

Client Access is Dead!

Long Live ACS

Steve Bradshaw
Technical Director – i-UG
Friendly Techie at Rowton IT

Before we begin a quick “Thank You”

- Most of the slides in this presentation from IBM
- So I would like to acknowledge that and say thanks to

Tim Rowe and Wayne Bowers
IBM Rochester

You will see my comments in red as we go along

Setting the Scene

- What you are about to see is not new (GA June 2013)
- It is however, relatively unknown
- It is a key part on IBM strategy going forward
- It has been my “daily driver” for 5 years
- It has been rock solid in that time
- IBM are adding features all the time, typically 2 updates a year
- Please ask questions as we go
- I hope to have the answers

Why Bother with ACS

What's wrong with IBM i Access for Windows?

- Firstly, it's just that "for Windows"
- It is cumbersome to centrally manage
i.e. deploy, update and administer the client on user workstations
- IBM has "Stabilised" and now withdrawn it
- It is not supported on Windows 10
"Not supported" does not mean "it doesn't work"
It means it's untested and if you have a problem you are on your own
- Put another way, you are one Windows Update away from disaster

Agenda

- Introduction
- Deployment
- Configuration
- Migration

Introduction

Application Packages

- ❑ **Core offering (platform independent)**
 - 5250 display and printer emulator
 - Data transfer
 - Printer Output
 - IFS File Manager
 - Console consolidation
 - Database Tools (Run SQL Scripts, etc)
 - Other misc features

- ❑ **Windows Application Package**
 - Windows Installer MSI Package
 - Data drivers (ODBC, OLEDB, .Net)
 - Printer drivers

- ❑ **Linux Application Package**
 - RPM and Debian Install Packages
 - ODBC driver



Note: you don't need to use Application Packages to use Core

Dependencies - In “Steve” Speak

- The IBM i Access Client Solutions **core** platform independent product has **no conflicts** with either of the Linux or Windows packages.

You can run ACS and IBM i Access for Windows on same PC at same time without conflict

- IBM i Access Client Solutions **Application Packages** are built using the exact same infrastructure as the IBM i Access for Windows and IBM i Access for Linux products. Therefore they are **mutually exclusive**.

ACS uses the same software for ODBC / .Net / Printer drivers, you can't install both versions. If you have them already you don't need to install them, they're the same

- IBM i Access Client Solutions does not provide any Navigator interface instead relying on the IBM Navigator for i web based infrastructure that was introduced with IBM i OS 6.1 and has continually been enhanced since

IBM's want you to use ACS for day to day access from desktops and IBM Navigator for i for admin functions you performed in the old Windows Navigator GUI client to access your Nav4i you can do so direct <http://{YourSystem}:2001>

Note: the Performance Tools in Navigator for i (Nav4i) are fabulous.

IBM i ACS – Platform Independent

- Runs anywhere that has Java™
 - Java 8 or later
 - Java 8 or 11 Recommended
- This includes:
 - Windows
 - Mac
 - Linux
 - AIX
 - IBM i



IBM i ACS – Not all versions of Java are the same

- There are many versions of Java
 - Oracle has decided business should pay for theirs
- <https://powerwire.eu/do-i-need-to-pay-for-java>

powerwire.eu/do-i-need-to-pay-for-java

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PowerWire.eu
Independent IBM i, AIX and Linux news for Europe and beyond

IT'S NOT TOO LATE TO UPGRADE
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Do I need to pay for Java?

January 9, 2019 by Steve Bradshaw



Over the last few months, you may have noticed some rather confusing messages about the need to pay for Java. They imply that you need to pay to use Java if you are a business, and in some cases this will be true but in most cases you will NOT need to pay a penny.

What's going on?

In a nutshell, Oracle would like some more money, this desire is understandable and shared by a large population of the planet but unlike (I hope) most of the world, the way that they want to get that extra cash is through casting F.U.D. (Fear, Uncertainty and Doubt).

IBM i ACS – Not all versions of Java are the same

- IBM ACS can run with it's own version of Java
 - I recommend you use OpenJDK with ACS
- If you use any other version of Java on the PC it will co-exist
- If you don't want your users to have Java available, you can limit OpenJDK to just run ACS

IBM i ACS – Using OpenJDK with ACS

- IBM ACS Website gives you full details on how
 - <https://www.ibm.com/support/pages/getting-ibm-openj9-java-and-including-it-ibm-i-acs>



Getting IBM OpenJ9 Java and Including it with IBM i ACS

How To

Summary

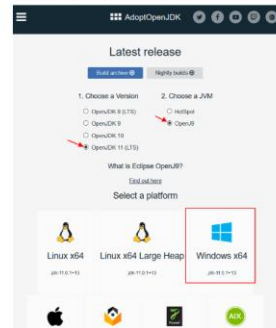
How to get the IBM OpenJ9 OpenJDK from www.ibm.com/support/pages/getting-ibm-openj9-java-and-including-it-ibm-i-acs and include it with the IBM i ACS Client Solutions package so that Java will be used with IBM i ACS is launched or deployed.

Steps

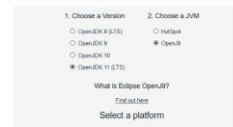
1. Go to the AdoptOpenJDK website to download the current IBM OpenJ9 JDK 11 using this URL:

<https://adoptopenjdk.net/windows.html?module=openjdk11&os=win&architecture=x64>

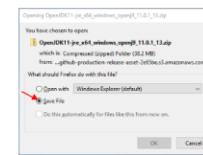
And make sure that the options for OpenJDK11 and OpenJ9 are selected as shown below. For this example select the Windows x64 platform as shown below:



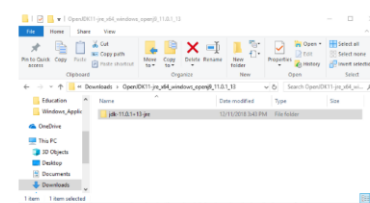
2. IBM i ACS Client Solutions only requires the JRE so select to download that as shown below:



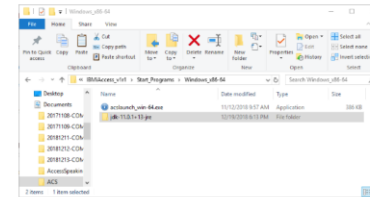
3. Save the zip file to the workstation.



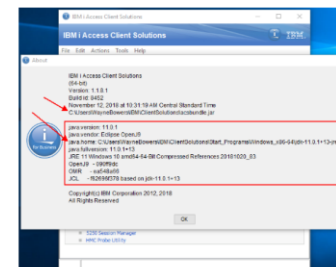
4. After saving the file, unzip it and it will contain a jre folder like shown here.



5. Copy that jre folder to the corresponding IBM i ACS Client Solutions Start Programs folder. Since in this example we are working the most common deployment of 64-bit Windows we will copy that into the Windows_x64-64 folder as shown below:



6. Now if IBM i ACS Client Solutions is launched or deployed from this location this is the Java that will be used. If I wanted to deploy IBM i ACS on my Windows 64-bit PC I would go to the Windows Application folder and run one of the 64-bit install scripts. When that install process copies IBM i ACS to the Windows workstation the Java in the Start Programs folder will be copied also, and that Java will be used by that IBM i ACS deployment as shown from Help -> About.



Product Availability

- IBM i Access Client Solutions is identified as LPP 5733-XJ1
 - Not an IBM i OS installable LPP
- The GA version of the product is available to customers with valid SWMA and IBM i OS 6.1, 7.1, 7.2, 7.3 and 7.4 and is downloaded from the IBM i Access Client Solutions or IBM Entitled Software Support (ESS) websites
 - Technote with example instructions
 - <http://www-01.ibm.com/support/docview.wss?uid=nas8N1010355>
- Product distributed in zip files
 - Platform Independent Core Java product
 - From IBM i ACS website: IBMiAccess_v1r1.zip
 - On ESS: IBM_i_Access_Client_Solutions_LCD#_*.zip
 - Contains product jar and other supporting files
 - Windows Application Package
 - IBM_i_Access_Client_Solutions_-_Win_AP_LCD#_*.zip
 - Contains 32bit and 64bit Windows installers
 - Linux Application Package
 - IBM_i_Access_Client_Solutions_-_Linux_AP_LCD#_*.zip
 - Contains Linux RPM and Debian installers

Product Details

- Supported connecting to IBM i OS 7.4, 7.3, 7.2, 7.1 and 6.1
I've tested it with 5.4 and it worked just fine
- IBM i OS supports IBM i Access Client Solutions exactly the same as IBM i Access for Windows
 - Checks the same 57xxXW1 Licenses for 5250 and Data Transfer
 - Connects to the same IBM i Access Host Servers on the same ports in the same way
 - Exit programs will continue to have the same impact
 - Application Administration local policies will still be applied
- No new firewall policies should be required

Deployment

Deployment

- IBM i Access Client Solutions is **not installed** to the client operating system, **it is deployed**. You just copy the image somewhere and you can run it
 - There is no Windows Based Installer (setup.exe) installation program for the core of the product.
- Access Client Solutions Deployment
 - The deployment involves the client bundle being placed wherever it is desired to be executed from, and determining where the product settings are going to be stored.
- Client Bundle
 - Contains the Java executable Jar, properties file, platform specific start executables and javascript start samples, product documentation, and licensing notices.
 - All that is required to be deployed is the Java executable Jar
 - The rest is optional
- No JRE distributed
 - IBM i Access Client Solutions does not deploy a specific JRE
 - Relies on a Java 1.6 or higher (Java 1.8 recommended) JRE to be accessible on the client OS

You need to install Java 8 or 11 on your PC to run ACS
Avoid Java 9,10,12 & 14

Deployment: Initial Questions

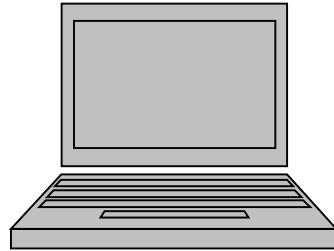
- When thinking about deployment, ask yourself where you want to put:

1. the product image?
(executable java jar file)

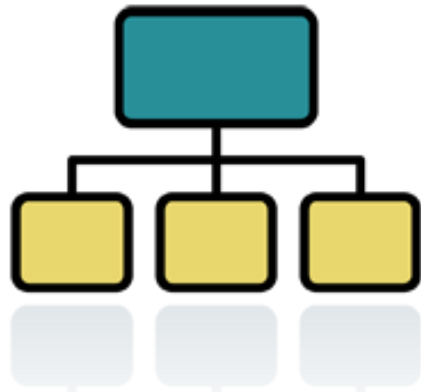
2. the user's settings?
(system configurations,
5250 sessions, etc.)

Deployment: Options

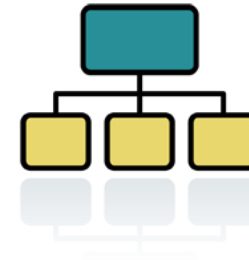
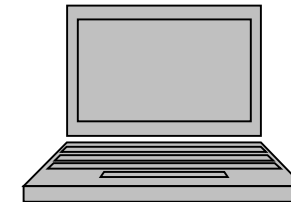
Computer (local)



USB Thumb Drive



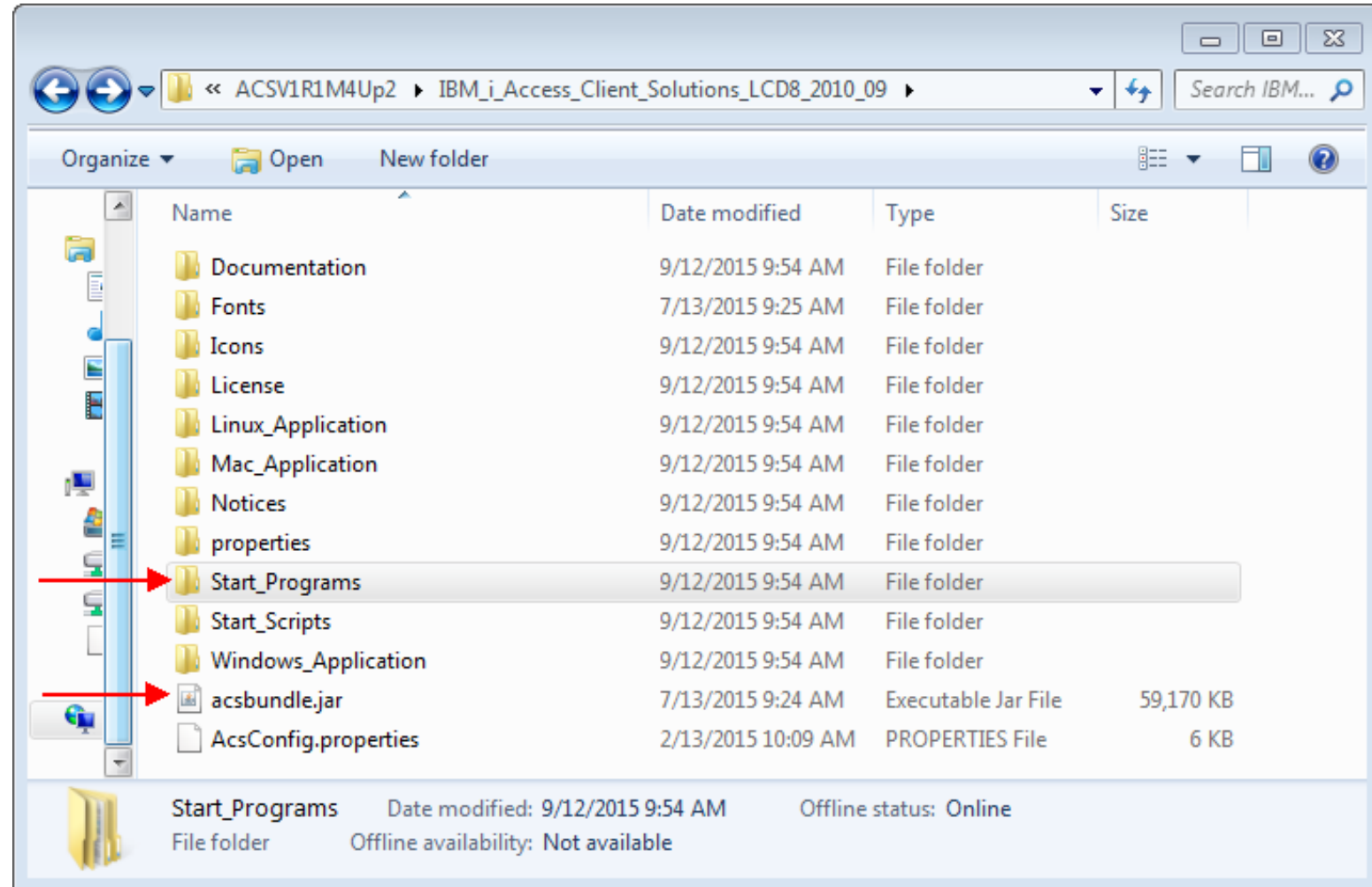
Network Share



Hybrid Network and local

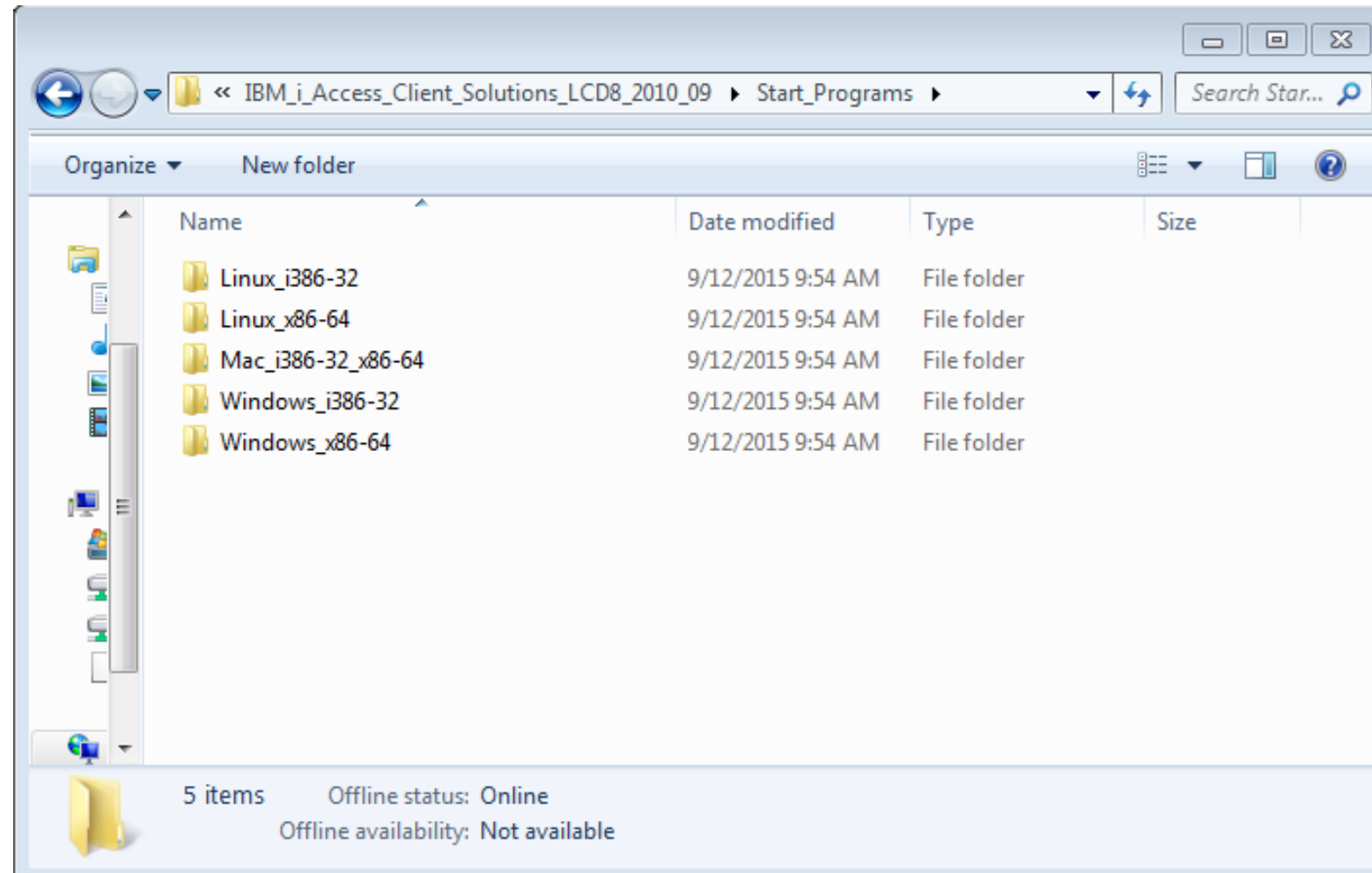
Basic Local Deployment

What you get in the package



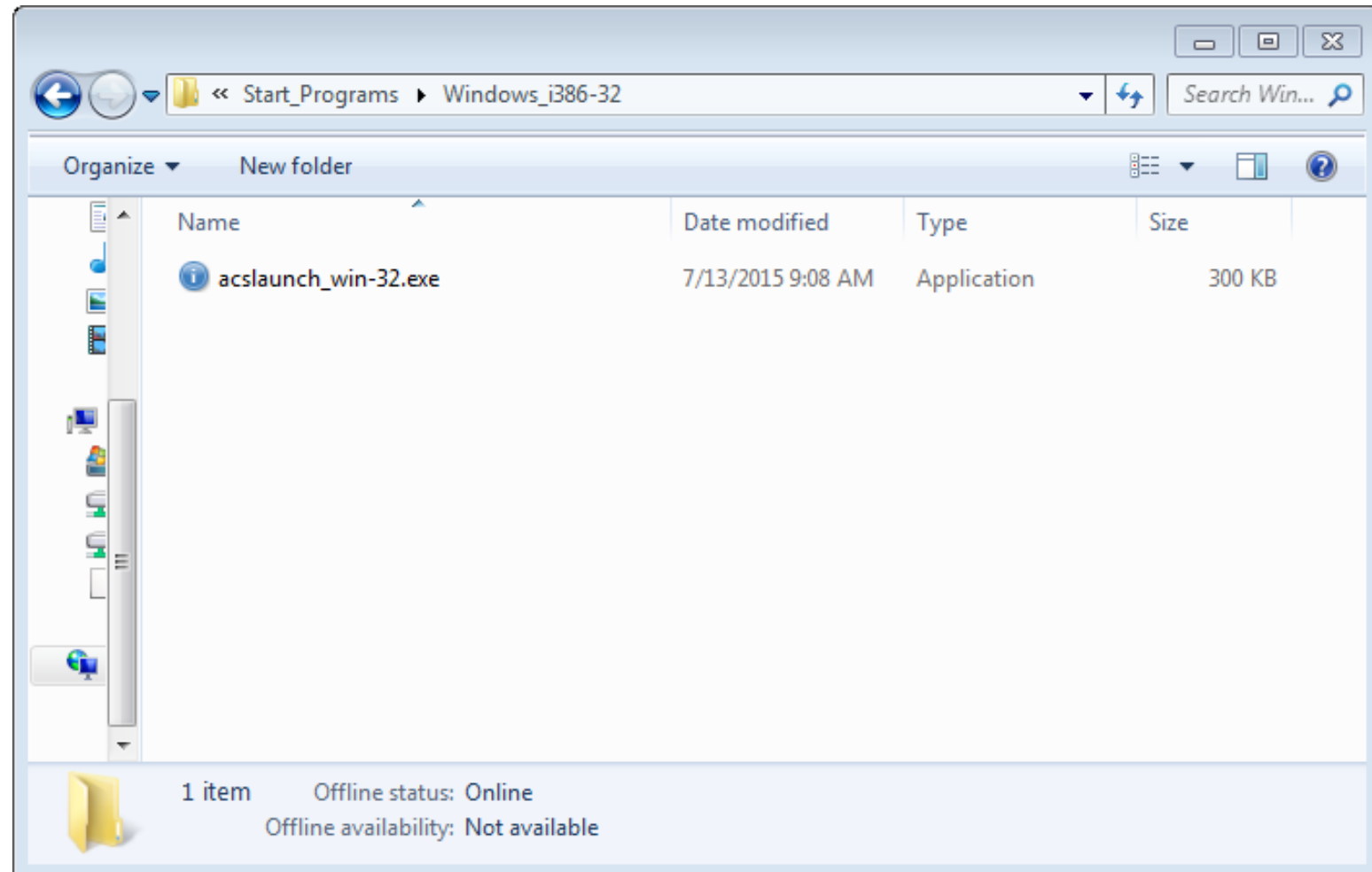
Basic Local Deployment

Start Programs – Operating System specific launch executables



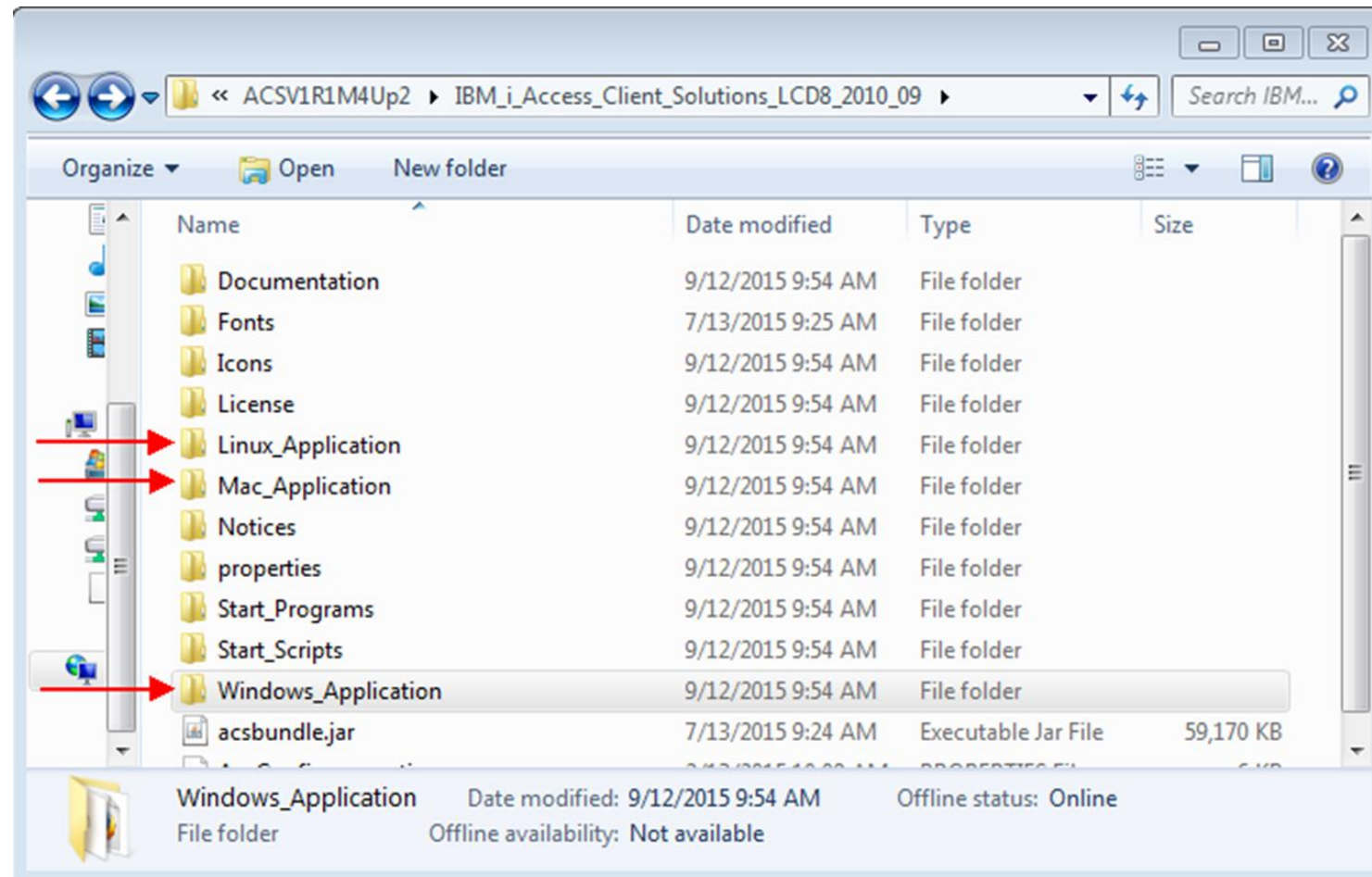
Basic Local Deployment

Start Programs – Operating System specific launch executables



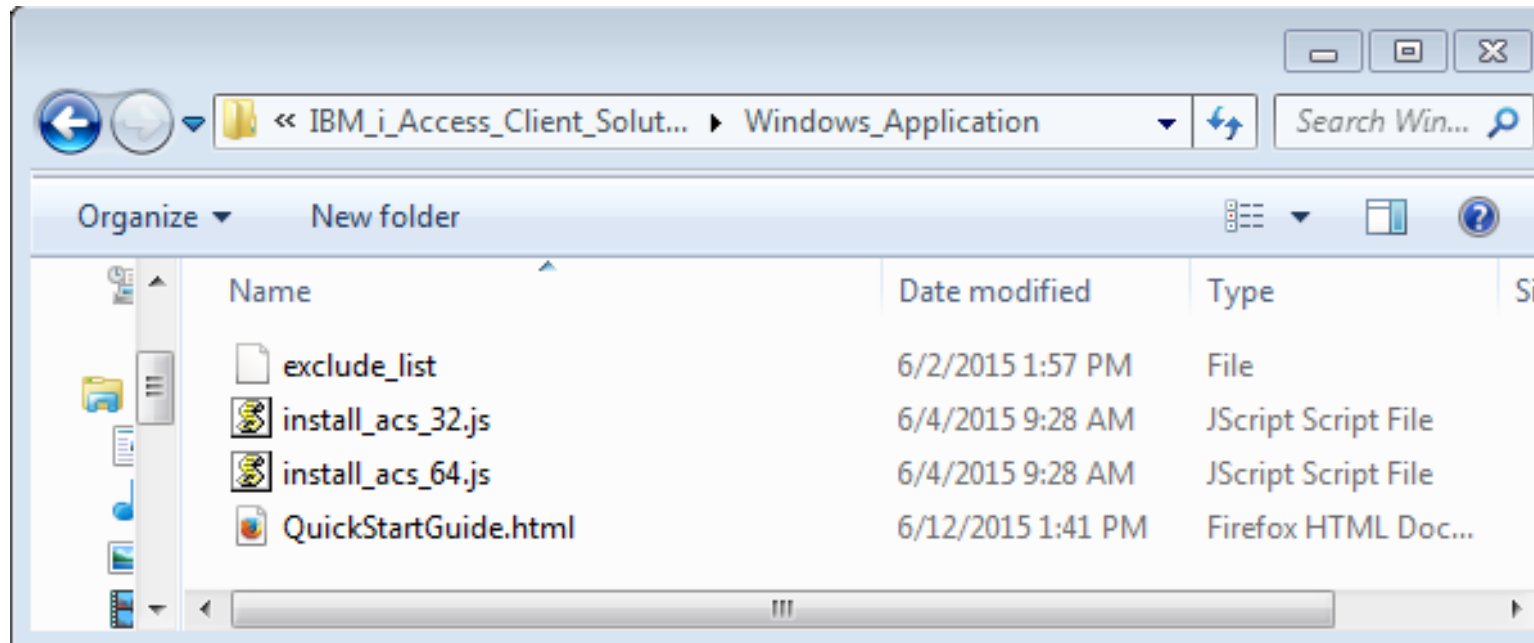
Provided Deployment/Install Scripts

- IBM i Access Client Solutions v1r1m4 provided Operating System specific Application deployment scripts to make deployment easier for an user
- Javascript will copy the IBM i Access Client Solutions deployment to a specific location that makes sense for the Operating System being used.



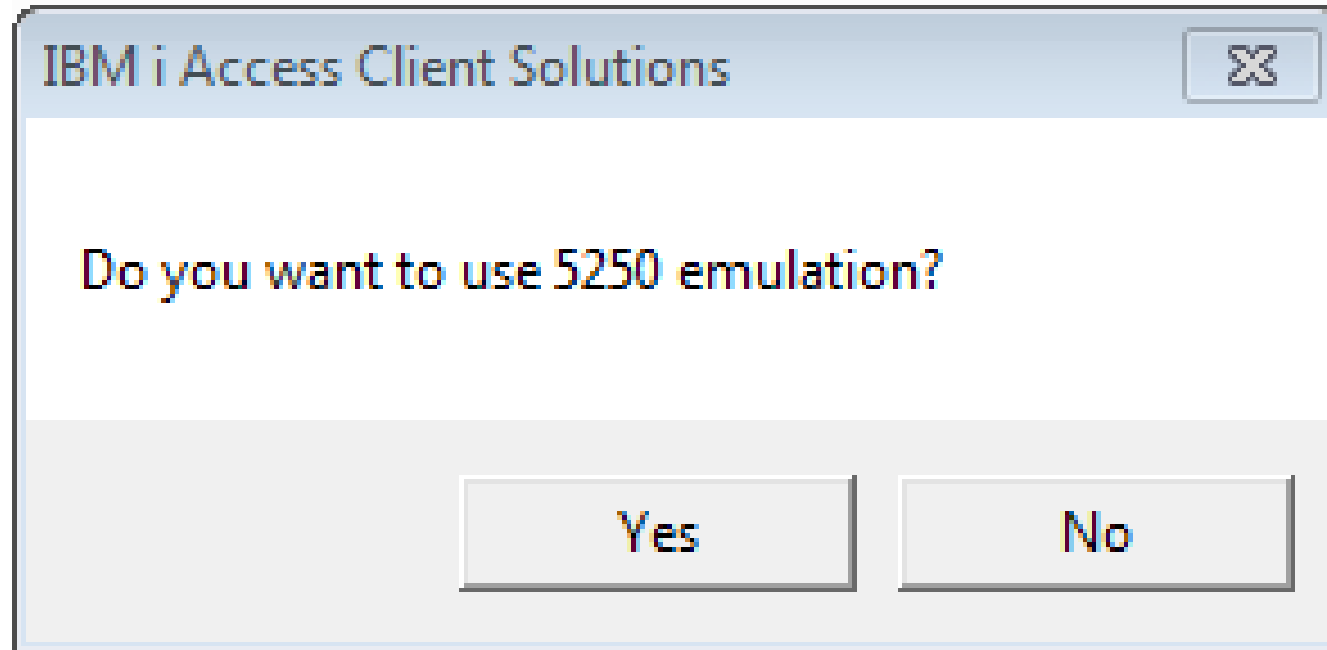
Provided Windows Deployment/Install Script

- Provided install_acs Javascript on Windows will copy the IBM i Access Client Solutions deployment to C:\Users\<WindowsUser>\IBM\ClientSolutions.
- Deployment will ask the user which functions they want to use, if it should create shortcuts on the Desktop for the Main User Interface and 5250 Session Manager. It will also create file associations for the .hod, .bchx, .dttx & .dtfx if they haven't already been created.



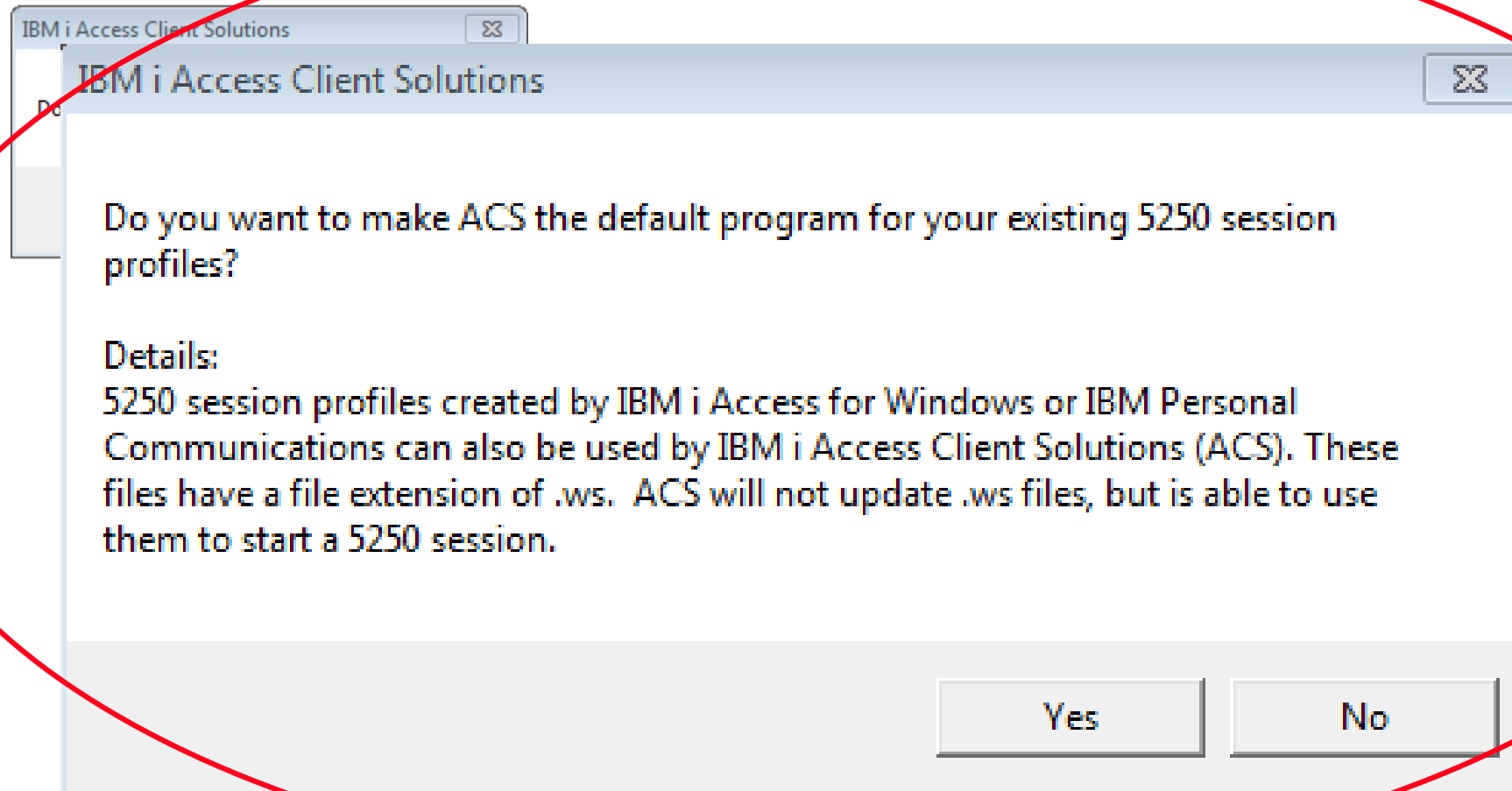
Provided Windows Deployment/Install Script

- Deployment Prompts



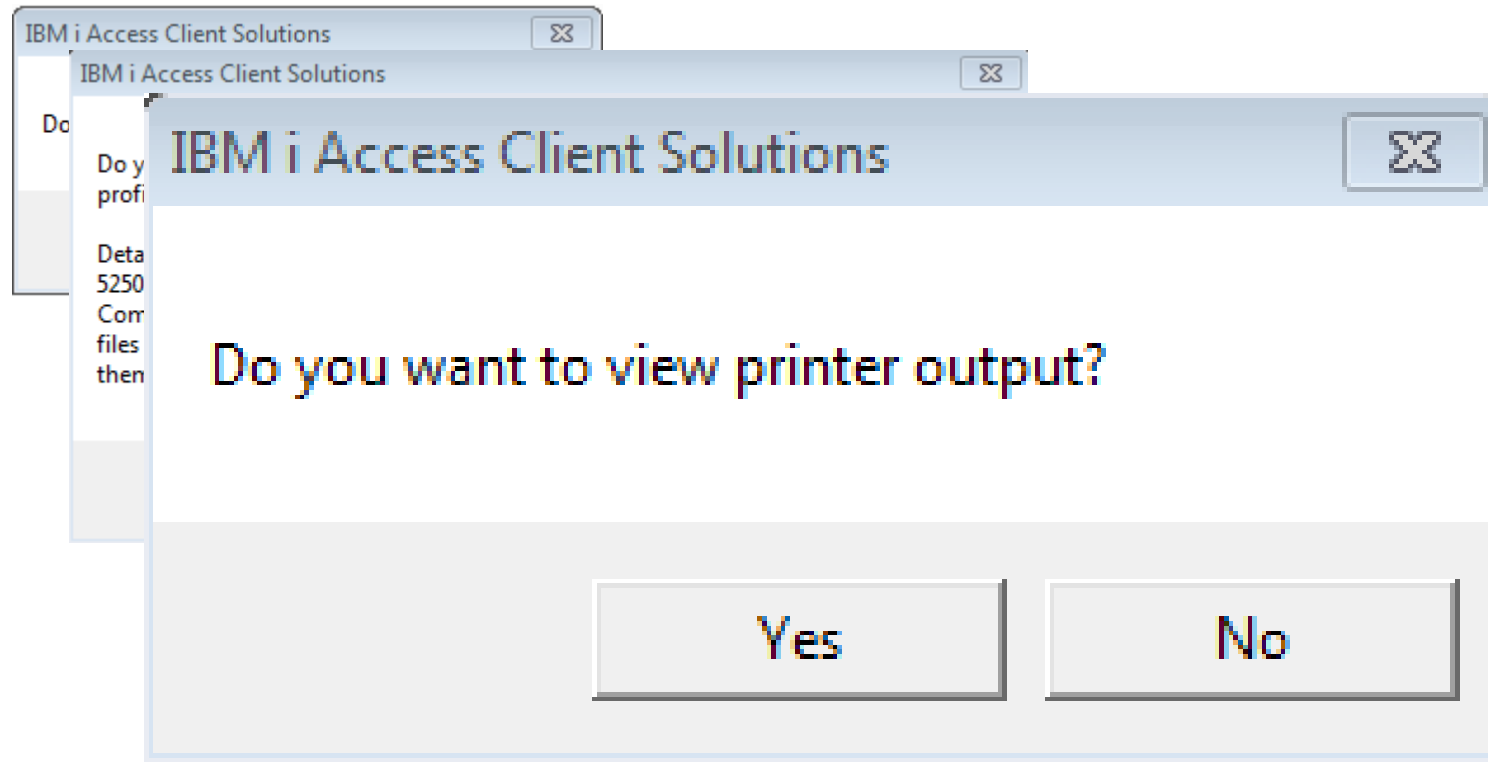
Provided Windows Deployment/Install Script

- Deployment Prompts



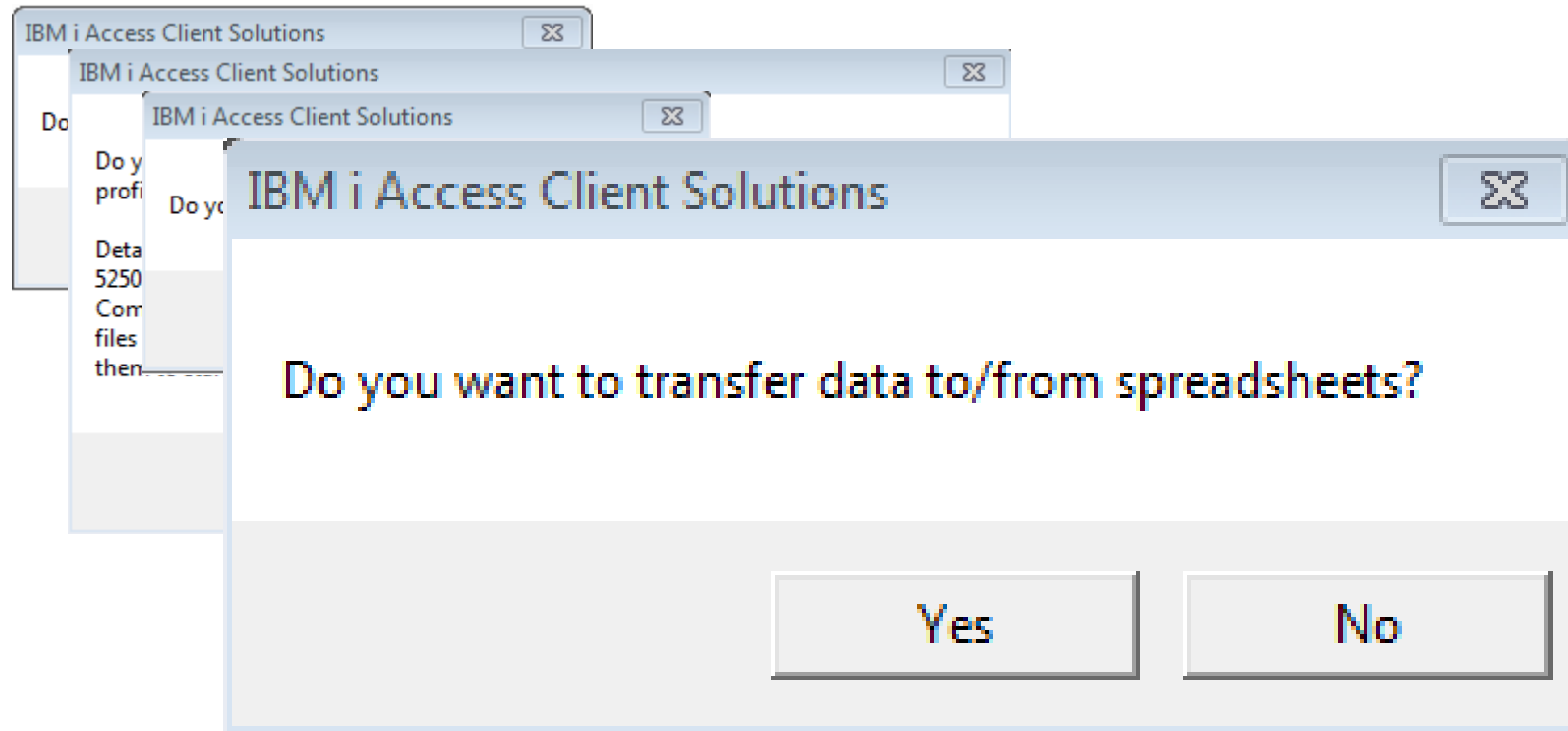
Provided Windows Deployment/Install Script

- Deployment Prompts



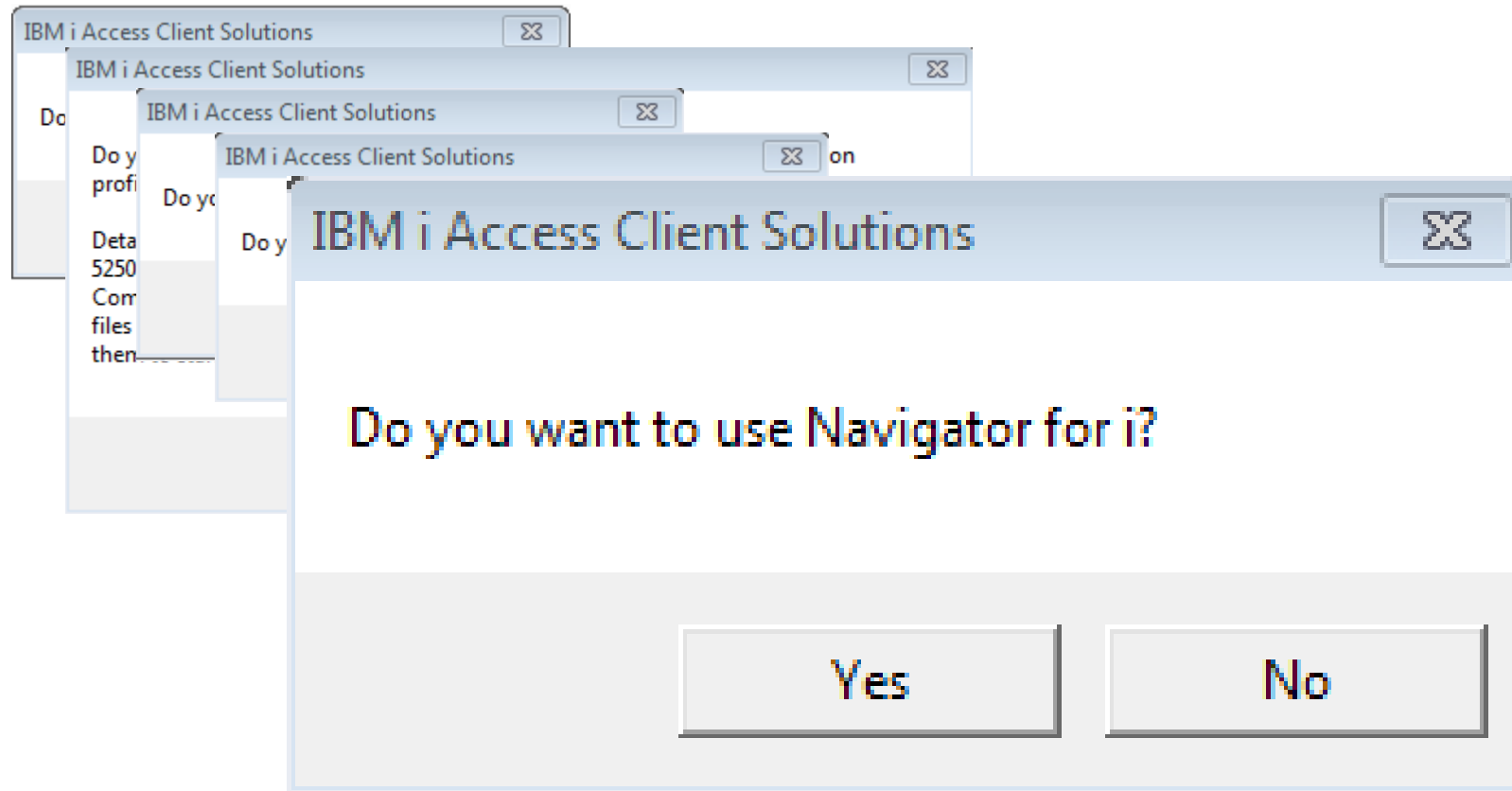
Provided Windows Deployment/Install Script

- Deployment Prompts



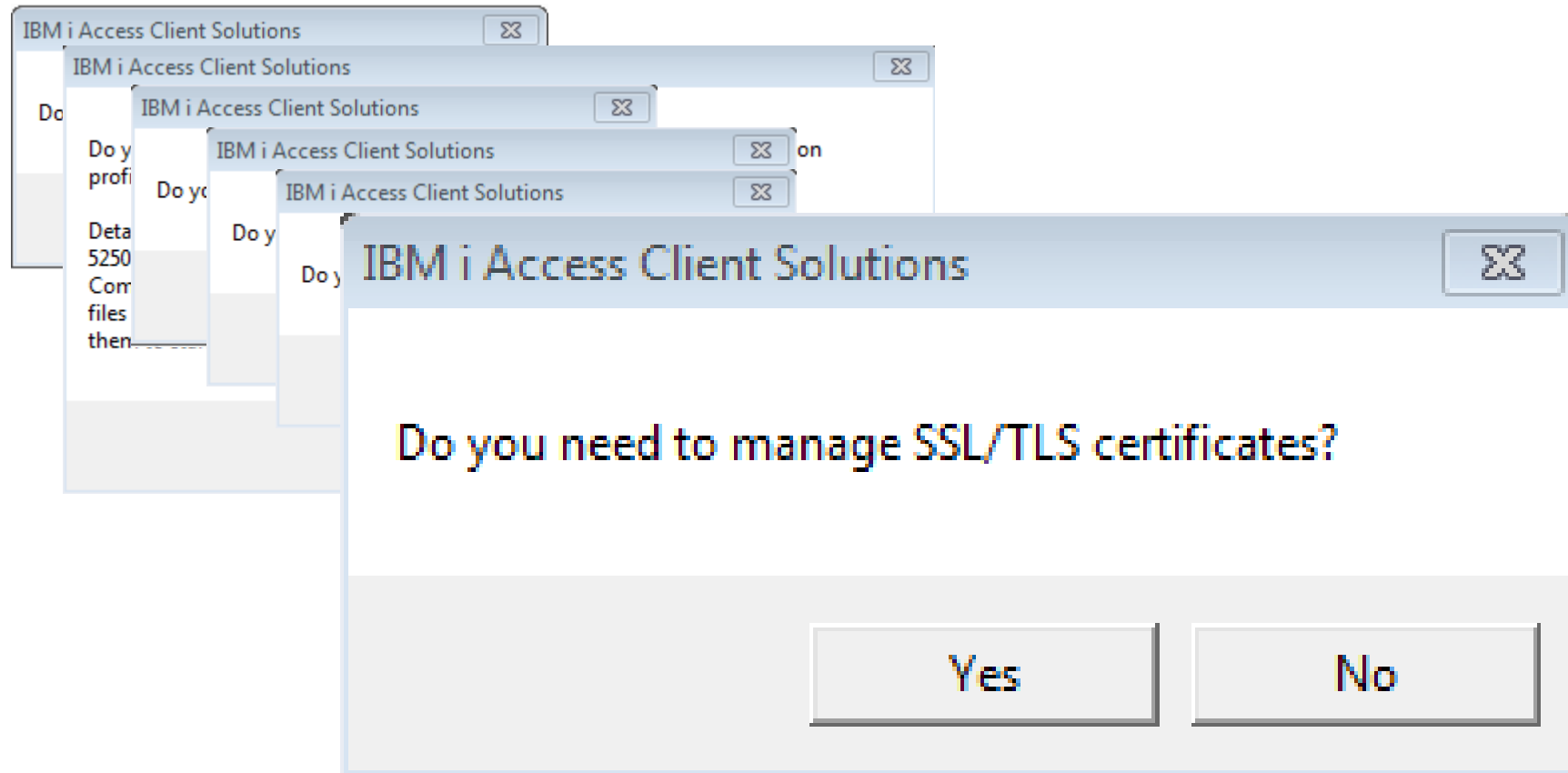
Provided Windows Deployment/Install Script

- Deployment Prompts



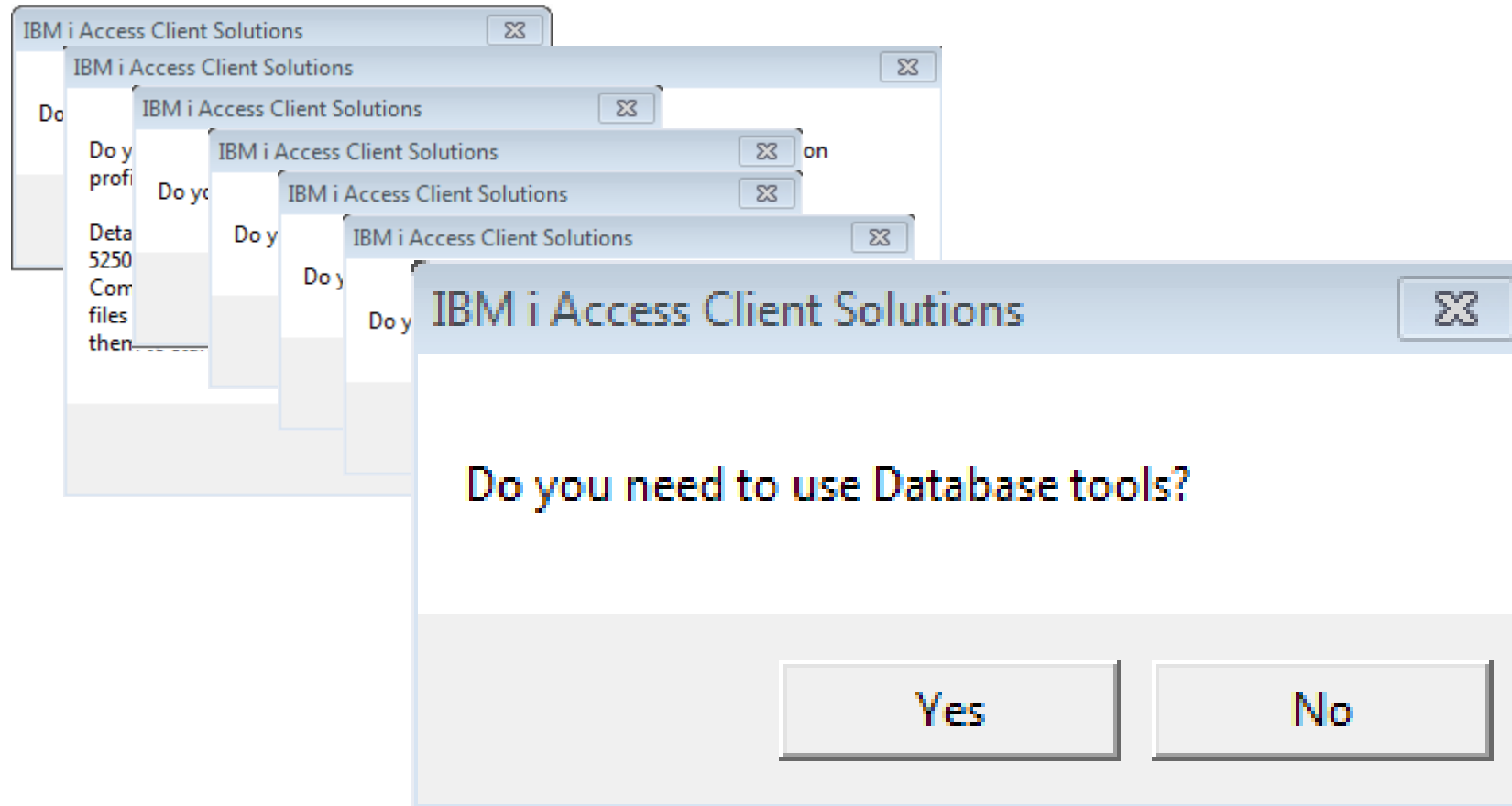
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- Deployment Prompts



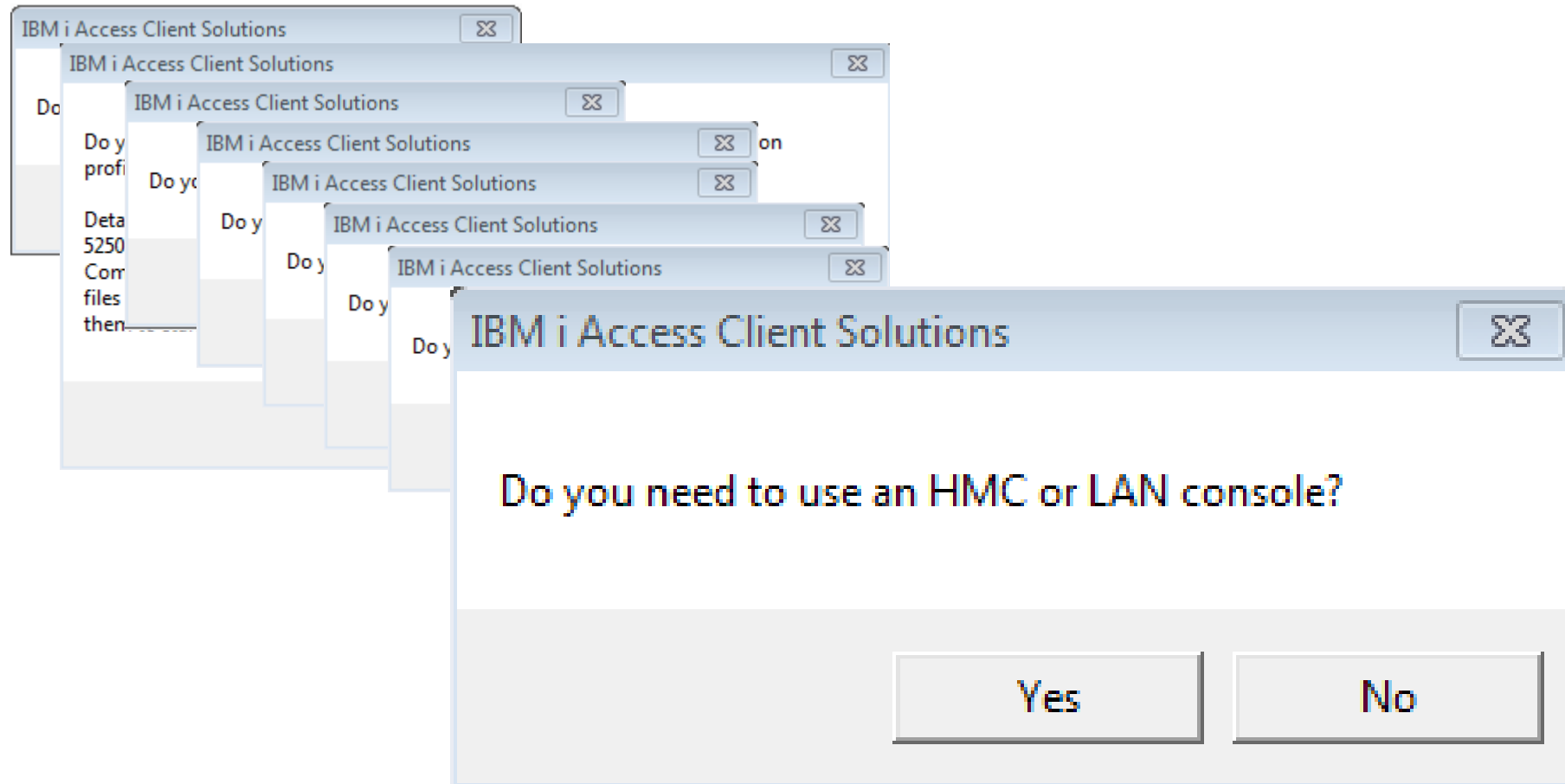
Provided Windows Deployment/Install Script

- Deployment Prompts



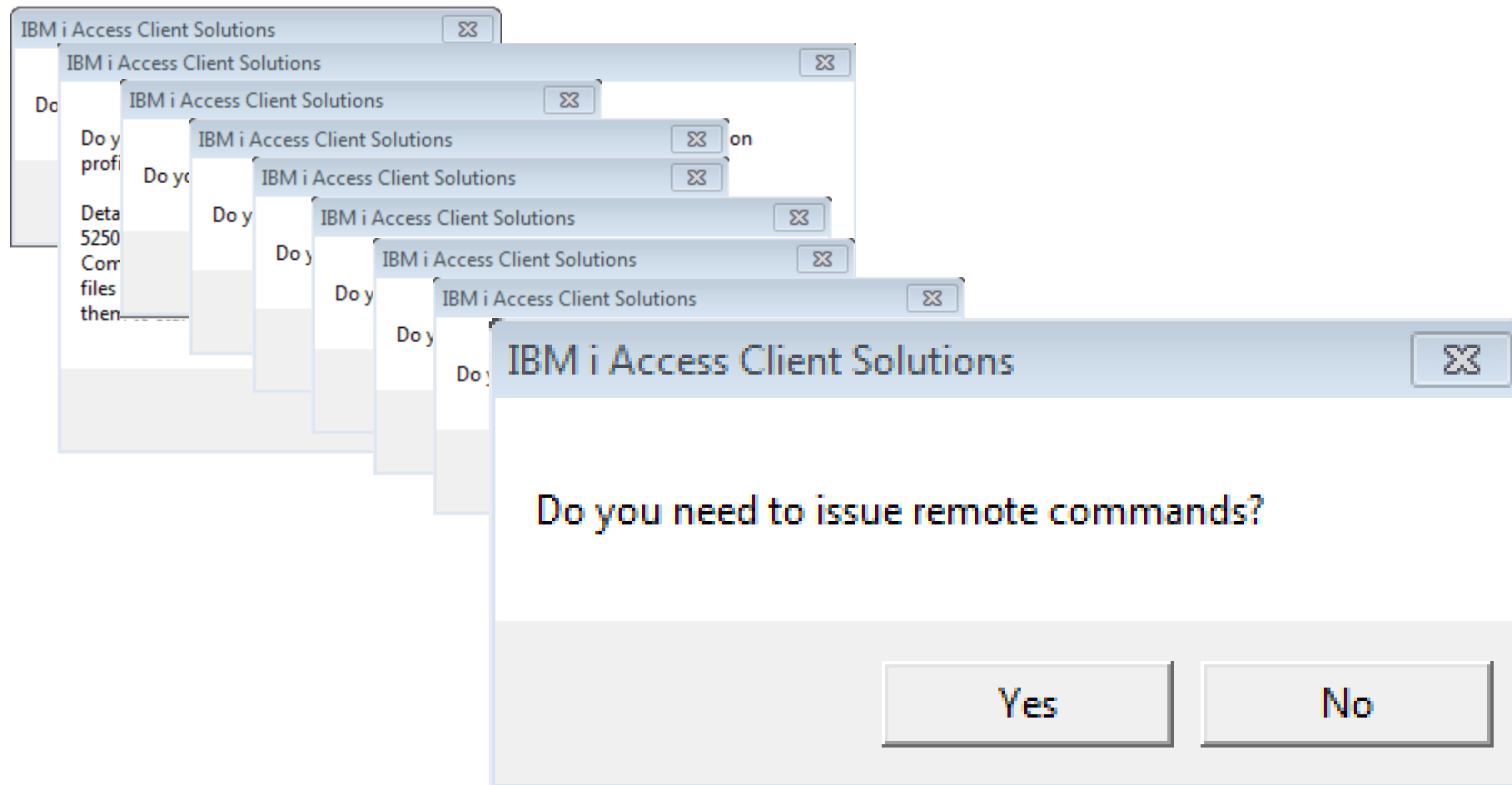
Provided Windows Deployment/Install Script

- Deployment Prompts



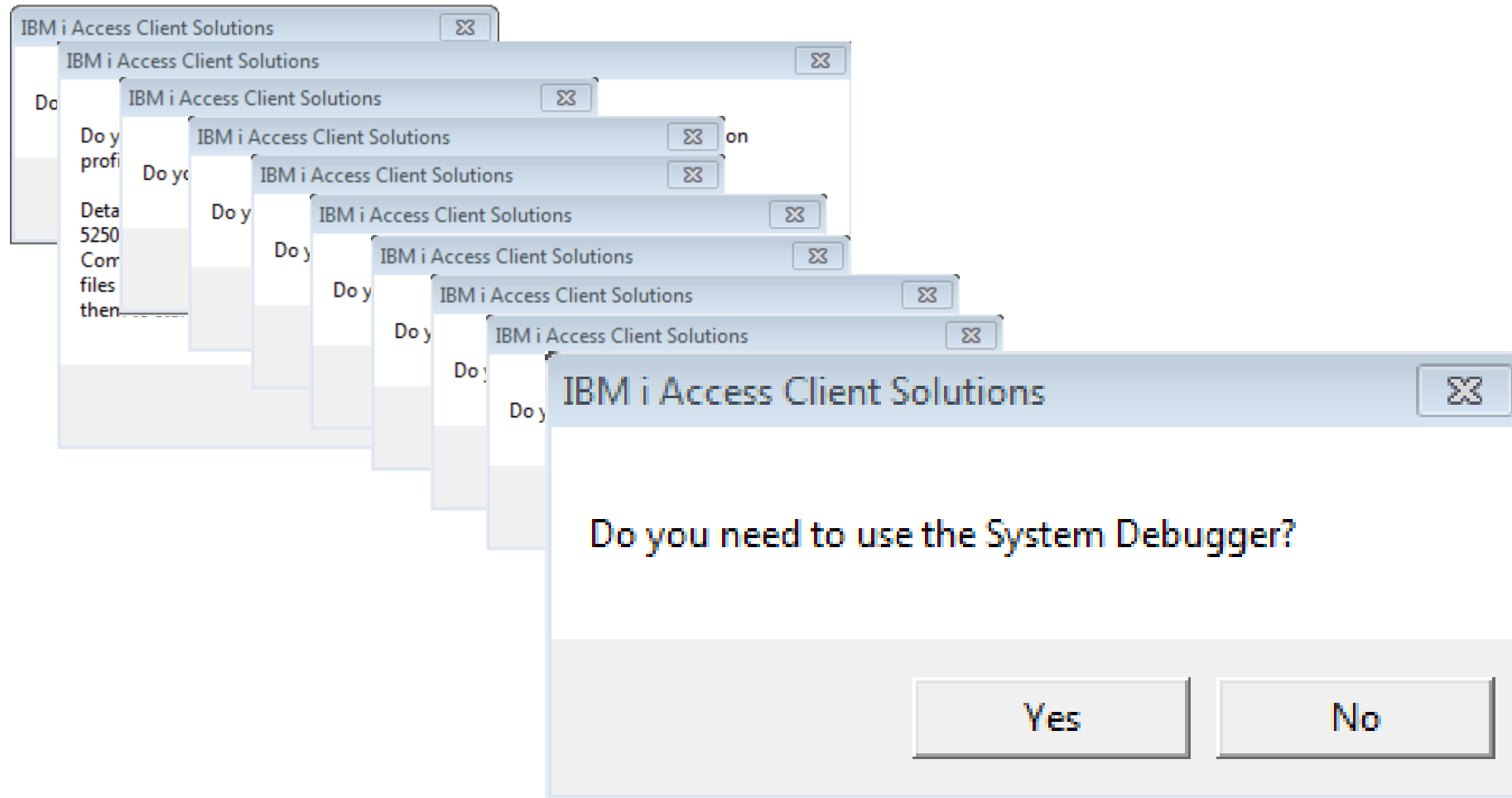
Provided Windows Deployment/Install Script

- Deployment Prompts



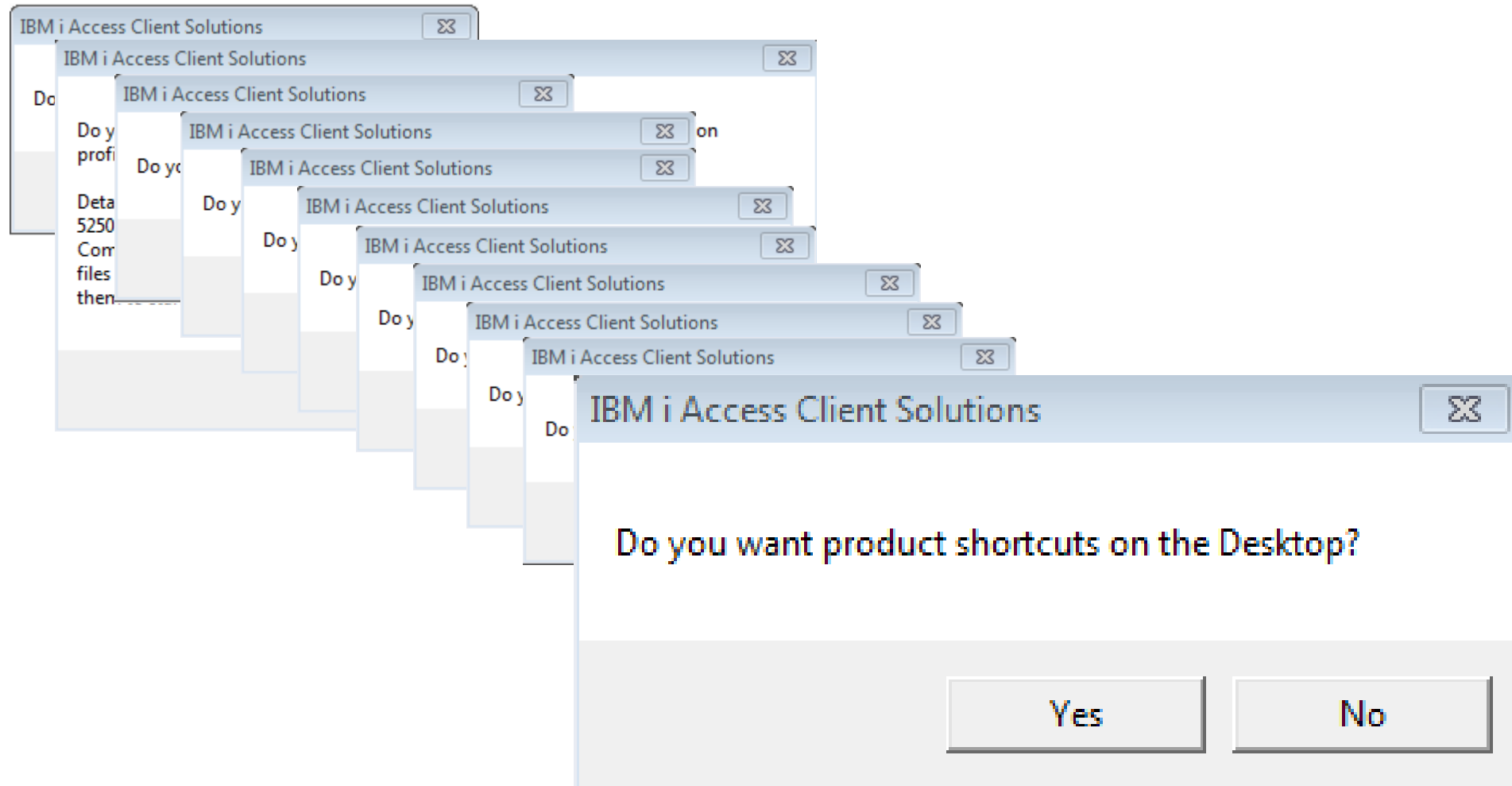
Provided Windows Deployment/Install Script

- Deployment Prompts



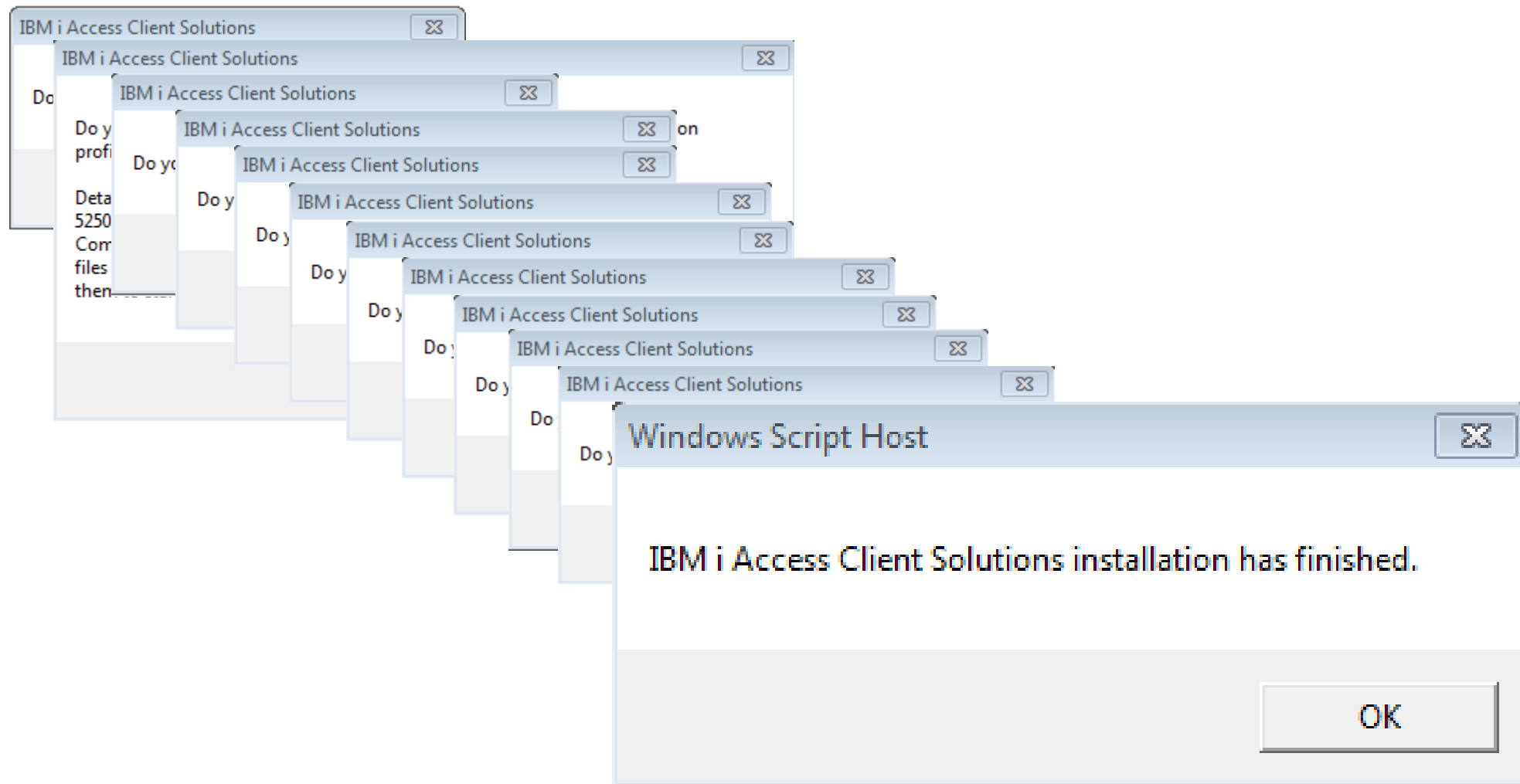
Provided Windows Deployment/Install Script

- Deployment Prompts



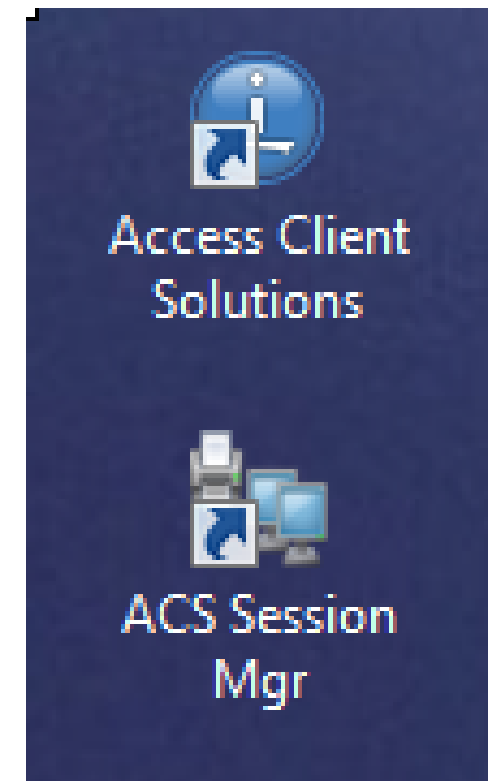
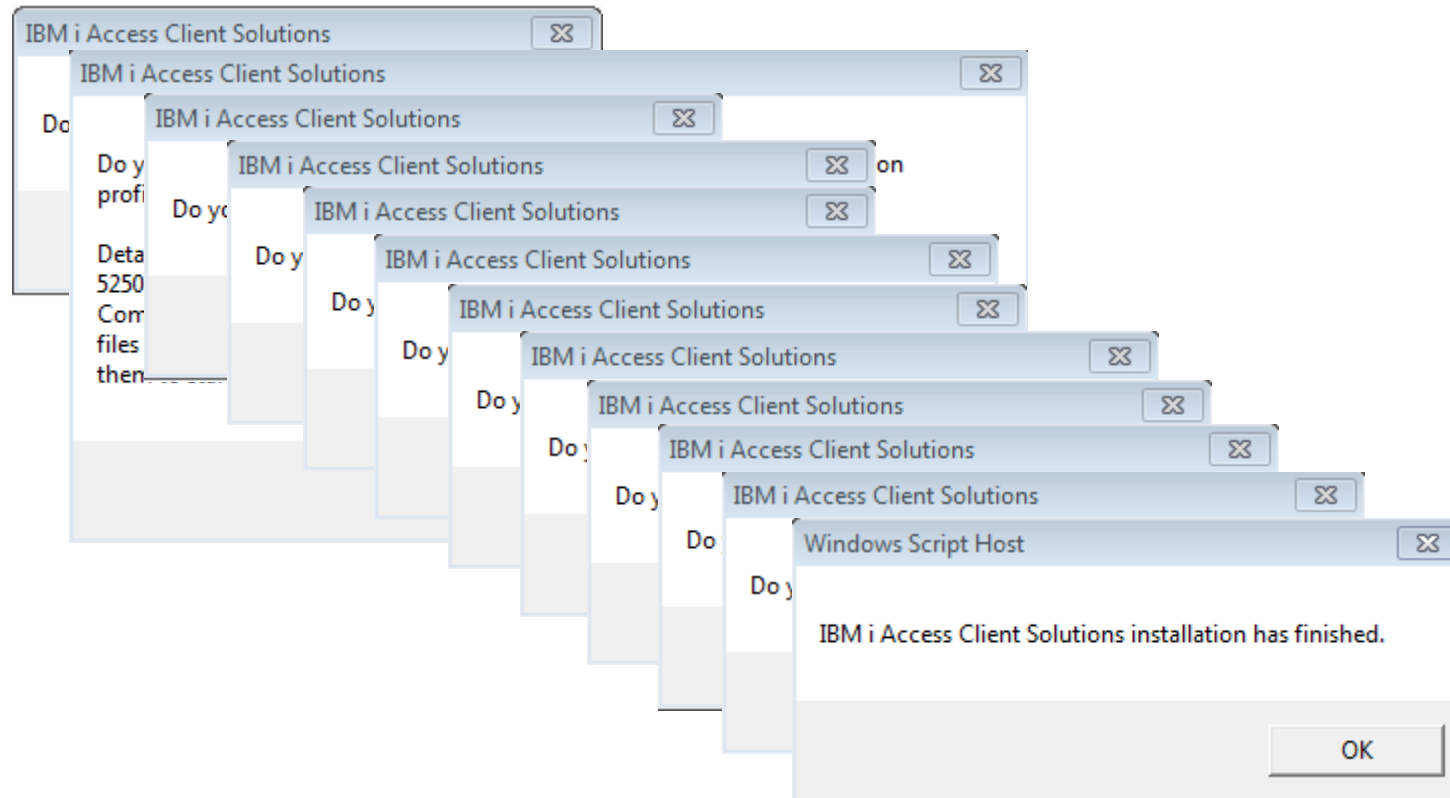
Provided Windows Deployment/Install Script

- Deployment Prompts



Provided Windows Deployment/Install Script

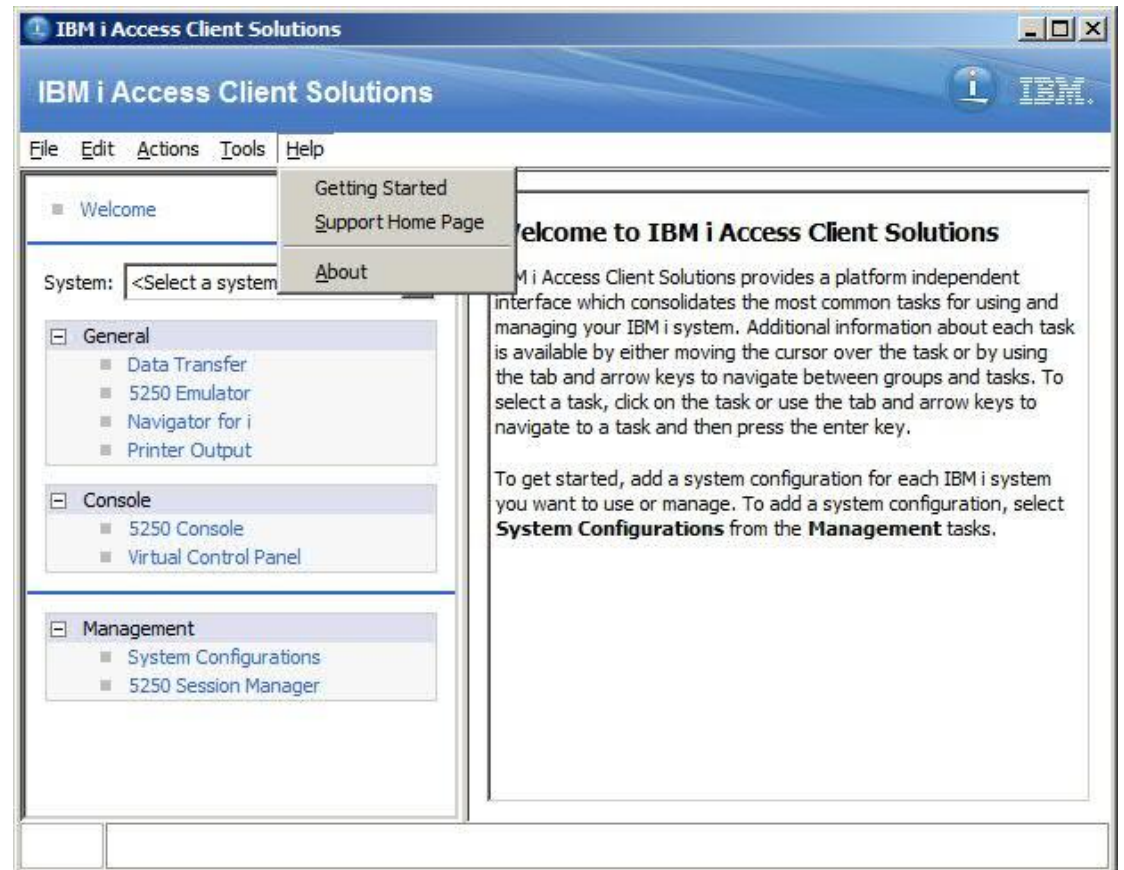
- Deployment Prompts



Getting Started

- Main User Interface provides an easy to use launch point for features
- Product contains Documentation folder containing "QuickStartGuide" and "GettingStarted" documents
- "GettingStarted" can also be launched from Main User Interface

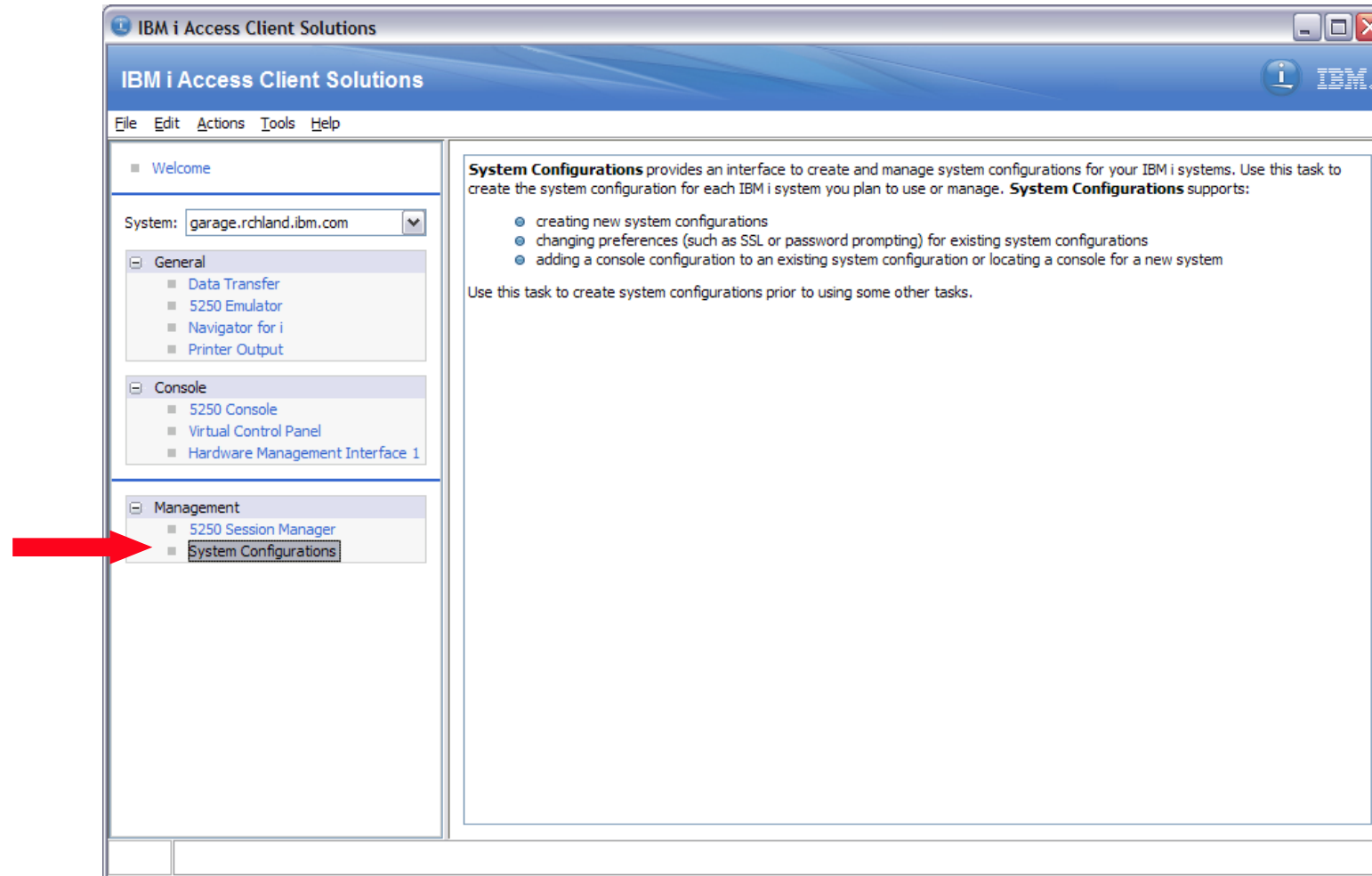
- Take a moment to try the Getting Started option on your PCs now



Configuration

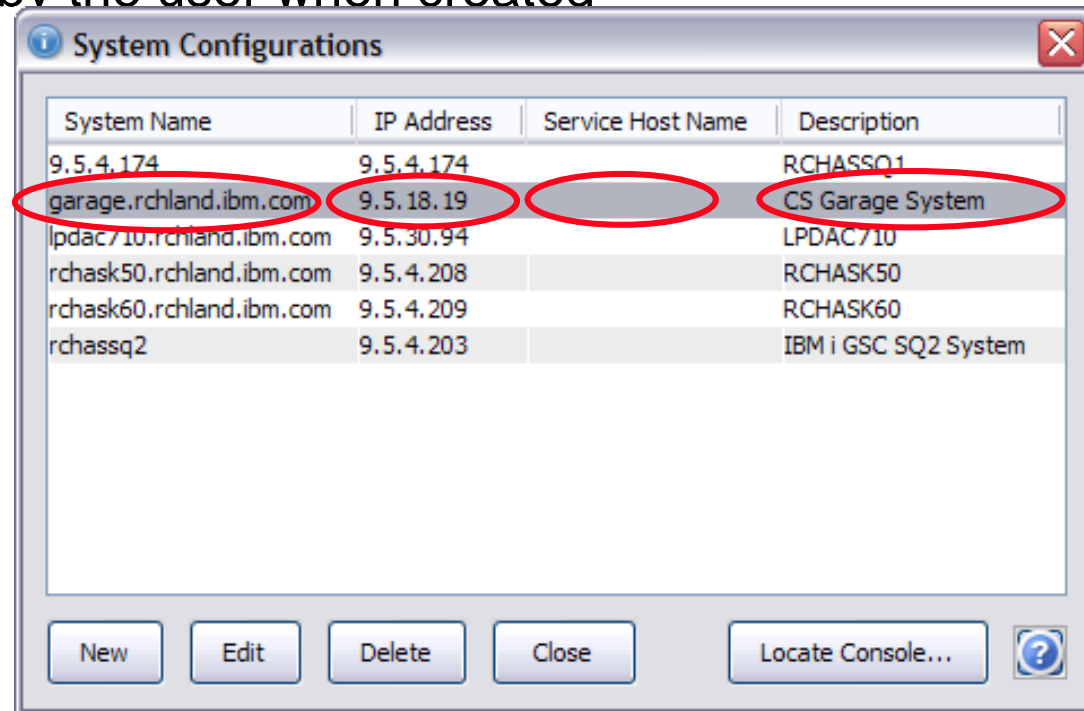
System Configurations

- Use the System Configurations panel to store connection information on the IBM i Systems that will be used



System Configurations

- Create, Edit or Delete connection information for IBM i Systems that are used.
 - **System Name:** What is entered by the user to connect to this host
 - **IP Address:** What the PC's DNS environment last returned when connecting to the System Name
 - **Service Host Name:** The HMC / System's Console host name or IP address as configured
 - **Description:** Defined by the user when created



System Name	IP Address	Service Host Name	Description
9.5.4.174	9.5.4.174		RCHASSQ1
garage.rchland.ibm.com	9.5.18.19		CS Garage System
lpdac710.rchland.ibm.com	9.5.30.94		LPDAC710
rchask50.rchland.ibm.com	9.5.4.208		RCHASK50
rchask60.rchland.ibm.com	9.5.4.209		RCHASK60
rchassq2	9.5.4.203		IBM i GSC SQ2 System

Buttons: New, Edit, Delete, Close, Locate Console..., ?

New System Configuration

The image displays two screenshots of the 'Add New System' dialog box, showing different tabs.

Left Screenshot (General Tab):

- System name:
- Description:
- ☐ Use SSL for connection
- Verify Connection

Right Screenshot (Connection Tab):

Password Prompting

- ☐ Use shared credentials
- ☒ Use default user name to prompt once for each system
- Default user name:
- ☐ Prompt for user name and password every time
- ☐ Use kerberos authentication; do not prompt

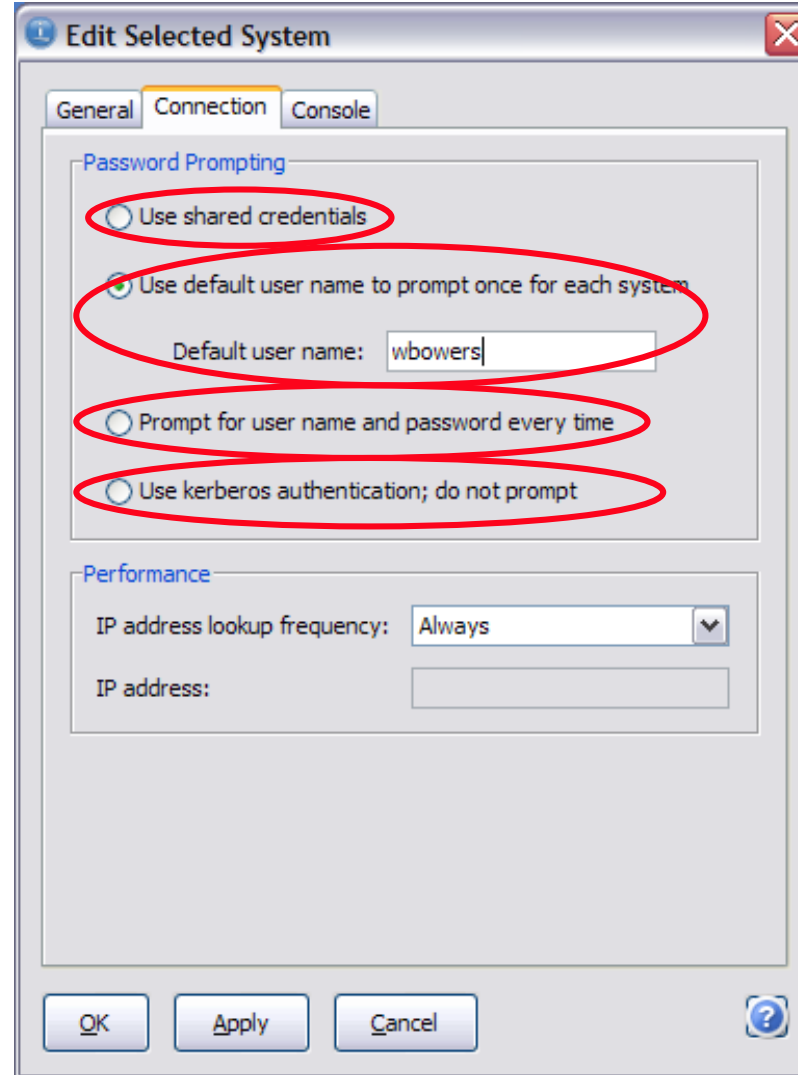
Performance

- IP address lookup frequency: Always
- IP address:

- OK - Saves the information entered and closes the panel
- Save/New - Saves the information entered and clears the panel
- Cancel - Closes the panel without saving anything

Authentication Options

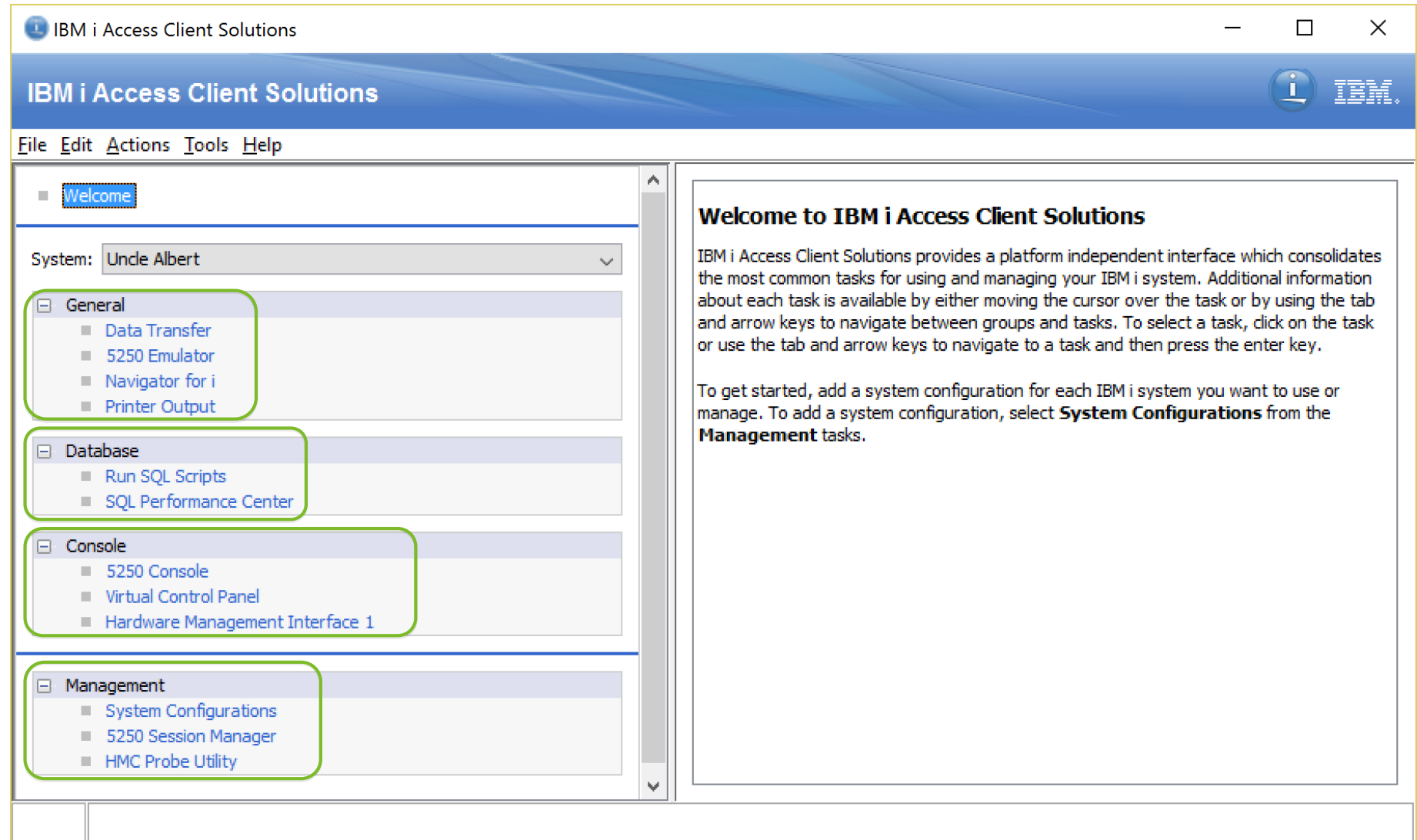
- Use Shared credentials
 - Prompt for logon credentials that will be shared by systems using this option.
 - The credentials will be saved until the user logs off
- Use default user name to prompt once for each system
 - Caches credentials for duration of desktop session
- Prompt for user name and password every time
- Use kerberos authentication; do not prompt
 - No further IBM i Access Client Solutions configuration needed



Exploring the Interface

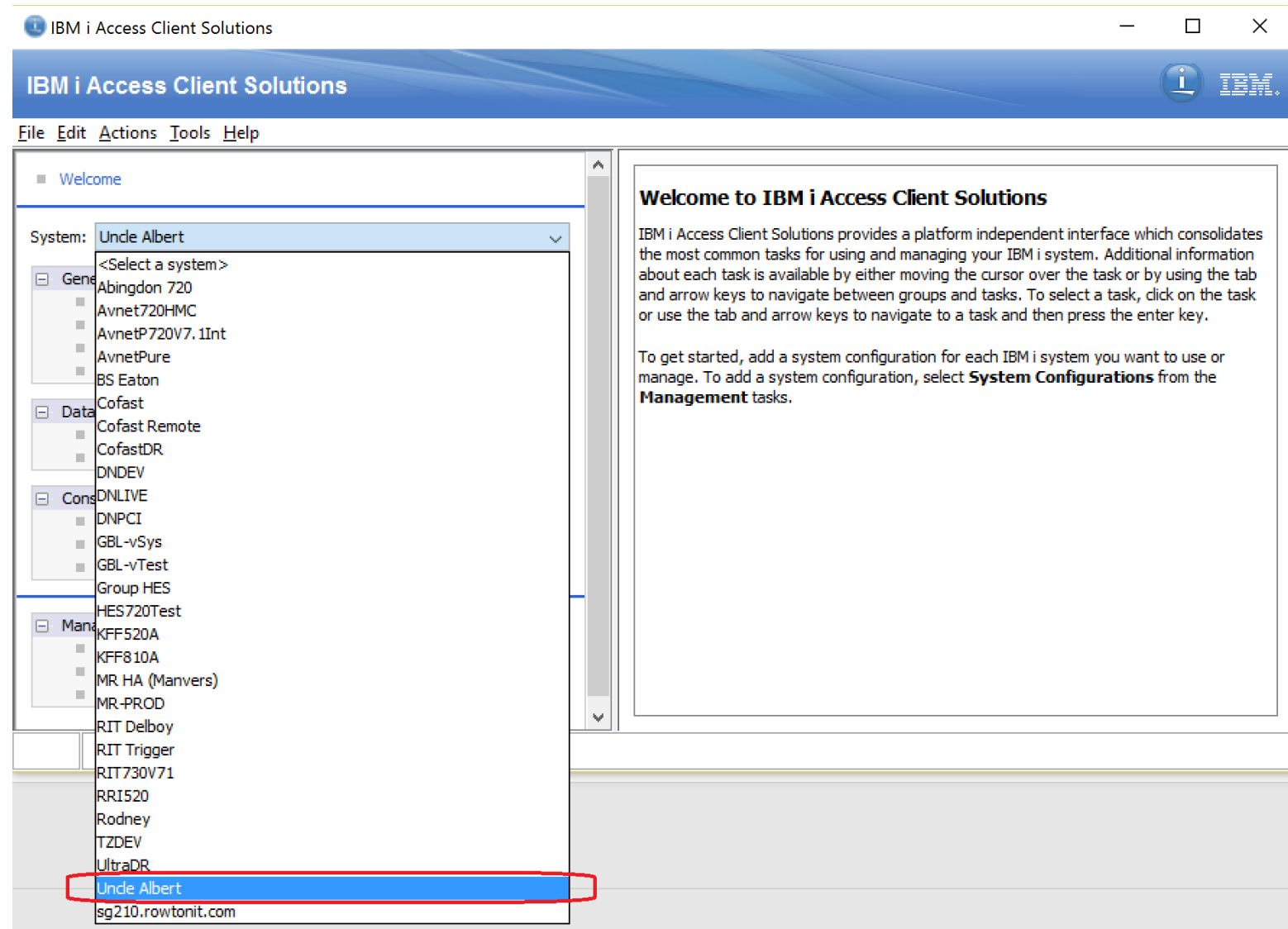
Function Selection

Grouped into four sections based on function type

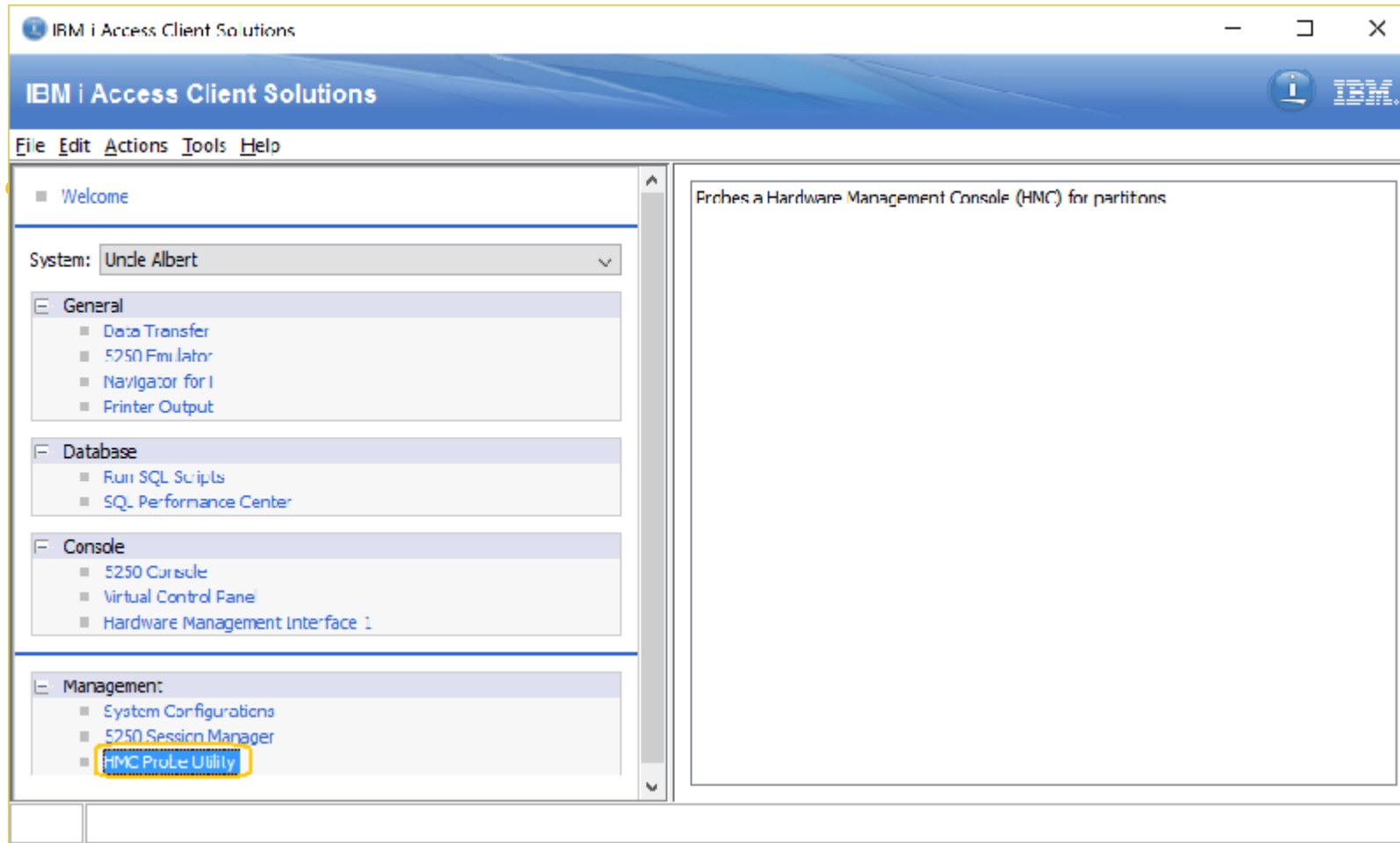


Exploring the Interface

System Selection
choose from the
pull down list



Exploring the Interface



Help Text

Context sensitive
Changing base on
what you have
selected

Printer Output

The screenshot displays the IBM i Access Client Solutions interface. The main window, titled 'Printer output on Uncle Albert', shows a table of printer output records. A context menu is open over the second record, with 'Download and View' selected. A Notepad window is open in the foreground, displaying the downloaded printer output file 'ACS.splf-7657344350003859760'. The output is a list of PTF groups and their status, including 'HIGH AVAILABILITY FOR IBM I', 'BACKUP RECOVERY SOLUTIONS', and 'DB2 FOR IBM I'.

Printer Output Table:

Output name	User-specified data	User	Status	Printer	Pages per copy	Copies left	Time created	Date created	Output queue	Printer device type	Number
QSYSVRT	WRKSYSVAL	ACS	*READY		4	1	12:55:33 PM	04/06/2016	QGPL/QPRINT	*SCS	1
QSYSVRT		ACS	*READY		1	1	1:01:20 PM	04/06/2016	QGPL/QPRINT	*SCS	5

Printer Output Content (ACS.splf-7657344350003859760):

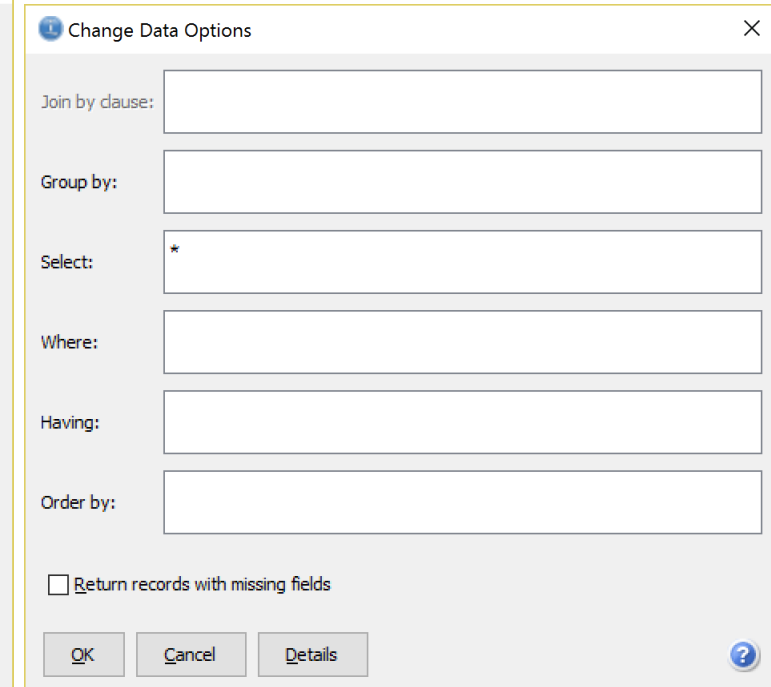
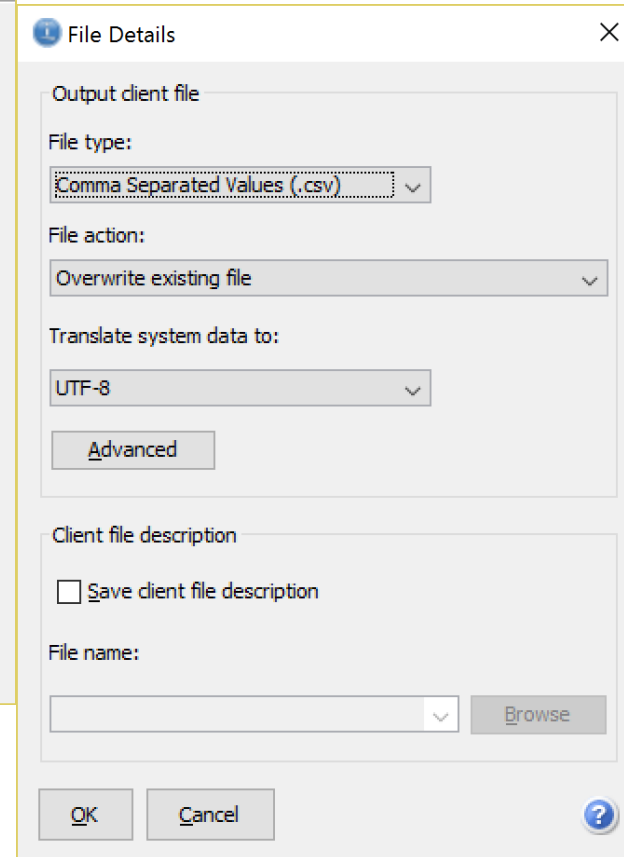
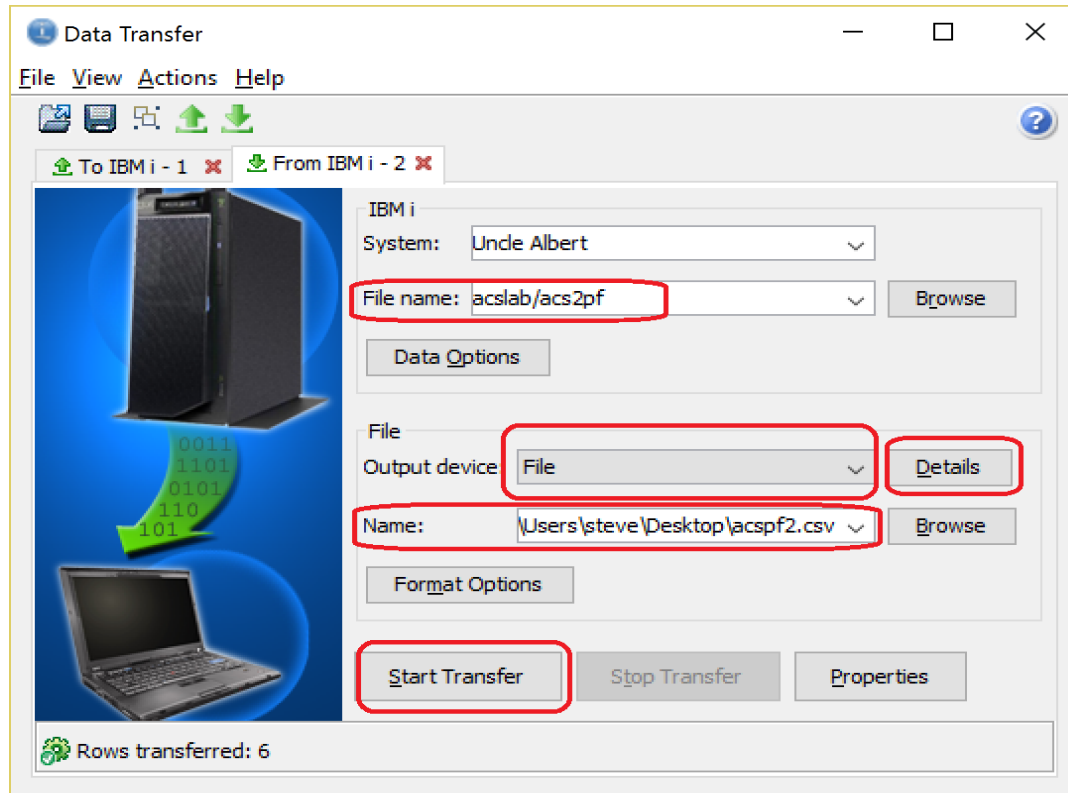
```
WORK WITH PTF GROUPS                                     Page 1
5770SS1 V7R3M0 160422                                     UALBERT 04/06/16 13:01:20 UTC

Work with PTF Groups

PTF Group          Level  Status  Text
SF99876            1    Installed HIGH AVAILABILITY FOR IBM I
SF99875            2    Installed HARDWARE AND RELATED PTFS
SF99731            2    Unknown  ALL PTF GROUPS EXCEPT CUMULATIVE PTF PACKAGE
SF99731            4    Unknown  ALL PTF GROUPS EXCEPT CUMULATIVE PTF PACKAGE
SF99730           16085 Installed CUMULATIVE PTF PACKAGE C6085730
SF99729            2    Installed SF99729: 730 GROUP HIPER
SF99729            4    Installed GROUP HIPER
SF99728            1    Installed SF99728: 730 GROUP SECURITY
SF99728            3    Installed GROUP SECURITY
SF99725            1    Installed JAVA
SF99724            1    Installed BACKUP RECOVERY SOLUTIONS
SF99724            3    Installed BACKUP RECOVERY SOLUTIONS
SF99723            2    Installed PERFORMANCE TOOLS
SF99722            1    Installed IBM HTTP SERVER FOR I
SF99722            2    Installed IBM HTTP SERVER FOR I
SF99703            1    Installed DB2 FOR IBM I

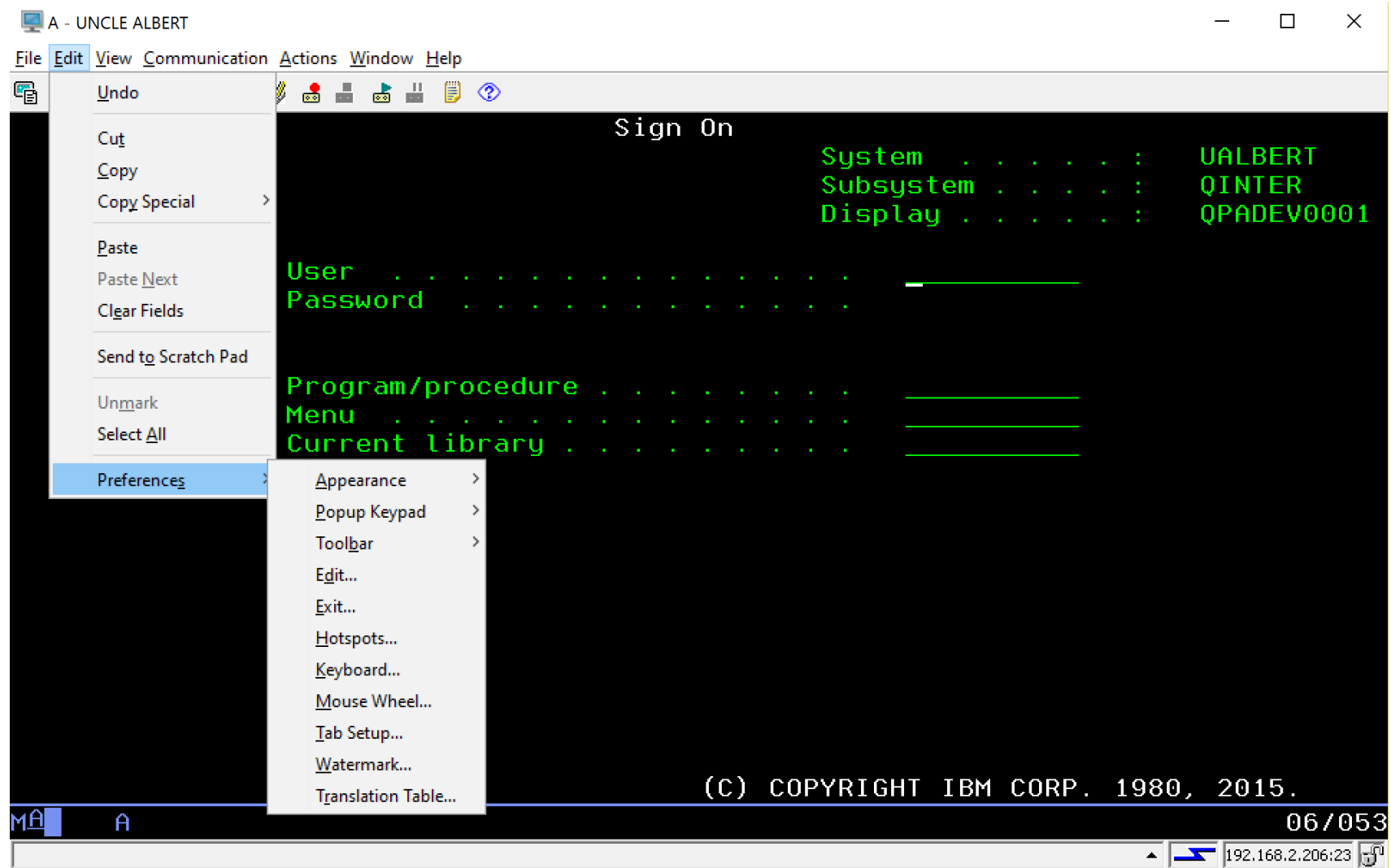
***** END OF LISTING *****
```

Data Transfer



The customisation options are similar to the current IBM i Access for Windows emulator

Customising 5250



The customisation options are similar to the current IBM i Access for Windows emulator

Customising 5250

Hotspots Setup (A - UNCLE ALBERT)

URL Hotspots

☒ Display URLs as Hotspots

☒ Don't show URLs in unprotected fields

☒ Underline ☐ 3-D Buttons

Function/Number Hotspots

☐ PFnn ☐ FPnn ☒ Fnn ☐ nn

☒ Show as 3-D Buttons

Macro Hotspots

☐ Execute Macro

☐ Show as 3-D Buttons

Point-and-Select Commands

☐ ENTER at cursor position

☐ Enter string at cursor position

OK Cancel Defaults Help

My favourite is enabling 3D Hotspots

A - UNCLE ALBERT

File Edit View Communication Actions Window Help

MAIN IBM i Main Menu System: UALBERT

Select one of the following:

1. User tasks
2. Office tasks
3. General system tasks
4. Files, libraries, and folders
5. Programming
6. Communications
7. Define or change the system
8. Problem handling
9. Display a menu
10. Information Assistant options
11. IBM i Access tasks
90. Sign off

Selection or command
===>

F3=Exit F4=Prompt F9=Retrieve F12=Cancel F13=Information Assistant
F23=Set initial menu

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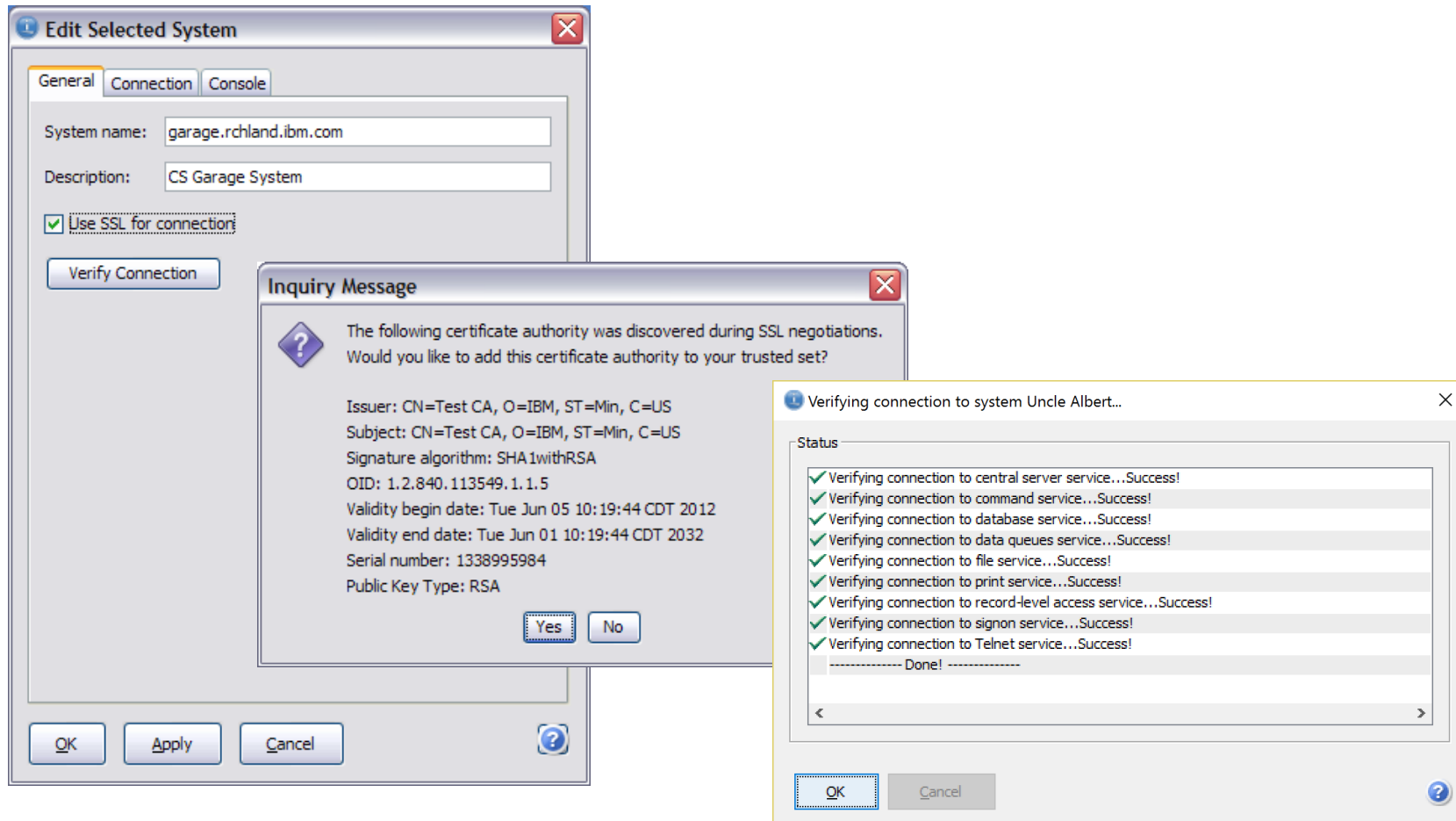
MA A 20/007

192.168.2.206:23

5250 Emulation Improvement

- IBM has enhanced the emulator
 - Copy & Paste now work with Ctrl c & Ctrl v
 - Copy & Paste now select and paste data more predictably
 - You can choose Tabbed or separate windows for the browsers
 - You can put a watermark in the background of you screen
 - This can be image or text – ideal for branding or differentiating systems
 - New Screen History function
 - Turn this one to create a storyboard of what you did in lead up to current screen
 - And those are just the ones I've found

Use SSL



- Use SSL specifies that the connection will be secured
- If the Certificate Authority negotiated is not trusted, the user will be prompted to add to trusted list
- There still is a Key Management utility if needed

Run SQL Scripts

The screenshot displays the IBM i Access Client Solutions interface. The main window is titled 'IBM i Access Client Solutions' and shows a sidebar with a tree view containing 'Welcome', 'System: Uncle Albert', 'General' (with sub-items like Data Transfer, 5250 Emulator, etc.), 'Database' (with 'Run SQL Scripts' highlighted in a red box), 'Console', and 'Management'. A context menu is open over the 'Run SQL Scripts' option, showing standard editing actions like Undo, Redo, Cut, Copy, Paste, Select All, Find, Find Next, Find and Replace, and Toggle Comments, along with an 'Insert from Examples...' button. To the right, an 'Examples' dialog box is open, listing various SQL scripts under the 'IBM i Services' category. The 'Security - Review *ALLOBJ users' script is selected. The script content is displayed in a text area on the right, showing a SQL query that filters users based on special authorities.

Examples

IBM i Services

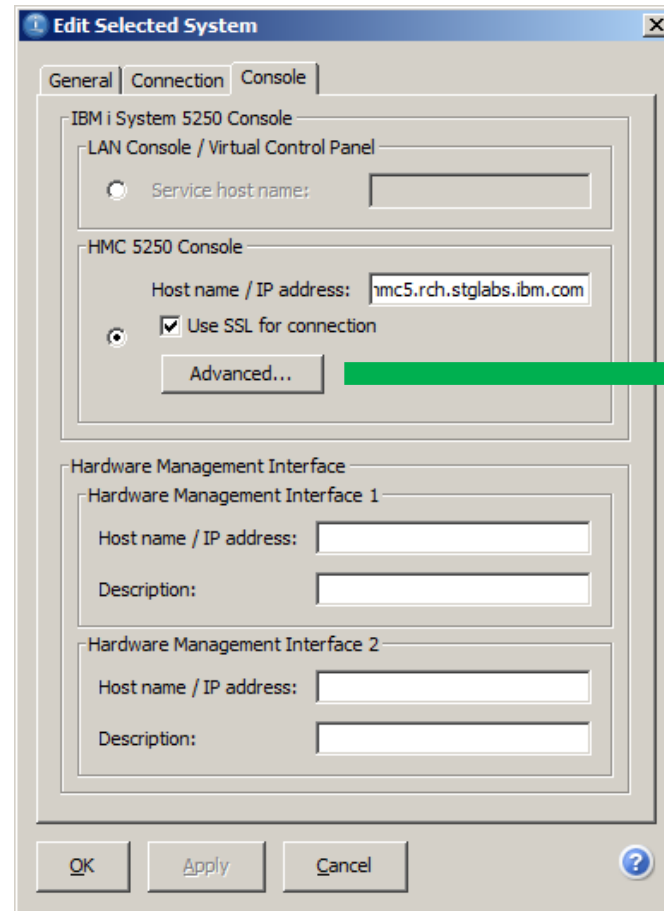
Security - Review *ALLOBJ users

```
1  -- category: IBM i Services
2  -- description: Security - Review *ALLOBJ users
3  --
4  -- Reference: https://ibm.biz/DB2foriServices
5  -- Which users have *ALLOBJ authority either directly
6  -- or via a Group or Supplemental profile?
7  --
8  SELECT AUTHORIZATION_NAME, STATUS, NO_PASSWORD_INDICATOR, PRE
9  TEXT_DESCRIPTION
10 FROM QSYS2.USER_INFO
11 WHERE SPECIAL_AUTHORITIES LIKE '%*ALLOBJ%'
12 OR AUTHORIZATION_NAME IN (
13   SELECT USER_PROFILE_NAME
14   FROM QSYS2.GROUP_PROFILE_ENTRIES
15   WHERE GROUP_PROFILE_NAME IN (
16    SELECT AUTHORIZATION_NAME
17    FROM QSYS2.USER_INFO
18    WHERE SPECIAL_AUTHORITIES like '%*ALLOBJ%'
19   )
20 )
21 ORDER BY AUTHORIZATION_NAME;
```

Insert

IBM includes some handy examples

Console Configuration



Edit Selected System

General | Connection | Console

IBM i System 5250 Console

LAN Console / Virtual Control Panel

☐ Service host name:

HMC 5250 Console

Host name / IP address: hmc5.rch.stglabs.ibm.com

☒ Use SSL for connection

Advanced...

Hardware Management Interface

Hardware Management Interface 1

Host name / IP address:

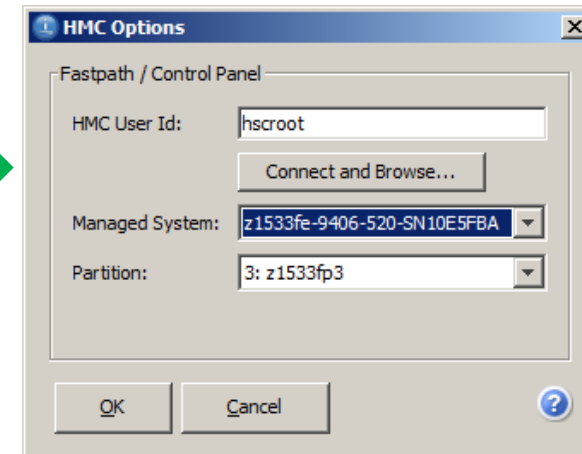
Description:

Hardware Management Interface 2

Host name / IP address:

Description:

OK Apply Cancel



HMC Options

Fastpath / Control Panel

HMC User Id: hscroot

Connect and Browse...

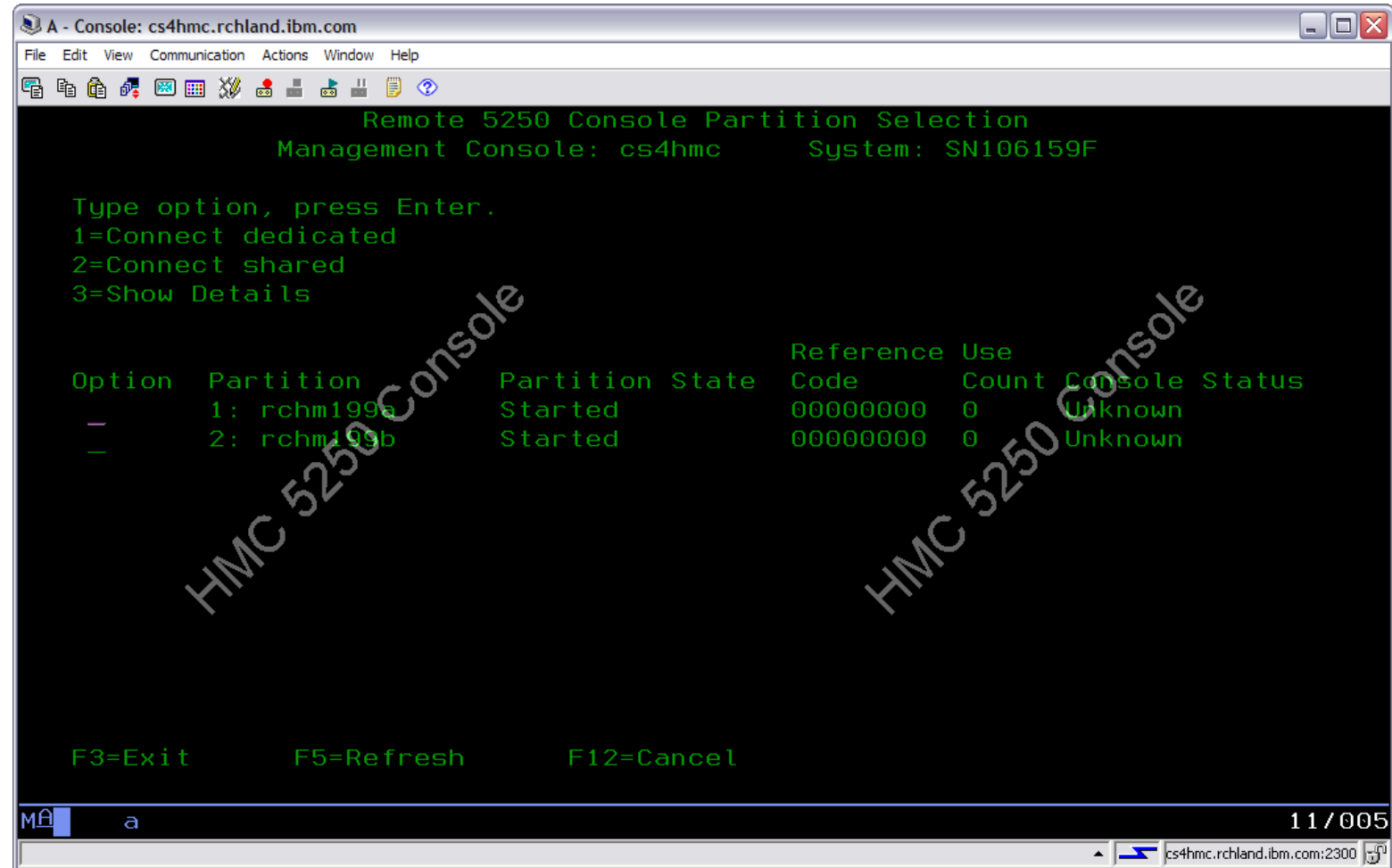
Managed System: z1533fe-9406-520-SN10E5FBA

Partition: 3: z1533fp3

OK Cancel

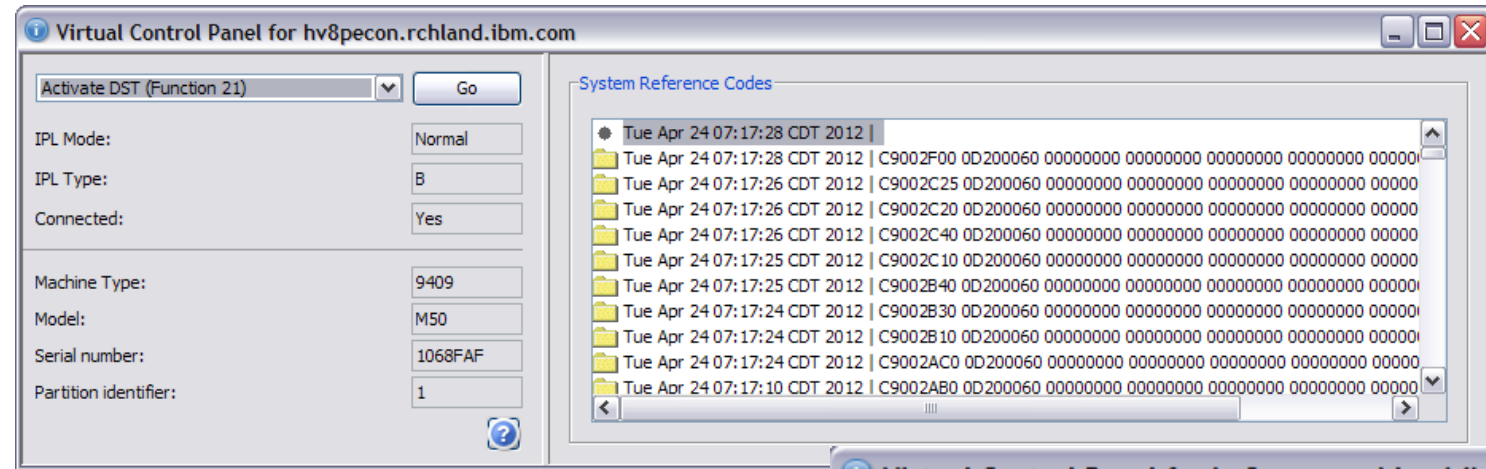
5250 Console

- 5250 HMC Console

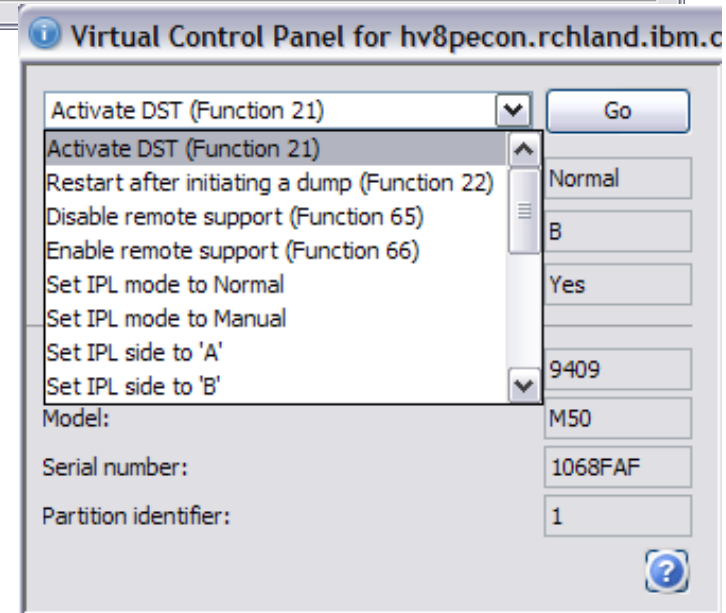


Virtual Control Panel

- Virtual Control Panel



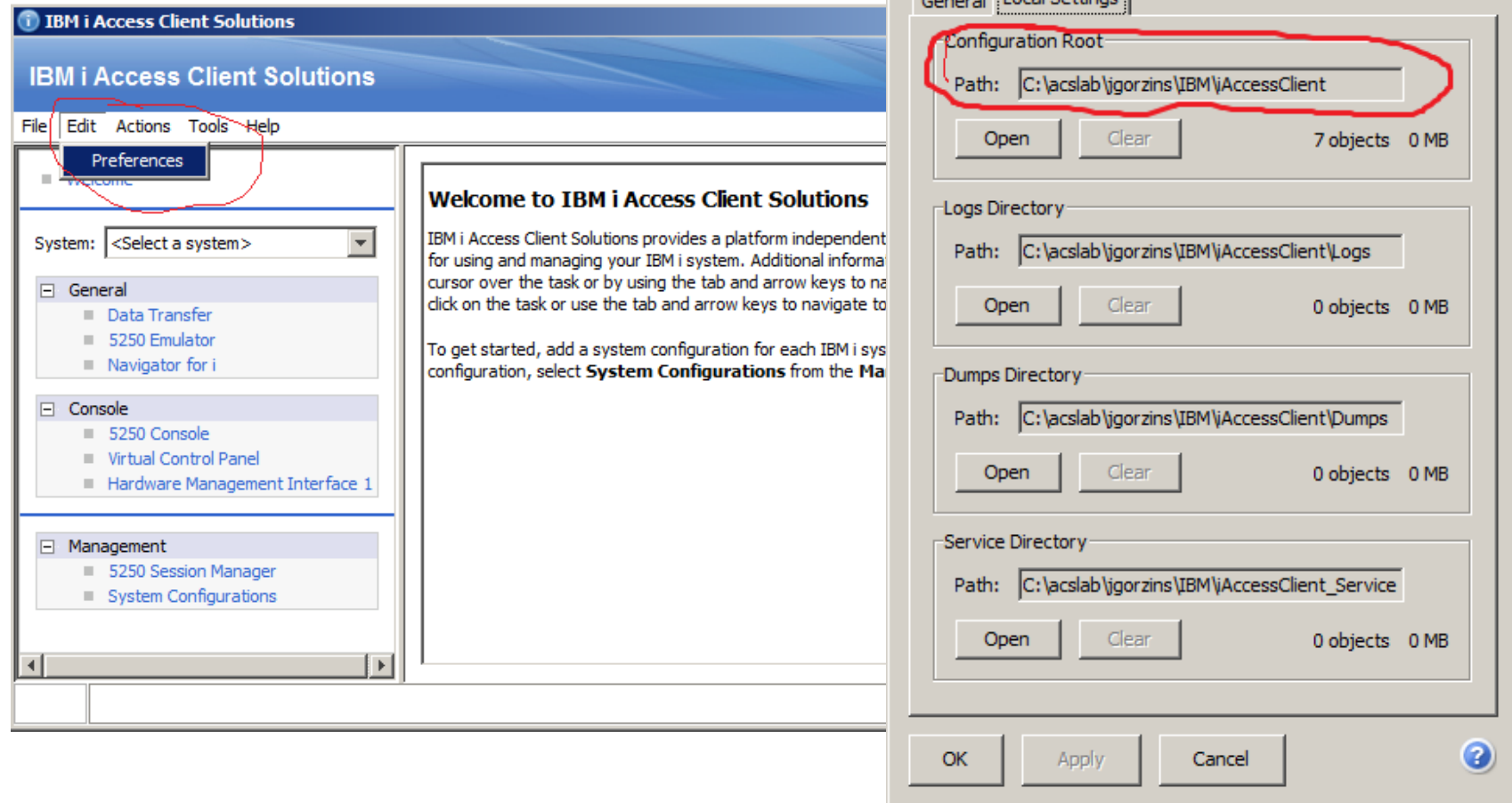
- Service Functions
 - Providing options for service commands instead of providing the up and down arrows and enter
- Starting in V1R1M3 supported with LAN and HMC console types



AcsConfig.properties

- IBM i Access Client Solutions uses a product configuration file, named “AcsConfig.properties”
- AcsConfig.properties is simply a list of configuration properties and values.
- These properties may also be specified on the command line
-D<property>=<value>
- One such property is
com.ibm.iaccess.AcsBaseDirectory

Verifying Location



Limiting Functions

- There are two approaches to limiting the functions that the user has access to when running IBM i Access Client Solutions
 - List of Excluded Components tied to the product deployment
 - Runtime restrictions stored on the client workstation

Excluding Components

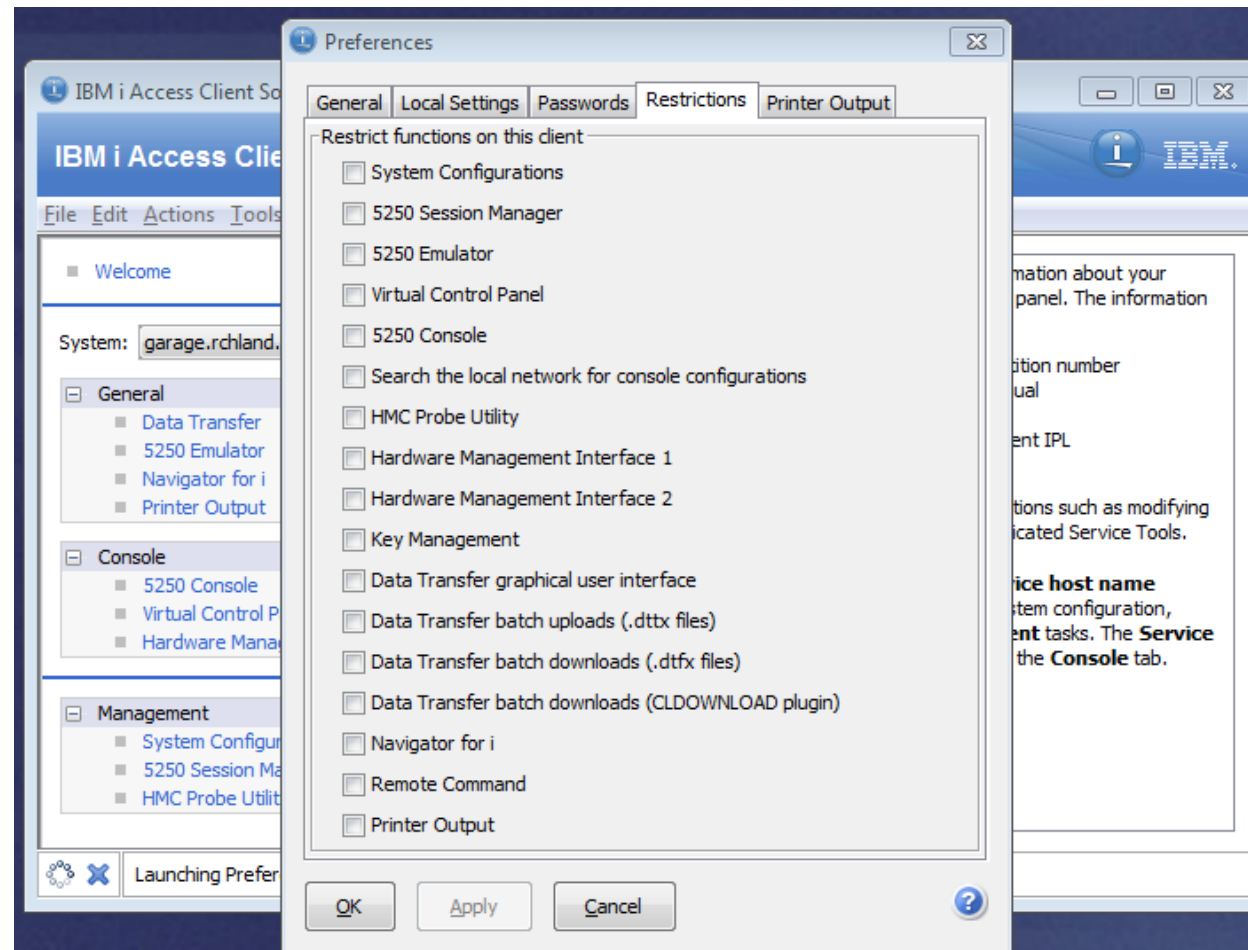
- Deployed via AcsConfig.properties file next to or within acsbundle.jar
 - Property must be set:

com.ibm.iaccess.ExcludeComps

- Set this property to a comma-separated list of function keywords
- The function keywords which may be specified are:
 - **DATA XFER** - Data Transfer to/from IBM I
 - **EMULATOR** - 5250 Display/Print emulation and 5250 Session Manager
 - **KEYMAN** - SSL certificate management
 - **OPCONSOLE** - Operations console and Virtual Control Panel
 - **RMT CMD** - Remote Command (available from the command line)
 - **SPLF** - Printer Output
 - **HWCONSOLE** - Hardware management interface
 - **L1CPLUGIN** - Navigator for i

Runtime Restrictions

- Can be set via the IBM i Access Client Solutions application when ran with **Administrator or Root level authority**.
- GUI interface from Edit -> Preferences



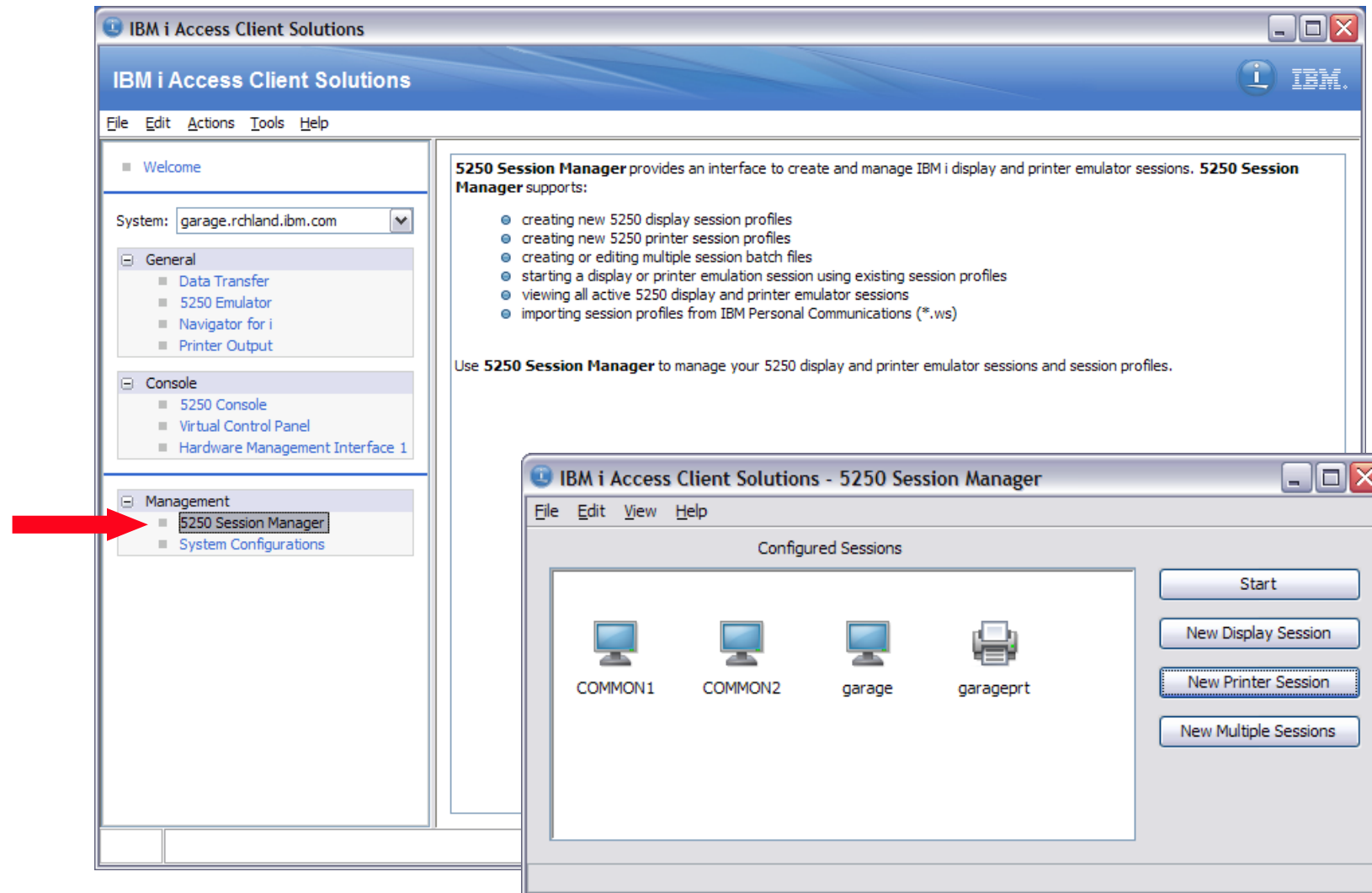
Migration

Migration

- IBM i Access Client Solutions provide several tools to assist with migrating from the IBM i Access for Windows client environment to IBM i Access Client Solutions
 - 5250 Migration Tools
 - Workstation file and keyboard map migration
 - Macro migration
 - Legacy File Associations
 - Data Transfer
 - Saved Data Transfer migration
 - System Connections
 - CWB* Commands

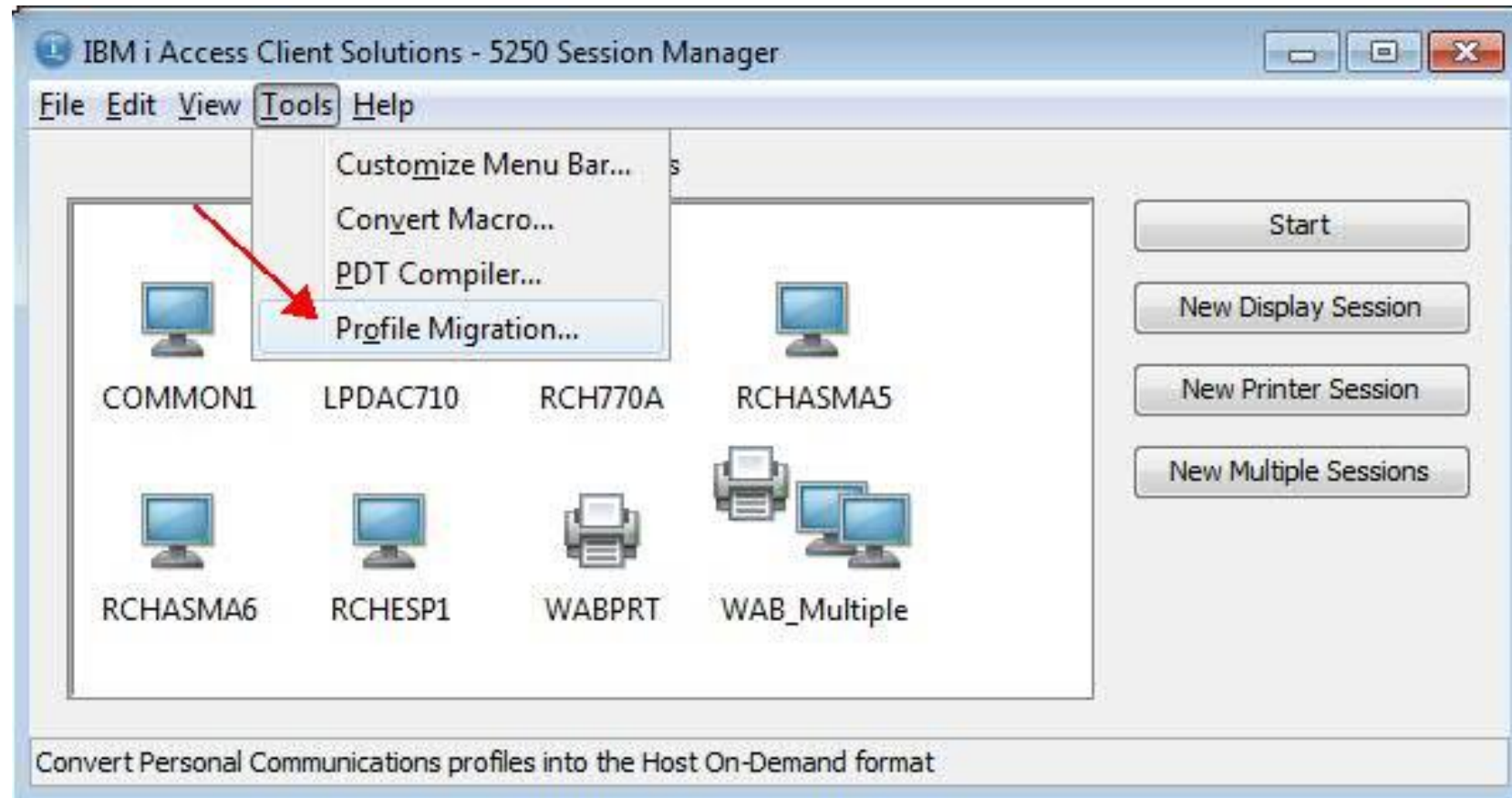
5250 Migration

- 5250 Session Manager



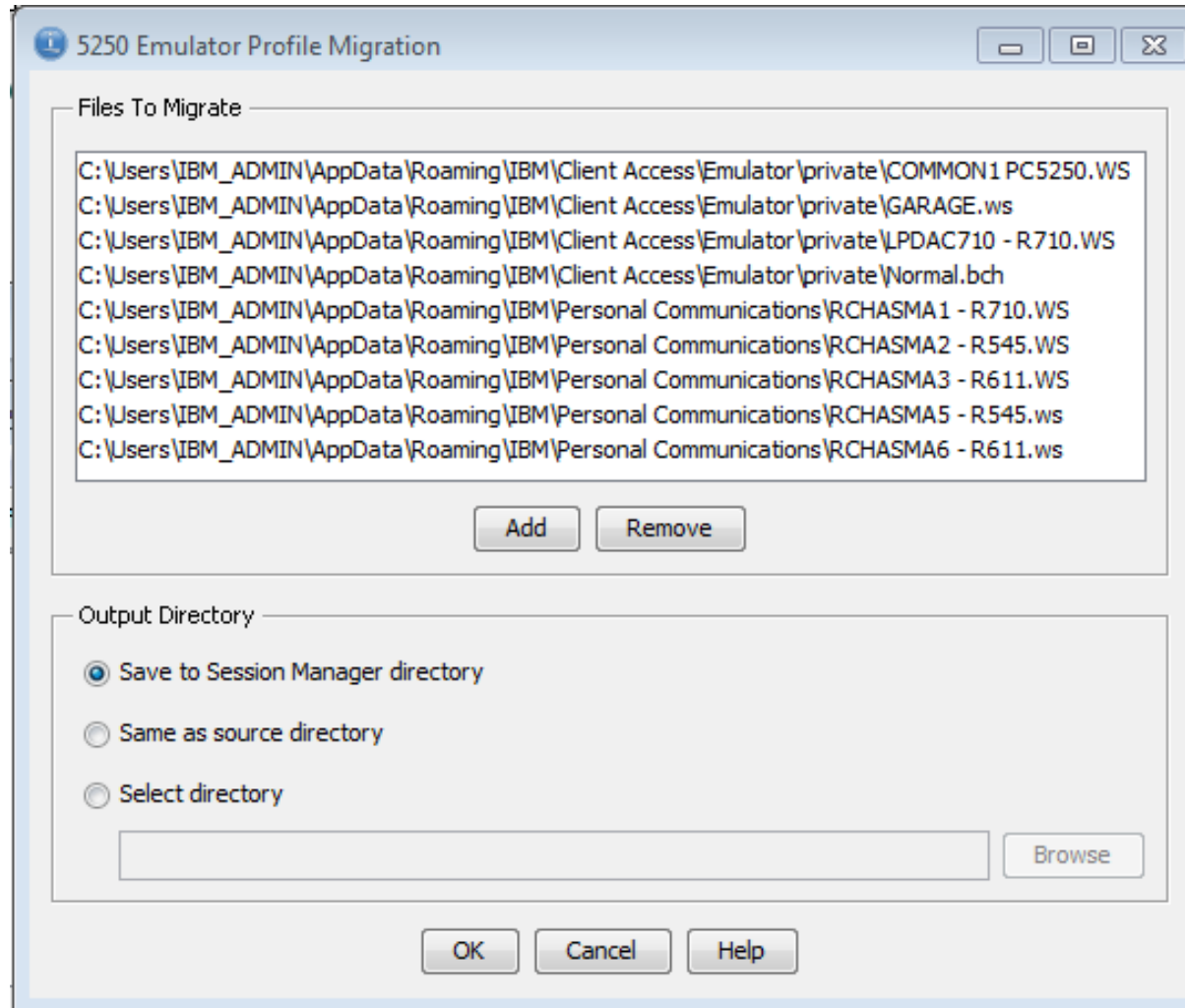
5250 Migration

Migration – 5250 session profiles



5250 Migration

Migration – 5250 session profiles



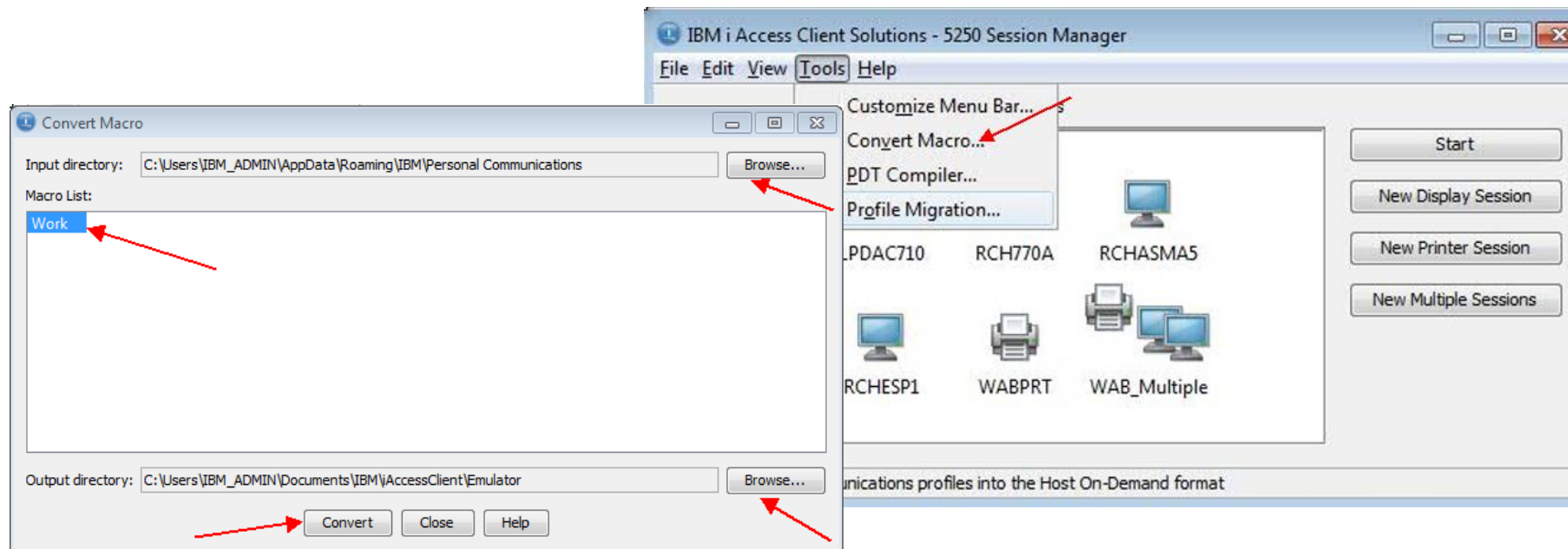
5250 Migration

Migration – 5250 session profiles

- Key mappings are also converted. A converted .kmp file will be saved in the same location that the new .hod file is created and will be referenced by that .hod file.

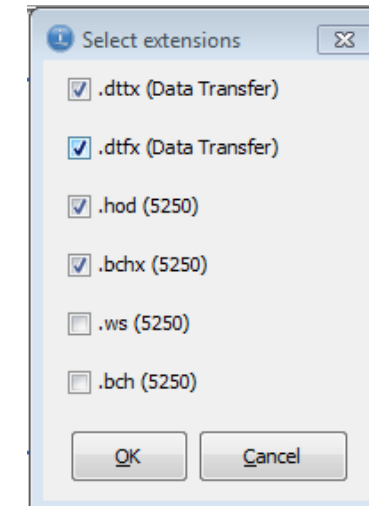
5250 Migration

Macro Migration

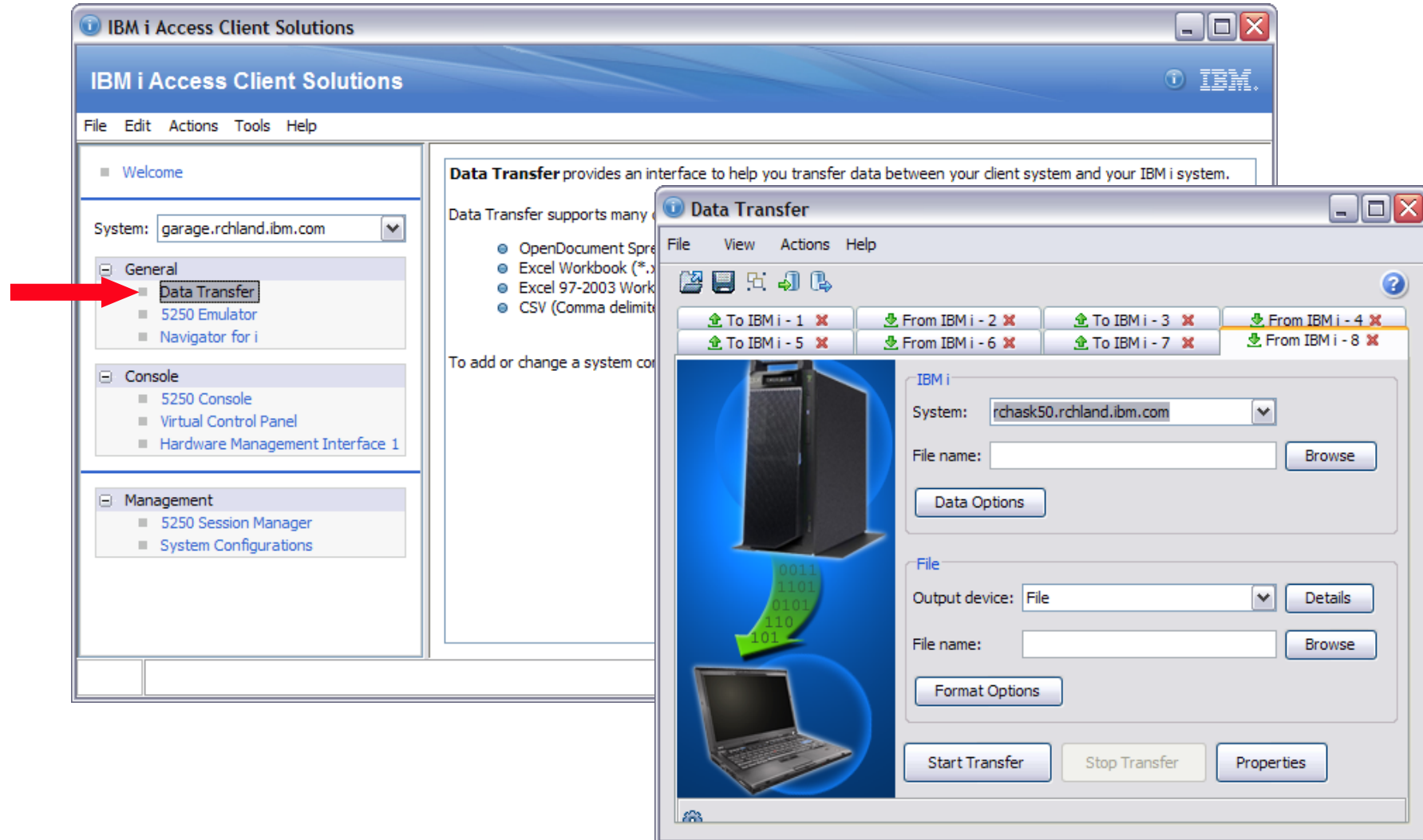


5250 Migration

- Create File Association for IBM i Access for Windows saved .ws or .bch file to be opened with IBM i Access Client Solutions

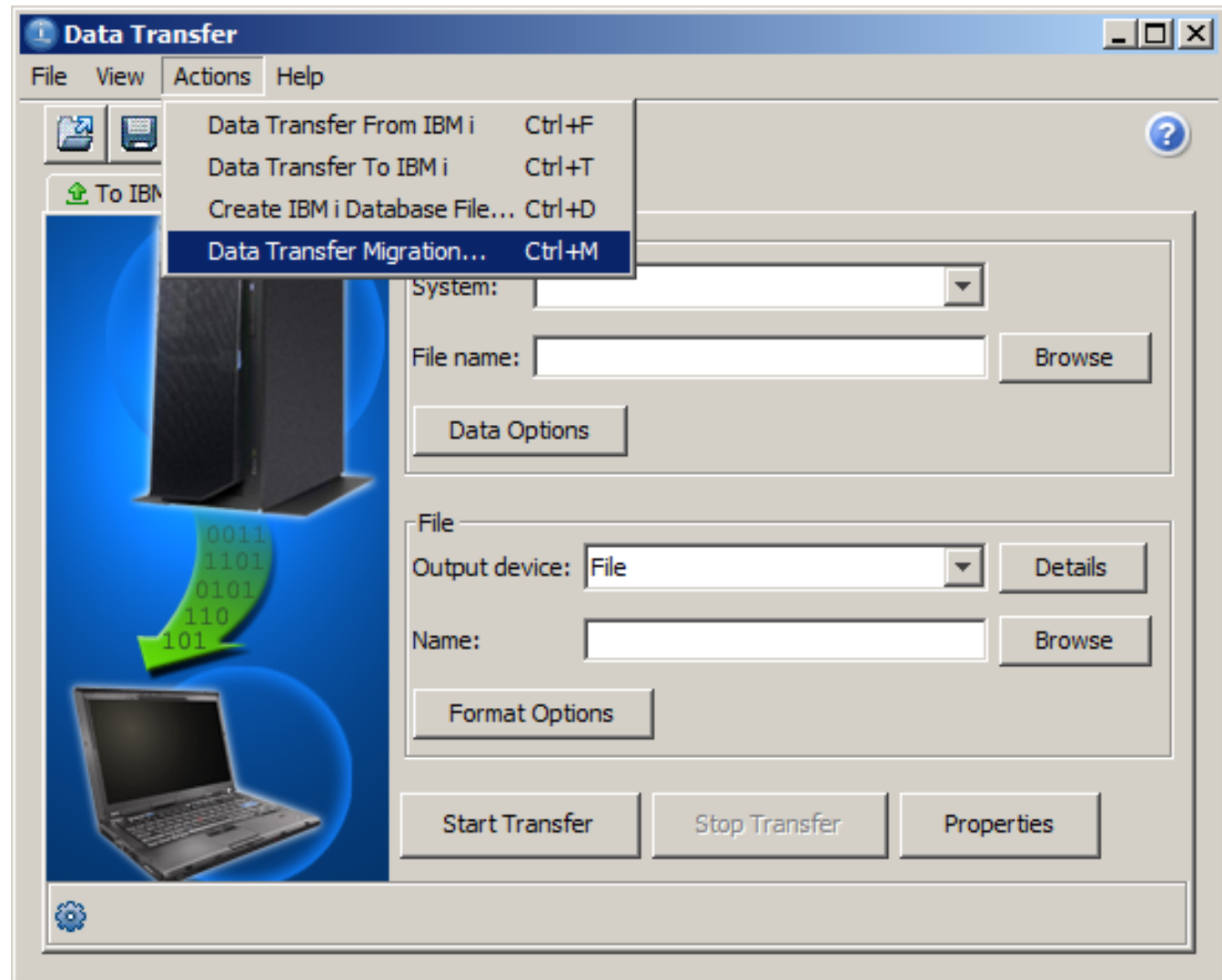


Data Transfer Migration



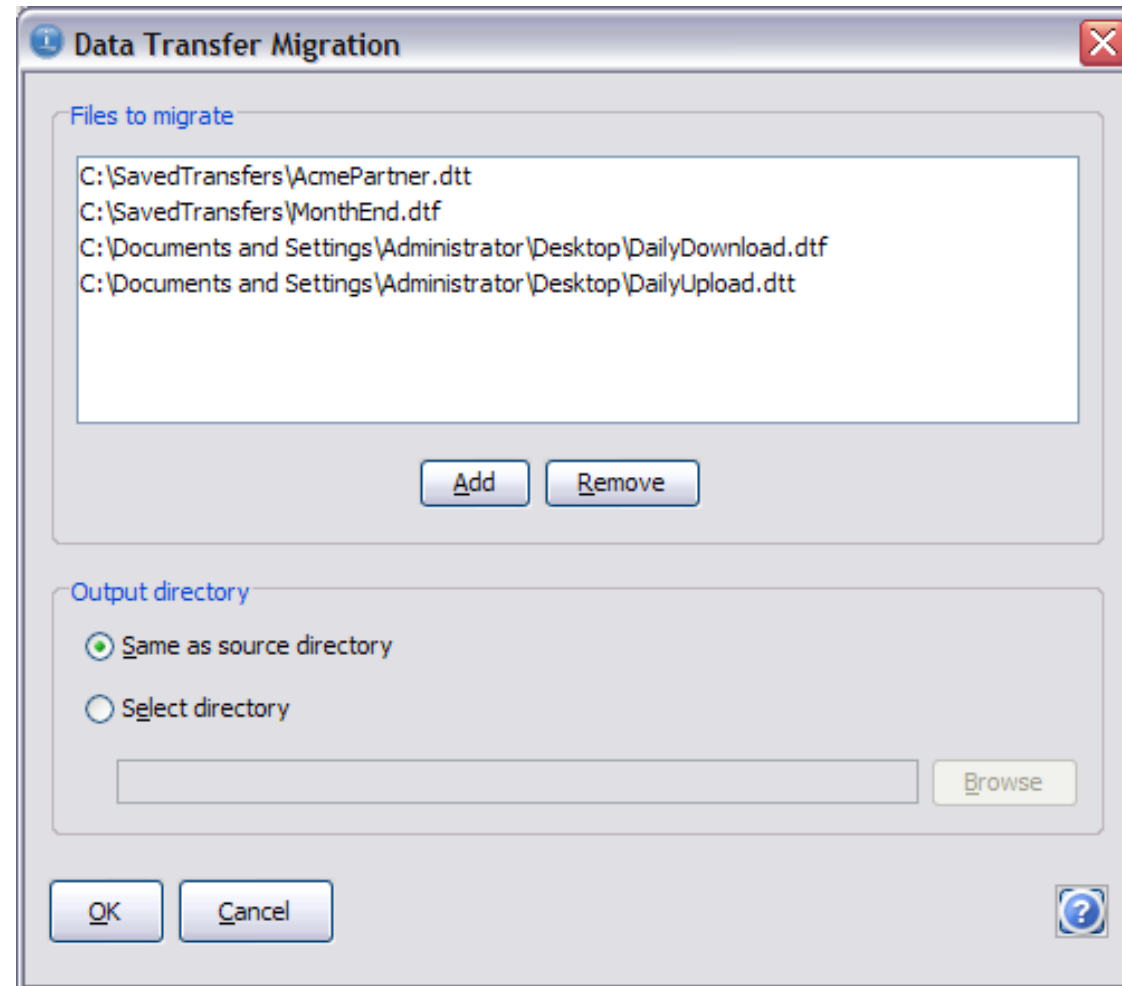
Data Transfer Migration

Migration – Data Transfer saved requests



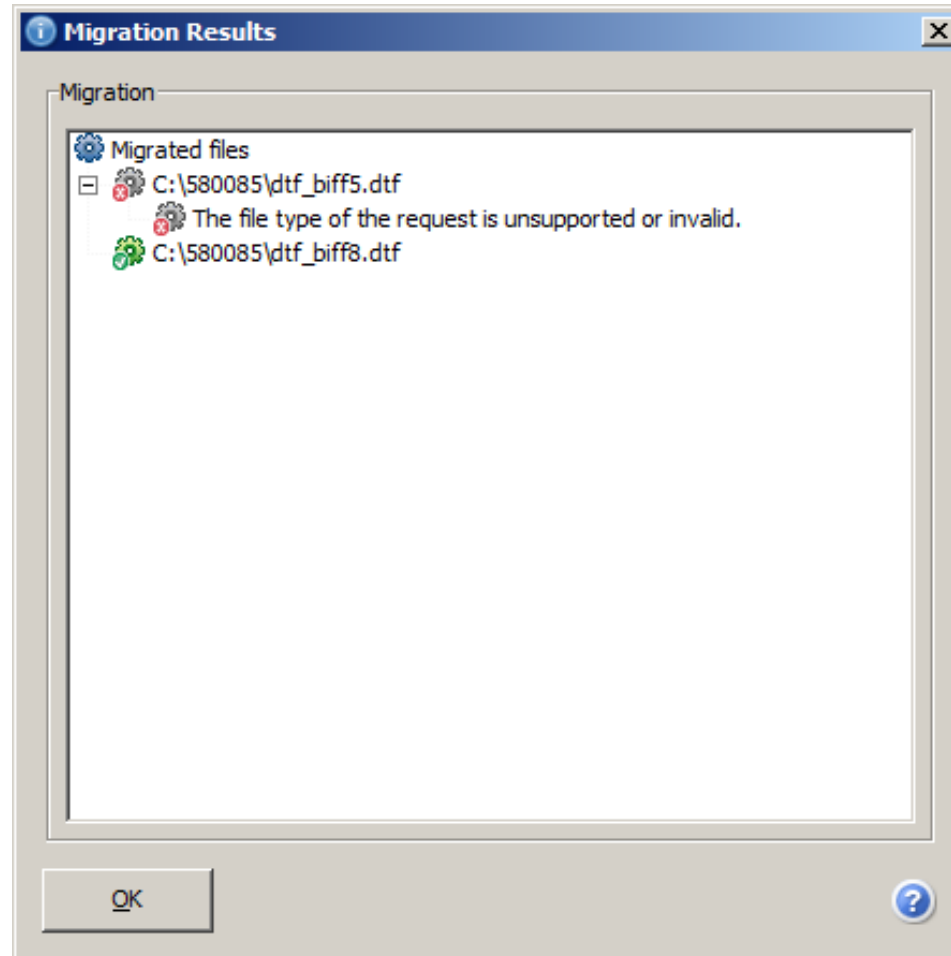
Data Transfer Migration

- Migrates saved .dtt and .dtf files to IBM i Access Client Solutions .dttx and .dtfx files



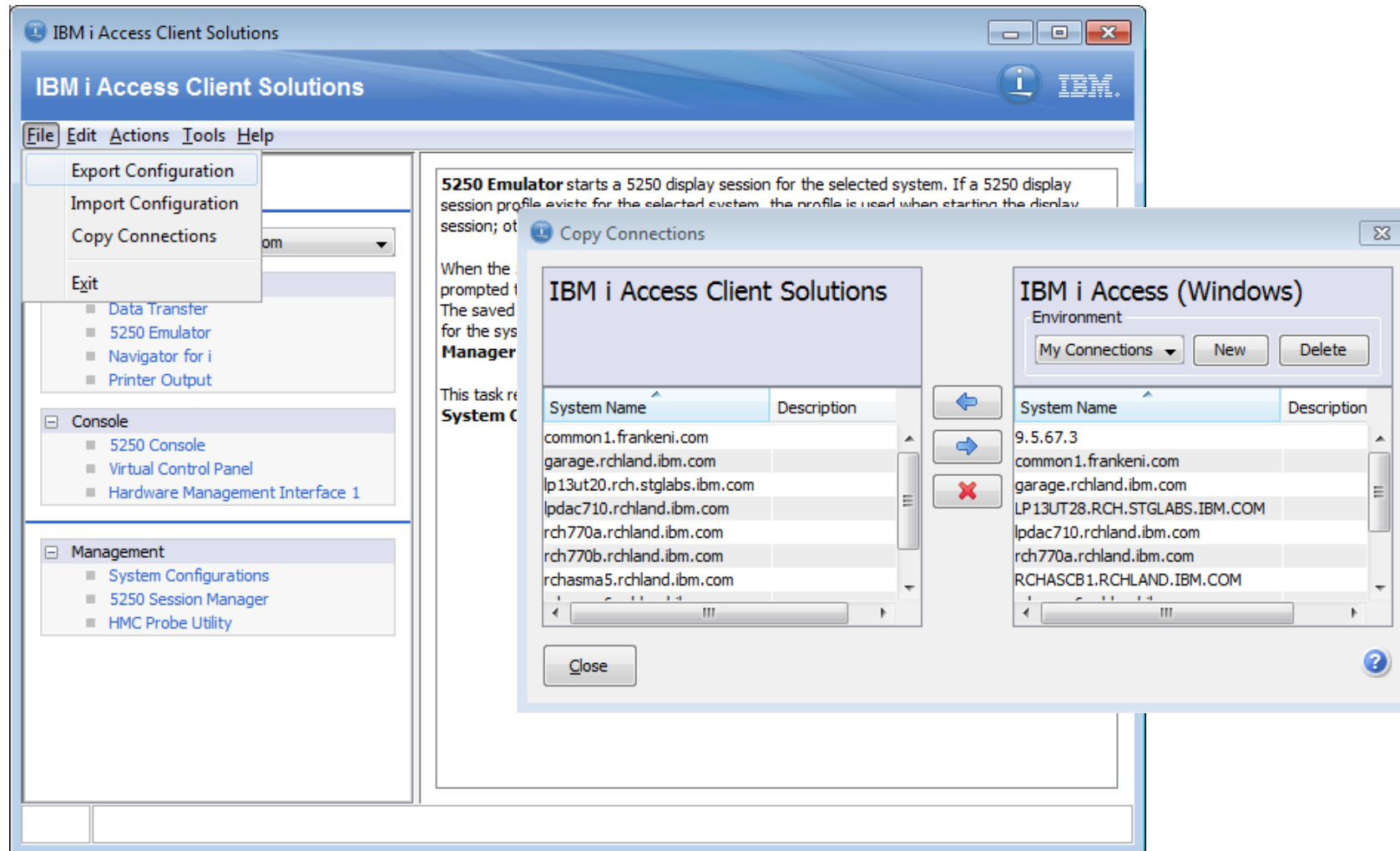
Data Transfer Migration

- Results of Migration
 - Green check indicates success
 - Red x indicates failure and there are more details



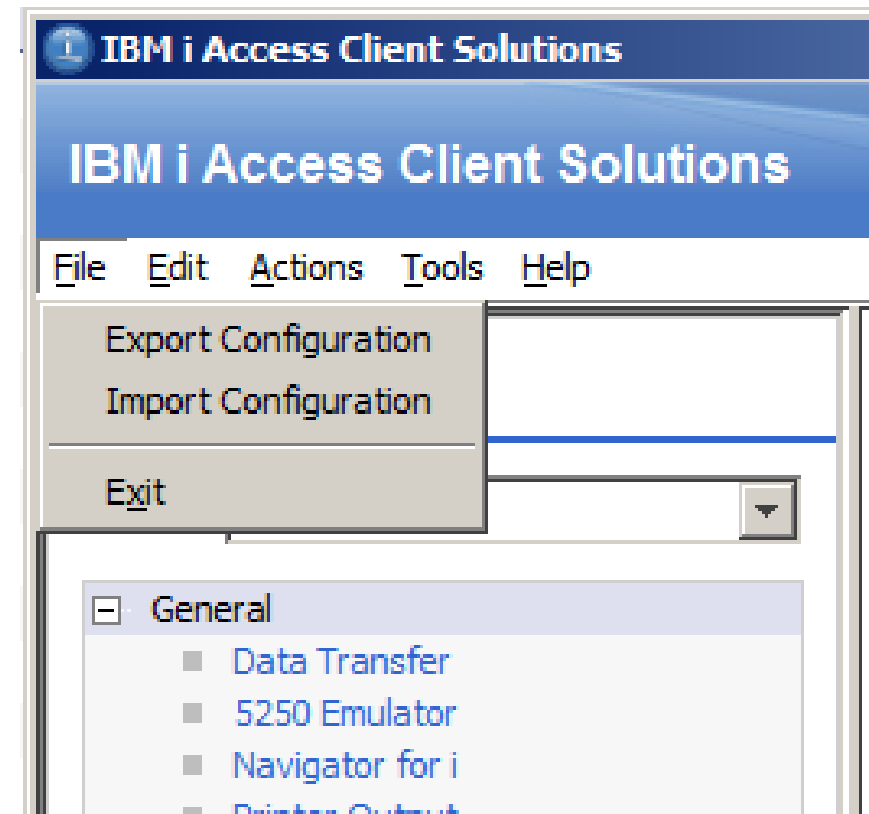
System Connections

- IBM i Access Client Solutions Copy Connections can be used to move System Configurations



Export/Import

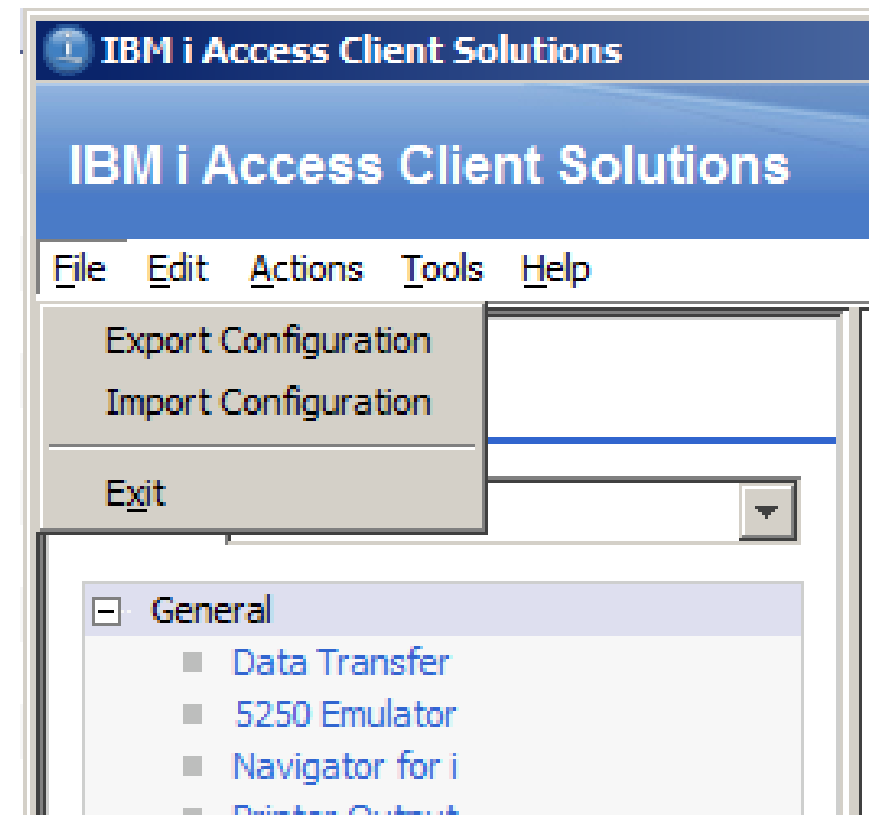
- IBM i Access Client Solutions has a mechanism for saving (exporting) and restoring (importing) a user's settings and preferences.
- When a configuration is exported, all information is stored in an **export file**.
- Stored data includes emulator session profiles



This is not an IBM i Access for Windows Migration tool.
It is an ACS to ACS migration tool.

Export/Import

- An export file can therefore be used to
 - Back up settings
 - migrate settings from one PC to another.
 - Propagate settings to multiple PC's



CWB* Commands

- IBM i Access for Windows provided several CWB* commands
 - CWBPING Connection Verification
 - CWBCFG System Configuration
 - CWBLOGON Credential Caching
- IBM i Access Client Solutions provides they same types of capabilities via what are called Plugins passed with Parameters to ACS.
 - Basic syntax is

```
acslaunch win-32.exe /plugin=<name>
           [/system=<system>] [/options]
```

- Or

```
java -jar acsbundle.jar /plugin=<name>
    [/system=<system>] [/options]
```

Questions??