

uniformance

Overview of PHD2Rel and Rel2PHD

Lesson Objective

Objective

Transfer history data from PHD to relational tables in an Oracle RDBMS (PHD2Rel) and transfer values from an Oracle relational table to PHD history (Rel2PHD).

Topics

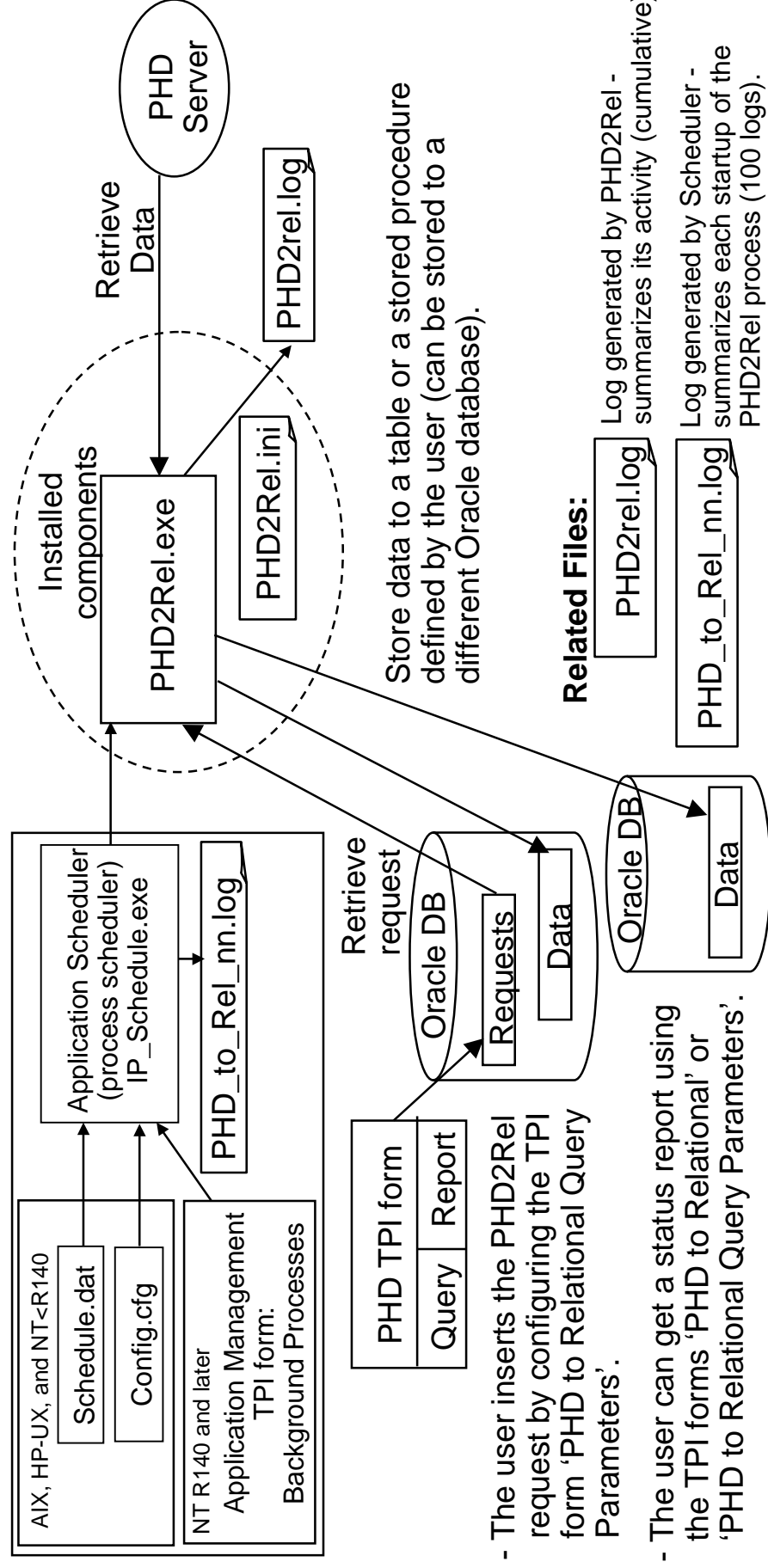
- PHD2Rel
 - Components and Data Flow
 - Implementation Steps
 - .ini File
 - TPI Forms
 - Required Scripts
 - Examples
- Rel2PHD
 - Components and Data Flow
 - Inserting Data into the Oracle table
 - Examples
- Scheduling PHD2Rel and Rel2PHD
- Suggested Oracle Reference

References:

- *PHD User Manual*, PIM0201 Forms
 - PHD to Relational
 - PHD to Relational Query Parameters
 - Background Processes
 - PHD to Relational
 - Relational to PHD
- *Uniformance Relational To PHD User Guide*, PIM2701
- *Uniformance Background Processing Descriptions User Guide*, PIM1001 (Application Server section)
- *Uniformance System Environment User Guide*, SM0401 (Application Startup/Shutdown section)
- *Uniformance Application Server Installation Guide*, SM0501 (This is an internal Honeywell document.)

PHD2Rel - Components and Data Flow

- The PHD to Relational (PHD2Rel) function is a background process running on a user defined frequency.
- PHD2Rel performs regularly scheduled transfers of user specified data from PHD to a relational table in an Oracle RDBMS or to an executable script. The "executable script" option provides the ability to perform custom processing of the retrieved data.
- The retrieved data can be values or aggregates over a user-specified time period for a tag or a list of tags.



- The user inserts the PHD2Rel request by configuring the TPI form 'PHD to Relational Query Parameters'.
- The user can get a status report using the TPI forms 'PHD to Relational' or 'PHD to Relational Query Parameters'.

PHD2Rel.ini File

```
Phd2Rel.ini - Notepad
File Edit Search Help

# Initialization file for PHD-TO-Relational.
#
# # P2R_CONNECT_STRING -- Specifies the PHD Server connect string.
# # P2R_USERNAME -- The user name used to login to PHD. A proxy login is performed
# # if not specified or blank.
# # P2R_PASSWORD -- The password to login to PHD. This parameter is ignored if
# # P2R_USERNAME is not specified.
# # P2R_DB_ALIAS -- Specifies the Oracle Database that contains the PHD-TO-REL requests.
# # If not specified or left blank, the default Database is accessed.
# # P2R_DB_USERNAME -- The user name to login to the Oracle Database. The username and
# # password can be specified together (but separated by "/").
# # Specify only "/" to locally access the "OPS$xxxx" account.
# # P2R_DB_PASSWORD -- The password for the user account. Do not specify this parameter if
# # the password is already specified by P2R_DB_USERNAME.
# # P2R_FREQUENCY -- In unit of minutes. Specify the maximum time span may pass before the PHD-TO-REL
# # requests are examined for processing. The default is 60 minutes.
# # P2R_EXEC_OFFSET -- In unit of minutes. PHD-TO-REL usually executes exactly on the hour.
# # P2R_EXEC_OFFSET instruct PHD-TO-REL to execute at an offset from the
# # top of the hour.
# # P2R_EXEC_TEST -- A value of none-0 instructs that the PHD-TO-REL requests be executed
# # immediately at startup or at the frequency dictated by P2R_FREQUENCY
# # and Execution Interval. Also the P2R_EXEC_OFFSET parameter is ignored.
# # P2R_OUTPUT_DIR -- Specifies the output files' directory path for the "Write To File" and
# # "Append To File" requests. The default directory is "%IP_ROOT%\log"
# # on NT, "%IP_ROOT%\log" on Unix, and "%IP_ROOT:[COMMON.LOG]" on OpenVMS.
# # P2R_SCRIPT_DIR -- Specifies the command files' directory path for the "System Call"
# # requests. The default directory is "%IP_ROOT%\bin" on NT, "%IP_ROOT/bin"
# # on Unix, and "%IP_ROOT:[COMMON.EXE]" on OpenVMS.
#
# #
P2R_CONNECT_STRING=localhost
#P2R_USERNAME=PHD_READONLY
#P2R_PASSWORD=PHD_READONLY
P2R_DB_ALIAS=TOTALPLANT
P2R_DB_USERNAME=/
#P2R_DB_PASSWORD=
P2R_FREQUENCY=60
P2R_EXEC_TEST=0
#P2R_EXEC_OFFSET=10
#P2R_OUTPUT_DIR=
#P2R_SCRIPT_DIR=
```

The PHD2Rel interface uses parameters defined in the PHD2REL.ini file to control the execution of the process.

Honeywell recommends that you not change the parameters for PHD2REL and REL2PHD in the config.cfg and schedule.dat files.

For a default Oracle logon (P2R_DB_USERNAME= /), PHD2Rel will log onto Oracle using the operating system authentication logon (username OPS\$name, where name is the operating system username). Ex: OPS\$ TOTALPLANT

For more details, refer to *PHD User Manual*, Background Processes, PHD to Relational

For platforms < NT/R140, the Schedule.dat and Config.cfg files are used to configure and schedule background processes.

For PHD2REL and REL2PHD, Honeywell recommends that you not change the parameters in the Config.cfg and Schedule.dat files.

```

Schedule.dat - Notepad
File Edit Search Help

### IMPORTANT NOTE ###
# This file is no longer used for application scheduling.
# Please see documentation for Background Processes configuration.
#
# File with process scheduling information, used by schedule process
# Format:
#   process name, schedule type, program name, process frequency, default frequency [, opt
#   Where optional arguments take the form:
#   # argument name, argument type, argument value
#
AUTO_REPROCESS, PERIODIC, auto_reprocess.exe, AUTO_REPROCESS_QUEUE_FREQ, 00:15:00
BATCH_TRACK, PERIODIC, batch_tracking.exe, BATCH_TRACK_QUEUE_FREQ, 00:10:00
EXTRACT_SCHED, PERIODIC, ext_sched.exe, EXTRACT_SCHED_QUEUE_FREQ, 00:02:00
INSTRUCTION_CREATE, PERIODIC, auto_create_instrcn.exe, AUTO_INSTRUCTION_CREATE_QUEUE_FREQ
INSTRUCTION_SCHED, PERIODIC, sched.exe, INSTRUCTION_SCHED_QUEUE_FREQ, 02:00:00, INSTRUCTIO
LAB_DATA_INTEGRATOR, PERIODIC, ip_routine_limsqom.cmd, LIMS_QUEUE_FREQ, 00:15:00
NIGHTLY, TIMEOFDAY, ip_nightly.cmd, NIGHTLY_START, 06:30:00, AUTO_PROCESS, QUERY_EXISTS,
OPERATION_ALARMS, PERIODIC, op_alarm.exe, OPERATION_ALARMS_QUEUE_FREQ, 00:15:00
OPERATION_EVENTS, PERIODIC, op_event.exe, OPERATION_EVENTS_QUEUE_FREQ, 00:15:00
OPERATION_MONITORING, PERIODIC, op_mon.exe, OPERATION_MONITORING_QUEUE_FREQ, 00:10:00
PHDATA_LOADER, PERIODIC, phdata_loader.exe, PHDATA_LOADER_QUEUE_FREQ, 00:05:00
PRODUCTMOVE_SCHED, PERIODIC, sched.exe, PRODUCTMOVE_SCHED_QUEUE_FREQ, 00:02:00, PRODUCTMOU
PRODUCTION_SCHED, PERIODIC, process_prod_sched.exe, PROD_SCHED_QUEUE_FREQ, 00:15:00
SAMPLE_SCHED, PERIODIC, sched.exe, SAMPLE_SCHED_QUEUE_FREQ, 02:00:00, SAMPLE_SCHED_RUN_FRE
TAG_SYNCHRONIZATION, TIMEOFDAY, tagsync.exe, TAGSYNC_EXECUTION_TIME, 06:30:00
TANK_COMP, PERIODIC, tank_comp.exe, TANK_COMP_QUEUE_FREQ, 00:10:00
PHD_TO_REL, PERIODIC, phd2rel.exe, PHD_TO_REL_QUEUE_FREQ, 00:15:00, PHD_TO_REL_INIFILE, PHD2REL.INI
REL_TO_PHD, PERIODIC, pipetophd.exe, REL_TO_PHD_QUEUE_FREQ, 00:01:00
EVENT_JOURNAL, PERIODIC, evt_jrnl.exe, EVENT_JOURNAL_QUEUE_FREQ, 00:00:10, EVENT_JOURNAL_INIFILE, EVT_JRNL.INI

```

Overview of PHD2REL Implementation Steps

Configure the Application Scheduler

1. If R140 or later on NT, complete the TPI “Background Processes” form to configure the PHD2Rel process. For AIX, HP-UX, or <R140 on NT, configure the Schedule.dat file.

Configure PHD2Rel

1. Complete the TPI form “PHD to Relational Query Parameters” to define a PHD2Rel request.
2. Execute an SQL script to do one of the following, depending on the desired output destination:
 - Create an Oracle table.
 - Create an Oracle stored procedure and table.
3. Wait for PHD2Rel to execute, then view the PHD2Rel.log file or the status messages in the TPI form to verify its operation.
4. If any changes need to be made to the PHD2Rel.ini file, make the changes, then stop and restart the Background Scheduler.

View Data

1. Access the data using an SQL tool (such as MSeXcel, MSAccess, SQL Plus33, or ODBC Test).

Configuring Background Processes - PHD_TO_REL

On NT R140 and later, PHD_TO_REL is scheduled through the Background Processes TPI form (TPI/Application Management/Background Processes). The background process scheduler reads the information that is entered into the form.

PHD_TO_REL and other background processes that existed prior to R140 do not use the **Message Level** parameter or the **Status** tab.

TotalPlant Information - [Background Processes]

Background Processes

TotalPlant

Process Name

PHD_TO_REL

Execution Type

P

Execution Frequency

720

Message Level

4

Next Execution Time

Execution Node

Last Run Time

Program Type

OS Program

Enabled

☒

Description

Status

Parameters

Execution Statements

Parameter

INI_FILE

Parameter Value

PHD2REL.INI

Sequence

1

Record: 1 of 1 (Filtered)

Parameter value.

Status

Parameters

Execution Statements

Operating System Name

Start Statement

NT

PHD2REL

*

Configuring Background Processes - PHD_TO_REL, continued

For definitions of parameters for background processes, look up PHD_TO_REL in the *Uniformance Background Processing Descriptions User Guide*, PIM1001, Application Server section.

Excerpts from the documentation:

Application	Process Name	Program Type	Exec Type	Description
PHD	PHD_TO_REL	OS Program	P	PHD to relational

PHD_TO_REL				
Execution Statement:				
Operating System Name:		NT		
Start Statement:		phd2rel		
Parameter	Default Value	Seq	Parameter Required	Value Required Description
INI_FILE		1	Yes	Yes
				Name of ini file containing configuration information for the process.

PHD to Relational Query Parameters Form

The screenshot shows the 'PHD to Relational Query Parameters' form. The 'Output Destination' section is highlighted with a red box. The 'Retrieval' section is also highlighted with a red box. The 'Enabled?' checkbox is checked. The 'Variable List' section shows a list of variables with a 'Tagset' column. The 'Current Status' section shows 'Last Executed' and 'Status Detail'. The 'Record' section shows 'Type of destination'.

This form is used to configure PHD2Rel requests: tags, frequency, and other parameters. From this form, you can

- add a new request,
- edit or disable a request, or
- get detailed information about an existing request.

The “*” indicates fields that are mandatory.

*Name	Unique name to identify the request.
Enabled?	If enabled, the request is a candidate to be executed at the next scheduled execution time.
Type	Output Destination TABLE - Destination is a database table. The destination table must exist. PROC - Data is to be passed to a stored procedure or script. The stored procedure must exist. WRITE TO FILE – Data of the last execution interval is to be written to a file. The file will be overwritten on each execution cycle. Only data in the last execution interval is retrieved. APPEND TO FILE – Data is to be appended to a file. If the file does not exist, it will be created. SYSTEMCALL – Data is to be sent to a Unix shell script, Windows NT command file, or an Open VMS command file. Username to login to destination server. Entry is not limited to values in list. Password to login to destination server. Entry is masked with “” characters. Database name to login to destination server (ex: TOTALPLANT). Name of table if destination type is TABLE, or the name of a procedure or script file if destination type is PROCEDURE.
User	Username to login to destination server. Entry is not limited to values in list.
Password	Password to login to destination server. Entry is masked with “*” characters.
Database	Database name to login to destination server (ex: TOTALPLANT).
Name	Name of table if destination type is TABLE, or the name of a procedure or script file if destination type is PROCEDURE.

PHD to Relational Query Parameters Form

TotalPlant Information - [PHD to Relational Query Parameters]

File Edit Records Window Help

PHD to Relational Query Parameters

Enter Query

TotalPlant

Name JAN_REQUEST

Enabled? ☒

Output Destination

Type TABLE

User TOTALPLANT

Password *****

Database TOTALPLANT

Name jan_output

Retrieval

Type Value

Attributes Who, Val, TS, Tagname, Conf

Interval 1 Minute

Execution Interval Hourly

Retrieval Section	
*Type	Type of request for the selected Tagname or for all tags in the selected Tagset: Average, Delta, Maximum, Minimum, Standard Deviation, Regression Constant, Regression Slope, Regression Deviation, First, Last, Value
*Attributes	Combination of attributes to be retrieved for this request: Value, Timestamp, Confidence factor, Tagname, Who (Retrieval request and requester).
*Interval	Retrieval interval (resample interval)-time period under consideration on each scheduled execution (1, 5, 6, 12, 15, 30 minutes, hourly, daily, weekly, monthly).
*Execution Interval	Interval on which request is scheduled to execute.

PHD2Rel and Rel2PHD

PHD RI50

P51771.11 12/99

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PHD to Relational Query Parameters Form, continued

PHD to Relational Query Parameters

Output Destination

Name:

Type:

User:

Password:

Database:

Name:

Retrieval

Attributes:

Interval:

Execution Interval:

Enabled? ☒

Variable List

Tagset:

Tagname:

Tagset: ☒

Current Status

Last Executed:

Status Detail:

Variable List Section

Tagname option	Tagset option
Specifies retrieval request for a Tagname you select from the	
Specifies retrieval request for a Tagset you select from the	

PHD to Relational - Target Table Example

When the output type is "Table", the retrieved tag values and related information are inserted into the named relational table. The table must be created before the PHD-To-REL request is executed and must have the same column names and structure as the following sample:

SQLcreatetable.txt - WordPad

File Edit View Insert Format Help

CREATE TABLE PHD2REL OUTPUT (

TAGNAME

TIMESTAMP

VALUE

CONFIDENCE

RETRIEVAL_TYPE

RETRIEVAL_INTERVAL

TITLE

SOURCE_SERVER

TABLESPACE IP_DATA_TS;

)

Table Name

Retrieval Request

Requestor

Data Type

VARCHAR2(32)

DATE

VARCHAR2(81)

NUMBER (5)

VARCHAR2(20)

VARCHAR2(30)

VARCHAR2(60)

Tagname

Date and time

Data value

Tag confidence

Type - average, min, max ,etc.

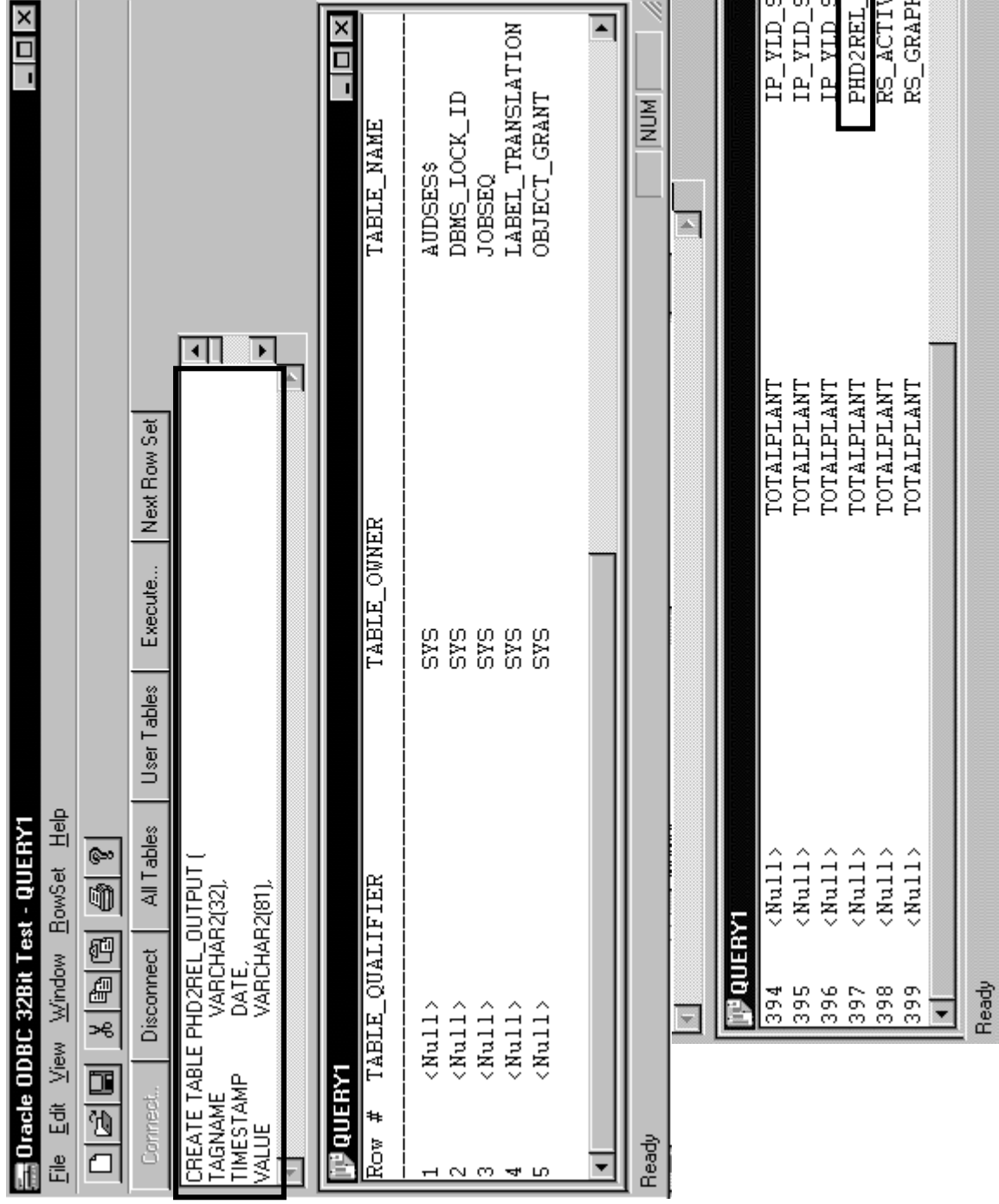
Retrieval interval

Request name (title)

PHD host or port

(If you do not specify WHO as one of the Retrieval Attributes in the PHD To Relational Query Parameters TPI form, the last four columns of data will be NULL.)

PHD to Relational - Target Table Example, continued



In this example, ODBC Test was used to create an Oracle table named PHD2REL_OUTPUT.

PHD2Rel Test Mode

PHD2Rel provides a test mode.

Excerpt from PHD2Rel.ini:

```
# P2R_FREQUENCY -- In unit of minutes. Specify the maximum time span may pass before the PHD-T0-REL
# requests are examined for processing. The default is 60 minutes.
# P2R_EXEC_OFFSET -- In unit of minutes. PHD-T0-REL usually executes exactly on the hour.
# P2R_EXEC_OFFSET instruct PHD-T0-REL to execute at an offset from the
# top of the hour.
# P2R_EXEC_TEST -- A value of none-0 instructs that the PHD-T0-REL requests be executed
# immediately at startup or at the frequency dictated by P2R_FREQUENCY
# and Execution Interval. Also the P2R_EXEC_OFFSET parameter is ignored.
# P2R_OUTPUT_DIR -- Specifies the output files' directory path for the "Write To File" and
# "Append To File" requests. The default directory is "%IP_ROOT%\log"
# on NT, "%$IP_ROOT/log" on Unix, and "IP_ROOT:[COMMON.LOG]" on OpenVMS.
# P2R_SCRIPT_DIR -- Specifies the command files' directory path for the "System Call"
# requests. The default directory is "%IP_ROOT%\bin" on NT, "$IP_ROOT/bin"
# on Unix, and "IP_ROOT:[COMMON.EXE]" on OpenVMS.
#
```

```
P2R_CONNECT_STRING=localhost
P2R_USERNAME=PHD_READONLY
P2R_PASSWORD=PHD_READONLY
P2R_DB_ALIAS=TOTALPLANT
P2R_DB_USERNAME=/
P2R_DB_PASSWORD=
P2R_FREQUENCY=60
P2R_EXEC_TEST=0
P2R_EXEC_OFFSET=10
P2R_OUTPUT_DIR=
P2R_SCRIPT_DIR=
```

PHD2Rel executes each request at the Execution Interval specified in the TPI form (ex. top of the hour)

For testing purposes, you may set the P2R_EXEC_TEST to one (1) and set P2R_FREQUENCY to the desired testing frequency (ex. 5 minutes). After restarting the Scheduler, PHD2Rel will execute at that frequency.

er's Enter Query TotalPlant Enabled? ☒

Retrieval Type Value

Attributes Val, TS, Tagname, Conf

Interval 1 Minute

Execution Interval Hourly

PHD to Relational Form and Log

TotalPlant Information - [PHD to Relational]

File Edit Records Window Help

File Edit View Attach Tables Security Configuration Window Help

PHD to Relational

Enter Query

Name	Executed	Last Value
JAN_REQUEST		****NEW****
REL_120_TEST_RAMP	4/28/98 15:57:00	****DISABLED****
RQST_1	4/28/98 16:15:00	31.4167995452881
RQST_2	4/28/98 15:58:00	****MODIFIED****
RQST_3	4/28/98 16:15:00	31.4167995452881

NEW - Request is new and has never been executed.

DISABLED - Request is currently disabled.

value(status) - Request was successful. This is last value/status returned.

MODIFIED - Request has been modified since last execution.

ERROR - Attempting to execute request resulted in an error.

PHD to Relational Form:

TPI provides a form to view the status of PHD2Rel requests. The fields in this form are read only.

The **PHD2Rel.log** file reports the activity of the PHD2Rel function.

The log file will grow. The user must manage the file.

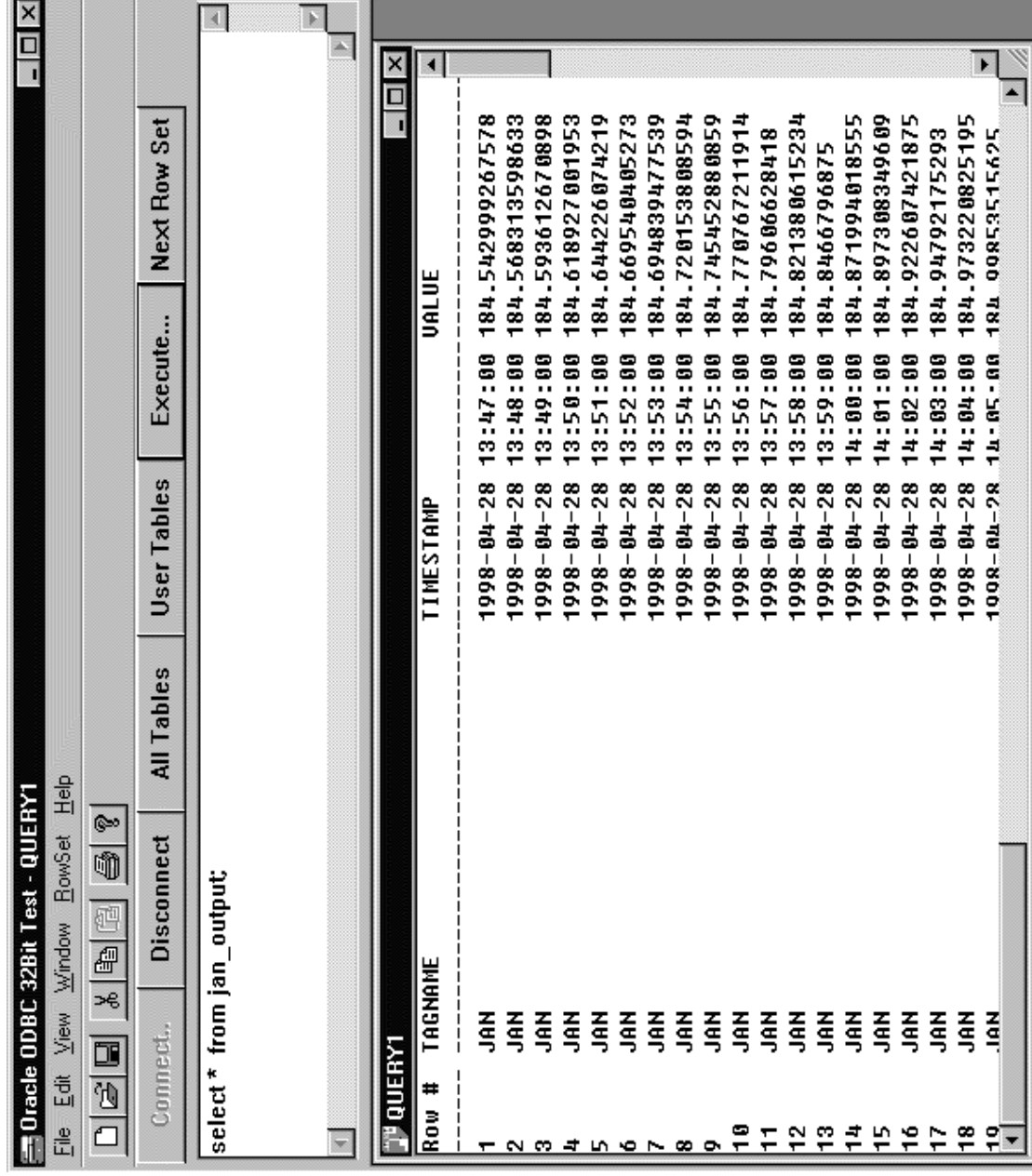
phd2rel.log - Notepad

File Edit Search Help

```
Wed Apr 08 12:38:51: phd sethost: Connect to PHD Server failed: "localhost"
Wed Apr 08 12:38:51: PHD ERROR(10044): -E- CONNECTFAIL - Network client connect request failed.
Wed Apr 08 12:39:03: Processed 0 requests with 0 failures.
Wed Apr 08 13:38:59: DB ERROR(fffffc14): ORA-01004: default username feature not supported; Logon denied
ORA-01
Wed Apr 08 13:38:59: DB ERROR(fffffc0c): ORA-01012: not logged on
Wed Apr 08 13:38:59: Processed 0 requests with 0 failures.
Wed Apr 08 13:38:59: Sleeping until PHD Server time: 08-APR-98 14:38:55 (892071535). ZZZZZZ
```

PHD to Relational - Target Table Example, continued

After the PHD2Rel process executes, you may use an SQL tool such as ODBC Test to view the data.



The screenshot shows the Oracle ODBC 32Bit Test - QUERY1 window. The main text area contains the SQL query: `select * from jan_output;`. Below the query, a table of results is displayed with three columns: Row #, TAGNAME, and VALUE. The table contains 20 rows of data, each with a timestamp and a numerical value.

Row #	TAGNAME	TIMESTAMP	VALUE
1	JAN	1998-04-28 13:47:00	184.542999267578
2	JAN	1998-04-28 13:48:00	184.568313598633
3	JAN	1998-04-28 13:49:00	184.593612670898
4	JAN	1998-04-28 13:50:00	184.618927001953
5	JAN	1998-04-28 13:51:00	184.644226074219
6	JAN	1998-04-28 13:52:00	184.669540405273
7	JAN	1998-04-28 13:53:00	184.694839477539
8	JAN	1998-04-28 13:54:00	184.720153808594
9	JAN	1998-04-28 13:55:00	184.745452880859
10	JAN	1998-04-28 13:56:00	184.770767211914
11	JAN	1998-04-28 13:57:00	184.79606628418
12	JAN	1998-04-28 13:58:00	184.821380615234
13	JAN	1998-04-28 13:59:00	184.8466796875
14	JAN	1998-04-28 14:00:00	184.871994018555
15	JAN	1998-04-28 14:01:00	184.897308349609
16	JAN	1998-04-28 14:02:00	184.922607421875
17	JAN	1998-04-28 14:03:00	184.94792175293
18	JAN	1998-04-28 14:04:00	184.973220825195
19	JAN	1998-04-28 14:05:00	184.00853515625

PHD to Relational - Target Table Example, continued

You may use an SQL tool such as MSAccess to view the data.

1. Open any database.
2. File/Get External Data/Link Tables
3. Files of Type/ODBC Databases/Machine Data Source/
TOTALPLANT32
4. Logon to Oracle.
5. Locate and select table
6. Select all fields.
7. Open table.

TAGNAME	TIMESTAMP	VALUE	CONFIDENCE	RETRIEVAL_TIME	RETRIEVAL_IN	TITLE	SOURCE_SERVICE
JAN	1/98 1:47:00 PM	184.542999	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 1:48:00 PM	184.568311	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 1:49:00 PM	184.593612	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 1:50:00 PM	184.618927	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 1:51:00 PM	184.644226	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 1:52:00 PM	184.669540	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 1:53:00 PM	184.694839	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 1:54:00 PM	184.720153	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 1:55:00 PM	184.745452	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 1:56:00 PM	184.770767	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 1:57:00 PM	184.796086	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 1:58:00 PM	184.821380	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 1:59:00 PM	184.846679	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 2:00:00 PM	184.871994	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 2:01:00 PM	184.897306	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 2:02:00 PM	184.922607	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 2:03:00 PM	184.947921	0	Value	1 Minute	JAN_REC	localhost
JAN	1/98 2:04:00 PM	184.973220	0	Value	1 Minute	JAN_REC	localhost

PHD2Rel Application Example

Reporting:

A system script can be written to do some intelligent checking and data processing of the data.

For example, the script could find data that has a confidence of zero during a specific time period and put the data into different tables and reports. Some users have system scripts to write reports.

Commonality of Data:

Maintain calculated averages in a relational database for end user access, instead of having the server do reductions on demand.

If you give end users this alternative for calculations on large amounts of data (for example, a yearly average for a tag that has five second samples), it may improve server performance.

Hands-On Exercise

Configure Background Process

1. Complete the TPI “Background Processes” form to configure the PHD_TO_REL process.

Configure PHD2REL.INI file

1. For the purpose of this exercise, modify the PHD2Rel.ini file to cause PHD2Rel to run in the “test” mode every two minutes.
2. Restart the background scheduler to implement the changes to the file.
3. Look at the Task Manager processes of the PHD Server and verify that the PHD2Rel function is executing.

Hands-On Exercise, continued

Perform PHD2Rel Request

Create an Oracle table named GnnOUTPUT, then create an hourly PHD2Rel request named GnnREQUEST. Configure the request to retrieve the current value at one minute intervals and all of the other available attributes for one of your PHD tags (ex. Gnn.TIC21###.PV, where ### is your assigned number).

1. Copy file P2R_TEMP.SQL from your instructor's machine to C:\TEMP. (The file contains the script to create an Oracle table for a PHD2Rel request.)
2. Modify the script to create a table named GnnOUTPUT.
3. Create the table GnnOUTPUT, by executing the script in an SQL tool--use SQL Plus 33 at the Command Prompt:

Plus33 TOTALPLANT/TOTALPLANT@TOTALPLANT @C:\TEMP\P2R_TEMP.SQL

4. Use ODBC Test to verify that the user table exists:
 - machine data source/TOTALPLANT 32
 - user tables
 - row set/100
 - next row set (until you find table)
(instead, you could use Oracle Schema Manager)

Execute this command to view the contents of the table: Select * from GnnOUTPUT;

Hands-On Exercise, *continued*

5. Complete the TPI form to define the PHD2Rel request:

Name	GnnREQUEST
Type	TABLE
User	TOTALPLANT
Password	TOTALPLANT
Database	TOTALPLANT
Table Name	GnnOUTPUT
Retrieval Type	VALUE
Attributes	all
Interval	1 MINUTE
Execution Interval	HOURLY
Tagname	Gnn.TIC21###.PV

6. From ODBC test, check to see that data was stored in the table: Select * from GnnOUTPUT;

7. If there is no data in the table, query the 'PHD to Relational' TPI form to view the status of your request.

Hands-On Exercise, *continued*

(Helpful Hint for future use: Double click on your request name in the 'PHD to Relational' form, and it goes to the configuration form for that request.)

8. View the most recent messages in LOG\PHD2REL.LOG in the Uniformance Application Server directory.

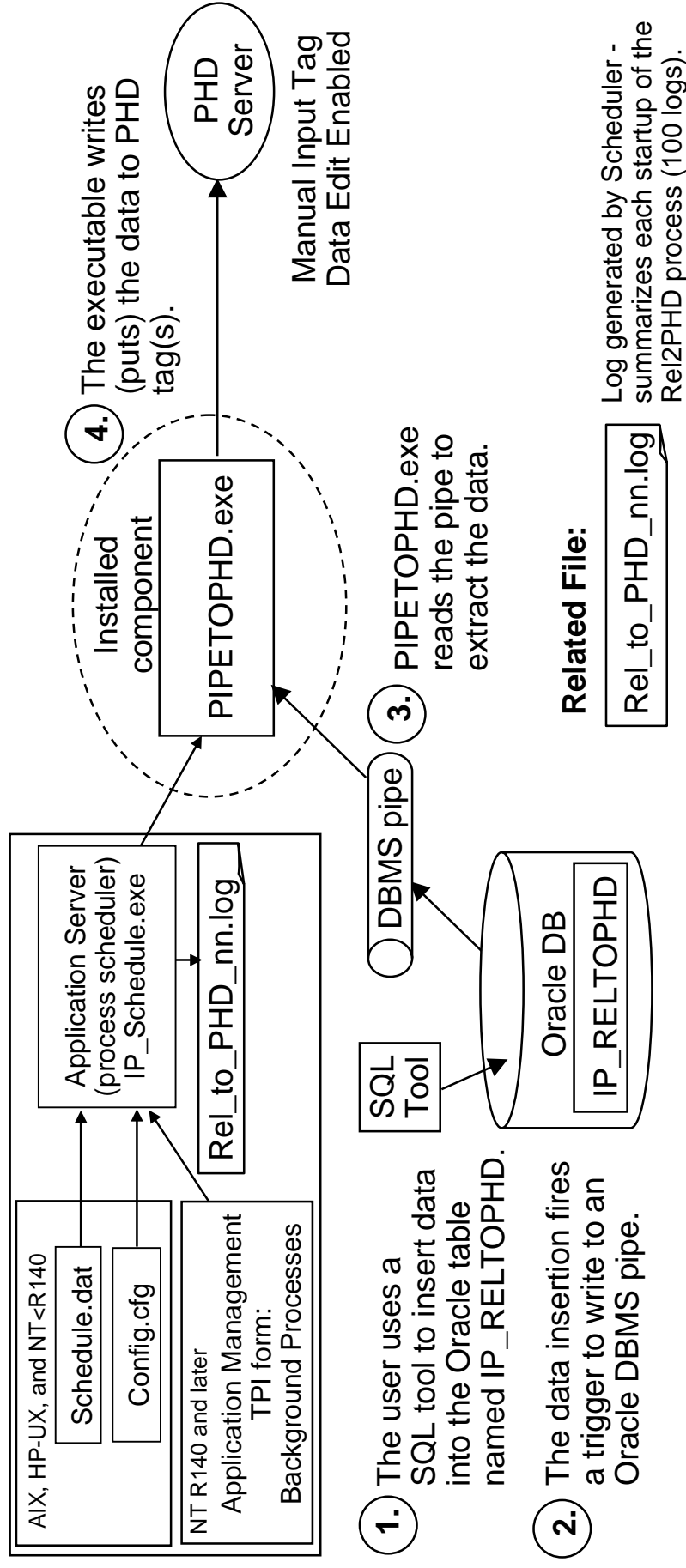
View PHD2REL data

1. View your PHD2Rel data with MSAccess:
 1. Open a blank database.
 2. From File New Database dialog, select CREATE.
 3. File/Get External Data/Link Tables
 4. Files of Type/ODBC Databases/Machine Data Source/TOTALPLANT32
 5. Logon to Oracle.
 6. Locate and select table (ex. TOTALPLANT.GnnOUTPUT)
 7. Select all fields.
 8. Open table.

END OF EXERCISE

Rel2PHD - Components and Data Flow

- The Relational to PHD interface is a mechanism for SQL applications to download data to and/or remove data from PHD. It allows developers and users with SQL knowledge to add/remove PHD data without having to have knowledge of the PHD API.
- To add/remove PHD data requires using SQL to insert a row into an Oracle database table. The table structure is predefined and is included with the PHD Oracle database. SQL tools that can be used to read/write into Oracle include the following:
 - SQL Plus33
 - MSeExcel (MSQuery)
 - ODBC Test
 - MSAccess (MSQuery)



Structure of IP_RELTOPHD Table

Column Name	Null?	Data Type
ID_NO	NOT NULL	NUMBER(9)
ACTION	NULL	VARCHAR2(6)
TAGNAME	NOT NULL	VARCHAR2(32)
TAG_VAL	NULL	VARCHAR2(80)
TIMESTAMP	NOT NULL	DATE
CONF	NULL	NUMBER(3)
UNITS	NULL	VARCHAR2(10)
IMMEDIATELY	NULL	VARCHAR2(1)
WHO_INSERTED	NULL	VARCHAR2(30)
ADDED_TIMESTAMP	NULL	DATE
EXEC_TIMESTAMP	NULL	DATE
RETAIN_HOURS	NULL	NUMBER(4,2)
PIPE_NAME	NULL	VARCHAR2(30)
RAISE_EXCEPTION	NULL	VARCHAR2(1)
STATUS	NULL	NUMBER(9)
STATUS_TEXT	NULL	VARCHAR2(255)

NOT NULL - The column value cannot be undefined; that is, a value must be supplied to it when a record is inserted. The value may be supplied by the person or application inserting the record, or by a trigger.

NULL - The column value can be undefined; that is, you do not have to supply a value to it when inserting a record.

Structure of IP_RELTOPHD Table, *continued*

ID_NO	Not usable by external applications (for internal use only).
ACTION	Default is INSERT. 'DELETE' - Initiates data deletion request to PHD. 'INSERT' - Initiates data insertion request to PHD (inserts data or replaces existing data for same timestamp).
TAGNAME	Contains the name of a valid PHD tag.
TAG_VAL	Must contain the value to be sent to PHD when performing an 'INSERT' action.
TIMESTAMP	Contains date and time for which TAG_VAL is valid, or identifies which value is to be deleted from PHD. Must be supplied as an Oracle DATE data type (DD-MMM-YY HH:MM:SS)
CONF	Contains the confidence (0-100) of TAG_VAL. (NULL value = 100).

For a complete definition of the table, refer to *Uniformance Relational to PHD User Guide*, PIM2701.

Data Insertion SQL Examples

```
insert into ip_reltophd(ID_NO,TAGNAME,TAG_VAL,TIMESTAMP)
values(1, 'f2001.pv', 1500.0, to_date('03/26/1998 14:20:00', 'mm/dd/yyyy hh24:mi:ss'));
```

```
insert into ip_reltophd(ID_NO,TAGNAME,TAG_VAL,TIMESTAMP, CONF)
values(2, 'TEST_INPUT_02', '15.0', to_date('03/16/1998 17:21:00', 'mm/dd/yyyy hh24:mi:ss'), 100);
```

```
insert into ip_reltophd(ID_NO,TAGNAME,TAG_VAL,TIMESTAMP, CONF)
values(3, 'TEST_INPUT_03', '15', to_date('03/16/1998 17:22:00', 'mm/dd/yyyy hh24:mi:ss'), 100);
```

```
insert into ip_reltophd(TAGNAME,TAG_VAL,TIMESTAMP, CONF)
values('WRITE2LCN.SP', '0', to_date('03/19/1998 09:11:00', 'mm/dd/yyyy hh24:mi:ss'), 100);
```

Configuring Background Processes - REL_TO_PHD

On NT R140 and later, REL_TO_PHD is scheduled through the Background Processes TPI form (TPI/Application Management/Background Processes). The background process scheduler reads the information that is entered into the form.

REL_TO_PHD and other background processes that existed prior to R140 do not use the **Message Level** parameter or the **Status** tab.

TotalPlant Information - [Background Processes]

Background Processes

Process Name

REL_TO_PHD

Execution Type

C

Execution Frequency

1

Message Level

0

Next Execution Time

6/14/99 11:59

Execution Node

Last Run Time

Program Type

OS Program

Enabled

☒

Enter Query

TotalPlant

Status

Parameters

Execution Statements

Parameter

Parameter Value

Sequence

CONNECT_STRING

1

PARAM2

2

PARAM3

3

*

Record: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 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1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 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1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867 1868 1869 1870 1871 1872 1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574 2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587 2588 2589 2590 2591 2592 2593 2594 2595 2596 2597 2598 25

Configuring Background Processes - REL_TO_PHD, continued

For definitions of parameters for background processes, locate REL_TO_PHD in the *Uniformance Background Processing Descriptions User Guide*, PIM1001, Application Server section.

Excerpts from the documentation:

Application	Process Name	Program Type	Exec Type	Description
General Mandatory	REL_TO_PHD	OS Program	C	Relational to PHD

REL_TO_PHD
Execution Statement:
Operating System Name: NT
Start Statement: pipetophd

CONNECT_STRING - User/pwd@tnsname
If using INTS, the best choice is to leave this value NULL.

On NT, the account and database to which the Scheduler connects are defined in Control Panel/Services/HoneywellBackgroundScheduler TOTALPLANT/Startup/Account and Password

Parameter	Default Value	Seq	Parameter Required	Value Required	Description
CONNECT_STRING		1	Yes	No	Database connection string. If left NULL, the scheduler will default it to the account and database it has connected with.
PARAM2		2	Yes	No	The database pipename the program will accept data from.
PARAM3		3	Yes	No	If value is DEBUG, then the process will record debug messages to the log file for the process.

Rel2PHD Errors

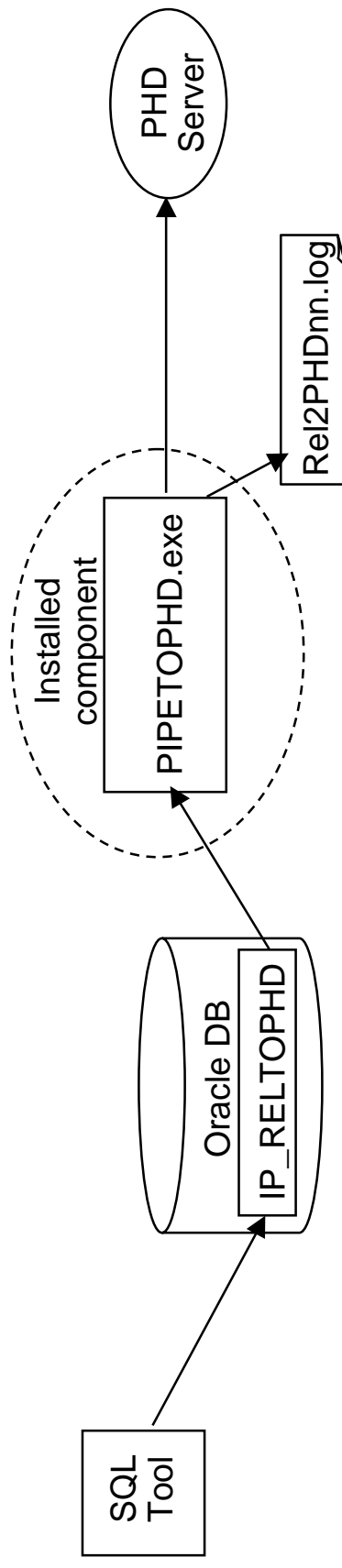
As long as the connection between PIPETOPHD.EXE and the Oracle Server remains open, the PHD error messages returned by the PHD Server are passed back to the trigger.

If errors occur while the data is being processed for inserting to the PHD Server, either an Oracle Exception is raised or the error message is added to the record, depending on the specified RAISE EXCEPTION value.

If PIPETOPHD.EXE has trouble sending the errors back to the trigger, it inserts them in the REL_TO_PHD_nn.log file.

It is strongly recommended that the user check the REL_TO_PHD_nn.log file for errors each time the RELTOPHD function is used. The REL_TO_PHD_nn.log file contains not only error messages, but also the information of processed records.

For details on Error Handling and Automated Maintenance, refer to *Uniformance Relational to PHD User Guide*, PIM2701.

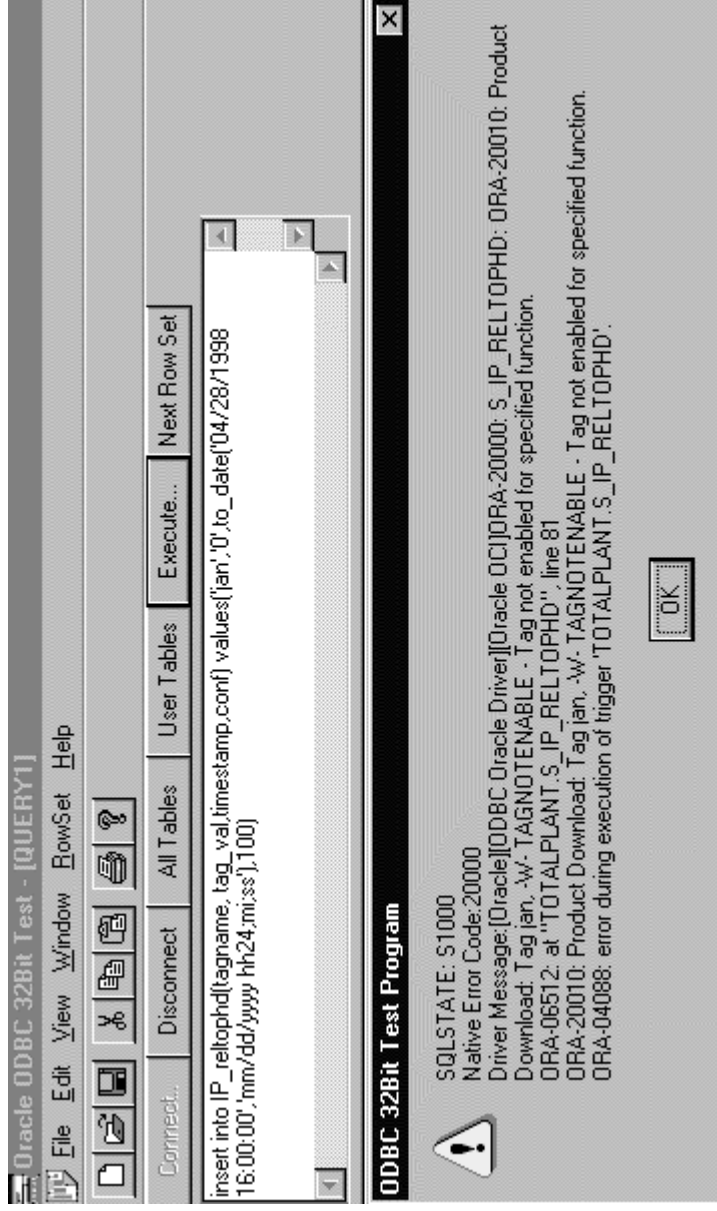


Rel2PHD Errors, continued

Enable Data Edit

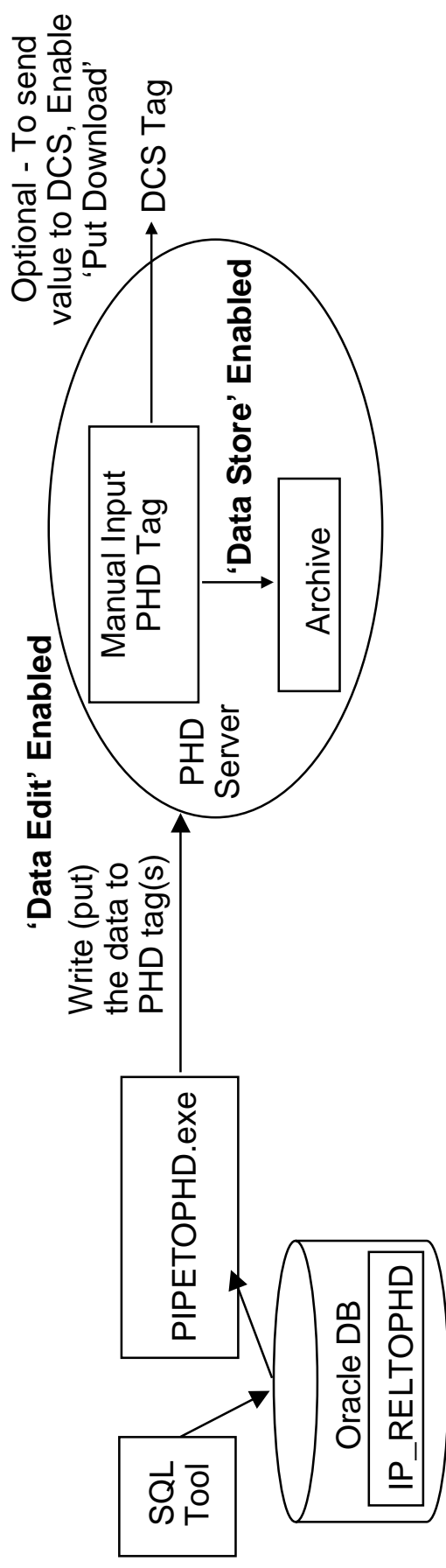
If you do not **enable Data Edit** for the PHD tag, an error message is generated when you attempt a Rel2PHD request to the tag.

The following error message example shows a Windows' Message Box displayed in ODBCTEST.



Rel2PHD Application Example

- Rel2PHD can be used to **historize values** users have inserted into the IP_ReltoPHD Oracle table; for example, lab results.



Suggested Reference

For beginners as well as general users:

"ORACLE The Complete Reference Electronic Edition New for Release 7.3" , from the Oracle Press

For example, it has the following sections:

- "PART I: Critical Database Concepts" ,
- "PART II: SQL -- Going from Beginner to Expert" ,
- "PART III: ORACLE7 Data Dictionary"
- "PART IV: Designing for Productivity" .

Hands-On Exercise

Configure Background Process

1. Complete the TPI “Background Processes” form to configure the REL_TO_PHD process.

Perform Rel2PHD Request

In this exercise, you will configure a tag to accept Rel2PHD put requests, then change the tag's value using Rel2PHD.

1. Select one of your Collected or Manual Input tags for this exercise. Configure the tag to have Data Edit enabled.
 2. Look at the data queue for the tag. Record a timestamp that has been archived, but is still in the data queue.
-

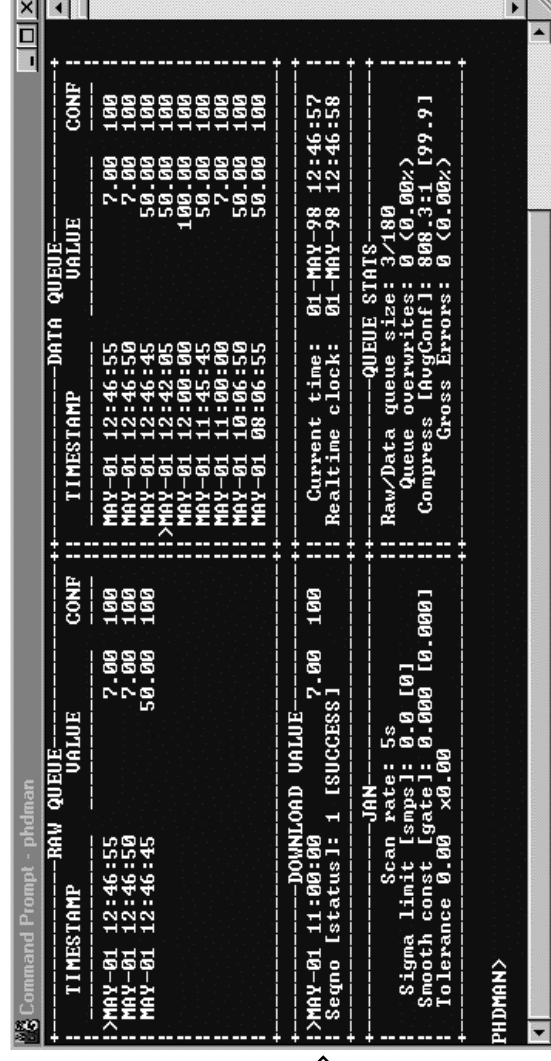
3. Using Rel2PHD, change the archived value at the timestamp you recorded above:

- _ Open MS Access
- _ Blank Database
- _ Create
- _ New
- _ Link Table
- _ File of Type: ODBC Databases
- _ Machine Data Source
- _ TOTALPLANT32 then OK
- _ Logon as TOTALPLANT/TOTALPLANT
- _ Select table TOTALPLANT.IP_RELTOPHD then OK
- _ OPEN
- _ Put Data in fields (refer to page 25 of this training module)
- _ Click on the record selector box at left of record.

4. View the data queue to verify the change:

Hands-On Exercise, continued

5. Configure your tag to perform Put Download to the DCS, then use Rel2PHD to change the value of a timestamp.
6. Use the tag's data queue to verify that the Put Download was successful.



7. Now use Rel2PHD to change an archived value of a PHD tag that is a character string (Ex: point description).

END OF EXERCISE

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