NOMAD

Release Overview and
Documentation Updates
NOMAD 8.00

SELECT
B U S I N E S S   S O L U T I O N S

Select Business Solutions

Select Business Solutions provides a number of software products that specialize in reporting and application development for mainframe data sources.

NOMAD 8.00 is Select Business Solutions' latest NOMAD release. It contains new features to provide additional functionality, plus NOMAD maintenance.

NOMAD® is Select's flagship, fourth generation language *(4GL)* and data management system used by companies worldwide through a Windows 3270-style interface.

NOMAD Reporter™ is Select's 4GL-based product for reporting-only access to a variety of mainframe data sources.

UltraQuest™ provides a Web-based interface to the mainframe for reporting, as well as for application development and delivery. An integral component of UltraQuest is the UltraQuest 4GL, which is also available in the NOMAD product.

Through many years of experience dealing with mainframe environments and its data, Select provides a comprehensive suite of products to maximize your investment in this platform.

Introduction to This Document

Audience

This document is for all UltraQuest and NOMAD users on the z/OS and z/VM operating systems.

Goals

This document provides an overview of the new features and enhancements introduced with NOMAD version 8.00.

A brief description of each new feature and enhancement is presented in this Release Overview. More detailed information is provided in the *UltraQuest and NOMAD Reference Manual*[1] or the appropriate supplemental guide.

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1. Version 8.00 of the *UltraQuest and NOMAD Reference Manual* and other guides are provided on the *UltraQuest and NOMAD Online Library* CD-ROM.

Installation Enhancements

Expanded use of Shared File System (z/VM)

New options have been added to $NOMOPTS that allow you to specify a Shared File System directory:

- on which the Secure System Profile (@SYSTEM NOMAD) must be found
- to be used as the NOMAD Shared Disk
- as NOMID, the NOMAD install disk.

APF Authorization Behavior Change (*z/OS*)

All libraries in the STEPLIB/JOBLIB concatenation must be APF authorized for NOMAD to run APF authorized *only if* the NOMAD LINKLIB is in the STEPLIB/JOBLIB concatenation. For example, if the NOMAD LINKLIB is in TASKLIB, the libraries in the STEPLIB/JOBLIB concatenation do *not* need to be APF authorized. In prior NOMAD versions, NOMAD could run APF authorized only if all libraries in the STEPLIB/JOBLIB concatenation were APF authorized

NSS EXEC Improvements (*z/VM*)

The NSS EXEC, used to define NOMAD memory expansion segments, has been improved to make it easier to use.

Controlling the Environment

DIAGALL Option on NOMAD2 Command

There is a new option on the NOMAD2 invocation command, DIAGALL. DIAGALL provides the same information as DIAGL plus all of the options configured in $NOMOPTS. This could be useful for finding the location of the secure @SYSTEM profile if there is a failure in the @SYSTEM code which prevents invocation of NOMAD.

OPTION LISTERROR EVAL

OPTION LISTERROR EVAL controls the 4GL error handling behavior when an error is encountered with the evaluation of an expression or an assignment during a LIST or CREATE command that would result in output that was either truncated or contained invalid data.

With OPTION LISTERROR EVAL ACCESS, an error is generated *only* when an expression evaluation or assignment error occurs during the LIST or CREATE access phase. This is the default, and reflects the current behavior of NOMAD. With this setting, if an evaluation or assignment error occurs during the report phase of a LIST/CREATE command, the command may display error messages but it succeeds with a zero return code (&RC=0) and error handling (OTHERWISE, ON ERROR) is not triggered.

With OPTION LISTERROR EVAL ALL, an error is generated and error handling is triggered when an expression evaluation or assignment error occurs at *any* time during a LIST or CREATE command, including when the error occurs during the report phase.

Data Storage and Display Formats

CLEAR Command Enhancement

The CLEAR command now returns storage that was used for the data in varying arrays and for the INSTANCE function.

Performing Calculations

DDQUERY Function Enhancements (*z/OS only*)

The new DBBLKPCT attribute for the DDQUERY function returns the percent of blocks used (of the total allocated) for the data set containing the database for a segment in an active local or shared database.

The existing DBBLKSIZ, DBBLKTOT, and DBBLKUSD DDQUERY attributes now return values for a segment in an active shared database. Previously, they returned *notavailable* for segments in an active shared database.

QUERY Function Enhancements

If the new FILESTATS keyword is specified on a FILE DEFINE/OPEN command and records are written to that *file-id*, then QUERY('NUMRECORDS', '*file-id*') returns the number of records written to *file-id* and QUERY('NUMBYTES', '*file-id*') returns the number of bytes written to *file-id* excluding trailing blanks.

Functions Available with an UltraQuest License

The CONFORM, ENDATE, INDXVAL, LAG, LEAD, SDATE, and UNDATE functions are now available at sites with an UltraQuest license.

QUERY Function—New Attributes

The QUERY('LISTERROR', 'EVAL') function returns the current value of the OPTION LISTERROR EVAL command: ACCESS or ALL.

Building and Using a Database

Features Available with an UltraQuest License

The DEFAULT command and time-series arrays are now available at sites with an UltraQuest license.

DEFINE FIXTONAV Parameter

The FIXTONAV parameter may now be specified on *any* defined item that references data in an external file, except DEFINE...AS EXTRACT. Previously, you could specify FIXTONAV only if the defined item had an internal format of packed (P) or extended packed (EP).

FIXTONAV is useful when the defined item's expression includes the VALUE function and the original data may sometimes not be in the correct format (e.g. it may contain low or high values).

Recordtype Hierarchies and Repeating Segments Enhancement

As was true in earlier NOMAD versions, the recordtype hierarchy segments in a recordtype hierarchy must all form a single path of segments below the master. However, recordtype hierarchies may now contain repeating segments.

Recordtype Hierarchies and Concatenated VSAM Databases

Recordtype hierarchy segments are now allowed in a VSAM concatenated database.

Finding and Displaying Data

SELECT DO FIRST/LAST

The SELECT command now includes an optional DO FIRST/LAST parameter. This allows you to control the order in which selection criteria is evaluated, to improve access efficiency.

SELECT AND/OR Efficiency Improvement

If a SELECT or WHERE expression of the form

        expression1 or *expression2*

is evaluated and *expression1* is TRUE, then *expression2* will now usually no longer be evaluated. Similarly, if a SELECT or WHERE expression of the form

        expression1 and *expression2*

is evaluated and *expression1* is FALSE, then *expression2* will now usually no longer be evaluated.

Features Available with an UltraQuest License

The DISPLAY command is now available at sites with an UltraQuest license.

Manipulating and Transferring Data

CREATE...DUP ALL

The new DUP ALL CREATE command parameter causes *all* object-item values to be repeated where they are normally set to *notavailable*. This is typically the desired behavior of the CREATE command, as *notavailable* values are usually not desired in external files. The DUP ALL parameter is accepted in all varieties of the CREATE command, including CREATE, CREATE...FOR, and CREATE XML.

Obtain Number of Records and Bytes Written to an External File

The new FILESTATS keyword on the FILE DEFINE/OPEN commands causes NOMAD to save the number of bytes and records written to an output file. The byte count excludes trailing blanks. These values may be retrieved by using the QUERY('NUMRECORDS', '*file-id*') and QUERY('NUMBYTES', '*file-id*') functions.

Writing Procedures

TRACE and Execution Error Message Improvements

When tracing a procedure that contains an INCLUDE directive, the trace now provides additional information to help you find the statements being traced:

- An indication of where the INCLUDE starts.
- An indication of where the INCLUDE ends.
- The line number relative to the beginning of the INCLUDE or original procedure, in parentheses.

When tracing a procedure that returns to another procedure, the trace now names the procedure to which control has returned.

When one of the following messages is displayed where the statement mentioned is in or following an included procedure:

```
EXC0301: Return Code ", executing statement ", in ".

EXC1555: Note: RETURN ERROR " executed at statement ", in
procedure ".
```

the message is followed by this new message:

```
EXC0611: The above statement may be found at line " in
procedure ".
```

SLIST QUERY Command Behavior Change

The DBBLKSIZ, DBBLKTOT, and DBBLKUSD attributes of the SLIST QUERY command now return values for a segment in an active shared database. Previously, they returned *notavailable* for segments in an active shared database.

z/OS Considerations

VSM ALLOWUSERKEYCSA (NO) Support

NOMAD now supports the z/OS VSM ALLOWUSERKEYCSA(NO) option, which is recommended by IBM.

z/OS Batch Enhancement

The SYSTEM ALLOCATE and SYSTEM FREE commands may now be issued in z/OS batch mode (i.e. in jobs where NOMAD is invoked via an EXEC PGM=NOMAD2 statement).

LIBRARY Command Behavior Change

If a "*" is included in a LIBRARY ADD command, prefixes are moved to the beginning or end of the list even if they are already in the list. For example, suppose the current library list is:

```
LIB1
LIB2
LIB3
```

The following command is then issued:

```
library add lib3 lib4 *
```

The new library list is:

```
LIB3
LIB4
LIB1
LIB2
```

In previous versions of NOMAD, the new library list was:

```
LIB4
LIB1
LIB2
LIB3
```

LIBRARY Command Clarification

Prefixes may be specified as unquoted strings or using scalar or array alphanumeric &variables. If using &variables, the LIBRARY command must be placed in TRANS mode.

Creating Worksheet Files

The default values of the system &variables &WKSLRECL, &WKSMAXCOL, and &WKSMAXROW have changed as shown in the following table:

&Variable	Internal Format	Default Value	Contains...
&WKSLRECL	I2	32750 (was 512)	the maximum record length for delimited data file.
&WKSMAXCOL	I2	N/A (was 256)	the maximum number of columns (items) permitted in worksheet. When &WKSMAXCOL is *notavailable*, there is no limit on the number of columns in a worksheet.
&WKSMAXROW	I4	N/A (was 8192)	the maximum number of rows (instances) permitted in worksheet. When &WKSMAXROW is *notavailable*, there is no limit on the number of rows in a worksheet.

CREATE FOR CHART

The charting product used by NOMAD has been replaced. In place of WebCharts3D, we are now using Highcharts from Highsoft.

Highcharts features the following improvements over WebCharts3D:

- No applet is used, avoiding security issues which now arise when running an applet in a Web browser.
- New chart types are supported:
  - *bar* displays a horizontal bar chart (whereas *column* displays a vertical bar chart)
  - *area* displays an area chart (a line chart with the area below the line shaded in)
  - *areaspline* displays an area curve chart (a curve chart with the area below the curve shaded in)
- Better handling of labels with denser data.
- Animation when the chart is first displayed.
- Improved chart appearance.

Recommendation: Convert existing charting applications to use Highcharts. Charts using WebCharts3D should continue to work, but will not be supported.

Note the following if converting existing charting applications to use Highcharts:

- Three-dimensional charts are supported only for *bar, column,* and *pie* charts.

- Pie charts are supported only for a single series. Existing requests that generated multiple pie charts will now generate only one pie chart. To avoid generating multiple series in a chart request, do not include a *BY-clause* and do not include more than one *object-clause*.

- If you are using Internet Explorer to display charts, version 11 or higher is recommended.

- When displaying a chart in Internet Explorer, you may see the message "Internet Explorer restricted this webpage from running scripts or ActiveX controls." Refer to the *CREATE FOR CHART Guide* for instructions on suppressing this message.

Formatted Output

The TRANSFORM TEXT [TO] PDF command has been enhanced in the following ways:

- *PAGELENGTH n* may be specified on the TRANSFORM command to indicate the number of lines to display per PDF page.

- The font used in PORTRAIT mode has been changed from Courier 9-point to Courier 10-point, to better fill out the page. The font used in LANDSCAPE mode remains Courier 9-point.

Enhancements to the NOMAD Interface for DB2 (z/VM and z/OS)

ROWSET Fetching (*z/OS only*)

During a LIST, CREATE, or DB2 SELECT command, NOMAD will now usually fetch a set of rows with a single call to the DB2 database engine. The size of the buffer for retrieving multiple rows is determined by the new OPTION DB2FETCHSIZE command, whose default value of *100* uses a 100 kilobyte buffer. The multiple-row fetch feature is supported in DB2 version 8.10 and higher.

Expressions Involving DATE/DATETIME Items and AMONG Arrays Now Processed by DB2

The following types of screens are now processed by DB2:

```
Date_Item AMONG(&Date_Array)

Date_Item AMONG(CONSTANT(&Date_Array))

DateTime_Item AMONG(&DateTime_Array)

DateTime_Item AMONG(CONSTANT(&DateTime_Array))
```

Note that the following screens are *not* processed by DB2:

```
Date_Item AMONG(&Date_Scalar, ...)

Date_Item AMONG(CONSTANT(&Date_Scalar, ...))

DateTime_Item AMONG(&DateTime_Scalar, ...)

DateTime_Item AMONG(CONSTANT(&DateTime_Scalar, ...))
```

Replace scalar &variable usage above with constants or with a single array &variable.

Comparisons to &NAV Now Processed by DB2

Data screen phrases of the form "*item* eq &nav" and "*item* ne &nav" are now processed by DB2. Previously, all data was passed by DB2 to the 4GL for the evaluation of this type of screen.

Support for Long EXTNAMEs Added (*z/OS only*)

The maximum value for the length of the external name (EXTNAME) of a DB2 for z/OS MASTER or SEGMENT has been increased from 18 characters to 128 characters. The maximum value for the length of the external name (EXTNAME) of a DB2 for z/OS ITEM has been increased from 18 characters to 30 characters.

SCHEMGEN Enhancement

When you select tables to include in the schema, you may now optionally enter a string in the new 'Prefix to remove' column. If a string is placed in that column, it is removed from the beginning of all generated item names for columns that start with that string, unless the name is *exactly* that string. For example, if the DB2 table contains columns named EMPLOYEE, EMPLOYEETITLE, EMPLOYEESALARY and you enter *EMPLOYEE* in the 'Prefix to remove' column, the 4GL item names generated will be EMPLOYEE, TITLE, SALARY.

Enhancement for LIST and &INSTANCE_LIMIT (*z/OS only*)

When performing a LIST or CREATE request against a DB2 database on z/OS, if the TEST *n* parameter is *not* set and &INSTANCE_LIMIT is less than or equal to 10,000, an *OPTIMIZE FOR n ROWS* clause is added to the SQL SELECT statement used to satisfy the 4GL request, where *n* = &INSTANCE_LIMIT.

Enhancements to NOMAD Session Manager (z/OS only)

Mixed case passwords are optionally supported. This is enabled by specifying MCPSWD=YES on the VTDDFLT or SETDFLT command.

Enhancements to the UltraQuest & NOMAD Collection

COPYBOOK Generation of NOMAD Names

A new option in CBCONFIG, *Name_Generation_Method = Original*, allows you to generate the same MASTER and ITEM names as version 7.52 and earlier of the COPYBOOK utility. While the current name generation method tends to generate more useful names, this option may be used when you need to keep the same names in the SCHEMA as you generated using an earlier version of the COPYBOOK utility.

COPYBOOK Behavior Change During Translation

If you make a mistake when translating a COBOL FD while in the COPYBOOK Utility, you may select *Translate a COBOL source file* again from the main *COPYBOOK Translator* menu. The following pop-up message is displayed:

```
There is a translated Copybook already
loaded in the COPYBOOK database.
Type QUIT to retain the current Copybook
or press ENTER to delete it and load another.
```

After you press *ENTER*, the *COPYBOOK - COBOL Source* menu is displayed again. The new behavior is that the file identifier for the COBOL source remains unchanged, so you may simply press *ENTER* again to translate the same COBOL FD again.

COPYBOOK Behavior Change During Schema Creation

If any errors occur during generation of the schema file, the following pop-up message box displays:

```
ERRORS ENCOUNTERED in creating Schema file.

You must edit and correct these errors before
you will be able to compile and use this
Schema file to access the external file.

To find error messages in the Schema file,
look for the string "****".

Press ENTER to continue.
```

If you see these messages, follow the instruction to find and correct the errors in the schema. *Failure to do so will result in errors or incorrect data when attempting to compile this schema or use it to access data*.

Enhancements to Systematics Interface

Systematics Interface

The UltraQuest and NOMAD Systematics Interface provides the ability to use NOMAD or UltraQuest to access data in the Systematics suite of retail banking applications from Fidelity National Information Services, Inc. It consists of the following two components:

- the Loan Customers product, which provides access to the ALS-SM *(Advanced Lending Solutions)* and RM *(Relationship Management)* master files

- the Deposits and Collections product, which provides access to the IMPACS *(Integrated Monetary Processing Account System)*, KO *(Collections)*, ST *(Savings Time)*, and ST Plan files

Access to FMS *(Financial Management System)* files is provided with either of the above components.

The following new features are described in the latest version of the *UltraQuest and NOMAD Systematics Interface and Install Guide*.

XLEN is now supported

Some files in the Loan Customers Package use XLEN processing, which enables extended record lengths. These files are now supported in the Systematics Interface by adding the keyword XLEN to the MASTER statement in the schema.