



## HP NonStop Server for Java Version 4.0 software

### Features at a glance

- State-of-the-art Java programming language and execution environment for NonStop servers
- Supported by a broad range of development tools, including popular open source tools like Apache Ant
- Easy integration with NonStop SQL database
- Compatible with Java standards
- Support for Java 2 SDK Version 1.4.1 features
- Optimized for server-side operations
- Significantly improved performance over previous versions of NonStop Server for Java software

Java is one of today's most popular open application environments. That's because the Java language is a defined standard supported by many vendors, and compliance with that standard means open systems capability. A simple, object-oriented programming language with syntax similar to that of C++, the Java language has many features that aid in making Java programs robust and safe as well as in improving programmer productivity.

In the past, the Java language was used primarily for Internet and intranet client-side applications. However, it has now moved beyond the desktop, to deliver Java benefits to traditional server-based applications, such as online transaction processing (OLTP), messaging, and Web servers. Server-based Java programs that extend server functionality are becoming increasingly valuable.

HP NonStop Server for Java Version 4.0 software is a certified implementation of Java 2 Platform, Standard Edition (J2SE) Version 1.4.1, which provides an enterprise-class software environment that allows you to run standard Java applications on NonStop servers. This software, together with HP NonStop Servlets for JavaServer Pages, NonStop Server for Java Message Service (JMS), HP JToolkit for NonStop servers, and BEA

WebLogic Server 8.1 software, makes it easy to develop new Java applications that take advantage of the business-critical features of the industry's most scalable and reliable server.

In addition, NonStop Server for Java software, along with HP JToolkit for NonStop servers, provides you with application program interfaces (APIs) and tools that combine the advantages of Java technology with your knowledge of existing NonStop server products, such as Pathway and Enscribe software. Using these Java APIs allows you to take advantage of the productivity features of the Java language to design new applications that provide deep integration with existing software assets and leverage existing knowledge and skill sets.

Also, NonStop Server for Java 4.0 software demonstrates almost three times better performance than NonStop Server for Java 3.1 software, as measured by a computationally intensive (no database I/O) benchmark.\*

In summary, NonStop Server for Java software lets you develop standard server-side Java applications with tools from a wide variety of platforms, including HP AlphaServer, Microsoft Windows, Linux, and Sun environments. In addition, NonStop Server for Java software supports IEEE floating point computations in hardware and includes a Java HotSpot compiler to enhance the overall performance of your server-side Java applications.

## **State-of-the-art Java programming language and execution environment for NonStop servers**

NonStop Server for Java software enables you to use the state-of-the-art Java programming language and execution environment on a range of NonStop servers. The Java computing client/server model and the computer industry's movement toward "thin" clients accessing "fat" servers place a premium on servers that are reliable, scalable, and powerful. Server strengths in expandability, resilience, and performance are ideal for capitalizing on this thin-client/fat-server model.

Today, numerous Java technology-based, server-side products are beginning to emerge. NonStop Server for Java software is designed to allow off-the-shelf server-side Java applications that conform to the 100% Pure Java specification to run on the HP NonStop server platform.

There are several reasons for the growing popularity of the Java language:

- A complete platform for developing and deploying enterprise, server-side applications
- Outstanding portability
- Ease of programming

## **Java for large-scale enterprise applications**

The advent of standards like the Java 2 Platform, Enterprise Edition (J2EE), make it possible to develop applications that are no longer tied to vendor-specific APIs. The J2EE platform provides the APIs needed to develop large-scale enterprise applications. These platforms rely on the services of the J2SE—as implemented by NonStop Server

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\* Note that some Java applications may be more than three times faster on NonStop Server for Java 4.0 software, and some may be less than three times faster.

for Java software running on NonStop servers—for their proper functioning. HP's preferred J2EE application server is BEA WebLogic Server. WebLogic Server 7.0 is available now for NonStop Server for Java 3.1, and WebLogic Server 8.1 is expected to be available for NonStop Server for Java 4.0 in early 2004. For more information about BEA WebLogic Server on HP NonStop servers, refer to <http://h71033.www7.hp.com/page/NED-BEA.html>.

## **Outstanding portability**

Java is a platform-neutral language that is highly portable. To achieve this portability, the Java compiler generates byte code in a format designed to run efficiently on multiple hardware and software platforms.

Java applications will run on any platform that has a Java Virtual Machine (JVM) implementation, so you can move your Java applications from one platform to another as required. This capability appeals especially to independent software vendors (ISVs) that want to offer their solutions on a variety of platforms. Large corporate customers that develop custom applications and deploy them on various hardware and operating system platforms also benefit from Java portability.

## **Ease of programming**

A major strength of the Java language is its outstanding programmer productivity over both procedural languages and other object-oriented languages. These benefits accrue largely because Java is the state-of-the-art language with respect to object-oriented languages. It provides strong variable types, does not directly support pointers, and handles garbage collection automatically.

NonStop Server for Java software implements all of these aspects of the standard Java environment while also providing various ways to leverage the proven scalability, reliability, data integrity, and manageability of NonStop servers. When coupled with a rich set of options for interactive development tools, this software provides substantial development productivity benefits.

## **Supported by a broad range of development tools**

Applications designed to run in the NonStop Server for Java environment can be built using many popular Java development tools. For example, you can take advantage of the wide selection of low-cost graphical development tools available on Windows and Linux workstations. Java applications can be developed and debugged using Borland JBuilder and other Java software development tools (such as Oracle JDeveloper and IBM Visual Age for Java, although these tools have not been tested with NonStop Server for Java 4.0). A particularly good white paper is available on Borland's website that covers the use of Borland JBuilder for the development of BEA WebLogic Server 7.0 applications on HP NonStop servers.

You can analyze your Java applications running on NonStop Server for Java software by using the standard *hprof* profiling agent, which is available with NonStop Server for Java software. The data collected by this agent can then be imported to any standard tool that is capable of visually rendering the data. One such tool is HPjmeter from HP, which is downloadable at no cost from HP's website.

Once you have created an application, you can transfer the code to a NonStop server running NonStop Server for Java software. Once the application is running on the NonStop server, it can be debugged interactively—and profiled—using the Borland JBuilder and HPjmeter tools, respectively.

In addition, NonStop Server for Java 4.0 is supported by popular open source tools, such as Apache Ant, a Java based build tool.

## **Easy integration with NonStop SQL databases**

NonStop Server for Java software includes the driver software needed to access HP NonStop SQL database tables. NonStop Server for Java software can access NonStop SQL relational database management software through the standard Java Database Connectivity (JDBC) 3.0 API.

In addition, long-name support in JDBC allows JDBC applications to run on NonStop Server for Java software using existing table, catalog, and index names. These names can be mapped unchanged to NonStop SQL table names, allowing your JDBC code to remain portable while accessing files on the NonStop platform.

NonStop Server for Java software also supports a transaction package that provides access to HP NonStop Transaction Management Facility (NonStop TMF) software. The package can be used with the transaction-aware NonStop SQL database drivers, to define transactions across transaction services, such as those that include both JDBC and Java to Pathway calls.

## **A range of NonStop servers**

NonStop Server for Java 4.0 runs on all NonStop S-series servers except for the NonStop S700B and S70000 servers. Specifically, this software will not be available on the processor multifunction unit (PMF) customer replaceable unit (CRU) model numbers 1951 and 1951-4, because they do not have hardware support for IEEE floating point operations. NonStop S-series servers combine a unique parallel processing architecture with RISC technology to deliver outstanding price/performance and reliability in open computing environments.

The loosely coupled architecture consists of multiple processors, buses, and other components. This architecture prevents all single and most multiple hardware and software failures from disrupting an application or affecting data integrity. As a result, these servers provide an unmatched platform for critical business applications.

## **Compatible with Java technology**

NonStop Server for Java software is a compatible version of Sun Microsystems' J2SE Software Development Kit (SDK) Version 1.4.1. It includes the following standard Java components:

- JVM based on Java 2 SDK Version 1.4.1
- All core Java APIs of Java 2 SDK Version 1.4.1
- Java 2 SDK Version 1.4.1 tools, except those that require a graphical user interface as part of their functionality

## Features that were new in previous releases of NonStop Server for Java software (Versions 3.0 and 3.1)

The major features in Java 2 SDK Version 1.3.1 that are supported by NonStop Server for Java 3.0 software include the following:

- Performance enhancements, including support for performing floating point operations in hardware
- RMI enhancements, including the ability to use CORBA's Internet Inter-ORB Protocol (IIOP) communication protocol
- A CORBA 2.3.1-compatible Object Request Broker (ORB), a runtime component that is a fully compatible Java ORB for distributed computing using IIOP communication
- A new version of the IDL-to-Java compiler
- Enhancements made to various packages as part of J2SE 1.3 specifications

## Features that are new in NonStop Server for Java 4.0 software

Following are new features of NonStop Server for Java 4.0 software:

- HotSpot compiler and runtime, which analyzes the way applications actually run and compiles applications adaptively to maximize performance.
- The Java graphics environment is now enabled, following the headless definition, which is for platforms that do not support displays, mice, or keyboards, such as Web servers, enterprise servers, and printers. It enables printing, 2-D, and production of images.
- Correct handling of headless mode exceptions for some AWT and Swing methods when called in headless mode.
- XML parsing and processing (Java API for XML Processing, JAXP 1.1) and data binding.
  - XML parser and DOM 1.0
  - XML data binding
  - DOM 2.0 and SAX 2.0
  - Support for XSL Transformations (XSLT)
- New I/O (NIO; scalable I/O for sockets and files, character set API): new SDK 1.4 APIs provide new features and improved performance in the areas of buffer management, scalable network and file I/O, character-set support, and regular-expression matching. The NIO APIs supplement the I/O facilities in the java.io package.
- Security (Java Cryptography Extension, JCE; Java Secure Socket Extension, JSSE; and Java Authentication and Authorization, JAAS).
  - JSSE Optional Package in core
  - JAAS Optional Package in core
  - JCE Optional Package in core
  - Certificate path building and verification
  - Kerberos via Java Generic Security Services (JGSS)
- New APIs for event and error logging: The Java Logging APIs, introduced in package java.util.logging, facilitate software servicing and maintenance at customer sites by producing log reports. The Logging APIs capture information such as security failures, configuration errors, performance bottlenecks, and/or bugs in the

application or platform. The core package includes support for delivering plain text or XML-formatted log records to memory, output streams, consoles, files, and sockets. Note: Direct access to HP's Event Management Service (EMS) is not supported in this release, although the Java Native Interface (JNI) can be used with NonStop platform-specific APIs for this purpose.

- Support for JDBC 3.0 features, including Java Transaction API (JTA) and disconnected rowsets.
- Preferences: These APIs (part of package `java.util.prefs`), allow applications to store user, system preference, and configuration data persistently in an implementation-dependent backing store, and retrieve this information as required. The Preferences API is intended to replace most common uses of class `java.util.Properties`, rectifying many of its deficiencies, while retaining its light weight.
- Assertions: Assertions are Boolean expressions that programmers believe to be true concerning the state of a computer program. For example, after sorting a list, programmers might assert that the list is in ascending order. Evaluating assertions at runtime to confirm their validity is one of the most powerful tools for improving code quality, as it quickly uncovers programmer misconceptions concerning program behavior.
- Chained Exceptions Facility: Implements a common API to record and reconstruct exceptions that cause other exceptions, making it possible for preexisting programs to provide this information with minimal programming effort.
- I18N (Unicode 3.0, Hindi, Tai, and GB18030 [Chinese]).
- More CORBA support (POA and ORB daemon naming service).

The J2SE 1.4 ORB is based on the following CORBA specifications:

- CORBA 2.3.1 (formal/99-10-07)
- IDL-to-Java language mapping (ptc/00-01-08)
- Revised IDL-to-Java language mapping (ptc/00-11-03)
- Java-to-IDL language mapping (ptc/00-01-06)
- Interoperable Naming Service (ptc/00-08-07)
- Portable Interceptors (ptc/2001-03-04)

## Related products

The following related products are also available for NonStop servers:

- *JToolkit for NonStop servers software*—Provides APIs and tools that combine the advantages of Java technology with your knowledge of existing NonStop server products, such as Pathway and Enscribe.
- *NonStop Servlets for JavaServer Pages software*—Implements both the servlets and JavaServer Pages specifications.
- *NonStop Server for Java Message Service software*—A unique JMS API implementation, which uses the services of the NonStop SQL database management system to provide message queue management and publish/subscribe capabilities within a relational database context.
- *NonStop CORBA 2.3* includes a Java ORB as well as a C++ ORB.
- *NonStop Server Toolkit for BEA WebLogic Server 2.0 is expected to be available in the March 2004 time frame.* This toolkit enables BEA WebLogic Server 8.1, a full-function application server environment with support for the J2EE specification, to

exploit the parallelism of NonStop servers. Note that BEA WebLogic Server 7.0 is not supported on NonStop Server for Java 4.0 software.

Note that the following Java based products will require new releases to work with NonStop Server for Java 4.0 software: NonStop Servlets for Java Server Pages, JToolkit for NonStop servers, and the Java ORB contained within NonStop CORBA 2.3. BEA WebLogic Server 7.0 will not be supported on NonStop Server for Java 4.0 software; rather, BEA WebLogic Server 8.1 is expected to be available for NonStop Server for Java 4.0 in the first half of 2004.

## Ordering information

| <i>Product ID</i> | <i>Description</i>                           |
|-------------------|--|
| SJ96V4            | NonStop Server for Java Version 4.0 software |

### Manuals (available in HTML and included on the product disk)

| <i>Order no.</i> | <i>Title</i>  |
|------------------|---|
| 426947-003       | <i>NonStop Server for Java Programmer's Reference</i> |
| 426948-003       | <i>NonStop Server for Java Tools Reference Pages</i>  |
| 426998-003       | <i>NonStop Server for Java API and Reference</i>      |

## Specifications

### System requirements

|          |   |
|----------|---|
| Hardware | All NonStop S-series servers except NonStop S700B and S70000 servers. Specifically, NonStop Server for Java version 3.0 software is not available on the following PMF CRU models: 1951 and 1951-4. |
| Software | HP NonStop Kernel operating system Release Version Update G06.20 and later<br>Open System Services (OSS) operating system environment   |

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