



## IBM AIX Live Application Mobility demo

### *Moving DB2 in an SAP environment*

R: Hello and welcome to a demonstration of the live application mobility technology possible with AIX 6.1. My name is Rich Bassemir and I am here with Joe Pu. Hello Joe.

J: Hello

R: What we are going to show you is a sample of the technology called live application mobility and how it might be used.

J: Rich, can you give us a brief explanation of live application mobility?

R: I guess the simplest way to describe it Joe is the ability to move an application running on one system to another physical system without having to stop the application.

J: Amazing. Okay, let's see how this works....

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R: Let's take a look at our environment for this demo. We have 4 systems. A large p570 with 16 processors that is our "production" system. A smaller p510 that is currently running a DB2 database server. A NFS server and a SAP test case driver we will use to simulate a SAP user workload. In our demo we will move the DB2 database server running on the p510 to the larger p570 while the driver is simulating the SAP user workload.

J: Why might we want to move the DB2 server?

R: Good question. There are multiple reasons one might want to move this application. For example, let's say you wanted to consolidate IT resources on the larger p570, or maybe the p510 is scheduled for service maintenance, or maybe the p510 is under powered for the DB2 application and needs to be upgraded.

J: So you can move the DB2 server without shutting down the SAP solution using the database.

R: exactly. This gives the IT shop more flexibility in managing their resources.

J: okay you have my interest, tell us more.

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R: Let's look a little closer at the systems the demo is using. The p570 is a large machine that has been partitioned up into multiple LPARs. The LPAR we are using is the one we call LPAR1 in this diagram. It is an LPAR that is assigned 1.5 CPU, 10 gigs of memory and is running AIX 6.1 SP1.

J: Do we have to be running AIX 6.1?

R: yes. AIX 6.1 is necessary to do live application mobility. You will see our p510 is also carved up into multiple LPARs. The LPAR we are using is the one we called LPAR2 in this diagram. It is an LPAR that is assigned just 1 CPU, 16 gigs of memory and is also running AIX 6.1 SP1

J: Why do we need the NFS server?

R: ah, the NFS server is necessary because it supplies the disk I/O that the database server is using. If the database server was running on local disks on our p510 that we would certainly have a problem moving the database if the p510 was taken away. Good question.

J: okay, so how are we going to move the DB2 server?

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R: To explain what is going to happen we need to look at what each of those LPARs are running. This figure shows our two LPARs, LPAR1 and LPAR2. The smaller circles represent workload partitions or WPARs. We have a DB2 running in a WPAR on LPAR2 and a SAP server running on a WPAR in LPAR1.

J: For those folks that might not have heard of a WPAR before can you tell us what it is?

R: Very simply put, a WPAR is a software-created virtual operating system that is running under a single instance of AIX 6.1.

J: So in the example here the DB2 server is running in this virtual operating system environment with LPAR2.

R: Correct. And it is necessary for the application to be running in a WPAR in order to move it to another system.

J: How hard is it to build a WPAR environment?

R: It is not hard at all but outside the scope of our demo so I would refer people to some of the great references available in Redbooks, FAQs and whitepapers online.

What this demo is going to do is move the WPAR running DB2 from LPAR2 to LPAR1.

J: Okay, Rich how does this happen?

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R: Moving the WPAR is extremely simple using a licensable product called Workload Partitions Manager for AIX.

J: Is this required software?

R: Technically I understand a move could be done without the WPAR manager but it requires a deep understanding of the steps and coordination between the target and source systems.

J: So you would not recommend it?

R: No I wouldn't. You will see how easy it is to relocate a WPAR in the demo. Here is the welcome screen for the WPAR manager. If we expand the Resources view.

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R: And select the managed systems link

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R: We see all the systems this WPAR manager recognizes

J: So this is a list of all systems that are registered with the WPAR manager?

R: correct. Which is great because WPAR manager provides a single point of control for all your different WPARs. In our example here, we are only managing two different systems.

If we select the workload partitions link.

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R: You can see here we are presented with a list of all WPARs registered with the WPAR manager. There is a SAP WPAR and the DB2 WPAR.

J: I see both of them are currently active, why is only one of them checked as relocatable?

R: That was because when the sap WPAR was created it was not defined as a partition that could be relocatable.

J: So the DB2 WPAR is the mobile and the WPAR we are going to move.

R: That's right, but before we start the move let's look closer at our environment. Let's telnet to the LPAR1 system

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R: Here we have a telnet session with LPAR1. This is the LPAR running SAP. If we type the command lswpar.

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J: ah, I see the sap WPAR listed

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R: and if we type the command lparstat we see information about this LPAR

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J: yes, we can see the LPAR has an entitlement of 1.5 processing units and 10 gigs of memory.

R: Yep, now let's minimize this window and telnet into our second LPAR, LPAR2

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No action

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R: let's type the command lswpar here

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R: and we see this LPAR is running the DB2 WPAR

J: and what if we run lparstat on this partition?

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No action

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R: here we see that this LPAR has an entitlement of one CPU and 16 GB of memory. Let's minimize this window and now look at the monitors we will use during the demo

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R: We are using an LPAR monitoring tool call gmon. The red dial will show how many processing units LPAR1 is using. This is the LPAR running the SAP server. The green dial shows how many processing units are used by LPAR2, the LPAR running the DB2 database.

J: No much activity on them now.

R: Once we start the driver we will see that change. Let's check to make sure the SAP server is running. We will open a telnet session with the WPAR running the SAP server.

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R: I will change to the right user

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R: and issue the start SAP command

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R: and we see that SAP is already running, so let's minimize this window and check to make sure our DB2 database is running by opening a telnet session with the WPAR where the DB2 server is running

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R: In this DB2 WPAR I will change to the db2 user

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R: and start the db2 server

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R: you can see from the response that the db2 server is already running. Since SAP and DB2 are both up and running we will now start the SAP user load. I will minimize this window and open a telnet session with the SAP driver.

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R: From this telnet session with the SAP workload driver I will change directories

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R: and issue the benchrun command

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R: The workload has started and the script is now just waiting for the simulation to finish so let's minimize this session.

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R: Next we want to monitor the SAP workload. To do this we will use a script called simstat. We need to open a new telnet session with the SAP WPAR.

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R: Here in the telnet window we will change to the appropriate directory and start the simstat script. The simstat script has started and will report every 30 seconds the active users and response times.

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R: The monitor has started. We see the column labeled UACT, our active users, ramping up to 200. This test is set to run 200 users. We will use this column to monitor the active SAP users.

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R: We are monitoring SAP every 30 seconds. This demo is not running real time but instead we are capturing screens every 30 seconds.

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R: As we are ramping up you will notice that red dial is showing us the CPU resources the SAP server is using and the green dial indicates the CPU resources the DB2 server is using.

The DB2 server is using less than one tenth of a CPU. The SAP server is using about  $\frac{3}{4}$  of a CPU worth of resources.

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R: See how the resources used continue to climb. DB2 now greater than .1 and SAP is using a full CPU worth of resources.

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R: Now that the load is up to the full 200 users, let's initiate the relocation.

J: How do we do that?

R: We use the WPAR manager and select the DB2 WPAR

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R: Then we select Actions and the select "relocate" option

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R: We are presented with a decision as to where to move the WPAR. Notice that the WPAR manager will suggest the best available system. In our case here it is also the only available system. I will accept that target system and click okay.

J: Is that all there is to it?

R: It is that easy when you use the WPAR manager

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R: Notice how WPAR manager now reports the state of this WPAR as Transitional. The WPAR manager is working on moving that WPAR. It will go through a series of steps to complete the relocation.

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R: Notice the usage on the green dial. That LPAR is now using 100% of its CPU resources.

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J: I also see the number of active users on SAP has dropped to zero.

R: That's right; we don't have any active users while the WPAR is being prepared for the move. The applications on the WPAR are stopped and the state of the WPAR is being checkpointed.

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R: The LPAR2 went 100% utilization of its entitlement of one CPU.

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J: I see the db2 WPAR has gone to zero.

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R: Yep, and notice that it is now on that the DB2 WPAR is once again active on the new LPAR, LPAR1. You will also notice that 200 active SAP users are coming back.

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R: Now that all 200 users are back the relocation is complete. Let's telnet back into the LPAR2 partition.

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R: and if we issue the lswpar command we see the db2 WPAR is no longer listed.

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R: If we minimize this session and open our telnet session on LPAR1

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R: and run lswpar again

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J: There are now two WPARs running on this LPAR.

R: Our relocation has in deed completed and we can now remove our p510 for service (if all the other LPARs are down).

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J: The WPAR manager sure makes this process easy.

R: Yes but actually the WPAR manager did a lot of things under the covers. Let's look at all the tasks the WPAR manager completed. If we select the "monitoring" link.

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R: and select "task activity"

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R: we see a list of all relocations done in the last 24 hours. Let's expand the most recent one, the one we just completed.

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R: I'll expand this window

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R: and let's move the scroll bar so we can see the full list

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R: We now see a list of all the steps the WPAR manager took to successfully move the db2 WPAR from one LPAR to another.

J: There is a lot of steps. I can see why one would want to use the WPAR manager to relocate a partition.

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R: That completes the demo. If you are interested in learning more about WPARs or live application mobility here are some valuable references.

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