OpenEnterprise NW3000 Archiving Overview Reference Guide (V2.83)

Remote Automation Solutions

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Contents

1 NW3000 Archiving Overview

NW3000 Archiving is a process that enables Bristol RTUs to be configured to collect audit and archive data, and then to insert this data into the OpenEnterprise historical event and signal tables. The most obvious benefit of doing this is that it provides a backup mechanism for data collection should there be a loss of communication with the RTU. This process is known as "backfill", and it is completed by the OEBFill component, which runs as an Exported DLL within OpenBSI's Harvester application. Preparation for NW3000 Archiving involves the proper configuration of a number of components:-

1. The ACCOL control language code that runs in the RTU.

2. The NW3000 Archives configuration tool, which prepares the OpenEnterprise database to receive NW3000 Archive data.

3. Further configuration of the OpenEnterprise database is also necessary for NW3000 Archiving.

4. The OpenBSI Harvester application that collects the archive and audit data from the RTU.

5. The OpenBSI Converter application that enables OEBFill to insert the RTU data collected by Harvester into OpenEnterprise.

6. The OEBFILL DLL that inserts the data collected by the Harvester application into the OpenEnterprise database.

Archive data is used to update the appropriate signal object. When coupled with a suitably configured historical stream, the archive data will be logged to the historian.

Audit data will be inserted into the EventHistory table.

The OEBFill DLL can support archive and audit data, just archive data or just audit data. The system can also control which archives are processed.

1.1   ACCOL Configuration

ACCOL (Advanced Communications and Control Oriented Language) is the programming language used to control the Bristol NW3000 family of RTUs. It consists of a library of Function Blocks. This library is also used by the IEC 61131-3 programming interface utilized by Bristol 's Control Wave RTUs. To prepare for NW3000 Archiving, one or two of these function blocks must be present in the control program. They are the EAUDIT module, and the ARC_STORE module. If the ARC_STORE is used, then an Archive file must also be configured in the code.

1.1.1   ACCOL Archiving Configuration

Configuration of archive data in ACCOL comprises two items - the ARC_STORE module and the ARCHIVE file.
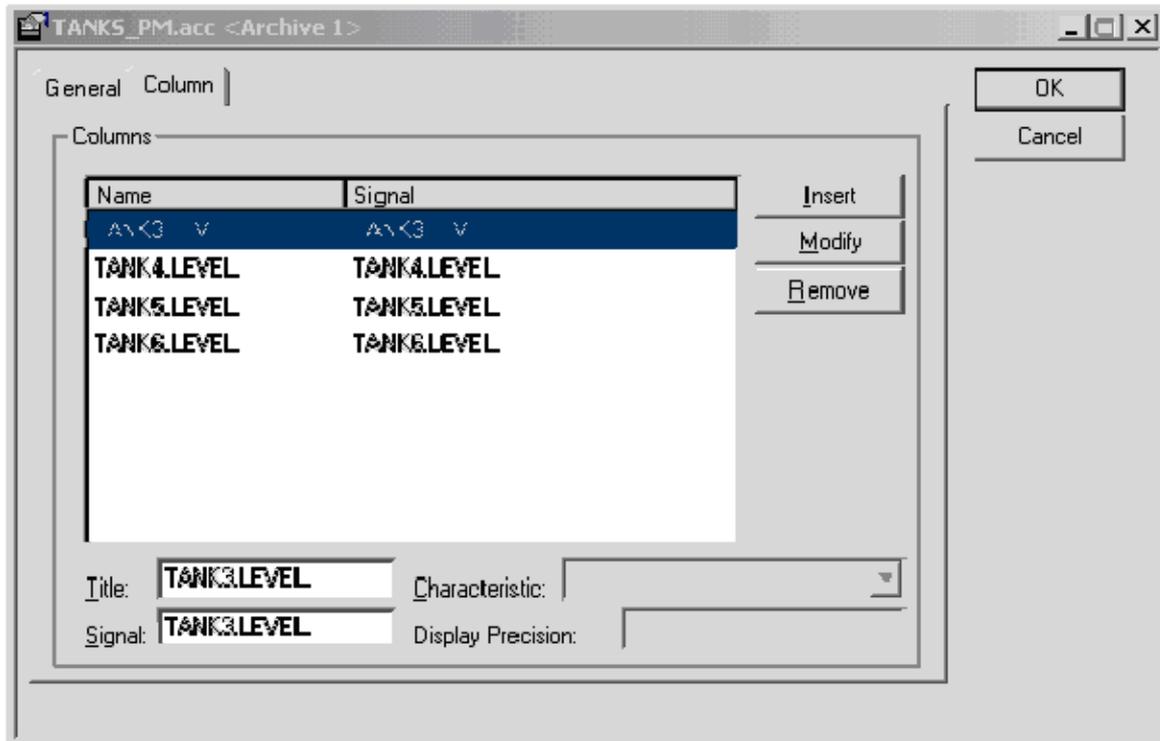
1.1.1.1   The ARC_STORE module

When using archive data, the ACCOL must be configured to only log signal values when communication with the master has been lost. The following example shows Archive 1 logging a record once every 15 seconds when BIP1 has failed.

```
*TASK 11 RATE: 15.000000 PRI: 1
  10 * IF (#LINE.004)
```

```
20 *   ARC_STORE
     ARCHIVE 1
70 * ENDIF
```

1.1.1.2   The Archive File

Workbench is an application which facilitates the creation of ACCOL source files. When defining the archive file, the column Name and Signal must be identical, as the following example screen shot from Workbench demonstrates. A single archive can have a mixture of analog and digital signals.

1.1.2   ACCOL Auditing Configuration

When using audit data, the ACCOL must be configured to only log when communication with the master has been lost. The following example shows the EAUDIT module declared in TASK 0 with a mode terminal wired to an analog signal called AUDIT.MODE. The initial value was set at 4 (meaning alarm logging is disabled).

```
*TASK 0
10 *   EAUDIT
   STATUS  AUDIT.STATUS.
   MODE  AUDIT.MODE.
   OUTPUT_1 AUDIT.ALARMS.NUM
   OUTPUT_2 AUDIT.EVENTS.NUM
```

The following example shows TASK 12 enabling the EAUDIT module to log alarms only when line BIP1 has failed. When BIP1 is ok, the logging is stopped (-1.0).

```
*TASK 12 RATE: 1.000000 PRI: 1
  10 * IF (#LINE.004)
  40 *    CALCULATOR
    10     AUDIT.MODE.=1.0
  50 * ELSE
  60 *    CALCULATOR
    10     AUDIT.MODE.=-1.0
  70 * ENDIF
```

1.1.2.1   EAUDIT Module Mode Values

The EAUDIT mode value controls what data is logged and can also be used to start and stop logging. When the module is defined in TASK 0, the following mode values apply:

Value	Explanation
0	Log all alarms and events (signal value changes), logging enabled.
1	Log alarms only, logging enabled.
2	Log events only, logging enabled.
3	Log all alarms and events (signal value changes), logging disabled.
4	Log alarms only, logging disabled.
5	Log events only, logging disabled.

If logging should be initially enabled, chose a value between 0 and 2. If logging should be initially disabled, chose a value between 3 and 5.

At runtime, the mode can be set to –1 to stop logging. To start or resume logging, set the mode back to the appropriate value 0 to 3.

1.2   NW3000 Archives Tool Configuration

This step configures OpenEnterprise to process the archive data that has been set up in the ACCOL Archive file. Each Archive file required for import must have its configuration imported into the OpenEnterprise database using a special ToolBox editor - the NW3000 Archives tool. The NW3000 Archives tool is accessed from the ToolBox.
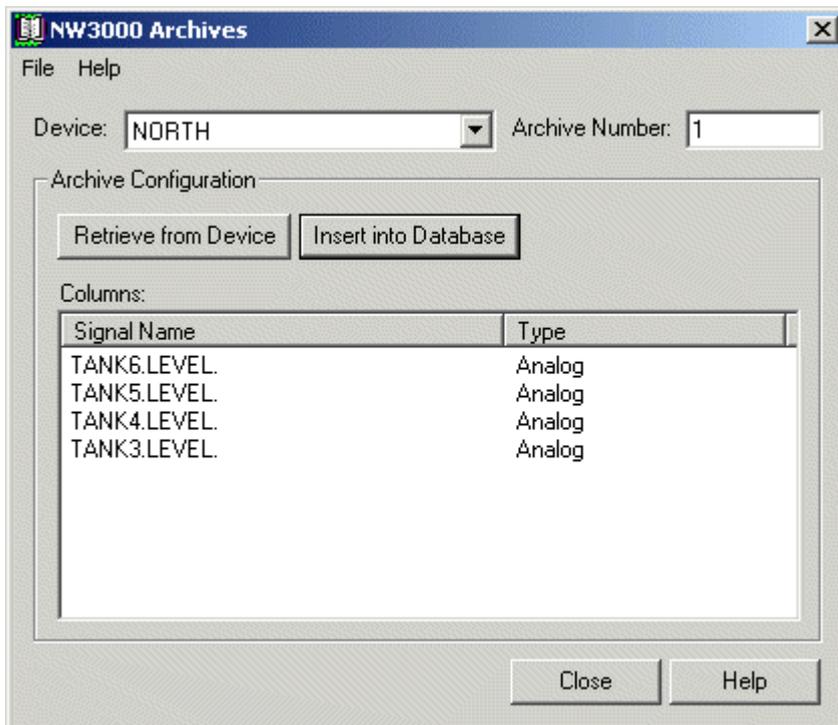
Select the appropriate Device name, enter the archive number and select Retrieve from Device. After a short period of time, the Columns pane should display the archives column names and signal types. To complete the import process, select the Insert into Database button when enabled. For more information on using the NW3000 Archive Tool please refer to its help file.

Repeat for each archive required for backfill processing. Any archives configured within the ACCOL, but not imported, will be discarded by OEBFILL.

1.3   OpenEnterprise Database Configuration

To enable NW3000 Archiving, the following items need special configuration in the OpenEnterprise database:-

    1. NW3000 RDI Configuration

    2. NW3000 Device Configuration

    3. Historical Stream Configuration

1.3.1   NW3000 RDI Configuration

The RDI3000 must be enabled to request an archive and audit collection when a dead device comes online. This is referred to as an on demand request. By default, on demand requests are disabled.

The following SQL will enable on demand for all NW3000 Devices:

```
SQL> update nw3000driver set disableOnDemand = false; commit;
```

By default, an RTU must be identified by OpenEnterprise as being offline for more than 30 seconds for an on demand request to be initiated. This value can be set to any time period. The following SQL shows how to set the time period to 90 seconds.

```
SQL> update nw3000driver set onDemandExclusion = 90; commit;
```

The system should now be ready to collect archive and audit data when a dead device goes online.

OpenEnterprise Database Configuration

1.3.2   NW3000 Device Configuration

If only a subset of devices will contain archive and audit data, on demand requests can be disabled for the remaining devices using the following SQL:

```
SQL> update nw3000device set enableOnDemand = false where devicename =
'<devicename>'; commit;
```

OpenEnterprise Database Configuration

1.3.3   Historical Stream Configuration

The Historical Streams (also known as Logging Groups) are the virtual tables where the Historian logs historical data.

1.3.3.1   Event History

Audit data will automatically be inserted into the OpenEnterprise EventHistory table. No further configuration is required.

1.3.3.2   Signal History

In order to log archive data as signal history, the associated historical streams must be configured for exception logging for the logValue and logtime attributes. A value should be logged whenever the logTrigger attribute changes value.

The following example shows how a historical stream could be configured to log analog signal history with archive backfill. Each SQL command should be given in the order shown. The titles are only included to aid understanding of each command.

1.3.3.2.1   Create the Logging Group (Stream)

```
INSERT INTO oelogcontrol (id, source, namecolumn, enable,
userenabling,triggercolumn) VALUES (10, 'nw3000realanalog_table', 'name',
TRUE, TRUE, 'logtrigger');commit;
```

1.3.3.2.2   Define the Logged Columns

```
INSERT INTO oelogcolumn (control, name, type, sourcecolumn) VALUES (10,
'value', 0, 'logvalue');
```

```
INSERT INTO oelogcolumn (control, name, type, sourcecolumn, indexmethod)
VALUES (10, 'occurrencetime', 0, 'logtime', 1);commit;
```

1.3.3.2.3   Define the Raw Dataset

```
INSERT INTO oelogdata (rate, control, buffercount, buffersize) VALUES
('0s', 10, 144, 6372);commit;
```

```
UPDATE oelogcontrol SET raw = 'raw10_table' WHERE id = 10;commit;
```

1.3.3.2.4   Create a view on the Raw table

```
CREATE VIEW raw10 AS select * from raw10_table;commit;
```

1.3.3.2.5   Define the Viewname

In the OELogData table. This enables Trends to access the historical data

```
UPDATE oelogdata SET viewname = 'raw10' WHERE rate = '0s' AND control =
10;commit;
```

1.3.3.2.6   Grant everyone access to the View

```
grant all on raw10 to PUBLIC;
```

1.4   Harvester Configuration

Configure Harvester to collect the archive and audit files. Refer to the Harvester online help for further information on how this is done. The following example shows Harvester configured to collect archive and audit data from the CFE1 RTU.
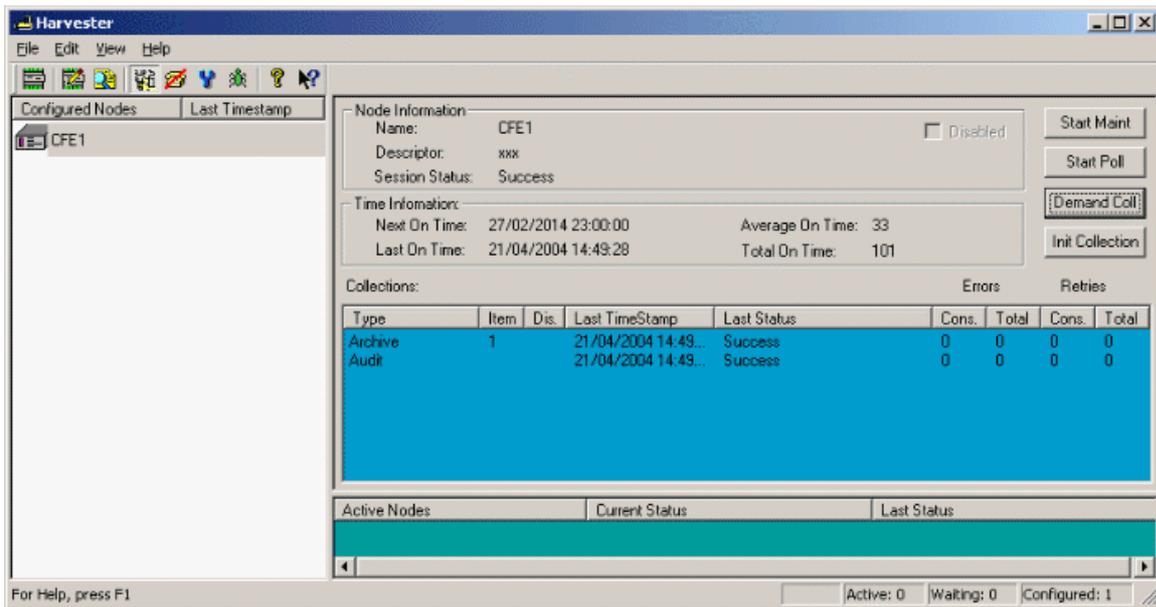
1.4.1.1   Note:

The example above is scheduled for timed collection once every 3600 days. This effectively disables timed collection and will rely upon rdi3000 manually requesting collection when a dead device comes online. However, NW3000 Archiving is not limited to this backfill mode of operation (i.e. initiation of historical data collection only when an RTU is brought back online).

By configuring the Harvester application collect archive and audit data at a shorter interval (i.e. daily), archive and audit data can be scheduled for regular collection and insertion into the OpenEnterprise database straight from the RTU. The ACCOL would also need to be modified to turn archiving and auditing collection on at all times. OEBFill will then insert the data into OpenEnterprise at these regular intervals.

1.5   Converter Configuration

1. Start Converter and Stop collection by selecting (Export | Stop) from the menu bar.
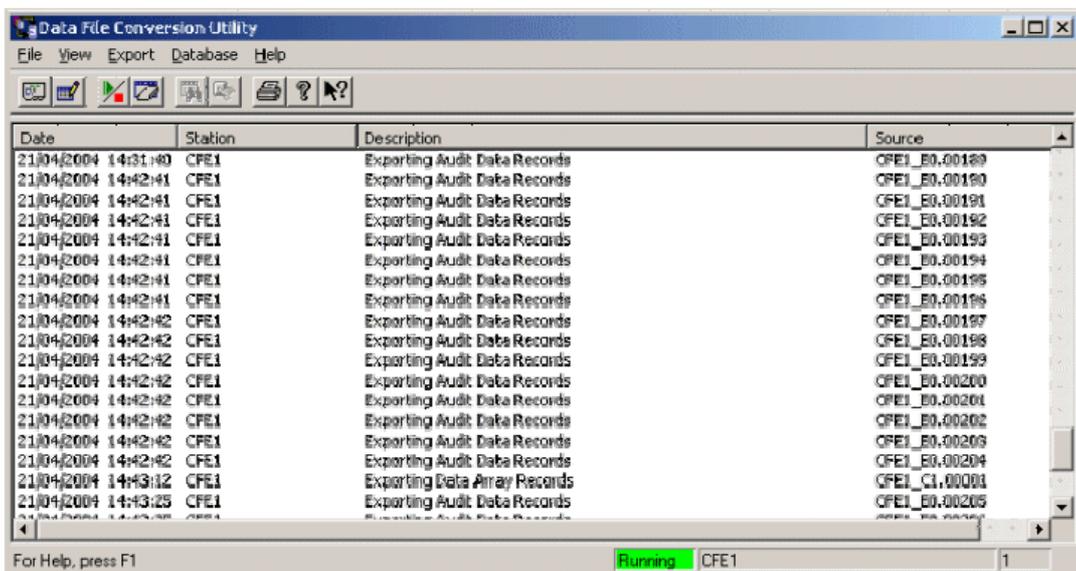
2. Open the Data File Conversion Setup dialog shown in Step 5 below by selecting (File | Initialization) from the menu bar.

3. Select the Export Libraries tab.

4. Select the **[Add New DLL]** button.

5. Type OEBFILL into the *Export DLL Name* text field and press Return.
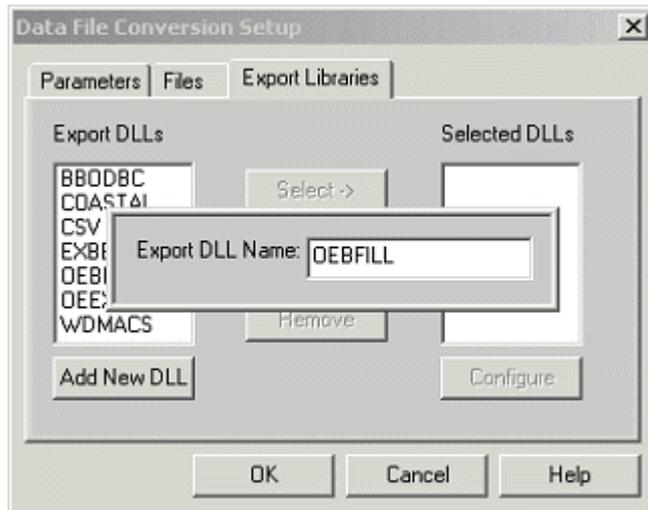
6. Now select OEBFILL in the *Export DLLs* pane and press the **[Select ->]** button

7. The OEBFill DLL can now be configured by selecting it from the *Selected DLLs* pane and then clicking the **[Configure]** button..

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1.6   Configure OEBFill DLL

The OEBFILL DLL can be configured to enable or disable processing of archive and audit data. By default both are enabled and the default configuration should be sufficient for most systems. Please refer to the OEBFill help file for more information on the configuration of this component.
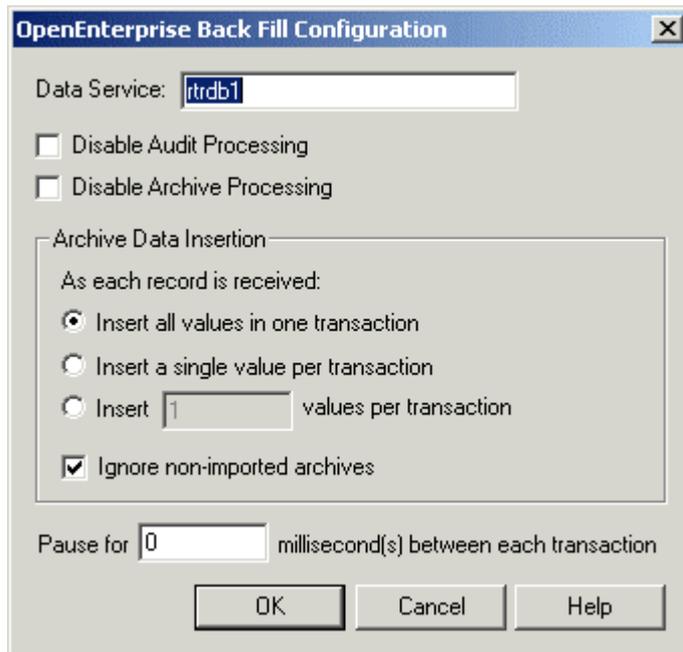
At this stage you should test the collection of the archive and audit files by selecting the Demand Coll button on the Harvester. When archives and audits are collecting correctly, the Collector should indicate data files being processed. To test the example setup we have given, disconnect the serial cable from BIP1 for a period of time in order for the ACCOL to log some archive records (and possibly some audit alarms).

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