IBM AIX Live Update Workshop

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Estimated time

03:00

Overview

This workshop covers:

- The steps involved to install an AIX SP without a reboot (60 minutes)
- The steps involved to install an AIX TL and interim fix without a reboot (60 minutes)
- The steps to perform a PowerVC-based live update operation (60 minutes)

There are three sections:

- The first section is split into sections 1 and 1a. Students will:

    - Install an AIX service pack with live update (using **`geninstall`**) on a HMC managed LPAR
    - Use procedures to perform a disruptive rollback after a SP live update
- The second section is split into sections 2 and 2a. Students will:
    - Install an AIX TL, and an ifix, with AIX Live Update
    - Perform a non-disruptive rollback of an ifix
- The second section is split into sections 3 and 3a. Students will:
    - Manage an AIX virtual machine (VM) with PowerVC
    - Install an ifix with live update on a PowerVC managed AIX VM

Workshop instructions

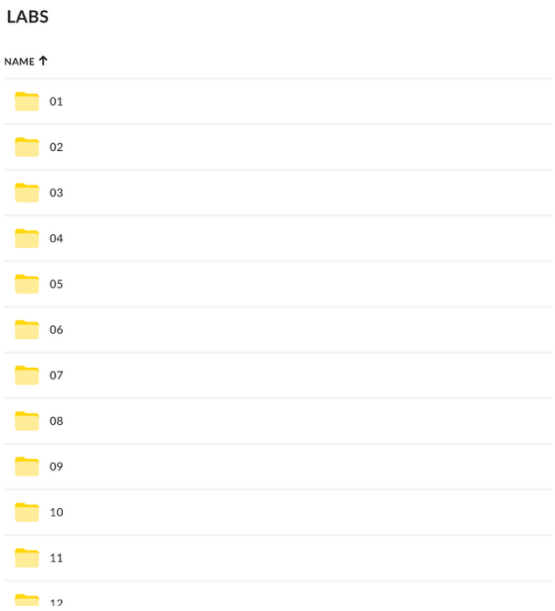
Accessing the lab

Information: This section describes the procedure to access the workshop lab environment before you begin the lab steps. One method of accessing your systems is through a web browser such as Firefox as documented below. The goal is for you to log in to an access server from where you can launch applications like Putty and Firefox to access the setup needed for this workshop.

1. Use PuTTY to open a SSH session to your assigned AIX partition. Log in as the root user. **Do not use a virtual console terminal session**.
2. Open the BOX folder containing a list of numbered directories.

   `ibm.biz/aixlu26`

   __ a. For example:



3. Open the folder number associated with your assigned Student number. Your instructor will assign you a Student number before you start the lab.

What is your student number? _____

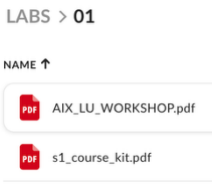
Note: Before proceeding to the next step. If you have not been assigned a student number or you are unsure of your assigned student number please ask your lab instructor for help now.

4. When you open your assigned BOX folder you will see two documents that provide:

   __ i. Your lab environment access information. The document named **s*X*_course_kit.pdf**. Where ***X*** is your student ID.

__ ii. The workshop guide for the lab you are taking. The document named **AIX_LU_WORKSHOP.pdf**. This is the same document you're reading right now.

__ a. The sample screenshot below shows an example for Student 1.



5. Open the **s*X*_course_kit.pdf** document first.

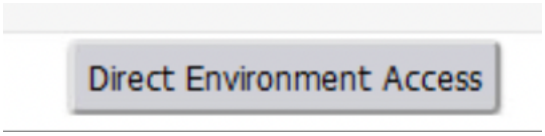
6. Launch your lab environment by selecting the link provided to you in the course kit document. Look for **Your URL is** in your **s*X*_course_kit.pdf** document. For example:

   Student 1
   Your URL is https://labs.edu.ihost.com/1250279.s1/ceb0

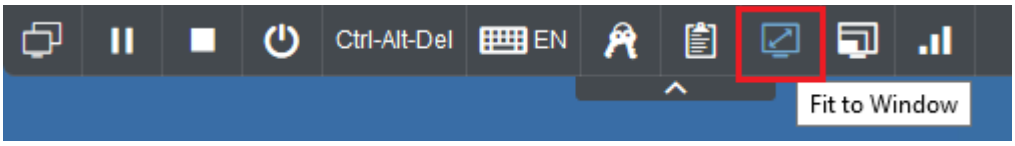
7. A Windows virtual machine (VM) should be present. If it's not already running, power this VM on, and wait for a couple of minutes and expand its view.

8. Enter the password for the **IBM** user. It should be '**Passw0rd$$**' (where **0** is the *number* zero). Cancel all popups to get to the desktop of this Windows VM. Click **Yes** if you're prompted to make this VM discoverable in the network.

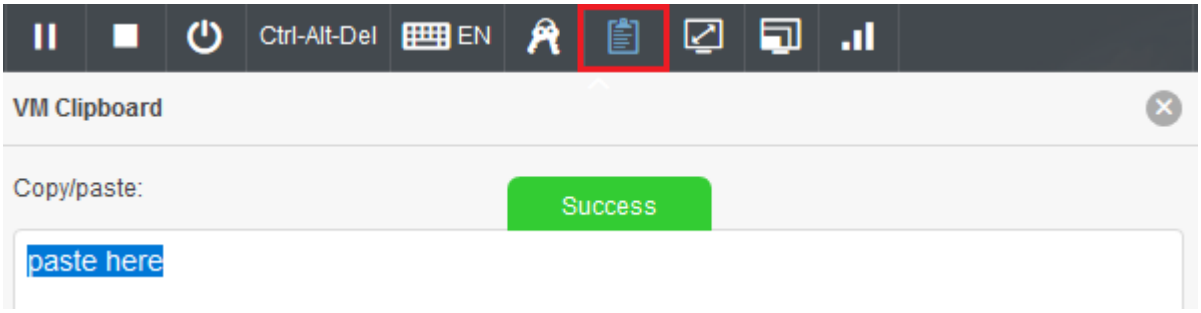
9. You can optionally click **Direct Environment Access** to acquire a larger desktop space.



10. You can optionally click the **Fit to Window** button as shown below to avoid scrolling inside the VM.



11. You can copy and paste into this virtual machine, by first pasting into the **VM Clipboard** feature as shown below and then to the applications in this VM.



12. From this access server (or access VM), you may launch applications such as **Putty** and **Firefox** as required while performing the hands-on exercises.

Section 1: Install an AIX SP with live update (HMC-based)

Information: This section (1) describes the procedure to perform a HMC-based AIX live update by first authenticating with a HMC and then installing an AIX service pack with **geninstall**. In section 1a, students will also perform a (disruptive) rollback to practice the steps required for backing out a live update operation, should it ever be required.

13. Use PuTTY to open a SSH session to your assigned AIX partition. Log in as the root user. **Do not use a virtual console terminal session**.
14. Your instructor should have provided you with information about your lab environment, your system, and user assignments. This information is available in the workshop course kit. Take notice of the following details from that lab environment information:
    - Name of your server (managed system): _____
    - HMC user name and password: _____
    - AIX partition name: _____
    - AIX partition IP address: _____
    - AIX partition root user password: _____
15. List the physical volumes that are configured in the partition. You should observe four physical volumes. The **hdisk0** device should be used for the rootvg volume group. The remaining physical volumes should not be part of any volume group. Let your instructor know if your partition has a different configuration. The example output shown below is from a AIX partition with the correct configuration. The PVID of the **hdisk0** device will be different on your system.

    lspv

    __ a. Command and sample output:

    ```
    root@sys8681-aix-t1.ibm.edu / # lspv
    hdisk0          00f9c1909ecef90c                    rootvg          active
    hdisk1          none                                None
    hdisk2          none                                None
    hdisk3          none                                None
    ```

16. List the paths that are available to each disk. You should observe two paths in the **Enabled** state for each disk. Let your instructor know if your partition has a different configuration.

    lspath

    __ a. The example output shown below is from a partition with the correct configuration. There are two paths to each disk device. One path to each disk uses the **vscsi0** adapter, the other path uses the **vscsi1** adapter.

    ```
    root@sys8681-aix-t1.ibm.edu / # lspath
    Enabled hdisk0 vscsi0
    Enabled hdisk1 vscsi0
    Enabled hdisk2 vscsi0
    Enabled hdisk3 vscsi0
    Enabled hdisk3 vscsi1
    Enabled hdisk2 vscsi1
    ```

```
Enabled hdisk1 vscsi1
Enabled hdisk0 vscsi1
```

17. Determine the size of each **hdisk*X*** device configured in the partition. There should be three free disks that are at least the same size as the disk being used for the rootvg volume group. Let your instructor know if your partition has a different configuration.

    **lspv | awk '{print $1}' | xargs -n1 lsmpio -ql **

    | egrep "Device|Cap"

    __ a. Commands and sample output:

    ```
    root@sys8751-aix-t1.ibm.edu / # lspv | awk '{print $1}' | xargs
    -n1 lsmpio -ql \
    > | egrep "Device|Cap"
    Device:  hdisk0
               Capacity:  20.00GiB
    Device:  hdisk1
               Capacity:  20.00GiB
    Device:  hdisk2
               Capacity:  20.00GiB
    Device:  hdisk3
               Capacity:  20.00GiB
    ```

    __ b. In the example output shown, all the disks are the same size (20 GB). The **hdisk0** device is being used for **rootvg**. There are three additional disks of the same size (**hdisk1**, **hdisk2** and **hdisk3**).

18. Change your current working directory to **/var/adm/ras/liveupdate**.

    cd /var/adm/ras/liveupdate

19. Copy the template file **lvupdate.template** to **lvupdate.data**.

    cp lvupdate.template lvupdate.data

20. Change the permissions of the **lvupdate.data** file to include write permission for the file owner.

    chmod +w lvupdate.data

21. Determine the current LPAR ID of the partition.

    uname -L

    __ a. Command and sample output; the LPAR ID is the first field shown in the output:

    ```
    root@sys8681-aix-t1.ibm.edu /var/adm/ras/liveupdate # uname -L
    3 sys8681-aix-t1
    ```

22. Edit the **lvupdate.data** file, and take the following actions:

    __ a. Read the comments at the start of the file that describe how the various fields are used.

    __ b. Set the value of the **nhdisk** field to **hdisk1**.

    __ c. Set the value of the **mhdisk** field to **hdisk2**.

    __ d. The partition does not have any paging space or dump devices in non-rootvg volume groups. This means the **tohdisk** and **tshdisk** fields are not required.

__ e. Set the **lpar_id** field to the current LPAR ID plus 20. This is the desired LPAR ID for the surrogate LPAR that is created by the live update operation. For example, if your current LPAR ID is 5, you would enter 25 here.

__ f. Set the **alt_lpar_id** field to the *current* LPAR id. This indicates an alternate partition ID for the surrogate. If the value specified for the **'lpar_id'** attribute is already in use, live update will use this alternate ID if it is not in use. This is useful when performing multiple live updates.

__ g. Set the **management_console** field to **hmc1**. Note that your student course kit may have a different name for your HMC, such as pokvhmc17 for example. Ignore this name and simply use **hmc1**.

__ h. Set the **user** field to your assigned HMC user ID.

__ i. Save the file, and quit the editor.

__ i. Command and sample output:

```
# vi lvupdate.data
...
disks:
        nhdisk  = hdisk1
        mhdisk  = hdisk2
        tohdisk =
        tshdisk =

hmc:
        lpar_id  = 23
        alt_lpar_id = 3
        management_console = hmc1
        user = team5042_1
```

23. Generate the HMC token. Specify the HMC hostname of **hmc1** and user ID you configured in the **lvupdate.data** file. Replace ***teamXXXX_X*** with your assigned HMC username and ***hmcpass_word*** with the password for your assigned HMC username. Then list the HMC authentication token details.

```
hmcauth -a hmc1 -u teamXXXX_X -p hmcpass_word
```

```
hmcauth -l
```

__ a. Command and sample output:

```
# hmcauth -a hmc1 -u team5042_1 -p sadtoro_70
# hmcauth -l
Address  : 10.8.252.130
User name: team5042_1
Port     : 12443
```

24. Create a backup clone of **rootvg**. Create the **rootvg** clone on **hdisk3**. It is best practice to create a bootable clone of rootvg before starting live update. We will use this later to perform a roll back procedure.

```
cd /
```

```
alt_disk_copy -Bd hdisk3
```

__ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # alt_disk_copy -Bd hdisk3
Calling mkszfile to create new /image.data file.
Checking disk sizes.
Creating cloned rootvg volume group and associated logical
volumes.
Creating logical volume alt_hd5
...etc...
forced unmount of /alt_inst
Changing logical volume names in volume group descriptor area.
Fixing LV control blocks...
Fixing file system superblocks...
root@sys8681-aix-t1.ibm.edu / #
```

25. Check that the **altinst_rootvg** has been created. Verify the rootvg clone now exists on **hdisk3**.

    lspv

__ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # lspv
hdisk0          00f9c1909ecef90c          rootvg          active
hdisk1          none                      None
hdisk2          none                      None
hdisk3          00f9c190bce34467          altinst_rootvg
```

26. Mount the NFS directory that contains the fixes for AIX 7.3 TL1 SP2. The NFS server IP address is 10.8.252.1, and the remote directory location is **/export/products/AIX73TL1/TL1SP2**.

    mount 10.8.252.1:/export/products/AIX73TL1/TL1SP2 /mnt

27. Perform a live update preview install of the fixes provided in the directory mounted at **/mnt**. Review the output, and fix any issues that have a status of FAILED.

    geninstall -k -p -d /mnt -Y update_all

__ a. Command and sample:

```
root@sys8681-aix-t1.ibm.edu / # geninstall -k -p -d /mnt -Y
update_all

install_all_updates: Initializing system parameters.
install_all_updates: Log file is
/var/adm/ras/install_all_updates.log
install_all_updates: Checking for updated install utilities on
media.
install_all_updates: Updating install utilities to latest level
on media.
************************************************************
**************
installp PREVIEW:  installation will not actually occur.
************************************************************
**************
```

```
+-----------------------------------------------------------------
--------------+
                    Pre-installation Verification...
+-----------------------------------------------------------------
--------------+
Verifying selections...done
Verifying requisites...done
Results...

SUCCESSES
---------
  Filesets listed in this section passed pre-installation
verification
  and will be installed.

  Mandatory Fileset Updates
  -------------------------
  (being installed automatically due to their importance)
  bos.rte.install 7.3.1.3                    # LPP Install
Commands

  Requisites
  ----------
  (being installed automatically;  required by filesets listed
above)
  bos.dsc 7.3.1.3                            # Digital
Signature Catalog

  << End of Success Section >>

+-----------------------------------------------------------------
--------------+
                  BUILDDATE Verification ...
+-----------------------------------------------------------------
--------------+
Verifying build dates...done
FILESET STATISTICS
------------------
    1  Selected to be installed, of which:
        1  Passed pre-installation verification
    1  Additional requisites to be automatically installed
  ----
    2  Total to be installed

RESOURCES
---------
  Estimated system resource requirements for filesets being
installed:
                (All sizes are in 512-byte blocks)
      Filesystem                    Needed Space
Free Space
```

```
      /                                        72
2187136
      /usr                                  25984
2529104
      /tmp                                    560
6282136
      -----                                --------
------
      TOTAL:                                26616
10998376

  NOTE:  "Needed Space" values are calculated from data
available prior
  to installation.  These are the estimated resources required
for the
  entire operation.  Further resource checks will be made during
  installation to verify that these initial estimates are
sufficient.

****************************************************************
**************
End of installp PREVIEW.  No apply operation has actually
occurred.
****************************************************************
**************
install_all_updates: Processing media.
install_all_updates: Generating list of updatable installp
filesets.

*** ATTENTION: the following list of filesets are installable
base images
that are updates to currently installed filesets.  Because these
filesets are
base-level images, they will be committed automatically. After
these filesets
are installed, they can be down-leveled by performing a force-
overwrite with
the previous base-level. See the installp man page for more
details. ***

   ICU4C.rte 7.3.1.15
   openssl.base 3.0.7.1001
   openssl.man.en_US 3.0.7.1001

   << End of Fileset List >>
...etc...
+-------------------------------------------------------------
--------------+
                  BUILDDATE Verification ...
+-------------------------------------------------------------
--------------+
```

```
Verifying build dates...done
FILESET STATISTICS
------------------
   68  Selected to be installed, of which:
        2  Passed pre-installation verification
       66  Deferred (see *NOTE below)
  ----
    2  Total to be installed

*NOTE  The deferred filesets mentioned above will be processed
after the
       installp update and its requisites are successfully
installed.

RESOURCES
---------
  Estimated system resource requirements for filesets being
installed:
                (All sizes are in 512-byte blocks)
      Filesystem                    Needed Space
Free Space
      /                                   72
2187136
      /usr                             25984
2529104
      /tmp                               560
6282024
      -----                          --------
------
      TOTAL:                           26616
10998264

  NOTE:  "Needed Space" values are calculated from data
available prior
  to installation.  These are the estimated resources required
for the
  entire operation.  Further resource checks will be made during
  installation to verify that these initial estimates are
sufficient.

********************************************************************
**************
End of installp PREVIEW.  No apply operation has actually
occurred.
********************************************************************
**************

install_all_updates: ATTENTION, a higher level of install
utilities is
available. The preview option will be more accurate and complete
after
```

```
updating to the latest level (see the -i option).

install_all_updates: Log file is
/var/adm/ras/install_all_updates.log
install_all_updates: Result = SUCCESS

********************************************************************
***************
Live Update PREVIEW:  Live Update operation will not actually
occur.
********************************************************************
***************

+------------------------------------------------------------------
--------------+
                    Pre-Live Update Verification...
+------------------------------------------------------------------
--------------+
Verifying environment...done
Verifying /var/adm/ras/liveupdate/lvupdate.data file...done
Computing the estimated time for the live update
operation...done
Results...

EXECUTION INFORMATION
---------------------
  LPAR: sys8681-aix-t1.ibm.edu
  HMC: 10.8.252.130
  user: team5042_1

  Blackout time(in seconds): 10
  Total operation time(in seconds): 673

  << End of Information Section >>

+------------------------------------------------------------------
--------------+
                    Live Update Requirement Verification...
+------------------------------------------------------------------
--------------+

INFORMATION
-----------
INFO: Any system dumps present in the current dump logical
volumes will not be available after live update is complete.

  << End of Information Section >>

+------------------------------------------------------------------
--------------+
                    Live Update Preview Summary...
```

```
+-------------------------------------------------------------------
--------------+
The live update preview succeeded.

*******************************************************************
***************
End of Live Update PREVIEW:  No Live Update operation has
actually occurred.
*******************************************************************
***************
root@sys8681-aix-t1.ibm.edu / #
```

28. Review the output from the live update preview and answer the following questions.

    - What is the estimated blackout time?_____
    - What is the estimated total operation time? _____
    - In the example output, the estimated blackout time was 10 seconds and the estimated total operation time was 673 seconds (approximately 11.2 minutes). Your results will be different.

      ```
      Blackout time(in seconds): 10
      Total operation time(in seconds): 673
      ```

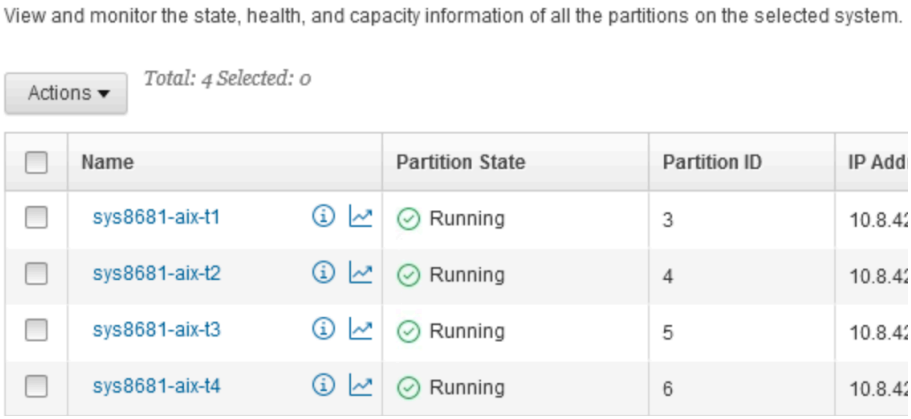
29. Using a web browser, connect to your assigned HMC IP address using the https protocol. Log in to the HMC UI using your assigned HMC user ID and password.

    https://HMC-IP-ADDRESS/

30. Double click on the icon for your assigned managed system to view all the client partitions on that system. Next, change the display of partition information to use the table format by clicking the **Display Table View** button located on the top right corner of the work area.

    __ a. The **Display Table View** button is located on the right side of the work area, as shown in the example below.

    __ b. After the **Display Table View** button has been selected, the partition information is displayed in a table format, as shown in the example below.



31. Return to the terminal session connected to your assigned AIX partition, and determine the current service pack level. It should be AIX 7.3 TL1 SP1.

    `oslevel -s`

    __ a. Example command and output:

    ```
    root@sys8681-aix-t1.ibm.edu / # oslevel -s
    7300-01-01-2246
    ```

32. Cat the **/proc/version** file to determine the current AIX kernel version and build date. In the example below the kernel version is 2246C_73B and the build date is November 17th, 2022.

    `cat /proc/version`

    __ a. Example command and output:

    ```
    root@sys8681-aix-t1.ibm.edu / # cat /proc/version
    Nov 17 2022
    11:47:30
    2246C_73B
    @(#) _kdb_buildinfo unix_64 Nov 17 2022 11:47:30 2246C_73B
    ```

33. Use the AIX live update feature to install the fixes for the AIX 7.3 TL1 SP2 service pack supplied in the directory mounted at **/mnt**. Use the **`-Y`** flag to accept license agreements for new software components. View the output from the **`geninstall`** command as the installation proceeds. When you observe the message **`Initializing live update`** on original LPAR, also monitor the LPAR table view in the HMC browser session.

    `geninstall -k -d /mnt -Y update_all`

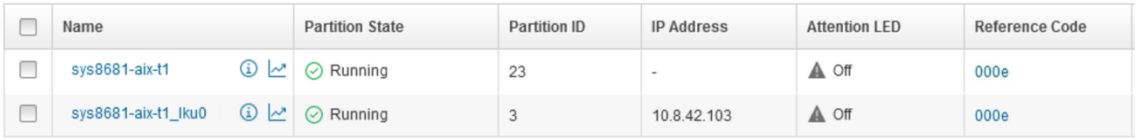
34. Notice that the fileset updates are installed first. This will take several minutes to complete (updating the filesets alone will take about 5 to 10 minutes).

35. Once the fileset updates are installed, the live update operation commences. This message will appear in the output, **`Beginning live update operation on original LPAR`**.

36. In the HMC UI, the first change observed is that the partition on which the AIX live update operation is being performed is renamed by adding the suffix **_lk0**. The surrogate LPAR is then created using the original partition name and the new LPAR ID value specified in the **lvupdate.data** file.

    __ a. An example is shown below (note we have entered only part of the LPAR name for Student 1's LPAR, e.g. **aix-t1**, in the advanced filter, so that all other LPARs are

excluded in the display, as this makes it easier to display the changes to your assigned LPAR during the live operation):



Name	Partition State	Partition ID	IP Address	Attention LED	Reference Code
sys8681-aix-t1	Running	23	-	Off	000e
sys8681-aix-t1_lku0	Running	3	10.8.42.103	Off	000e

__ b. The original LPAR is removed at the end of the AIX live update operation, once all the processes have been moved to the surrogate LPAR. An example is shown below:

Name	Partition State	Partition ID	IP Address
sys8681-aix-t1	Running	23	10.8.42.103

37. When the "**Creating rootvg for boot of surrogate**" message appears in the **geninstall** output, in a new PuTTY ssh session on your AIX LPAR, display the paths during the live update process. You will notice that there is only one path per disk, through only one VSCSI adapter. The other VSCSI adapter has been moved to the surrogate LPAR.

```
root@sys8681-aix-t1.ibm.edu / # lspath
Enabled hdisk0 vscsi1
Enabled hdisk1 vscsi1
Enabled hdisk2 vscsi1
Enabled hdisk3 vscsi1
```

38. From the same second PuTTY ssh session, display the configured IP addresses for all network interfaces. Observe that a new, temporary, virtual network adapter has been assigned (**en1**). It is configured with a IPv6 address. This interface is used for live update communication between the original and surrogate LPARs.

    ifconfig -a

    __ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # ifconfig -a
en0:
flags=1e084863,81cc0<UP,BROADCAST,NOTRAILERS,RUNNING,SIMPLEX,MUL
TICAST,GROUPRT,64BIT,CHECKSUM_OFFLOAD(ACTIVE),LARGESEND,CHAIN>
        inet 10.8.53.103 netmask 0xffffff00 broadcast
10.8.53.255
         tcp_sendspace 262144 tcp_recvspace 262144 rfc1323 1
en1:
flags=1e084863,181cc0<UP,BROADCAST,NOTRAILERS,RUNNING,SIMPLEX,MU
LTICAST,GROUPRT,64BIT,CHECKSUM_OFFLOAD(ACTIVE),LARGESEND,CHAIN>
        inet6 fe80::c834:6dff:fe4a:ec04/64
         tcp_sendspace 262144 tcp_recvspace 262144 rfc1323 1
...
```

39. Display the VLAN information for the new virtual Ethernet adapter. VLAN 4094 is used for live update communication.

    entstat -d en1 | grep -i vlan

    __ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # entstat -d en1 | grep -i vlan
Invalid VLAN ID Packets: 0
Port VLAN ID:  4094
VLAN Tag IDs:  None
```

40. List the configured virtual Ethernet adapters. Observe that there is a second adapter configured now.

    lsdev -Cc adapter | grep Ether

    __ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # lsdev -Cc adapter | grep Ether
ent0    Available  Virtual I/O Ethernet Adapter (l-lan)
ent1    Available  Virtual I/O Ethernet Adapter (l-lan)
```

41. **Note:** The live update operation will take some time to complete (around 20-30 minutes). Students should monitor the output and wait for the operation to finish before proceeding to the next step.

    __ a. Review the output of the **geninstall** command displayed on the screen, as well as the **/var/adm/ras/liveupdate/logs/lvupdlog** log file generated by the AIX Live Update operation.

    __ b. The **geninstall** command output showing the successful completion of a live update operation is shown below:

```
Non-interruptable live update operation begins in 10 seconds.


Broadcast message from root@sys8681-aix-t1.ibm.edu (pts/0) at
01:22:16 ...

Live AIX update in progress.


Initializing live update on original LPAR.

Validating original LPAR environment.

Beginning live update operation on original LPAR.

Requesting resources required for live update.
.......................
Notifying applications of impending live update.

Creating rootvg for boot of surrogate.
.........................................
Starting the surrogate LPAR.
............................................................
Creating mirror of original LPAR's rootvg.
..............
Moving workload to surrogate LPAR.
............
        Blackout Time started.
```

```
        Blackout Time end.

Workload is running on surrogate LPAR.
.............................................................
.............................................................
.........................
Shutting down the Original LPAR.
.........................
The live update operation succeeded.


Broadcast message from root@sys8681-aix-t1.ibm.edu (pts/0) at
01:38:12 ...

Live AIX update completed.


File /etc/inittab has been modified.

One or more of the files listed in /etc/check_config.files have
changed.
        See /var/adm/ras/config.diff for details.
root@sys8681-aix-t1.ibm.edu / #
```

42. When the live update operation has completed successfully, determine the current LPAR ID of your AIX partition. Is the value the same as the result obtained earlier?

    uname -L

    __ a. Command and sample output:

    ```
    root@sys8681-aix-t1.ibm.edu / # uname -L
    23 sys8681-aix-t1
    ```

    __ b. The expected answer is that the LPAR ID is different from that obtained previously. The new LPAR ID value should match the value specified for the **lpar_id** field in the **lvupdate.data** file. The value has changed because the terminal session is now communicating with processes that are running in the surrogate LPAR. The surrogate LPAR must have a different LPAR ID than the original LPAR, since both partitions exist concurrently during the AIX live update operation, and every partition on a managed system must have a unique LPAR ID.

43. Determine the current service pack level. Is it the same as the value you obtained earlier?

    oslevel -s

    __ a. Example command and output:

    ```
    root@sys8681-aix-t1.ibm.edu / # oslevel -s
    7300-01-02-2320
    ```

    __ b. The expected answer is that the service pack level is different from that obtained previously. The fixes for the AIX 7.3 TL1 SP2 service pack have been installed by the AIX live update operation, without the requirement to stop applications or reboot the operating system running in the partition.

44. The updated AIX kernel is now active. Display the **/proc/version** file to determine the AIX kernel version and build date. In the example below the kernel version is 2316B_73B and the build date is April 21st, 2023. This confirms the new kernel is actively loaded and running on the system.

    cat /proc/version

    __ a. Example command and output:

```
root@sys8681-aix-t1.ibm.edu / # cat /proc/version
Apr 21 2023
13:58:32
2316B_73B
@(#) _kdb_buildinfo unix_64 Apr 21 2023 13:58:32 2316B_73B
```

45. Congratulations, you've successfully completed an AIX Live Update operation to install a new service pack without a reboot!

46. Review the recorded (actual) blackout time in the mobility time estimator (mobte) alog file. Look for `blackout=`.

    alog -ot mobte

    __ a. Command and sample output:

```
# alog -ot mobte

LiveUpdate

time=082825:22:56:58 pid=23643898043695105 type=Global
dep_mfreq=6222439944Hz dep_sfreq=6222439944Hz dep_cont=100
bw=120000000B/s dep_iorbw=678011273B/s dep_iowbw=436979933B/s
dep_pipebw=334137784B/s dep_rvgsz=10912MB dep_lulvsz=4082MB
dep_cpuavail=10000 dep_flags=0x0 arr_mfreq=6222439944Hz
arr_sfreq=6222439944Hz arr_cont=100 arr_iorbw=678011273B/s
arr_iowbw=436979933B/s arr_pipebw=334137784B/s arr_rvgsz=10912MB
arr_lulvsz=4082MB arr_cpuavail=10000 arr_flags=0x0 files=85 procs=43
threads=139 datasz=2070888B socks=61 mempg=13739 nmqs=1 nmsgs=0 nqbs=0
nsems=8 shmsz=0 mmapsz=31312 flags=0x0 stdl_blackout=9.000000s
stdl_global=699.000000s blackout=15.292975s global=623.159668s
```

    __ b. In this example, the blackout time in the alog output is 15.292975 seconds. Your results will be different.

47. Display the paths after the live update process. You will notice that there are, once again, two paths per disk. Both VSCSI adapters are now assigned to the surrogate partition.

```
root@sys8681-aix-t1.ibm.edu / # lspath
Enabled hdisk0 vscsi1
Enabled hdisk1 vscsi1
Enabled hdisk2 vscsi1
Enabled hdisk3 vscsi1
Enabled hdisk3 vscsi0
Enabled hdisk2 vscsi0
Enabled hdisk1 vscsi0
Enabled hdisk0 vscsi0
```

48. Display the physical volume information. Note the names of the volume groups that are listed on the disk devices that were specified for the **nhdisk** and **mhdisk** fields in the **lvupdate.data** configuration file.

    __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # lspv
hdisk0          00f9c1909ecef90c          rootvg          active
hdisk1          00f9c190b7c9c97f          lvup_rootvg
hdisk2          00f9c190b7c9c9a4          None
hdisk3          00f9c190bce34467          altinst_rootvg
```

    __ b. The disk specified as **nhdisk** (**hdisk1** in the example) now has a volume group labeled **lvup_rootvg**, which contains the rootvg volume group that was used to boot the surrogate LPAR. This volume group was created by copying the original LPAR rootvg volume group after the service pack fixes were installed.

    __ c. When installing a new technology level or service pack, the disk specified as **mhdisk** is not in use in the surrogate partition when the live update operation completes.

49. Attempt to unconfigure and undefine (delete) the disk devices (for **nhdisk** and **mhdisk**) that are not part of the rootvg volume group. Are you successful in performing this task for all the disk devices?

```
rmdev -l hdisk1 -d
rmdev -l hdisk2 -d
```

    __ a. Commands and sample output:

```
# rmdev -l hdisk1 -d
Method error (/etc/methods/ucfgdevice):
0514-062 Cannot perform the requested function because the
specified device is busy.
# rmdev -l hdisk2 -d
hdisk2 deleted
```

    __ b. The disk (**hdisk1**) with the volume group labeled **lvup_rootvg** cannot be unconfigured. This is because it contains the rootvg volume group that was used to boot the surrogate LPAR and to provide the chroot environment into which the processes from the original LPAR are migrated. This disk cannot be removed from the partition, or used for any other purpose, until the partition is rebooted or another live update operation is performed.

50. List the configured virtual Ethernet adapters. Observe that there is only one virtual Ethernet adapter listed now.

```
lsdev -Cc adapter | grep Ether
```

    __ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # lsdev -Cc adapter | grep Ether
ent0    Available  Virtual I/O Ethernet Adapter (l-lan)
```

51. Display the configured IP addresses for all network interfaces. Observe that there is only one interface now (**en0**). The temporary interface is no longer configured.

```
ifconfig -a
```

__ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # ifconfig -a
en0:
flags=1e084863,81cc0<UP,BROADCAST,NOTRAILERS,RUNNING,SIMPLEX,MUL
TICAST,GROUPRT,64BIT,CHECKSUM_OFFLOAD(ACTIVE),LARGESEND,CHAIN>
        inet 10.8.53.103 netmask 0xffffff00 broadcast
10.8.53.255
         tcp_sendspace 262144 tcp_recvspace 262144 rfc1323 1
...
```

Section 1a: Rolling back

Information: This section describes the procedures to perform a (disruptive) rollback to practice the steps required for backing out a live update operation, should it ever be required.

52. Prior to starting the live update operation a clone of the rootvg volume group was created. This serves as a backup of the system before the live update operation. It contains the previous AIX level.
53. If there was ever a need to roll back to the previous AIX level, the LPAR could be rebooted using the rootvg clone (backup). The steps that follow will guide you in this process. This is a disruptive operation, requiring a reboot.
54. Use PuTTY to open a SSH session to your assigned LPAR. Log in as root.
55. Change the bootlist to point to the disk assigned to the **altinst_rootvg** volume group (**hdisk3**).

    lspv
    bootlist -m normal hdisk3 ; bootlist -m normal -o

    __ a. The **altinst_rootvg** volume group should be assigned to **hdisk3**. Use **lspv** to determine that this is the case on your system.

    ```
    root@sys8681-aix-t1.ibm.edu / # lspv
    hdisk0          00f9c1909ecef90c          rootvg          active
    hdisk1          00f9c190b7c9c97f          lvup_rootvg
    hdisk3          00f9c190bce34467          altinst_rootvg
    ```

    __ b. Change the normal bootlist to boot from **hdisk3**.

    ```
    root@sys8681-aix-t1.ibm.edu / # bootlist -m normal hdisk3 ;
    bootlist -m normal -o
    hdisk3 blv=hd5 pathid=1
    hdisk3 blv=hd5 pathid=0
    ```

56. Use PuTTY to open a SSH session to your assigned HMC. Log in using your assigned HMC username and password.
57. Use the HMC CLI command **vtmenu** to open a virtual console terminal to your assigned LPAR, and then log in as the root user.

    __ a. Command and sample output:

    ```
    team5044_1@pokvhmc19:~> vtmenu

     ------------------------------------------------------------
      Partitions On Managed System:  sys875
      OS/400 Partitions not listed
     ------------------------------------------------------------
       1)    sys8751-aix-t1                          Running
       2)    sys8751-aix-t2                          Running
       3)    sys8751-aix-t3                          Running
       4)    sys8751-aix-t4                          Running
       5)    sys8751-vios1                           Running
    ```

```
  6)    sys8751-vios2                          Running


Enter Number of Running Partition (q to quit): 1
    Opening Virtual Terminal On Partition sys8751-aix-t1 . . .


 Open in progress

 Open Completed.


Welcome to the IBM Remote Lab Platform


CLPTST4G ERC 1.0 / 1223434
AN34G test course

November 8, 2024, 6:00 PM  America/Denver
November 13, 2024, 6:00 PM  America/Denver

AIX 7300-01-01-2246
sys8751-aix-t1.ibm.edu / 10.8.44.103

This system is authorized for use in the completion of the material
outlined in the lab exercise guide only.


login: root
root's Password:

Welcome to CLPTST4G ERC 1.0
AN34G test course

 Last unsuccessful login: Mon Nov 11 15:01:05 EST 2024 on ssh from
10.114.203.1
 Last login: Wed Nov 13 03:52:24 EST 2024 on /dev/pts/0 from
10.114.203.1

 root@sys8751-aix-t1.ibm.edu / #
```

58. Reboot the operating system.

    shutdown -Fr

59. When the console **login:** prompt is displayed, log in as the **root** user.

60. Confirm that the LPAR booted from **hdisk3**. View the disks assigned to volume groups. Check that **rootvg** is now assigned to **hdisk3** and that **hdisk0** is now assigned to **old_rootvg**. Note that **hdisk1** is no longer assigned to **lvup_rootvg**.

    lspv

    __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # lspv
hdisk0          00f9c1909ecef90c          old_rootvg
hdisk1          00f9c190b7c9c97f          None
hdisk2          00f9c190b7c9c9a4          None
hdisk3          00f9c190bce34467          rootvg          active
```

61. Confirm that the system booted to the previous AIX level, 7300-01-01-2246.

    oslevel -s

    __ a. Command and sample output:

    ```
    root@sys8681-aix-t1.ibm.edu / # oslevel -s
    7300-01-01-2246
    ```

62. The goal is to return the system to the same state it was prior to performing the live update operation. This includes ensuring that **rootvg** is on **hdisk0**. These steps are only necessary in the lab environment so that later steps can be performed with a fresh environment.

63. Remove the **old_rootvg**.

    alt_rootvg_op -X old_rootvg

64. Verify that **old_rootvg** has been removed.

```
root@sys8681-aix-t1.ibm.edu / # lspv
hdisk0          00f9c1909ecef90c                    None
hdisk1          00f9c190b7c9c97f                    None
hdisk2          00f9c190b7c9c9a4                    None
hdisk3          00f9c190bce34467                    rootvg          active
```

65. Clone **rootvg** to **hdisk0**.

    alt_disk_copy -Bd hdisk0

66. Change the bootlist to point to the disk (**hdisk0**) assigned to the **altinst_rootvg** volume group.

    lspv
    bootlist -m normal hdisk0 ; bootlist -m normal -o

    __ a. The **altinst_rootvg** volume group should be assigned to **hdisk0**. Use **lspv** to determine that this is the case on your system.

    ```
    root@sys8681-aix-t1.ibm.edu / # lspv
    hdisk0          00f9c1909ecef90c          altinst_rootvg
    hdisk1          00f9c190b7c9c97f          None
    hdisk2          00f9c190b7c9c9a4          None
    hdisk3          00f9c190bce34467          rootvg          active
    ```

    __ b. Change the normal bootlist to boot from **hdisk0**.

    ```
    root@sys8681-aix-t1.ibm.edu / # bootlist -m normal hdisk0;
    bootlist -m normal -o
    hdisk0 blv=hd5 pathid=1
    hdisk0 blv=hd5 pathid=0
    ```

67. Reboot the LPAR.

    shutdown -Fr

68. When the console **login:** prompt is displayed, log in as the **root** user.

69. Confirm that the LPAR booted from **hdisk0**. View the disks assigned to volume groups. Check that **rootvg** is now assigned to **hdisk0** and that **hdisk3** is now assigned to **old_rootvg.**

    lspv

    __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # lspv
hdisk0          00f9c1909ecef90c          rootvg          active
hdisk1          00f9c190b7c9c97f          None
hdisk2          00f9c190b7c9c9a4          None
hdisk3          00f9c190bce34467          old_rootvg
```

70. Remove the **old_rootvg**.

    alt_rootvg_op -X old_rootvg

71. Verify that **old_rootvg** has been removed. Ensure that **rootvg** is now assigned to **hdisk0** and that all remaining disks are no longer assigned to any volume group.

    lspv

    __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # lspv
hdisk0          00f9c1909ecef90c          rootvg          active
hdisk1          00f9c190b7c9c97f          None
hdisk2          00f9c190b7c9c9a4          None
hdisk3          00f9c190bce34467          None
```

72. Confirm that the system is once again booted from the previous AIX level, 7300-01-01-2246.

    __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # oslevel -s
7300-01-01-2246
```

73. Check the status of disk paths.

    lspath

    __ a. **Note:** The lab environment uses VSCSI disks. If you are using vSCSI disks and create a backup copy (alt_disk_copy) of the root volume group (rootvg), the AIX live update operation might change the Logical Unit Addresses (LUA) of the disks. In this scenario, if you boot from the backup copy (alt_disk_copy), the **lspath** command might display the disk paths that are missing. The disk paths that are missing were associated with the old LUA values. The missing disk paths do not cause any functional problems. You can run the **rmpath** command to remove the disk paths and have the same number of disk paths that you had before you ran the live update operation. The *Best practices for the Live Update function* documentation page explains this situation in more detail: https://www.ibm.com/docs/en/aix/7.3?topic=planning-best-practices.

    __ b. *ONLY PERFORM THIS STEP IF THERE ARE MISSING PATHS*, otherwise go to the next step. If there are any disk paths in a missing state, run the **/home/AN34/cleanpaths.sh** script now.

```
# lspath | grep Missing
Missing hdisk0 vscsi0
Missing hdisk1 vscsi0
```

```
Missing hdisk0 vscsi1
Missing hdisk2 vscsi1
Missing hdisk1 vscsi1
# /home/AN34/cleanpaths.sh
```

__ c. Confirm all paths are now **Enabled**.

```
root@sys8681-aix-t1.ibm.edu / # lspath
Enabled hdisk0 vscsi1
Enabled hdisk1 vscsi1
Enabled hdisk2 vscsi1
Enabled hdisk3 vscsi1
Enabled hdisk3 vscsi0
Enabled hdisk2 vscsi0
Enabled hdisk1 vscsi0
Enabled hdisk0 vscsi0
```

74. Exit from the **vtmenu** session and exit the HMC CLI sessions.

75. Close all open PuTTY sessions now.

Section 2: Install an AIX TL, and an ifix, with live update (HMC-based)

Information: This section describes a procedure to install an AIX TL and an ifix, using AIX Live Update. You will use a combination of the **update_all**, **emgr** and **geninstall** tools to install the updates without a reboot. Unlike the previous section where students used **geninstall** (alone) to install the updates and initiate the live update operation, in this section students will take a different approach.

The **geninstall** tool can be used to install AIX updates (SPs & TLs) and interim fixes (ifixes), and perform a Live Update operation. Alternatively, it's also possible to install AIX updates and ifixes, using standard tools, like **update_all** and **emgr**, and then perform a Live Update operation, with **geninstall**, to activate the updates/fixes without a reboot. Students will explore this method in this section.

It is best practice to create a bootable clone of rootvg before starting live update. Students did this in section 1. However, to save time students will not create a clone in this section as it will not be required for the remainder of the workshop.

76. Using PuTTY open a SSH session to your assigned AIX partition. Log in as the root user. **Do not use a virtual console terminal session**.

77. Generate the HMC token. Specify the HMC hostname of **hmc1** and the HMC user ID you specified in the **lvupdate.data** file. Then list the HMC token details.

    hmcauth -a hmc1 -u *teamXXXX_X* -p *hmc_password*

    hmcauth -l

    __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # hmcauth -a hmc1 -u team5042_1 -p
sadtoro_70
root@sys8681-aix-t1.ibm.edu / # hmcauth -l
Address  : 10.8.252.130
User name: team5042_1
Port     : 12443
```

78. Mount the NFS directory that contains the fixes for AIX 7.3 TL2 SP2. The NFS server IP address is 10.8.252.1, and the remote directory location is **/export/products/AIX73TL2/TL2SP2**. Mount this directory over **/mnt**.

    mount 10.8.252.1:/export/products/AIX73TL2/TL2SP2 /mnt

    __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # mount
10.8.252.1:/export/products/AIX73TL2/TL2SP2 /mnt

root@sys8681-aix-t1.ibm.edu / # mount | grep mnt
10.8.252.1 /export/products/AIX73TL2/TL2SP2 /mnt  nfs3  Oct 24 21:27
```

79. Change directory to **/mnt** and update the **bos.rte.install** fileset first.

cd /mnt ; installp -d . bos.rte.install

80. Confirm the **bos.rte.install** fileset has been updated. The fileset level should now be 7.3.2.3.

lslpp -l bos.rte.install

__ a. Command and sample output:

```
# lslpp -l bos.rte.install
  Fileset                      Level  State      Description
  ----------------------------------------------------------------------------
Path: /usr/lib/objrepos
  bos.rte.install            7.3.2.3  APPLIED    LPP Install Commands

Path: /etc/objrepos
  bos.rte.install            7.3.2.3  APPLIED    LPP Install Commands
```

81. Preview the installation of the TL2 SP2 update using the **update_all** command with **-p** option.

update_all -p -Y -c -v -d .

__ a. Command and partial sample output:

```
root@sys8681-aix-t1.ibm.edu /mnt # update_all -p -Y -c -v -d .
...etc...
------------------
  310  Selected to be installed, of which:
      310  Passed pre-installation verification
    2  Additional requisites to be automatically installed
  ----
  312  Total to be installed

RESOURCES
---------
  Estimated system resource requirements for filesets being installed:
                (All sizes are in 512-byte blocks)
      Filesystem                    Needed Space              Free Space
      /                                 148991               2187424
      /usr                             1162358               2495472
      /var                              311400               4483704
      /tmp                               43952               4447664
      /opt                                 760               6252168
      -----                             --------               ------
      TOTAL:                            1667461              19866432

  NOTE:  "Needed Space" values are calculated from data available prior
  to installation.  These are the estimated resources required for the
  entire operation.  Further resource checks will be made during
  installation to verify that these initial estimates are sufficient.

ADDITIONAL INFORMATION
----------------------
One or more of the selected filesets will cause a bosboot to be performed.
The bosboot command will rebuild the boot image.  As a result it may
be necessary to reboot your system for the changes to take effect.

It is recommended that you reboot the system as soon as possible
after the installation of this software to avoid disruption of
```

```
current functionality.

*******************************************************************************
End of installp PREVIEW.  No apply operation has actually occurred.
*******************************************************************************
install_all_updates: Log file is /var/adm/ras/install_all_updates.log
install_all_updates: Result = SUCCESS
root@sys8681-aix-t1.ibm.edu /mnt #
```

82. Install the TL2 SP2 update now, using the **update_all** command. This will take 25-30 minutes to complete.

    update_all -Y -c -v -d .

83. Review the installation log file. Verify all the updates were installed successfully.

    vi /var/adm/ras/install_all_updates.log

    __ a. Review the **Result** of each filesets (at the bottom of the log file) and ensure that the word **SUCCESS** appears next to each updated fileset. For example:

    ```
    ...
    bos.mp64                  7.3.2.3         USR         APPLY
    SUCCESS
    bos.mp64                  7.3.2.3         ROOT        APPLY
    SUCCESS
    ...
    ```

84. Check the AIX level now. It should report AIX 7.3 TL2 SP2.

    oslevel -s

    __ a. Command and sample output:

    ```
    root@sys8681-aix-t1.ibm.edu /mnt # oslevel -s
    7300-02-02-2420
    ```

85. Verify that even though TL2 SP2 has been installed, the old AIX kernel is still active (typically requiring a system restart for the new, updated kernel to become active).

    cat /proc/version

    __ a. Command and sample output:

    ```
    root@sys8681-aix-t1.ibm.edu /mnt # cat /proc/version
    Nov 17 2022
    11:47:30
    2246C_73B
    @(#) _kdb_buildinfo unix_64 Nov 17 2022 11:47:30 2246C_73B
    ```

86. Commit any filesets in the APPLIED state now. This must be performed before starting Live Update, otherwise it will not succeed.

    installp -c ALL

    __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu /mnt # installp -c ALL
+-----------------------------------------------------------------------------+
                    Pre-commit Verification...
+-----------------------------------------------------------------------------+
```

```
Verifying selections...done
Verifying requisites...done
Results...

SUCCESSES
---------
  Filesets listed in this section passed pre-commit verification
  and will be committed.

  Selected Filesets
  -----------------
  bos.dsc 7.3.1.3                          # Digital Signature Catalog
  bos.rte.install 7.3.1.3                  # LPP Install Commands

  << End of Success Section >>

FILESET STATISTICS
------------------
    2  Selected to be committed, of which:
        2  Passed pre-installation verification
  ----
    2  Total to be committed

+-----------------------------------------------------------------------------+
                        Committing Software...
+-----------------------------------------------------------------------------+

installp:  COMMITTING software for:
        bos.dsc 7.3.1.3

Filesets processed:  1 of 2  (Total time:  0 secs).

installp:  COMMITTING software for:
        bos.rte.install 7.3.1.3

Finished processing all filesets.  (Total time:  0 secs).

+-----------------------------------------------------------------------------+
                                Summaries:
+-----------------------------------------------------------------------------+

Installation Summary
--------------------
Name                        Level           Part        Event       Result
-------------------------------------------------------------------------------
bos.dsc                     7.3.1.3         USR         COMMIT      SUCCESS
bos.rte.install             7.3.1.3         USR         COMMIT      SUCCESS
bos.rte.install             7.3.1.3         ROOT        COMMIT      SUCCESS
root@sys8681-aix-t1.ibm.edu /mnt #
```

87. List the installed ifixes on the system. There should be no ifixes installed.

    emgr -l

    __ a. Command and sample output:

    ```
    root@sys8681-aix-t1.ibm.edu / # emgr -l
    There is no efix data on this system.
    ```

88. In the **/home/AN34/ifix** directory there is an ifix that will be installed next. The ifix is named **IJ51842s2a.240718.AIX73TL02SP02.epkg.Z**. Confirm that installing the ifix with Live Update is supported.

```
emgr -pe \
/home/AN34/ifix/IJ51842s2a.240718.AIX73TL02SP02.epkg.Z \
| grep LU
```

__ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # emgr -pe /home/AN34/ifix/
IJ51842s2a.240718.AIX73TL02SP02.epkg.Z | grep LU
LU CAPABLE:       yes
ATTENTION: system reboot will be required by the actual (not preview)
operation.
Please see the "Reboot Processing" sections in the output above or in the
/var/adm/ras/emgr.log file.
```

__ b. Note in the output that **LU CAPABLE** is reporting **yes**, meaning the ifix supports installation using Live Update.

89. Preview the ifix install.

```
emgr -pe /home/AN34/ifix/IJ51842s2a.240718.AIX73TL02SP02.epkg.Z
```

90. Install the ifix now.

```
emgr -e /home/AN34/ifix/IJ51842s2a.240718.AIX73TL02SP02.epkg.Z
```

__ a. Command and sample output:

```
# emgr -e /home/AN34/ifix/IJ51842s2a.240718.AIX73TL02SP02.epkg.Z
...etc...
Operation Summary
+-----------------------------------------------------------------------------+
Log file is /var/adm/ras/emgr.log

EPKG NUMBER       LABEL              OPERATION              RESULT
===========       ==============     =================      ==============
1                 IJ51842s2a         INSTALL                SUCCESS

ATTENTION: system reboot is required. Please see the "Reboot Processing"
sections in the output above or in the /var/adm/ras/emgr.log file.

Return Status = SUCCESS
```

91. Verify that the ifix is now installed.

```
emgr -l
```

__ a. What is the state of the ifix?

__ b. Can you explain the state of the fix at this time?

```
root@sys8681-aix-t1.ibm.edu / # emgr -l

ID  STATE LABEL      INSTALL TIME      UPDATED BY ABSTRACT
=== ===== ========== ================= ==========
=====================================
```

```
1   *Q*   IJ51842s2a 08/27/25 06:10:54           IFIX for IJ51842

STATE codes:
 S = STABLE
 M = MOUNTED
 U = UNMOUNTED
 Q = REBOOT REQUIRED
 ...
```

__ c. The ifix is installed, however the state is **Q**, meaning the system needs to be rebooted for the fix to take effect. The ifix was installed using **emgr**. A Live Update operation must be started now for the ifix to take effect, without restarting the AIX OS.

92. Perform a Live Update preview. No other flags or options need to be supplied as the ifix has already been installed (but not activated). Review the output, and fix any issues that have a status of FAILED.

geninstall -p -k

__ a. Command and sample:

```
root@sys8681-aix-t1.ibm.edu / # geninstall -p -k

********************************************************************************
Live Update PREVIEW:  Live Update operation will not actually occur.
********************************************************************************

+-------------------------------------------------------------------------------+
                    Pre-Live Update Verification...
+-------------------------------------------------------------------------------+
Verifying environment...done
Verifying /var/adm/ras/liveupdate/lvupdate.data file...done
Computing the estimated time for the live update operation...done
Results...

EXECUTION INFORMATION
---------------------
  LPAR: sys8681-aix-t1.ibm.edu
  HMC: 10.8.252.130
  user: team5042_1

  Blackout time(in seconds): 10
  Total operation time(in seconds): 668

  << End of Information Section >>

+-------------------------------------------------------------------------------+
                    Live Update Requirement Verification...
+-------------------------------------------------------------------------------+

INFORMATION
-----------
INFO: Any system dumps present in the current dump logical volumes will not be
available after live update is complete.

  << End of Information Section >>
```

```
+-------------------------------------------------------------------------------+
                    Live Update Preview Summary...
+-------------------------------------------------------------------------------+
The live update preview succeeded.

********************************************************************************
End of Live Update PREVIEW:  No Live Update operation has actually occurred.
********************************************************************************
root@sys8681-aix-t1.ibm.edu / #
```

93. Use the AIX Live Update feature to complete the activation of the ifix, and the TL2 SP2 updates.

    cd /

    geninstall -k

__ a. View the output from the **geninstall** command as the operation proceeds. No other flags or options need to be supplied as the updates and ifix have already been installed (but not activated). When you observe the message ”**Initializing live update**“ on the original LPAR, also monitor the LPAR table view in the HMC browser session.

__ b. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # geninstall -k

+-------------------------------------------------------------------------------
--+
                    Pre-Live Update Verification...
+-------------------------------------------------------------------------------
--+
Verifying environment...done
Verifying /var/adm/ras/liveupdate/lvupdate.data file...done
Computing the estimated time for the live update operation...done
Results...

EXECUTION INFORMATION
---------------------
  LPAR: sys8681-aix-t1.ibm.edu
  HMC: 10.8.252.130
  user: team5042_1

  Blackout time(in seconds): 10
  Total operation time(in seconds): 668

  << End of Information Section >>

+-------------------------------------------------------------------------------
--+
                    Live Update Requirement Verification...
+-------------------------------------------------------------------------------
--+

INFORMATION
-----------
```

```
INFO: Any system dumps present in the current dump logical volumes will not
be available after live update is complete.

  << End of Information Section >>

+-------------------------------------------------------------------------
--+
                    Live Update Preview Summary...
+-------------------------------------------------------------------------
--+
The live update preview succeeded.

Non-interruptable live update operation begins in 10 seconds.


Broadcast message from root@sys8681-aix-t1.ibm.edu (pts/0) at 17:15:49 ...

Live AIX update in progress.


Initializing live update on original LPAR.

Validating original LPAR environment.

Beginning live update operation on original LPAR.

Requesting resources required for live update.
.......................
Notifying applications of impending live update.

Creating rootvg for boot of surrogate.
.........................................
Starting the surrogate LPAR.
.................................................
Creating mirror of original LPAR's rootvg.
.................
Moving workload to surrogate LPAR.
...........
        Blackout Time started.

        Blackout Time end.

Workload is running on surrogate LPAR.
.....................................................................
.....................................................................
....
Shutting down the Original LPAR.
.................
The live update operation succeeded.


Broadcast message from root@sys8681-aix-t1.ibm.edu (pts/0) at 17:31:15 ...

Live AIX update completed.
```

```
File /etc/inittab has been modified.

One or more of the files listed in /etc/check_config.files have changed.
        See /var/adm/ras/config.diff for details.
root@sys8681-aix-t1.ibm.edu / #
```

94. Wait for the Live Update operation to finish. It will take about 10-15 minutes to complete.
95. Display the status of the ifix. What is the status now?

    emgr -l

    __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # emgr -l
ID  STATE LABEL      INSTALL TIME      UPDATED BY ABSTRACT
=== ===== ========== ================= ==========
====================================
1    S    IJ51842s2a 08/27/25 06:10:54            IFIX for IJ51842

STATE codes:
 S = STABLE
 ...
```

    __ b. The ifix state is now **S**, meaning it is stable. This indicates that the ifix changes are now active on the system. There was no need to reboot the system for this fix to take effect as it was enabled during the Live Update process when the workload moved to the surrogate LPAR.

96. The ifix has now been installed successfully, without a reboot.
97. Check the AIX level now. It should report AIX 7.3 TL2 SP2.

    oslevel -s

    __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu /mnt # oslevel -s
7300-02-02-2420
```

98. Once the live update operation is finished the updated AIX kernel is now active. Display the **/proc/version** file to determine the AIX kernel version and build date. In the example below the kernel version is 2420B_73D and the build date is May 16th, 2024. This confirms the new kernel is running on the system. There was no need to reboot the system for the updates to take effect.

    cat /proc/version

    __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # cat /proc/version
May 16 2024
09:06:23
2420B_73D
@(#) _kdb_buildinfo unix_64 May 16 2024 09:06:23 2420B_73D
```

    __ b. The AIX OS has also been updated to a newer TL/SP, without a reboot, using a combination of the **update_all** and **geninstall** commands.

99. Check for the successful completion of the live update process in the AIX error report.

errpt | grep LVUPDATE

__ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # errpt | grep LVUPDATE
12295E0B   0909232825 I S LVUPDATE       Live AIX update completed successfully
9A74C7AB   0909231725 I S LVUPDATE       Live AIX update started
```

100. Congratulations, you've successfully completed an AIX Live Update operation to install a new technology level and an ifix without a reboot!

101. Close all open PuTTY sessions now.

Section 2a: Non-disruptive roll back of an ifix with live update

Information: This section describes the procedures to perform a non-disruptive rollback of an ifix. Students will perform the steps required for backing out an ifix install with live update. This requires the student first remove the ifix, with **emgr** command. Once the ifix has been removed successfully, they can then perform another live update operation.

102. Use PuTTY to open a SSH session with your AIX LPAR now.

103. Remove the ifix that you installed in the previous section.

emgr -rL IJ51842s2a

__ a. Command and sample output:

```
root@sys8751-aix-t1.ibm.edu / # emgr -rL IJ51842s2a
+-------------------------------------------------------------
-------------+
Efix Manager Initialization
+-------------------------------------------------------------
-------------+
Initializing log /var/adm/ras/emgr.log ...
Accessing efix metadata ...
Processing efix label "IJ51842s2a" ...

+-------------------------------------------------------------
-------------+
Efix Attributes
+-------------------------------------------------------------
-------------+
LABEL:             IJ51842s2a
INSTALL DATE:      05/18/26 00:12:43
STATE:             STABLE
ABSTRACT:          IFIX for IJ51842
PACKAGER VERSION:  7
VUID:              00F7CD554C00071804071024
REBOOT REQUIRED:   yes
BUILD BOOT IMAGE:  yes
LU CAPABLE:        no
PRE-REQUISITES:    yes
SUPERSEDE:         no
PACKAGE LOCKS:     no
E2E PREREQS:       no
FIX TESTED:        no
ALTERNATE PATH:    None
EFIX FILES:        1

Install Scripts:
```

```
   PRE_INSTALL:   no
   POST_INSTALL:  no
   PRE_REMOVE:    no
   POST_REMOVE:   no

File Number:      1
   LOCATION:      /usr/lib/methods/cfgmlxent
   FILE TYPE:     Standard (file or executable)
   INSTALLER:     installp
   SIZE:          664
   ACL:           DEFAULT
   CKSUM:         07790
   PACKAGE:       devices.ethernet.mlx.rte
   MOUNT INST:    no

+-----------------------------------------------------------------
--------------+
Efix Description
+-----------------------------------------------------------------
--------------+
IJ51842 - ROCE ADAPTERS DEFINED AFTER SP UPDATE

+-----------------------------------------------------------------
--------------+
Space Requirements
+-----------------------------------------------------------------
--------------+
Checking space requirements ...

Space statistics (in 512 byte-blocks):
File system: /usr, Free: 2067864, Required: 2012, Deficit: 0.
File system: /tmp, Free: 4447880, Required: 66901, Deficit: 0.

+-----------------------------------------------------------------
--------------+
Efix State
+-----------------------------------------------------------------
--------------+
Setting efix state to: REMOVING

+-----------------------------------------------------------------
--------------+
Package Locking
+-----------------------------------------------------------------
--------------+
Processing package unlocking for all files.
File 1: unlocking installp fileset devices.ethernet.mlx.rte.

All package locks processed successfully.
```

```
+-----------------------------------------------------------------
--------------+
Efix File Removal
+-----------------------------------------------------------------
--------------+
Setting up for removal of efix files ...
Removing all efix files (in reverse order of installation):
Removing efix file #1 (File: /usr/lib/methods/cfgmlxent) ...
Successfully updated the Kernel Authorization Table.
Successfully updated the Kernel Role Table.
Successfully updated the Kernel Command Table.
Successfully updated the Kernel Device Table.
Successfully updated the Kernel Object Domain Table.
Successfully updated the Kernel Domains Table.
Successfully updated the Kernel RBAC log level.

Total number of efix files removed is 1.

+-----------------------------------------------------------------
--------------+
Reboot Processing
+-----------------------------------------------------------------
--------------+

*** NOTICE ***
This efix package requires the target system to be rebooted
after the current
operation is complete. It is recommended that you reboot the
target system as
soon as possible after installation to avoid disruption of
current functionality.

+-----------------------------------------------------------------
--------------+
Boot Image Processing
+-----------------------------------------------------------------
--------------+
Rebuilding boot image ...
bosboot: Boot image is 69660 512 byte blocks.
Successfully rebuilt boot image.

+-----------------------------------------------------------------
--------------+
Operation Summary
+-----------------------------------------------------------------
--------------+
Log file is /var/adm/ras/emgr.log

EFIX NUMBER       LABEL               OPERATION
RESULT
```

```
===========       ==============      =================
==============
1                 IJ51842s2a          REMOVE
SUCCESS

ATTENTION: system reboot is required. Please see the "Reboot
Processing"
sections in the output above or in the /var/adm/ras/emgr.log
file.

Return Status = SUCCESS
root@sys8751-aix-t1.ibm.edu / #
```

__ b. Note in the output that **emgr** displays a message stating that a system reboot is required. Of course, you will use live update instead to ensure this change takes effect on the system, without rebooting the LPAR.

104. Confirm the ifix is no longer installed.

emgr -l

__ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # emgr -l
There is no efix data on this system.
```

105. Two free (unused) disks are required now to perform another live update. Recall that **hdisk1** is now in inuse (assigned to **lvup_rootvg**). However, **hdisk2** and **hdisk3** can be used for the next live update operation.

lspv

__ a. Command and sample output:

```
root@sys8751-aix-t1.ibm.edu / # lspv
hdisk0          00f70f4d24d74429            rootvg          active
hdisk1          00f70f4d5d749e0c            lvup_rootvg
hdisk2          00f70f4d5d749e31            None
hdisk3          00f70f4d5d663f4f            None
```

106. Change your current working directory to **/var/adm/ras/liveupdate**.

cd /var/adm/ras/liveupdate

107. Edit the **lvupdate.data** file, and take the following actions:

__ a. Set the value of the **nhdisk** field to **hdisk2**.

__ b. Set the value of the **mhdisk** field to **hdisk3**.

__ c. Do not make any other edits or changes to the file.

__ d. Save the file, and quit the editor.

__ e. Command and sample output:

```
# vi lvupdate.data
...
disks:
```

```
        nhdisk  = hdisk2
        mhdisk  = hdisk3
...
```

108. Perform a live update preview. No other flags or options need to be supplied as there are no updates or fixes to install in this case. Review the output, and fix any issues that have a status of FAILED.

cd /

geninstall -p -k

__ a. Command and sample output are shown below:

```
root@sys8681-aix-t1.ibm.edu / # geninstall -p -k

************************************************************
***************
Live Update PREVIEW:  Live Update operation will not actually
occur.
************************************************************
***************

+-------------------------------------------------------------
--------------+
                    Pre-Live Update Verification...
+-------------------------------------------------------------
--------------+
Verifying environment...done
Verifying /var/adm/ras/liveupdate/lvupdate.data file...done
Computing the estimated time for the live update
operation...done
Results...

EXECUTION INFORMATION
---------------------
  LPAR: sys8681-aix-t1.ibm.edu
  HMC: 10.8.252.130
  user: team5042_1

  Blackout time(in seconds): 10
  Total operation time(in seconds): 666

  << End of Information Section >>

+-------------------------------------------------------------
--------------+
                    Live Update Requirement Verification...
+-------------------------------------------------------------
--------------+

INFORMATION
-----------
```

```
INFO: Any system dumps present in the current dump logical
volumes will not be available after live update is complete.

  << End of Information Section >>

+-------------------------------------------------------------
--------------+
                    Live Update Preview Summary...
+-------------------------------------------------------------
--------------+
The live update preview succeeded.

*************************************************************
**************
End of Live Update PREVIEW:  No Live Update operation has
actually occurred.
*************************************************************
**************
root@sys8681-aix-t1.ibm.edu / #
```

109. Use the AIX live update feature to complete the removal of the ifix. View the output from the **geninstall** command as the installation proceeds. No other flags or options need to be supplied as there are no updates or fixes to install in this case. When you observe the message **Initializing live update** on the original LPAR, also monitor the LPAR table view in the HMC browser session.

geninstall -k

__ a. An example command is shown below.

```
root@sys8681-aix-t1.ibm.edu / # geninstall -k

+-------------------------------------------------------------
--------------+
                    Pre-Live Update Verification...
+-------------------------------------------------------------
--------------+
Verifying environment...done
Verifying /var/adm/ras/liveupdate/lvupdate.data file...done
Computing the estimated time for the live update
operation...done
Results...

EXECUTION INFORMATION
---------------------
  LPAR: sys8681-aix-t1.ibm.edu
  HMC: 10.8.252.130
  user: team5042_1

  Blackout time(in seconds): 10
  Total operation time(in seconds): 666

  << End of Information Section >>
```

```
+-------------------------------------------------------------
--------------+
                    Live Update Requirement Verification...
+-------------------------------------------------------------
--------------+

INFORMATION
-----------
INFO: Any system dumps present in the current dump logical
volumes will not be available after live update is complete.

  << End of Information Section >>

+-------------------------------------------------------------
--------------+
                    Live Update Preview Summary...
+-------------------------------------------------------------
--------------+
The live update preview succeeded.

Non-interruptable live update operation begins in 10 seconds.


Broadcast message from root@sys8681-aix-t1.ibm.edu (pts/0) at
06:06:07 ...

Live AIX update in progress.


Initializing live update on original LPAR.

Validating original LPAR environment.

Beginning live update operation on original LPAR.

Requesting resources required for live update.
.........................
Notifying applications of impending live update.

Creating rootvg for boot of surrogate.
.....................................
Starting the surrogate LPAR.
.....................................................
Creating mirror of original LPAR's rootvg.
.................
Moving workload to surrogate LPAR.
........
        Blackout Time started.

        Blackout Time end.
```

```
Workload is running on surrogate LPAR.
.................................................................
.................................................................
.................................
Shutting down the Original LPAR.
.................
The live update operation succeeded.


Broadcast message from root@sys8681-aix-t1.ibm.edu (pts/0) at
06:21:43 ...

Live AIX update completed.


File /etc/inittab has been modified.

One or more of the files listed in /etc/check_config.files have
changed.
        See /var/adm/ras/config.diff for details.
root@sys8681-aix-t1.ibm.edu / #
```

110. List the physical volumes now and confirm **hdisk2** is assigned to the **lvup_rootvg** volume group.

     lspv

   __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # lspv
hdisk0          00f70f4d24d74429          rootvg          active
hdisk1          00f70f4d5d749e0c          None
hdisk2          00f70f4d5d749e31          lvup_rootvg
hdisk3          00f70f4d5d663f4f          None
```

111. Now that the Live Update operation is finished, the removal of the ifix is complete. The system could be used in this state now. However, for the purposes of the next section in this workshop, the system will be rebooted.

112. Using PuTTY open a SSH session to your assigned HMC. Log in using your assigned HMC username and password.

113. Use the HMC CLI command **vtmenu** to open a virtual console terminal to your assigned AIX LPAR, and then log in as the **root** user.

114. Reboot the LPAR now to free up **hdisk2** so that it can be managed in the next section.

     shutdown -Fr

115. When the console **login:** prompt is displayed, log in as the **root** user.

116. After the reboot, verify **hdisk2** is no longer assigned to **lvup_rootvg**.

     lspv

   __ a. Command and sample output:

```
root@sys8681-aix-t1.ibm.edu / # lspv
hdisk0          00f9c1909ecef90c             rootvg          active
hdisk1          00f9c190b7c9c97f             None
hdisk2          00f9c190b7c9c9a4             None
hdisk3          00f9c190bce34467             None
```

117. Log out from the virtual terminal session on the LPAR.

118. Exit from the **vtmenu** session and exit the HMC CLI sessions.

119. Close the PuTTY SSH session with the HMC.

Section 3: Prepare the AIX environment for PowerVC management

Information: This section describes the specific procedures required to prepare the AIX LPAR for management by PowerVC. Students will first remove all existing disks from the LPAR, except for the rootvg disk. This is done so that students may observe more clearly how PowerVC automatically creates and assigns volumes to the VM during the live update process.

120. Using PuTTY open a SSH session to your assigned AIX partition. Log in as the root user. **Do not use a virtual console terminal session**.

121. List the physical volumes that are configured in the partition. You should find four physical volumes. The **hdisk0** device should be used for the rootvg volume group. The remaining physical volumes should not be part of any volume group. Let your instructor know if your partition has a different configuration.

```
lspv
```

__ a. The example output shown below is from an AIX partition with the correct configuration. The PVID of the **hdisk0** device will be different on your system. Disks **hdisk1**, **hdisk2** and **hdisk3** should not be assigned to a volume group at this time.

```
root@sys8841-aix-t1.ibm.edu / # lspv
hdisk0          00f9c199fd5067e4          rootvg          active
hdisk1          00f9c199fec42e0c          None
hdisk2          00f9c199fec42e2f          None
hdisk3          00f9c199feb94c95          None
```

122. Remove all unused disks from AIX. The disks should be hdisk1, 2 and 3.

```
rmdev -dl hdisk1
rmdev -dl hdisk2
rmdev -dl hdisk3
```

123. Only the **rootvg** volume group, assigned to one disk (**hdisk0**), should exist now.

```
lspv
```

__ a. The example output shown below is from an AIX partition with the correct configuration. The PVID of the **hdisk0** device will be different on your system.

```
root@sys8841-aix-t1.ibm.edu / # lspv
hdisk0          00f9c199fd5067e4          rootvg          active
```

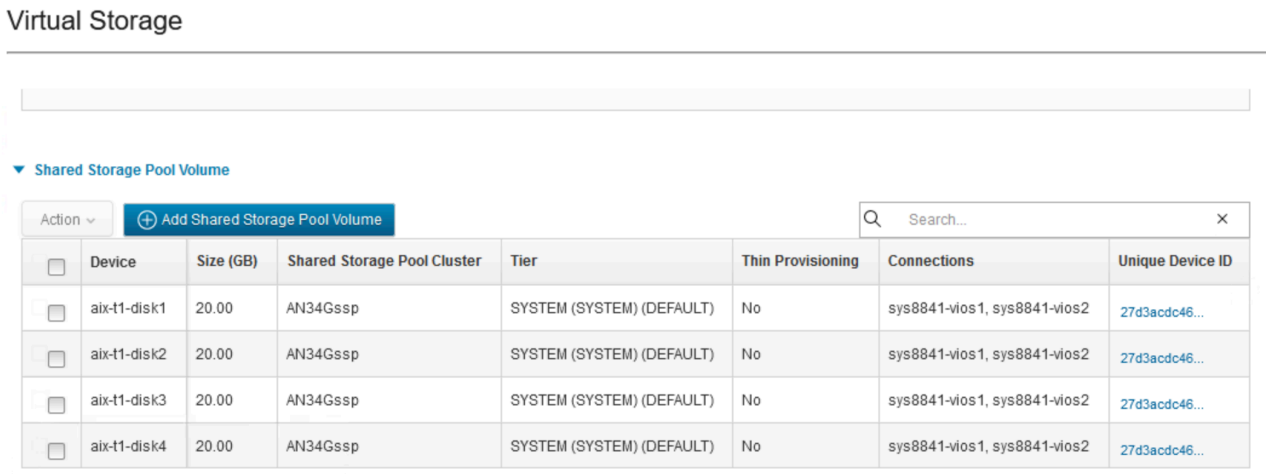
124. Using a web browser, connect to your assigned HMC IP address using the https protocol. Log in to the HMC UI using your assigned HMC user ID and password.

125. Select the icon for your assigned managed system to view all the client partitions on that system.

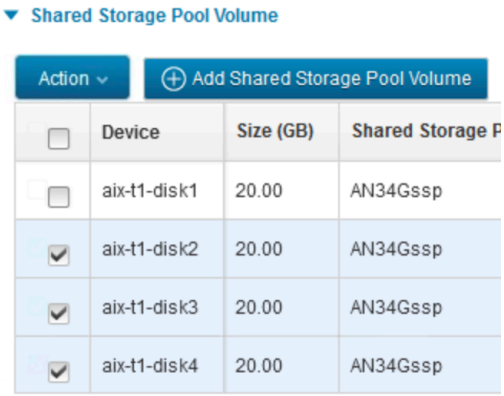
126. Select the icon for your assigned LPAR.

127. Select **Virtual Storage** for your LPAR.

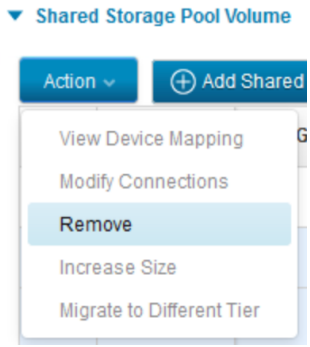
128. Remove the disk mappings from LPAR with HMC UI. Expand the **Shared Storage Pool Volume** section to display all disks currently assigned to your LPAR.



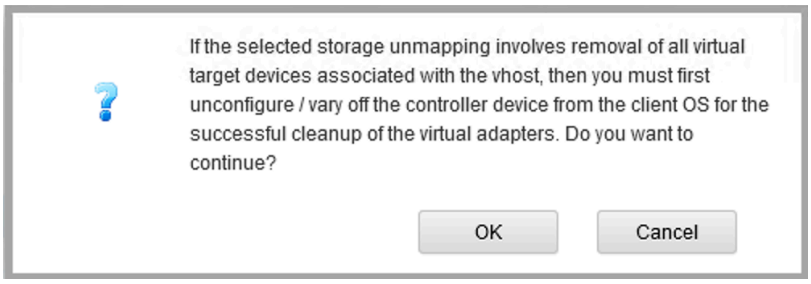
129. Select all the disks, *except for the first disk*. Select *only* **aix-t*x*-disk2**, **aix-t*x*-disk3** and **aix-t*x*-disk4**. Where ***x*** is your team number.



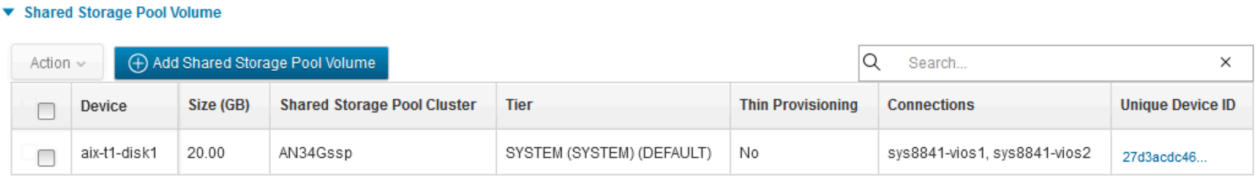
130. Click **Action** and select **Remove**.



131. Click **OK** to start the disk unmapping process.



132. Only one disk (SSP volume) named **aix-t*x*-disk1** (where ***x*** is your team number) should be displayed now for your LPAR.



133. Using PuTTY open a SSH session to the first VIOS partition (**sys*XXXX*-vios1**). Check the workshop course kit for the IP address information for your VIOS. Log in as the **padmin** user.

134. Remove the three (now unassigned) SSP volumes (logical units, also known as LUs) for your LPAR. Search for your LPAR name in the **`lu -list`** output. Be sure to only remove the LUs that belong to your LPAR. *Only remove LUs named aix-t**x**-disk**2**, aix-t**x**-disk**3** and aix-t**x**-disk**4***. Where ***x*** is your team number. ***BE VERY CAREFUL NOT TO REMOVE the LU named aix-tx-disk1***, as this will render your LPAR unusable, there will be no way to recover from this action and you will not be able to complete the workshop. Take time to review the commands before entering them to avoid any missteps or errors.

`lu -list | grep aix-tx | grep disk[234]`

`lu -remove -lu aix-tx-disky`

__ a. Commands and sample output for ***aix-t1***:

```
[padmin@sys8841-vios1]$ lu -list | grep aix-t1 | grep disk[234]
aix-t1-disk2 20480 0           9ceb3a23177be6330eb5162d4843933a
aix-t1-disk3 20480 0           b0eb7aaa6d6cb3352f2a9ea574e20568
aix-t1-disk4 20480 0           754b81ba09655e6311b55122565d6b9a

[padmin@sys8841-vios1]$ lu -remove -lu aix-t1-disk2
Logical unit aix-t1-disk2 with udid
"9ceb3a23177be6330eb5162d4843933a" is removed.

[padmin@sys8841-vios1]$ lu -remove -lu aix-t1-disk3
Logical unit aix-t1-disk3 with udid
"b0eb7aaa6d6cb3352f2a9ea574e20568" is removed.

[padmin@sys8841-vios1]$ lu -remove -lu aix-t1-disk4
Logical unit aix-t1-disk4 with udid
"754b81ba09655e6311b55122565d6b9a" is removed.
```

135. There should be only one LU listed for your LPAR now.

```
lu -list | grep aix-tx
```

__ a. Command and output for ***aix-t1***:

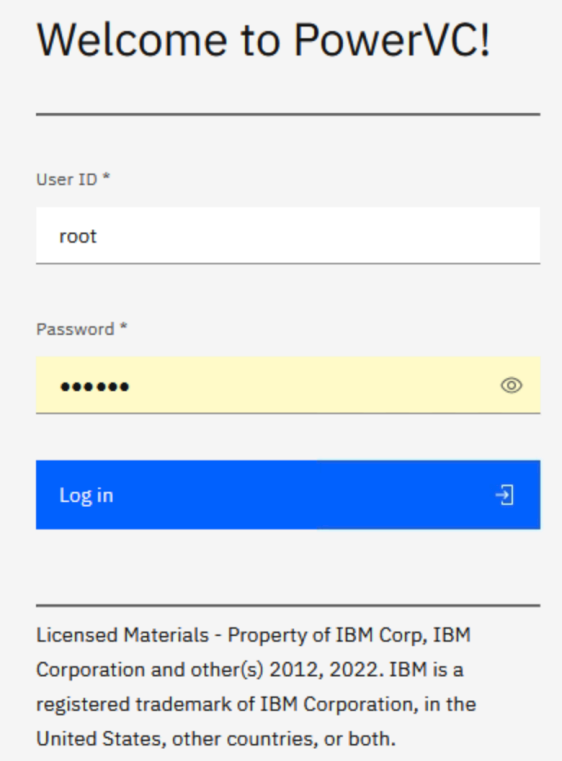
```
[padmin@sys8841-vios1]$ lu -list | grep aix-t1
aix-t1-disk1     20480          0           b25fd8891106acbfb20bfecd174135ad
```

136. Exit the VIOS CLI session now.

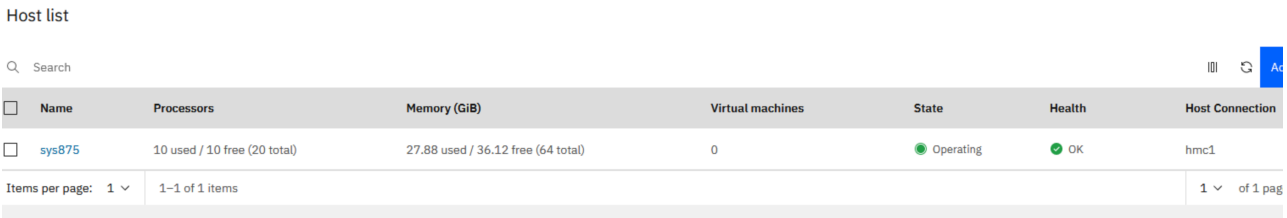
137. Connect to the PowerVC UI. Open a web browser (Firefox) from your access server and enter the URL for the virtual IP address of the PowerVC server. Use the https protocol. You will find the virtual IP address information for the PowerVC server in your course kit. Add security exceptions if necessary until you see the login screen. (The first-time load may take a while. Please wait if needed.)

```
<https://Virtual IP address of the PowerVC server>
```

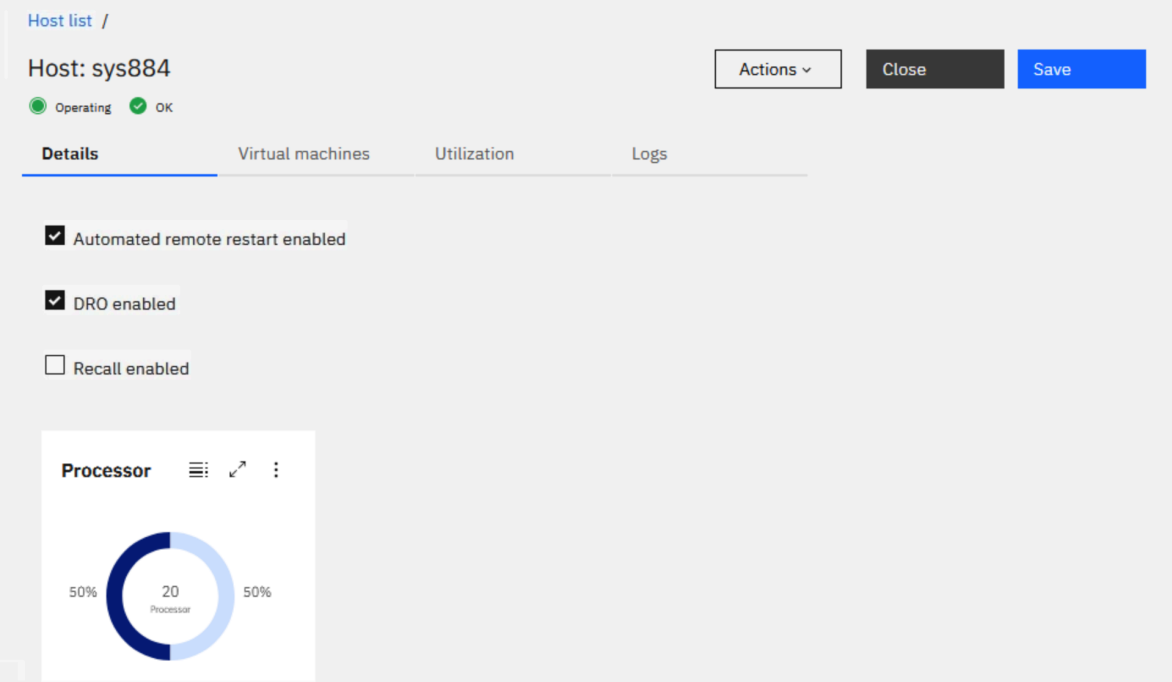
138. Log in as root using the given credentials.



139. Select the **Host list** menu item to view your host. The Power server for the workshop has already been added to PowerVC by your instructor.

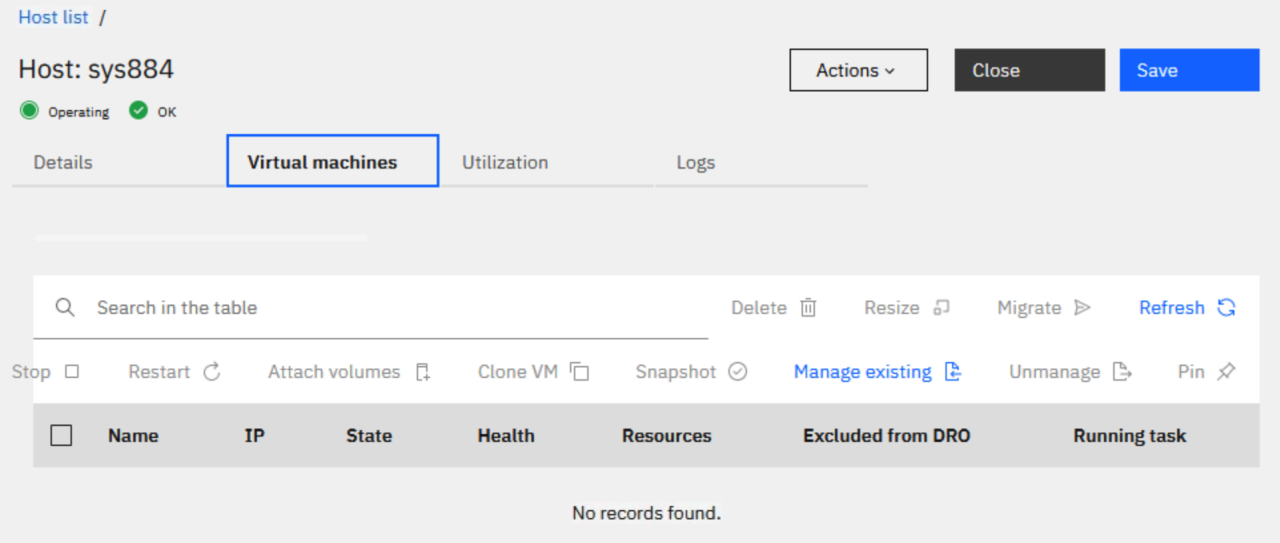


140. Select the host to view its properties.

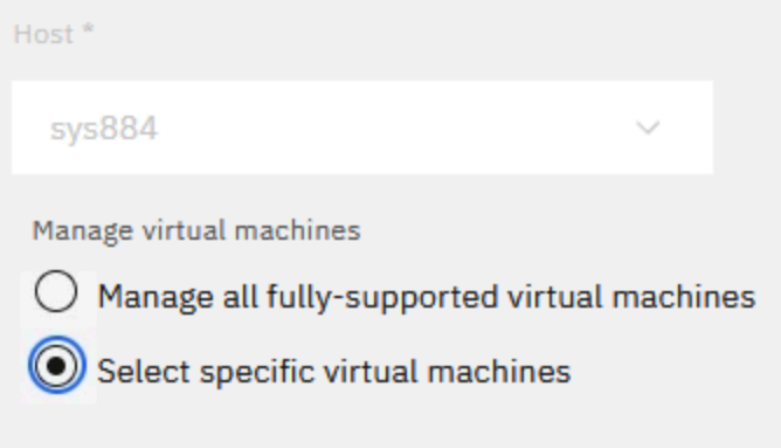


141. Select the **Virtual machines** tab.

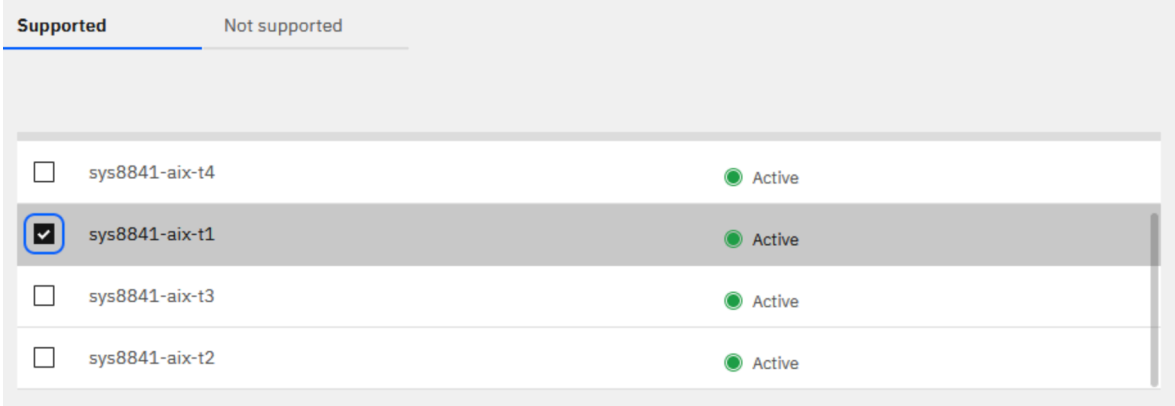
142. Select **Manage existing**.



143. Select the '**Select specific virtual machines**' button after selecting your host, as shown below.

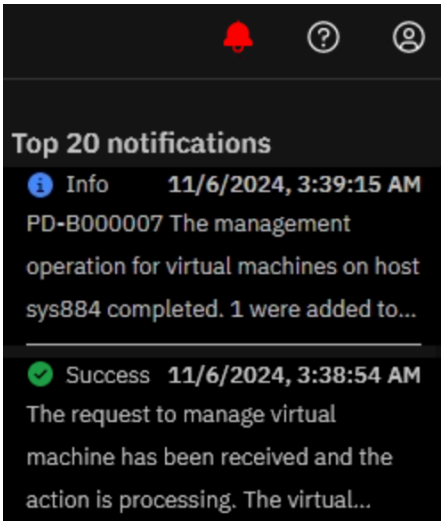


144. Scroll down and select the virtual machine **assigned to your student number**. Recall that the virtual machine ending with your team-name (**tx**) suffix is yours.



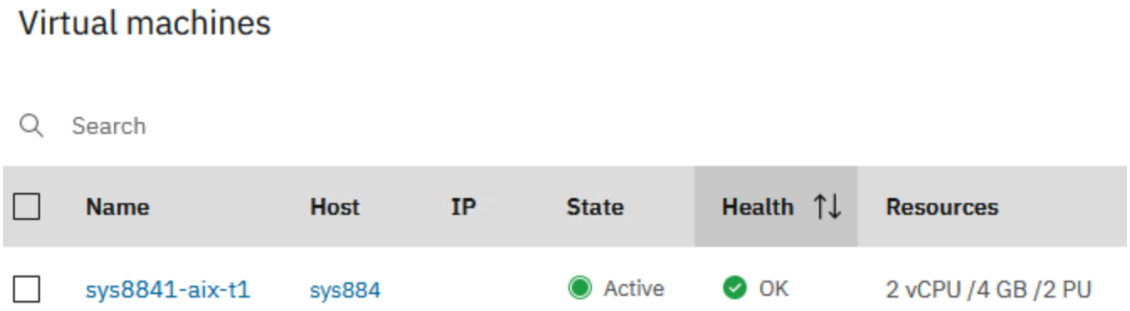
145. Scroll up and click the **Import** button.

146. After a few minutes, you should get a notification like this. Go to the **VM list** view.



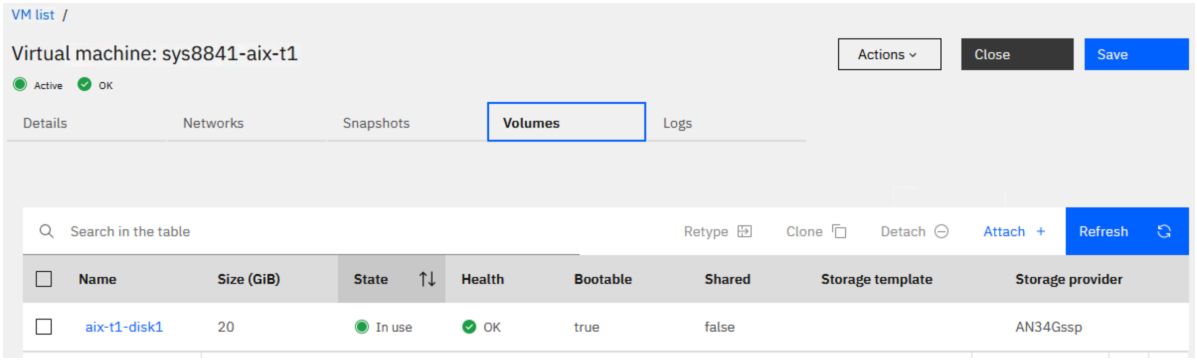
147. Wait for a couple of minutes (check the notifications) and ensure that the VM has been added. You may need to press the refresh icon a few times for the VM list to update. From the left-side pane, under **Virtual machines**, select **VM list**. The VM **State** should be

'**Active**' and **Health** should be '**OK**', to prevent any issues with this section. It may take several minutes (around 5 minutes). You may need to press the refresh icon a few times for the state to update.



148. Select your VM. Locate its PowerVC instance **ID** (under **Details**).

149. In your VM view panel, click **Volumes**. Review the PowerVC managed volumes for your VM. One volume only (the disk for rootvg) will be displayed. If the **Health** for the volume does not show '**OK**', wait a few minutes and refresh the panel, until it displays as '**OK**'.



Section 3a: Live update with PowerVC managed VM

Information: In this section of the workshop students will perform a PowerVC-based live update operation. Students will install an ifix with **geninstall** and monitor the PowerVC server while the live update process takes place.

150. Use PuTTY to open a SSH session with your AIX LPAR now.

151. From your AIX VM, issue the following command to backup the current **lvupdate.data** file.

```
cp -p \
/var/adm/ras/liveupdate/lvupdate.data /tmp/bkp.lvupdate.data
```

152. Remove the **/var/adm/ras/liveupdate/lvupdate.data** file. This file will be created automatically, and, unlike HMC-based live updates, does not need to exist or be configured prior to starting live update with PowerVC.

```
rm /var/adm/ras/liveupdate/lvupdate.data
```

153. Clear the AIX error report to make it easier to review when the live update started and completed.

```
errclear 0
```

154. Verify that there is no HMC authentication token present now.

```
hmcauth -l
```

__ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # hmcauth -l

root@sys8841-aix-t1.ibm.edu / #
```

155. From your AIX VM, authenticate with your PowerVC server. Specify the virtual IP address of the PowerVC server. Then display the authentication token details.

```
pvcauth -u root -p abc123 -a <virtual-ip-pvc>
```

```
pvcauth -l
```

__ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # pvcauth -u root -p abc123 -a
10.8.50.111
root@sys8841-aix-t1.ibm.edu / # pvcauth -l
Address  : 10.8.53.111
User name: root
Project  : ibm-default
Port     : 5000
TTL      : 5:59:55
```

156. Take notice of the current LPAR ID for your VM.

uname -L

__ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # uname -L
23 sys8841-aix-t1
```

157. Install an ifix with live update. The ifix, named **IJ51842s2a.240718.AIX73TL02SP02.epkg.Z**, is located in **/home/AN34**. This is the same ifix you installed in the previous section; you will install it again with live update.

158. First, perform a live update preview. Confirm **geninstall** is now communicating with PowerVC and not the HMC.

**geninstall -p -k -d /home/AN34/ifix **

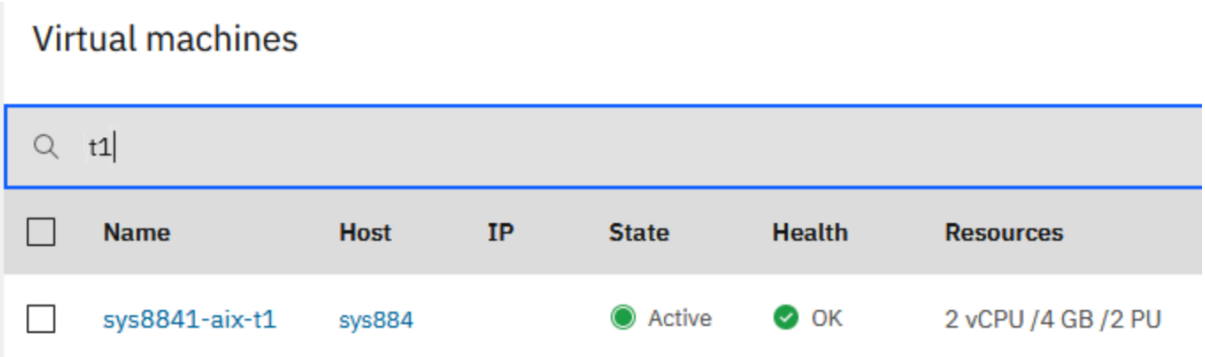
IJ51842s2a.240718.AIX73TL02SP02.epkg.Z

__ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # geninstall -p -k -d
/home/AN34/ifix IJ51842s2a.240718.AIX73TL02SP02.epkg.Z


********************************************************************
***************
Live Update PREVIEW:  Live Update operation will not actually
occur.
********************************************************************
***************

+-----------------------------------------------------------------
--------------+
                    Pre-Live Update Verification...
+-----------------------------------------------------------------
--------------+
Verifying environment...done
Verifying /var/adm/ras/liveupdate/lvupdate.data file...done
Computing the estimated time for the live update
operation...done
Results...

EXECUTION INFORMATION
---------------------
  LPAR: sys8841-aix-t1.ibm.edu
  PowerVC: 10.8.53.111
  user: root

  Blackout time(in seconds): 10
  Total operation time(in seconds): 1131

  << End of Information Section >>

+-----------------------------------------------------------------
--------------+
```

```
                    Live Update Requirement Verification...
+-----------------------------------------------------------------------
--------------+

INFORMATION
-----------
INFO: Any system dumps present in the current dump logical
volumes will not be available after live update is complete.

  << End of Information Section >>

+-----------------------------------------------------------------------
--------------+
                    Live Update Preview Summary...
+-----------------------------------------------------------------------
--------------+
The live update preview succeeded.

*************************************************************************
***************
End of Live Update PREVIEW:  No Live Update operation has
actually occurred.
*************************************************************************
***************
root@sys8841-aix-t1.ibm.edu / #
```

159. From the PowerVC UI, open the **VM list** panel. In the search bar, above the **VM list**, enter the name of your VM. This will restrict the list of VMs to only display your VM during the live update operation. Keep this open, as you will monitor this during the live update process.



160. Start live update on the VM now and install the ifix.

**geninstall -k -d /home/AN34/ifix **

IJ51842s2a.240718.AIX73TL02SP02.epkg.Z

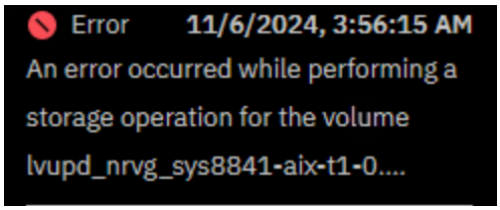
__ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # geninstall -k -d
/home/AN34/ifix  IJ51842s2a.240718.AIX73TL02SP02.epkg.Z

+-----------------------------------------------------------------------
--------------+
```

```
                    Pre-Live Update Verification...
+-------------------------------------------------------------------
--------------+
Verifying environment...done
Verifying /var/adm/ras/liveupdate/lvupdate.data file...done
Computing the estimated time for the live update
operation...done
Results...

EXECUTION INFORMATION
---------------------
  LPAR: sys8841-aix-t1.ibm.edu
  PowerVC: 10.8.53.111
  user: root

  Blackout time(in seconds): 10
  Total operation time(in seconds): 1126

  << End of Information Section >>

+-------------------------------------------------------------------
--------------+
                    Live Update Requirement Verification...
+-------------------------------------------------------------------
--------------+

INFORMATION
-----------
INFO: Any system dumps present in the current dump logical
volumes will not be available after live update is complete.

  << End of Information Section >>

+-------------------------------------------------------------------
--------------+
                    Live Update Preview Summary...
+-------------------------------------------------------------------
--------------+
The live update preview succeeded.

Non-interruptable live update operation begins in 10 seconds.


Broadcast message from root@sys8841-aix-t1.ibm.edu (pts/3) at
03:51:17 ...

Live AIX update in progress.


Initializing live update on original LPAR.
```

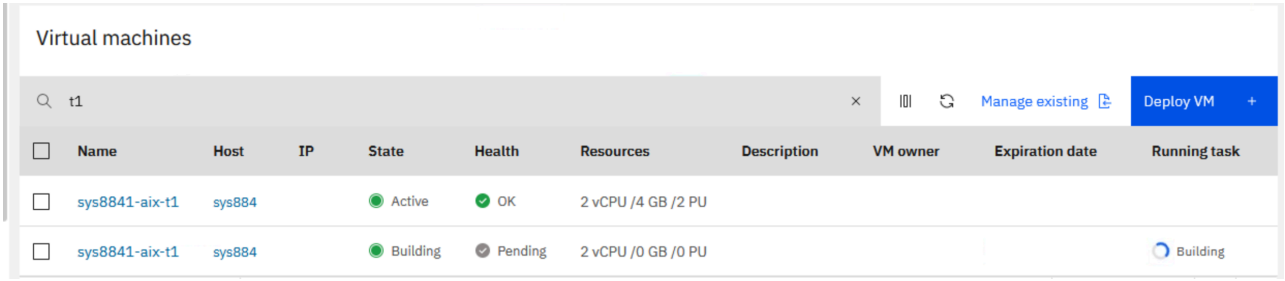
```
Validating original LPAR environment.

Beginning live update operation on original LPAR.

Requesting resources required for live update.
.............
Notifying applications of impending live update.
....
Creating rootvg for boot of surrogate.
..............................................
Starting the surrogate LPAR.
..............................................................
..............................................................
..............................................
Creating mirror of original LPAR's rootvg.
.........................
Moving workload to surrogate LPAR.
........
        Blackout Time started.

        Blackout Time end.

Workload is running on surrogate LPAR.
..............................................................
..............................................................
..............................................................
Shutting down the Original LPAR.
.......................
The live update operation succeeded.


Broadcast message from root@sys8841-aix-t1.ibm.edu (pts/3) at
04:13:46 ...

Live AIX update completed.

root@sys8841-aix-t1.ibm.edu / #
```

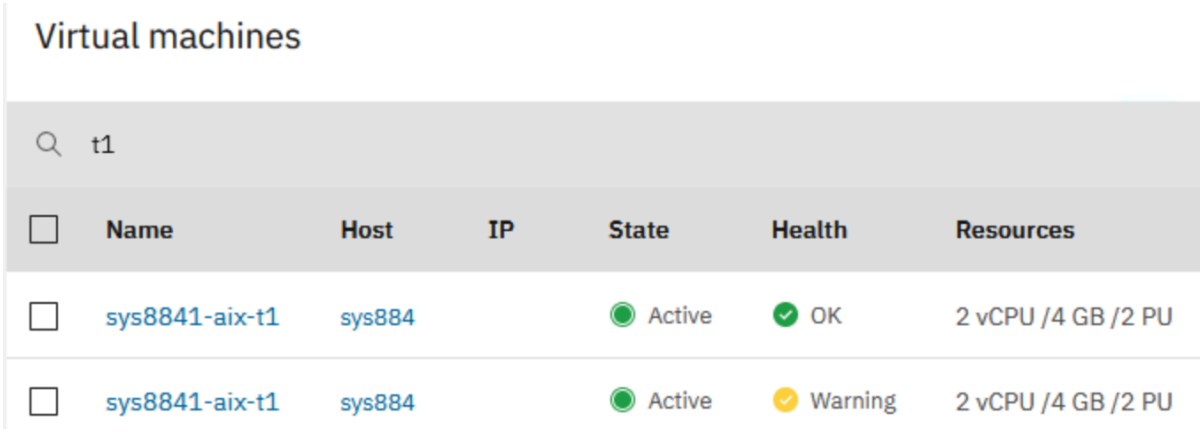
__ b. Note: You can safely ignore the following message in the PowerVC logs and notifications. This message is related to a bug in the version of PowerVC used in the lab. It does not prevent live update from completing successfully. This is resolved in a later fix pack release for this version of PowerVC.



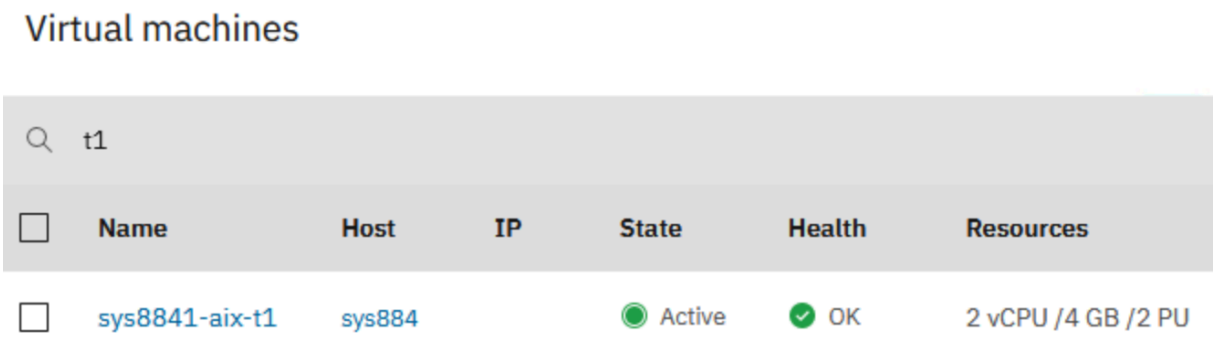
161. From the PowerVC UI, notice the newly deployed surrogate VM. You may need to press the refresh icon a few times for the list to update. The new VM will move from a state of **Building** to **Active** (the **Health** status will remain in a state of **Warning** for the much of the

live update process). You may also notice that the new surrogate VM is stopped and restarted a few times during the process.

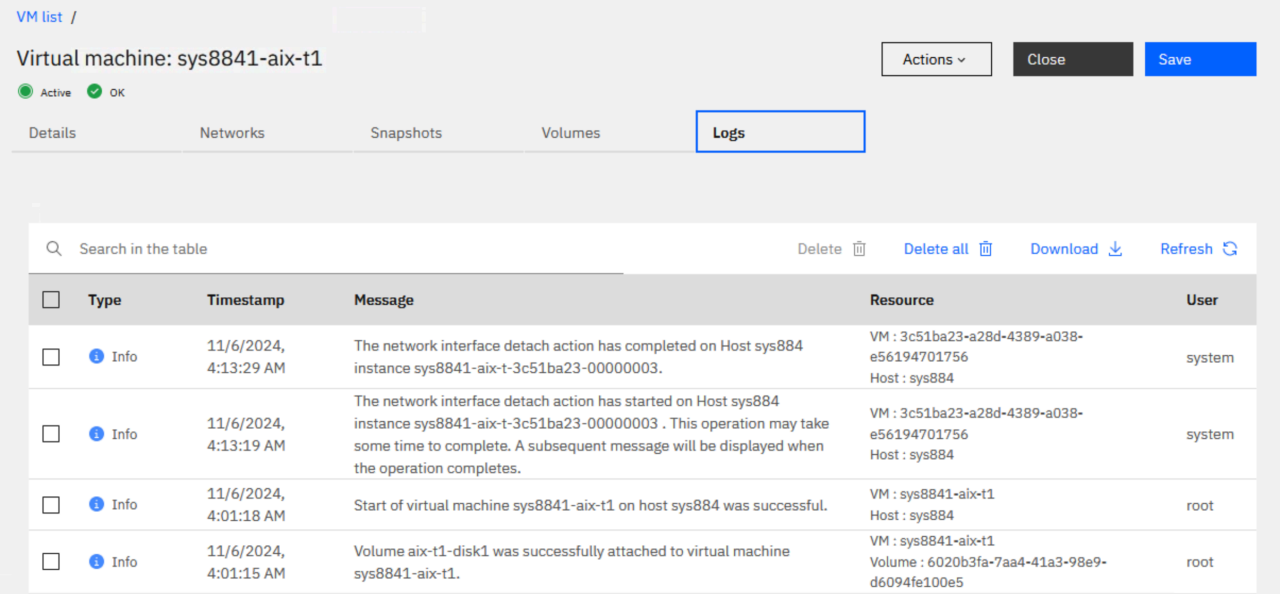




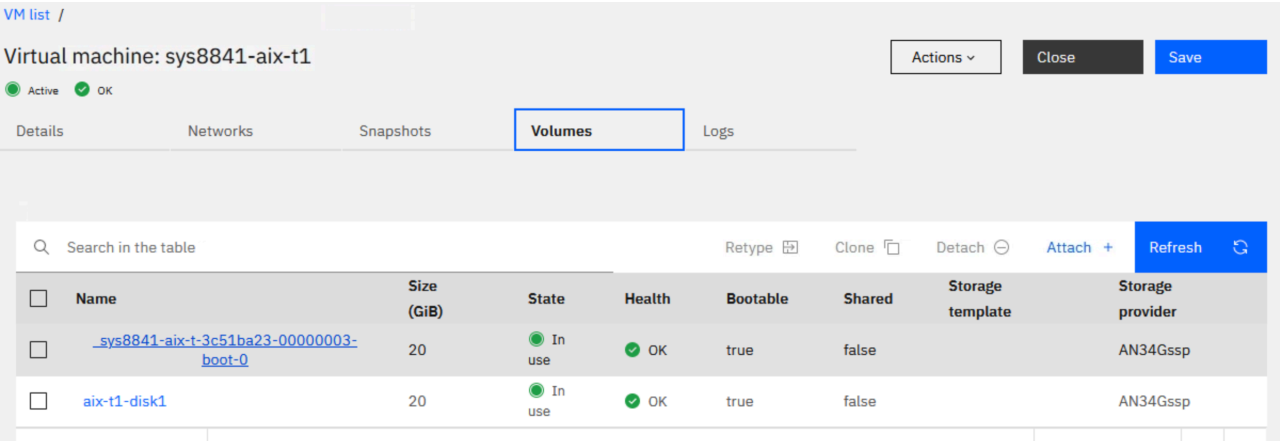
162. When the live update operation completes successfully, only the surrogate VM will remain.



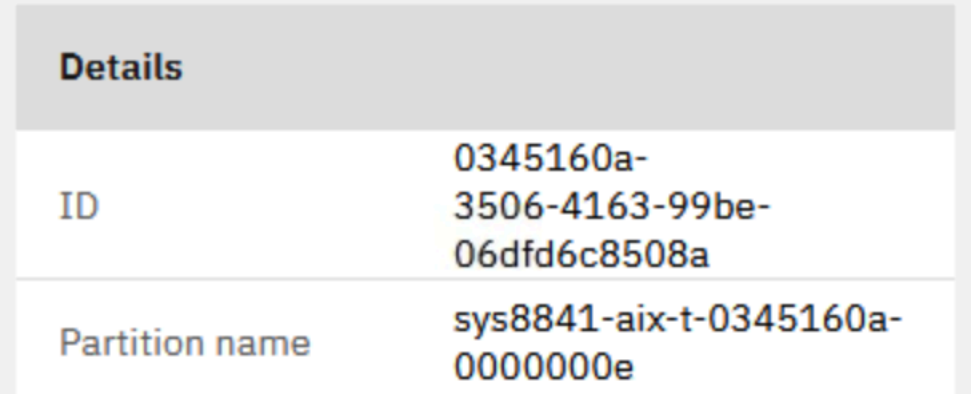
163. Select your VM again from the **VM list**. In your VM view panel, click **Logs**. Review the log entries.



164. In your VM view panel, click **Volumes**. Review the volumes assigned to your VM now. Observe that a new volume (…`boot-0`) has been automatically created and assigned to your VM for use by live update.



165. Click **Details** and look for the VM instance **ID**. Observe that this instance **ID** is different to the one viewed earlier. The output below is only an example, your information will be different.



166. Compare the VM instance **ID** with the results from the **uname** command on AIX. Note that part of the VM instance **ID** is included in this output.

uname -L

__ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # uname -L
7 sys8841-aix-t-0345160a-0000000e
```

167. Confirm that the ifix was installed successfully.

emgr -l

__ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # emgr -l

ID  STATE LABEL      INSTALL TIME      UPDATED BY ABSTRACT
=== ===== ========== ================= ==========
=====================================
1    S    IJ51842s2a 11/11/24 23:07:26          IFIX for IJ51842

STATE codes:
 S = STABLE
 M = MOUNTED
 U = UNMOUNTED
 Q = REBOOT REQUIRED
 B = BROKEN
 I = INSTALLING
 R = REMOVING
 T = TESTED
 P = PATCHED
 N = NOT PATCHED
 SP = STABLE + PATCHED
 SN = STABLE + NOT PATCHED
 QP = BOOT IMAGE MODIFIED + PATCHED
 QN = BOOT IMAGE MODIFIED + NOT PATCHED
 RQ = REMOVING + REBOOT REQUIRED
```

168. Check for the successful completion of the live update process in the AIX error report.

errpt | grep LVUPDATE

__ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # errpt | grep LVUPDATE
12295E0B 1106041324 I S LVUPDATE Live AIX update completed successfully
9A74C7AB 1106035024 I S LVUPDATE Live AIX update started
```

169. After the live update is completed, display the assigned physical volumes in AIX. Observe that there is a new disk (**hdisk2**) assigned to the **lvup_rootvg** volume group.

lspv

__ a. Command and sample output:

```
root@sys8841-aix-t1.ibm.edu / # lspv
```

```
hdisk0          00f9c199fd5067e4                rootvg          active
hdisk2          00f9c19900acd177                lvup_rootvg
```

170. Congratulations, you have now successfully completed your first PowerVC-based live update.

171. Close all open terminal sessions and web browser sessions, with all lab systems, now.

172. **Please Note:** This hands-on lab is based on exercises from the **Mastering IBM AIX Live Updates** class (course code **AN34G**), from the IBM Power Technical Training team. You can find more information on the complete course here: https://www.ibm.com/training/course/mastering-aix-live-update-AN34G

173. You can also find a list of all the AIX courses available from the IBM Power Technical Training team here: https://www.ibm.com/training/search?query=aix

End of workshop