

Session: C38



# iSeries Operations Navigator Overview

*IBM @server iSeries*

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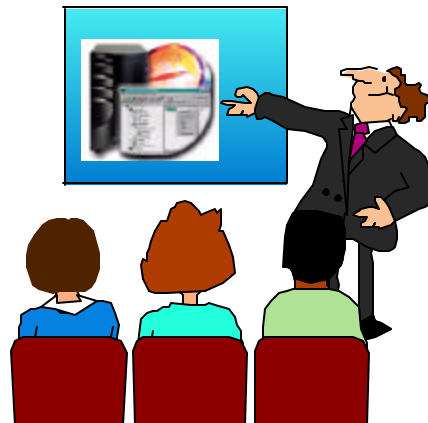
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## Additional Information

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- **Operations Navigator website:**
  - [http://www.ibm.com/eserver/series/oper\\_nav](http://www.ibm.com/eserver/series/oper_nav)
- **Management Central website:**
  - <http://www.ibm.com/eserver/series/sftsol/mgmtcentral.htm>
- **Redbooks ([www.redbooks.ibm.com](http://www.redbooks.ibm.com)):**
  - Managing AS/400 V4R4 with Operations Navigator, SG24-5646-00
  - Management Central: A Smart Way to Manage AS/400 Systems, SG24-5407-00
  - AS/400 Client Access Express for Windows: Implementing V4R4M0, SG24-5191-00
- **iSeries Information Center**
  - Repository of iSeries and AS/400 documentation. Installed locally via the Information Center CD, or accessed on the internet at <http://www.ibm.com/eserver/series/infocenter>
- **INFO APARs**
  - Available at the Operations Navigator web site
  - Have information on known problems and PTFs required
- **Client Access information**
  - Available at [www.ibm.com/eserver/series/clientaccess](http://www.ibm.com/eserver/series/clientaccess)



## Basic Concepts

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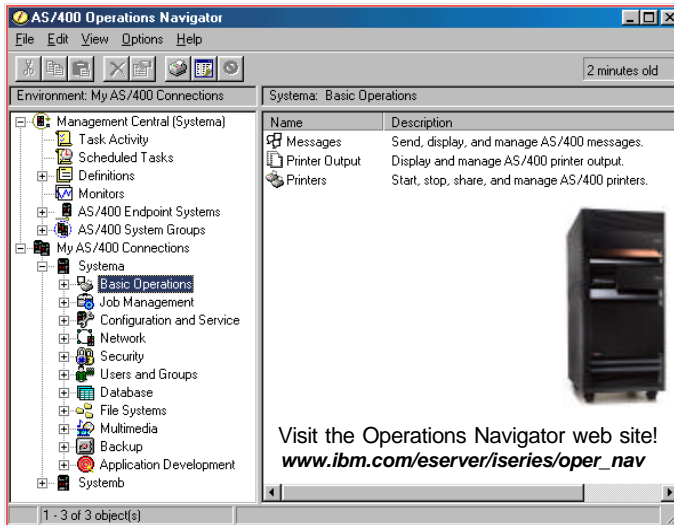
## Our goals

**Modernize the user interface**

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**Leverage the latest user interface technology**

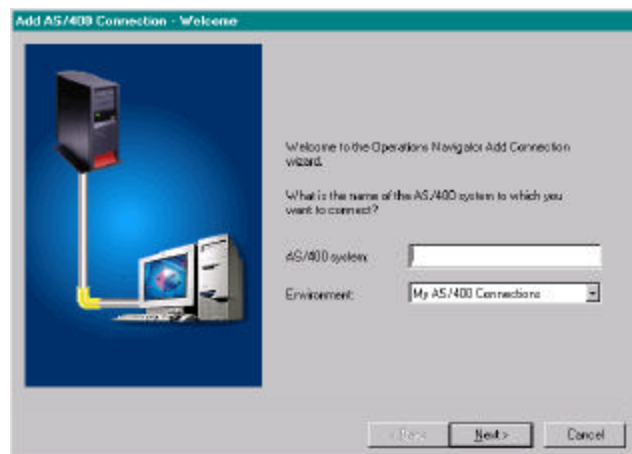
**Easy administration of systems in a network**



## Operations Navigator Adds Ease of Use

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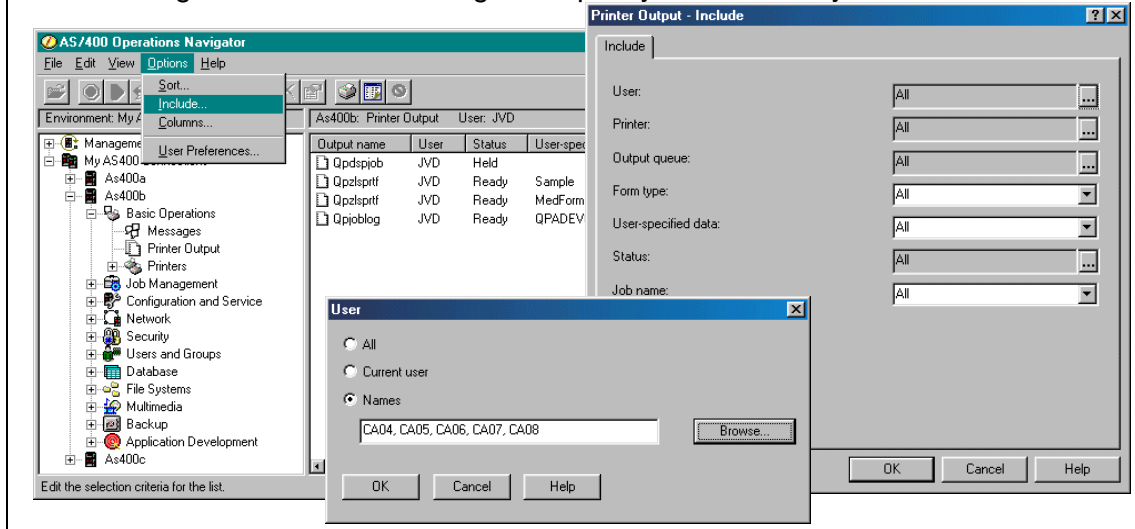
- Leverage your user's Windows skills
  - Explorer view, properties sheets, context menus, drag and drop
- Reduce need to learn command interface
  - Easier to understand terminology / concepts
  - Graphics - not just icons
  - Wizards
  - High degree of function integration, not standalone utilities



## Operations Navigator Makes Users Productive

- Lists of objects give rich information
- Customized views (Include, Columns, Sort)
- Desktop shortcuts to frequently used functions
- AutoRefresh, list print, find in list, drag and drop capability
- Management Central--manage multiple systems as easy as one

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## Operations Navigator Is Easy to Control

### Granular install / Selective Setup

- Capability to give users only what they need

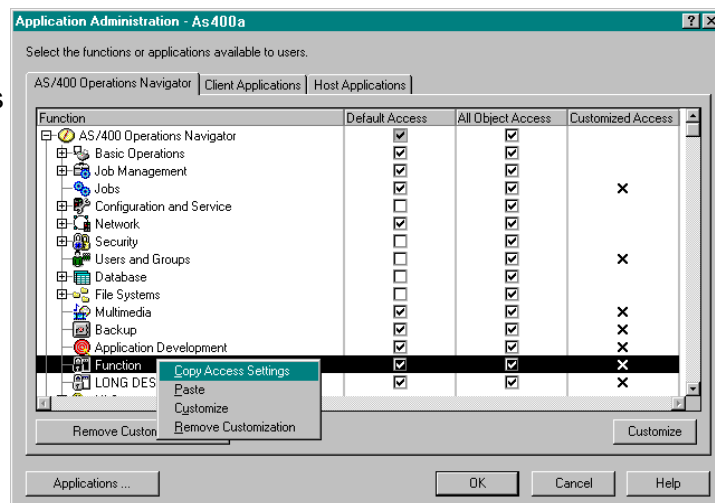
### Application Administration

- Provides runtime access restrictions to OpNav (and other) functions

### Client Access Express policies

- Prevent install or running Operations Navigator

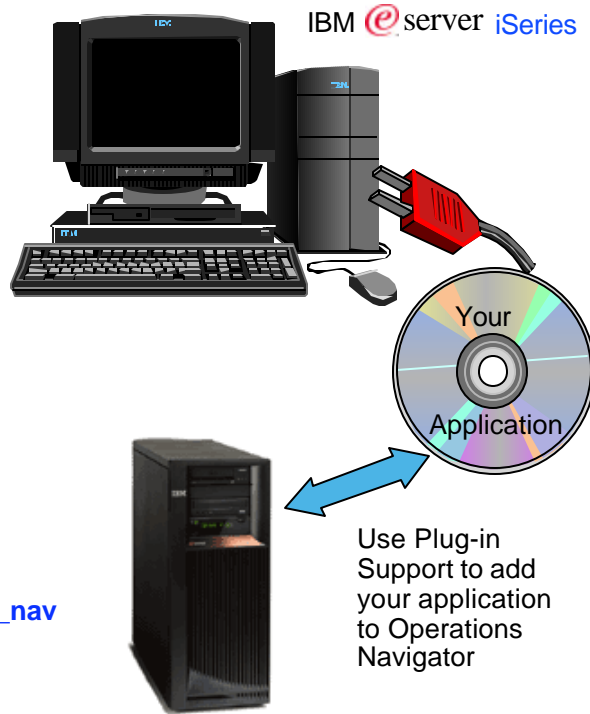
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## Plug-in Support

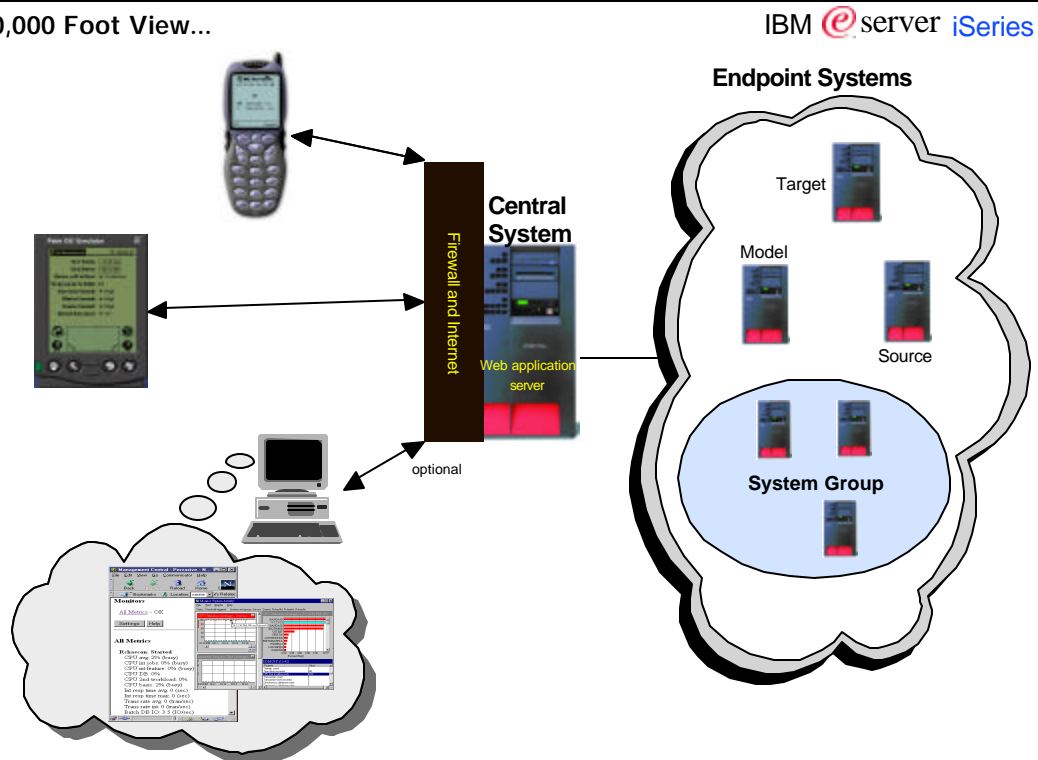
- Allows anyone to add their own applications to Operations Navigator
- Use Client Access Install to distribute your application
- Plug-ins can be written in Java, C++, or Visual Basic
- Documentation and sample application in the Client Access Express Toolkit

For more information visit:  
[www.ibm.com/eserver/series/oper\\_nav](http://www.ibm.com/eserver/series/oper_nav)



## Management Central Basics

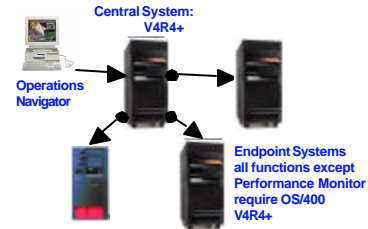
10,000 Foot View...



## Management Central Basic Concepts

- You can have one or more **central systems** in your network; from within Operations Navigator you use one at a time
- AS/400 and iSeries servers connected to the central system can be managed; these are referred to as **Endpoints**
  - Central server gets requests from Operations Navigator and sends it to the targeted systems
  - Status and any results flow back from the endpoints to the central server
  - Operations Navigator gets status and results from the central server
  - Tasks can be long-running or scheduled, PC is not required to wait for tasks to complete
- Endpoints can be collected into **System Groups** for convenience
  - Can operate against a group with one request
- With the Express version of Operations Navigator, all functions require a V4R4 central system
  - Monitors can be run on V4R3 endpoints, all other functions require V4R4 endpoints

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## Notes: 10,000 Foot View...

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Management Central is a suite of systems management functions that began to appear with OS/400 Version 4 Release 3 (V4R3). It provided management capabilities built into base OS/400 and integrated into the AS/400 Graphical interface, Operations Navigator at no additional cost. The first functions included system monitors and system groups. In V4R4, it was greatly enhanced to enable long running, batch, scheduled or unattended operations for commands, packages, fix management and inventory. V4R5 ushered in the wireless and web enablement with Pervasive functions which included system availability and system monitors.

In V5R1 it is expanding with enhancements to existing applications along with new applications. The new applications include functions for user administration, system value management, job monitoring, message monitoring and historical performance graphical interface. The pervasive devices have also be expanded to include Commands, Job monitors and Message monitors.

Management Central uses the basic system operations on each of the endpoints (e.g., APIs for performance monitoring, system commands, etc.). Management Central does not place any limitation on the number of endpoint systems used by its functions. There will be practical limits determined by your environment, networks, management policies, etc. In addition, there is no limit to the number of endpoint systems that can be in a group

Endpoints do not need to be at the same level as the Central System, nor does the Central System need to be at the same level as the Client, HOWEVER, Management Central is only as good as the client and Central System combination.

## Notes: Management Central Terms

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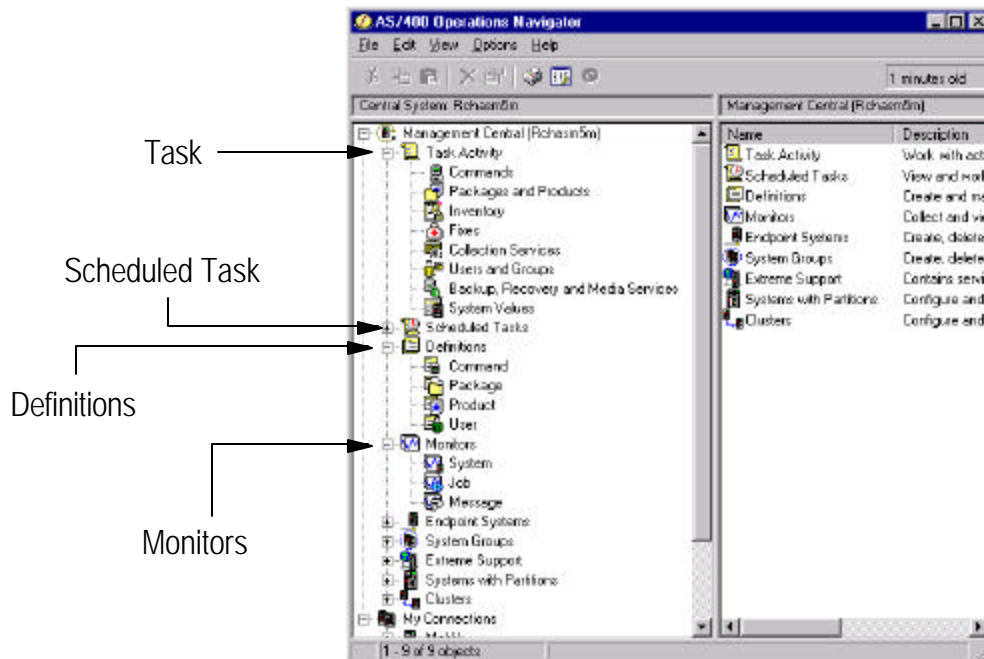
Management Central basic terms:

- **PC** provides the graphical interface (i.e., view) both input and output of management activities.
- **Central System** connects to other systems (called endpoints).
- **Endpoints** are just systems which your PC does not need to be in direct contact with in order to "manage"
- **Source System** is from which objects, files and information are sent within Management Central's send tasks. The Source System is the source of the objects, files and information being sent.
- **Model System** has all and only desired fixes installed or has all system values set properly for the targets.
- **Target Systems** is where objects, files and information are sent within Management Central's send tasks. The Target Systems are the destinations of the objects, files and information being sent. Target Systems are often grouped into System Groups.
- **Inventory** contains records which contain information about server hardware, software, fixes, users and groups (V5R1), or system values (V5R1)
- **Fixes** are PTFs.

## Management Central Basics

Main View Terminology

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## Notes: Main View Terminology

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**Task** - Asynchronous activity distributed over a group of endpoints that performs an specific action. A task is explicitly started or scheduled to start through user interaction and then runs through completion. It can only be explicitly changed while it is scheduled. It can also be explicitly canceled through user interaction.

- Commands
- Object and Product Package Distributions
- Collection Services
- Inventory Collections
- Software Fix - AS/400 PTF Operations
- Users and Groups
- System Values

**Scheduled Task** - This is a regular task which the user wanted to run at a specified date and time. Once the scheduled task as run, it will be moved in with the other base Tasks.

**Definition** - Data and/or activity description that can be constructed, viewed and managed.

- Command Definition - description and parameters of a command operation.
- Packages Definition - a collection of objects and/or files grouped together for the purpose of distribution
- Product Definition - a collection of objects and/or files grouped and formed as an installable product.
- User Definition - a predefined user with attributes predefined. Other users can be created based on these user.

**Monitor** - Activity distributed over a group of endpoints that collects, presents and warns the user. A monitor can be explicitly started, changed and stopped through user interaction.

- **System** - original monitors for performance
- **Job** - monitors a specific criteria of jobs or servers
- **Message** - monitors a specified message queue for a criteria of messages.

## Getting Started

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## Packaging, Installation, & Connections

## Packaging

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- OS/400 releases and corresponding Client Access releases:

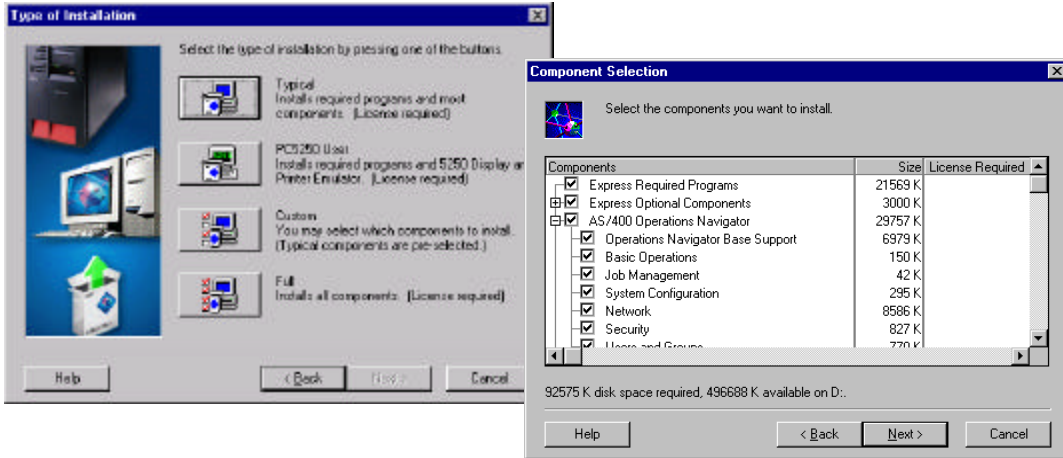
OS/400 Version	Client Access Version	Client Access Product
V3R7	V3R1M2	5763-XD1
V4R2	V3R1M3	5763-XD1
V4R3	V3R2M0	5763-XD1
V4R4	V4R4M0 (Express)	5769-XE1
V4R5	V4R5M0 (Express)	5769-XE1
V5R1	V5R1M0(Express)	5722-XE1

- Operations Navigator is an optionally installed component of Client Access for Windows 95/NT and Client Access Express for Windows
- For V3R7-V4R3 systems, it's available by installing Client Access for Windows 95/NT (5763-XD1)
  - Use the Client Access CD, the Operations Navigator CD, or for V4R2 and later install from the AS/400 using NetServer
- For V4R4 and V4R5, Client Access Express for Windows is shipped with OS/400
  - Install using the Client Access CD or NetServer
- Does not require a Client Access license
- As of V4R4, enhancements to Operations Navigator are delivered in Client Access Express only

## Operations Navigator Installation

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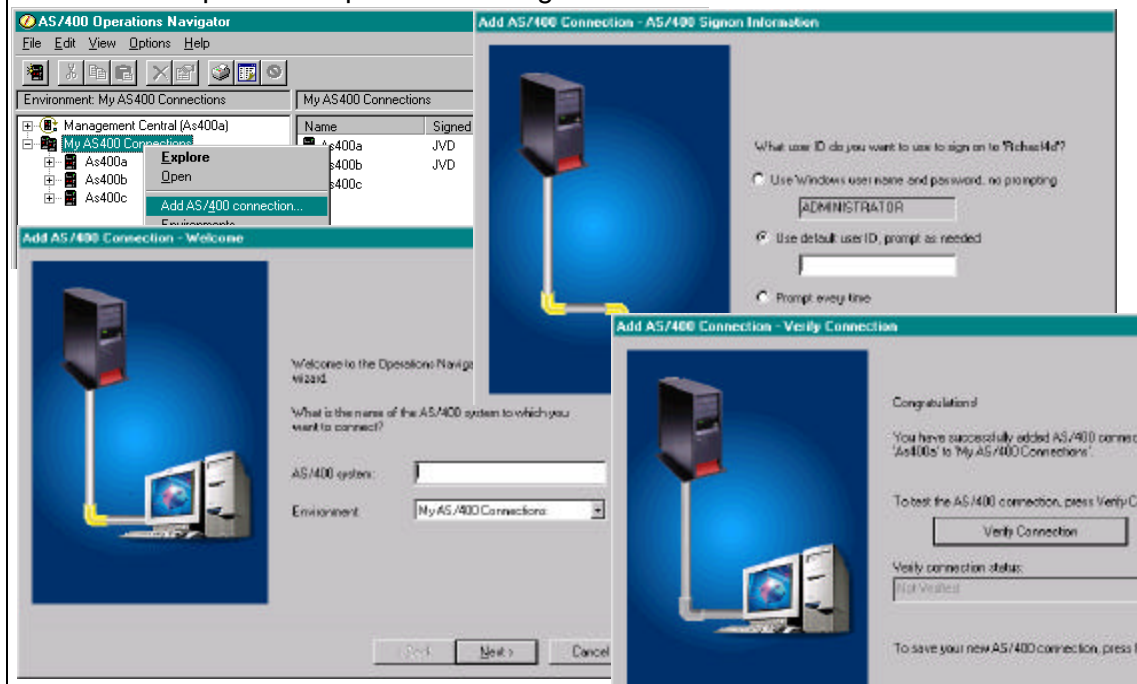
- Operations Navigator components are selectively installable
- Basic Operations installed with Client Access Typical Install (Messages, Printer output, Printers)
- Additional components installed using Client Access Custom Install or Selective Setup after install



## Connections

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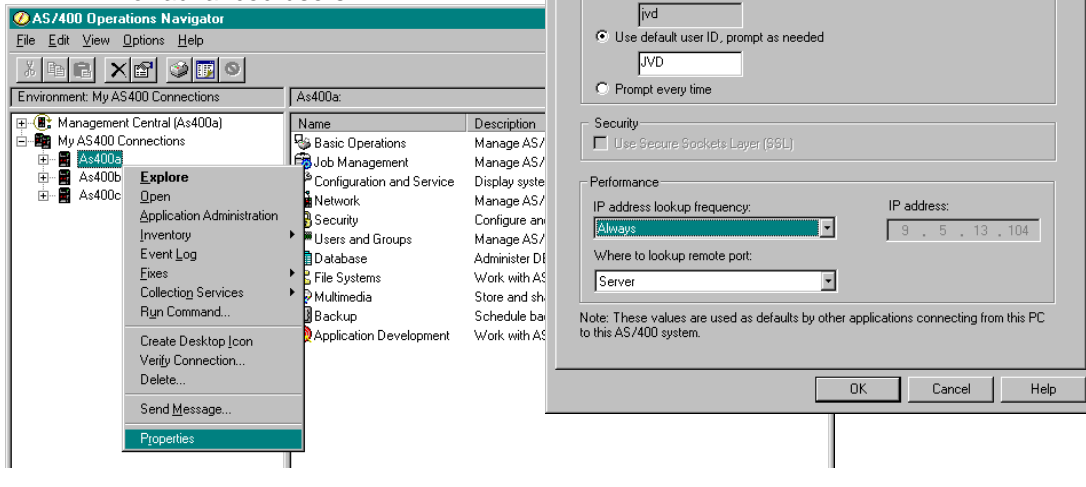
- Operations Navigator provides the Connection GUI
- Three simple wizard panels to configure a connection



## Connections

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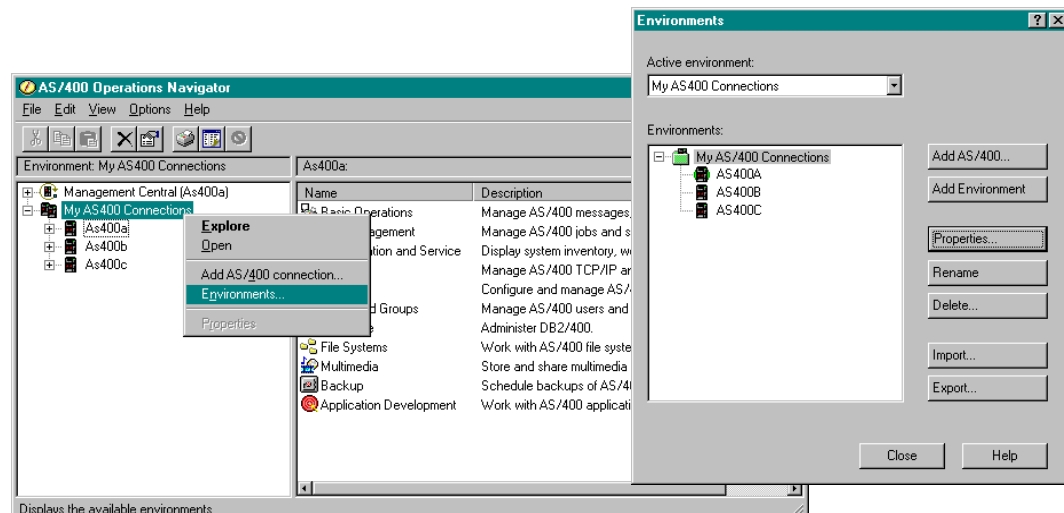
- Connection attributes can be changed in the system's properties
- Properties Connection tab allows you to:
  - Change sign on information
  - Set SSL on for this connection
  - Set server and port lookup values
- ◆ For advanced users




## Environments

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- Client Access Environments function moved into Operations Navigator
  - Set up and switch between multiple sets of systems
  - Import/Export environments
- ◆ Administrator can set up connections as desired and propagate to clients

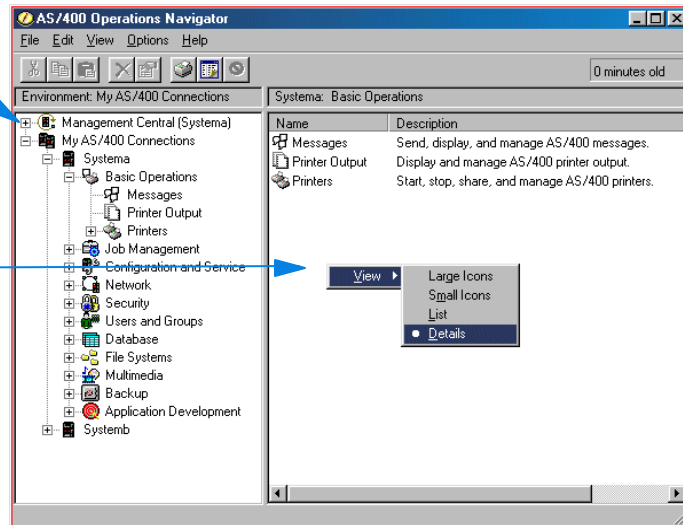


 A Tour of the Main Window

## Using the Main Window

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- **Function tree**
  - Folders which can be expanded
    - ◆ Click the plus or double click the icon or folder
  - Single click to select a folder to see its contents in the right pane
  
- **Details pane**
  - Contains subfolders or objects
  - Defaults to "details" view with columns of additional information
  - Can be set to show only large, small icons, or icon list view





## Using the Main Window

Client Access Connection Environment that's in use or Management central system

Number of objects in right pane / descriptions of menu choices

Data "freshness" indicator

Folder being listed and any options used for "Include"

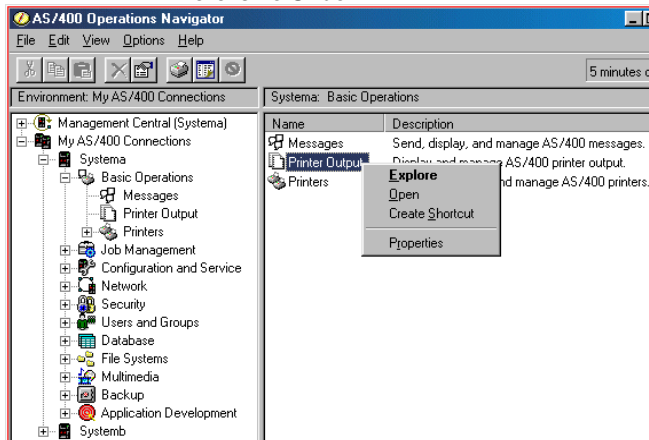
- **Information / Status Areas**
  - Keeps track of what you're looking at
  - Provide quick help
  - Show how old information is
    - How long since the data was retrieved

## Common Actions

- **Explore**
  - Places contents in details pane
    - Same as selecting it
  - On File and context menus
- **Open**
  - Places contents in a new window
  - On File and context menus
- **Properties**
  - Shows the description/attributes of an object
  - On File and context menus and toolbar
- **Print**
  - Prints the entire contents of the details pane
  - Includes print preview
  - On File menu and toolbar
- **Refresh**
  - Gets the latest data for the list in view
  - On View menu and toolbar

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- **New...**
  - Creates a new object
  - Located on folder containing objects
- **New Based On...**
  - Creates a new object based on the one you have selected
- **Delete**
  - When you don't want it any more!
  - There is no Undo

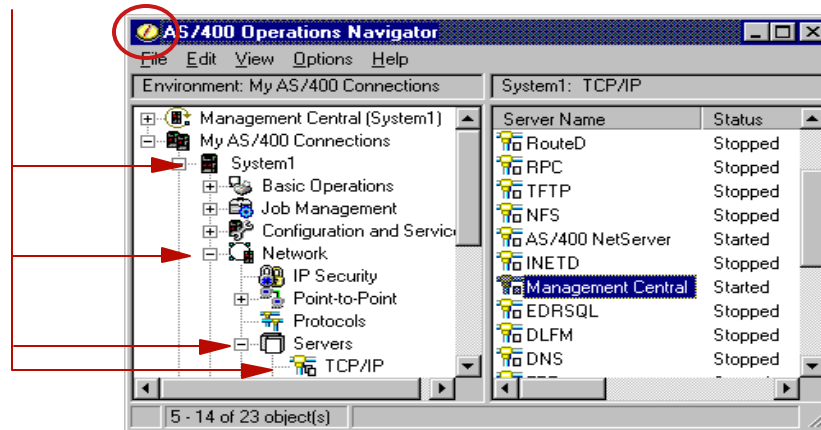


## Management Central Configuration and Startup

### Central System Setup

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- Configure TCP/IP on your iSeries!!!!
- Starting from the command line
  - STRTCPSVR \*MGTC
  - Autostarted with TCP/IP startup
- Starting from Operation Navigator



## Notes: Management Central Configuration and Startup

 IBM  iSeries

V4R4 (and later): The Management Central server will automatically start/end when TCP/IP is started/ended. The specific host commands are STRTCPSVR \*MGTC and ENDTCPVSR \*MGTC. Operations Navigator can also be used by expanding a local system (under My AS/400 Connections), -->Network-->Servers-->TCP/IP and right-clicking on the Management Central server and selecting the appropriate context menu item. The central system will start automatically when the first GUI connects by expanding the Management Central folder at the top.

Most start and connection problems are TCP/IP configuration problem on the server. The following TCP/IP related questions are helpful in problem determination.

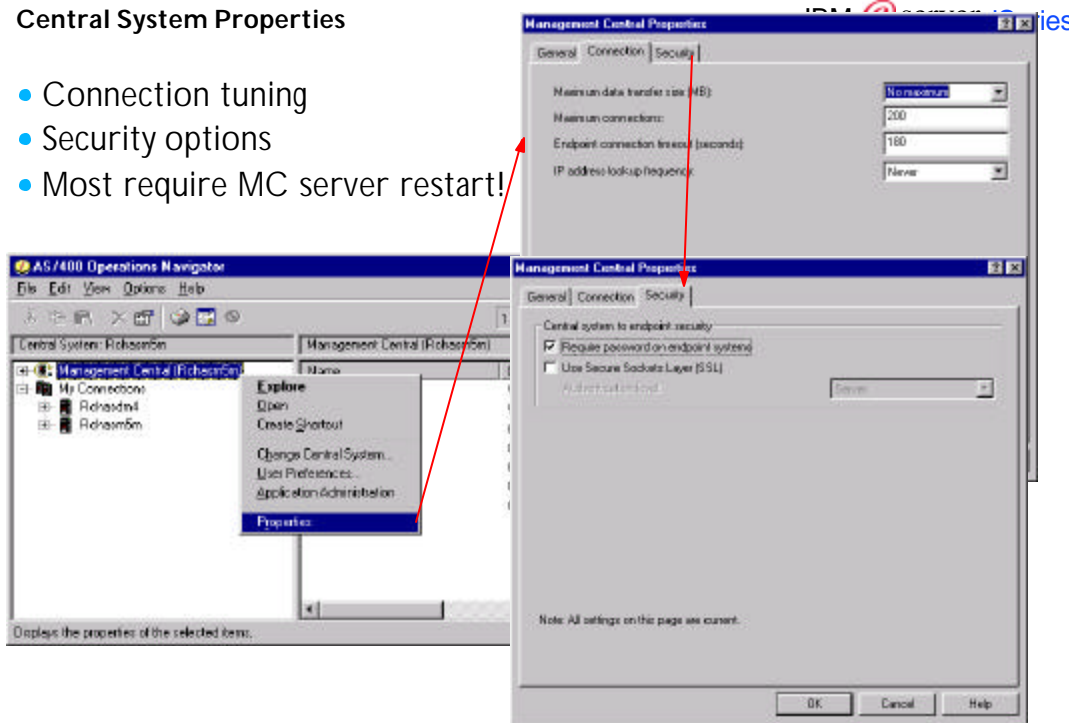
- Has TCP/IP been configured on the AS/400 systems in the network?
- Is TCP/IP started been started on the AS/400 systems in the network?
- Can the host be 'pinged' from the client or another AS/400?
- Can the client be 'pinged' from the AS/400?
- Can the other AS/400's in your network be 'pinged' from the client, from other AS/400's)?
- If Domain Name Server (DNS) is being used, are the system names in the network entered correctly, both short and long names (both are required)?
- Is the domain information specified correctly (host name and domain name: CFGTCP, opt 12)?
- If DNS is not being used, is the host table set up properly (both short and long name are required: CFGTCP, opt 10)?
- Is there a port conflict (Management Central uses port 5555: NETSTAT, opt 3)? View the Service Entry Table (CFGTCP, opt 21, opt 1) to identify port assignments. Management Central has three port numbers assigned to it: non-SSL service as-mgtctrl is port 5555, SSL service as-mgtctrl-cs is port 5577, SSL service as-mgtctrl-ss is port 5566. If they aren't defined in the service table, add them. Protocol is tcp.

If the above trouble shooting steps don't solve the problem, and on-site personnel can't help, call IBM service.

## Central System Properties

### Central System Properties

- Connection tuning
- Security options
- Most require MC server restart!



## Notes: Central System Properties

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**Require password on endpoint systems** - Specifies that the user profile used to sign on to the central system must have the same password on each endpoint system. Even if this box is not checked, the user profile used to sign on to the central system must exist on each endpoint system. Selecting this box sets only the value for the central system. **Each endpoint system must be explicitly configured to require the password for Management Central functions.**

**Use Secure Sockets Layer (SSL)** - Specifies the use of SSL to ensure secure transmissions between the central system and the endpoint systems. SSL provides the transport and authentication of public key system certificates as well as private connection and data encryption. An SSL connection can occur only between an SSL-enabled central system and an SSL-enabled endpoint system. An SSL-enabled system is a system on which the required administration and configuration tasks have been performed. If an SSL error appears in the Management Central server's job log, it's likely that SSL has been turned on for Management Central, but the network has not been properly configured to use SSL. Refer to the Management Central Redbook for details on configuring SSL in your network. **Attention: The System administrator must do the necessary SSL setup on each system before SSL will work properly. If SSL is not configured properly, Management Central may not be able to communicate with any endpoint systems. If SSL is enabled on a V5R1 central system, none of the Management Central Java components will be shown on the GUI. MC Java framework currently does not support SSL.**

**Authentication level** - If Use Secure Sockets Layer (SSL) is selected, select an authentication level.

**Maximum data transfer size (MB)** - Specifies the maximum size in megabytes (MB) for a list of files sent from a source system to the endpoint system. The value specified must be less than or equal to 2048. This does not apply to sending files, folders, or packages to systems or groups. Limiting the size of the list effectively limits the length of time allowed to complete the data transfer.

**Maximum connections** - Specifies the maximum number of endpoint systems that the central system can connect to at the same time. For example, if 200 for Maximum connections specified and then connect to 202 endpoint systems, two connections fail.

**Endpoint connection time-out (seconds)** - Specifies the number of idle seconds that the central system will wait before the attempt to connect to an endpoint system is ended.

**IP address lookup frequency** - Specifies how often the IP address must be verified when connecting to an endpoint system. Select Always or Never. If Always is selected connecting to an endpoint system takes longer, but the IP addresses are always correct. If Never is selected connecting to an endpoint system is quicker because the connection uses the IP address currently stored in Management Central. Run Discover Systems at any time to update the list of IP addresses stored in Management Central.

See online help for which configuration options require the user to restart the MC server jobs.



 Power Techniques

## Operations Navigator Power Techniques

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### Sort, Include, and Columns

- Customize lists the way YOU want

### Find and Print

- Locating things in lists
- Print list in details pane

### Auto-refresh lists

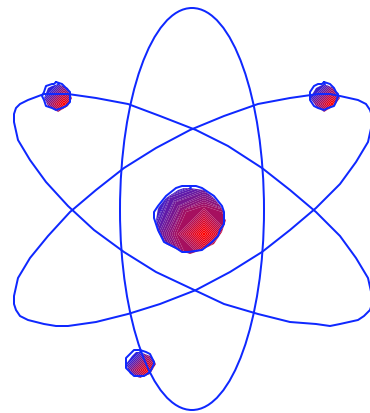
- How to keep your lists current

### Shortcuts and Desktop Icons

- Go straight to the functions you want to use

### Drag & Drop

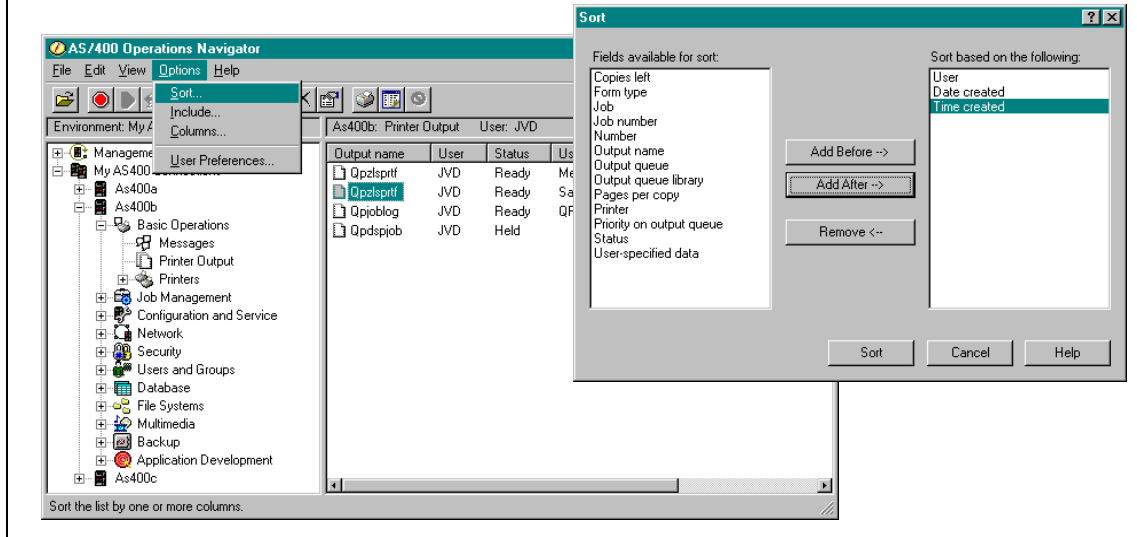
- Move things with a flick of your wrist



## Sorting Lists

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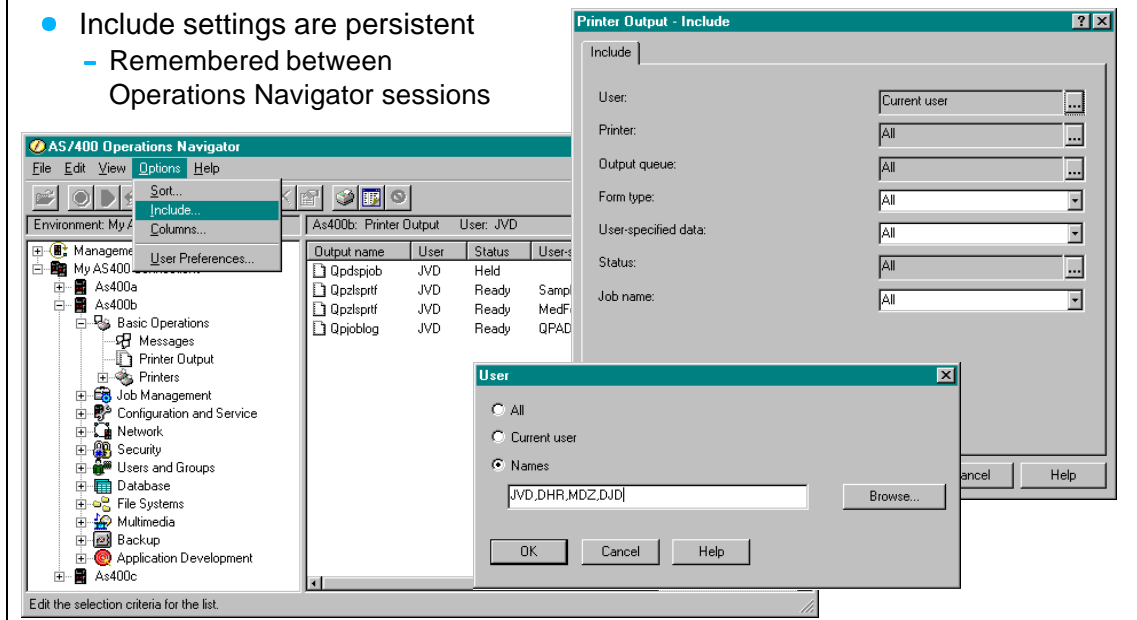
- Click sorting by clicking on the column heading
  - Column headings with a 3-D appearance typically can be click sorted
  - Easy to use but only one column at a time
  - Toggles sort direction
- Sort dialog allows you to specify multiple columns to sort by



## Include--Filtering Lists

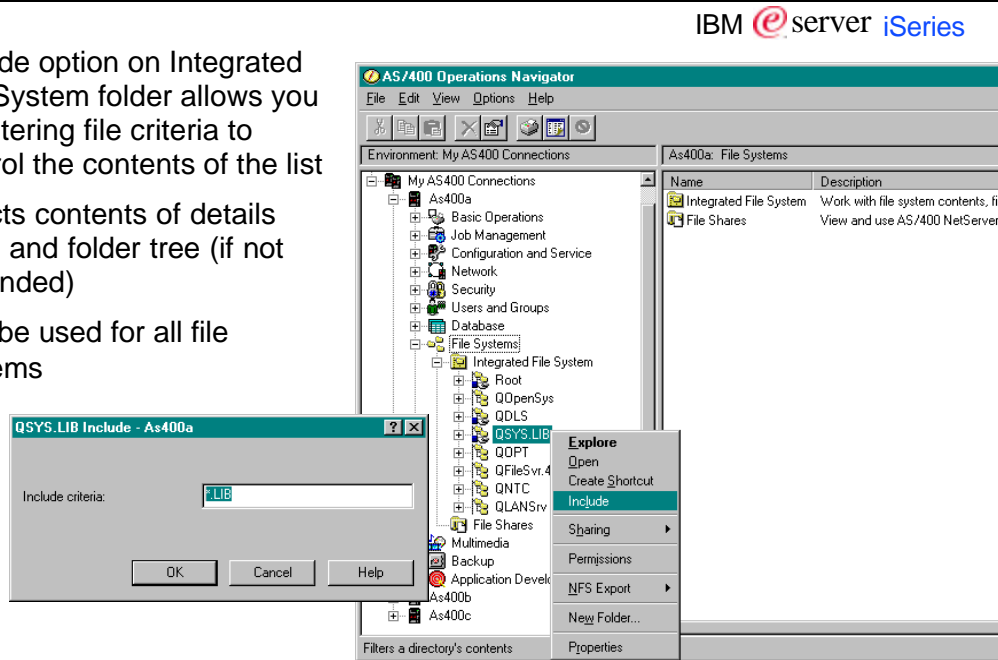
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- Include allows you to select just the data you want to see in the list
- Criteria vary depending on the type of object
- Include settings are persistent
  - Remembered between Operations Navigator sessions



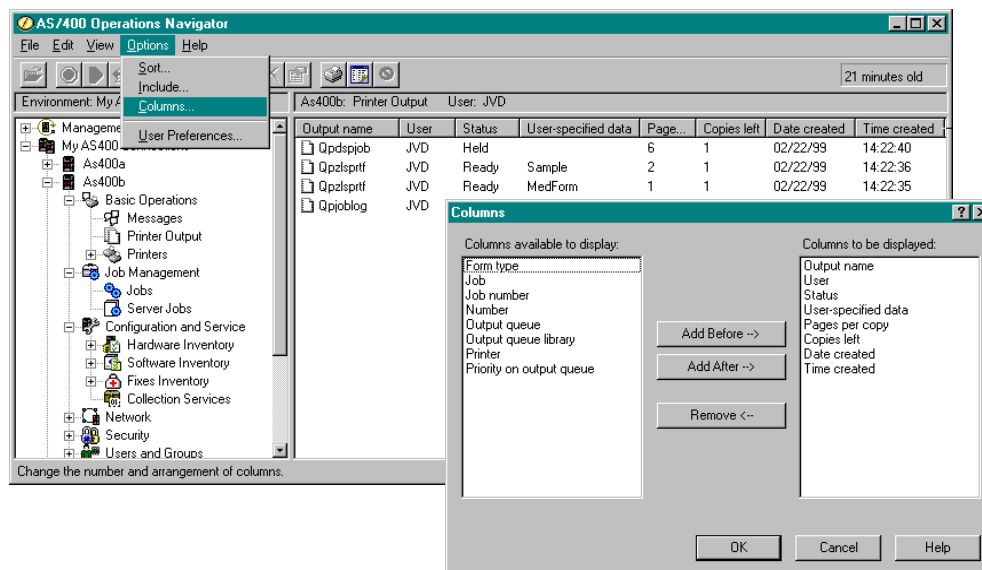
## Filtering in the File System Folder

- Include option on Integrated File System folder allows you to entering file criteria to control the contents of the list
- Affects contents of details pane and folder tree (if not expanded)
- Can be used for all file systems



## Columns -- Selecting What You Want To See

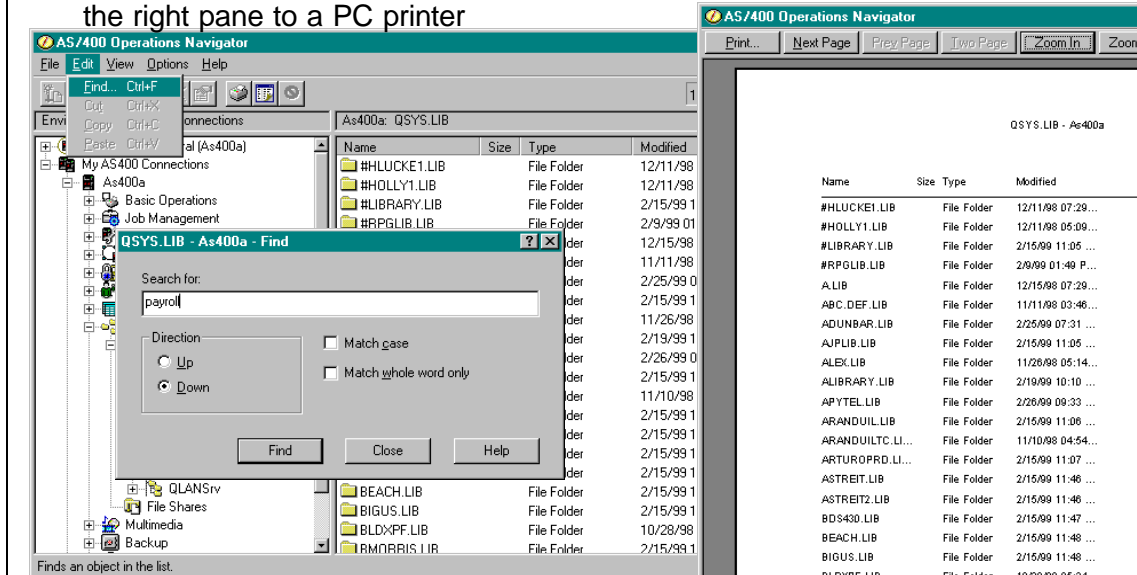
- Select AND order the columns you want to see in the list
- Column settings are persistent
  - Remembered between Operations Navigator sessions



## Find and Print

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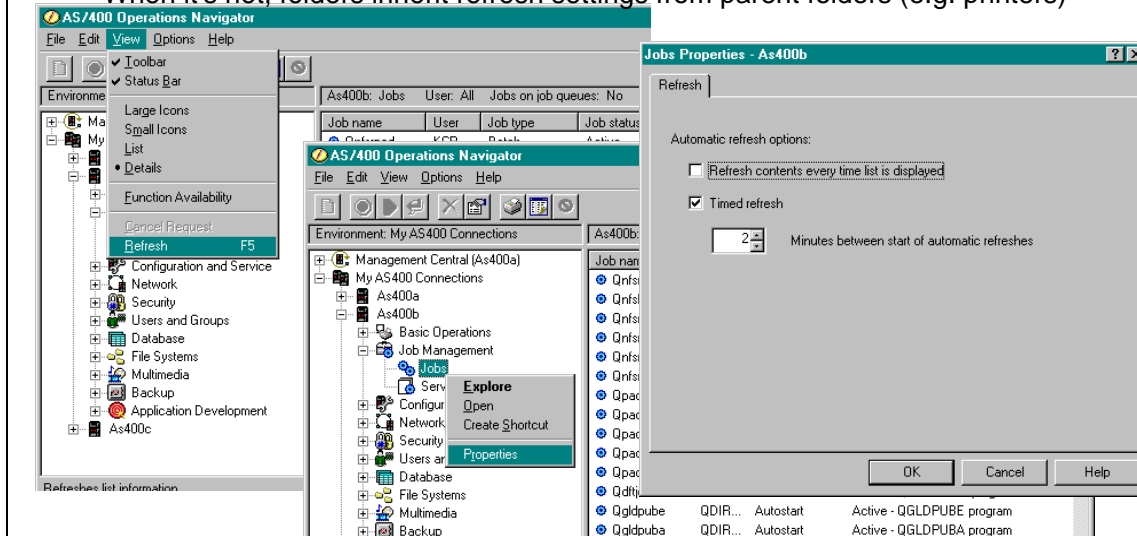
- Find allows you to find the next occurrence of a text string in the right pane of Operations Navigator
  - Searches all the displayed columns, not just the name
- Print and Print preview (on the File pulldown menu) print entire contents of the right pane to a PC printer



## Auto-refresh

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- Operations Navigator lists are retrieved once and cached on the PC
  - Better performance
- Users must manually refresh list or Use Auto-refresh
  - Refresh tab is available for many folders in their Properties
  - When it's not, folders inherit refresh settings from parent folders (e.g. printers)



## Notes: Refresh



### Why and How to Refresh

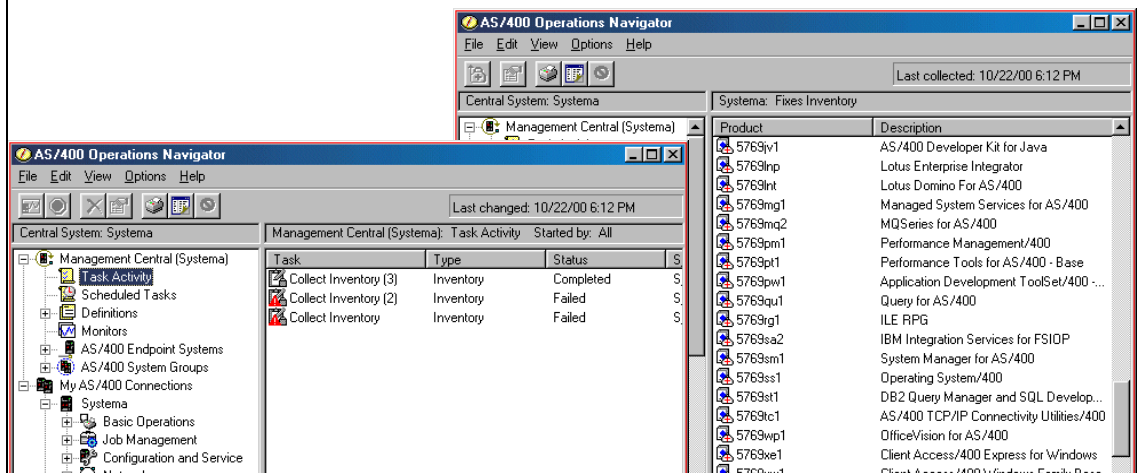
Once a list of items is retrieved from the server and put in the right pane, it is cached on the PC. Clicking again on the folder in the tree that generated that list produces the list very quickly because it has been cached. The status area in the upper right of the main window shows a "data freshness" indicator which tells you how old the data in that pane is (for example, "3 minutes old"). To get the latest data use the refresh option in the View pull down menu or the refresh toolbar button.

Most lists don't change that often. Some lists, like printer output on an active printer, however, could be changing quickly. For these cases you can set automatic refresh options using the refresh tab in folder properties. You can have Operations Navigator always refresh a list whenever you select its folder (no caching), or you can turn on a timed refresh which will update the list for you automatically on a regular basis. If the tree folder you want auto-refreshed does not have a refresh tab in its properties, it is inheriting its refresh options from a parent folder higher up in the tree. For example, the properties window for individual printers do not have a refresh tab. However, the Printers folder does; changes to refresh settings on the Printers folder affect every printer.

## Auto-Refresh in Management Central



- **Some lists are dynamic and always updated by the central system**
  - Data freshness indicator looks like "Last changed: 2/24/99 9:01 AM."
  - No need to refresh these lists.
- **Other lists are collected at a particular time**
  - Such as Fixes inventory on either an endpoint or a system in your connections list
  - Data freshness indicator looks like "Last collected: 2/24/99 9:01 AM."
  - To refresh these lists, you must request that the inventory be collected again.
    - To refresh the inventory, use the Inventory -> Collect menu option on the system or endpoint



## Notes: Refresh



### Refreshing in Management Central Folders

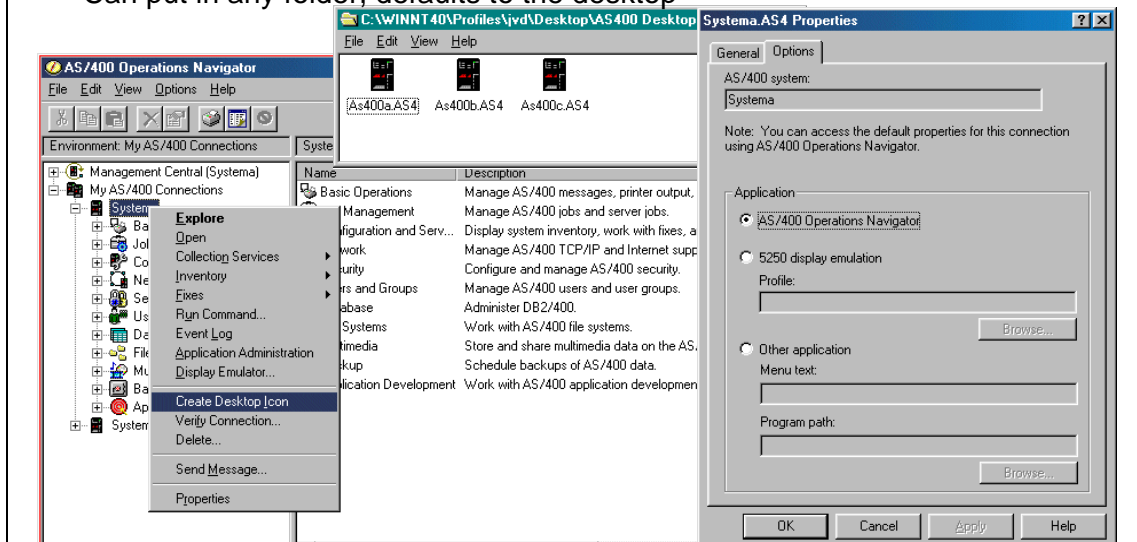
Some lists provided by Management Central are an exception to the explanation provided above. The Task Activity and Monitor lists are dynamic and always updated by the central system as needed. The data freshness indicator in these cases looks like "Last changed: 2/24/99 9:01 AM." There is no need to refresh these lists.

When viewing hardware or software inventory on an endpoint, or viewing PTF inventory on either an endpoint or a system in your connections list, you are viewing inventory collected at a particular time. In these cases the data freshness indicator looks like "Last collected: 2/24/99 9:01 AM." To refresh these lists, you must request that the inventory be collected again. To collect the latest inventory, use the Inventory - Collect menu option on the system or endpoint of interest.

## Desktop Icons



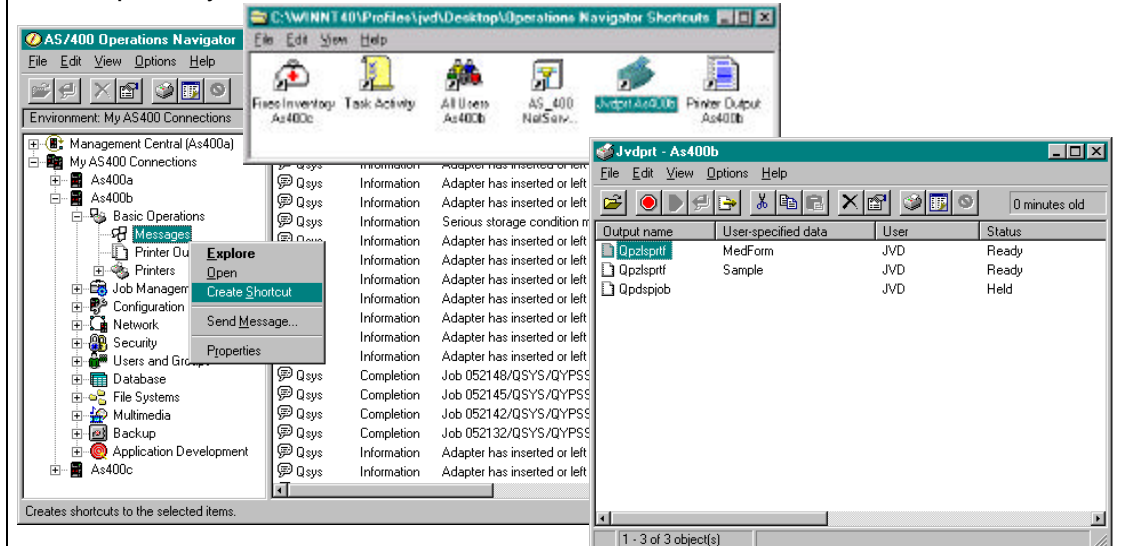
- An icon that can be customized to connect to the server and start:
  - Operations Navigator
  - PC5250 Emulation
  - Another application of your choice
- Can put in any folder, defaults to the desktop



## Shortcuts

- Quick access to a list of objects
- Drag and drop a folder to the desktop or use the Create Shortcut menu option
- Shortcuts open a separate window with just the contents of the list
- Separately customizable via Include and Columns

IBM  iSeries



## Note: Desktop Icons & Operations Navigator Shortcuts

IBM  iSeries

### Desktop Icons

Desktop icons are useful when you want to start Operations Navigator, PC5250 (including which 5250 profile to use), or a program of your choosing quickly from the desktop or one of your folders.

### Operations Navigator Shortcuts

Operations Navigator's shortcuts are Windows shortcuts to the Operations Navigator program, cwbnnav.exe, and include information about which folder to open. They can be created by dragging and dropping a folder from Operations Navigator's function tree to the desktop or by using the Create Shortcut menu option on folders' pop-up menus.

You do not need Operations Navigator to be started to use a shortcut; double clicking on a shortcut opens a window with the shortcut folder's contents. However, each shortcut you open will start a new copy of the Operations Navigator program. Opening multiple shortcuts impacts your PC's performance (depending on how much memory is installed on the PC).

Shortcuts can be customized separately from the main Operations Navigator window. If the list supports Include and Columns, the shortcut icon stores these settings with the shortcut. So, for example, it's possible to have two different shortcuts to the same printer, each with different Include settings. (An exception to this is shortcuts provided by Management Central.)

## Drag and Drop

IBM @server iSeries

- **Users**
  - Copy to other AS/400 or iSeries 400 servers (Users & Groups or All users folders)
  - Add users to or remove from groups
- **Groups**
  - Copy group profile (not group members) to other AS/400 or iSeries 400 servers (Users & Groups or Groups folders)
- **Directories and files in the integrated files system**
  - QSYS.LIB drag and drop supported as of V5R1
  - Copy/Move to other AS/400s (Integrated file system folders)
  - Copy/Move to the PC desktop
- **Printer output**
  - Copy/Move to a different printer
  - Copy to a printer on a different AS/400 or iSeries 400 server
    - Requires TCP/IP LPR/LPD between the two systems
  - Copy to the PC desktop (copies only the text)
- **Tree folders to the desktop to create shortcuts**
- **Copy/move functions described above are also available via Cut/Copy/Paste menus**
- **Database tables to other libraries with and between systems**
- **Database view definition**
  - Drag and drop used to include tables in a joined view, indicate columns to join, columns in the view

## Basic Functions

IBM @server. For the next generation of e-business.





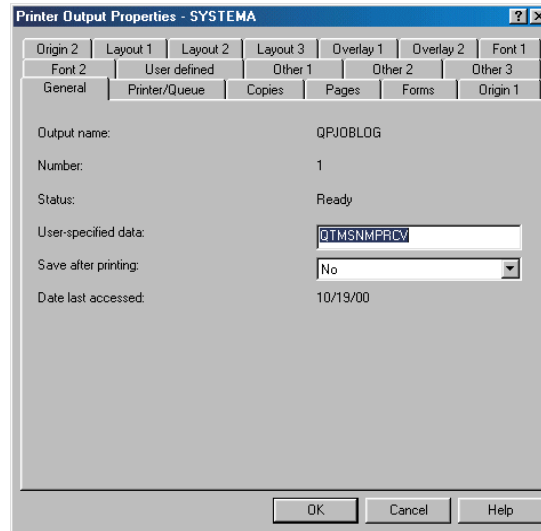




## Printer Output Properties

IBM  iSeries

- Display all properties
- Change properties, such as:
  - Printer/Queue
  - Number of copies
  - Priority
  - Form type



## Notes: Printer Output Properties

IBM  iSeries

The Printer Output Properties are the Spooled File Attributes. On a PC5250 screen, the user can either display or change these attributes using two different commands - WRKSPFLA or CHGSPFLA.

These are the changeable properties:

General - User specified data (description of the output) and Save after printing

Printer/Queue - Printer name, Output queue and Priority

Copies - Total Copies and Copies (number of copies left to be printed)

Pages - Starting Page, Ending Page and Restart printing

Forms - Form type, Align Page, Number of separator pages and Form feed

Layout 1 - Print on both sides and Pages per side

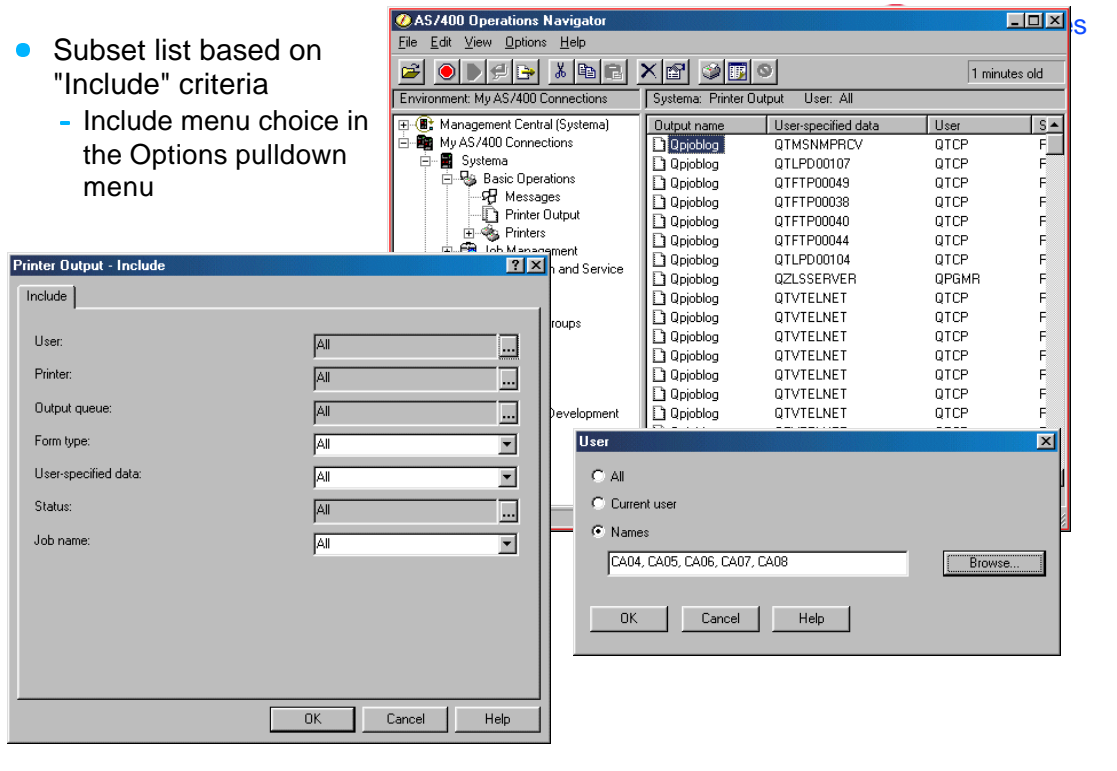
Overlay - Front/Back side overlay and Front/Back side overlay offset

Other 1 - Print fidelity, Print quality and Output becomes available

In addition to these changeable fields, there is additional information available on the spooled file on these properties pages. For example, on the General tab the user finds information about the Output name and the Status, on the Origin tab the Time and Date as well as the User, the Job and the System the output was created on is displayed. The Other 1 tab shows the Device requirements, such as AFP Resources and Bar codes, the Other 2 and Other 3 tabs display additional attributes, for example Final Form text, Highlight, Rotation, Subscript, Superscript, Variable characters per inch, Variable font, Variable drawer and many more.

## Printer Output List

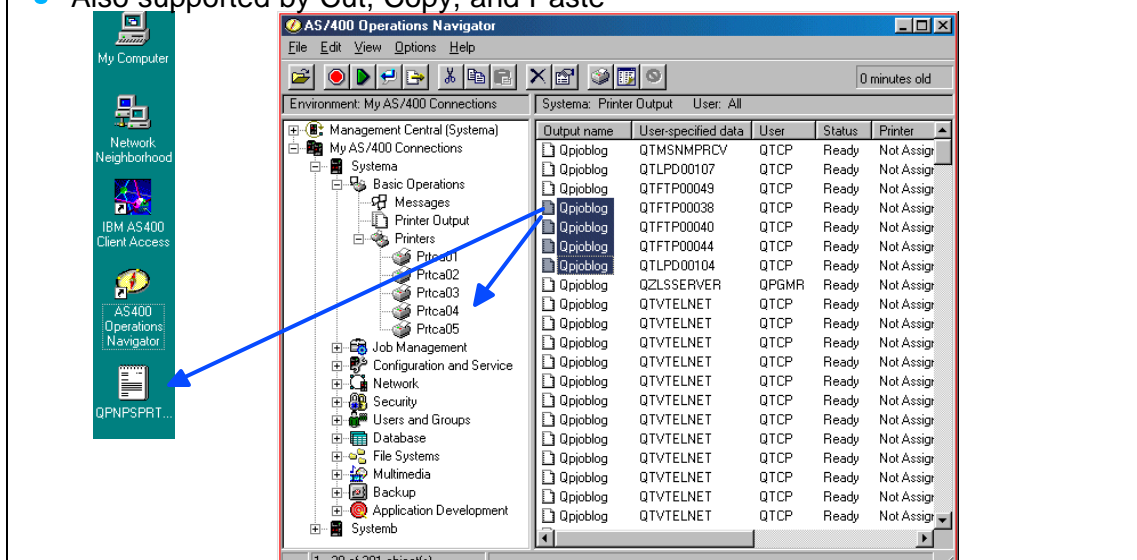
- Subset list based on "Include" criteria
  - Include menu choice in the Options pulldown menu



## Printer Output Drag and Drop

- Can be used to move or copy output from one printer...
  - ...to another
  - ...to a printer on a different system (using TCP/IP)...
  - ...or to the Desktop (creates a PC text file, great for attaching to e-mail)
- Also supported by Cut, Copy, and Paste

IBM  iSeries



## Notes: Printer Output Drag and Drop

IBM  iSeries

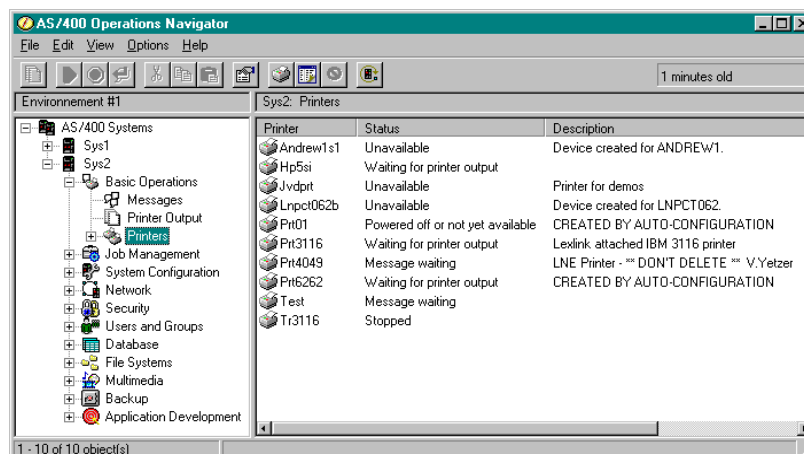
Drag and drop printer output to move or copy it to a different printer, a printer on a different system, or on your PC desktop to create a text file (graphic data in the file is ignored).

Copying (or dragging and dropping) a printer output file or moving one from one system to another uses the OS/400 LPR command. It requires a TCP/IP connection between the systems and the LPD server must be started on the target system.

## Printer Functions

IBM  iSeries

- Manage Printers
- View Printer Output
- Display Properties



## Manage Printers

- Explore printer output
- Start/Stop/Restart
- Hold/Release
- Make Available / Unavailable
- Reply to messages
- Properties

The screenshot displays the AS/400 Operations Navigator interface. On the left, a tree view shows the 'Printers' folder expanded, listing printers Prtca01 through Prtca05. A context menu is open over Prtca01, showing options like 'Explore', 'Start...', 'Stop...', 'Restart...', 'Make Available', 'Make Unavailable', and 'Properties'. On the right, two dialog boxes are shown: 'Start' and 'Printer Properties - SYS2'. The 'Start' dialog has fields for Printer name (PRTCA01), Output queue (Printer default), Library, and Message queue (Printer default). The 'Printer Properties' dialog shows details for printer PRT3116, including its type (SCS), description (Lexlink attached IBM 3116 printer), status (Waiting for printer output), and message queue (QSYSOPR).

## Notes: Manage Printers

The Printer function offers the user a variety of tasks that can be performed against their server printers. It combines writer, printer, and output queue into one logical printer. Many of the functions can be compared to the Work with all Printers (WRKWTR) command. The tasks can be selected from the context menu (right mouse click). This includes:

**Start** a printer  
 When starting a printer the user can also change several starting options, such as the Output and Message queue, Form type and Separator page information, First file to print, Auto end and more.

**Stop** a printer  
 Immediately, After current copy, At page end.

**Restart** the printer at  
 Starting page, Ending page, Next page, Page number n

**Hold**  
 Immediately, After current copy, At page end.

**Release**  
 Current page, Beginning of current file, Beginning of next file, Page number n

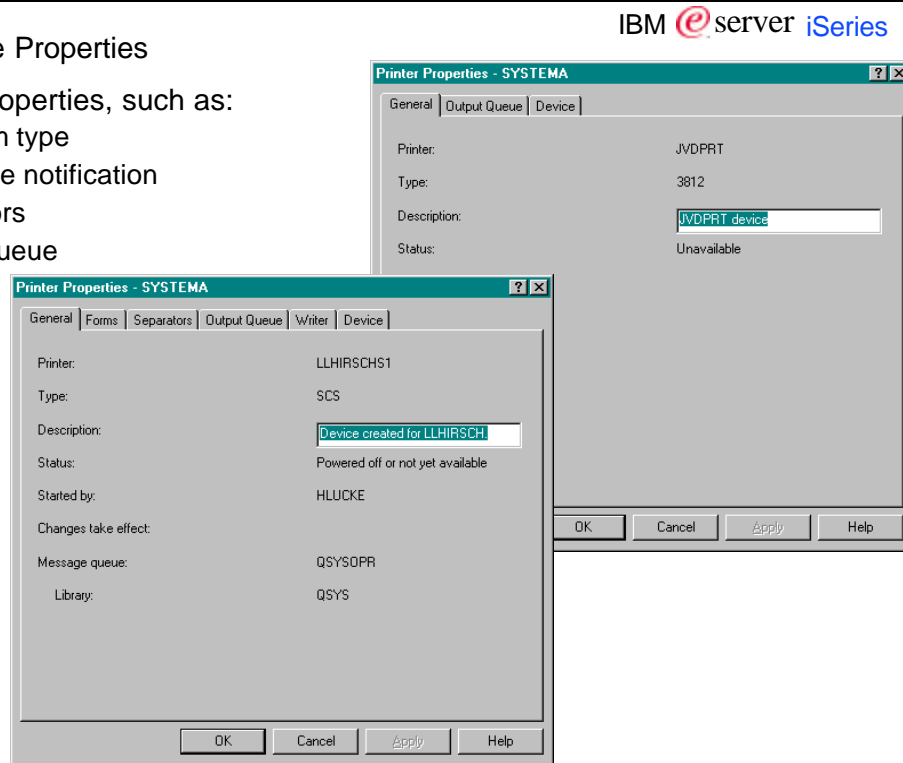
**Reply** to messages  
 When the user chooses the Reply to message option from the context menu, the message is displayed along with the message ID and the time and date sent. The default reply is entered into the reply field, so simply click on the OK button, if this is the desired reply.

**Make available** (Vary on the printer)  
**Make unavailable** (Vary off the printer)  
 Menu options are available based on the current status of the printer.

Changing the printer properties is the same as option 2 (Change) on the Work with All Printers menu (WRKWTR).

## Printer Properties

- Display the Properties
- Change properties, such as:
  - Next form type
  - Form-type notification
  - Separators
  - Output queue



## Notes: Printer Properties

IBM eServer iSeries

In addition to the tasks mentioned earlier, the user can also display and change the Printer Properties. This includes

### General

Displays the Printer name, Type, Description, Status, who started the printer and the Message queue name.

On this settings page the user can decide when changes to any of the properties pages should take effect - After current file is printed or After all files are printed.

### Forms

Here the user can choose the Next form type and the Next form-type notification. Current definitions are displayed.

### Separators

Current Separator drawer and Number of separator pages are displayed and can be changed.

### Output Queue

The current Output Queue and its Status are displayed. The output queue can be changed. The user can take advantage of the Find button to search for available output queues.

### Writer

name, Status, Allow direct printing (Yes or No) and End automatically (Yes or No) are displayed.

### Device

Information about the device, such as Printer name, Device status, Printer Type and AFP (Yes or No) is displayed.

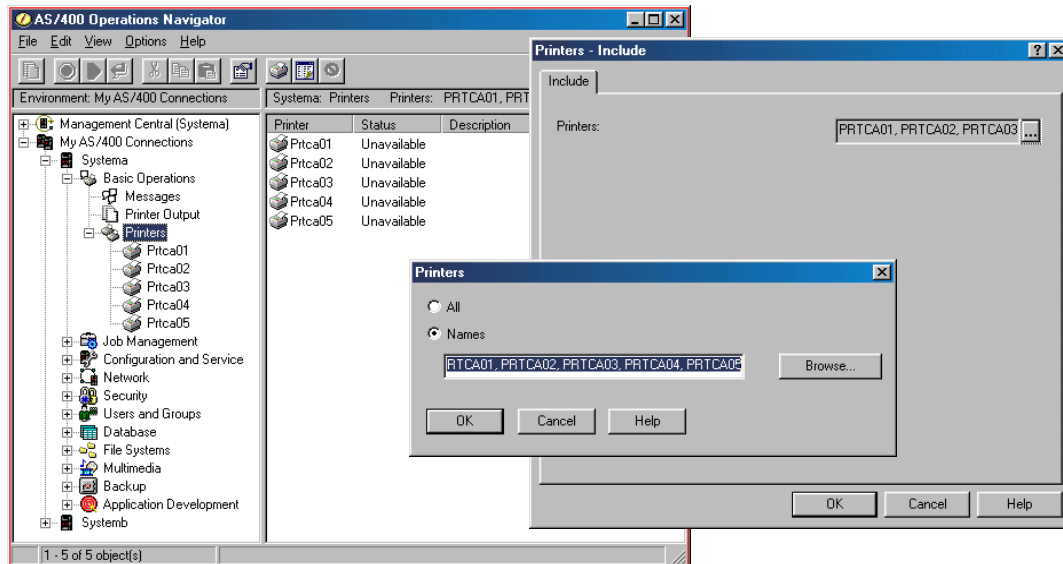
If a printer is not started, only the General, Output Queue and Device tabs are available on the printer properties. Changing the printer properties is the same as option 2 (Change) on the Work with All Printers menu (WRKWTR).



## Viewing Printers



- Subset list of printers based on "Include" criteria



 System Messages

## Message Functions

IBM iSeries

- Send messages to specific users, all users, or all workstations including break messages (only affects PC5250 emulation)
- Messages needing a reply sorted to the top

## Messages

- View details, Delete, Reply
- Display properties

Detailed Message Information

Message ID: CPA57EF  
 Date and time sent: 10/22/00 15:56:57

Message:  
 Controller S400B contact not successful. Probable remote station problem. (C R)

Message help:  
 Cause . . . . . The system was trying to exchange identifiers with the station when an error occurred. The probable causes are: -- The controller description on the remote system is not varied on. -- A configuration problem. -- A remote hardware problem. -- A local hardware problem or network problem if on an Ethernet network. -- A timing or performance problem. Recovery . . . . . Do the following: -- Do the following: --

Reply

From: QSYS  
 Date sent: 10/22/00  
 Time sent: 15:56:57

Message:  
 Controller S400B contact not successful. Probable remote station problem. (C R)

Message help:  
 Cause . . . . . The system was trying to exchange identifiers with the station when an error occurred. The probable causes are: -- The controller description on the remote system is not varied on. -- A configuration problem. -- A remote hardware problem. -- A local hardware problem or network problem if on an Ethernet network. -- A timing or performance problem. Recovery . . . . . Do the following: -- Do the following: --

Reply

## Notes: Messages



The Messages Function allows the user to display, reply to, delete, and send messages. This function is similar to the Display Messages (DSPMSG), Send Message (SNDMSG), and Send Break Message (SNDBRKMSG) commands.

Depending on the user's access rights, they are able to display their own messages, other user's messages, or System operator messages by setting their preferences in the Include dialog under the Options menu.

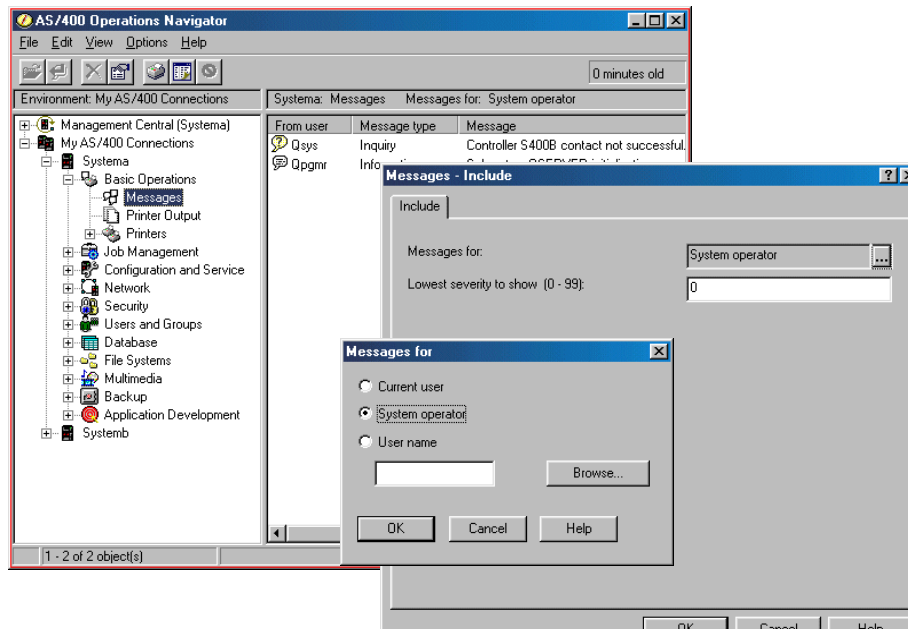
In addition, the context menu allows users to display message details, and to delete messages from a message queue if they have the proper access rights.

The properties of messages provide information such as User, the Message ID and a short Message text, Date and Time sent, Severity, Message type, Message queue, From job, and From program.

## Viewing Messages



- Subset list of messages based on "Include" criteria
- You can also view all system operator messages



## Notes: Viewing Messages

IBM  iSeries

Depending on a user's rights, they are able to filter the display of messages. This is done using selecting Include from the Options menu bar. The user can subset the list of messages shown in the right pane based on the User or the Message Severity.

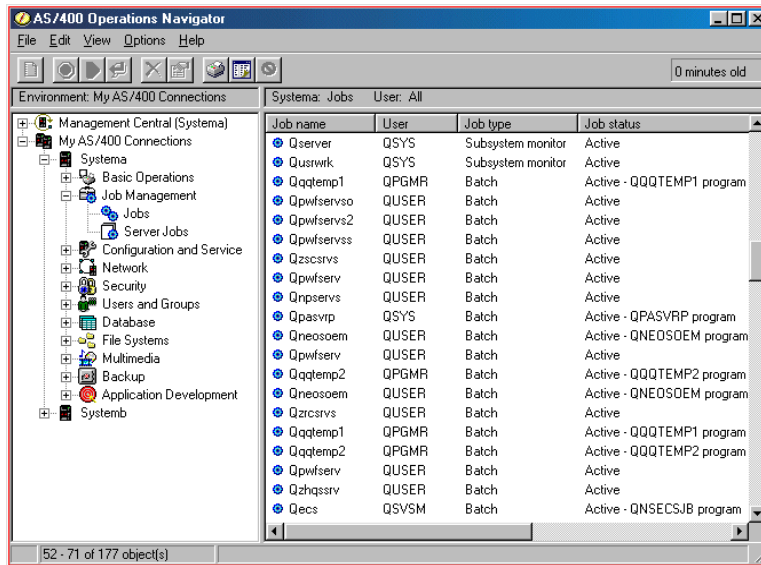
This is especially useful if you want to monitor all of the System Operator messages.

 Jobs

## Job Functions

IBM 

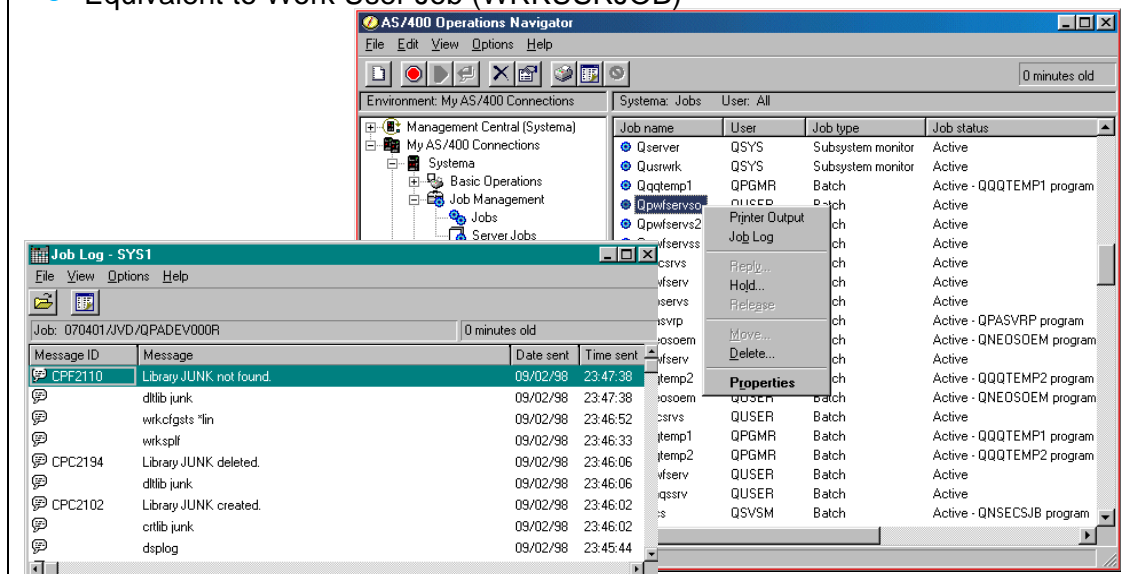
- Manage jobs
- Display printer output, job log
- Display Properties



## Manage Jobs

IBM 

- Move, Hold, Release, End job (Delete)
- Reply to job messages
- Display printer output and the job log
- Equivalent to Work User Job (WRKUSRJOB)



## Notes: Jobs

IBM  iSeries

The Jobs Function of Operations Navigator corresponds to the Work with User Jobs (WRKUSRJOB) command. The following actions can be performed against jobs:

- Display the printer output
- Display the Job log
- Details of each entry in the job log can be displayed by double-clicking on them
- Reply to messages
- Hold
- Release
- Delete (ENDJOB command)
- Immediately or Controlled
- Delay time
- Delete printer output
- Maximum job log entries
- End additional interactive jobs (None/Group job/All)
- Move - TFRJOB
- Moves jobs that are on a job queue to another job queue

The various properties pages correspond to the options a user finds on the Display Job (DSPJOB) command. For example the General 1 tab provides the same information as does Option 1 (Display job status attributes) from the DSPJOB command.

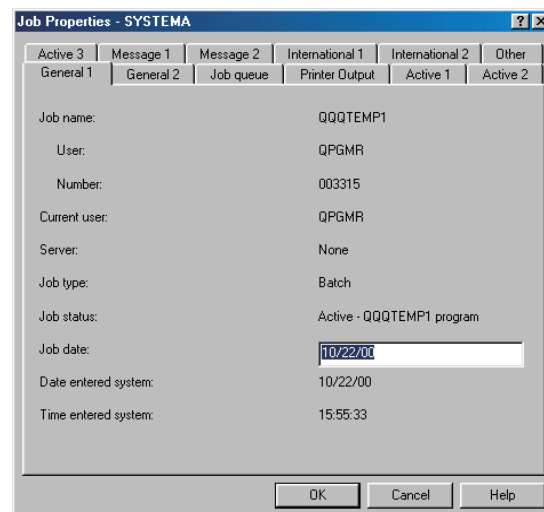
Changing the properties of a job is the same as issuing the Change Job (CHGJOB) command on a green screen.

**Note: In V5R1 the basic Jobs folder has been moved into Basic Operations. Replacing the Job Management Folder is the new Work Management Folder which contains the latest GUI for managing active jobs, server jobs, job queues, subsystems, and memory pools.**

## Jobs Properties

IBM  iSeries

- Display all job properties
- Change properties, such as:
  - Job queue
  - Priority on queue
  - Run priority
  - CCSID



## Notes: Job Properties



The various properties pages correspond to the options a user finds on the Display Job (DSPJOB) command. For example the General 1 tab provides the same information as does Option 1 (Display job status attributes) from the DSPJOB command. In the properties pages the user finds information about the job, such as

General 1 and General 2

Job name, Job type, Subtype, Job status, Date and Time the job entered the system, Job description

Active 1, Active 2 and Active 3

Run priority, Subsystem, Current user, Special environment, CPU time, Temporary storage, Total response time, Auxiliary I/O requests, Interactive transactions, Switch settings, and many more

Message 1 and Message 2

Message handling, Message logging, Message queue

Changing the properties of a job is the same as issuing the Change Job (CHGJOB) command on a green screen. These are some of the attributes that can be changed (depending on the job type):

Printer output tab: Printer, Priority on output queue, Output queue, Print text (printed at the bottom of each page of output the printer produces) and the Print key format

Active 1 tab: Run priority

Active 2 tab: Time slice, Eligible for purge

Active 3 tab: Switch settings

Message 1 tab: Break, Status and Inquiry message handling, Message logging

Date/time tab: Date format, Date and Time separator

Language tab: Language ID, Country ID, Sort sequence table, CCSID

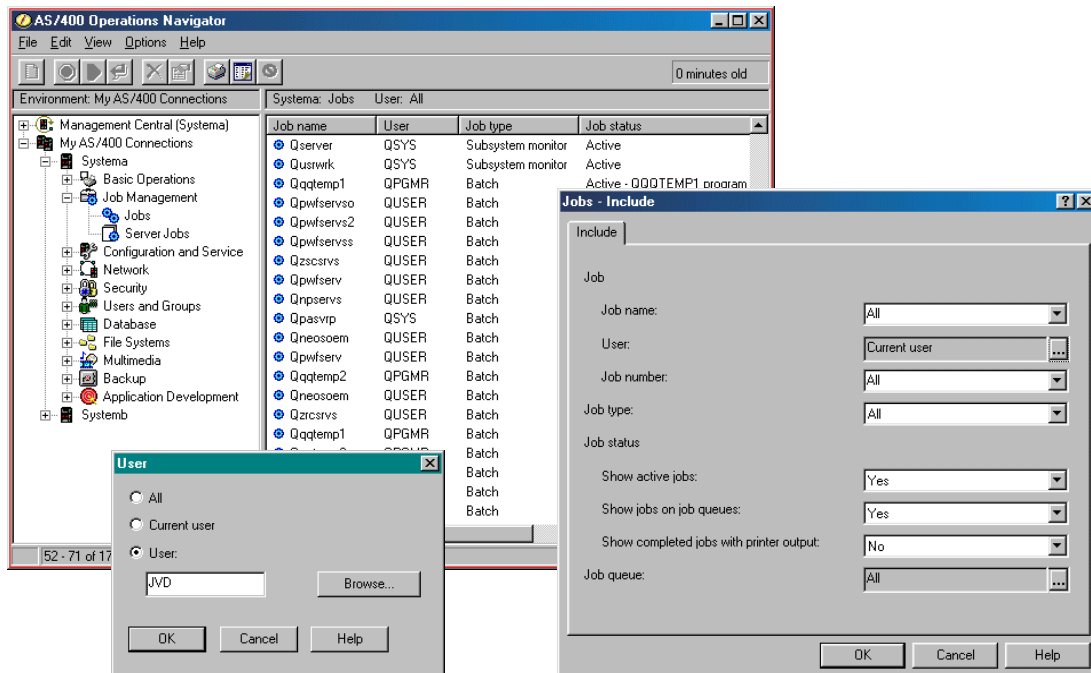
Other tab: Device recovery action (for interactive jobs), Accounting code

These values can not be changed for System jobs and Subsystem monitor jobs.

## Including Jobs



- Subset list of jobs based on "Include" criteria



# Server Jobs



- Manage jobs used by server programs (NetServer, FTP, Telnet, etc.)
- Shows which user is currently using the server
- Server jobs have the same menu options as user jobs
- Available in two places:
  - Server Jobs folder
  - Server Jobs menu option for servers

The screenshot shows the AS/400 Operations Navigator interface. On the left, a tree view shows the hierarchy: Management Central (As400a) > My AS400 Connections > As400a > Server Jobs. A context menu is open over a job named 'Qzlsfile', showing options like 'Printer Output', 'Job Log', 'Repl...', 'Hold...', 'Release', 'Move...', and 'Delete...'. On the right, a table lists various server services and their status.

Server Name	Status	Descri
RouteD	Stopped	ROUTE
RPC	Stopped	RPC
TFTP	Stopped	Trivial F
NFS	Stopped	Network
AS/400 NetServer	Started	AS/400
INETD	Stopped	INETD
Management Central	Started	Manage
EDRSQL	Stopped	Extende
DLFM	Stopped	Datalink
DNS	Stopped	DNS
FTP	Started	FTP
HTTI	Stopped	HTTP a
LPD	Started	LPD
POP	Started	POP
Rem	Stopped	Remote
SMT	Started	SMT
TELNET	Started	TELNET
Workstation gateway	Stopped	Worksta
Directory	Stopped	Directory



Configuration and Service

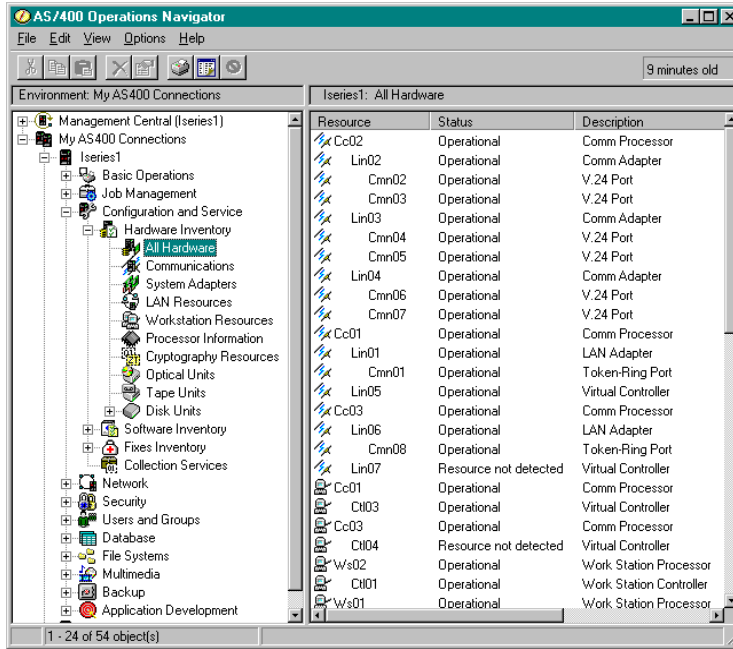


# Hardware Inventory

- **Hardware Inventory**

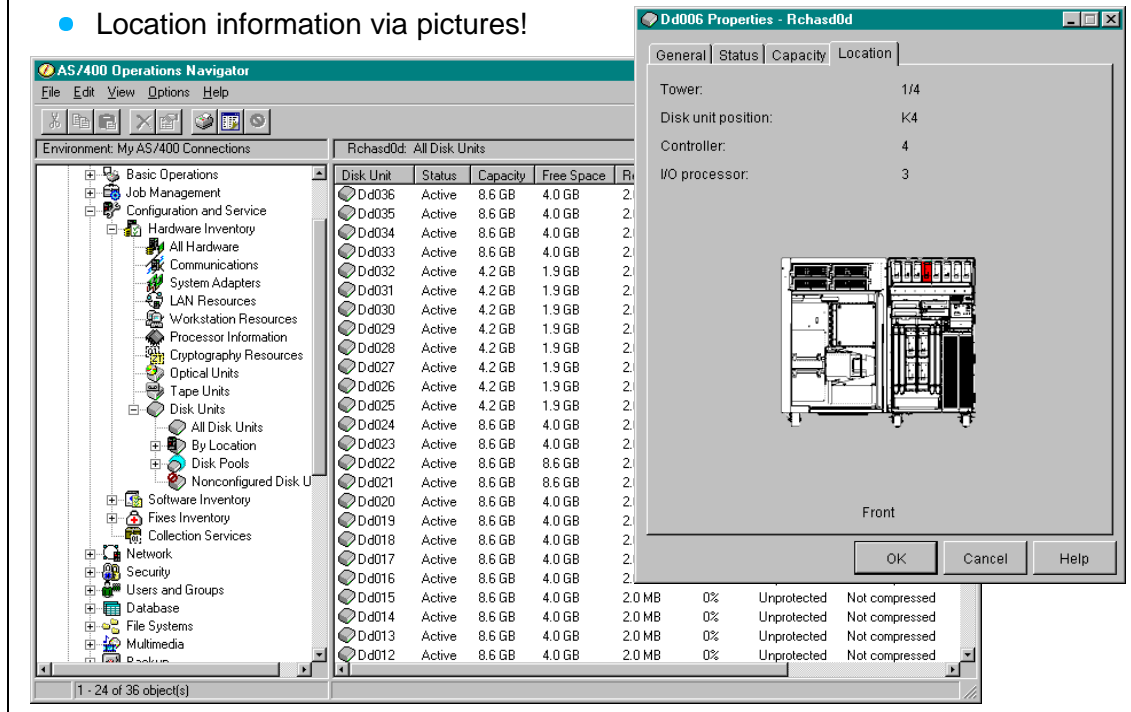


- Comparable to the Display Hardware Resource (DSPHDWRSC) command
- View hardware and its properties




# Disk Unit Management

- One place for all DASD info and tasks
- Location information via pictures!

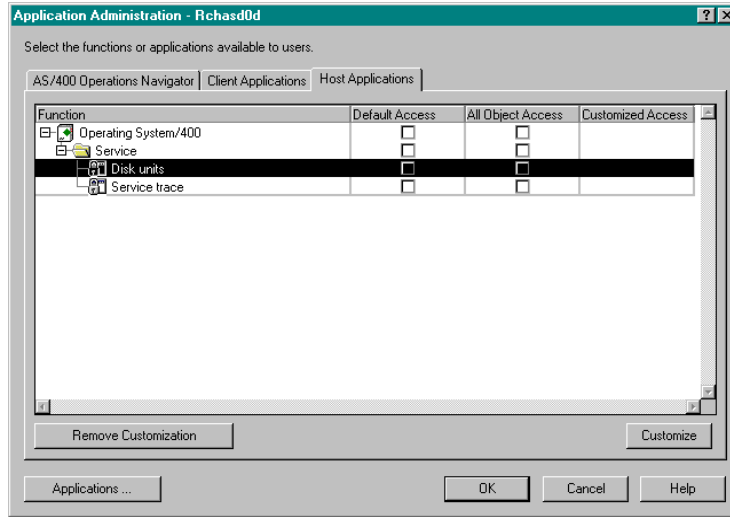


## Disk Unit Management


- **Disk Management GUI supports:** IBM 
  - View of all disk units, or units by tower, disk pools, or all non-configured units
  - Add Disk Unit via wizard
  - Format non-configured disk units
  - Scan surface
  - View properties of a disk unit: Status, capacity and location

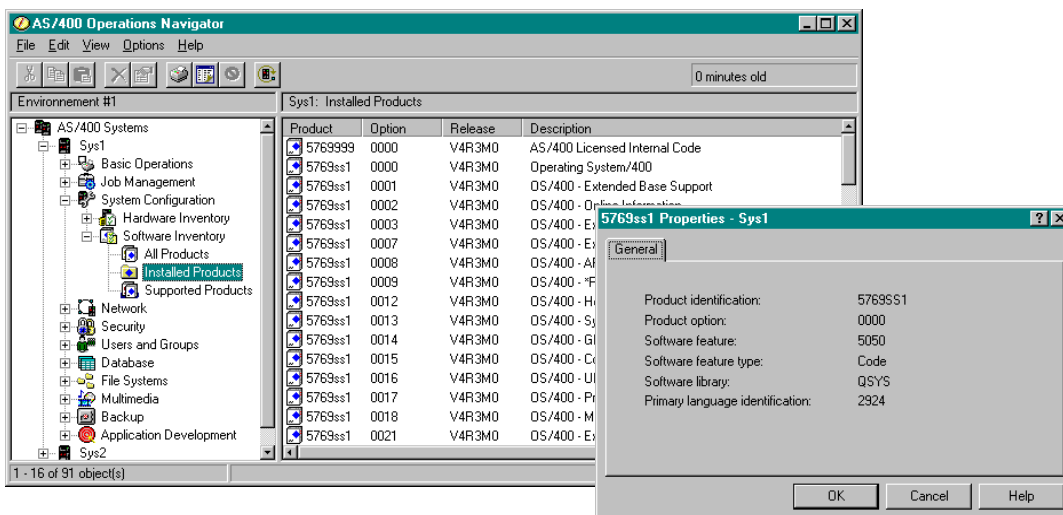
• **Note:** To see the Disk Units folder in Operations Navigator, a security administrator must allow it to be used

- The Host Applications tab in Application administration is where specific users or groups, or profiles which have all object privilege can be granted access to the disk unit functions



## Software Inventory

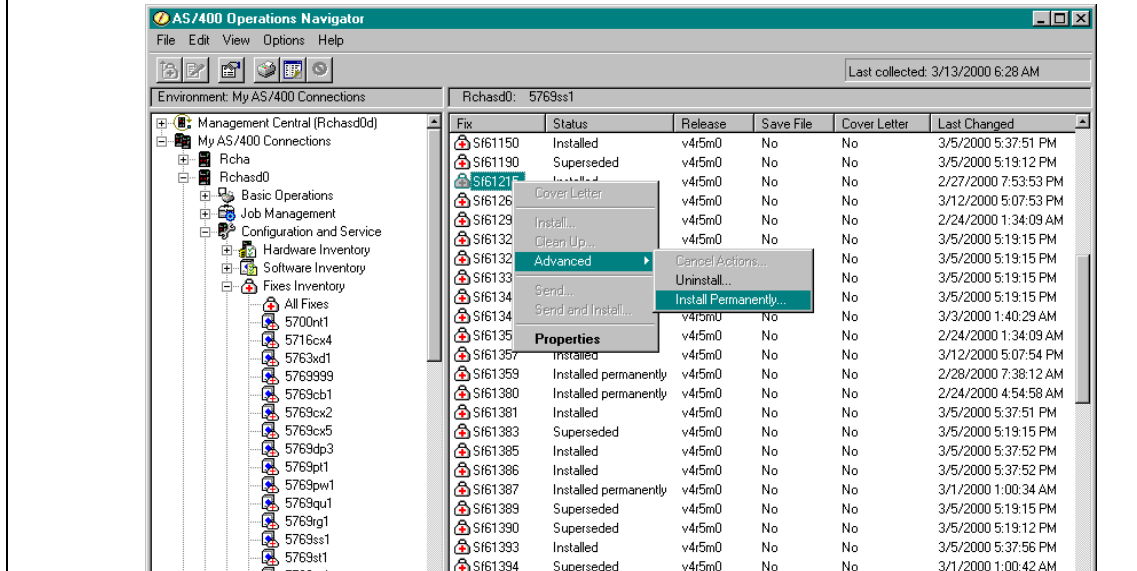
- **Displays the AS/400 software inventory** IBM 
  - Equivalent information to Display Software Resources (DSPSFWRSC) command
  - Supported Products folder contains products supported on other systems in your network



## Fixes Inventory

IBM  iSeries

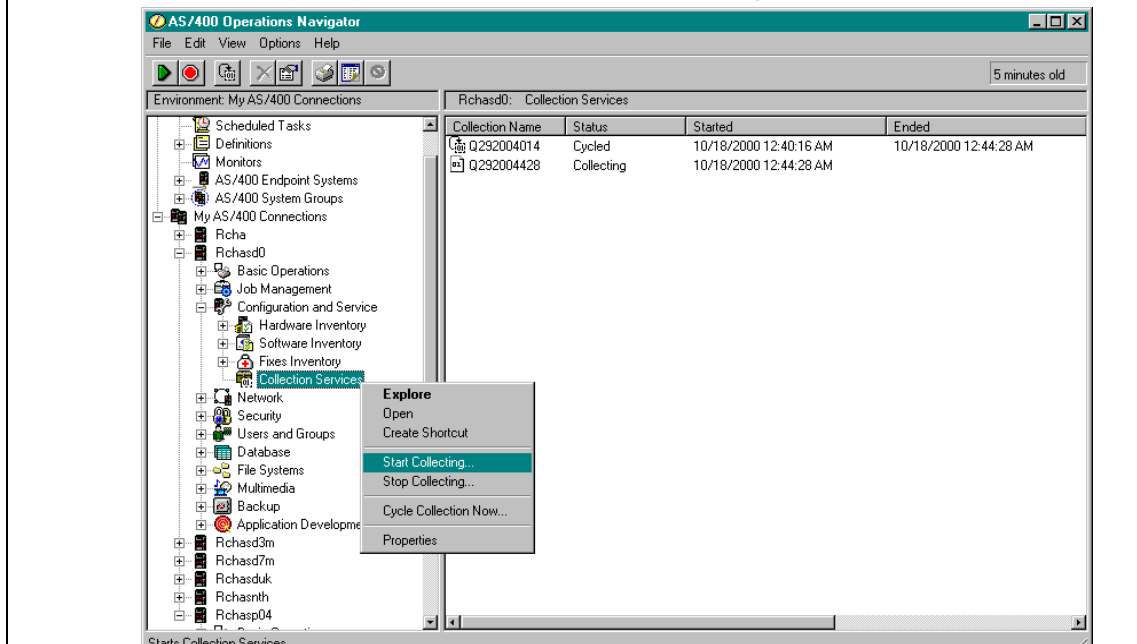
- Allows you to see and manage fixes on this server
  - Install, install permanently, Uninstall, Clean up (delete save files and cover letters)
  - Not real time data; Fix inventory needs to be collected periodically
    - Use the Inventory menu option on a system to collect or schedule collection of fixes
  - Fix tasks are also on the System, System Group, or Endpoint popup menu

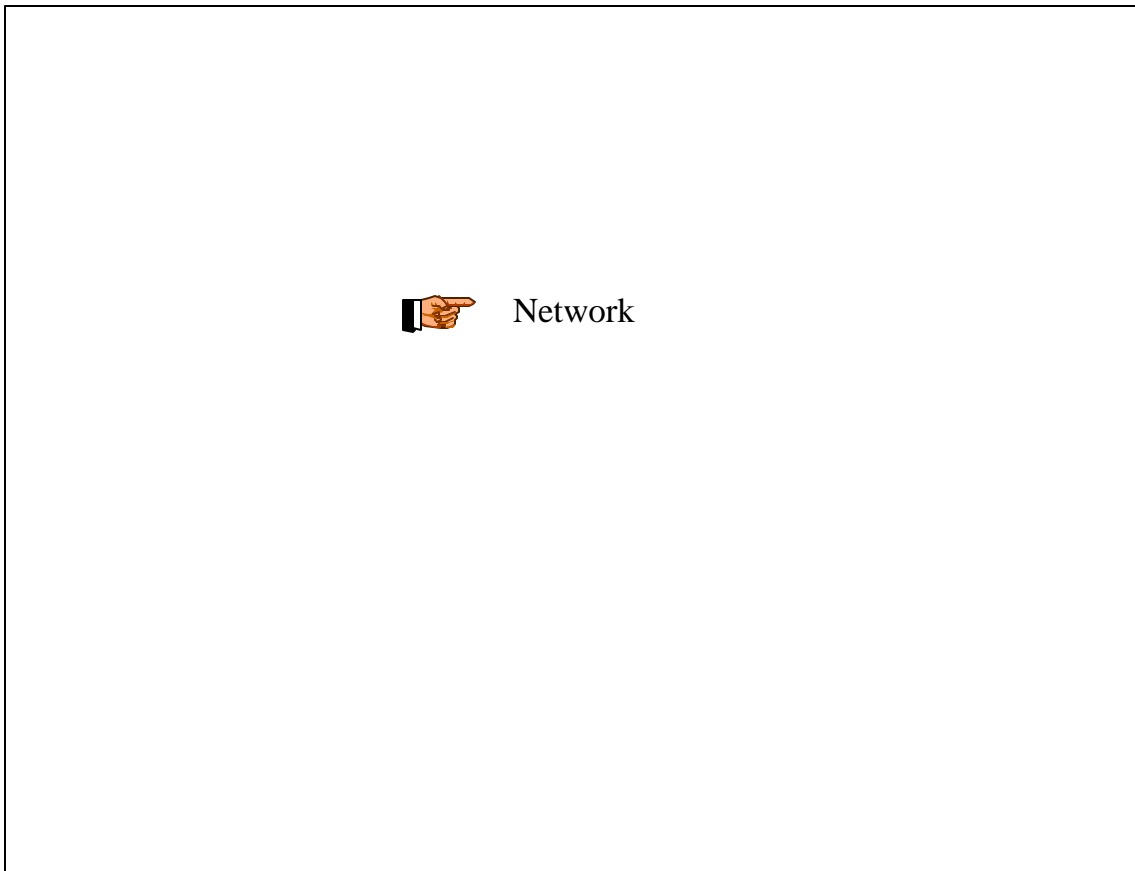


## Collection Services

IBM  iSeries

- **Collect performance data for later detailed analysis**
  - Set start/schedule/stop collection, set collection options, move data into database files
  - Data can be analyzed by Performance Tools/400 licensed program



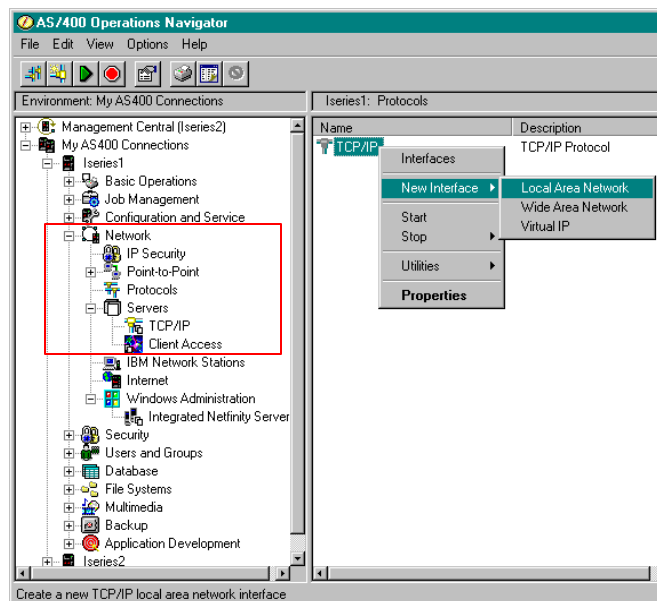


## TCP/IP Configuration

IBM iSeries

### Network contains support for configuring and managing TCP/IP

- IP Security, including VPN, packet filtering, and network address translation
- Point-to-point communications
- Start/stop TCP/IP, TCP/IP properties
  - Host domain, host table, port restrictions, TCP/IP servers to start when TCP starts
- Create/delete, start/stop TCP/IP interfaces
  - Software Servers: Start/stop, properties/configuration, server jobs
  - TCP/IP
  - Client Access
  - Domino (with Domino GUI plug-in)

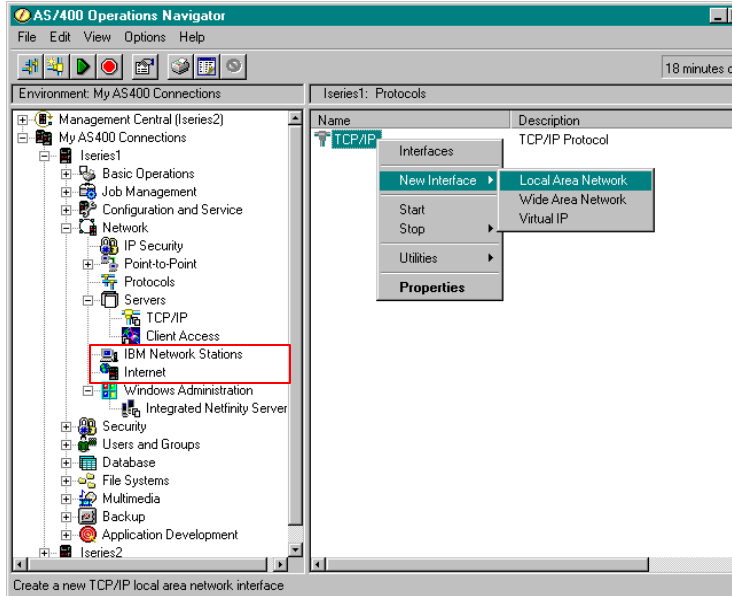


## Web-based Configuration Tools

IBM  iSeries

### Network also contains support for Network Stations, Web-based Applications for configuring the AS/400 on the Internet

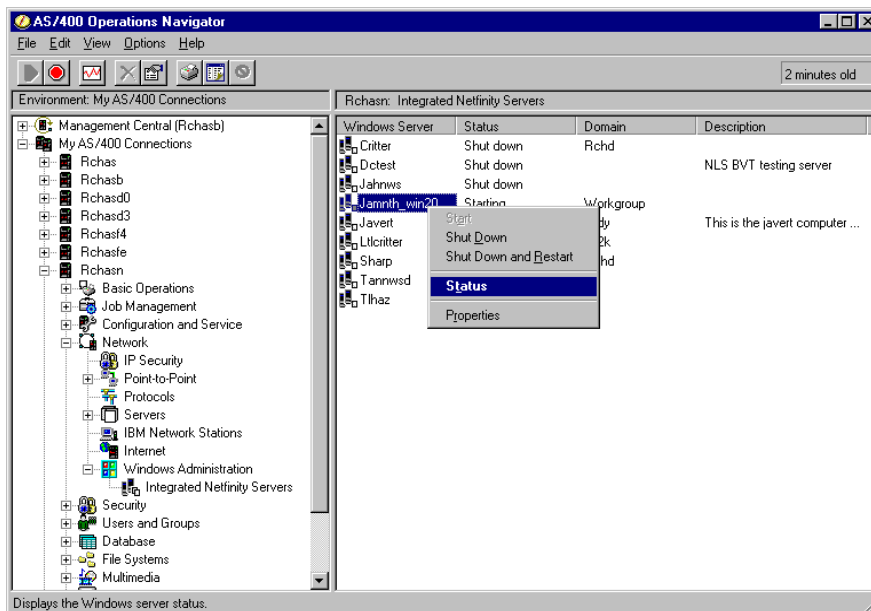
- Network Station Manager (launched into a browser)
- Web-based configuration applications
  - e.g., HTTP Configuration, Digital Certificate Manager

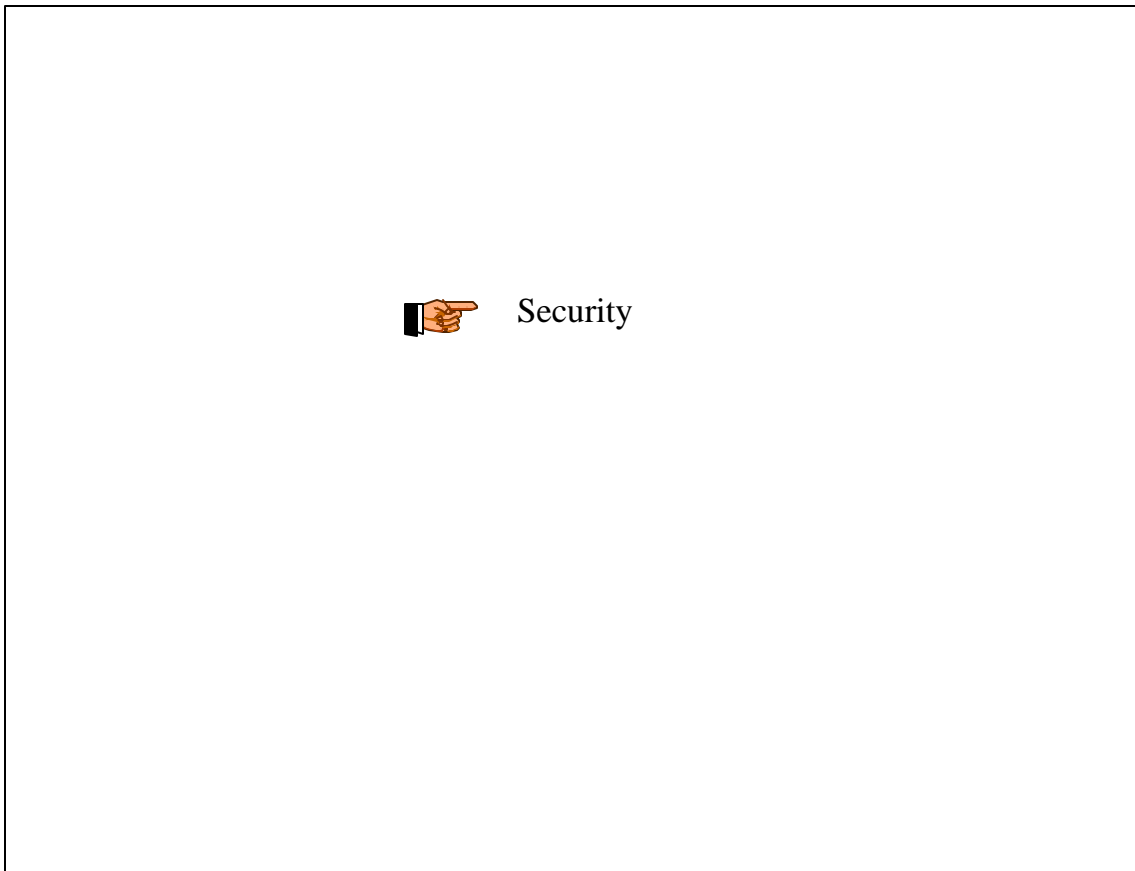


## Integrated Netfinity Servers

IBM  iSeries

- Manage Windows servers (NT, Windows 2000)
  - Start/stop, status, and properties

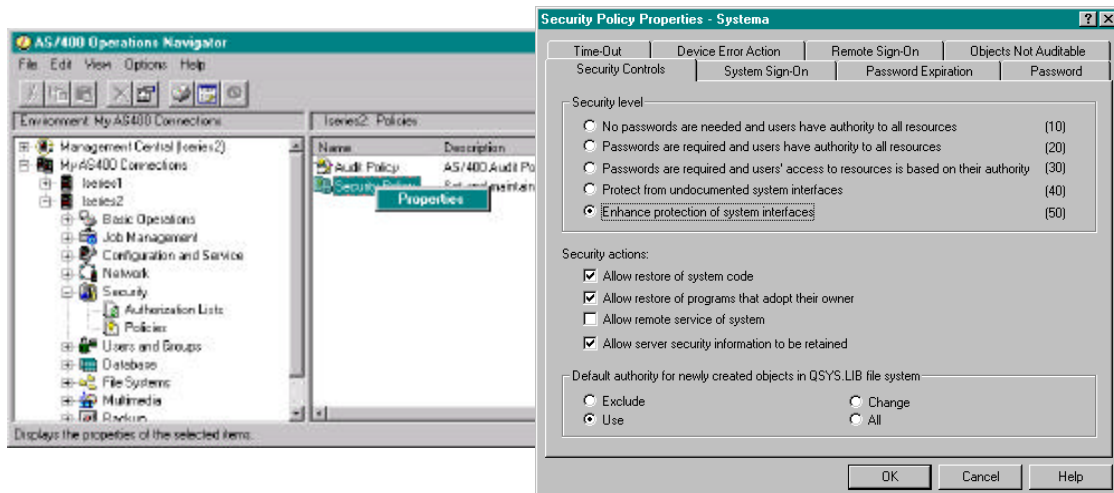




## Authorization Lists and Security Polices

IBM  iSeries

- **Authorizations lists**
- **Security policies**
  - A GUI for managing security and auditing system values



## Configure System Security

### Security Wizard

- Advises how to set security system values based on how you use your system
- Available from the "Configure" option on the Security folder

The screenshot shows the AS/400 Operations Navigator interface on the left and two overlapping windows of the AS/400 Security Wizard on the right.

The AS/400 Security Wizard - Sys2 window (top) asks: "Is your AS/400 directly connected to the Internet or in a network that is connected to the Internet?" with radio buttons for "Yes" (selected) and "No". A note below states: "Note: If you are not sure whether your system is connected to the Internet, or if you intend to connect to the Internet in the future, select Yes."

The AS/400 Security Wizard - Sys2 window (bottom) displays a welcome message: "Welcome to the AS/400 Security Wizard! Use the wizard to: Create a set of security recommendations for your AS/400. Create reports explaining the security recommendations. Apply the recommendations to your AS/400 (optional). You can cancel at any time by clicking the Cancel button." It includes "Back", "Next", and "Cancel" buttons.

The AS/400 Operations Navigator window shows a tree view with "Security" selected under "Sys2". A context menu is open over "Security" with options: "Explore", "Open", "Create Shortcut", "Configure", and "Properties". The "Configure" option is highlighted.



Users and Groups

## Users and Groups

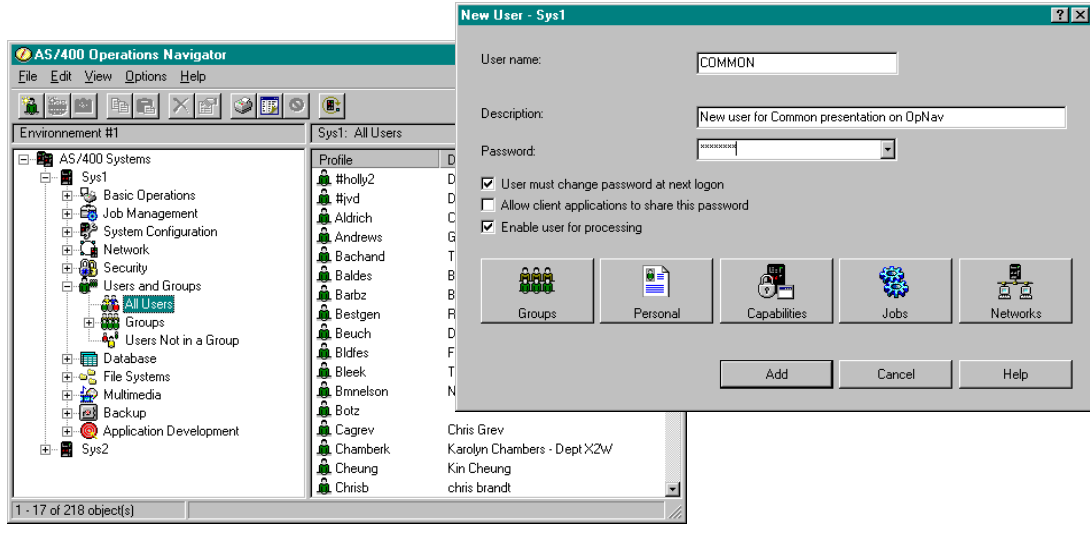
- **Users and Groups Functions**

- Create, Change, Delete, Copy Users
- Create, Change, Delete, Copy Groups
- Add Users to Groups

IBM  iSeries

- **User includes:**

- All user profile information
- System distribution directory entry
- Domino enrollment (if Domino GUI plug-in installed)



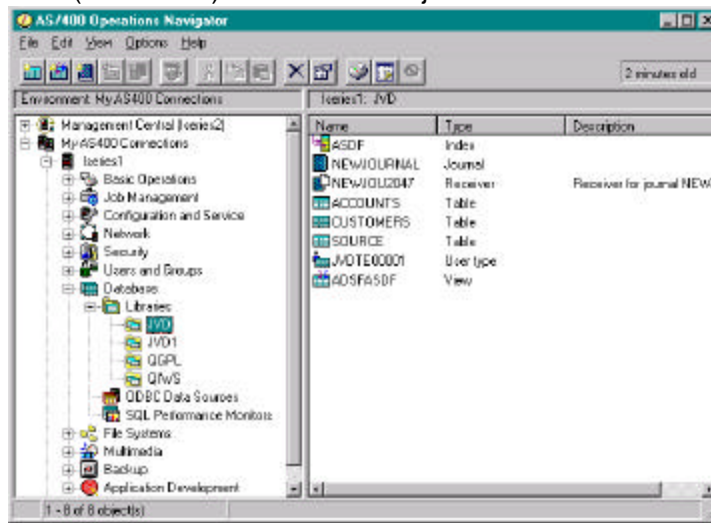
 Database



## Database

IBM  iSeries

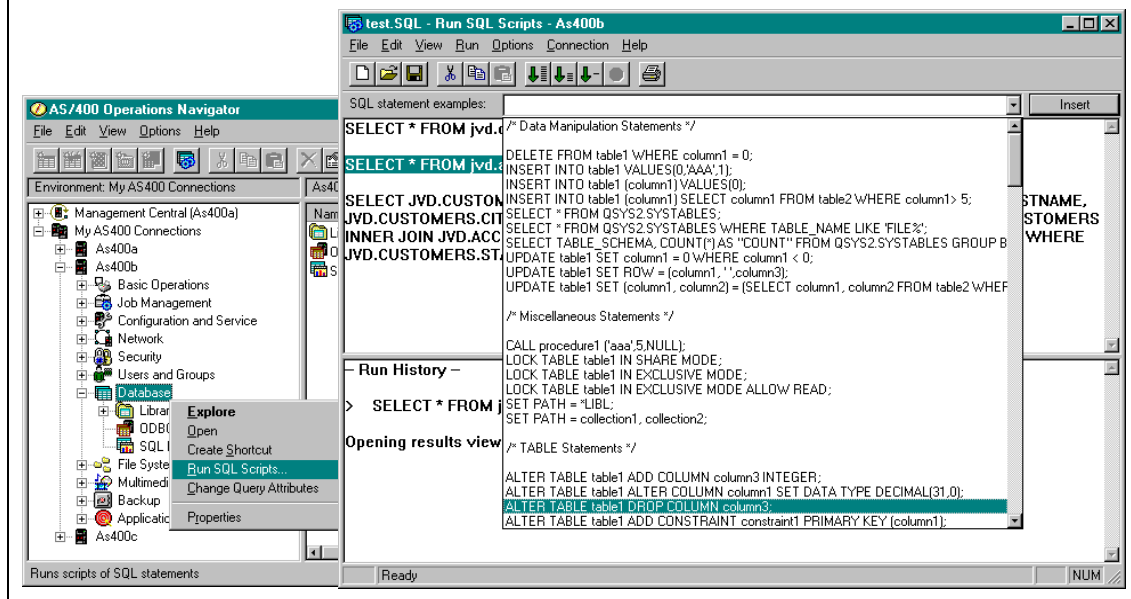
- **GUI for managing DB2/400 objects and performance**
  - Create tables, views, aliases, indexes, functions, procedures, journals, data types
  - Quickview/edit tables
  - Collect SQL performance data
  - Manage permissions (authorities) on database objects



## Database: SQL Scripts

IBM  iSeries

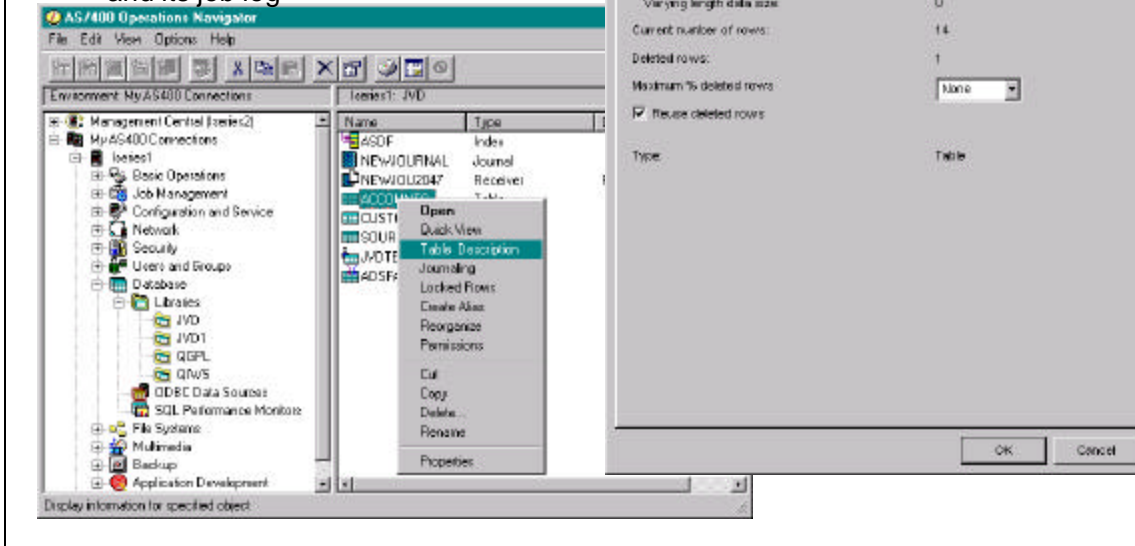
- **Create, save, run SQL Scripts**
  - Document editor interface associated to files of .SQL
  - Run all, selected, or single statements
  - SQL examples can be inserted and modified



## Table Enhancements

- **Table Description**
  - Equivalent to Display File Description (DSPFD) command
- **Locked rows**
  - Shows locked rows, the locking job and its job log

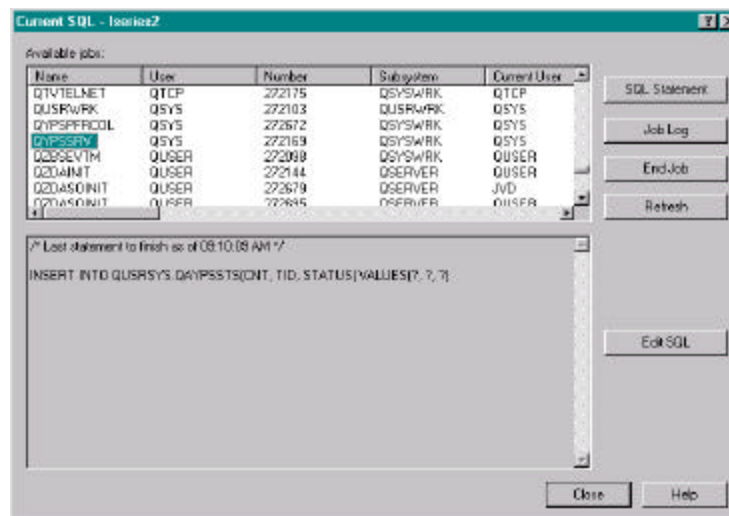
IBM  iSeries



## View Executing SQL

- **Current SQL for a Job**
  - List of active jobs from which you can see SQL statements being executed
  - Some job control too (joblog, end job)
  - Ability to take the SQL statement into the SQL editor

IBM  iSeries



# Visual Explain



- Pictorial view of query execution
- Allows query developer to understand execution flow, do performance tuning


- Mouse over an icon to get brief info about that step
- Icons represent steps during SQL execution
- Details pane on the right provides detailed info for a selected step

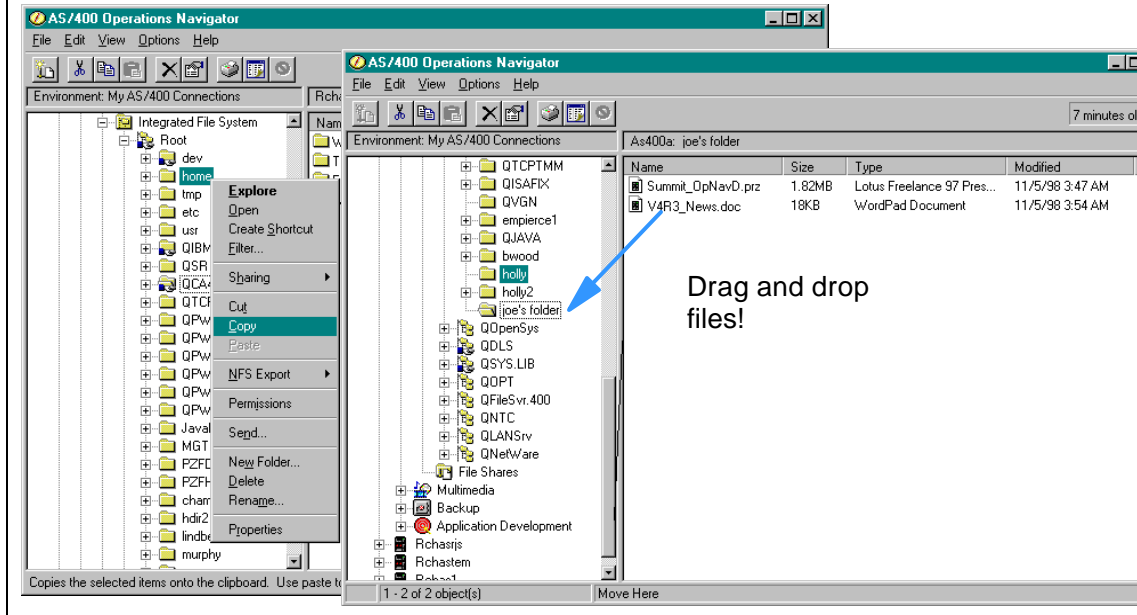
The screenshot shows the 'Visual Explain' window for a query: `SELECT A.KEYFLD,B.KEYFLD,C.KEYFLD FROM QQLIB310.QQMKFP001 A, QQLI...`. The main area displays a flow diagram with steps: 'Final Select', 'Nested Loop Join', 'Index Scan - Key Partitioning', and 'Table Scan'. Arrows indicate the flow from 'Table Scan' and 'Index Scan - Key Partitioning' to 'Nested Loop Join', and then to 'Final Select'. A 'Details' pane on the right is open for the 'Nested Loop Join' step, showing various performance metrics.

Attribute	
Time information (start time, ...)	
Timestamp for Creation of M...	2000-01-18-
Statement Start Timestamp	2000-01-18-
Statement End Timestamp	2000-01-18-
Optimization Time, in Millise...	28466
ODP Open Time, in Milliseco...	437
Total Time, in Microseconds	920768
Statement Open Time, in Mic...	460384
Statement Fetch Time, in Mill...	0
Statement CLOSE Time, in ...	0
Information about SQL state...	
Statement Number	6
Statement Function	Select
Statement Operation	Open
Statement Type	Dynamic
Statement Name	STMT0002
Statement Outcome	Successful
SQL Return Code	0

File Systems

## File Systems

- **Cut, copy, and paste, drag/drop folders and files** IBM  iSeries
  - Within and between servers and the PC desktop (for QSYS.LIB requires V5R1 GUI)
- **Create, rename, delete folders and objects**

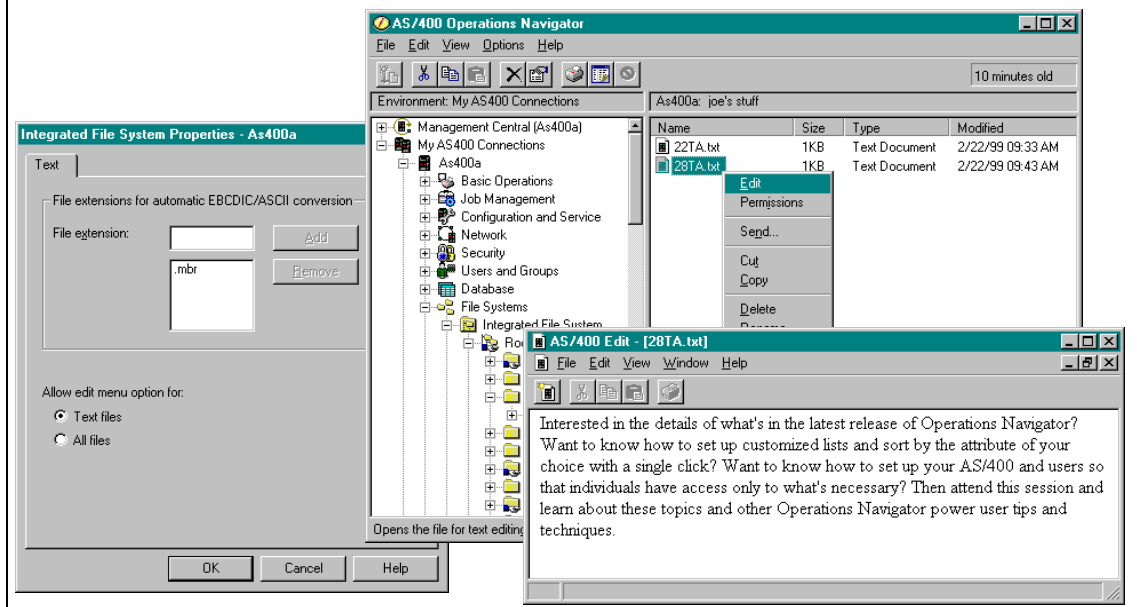


## File Systems (cont.)

### Integrated file system Editor

IBM  iSeries

- Turn on the edit menu for all files that contain text (e.g., HTML, etc.) using the Integrated File System folder properties

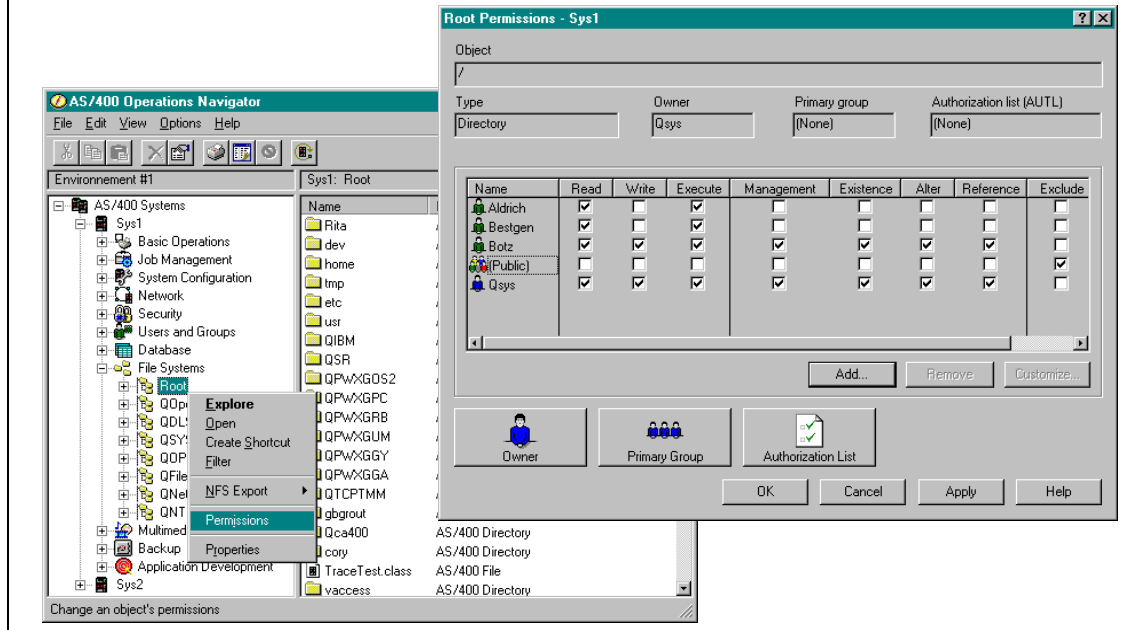


# Permissions

## Graphical version of edit object authority



- Includes assignment of an authorization list, management of object ownership, and primary group



## Note: File Systems



It's easier to manage the AS/400 integrated file system with latest Operations Navigator. In addition to allowing security administrators to manage object authorities ("Permissions") you can also now add, rename, and delete directories and objects in the file system. You can also cut/copy/paste and drag and drop objects within and between AS/400s and the PC desktop (objects in QSYS.LIB can only be dragged & drop with V5R1 Operations Navigator).

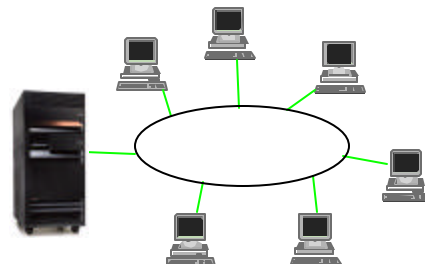
Operations Navigator also supplies an editor for text files in the integrated file system; the Edit option appears by default on files known to contain text (file types registered to use Notepad on the desktop) but you can turn Edit on for all files. Then files that aren't associated with Notepad (e.g., .HTML) can be edited as well.

 AS/400 NetServer


## AS/400 NetServer

IBM  iSeries

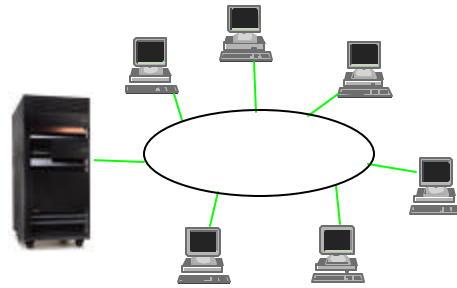
- What: File and print serving
- Who: Windows NT, Windows 98, Windows 95, Windows for Workgroups, Windows NT Server 4.0 TSE, Windows 2000
  - With PTFs for some releases: Windows 2000, Windows NT Server 4.0 Terminal Server Edition (TSE)
- Where: NetServer is part of the base OS/400 Operating System
- When: Available in V4R2 and later
- How: NetServer uses TCP/IP
- Why: Clients do not need additional software such as Client Access to access AS/400 files and printers



## NetServer Vs. Client Access

IBM  iSeries

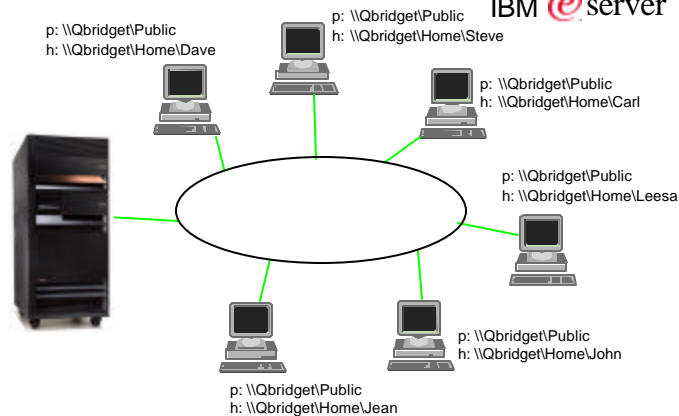
- **NetServer**
  - Doesn't require proprietary client software (part of Windows clients)
  - Can share directories with read only access
  - Can share individual directories, better AS/400 security control
  - NetServer can be hidden from the Windows Network Neighborhood by setting the browse interval property parameter to zero
  - NetServer can hide shares from the network by ending them with a \$
- **Client Access**
  - Has many functions not available in Windows, such as 5250, ODBC, data transfer, etc.
  - No concept of "shares", makes all of AS/400 IFS available
  - Background jobs running on PC



## File Sharing Examples

IBM  iSeries

Qbridget  
/NetServer/Public  
/NetServer/Home  
/Dave  
/Steve  
/Carl  
/Leesa  
/John  
/Jean



**Need everyone to run the same BAT file but only want to update it in one place instead of on every PC?  
Put it in a NetServer file share that everyone can access.**

**Need to share an install image?  
Put it in a NetServer file share that everyone can access.**

## Notes: NetServer



NetServer (AS/400 Support for Windows Network Neighborhood) was a new server application on the AS/400 for V4R2. The AS/400 can now be a file and printer server compatible with Windows NT and OS/2 LAN Servers. From Windows 95, Windows NT, and OS/2 Warp, your clients can now do file and printer serving from the AS/400 without requiring any software to be loaded on the client other than the operating system itself. From Operations Navigator, you can manage the NetServer using the following capabilities:

Start or Stop NetServer.

View the NetServer Properties to view the status of the server and change such attributes as:

Server name, Domain name, Guest user profile, WINS Server configuration, etc.

Open the NetServer configuration for an AS/400 to:

Create a New File Share or view the Properties for an existing file share

Create a New Print Share or view the Properties for an existing print share

Monitor all of the current sessions using NetServer and view the session's Properties

The significant differences between NetServer and Client Access are the following:

The operating system of the PC client contains all of the software that is required to access the NetServer.

NetServer does not provide any data translation services.

NetServer does not provide support for handling clients that use different code pages in the network.

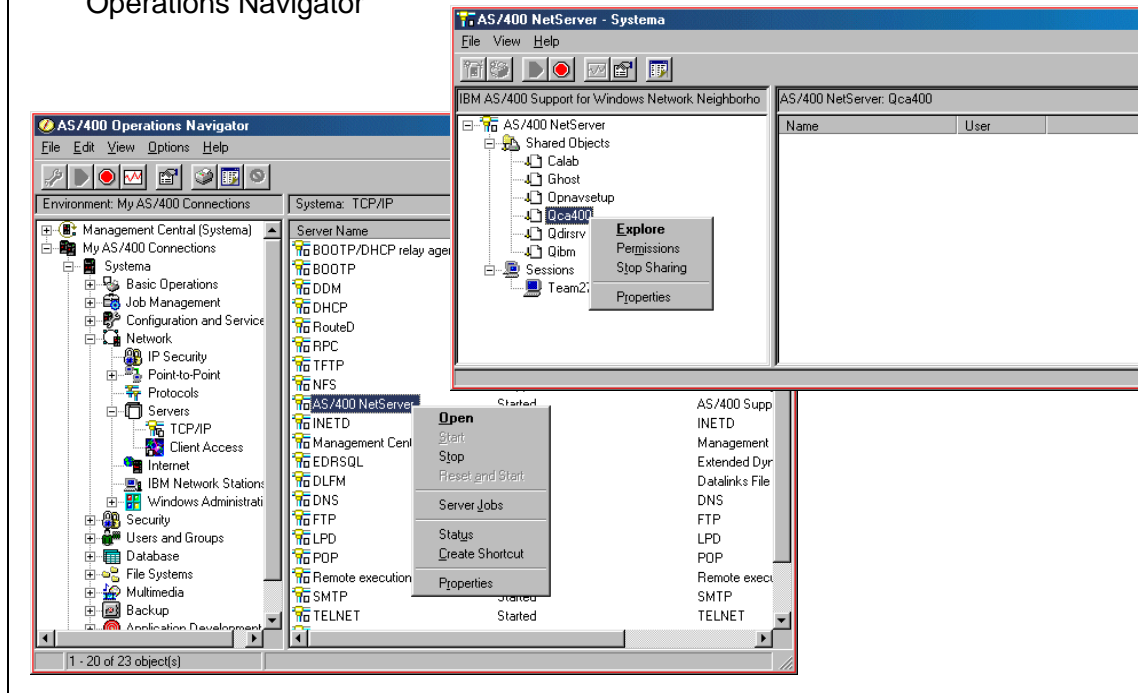
NetServer does not share the entire integrated file system tree by default.

NetServer has changed location from the previous release. It is now located with the TCP/IP servers. It has its own configuration window and some new functions. It's possible to get status information on NetServer connections.

## NetServer GUI



- Configure and manage NetServer with Operations Navigator

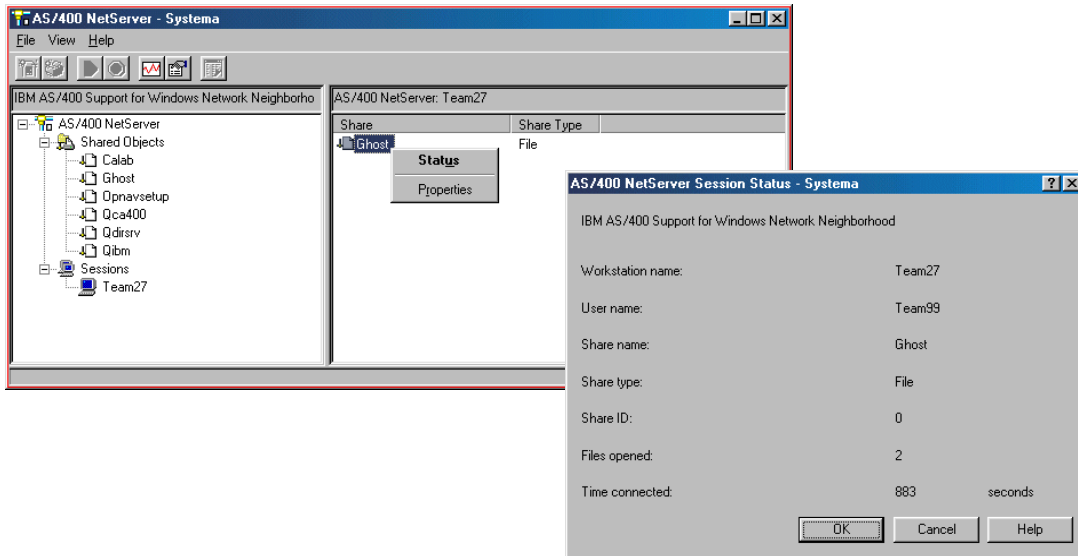




## NetServer GUI

IBM  iSeries

- View users connected to shares
- View sessions using NetServer and the shares they currently use
- Get status of each share connection



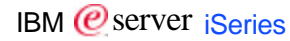
## Note: NetServer GUI

IBM  iSeries

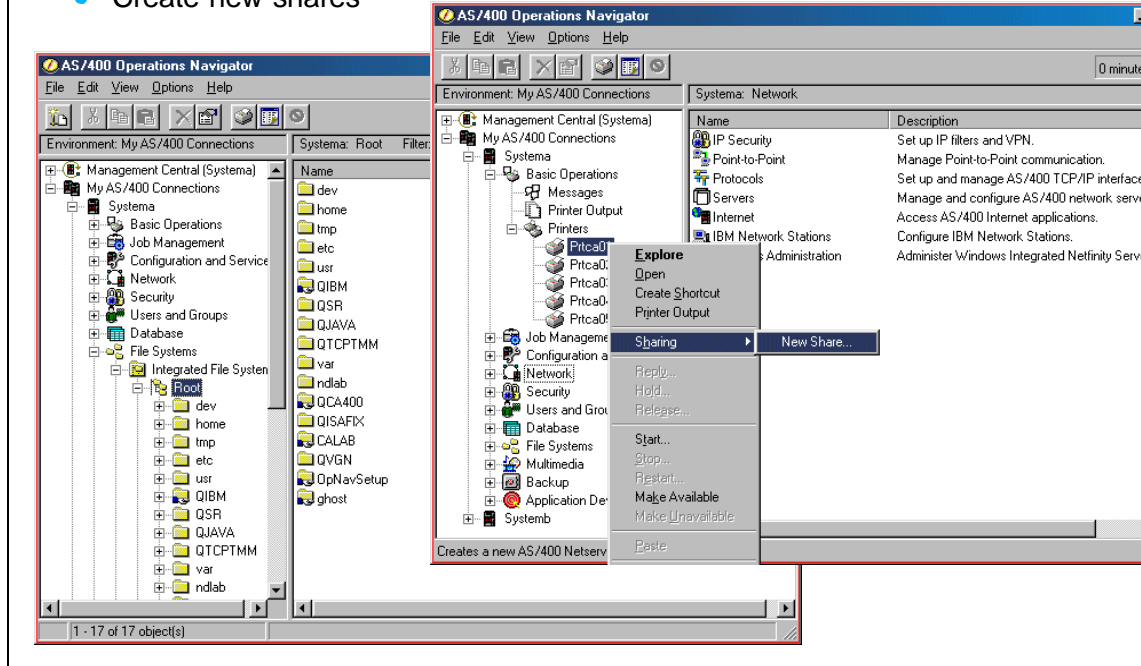
Operations Navigator has added a number of enhancements designed to make it easier to manage NetServer. NetServer is a native file and print server which appeared in V4R2 of OS/400. Windows clients can make use of AS/400 print and file resources without any additional software on the client beyond the Windows operating system. With the Express client, NetServer is the only way to use AS/400 network drives and printers. For more information on NetServer, including set up information, go to [www.ibm.com/eserver/series/netserver](http://www.ibm.com/eserver/series/netserver).

Printer and file sharing is indicated visually through the use of the "shared" icon. You can start sharing a printer or directory by using the Sharing menu option available on the popup menu for printers and directories. Since the file system is quite large, Operations Navigator includes a new folder, File Shares, which shows all shared directories in one place. From this folder the individual shares can be explored and opened using NetServer; you can also map a network drive to a file share from Operations Navigator. NetServer configuration is available under Network-Servers-TCP/IP; take the Open option for the NetServer server. For convenience we've provided the same function with the new Open NetServer Configuration menu option on the File Shares folder.

## NetServer Integration in the GUI

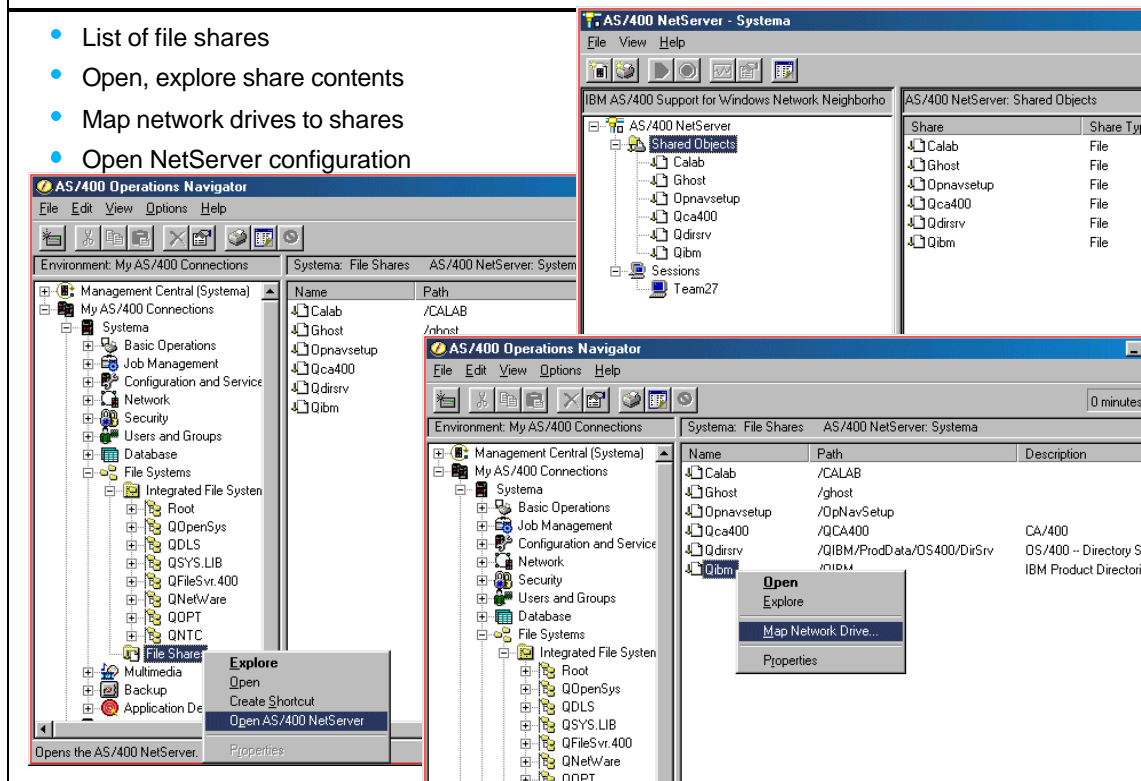


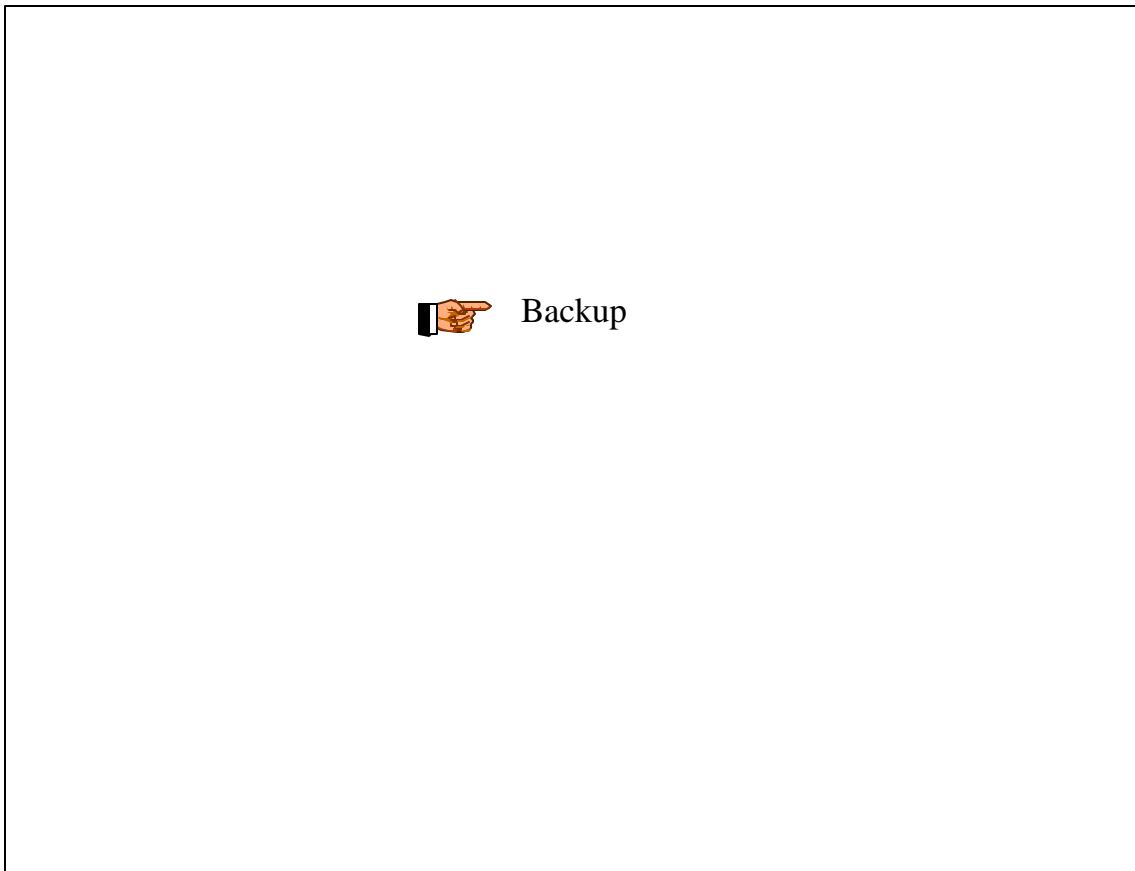
- See which folders and printers are being shared
- Create new shares



## NetServer Integration in the GUI

- List of file shares
- Open, explore share contents
- Map network drives to shares
- Open NetServer configuration

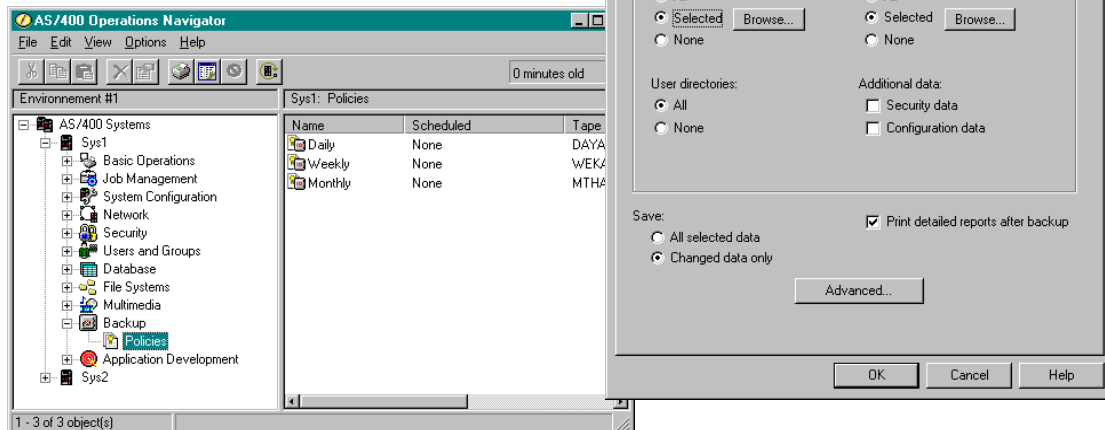




## Backup

IBM  iSeries

- **Graphical interface to Operational Assistant backup functions**
  - Display information for the three IBM-supplied system backup sets (Daily, Weekly, and Monthly).
  - Change the properties of each backup set
- **NOTE:** This folder is replaced when the V5R1 BRMS GUI plug-in is installed



## Notes: Backup

IBM  iSeries

Information about the IBM-supplied system backup sets is shown in the backup policies list view. It includes information about the last backup run and the next scheduled backup to be run for each type.

The target user of the Backup function of Operations Navigator are customers that typically today are using Operational Assistant Backup, the SAVE and RESTORE menus, or the OS/400 save and restore commands. It is not intended for customers that have Backup Recovery Media Services (BRMS/400) or a similar product installed. It is also not intended for customers that use other complex save strategies.

There is no option to backup the entire system. This is because it requires a restricted system (all subsystems have to be ended), which would also bring down the PC that tries to initiate the backup.

IFS saves can be included in the IBM-supplied system backup sets. The user can decide to backup ALL or NONE IFS data. This new function is also available via a checkbox in Operations Navigator.

The tape drive is the only device supported for the backup function.

Current settings for the IBM-supplied system backup sets (monthly, weekly, daily) can be displayed/changed by double-clicking on the corresponding icon or by displaying its properties page.

**With V5R1 a plug-in is available which replaces this simple backup function with the more powerful GUI for the Backup, Recovery, and Media Services LP.**

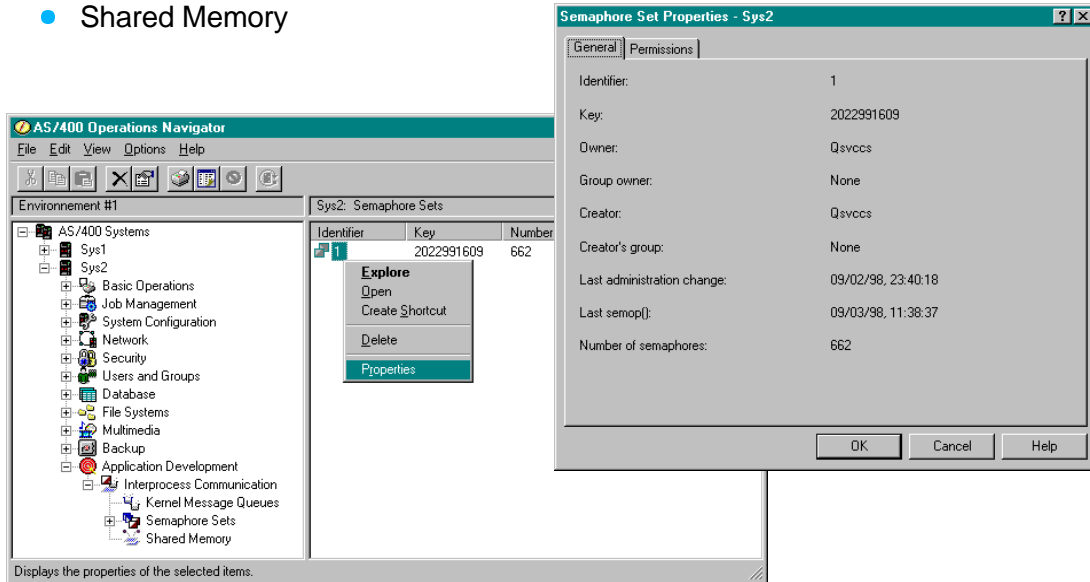


Application Development

## Interprocess Communication

IBM  iSeries

- Kernel Message Queues
- Semaphores and Semaphore Sets
- Shared Memory



## Notes: Application Development

IBM  iSeries

Interprocess Communication (IPC) is a tool for the AS/400 Application Developer who writes C or C++ programs. It allows you to manage the following IPC objects:

**Message Queues** -- This is not the traditional AS/400 message queue. These are based on the UNIX System V Message Queues. One process or thread will usually put a message on the queue, and another process will get that message off of the queue.

**Semaphore Set** -- a grouping of one or more semaphores.

**Semaphore** -- an integer value that can be incremented or decremented. It is used to synchronize two or more processes. A process will usually wait until a semaphore reaches a certain value before performing an operation.

**Shared Memory** -- a piece of storage that is shared between two or more processes. The processes can read or write whatever they want inside of the shared memory.

These IPC objects are not created through Operations Navigator. A C or C++ program is what creates these objects on the AS/400. If a program fails to cleanup the Interprocess Communication objects, you can use Delete on the context menu of each object to clean it up. In addition, you can view the status of these IPC objects.

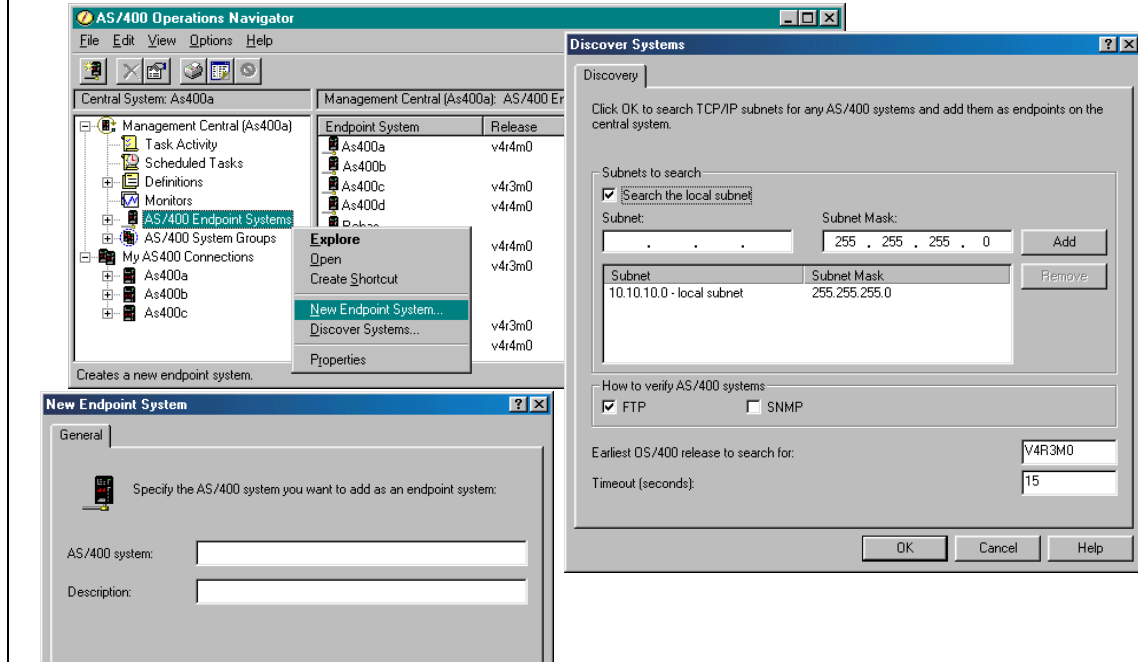
# Management Central Functions

IBM @server. For the next generation of e-business.

 Defining Endoints and System Groups

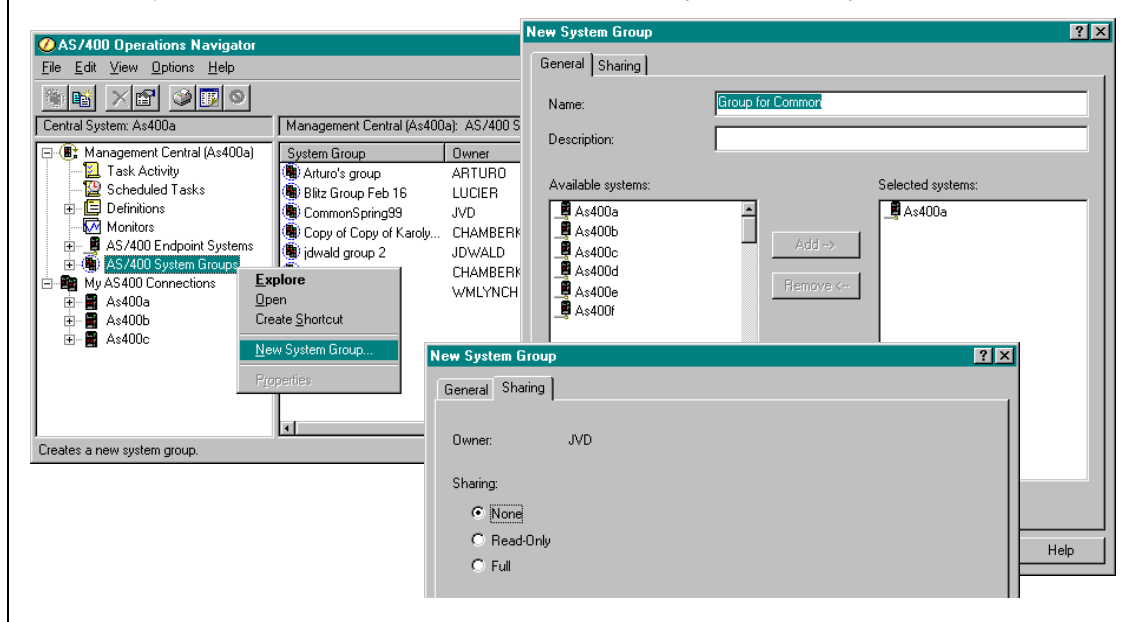
## Defining Endpoints

- Endpoints can be discovered with TCP/IP or entered manually
- Available to all Management Central users



## System Groups

- Groups can be created out of Endpoints you desire
- Groups can be shared with other users, but by default they are not



## System/Endpoint Menus

IBM  iSeries

- **Systems and Endpoints all support the following menu options:**
  - Inventory
  - Monitors
  - Fixes
  - Collection Services
  - Run Command
  - Users & Groups (V5R1)
  - System Values (V5R1)



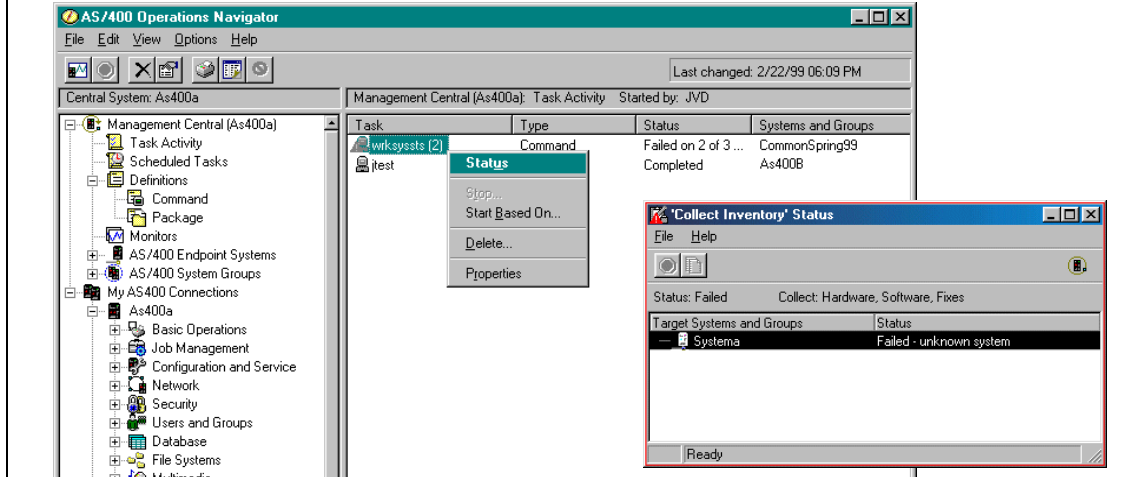
Management Central Main Folders and Tasks



## Main Folders: Task Activity

- Task Activity folder keeps a record of long-running tasks
  - While running and completed
- Can see detailed status of the request by system, start new tasks based on a task, or delete the task
- Include dialog can be used to include by user, type, or status
- Columns dialog can be used to add, remove, and reorder columns

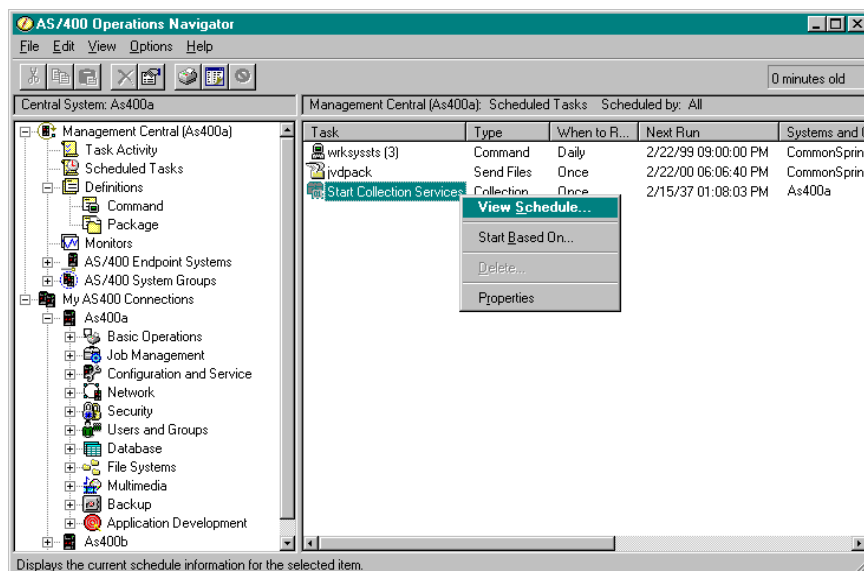
IBM  iSeries



## Main Folders: Scheduled Tasks

- Scheduled tasks keeps track of tasks that have been scheduled
- Can view the schedule, create a new task based on a scheduled one, and delete tasks

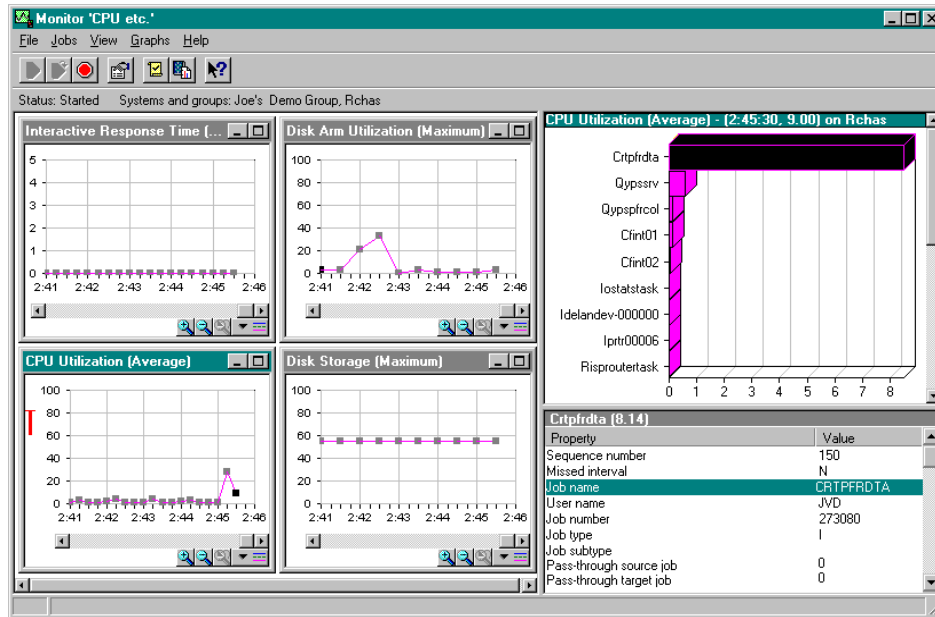
IBM  iSeries



## Performance Monitors

IBM  iSeries

- Real-time graphical performance monitoring



## Performance Monitors

IBM  iSeries

- Select metrics to collect
- Optionally create trigger events and reset events
- Automated actions
  - Respond to trigger or reset event

## Notes: Monitors

IBM  iSeries

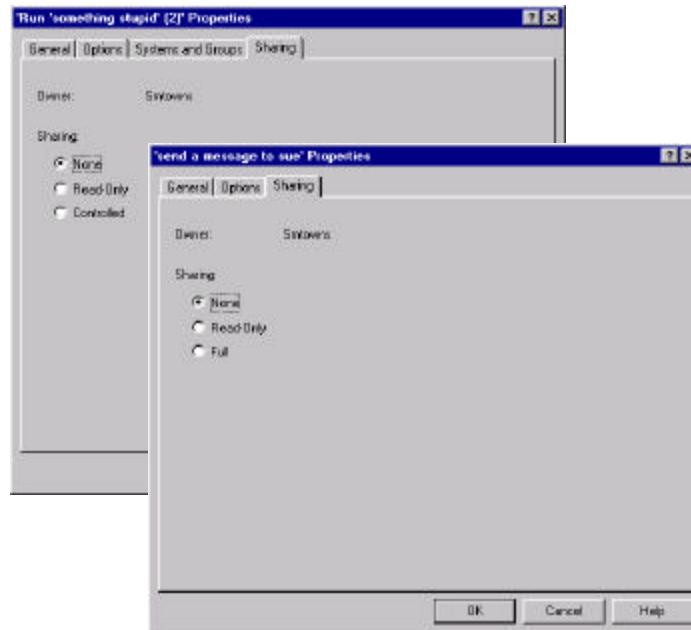
Monitors. When a monitor has been created, it can be started against any combination of endpoints or system groups. A running monitor can be opened into a three-pane graphical view. The leftmost pane has real-time graphs (e.g., a graph of average CPU utilization over time) of the selected metrics; as new data points are collected they are automatically added to the graphs. Clicking on the point of interest will provide second level details in the pane at the upper right; e.g., clicking on a CPU utilization point will show a bar graph of the top 20 jobs contributing to the CPU utilization at that point. Clicking on a second level item will provide details on that item; e.g., clicking on a particular job in the upper right pane will display the job's attributes in the pane at the lower right.

## Sharing

### Property Options

- Tasks
  - All tasks
  - Types
    - ◆ None
    - ◆ Read-only
    - ◆ Controlled
- Definitions
  - All definitions
  - Types
    - ◆ None
    - ◆ Read-only
    - ◆ Full

IBM  iSeries



## Notes: Property Options

IBM  iSeries

Most Management Central objects support Sharing. The Sharing level enables the object owner to grant or restrict the ability of other users to view, change and use that individual Management Central object.

The Operations Navigator Options menu supports the specification of the default level of sharing for all newly created tasks.

Sharing - The owner has specified one of the following levels of sharing:

None - Other users cannot view this item.

Read-only - Other users can view and use it. Other users can create a new one based on this one and make changes to the new one as needed. However, other users cannot change it, delete it, or stop it if it is running.

Controlled - Other users can start and stop the task or monitor. Other users can also view and use it to create a new one.

Full - Other users can change and delete the definition. Other users can also view and use it to create a new definition.

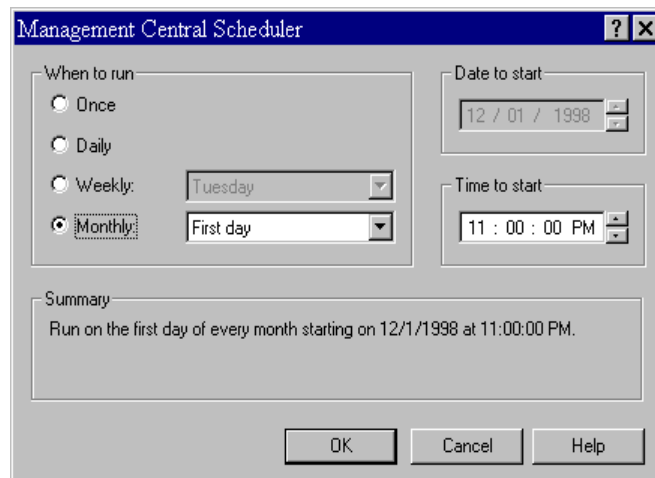
System monitors can NOT be shared.

## Advanced Functions

### Basic Scheduling

IBM  iSeries

- Provided with Management Central
- Based on job scheduler entries
- Simple scheduling
- All types of MC tasks



## Notes: Basic Scheduling



Use the Management Central Scheduler to specify when Management Central tasks are run. You can schedule any task for which a Schedule button is available. For example, you can schedule any of the following tasks on selected systems and groups:

- Run commands
- Send fixes or packages of files and folders
- Delete the save files and cover letters for selected fixes
- Start installing fixes, uninstalling fixes, or installing fixes permanently
- Cancel actions for fixes that have pending restart actions
- Collect hardware, software, or fixes inventory
- Start and stop Collection Services
- Updating system values (V5R1)
- Sending user profiles (V5R1)
- (the list goes on....)

Management Central does not show all the scheduled entries from the AS/400. Only those scheduled entries created by Management Central will be shown in the Scheduled Tasks container.

When you are using the integrated scheduler, the basic job schedule entry functions are used (ADDJOBSCDE, WRKJOBSCDE, etc.) under the covers. All Management Central job schedule entries will appear as job 'Qnnnn', where nnnn is a hex number, on the 'Work with Job Schedule Entries' display on an AS/400 green screen.

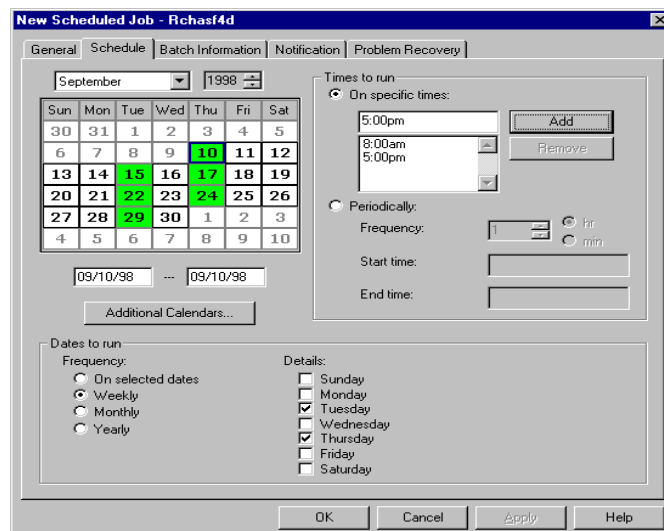
For more complex scheduling, an Operations Navigator plug-in is available for IBM Advanced Job Scheduler

## Advanced Functions



### IBM Advanced Job Scheduler

- Graphical User Interface integrated into Operations Navigator
- CL Commands
- Calendaring
- Job Sequencing
- Dependency Scheduling
- Job History/Statistics
- Report Distribution
- Pager Capabilities



## Notes: Advanced Job Scheduler

IBM  server 

Operations Navigator provides an integrated scheduler to organize when tasks are to start. The Advanced Job Scheduler can be installed to over the default scheduler. The Advanced Job Scheduler is a separate licensed program (5769-JS1) that provides more robust scheduling than the base scheduler. The Advanced Job Scheduler offers full calendar management. The Advanced Job Scheduler must be installed separately on both the Central System and the Graphical Client. When Advanced Job Scheduler is installed on the Graphical Client it will automatically be used instead of the Management Central job scheduler.


The Advanced Job Scheduler graphical user interface allows you to: schedule jobs, create groups, work with groups, submit jobs and groups immediately, display the status of jobs, and create calendars and holiday calendars. Some of the functions of the Advanced Job Scheduler include:


- **Calendaring:** lets you use additional calendars (for example a Holiday Calendar).
- **Job Sequencing:** allows you to schedule a series of jobs in a sequence.
- **Dependency Scheduling:** allows you to schedule a job or a group of jobs to run depending on the previous job result or object existence.
- **Job History/Statistics:** allows you to examine the status of jobs for further action.
- **Pager Capability:** if a job completes successfully or fails, either a message can be sent to a user or to a pager.
- **GUI and CL Interface:** give both interface, GUI from Operations Navigator and 5250 screen.

It is recommended that you install on all Graphical Clients using Management Central or none.

For more information about Advanced Job Scheduler and how to use it, see the Advanced Job Scheduler topic in the AS/400 Information Center on the Web at <http://www.ibm.com/eserver/series/infocenter> or try <http://www.ibm.com/eserver/series/jscheduler/>

## Important Concepts

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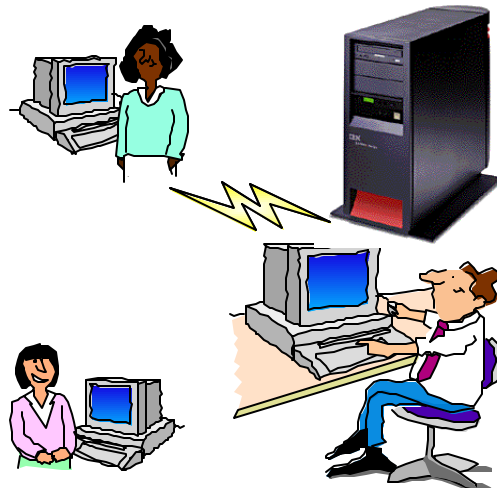
 Restricting Access to Operations Navigator

## Safely Using Operations Navigator

IBM @server iSeries

- Controlling the Client
  - Function Availability
  - What is Installed/Updated
  - Microsoft Policies
  - Application Administration
  - Passwords
- Controlling the Connection
  - Secured Sockets Layer (SSL)
- Controlling the AS/400
  - Security Wizard
  - Security Policies (system values)
  - Audit Policies
  - Users and Groups
  - Resource Security

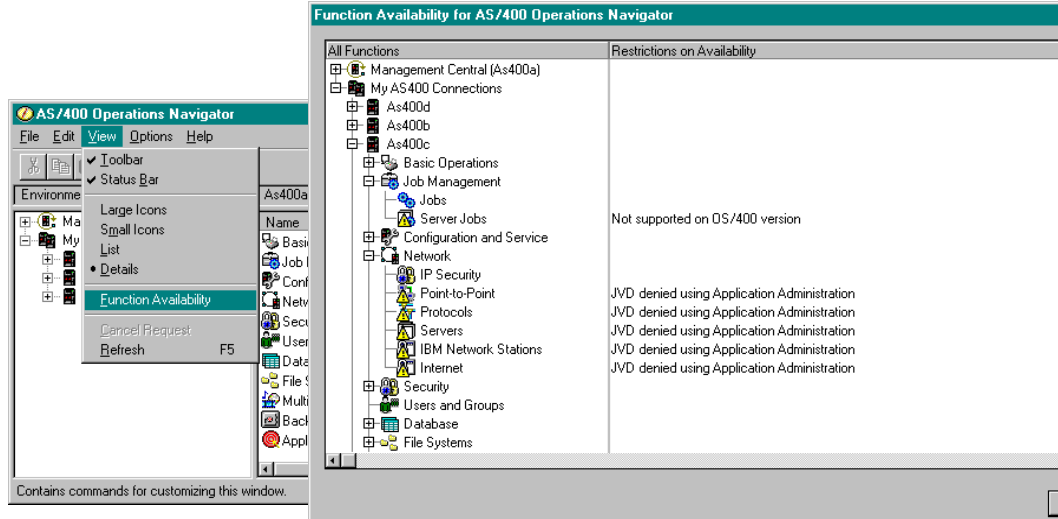
***If you don't have the authority to do the function on the green-screen then you can't do it through Operations Navigator!***



## Function Availability

IBM  iSeries

- A menu option which shows why functions don't appear in the function tree (Under the View pulldown menu)
  - Not installed?
  - Not supported by the OS/400 release on this system?
  - User denied access by Application Administration settings?
  - Function not supported over SSL?



## Restricting Install

IBM  iSeries

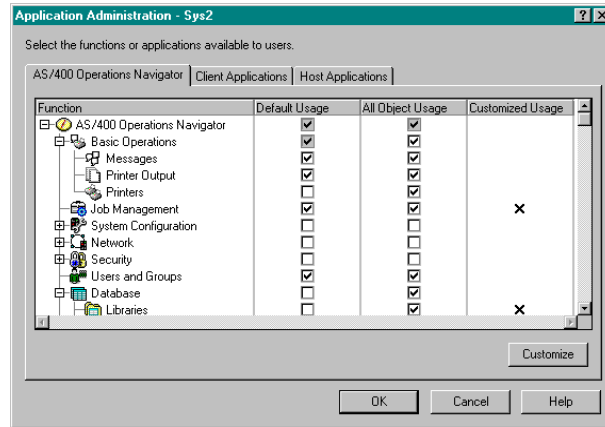
- Limit access to functions by limiting what is installed
- If users can access the "full" install image, they can install undesired components.
  - Users can run Selective Setup
- For multi-user PCs it may be desirable to allow some users to use a given function, but not to allow others to do so.
  - This is especially true in a Windows Terminal Server scenario.
- Control access to file share QIBM
  - NetServer ships with QIBM as a file share that everyone can use
  - Can create a new file share for the Client Access path



## Application Administration



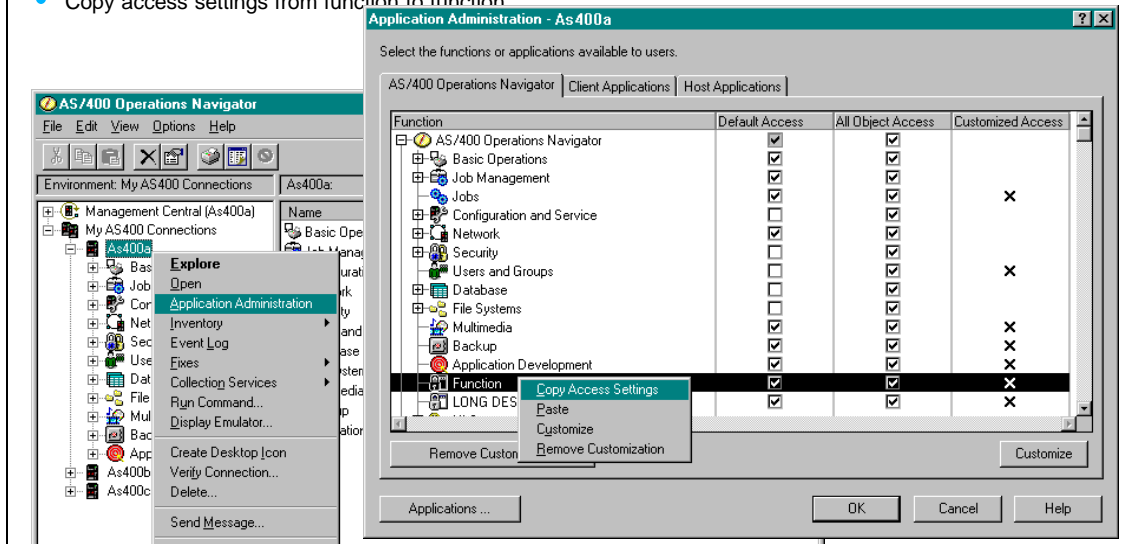
- What does it do?
  - Controls access to Operations Navigator functions
  - Similar to limited capability for PC5250 interfaces
  
- When do you use it?
  - When you want to control what functions users see in Operations Navigator
  
- How do you use it?
  - Operations Navigator interface for system defaults and individual users



## Application Administration - By System



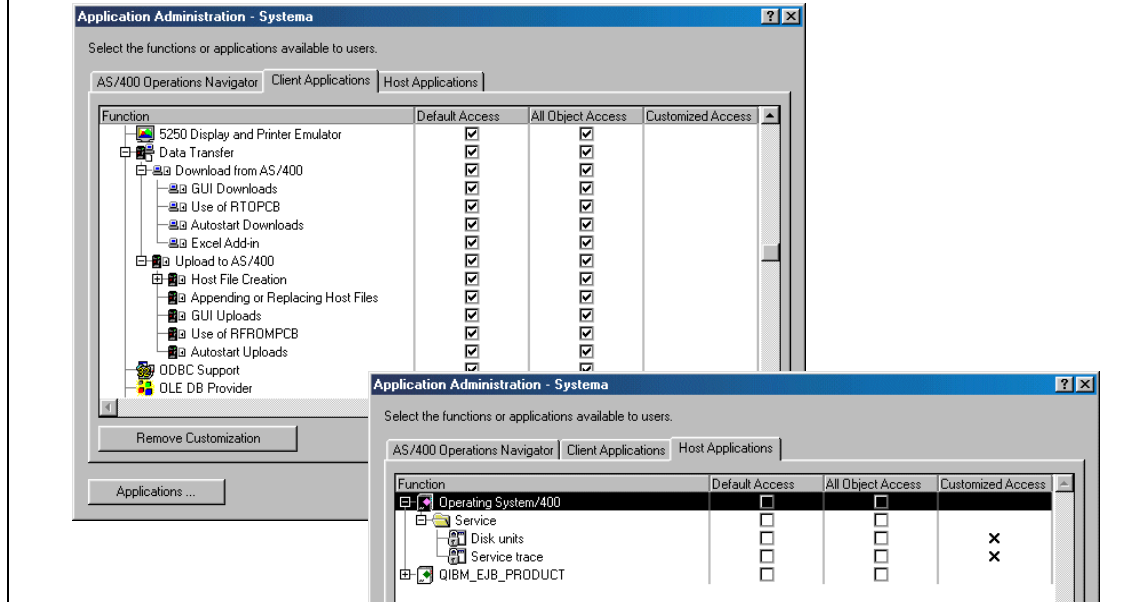
- Centrally control access to Operations Navigator functions
- Can be set up differently for each AS/400 you manage
- Information stored on the server; users get the same access no matter which PC they use (stored with their user profile)
- Can set up a default access scheme for each system (use it to remove functions)
- Control general users and users with All Object authority separately
- Copy access settings from function to function



## Application Administration - By System

IBM  iSeries

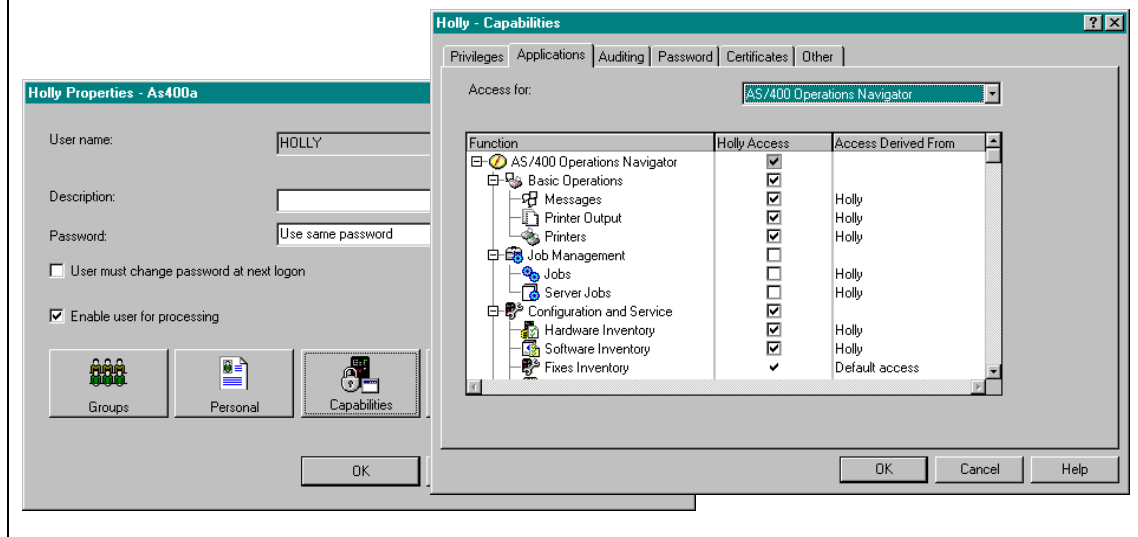
- Control access to server and client applications that want to make use of Application Administration
- Disk management is not available by default



## Application Administration - By User

IBM  iSeries

- Individual users and groups can be given more or less access
  - Use user or group properties, Capabilities button, Applications tab
- All Application Administration information is stored on the server and roams with users when they use Operations Navigator on a different PC



## Notes: Application Administration

IBM  iSeries

Operations Navigator gives you two ways to control which functions users can use. The first is by controlling which Operations Navigator functions are installed. The second is Operations Navigator's Application Administration function which does run time checking to determine whether the user is allowed to use Operations Navigator and some Client Access functions. It is similar to the ability to remove the command line from users' screens on the green screen user interface in that it removes the functions from the GUI.

Application administration can be set up and managed centrally by the security administrator from one workstation. By default all functions are accessible to users unless you use Application Administration (that is, users can try all functions; their requests may later be denied at the AS/400 due to insufficient privilege or insufficient object authority). To remove functions from Operations Navigator, you can set up a default access scheme for Operations Navigator users. For example, one possibility is that by default users only get the basic operations folder. Operators and administrators who need more functions can be given them by adjusting application capabilities in the appropriate user or group properties. All application administration information is stored on the server and is checked as soon as the user expands an icon and signs on to that system. This means that users can "roam" from PC to PC and their application administration settings will follow them.

Note: Application administration is not security!! It is access control for users of Operations Navigator and Client Access only. You must employ the standard security functions to fully protect your system.

## Notes: Application Administration

IBM  iSeries

**Default Access.** The Application Administration menu option available on each AS/400 system allows you to set up the default access scheme for Operations Navigator and any other host or client applications which make use of Application Administration. You can explicitly give or take away access to the default user; you can also take away access to all but those users with \*ALLOBJ (all object) privilege.

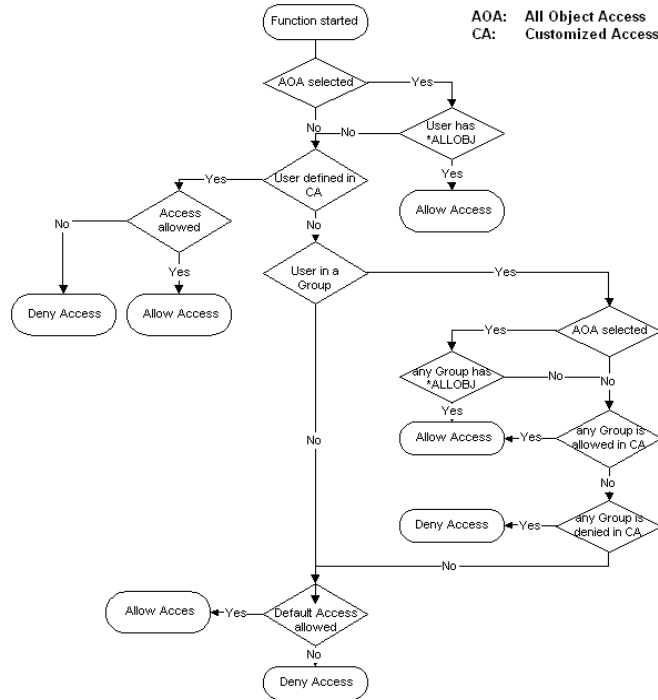
**Individual Access.** An individual user can then be given more or less access. View the individual's user properties under "Users and Groups," push the "Capabilities" push button (this was called "Security" in previous releases), and click on the "Applications" tab in the Capabilities dialog. This dialog shows you if the user currently has access to each subcomponent of Operations Navigator, and from where the usage is derived--the default access scheme, \*ALLOBJ privilege, membership in a group that has explicit access, or explicit user access.

## Notes: Application Administration Decision Tree

IBM  iSeries

### Using Application Administration

This chart shows whether, for a particular user, access to a function is allowed or denied. It shows the interaction between the customized application administration settings, whether the user has All Object privilege, group membership, etc. **"AOA selected"** means that users with All Object privilege are allowed to access the function according to the default access scheme for the server. **"User defined in CA"** means that the user's application settings have been changed to either explicitly allow or deny access.

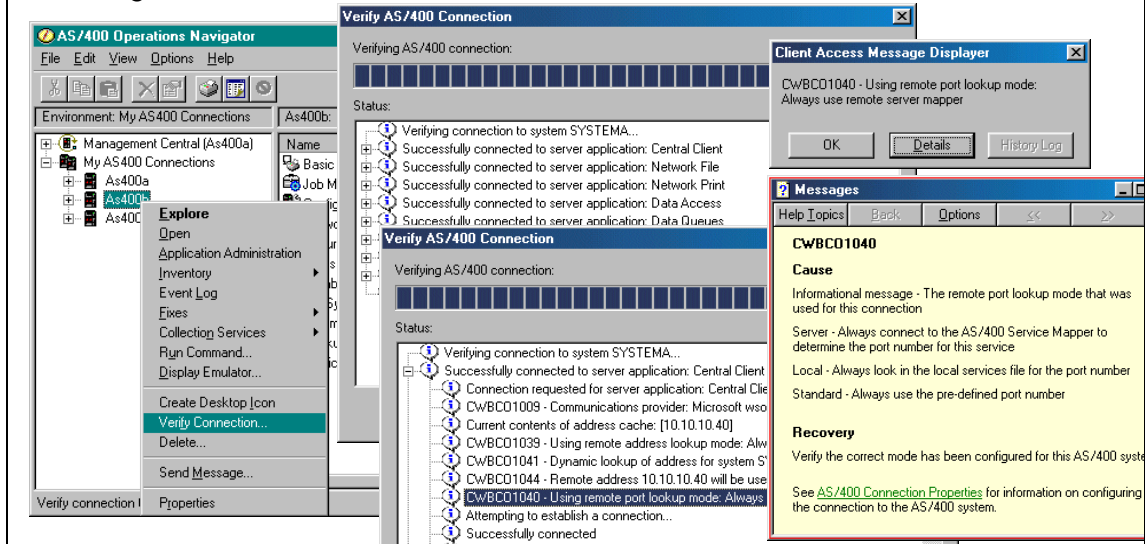


### Dealing With Problems

## Communications Problems

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- Use Verify Connection menu option to "ping" the AS/400 servers needed to use Operations Navigator
- Servers that are not started can be started through Operations Navigator (Network/Servers/Client Access folder) or use STRHOSTSVR command on the green screen



## Notes: Server Problems

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Operations Navigator uses the Client Access server programs (OS/400 Option 12, Host servers) to communicate from the PC to the AS/400. Which specific server or servers are used by the functions in Operations Navigator varies from function to function. It's best to keep them all running. By default they are started when TCP/IP is started.

You can check on the status of your Client Access server programs by:

- Looking at the list of servers in the Network-Servers-Client Access list in Operations Navigator (as long as the three required servers are running--see below)
- The Verify Connection menu option on the popup menu for the AS/400 system
- The CWBPING command on the DOS command line

To be able to use Operations Navigator to start servers, the following servers must already be started:

- Central Client
- Remote Command
- Security

If any of these three is not started, you need to use the STRHOSTSVR CL command to start the server programs.

If you encounter other problems, start the Client Access Express history log (Start the Client Access Diagnostic tools. This places the diagnostic tools icon in the system tray (right side of the Windows taskbar). Use this icon to turn on history logging. Repeat the steps that generated the problem, then display the history log. There may be helpful information logged there about the problem and how to resolve it.

## Performance Problems

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- Performance improves during the course of a session
  - More caching, more things loaded in memory
- Exceed PC size recommendations provided by Client Access, especially for memory
  - Use at least a 400-500 mHz CPU, 128 MB memory; more is better
- Keep up to date with Client Access service packs
- Read the Operations Navigator Information APARs available at [www.ibm.com/eserver/series/oper\\_nav](http://www.ibm.com/eserver/series/oper_nav)
- Use include/filtering where possible to subset a large list, especially in the File Systems folder
- If you have multiple things to do and don't want to wait for tasks to complete and have plenty of PC memory:
  - You can start multiple copies of Operations Navigator and multi-task between them

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