

HPE NONSTOP DEVELOPMENT ENVIRONMENT FOR ECLIPSE 13.0

The integrated development environment
for HPE Nonstop developers

Key features

- Plug-in for Eclipse 2022-06 (version 4.24) for HPE Nonstop software development.
- Single development environment for:
 - Native C/C++, COBOL, pTAL, and Java languages.
 - HPE Nonstop i and HPE Nonstop X servers.
- Projects can be hosted on the local desktop or on remote HPE Nonstop servers.
- Migrate legacy ETK projects or TNS/E into TNS/X projects.
- Supports programs having embedded SQL statements.
- Secure connectivity to HPE Nonstop servers.

Benefits

- Industry-standard development environment and tools for HPE Nonstop software development.
- Develop software using commodity PCs.
- Use a single IDE for the complete development lifecycle (Create -> Edit -> Build -> Run -> Debug).
- Easily migrate from legacy development environment and tools.

Introduction

About NSDEE

HPE Nonstop Development Environment for Eclipse (NSDEE) is a PC-based integrated development environment (IDE) for HPE Nonstop developers. It enables developers to create, edit, build, and debug HPE Nonstop software using Microsoft Windows PCs. The projects can be built for Open System Services (OSS) and/or Guardian environment on HPE Nonstop. PC-based language cross compilers (licensed separately) are required to build your local projects.

NSDEE is a plug-in for Eclipse, a widely popular open-source IDE, developed by the Eclipse foundation (eclipse.org). It provides HPE Nonstop platform-specific enhancements to Eclipse while preserving the usability and extensibility of the Eclipse IDE. You can further extend your Eclipse environment using a choice of thousands of plug-ins available from the Eclipse foundation and from commercial vendors.

About NSDEE 13.0

Please see [here](#)

New features in NSDEE 12.0

Enhancements in NSDEE 12.0 release are listed in the section [enhancements in NSDEE 12.0](#).

Benefits

Now, you can develop software for HPE Nonstop using the widely popular Eclipse IDE. NSDEE is a plug-in that enables you to develop code with HPE Nonstop-specific features and extensions but at the same time leverage your knowledge and familiarity with Eclipse. With Eclipse being widely supported in the industry, you can build your software for multiple target platforms by simply adding platform specific plug-ins such as compilers, preprocessors, and so on.

You can also integrate with other developer environment products such as configuration management (CM) tools, defect-tracking tools, etc., using Eclipse plug-ins supplied by their vendors and manage all your development from a single IDE. You can further extend your environment by writing your own plug-ins to suit your specific project needs.

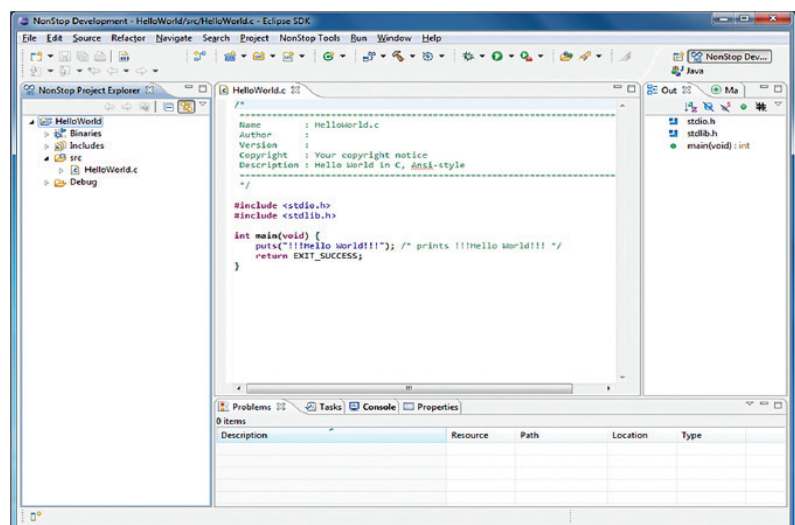


Figure 1. HPE Nonstop project workspace

HPE provides HPE Nonstop-specific plug-ins that extend the capabilities of Eclipse and CDT for HPE Nonstop software development. NSDEE offers you a one-stop, state-of-the-art IDE that increases your productivity, reduces your development costs, and streamlines your application development. Your PC-based compilations run faster, which helps to boost productivity, and greater productivity translates into reduced development costs. The ability for you to use inexpensive PC hardware for development leads to better use of your premium HPE Nonstop server resources.

The Eclipse development platform has been very popular among developers for many years and is the dominant IDE in many organizations. With the number of open-source initiatives being built on top of the Eclipse IDE, it is an ideal development environment for your web, client/server, and applications enabled for service-oriented architecture (SOA). If you are familiar with Eclipse, you will easily be able to use NSDEE and become productive quickly. Your organization can easily hire developers from the widely available pool of Eclipse-skilled developers in the job market. When your teams work using one of the leading-edge technology, it increases their job satisfaction and efficiency when developing applications for HPE Nonstop servers.

Benefit from thousands of applications from the Eclipse marketplace and get your favorite open-source or third-party Eclipse plug-ins to enrich your development environment and help you deliver better productivity and quality in your project. Alternatively, you may also develop a plug-in customized for your project-specific needs and work preferences.

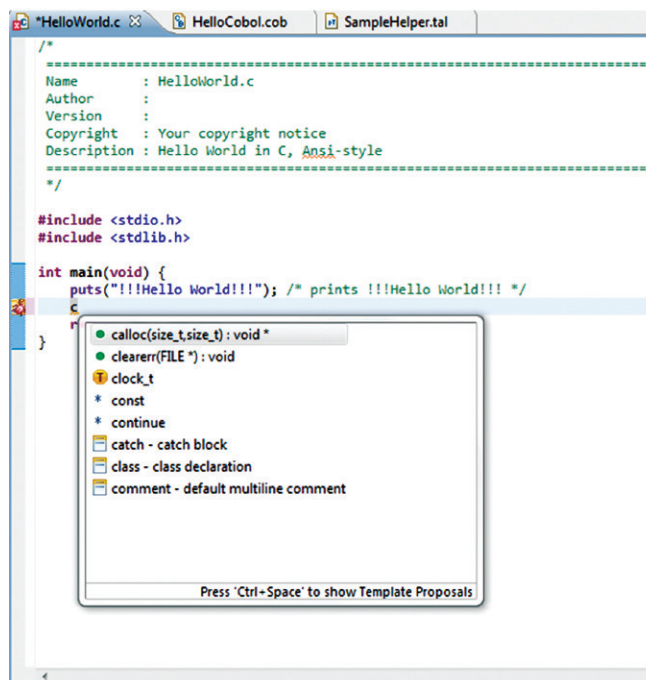


Figure 2. The C/C++ language editor

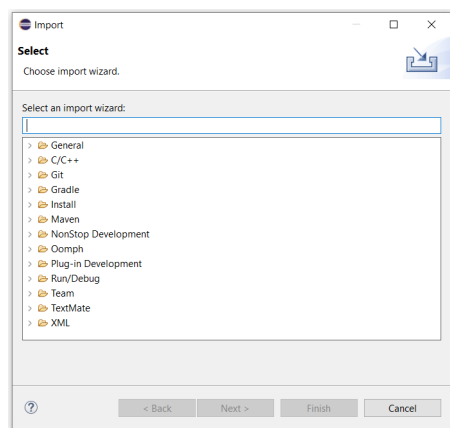


Figure 3. The project import wizard

Features

In NSDEE, you find a truly integrated set of tools and facilities to develop, build, deploy, and debug HPE Nonstop applications thereby improving productivity and enhancing your experience with HPE Nonstop application development.

NSDEE supports building HPE Nonstop applications on PCs using Windows-hosted cross compilers and tools, or on the remote HPE Nonstop servers using compilers and tools running on those servers. NSDEE also provides facilities for transferring source files and binaries to and from HPE Nonstop servers, as well as facilities for editing remote source files locally.

NSDEE includes an integrated debugger for debugging HPE Nonstop applications. NSDEE supports the full build, edit, and debug development cycle within its IDE.

Migrating from ETK

If you have an existing project developed using ETK, NSDEE used to provide wizard-based tools to import these projects easily and helps you adopt NSDEE as your development environment for the existing projects. The import features facilitate reuse of the existing project configurations and project files as much as possible while transitioning over to NSDEE and thereby help in reducing the time required for you to be productive on your new Eclipse environment.

Important note: This feature is deprecated in NSDEE 10.0 release. This feature will be completely removed in the next NSDEE release.

Support for Java and HPE Nonstop native programming languages

You can use NSDEE to write programs in all native languages that are supported on the HPE Nonstop platform such as C/C++, COBOL, and pTAL.

Your project can have source files written in different supported languages as long as the appropriate cross compilers have been installed for local builds. Each language compiler product needs to be ordered separately. NSDEE is upward compatible with future cross compiler releases i.e., NSDEE allows you to install newer compiler releases without having to reinstall or upgrade NSDEE.

Using NSDEE, you can build dynamic link libraries (DLLs), position-independent code (PIC), and user libraries. The project-creation wizards provided by NSDEE offer options using which you can select the appropriate object files to build for your project.

Writing database applications

NSDEE enables you to write applications that use embedded SQL statement in programs. The project-creation wizard guides you through the database settings that can be configured for an application such as catalog name, embedded file settings, and preprocessor setup. HPE Nonstop SQL/MP code can be embedded in C and COBOL, whereas HPE Nonstop SQL/MX code can be embedded into C, C++, and COBOL. You would require SQL preprocessors in order to be able to compile these projects.

Support for local and remote software builds

You can build projects on the local PC using cross compilers. Alternatively, your project artifacts can reside on and can be built on remote HPE Nonstop hosts using host-based compilers. Thus, you have the complete flexibility to direct the usage of HPE Nonstop system resources for software development based on your unique setup and resources at your disposal. In other words, if you are a developer who prefers to develop applications from your desktop, you can do so without having to switch back and forth between Eclipse and other tools. This enables more developers to share HPE Nonstop servers and use them only for running target applications during the debug phase.

Makefiles

NSDEE can create the makefile for your project, or you can create it for yourself and have NSDEE use it for the project. You can toggle this managed build attribute of a project on or off, giving you more flexibility in how to develop your application. You also can create custom makefile targets and modify build behavior while still having NSDEE manage builds and create makefiles for you. In addition, you can have greater flexibility for your builds by using smaller and more concise “makefiles” and by using “makefile” includes. You can create multiple build configurations for a single project. You can target your project builds for OSS and/or Guardian environments of HPE Nonstop.

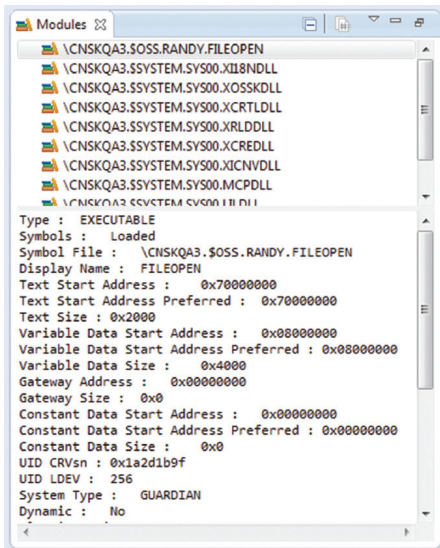


Figure 4. Modules view

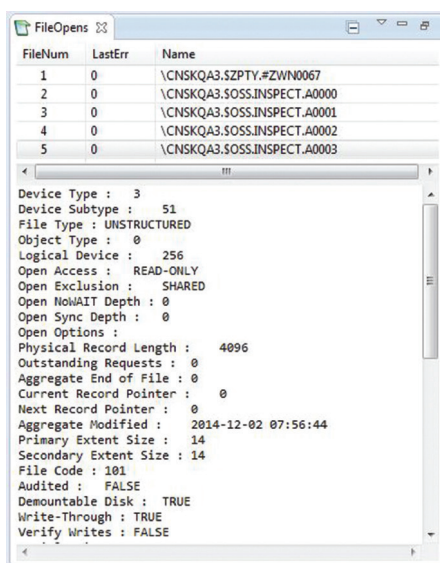


Figure 5. FileOpens view

Integrated installer

The NSDEE DVD comes with CDT and NSDEE plug-ins pre-installed within Eclipse. All you need to do is copy the package to your hard drive, unzip the 64-bit version of the product, and launch Eclipse.

Launch TS/MP serverclass programs

If your program is a serverclass, you can deploy and launch, and debug launch it as a TS/MP serverclass from within NSDEE. NSDEE allows you to define your program as a serverclass, assign it to a PATHMON environment on the host, set its parameters, pass arguments, and launch it—all through an easy-to-use GUI-based menus.

Deploy, launch, and debug applications

You can deploy and launch applications on the remote HPE Nonstop host thereby avoiding the need to establish a separate Telnet/secure shell (SSH) session for this purpose. The NSDEE debugger provides a rich set of features typical of most modern debuggers. The debugging support is provided for native mode TNS/E and TNS/X objects. The debugger connects to the target program running on an HPE Nonstop host over an IP network using Telnet or SSH.

Integrated help system

Understanding the features and facilities available in NSDEE is made easy with access to documentation online through the Eclipse help system. It provides a comprehensive, context-sensitive help and dynamic help relevant for the currently active view.

Secure connectivity

Corporate security policies are increasingly being tightened to guard against security breaches. NSDEE users can use SSH to connect securely to their HPE Nonstop host for all their development tasks and in effect comply with the stringent corporate security policies.

COBOL Editor++

- Supports language grammar-based syntax highlighting.
- Outline view containing Program-ID, Data division, and Procedure division along with the variables and procedures defined under them.
- COBOL Editor++ is the default editor from NSDEE 8.0.
- Supports local and remote COBOL files including those opened using “Open remote file” tool.
- Supports cross reference, content assist, and rename element.
- Supports hovering over static content as well as while debugging and error markers.
- It also has a preference page to customize syntax coloring.

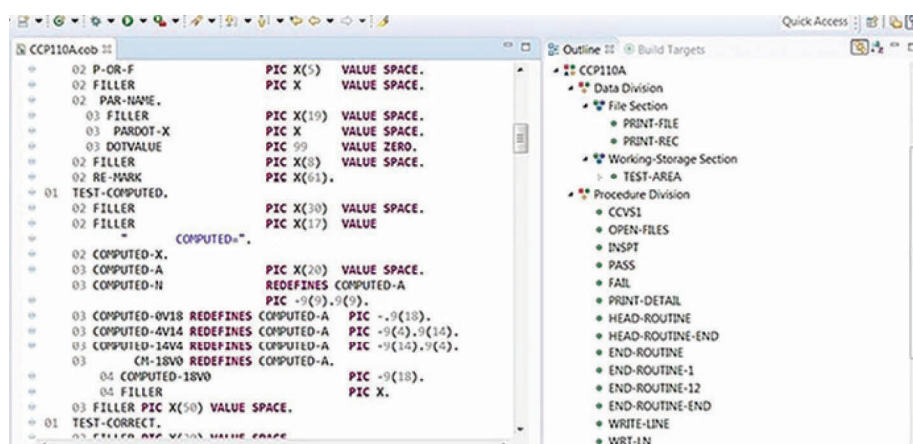


Figure 6. COBOL Editor++

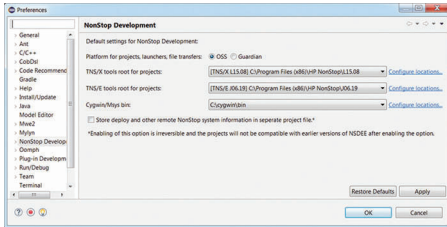


Figure 7. HPE Nonstop preferences

Integrated Native Inspect memory debugging

New memory tab under Debug Launch including Heap profiling, memory leaks, and heap corruption. Include leak error report post debugging.

Integrated code coverage functionality

- Auto-detecting profmrg and codecov tools along with cross compilers and linkers
- Enable code coverage at the time of project creation or in project properties
- Two new tools profmrg and codecov are added for all managed and makefile local projects

Option to maintain separate deploy information for project sharing

Deploy information can now be stored in a separate file “.remote” to allow projects shared to remain under source control yet allow user specific information to stay outside the .cproject or project file.

Switching user while debugging applications

Allows user to switch username while debugging applications. This allows a user connecting (i.e., the developer) to switch to the current application user ID (operational user ID).

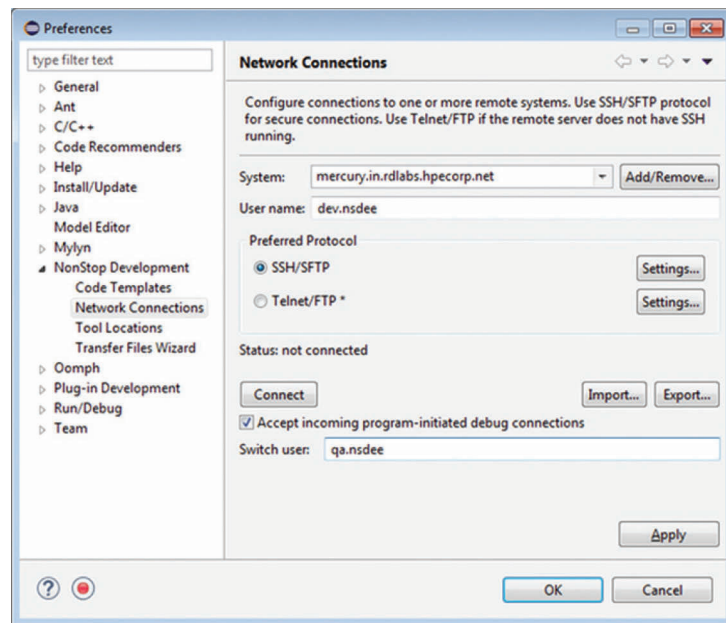


Figure 8. Switching user while debugging applications

Use HPE Nonstop process name or OSS Process ID for attaching to a process. In addition to the use of CPU, PIN, one can now attach the debugger to a process by providing either its process name or its OSS PID.

For more information on NSDEE 8.0, please download the documents HPE Nonstop Development Environment for Eclipse 8.0 User Guide and HPE Nonstop Development Environment for Eclipse 8.0 Debugging Supplement available at hpe.com/info/HPE-Nonstop-docs.

HPE Financial Services: Creating investment capacity to accelerate digital transformation.

HPE Financial Services helps organizations create the investment capacity they need for digital transformation, in an innovative and sustainable way. HPEFS partners with customers to develop a playbook for their entire IT asset portfolio (from edge to cloud to end user), one that is unique to their aspirations and size. Our financial and asset management solutions are anchored by best-in-class tech upcycling services. For more information, visit: hpe.com/us/en/services/financial-services.html.

Enhancements in NSDEE 9.0

NSDEE 9.0 is built on Eclipse 2018-12 (4.10) and CDT 9.6. The following provides a brief overview of the new features and enhancements in release 9.0.

Java SE 11 support

NSDEE 9.0 works with both Oracle® Java SE 8 and Oracle Java SE 11 simultaneously. Please note that NSDEE 9.0 supports only 64-bit deployment. This is true for deployments on both Java SE 8 and Java SE 11.

Quick fix to change project compliance and JRE to 11

Eclipse 2018-12 (4.10) and hence NSDEE 9.0 provides a quick fix to change the current project to be compatible with Java SE 11. This is called Change project compliance and JRE to 11.

Refactoring

It is now possible to change the name of a source file and/or project folder in a C/C++ project without any refactoring. After the “Rename” option is clicked in the drop-down menu that appears when right-clicking a source file name or a project, a dialog box comes up with an option to either rename all the references or not i.e., to decide either refactoring needs to be done or no refactoring is required. This is a new feature in CDT 9.6.

COBOL Editor++ Enhancements

Full support for ANSI COBOL is provided from NSDEE 9.0. All characters and words present up to column 6 and beyond column 80 will be considered as comments as per ANSI COBOL standards. From NSDEE 9.0 onwards, the editor supports REPLACE statement also.

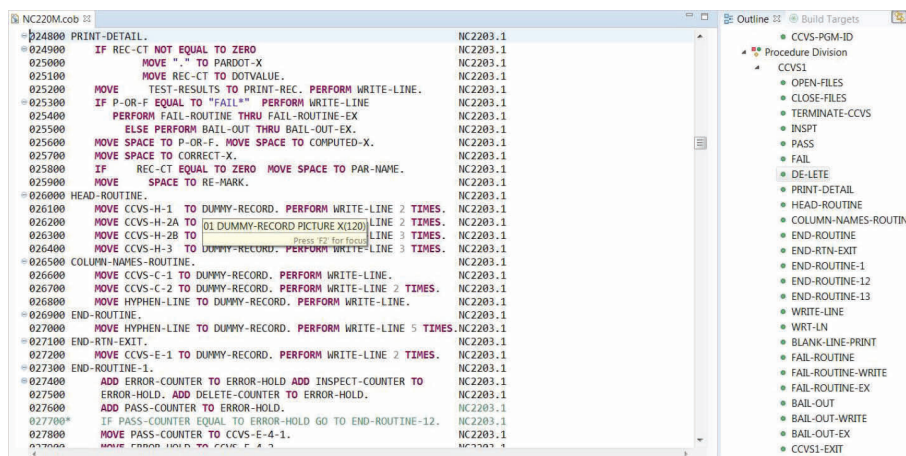


Figure 9. COBOL Editor++ Enhancements

C/C++ Editor Enhancements

#Pragma directive support is made available for columns, functions, and sections.

Build script generation

The editor provides a facility to generate a full build script by just right-clicking the project and selecting the corresponding option. The generated build script can be exported outside of Eclipse, is complete and can stand on its own including triggering a “make” operation. This enables automating the build operations as a part of DevOps model.

REPLACE option for SFTP during remote deployment

The SFTP operation prior to deploying the application on the remote HPE Nonstop server now supports a “REPLACE” option in addition to the “OVERWRITE” that was existing in previous versions of NSDEE. While the OVERWRITE effectively just changes the contents of the existing file with new contents, the REPLACE option will remove the existing file and add a new file, thus changing the ownership of the file for the SFTP operation.

Thread level debugging

Debug sessions started with TNS/X Native Inspect (i.e., xlnspect) version T0903L02^AAI can examine a multi-threaded application at its constituent thread levels with the application having been suspended from running. Debug view will show all the individual threads and their stack traces. You can expand each thread, go to views such as variable view, expressions view etc., and read the corresponding values.

Breakpoints also can be set at a thread-specific level. A “filter” mechanism is provided to enable setting thread specific breakpoints. Figure 10 shows the thread specific breakpoints menu.

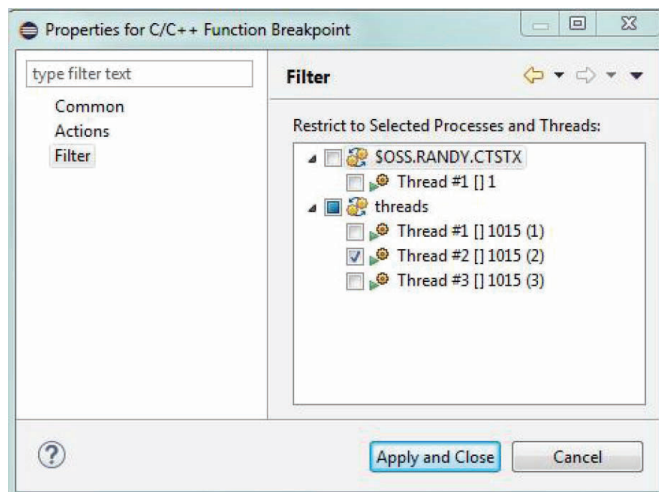


Figure 10. GUI thread level breakpoints setting

Memory Access Breakpoints (MABs)

NSDEE 9.0 allows setting MABs using the GUI from NSDEE 9.0 onwards. Previously MABs could only be set through the command line interface. Three types of MAB—namely, Change, Read/Write, and Write—are supported. Like other breakpoint types, a MAB can either be set for all threads of a process or for selected threads. For additional guidelines on the use of MABs please refer to the Native Inspect Manual that can be obtained from hpe.com/info/nonstop-ldocs. Figure 11 shows the MABs menu.

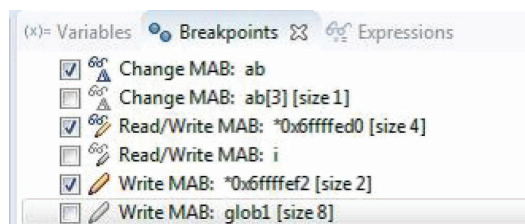


Figure 11. Memory Access Breakpoints

Breakpoint for dynamic printf

NSDEE 9.0 enables to set a dynamic printf statement to be run at specified breakpoints while tracing the running program trying to find faults. The running program does not stop but continues after printing the specified content when it hits the dynamic printf statement.

Modules view

Is automatically updated when the program adds/removes DLLs dynamically. Previously user had to manually refresh the “Modules view.”

View synchronization for memory changes

The memory, variables and expressions views of a project get updated automatically if the user changes the values of any variable from debugger console.

New features in NSDEE 10.0

NSDEE 10.0 is built on Eclipse 2020-03 (4.15) and uses the Eclipse plug-ins, namely, CDT 9.11 and Xtext 2.21.0. The following provides a brief overview of the new features and enhancements in NSDEE release 10.0.

Enhancements to remote operations with host HPE Nonstop

Password-less authentication

— HPE Nonstop C/C++ and COBOL cross-compilers support this feature from L20.10 RVU. Prior to this RVU a user needing to access the remote HPE Nonstop system in order to compile C/++ or COBOL applications that contain SQL statements was required to enter the username and password credentials before initiating remote builds on an HPE Nonstop host system. Starting from L20.10 a password-less authentication mechanism is available which is based on SSH keys.

NSDEE 10.0 provides for building applications having embedded SQL statements using password-less secure connections. You can configure SSH keys in the Windows machine using NSDEE for building such applications.

- NSDEE 10.0 provides the ability to configure SSH keys for the developer at the Windows machine which will be used for authenticating that user at the HPE Nonstop host before allowing access to applications that have embedded SQL statements. These SQL statements fetch the database tables in question and return the table structures to the SQL preprocessors running on the Windows machine. The SSH based mechanism is called “password-less authentication.”
- Headless deployment of projects also benefits from password-less secure connections.

Network connection to HPE Nonstop

- Key exchange algorithms, ciphers and message authentication codes can now be configured in NSDEE for the above mentioned SSH connections.
- NSDEE 10.0 supports establishing secure remote connections between the Windows machine and the HPE Nonstop host using XYPRO Access Control (XAC) software.

COBOL Editor++ Enhancements

- New COBOL directives SETTOG, REESTOG, IF and IFNOT have been added to the COBOL Editor++.
- COBOL editor scalability mode is now configurable based on the size of the source files.

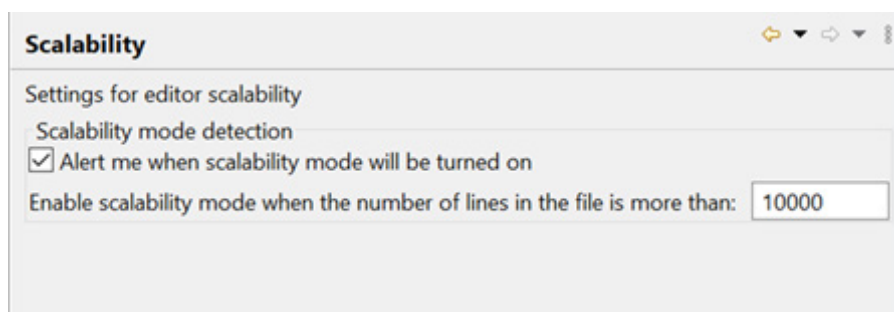


Figure 12. COBOL Editor++ scalability setting

Debugging enhancements

- TS/MP Serverclass debugging now supports memory debugging and heap analysis. A warning is raised about changes to Serverclass parameter values when the debug is launched and the Serverclass program is restarted. Values are reset to the original when the debug completes.
- The debug view has been enhanced to display the process IDs of both the application under test as well as the debugger's own ID. This will help the user to directly interact/work with the processes running on the remote HPE Nonstop host.
- Event breakpoints are now supported in NSDEE. With this all HPE Nonstop supported breakpoints are now available to be set from NSDEE debugging window.

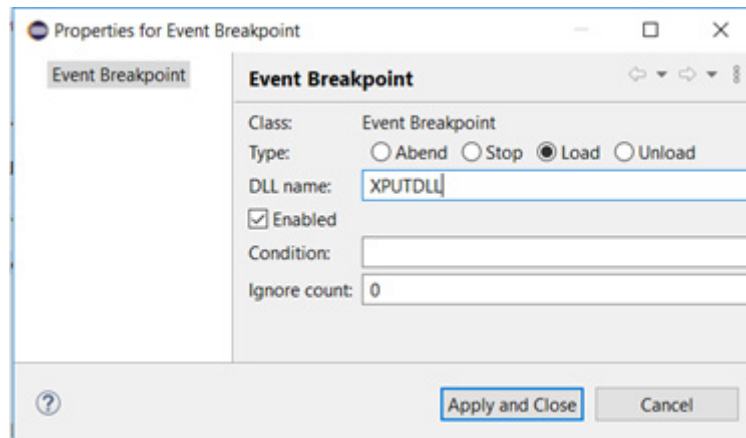


Figure 13. Event Breakpoint settings

- String values can now be assigned to program variable types that support it.
- NSDEE Console now shows termination time in addition to console launch time.

Note

The following functionalities have been deprecated in NSDEE 10.0 release. They will be removed from the next major release of NSDEE.

- Importing ETK Projects
- Importing NSDEE 2.x Projects
- Launching Visual Inspect (VI)

Enhancements in NSDEE 11.0

NSDEE 11.0 is built on Eclipse 2021-06 (4.20) and uses the Eclipse plug-ins, namely, CDT 10.3 and Xtext 2.25.0. For information on these releases, refer the Eclipse online documentation available at help.eclipse.org/2021-06/index.jsp. The following provides a brief overview of the new features and enhancements in NSDEE release 11.0.

HPE Nonstop tools

- New tool to transfer files from the remote HPE Nonstop to the local Windows machine.
- Existing tool to transfer files from the local Windows machine to the remote HPE Nonstop has been enhanced.
- Both the transfer tools offer facility to rename the files being transferred at the destination.
- Tools to import ETK projects, import NSDEE 2.x projects and to Launch Visual Inspect have been removed.
- Network connections can now be moved up and down with respect to their usage preference.

Indexing and auto-completion of boost libraries are supported

Secure shell (SSH) and SFTP are the default options for communicating with the remote HPE Nonstop system. Connecting to remote HPE Nonstop using Telnet/FTP is not recommended (deprecated and may be removed in future updates).

Remote Terminal plug-in is not part of NSDEE third-party.zip from this release. It can be installed from the CDT plug-in.

Enhancements to the debugger subsystem

Users can now use the “Find Global Variables” window, select and add the desired global and static scope variables to the Expressions View. This feature is compatible with TNS/E and TNS/X host debuggers.

Note that from NSDEE 11.0 “HPE Nonstop Development perspective” is the default perspective when opening a new workspace.

Enhancements in NSDEE 12.0

This release is a plug-in to Eclipse 2022-06 (4.24) and is shipped with C/C++ Development Tooling 10.7 (CDT 10.7) and Xtext 2.27.0.

NSDEE 12.0 includes OpenJDK 17.0.3 runtime environment

Previously users had to pre-install Java before installing Eclipse and the NSDEE.

Remote Terminal plug-in is now installed as part of Eclipse installation itself.

Hence there is no need for a separate installation of the same from the CDT plug-in.

A significant difference between NSDEE 12.0 and the previous versions is that the branding has been changed from “HP” to “HPE.” Users while migrating workspaces from earlier versions to NSDEE 12.0 must follow certain steps while doing the migration. These steps are described in detail in the [HPE Nonstop Development Environment for Eclipse 12.0 User Guide](#).

However, all projects from the earlier versions of NSDEE can be seamlessly imported into a workspace of NSDEE 12.0.

Apart from the above, several improvements have been implemented in the debugging launch mechanism. This release has also resolved a few issues with remote projects using slow Telnet connections. Refer to the softdocs of T0850 and T0880 for more information.

NSDEE 13.0

This release is a plug-in to Eclipse 2024-06 (4.32) and is shipped with C/C++ Development Tooling 11.6 (CDT 11.6) and Xtext 2.35.0.

NSDEE 13.0 includes OpenJDK 21.0.3 runtime environment

OpenJDK 21.0.3 is part of NSDEE and need not be pre-installed.

Table 1. System requirements

Hardware	
Memory	Windows x64: 2 GB (3 GB recommended) Red Hat® Enterprise Linux® (RHEL) 9.2 and later x86_64: 6 GB (8 GB recommended)
Disk space	600 MB for Eclipse, CDT, NSDEE plug-in, and Cygwin + 200 MB per target Release Version Update (RVU) or per each installed cross compiler
Software	
Operating system	PC: Windows 11 or Windows 10 x64 or Red Hat Enterprise Linux (RHEL) 9.2 and later. HPE Nonstop: L-Series OS with RVUs L18.08 or later with T0903L02^AAK or later (if the new debugging enhancements available in NSDEE 9.0 and later versions are to be used). Refer to softdocs for specific SPR levels to ensure access to all new features. The last version of NSDEE for working with J-series HPE Nonstop i platform is NSDEE 12.0. NSDEE 13.0 and later support only the L-series HPE Nonstop X and the vNS (Virtualized HPE Nonstop) platforms.
HPE Nonstop SQL	Connectivity and access to the server is required to compile programs with embedded HPE Nonstop SQL/MP statements. To compile programs with embedded HPE Nonstop SQL/MX statements, version 3.0 (IPM AAE or later) of a Windows-hosted HPE Nonstop SQL/MX preprocessor is required; version 3.0 or later of preprocessors is required to use embedded module definitions. Preprocessors are language specific and ship on-site update tapes (SUTs) with the HPE Nonstop SQL/MX product.
Eclipse	Eclipse version 2024-06 (4.32) (included in product DVD, bundled with CDT and NSDEE plug-ins)
CDT	CDT version 11.6 (included in product DVD, bundled with Eclipse and NSDEE plug-ins)
Xtext	Xtext version 2.35.0 (included in product DVD, bundled with Eclipse and NSDEE plug-ins)
Target Management Terminal	Target Management Terminal version 3.4.1 (included in product DVD under third-party packages)
Java	PC and Linux: Eclipse 4.32 comes with OpenJDK 21 which gets installed automatically.
PC-based cross compilers	Based on the programming language used in the project
Build tools	Cygwin Make 4.4.1-2 or MYSYS 1.0 (included in the product DVD)

Table 2. Ordering information

HPE Nonstop development environment for eclipse

The last version of NSDEE for working with J-series HPE Nonstop i platform is NSDEE 12.0. NSDEE 13.0 and later support only the L-series HPE Nonstop X and the vNS (Virtualized HPE Nonstop) platforms.

HPE Nonstop Servers (J-Series)

PID	Description
QSB98V1	HPE Nonstop Development Environment for Eclipse Core with Debugging, single-seat license
QSB98V1A	5-seat license of HPE Nonstop Development Environment for Eclipse Core with Debugging
QSB98V1B	10-seat license of HPE Nonstop Development Environment for Eclipse Core with Debugging
QSB98V1C	25-seat license of HPE Nonstop Development Environment for Eclipse Core with Debugging

HPE Nonstop Servers (L-Series)

PID	Description
BE436AM*	HPE Nonstop Development Environment for Eclipse Media
BE230AL*	HPE Nonstop Development Environment for Eclipse License To Use

* **Note:** On L-Series, order the SKU BE230AL in right quantities to match the number of user licenses required. You may then order one media SKU BE436AM per development server.

Note:

On the J-Series systems, prior to NSDEE 6.0, NSDEE has been available in the Core only option (No debugging option) with the PID QSB99V1. NSDEE 6.0 and subsequent releases are distributed under the core and debug option only (QSB98V1). A zero net cost trade-in option is available for customers to upgrade from QSB99V1 to QSB98V1 using the PID QSB99V1U. J-Series customers using the NSDEE Core only PIDs are advised to migrate to NSDEE Core + debug product using this free of charge upgrade option to continue using the latest releases of NSDEE.



Table 3. Available upgrade options for migrating from NSDEE Core to NSDEE Core and debug

Product ID	Description
QSB99V1U	UPGR CRED—QSB99V1 TO QSB98V1 1U
QSB99V1AU	CREDIT—QSB99V1A TO QSB98V1A 5U
QSB99V1BU	CREDIT—QSB99V1B TO QSB98V1B 10U
QSB99V1CU	CREDIT—QSB99V1C TO QSB98V1C 25U

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