

# Tools You Can Use: Planning and Memory

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While many of us know and regularly use the AIX tools IBM provides, as time goes by, these tools get enhanced and new ones added. So let's examine some of the newer or updated tools and flags, specifically related to:

- System Planning Tool (SPT)
- Active Memory Expansion (AME), and
- Network Install Manager (NIM) commands

## SPT

SPT is great for designing a system, especially when it comes to mapping cards to I/O drawers and so on. It has been repeatedly upgraded and additional functions have been added. The current version (6.12.109.0) can be used to design and document systems. For the most part, I export a .sysplan file from the hardware management console (HMC) before and after any changes. This provides great documentation and makes it easy to rebuild the server from scratch should it become necessary.

Although a .sysplan file can be used to deploy LPARs or as input to econfig, I primarily use it to document the system. SPT keeps track all of the resources assigned to the LPARs as well as providing diagrams and slot mappings. In a disaster situation or even for day-to-day purposes, the system plan is one of the better tools to document what's needed to rapidly recreate the system.

## AME

A POWER7 technology, AME allows an administrator to define an LPAR with less physical memory than it actually needs to run. It relies on memory compression, which kicks in only when it's necessary to use memory beyond that defined as the base.

For example, if an LPAR needs around 6GB at peak but only 3GB most of the time, it could be defined with 3GB and an AME expansion factor of 2. This lets the LPAR use up to 6GB with compression starting after the first 3GB are in use. Its implementation requires the POWER7 server is licensed for AME and that the HMC and AIX are at specific minimum levels. However, it can be useful in dynamic environments, especially when the system is short on memory but has a few spare CPU cycles. I use it regularly on my dev/test systems to run more LPARs on the server.

AME is transparent to applications, which makes it easy to implement. Adding AME to an LPAR requires completing a few fields in the profile definition in the HMC, and then the LPAR needs to be reactivated. One way to avoid this is to always define AME to all LPARs while setting the expansion factor to 1.0. This effectively disables AME while allowing the expansion factor to be increased dynamically without needing to reactivate the LPAR.

AME isn't designed for LPARs that are short on both memory and CPU as compression will use some CPU. Also, AME only uses the smaller memory page sizes, so some of the larger page sizes aren't available. And, in a Live Partition Mobility (LPM) environment, both servers must have AME enabled.

The amepat command can be used for planning and monitoring AME once it's running in active mode.

The command runs on POWER4 through POWER7 servers and AIX 7 or AIX 6.1 TL04 and higher. amepat provides statistics and recommendations on how to use AME to reduce the required physical memory for the LPAR and how much additional CPU it would need for compression and decompression activities.

While many administrators are aware of AME, not everyone is aware that several commands have been updated to report AME statistics. These include the following:

- svmon -G -O summary=ame,pgsz=on,unit=MB
- lparstat -i
- lparstat -c
- vmstat -c
- topas (new AME section)

Lastly, topas\_nmon will record AME information in the .nmon file, which can then be post-processed.

AME should be in everyone's toolbox in a POWER7 environment. It won't be used everywhere, but it can save significant amounts of memory in dev/test and non-database environments.

## Media Management

One of the most frustrating things is trying to find or load install media. Many LPARs don't have attached DVD readers or do not have access to them. For servers that had VIO servers I started using file backed optical (FBO) some time ago. This allowed me to load iso images of media into a repository on my VIO server, which then could be made available to the client LPARs on that server. However, this meant duplicating the repositories on each server's VIO server. There's now the capability to use the loopmount command to mount iso images directly into filesystems on an LPAR. As an example:

After using software to rip the AIX 7 base dvd to a .iso file, it was uploaded to a network file system (NFS) server. On the NFS client:

```
loopmount -i aixv7-base.iso -m /jaqui -o "-V cdrfs -o ro"
```

This mounts the AIX 7 base iso as a filesystem called /jaqui. You can now create an lpp\_source or spot from the iso, or you can simply read the files.

## NIM

Three tools were added to the NIM repertoire—nimadm, nim\_alt\_clone and multibos. Taking advantage of these can make life easier for administrators who need to perform upgrades, especially because they significantly reduce the time needed to back out an upgrade.

The NIM alternate disk migration or nimadm command is a utility that allows the system administrator to create a copy of rootvg to a free disk and to simultaneously migrate it to a new version or release level of AIX. This is far less risky than taking a backup, booting from the DVD and doing an in-place migration. It's a simple reset of the bootlist and a reboot to fall back to the old system, as all of the changes are made to the copy on the additional disk.

Similarly, nim\_alt\_clone is used to clone rootvg and then perform an update. The primary difference from nimadm is it's typically used to update the system within the same version and release, i.e. upgrading to new technology levels and service packs.

Finally, we have multibos, which allows the root administrator to create multiple instances of AIX on the same disk. So on a single disk, the administrator could create update, and manage multiple versions of the OS on a rootvg. This is done by setting up an alternate OS that boots from a separate boot logical volume (BLV).

These three tools greatly supplement the NIM toolkit, making system updates easier and safer.

## **Make Life Easier**

These are just a few of the tools that should be in an administrator's toolbox to make life easier. Becoming familiar with these will assist in ensuring you get the maximum out of your servers with minimal risk.

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