Enterprise COBOL V5 Compiler, an applied science...

- Introduces advanced optimization technology
- Designed to optimize applications for current and future System z hardware
- Initial delivery of performance improvements seen in C/C++ and Java compilers on System z
- Compiler "back end" is enhanced with technology that has long been in use in IBM's Java products.
- Back end = part of compiler that does code generation and optimization
- Modern, robust compiler
- New COBOL-specific optimizations have been added.
- Exploits 2990, 2890, System z9, System z10, Enterprise 196, zEC12 and z990.

New Code Generator and Program Optimizer

- Common components means more timely exploitation of
  - Architecture advances
- Support modern development tools
  - Tools supplied by ISV’s
  - IBM z/OS Problem Determination Tools
- Rational Development Tools
- Continue to deliver new features to simplify programming and debugging to increase productivity
- Private industry standard DRAFT, with documented IBM extensions to represent debug information
- APIs are available to allow tools to inspect this information.

New Compiler Options for performance

- ARCH 7 [6 7 8 9 10]...allows code generator to use instructions found in various levels of zArchitecture
- OPTIMIZE(1 | 2)...
  - Levels of optimization
  - Higher levels improve run-time performance
  - Highest level has somewhat reduced "debuggability"
- STOGOT / NOPRIBGOT...
  - Change only for special cases.
- APFL VOLATILE / NOVOLATILE...
  - Use full complement of floating point registers.
- DISPSIN(SEP), DISPSIN(32P), DISPSIN(32P)
  - Display controls output formatting for DISPLAY of binary numeric items.
  - Can format output sign as separate sign for easier to read output.
- Binary Arithmetic Operands > than 9 Digits
  - Binary arithmetic with 9 or more digits is supported.
  - The compiler supports new instruction for carrying out this conversion.

PDSE for COBOL V5 executables...

- COBOL improves performance using new features only available in Program Object (PO).

Instruction Scheduling For Performance

- Timing (100 million in a loop)
  - V5: 2.35 cpu seconds
  - V4: 2.50 cpu seconds
  - V5 is 6% faster

Optimization of Decimal PICTURE Scaling

- Timing (100 million in a loop)
  - V5: 0.31 cpu seconds
  - V5 is 85% faster

New compiler features introduced

- Improved usability
- Reduced administration overhead with support for z/OS System Management Facilities (SMF) records
- Better debugging targeted to object program debug movers
- Debug data always include:
  - No separate debugging files to find or keep track of
  - Executable does not have bigger loaded footprint
- New pattern search for program listings

Some New COBOL language features

- Floating comment delimiter
  - ** / to end of a comment
- Raise WORKING-STORAGE section size limit to 2GB
  - (from 128MB)
- Larger individual data items
  - Up to 999,999,999 bytes
- Support for UNBounded tables
  - X OCCURS To UNBOUND depending on Y.
- LINKAGE SECTION only

UF8 Unicode Built-in Functions

- UTF-8 Characters are 1 - 4 bytes in length.
- ULENGLength: returns the logical length of a UTF-8 string.
- UPOS: returns the byte position in a UTF-8 string of the Nth logical character.
- UVALID: takes an alphanumeric or alpha and national item and returns zero or the index of the first invalid UTF-8 (alphanumeric or alpha) or UTF-16 (national) character.
- UWIDTH: returns the width in bytes of the Nth logical character.
- USUPPLEMENTARY: takes a UTF-8 or UTF-16 string and returns a pointer to the first UNICODE

ODBC/V5 vs programs

- No more load modules
- Compiler output is OPTF format object, input to binder
- Binder output is Program Object
- Program Object cannot reside in PDS, PDSE only

Catcher