



## **IBM AIX 6.1 workload partition podcast - script**

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CHRISTOPHER HALES: Hello, and welcome to the AIX 6.1 Workload Partition podcast. My name is Christopher Hales. Now this podcast is designed to give you some basic information about a new feature in AIX 6.1 called Workload Partitions, and we refer to them fondly as WPARs. Now my guest today is my colleague, Richard Bassemir. Welcome, Richard.

RICHARD BASSEMIR: How are you doing, Chris?

CHRISTOPHER HALES: Now I've asked you here today really so that I can pick your brains about WPARs.

RICHARD BASSEMIR: Okay.

CHRISTOPHER HALES: So my first question really is that, you know, I've heard this feature is in AIX 6.1, and I really just wanted to know what on earth a Workload Partition actually is.

RICHARD BASSEMIR: Okay. A Workload Partition, or WPAR as we call it, is a software-created virtual operating system. It is stability to have an instance of an AIX operating system within an AIX operating system. I like to use the analogy of a television, where you have a picture within a picture. The WPAR concept is similar; consider that you took AIX 6.1 and you installed it on an ordinary machine.

CHRISTOPHER HALES: Uh-huh.

RICHARD BASSEMIR: You then log onto that machine, and then you create another instance of AIX while you're on that machine; that is, you can think of the AIX environment as your big TV screen, and then when you create the WPAR, you're creating that picture within the picture.

CHRISTOPHER HALES: I see. Now I'm very familiar with logical partitions, LPARs. Perhaps you could point out some differences between LPARs and WPARs for me.

RICHARD BASSEMIR: That is a good question. There are several differences between LPARs and WPARs. I know you first say that the WPAR is not meant to be a replacement for LPARs. The WPAR is just another way of more flexibility in the way to do your business. For example, the WPARs on a system will all run the same version of AIX, the same level of AIX.

CHRISTOPHER HALES: Right.

RICHARD BASSEMIR: When you're working with LPARs, though, as you probably know, you can install a different level of AIX on every LPAR.

CHRISTOPHER HALES: Yeah.

RICHARD BASSEMIR: Another difference is that the WPARs are dependent on a single instance of AIX, whereas you look at an LPAR they're independent. They each have their own version of AIX operating system. You'll find that the WPARs are really quick to deploy, and so it's very easy for that dynamic environment to create a WPAR.

The LPARs, on the other hand, take a little longer to set up because they require provisioning a system and loading a full-blown AIX operating system and all the associated resources, but I want to stress, and remember that the WPARs are not meant to be a replacement for the LPARs, and there'd be times where the LPARs would be the preferred method over WPARs and vice versa.

CHRISTOPHER HALES: Now in LPARs, there are slightly different flavors of LPAR. For example, there's dynamic LPARs; there's shared processor LPARs; there's dedicated processor LPARs. Now are there different kinds of WPARs?

RICHARD BASSEMIR: Actually, there are, Chris. There are two types of WPARs. The first one we call a system WPAR. The system WPAR is where the entire virtual operating system is provided to the user; the second type is called an application WPAR. The application WPAR is more of a lightweight WPAR. It's kind of like a wrapper that goes around an application. The application WPAR does not have a separate security context for that WPAR so, in other words, the application WPAR would not have its own set of users. Both WPARs, on the other hand, do have their own network connection and both provide isolation from other WPARs.

CHRISTOPHER HALES: Now is it true to say that, uh, each WPAR can be running a different level of AIX?

RICHARD BASSEMIR: No. that's not true because ...

CHRISTOPHER HALES: No?

RICHARD BASSEMIR: ... each WPAR is sharing the kernel of the AIX that's in that global environment, that global level. However, of course, the WPARs can certainly run different levels of applications within them, and this can come in really handy if you're in a testing development type of organization or where you need to install different levels of applications very quickly, and install and do your debug in that WPAR environment.

CHRISTOPHER HALES: I see. Now one question that's come up again and again in virtualization conversations that I have with customers, particularly with regarding two partitions, is do the partitions interact with each other? Do they interfere with each other in any way? So the same question I think is posed here for WPARs. Do the WPARs interact with each other?

RICHARD BASSEMIR: You know, it doesn't surprise me people would ask that type of question, and the answer is that they do not interact with one another, and that's the beauty of this technology. It is very possible to quickly create a WPAR that appears to the application as a complete AIX operating system. Let me qualify that and say each system WPAR has its own security environment, and by that I mean if I'm on a system WPAR and I created a user called Chris, and then I go to a different system WPAR that user Chris is not known, so that's what I mean when I say each WPAR has its own security context. In addition to that, processes that are running on my WPAR will not interact with processes that are running on your WPAR, Chris.

CHRISTOPHER HALES: Right.

RICHARD BASSEMIR: And along the same lines, the processes that you're running in your WPAR won't interact with mine because these WPARs are separate and secure from one another.

However, one caution is that by default, the resource controls for each WPAR are set to unlimited. The resource controls really tell the WPAR how much CPU and memory it can use, so obviously one of the things that you'd want to do when you're setting up your WPAR, and depending on how you want to use your WPARs, that you would want to limit or put bounds on the resources that are used for each WPAR, and this is very easy to do either with a command line or using smitty. I'm sure we're familiar with smitty.

CHRISTOPHER HALES: Right.

RICHARD BASSEMIR: You can even go a step further; that there is a separate licensable product called the IBM Workload Partition Manager, which is

more elaborate. It will help you manage and control resources and multiple WPARs.

CHRISTOPHER HALES: I can see that's quite important for us then to set the expectations and educate systems administrators with regard to the defaults for WPARs to make sure that things are as they expect. Now the other thing that is important I think to know is can I create a WPAR when I'm already logged on in a WPAR, and can I create a grandchild and go on from there?

RICHARD BASSEMIR: Oh, so it's like you want to create a picture within a picture within a picture?

CHRISTOPHER HALES: Yeah. Kind of like that.

RICHARD BASSEMIR: You know, like standing in a dressing room and looking at the mirror and seeing yourself to infinity. Right?

CHRISTOPHER HALES: Yeah.

RICHARD BASSEMIR: No. You cannot do that. I'm not so sure you'd want to do that, but no, the WPAR can only be created from the global environment so there's only two levels of hierarchy.

CHRISTOPHER HALES: Now you might have the brain the size of a small planet, but for me in particular, I might find it pretty difficult to create a WPAR. Just how difficult is it?

RICHARD BASSEMIR: It doesn't take many brains at all. As a matter of fact, I think that you could do it, Chris.

CHRISTOPHER HALES: Oh, thank you very much for that.

RICHARD BASSEMIR: It is amazingly easy to create a WPAR, and it can be done in a single command or, again, it can be done using smitty for those of you that prefer the menu-driven approach, and it doesn't take long either. I've created WPAR, I'd say, in less than eight minutes, and this is extremely helpful in creating new environments on the fly, and I'll give you an example, Chris.

It was the other day. I was working in my WPAR, my AIX environment, and a colleague wanted to try something in my environment.

CHRISTOPHER HALES: Right.

RICHARD BASSEMIR: And rather than stopping what I'm doing and interrupting the testing that I was actually doing, I was able to go to the global

environment, create a WPAR, and give him his own WPAR, his own route access and send him about his way, and I was able to continue with the work I was doing.

CHRISTOPHER HALES: Oh, pretty good. Now the other thing that you mentioned today was that you're doing some testing of an application. Now that's pretty interesting. Now will any application run in a WPAR?

RICHARD BASSEMIR: I'd like to tell you that any application will run in a WPAR, but that'll be like saying your TV will be able to watch any college football game, so the answer really is it depends. There are trade-offs when you are creating a WPAR environment. For example, the WPAR environment, remember, is sharing resources that are in the global environment, and those shared resources can't really be changed, so clearly to maintain the integrity of the system, it's necessary to restrict those shared resources.

For example, if you were to look inside the WPAR environment, you would see certain file systems are read-only, and if an application that's running in this WPAR were to write to those file systems, it might be a bit of a problem.

CHRISTOPHER HALES: Right. Now knowing my luck then, the applications that I'm involved in, will certainly will need to write to those kinds of file systems, so what do we do then?

RICHARD BASSEMIR: And you probably would be the only application in that type of situation, and the answer is that this technology is very flexible; setting up the WPAR, you're very flexible.

CHRISTOPHER HALES: Yeah.

RICHARD BASSEMIR: When the WPAR is created, it is possible to create additional file systems, and you can make those file systems rewrite file systems, and you can map those down to the WPAR to handle situations like this, but obviously it would be prudent to do some testing and to make sure that there are no gotchas or no surprises.

CHRISTOPHER HALES: I see, but talking about applications, though, if I had installed an application in the global environment, could I run that in the WPAR?

RICHARD BASSEMIR: Oh, now this is a great, great question, and this is one of the things you can do with the WPARs. We call it running in a shared application. In other words, you install the application and its binaries in the global environment, and the global environment is sharing that file system with all the WPARs.

CHRISTOPHER HALES: Uh-huh.

RICHARD BASSEMIR: So you're able to run that application in the WPARs, and I'll give you an example. One of the popular applications that we'll use here for remote access to machines is an application called VNC. I don't know. Have you ever used it?

CHRISTOPHER HALES: Yeah, VNC. Yeah.

RICHARD BASSEMIR: Yeah?

CHRISTOPHER HALES: Very familiar with that. Yeah.

RICHARD BASSEMIR: We use it a lot here, so what I did is I installed VNC in the global environment, and then that VNC and its binaries, it's in the global environment in the shared directories ...

CHRISTOPHER HALES: Right.

RICHARD BASSEMIR: ... shared file systems, and so when I go to my WPAR, I am able to start the VNC server, so without having to install anything in the WPAR environment, I'm able to VNC not only to my WPAR, but I can VNC to the global environment as well.

CHRISTOPHER HALES: Does that mean that when you're establishing that connection between the VNC and the WPAR that the WPAR itself has its own TCP/IP address?

RICHARD BASSEMIR: That's correct.

CHRISTOPHER HALES: Oh.

RICHARD BASSEMIR: And one of the things that is important, obviously, is to have an IP address so you can connect your WPARs to the network.

CHRISTOPHER HALES: Right. And that's different from the global environment?

RICHARD BASSEMIR: That is different from the global environment.

CHRISTOPHER HALES: Right.

RICHARD BASSEMIR: One of the things that you'll do when you create the WPAR, one of the primaries, you pass it, is the host name, and what the WPAR command does is it resolves that host name to an IP address. Now for some reason the host name can't be resolved to an IP address, the made WPAR actually

will still continue and make a WPAR, but it wouldn't have network connections. You might find that not too useful.

So when I create a WPAR with the network connection or with a network, what I'm actually doing is I'm creating an IP alias, and that IP alias is on the global environment, so if I were to go to the global environment and look at my IP configuration, I would see the IP addresses for all the WPARs, and, of course, once I have that network connection in my WPAR, I then can use the TCP commands, like Telnet and FTP, to communicate directly to my WPAR.

CHRISTOPHER HALES: All right. Now talking about communications, though, is it possible to use inter-processed communications, you know, IPC, with WPARs?

RICHARD BASSEMIR: Yes, it is, Chris. You can use IPC between processes within a single WPAR. Remember, the WPARs are isolated and secure from one another, so when an IPC cannot be used between WPARs. All right?

CHRISTOPHER HALES: Aah!

RICHARD BASSEMIR: If you do have a need to communicate between WPARs, though, you could use remote procedure calls or other network-based communication protocol.

CHRISTOPHER HALES: Great. Well, I think we've had a really good look at the basics of WPARs, and thanks very much for that, Rich.

RICHARD BASSEMIR: Oh, you're welcome.

CHRISTOPHER HALES: But one thing that I'm struggling with a little bit here is what are the real benefits of WPARs? I mean, when would I want to use WPARs?

RICHARD BASSEMIR: That's another good question, but using the WPARs, it's possible to reduce the number of AIX operating system instances that you might have. By reducing the number of AIX instances, you are increasing your administration efficiencies, so you might want to use WPARs to consolidate some of your multiple AIX systems onto one. The WPARs also lend themselves to very fast deployment. As I mentioned before, I could build a WPAR in, like, eight minute, so you might want to make use of WPARs when there is a need to quickly provision an AIX system for development or test, or maybe for a demonstration.

Another use might be for the WPARs, they help facilitate the delegation of administration tasks. You might have a situation where a user needs root authority to an AIX system and yet, you don't want to give him root authority to your system so you create a WPAR and make them the root user for that WPAR, and so they

get their root authorization to do what they need to do, but they do not have root authorization at the global level.

CHRISTOPHER HALES: Right.

RICHARD BASSEMIR: So you maintain that system. You're not going to compromise the security of your global environment.

CHRISTOPHER HALES: So what I think I'm hearing here, Rich, is that you can gain some real benefits here, some real savings in operational costs and time; you can deploy rapidly; therefore, you can capture markets or get the benefits of getting those servers and images in quickly ..

RICHARD BASSEMIR: Yeah.

CHRISTOPHER HALES: ... and that you can aid the systems administrators without compromising security so ...

RICHARD BASSEMIR: Absolutely.

CHRISTOPHER HALES: ... there are some pretty important benefits there, and if I look at the capability of LPARs and WPARs now, it seems to me that we've got that continuum of flexibility and capability, so that the customers can choose what best suits them, suits their workload, suits their environment and their estates.

RICHARD BASSEMIR: Exactly.

CHRISTOPHER HALES: Now if anyone would like to get any sort of more technical detail on WPARs, please, will you just give them some advice on where to go.

RICHARD BASSEMIR: Right. And you're absolutely right, Chris. We really are just scratching the surface of the flexibility and the things that you can do with the WPARs and when you might want to use them, so there's a lot of information that is available. One of the things that I would recommend is there is a Redbook that is coming out, and if you go to the [ibm.com/redbooks](http://ibm.com/redbooks), the name of the Redbook is called Workload Partition Management in AIX 6.

CHRISTOPHER HALES: Okay. In Redbooks. Yeah.

RICHARD BASSEMIR: An excellent resource there with lots of information. If you happen to be a business partner, you can log onto [ibm.com/partnerworld/systems](http://ibm.com/partnerworld/systems), and if you, I believe, look under resources, do a search for WPAR, you will find several interactive tutorials, which will actually give you some hands-on on what it is like to build a WPAR, manage some of the WPAR

resources, and interesting things like that. I think there might be four or five different interactive tutorials there that would help.

CHRISTOPHER HALES: Okay. So it's worth digging around there?

RICHARD BASSEMIR: Absolutely.

CHRISTOPHER HALES: Okay. Well, that brings us to the end of the podcast, Rich, and it's just really left up to me to say thank you very much indeed for coming along today and ...

RICHARD BASSEMIR: Well, thank you, Chris.

CHRISTOPHER HALES: ... sharing with us your knowledge about WPARs. Thank you very much, indeed. Take care. Bye-bye now.

RICHARD BASSEMIR: So long.

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(CONCLUSION OF SESSION)

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