

IBM Power Development Platform

AIX porting Image usage guide

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Power Development Platform

User guide for the AIX porting image

1. Abstract

When using the IBM Power Development Platform (PDP) available at **ibm.com**/partnerworld/PD to port or migrate your solution on an IBM Power Systems server, you can take advantage of the PDP porting image. The preconfigured image includes IBM AIX, IBM WebSphere Application Sever, IBM DB2 and other components to help you cut down on complexity and time.

2. Introduction

The PDP porting image is an IBM Power Systems, IBM AIX® 7.1 PDP image preconfigured with IBM middleware (such as IBM WebSphere® Application Server and IBM DB2®), tools, compilers, and operating system fix packs. The image represents the latest set of IBM middleware and tools for porting, migrating, or upgrading a solution to the latest IBM operating system and middleware.

The purpose of this document is to explain what is included in the PDP porting image as well as explain how to use its various components and assumes a working knowledge of the PDP. Application developers who are interested in porting their application from another platform to POWER7 will benefit from using the PDP Porting image. Likewise, developers with applications that run on earlier versions of AIX find the preconfigured middleware and tools in the PDP porting image useful as they verify their software functions on the latest version of AIX.

3. Creating a reservation

This section provides you with information on how to create a reservation in the PDP.

3.1 Basics

This document assumes that you have a working knowledge of the PDP. If this is not the case, refer to the PDP How to section.

The how-to page contains information about how to create a reservation, access it, utilize it, and so on. In addition, the instance of Firefox installed in the porting image has had the homepage modified to a PDP porting and home page. Also the bookmarks have been modified to ease the user's needs. When you connect to your running system, you can use Firefox and select the "Software Access Catalog" tab to go to the software access catalog to download and install IBM middleware on your virtual server.

3.2 Additional information

When creating a reservation for the porting image, make sure to select the project classification port or migration:

- 1. Click Add resource to cart.
- 2. Select AIX 7.1 Porting Stack (see Figure 1).



Standard image 👻	IBM	AIX -	IBM AIX 7.1
Support of the second s	4) inferences	and the particular	IBM AIX 7.1
Physical Resources			IBM AIX 7.1 Porting Image
Architecture CPUs Memo			BIBM AIX 6.1
IBM DOWED 7 -	1	2 -	h

Figure 1. Project classification

4. PDP porting image details

This section provides you with details about what the PDP porting image contains.

4.1 Overview

The porting image contains the following components:

- IBM AIX7.1
- IBM WebSphere
- Java (32 and 64 bit)
- IBM HTTP Server
- IBM DB2 Enterprise Server Edition
- IBM Rational Developer for Power daemon
- Java Performance Advisor
- AIX Linux Toolkit and RPMs
- IBM C and C++ compilers
- GNU compilers
- AIX packages to create a CDE desktop

4.2 Installed operating system and fix pack

The PDP Porting Image runs on AIX 7.1 operating system and Power7 hardware. The version number is *7100-00-03-115*. This is also known as AIX 7.1 SP3.



4.3 Installed middleware

Middleware	Version	Installation location
IBM HTTP Server	7.0.0.17	/usr/IBM/HTTPServer
WebSphere Application Server	7.0.0.17	/usr/IBM/WebSphere/AppServer
DB2 Enterprise Server Edition	9.7.4	/opt/IBM/db2/V9.7
Rational Developer for Power	8.0	/opt/IBM/RDPower/8.0/rse
Daemon		
IBM Java 6 64 bit	Java version 1.6.0 Java SE Runtime Environment (build pap6460sr9fp1- 20110208_03(SR9 FP1)) IBM J9 VM (build 2.4, JRE 1.6.0 IBM J9 2.4 AIX ppc64-64 jvmap6460sr9- 20110203_74623 (JIT enabled, AOT enabled) J9VM - 20110203_074623 JIT - r9_20101028_17488ifx3 GC - 20101027_AA)	/usr/java6_64/
IBM Java 6 64 bit	Java version 1.6.0 Java(TM) SE Runtime Environment (build pap3260sr9fp1- 20110208_03(SR9 FP1)) IBM J9 VM (build 2.4, JRE 1.6.0 IBM J9 2.4 AIX ppc-32 jvmap3260sr9- 20110203_74623 (JIT enabled, AOT enabled) J9VM - 20110203_074623 JIT - r9_20101028_17488ifx3 GC - 20101027_AA) JCL - 20110203_01	/usr/java6

4.4 Compilers

Compiler	Version	Installation location
IBM XL C/C++	11.2	/usr/bin
GNU C/C++	4.6.0	/usr/local/bin

4.5 Tools

Tool	Version	Installation location
Java Performance Analyzer	1.0	/usr/local/jpa
Cscope	15.7a	/usr/local/bin
Ddd	3.3.3.1	/usr/bin
GNU Make	3.80	/usr/bin
AIX Linux Toolbox	latest	

4.6 Other

Note the following settings:

- Firefox is installed and the default home page is set to the IBM Porting Resource Page at **ibm.com**/partnerworld/page/pw_com_sys_PDP_optimization_resrc. The IBM Porting Resource Page has many useful links to Java version, middleware fix packs, the Software Access Catalog and porting tools.
- Firefox also has useful bookmarks set for porting and migrating.
- DB2 created a default instance db2inst1 in /home/db2inst1 with the password db2inst1.
- The UNIX® user ihsadmin was created to administer IBM HTTP Server with the password **ihsadmin**.
- The UNIX users ihsadmin, db2inst1, dasusr1, db2fenc1 were created with the passwords to match the user name. However, remote login is disabled, so you cannot log in with those IDs.

5. Working with the PDP porting image

The following sections provide you with information on how to take advantage of the PDP porting image.

5.1 Root user convenience aliases

The PDP porting image root \$HOME/.profile is set up with convenience aliases to save you from typing. Among others, the following aliases are especially useful: startihs, stopihs, startwas, stopwas, gowaslogs, and goihslogs.

5.2 Starting and stopping IBM HTTP Server

To start and stop IBM HTTP Server using preconfigured aliases, perform the following steps:

- 1. Become the root user, by typing su -.
- 2. Use the alias **startihs** to start IBM HTTP Server.
- 3. Use the alias **stopihs** to stop IBM HTTP Server.

Or, start and stop the IBM HTTP Server using the apachectl command:

- 1. Change to the /usr/IBM/HTTPServer/bin directory
- 2. To start IBM HTTP Server, type ./apachectl start.
- 3. To stop IBM HTTP Server, type ./apachectl stop.

Note: The IBM HTTP Server administrator has been set up with the user ID ihsadmin and password ihsadmin.

5.3 Starting and stopping WebSphere Application Server

To start and stop the IBM WebSphere Application Server using KSH aliases, perform the following steps:

- 1. To become the root user, type the su command e.g. su root.
- 2. Utilize the alias **startwas** to start WebSphere Application Server.
- Utilize the alias stopwas to stop WebSphere Application Server. Alternatively, start and stop the IBM WebSphere Application Server using the startServer.sh and stopServer.sh scripts.
- 4. Navigate to the /usr/IBM/WebSphere/AppServer/profiles/was7profile/bin.
- 5. To start WebSphere Application Server, type ./startServer.sh server1 -user



wasadmin -password wasadmin.

6. To start WebSphere Application Server, type ./stopServer.sh server1 -user wasadmin -password wasadmin.

5.4 Accessing the WebSphere Administrative Console

Use your supplied IP address by the PDP Connections tab as follows http://172.xxx.xx.9060/admin. This guide uses the IP address 172.29.140.52 to illustrate how to connect to and use middleware. For example, http://172.29.140.52:9060/admin. Log in as user: wasadmin with the password wasadmin.

5.5 Starting and stopping the DB2 Enterprise Server Edition

DB2 is installed and a default instance db2inst1 is created. You can use this instance or create your own. To use this instance, perform the following steps:

- 1. Become db2inst1 by typing **su db2inst1**.
- 2. Supply the password db2inst1.
- 3. At the command prompt, type db2start.
- 4. Stop the instance's database manager with the command db2stop.

Note: The db2inst1 instance uses port 60000 as its SVCENAME (TCP/IP Service Name).

5.6 Accessing the Rational Developer for Power daemon

Rational Developer for Power is running by default. It is installed to run on the default ports. You can access it remotely using your Rational Developer for Power environment.

6. Example usages

Note: You need to use your IP address instead of the IP address show in the examples. These examples relate to the middleware and tools for developers to port or migrate their applications.

6.1 Firefox

To access resources and the IBM Software Access Catalog using your browser (Firefox is provided), perform the following steps:

Log in to the PDP Porting Reservation using VNC Viewer.

Start Firefox from the command line of a terminal window using the command firefox&.

The home page is set to the PDP Resource Page at

ibm.com/partnerworld/page/pw_com_sys_PDP_optimization_resrc, which offers resources to help you port or migrate your solution and it provides access to the IBM Software Access Catalog from your PDP reservation. Using the IBM Software Access Catalog, you can download and install various version of software from the IBM software portfolio.

In addition, by default, this instance of Firefox offers many useful bookmarks already set as follows:



Figure 2. Bookmarks

6.2 Developer tools and source browsing

6.2.1 idebug

IBM Distributed Debugger [idebug] for AIX 11.2 does not include the AIX client. All the features of idebug has been incorporated into Rational Developer for Power. Refer to section 6.3.

6.2.2 GNU Data Display Debugger [ddd]

GNU DDD is a graphical front-end for the command-line debuggers GDB, DBX, JDB, and other open-source debuggers and has become famous because of its interactive, easy-to-use front-end. To run GNU debugger, type **ddd** from the command line.

6.2.3 Cscope

Cscope is an open-source source browser that allows searching for text, symbols, functions and allows developers easy access to code and editing. To run cscope, type cscope from the command line. To learn how to load source into the database for browsing refer to the help, cscope –help.

One option to use to load source into the database is to use a namefile. List all your source with absolute path in the namefile and use the cscope namefile option to load the namefile. For example, cscope –Rui <namefile>.

Example Namefile:

/dev/source/foo.c



/dev/source/foo.h

•••

6.2.4 Make or Gnu Make

Gnu Make 3.80 is the default make and is already installed. To verify, type make –version. Gmake also works.

6.3 Rational Developer for Power daemon

Rational Developer for Power daemon is installed and should be already running. To verify, that it is running, type **ps –ef | grep RDPower**. It should return with the following results:

```
root 9109616 1 0 Jul 08 - 0:17
/usr/java5/bin/java -Xms64m -
Xmx128m -Xss2m -DA_PLUGIN_PATH=/opt/IBM/RDPower/8.0/rse// -
DDSTORE_TRACING_ON=fa
lse org.eclipse.dstore.core.server.ServerLauncher 8050
```

Note that the server is running on port 8050: default.

6.3.1 Client

If you have Rational Developer for Power installed or want to download an evaluation version, you can add the desktop Rational Developer for Power client to your PDP Image:

- 1. Click File → New → Remote C/C++ Project.
- 2. From the Remote C/C++ Project window, give your project a name.
- 3. In the remote location section, click **Browse** to establish a connection to your host system.
- 4. From the Browse for Folder window click **New**. From the **New Connection** window, select *AIX or Linux* system, which refers to the system to which you will be establishing a connection.
- 5. From there follow the prompts *Specifying a valid IP and the port#.* The default is 8050. For the output, see Figure 3.

emote C/C++ Project					1
Project name must be specified	Browse For Folder		O New Connect	tion	
Project Name: 2	Select a folder Connection: VLP_GOLD	~	Remote AIX S	ystem Connection	
temote Location:	My Home		3 Please enter a v	ald connection name.	
Associate a local location (allows the use of local tools such as source Local Location	* > My Home * > Root		Parent profile:	IBM-68D01CF8A78	
Use default location Contorn Contorn			Host name:	172.29.136.151	
			Connection name Description:		
Work with local copy of files and push file changes to remote locati Push on save Do to			Verify host nar	ne	
Local location is a mounted folder pointing to the remote location					
Validate mount location					
		ок 🗌			

Figure 3. Rational Developer for Power output

6.4 C and C++ compilers

The latest GNU [v.4.6.0] and IBM xIC C and C++ compilers [v11.2] are installed. If you are using C++ or C, you can invoke them easily from the command line.

gcc /g++	GNU C/C++ Compilers
cc/xlc	XL C Compiler
xlc++/xlC	XL C++ Compiler

6.5 Middleware

To run the middleware, perform the following steps:

- 1. After VNC connectivity to the PDP logical partition (LPAR) is established, start IBM HTTP Server and WebSphere Application Server.
- 2. You need to use the IP address of the partition.

6.5.1 Loading the IBM HTTP Server default page

To open the default IBM HTTP Server page, perform the following steps:

- 1. With IBM HTTP Server running, navigate to the IP address given in your PDP reservation.
- 2. If necessary, accept self-signed security certifications. The default IBM HTTP Server page opens (see Figure 4).



Figure 4. Default IBM HTTP Server page

- 6.5.2 Showing an installed application example in WebSphere
 - 1. Show the SOX snoop Servlet.
 - 2. Point your browser to <u>https://172.29.140.52/partnerworld/sox/tools/SoxSnoopServlet</u> to open the snoop Servlet page (see Figure 5).

Snoop Servlet - Mozilla Firefo	xc
Ele Edit View Higtory Bookma	rks Bols Help
172.29.140.52 https:	//172.29.140.52/partnerworld/sox/tools/SoxSnoopServlet
🚹 🖨 😃 🔎 Most Visited 🗋	Bookmark this! 🞯! My Yahoo! 🚾 LotusLive 🔝 IBD W Wiki 📄 CTG Timeshee
IBM HTTP Server	×
Snoop Servlet	- Request/Client Information
Requested URL:	
https://172.29.140.52/partnerv	vorld/sox/tools/SoxSnoopServlet
Servlet Name:	
SoxSnoopServlet	
Request Informatio	on:
Remest IIRI	/partnerworld/sov/tools/SovSnoonSeptlat
Request protocol	HTTD/1 1
Condet protocol	/SovSoonSordat
Deth info	soxonoopservier
Paul mo	
Path translated	<none></none>
Character encoding	<none></none>

Figure 5. Snoop Servlet page

3. Show the SOX Snoop JSP
4. Point your browser to your partition as follows: <u>https://172.29.140.52/partnerworld/sox/tools/SoxSnoop.jsp</u>. The JSP Snoop page opens



🥹 JSP snoop page - Moz	zilla Firefox			
<u>File E</u> dit <u>V</u> iew Hi <u>s</u> tory	<u>B</u> ookmarks <u>T</u> ools <u>H</u> elp			
(←) 172.29.140.	52 https://172.29.140.52/partnerworld/sox/tools/SoxSnoop.jsp			
🗗 🔒 🔮 🖻 Most Vis	ited 📄 Bookmark this! 🧐 My Yahoo! 🚾 LotusLive 🔟 IBD W Wiki 📄 CTG Timesheet 🚾			
IBM HTTP Server	🗙 🕅 2011 Planning Meeting - Migration 🛛 😢 My Yahoo!			
JSP Snoop				
Server Info: IBM Web	bSphere Application Server/7.0			
Time in sea	ssion variable.			
Session time : null				
Request inform	mation			
Request method	I: GET			
Requested URL: https://172.29.140.52/partnerworld/sox/tools/SoxSnoop.jsp				
Request UR	I: /partnerworld/sox/tools/SoxSnoop.jsp			
Request protoco	I: HTTP/1.1			
Servlet path	a: /SoxSnoop.jsp			
Path info	o: null			
Path translated	l: mil			
Query string	g: null			
Content length	i: -1			
Content type	e: mull			
Server name	e: 172.29.140.52			
Server por	t: 443			
Remote user	r: mill			
Remote address	s: 172 29 96 57			
Remote host	t: 172 29 96 57			
Authorization scheme	ar mil			
rumorization scheme				
Request heade	ers			
Header:	Value:			
Header: Host	Value: 172.29.140.52			

6.5.3 Verifying DB2

To verify DB2, perform the following steps:

- 1. Install DbVisualizer from <u>www.dbvis.com/products/dbvis/download</u>. Select the **with** Java VM version.
- 2. Create a new DB2 connection with your DB2 instance at the IP address, Port- 60000.
- 3. Enter the user ID db2inst1 and password db2inst1 and connect (see Figure 7).

DbVisualizer Free 7.1.4 - Untitled				-	
File Edit View Database Scripts SQL Tools Window Help					
🖜 🔜 🔤 🐗 🚳 🔋 🕄 🕐 🖓					
Jatabases 🚑 Scripts		Object View	SQL Commander		
19 1 I I I I I I I I I I I I I I I I I I		👵 Database	Connection: VLP PortDB Prod	Ac	tions 🔻
VLP PortDB QA	^	VLP PortDB Prod			
VLP PortDB QA 2		Connection	Database Info 🔗 Data Types		
		Connection			
		Connection —	VI D DortDR Drod		
		Alids:			~
INOPERATIVE VIEW		Database Type:	DB2LOW		
MATERIALIZED QUERY TABLE		Driver (JDBC):	C DB2	~	2
		Database URL:	jdbc:db2://172.29.140.52:60000/portdb	~	× 11
TABLE			URL Format:jdbc:db2:// <server>:<port50000>/<database></database></port50000></server>		
COMPANY		Authentication —	di Stanis	- 1	
WEB_USER		Usend:		_	
		Password:	******		
	_		Reconnect Disconnect		
ULW Frocedures	=				
🕀 🤱 SQLJ		Connection Message	U alanan a		
SYSCAT		DB2/AIX64			
		IBM DB2 JDBC U	Iniversal Driver Architecture		
SYSIBMADM		3.57.82			
SYSIBMINTERNAL		Ame	rica/Chicago Development Profile: generic 🐻 Connected	d - 00	0:00:23
	~	Connection Propert	ies		

TRM

Figure 7. DbVisualizer page

6.5.4 Java Performance Advisor tool

To start Java Performance Advisor, perform the following steps:

- 1. Log in to the PDP Partition or LPAR using VNC Viewer.
- 2. Become root in an xterm window, for example su root.
- 3. Navigate to /usr/local/jpa.
- 4. Type jpa.pl. The output should look similar to the screen capture in Figure 8.

-1			
s	Since a on this pa If the hown. If this	a pid was not specified, the following list is artition. JVM is a WebSphere job, the Profile and Applic s is not a WebSphere JVM, N/A is displayed.	the current JVMs a cation Server names
P	ID App Serv	Class Name ver Name	WAS Profile
3	014796	com.ibm.lwi.LaunchLWI	N/A
6	619284 Server1	com.ibm.wsspi.bootstrap.WSPreLauncher	was7profile
9	371824 N/A	/opt/IBM/RDPower/8.0/rse/runserver.sh	N/A
2	818194 N/A	com.ibm.lwi.LaunchLWI	N/A
9	502826 N/A	org.eclipse.dstore.core.server.ServerLauncher	N/A
9	306146 N/A	org.eclipse.dstore.core.server.Server	N/A

Figure 8. Java Performance Advisor output



- 1. If WebSphere is running, you see a was7profile UNIX process ID. In the above case, that is 6619284.
- 2. Rerun jpa.pl by typing jpa.pl –o filename.xml pid. In the case above jpa.pl –o PDP_jpa_output.xml 6619284
- 3. Type **y** to agree to the license agreement.

After the program has completed, the command prompt returns. Verify the results by opening the file PDP_jpa_output.xml locally in your browser.

<u>V2</u>	u00018	384's X desktop (I48	8pp055_pub:1)								
	-			AIX Java Performance A	Advisor – Mo	ozilla Firefo	х			• [
2	Eile Edit View Higtory Bookmarks Tools Help										
	🗢 🖶 🔻 🕺 🚱 🏠 🐻 file:///usr/bcal/pa_output.xml								🗇 🔻 🛃 🕇 Google	Q	
	📷 Mos	t Visited 🔻 🛛 📷 Most Vis	ited 🔻								
	i AIX	Java Performance Advis	n 🕂							•	
		×.	AIX J	ava Perform	ance	Advis	sor		IB)		
	The	ratings and recon	nmendations in the table	e below were chosen w	ith the foll	owing info	ormatio	on:			
	Admin Experience : Beginner Process ID : 6619284 Java Importance on Partition : Secondary User name : root System Usage : Production Command Line : Show						Hostname : l488pp055_pub Date Taken : Jun 28, 2011 Time Taken : 19:44				
		Hardware						WebSphere			
		Name	Current Value	Recommended Value	Risk 1=lowest 5=highest	Impact 1=lowest 5=highest		Name	Current Value	Recom	
		Model	IBM,9179-MHB		1	5	Q	WebSphere Version	7.0.0.17	More Detail	
		Processor Family	POWER 7		3	5			L		
		Processor Speed	3.86 GHz		1	5		Java			
		System Active Processors	48		1	5		Name	Current Value	Recom	
	A	Partition Active Processors	0.25	>= 1	3	2	Q	JVM Version	1.6.0 SR9	More Detail	

Figure 9. AIX Java Performance Advisor

7. Summary

This document discusses the process of installing and configuring the PDP porting image. The document shows what software is installed and how it is configured. The preinstalled software and tools should greatly easy the porting and migration efforts.



8. Resources

The following resources and webpages can help you with your porting, migration and work.

Websites

- Power Development Platform (PDP) ibm.com/partnerworld/pdp
- Power Development Platform : Resources to develop your solution on IBM Power Systems

ibm.com/partnerworld/page/pw_com_sys_PDP_optimization_resrc

- IBM Power Systems on IBM PartnerWorld ibm.com/partnerworld/systems/p
- ISV resources to port to IBM platforms ibm.com/partnerworld/page/pw_com_sys_port_to_ibm
- IBM Systems porting and migration solution roadmaps ibm.com/partnerworld/wps/pub/systems/technical/roadmaps
- ISV solutions optimized on IBM POWER7
 ibm.com/partnerworld/page/pw_com_isv_solutions_optimized_power7
- AIX Version 7.1 Information Center http://publib.boulder.ibm.com/infocenter/aix/v7r1/index.jsp
- IBM Power Systems Hardware Information Center
 http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/index.jsp

Tools

• AIX Linux Toolbox

 $ibm.com/\ensuremath{\mathsf{systems/power/software/aix/linux/toolbox/download.html}$

- AIX Toolbox for Linux Applications
 ibm.com/systems/power/software/aix/linux/toolbox/alpha.html
- Using the IBM WebSphere Application Server Runtime Performance Advisor http://publib.boulder.ibm.com/infocenter/wasinfo/v6r0/index.jsp?topic=/com.ibm.webs phere.express.doc/info/exp/ae/tprf_enablingrpa.html
- Rational Developer for Power Systems Software ibm.com/software/rational/products/rdp/#
- Evaluate: IBM Rational Application Developer for WebSphere Software ibm.com/developerworks/downloads/r/rad/
- Cscope

http://cscope.sourceforge.net/

- C and C++ Compilers
 ibm.com/software/awdtools/xlcpp/
- AIX Open Source Packages
 www.perzl.org/aix/
- Rational Purify for Linux and UNIX

 $ibm.com/developerworks/downloads/r/rpp/?S_TACT=105AGX23\&S_CMP=DWNL$

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