

VMR DR V1.3.0.1 Lab Environment [RHEL & SLES SAP HANA 2.0 Testing]

Primary

(2) SAP HANA DB V2.0
OS: RHEL 7.6
RHEL HA Extensions

(1) S/4 Application Servers
OS: RHEL 7.6

(2) SAP HANA DB V2.0
OS: SLES 12 SP3
SLES HA Extensions

(1) S/4 Application Servers
OS: SLES 12 SP3

Managed

VM01 – RHEL 7.5
HANA 2.0 DB

VM02 – RHEL 7.5
HANA 2.0 DB

VM03 – RHEL 7.5
App Server

VM04 – SLES 12
HANA 2.0 DB

VM05 – SLES 12
HANA 2.0 DB

VM06 – SLES 12
App Server

VIO 1

VIO 2

VIO level: 2.2.6.21



HMC: V9R1 (1805181211)



S822 (8284-22A)
FW: SV860_FW860.51 (165)



SVC / Flash 900 FW: 8.1.3.0

Secondary

KSYS LPAR
OS: AIX 7.2.2
GDR: V1.2.0.1

KSYS

VMR-DR

CPU: 1
Memory: 32GB
Disk: 100GB



HMC: V9R1 (1805181211)



S822 (8284-22A)
FW: SV860_FW860.51 (165)

VIO 1

VIO 2

VIO level: 2.2.6.21



V9000 FW: 8.1.3.0

Native IP Replication

VM Recovery Manager DR: LUN Provisioning Steps

User Actions:

- Define the LUNs for the Source VMs
- Define Target LUNs & Establish Replication (Sync or Async)
- Match zoning between the 2 Sites

KSYS:

- Discovery Process will create the Consistency Group encompassing all VMs
- Default behavior is to manage all VMs on that Host

If the copies are not Consistent Synchronized the Discover / Verify will fail so after establishing the initial sync you have to wait and confirm that these complete

You can see that all of my OS, Data/Work, and cluster "Shared HeartbeatLUNs" are replicated and have matching targets

Red Grouping would have been RHEL DB & App Server LPARs & Green for SLES

In the current screen capture the discover had already automatically created the VMR Consistency Group and pooled all the LUNs in it – relationships can't be in another CG for VMR to manage them

View of GDR Consistency Group

| Name | State | Master Volume | Auxiliary Volume |
|-----------------|-------------------------|---------------------|-------------------------|
| Not in a Group | | | |
| ✓ VMRDG_GDR1201 | Consistent Synchronized | Master_SVC | Master_V9000 |
| rcrel7 | Consistent Synchronized | S822_VM0102_Shared0 | S822_VM0102_Shared0_Aux |
| rcrel8 | Consistent Synchronized | S822_VM0102_Shared1 | S822_VM0102_Shared1_Aux |
| rcrel0 | Consistent Synchronized | S822_VM01_Boot | S822_VM01_Boot_Aux |
| rcrel5 | Consistent Synchronized | S822_VM01_Work | S822_VM01_Work_Aux |
| rcrel1 | Consistent Synchronized | S822_VM02_Boot | S822_VM02_Boot_Aux |
| rcrel6 | Consistent Synchronized | S822_VM02_Work | S822_VM02_Work_Aux |
| rcrel2 | Consistent Synchronized | S822_VM03_Boot | S822_VM03_Boot_Aux |
| rcrel11 | Consistent Synchronized | S822_VM0405_Shared0 | S822_VM0405_Shared0_Aux |
| rcrel3 | Consistent Synchronized | S822_VM04_Boot | S822_VM04_Boot_Aux |
| rcrel9 | Consistent Synchronized | S822_VM04_Work | S822_VM04_Work_Aux |
| rcrel4 | Consistent Synchronized | S822_VM05_Boot | S822_VM05_Boot_Aux |
| rcrel10 | Consistent Synchronized | S822_VM05_Work | S822_VM05_Work_Aux |
| rcrel12 | Consistent Synchronized | S822_VM06_Boot | S822_VM06_Boot_Aux |

(managing all 6 VMs)

Primary Subsystem

Flash_900_A

Online
6 MDisks, 94 Volume copies
Easy Tier Balanced

Pool Allocation
Allocated 5.71 TiB
Capacity 12.48 TiB
Virtual Capacity 14.17 TiB

40%

+ Create Volumes | Actions | All Volumes | 822

Showing 9 volumes | Selecting 0 volumes

| Name | State | Synchronized | Volume Group | UID | Host Mappings | Capacity | !!! |
|---------------------|----------|--------------|--------------|----------------------------------|---------------|------------|-----|
| S822_VM01_Boot | ✓ Online | | | 600507680C80032450000000000003B9 | Yes | 100.00 GiB | |
| S822_VM01_Work | ✓ Online | | | 600507680C80032450000000000003BE | Yes | 300.00 GiB | |
| S822_VM02_Boot | ✓ Online | | | 600507680C80032450000000000003BA | Yes | 100.00 GiB | |
| S822_VM02_Work | ✓ Online | | | 600507680C80032450000000000003BF | Yes | 300.00 GiB | |
| S822_VM03_Boot | ✓ Online | | | 600507680C80032450000000000003BB | Yes | 100.00 GiB | |
| S822_VM04_Boot | ✓ Online | | | 600507680C80032450000000000003BC | Yes | 100.00 GiB | |
| S822_VM05_Boot | ✓ Online | | | 600507680C80032450000000000003BD | Yes | 100.00 GiB | |
| S822_VM0102_Shared0 | ✓ Online | | | 600507680C80032450000000000003C0 | Yes | 10.00 GiB | |
| S822_VM0102_Shared1 | ✓ Online | | | 600507680C80032450000000000003C1 | Yes | 10.00 GiB | |

On Target Subsystem I created the target LUNs, manually created the Host definitions for the LPARs that would be moving there and assigned the LUNs to each LPAR definition

Secondary Subsystem

Flash_V9000

Online
1 MDisk, 9 Volume copies
Easy Tier Inactive

Pool Allocation
Allocated 146.00 GiB
Capacity 10.40 TiB

+ Create Volumes | Actions | All Volumes | Filter

Showing 9 volumes | Selecting 0 volumes

| Name | State | Synchronized | Volume Group | UID | Host Mappings | Capacity | !!! |
|-------------------------|----------|--------------|--------------|----------------------------------|---------------|------------|-----|
| S822_VM01_Boot_Aux | ✓ Online | | | 600507680C8101AB38000000000000D8 | Yes | 100.00 GiB | |
| S822_VM01_Work_Aux | ✓ Online | | | 600507680C8101AB38000000000000DD | Yes | 300.00 GiB | |
| S822_VM02_Boot_Aux | ✓ Online | | | 600507680C8101AB38000000000000D9 | Yes | 100.00 GiB | |
| S822_VM02_Work_Aux | ✓ Online | | | 600507680C8101AB38000000000000DE | Yes | 300.00 GiB | |
| S822_VM03_Boot_Aux | ✓ Online | | | 600507680C8101AB38000000000000DA | Yes | 100.00 GiB | |
| S822_VM04_Boot_Aux | ✓ Online | | | 600507680C8101AB38000000000000DB | Yes | 100.00 GiB | |
| S822_VM05_Boot_Aux | ✓ Online | | | 600507680C8101AB38000000000000DC | Yes | 100.00 GiB | |
| S822_VM0102_Shared0_Aux | ✓ Online | | | 600507680C8101AB38000000000000DF | Yes | 10.00 GiB | |
| S822_VM0102_Shared1_Aux | ✓ Online | | | 600507680C8101AB38000000000000E0 | Yes | 10.00 GiB | |

VM Zoning & LUN Mapping Configuration

You can see how the NPIV Primary and Secondary WWPNS were defined to each LPAR. Each of these had 4 FC connections and in turn 8 WWPNS

* Secondary WWPNS is not active until an LPM operation takes place

LPARs are not active on Site 2 hence why all of the ports are currently offline

Primary Subsystem

S822_VM05
8 ports
Host Type: Generic

| Name | Type | Status | # Nodes Logged In |
|------------------|------|---------|-------------------|
| C05076081B9F01DB | FC | Active | 2 |
| C05076081B9F01DA | FC | Offline | 0 |
| C05076081B9F01DB | FC | Active | 2 |
| C05076081B9F01DC | FC | Offline | 0 |
| C05076081B9F01DD | FC | Active | 2 |
| C05076081B9F01DE | FC | Offline | 0 |
| C05076081B9F01DF | FC | Active | 2 |

#1A

#1B

Secondary Subsystem

Host Details: S822_VM05

Overview Mapped Volumes Port Definitions

Showing 8 host ports | Selecting 0 host ports

| Name | Type | Status | # Nodes Logged In |
|------------------|------|---------|-------------------|
| C05076081B9F01D8 | FC | Offline | 0 |
| C05076081B9F01D9 | FC | Offline | 0 |
| C05076081B9F01DA | FC | Offline | 0 |
| C05076081B9F01DB | FC | Offline | 0 |
| C05076081B9F01DC | FC | Offline | 0 |
| C05076081B9F01DD | FC | Offline | 0 |
| C05076081B9F01DE | FC | Offline | 0 |
| C05076081B9F01DF | FC | Offline | 0 |

Mac Terminal

```

c0fg: SAP_Lab
zone: S822_VM01
c0:50:76:08:1b:9f:01:b8
c0:50:76:08:1b:9f:01:b9
c0:50:76:08:1b:9f:01:ba
c0:50:76:08:1b:9f:01:bb
c0:50:76:08:1b:9f:01:bc
c0:50:76:08:1b:9f:01:bd
c0:50:76:08:1b:9f:01:be
c0:50:76:08:1b:9f:01:bf
50:05:07:68:0c:32:64:76
50:05:07:68:0c:32:64:8a
50:05:07:68:0c:52:64:76
50:05:07:68:0c:52:64:8a

zone: S822_VM02
c0:50:76:08:1b:9f:01:c0
c0:50:76:08:1b:9f:01:c1
c0:50:76:08:1b:9f:01:c2
c0:50:76:08:1b:9f:01:c3
c0:50:76:08:1b:9f:01:c4
c0:50:76:08:1b:9f:01:c5
c0:50:76:08:1b:9f:01:c6
c0:50:76:08:1b:9f:01:c7
50:05:07:68:0c:32:64:76
50:05:07:68:0c:32:64:8a
50:05:07:68:0c:52:64:76
50:05:07:68:0c:52:64:8a

zone: S822_VM03
c0:50:76:08:1b:9f:01:c8
c0:50:76:08:1b:9f:01:c9
c0:50:76:08:1b:9f:01:ca
c0:50:76:08:1b:9f:01:cb
c0:50:76:08:1b:9f:01:cc
c0:50:76:08:1b:9f:01:cd
c0:50:76:08:1b:9f:01:ce
c0:50:76:08:1b:9f:01:cf
50:05:07:68:0c:32:64:76
50:05:07:68:0c:32:64:8a
50:05:07:68:0c:52:64:76
50:05:07:68:0c:52:64:8a

zone: S822_VM04
c0:50:76:08:1b:9f:01:d0
c0:50:76:08:1b:9f:01:d1
c0:50:76:08:1b:9f:01:d2
c0:50:76:08:1b:9f:01:d3
c0:50:76:08:1b:9f:01:d4
c0:50:76:08:1b:9f:01:d5
c0:50:76:08:1b:9f:01:d6
c0:50:76:08:1b:9f:01:d7
50:05:07:68:0c:32:64:76
50:05:07:68:0c:32:64:8a
50:05:07:68:0c:52:64:76
50:05:07:68:0c:52:64:8a

zone: S822_VM05
c0:50:76:08:1b:9f:01:d8
c0:50:76:08:1b:9f:01:d9
c0:50:76:08:1b:9f:01:da
c0:50:76:08:1b:9f:01:db
c0:50:76:08:1b:9f:01:dc
c0:50:76:08:1b:9f:01:dd
c0:50:76:08:1b:9f:01:de
c0:50:76:08:1b:9f:01:df
50:05:07:68:0c:32:64:76
50:05:07:68:0c:32:64:8a
50:05:07:68:0c:52:64:76
50:05:07:68:0c:52:64:8a

zone: S822_VM01
c0:50:76:08:1b:9f:01:b8
c0:50:76:08:1b:9f:01:b9
c0:50:76:08:1b:9f:01:ba
c0:50:76:08:1b:9f:01:bb
c0:50:76:08:1b:9f:01:bc
c0:50:76:08:1b:9f:01:bd
c0:50:76:08:1b:9f:01:be
c0:50:76:08:1b:9f:01:bf
50:05:07:68:0c:32:64:76
50:05:07:68:0c:32:64:8a
50:05:07:68:0c:52:64:76
50:05:07:68:0c:52:64:8a

zone: S822_VM02
c0:50:76:08:1b:9f:01:c0
c0:50:76:08:1b:9f:01:c1
c0:50:76:08:1b:9f:01:c2
c0:50:76:08:1b:9f:01:c3
c0:50:76:08:1b:9f:01:c4
c0:50:76:08:1b:9f:01:c5
c0:50:76:08:1b:9f:01:c6
c0:50:76:08:1b:9f:01:c7
50:05:07:68:0c:32:64:76
50:05:07:68:0c:32:64:8a
50:05:07:68:0c:52:64:76
50:05:07:68:0c:52:64:8a

zone: S822_VM03
c0:50:76:08:1b:9f:01:ca
c0:50:76:08:1b:9f:01:cb
c0:50:76:08:1b:9f:01:cc
c0:50:76:08:1b:9f:01:cd
c0:50:76:08:1b:9f:01:ce
c0:50:76:08:1b:9f:01:cf
50:05:07:68:0c:32:64:76
50:05:07:68:0c:32:64:8a
50:05:07:68:0c:52:64:76
50:05:07:68:0c:52:64:8a

zone: S822_VM04
c0:50:76:08:1b:9f:01:d0
c0:50:76:08:1b:9f:01:d1
c0:50:76:08:1b:9f:01:d2
c0:50:76:08:1b:9f:01:d3
c0:50:76:08:1b:9f:01:d4
c0:50:76:08:1b:9f:01:d5
c0:50:76:08:1b:9f:01:d6
c0:50:76:08:1b:9f:01:d7
50:05:07:68:0c:32:64:76
50:05:07:68:0c:32:64:8a
50:05:07:68:0c:52:64:76
50:05:07:68:0c:52:64:8a

zone: S822_VM05
c0:50:76:08:1b:9f:01:d8
c0:50:76:08:1b:9f:01:d9
c0:50:76:08:1b:9f:01:da
c0:50:76:08:1b:9f:01:db
c0:50:76:08:1b:9f:01:dc
c0:50:76:08:1b:9f:01:dd
c0:50:76:08:1b:9f:01:de
c0:50:76:08:1b:9f:01:df
50:05:07:68:0c:32:64:76
50:05:07:68:0c:32:64:8a
50:05:07:68:0c:52:64:76
50:05:07:68:0c:52:64:8a

zone: S84_VM01
zone: V9000
50:05:07:68:0c:32:64:76

```

Storage A

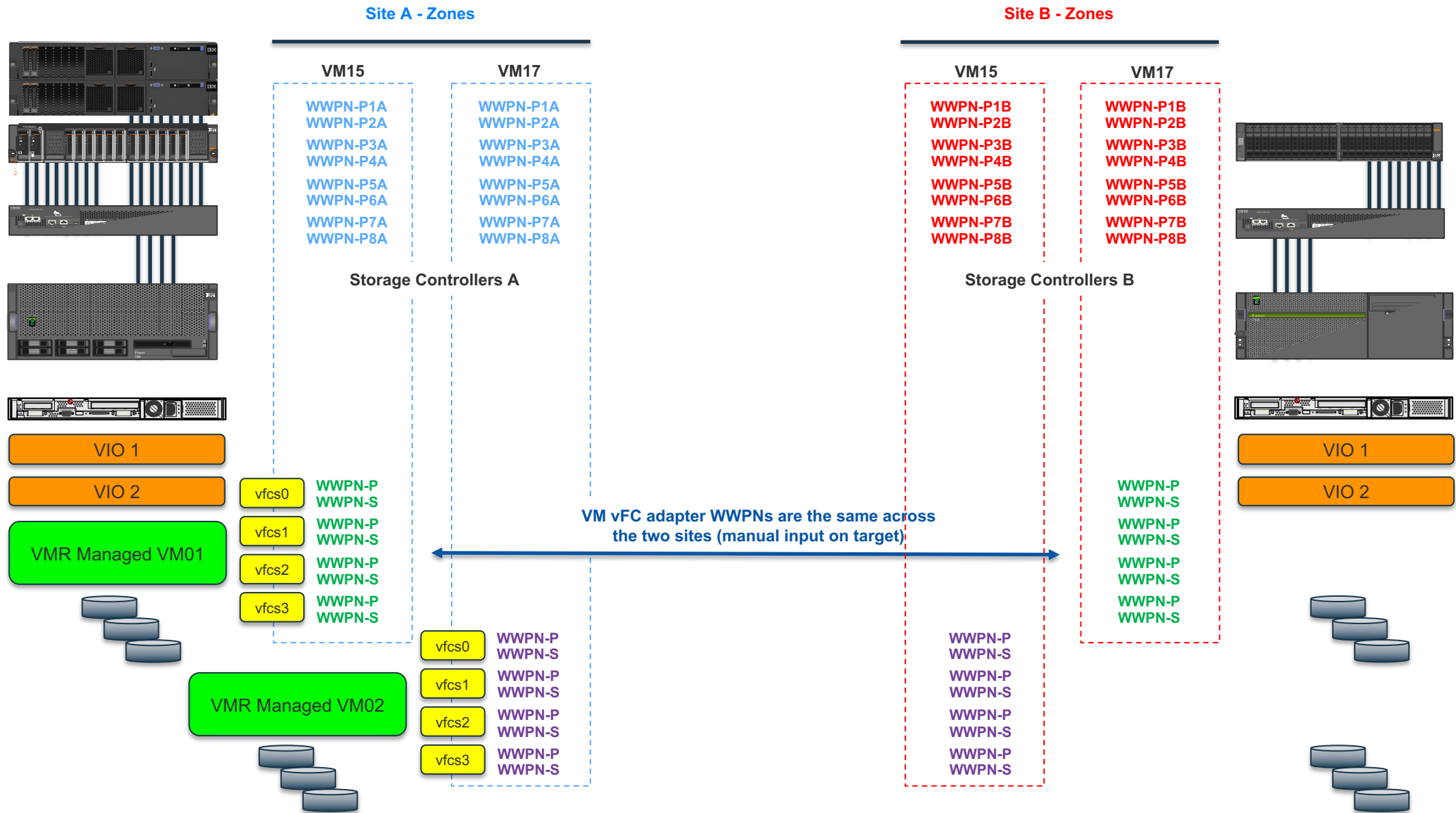
Storage B

Zoning of Site1 on left with Zoning for Site 2 on right for each of the Managed LPARs

Same WWPNS

Manually inputted on Site 2

VM Recovery Manager DR: Lab Environment High Level Zoning Example



Another Example from a different deployment where the Zoning was propagated to the Secondary Site Manually

Basically different storage controllers on each site but same WWPNs for the Managed LPARs

If you are missing some of the the NPIV WWPNs on either the Storage Side Host definition (Chart 4) or in the Zoning you are going to have the type of failure that you are seeing where the KSYS checks are not able to find adapters that they are expecting

| Name | Type | Status | # Nodes Logged In |
|-----------------|------|---------|-------------------|
| C05076081B9F0D8 | FC | Offline | 0 |
| C05076081B9F0D9 | FC | Offline | 0 |
| C05076081B9F0DA | FC | Offline | 0 |
| C05076081B9F0DB | FC | Offline | 0 |
| C05076081B9F0DC | FC | Offline | 0 |
| C05076081B9F0DD | FC | Offline | 0 |
| C05076081B9F0DE | FC | Offline | 0 |
| C05076081B9F0DF | FC | Offline | 0 |

VM1A

V7000 #1

V7000 #2

```

Effective configuration:
cfg: Zone
zone: p118hana1a_sv7067
50:05:07:68:02:10:d6:60
50:05:07:68:02:20:d6:60
50:05:07:68:02:10:d6:61
50:05:07:68:02:20:d6:61
c0:50:76:09:8b:16:00:18
c0:50:76:09:8b:16:00:19
c0:50:76:09:8b:16:00:1a
c0:50:76:09:8b:16:00:1b

zone: p118hana1b_sv7067
50:05:07:68:02:10:d6:60
50:05:07:68:02:20:d6:60
50:05:07:68:02:10:d6:61
50:05:07:68:02:20:d6:61
c0:50:76:09:8b:16:00:34
c0:50:76:09:8b:16:00:35
c0:50:76:09:8b:16:00:36
c0:50:76:09:8b:16:00:37

zone: p118hana2a_sv7067
50:05:07:68:02:10:d6:60
50:05:07:68:02:20:d6:60
50:05:07:68:02:10:d6:61
50:05:07:68:02:20:d6:61
c0:50:76:09:8b:16:00:1c
c0:50:76:09:8b:16:00:1d
c0:50:76:09:8b:16:00:1e
c0:50:76:09:8b:16:00:1f

zone: p118hana2b_sv7067
50:05:07:68:02:10:d6:60
50:05:07:68:02:20:d6:60
50:05:07:68:02:10:d6:61
50:05:07:68:02:20:d6:61
c0:50:76:09:8b:16:00:38
c0:50:76:09:8b:16:00:39
c0:50:76:09:8b:16:00:3a
c0:50:76:09:8b:16:00:3b

zone: p118hana3a_sv7067
50:05:07:68:02:10:d6:60
50:05:07:68:02:20:d6:60
50:05:07:68:02:10:d6:61
50:05:07:68:02:20:d6:61
c0:50:76:09:8b:16:00:20
c0:50:76:09:8b:16:00:21
c0:50:76:09:8b:16:00:22
c0:50:76:09:8b:16:00:23

zone: p118hana3b_sv7067
50:05:07:68:02:10:d6:60

Effective configuration:
cfg: B0S014
zone: p118hana1a_sv7094
50:05:07:68:02:10:40:98
50:05:07:68:02:20:40:98
50:05:07:68:02:10:40:99
50:05:07:68:02:20:40:99
c0:50:76:09:8b:16:00:18
c0:50:76:09:8b:16:00:19
c0:50:76:09:8b:16:00:1a
c0:50:76:09:8b:16:00:1b

zone: p118hana1b_sv7094
50:05:07:68:02:10:40:98
50:05:07:68:02:20:40:98
50:05:07:68:02:10:40:99
50:05:07:68:02:20:40:99
c0:50:76:09:8b:16:00:34
c0:50:76:09:8b:16:00:35
c0:50:76:09:8b:16:00:36
c0:50:76:09:8b:16:00:37

zone: p118hana2a_sv7094
50:05:07:68:02:10:40:98
50:05:07:68:02:20:40:98
50:05:07:68:02:10:40:99
50:05:07:68:02:20:40:99
c0:50:76:09:8b:16:00:1c
c0:50:76:09:8b:16:00:1d
c0:50:76:09:8b:16:00:1e
c0:50:76:09:8b:16:00:1f

zone: p118hana2b_sv7094
50:05:07:68:02:10:40:98
50:05:07:68:02:20:40:98
50:05:07:68:02:10:40:99
50:05:07:68:02:20:40:99
c0:50:76:09:8b:16:00:38
c0:50:76:09:8b:16:00:39
c0:50:76:09:8b:16:00:3a
c0:50:76:09:8b:16:00:3b

zone: p118hana3a_sv7094
50:05:07:68:02:10:40:98
50:05:07:68:02:20:40:98
50:05:07:68:02:10:40:99
50:05:07:68:02:20:40:99
c0:50:76:09:8b:16:00:20
c0:50:76:09:8b:16:00:21
c0:50:76:09:8b:16:00:22
c0:50:76:09:8b:16:00:23

zone: p118hana3b_sv7094
50:05:07:68:02:10:40:98
    
```


Storage Subsystem: Create optional KSYS User & ssh key

The image displays two screenshots of the IBM storage subsystem GUIs, showing the 'Users' management interface. The top screenshot is for the 'IBM SAN Volume Controller Master_SVC' and the bottom screenshot is for the 'IBM FlashSystem V9000 Master_V9000'. Both screenshots show a table of users with columns for Name, User Group, Password, and SSH Key. The 'ksysadmin' user is highlighted in both tables. To the right of each screenshot is a 'User Properties' dialog box for the 'ksysadmin' user, showing 'Local' authentication mode, 'SecurityAdmin' user group, and 'Configured' status for both password and SSH public key.

| Name | User Group | Password | SSH Key |
|-----------|---------------|------------|---------|
| admin | SecurityAdmin | Configured | No |
| ksysadmin | SecurityAdmin | Configured | Yes |
| superuser | SecurityAdmin | Configured | No |

| Name | User Group | Password | SSH Key |
|----------------|-----------------|------------|---------|
| admin | SecurityAdmin | Configured | No |
| demo | SecurityAdmin | Configured | No |
| ksysadmin | SecurityAdmin | Configured | Yes |
| sra_monitor | Monitor | None | No |
| sra_privileged | RestrictedAdmin | None | No |
| superuser | SecurityAdmin | Configured | No |

- Copied /.ssh/id_rsa.pub from ksys node into the GUI for each storage subsystem & created *ksysadmin* user