VSI BASIC for OpenVMS I64 Systems
V1.8-004 Release Notes

Summary of I64 BASIC V1.8-004

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1 Release Summary

VSI BASIC for OpenVMS I64 Systems is a native compiler that runs on and generates code to run on OpenVMS I64 systems. Version V1.8-004 is a port of the Alpha BASIC compiler to the Itanium architecture.

2 General Notes

- Throughout these notes, the term VSI BASIC or the name BASIC used alone, applies to VSI BASIC for OpenVMS I64 Systems, HP BASIC for OpenVMS Alpha Systems, and HP BASIC for OpenVMS VAX Systems. The following terms refer to information that applies specifically to the corresponding product.

  I64 BASIC – VSI BASIC for OpenVMS I64 Systems
  Alpha BASIC – HP BASIC for OpenVMS Alpha Systems
  VAX BASIC – HP BASIC for OpenVMS VAX Systems

- I64 BASIC V1.8-004 minimally requires OpenVMS I64 Version 8.4-1H1 to run.

- The default data type for I64 BASIC is IEEE S_floating point whereas for Alpha BASIC and VAX BASIC the default is VAX F_floating point. To continue use of the VAX floating point data types you must use the /REAL_SIZE={SINGLE | DOUBLE | GFLOAT} qualifier, or the OPTION SIZE=REAL {SINGLE | DOUBLE | GFLOAT} statement.

  Since the VAX floating point data types are not available in the Itanium hardware, they are supported by converting the values to an appropriate IEEE data type, performing the calculation, and then converting the values back to VAX floating point data type. This process can cause rounding errors and the results to differ slightly from those obtained using VAX floating point directly.

  Note that constants in programs are represented in the default floating point data type unless explicitly specified otherwise, and they may be subject to conversion to IEEE data types.

  See the white paper, "OpenVMS floating-point arithmetic on the Intel® Itanium® architecture" at
  http://www.hp.com/products1/evolution/alpha_retaintrust/download/i64-floating-pt-wp.pdf
  for more information.

- By default, programs are compiled at optimization level 4 (/OPT=LEVEL=4), the highest level of optimization. If you encounter problems with the generated code, try compiling the program with a lower level of optimization. This may correct the problem. Please report any problems to HP, even if the program works correctly at a lower optimization level.

3 Feature enhancements

Some minor feature enhancements have been made for version 1.8-004. These include:

- Routine parameters that are passed by reference whose address is not aligned no longer generate alignment faults.
- Various diagnostic messages have been improved.

4 Problems In I64 BASIC fixed for V1.8-004

A number of problems have been fixed in I64 BASIC V1.8-004. The known problems that have been fixed include:

- A dump was getting generated when the program was trying to perform copy in an optimized mode. This issue has been fixed.
- Extremely long command lines no longer cause a compiler internal error.
- The display of S-Float constants in listing files no longer causes an error.

5 Known Problems and Restrictions in I64 BASIC V1.8-004

5.1 General Problems

The following are known general problems with I64 BASIC V1.8-004.

- Floating point numbers displayed in E-format may differ.

  In some cases floating point numbers displayed in E-format may contain an additional zero in the exponent field. For example, 6.0E+002 instead of 6.0E+02

- Floating point exceptions not accurately reported.

  In some cases a floating point exception may not be accurately reported. For example: a divide-by-zero exception may be reported as an invalid-number.

- Inability to open UNDEFINED type file for output.

  It is currently not possible to open a file of type UNDEFINED for output.

  Workaround: Create an empty file with the desired attributes by some other means, for example with a program in a different language or with the DCL command CREATE/FDL. Then in BASIC open the file for input with the APPEND attribute. The following code fragment illustrates the technique.

```
%INCLUDE "$FDLDEF" %FROM %LIBRARY "SYS$LIBRARY:BASIC$STARLET"

EXTERNAL INTEGER FUNCTION FDL$CREATE

MAP (outbuff) STRING myrec = 512

DECLARE INTEGER i, fdlstat
DECLARE STRING resultname

fdlstat = FDL$CREATE ("RECORD; FORMAT UNDEFINED;",                    &
                      "myfilename", ".DAT", resultname,,              &
                      FDL$M_FDL_STRING +                              &
                      FDL$M_DEFAULT_STRING +                          &
                      FDL$M_FULL_OUTPUT)

OPEN resultname FOR INPUT AS FILE #3, ORGANIZATION UNDEFINED,         &
                                      ACCESS APPEND,                  &
                                      MAP outbuff,                    &
                                      RECORDTYPE ANY
```

```
myrec = ...
PUT #3
```

- DET incorrect with default XFLOAT type.

  When the default floating point type is set to XFLOAT, the result of the determinant statement (DET) is incorrect.

  Workaround: Use explicitly declared variables of XFLOAT type, and avoid using XFLOAT type as the default floating point type when the DET statement is used.

- The most-negative integer constants cannot be represented.

  The compiler incorrectly gives an integer overflow message when the most negative integer constants:

```
BYTE -128%
WORD -32768%
LONG -2147483648%
```

  are used.

  Workaround: Use the appropriate expression:.

```
BYTE -127% - 1%
WORD -32767% - 1%
LONG -2147483647% - 1%
```

- Passed by value quadword arguments in STARLET are not yet supported.

  Since routines that declare pass by value quadword parameters are not yet supported by BASIC, declarations of routines that do this are not included in BASIC$STARLET.TLB.

  Workaround: Use of the these routines should be avoided until full support of 64-bit quantities is provided.

- The CMA facility found in BASIC$STARLET.TLB is incompatible with BASIC.

  BASIC is not currently thread safe and will not work with the CMA$DEF module in BASIC$STARLET.TLB. Compiling it with BASIC results in a number of Record type undefined errors.

  Workaround: BASIC does not support the CMA facility and compiling the CMA$DEF module should be avoided.

5.2 OpenVMS Debugger Problems

With this release of the compiler, debugging support for I64 BASIC programs is not complete. The "OpenVMS I64 V8.4-1H1 Release Notes" document contains general release notes on the debugger. This section describes additional problems and workarounds specific to I64 BASIC programs.

- Examining a symbol declared with the DIMENSION keyword sometimes causes a debugger access violation.

  Workaround: Type SHOW SYMBOL/ADDRESS then examine the memory location directly.

- Examining a field in a record sometimes fails with the error:

```
%DEBUG-W-NOFIELD, 'xxx' is not a field in this record
```

Workaround: Examine the entire record.

- In some cases the Debugger can not determine the end of user code. In these cases, the following message may be produced if you STEP at the last line of user application code:

```
DBG> Step
%DEBUG-W-SCRNOSRCLIN, no source line for address xxxxxxxx for display in SRC
```

  You can ignore this message.

- Examining some types of variables is not possible, including: A RECORD variable, or an array of RECORDs which is declared in a MAP DYNAMIC and also passed as a parameter to another routine.

- Examining EXTERNAL constants with a plain EVALUATE command results in a warning message. Instead the EVALUATE/ADDRESS command should be used. Note that it is not possible to display EXTERNAL constants in floating point format.

- Problems with examining dynamic objects in the debugger.

  Certain types of dynamic objects referenced by descriptors cannot be displayed in the OpenVMS debugger.

  Workaround: The inability to display these kinds of objects is a restriction.

6 VSI BASIC for OpenVMS I64 Systems Documentation and Online Information

6.1 Online Release Notes and Help File

I64 BASIC provides the following online information, which is copied to the user's system during installation:

- The VSI BASIC for OpenVMS I64 Systems online Release Notes
- I64 BASIC DCL Help
- I64 BASIC Language Topics Help

6.1.1 VSI BASIC for OpenVMS I64 Systems Online Release Notes

The VSI BASIC for OpenVMS I64 Systems online Release Notes provide a copy of these notes online. After I64 BASIC has been installed, the online Release Notes can be displayed on the screen using the TYPE command:

```
$ TYPE/PAGE SYS$HELP:BASIC01n.RELEASE_NOTES
```

For example, the Release Notes for Version 1.8-004 are named BASIC018.RELEASE_NOTES.

To display or print the I64 BASIC Release Notes before installing I64 BASIC, specify OPTIONS N at the end of the @VMSINSTAL command line (see the I64 BASIC installation guide).

6.1.2 I64 BASIC DCL Help

The I64 BASIC DCL HELP module in SYS$HELP:HELPLIB.HLB provides online access to I64 BASIC DCL help. This help describes all the qualifiers of the BASIC compiler.

To view the online I64 BASIC DCL help file using the HELP command, type:

```
$ HELP BASIC
```

For example, to display help on the /LINES qualifier type:

```
$ HELP BASIC /LINES
```

You can abbreviate the HELP command words. For instance, to specify help on the /SEPARATE_COMPILATION qualifier, you might use the following command:

```
$ HELP BAS /SEP
```

Alternatively, you can extract the module BASIC from the help library SYS$HELP:HELPLIB.HLB to a separate file. Once extracted to a file, use the SEARCH command or an editor to look up items in the file.

To extract the BASIC DCL HELP module from the help library:

```
$ LIBRARY/EXTRACT=BASIC/OUTPUT=BASIC_HELP.TXT SYS$HELP:HELPLIB.HLB
```

6.1.3 I64 BASIC Language Topics Help

HELP on BASIC language topics, available from the VAX BASIC environment is accessible from DCL in I64 BASIC. For help on language features, type the following command at the DCL prompt:

```
$ HELP/LIBRARY=BASICHELP
```

Alternately, a symbol can be defined to access help on BASIC language features directly. For example, the DCL command:

```
$ BASHELP == "HELP /LIBR=BASICHELP"
```

will allow you to type:

```
$ BASHELP BASIC-topic
```

6.2 Corrections to Documentation

The following corrections should be made to the Alpha BASIC manuals.

6.2.1 Reference Manual

Corrections to the online HTML documentation *HP BASIC for OpenVMS Systems Reference Manual*.

- The Table of Result Data Types in Alpha BASIC Expressions in Section 1.6.1.2 has two incorrect entries in the online HTML documentation. The table in the paper and PDF documentation however is correct. The entries for GFLOAT/SFLOAT and SFLOAT/GFLOAT should be GFLOAT.

6.2.2 User's Guide

Corrections to the *HP BASIC for OpenVMS Systems User Manual*.

- The conditional at the end of Example 13-1, in the "File Input and Output" chapter should have an equal sign instead of "AND". It should read as *Rms_status = Rms$_normal* instead of *Rms_status AND Rms$_normal*.

7 Reporting problems with I64 BASIC V1.8-004

If you experence a problem, please file a PTR problem report, including enough information to reproduce the problem.

Thank you for your continued support of VSI BASIC for OpenVMS I64 Systems.