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NETCOOL® SOLUTIONS

Netcool®/OMNIbus™
Version 7

Virtual Workshop
for
OMNIbus Administrator (v7.0.2)

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Micromuse Ltd
Disraeli House
90 Putney Bridge Road
London SW18 1DA
Tel: +44 (0)20 8875 9500

Document Control Page

This document has been prepared by the following Micromuse personnel:

Authors: Don Wildman

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TABLE OF CONTENTS

1   Introduction

1.1 Overview

The purpose of this workshop is to provide a practical introduction to the improved centralized administration functionality provided by Netcool/OMNIbus v7.0.2. It is intended for use by engineers who have completed v7 training either in the classroom or by completion of the v7 Virtual Workshop, and who have a good practical understanding of ObjectServer configuration and the management of the Netcool Process Control Agents. Installation of v7 or v7.0.1 is a pre-requisite for installation of v7.0.2.

This document describes the changes and additions that v7.0.2 delivers to the Administrator graphical user interface (GUI). It does not describe the initial Administrator functionality delivered with v7/v7.0.1 that is described in the v7 Virtual Workshop and Administration Guide.

The experienced user will find much of the dialogue intuitive so may choose to use this workshop primarily as a reference to specific new or improved functionality. **However all users are recommended to study section 2 Installation, section 3 Initial Setup, and important notes in the VisualPA sections 5.1 Overview and 5.2 PA Configuration files.**

The enhanced Netcool Administrator for OMNIbus tool provides a new desktop style user environment providing three areas of functionality, each under license control.

- **Single ObjectServer configuration**
  This basic mode provides the user with the capability to connect to a single ObjectServer at a time to execute the ObjectServer Administration functionality. The ObjectServer connection may be closed, and a new connection established to the same or different ObjectServer without first terminating the configuration client desktop session.
  The option provides similar functionality to that of nco_config as supplied with v7.0.1. A number of enhancements have been made to improve the usability and workflow of the administrator session.

- **Multiple ObjectServer configuration**
  This Power Admin feature enhances Netcool Administrator allowing concurrent sessions to multiple ObjectServers. This facilitates the execution of similar tasks across each connected ObjectServer. Aspects such as the ability to paste an entire table definition from one ObjectServer to another in a single operation are thus possible.

- **VisualPA (also known as VisiPA)**
  This second Power Admin feature provides GUI based administration functionality for v7 Process Control Agents providing a status display of managed Process and Services refreshed at regular intervals. The functionality includes all options currently supported by the command line pa options providing the ability to add amend delete stop and start Services and Processes from a central administration point.
  Note that the current Windows PA agents have limited functionality and so cannot be managed from Administrator. You should only connect to UNIX based v7 Process Agents at this stage.

Note: There may be cosmetic differences between the screenshots in this document and the actual application. There are two main reasons for this:
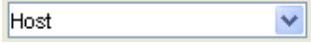
- The application may have changed subsequent to the preparation of the screen shots in this document.
- The cosmetic appearance of the application may be different on different platforms. The screenshots for this document were done on a Windows XP platform.

1.2   Document Structure

The document provides the following sections in addition to this introduction.

- Installation
  A description of installation and license requirements.
- Initial Setup
  A description of the initial configuration of a User's Administrator default settings
- ObjectServer Configuration
  New and modified functionality available within an ObjectServer administration
  session. Functionality existing in 7.0.1 is not explained in this document.
- Visual PA
  A full description of the options for configuration and management of PA agents,
  services and processes. The reader is assumed to have practical experience of PA
  management so the underlying functionality of PA is not described in detail.

1.3   Glossary

Administrator	Netcool® Administrator for OMNIbus™. (This application)
UI	User Interface
GUI	Graphical User Interface
PA	Process Administrator daemon (also known as PAD)
Managed Components	The software configured by Administrator (e.g. ObjectServers, PAs)
Managed processes	Processes under PA, PA and Administrator processes (excluding clients)
The Netcool System	Netcool Omnibus installation
Editing	All actions normally associated with viewing and modifying.
Process Status	Information about a process, including execution status, i.e. Running, Stopped, restarting, and identifier of host on which the process is running.
User	A person or other entity that employs the services provided by Administrator
Interfaces file	This file stores connection information for PAs and ObjectServers. On Windows the file is called: 'sql.ini' On Unix the file is called: 'omni.dat'
Drop-down or Combo-box	A GUI control comprising a text field and a list that is displayed when pressing the button on the right of the control: In editable mode, this control allows the user to enter text in the text field as well as selecting items from the list. In non-editable mode the user may only select items from the list.
Context menu or right-click menu	A menu displayed by right-clicking with the mouse. The contents of the menu will depend on the item being clicked on.
Disabled	A GUI control state. Disabled controls will not respond to the user. The disabled state is often indicated to the user by 'greying' the control – but this will be operating system dependent.
Read-only	A GUI control state. A read-only control may respond to the user but will not allow the user to change the contents of the control. E.g. a read-only text field will not allow the user to type into the field but will allow selection and copying of text in the field. A disabled text field does not even allow the selection of text.
Toggle button	A button, that when clicked on, stays pressed in (i.e. selected). It must be clicked on a second time to pop out (i.e. deselect). The way in which its selection/de-selection state is represented in the GUI will be operating system dependent.

1.4 Index of Lab Exercises

2   Installation

2.1 Licensing

Netcool/Administrator requires FLEX licensing v9.2 which is the latest version available from the support download site.

> http://support.micromuse.com/downloads/

There are three license codes:

- Basic ObjectServer administration   cro_nco_config
- Multiple ObjectServer administration   cro_nco_administrator
- VisualPA   cro_nco_visualpa

The first of these has been provided with the v7 ObjectServer by default. The other two codes are optional Power Admin add-ons. Recently requested v7 licenses may also include these items. Users wishing to add these components to existing license request them via the details box of the license request form.

The additional licenses may be added at any time. The associated functionality will be enabled on start of the administrator application according to the licenses available.

2.2 Installation

Lab: 1) Installation

V7.0.2 applies as a patch to a full v7 installation. Users new to v7 must first obtain and install the v7.0.1 OMNIbus distribution before installing v7.0.2.

The Administrator invokes functionality provided by the UNIX process agent that is not available from the command line. It is necessary for the PA patch delivered with v7.0.2 to be implemented for that functionality to be fully enabled. Further details are provided in the release notes.

Obtain the v7.0.2 and related PA patches including the Netcool/Administrator software from the Micromuse Support site: http://support.micromuse.com/downloads/ or appropriate ftp site.

On UNIX based systems install the software as normal OMNIbus patches using the nco_patch utility. On Windows which does not at the moment provide full PA functionality simply uncompress the Administrator patch file into the %OMNIHOME directory.

Obtain licenses for the functionality that you wish to exercise.

***Do not execute the application until you have read section 3 initial setup.***

You will need at least one server running OMNIBUS v7 PA and ObjectServer processes to be able to complete the labs in this workshop

3   Initial Setup

3.1   Overview

Administrator consists of a desktop environment supporting multiple windows within its framework. Basic configuration is held in a .netcool directory in the user's home directory. On initial execution the desktop will display the basic menu bar at the top of the display. A button bar will be displayed to the left if either of the optional Power Admin licenses are available. The button bar is suppressed by default if only the basic license is found. It may be enabled or disabled via the View menu.

On first execution the Connections wizard is displayed. Described in detail in section 3.2 this wizard enables the import of ObjectServer and Process Agents that will be administered by this user. The wizard will only display in later sessions if the underlying configuration files have been modified. The user may also choose to re-import the interfaces at any time by use of the import function in the File menu.
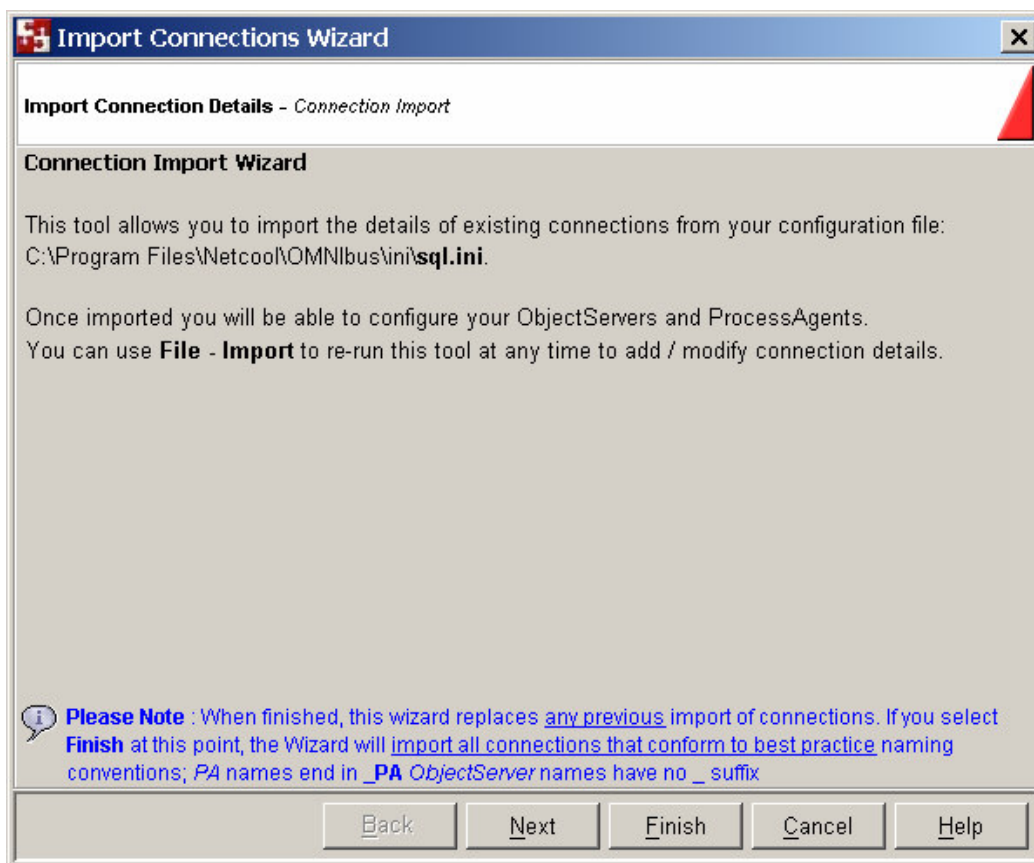
Lab: 2) Import Connections

Run the Administrator application with the UNIX command nco_config, or by selecting the Administrator icon from the Windows application bar. Follow the steps in the import connections wizard described in the next sections.
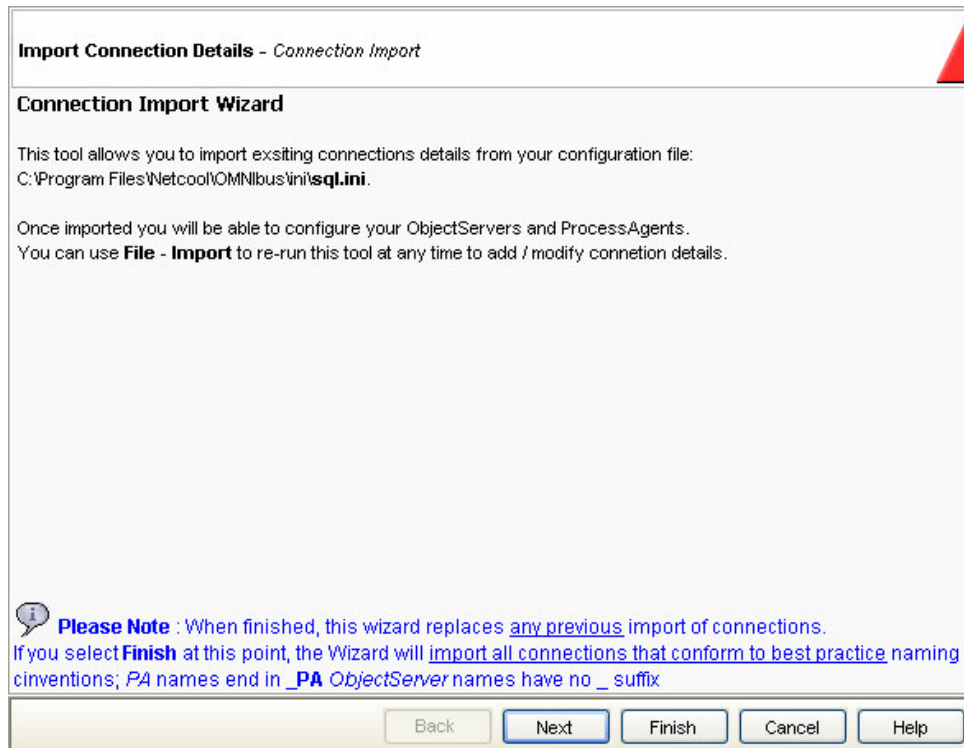
3.2   Import Connections Wizard

Administrator takes its ObjectServer, PA and host information from the sql.ini/omni.dat file found in the Omnibus installation. The process of reading the sql.ini/omni.dat file and deciding which entries are ObjectServers and which are PAs is performed using a wizard style interface.

Note: If the Visual PA license is not present the PA import options will not be made available. In that case, there will be fewer steps in the Wizard so some detail on the forms will appear slightly differently to the following examples.

- The wizard will be run automatically when the new version of nco_config is run for the very first time
- The user will be prompted to run the wizard if the sql.ini/omni.dat file has changed since the last import or if the users saved setup files have been deleted from .netcool in their home directory.
- The wizard can be run if the user selects the menu item: File→ Import

3.2.1   Introduction page

This details which file is being read and what effect it will have.

- **Next button** - Selecting this button will display the next wizard page (which will be the ObjectServer Connections page).
- **Finish button** - Selecting this button will complete the import operation. The OS and PA entries created will be based on the standard naming convention (described later). If the entries in the interfaces file **do not** follow the standard naming convention then the 'Finish' button should **not** be selected at this stage.
- **Cancel button** - Selecting this button will cancel the import operation.
- **Help button** - Selecting this button will display the application's help system.

3.2.2 ObjectServer Connections page

This window allows the user to specify which entries are for ObjectServers. The entries will be pre-selected according to the recommended naming convention and workflow 'Best Practice' for entries in the interfaces file:

- PA names have a '_PA' suffix.
- Gateway names have a '_GATE' suffix
- Proxy names have a '_PROXY' suffix
- Any name that does not have one of the above suffixes is considered an ObjectServer for the initial selection. The user may then add or remove entries to obtain the required set of ObjectServers to be managed through this instance of Administrator
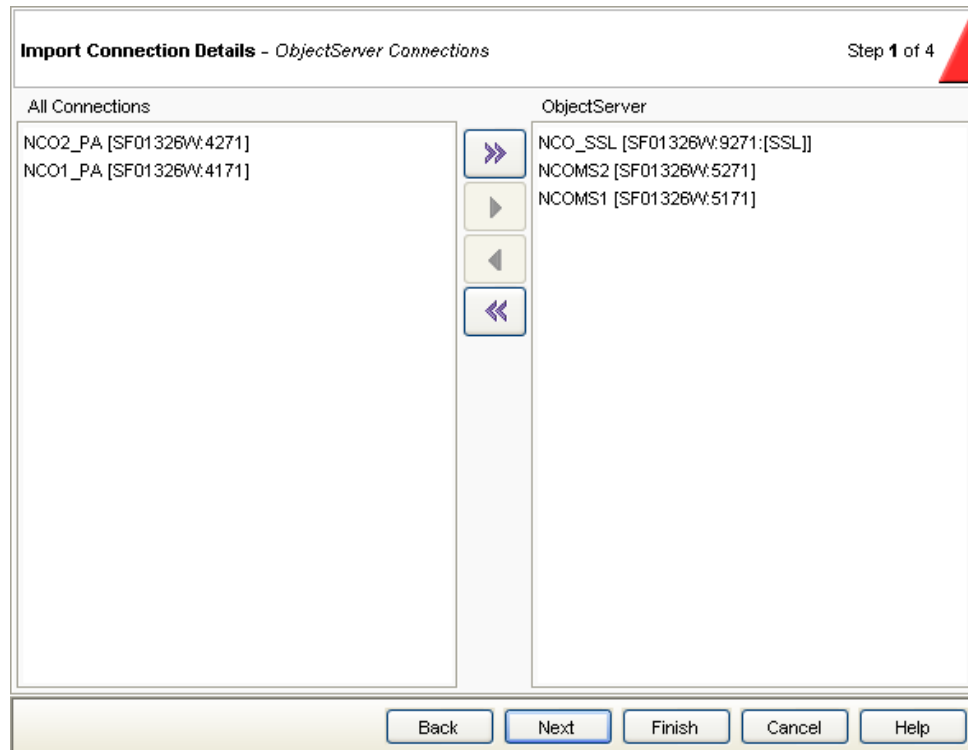
- **All Connections list** - This multi-selection list contains the names of all the entries that are not considered to be ObjectServers. Double clicking on an entry will move it to the other list.
- **ObjectServer list** - This multi-selection list contains the names of all the entries that are considered to be ObjectServers. Double clicking on an entry will move it to the other list.
- **Remove All button** - Moves all the entries from the 'ObjectServer' list and puts them in the 'All Connections' list.
- **Remove Selected button** - Moves all the selected entries from the 'ObjectServer' list and puts them in the 'All Connections' list.
- **Add All button** - Moves all the entries from the 'All Connections' list and puts them in the 'ObjectServer' list.
- **Add Selected button** - Moves all the selected entries from the 'All Connections' list and puts them in the 'ObjectServer' list.
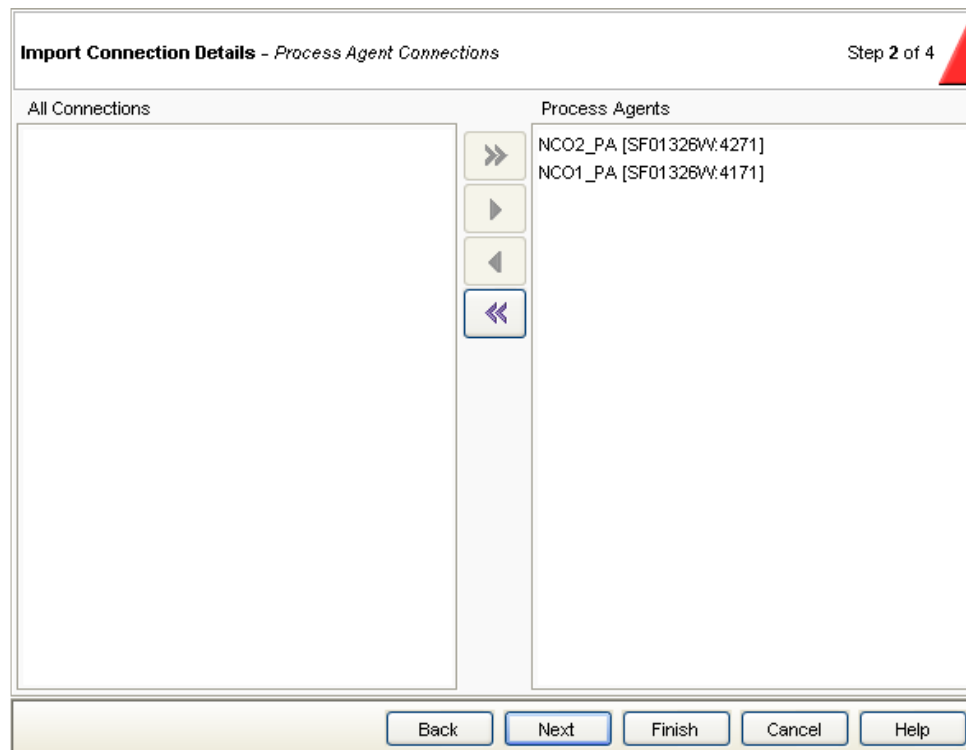- **Next button** - Selecting this button will display the next wizard page (which will be the PA Connections page).

- **Finish button** - Selecting this button will complete the import operation. The PA entries created will be based on the standard naming convention. The user may now add or remove entries to obtain the required list of ObjectServers.
- **Cancel button** - Selecting this button will cancel the import operation.
- **Help button** - Selecting this button will display the application's help system.

3.2.3 PA Connections page

This window allows the user to specify which entries are for PAs and will only appear if the Visual PA license is available. The entries will be pre-selected according to the standard naming convention which is described in the previous section.
Note: At this point the software cannot detect the type of system on which the PA processes are located. Take care to import only PA processes running on UNIX platforms. The functionality of the Windows PA process is currently limited and does not support the connections needed by the Administrator Client.

The lists and buttons on this window operate in the same way as the ObjectServer connections window.

- **Next button** - Selecting this button will display the next wizard page (which will be the Summary page).
- **Finish button** - Selecting this button will complete the import operation.
- **Cancel button** - Selecting this button will cancel the import operation.
- **Help button** - Selecting this button will display the application's help system.

3.2.4 Summary page

This window summarizes the connection designations made in the previous two windows. Selecting the finish button will finish the import process.

```
Import Connection Details – Connections Import Summary                Step 3 of 4

Details of connections
The following connections will be imported from sql.ini

ObjectServer Connections
  NCO_SSL [SF01326W:9271:[SSL]]
  NCOMS2 [SF01326W:5271]
  NCOMS1 [SF01326W:5171]

                                                    Summary of the connection settings

ProcessAgent Connections
  NCO2_PA [SF01326W:4271]
  NCO1_PA [SF01326W:4171]




    Selecting Finish will instruct this wizard to replace any previous import of connections.

                        Back    Next    Finish    Cancel    Help
```

3.3   Button Bar

This is located on the left of the main application window and may be enabled or disabled via the View menu.

> *Lab: 3) Navigation*
>
> *Explore the Navigation options in the Button Bar as you go through the Host, ObjectServer and PA options in the following sections. Test the Tool and connection capability as the various menus are explained.*

3.3.1 Host navigation

The Navigator button provides a list of hosts for which Objects have been imported. Each host entry may be expanded to see a list of ObjectServers and PAs configurable on that host. Double-clicking an ObjectServer or PA initiates a connection dialogue.


Hosts may be grouped into "Regions". This feature allows each user to group the managed hosts for ease of management in a complex installation.
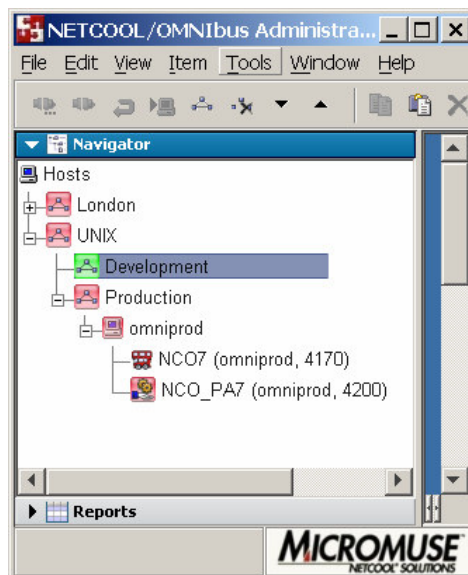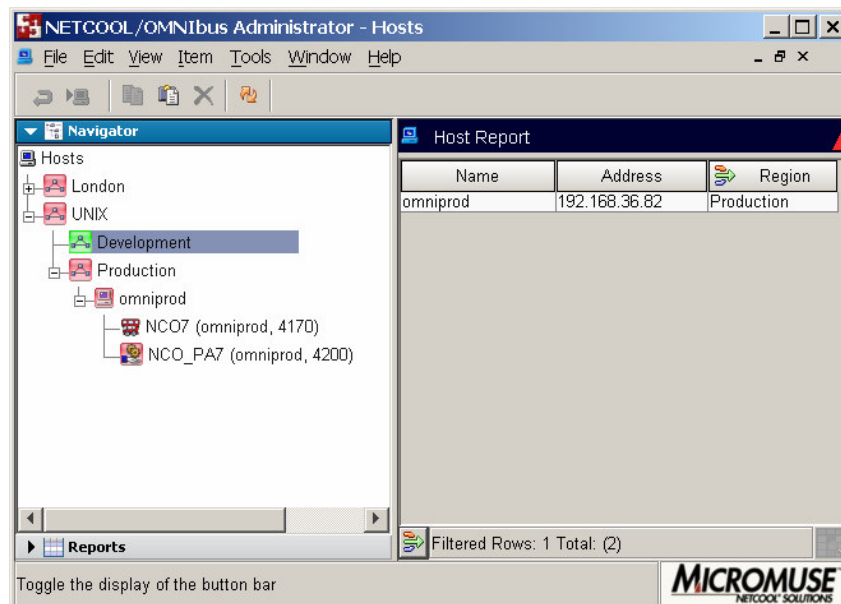
3.3.2   Report section

This section of the panel provides access to report windows for Hosts, ObjectServers and PAs imported into the Administrator. Selecting a button in this section will display the associated report in the Administrator desktop.
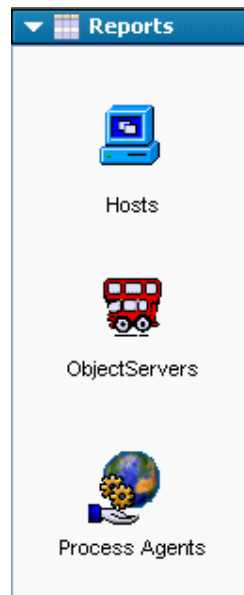
3.3.2.1 Host report

This lists the details of the hosts that the application read in from the sql.ini/omni.dat.

- • **Name column** - The name of the host machine, as defined in the interfaces file.
- • **Address column** - The IP address of the host machine.
- • **Region** – Displayed if the user has defined Regions to group hosts. In the example shown a Filter has been applied to the Hosts report to show only Hosts contained in the region named "Production". See section 4.8 for more information on filter usage.

- **Context menu** - This is displayed by right-clicking a row in the report.
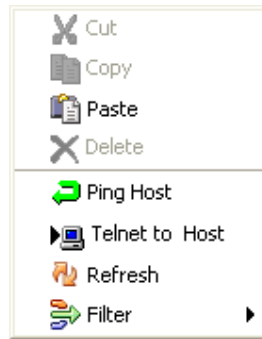
- **Ping Host** - Selecting this will run the ping tool for the currently selected host.
- **Telnet to Host** - Selecting this will run the telnet tool for the currently selected host.
- **Refresh** – provides a refresh of the report data.
- **Filter** – Enables filtered views. See section 4.8 for a full description off filtering functionality.

3.3.2.2 ObjectServer report

This lists the details of the ObjectServers that the application read in from the sql.ini/omni.dat (interfaces) file.

- **Name column** - This column shows the name of the ObjectServer (as defined in the interfaces file).
- **Host column** - This column shoes the name of the machine that the ObjectServer runs on.
- **Port column** - This column shows the port number that the ObjectServer listens on.
- **SSL column** - This column indicates if the connection to the ObjectServer uses SSL.

- • **Context menu**
  This is displayed by right-clicking a row in the report.

- • **Connect to ObjectServer** - Selecting this will display the 'ObjectServer Security' dialog.
- • **Ping Host** - Selecting this will run the ping tool for the host that the ObjectServer is located on.
- • **Telnet to Host** - Selecting this will run the telnet tool for the host that the ObjectServer is located on.
- • **Refresh** – provides a refresh of the report data.
- • **Filter** - Enables filtered views. See section 4.8 for a full description off filtering functionality.
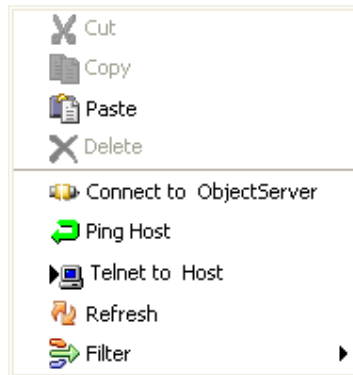
3.3.2.3 PA report

This lists the details of the PAs that the application read in from the sql.ini/omni.dat interfaces file.


- • **Name column** - The name of the PA as defined in the interfaces file.
- • **Host column** - The name of the host machine that the PA is running on.
- • **Port column** - The port number that the PA can be contacted through.
- • **SSL column** - This column indicates if an SSL connection is being used to communicate with the PA.
- • **Running column** - This column shows the number of running processes controlled by the PA. To get this information, the user must have connected to the PA. A hyphen ('-') will be displayed if the user has not connected to the PA yet.
- • **Pending column** - This column shows the number of pending processes controlled by the PA. To get this information, the user must have connected to the PA. A hyphen ('-') will be displayed if the user has not connected to the PA yet.

- **Dead column** - This column shows the number of dead processes controlled by the PA. To get this information, the user must have connected to the PA. A hyphen ('-') will be displayed if the user has not connected to the PA yet.
- **Save Required column** - If changes have been made to the PA's configuration but the PA's configuration file has not been updated then this column will show a 'true' value (tick).
- **Context menu** - This is displayed by right-clicking a row in the report.
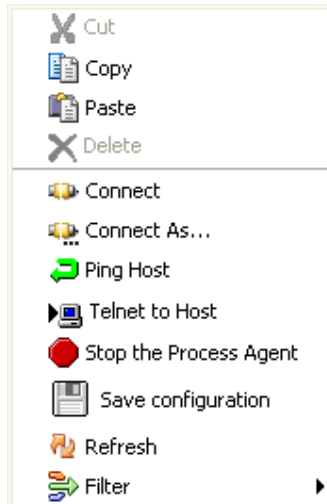
- **Cut menu item** - Not enabled – you cannot cut rows in a PA report.
- **Copy menu item** - Selecting this will copy the contents of the PA (i.e. the processes and services) to the clipboard.
- **Paste menu item** - Selecting this will paste the PA contents on the clipboard to the selected PA. If the selected PA is not connected (i.e. the Process/Service Details dialog is not displayed) then the PA Security dialog will be displayed so that a connection can be made. Once connected, the Process Agent Consistency Checker wizard (section 5.9) will be displayed so that alterations can be made to the PA contents before pasting into the target PA.
- **Delete menu item** - Not enabled – you cannot delete rows in a PA report.
- **Connect menu item** - Selecting this will display the Process Agent Security dialog if no default login details have been set, otherwise it will attempt to log in using the default login details.
- **Connect As menu item** - Selecting this will display the Process Agent Security dialog.
- **Ping Host menu item** - Selecting this will run the ping tool for the host that the PA is located on.
- **Telnet to Host menu item** - Selecting this will run the telnet tool for the host that the PA is located on.
- **Stop the Process Agent menu item** - Selecting this will stop the currently selected PA.
- **Refresh** – provides a refresh of the report data.
- **Filter menu item** - Enables filtered views. See section 4.8 for a full description off filtering functionality.

3.4   Connection Security

Connection to the ObjectServers and Process Agents is managed through connection dialogues. An ObjectServer connection is validated against the appropriate ObjectServer. PA connections are validated against the PA host system level authentication. Each

connection dialogue provides the options to save the logon details for reuse during the Administrator session. This facilitates multiple access where the user has similar username and password details for multiple objects. The two dialogues are described in the following sections.

3.4.1 ObjectServer Security dialog

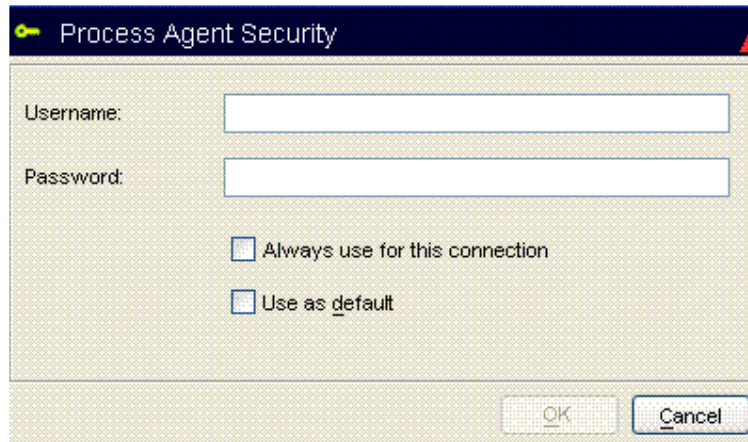This dialog is displayed whenever the user attempts to connect to an ObjectServer.

- **Username field** - This editable text box allows the user name to connect with to be specified.
- **Password field** - This editable text box allows the password to connect with to be specified. Text typed into this field is hidden for security reasons.
- **Always Use for this connection** - Checking this box indicates that the next time the user tries to connect to the same ObjectServer during this administrator session, the same login details will be used automatically (i.e. the user will not see a login dialog). These login details will not be remembered once the current session ends.
- **Use As Default check box** - Checking this box indicates that the next time this dialog is displayed during this administrator session, the previously entered user name and password will automatically be entered into their respective fields. If the box is unchecked then the user name and password will be blank the next time this dialog is displayed. These login details will not be remembered once the current session ends.

3.4.2 Process Agent Security dialog

This dialog is displayed whenever the user attempts to connect to a PA.

NB: While full functionality of the Administrator application itself is available on all supported platforms, the Process Agent to be managed must be running on a UNIX platform. Full Process Control functionality is yet to be made available on Windows operating systems.

- **Username field** - This editable text box allows the user name to connect with to be specified. This will be the operating system level username for the server on which the Process Agent is operating
- **Password field** - This editable text box allows the password to connect with to be specified. Text typed into this field is hidden for security reasons.
- **Always Use for this connection** - Checking this box indicates that the next time the user tries to connect to the same PA, the same login details will be used automatically (i.e. the user will not see a login dialog). These login details will not be remembered once the current session ends.
- **Use As Default check box** - Checking this box indicates that the next time this dialog is displayed, the previously entered user name and password will automatically be entered into their respective fields. If the box is unchecked then the user name and password will be blank the next time this dialog is displayed.

4 ObjectServer Configuration

The ObjectServer configuration functionality has been extended in the new version of Administrator to improve the workflow and usability of the interface. The following sub-sections describe only the new and changed functionality.

Lab: 4) ObjectServer configuration

Explore the various menu options particularly the new filter capabilities as you read through the following sections. If you are working on a test system then you may wish to create temporary databases and tables to explore the modified database and table functionality.

4.1 Database Context Menu

The drop database functionality has been updated to remove the limitation that the dropped database could not contain any tables. Issuing the drop command for a database will now operate against a database containing tables by first dropping the tables.
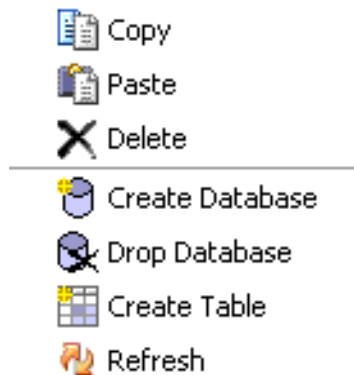
- **Copy** - A copy of the database schema plus the schemas of the tables in the database will be put on the clipboard. Note: the rows contained in any tables will not be copied.
- **Paste** - If the clipboard contains a database schema (optionally, plus tables) then a dialog will be displayed so that the user can specify a name for the database that will be created from the schema on the clipboard. The name must be unique. If the clipboard contains a table schema then a dialog will be displayed so that the user can specify a name for the table that will be created from the schema on the clipboard. The table name must be unique in the context of the table being pasted to.
- **Create Database** - Provides the ability to create a new database.
- **Drop Database** - The tables in the database to be dropped are emptied and then deleted before an attempt is made to drop the database. This has been done because a database cannot be dropped if it contains any tables.
- **Create Table** - Provides the ability to create a new table within the selected database.

4.2   Database Table Context Menu

New functionality for updating data has been added to the Data View of a database table. Right clicking on a data row will result in the context menu below being displayed. Right clicking in the Data View when a row is not selected will result in the same menu except for the Update Row and Delete Row options.
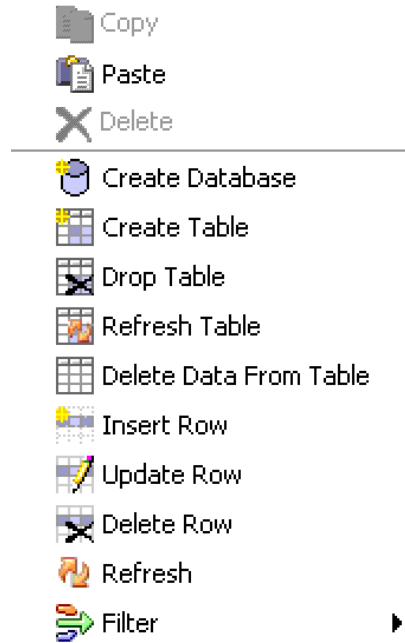
- **Copy** - A copy of the table schema will be put on the clipboard. Note: the rows contained in the table will not be copied.
- **Paste** - If the clipboard contains a table schema then a dialog will be displayed so that the user can specify a name for the table that will be created from the schema on the clipboard. The table name must be unique in the context of the table being pasted to.
- **Create Database** - Provides the ability to create a new database.
- **Create Table** - Provides the ability to create a new table within the selected database.
- **Drop Table** - This is not a new option but its functionality has been modified so that it removes data from the selected table before dropping the table. It is not possible to drop a table that has data in it.
- **Delete Data From Table** - Selecting this option will remove all the rows in the currently selected table.
- **Insert Row** - This will display the Insert Row dialog. This allows the user to specify values for the columns in the new row.
- **Update Row** - This will display the Update Selected Row(s) dialog. This allows the user to specify new values for the columns in the selected rows.
- **Delete Row** - This will cause the selected rows to be deleted.

4.3   Insert Row dialog

This dialog enables the user to add a row to a database table. The user must provide a value
for the primary column and any 'no default' columns in the table. All other columns are
optional and their inclusion is decided by clicking on the tick box to the left of the column
name. When a column is included, a value editor is displayed to the right of the column
name.

- **Table area** - This specifies the database and table that are to be updated.
- **Columns area** - This specifies the columns in the table being updated and the values to
  be put in the new row.
  o **Value editor** - This field, to the right of the column name, allows the user to enter a
    value for the column that will be inserted into the table. In the *alerts.status* table
    columns may have conversions. These will be displayed in a drop-down control.
- **Ok button** - Selecting this will dismiss the dialog and result in a new row being inserted
  into the specified table in the ObjectServer.
- **Cancel button** - Selecting this will dismiss this dialog – no changes will be made to the
  specified table.

4.4   Update Row dialog

This dialog enables the user to update rows in a database table. The user cannot change the value for the primary column. All other columns are optional and their inclusion is decided by clicking on the tick box to the left of the column name. When a column is included, a value editor is displayed to the right of the column name.

- **Table area** - This specifies the database and table that are to be updated.
- **Columns area** - This specifies the columns in the table being updated and the values to be put in the new row.
  - o   **Value editor** - This field, to the right of the column name, allows the user to enter a value for the column that will be inserted into the table. In the alerts.status table columns may have conversions. These will be displayed in a drop-down control.
- **Ok button** - Selecting this will dismiss the dialog and result in the currently selected rows being updated with the column values specified by the user.
- **Cancel button** - Selecting this will dismiss this dialog – no changes will be made to the selected rows.

4.5   Improved Workflow

Several new links have been added to the maintenance dialogues to ease to workflow when creating related items.

4.5.1 New Restriction Filter button

A 'New Restriction Filter' button is provided on the 'Restriction Filters' panel in the 'Edit User' dialog (shown below – button marked with red arrow) and the 'Edit Group' dialog. This facilitates the maintenance of Restriction Filters without leaving the User or Group dialogues.

4.5.2 New User button

There is a 'New User' button provided on the 'Users' panel in the 'Edit Group' dialog (shown below– button marked with red arrow) facilitating the creation of new Users without closing the Group maintenance dialogue.

4.5.3 New Trigger Group button

There is a 'New Trigger Group' button provided on the 'Edit Database Trigger' (shown below
– button marked with red arrow), 'Edit Signal Trigger' and 'Edit Temporal Trigger Panel'
dialogs facilitating the creation of new Trigger Groups without closing the Trigger dialogue.

4.6　Permission Objects dialog

This dialog is reached by editing a role, selecting the 'Permissions' tab and then selecting the 'Add permission' button. The purpose of this dialog is to build a list of permissions from the set of all permissions. It is a more efficient method of adding permissions to a role than the previous mechanism.
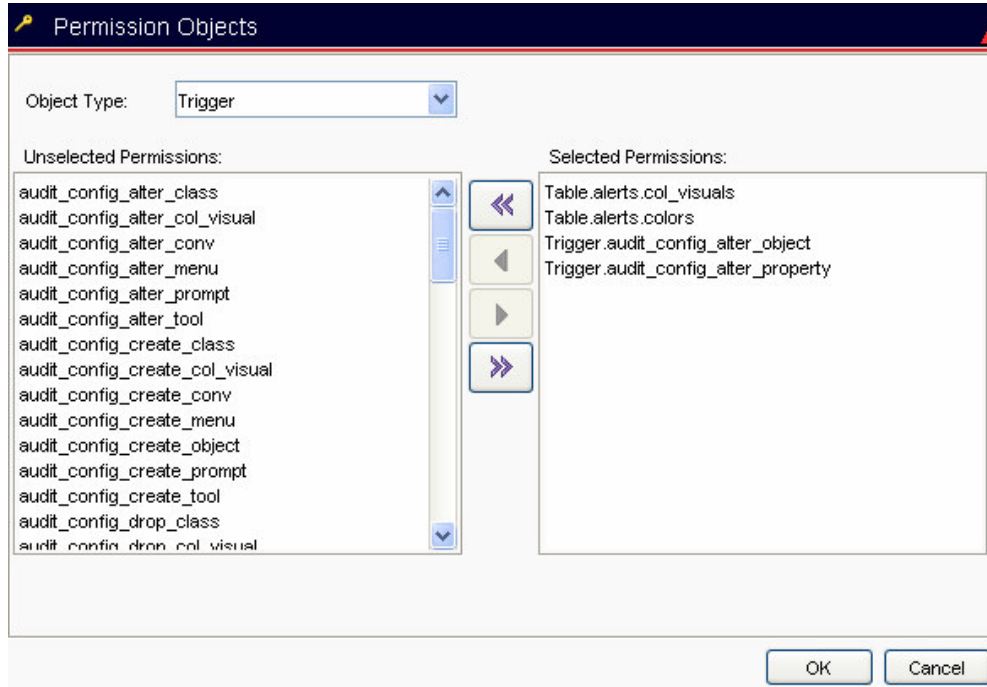
- **Object Type drop-down** - This non-editable drop-down lists the objects for which permissions can be specified. Selecting an item in the list will result in the 'Unselected Permissions' list being updated.
- **Unselected Permissions list** - This lists the permissions which exist for the object specified by the 'Object Type' drop-down but do not appear in the 'Selected Permissions' list. The names listed are not fully qualified as the object type can be inferred from the 'Object Type' drop-down.
- **Selected Permissions list** - This lists the permissions that are to be applied when the 'OK' button is selected. The names of the permissions are fully qualified as their object type cannot be inferred from the 'Object Type' drop-down.
- **Remove All button** - Selecting this button removes all items from the 'Selected Permissions' list. Any of the removed permissions that have an object type the same as the current 'Object Type' will be added to the 'Unselected Permissions' list.
- **Remove Selected button** - Selecting this button removes all the currently selected items from the 'Selected Permissions' list. Any of the removed permissions that have an object type the same as the current 'Object Type' will be added to the 'Unselected Permissions' list.
- **Add Selected button** - Selecting this button moves the currently selected items from the 'Unselected Permissions' list to the 'Selected Permissions' list.
- **Add All button** - Selecting this button moves all the items from the 'Unselected Permissions' list to the 'Selected Permissions' list.

4.7   Trigger specific filter buttons

These toggle buttons appear in the toolbar when the Triggers panel is displayed:

They apply a filter and view to the triggers table (when pressed in) which is customized for the three different kinds of trigger. Un-selecting a selected button will restore the table to its unfiltered, standard view state. Only one button may be selected at a time and the effects of selecting one button after another are not cumulative. I.e. the filtering and view configuration applied after selecting one button will not be retained upon selecting another button.

- **Show Database Triggers Only** - Selecting this button will filter the triggers table on database triggers and display two extra columns: 'Database' and 'Table'.
- **Show Signal Triggers Only** - Selecting this button will filter the triggers table on signal triggers and display one extra column: 'Signal'.
- **Show Temporal Triggers Only** - Selecting this button will filter the triggers table on temporal triggers and display one extra column: 'Interval'.

4.8   Table filters and views menu

4.8.1 Menu

Many of the tables now support filters and views. This functionality can be accessed by right clicking on a table's header. The menu, shown below, is displayed if filtering or configuration of views is possible on the table. Menu options may be hidden or disabled if they are not applicable in the context the menu is being displayed.
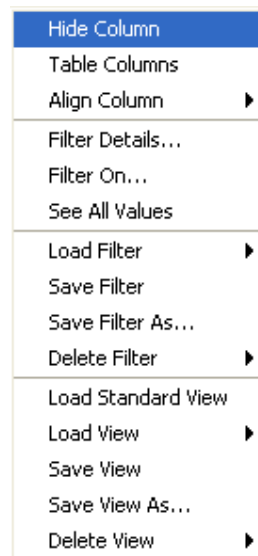
The rest of this section details the menu items.

- **Hide Column** - This will hide the column that has been right-clicked on.
- **Tables Columns** - This will display the 'Column Settings' dialog which will allow columns to be hidden of shown by clicking on the column names listed.
- **Align Column** - Allows the clicked-on column's data to be aligned in one of the following ways:
  - o   Left
  - o   Centre
  - o   Right
- **Filter Details** - Selecting this item will display the 'Filter Settings' dialog.

- **Filter On** - This will display the 'Filter' dialog which allows a filter to be defined for the current table. When the filter is applied, each row in the table will be tested to see if it satisfies the filter. I.e. that comparing the contents of the column specified with the value specified using the operator specified will produce a result of 'true'.

- **See All Values** - Selecting this option will remove any filters that may have been applied to the table. Therefore all rows will be displayed.

- **Load Filter** - Loading a filter will remove any existing filtering and apply the loaded filter. If there are less than five or fewer filters saved for a table then the saved filters will appear as sub-items (shown below) of the 'Load Filter' item.

Load Filter ▶	my filter
Save Filter	my filter2
Save Filter As…	
Delete Filter ▶	

> If more than five filters have been saved then the 'Load Filter' menu item will have '…'. Selection of this menu item will result in the 'Load Filter' dialog being displayed.

> The filters available to be loaded will be those saved against the name of the user who is running the Administrator application (i.e. the operating system user).

- **Save Filter** - Selecting this menu-item will save the details of the currently applied filter. This item will only be enabled if a filter is currently applied to the table.

> If the current filter was loaded then the filter details will replace those stored for the loaded filter. If not, then the 'Save Filter' dialog will be displayed which allows a filter name to be specified.

> The filter will be saved against the name of the user who is running the Administrator application (i.e. the operating system user). The filter will only be available to this user.

- **Save Filter As** - Selecting this menu item will always result in the 'Save Filter' dialog being displayed.

- **Delete Filter** - Deleting a filter will remove details of the selected filter from the system's permanent storage. Any filtering on the table will be un-affected. The appearance of this menu item depends on the number of filters saved; see the section describing the 'Load Filter' menu item for details.

> Depending on the number of filters saved, the 'Delete Filter' dialog may be shown.

> The filter will be saved against the name of the user who is running the Administrator application (i.e. the operating system user). The filter will only be available to this user.

- **Load Standard View** - Selecting this item will configure the table's columns in the default (i.e. 'factory settings') configuration.

- **Load View** - This menu item allows previously saved column configurations to be applied to the current table. The appearance of this menu item depends on the number of views saved; see the section describing the 'Load Filter' menu item for details.

> Depending on the number of filters saved, the 'Load View' dialog may be shown.

> The views available to be loaded will be those saved against the name of the user who is running the Administrator application (i.e. the operating system user). This view will be used the next time the table is displayed unless another view is subsequently saved or loaded for the table.

- **Save View** - This menu item will save the current table's column configuration to permanent storage. If a view is already applied to the table then the configuration will replace that view. Otherwise, the 'Save View' dialog will be displayed so that a view

name can be specified by the user.

The view will be saved against the name of the user who is running the Administrator application (i.e. the operating system user). The view will only be available to this user. This view will be used the next time the table is displayed unless another view is subsequently saved or loaded for the table.

- **Save View As** -
  This menu item will do the same as 'Save View' except that the 'Save View' dialog will always be displayed.

- **Delete View** -
  Deleting a view will remove details of the selected view from the system's permanent storage. Any column configuration applied to the current table will be un-affected. The appearance of this menu item depends on the number of views saved; see the section describing the 'Load Filter' menu item for details.

  Depending on the number of views saved, the 'Delete View' dialog may be shown.

  The views available for deletion will only be ones saved by this user.

4.8.2   Column Settings Dialog

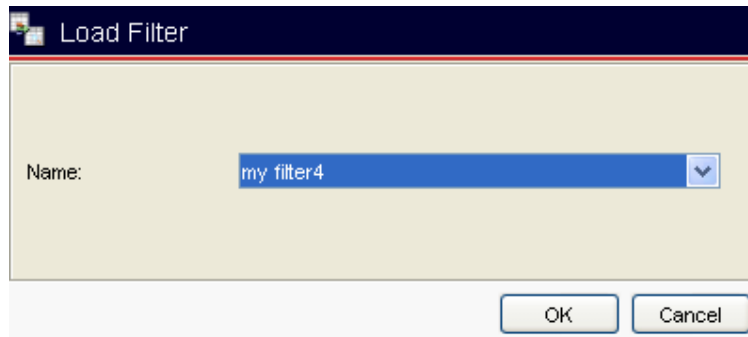Reports and controls the visibility of columns in a table.

- **Column name field** - Left-click this field to toggle the visibility of the column named (a 'check' indicates that column is visible). Changes to the state of this field will have an immediate effect on the table.

4.8.3 Filter Settings dialog

This details the how the table's data is being filtered. There will be multiple entries listed if multiple filters have been applied to the table.

- **Attribute column** - This read-only column refers to the name of the table column that contains the values being tested by the filter.
- **Comparator column** - This read-only column lists the operators being used. E.g. equals, not equals, etc.
- **Value column** - This read-only column shows the value being filtered against.

4.8.4 Filter dialog

This dialog is used to specify a filter condition. The Column field will contain the names of the current table's columns. This dialog has Apply button so that several filter conditions can be applied to the table without existing the dialog. Applying a filter condition will have an immediate effect on the table.

- **Column field** - This non-editable drop-down allows a column to be specified as the source of values to be filtered against.
- **Operation field** - This non-editable drop-down allows a comparison operator to be specified for the filter operation.
- **Value field** - This editable text box allows the value to filter against to be specified.
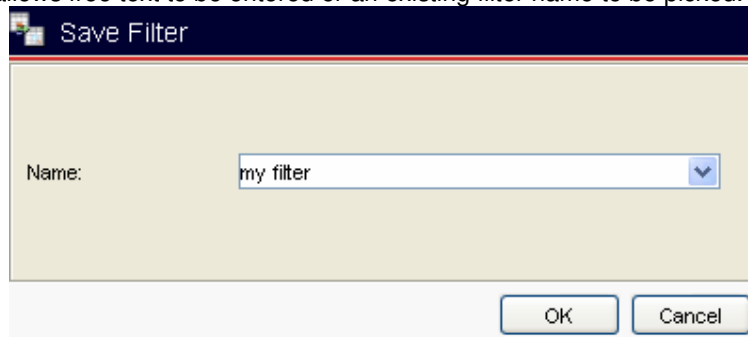
4.8.5 Load Filter dialog

This dialog allows the user to specify a filter to be loaded.

- **Name field** - This non-editable drop-down allows a filter name to be specified.
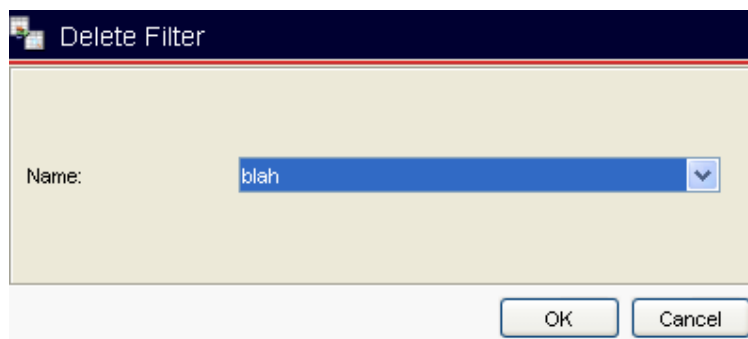
4.8.6 Save Filter dialog

This dialog allows free text to be entered or an existing filter name to be picked.

- **Name field** - This editable drop-down allows a filter name to be specified by typing in the name or selecting an existing name from the drop-down list (assuming that some filters have already been saved). Names may only contain letters, numbers and spaces.
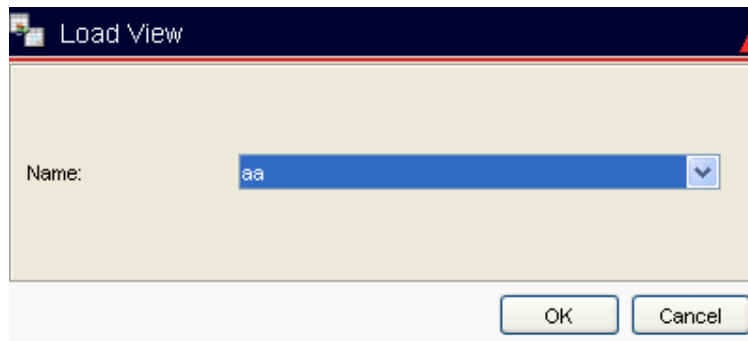
4.8.7 Delete Filter dialog

This dialog allows the user to specify a filter to be deleted.

- **Name field** - This read-only drop-down allows a filter name to be chosen.

4.8.8 Load View dialog

This dialog allows the user to specify a view configuration to be loaded from permanent storage and applied to the current table.

- **Name field** - This non-editable drop-down allows a view name to be specified.

4.8.9 Save View dialog

This dialog allows free text to be entered or an existing view name to be picked.

- **Name field** - This editable drop-down allows a view name to be specified by typing in the name or selecting an existing name from the drop-down list (assuming that some views have already been saved). Names may only contain letters, numbers and spaces.

4.8.10 Delete View dialog

This dialog allows the user to specify a filter to be deleted.
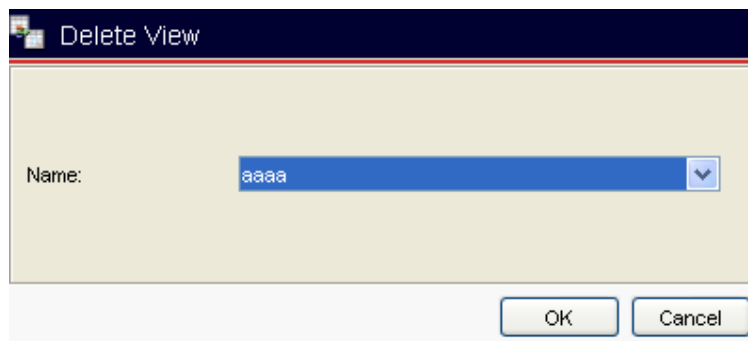
• **Name field** - This read-only drop-down allows a filter name to be chosen.

4.8.11 Table cell context menu
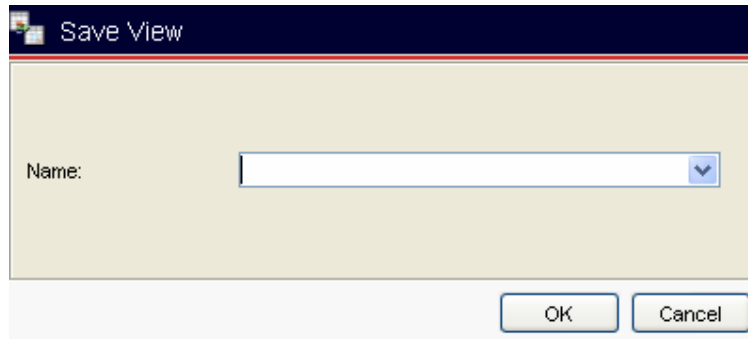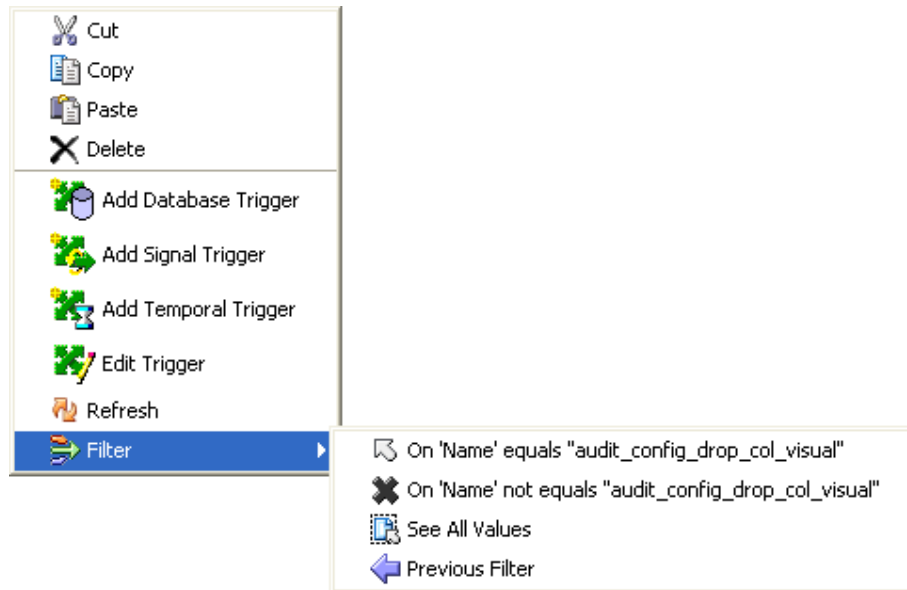
For those tables that support filters, right-clicking on a cell in the table will result in a menu being displayed similar to the one shown below. As well as the items specific to the table being clicked on (in this case, trigger operations) there is now a 'Filter' menu item at the bottom of the menu. Under the 'Filter' menu item are four filter related sub-items.

- **On Equals** - The name of this menu item will contain the details of filter which may be applied to the table. The name of the sub-item will be of the form:

  On '<column name>' equals "<contents of cell>"

  <column name> is the name of the column of the cell clicked-on.
  <contents of cell> is the data in the cell clicked-on.

  Selecting this sub-item will result in the filter being applied, in addition to any other filters that may already be applied to the table. I.e. it is cumulative filtering.

- **On Not Equals** - The name of this menu item will contain the details of filter which may be applied to the table. The name of the sub-item will be of the form:

  On '<column name>' not equals "<contents of cell>"

  <column name> is the name of the column of the cell clicked-on.
  <contents of cell> is the data in the cell clicked-on.

  Selecting this sub-item will result in the filter being applied, in addition to any other filters that may already be applied to the table. I.e. it is cumulative filtering.

- **See All Values** - Selecting this sub-item will result in all filtering being removed from the table.

- **Previous Filter** - Selecting this sub-item will remove the last filter to be applied to the table. If several filters have been applied to a table, it makes it possible to step back through the filters – removing one at a time.

4.8.12 Table status bar

Tables that support filters and views now have a status bar that includes two new elements. In addition to this, the status bar message details the number of rows displayed against the total number of rows in the table. This message is displayed when the table's data is first loaded or refreshed.
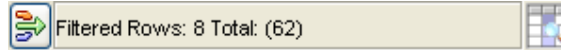
- **Status bar filter button** - This button appears on the left of a table's status bar. It is enabled when a filter has been applied to the table. Pressing the button will result in the 'Filter Settings' dialog being displayed.
- **Status bar view icon** - This icon appears on the right of a table's status bar. It is enabled when a view has been applied to the table. The tool-tip for the icon will display the name of the view.

4.8.13 Table column header

Tables that support filters now have an icon that can appear in a column header (example shown below). The icon indicates that the table's rows are being filtered on the contents of that column. If more than one column is being filtered on then more than one icon will appear.
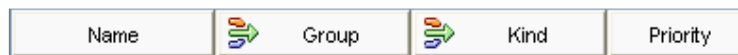
5   Visual PA

5.1   Overview

Visual PA provides GUI based central administration functionality for v7 Process Control Agents. Once the user has logged on to a Process agent a status window is available showing the current status of the managed Services and Processes. The status data is refreshed at timed intervals.

The configuration functionality includes all options currently supported by the command line nco_pa options providing the ability to add, amend, delete, stop, and start both Services and Processes from a central administration point. The commands generated by Administrator take effect immediately at the process agent. They may take some seconds to reflect in the Administrator status display as the status refresh depends on the timed refresh cycle. Changes made in Administrator are not automatically saved to the configuration file. An option to save the file is enabled and is described in section 5.2.

Note: The use of Administrator facilitates the use of PA agent functionality that was previously limited or not possible through the command line interface. When several PA processes are connected by routing statements each agent can be made aware of processes in the other PA agents. That has two effects. Firstly while an agent is running you can see the status of local and remote processes through nco_pa_status. Then if a PA agent is shutdown but its processes remain running, on restart it will first check the process status with other PA systems and link to running processes. It will only restart processes that are not shown as running by the other agents.

Each time you modify a running agent through the Administrator or nco_pa_addentry, the modified process will be visible and manageable in all connected PAs, provided that both the Service and Process names are unique across the systems.

Until now the benefit of this functionality was limited as the process will not appear in the remote PA after a restart unless it has been added manually and accurately to the remote PA configuration file.

With V7.0.2 it becomes possible to add, modify, delete, stop and start PA entries remotely. They then become visible to each linked agent. You have the option to save the configuration files of the agents so that your changes are accurately added to the configuration files. This online functionality allows full remote management of your process control agents from a single console. It also means that once agents are aware of each others' processes, and the information has been saved to the configuration files, that on restart of a PA agent it will reconnect to its running processes. Changes made to a process or service through one agent will be reflected in all connected agents that are running at the time the change is made.

When you first connect to existing PA agents with Administrator the remote processes will not be visible unless they have been defined manually in the local agent's configuration. To enable the functionality described above, simply "touch" each Service or Process with the "edit" option making no changes. The touched process will then appear in each linked Agents. Save each configuration file once that process is complete.

The PA agents do not currently support dynamic addition of routing statements. To add a new agent to a routing group copy and modify the current configuration from an existing agent to have visibility of the current processes. Update each of the other agents' configurations in turn adding the new routing entry. Stop and start each of the existing agents to pick up the new routing leaving their process running. On restart the agents will reconnect to their running processes. You can then add new processes for to the agents via the Administrator as described earlier in this section.

5.2　PA Configuration files

Administrator implements a previously unused facility to instruct Process Control to save its current configuration file. This option should only be used once the PA patch provided with v7.0.2 has been applied.

The user should be aware of some restrictions that affect the results of this functionality. When reading its configuration file on startup Process Control ignores comments and any invalid process or service formats.   When instructed to save its configuration it writes out only default comment blocks and valid process and services.

This has two effects. Firstly, all user comments and any Processes that were commented out in the original configuration file are lost as the configuration file is simply overwritten. Any entry within a Service that refers to those Processes also will not appear in the new configuration file.

It is common practice to temporarily disable a process on start-up by commenting out its process entry in the configuration file. An alternate method should be applied when using Administrator to retain the process structure within a saved configuration file:

- Stop the Process that is not currently needed.
- Create a Service that does not autostart.
  Note that a pa configuration file nco_pa.conf.patch is provided with an example already created.
- Copy and Paste the Process definition into the new Service.
- Delete the Process from the original Autostart Service.

Now, if PA is restarted, the new service and linked process(es) will not start. To reinstate the process simply reverse these steps to move the process back to the autostart service and restart the process.

Methods of improving this functionality are being investigated for a future version of PA.

> *Lab: 5) PA configuration*
>
> *Explore the menu options described in the next sections to understand the functionality available to you in the administration of process control. Practice usage as far as you are able with the systems at your disposal.*

5.3　PA Configuration window

This window will be displayed when the user connects to a PA. The window contains a navigation pane on the left which allows the user to select which of two panes are displayed on the right.

Important: Process agents linked by routing lists are aware of all services and processes within the linked set of agents. This is provided that the Process and Service names are unique across the domain. When a correctly linked agent starts up it will check the other agents for details of its processes and connect to any running processes before starting any remaining processes in its configuration. To facilitate this functionality a Process Agent Consistency Checker wizard is provided with copy and paste options to enable the renaming of services and processes to achieve a unique naming structure. Note also that successful linking depends upon successful host recognition within the linking tables. Administrator does not enforce these requirements so the user should ensure that hosts as defined in the process agent configuration can be properly resolved and that the chosen Service and Process names are unique.

5.3.1 Service/Process Details pane

This displays details of the services and processes controlled by the PA.
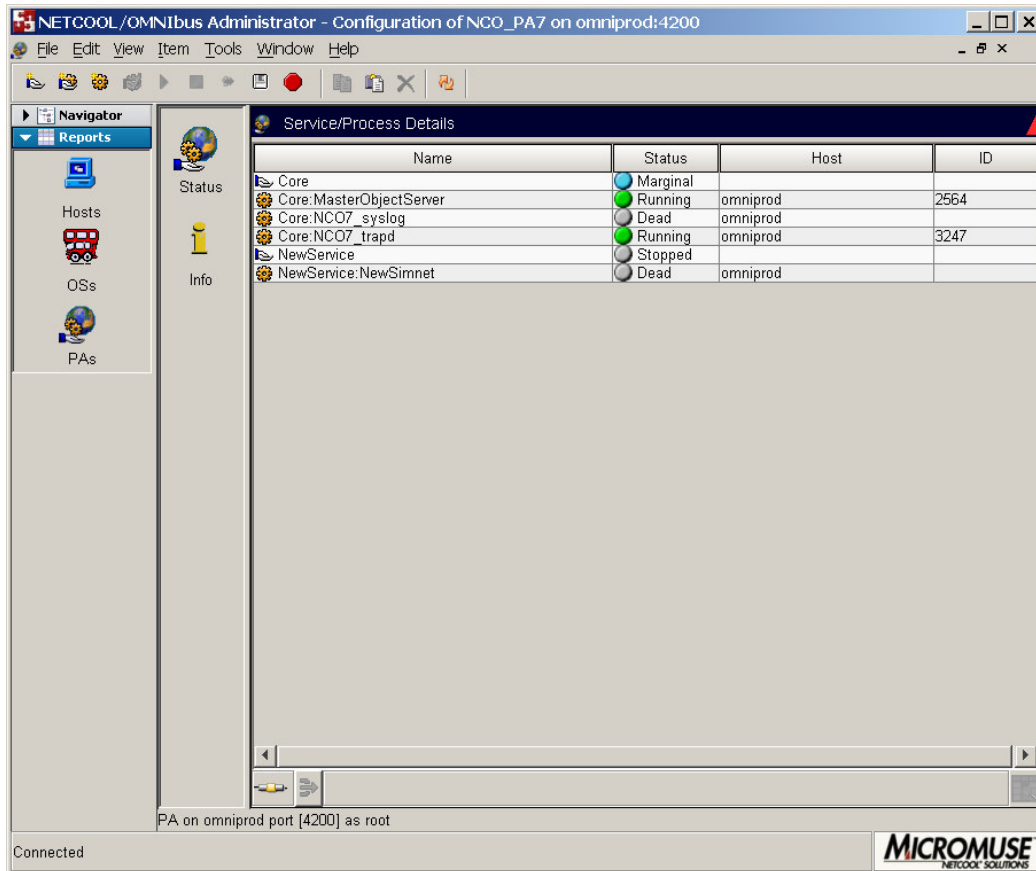

- **Name column** - Shows the name of a service or process:
  - o ![icon] indicates a service
  - o ![icon] indicates a process
- **Status column** - indicates the status of the service or process.
- **Host column** - indicates the host that the process is running on. This will be blank for services.
- **ID column** - shows the ID of a process. This will be blank for services and for processes that are not currently running.
- **Status bar** - appears at the bottom of the table.
  The Connection icon on the left indicates if the connection to the PA is ok. There will be a red slash overlaid if the connection is lost (e.g. if the PA stops running).
  The text message indicates which PA is connected to and the name of the logged-in user.

5.3.2 Service/Process context menu

This menu is displayed when a service or process row is right-clicked on. The displayed menu items will depend on the status of the item clicked on. See below for more details.
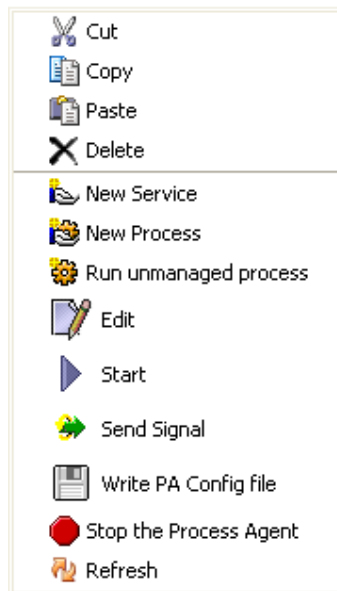

- **Copy menu** - Selecting this item will copy the selected service (and its processes) or process to the clipboard.
- **Paste menu item** - Selecting this item will paste the contents of the clipboard to the current PA.
  - If a service is on the clipboard, the Process Agent Consistency Checker wizard (See section 5.9) will be displayed before the paste operation completes.
  - If a process is on the clipboard, the Process Details dialog will be displayed before the paste operation completes.
  - If the clipboard does not contain a service or process then nothing will happen.
- **Delete menu item** - If the currently selected row is a process then selecting this option will remove the process from the service.
  - If the currently selected row is a service then selecting this option will remove the service from the PA.
- **New Service menu item** - Selecting this menu item will result in the display of the 'Define Service' dialog.
- **New Process menu item** - Selecting this menu item will result in the display of the 'Define Process' dialog. A process will be created based on the information entered in this dialog.
- **Run External Action menu item** - Selecting this menu item will result in the display of the 'Run External Action' dialog. An unmanaged process will be run, based on the information entered into the dialog.
- **Edit menu item** - Selecting this menu item will result in the display of either the 'Service Details' dialog or the 'Process Details' dialog. Which gets displayed will depend on the item that is selected when the menu it is selected.
- **Start menu item** - Selecting this menu item will tell the PA to start the selected process. This menu item will only be visible for processes that have a 'Stopped' or 'Dead' status.
- **Stop menu item** - Selecting this menu item will tell the PA to stop the selected process. This menu item will only be visible for processes that have a 'Marginal', 'Pending' or 'Running' status.

- **Send Signal menu item** - Selecting this menu item will result in the display of the 'Send Signal' dialog. The signal specified in the dialog will be sent to the process by the PA. This menu item will only be visible for processes.

- **Write PA Config menu item** - Selecting this menu item will result in the PA being told to update its configuration file with its current configuration. A message box will be displayed to indicate success or failure of the operation.
  Note: In the current version of PA the file will be written to the default file nco_pa.conf. This is outside the control of nco_config.

- **Stop the Process Agent menu item** - Selecting this menu item will result in the PA being told to stop.

- **Refresh menu item** - Selecting this menu item will result in the table contents being refreshed.

5.3.3   Status Information pane

This window displays information about the PA version and the debug level of the PA's log.
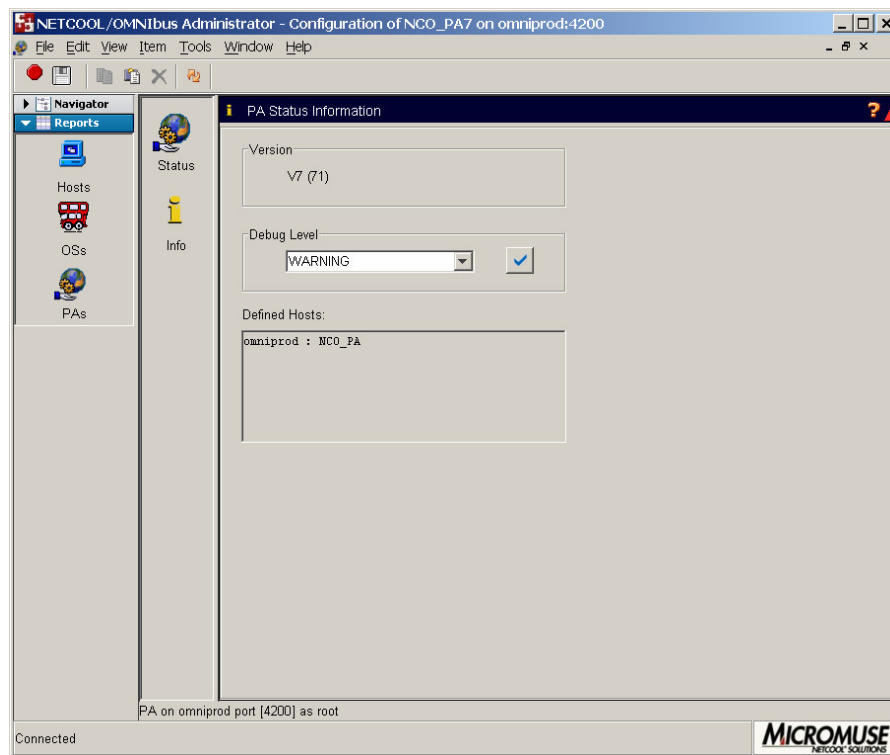

- **Version label** - This shows the version number of the PA.

- **Debug Level drop-down and button** - The drop-down shows the debug level for the PA and allows the user to change it. Once the desired level is selected, the user selects the 'Tick' button to apply the change.

- **Defined Hosts label** - This label lists the PAs that are known by this PA. The format of the list items is:

    < host name > : < PA name>

    This information is read from the PA's configuration file. Note: the hosts listed in the PA's configuration file may not be the same as those listed in the interfaces file.

5.4   Define Service dialog

This dialog allows the details of a new PA service to be specified.
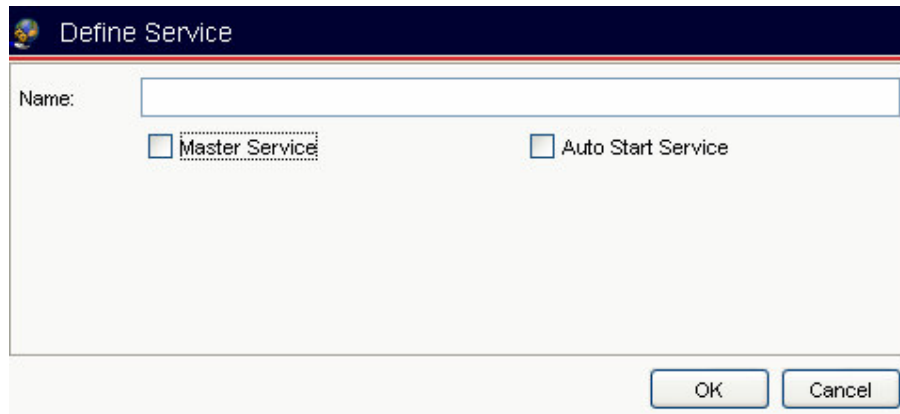
- **Name field** - This editable text field allows the user to specify the name of the service.
- **Auto Start Service check box** - Checking this box will tell the PA that the service should be automatically started when the PA starts up.
- **Master Service check box** - Checking this box makes the new service a master service which means that it will be the first to be started by the PA if several services are auto-started.

5.5   Service Details dialog

This dialog allows the details of an existing PA service to be changed.
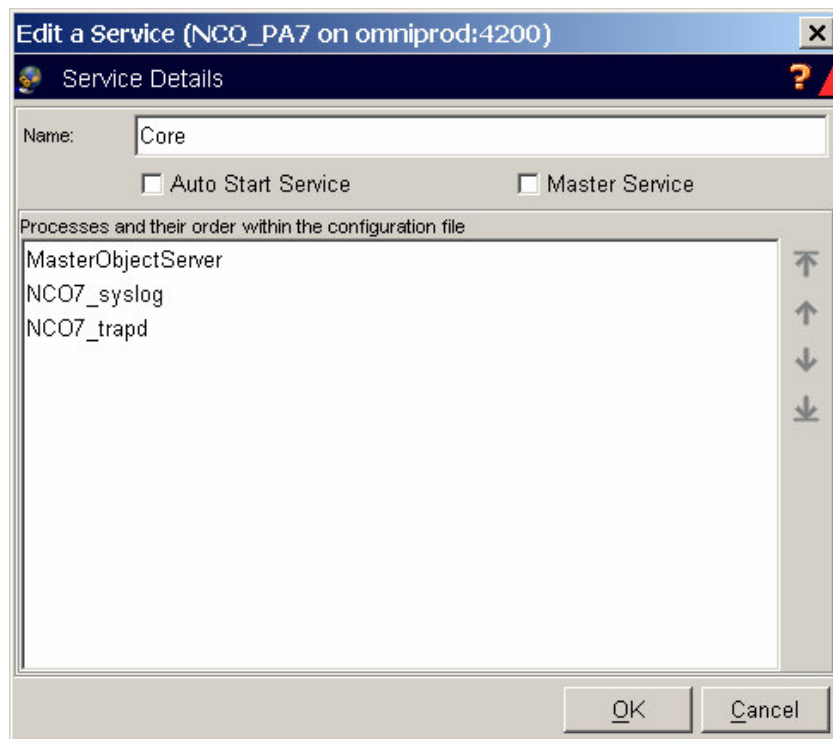
- **Name field** - This editable text field allows the user to specify the name of the service.
- **Auto Start Service check box** - Checking this box will tell the PA that the service should be automatically started when the PA starts up.

- **Master Service check box** - Checking this box makes the new service a master service which means that it will be the first to be started by the PA if several services are auto-started.
- **Processes list** - This list shows the processes that are controlled by the service. The buttons to the right of the list allow the user to specify the order that the processes within the service are started. The delete button allows processes to be removed from the service.

5.6 Process Details dialog

This dialog allows the user to set the properties associated with a process.

5.6.1 Process tab

- **Name field -** This text field allows the user to specify the name of the process. This field is only editable if a process is being created. I.e. you cannot change the name of an existing process.
- **Command field** - This text field allows the user to specify the command to be run when this process is run.
- **Host field** - This non-editable drop-down allows the user to specify the host machine to run the command on.
- **Service field** - This non-editable drop-down allows the user to specify the service that the process belongs to. This field is disabled if editing a process. I.e. you cannot change the service of an existing process.
- **Managed check box** - Checking this box will tell the PA to restart the process if it dies.

- **Run As ID spinner** - This editable spinner tells the PA what ID to give the process when it is run.
- **Retry Count spinner** - This editable spinner tells the PA how many times to retry starting a process if the process fails to start.
- **Type drop-down box** - This non-editable drop-down allows the user to specify the whether or not the process is PA aware.
- **Dependency drop-down box** - This non-editable drop-down will only be displayed if the 'Type' field is set to 'PA aware'. It allows the user to specify a time dependency or a dependency on another PA aware process. The three values that this drop-down lists are:
  - o   Delay
  - o   Process
  - o   None
      - **Seconds field** - Selecting the 'Delay' dependency makes visible the 'Seconds' field. This editable spinner allows the user to specify the number of seconds after the start of the service that this process should be started.

      - **Name field** - Selecting the 'Process' dependency makes visible the 'Name' field. This non-editable drop-down allows the user to select another PA aware process that this process will be dependent on. If this process is dependent on another then this process will not be started by the PA until the other process has started successfully.

5.6.2 Messages tab
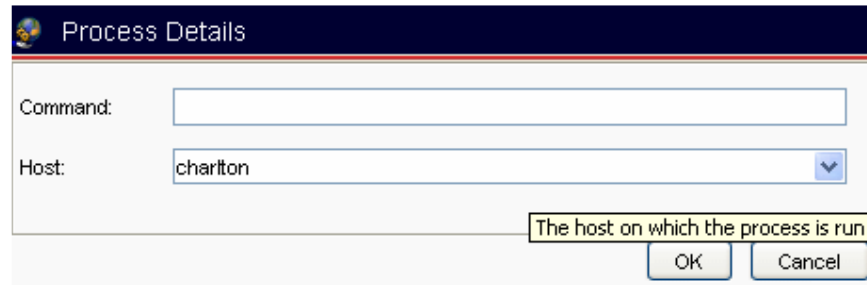
- **Restart field** - This editable text box allows the user to specify a message which will be sent to the syslog if the process is restarted. It has a maximum length of 255 characters.
- **Alert field** - This editable text box allows the user to specify a message which will be sent to the syslog if the process dies. It has a maximum length of 255 characters.

5.7　Run External Action dialog

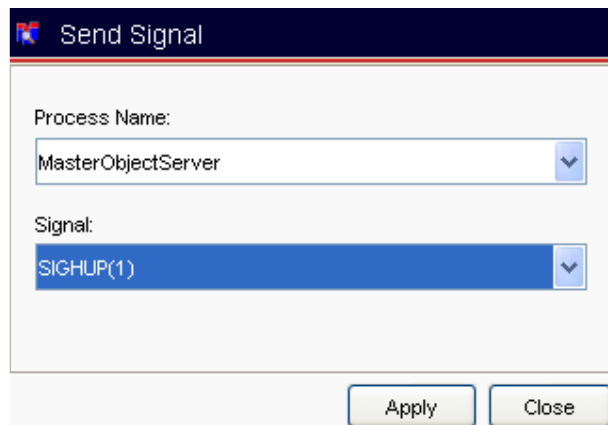This dialog allows the user so specify a command to be run on a host.

- **Command field** - This editable field allows the user to specify the command string to run. Commands are limited to 255 characters in length. It is the user's responsibility to ensure that the command is valid.
- **Host drop-down** - This non-editable drop-down allows the user to specify the host that the command will be run on. It is the user's responsibility to ensure that it is possible for the command to be run on the host specified.

5.8　Send Signal dialog

This dialog allows the user to specify a signal type and a process for sending a signal. Each time the apply button is pressed, a signal is sent.


- **Process Name drop-down** - This is a non-editable drop-down list that lists the names of the processes controlled by the PA.
- **Signal drop-down** - This is a non-editable drop-down list that lists the signal types that can be sent to a process.

5.9   Process Agent Consistency Checker wizard

This wizard is displayed when the user pastes the contents of a PA into another PA. It allows a copy of the contents of the PA on the clipboard to be altered before being pasted. This may be required to avoid naming clashes. Any changes made will not affect the copy on the clipboard - only what gets pasted.

5.9.1   Introductory wizard page

This page explains to the user the procedure they are about to go through.
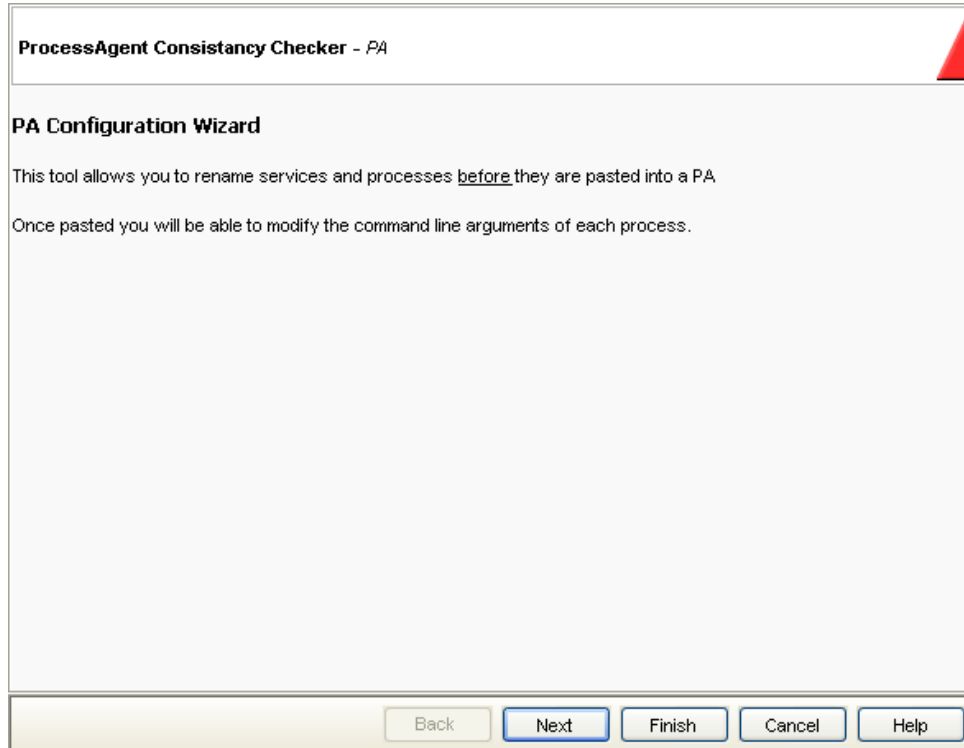
- **Next button** - Selecting this button will display the next wizard page (which will be the Service and Processes page).
- **Finish button** - Selecting this button will complete the paste operation. The wizard will then disappear.
- **Cancel button** - Selecting this button will cancel the paste operation.
- **Help button** - Selecting this button will display the application's help system.

5.9.2   Service and processes wizard page

This page (which will be repeated for each service in the PA) shows the details of a service and its contents (i.e. processes). The user may change:

- the name of the service
- the properties of any process belonging to the service
- whether the process is included in the service that gets created on the target PA

**ProcessAgent Consistancy Checker** - *ProcessAgent Consistancy Checker*   Step **1** of 8

ServiceName : ServiceZero1

Old Process Name	New Process Name	Include in Paste
Sleep5	Sleep5	✓ true

Click on a cell to edit the source name or toggle its inclusion

[Back] [Next] [Finish] [Cancel] [Help]

- **Service Name field** - This editable text box allows the user to specify a new name for the service. The maximum length of the name is 255 characters.
- **Process list** - This editable list shows which processes are included in a service. The New Process Name cells are editable by selecting the row containing the cell to be edited and then clicking on the cell. The Include In Paste cell can be toggled between 'true' and 'false' by clicking on the cell.
- **Process list context menu** - Right clicking a process in the list will result in a contextual menu being displayed (shown below) which allows the user to edit the process via the Process Details dialog and whether the process is included in the paste operation.

Edit Process Details
✓ Include In Paste
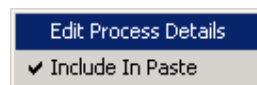
- **Back button** - Selecting this button will display the previous wizard page.
- **Next button** - Selecting this button will display the next wizard page (which will be either another Service and Processes page or the Summary page).
- **Finish button** - Selecting this button will complete the paste operation. The wizard will disappear.
- **Cancel button** - Selecting this button will cancel the paste operation.
- **Help button** - Selecting this button will display the application's help system.

5.9.3 Summary wizard page

This is the last page of the wizard. It summarizes the services and processes which will be pasted. It includes any name changes that may have been made.

ProcessAgent Consistancy Checker – *PA*   Step **8** of 8

Details of paste action

Service 'ServiceTwo'
       Sleep4 -> Sleep4
       Sleep3 -> Sleep3

Service 'ggg'
       fff -> fff

Service 'ServiceZero2oixxx'
       Sleep5oixxx -> Sleep5oixxx

Service 'ServiceOne'
       Sleep1 -> Sleep1
       Sleep2 -> Sleep2
       Sleep6 -> Sleep6
       efd -> efd
       ggg -> ggg

The following processes were not pasted:

Selecting **Finish** will instruct this wizard to replace any previous import of connections.

[Back]   [Next]   [Finish]   [Cancel]   [Help]

- **Back button** - Selecting this button will display the previous wizard page.
- **Finish button** - Selecting this button will complete the paste operation. The wizard will disappear.
- **Cancel button** - Selecting this button will cancel the paste operation.
- **Help button** - Selecting this button will display the application's help system.