IBM Power Development Cloud

AIX & PowerLinux Porting Image user guide

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IBM Power Development Cloud

User guide for the PDP porting images

1. Abstract

Typically ISVs use IBM Power Development Cloud (PDP) (www.ibm.com/partnerworld/pdp) to develop or test or port their solutions on IBM Power Systems. If solution is built or has to be built on IBM blue stack, ISVs can take advantage of the PDP porting images. The preconfigured porting images include IBM AIX & IBM PowerLinux (RHEL and SuSe) with IBM WebSphere Application Sever, IBM DB2 and other components to reduce the time required to configure the IBM Middleware.

2. Introduction

The PDP porting image is a combination of IBM Power Systems, IBM AIX® 7.1 and IBM PowerLinux (RHEL & SuSe) 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 images 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 images. Likewise, developers with applications that run on earlier versions of AIX, RHEL & SuSe, find the preconfigured middleware and tools in the PDP porting images to be useful as they verify their software functionality on the latest version of AIX/ RHEL/ SuSe.

3. Creating a reservation

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

3.1 Basics

This document assumes that end user has a working knowledge of PDP. If not, please refer to the web link: http://www-304.ibm.com/partnerworld/wps/servlet/ContentHandler/stg_com_sys_power-development-platform

The how-to page contains information about how to create a reservation, access it, utilize it, and so on.

3.2 Creating a porting image reservation

To create a reservation with a porting image, after selecting the Project name, Project description, Project Opportunity, Project classification, start date and end date, please use the following steps:

1. In the "**Logical Resources**" Section.
2. Either Select "**AIX 7.1 Porting image/ RedHat Linux 6 Porting image/ SuSe Linux 11 Porting image"** (see *Figure 1*, 2, 3).

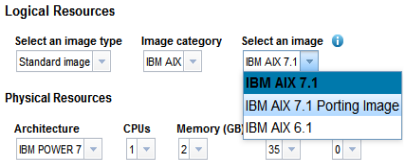

Figure 1. AIX Porting image

Figure 2. RHEL Porting image

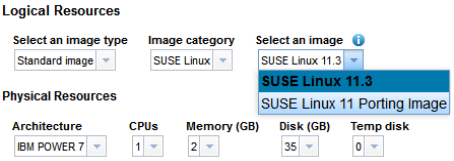

Figure 3. SuSe Porting image

3. Click on "**Add Resources to Project"**
4. Once the details are populated in "**Resources**" section, Click on "**Create Project and Reservation"**

4. PDP AIX porting images details

This section provides you the details about what an AIX 7.1 porting image in PDP contains:

4.1 Overview

The porting image has 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 AIX Porting Image runs as AIX 7.1 operating system on 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 Daemon	8.0	/opt/IBM/RDPower/8.0/rse
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) JCL - 20110203_01	/usr/java6_64/

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:

- DB2 is installed with 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 same passwords as user name. However, remote login is disabled, so you cannot log in with those IDs.

5. PDP PowerLinux porting images details

This section provides details about PowerLinux (RHEL/ SuSe) porting image/ PowerLinux Development stack in PDP:

5.1 Overview

The porting image has the following components:

- IBM PowerLinux (RHEL/ SuSe)
- IBM WebSphere Application server (WAS)
- PowerLinux SDK
- IBM DB2 Enterprise Server Edition
- IBM XL C and C++ compilers and GNU C/C++ compilers

5.2 Installed operating system and fix pack

The PDP PowerLinux Porting Image can be either of the following:
RHEL 6.4 or SLES 11 SP2

5.3 Installed middleware

Middleware	Version	Installation location
WebSphere Application Server	8.5	/opt/IBM/WebSphere/AppServer
DB2 Enterprise Server Edition	10.5	/opt/ibm/db2/V10.5
PowerLinux SDK	1.4.0	/opt/ibm/ibm-sdk-lop

5.4 Compilers

Compiler	Version	Installation location
IBM XL C/C++	12.1	/usr/bin
GNU C/C++	NA	/usr/bin

5.5 Tools & Packages

Tool	Additional info	Tools details
PowerLinux SDK	includes several software bundles	http://www-304.ibm.com/webapp/set2/sas/f/lopdiags/sdklop.html
Advance Toolchain	V7.0	http://ibm.co/AdvanceToolchain

5.6 Other: Note that WAS, DB2 and PowerLinux SDK have been installed. So no WAS profiles, DB2 instances have been created. Configurations have to be done by ISVs. For instructions on how to configure WAS v8.5.5, please refer the WAS Infocenter:

http://www-01.ibm.com/support/knowledgecenter/SSAW57_8.5.5/as_ditamaps/was855_welcome_ndmp.html?lang=en

For instructions on how to configure DB2 v10.5, please refer the DB2 information center:

http://www-01.ibm.com/support/knowledgecenter/SSEPGG_10.5.0/com.ibm.db2.luw.kc.doc/welcome.html?lang=en

CORE Tools	Application CORE Tools	Web CORE Tools
Linux SDK	XL C/C++	Java
Cscope	DDD (Data Display Debugger) RHEL Only	Netbeans
Valgrind		Apache
gdb (RHEL only)		Websphere with DB2
strace		TOMCAT
autoconf		PHP
libtool		Ruby on Rails
vim		gedit

6. Working with the PDP AIX 7.1 porting image

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

6.1 Root user convenience aliases

The PDP AIX 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.

6.2 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**.

6.3 Starting and stopping IBM 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.
3. 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**.

6.4 Accessing the WebSphere Administrative Console

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

6.5 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 the port 60000 as its SVCENAME (TCP/IP Service Name).

6.6 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.

7. Example usages of AIX porting image's tools

Note: You need to use your reservation's IP address instead of the one shown in the examples.

7.1 Firefox

To access web resources and the IBM Software Access Catalog using your browser, you may follow the PDP-SAC user guide. For your reference, you may visit the following web link:

https://public.dhe.ibm.com/partnerworld/pub/pdp/pdp_sac_uguide.pdf

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

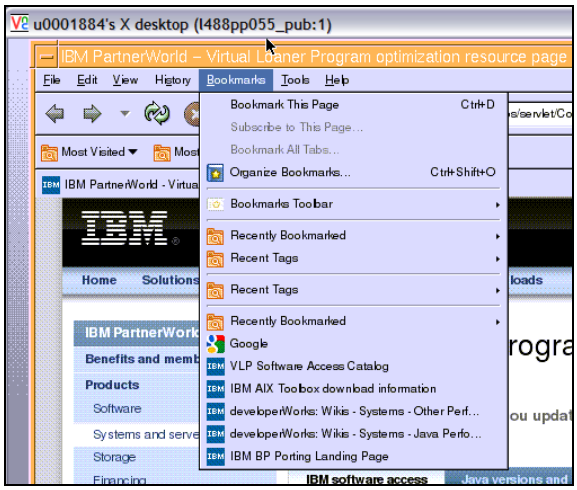

Figure 4. Bookmarks

7.2 Developer tools and source browsing

7.2.1 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.

7.2.2 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.

7.2.3 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

…

7.2.4 Make or Gnu Make

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

7.3 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=false org.eclipse.dstore.core.server.ServerLauncher 8050

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

7.3.1 *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 5.

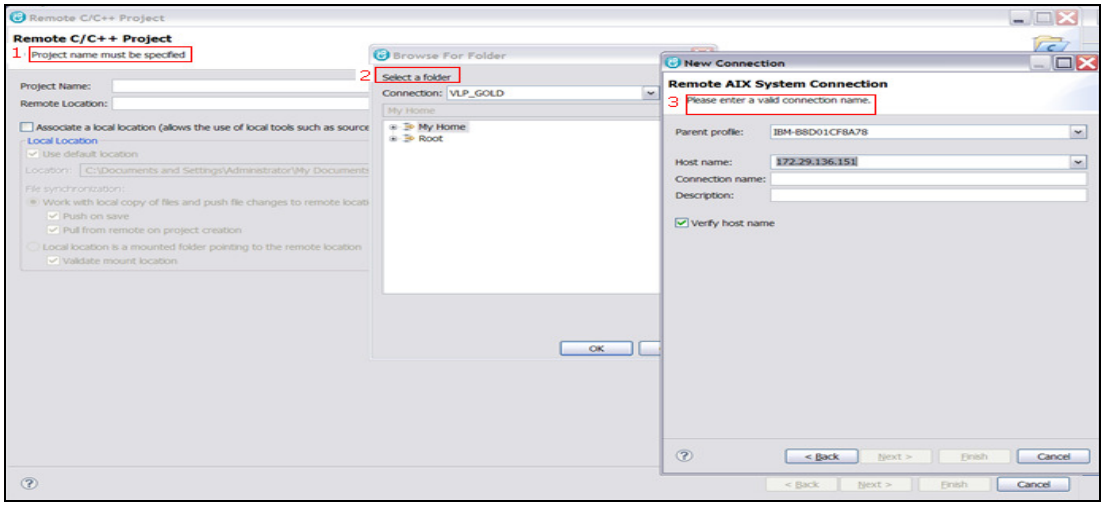

Figure 5. Rational Developer for Power output

7.4 C and C++ compilers

The latest GNU [v.4.6.0] and IBM xlC 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

7.5 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.

7.5.1 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 6).

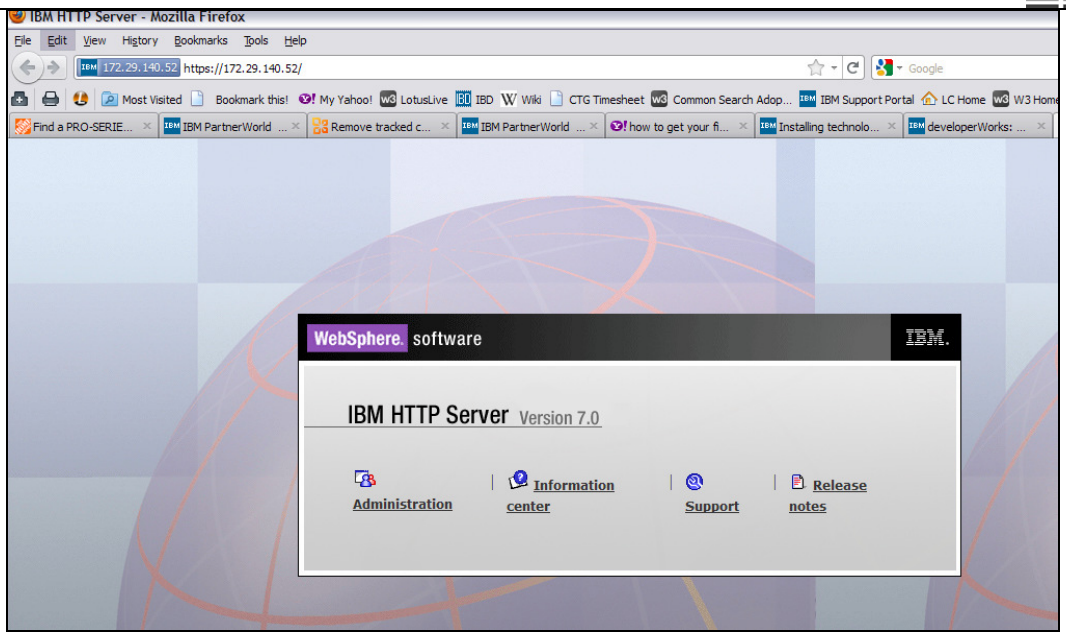

Figure 6. Default IBM HTTP Server page

7.5.2 *Showing an installed application example in WebSphere*

1. Show the SOX snoop Servlet.
2. Point your browser to https://172.29.140.52/partnerworld/sox/tools/SoxSnoopServlet to open the snoop Servlet page (see Figure 7).

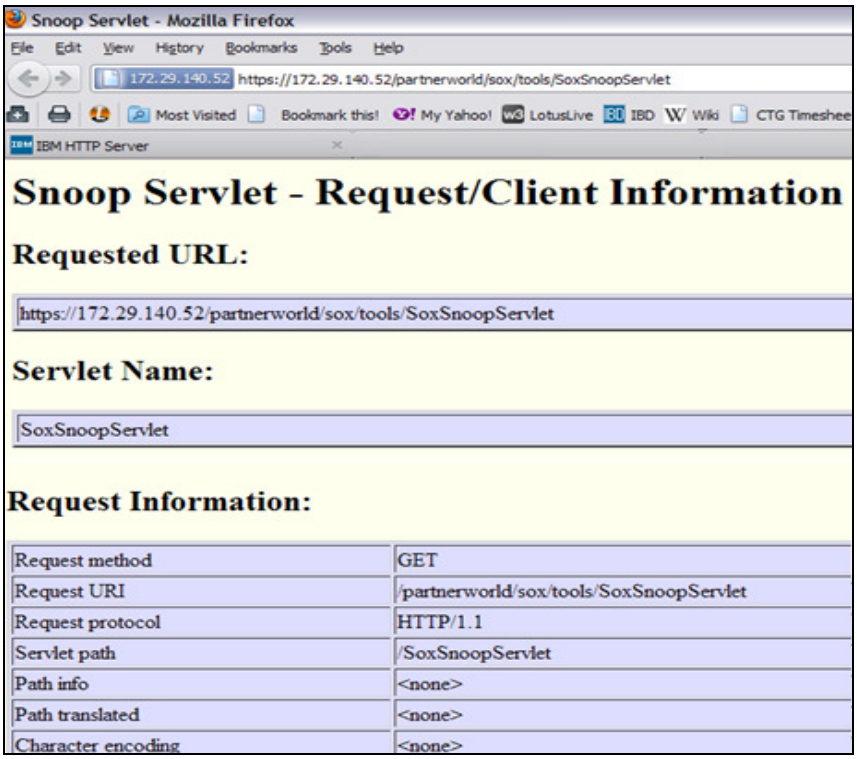

Figure 7. Snoop Servlet page

3. Show the SOX Snoop JSP
4. Point your browser to your partition as follows:

https://172.29.140.52/partnerworld/sox/tools/SoxSnoop.jsp. The JSP Snoop page opens

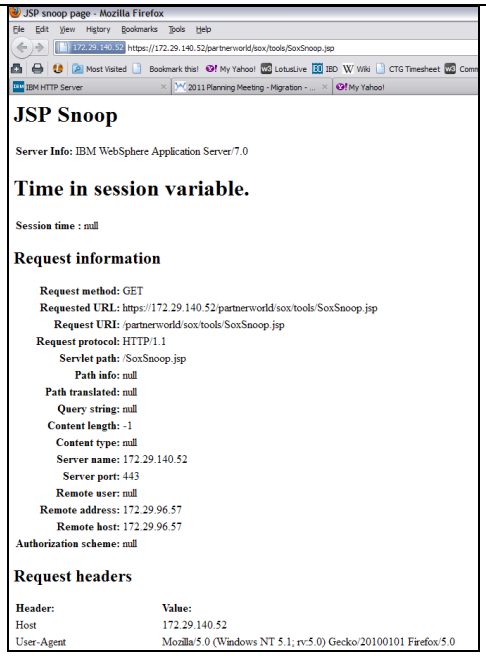

Figure 8. JSP Snoop page

7.5.3 Verifying DB2

To verify DB2, perform the following steps:

1. Install DbVisualizer from www.dbvis.com/products/dbvis/download. 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 9).

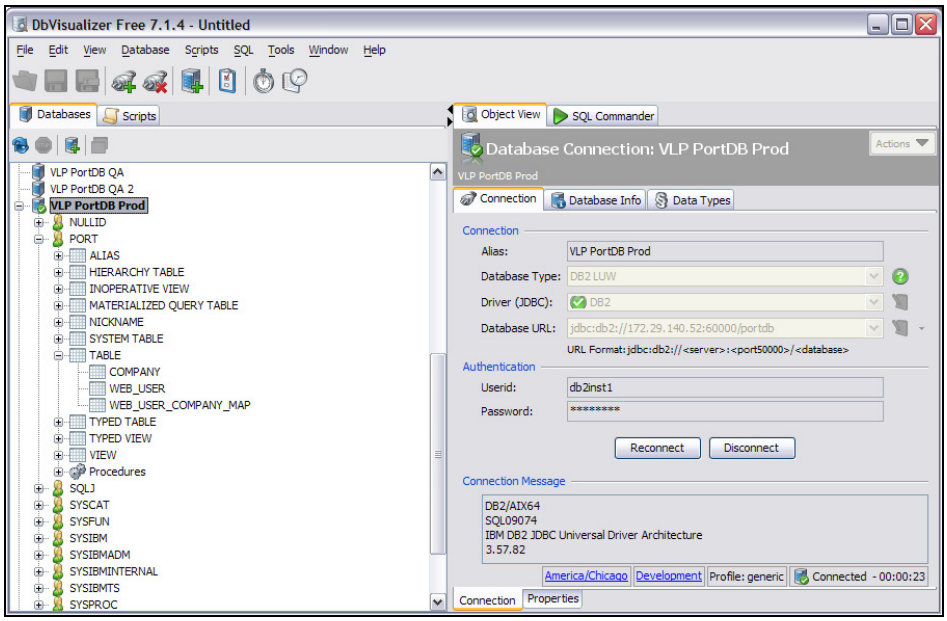

Figure 9. DbVisualizer page

7.5.4 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 10 ***Figure***.

```
Win4
    Since a pid was not specified, the following list is the current JVMs a
 on this partition.
    If the JVM is a WebSphere job, the Profile and Application Server names
shown.
    If this is not a WebSphere JVM, N/A is displayed.

PID        Class Name                                    WAS Profile
   App Server Name

3014796    com.ibm.lwi.LaunchLWI                         N/A
   N/A
6619284    com.ibm.wsspi.bootstrap.WSPreLauncher         was7profile
   server1
9371824    /opt/IBM/RDPower/8.0/rse/runserver.sh         N/A
   N/A
2818194    com.ibm.lwi.LaunchLWI                         N/A
   N/A
9502826    org.eclipse.dstore.core.server.ServerLauncher N/A
   N/A
9306146    org.eclipse.dstore.core.server.Server         N/A
   N/A

root@l488pp055_pub /usr/local/jpa: #
```

Figure10. 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.

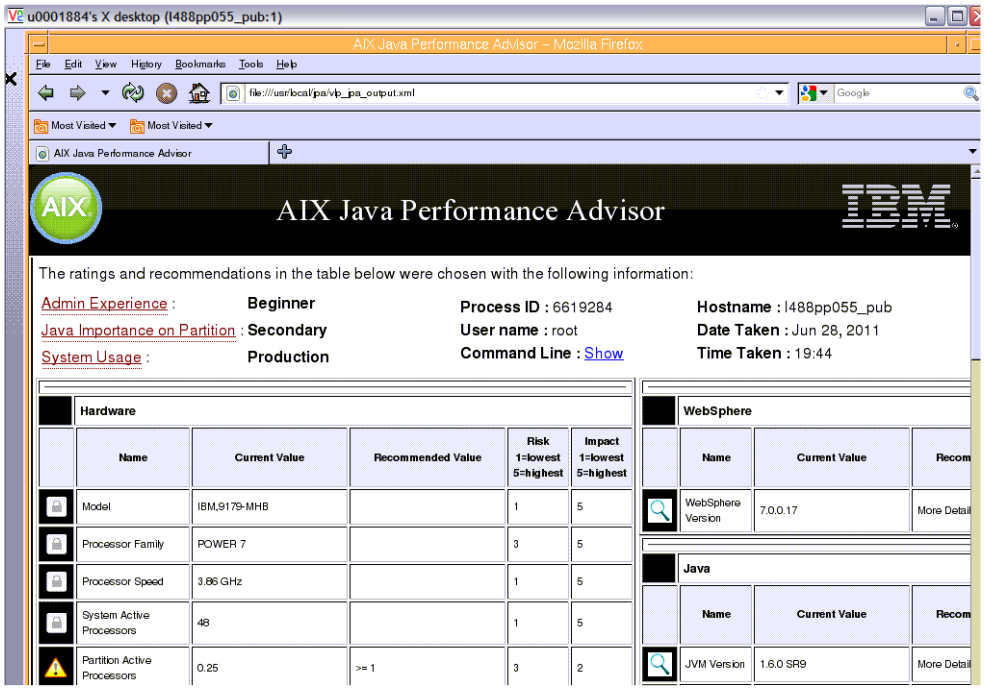

Figure11. AIX Java Performance Advisor

8. Summary

This document discusses the details about AIX, RHEL and SuSe porting images that have been included in PDP. The document also shows what software is installed and how it is configured on AIX and PowerLinux. The preinstalled software and tools should greatly ease the porting and migration efforts.

9. Resources

The following resources and webpages can help you with your development/ testing/ porting/ migration.

- Power Development Program (PDP)
  www.ibm.com/partnerworld/pdp
- IBM Power Systems on IBM PartnerWorld
  www.ibm.com/partnerworld/systems/p
- ISV resources to port to IBM platforms
  www.ibm.com/partnerworld/page/pw_com_sys_port_to_ibm
- IBM Systems porting and migration solution roadmaps
  www.ibm.com/partnerworld/wps/pub/systems/technical/roadmaps
- ISV solutions optimized on IBM POWER7
  www.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
  www.ibm.com/systems/power/software/aix/linux/toolbox/download.html
- AIX Toolbox for Linux Applications
  www.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.websphere.express.doc/info/exp/ae/tprf_enablingrpa.html
- Rational Developer for Power Systems Software
  www.ibm.com/software/rational/products/rdp/#
- Evaluate: IBM Rational Application Developer for WebSphere Software
  www.ibm.com/developerworks/downloads/r/rad/
- Cscope
  http://cscope.sourceforge.net/
- C and C++ Compilers
  www.ibm.com/software/awdtools/xlcpp/
- AIX Open Source Packages
  www.perzl.org/aix/
- Rational Purify for Linux and UNIX
  www.ibm.com/developerworks/downloads/r/rpp/?S_TACT=105AGX23&S_CMP=DWNL
- IBM Software Development Kit for PowerLinux
  http://www-304.ibm.com/webapp/set2/sas/f/lopdiags/sdklop.html
- IBM Advance Toolchain for PowerLinux
  http://ibm.co/AdvanceToolchain
- IBM XL C/C++ for PowerLinux
  http://www.ibm.com/software/products/us/en/xlcpp-linux
- IBM WebSphere Enterprise
  http://www.ibm.com/software/products/us/en/appserv-was
- IBM DB2 Enterprise Server
  http://www.ibm.com/software/products/us/en/db2enterprise-server-edition

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