

HP BridgeWorks Version 3.0A

Release Notes for OpenVMS

September 2004

HP BridgeWorks Version 3.0A introduces new and innovative features that enable and support enterprise-level distributed applications, and includes several important bug fixes.

This file contains information that will help you install and use this release of HP BridgeWorks.

Software Version
HP BridgeWorks Version 3.0A

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About HP BridgeWorks Version 3.0A Release Notes for OpenVMS

These Release Notes contain BridgeWorks Version 3.0A release information for both OpenVMS and Windows.

For the OpenVMS installation instructions - including instructions for running the BridgeWorks Manager and process quota recommendations - refer to [BWX030A_INSTALLATION_GUIDE.TXT | PDF | PS](#), available from the web download page.

Complete product documentation is available from the online Help installed with the Windows BridgeWorks kit.

RELEASE NOTES

BEFORE YOU BEGIN YOUR PROJECT...

There are many more aspects to encapsulating and distributing an application than can be addressed in these release notes. Please refer to key usage topics, available from the BridgeWorks Help *Welcome Page*.

Among these usage topics are:

- Preparation of 3GL Routines and ACMS Tasks
- Transport Options
- Scalability and Your Application
- Session Options and Your Application
- Making Configuration Changes
- Working with Rdb and Oracle9i Databases
- Debugging Your Server Routines
- Using the Bwx Classes
- Compiling and Running Java Clients

Performance Disclaimer – Please Read

HP makes no performance claims for BridgeWorks-generated applications. Performance metrics for HP BridgeWorks are largely dependent on the underlying cross-platform technologies used by BridgeWorks - including RPC and ICC transports; COM, Java, and EJB components; J2EE application servers; and DECdtm and XA protocols for transactions. Given the complexities of distributed computing and the huge diversity of potential production environments, including such factors as data throughput and network speed, it is not possible to make any baseline assertions about the performance you should expect.

For these reasons, it is strongly recommended that you obtain the advice of a qualified services consultant before embarking on any major or mission-critical project.

1. Version 3.0A New Features Summary

Multi-developer Support

The BridgeWorks UI now helps coordinate team members using a shared BridgeWorks connection database. As developers work with a connection definition within BridgeWorks, they are registered within the database itself. If other team members attempt to work with the same connection definition (in that shared database), they are notified that it is being modified, as well as who is modifying it. BridgeWorks then allows the developer to open the connection definition in read-only mode.

New Installation Procedures

The OpenVMS kit has been changed to use PCSI, while the Windows kit has been changed to use the latest Install Shield. The new installation procedures provide the user with a more robust set of options, including an enhanced uninstall.

Multi and Mixed Character Set Support

Java supports many different characters sets. BridgeWorks now supports the passing of strings

based on these many character sets. This support also includes the mixing of character sets within a single string.

Better Support for ODS-5 Disks

BridgeWorks has improved its support for the ODS-5 file system. Previously, BridgeWorks had problems seeing some directories and files with mixed case characters in its name.

Corrected Problems in Version 3.0A

Fixed ACCVIO in BWX\$MANAGER

In some rare cases, the BridgeWorks Manager would ACCVIO when it could see, but not open, a .bwx configuration file. Although the root cause of the problem is environmental (such as bad file protections on the .bwx files), this has been fixed so that the Manager no longer crashes.

Fixed FTP (Import) Issues

Various FTP/browsing errors have been resolved during the ANA import procedure. These errors include files not being displayed in the file browse list, and a possible BridgeWorks crash in some cases when a specified directory is invalid.

2. Version 3.0 New Features Summary

Support for Cross-Platform Transactions

BridgeWorks now enables two-phase commit transactions that originate from a Java client and are coordinated by a J2EE transaction manager, such as BEA WebLogic Server. BridgeWorks supplies all the infrastructure components for OpenVMS integration of DECdtm-based 3GL or ACMS transactional applications and other resource managers - including transaction-aware databases, such as Rdb and Oracle9i.

New Transport Options

An enhanced transport-layer architecture optimizes transport by providing ICC (Intra-cluster Communications), RPC, or no-transport options. ICC provides clustered OpenVMS systems with the fastest transport available. RPC transport no longer requires the DCE RPC developer license.

More-Efficient Runtime Code

BridgeWorks now uses an improved component architecture that uses optimized runtime libraries and reduces the amount of user-specific generated code. This reduces build times, simplifies deployment, and improves maintainability.

New Server Management Services

The BridgeWorks Manager provides new directory services and server management for the middle component. This includes load-balancing capabilities, such as keeping track of available servers and maintaining pools of free servers (determined by configurable parameters for minimum, maximum, and idle servers) to speed response times. These extra capabilities allow some connections to avoid the high cost of process creation at server startup.

SYSUAF-Based Security

BridgeWorks now supports OpenVMS SYSUAF-based client authentication. This means that server processes will start up in the BridgeWorks default (SYSTEM or another specified) account, and clients will be able to use a log-in and log-out method to access other OpenVMS accounts required to use the wrapped application.

Enhanced Structures

An enhanced structures scheme gives you the option of using Java-based get and set access methods for individual fields. This implementation is consistent with the getter/setter bean that is recognized by Java IDEs, such as NetBeans. By using enhanced structures, you can simplify client coding and optimize call-time performance by doing most data marshaling at the time the values are being read from and written to the client.

Structures Are an Abstract Class

The `BwxStructure` class is now an abstract class, rather than an interface wrapper. Generated structure classes now inherit from it, which means it is no longer, and can no longer, be referenced from a Java client. This greatly simplifies the use of structures from within Java clients.

New `BwxDecimal` Class

A new `BwxDecimal` class is available to Java clients. Previously, OpenVMS decimal string datatypes were handled as Strings. The `BwxDecimal` class makes available the full range of Java's `BigDecimal` class operations: basic arithmetic, scale manipulation, comparison, hashing, and format conversion. (See Section 5: Upgrading)

Enhanced Exceptions

In V3.0 and higher, BridgeWorks adds enhanced exception handling. There is now a root exception class, `BwxException`, and two derived exception classes, `BwxServerException` and `BwxConnectException`. `BwxServerException` will be thrown for all server side exceptions, while `BwxConnectException` will be thrown for all connection related errors/exceptions. All three exceptions thrown by BridgeWorks also make available the internal status, the original OS status, the severity level, and the facility code of the originator of the error. This allows a client to better differentiate and classify the exceptions, and more easily make decisions based on them.

3. Upgrading from BridgeWorks 2.1 or 2.1A

Version 3.0A of BridgeWorks has been designed to coexist with previous versions of BridgeWorks. This is true for the development and the runtime environments. However, the new scheme is not backward-compatible:

On OpenVMS

Version 3.0 and higher installs an enhanced BridgeWorks Manager. This replaces the existing Version 2.0/2.1 Manager - using the same process name, `BWX$MANAGER` - and renaming the 2.1/2.1A Manager to `BWX$MGR_V21`. If configured to start automatically, the `BWX$MGR_V21` process will continue to be available for 2.1/2.1A connections.

On Windows

The BridgeWorks Windows kit installs in `C:\Program Files\HP BridgeWorks` by default (whereas previous versions installed in `C:\Program Files\Compaq BridgeWorks` by default). The Version 3.0 and higher registry section is also new. The Version 3.0 and higher connection database and data source are also named differently. Note that the Version 3.0 and higher database is named `BWXData_2_03.mdb` (and the Version 2.1/2.1A database was named `BWXData_2_02.mdb`).

Connection database upgrade

The BridgeWorks installation process prompts you to import existing connections (in a 2.1 or 2.1A database) into the new database. This is your ONLY opportunity to perform the automatic import unless you rerun the installation. Your existing connection database is

unaffected. When you generate the code for an existing connection using Version 3.0 and higher, the new code that will be generated will be entirely in the new component architecture. It is not backward-compatible.

Extended Method Code

Extended method code (customized middle component code) is no longer supported by BridgeWorks. Any such code in your existing connections will NOT be saved or regenerated. To find such code, in \middle directories generated by previous versions of BridgeWorks, do the following:

1. In a text editor, open COM files named <Interface>_view.cpp or JavaBeans files named C<Interface>Bean.java or EJB files named <Interface>EJB.java. (You should find one for each interface defined in your connection).
2. Look for the comment // To do: add your implementation inside the *_PRESERVE tags.

Existing clients

Required changes to existing client code have been minimized as much as possible. In fact, COM clients should not require any revision. Java clients previously compiled in the 2.1/2.1A environment will continue to compile and run in the BridgeWorks 2.1/2.1A environment.

However, when an existing Java client is recompiled in the Version 3.0 and higher environment, it will always require a change to its import statements.

New Package Statement

To use the BridgeWorks-supplied type classes, your client package statements must be changed from:

```
import com.compaq.bwx.Bwx<Type>;
```

to:

```
import com.hp.bwx.Bwx<Type>;
```

Example of updated statements:

```
import com.hp.bwx.BwxLong;  
import com.hp.bwx.BwxDecimal;
```

See Help: Using the Bwx Classes

Further changes are required if your existing clients use the `BwxStructure` class, or the `BwxString` class for decimal string types.

New BwxStructure Class

The `BwxStructure` class now offers two modes of use: enhanced and standard. If you are writing new Java clients, you are recommended to use the new Enhanced mode. If you have existing clients, you can continue using the previous structure wrapping scheme by making the following change:

Upgrade Step

If you have existing clients, remove explicitly declared `BwxStructure` parameters. The structure methods exposed by the middle component now inherit all the properties of the `BwxStructure` class.

For example, in 2.1/2.1A, initializing and declaring structures was a two-step process:

```
structarraystruct mySt = new structarraystruct();  
.  
.  
.  
.  
.  
.  
BwxStructure p1 = new BwxStructure(mySt);
```

In Version 3.0 and higher, only the first step is required.

Error handling

BridgeWorks Version 3.0 and higher rearranges and adds exception classes in order to better differentiate them for the client. However, depending on the current exception handling used in the client, this may require changes to the client.

If the client code generically catches the `Exception` class, then no changes are required. However, if the client code currently catches the `BwxServerException` class explicitly, then this will minimally need to be changed to `BwxException`. Optionally, you can add handlers to catch `BwxException`, `BwxServerException`, and `BwxConnectException` independently. This allows more flexibility in handling these different exception types.

All structures now require client error-handling code. This includes structure code that previously did not throw exceptions in your clients.

Upgrade Step

The structure constructor (`new`) should always be in a try/catch block or in a routine that can throw an exception to its calling routine.

See Help: Using the BwxStructure Class

New BwxDecimal Class

Previously, when building a Java client for a BridgeWorks connection, OpenVMS decimal string datatypes were handled as `Strings`. This limited the range of mathematical operations that you could perform on them. The `BwxDecimal` class makes available the full range of Java's `BigDecimal` class operations.

Upgrade Step

Change references to `BwxString` classes to `BwxDecimal` classes. The `BwxDecimal` constructor can take `BwxString` or a regular `String` as an argument.

Note: Clients can only pass in formats recognizable by the Java `BigDecimal` class. For example, "+100.0", but not "100.0+".

See Help: Using the BwxDecimal Class

New Component Build Commands

Build scripts have been streamlined and simplified, and now employ a simpler naming scheme:

Server Component Build Script

```
BUILD_SERVER.COM
```


Middle Component Build Scripts

```
BUILD_<type>_MIDDLE.COM  
build_<type>_middle.bat
```

where <type> can be **jb** for JavaBeans, **ejb** for Enterprise JavaBeans, and **com** for COM.

BridgeWorks Middle Component and Client Support Files

In the case of JavaBeans and EJB connections, many support files previously generated per connection are now included in a static file, `BwxUtil.jar`. (This reduces build times, simplifies deployment, and improves maintainability.) On OpenVMS Alpha systems, this file is installed in `SYS$LIBRARY`. On Windows, the default installation location for this file is in `\Program Files\HP BridgeWorks\lib`. Middle component build commands use this library, and your client compilation and run commands must include a reference to it also.

See Help: Compiling and Running Java Clients

4. Configuration Considerations and Requirements

ICC Startup File Should Be Enabled

When using ICC transport, it is highly recommended that you invoke the `ICC$STARTUP` file by adding `ICC$STARTUP` in your `SYSTARTUP_VMS.COM` file.

Manager Requires LOG_IO Privilege

The server component uses an event mechanism to notify the BridgeWorks Manager when it becomes free for new connections. The event mechanism makes use of a mailbox for communicating with the Manager. OpenVMS requires the `LOG_IO` privilege for all mailbox operations. The Manager and server now make extensive use of mailboxes to propagate information about reservations, so the `LOG_IO` privilege is mandatory for both server and Manager processes.

Making configuration changes

All server processes that the BridgeWorks Manager starts are detached processes running out of the account specified in the server's configuration file (`<CNXNAME>.BWX`). Many aspects of the server configuration for a particular connection are controlled by the Manager according to your customizable configuration settings. For example, you can effect per connection stack-size adjustments using the configuration file. The default is for DECThreads to use the system's default stack size. However, higher values will be required for some connections, including ones where Oracle9i participates in XA transactions.

See Help: Making Configuration Changes

5. Known Limitations and Issues in Version 3.0A and 3.0

Transaction Support for WebLogic

Although BridgeWorks Version 3.0 and higher works with BEA WebLogic Version 6.1 and higher, the transaction support within BridgeWorks does not work properly with WebLogic Version 7.0 and higher. In particular, when two EJBs are called as part of the same transaction, and both are part of

the same Domain, the transaction fails when the second EJB is called. This is an identified problem in WebLogic. The HP BridgeWorks engineering team is currently working with the WebLogic team to resolve this issue.

Workaround: Use WebLogic Version 6.1. If you are using WebLogic Version 7.0 or higher, specify a unique domain name for each EJB type. This forces WebLogic to use two Phase Commit Transactions when multiple EJBs are used in the same transaction.

Transactions Fail if WebLogic's JTA Health Monitor Times Out

Recent versions of WebLogic may mark a Resource Manager (RM), including the BridgeWorks RM, as *bad* if a transaction takes too long. This is caused by the internal timeout value of WebLogic's JTA health monitor. (By default, the JTA health monitor timeout value is set to two minutes within WebLogic, which is a different value than the normal transaction timeout.) Once this timeout occurs, all further attempted transactions may fail. The only way to clear this condition is to restart WebLogic.

Workaround: Override the JTA health monitor timeout value by adding the following lines to WebLogic's config.xml file, within the section for the domain that you are using:

```
<JTA
  MaxXACallMillis="240000"
/>
```

Handling Cluster Transition Delays

When running a BridgeWorks-generated EJB within an OpenVMS Cluster, the delay caused by a cluster transition may sometimes cause the server process supporting the EJB to crash. If this happens, the Java client that initiated the connection will get a Java exception returned for that EJB session.

Workaround: You can design your client to recover from the failed connection exception and reestablish a new connection. Since the EJB remains active, the BridgeWorks Manager will start up a new user server process to do a retry of the failed session or to service a subsequent EJB sessions.

COM-Related

A number of limitations and other errors related to COM connections are under investigation and have not been resolved in this release.

COM on OpenVMS Middle Component

Account and security issues related to running unauthenticated COM middle components on OpenVMS from a Windows client are under investigation. For this release, you are recommended to build and run COM middle components on Windows systems.

Log File Cleanup

In BridgeWorks V3.0 and higher, all server processes generate a log file (in addition to the BridgeWorks Manager log file). By default, the Manager removes these server logs periodically. To keep the logs, set the logging level to 2 or higher:

```
$ DEFINE /SYSTEM BWX$LOGLEVEL 2
```

Note: This logging level is more verbose and log files can become large rapidly (depending on the number of server being started).

Generated Code to Wrapper C++ Needs Modifying

In order to wrapper C++ applications, `C extern` statements must be removed from the generated `.c` and `.h` files. (These statements normally prevent name mangling of 3GL routine signatures.)

No-Transport Option Is Not Applicable to Single-Threaded Applications

Do not attempt to run a nonthreadsafe application (such as a COBOL-based application) in a no-transport environment. In the BridgeWorks no-transport option, the wrapped application image is loaded directly into the same process as the JVM. If the JVM is part of a larger environment, like BEA WebLogic or Tomcat, this will likely result in a handled exception when the COBOL application is accessed.

CONTACT AND SUPPORT INFORMATION

Software Support Contract

Standalone software support is available for HP BridgeWorks. For more information, contact your local HP support center at:

http://welcome.hp.com/country/us/en/contact_us.html

General Comments and Feedback

You may submit your technical suggestions and feedback to the BridgeWorks engineering team by sending mail to:

BridgeWorks@hp.com

Please do **not** use email for time-critical technical support questions, as response from the BridgeWorks engineering team is on a time-available basis only.

If you would like to provide comments or general feedback about the e-Business offerings on OpenVMS, please send mail to:

OpenVMS.eBusiness@hp.com

BridgeWorks Home Page

<http://www.hp.com/go/bridgeworks/>