Core Highways Release Notes v4.3.0.0

The Global Leader in Infrastructure Asset Management Solutions

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1 Document Control

1.1 Author

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1.2 Document Summary

This document provides a description of the changes in this release and information about how these changes may impact on an Exor installation.

1.3 Document History

Document History			
Revision	Date	By	Description
1.0	22nd November 2010	Rob Coupe	First Draft
1.1			

1.4 Reference documents

The chapter on Document Manager was extracted from draft user guide written and prepared by Ade Edwards for the 4.2.1.0 release. Some structure and formats have been changed.

1.5 Distribution

Exor Customers, Partners and Staff

1.6 Quality Assurance

Document Details	
File	Prepared By
Core Release Notes v4.3.0.0.doc	Rob Coupe
Document Name	Reviewed By
Core Release Notes v4.3.0.0	
Version	Approved for issue by
3.0	
Date of Issue	Support Manager
25-Nov-2010	

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2 Introduction

This document highlights the key changes to the exor Core Highways database following the release of **Core Highways v4.3.0.0.** It is specifically targeted at users and system administrators of the exor systems. Changes in the core database functionality have the potential to have wide impact across all exor applications and it is important that these changes are understood. However, many of the functions of **exor Core Highways** are extremely technical in nature and this document is aimed at those with some degree of technical knowledge and not necessarily at end users.

It is not intended to be a full system description but a guide to indicate what changes have been made, why they have been made and the potential failings if this upgrade is not applied.

This release is available as an upgrade from release 4.2.1.0 and 4.2.0.0 **exor Core Highways**.

After reading through this document, should you have any need for training or consultancy then please contact your **exor/Bentley** account manager. If these changes are considered important for your current release and this is incompatible with this patch release then please contact **exor support**.

The releases of core have been steadily improved with bug fixes having been applied to several fix releases. Recent fixes have been made available to earlier platforms such as 4.0.5.4 in particular in relation to the merge query. Other fixes have been released for the 4.2.0.0 platform. It is important that customers are aware that improvements are being made and the 4.3.0.0 has been built to merge several fixes into a single system. This has meant a change to some of the server-based APIs, some of which may be referenced by code written by customers and our colleagues in services. It is important that the API changes are understood as it is impossible for the development program to assess dependencies out on site. There has been a considerable amount done in order to keep the API code compatible from one release to another but at this release some serious differences are present and may result in some external code failing to compile.

The period since the last major release has been one of further consolidation with improved reliability but some significant improvements have been made in locator, document management and loading as well as in process automation. Individual sections have been written as part of Chapter 3 to describe each of these functional areas. The long list of tasks and ECDM logs has also been included; many of these fixes may have been supplied as fixes to earlier releases.

As promised in the previous release notes (v4.2.0.0), the list of changes has been extracted from the internal task and log monitoring system. The issues that have been attended to are a result of internal testing, customer raised issues and internally driven enhancements and improvements. Where the change has been made as a result of an existing ECDM log raised by a customer, the table of fixes makes reference to the ECDM log. The proportion of the number of fixes made in response to customer issues may have been reduced and it is suggested that this is a sign of improving quality.

However, there are some known issues that we have failed to address at this release but those considered important are listed in Chapter 4.

The 4.3.0.0 release is to be shipped with a new version of the MapViewer tool. This version has some important performance improvements in relation to speed of execution and the number of features to be selected and highlighted. Although recent releases of Spatial Manager will remain compatible with the release 4.3.0.0, it too has many fixes and improvements. It is important that the version on the release is used as important fixes have been made.

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3 Fixes, Enhancements and Changes at 4.3.0.0

The following are a list of internal task identifiers with associated ecdm fault logs (where appropriate) that have led to changes in the 4.3.0.0 release.

Several major enhancements were included in the 4.2.1.0 release and these are detailed below.

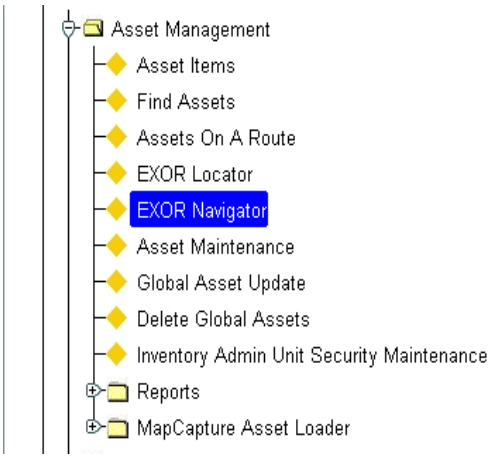
3.1 Task 0108984 – Query Builder and Navigator

This is a new tool, commonly known as Navigator, for building queries and browsing the results in a tabular or hierarchical format.

The Query Builder functionality allows generic queries to be constructed, saved and reused in a quick and simple manner. These queries are based on pre-defined metamodels within Asset Manager.

When a record is selected in the list of results, relevant information is displayed in a tree hierarchy in the right hand window. The user is able to select a row in the tree and navigate directly to an appropriate form to view or edit the details.

The 4.3 release caters specifically for hierarchies based on Enquiries, Defects and Work Orders.



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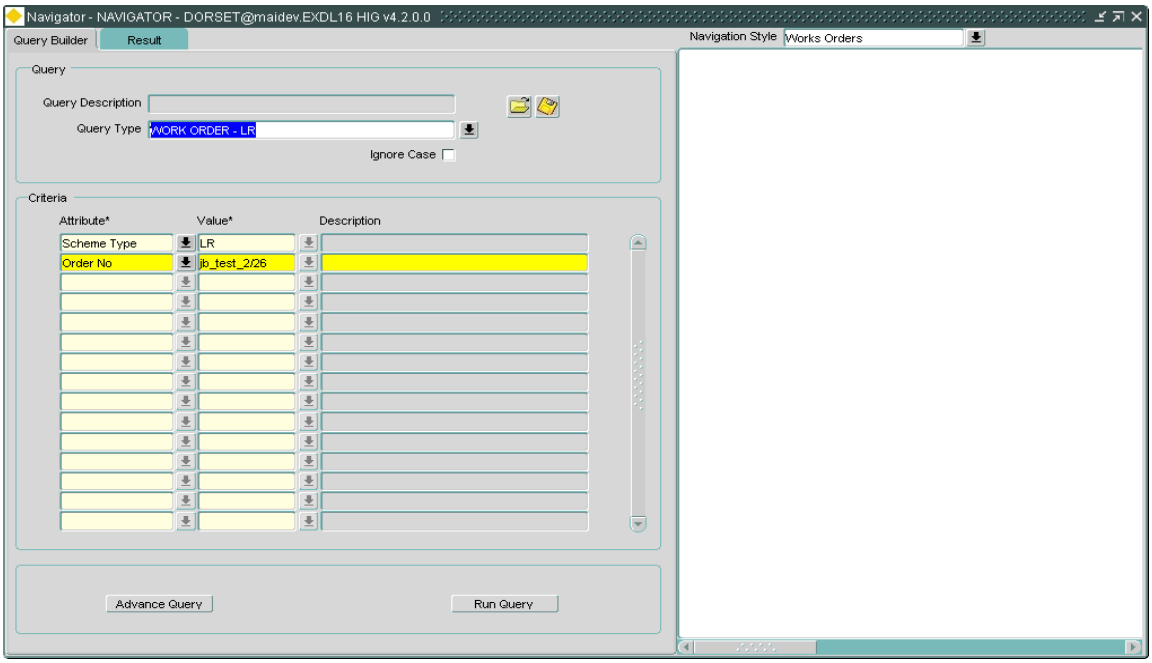

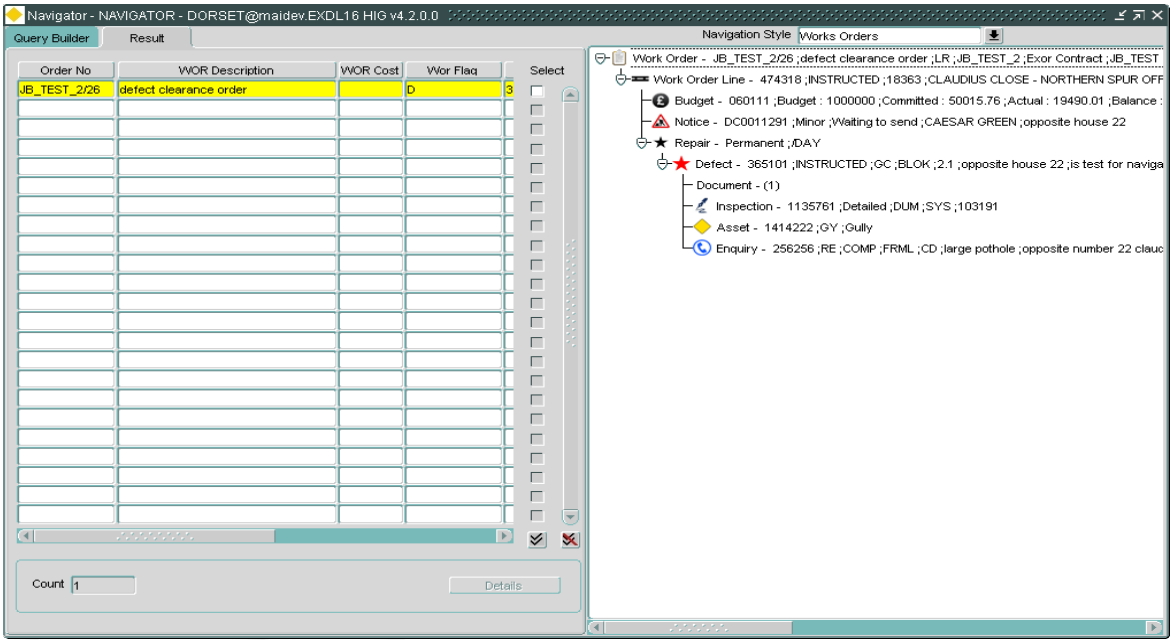

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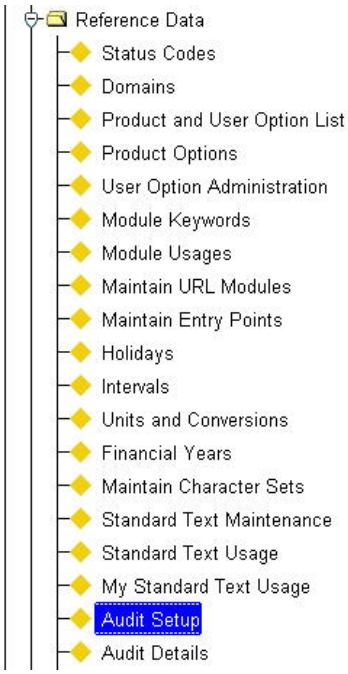
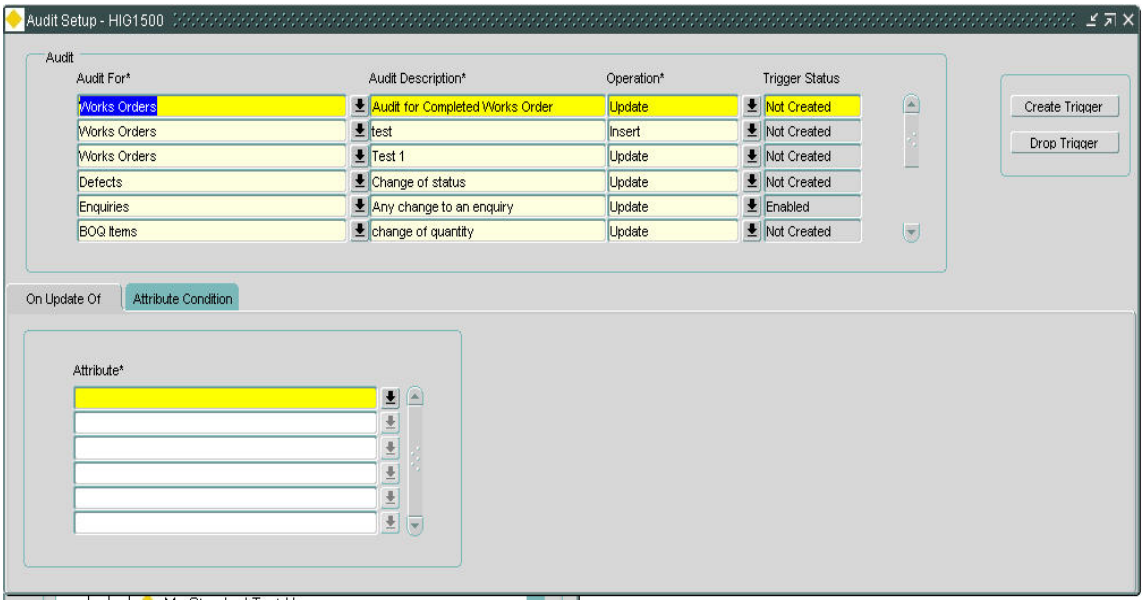
3.2 Task 0108985 - Audit Manager

A systems administrator will be able to configure business rules that define precisely what data will be audited and the conditions under which an audit takes place. Database triggers will be created from the rules to perform the audit.

It will be possible to generate audit records upon changes to any or all attributes on a particular record, as well as insert and delete operations. The records will be stored on a new audit table and will contain old and new values as well as the date/time changed and username. There is a new Audit Details form for querying and viewing these audit records.





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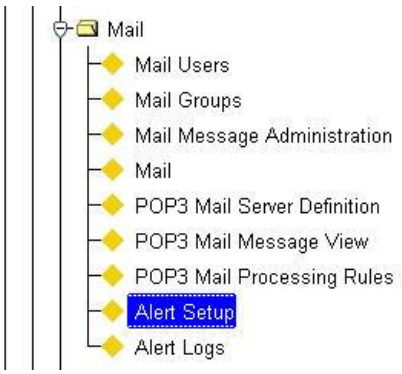
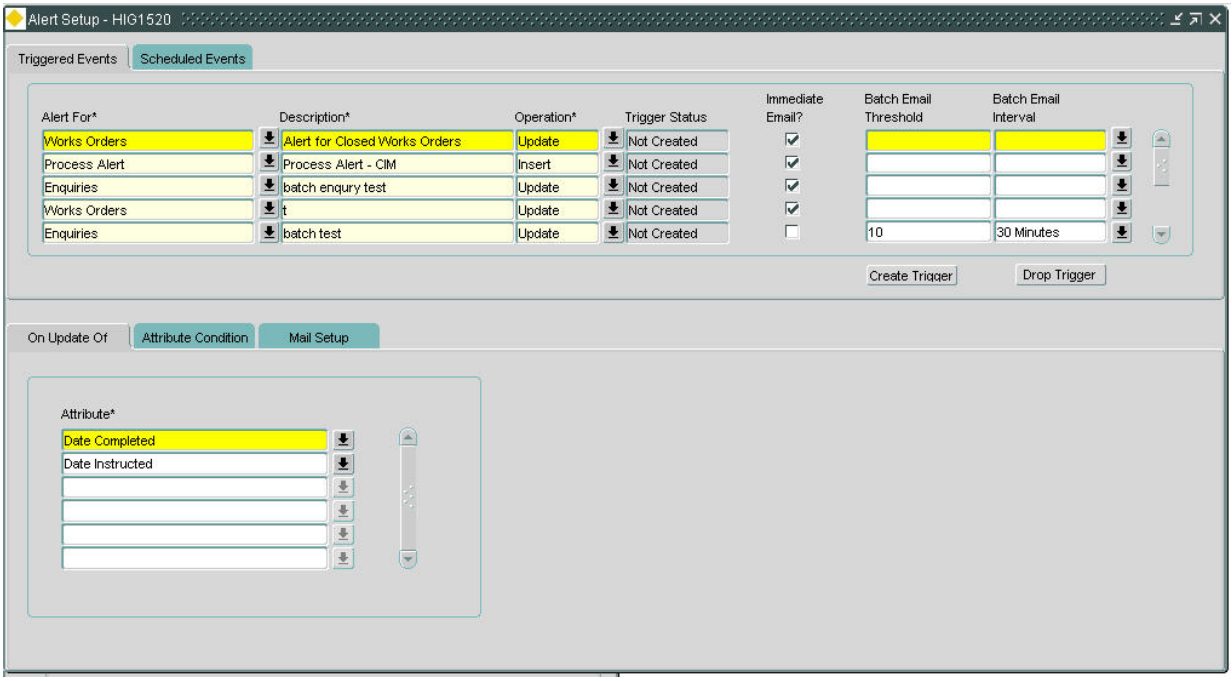
3.3 Task 0108986 - Alert Manager

The purpose of Alert Manager is to manage the automatic generation of email notifications (ie Alerts). A System Administrator will be able to configure business rules that define the precise content of emails and the conditions under which an email is to be sent. These rules may be implemented using database triggers or saved queries, depending on the nature of the alert.





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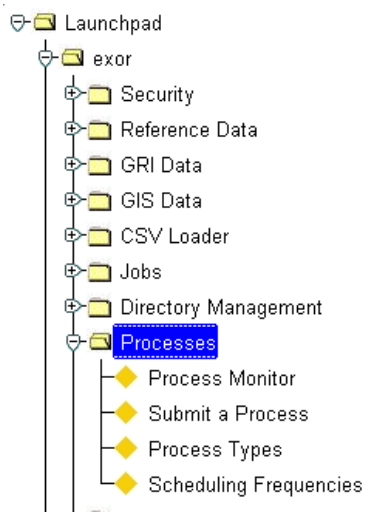
3.4 Task 0108982 – Process Automation Framework

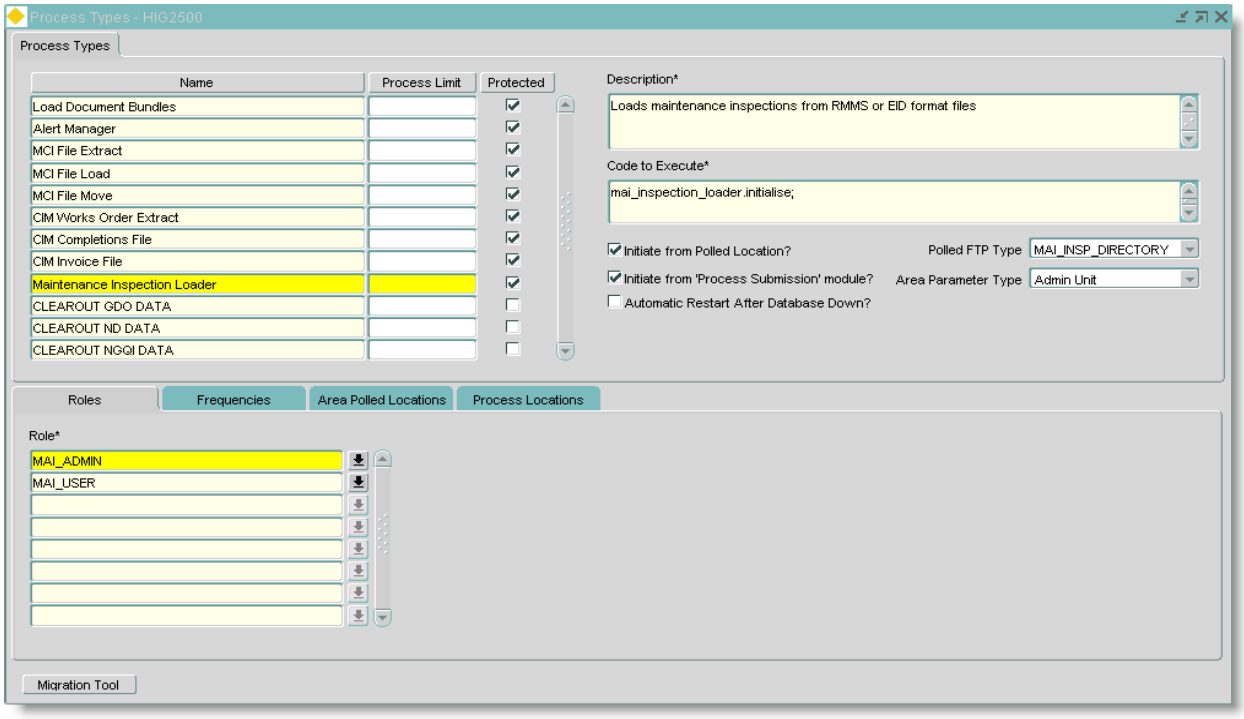
A common approach has been adopted for the execution, tracking and automation of new application processes. Typical examples include:

- Loading inspection data
- Loading documents and photographs
- Generating work orders



Process Type Definition

Each type of operation that needs to be executed via the framework must first be defined as a "Process Type", to identify the expected behaviour of processes. Processes may be initiated manually from a Process Submission screen or automatically from a polled FTP location.



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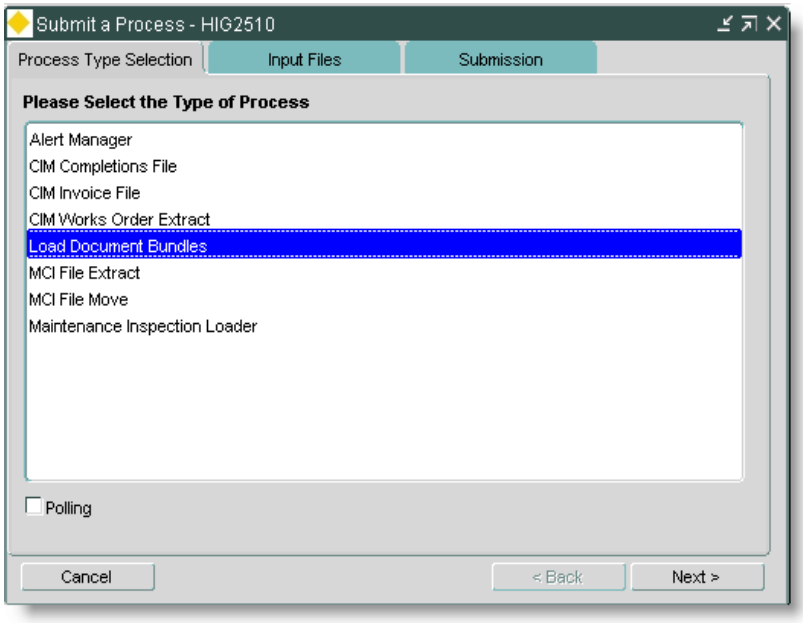
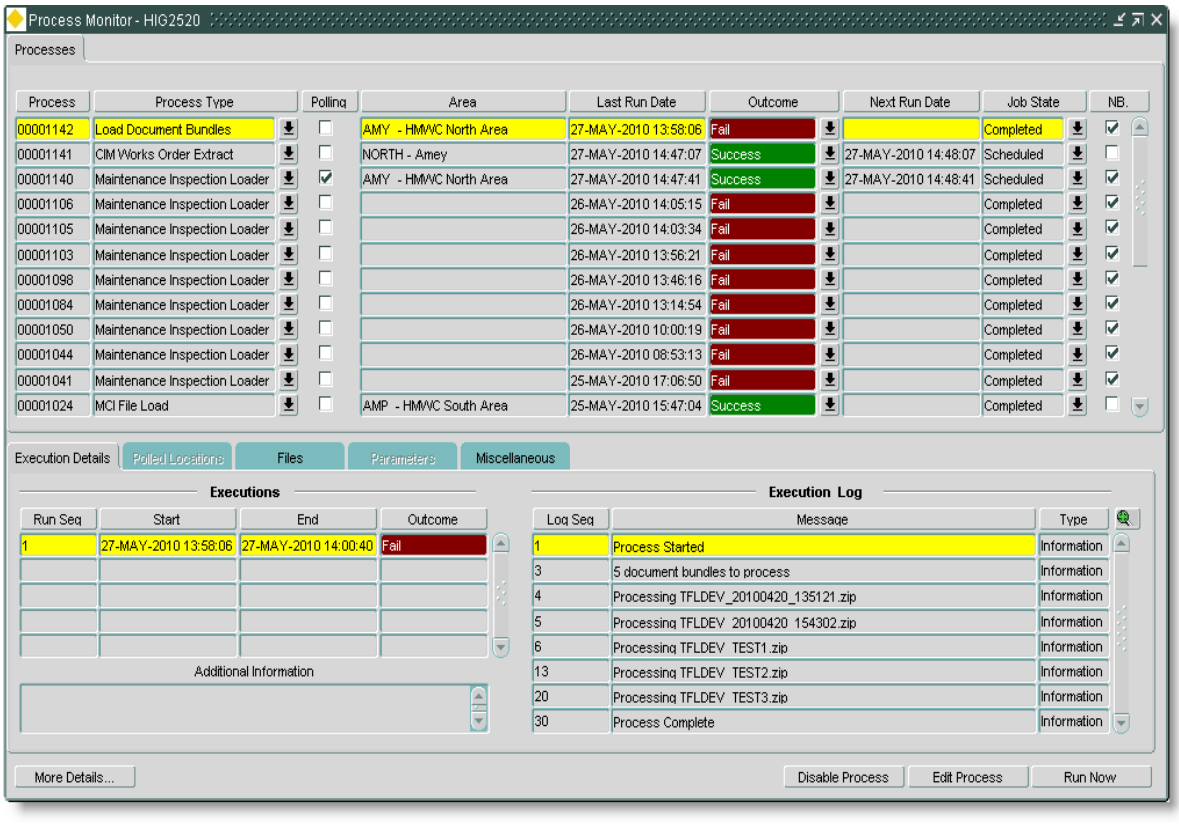
Submitting a Process

The Process Submission screen allows users to submit a process with specific input files and parameters.



Process Monitor

The Process Monitor screen allows users to view details of processes that have been submitted.



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3.5 Document Manager

The main changes in v4.3.0.0 Document Manager are Document Locations, and the file transfer between the Client application and the document locations.

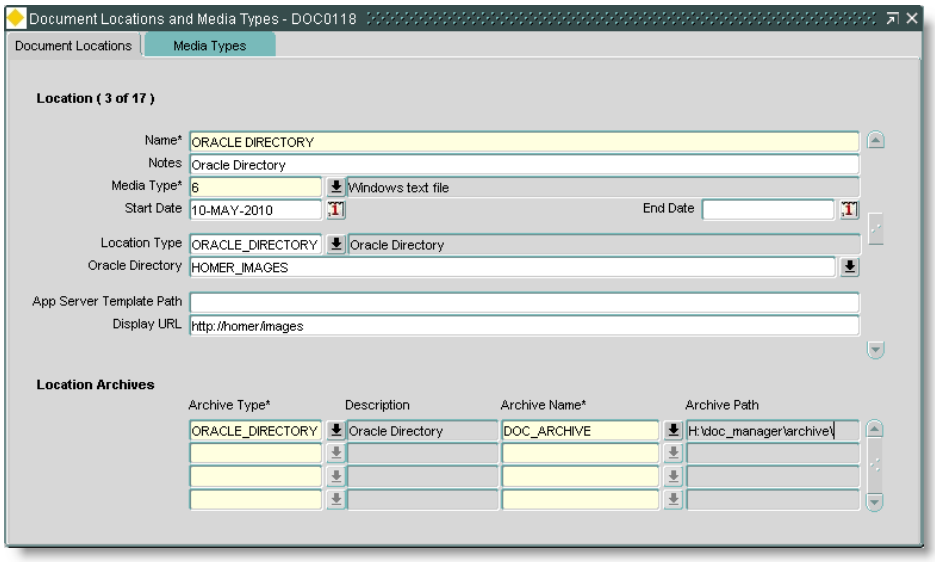
We now support 4 different types of Document Location :-

- Database Server Path
- Oracle Directory
- Application Server
- Oracle Database Table

The following information describes the configuration of these different Document Locations, how they can be used, along with Document Archiving.

Document Locations and Media Types

The “Document / Media Types” form DOC0118 has been changed, and renamed to **“Document Locations and Media Types”**.



The following gives descriptions of the fields-

Name: Name of the Document Location, this must be Unique.

Notes: A description of the Document Location, i.e. “Insurance Documents”

Media Type: The type of document stored in this location.

Start Date: Start date for the Document Location.

Location Type: This can one of the four Document Location Types as mentioned above.

Oracle Directory: Depending on the Document Location Type this label will change to reflect the area which the Documents are to be stored, i.e. “Oracle Directory”, “Table Name” etc.

App Server Template Path: If a Document Template File is used (*.DOT) then this path must be set to say where the DOT file is stored. This **HAS** to be on the **Application Server** as this is how Templates are currently generated using OLE in the Oracle Forms.

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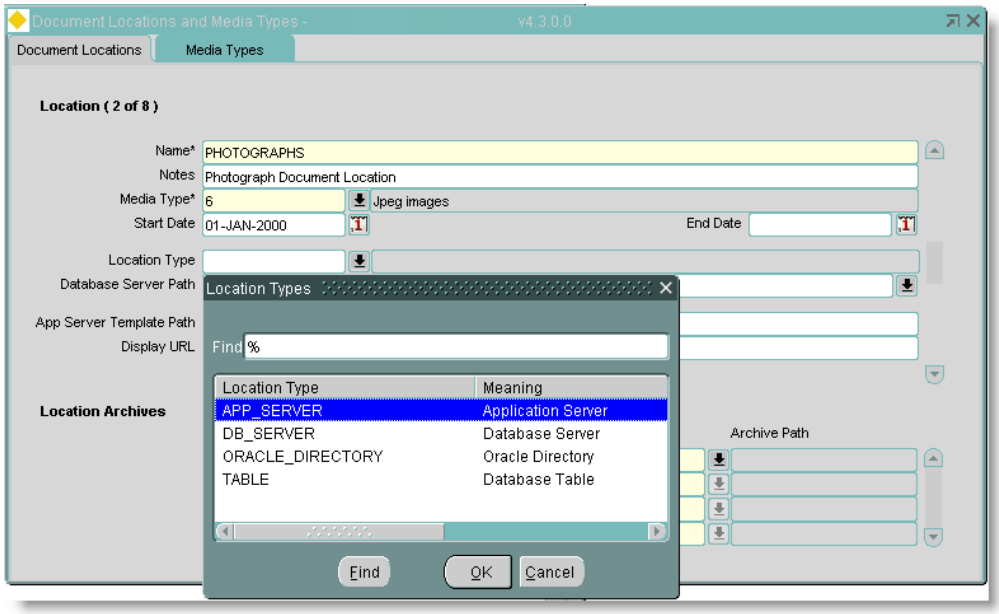
Display URL: If the Document Location is available via a URL, then this is where it is set. N.B. Please note, of the Document Location is based on an Oracle Directory, this URL will default to the URL set against the Hig Directories record (if set). See later section on “Oracle Directories” for more information. If a Database Table type is chosen, you can access the contents via a database DAD URL rather than using a standard Apache Web Alias with the other types. More info on configuration can be found in the user documentation.

Location Archives: This is where you can define one or many Oracle Directory location archives. This means a copy of the Document will be placed in the Location Archive. This is restricted to Oracle Directories only.

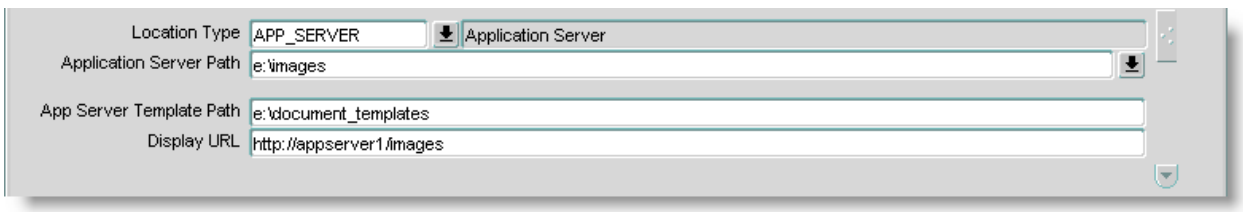
When defining a new Document Location, you are presented with the choice of four Location Types –



Once selected the fields on the form will change to make the definition process easier.

Fields on the form change accordingly when choosing **Location Type –**

“Application Server”



Application Server locations are locations which are based on the Forms Server. A MS Word Document template can be used to generate these documents (where appropriate) and this path must exist on the Application Server. The document location can be made available via a URL (web alias).

“**Database Server**”

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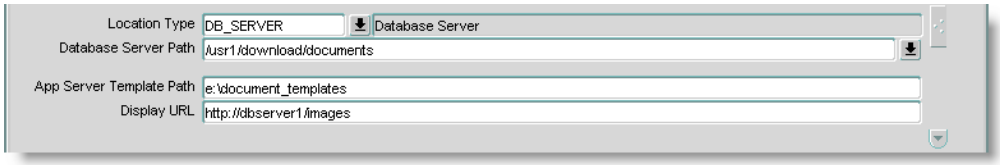
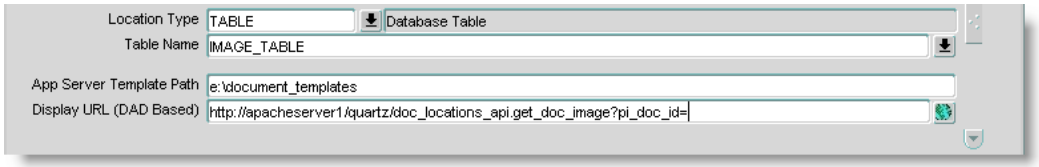


Database Server locations are locations which are based on the Database Server. A MS Word Document template can be used to generate these documents (where appropriate) and this path must exist on the Application Server. The document location can be made available via a URL (web alias).

"Oracle Directory"

Oracle Directory locations are locations which are based on an Oracle Directory. The Oracle Directory must exist as a Hig Directory. Oracle Directories can be configured to point to a file location on the Database Server, or to any Server on the network which the Database Server has full read/write/delete access to. A MS Word Document template can be used to generate these documents (where appropriate) and this path must exist on the Application Server. The document location can be made available via a URL (web alias). If the Hig Directory has the URL attribute set, the Display URL field should default to this.

"Database Table"

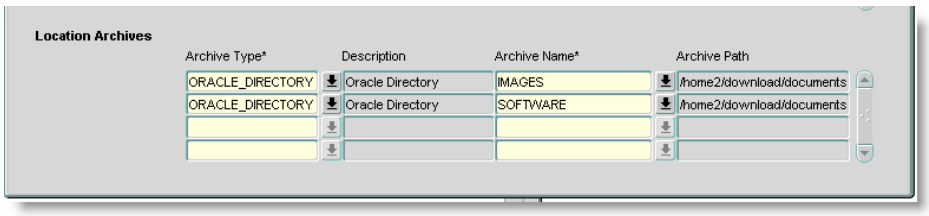


Database Table locations are locations which are based on an Oracle Table within the Highways schema. The tables must conform to a certain table column specification which is defined in the user documentation. An existing table can be chosen, or a new table can be created from this Form. A MS Word Document template can be used to generate these documents (where appropriate) and this path must exist on the Application Server. The document location can be made available via a URL, however this must be defined using a DAD. Pressing the LOV button will automatically lookup the URL from the NM3WEBHOST system options.

Location Archives

Archive destination cans be configured. When loading a document into the system using the application, you can define one or more Archive locations where a copy of the document is stored. However, there is no synchronisation between the archives and Document location.

The Location Archives are restricted to Oracle Directories, which can be configured to point to any server on the network that the Database Server has access to.



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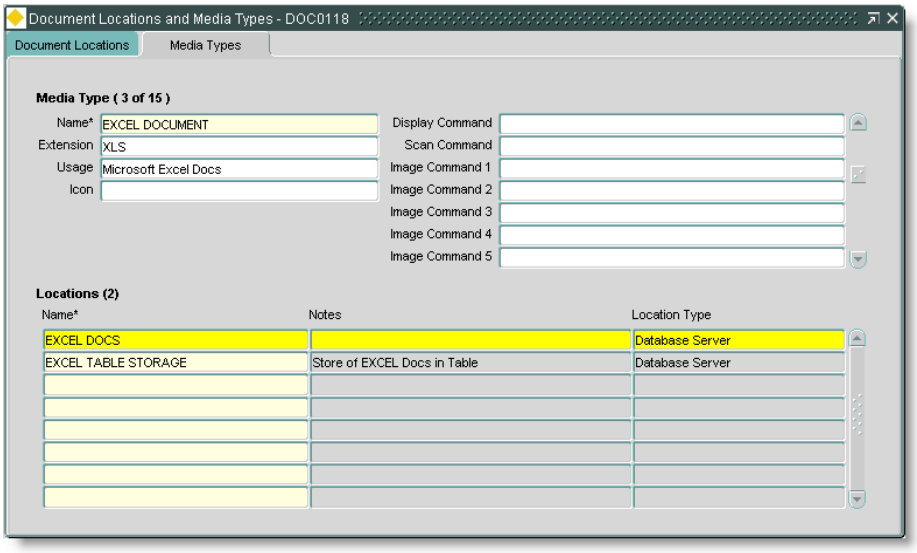
If, for whatever reason, a Location Archive becomes unavailable, the document loading process will carry on without failure.

Media Types

The Media Types are now available on the second tab:



The Media Types part of the module has had no changes apart from layout.

There is an info read-only block at the bottom showing which Document Locations use the Media Type.

The **Extension** field is used in the File Picker (shown later) which helps filter the files you are choosing to load from the client.

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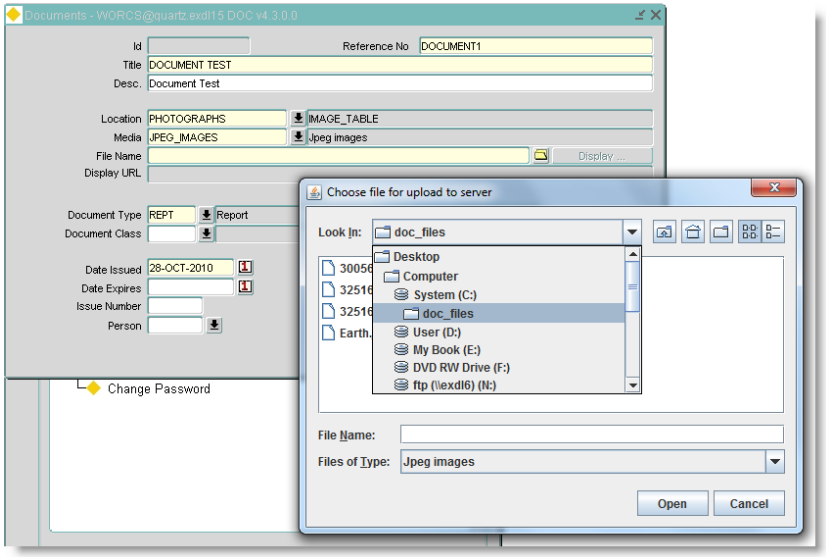
DOC0100 – Documents module

The Documents module layout has been changed to the standard look and feel. It has also been integrated with WebUtil, which provides a more robust and reliable form of File Transfer between the Client PC and the Document Location.

When choosing a file to associate with a new document record, you are presented with a File Selection box. This defaults to a directory on the Client Machine determined by the user option WORKFOLDER.



The files shown are restricted on the Media Type Extension – i.e. in this case Jpeg Image (JPG).

When the document is saved, the selected files is uploaded to the Document Location, and optionally Archived.

DOC0120 – Document Associations

The Document Associations module has been changed to use the standard look and feel. There are some changes to existing functionality, as well as new features available.

Create New

The user has to choose the required Document Location and Media Type. The file picker is filtered using the Extension data from the Media Type. The file will be uploaded with a progress bar.

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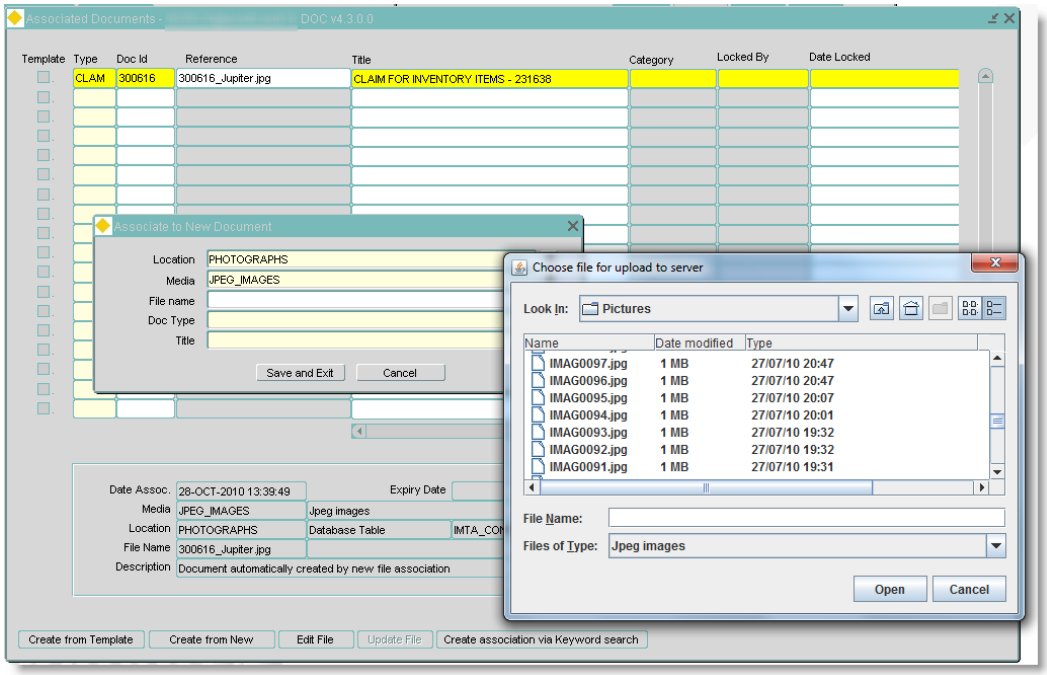


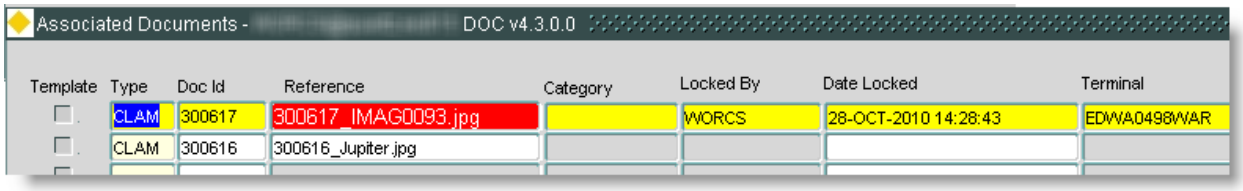
Create from Template

The Create from Template functionality has not changed. The file will be generated on the Application Server and transferred to the Document Location.

Edit File

Edit File is a new piece of functionality which allows users to “lock” a file for editing. This is only appropriate when using a Database Table Document Location.

To lock a file, you hit the “Edit File” button and this will download a copy onto your PC. The document is then “soft locked” and prevents other edits from the application. However, users are still allowed to Display the file.



The file can then be edited and uploaded back – or the lock released.

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When “Unlock File” is pressed it will release the lock on the document. When “Update File” is pressed it will upload the file from your Work folder back into the Oracle Table.

Create association via Keyword search

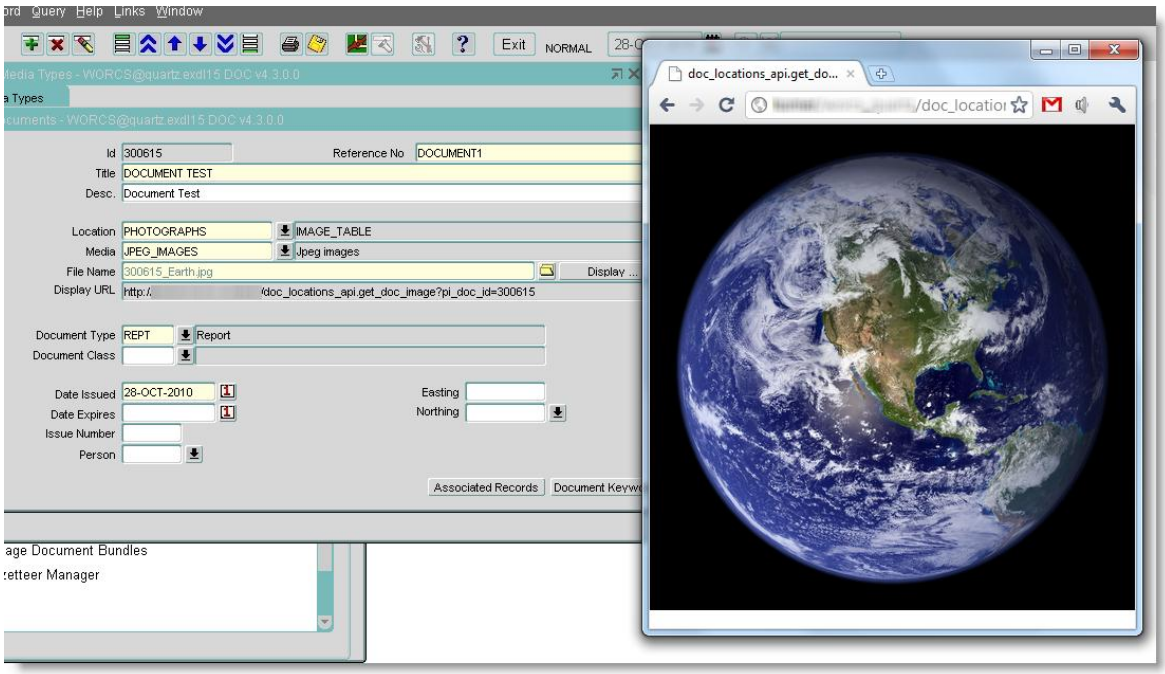
This area of functionality has remained unchanged in 4.3.0.0.

Displaying Documents

When a document is displayed, there are two methods of doing so. These methods are constant across both **DOC0100 – Documents** and **DOC0120 – Document Associations** modules.

Via URL

When a Document Location has a URL defined, the document will be opened via a URL in the internet browser. Depending on how your browser is configured to accept new links, it will open in a new window or a new tab. This will require navigating to.



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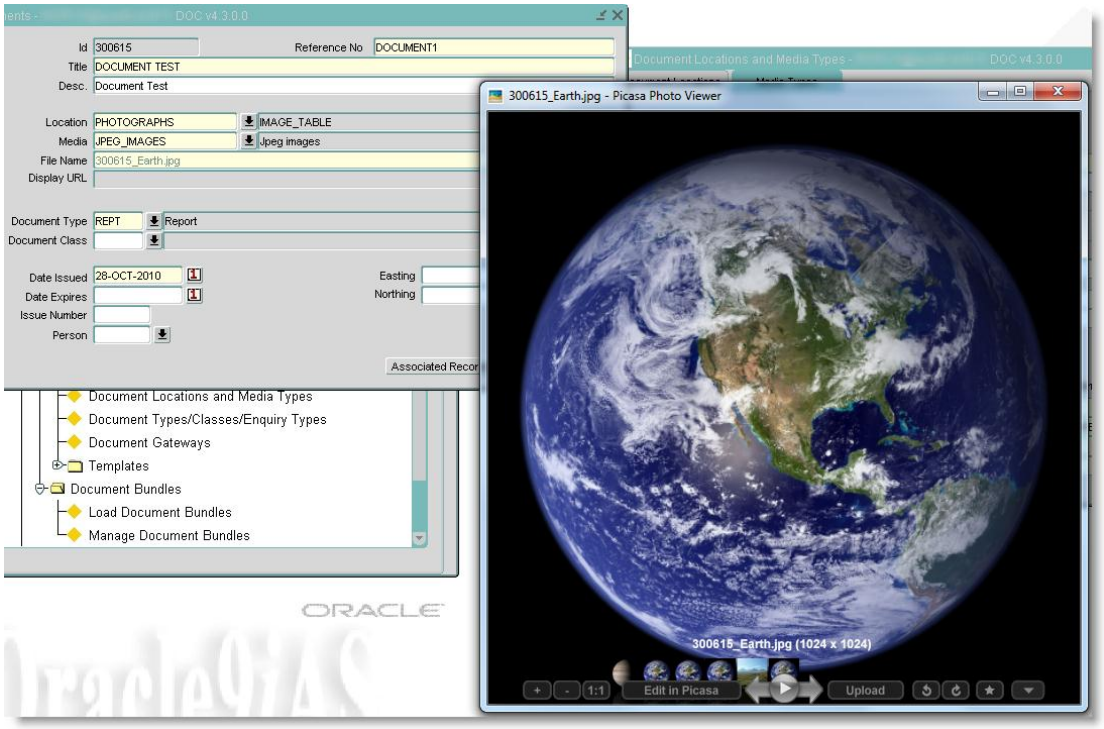
Via Client Viewer

When displaying a document from a Document Location without a URL set, the application will download a copy of the file to your work folder, and display it on the client PC in it's native application. So if your PC is configured to open JPGs in (for example) Picasa Photo Viewer, it will use that application.

This is configurable from your Windows Control Panel.



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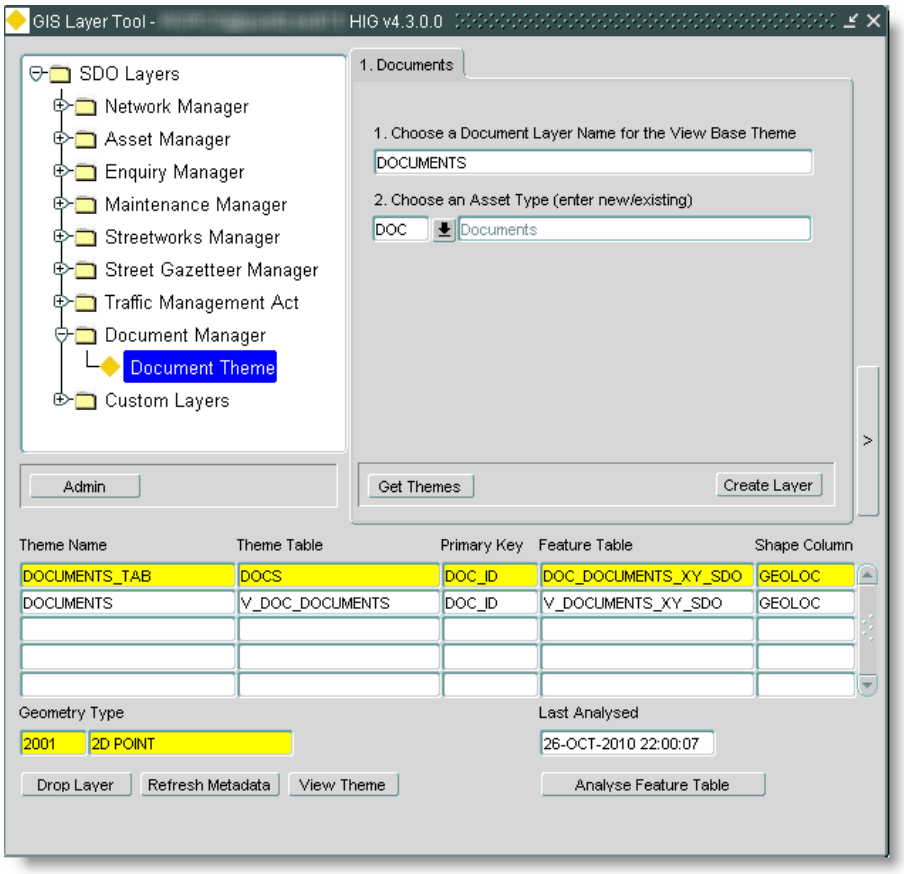
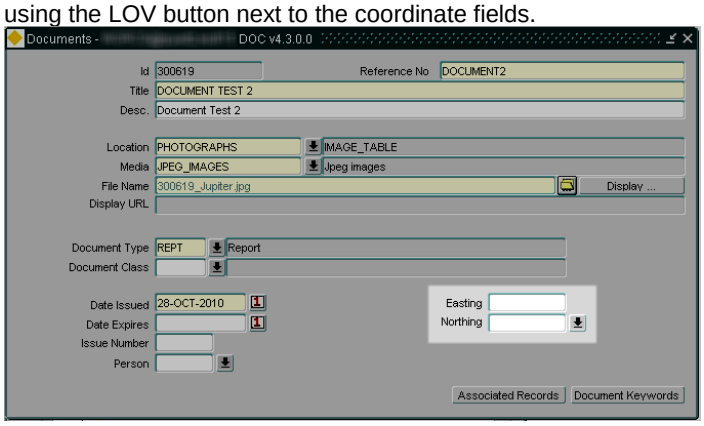
Spatial Enablement of Documents.

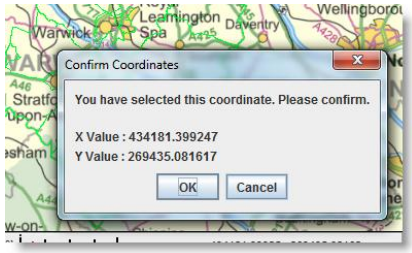
For a document record in DOC0100 – Documents module, you can assign a set of coordinates and create a spatial representation to display in the map.

You need to register a Document Layer to start with – use GIS0020 to achieve this, along with configuring Mapviewer/Exor locator to display it.



To assign a shape to a document, DOC0100 can be used to call Locator as an LOV to return the coordinates using the LOV button next to the coordinate fields.





Pressing the LOV will launch Locator and you use “Send XY to Application” to return a pair of coordinates. Alternatively you can manually enter them if known.

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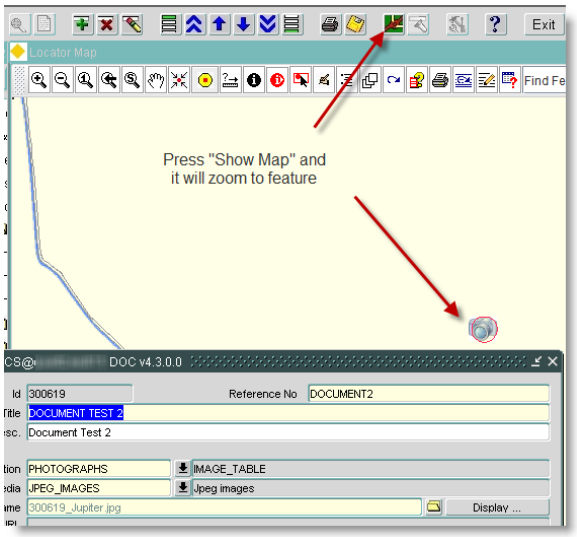
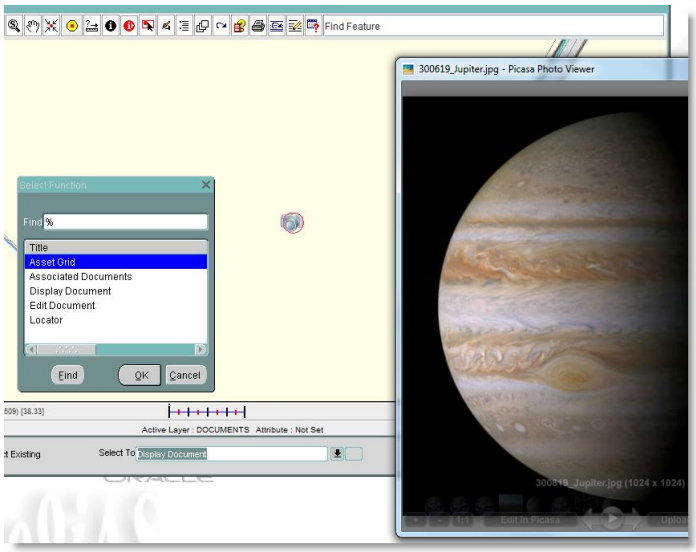


The standard “Show Map” toolbar button will zoom you to the feature.

Selecting “Edit Document” will call DOC0100 so that you can edit the document attributes.

The ability to Display and Edit the document are supplied as standard Theme Functions from the Document Theme and will display the document using the methods described earlier.



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Summary of functionality
This is a summary of the functionality now available in Document Manager 4.3.0.0.

Document Location Type	Works with URL?	Works with Archiving?	Works with Templates?	Allow Locking for Edits?
Database Directory	Yes	Yes	Yes	No **
Database Path	Yes	Yes	Yes	No **
Database Table	Yes	Yes	Yes	Yes
Application Server	Yes	No *	Yes	No **

All documents are able to have a spatial representation and are available from Locator to Display the document regardless of Document Location.

*The Archiving only works with PL/SQL, so the Application Server setting is restrictive. It is advised you model the Application Server area as an Oracle Directory.

**Locking for Edits only works for Oracle Table type Document Locations.

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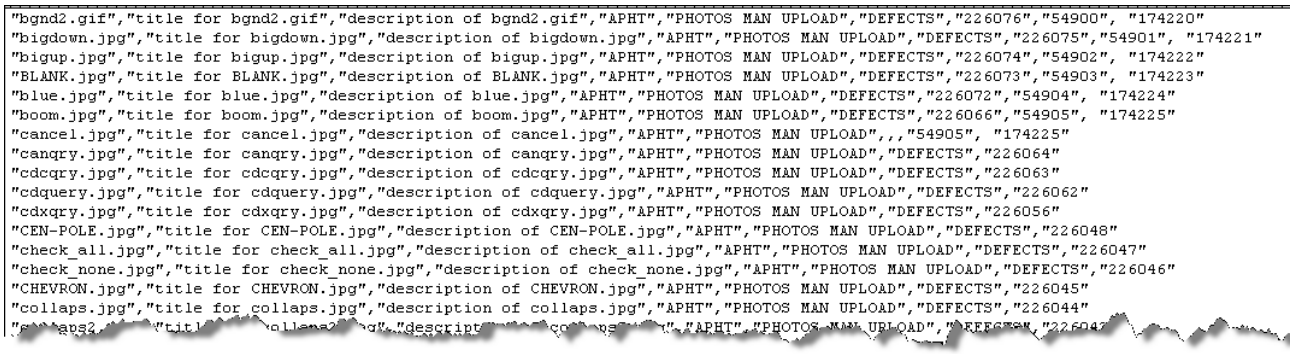
3.6 Task 0109184 - Document Bundle Loader

The 'Document Bundle Loader' has been introduced to facilitate the bulk loading of documents and association of these documents to database records. For example, loading of Maintenance Inspection photos and attributing the photos to the relevant inspection.

Document Bundles

A 'Document Bundle' is a zip file containing the following;

- Source files of the documents (eg .doc, .jpg, .pdf) that we need to reference from within Document Manager
- A 'Driving File' which lists all of the documents in a) and which gives sufficient information for each file in order to reference it in Document Manager. A sample file is shown below:



```
"bgnd2.gif","title for bgnd2.gif","description of bgnd2.gif","APHT","PHOTOS MAN UPLOAD","DEFECTS","226076","54900", "174220"
"bigdown.jpg","title for bigdown.jpg","description of bigdown.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226075","54901", "174221"
"bigup.jpg","title for bigup.jpg","description of bigup.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226074","54902", "174222"
"BLANK.jpg","title for BLANK.jpg","description of BLANK.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226073","54903", "174223"
"blue.jpg","title for blue.jpg","description of blue.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226072","54904", "174224"
"boom.jpg","title for boom.jpg","description of boom.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226066","54905", "174225"
"cancel.jpg","title for cancel.jpg","description of cancel.jpg","APHT","PHOTOS MAN UPLOAD",,,"54905", "174225"
"canqry.jpg","title for canqry.jpg","description of canqry.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226064"
"cdcqry.jpg","title for cdcqry.jpg","description of cdcqry.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226063"
"cdquery.jpg","title for cdquery.jpg","description of cdquery.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226062"
"cdxqry.jpg","title for cdxqry.jpg","description of cdxqry.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226056"
"CEN-POLE.jpg","title for CEN-POLE.jpg","description of CEN-POLE.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226048"
"check_all.jpg","title for check_all.jpg","description of check_all.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226047"
"check_none.jpg","title for check_none.jpg","description of check_none.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226046"
"CHEVRON.jpg","title for CHEVRON.jpg","description of CHEVRON.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226045"
"collaps.jpg","title for collaps.jpg","description of collaps.jpg","APHT","PHOTOS MAN UPLOAD","DEFECTS","226044"
```

Zip files are used primarily to combat clashes of filenames, but also to minimize the amount of data being transferred by loads initiated by an FTP process.

The Load Process

A standard 'Load Document Bundles' process type is shipped with Document manager. This process type will support manual submission and polling from an FTP location. When executed, the process will perform the following actions :

- Unzip each document bundle zip files into its own sub-directory on the database server
- The driving file is read and relevant documents and association records are created
- Finally, files are moved from the unzip location to the location that Document Manager expects to find them

The process framework functionality allows simple monitoring of the load processes and viewing of a log, as shown below:

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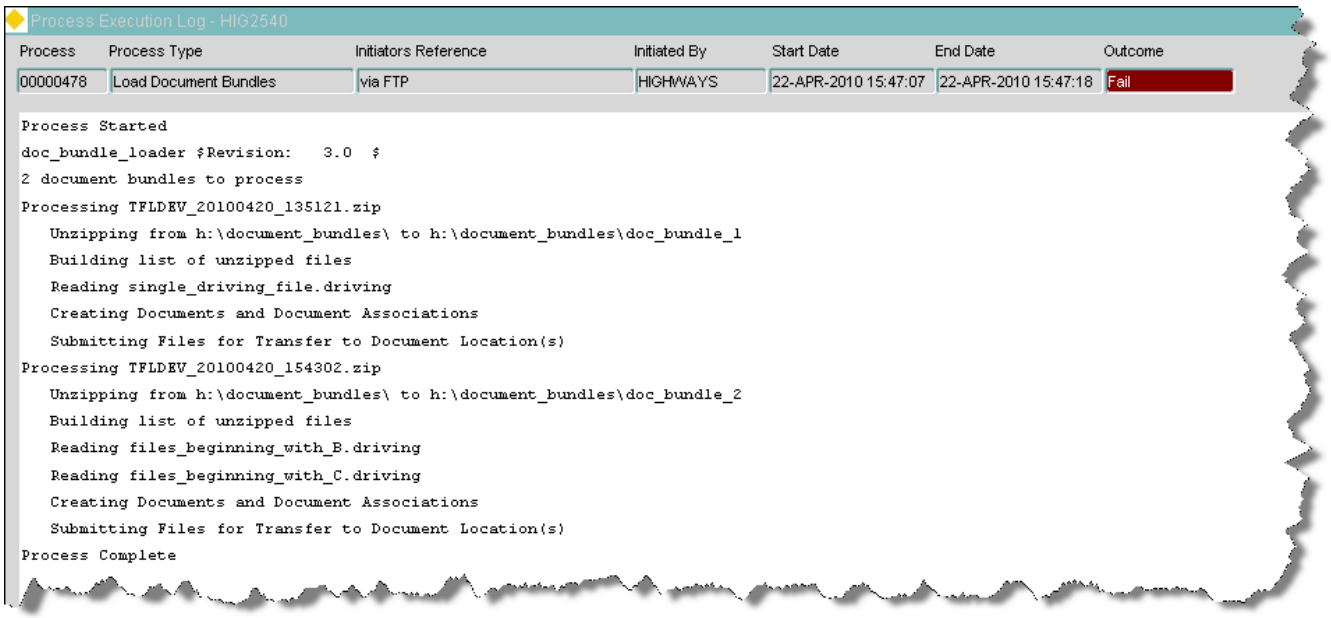
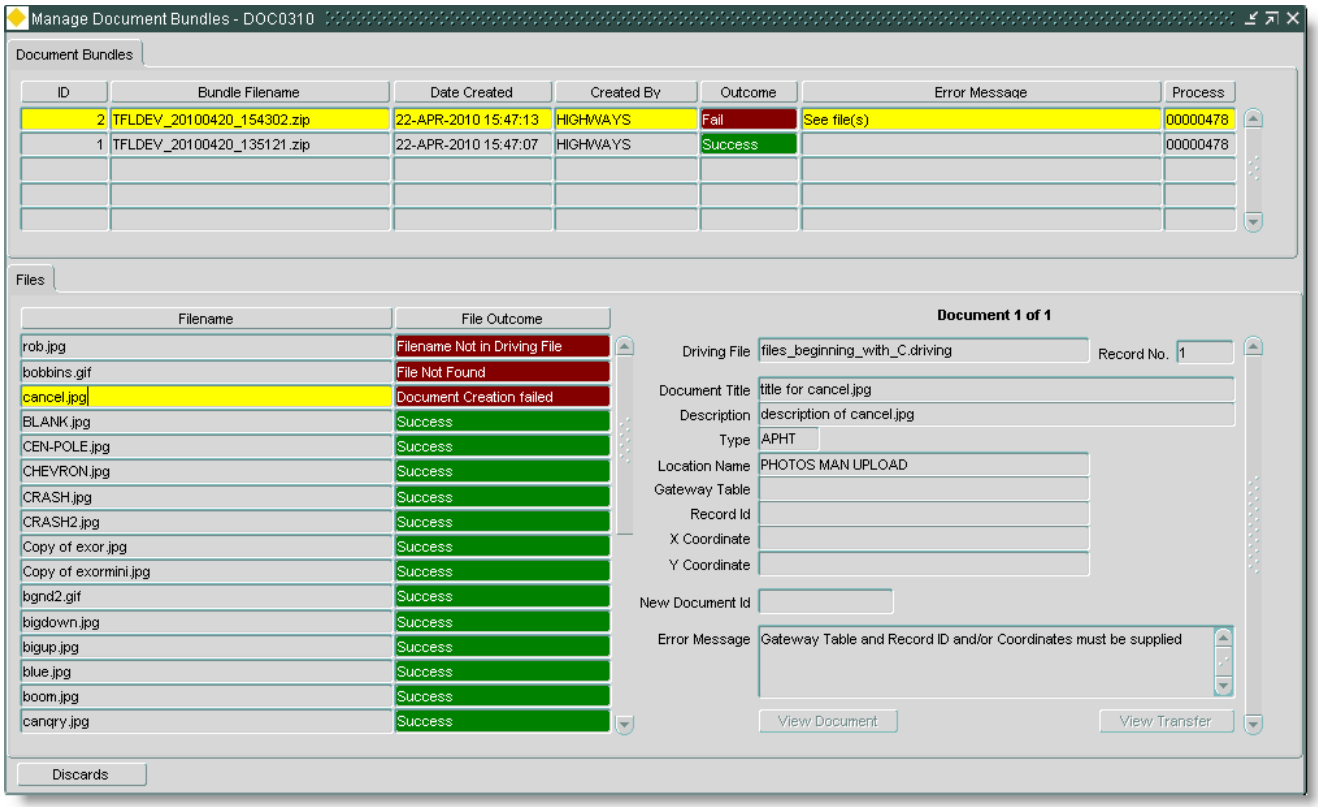


Management of Document Bundles

This form provides a more detailed overview of what has occurred during the loading of a document bundle. It can be invoked from the Launchpad or by pressing the More Details... button in the Process Monitor.



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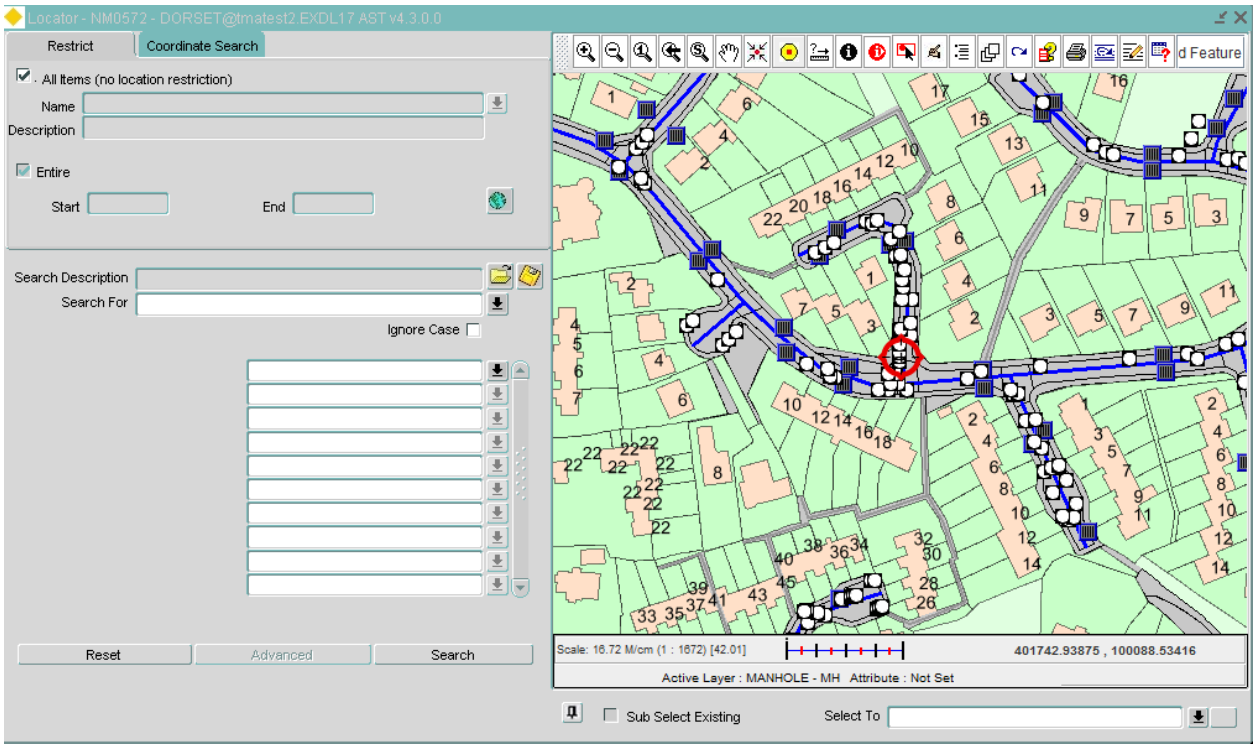
3.7 Task 0109676 Locator ID Tool

The ID tool is located on the MapViewer window of Locator on the toolbar as shown below.

The original Information tool placed to the left on the toolbar, will supply information relating to a feature in the active layer which is nearest the point at which the user clicks in the map area.

By contrast, the new ID tool is not restricted to the nearest layer. It will provide details of all features within a buffer of the point at which the user has clicked in the map. The buffer is defined in the product option buffer WEBMAPIDBF which is a spatial buffer defined in metres in cases where spatial data has a defined SRID and in map units where no SRID exists. The user will see a pop-up screen of information at the point, the point and buffer are highlighted as shown below.



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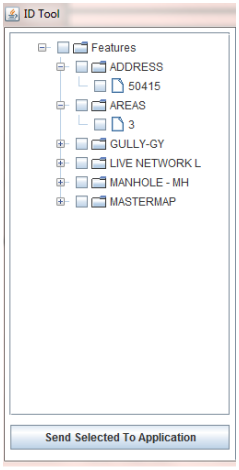
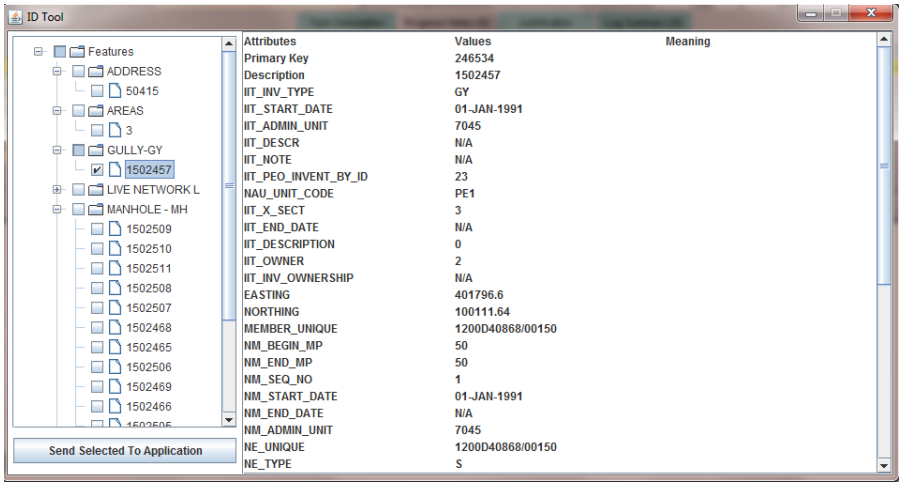


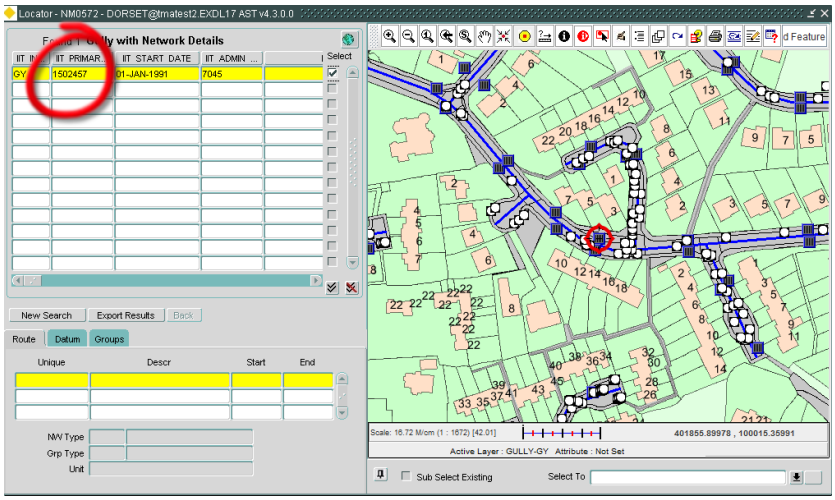
The ID tool data that is returned is an array of features and types ordered by distance from the point at which the user clicked within the map area.

The screen is composed of two areas. The left hand area is a hierarchical set of data of the feature types and identifiers as shown, Each feature type may be expanded to show the items of that type returned in the query. In this case, the right hand panel of the pop-up screen will be empty until such time that the user picks an individual feature.

When an individual feature is selected the right hand side will show the details as shown below.



Individual features may be selected and used as the basis to perform a query inside the locator module itself. By selecting the Gully as shown above and opting to use the “Send Selected to Application” button, the item is re-queried in the asset attribute grid on the left hand side of Locator as shown:



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3.8 Edit Latest Asset

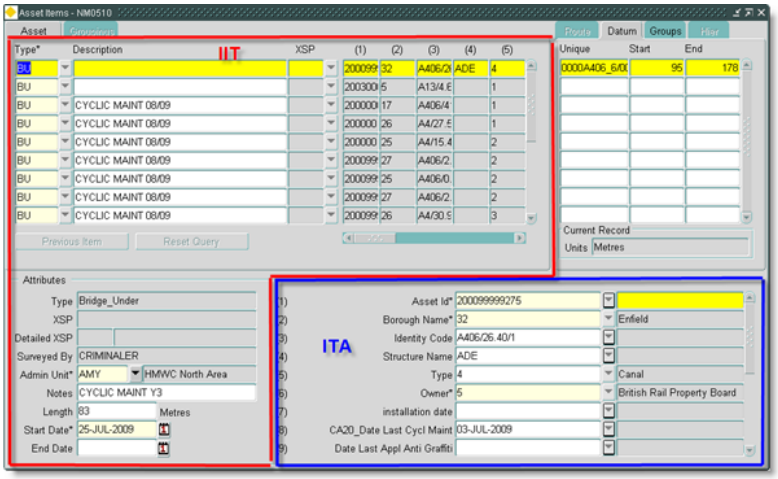
The system has been extended to allow a user to update the last occurrence of an asset even if the asset has been end-dated. This enhancement has been added to allow a user the ability to close the asset but revisit the data and make changes to provide reasons for the closure. Changes have been made to the asset modules

- NM0510 - Asset Items
- NM0590 - Asset Maintenance
- NM0560 - Assets on a route
- NM0570 -Find Assets

Whereas previous releases prevented update with an error such as that shown below, at release 4.3.0.0 the user is allowed to perform specific types of update, for example the location of an asset is prevented when the asset is closed.

Functionality can be turned on and off using the product option EDITENDDAT which has a default value of “N” so users must activate it if they wish to make use of the facility otherwise the system will behave as in previous releases.

An example module is shown below which highlights the attributes that may be updatable. Data can be modified in both the Main asset item block and Asset attribute block. It is these areas that have been modified.



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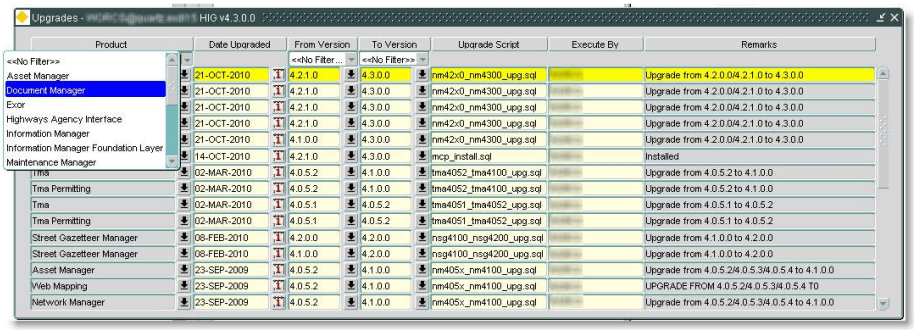
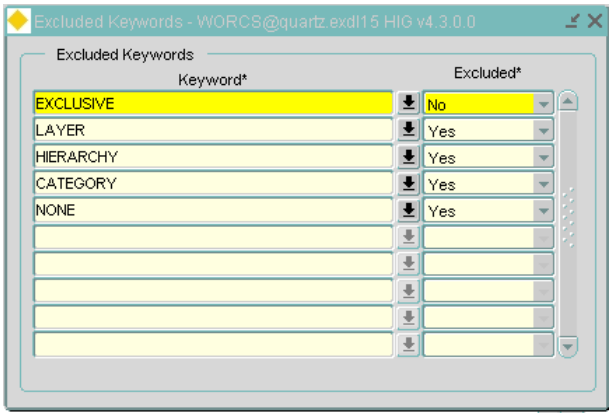
3.9 Other fixes and repairs in 4.3.0.0.

Please note that this list includes several repairs that have also been supplied as part of the 4.2.1.0 release.

Internal Task ID	Issue	Support Log(s)
0101930	Locator module - (NM0572) - Resolve navigation issue with Location Tabs.	
0107770	New module (HIG1870 - Upgrades) to show information regarding product upgrades and fixes. 	
0108246	New module - Excluded Keywords (HIG9140) added to allow users to maintain Oracle keyword exclusions. Use when validating Asset attribute view name columns. Please exercise some caution in the use of these exceptions, the module is included since there is a realisation that keywords may be reserved by Oracle for future use and some may prevent the use fo specific attributes in foreign tables or in asset views. 	
0108359	Documents module DOC0100 - Coordinate fields added to allow input of easting and northing position for a document. LOV button next to coordinate fields can be use to "get from map". Documents with a shape can now use the "Show Map" button to zoom to the geometry in Locator. Document module can also use the "Send To" functionality from Locator to Display an associated document from selected document geometry, and call Documents module to Edit the document record.	

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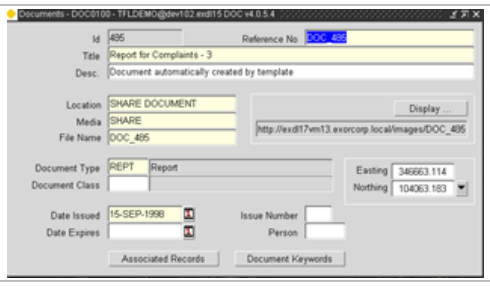
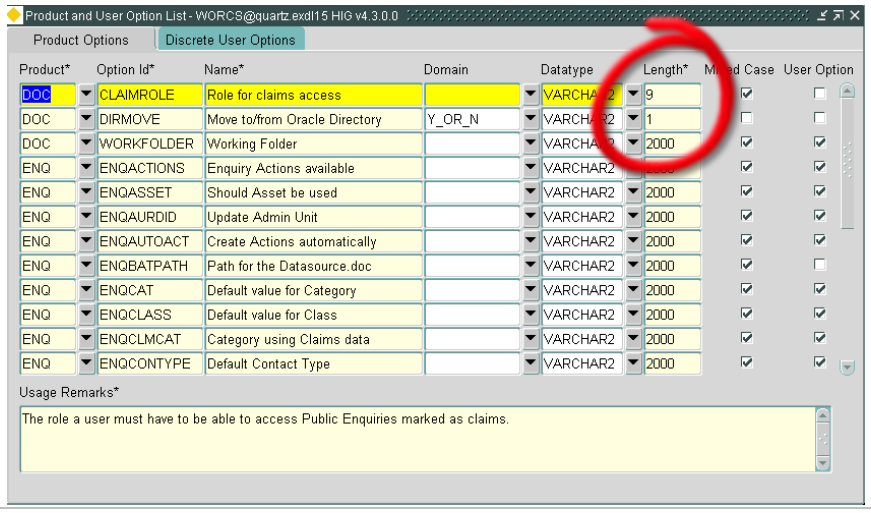
		
0108523	An enhancement has been made to the product options forms. When defining a product option the user is able to define a maximum length in HIG9135 Product and User Option List. This will then enforce the length in forms where the value of the product/user option itself is defined. This includes HIG9130: Product Options, HIG1837: User Option Administration and HIG1840 User Preferences. 	
0108839	When the user was transferred to the NM0105: Elements form, after executing a Split for example, the user was required to commit the changes they have made. In some instances the user was prompted to save having already committed. When committing the form, again, as instructed the user would then be told that there are no changes to save. The Elements form now works as it would be expected to.	
0108906	The restriction of character column length (254) in the DBF attribute file results in truncation of character data when extracting shapefiles from MCI. i.e. "TRUNCATING COLUMN ATR_6 TO A WIDTH OF 254 FROM 500." A change has been made to the Extract views so that the character attributes are CAST to the correct length based on the Asset attribute field length. This results in no truncation errors. The impact of this change is that any character attribute which exceeds 254 characters in length (and is defined in the Asset metamodel accordingly) will be truncated through the extract view, and therefore upon extract. This will remove the need for the customer to manually change the views upon creation. Refreshing and creation of new extract layers through the application will now create the views with above restrictions. This does not affect the Upload views.	720985
0108960	MapCapture Interface Loader - Ensure compatibility with cross attribute asset validation.	

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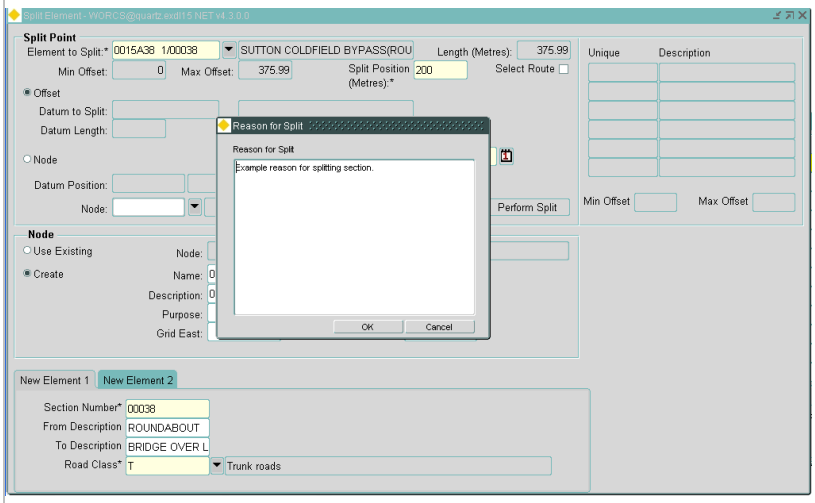
0108961	MapCapture Interface - Fully integrate MCI with the Process Automation Framework.	
0108975	When searching with locator, if one asset is returned the form will attempt to zoom to it. Previously when it was not possible to location the asset the form would raise an error on entering the results canvas saying that the asset could not be found. Now the form does a check before it attempts to zoom to singular assets to ensure it is possible first. If the user then attempts to zoom to this asset manually they will get the error message as expected.	
0108976	The navigation functionality of locator has been tidied up. When the user clicks the reset button the region of interest (the network information in the top left canvas of the form) is kept the same while the asset type and search criteria (bottom left) is restored to how it was on entering the form. When returning from the results canvas the Region of Interest and asset type are retained but the season criteria is reset.	
0108977	NM0590: Asset Maintenance would previously in some instances allow the user to make changes and then leave the form without being prompted to save. In other instances the form was not committing when the save button what being pressing in some areas of the form. The form has been modified to fix these issues.	
0108990	As an enhancement to the core product the “Reason for Change” functionality has been added. This allows the users to add a reason for why an amendment has been made in a number of the element forms. NM0200: Split Elements NM0201: Merge Elements NM0202: Replace Elements NM0206: Close Element NM0220: Reclassify Element NM2000: Recalibrate Element After clicking the forms action button a window will pop up that allows the user to enter in the reason why the amendment has been made.  When the following modules are run the reason for change is removed. NM0203: Undo Split NM0204: Undo Merge NM0205: Undo Replace NM0207: Unclose Element This functionality can be disabled by changing the product option NETREASON to “N”. This will return the forms to their original functionality.	

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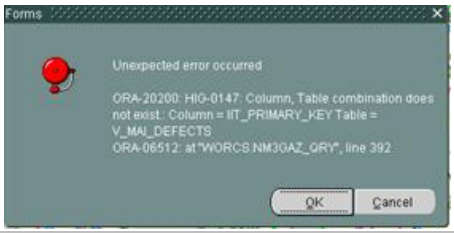
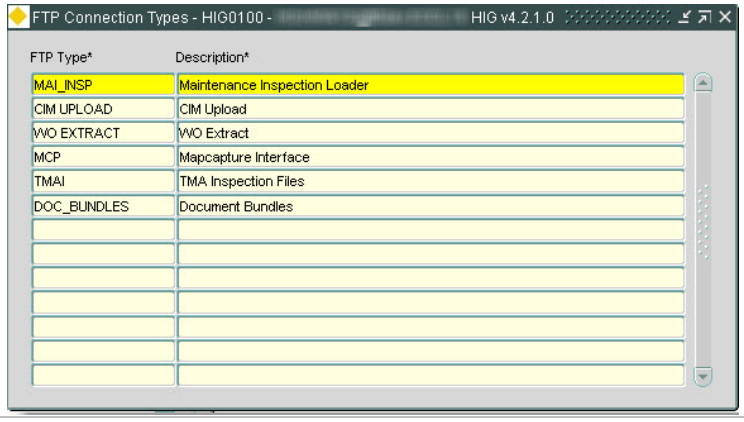
0109007	Assets on a Route by Offset report - correction to the XSP description information displayed.	724382
0109009	MapCapture Interface - Ensure cross platform compatability, i.e. execution of Esri SDE commands works on Solaris, Redhat and Windows database servers. No other OS are supported by MCi.	
0109085	Asset Searches - correction to querying on foreign table Asset using Primary Key field in Locator. 	
0109116	Reclassify - when reclassifying network with whole road AD data, check for any link data that could exist at a future date.	724670
0109117	Find Assets module - (NM0570) - increased the size of LOV windows.	
0109128	Groups of Groups module - (NM0115) - problem with admin unit LOV resolved in Enter-Query mode.	
0109129	Query by admin unit has been enabled in form NM0115	
0109132	MapCapture Interface Error Correction module – now works correctly with mixed case asset attributes.	
0109158	Users module - (HIG1832) - spaces in username handled with a sensible message.	
0109217	GIS Layer Tool module - (GIS0020) - Recalculate table statistics when refreshing the contents of the feature table.	
0109218	GIS Layer Tool module - minor Asset type navigation issue resolved.	
0109255	Locator module - ensure module does not attempt to autozoom when a search result returns one record and there is no corresponding shape.	725047
0109258	Removal of defunct SDE members tables and triggers.	725323 725397
0109297	Generation of spatial data can result in mutation. The trigger nm_members_sde_trg is now obsolete and is dropped in release 4.3	725066
0109318	New modules to maintain FTP Metadata. They are accessible via Launchpad > exor > FTP menu. FTP Types (HIG0100) - create an FTP type to store one or many FTP connections. 	

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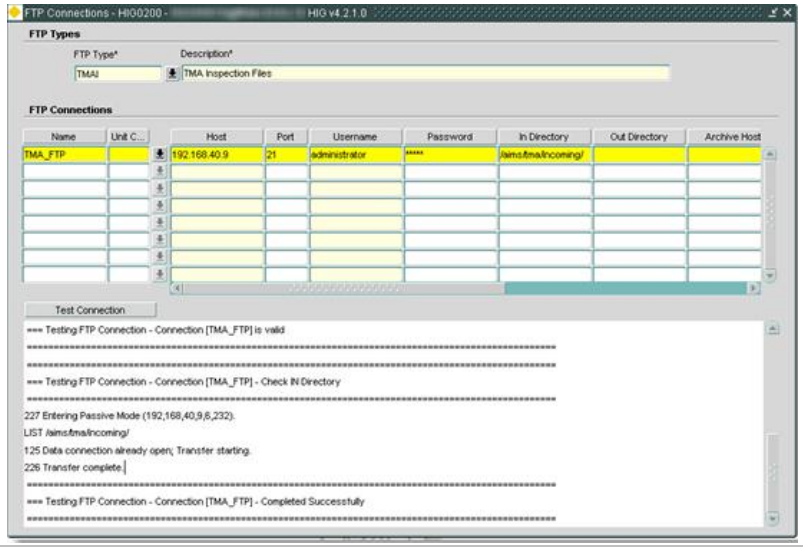
	FTP Connections (HIG0200) - define FTP connection details against an FTP type. These connection can optionally relate to an Admin Unit. You can define FTP in / out areas, and optional archiving in / out areas. The FTP metadata is used in conjuction with Process Framework at this release. Each FTP connection can be tested using HIG0200.  	
0109358	Creation of an Off-Network spatial representation of an asset using IIT_X and IIT_y as flexible attributes can result in "ORA-01403: no data found". Themes are created and asset types appear in the Spatial Manager hierarchy but trying to display the layer gives the error: "Layer not loaded". The same issue was found to occur for both ONA lines and polygons.	
0109359	Users module (HIG1832) - ensure locking strategy is correct when more than one user is using the module.	725482
0109363	New database roles for executing DBMS Scheduler Jobs - required for Process Framework. PROCESS_USER – carries the privs CREATE JOB (and EXTERNAL JOB) – can only alter their own jobs PROCESS_ADMIN – carries the privs CREATE ANY JOB (and EXTERNAL JOB) – can alter any job. These roles would NOT be granted by default, and would need allocating by the super users.	
0109450	Added server routine to interface with native unzip functionality within Windows, Solaris and Redhat OS. Used within Document Bundle Loader.	
0109470	SDOBATSIZE production option included in release. This can be used to increase an internal memory resident array size. Defaults to 200 if left unset. In cases where large numbers of records may be end-dated spatial queries on the native spatial data using the spatial index may return many rows which would be excluded through the use of a view-based predicate. Under some conditions, the two queries may result in no-rows found. In cases such as this, increase the buffer size.	725719
0109516	Assets on a Route report - truncation fixed on long element descriptions.	724425
0109551	Closing elements in Spatial Manager - fixed potential "single-row subquery returns more than one row" failure when attempting to close element associated with hierarchical assets.	726036
0109625	Users module (HIG1832) - errors relating to copying users resolved. Examples are given below.	

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	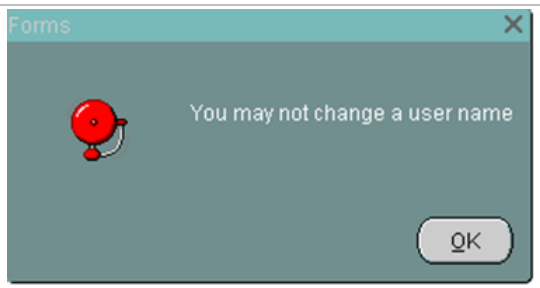 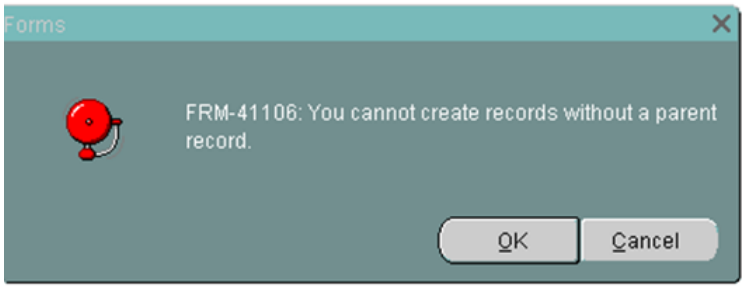	
0109626	Groups of groups module NM0115 could provide duplicate Admin Units in the LOV. This is now a distinct list.	
0109652	Locator Module - (NM0572) - Gaz Restriction should persist when Reset button is used. Locator will allow the user to enter and re-enter queries. At various stages, the user may reset the query. The button that performs a reset will only reset the query in relation to the asset type and attribute data; it will leave any gazetteer or road group queries. These may be reset via the button to create a new query.	
0109674	At some stage between release 4.2.1.0 and 4.3.0.0, the code to produce a list of objects in buffer, used in the ID tool of locator no longer delivers neither the distance to the object, nor the distance along an object when the projection flag is set.	
0109675	The MapViewer component of Locator has a potential in some limited circumstances to return a null element which may manifest itself as an empty record in the snapping tool LOV or in the ID tool output. This is a minor problem in one of the low level object types and is repaired in 4.3.0.0	
0109716	Replace element - "virtual column not allowed here" error fixed.	725167
0109751	Locator module - fixes made to the behaviour of the Reset button .	708824
0109764	Asset Validation and Searches - deal with single quotes in attribute values.	
0109771	Locating Assets - Incorrect warnings when locating contiguous asset types resolved.	716375
0109808	MapCapture Interface Loader - during the loading process, handle incomplete/invalid FTP archive connection details with a sensible error message.	
0109841	Under some circumstances, the Locator sub-select button was out of sync with the server settings leading to a failure to return results on spatial searches by polygon/rectangle etc.	

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Internal Task ID	Issue	Support Log(s)
0104956	Adding a username separated with a space can cause problems with a meaningless error message: "Unexpected error occurred ORA 00922 Missing or invalid option" Username on main canvas of hig1832 (users form) had been repaired previously but the copy canvas was not. This is now fixed.	
0108134	Asset attributes in various modules - ensure pressing "F3" key defaults to effective date when entering data into asset date fields.	
0108172	Find Assets module - improved interaction between "Standard" and "Advanced" modes. Re-running same Asset query issue resolved.	718097
0108603	MapCapture Interface - Provide off-network compatibility when loading asset shapefiles. Network reference ID is no longer mandatory.	
0108841	Spilt Element module - Previous to the fix the Split Element module (NM0200) would validate if you could select the route to split on entering a section. If this was not possible i.e. an error occurred during validation, the select route check box would be greyed out and the error suppressed. This prevented the user from knowing why it was not possible to select the route, which therefore made it difficult to fix the issue or understand why it was not possible. The user is now allowed to check this box and any errors will occur when the split is executed	
0109070	Asset Metamodel module - validate the columns used for Foreign Table asset Primary Key. Only allow unique Numeric columns to ensure compatibility with Locator, Asset extract and Network searches.	
0109092	Reclassifying a datum element - XSP violation error resolved.	699978
0109223	Running reports from the GRI issue resolved when using a complex query.	724015 725745
0109364	Network modules - corrected a potential Post Query error when querying back Elements with additional data associated.	
0109365	Network modules - Modification have been made to the LOV in nm0105, nm0110 and nm0115 forms for the group type fields. Previously the LOV would exclude any type that was in the NM_TYPE_SPECIFIC_MODULES table. Now the LOV will only exclude types that are specific to other modules and include types specific to the module (i.e. nm0105, nm0110 or nm0115)	
0109467	Holidays module - Form now behaves correctly when using Enter query.	
0109500	Network edit - Resolved issue with closing and re-opening network, any Additional Data is restored to the network element.	
0109557	Improved validation on the fields used for a Foreign Table asset type definition.	726113
0109563	Assets on a Route module - issue with using Network Extent as ROI resolved.	725744
0109610	Contiguity check in Assets modules issue resolved - warning being raised in some circumstances when it was not appropriate.	719329
0109613	Issue running Assets on a Route report resolved - truncation error.	723649
0109616	Truncation error in Asset modules when displaying the value of DEFITEMTYP product option.	724745
0109619	CSV Loader and Asset modules - end dated domain values are now validated properly when loading an Asset.	726160
0109624	A missing foreign key from the network types table (NM_TYPES) to the units (NM_UNITS) has been added.	
0109658	Merge Query module - corrected potential "String Buffer Too Small error" when performing merge query.	

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0109661	Asset Metamodel - validate the use of Oracle reserved words in attribute and view column names. Certain exclusions apply however. New module (HIG9140 - Excluded Keywords) can be used to maintain any required exclusions. See task 0108246	
0109668	The undo operation will remove recently added data (if allowed) and in doing so will undo a previous network operation. However, operations such as split or merge could produce new network associated data (ASD). The operation failed to remove the data associated with the new elements and left dangling ASD records.	726406
0109717	Create Users module - validation errors being raised twice error resolved.	726579
0109719	Locating Asset - contiguity warning could occur if locating an Asset which spans a distance break. Erroneous warning would occur, now resolved.	716375
0109739	Changes are required to the index on the inventory attribute banding metadata to support efficient queries in the merge query tool	
0109750	Failure to search for defects in Locator resulting in an error ORA-01722: invalid number. Change made to higgis. Function now checks for synonyms as well as just the table. Error message has been added to tell the user the need to add tables/synonym to doc0130. New error message added to metadata.	710992
0109786	Added server based routines to allow purging of oracle directories and database server paths where necessary.	
0109837	Process Framework - added the ability to disable a process.	
0109886	The SDO spatial checker script will generate errors that are bundled in a set under a header that relates to the previous check. Errors suggesting Missing feature views for Subordinate users are raised under the section labelled as Unrecognised Geometry Types (Gtypes).	
0109898	Registration of empty Spatial layers can result in ORA-30625: method dispatch on NULL SELF argument is disallowed ORA-06512: at "HIGHWAYS.NM3SDO", line 6625 ORA-06512: at line 1 This has now been repaired by the registration process inheriting extents and characteristics of other related data such as network layers.	726903
0109899	The function COALESCE_NW_DIMINFO should raise an exception if the networks are registered with different dimensions.	
0109913	Minor change to rename form HIG1834 from "Hig User Contact Details" to "User Contact Details"	
0109920	Asset Items module - Copying an Asset - asking to commit changes issue resolved.	726904
0109938	Recalibrate Network Element - caused by the same Esri metadata issues as Task 0110101. Please refer to this entry for more details.	725588
0109955	Locator - "Failed to Locate Feature" error not raised when performing a search which returns a single asset result, and the auto-zoom fails because no shape exists for the asset.	
0109959	This fixes a problem whereby merge query results segment sizes were calculated incorrectly in certain data configurations such as when an asset spanned multiple parts of the same datum, with gaps.	726936
0109962	Minor discrepancies affecting numeric attributes in the sde column registry have been repaired.	725805
0109984	Network Searches (Gaz Query) has been changed to identify Assets which have a location relative to any level in the network. Searches must be performed using an ROI at the same level, or above the Asset location to obtain a match. Searches can also be performed using a group intersection, i.e. using one Group of Datums type to idenfify Assets on a different Group of Datums type - but only when the Group types share the same	

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	underlying Datum network type. Forms such as Asset Maintenance, Locator, Find Assets and Assets on a Route will benefit from these changes.	
0109990	Asset Maintenance module - canvas positioning error resolved.	
0109999	Views - DOCS2VIEW view is now being exclusively shipped as part of Enquiries Manager, and is therefore removed from the Network Manager installation.	
0110011	Domain metadata module - now end-dates the domain value rather than deleting the value from the table when removing it as a valid domain value.	727212
0110037	Asset modules - locating overlapping assets with the same Start date previously failed - now resolved to allow where appropriate.	727092
0110042	Mapcapture Interface Extract and Upload - use an Esri attribute mapping file to allow compatibility with Esri SDE 9.2 and 9.3.1. along with backwards compatability at 9.1.	
0110048	NM0590: Asset Maintenance would previously in some instances allow the user to make changes and then leave the form without being prompted to save. In other instances the form was not committing when the save button what being pressing in some areas of the form. The form has been modified to fix these issues.	
0110051	Group of Groups module - tab navigation issue resolved.	727454
0110052	Group of Groups validation - with product option (GRPXCLOVWR) set to 'Y', Groups of Groups form is prevented from manipulating group members generated by auto-inclusion.	727455
0110058	Locator - Corrected validation on the Begin and End MP fields when performing an Asset search with an ROI set.	
0110062	Asset Metamodel module - correctly validate the length of Attribute and View name columns	727524
0110064	Locator Info Tool - improved interaction between Locator Info Tool and Locator results grid when using "Send to App" option.	
0110084	Provide interface for external processes to clearout failed FTP transfers to prevent re-submission of files.	
0110087	Merge Query module - "fetch out of sequence" error could occur when running Merge Query.	726539
0110089	Process Monitor module - ensure the Order By buttons work on all columns where available.	728223
0110094	Document Manager - Ensure doc_id is appended to document filename when loading into an Application Server type document location.	727533
0110101	Reshaping a datum - an error could potentially occur when reshaping a datum element. If the MUnit Esri metadata is incorrect for the datum layer, the geometry constructed in the Esri client could potentially suffer from a rounded geometry length. When performing the reshape, any Assets previously located at the end of the datum (within the layer M tolerance) could fail to re-dynseg to the reshaped geometry due to the rounded geometry length. A fix was put in the server code to re-evaluate the geometry length when a reshape is issued - along with correction to the underlying Esri SDE MUnit metadata used in the client when constructing new geometries. A data repair script is included in the UTL folder called "Report Shape Lengths.sql" to report an mismatches with datum lengths vs logical element length. If this report returns any differences it is advised that you run the "Repair Shape Length.sql" script to repair them. There is also a script called "Repair MUnits.sql" which recalculates the SDE MUnit metadata to prevent any potential geometry length rounding. It is advised that you run this script. You can report on this data using the corresponding "Report MUnits.sql" script.	727267

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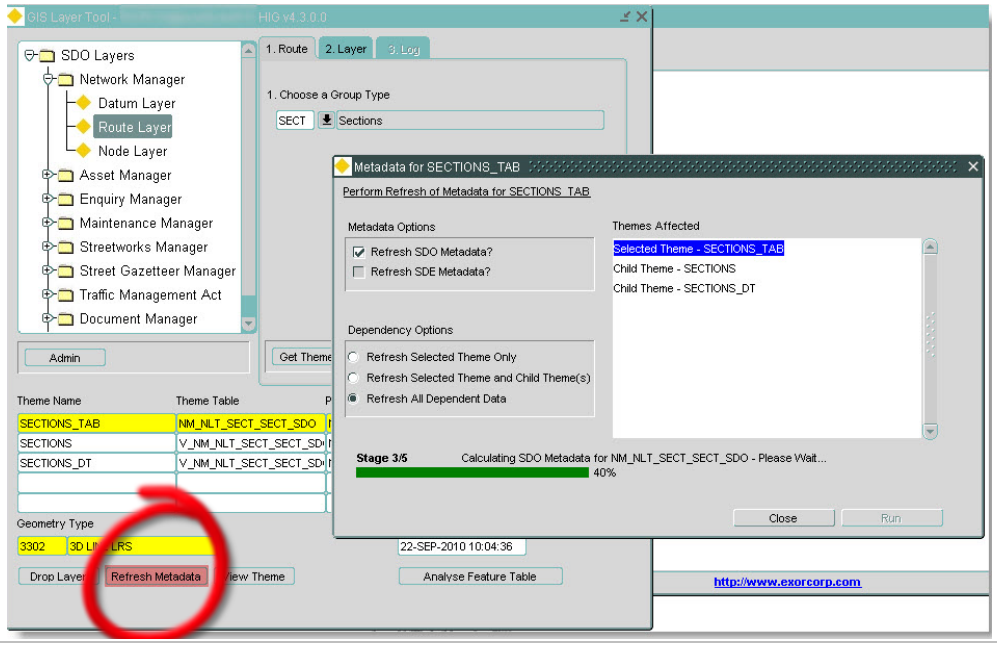
0110109	Document Manager - Added the ability to display documents which are stored as binary content in a Database table using a URL.	
0110134	Missing Product Option (WEBMAPIDBF) Info tool. Starting at release 4.2.1.0, a new and improved ID tool was implemented in the MapViewer component of Locator. Initially, this was released without the necessary upgrade to include a system option.	
0110140	Merge Query module - Resolved issue when pressing the "Validate Query" button a WHEN-BUTTON-PRESSED error could potentially occur when using Foreign table asset types.	727716
0110142	Utility Script 0110142_data_fix added to release. This script removes duplicate user details caused by an issue with details being created erroneously when updating existing records. The script will remove duplicate user details and keep the most recently modified details. WARNING:PLEASE ENSURE THE LAST MODIFIED DETAIL IS THE ONE YOU WISH TO KEEP BEFORE RUNNING THIS SCRIPT.	727863
0110146	Allows users to Refresh the Oracle Spatial metadata along with the ESRI SDE Spatial metadata. This is performed from the GIS layer tool screen as shown below. 	
0110147	Merge Query module - FRM-40735: POST-QUERY trigger raised unhandled exception ORA-06502 failure resolved. This was due to badly implemented impact analysis on changes to the length of the NE_DESCR column several years ago. Field sizes have been adjusted accordingly.	726762
0110193	Document Bundle Loader - improved error handling when failures occur on the server.	
0110194	Create Extent module - corrected inconsistency when returning from the Extended LOV using mouse or keystroke.	
0110237	Assets on a Route module - interaction between module and Gazetteer improved when selecting incompatible ROIs.	
0110252	Locator and various other methods use an internal procedure nm3sdo.get_objects_in_buffer. In cases where the spatial theme relates to a group or an asset (where multiple shapes are used to assemble the complete shape of an object), the code would return an array of spatial features in the buffer rather than the array of objects within the theme. If the theme was restricted through the use of predicates applied through a view, the application of the predicate could also multiply up the rows that are returned. This could result in effects such as the snapping tool in Locator returning more than one row for the same object. This code is now improved by the return of distinct identifiers for the spatial objects being queried. This improves performance, especially in earlier versions of the MapViewer component of Locator which would perform a nested-loop over the returned data. The MapViewer component of Locator has also been improved in release 4.3 to	728299

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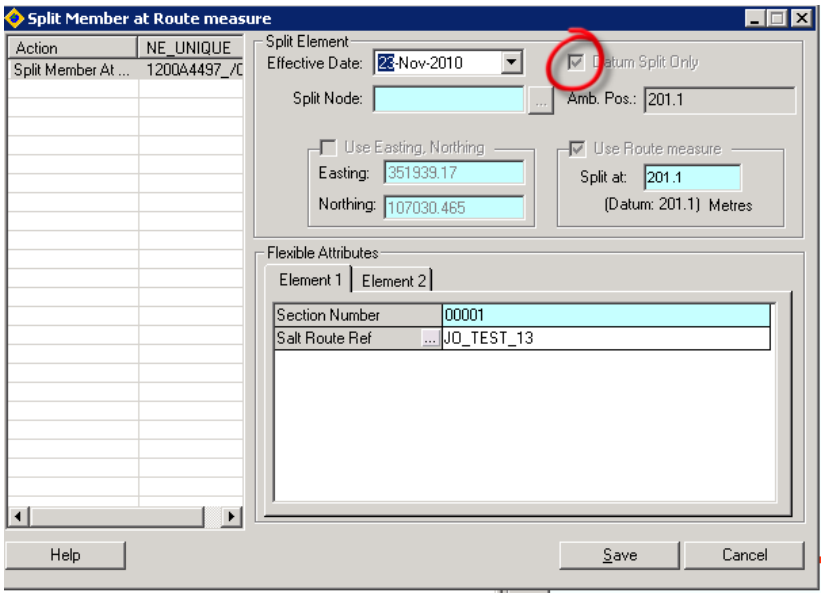
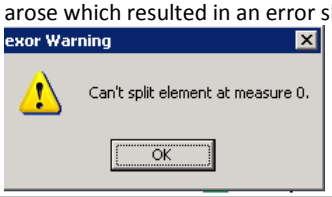
	perform operations such as highlight and select in a bulk mode on the server so performance on large numbers of features will be improved.	
0110295	Merge Query dynamic SQL could fail in some cases where column names inside a foreign table replicated the names of columns in one of the product tables such as NM_MEMBERS	
0110297	MapViewer - Ensure any user defined maps are picked up - otherwise revert to the system-wide MapViewer map definition.	728263
0110340	Hard coded tolerances in nm3sdo_geom.get_geom_from_gdo will fail to rectify and remove duplicates to the required tolerance. This affects spatial data being entered from Locator such as TMA Phase co-ordinates.	
0110370	Changes to merge query included code that made an incorrect join. The query would work on network groups with the same name as their network type. In cases where these strings differed, the units of measure of the underlying network type could not be found.	728262
0110425	Some dynamic SQL generated and executed in the methods within nm3sdo.get_objects_in_buffer could fail under some conditions. The dynamic SQL is better equipped with missing table alias having been added	
0110314	This is the same issue as task 0110300, ecdm log (728173). It is fixed in the 4.3 certified version of SM (revisison 3.13). The split function will not perform on linear routes that have auto-included members. The validation of this would fire during entry of the actual route so users who wished to use the route and an offset to split the datum would be prevented from navigating to the offset field. The new split form in SM will detect the auto-inclusion allow entry into the offset field to split the underlying datum at the route reference. The form will prevent the user from attempting to split the actual linear route by activating the split-datum-only option and making it inactive as shown.  The similar changes to forms have been supplied as a fix to 4.2.0.0 as fix 28 (Task 0110300).	728484
0109988	Failure of split within SM to split element at node. In some cases with local projections, problems arose which resulted in an error shown below  	
0109987	Failure of Spatial Manager in split form after changes to the co-ordinates. When used with a local projection SM allows the user to split at a specific co-ordinate but also allows the user to fine-tune these values. The changes could result in the lat/long value being displayed instead of the locally projected ordinate as shown:	

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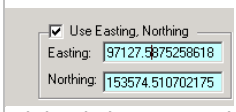
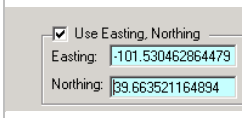
	 Minimal changes to the oridinate values such as changing .6 to .5 in the screen above could corrupt the easting value as shown. 	
0109667	Split using Spatial Manager under some circumstances could produce the error: " An unexpected application error has occurred. ORA-20000: NET-0367: Group Offset does not coincide with Non-Ambiguous Offset" This could be triggered after changes to the default measure which is derived from the point at which the user has clicked on the element to be split.	726401
0109655	This is a simple code change to the old Engineering Dynamic Segmentation which used the Oracle default date mask. It is fixed in 2.14 of nm3eng_dynseg.pkb and is assembled into fix53 of 4.0.5.4 and rolled into release 4.3.0.0. The date fields are returned in a format derived from the user-preferred date mask or 'DD-MON-YYYY' where this is null.	703513
0109654	Engineering dynseg is returning null data for foreign table assets.This has been incorrectly logged as a known issue (10th May 2010). In fact, it has been tested and seen to be working with the exact data as supplied. However, there were some issues when using some of the foreign where a flexible attribute was registered with the same name as one of the columns on a table used in a join. This was re-coded to include an alias and was seen to work correctly. This secondary issue is fixed in 4.0.5.4 Fix53 but cannot be replicated in its original form. However, further reading into the problem suggests that merge queries are being executed at a past effective date and then executing EDS queries at the current date. This may explain their null values. No specific testing on this issue has been performed in the 4.3.0.0 program.	726192

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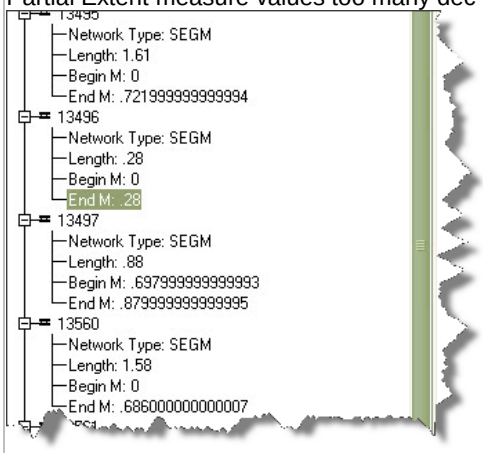
4 Known issues

Some changes from several years ago continue to cause problems. In particular, the changes to the length of the column NM_ELEMENTS_ALL.NE_DESCR have had some impact that even now has not quite been corrected. This is often difficult to find with failing code sometimes being embedded within some dynamic SQL. With customers reluctant to use the extended column size, the issue is being hidden. However, it is being taken seriously and there is an on-going process to sweep up all the affected areas of code.

The following list contains issues that are under investigation at the time of that release 4.3.0.0 was being prepared but have not been included or have been included but have not had a specific test confirm the resolution. Fixes for these issues may be issued on 4.3.0.0 at a future date. Known issues that relate to the merge query are listed in the chapter on merge query. This not an exhaustive list of all issues that have been raised either internally or by customers.

Internal Task ID	Issue	Support Log(s)
0107857	Failure to perform impact analysis on ne_descr	724062 721136
0110411	Cannot add auto-inclusion to two groups into the same group. This is due to a unique key on the NM_TYPE_INCLUSION table. This unique key prevents more than one child network type from being included in a specific parent type. The unique key will be suppressed and tests will be performed to ensure the software behaves as expected.	728434
0110300	The Split form fails to allow the user to split a datum by reference to a measure relative to a route that has auto-inclusion rules. Forms changes have been made and tested in a 4.2.0.0 environment in Fix 28. These same changes will be included in a future release.	728173
	This relates to an asset type property set to exclusive after using the system with the property set to non-exclusive.	726863
0110427 0110397	Spatial Manager GOS Memberships (History) fails to show correct member dates	728724 728675 728673
0110423	Spatial manager displays end-dated Admin Units in the LOV	728555
0109753	Partial Extent measure values too many dec places as shown 	726386
0108196 0108995	Map Viewer improvements such as those dealing with legend sizes are earmarked for release 4.4. In particular those listed below relating to the ecdm logs in column 3. Unable to view full legend, locator map and legend cannot be resized Legend not readable in Locator Mapviewer to allow users to set the scale	726510 724876 722477 722306 721947 713264

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0108950 0110209	The Locator map window fails to respond to the client setting of the user effective date	

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5 Merge Query

5.1 Merge Query from 4.0.5.4 through to 4.2.0.0

Many changes have been made to the bulk merge query module over the last year or so. At release 4.2.0.0 changes were made to ensure merge query remained consistent with the approach for case sensitive attributes on asset items. However, many fixes to the bulk merge program were also being supplied particularly to release 4.0.5.4. These fixes were incompatible with other changes to bulk merge and were also incompatible with the case sensitivity changes. The code base for 4.3.0.0 includes fixes that force a change to the API specification and hence has major impact on compilation and raises difficulties of incompatibility. This has meant that theoretically, three separate code bases existed for bulk merge.

- The 4.0.5.4 through 4.1 code base.
- 4.2 case sensitivity code base.
- 4.3 bug fix code base.

However, in reality the 4.2 case sensitivity code base has been terminated and a single code base has been supplied to customers on releases 4.0.5.4 through to 4.1.0.1 and is available to those on release 4.2 who decide that they do not require case sensitive queries. These customers will have lost the ability of the merge to operate on case sensitive attributes but have gained in relation to the more reliable modules. At release 4.3, all the reliability improvements, case sensitivity and further fixes have been rolled into the same code.

There remains some work and there are several known issues which are listed below. It is the intention to gradually replace the original merge query as and when the bulk merge and related software can deliver the full range of results of the original merge query. Hence, bug fixes may not have been applied to the original merge query. Comparison of the results from both methods remains an important part of the test plan.

5.2 Merge Query API Changes

In the process of dealing with some of the problems, the API specification has changed at release 4.3.0.0.

Old merge (nm3mrg package)

The old merge query remains relatively unchanged but includes some recent changes to increase the number of attributes used in a query. This is a minor change to a parameter held in a package header.

Bulk Merge Query

The changes in the bulk merge process can be seen in the nm3bulk_mrg package specification. This has changed from version 2.4 to 2.7 in the previous releases. The basic changes are

- Additional load procedures have been built.
- p_group_type parameter has been added to the criteria load procedures where not present already
- parameters p_nqr_source, p_nqr_source_id and p_domain_return have been added to std_run()
- parameter p_ignore_poe has been remove from std_run()
- A version of std_run() without p_longops_rec has been added

Merge Query assembles data through connectivity and shared location on a network area. It consists of three steps.

1. Load datum segments of the area of interest (the criteria datums)
2. Establish route connectivity
3. Run the merge logic over the prepared area of interest

The first step populates a set of network over which the merge is to operate. It can do this through several different methods and these are listed in section 1 below.

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The second step imposes a choice of the route that is used to establish large chains (merge sections) on connected segments. Changes have been made to force this choice of route to be of the type defined in the preferred LRM as described below.

The group type for route connectivity is taken from following sources in the given order.

1. If the source has a value and **is linear** then the value is used
2. The supplied group type argument (in procedure load_group_type_datums this is p_route_group_type, in all others it is p_group_type)
3. PREFLRM' product option

When more than one route traverses a datum then it is possible that the route cannot be determined unambiguously. This can happen when the connectivity group type is not given or it is non exclusive.

In cases of ambiguity the choice of route is made with regard to the priority as follows:

1. the route with highest number of member elements within the selected network is chosen.
2. If still ambiguous then the route with the lowest NE_ID value is chosen.

Depending on the type of the source of the network over which the merge is to operate, a datum element may be included more than once (through inclusion of two non-exclusive groups in a group-of-groups query). In cases where partial elements are included more than once, the minimum start and maximum end measures will be used.

Elements of network derived from a temporary extent have their own route references in the column NTE_ROUTE_NE_ID. This route is used when populated else the rules above will apply.

In the case of a network element not being a member of any groups, all the merge section connectivity will be reported against the element itself.

When loading the network, the data is consistent with the cuurent effective date as defined by m3user.get_effective_date()

Step 1 - Loading the Network

The loading of the elements over which the merge is to operate has changed. A choice of method is available. Whichever method is used, a temporary table will be populated with a list of datums over which the merge is to operate. The seven procedures are listed below, each using different types of input. They reside in the nm3bulk_mrg package.

1.1 load_group_datums

This procedure has changed from the previous releases in the additional argument of p_group_type
The calling syntax is

```
procedure load_group_datums(
   p_group_id                in  nm_elements_all.ne_id%type
  ,p_group_type              in  nm_group_types.ngt_group_type%type
  ,p_sqlcount                out pls_integer
)
```

This loads network data based on existing network elements and groups.

p_group_id is a reference to NM_ELEMENTS_ALL. It can be:

- group of groups
- non linear group
- linear group
- datum element

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p_group_type is the preferred group type for connectivity
p_sqlcount is the number of criteria datum records loaded

1.2 load_group_type_datums

This procedure will load all datums that are members of a specific group type. This has changed with the provision of the extra parameter to direct the route type on which the connectivity will be assessed.

```
procedure load_group_type_datums(
   p_group_type in nm_group_types.ngt_group_type%type
  ,p_route_group_type in nm_group_types.ngt_group_type%type
  ,p_sqlcount out pls_integer
)
```

p_group_type is the group type of the datums to be loaded. It can be a linear or non-linear group type.
p_route_group_type is the preferred group type for connectivity (same as p_group_type in other procedures)
p_sqlcount is the number of criteria datum records loaded

1.3 load_extent_datums

This loads network data from a saved extent. This is unchanged from earlier releases.

```
procedure load_extent_datums(
   p_group_type in nm_group_types.ngt_group_type%type
  ,p_nse_id in nm_saved_extents.nse_id%type
  ,p_sqlcount out pls_integer
)
```

p_group_type is the preferred group type for connectivity
p_nse_id is a reference of a saved extent
p_sqlcount is the number of criteria datum records loaded

1.4 load_temp_extent_datums

This loads network data as a result of criteria based on a temporary extent. This procedure was not available in previous releases.

```
procedure load_temp_extent_datums(
   p_group_type in nm_group_types.ngt_group_type%type
  ,p_nte_job_id in nm_nw_temp_extents.nte_job_id%type
  ,p_sqlcount out pls_integer
)
```

p_group_type is the preferred group type for connectivity
p_nte_job_id is a reference to a temp extent
p_sqlcount is the number of criteria datum records loaded

1.5 load_nt_type_datums

This loads criteria based on a datum network type. This is unchanged from previous releases.

```
procedure load_nt_type_datums(
   p_group_type in nm_group_types.ngt_group_type%type
  ,p_nt_type in nm_types.nt_type%type
  ,p_sqlcount out pls_integer
```


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)

p_group_type is the preferred group type for connectivity
p_nt_type is a reference to a network type.
p_sqlcount is the number of criteria datum records loaded

1.6 load_all_network_datums

This loads the whole set of all datum network elements. Again, this is unchanged from previous releases.

```
procedure load_all_network_datums(
   p_group_type in nm_group_types.ngt_group_type%type
  ,p_sqlcount out pls_integer
)
```

p_group_type is the preferred group type for connectivity
p_sqlcount is the number of criteria datum records loaded

1.7 load_gaz_list_datums

This loads criteria from a list of network elements and / or saved extents. Again, this is unchanged from previous releases.

```
procedure load_gaz_list_datums(
   p_group_type in nm_group_types.ngt_group_type%type
  ,pt_ne in nm_id_tbl
  ,pt_nse in nm_id_tbl
  ,p_sqlcount out pls_integer
)
```

p_group_type is the preferred group type for connectivity
pt_ne is a table of references to NM_ELEMENTS_ALL. Any individual NE_ID value can be datum, linear group, non linear group, group of groups
pt_nse is a table of saved extent ids
p_sqlcount is the number of criteria datum records loaded

Step 2 Establish route connectivity.

The routes that are used as a basis for the connectivity and as a means of providing long chains of homogeneous merge sections are established in this second step. The resultant data is populated in the table NM_ROUTE_CONNECTIVITY_TMP. This is described below.

NM_NE_ID_IN	route reference
CHUNK_NO	a route can have multiple connected segments. This column identifies each distinct segment – a change of value in this column identifies a break in connectivity
CHUNK_SEQ	The sequence of the datum within the connected segment (chunk)
NM_NE_ID_OF	The datum reference
NM_BEGIN_MP	The start measure of the part of the datum within the segment
NM_END_MP	The end measure of the part of the datum within the segment
MEASURE	calculated summary length start within one chunk
END_MEASURE	calculated summary length end within one chunk
NM_SLK	The starting measure of the datum relative to the route

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NM_END_SLK	The end measure of the datum relative to the route
NT_UNIT_IN	Route units
NT_UNIT_OF	Datum units
NM_CARDINALITY	Relative direction of the datum within the route.

The procedure to populate this data is described below.

```
procedure ins_route_connectivity(
   p_criteria_rowcount in integer
  ,p_ignore_poe in boolean
);
```

p_criteria_rowcount: is the number of datum criteria records loaded in the first step. This is returned in the out parameter p_sqlcount from all of the options in step 1.
p_ignore_poe: when true then the connectivity logic ignores the points of equation (dicintinuities of measure). When null then the value from system option 'MRGPOE' is used. The value 'N' of the option translates to p_ignore_poe = true. If the option has no value then this also translates to p_ignore_poe = true.

Each datum element in the selected area is records in the temporary table, the route being chosen according to the rules defined above.

Connectivity of dual carriageways is assessed such that a single connected segment will be established through the route segments with the first two sub-class sequence numbers.

When parameter p_ignore_poe = true then breaks in connectivity are introduced where NM_END_SLK and NM_SLK values of the two connecting datums are not equal.

Step 3 - The main merge logic.

This is the main merge logic procedure that produces the merge results. It has changed from previous releases having additional parameters to register the source drive the use of domains and bandings in the result set. The procedure is overloaded with the use of the longops parameter as described below.

```
procedure std_run(
   p_nmq_id in nm_mrg_query_all.nmq_id%type
  ,p_nqr_admin_unit in nm_mrg_query_results_all.nqr_admin_unit%type
  ,p_nqr_source in nm_mrg_query_results_all.nqr_source%type
  ,p_nqr_source_id in nm_mrg_query_results_all.nqr_source_id%type
  ,p_domain_return in varchar2
  ,p_nmq_descr in nm_mrg_query_all.nmq_descr%type
  ,p_criteria_rowcount in integer
  ,p_mrg_job_id out nm_mrg_query_results_all.nqr_mrg_job_id%type
  ,p_longops_rec in out nm3sql.longops_rec
  );
```

p_nmq_id is a reference to merge query definition
p_nqr_admin_unit is a reference to the admin unit used for the security of the resulting data
p_nqr_source is type of the network criteria source with possible values: The possible values are defined as constants in the nm3bulk_mrg package header.
p_nqr_source_id is a reference to the network criteria source.
p_domain_return indicates if code, meaning or both should be stored in the results for attributes with a domain. Values are:
C – code only (default)
M – meaning only
B – both code and meaning
p_nmq_descr is a description for the result set in free format
p_criteria_rowcount is the value of p_sqlcount from a load procedures in the first step
p_mrg_job_id is an out parameter returning the merge result set job id

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p_longops_rec is a system record used to update the oracle database longops table to keep track of the merge progress. This is used when merge is called as a part of other processes e.g. derived assets. For standalone use there is a second version of std_run() without the p_longops_rec parameter.

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Example usage of the API

Example of the new merge API usage. Running merge on a single group.

```
declare
  l_sqlcount    pls_integer;
  l_mrg_job_id  integer;
begin
  nm3dbg.debug_on;
  nm3bulk_mrg.load_group_datums(
     p_group_id   => :p_group_id
    ,p_group_type => :p_group_type
    ,p_sqlcount   => l_sqlcount
  );
  nm3bulk_mrg.ins_route_connectivity(
     p_criteria_rowcount  => l_sqlcount
    ,p_ignore_poe         => false
  );
  nm3bulk_mrg.std_run(
     p_nmq_id          => :p_nmq_id
    ,p_nqr_admin_unit  => :p_admin_unit_id
    ,p_nqr_source      => nm3bulk_mrg.NQR_SOURCE_ROUTE
    ,p_nqr_source_id   => :p_group_id
    ,p_nmq_descr       => :p_description
    ,p_domain_return   => 'B'
    ,p_criteria_rowcount => l_sqlcount
    ,p_mrg_job_id      => l_mrg_job_id
  );
  commit;
  nm3dbg.debug_off;
end;
```


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6 Merge Query Issues

This chapter is devoted to describing some of the issues that relate to merge query. Some issues still exist within the 4.3 release although many issues have been addressed. These lists also contains a reference to those issues that are deemed fixed via patches to the 4.0.5.4 release but were never included in the 4.2 release. Issues relating to old merge query have not been included unless the issue is also related to bulk merge query.

6.1 Issues fixed in 4.3.0.0

Internal Task ID	Issue	Support Log(s)
	This was a long-standing enhancement request. Bulk merge query now provides merge section results with references to a route of the type defined by the preferred LRM when appropriate.	698259
	This is an issue with the merge query views having assembled multiple point assets at a position but the inability of the merge views to reflect the multiple items as separate columns of data. The customer had been advised that the fix was available in 4.0.5.4 but it is uncertain as to whether this is true. It is far from certain that the merge views can accommodate multiple sets of repeating groups of attributes from non-exclusive asset data. This has not been investigated fully. It is known however that point data does pose a problem in the result set – by its failure to inherit other attributes from linear assets at the point source – see later.	699814
	This is a long standing enhancement request to provide the merge query tool with an option to choose all routes with specific attributes rather than having to create static extents. It has been on the books since April 2005. This has not been investigated. In theory, all routes with specific attributes should be available as an extent delivered from a PBI Query, hence its treatment with a low priority	700618
	This issue describes execution of original merge query on an extent. An attempt is made to use the extent or a non-linear route from the auto-inclusion rules as a means of a linear reference – this leads to the error below because no units exist. It is thought not to apply to the bulk merge due to its dependency on the route connectivity logic. ORA-20001: No Unit conversion found 4->\ ORA-06512: at "KANSAS.NM3UNIT", line 338 ORA-06512: at "KANSAS.NM3UNIT", line 130	704594
	This issue is raised to suggest that the merge query failed to split the network into appropriate homogeneous chunks. This is deemed fixed during work on the 4.0.5.4 release which has been migrated into the 4.3.0.0 release.	707990
	This is a lengthy ECDM log which degenerates to the single problem of the failure of the bulk merge query to correctly register the source network and type used as a definition of the area of interest. This is recorded in the NM_MRG_QUERY_RESULTS.NQR_SOURCE_ID. At the time of going to press, there remain some tests to ascertain the results when executed over a whole network i.e. in cases where no network extent or road group has been used in the execution. However, it is confirmed that this data is properly recorded in cases of execution over extents and groups.	715691
0108161	This is a failure of earlier versions of merge query to construct appropriate dynamic SQL resulting in the error below. ORA-00905: missing keyword ORA-06512: at “HIGHWAYS.NM3BULK_MRG”, line 1614 Deemed fixed at release 4.0.5.4 fix 19	719893
0109148	Merge Query fails to use preferred LRM. This was corrected in 4.0.5.4 release 45	720540
	Bulk merge did not include datums that were not members of a linear route	722431

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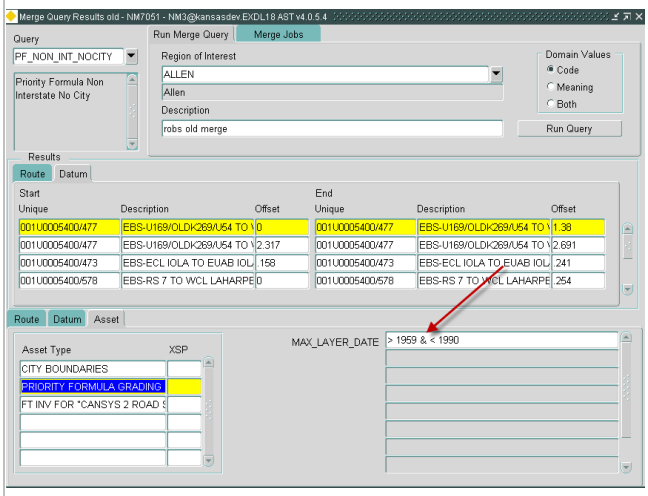
	This is an issue that was deemed fixed in 4.1.0.1 and is rolled up into 4.3 and also deemed fixed in 4.0.5.4 Fix 36. The dynamic SQL was too large for the internal variable which held the string. ORA-06502: PL/SQL: numeric or value error: character string buffer too small ORA-06512: at "RDINV.NM3BULK_MRG", line 1769	722950
	Request to view merge query results in Spatial Manager. Server code exists in the nm3mrg_sdo package to generate spatial representations of merge results. These may generate a mixture of point and linear data which is disallowed in the esri clients such as ArcMap. This data can be split into multiple views depending on the feature type and registered accordingly. This cannot be done through the product tools. The view definitions that are generated as standard will include a spatial view of the merge query results. This has been a feature of the system for many years.	723144
0108738	Failure of bulk merge to use domains and bandings.	723574
0108958	Merge Query - Cannot Return Decoded Values	724275
0109380	Failure of bulk merge to use banded attributes of a foreign table. This raises several problems that have all been corrected in release 4.3.0.0 as described below: Unlike banding of standard exor inventory assets which were completely ignored prior to 4.3, the merge query failed with an unexpected error due to inconsistent data types. This was investigated and fixed (it was failing on date bands that should have been converted to Julian dates). However, the fix was tested and although the merge chunks were assembled in a manner that was consistent with the bands, the asset attribute values were still stored as their original value and not the banding identifier. This was compared to the old merge which works correctly on date-based columns in foreign tables as seen below.  This issue was fixed in 4.0.5.4 Fix53 – the correct bandings are used as splitting agents but the attribute values are still incorrect. The remaining fix is made in the code in release 4.3.0.0 With Fix53 installed, the merge sections are assembled according to the banding intervals as required. However, problems exist where more than one asset exists with multiple values of the splitting agent within one band and therefore within one merge section, the results assemble all the values. Hence, asset and attribute pairs take on multiple values over a merge section – this is an apparent paradox as the results lie contrary to the merge query method. So, this remains incorrect under these circumstances but this is thought fixed in release 4.3.	725391

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	During testing there was an added failure when the banding sets were deemed too large for the string that held the dynamic SQL. This is also deemed fixed at 4.3	
0109651	Effective Date Merge Query returns incorrect results. This was deemed fixed in 4.0.5.4 Fix 53 and is rolled into the 4.3 release. It had where clause restricted to only elements with a null end-date thus only data that was common to the effective date and current date would be included.	726355
0109651	A version of the nm3mrg_view package defined view columns that returned incorrect counts of assets within an XSP. This was deemed fixed in 4.0.5.4 Fix 53 and any merge view definitions that have been generated with the nm3mrg_view package body at version 2.5 or below should be refreshed.	725568
0109429	Excessive shared pool usage. This was reduced in 4.0.5.4 Fix 53 and is rolled into release 4.3. However, please note that merge query is very complex and will need suitable resources in order to execute effectively.	725642
0108665	This issue describes differences in the bilk and original merge query results and also relates to differences in the engineering dynamic segmentation. This was deemed fixed in 4.0.5.4 Fix 53 and is rolled into the 4.3 release. Prior to this release extensive testing has been made on establishing the same merge sections using each method of merge query.	722259
0109741 and 0110087	Error results from execution of original merge query with excessive numbers of splitting agents are shown below: ERROR at line 1: ORA-01002: fetch out of sequence ORA-06512: at "NM31.NM3MRG", line 364 ORA-06512: at "NM31.NM3MRG", line 126 ORA-06512: at "NM31.MRWA_CLASS_ROAD_EXTRACT", line 360 ORA-06512: at "NM31.MRWA_CLASS_ROAD_EXTRACT", line 559 ORA-06512: at "NM31.MRWA_CLASS_ROAD_EXTRACT", line 687 ORA-06512: at "NM31.XMRWA_2005_CORPORATE_EXTR", line 291 ORA-06512: at line 1 This is deemed fixed in 4.0.5.4 Fix 64	726539
0109773	Merge query results in missing asset data. Fixed in 4.0.5.4 Fix 57 no customer feedback has been received but the fix has been rolled into release 4.3.0.0	726702
0109919	Inaccurate results in merge query. Fixed in 4.0.5.4 Fix 61 no customer feedback has been received but the fix has been rolled into release 4.3.0.0 The problem was found to exist where an asset type has multiple parts over a datum.	726936
0110029	Merge Query - buffer too small – probable cause in nm3dbg package. This was fixed in 4.0.5.4 Fix65 and has been rolled into release 4.3.0.0. ORA-06502: PL/SQL: numeric or value error: character string buffer too small ORA-06512 at "TRANSINFO.NM3BULK_MRG", line 1820	727371
	Missing data in merge results. It is likely that this problem arises from datums that are not in any linear route or one of the other issues that have already been fixed in the fixes up to and including 4.0.5.4 Fix 61. This can no longer be replicated and is deemed fixed.	726499
0110147	Post-query value error causes problem in forms client – likely due to descriptions being too long. This is caused by a failure of the proper assessment of the impact caused by the increase in length to the NE_DESCR column. This assessment is continuing into the 4.4 development.	726762
0108959	The customer reported that the MQ OFFSET_NE_UNIQUE Is Wrong. This was repaired in 4.0.5.4 Fix 45. The log then raises the related error of the incorrect source id on the merge query results. This is now fixed in this release.	724229
	This refers to an issue encountered by a customer which suggests that a point item existed in more than one merge section. It has not been able to replicate this error and the problem is deemd to either be fixed or is down to erroneous source data.	704791

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0110370	Schemes manager error caused by merge query problem as a result of a failure in unit conversion in the underlying merge query. This was due to recent changes to improve performance. The failure is due to a poorly implemented fix between 2.6 and 2.8 of nm3dynsql. Version 2.9 resolves the issue. The failure only arose when a route is used which has a group type with a different four-character code to the underlying network type. The fix is rolled into 4.3. Testing of the previous fix had been performed on a system which happened to have matching four-character codes.	728262
0108664	This relates to the extract of merge query data in a CSV file format. The user failed to extract data due to the failure to configure sensible metadata for padding of data. The required data needs to be corrected.	722938

6.2 Merge Query issues known to remain at release 4.3.0.0

Internal Task ID	Issue	Support Log(s)
0108253	Merge Query execution crashes Spatial Manager. This cannot be replicated, it may be due to merge query taking excessive resources and this may have changed as a result of previous improvements. Also, ArcMap may be more resilient in later releases such as ArcGIS 9.3.1. The log remains open.	718762 719757
	Merge query fails with error during extract. This may be due to the merge view definitions that were changed. The merge views had differences in columns and the extract uses data that relates to the columns in the view. A script should be constructed to flush out any disparities between columns in the merge extract that are not present in the views. As yet, this has not been done so the log remains open.	719809
	Merge query results have gaps in the LRM data. This was investigated by the customer and found to be as a result of the view definition and unit translation failing to give enough accuracy. However, the query that was used to illustrate the failure was also used as a test and gaps were seen in the original results. This was found to be as a result of a software failure and a great many unintentional discontinuities of measure caused by datum element lengths being set with an inappropriate number of decimal places. This was repaired on the customer database but the origin of this disparity remains unknown. Since then, this issue has been investigated after the application of a fix (version 2.32.1.0 of nm3bulk_mrg.pkb). Some test harness scripts were developed and the results analysed for gaps or overlaps. In every case at the route level and datum level, the gaps and overlaps were entirely due to discontinuities of measure inside the route itself or existence of distance breaks. The problem still persists however and is entirely due to a failure of the measures to be translated uniquely due to the irrational numbers used for conversion between feet and miles. In particular, it is due to the format mask of miles being set to be 3DP which is marginally inconsistent with whole numbers of feet. It is recommended that the merge views are re-coded to include an exact conversion rather than being reliant on the unit conversion function. This has a better chance of success but is still not 100% guaranteed. The data on the merge result views that is questionable is the datum chunk linear reference (in feet) which is translated into a route offset (in miles). However, route offsets are available in the merge sections table (route chunks) so it is questionable as to why the customer should require the route segment lengths as the sum of the converted datum lengths. 4.0.5.4 Fix53 is labelled as partially fixing this problem and thi sis rolled into release 4.3 but the fix remains incomplete.	724463
0109636	Merge results obtained from the batch interface give an error due to invalid network extent. The batch interface always executes old merge API. This has been modified to run the new merge depending on a system option and this treats network extents differently and fails when a datum exists in more than one group. Also, it is feasible that a datum can exist twice in a single group and use of this within the network extent will also fail. If this were to be fixed, the code is still likely to fail as a result of using min and max measures relative to a single datum – so gaps in the extent of the feature relative to the	724637

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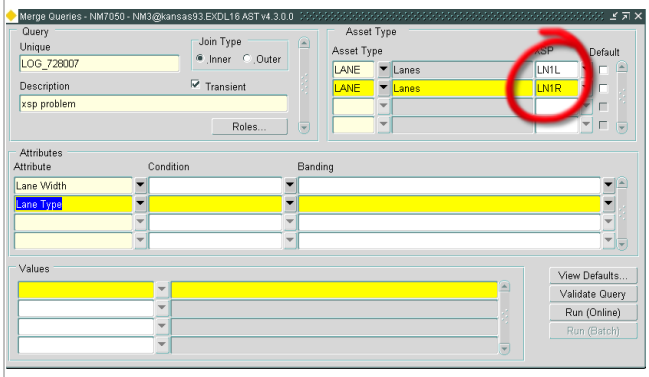
	route of choice will be ignored. This has not been explicitly tested but is flagged as fixed in the modules that have been assembled for release 4.3.0.0	
	Create derived assets form, nm0435, user cannot enter a route number manually. They must use the gazetteer to select a route (s) to run the form. This is an enhancement request and as such has not registered on the development radar until recently. This log has been around since September 2008. It relates to NM0435 and is still a problem.	716019
	Derived asset TSTR fails when a NM3ENG_DYNSEG.GET_FIRST_VALUE() derivation is used. The error states that the field Q.BEGIN_MP must be declared. This is marked as requiring a system test. The SQL for get_first_value works on a merge section on Kansas data so is believed fixed prior to 4.0.5.4 Fix53. It may be fixed but no explicit evidence has been generated.	722941
	Performance problems prior to 4.0.5.4 Fix 53 were raised in this log. Various improvements have been made, none of which specifically target this log and no customer feedback has been provided since Fix53 has been applied. Since these fixes have been rolled in release 4.3.0.0, the problem may no longer persist.	724081
	The limited amount of help relating to derived assets is based on the original code and not the later releases using bulk merge. This problem is likely to remain at release 4.3.0.0	724272
	Derived asset automatic refresh option is no longer available using bulk merge. “Before the upgrade (to 4054) we could set a Rebuild and a Refresh interval for keeping derived assets up to date. After the upgrade we only have the rebuild option.	724273
	This log relates to the change in derived assets that prevent the attributes of related assets from being used. The log states” Can no longer use "INV.xxxx" columns in derived asset setup as it causes an ORA-00904: invalid column name when creating the derived asset.” It is a log that is flagged as an enhancement request and therefore did not appear on the development radar. However, it is missing functionality and should be considered as a bug.	725193
	Enhancement request to allow multiple selections of assets and xsps to speed up the merge query extract definition.	727161
0110211	Failure of merge query to deliver a repeated XSP value. For example querying on an asset in xsps L1 and L2 will only bring back xsp data in one of the two in the restricted set. As an example, a query was built as shown below.  There is no way to restrict the XSP in the flexible attribute condition/criteria tab. Hence, if a user wishes to restrict by a combination of XSPs, the only way to achieve this is to configure two repeating asset types as shown above. However, the results over an area which has both assets (exclusive by XSP) will only contain one of the assets in a singular XSP.	728007

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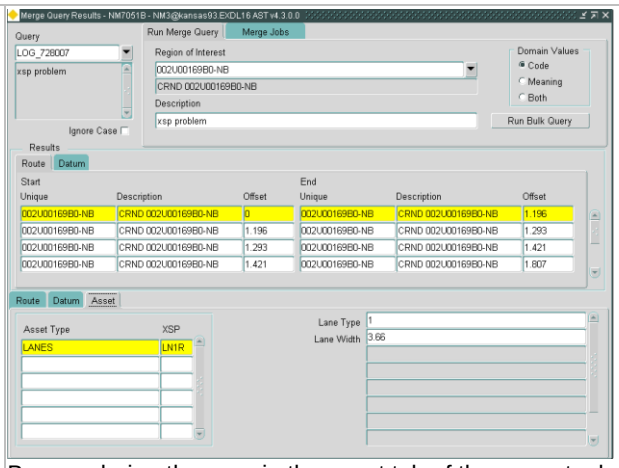
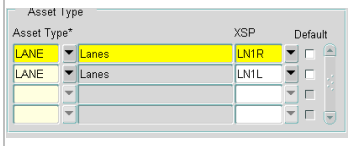
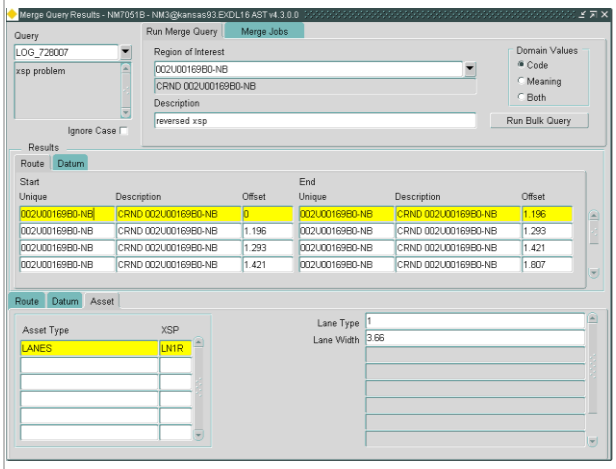
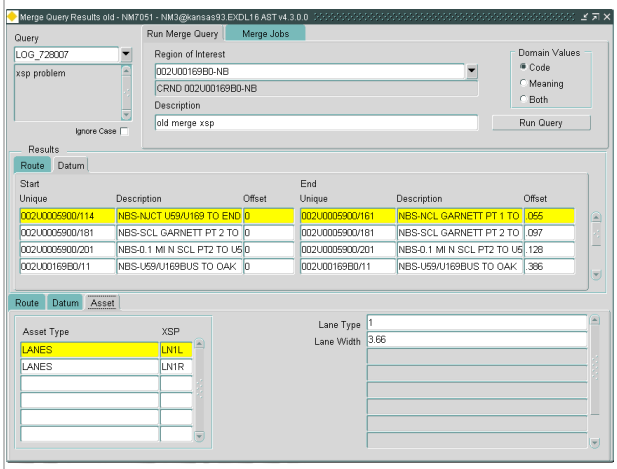


By re-ordering the xsps in the asset tab of the query tool, different results are obtained.





Execution of the old merge over the same route shows that the two assets are provided in the same section as desired:



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	A user has complained that a derived asset cannot be created due to the restricted number of column mappings.	724833
0110374	This is a problem whereby the data being returned as attributes of a point source within a merge query result set does not inherit attributes of the linear asset data that is also present at that point. This is a critical difference between old and new merge query results. This is fixed inside an internal release 4.0.5.4 Fix 70 and in 4.3.0.0 Fix 1 both are awaiting system test but the issue has been deemed suitable to be left until release 4.4	728377 728148
	If merge query cannot derive a linear reference for a chunk on a route due to the lack of meaningful measures due to the route never having been rescaled, it returns a measure of -1. Negative route offsets are allowed and this value should not be used as a means of reporting a problem.	72771
0110281	Failure of the merge result views indicating point data as a linear item due to the point being coincident with a node. Under these circumstances, the point source can be represented in two distinct merge sections which is then decoded by the view definition to indicate a linear item.	728396

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