Chris's AIX Live Update Best Practices for 2021!

 No Reboot Required!

Last Update: Aug 16th 2021

The official IBM AIX Live Update Best Practices are well documented here:

Best practices for the Live Update function
https://www.ibm.com/support/knowledgecenter/ssw_aix_72/com.ibm.aix.install/lvupdate_best_practice.htm

Please refer to these when planning a Live Update implementation in your environment.

I have written about my experiences with Live Update numerous times.

AIX Live Updates
http://gibsonnet.net/blog/cgaix/resource/AIXLiveUpdateblog.pdf

How to Live Update Your AIX System Without Rebooting the Server
http://gibsonnet.net/blog/cgaix/html/How%20to%20live%20update%20your%20AIX%20system%20without%20rebooting%20the%20server..html

Simplifying AIX Live Update with PowerVC
http://gibsonnet.net/blog/cgaix/html/Simplifying%20AIX%20Live%20Update%20with%20PowerVC.html

I've been testing and working with Live Updates over the last couple of years (since 2015). What follows are some of my "best practices", based on my experiences using this tool in the field. **They are not official IBM best practices and should be treated as such.** These are merely guidelines, based on anecdotal data I have collected whilst using the tool. I hope you find them useful. I'll update this page as I discover new items to add (or remove from) this list.

Best Practice 1. Always backup your system before a live update!
Always take a **mksysb**. Always create an **alt_disk_copy** of rootvg BEFORE you start a Live Update operation. Please ensure you have a way to back out cleanly.

Best Practice 2. Install your updates then perform a live update
Install your TL, SPs and ifixes then run Live Update. As per the picture below (from my LU presentation).

AIX 7.2 Live Update in a Nutshell

- **Chris's recommended BEST PRACTICE for Live update – install all your updates (including ifixes), just as you always have, then immediately start Live Update.**

- **PRIOR TO LIVE UPDATE:**
  - Spare disks available & configured (unless using PowerVC)
  - Configure **/var/adm/ras/liveupdate/lvupdate.data** (unless using PowerVC)
  - Run: **alt_disk_copy**
  - Run: **hmcauth (or pvcauth)**
  - Run: **geninstall -k –p** (verify LU environment is OK/ready)
  - Run: **smitty update_all** (update system now, if desired)
  - Run: **emgr** (install ifixes now, if desired)

- **PERFORM LIVE UPDATE:**
- Run one command: **geninstall –k**
- **You are done!**

- **Live Update restrictions (PLEASE READ THIS!!)**
  https://www.ibm.com/support/knowledgecenter/ssw_aix_72/com.ibm.aix.install/lvupdate_detail_restrict.htm

It may not be well known but you can use Live Update (**geninstall –k**) after you've installed AIX fixes. You don't have to include them in the Live Update process. You can patch the OS, and then kick off the LU process when you're done. The AIX knowledge center states:

*"**Note:** You can install any updates and interim fixes by using your preferred methods, and then perform a Live Update operation instead of restarting the system by running the following command:*

 # geninstall –k"

https://www.ibm.com/support/knowledgecenter/en/ssw_aix_72/com.ibm.aix.install/live_update_geninstall.htm

Note

You can install any updates and interim fixes by using your preferred methods, and then perform a Live Update operation instead of restarting the system by running the following command:

`# geninstall -k`

Here is an example of how you could perform a Live Update operation, immediately after you've patched your AIX OS. This example is taken from a PowerVC managed environment.

Here is an example of how you could perform a Live Update operation, immediately after you've patched your AIX OS. This example is taken from a PowerVC managed environment.

We start with an AIX system running AIX 7.2 TL5 SP1. We would like to **update it to SP2, WITHOUT A REBOOT!**

a) Create clone (backup) of current rootvg.

```
root@lkutest / # alt_disk_copy -Bd hdisk1
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.
Creating logical volume alt_hd6.
Creating logical volume alt_hd8.
Creating logical volume alt_hd4.
Creating logical volume alt_hd2.
Creating logical volume alt_hd9var.
Creating logical volume alt_hd3.
Creating logical volume alt_hd1.
Creating logical volume alt_hd10opt.
Creating logical volume alt_hd11admin.
Creating logical volume alt_lg_dumplv.
Creating logical volume alt_livedump.
Creating logical volume alt_datalv.
Creating /alt_inst/ file system.
Creating /alt_inst/admin file system.
Creating /alt_inst/data file system.
Creating /alt_inst/home file system.
Creating /alt_inst/opt file system.
Creating /alt_inst/tmp file system.
Creating /alt_inst/usr file system.
Creating /alt_inst/var file system.
Creating /alt_inst/var/adm/ras/livedump file system.
Generating a list of files
for backup and restore into the alternate file system...
Backing-up the rootvg files and restoring them to the alternate file
system...
Modifying ODM on cloned disk.
Building boot image on cloned disk.
forced unmount of /alt_inst/var/adm/ras/livedump
forced unmount of /alt_inst/var/adm/ras/livedump
forced unmount of /alt_inst/var
forced unmount of /alt_inst/var
forced unmount of /alt_inst/usr
forced unmount of /alt_inst/usr
forced unmount of /alt_inst/tmp
forced unmount of /alt_inst/tmp
forced unmount of /alt_inst/opt
forced unmount of /alt_inst/opt
forced unmount of /alt_inst/home
forced unmount of /alt_inst/home
forced unmount of /alt_inst/data
forced unmount of /alt_inst/data
forced unmount of /alt_inst/admin
forced unmount of /alt_inst/admin
forced unmount of /alt_inst
forced unmount of /alt_inst
Changing logical volume names in volume group descriptor area.
```

```
Fixing LV control blocks...
Fixing file system superblocks...
root@lkutest / #
```

b) Check current kernel build version. Check OS level prior to installing SP.

```
# cat /proc/version
Nov  3 2020
10:17:57
2045B_72V
@(#) _kdb_buildinfo unix_64 Nov  3 2020 10:17:57 2045B_72V

# oslevel -s
7200-05-01-2038
```

c) Authenticate with the PowerVC management server (or HMC if you're not using PowerVC).

```
root@lkutest / # pvcauth -u pvcadmin -p passw0rd -a cgpvc
root@lkutest / # pvcauth -l
Address  : 10.2.55.232
User name: pvcadmin
Project  : ibm-default
Port     : 5000
TTL      : 5:59:58
```

d) Install SP now. Install bos.rte.install first.

```
root@lkutest / # mount sydnim:/nim/cg/aix/aix72tl5sp2 /mnt
root@lkutest / # cd /mnt

root@lkutest /mnt # installp -d . bos.rte.install
...etc...

Installation Summary
--------------------
Name                       Level        Part      Event       Result
-------------------------------------------------------------------------
----
bos.rte.install            7.2.5.3      USR       APPLY       SUCCESS
bos.rte.install            7.2.5.3      ROOT      APPLY       SUCCESS
bos.rte.install            7.2.5.3      USR       COMMIT      SUCCESS
bos.rte.install            7.2.5.3      ROOT      COMMIT      SUCCESS
```

e) Install SP2 now using update_all. Confirm that SP2 has been installed. Do NOT reboot.

```
root@lkutest /mnt # update_all -Y -c -v -d .
........
bos.perf.libperfstat      7.2.5.1      USR       COMMIT      SUCCESS
bos.perf.libperfstat      7.2.5.1      ROOT      COMMIT      SUCCESS
bos.cluster.rte           7.2.5.1      USR       COMMIT      SUCCESS
bos.cluster.rte           7.2.5.1      ROOT      COMMIT      SUCCESS
bos.net.tcp.snmpd         7.2.5.1      USR       COMMIT      SUCCESS
bos.net.tcp.snmpd         7.2.5.1      ROOT      COMMIT      SUCCESS
bos.perf.tune             7.2.5.1      USR       COMMIT      SUCCESS
bos.perf.tune             7.2.5.1      ROOT      COMMIT      SUCCESS
bos.suma                  7.2.5.1      USR       COMMIT      SUCCESS
bos.suma                  7.2.5.1      ROOT      COMMIT      SUCCESS
```

```
bos.sysmgt.nim.client        7.2.5.1        USR        COMMIT        SUCCESS
bos.sysmgt.nim.client        7.2.5.1        ROOT       COMMIT        SUCCESS
mcr.rte                      7.2.5.2        USR        COMMIT        SUCCESS
mcr.rte                      7.2.5.2        ROOT       COMMIT        SUCCESS

installp:  * * *  A T T E N T I O N ! ! !
        Software changes processed during this session require this system
        and any of its diskless/dataless clients to be rebooted in order
        for the changes to be made effective.
     * * *  A T T E N T I O N  * * *
     System boot image has been updated. You must reboot the system
     after install_all_updates completes to properly integrate the updates.

install_all_updates: Checking for recommended maintenance level 7200-05.
install_all_updates: Executing /usr/bin/oslevel -rf, Result = 7200-05
install_all_updates: Verification completed.
install_all_updates: Log file is /var/adm/ras/install_all_updates.log
install_all_updates: Result = SUCCESS
root@lkutest /mnt #

root@lkutest /mnt # oslevel -s
7200-02-02-1810
```

f) Commit all applied updates now.

Starting with 7200-04-01, you will not be able to proceed until perform this step.
 # geninstall –k
0503-127 geninstall: Applied updates were found on the system.
Please commit all updates before running geninstall *to perform*
a Live Update.

```
# installp -c ALL
```

g) Perform Live Preview Update now.

```
# geninstall -kp
+--------------------------------------------------------------------------
---+
                  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: lkutest
  PowerVC: 10.1.1.50
  user: root
  Blackout time(in seconds): 9
  Total operation time(in seconds): 1145
  << 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.
***************************************************************************
****
```

h) Perform Live Update now.

```
# 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: lkutest
  PowerVC: 10.1.1.50
  user: root
  Blackout time(in seconds): 9
  Total operation time(in seconds): 1145
  << 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@lkutest (pts/0) at 00:40:23 ...

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@lkutest (pts/0) at 18:41:04 ...
```

Live AIX update completed.

i) Verify kernel build version is updated and now active.

```
# cat /proc/version
Mar 31 2021
12:11:47
2113B_72V
@(#) _kdb_buildinfo unix_64 Mar 31 2021 12:11:47 2113B_72V
```


Best Practice 3. PowerVC best practices for Live Update – nova configuration

a) network_allocate_retries
If you plan to use the Live Update function on a partition that is managed by PowerVC, you must set the **network_allocate_retries** property to a minimum value of 10 on the PowerVC server. This property must be specified in the **/etc/nova/nova.conf** file on the PowerVC server.

This prevents the following messages from appearing, after a Live Update operation:

"Failed to delete a virtual Ethernet adapter on the virtual machine. Check that the RMC is active for the virtual machine. Refer to the logs for more information"

and/or

"Cannot delete a virtual Ethernet adapter on the virtual machine because the HMC operation for delete failed with an HTTP error. Refer to the logs for more information and ensure that the virtual Ethernet adapter is manually removed after you attempt to delete it from the UI"

PowerVC logs will show error similar to this:

"2018-05-15 11:17:44.998 4643 ERROR powervc_nova.virt.ibmpowervm.hmc.driver [req-00a02a9c-61de-4d19-b809-d5e46ed08b99 80c16094b1b02ff4c70984790330525b64197707fe536f86cbea82d730304161 c3e51c6d67654131bcfaa77b8c4491ba - bf689afa9471460c876fadb2ae838f17 bf689afa9471460c876fadb2ae838f17] **Failed to delete a virtual Ethernet adapter on the virtual machine lkutest-548002b8-00000022.** *Check that the RMC is active for the virtual machine. Refer to the logs for more information.: K2HttpError: HTTP error for GET /rest/api/uom/LogicalPartition/1A088741-D22D-4444-A446-76E58D092761/ClientNetworkAdapter/a5293f04-b636-39db-8e2f-8110921f386f: 404 (Not Found)"*

Add this property as a new line as shown in the following example:

network_allocate_retries = 10

You must restart PowerVC for the change to take effect. e.g.

```
# head -2 /etc/nova/nova.conf
[DEFAULT]
network_allocate_retries = 10
….
```

b) instance_name_template
Changing the **instance_name_template** configuration setting in the PowerVC nova-XXX.conf file(s) can cause live update to fail. The following message will appear in the nova log file. e.g.

```
[root@pvc01 ~]# cd /var/log/nova
[root@pvc01 nova]# grep HSCL /var/log/nova/nova-compute-8305E6B_06699DR.log
, HSCL05DE A partition in the managed system already uses the name lkutest.
Provide another name for this partition.
```

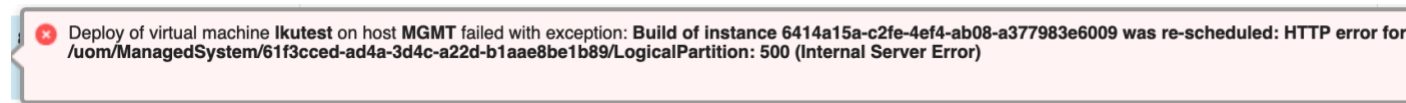PowerVC has the default **instance_name_template** value of :

```
instance_name_template = %(display_name).13s-%(uuid).8s-%(id)08x
```

Using this default value, new VMs deployed by PowerVC will be created with a unique name (as shown from the HMC) e.g. lkutest-642e9122-00000454.

If you change the default value, so that it creates new VMs with a short name, then new VMs will be deployed with a short name in PowerVC and on the HMC. For example lkutest (instead of lkutest-642e9122-00000454). e.g.

```
instance_name_template = %(display_name).20s
```

This will cause live update with PowerVC to fail with **500 (Internal Server Error)** error.



With this customised setting, PowerVC will try to deploy the surrogate VM with the **same name** as the original VM. This will fail, as the VM/LPAR names must be unique for live update to succeed. Changing the **instance_name_template** value is not currently supported with AIX live update and PowerVC.

You can check if your PowerVC environment is currently configured to use "short name" versus "long name" VMs, by viewing the "**Hypervisor partition name**" for a VM, from the PowerVC UI. e.g.

**Short VM name:**   Hypervisor partition name:   lkutest
**Long VM name:**    Hypervisor partition name:   lkutest-642e9122-00000454
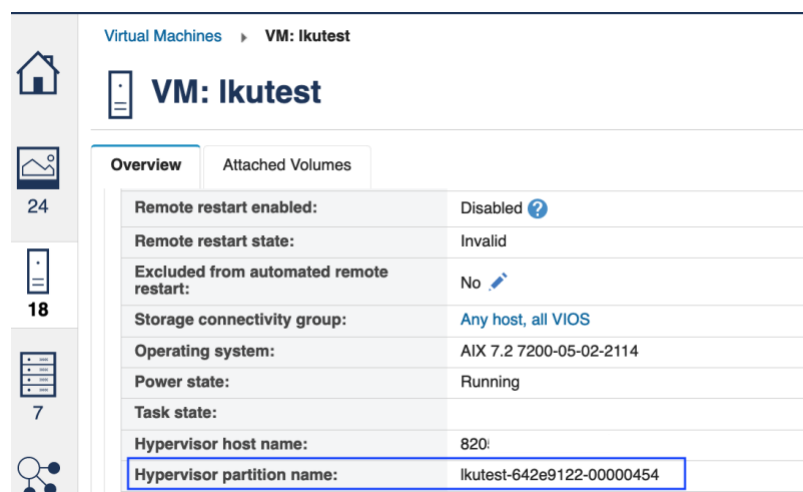


To avoid this issue, please leave the **instance_name_template** value at its default setting.

To return to the default values, edit the nova conf file(s) and restart the PowerVC nova service on the PowerVC server e.g.

```
[root@pvc01 nova]# vi nova-compute-8305E6B_06699DR.conf
[root@pvc01 nova]# grep instance_name_template nova-compute-
8305E6B_06699DR.conf
instance_name_template = %(display_name).13s-%(uuid).8s-
%(id)08x

[root@pvc01 nova]# /opt/ibm/powervc/bin/powervc-services nova
restart
```

Best Practice 4. Live Update "Blackout Time" Reporting

Use the **alog** command to check the actual blackout period during the *Blackout Time*, whilst the workload is moved from the Original to the Surrogate partition. e.g.

```
root@lkutest / # alog -t mobte -o
time=051418:11:05:02 pid=18577631930744833 type=Global
dep_mfreq=4572472429Hz dep_sfreq=4572472429Hz dep_cont=100 bw=60000000B/s
dep_iorbw=571837866B/s dep_iowbw=366226530B/s dep_pipebw=273906256B/s
dep_rvgsz=20448MB dep_lulvsz=4542MB dep_cpuavail=10000 dep_flags=0x0
arr_mfreq=4572472429Hz arr_sfreq=4572472429Hz arr_cont=100
arr_iorbw=571837866B/s arr_iowbw=366226530B/s arr_pipebw=273906256B/s
arr_rvgsz=20448MB arr_lulvsz=4542MB arr_cpuavail=10000 arr_flags=0x0
files=87 procs=44 threads=140 datasz=931088B socks=40 mempg=15077 nmqs=3
nmsgs=0 nqbs=0 nsems=7 shmsz=0 mmapsz=30677 flags=0x0
stdl_blackout=12.000000s stdl_global=1218.000000s blackout=11.417990s
global=1642.088501s
```

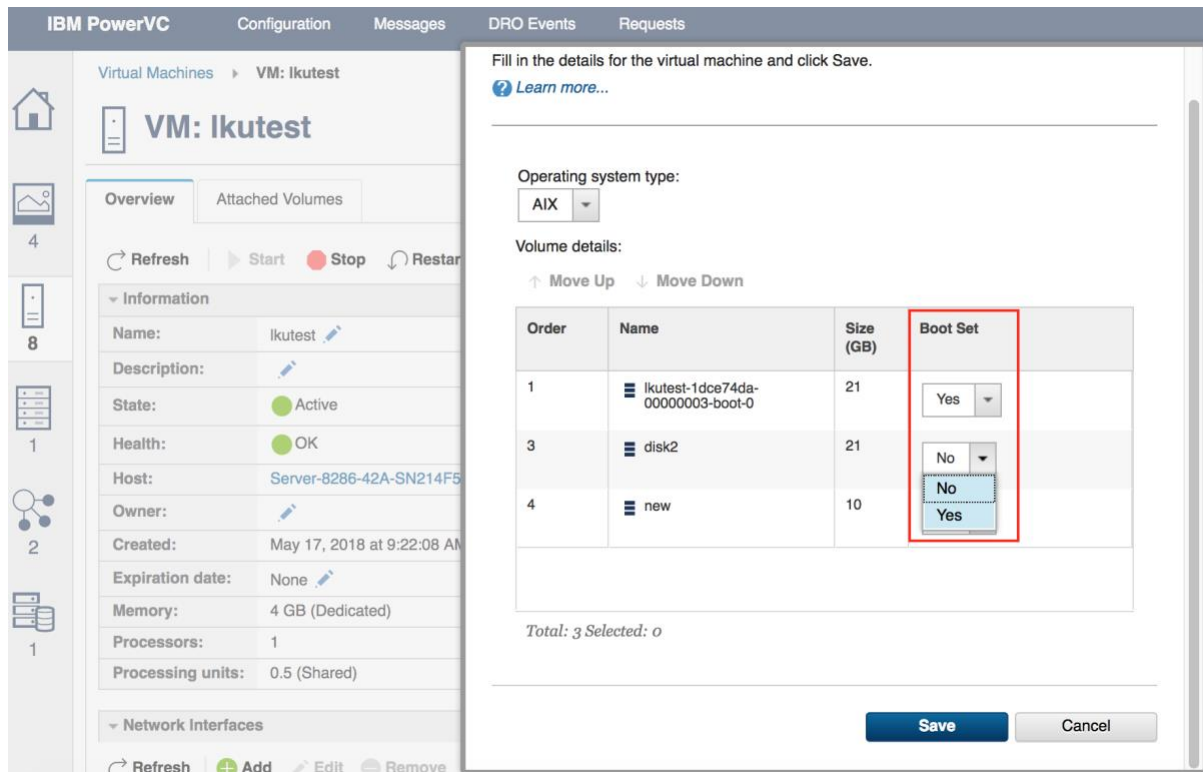## Best Practice 5. Live Update Boot Volumes in PowerVC

If you encounter the message below, when performing a Live Update with PowerVC, ensure that the boot disks are set correctly in PowerVC and try again. You can change the "Boot Set" to Yes for a VM by selecting it in PowerVC and editing its details.

```
1430-207 FAILED: Not all rootvg volumes are boot volumes in PowerVC.
```

Best Practice 6. Please read the Live Update restrictions and limitations resources BEFORE you attempt to use the tool!

Please read the Live Update restrictions and limitations resources *BEFORE* you attempt to use the tool. There are currently many restrictions and limitations that exist with Live Update. Make sure you are aware of the current constraints and evaluate if they will impact your environment or not.

Live Update restrictions

https://www.ibm.com/support/knowledgecenter/ssw_aix_72/com.ibm.aix.install/lvupdate_detail_restrict.htm

LPAR requirements for Live Update

https://www.ibm.com/support/knowledgecenter/ssw_aix_72/com.ibm.aix.install/lvupdate_limitations.htm

Best Practice 7. Try Live Updates without any installing updates!

Try Live Updates without applying updates! AIX Live Update is designed to be transparent to the running applications. With AIX 7.2.1, there is an easy way to try it out with your own workload, without having to apply an update.

Simply try **geninstall –k –p** (**preview**) to make sure that everything is okay with your configuration, and then use **geninstall –k** to perform the Live Update operation without applying an update.

Best Practice 8. Check all requisite filesets are installed for bos.liveupdate.rte

Ensure that the following filesets are installed on your AIX system. Fileset requisites for bos.liveupdate.rte are:

- artex.base.rte
- rsct.basic.rte

There is a known issue where the bos.liveupdate.rte update fileset is missing the check for several requisites that are necessary for the live update operation.

IV99459: FIX REQUISITES FOR BOS.LIVEUPDATE.RTE UPDATE FILESET
http://www-01.ibm.com/support/docview.wss?uid=isg1IV99459

I've encountered the following error when the **rsct.basic** fileset is not installed. You will observe the following in the **/var/ct/lvupd/ctlvupd.log** file:

```
Wed Nov 15 09:10:06 PST 2017 (12452188) : phase_check_on_original: CHECK
phase on ORIGINAL exiting with return code, 5
Wed Nov 15 09:11:12 PST 2017 (11469192) : rsct.basic fileset is not
installed.
```

Best Practice 9. Use clvupdate to clean up the system if a Live Update operation fails

The **/usr/sbin/clvupdate** utility is a command that can be used when troubleshooting or resolving issues with AIX Live Update. It is included with the bos.liveupdate.rte fileset. The clvupdate command is now a supported command. You can refer to the documentation for more information on the available options and usage (https://www.ibm.com/support/knowledgecenter/ssw_aix_72/com.ibm.aix.cmds1/clvupdate.htm). If necessary, please seek advice and guidance from IBM support before using this tool in a Live Update environment.

```
# lslpp -w /usr/sbin/clvupdate
  File                                          Fileset            Type
  ----------------------------------------------------------------------
  /usr/sbin/clvupdate                           bos.liveupdate.rte File


Usage:
    Attempt to clean up partition after a failed Live Update operation:
            clvupdate [-e] [-o] [-u]
            clvupdate [-e] [-n] [-u]
            clvupdate -d
            clvupdate -l
            clvupdate -r
            clvupdate -v

Flags:
    -d Remove surrogate boot disks only
    -e Ignore Live Update state
    -l Unlock Live Update lock only
    -n Run LVUP_ERROR phase scripts
    -o Force original shutdown
    -r Reset Live Update state and status only
    -u Ignore Live Update status
    -v Remove volume group from previous Live Update
```

Best Practice 10. Troubleshooting and debugging live update problems

Please refer to the **/var/adm/ras/liveupdate/logs/lvupdlog** log file for debugging information when troubleshooting a Live Update issue. This log file can provide very useful information if you are trying to determine why Live Update is not behaving as you would expect. The IBM support team will also use this log file to assist them with problem determination. They may ask you to collect additional information. Please refer to the **Live Kernel Update Must Gather Technote** for the additional steps.

Live Kernel Update Must Gather
https://www-01.ibm.com/support/docview.wss?uid=isg3T1023961

Best Practice 11. Use clvupdate to cleanup temporary storage volumes in PowerVC

In a PowerVC managed environment, please use the **clvupdate –v** command to remove the **lvup_rootvg** volume, post a Live Update operation and a reboot.

Removal of original LPAR and cleanup of resources after Live Update. If you wish to remove the Live Update surrogate boot disk (lvup_rootvg, after a reboot), you can use the clvupdate command. This command will contact the PowerVC management server (requires a pvcauth token) and will automatically remove the volume group and disk from the LPAR, as shown below.

```
; reboot LPAR
root@orion / # uptime
04:42AM   up 1 mins,  1 user,  load average: 1.08, 0.40, 0.15

root@orion / # lspv
hdisk0         00f94f587d8b0203                     rootvg          active
hdisk1         00f94f584f60b1c1                     lvup_rootvg

root@orion / # pvcauth -u pvcadmin -p maxpeck123 -a cgpvc
root@orion / # pvcauth -l
Address  : 10.1.50.232
User name: pvcadmin
Project  : ibm-default
Port     : 5000
TTL      : 5:59:53

root@orion / # clvupdate -v
The temporary Live Update storage was successfully removed.
Cleanup action succeeded.

root@orion / # lspv
hdisk0         00f94f587d8b0203                     rootvg          active
```

A message will appear in the PowerVC UI, indicating that the volume has been detached from the VM and deleted.

Best Practice 12. Check for missing disk paths before starting live update

Remove any missing disk paths using the rmpath command. Missing paths do not typically present any functional issues to a running AIX system. However, if not resolved, they can introduce errors with live update, that can be difficult to troubleshoot. I've submitted an RFE to check and warn for paths/devices in this state.

```
# lspath
Enabled hdisk5 vscsi1
Enabled hdisk3 vscsi1
Enabled hdisk4 vscsi1
Enabled hdisk0 vscsi1
Enabled hdisk1 vscsi1
Enabled hdisk2 vscsi1
Missing hdisk5 vscsi2
Enabled hdisk3 vscsi2
Missing hdisk4 vscsi2
Missing hdisk0 vscsi2
Enabled hdisk1 vscsi2
Missing hdisk2 vscsi2
Enabled hdisk6 vscsi1
Missing hdisk6 vscsi2
Enabled hdisk6 vscsi2
Enabled hdisk0 vscsi2
Enabled hdisk2 vscsi2
Enabled hdisk4 vscsi2

# rmpath -dl hdisk0 -p vscsi2
paths Deleted
# rmpath -dl hdisk2 -p vscsi2
paths Deleted
# rmpath -dl hdisk4 -p vscsi2
paths Deleted
# rmpath -dl hdisk5 -p vscsi2
paths Deleted
# rmpath -dl hdisk6 -p vscsi2
paths Deleted
```

https://www.ibm.com/support/knowledgecenter/ssw_aix_72/com.ibm.aix.install/lvupdate_best_practice.htm

Best Practice 13. Live Update Rollback best practices

Can I perform a rollback or backout "online" or "live" i.e. without a reboot?
A non-disruptive rollback is possible today with ifixes, but not Service Packs or Technology Levels. For an ifix you can remove the ifix, and instead of a reboot, do another Live Update with no other updates (**geninstall –kp**, then, **geninstall -k**).

Best Practice 14. Use DPO to check LPAR placement after live update

LPAR placement may have changed. Same as LPM. Use DPO to check and optimise if necessary. (lssrad –av on AIX. optmem DPO on the HMC).

Best Practice 15. Use genld to list processes that have old versions of libraries loaded

After a live update some apps will still use old versions of libraries. Is there a way to tell which apps are affected? The genld command is enhanced to list processes that have an old version of a library loaded so that processes can be restarted when needed in order to load the updated libraries. The new "-u" option lists only processes that have old versions of loaded objects.

https://www.ibm.com/support/knowledgecenter/en/ssw_aix_72/g_commands/genld.html

```
e.g.

# genld -lu
Proc_pid: 4915634   Proc_name: hostmibd
  9000000004f5ce0   16c90  /usr/lib/libcfg.a[shr_64.o]

Proc_pid: 5177766   Proc_name: nimsh
        d0609100   15f27  /usr/lib/libcfg.a[shr.o]

Proc_pid: 5308838   Proc_name: aso
  9000000004f5ce0   16c90  /usr/lib/libcfg.a[shr_64.o]

Proc_pid: 5767616   Proc_name: rpc.lockd
        d0609100   15f27  /usr/lib/libcfg.a[shr.o]

Proc_pid: 6947326   Proc_name: IBM.HostRMd
        d0609100   15f27  /usr/lib/libcfg.a[shr.o]

Proc_pid: 7078374   Proc_name: clcomd
        d0609100   15f27  /usr/lib/libcfg.a[shr.o]

Proc_pid: 7799098   Proc_name: sshd
        d0609100   15f27  /usr/lib/libcfg.a[shr.o]

Proc_pid: 7864602   Proc_name: sshd
        d0609100   15f27  /usr/lib/libcfg.a[shr.o]

Proc_pid: 8257802   Proc_name: rmcd
        d0609100   15f27  /usr/lib/libcfg.a[shr.o]

Proc_pid: 8585628   Proc_name: IBM.MgmtDomainRMd
        d0609100   15f27  /usr/lib/libcfg.a[shr.o]

Proc_pid: 8782132   Proc_name: IBM.ConfigRMd
        d0609100   15f27  /usr/lib/libcfg.a[shr.o]

Proc_pid: 9765170   Proc_name: topasrec
        d0609100   15f27  /usr/lib/libcfg.a[shr.o]
```

Best Practice 16. AIX Live Update and the Virtual I/O Server

I would like to know if I can use Live update to update the underlying AIX on our VIO-LPARs? No, AIX Live Update cannot be used to update VIOS. Most clients run dual VIOS so they can upgrade one at a time and keep their client LPARs running, without disruption.

Other Considerations

What is the typical blackout time for AIX Live Update?
"15 second time frame is about right for a lab environment but in real world I have seen times closer to 30-45 second range. This was an oracle workload and it actually recovers fine. The other systems were able to connect back to it with no issues. I tell people that if your application works well in a PowerHA active/passive environment it will work well with Live Update."

I don't have enough CPU to adopt Live Update! Help!

AIX Live Update with CPU Reduction
http://gibsonnet.net/blog/cgaix/html/AIX%20Live%20Update%20with%20CPU%20Reduction.html

AIX Live Update Across Frames
https://www.ibm.com/support/pages/node/6156195

http://gibsonnet.net/blog/cgaix/html/Testing%20AIX%20Live%20Update%20Across%20Power%20Systems%20Frames.html

Other Resources and Reference Material

David Sheffield's Video: Introducing AIX 7.2.1 Live Update
https://www.youtube.com/watch?v=dHvBQOXtjaY

AIX 7.2 Knowledge Center – Live Update
http://www-01.ibm.com/support/knowledgecenter/ssw_aix_72/com.ibm.aix.install/live_update_install.htm

2018 IBM Systems Technical University April 30th – May 4th, Orlando, Florida
a100000 - Update your AIX system without a reboot!
http://gibsonnet.net/blog/cgaix/resource/AIX_7.2_Live_Update_a100000.pdf

IBM AIX 7.2 Live Update - Experiences testing AIX 7.2 Live Update feature with Oracle Database 12c Release 2
https://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP102794

Configuring IBM DB2 with BLU Acceleration to support IBM AIX Live Update
https://developer.ibm.com/articles/au-aix-db2-blu/

SAP Applications with AIX Live Update. Last Updated May 19th 2021
https://www.ibm.com/support/pages/sap-applications-aix-live-update

Live Update Cookbook. March 30th 2021. Written by a customer (Christian Sonnemans)that is actually using LU in their environment! EXCELLENT RESOURCE! HIGHLY RECOMMENDED!!
https://community.ibm.com/community/user/power/blogs/christian-sonnemans1/2021/03/27/live-update-cookbook

AIX Live Update

Overview

Live update is a significant enhance to the AIX 7.2 Enterprise offering that allows customers to update a running kernel without shutting down an active workload.

Prior to AIX7.2TL1, major and minor releases of AIX required a reboot of the system for a new kernel to become active. This required application outages with the attached coordination issues. Even important updates got delayed causing issues that should never have occurred.

This offering covers concepts, implementation, configuration, monitoring, limitations as well as future direction of the Live Update technology. One objective of this engagement is to help focus ongoing development to meet actual customer's use cases and practices.

This offering provides a customer or business partner knowledge and hands-on experience to make an Intelligent decision when implementing Live Update technology over traditional migration strategies. This offering is a quick, cost effective method to integrate this new technology into an existing Power environment, training IT Staff and obtaining the best availability possible from IBM Power architecture.

Who benefits from this workshop?

* Customers and Business Partners considering Live Update over traditional migration strategies.

* Customers looking to quickly implement Live Updating into existing Power7 and Power8 environments and train their IT staff

* Business partners requiring the knowledge and skills necessary to assist customers evaluating workloads for Live Update

* Business partners and customers performing POC engagements to evaluate Live Update and integrate into exiting customer procedures and environments.

Duration:

* 3 – 4 day engagement. Customers and Business Partners preparing to implement AIX7.2 and achieve maximum application availability POC(Proof of Concept)

Delivery:

This is an onsite offering consisting of standup lectures. Presentation handouts are provided in PowerPoint format.
If the scope of this offering is to implement Live Update into an existing customer or POC environment, IBM will conduct a design and requirements review to insure successful updating of an AIX7.2TL1SP0 LPAR to a later service pack or TL.

Topics:

* Overview of traditional migration methodologies
* Introduction of Live Update concepts, design and comparison to traditional OS update technologies
* Introduction of Live Update requirements and Configuration options
* Configure AIX LPAR for Live Update and examining resource requirements

Terms and Conditions: Actual Tasks, Deliverables, Service Estimates, and travel requirements vary with each client's environment. When we have reached a final agreement on the scope of your initiative and our level of assistance, a formal document describing our proposed work effort, costs, etc, will be presented for your approval and signature.