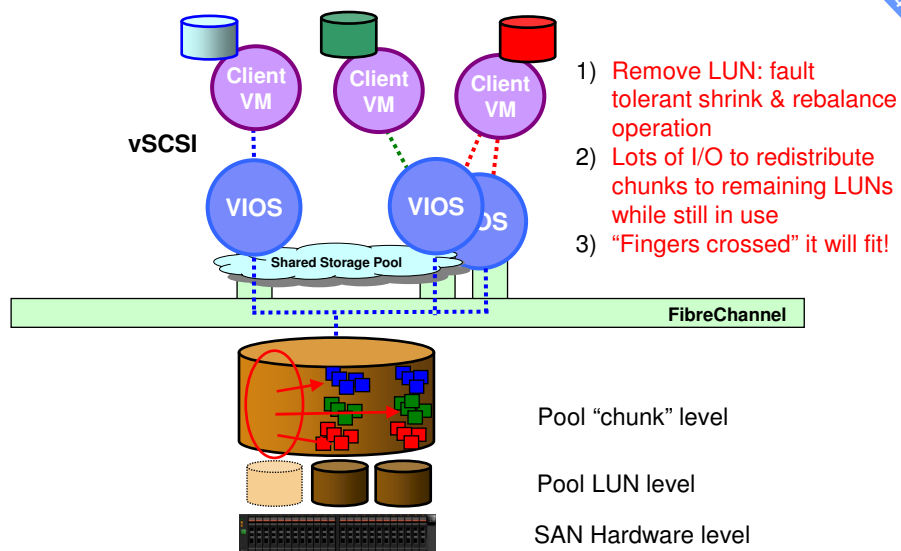


## Shared Storage Pool phase 4

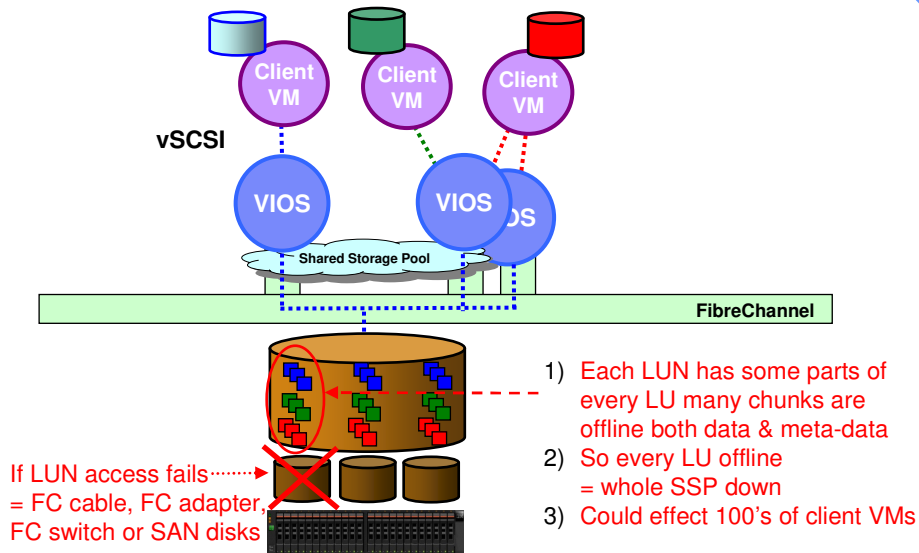
## SSP4 – new feature in brief

1. Remove LUN from Shared Storage Pool
2. Pool Mirroring Option for Resilience
  - Disaster Recover option to handle
  - Disk-subsystem failure or LUN offline failures
  - Doubles the disk requirement – typical of DR
  - SSP4 manages the mirror I/O (not the client VMs OS)
  - SSP4 does the silver & recovery re-silvering is autonomic
  - Managed using the **failgrp** command
3. New simpler SSP commands
  - **pv** – Physical Volume control SSP LUNs in the pool
  - **lu** – Logical Unit control SSP virtual disk
4. Network Unicast possible

## SSP4 – New Remove LUN function can be tricky



## SSP3 – LUN access failure = Single Point of Failure



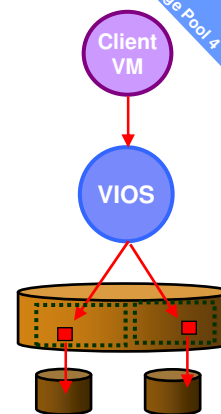
## Protecting your SSP data from DISASTER

### Client VM

- Only sees one copy & does one write
- Mirror is invisible → no admin work

### VIOS

- Do the hard work on the VIOS
- VIOS duplicates the writes to mirrors
- It knows about LUN states & LU mapping
- Autonomic re-silver recovery





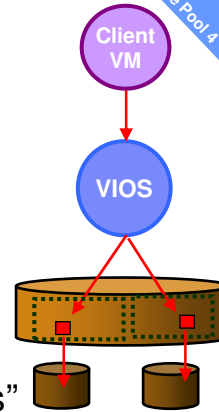
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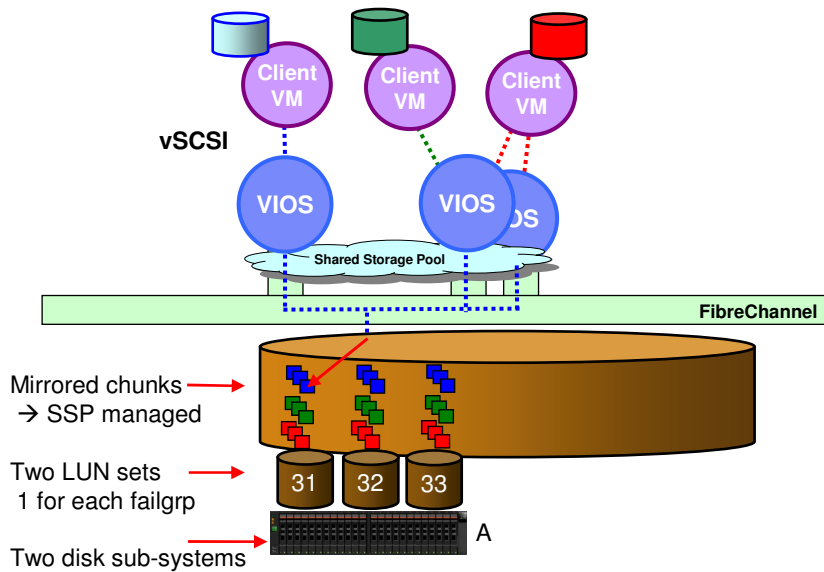


### New feature **failgrp** → “LUN failure groups”

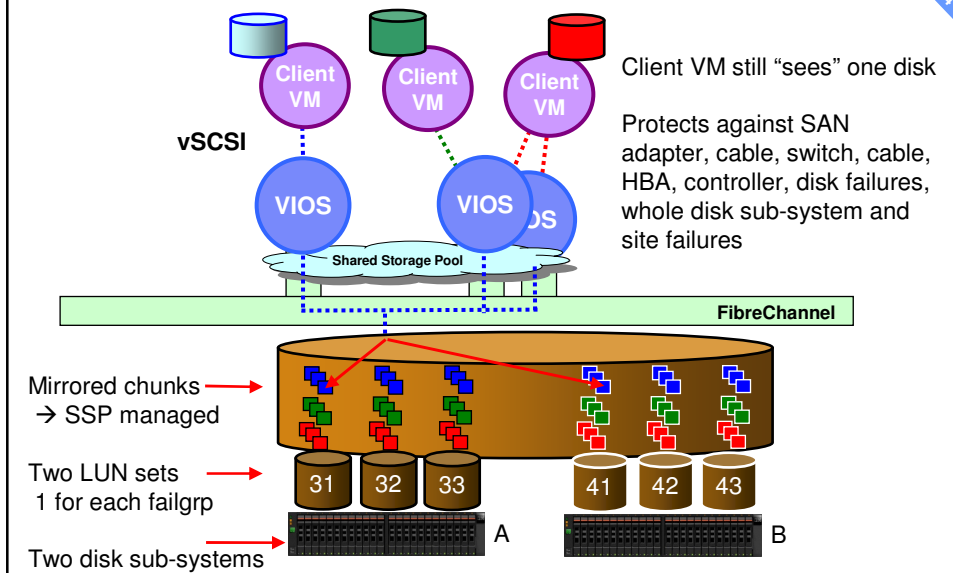
- Two sets of LUNs on two different disk units\*
- Whole pool is mirrored (not at LU level)
- A. Default one failgrp called “Default” → no mirror
- B. Optional: Adding a 2<sup>nd</sup> failgrp → adds the mirror

\* = recommended

## SSP4 – No extra failgrp = no Mirror



## SSP4 – Add 2<sup>nd</sup> failgrp = add Mirror



## Three New SSP4 Command

## New commands overview

- **failgrp**      Add a pool mirror copy command
  - create
  - remove
  - list
  - modify
- **pv**            SSP physical volume (LUN) command
  - add
  - remove
  - list
  - replace
- **lu**             SSP logical unit (virtual disk) command
  - create
  - remove
  - list
  - map
  - unmap

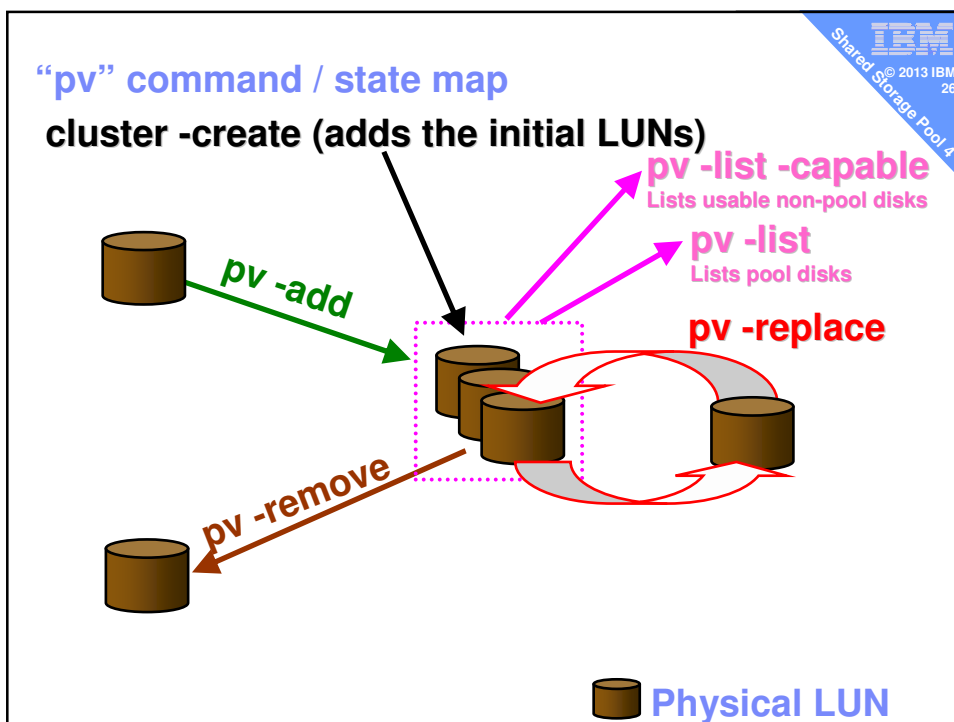
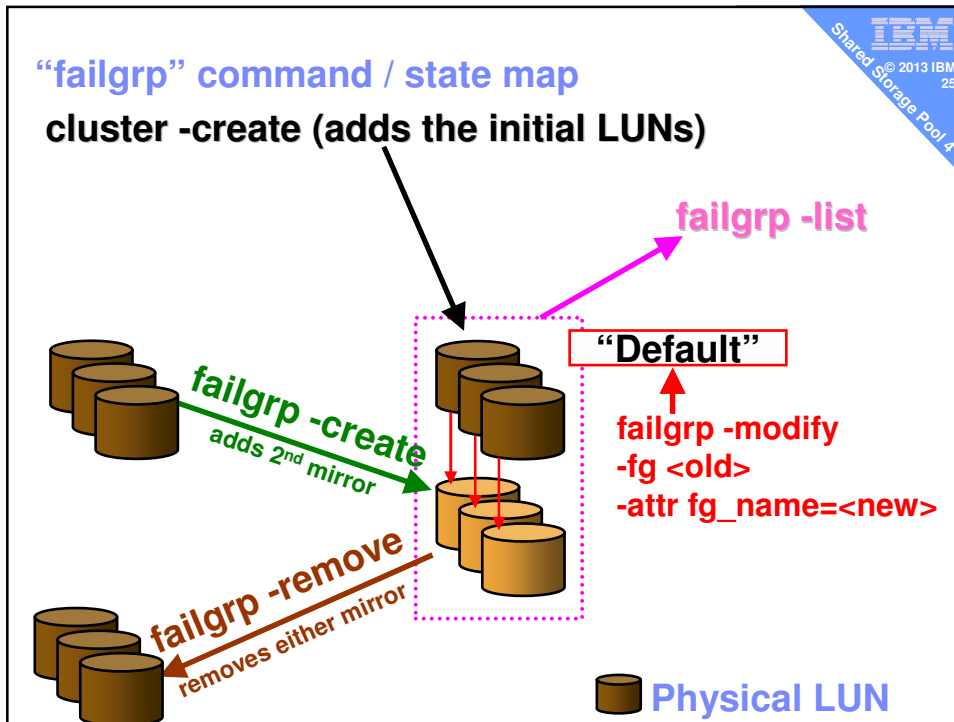
## Notes on failgrp, pv and lu: 1 of 2

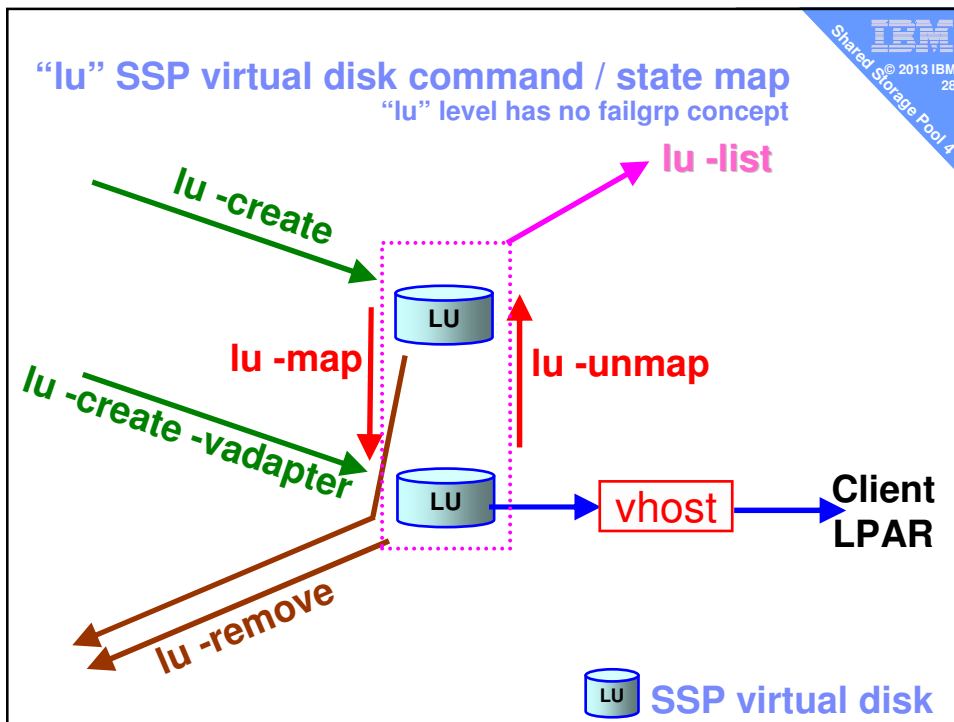
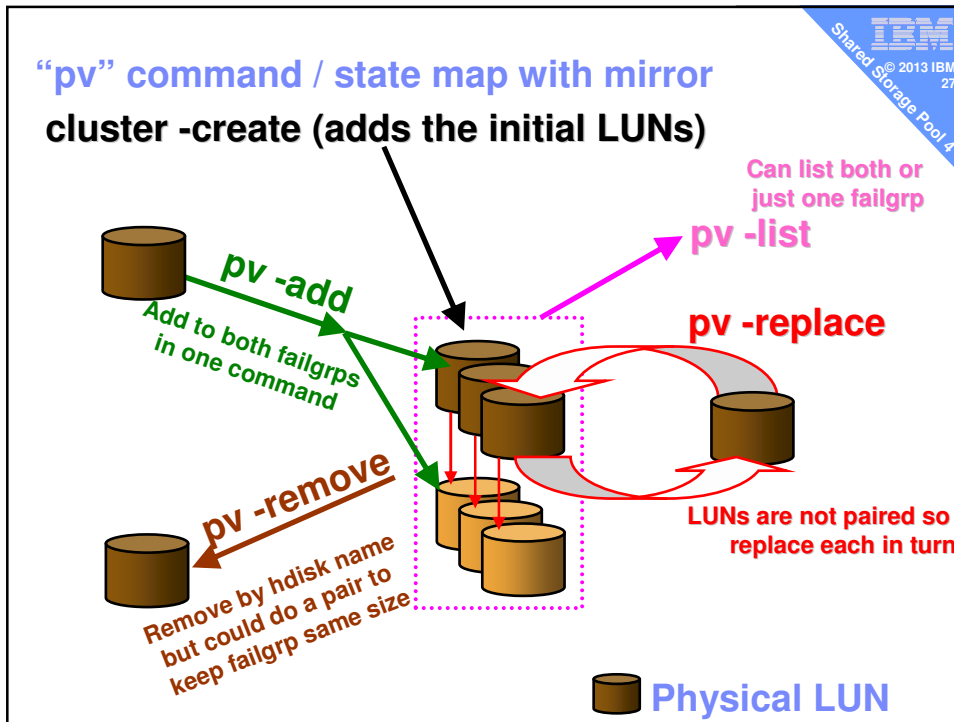
- Optional parameters: -clustername xxx -spname yyy
  - Totally pointless
  - Maximum of 1 cluster and 1 pool
  - No need to use them → for future use
- failgrp & pv have a “-file filename” option
  - List of disk names in a white space separated file
- Command Overlap
  - failgrp command = new function
  - pv command = superset of chsp -add & chsp -replace
  - lu command = superset of mkbdsp, chbdsp, rmvdev

## Notes on LUNs : 2 of 2

- SSP expects LUNs to be RAID5 (not enforced)
  - If you loose a failgrp mirror → you still want reliable disks
  
- Pool size = the size of the smaller failgrp's LUNs
  - Extra space in larger failgrp can't be mirrored so its ignored
  - QED keep failgrp's same size & add/remove LUNs in pairs
  
- This is not 1 to 1 LUN mirroring
  - You might add LUNs in pairs 1 in each failgrp but don't think the LUN pair is just mirrored
  - You have no control over the contents

## Three New SSP4 Command Lifecycle Diagrams

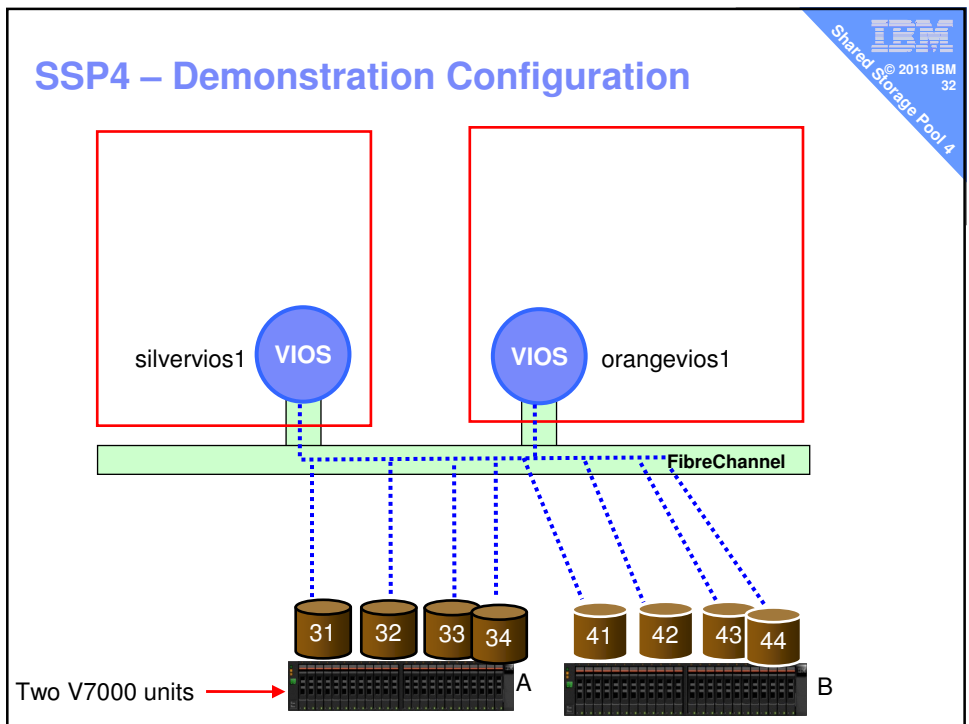
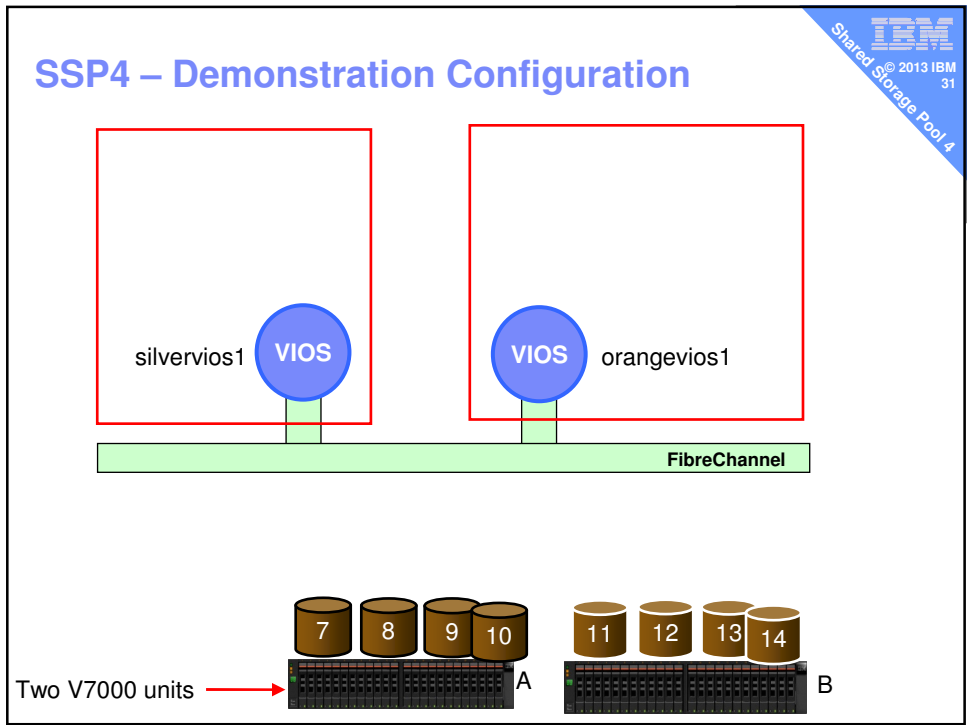




## Commands By Example

- failgrp - pool mirrors
- pv - LUNs in the pool
- lu - virtual disks for client VMs

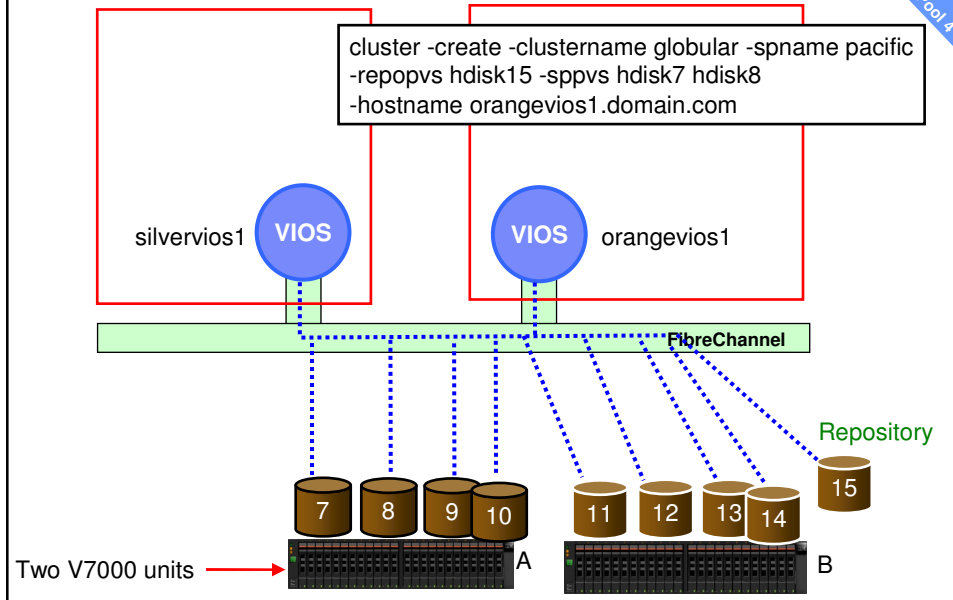
## Demonstration





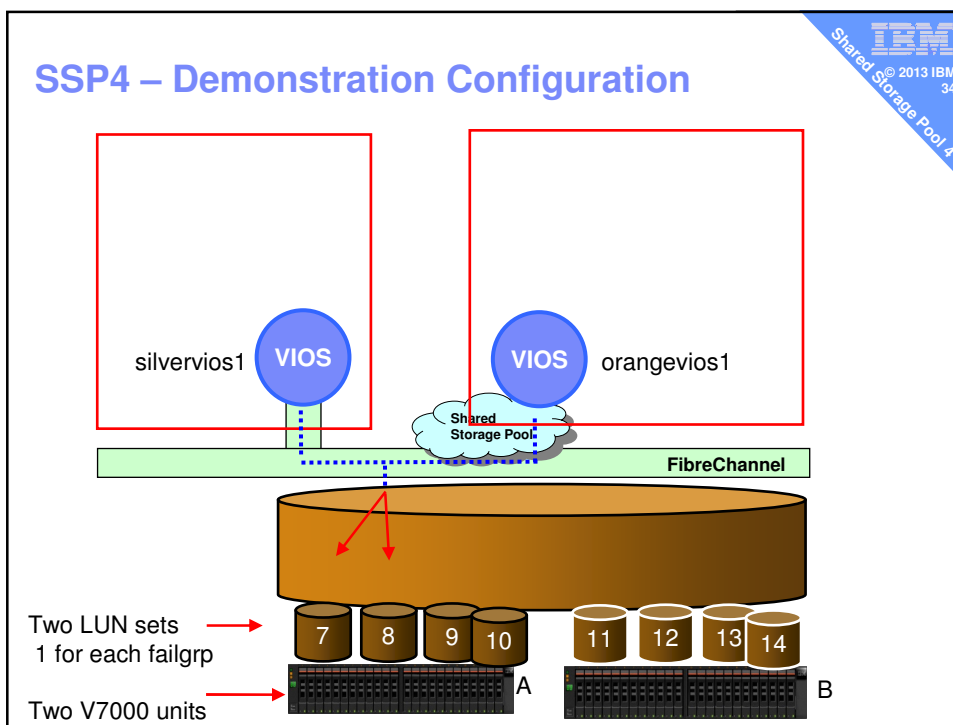
## SSP4 – Demonstration Configuration

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Shared Storage Pool 4

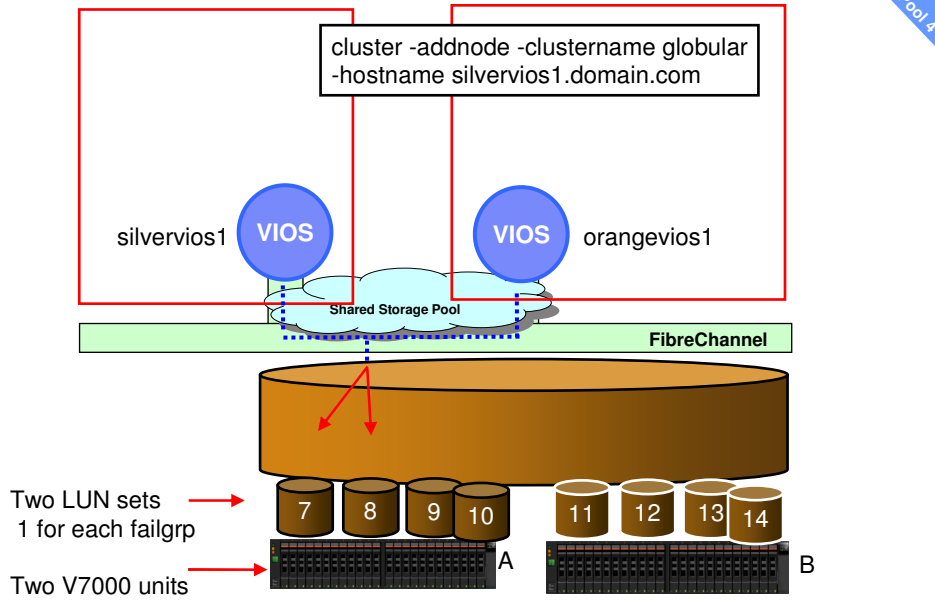


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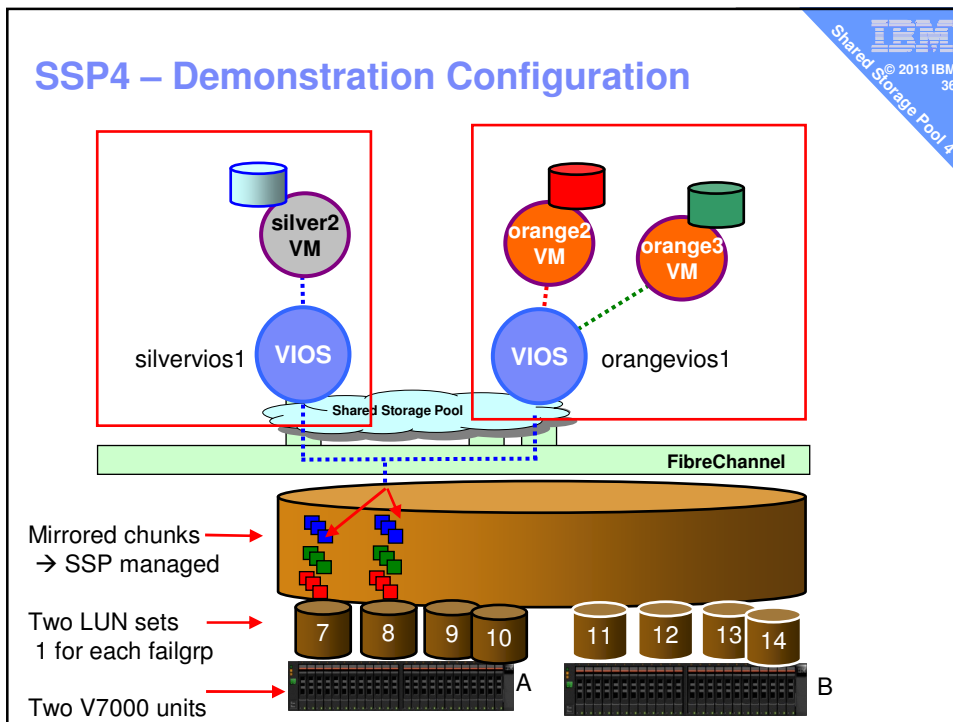
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Shared Storage Pool 4



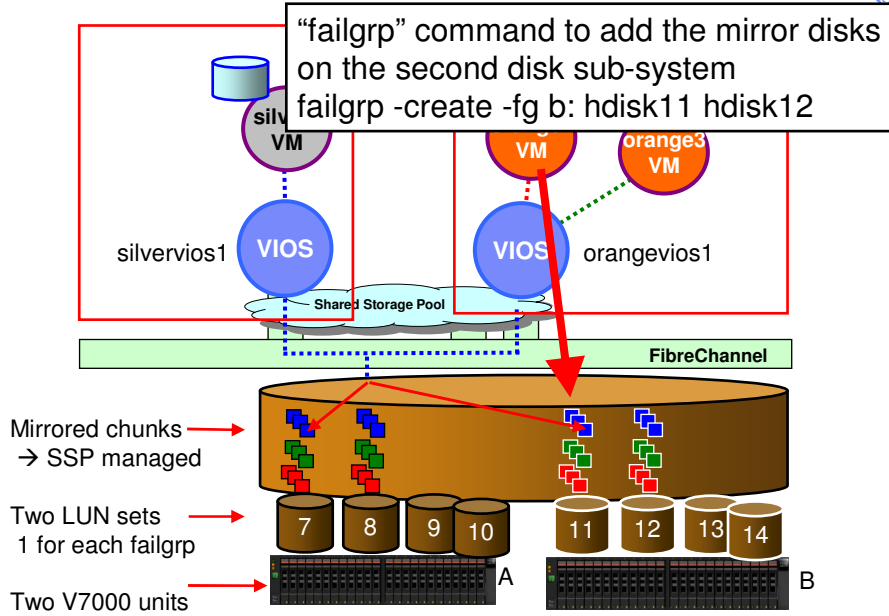
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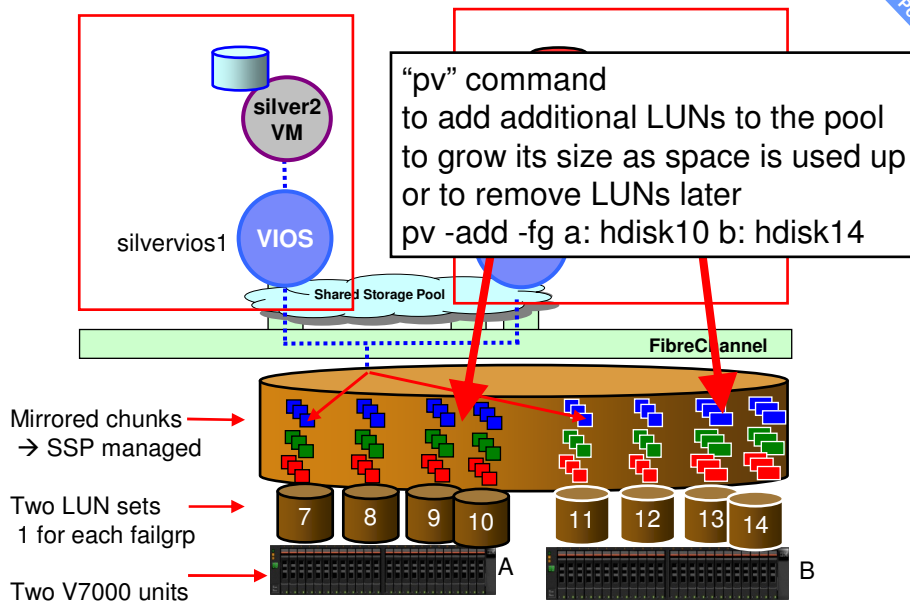
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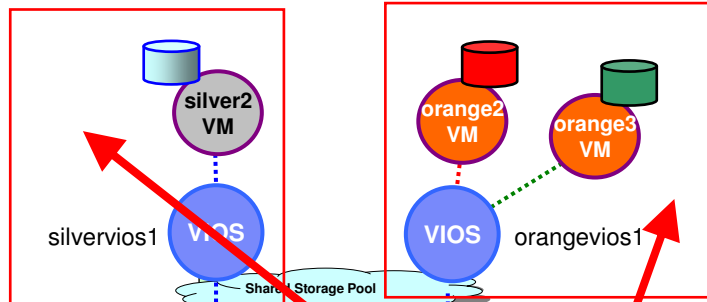
## SSP4 – Demonstration Configuration



## SSP4 – Demonstration Configuration



## SSP4 – Demonstration Configuration



“lu” command  
to allocate thin or thick provisioned  
space and map to the client VM  
in a second

```
lu -create -lu xyz -size 64G -vadapter vhost42
```

Mirrored chunks → SSP managed

Two LUN sets  
1 for each failgrp

Two V7000 units

## Repository Failure Scenarios

1. Moving the Repository to a new disk?  
**chrepos**
2. Oops!! I wrote garbage all over the Repository disk!  
Now what do I do? **chrepos**
3. I replaced the Repository while a SSP node was down,  
How do I fix that? **Go for coffee**
4. Darn!! I took the Repository LUN offline, How do I recover?  
**Get it back online and auto recovers**
5. Oh no!! I deleted the Repo LUN! Help!  
**Go for lunch then chrepos**
6. EK! FC laser failed – how come my SSP is still working!  
**Magic ... Actually it asks other VIOS to do the I/O**

Repository is rock solid technology  
→ Monitor those errlog messages on all VIO servers

## Call to action

- Shared Storage Pools another flexible asset to add to your toolbox
- Use SSP to
  - reduce man-power managing disks
  - clean up older LPARs
  - get everything LPM ready
  - add Thin provisioning, snapshots to old disks
  - remove older disk units ghastly GUI/CLI use & Zoning
- Pool mirroring with zero client change SSP4 is ready for Disaster Safe of Production workload
  - Upgrade to VIOS 2.2.3.1 ... TODAY

## Are you keeping up to date?

**mr\_nmon** on twitter

- Only used to POWER / AIX technical content, hints, tips and links



**You Tube**™ 125 techie hands-on videos on **YouTube** at <http://www.youtube.com/nigelgriffiths>

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