IBM Automatic Binary Optimizer for z/OS, V2.1

IBM

Chapter 1. Increase the performance of your compiled COBOL applications

Automatic Binary Optimizer for z/OS® optimizes previously compiled COBOL program modules to increase application performance and reduce CPU usage without source recompilation. It performs high-fidelity optimizations and generates code that fully exploits z15™, z15 T02, z14®, z14 ZR1, z13®, z13s®, zEC12, and zBC12 architecture without changing program logic or behavior. Automatic Binary Optimizer for z/OS must be licensed on all machines where the optimizer is used.

Automatic Binary Optimizer for z/OS delivers the following benefits:

- Advanced technology that improves the performance of previously compiled COBOL programs.
- Direct optimizations to already compiled COBOL programs. Source level migration, recompilation, and performance options tuning are not required.
- Ability to leverage the latest COBOL optimization technology.
- Ability to generate code to target IBM Z deployment systems (z15, z15 T02, z14, z14 ZR1, z13, z13s, zEC12, and zBC12).
- Ability to deliver user control to specify the data set of the optimized module.
- Ability to exploit the Vector Packed Decimal Facility of z15 for additional performance improvements.
- Inclusion of the Installation Verification Program (IVP), BOZJIVP, to verify that Automatic Binary Optimizer for z/OS is installed correctly and is functional.
- Inclusion of the IBM Run Time Instrumentation Profiler, to help identify COBOL modules that are good candidates for optimization using the Automatic Binary Optimizer.
- Delivery of simple, easy-to-install setup, which is also configurable, to allow setting of target architecture.
- Support of z/OS to automatically load optimized modules without requiring application JCL changes.
- Full support by IBM DevOps Tools, which includes the Application Delivery Foundation for z/OS family of products:
  - Developer for z/OS Enterprise Edition, which includes Debug for z/OS
  - Fault Analyzer for z/OS
  - Application Performance Analyzer for z/OS

Complementary to Enterprise COBOL for z/OS, V6.3

Automatic Binary Optimizer for z/OS is complementary to Enterprise COBOL for z/OS V6.3. Using Automatic Binary Optimizer for z/OS together with Enterprise COBOL bring these benefits:

- Speeding up migration by reducing the migration scope and effort
- Maximizing the application performance while minimizing the test effort
- Directly optimizing already compiled program modules using cutting edge technology to fully exploit the latest IBM Z systems while completely avoiding the pitfalls of a compiler migration

Migrating to Enterprise COBOL for z/OS V6.3 typically requires significant development and test resources. Use Automatic Binary Optimizer for z/OS to complement Enterprise COBOL for z/OS for migration:

- Use Enterprise COBOL for z/OS as the production build compiler for code under active development or maintenance.
- Use Automatic Binary Optimizer for z/OS to optimize modules for code that is not regularly updated.

Since Automatic Binary Optimizer for z/OS optimizes the already binaries directly, there is no need to recompile source, nor analyze, test and fix issues in existing source that might include invalid data/code and uninitialized variables. Overall testing and migration effort will be minimized while still achieving the best performance for your COBOL programs on the latest IBM Z systems.

Additional information can be found on the Enterprise COBOL for z/OS website.

Chapter 2. Highlights

Automatic Binary Optimizer for z/OS V2.1 delivers the following enhancements:

- Less system resource requirements, decrease in CPU resources and memory, to optimize already compiled COBOL programs.
- Ability to generate optimized programs with additional performance gains on IBM Z hardware.
- Output from the IBM Run Time Instrumentation Profiler tool that is enhanced to clearly summarize and display the profiling results.

The price metric for Automatic Binary Optimizer for z/OS V2.1 is execution-based, sub-capacity licensing. Automatic Binary Optimizer for z/OS V2.1 generates the SMF 89 records, and you can use the IBM Sub-Capacity Reporting Tool (SCRT) V27.1.2 or later to see Automatic Binary Optimizer for z/OS in the SCRT reports.

Performance improvements

Automatic Binary Optimizer for z/OS, V2.1 delivers additional performance improvements in the generated optimized COBOL programs. Areas of improved performance include programs with:

- INITIALIZE statements
- Packed and zoned decimal arithmetic statements
- INSPECT statements
- Long or variable MOVE operations
- Long or variable comparison operations
- Numeric editing statements
- Dynamic call statements
- Linkage section data items
- STRING statements

Automatic Binary Optimizer for z/OS, V2.1 provides reductions in resource usage. Significantly less system resources that includes memory usage and CPU time, is required by Version 2.1 to optimize load modules as compared to previous releases of Automatic Binary Optimizer for z/OS. With Version 2.1, compute-intensive applications can deliver additional performance when compared to Version 1.3. These improvements increase the return on investment of Automatic Binary Optimizer for z/OS.

Usability features

Automatic Binary Optimizer for z/OS, V2.1 is easier to use with the implementation of additional usability features. Additional usability features include:

- Improvements to the IBM Run Time Instrumentation Profiler tool. This helps identify COBOL modules that are good candidates for optimization with the Automatic Binary Optimizer for z/OS. The profiling information is improved to more clearly summarize and display the profiling results.
- Improvements to the listings to include the instructions from the value clause initialization section of the input compiled program.
- Support for optimization of modules that contain COBOL programs that were previously compiled with the CMPR2 option.
- Delivery of a new optimizer option, RTIBIND, to automate the process of generating IBM Run Time Instrumentation Profiler enabled modules.
- Improvements to the ABO IVP to detect if MACHMIG VEF is set.

- Delivery of a new tool, the ABO Assistant, to automate all the individual steps required to efficiently optimize your COBOL application using ABO and to clearly report on the CPU time savings from using ABO.
- Delivery of a new tool, the SMF Analyzer, provides streamlined SMF analysis directly on z/OS to find, filter, sort, and report on your top CPU-consuming applications.

Supported key COBOL language features

Automatic Binary Optimizer for z/OS supports the following key COBOL features:

- ARITH(EXTEND | COMPAT)
- CICS
- CICS HANDLE ABEND
- CICS HANDLE AID
- CICS language translator generated SERVICE LABEL statements
- CMPR2
- Db2
- DLL
- ENTRY
- I/O and debugging declaratives
- IMS
- NOOPTIMIZE, OPTIMIZE(STD | FULL)
- NUMPROC(NOPFD | PFD | MIG)
- Program segmentation
- RECURSIVE
- RENT and NORENT
- SORT and MERGE
- SQL
- SSRANGE
- TEST
- THREAD
- TRUNC(STD | BIN | OPT)
- User written SERVICE LABEL statements
- XML

The HANDLERS option is deprecated in Automatic Binary Optimizer for z/OS, V2.1. The previously default HANDLERS=Y behavior now always applies. This change will not affect the function or behavior of the optimized modules.

Automatic Binary Optimizer for z/OS, V2.1 supports COBOL programs that were compiled with:

- Enterprise COBOL for z/OS, V4
- Enterprise COBOL for z/OS and OS/390®, V3
- COBOL for OS/390, V2
- COBOL for MVS™ & VM, V1.2
- COBOL/370, V1.1
- VS COBOL II, V1.3 and V1.4 (LE-enabled only)

Tooling support

Optimized applications that were created with Automatic Binary Optimizer for z/OS are supported by IBM® DevOps Tools for problem analysis across your development lifecycle, which include IBM Application Delivery Foundation for z/OS family of products:

- Developer for z/OS Enterprise Edition, which includes Debug for z/OS. Helps examine, monitor, and control the execution of application programs.
- Fault Analyzer for z/OS.
  - Helps developers analyze and fix application and system failures.
  - Gathers information about an application and the surrounding environment.
- Application Performance Analyzer for z/OS. Helps developers in the design, development and maintenance cycles with an non-intrusive application performance analyzer.

Additional information can be found on the Application Delivery Foundation for z/OS website.

The IBM Sub-Capacity Reporting Tool (SCRT) is used to manage capacity. SCRT V27.1.2 or later is required to see Automatic Binary Optimizer for z/OS in your SCRT reports.

Trial product

Trial editions of Automatic Binary Optimizer for z/OS are available with a 90-day evaluation license at no charge. The trial editions allow testing and evaluation of the benefits of optimizing your existing COBOL applications in non-production environments. The trial editions are available as either an on-premises installed trial or as a simplified cloud service:

- The on-premises version of IBM Automatic Binary Optimizer for z/OS Trial is available through IBM Shopz.
- The Automatic Binary Optimizer for z/OS Trial Cloud Service is a simplified version of the Automatic Binary Optimizer for z/OS Trial that does not require installation of the trial product.

Chapter 3. System requirements

The following table presents the system requirements for Automatic Binary Optimizer for z/OS, V2.1 and Automatic Binary Optimizer for z/OS Trial, V2.1:

Required Software	Required Hardware	Optional Software Programs

Automatic Binary Optimizer for z/OS, V2.1 and Automatic Binary Optimizer for z/ OS Trial, V2.1 can be run on the following operating systems with applicable PTFs installed. For details of the PTFs, refer to the Program Directory.
 	
• z/OS V2.4 (5650-ZOS), or later
• z/OS V2.3 (5650-ZOS)
• z/OS V2.2 (5650-ZOS)
	Optimized modules produced by the Automatic Binary Optimizer can run on the following servers:
	
	• IBM z15 (z15)
	• IBM z15 T02 (z15 T02)
	• IBM z14 (z14)
	• IBM z14 ZR1 (z14 ZR1)
	• IBM z13 (z13)
	• IBM z13s (z13s)
	• IBM zEnterprise® EC12 (zEC12)
	• IBM zEnterprise BC12 (zBC12)
		Depending on the functions used, one or more of the following programs with applicable PTFs might be required. For details of the PTFs, refer to the Program Directory.
		
		• IBM Application Delivery Foundation for z/OS V3.2 (5655-AC6)
		  – IBM Developer for z/OS Enterprise Edition V14.2 (5655-AC5)
		  – IBM Debug for z/OS V14.2 (5655-Q50)
		  – IBM Fault Analyzer for z/OS V14.1.8 (5655-Q41)
		  – IBM Application Performance Analyzer for z/OS V14.2 (5655-Q49)

Chapter 4. For more information

To learn more about IBM Automatic Binary Optimizer for z/OS and Automatic Binary Optimizer for z/OS Trial, contact your IBM representative or IBM Business Partner, or visit: Automatic Binary Optimizer for z/OS at https://www.ibm.com/products/automatic-binary-optimizer-zos.