

RPG Open Access - easier than Pi!



Trevor Perry
FrescheThinker

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 @ericjooka

IBMCHAMPION 

Abstract


- RPG Open Access (RPGOA) has been called "the future of RPG on IBM i." Yet we have been told there are myths surrounding RPGOA. A standards committee has been established to guide the community to a consistent approach to RPGOA development and communication, but it has yet to gain traction. Looking back to the introduction of RPGOA, the confusion and lack of information persists.
- This session will explain RPG Open Access, starting with a basic explanation and overview. It will describe several actual customer implementations, and theorize on future possible uses for RPGOA. This session will also introduce you to resources on how to build your own RPGOA handlers to extend your existing applications and build modern IBM i applications from scratch.

What?

- IBM® Rational® Open Access: RPG Edition

<http://www-01.ibm.com/software/rational/products/openaccess/>

Rational Open Access RPG Edition



Access new devices and resources with extensions for RPG applications

IBM® Rational® Open Access RPG Edition provides the runtime enablement for the I/O handlers that are developed to extend ILE RPG I/O capabilities to new resources and devices. It allows programmers to use the simple, well-understood RPG I/O model to access new devices and resources that are not directly supported by RPG. Rational Open Access RPG Edition is a full-featured version of the limited support provided by native RPG SPECIAL files. Rational Open Access RPG Edition software:

- **Accesses multiple devices and resources** such as mobile devices, web services, cloud resources, external databases, XML files and spreadsheets.
- **Supports existing handlers provided by third parties**, including software vendors, business partners, service organizations and open-source software.
- **Takes advantage of existing RPG programming skills** by enabling RPG developers to access the resource or device in their applications using native RPG file specifications and I/O operations.
- **Supports RPG IV language enhancements** including the addition of ILE, which enables you to write modular, reusable code following programming best practices.
- **Is a technology that is now included at no additional charge** with the [IBM i RPG compiler](#) and runtime (Rational Open Access RPG Edition was formerly a priced, keyed offering)

System Requirements

This page outlines system requirements for a server running [IBM® Rational® Open Access: RPG Edition](#)

For more information:

To learn more about Rational Open Access: RPG Edition V1.1, contact your IBM representative or IBM Business Partner.

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Priority code: 109HG03W

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Rational Open Access RPG Edition

IBM Software
See what smarter software
can do for you.



Access new devices and resources with extensions for RPG applications

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My first experience

My First Experience

- Customer using a refactoring/repurposing tool
- 5250 for OS and existing programs
- OA version for handler
- Decided on RPG Open Access solution
- Found a recently written program
- Installed the handler
- Started the solution
- Signed on
- Navigated to the program
- Nothing looks different!

5250 refaced

look: Work With Movies - Windows Internet Explorer
C:\looksoftware 9.0\@UIX\SmartFrame\SmartFrame.htm

smartclient™

Work With Movies

Enter option, press Enter.

Display releases from to

Opt	Movie Name	Company	Rel Date	Status
	Crocodile Dundee	RimFire Films	01/01/40	On DVD
	Cyrano de Bergerac	Meridienne	24/06/20	On DVD
	William Shakespeare	The Shakespeare Cpny	02/01/03	On DVD
	Ken Follett	Dutton	20/03/10	On DVD
	Leonardo da Vinci	Joconde	15/01/10	Filming
	Harry Potter	Rowling and Mary	23/03/10	Filming
	Toy Story 1	Disney-Pixar	01/01/40	Filming
	Toy Story 2	Disney-Pixar	14/06/08	Filming
	Toy Story 3	Disney-Pixar	12/03/09	Filming
	Mike wants you	Disney-Pixar	14/01/10	In Theatres
	Cloudy with a Chance of M	Disney-Pixar	26/11/09	On DVD
	Shrek	DreamWorks	17/02/10	Filming
	Shrek 2	DreamWorks	17/02/10	Filming

Exit OK

RPG OA

look: Work With Movies - Windows Internet Explorer
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smartclient™

Work With Movies

Enter option, press Enter.

Display releases from to

Opt	Movie Name	Company	Rel Date	Status
	Crocodile Dundee	RimFire Films	1/01/40	On DVD
	Cyrano de Bergerac	Meridienne	24/06/20	On DVD
	William Shakespeare	The Shakespeare Cpany	2/01/03	On DVD
	Ken Follett	Dutton	20/03/10	On DVD
	Leonardo da Vinci	Joconde	15/01/10	Filming
	Harry Potter	Rowling and Mary	23/03/10	Filming
	Toy Story 1	Disney-Pixar	1/01/40	Filming
	Toy Story 2	Disney-Pixar	14/06/08	Filming
	Toy Story 3	Disney-Pixar	12/03/09	Filming
	Mike wants you	Disney-Pixar	14/01/10	In Theatres
	Cloudy with a Chance of M	Disney-Pixar	26/11/09	On DVD
	Shrek	DreamWorks	17/02/10	Filming
	Shrek 2	DreamWorks	17/02/10	Filming

Exit OK

What happened?

- Subfile delivered to the client
 - 5250: One page at a time
 - RPGOA: The entire list

- Client's built in grid sorting functionality
 - 5250: One page at a time
 - RPGOA: The entire list

- Date fields turned into combos

5250 refaced

The screenshot shows a web browser window with the address bar displaying 'C:\looksoftware 9.0\@UIX\SmartFrame\SmartFrame.htm'. The page features the 'smartclient' logo and navigation buttons for 'Add' and 'Spool file'. The main content area is titled 'Work With Movies' and includes a search prompt 'Enter option, press Enter.' and a date range filter 'Display releases from' with two empty input boxes. A table lists movie titles, companies, release dates, and statuses. A pink arrow points to the 'Cyrano de Bergerac' row. At the bottom right, there are 'Exit' and 'OK' buttons. A yellow brushstroke is visible at the bottom left of the window.

Opt	Movie Name	Company	Rel Date	Status
	Crocodile Dundee	RimFire Films	01/01/40	On DVD
	Cyrano de Bergerac	Meridienne	24/06/20	On DVD
	William Shakespeare	The Shakespeare Cpny	02/01/03	On DVD
	Ken Follett	Dutton	20/03/10	On DVD
	Leonardo da Vinci	Joconde	15/01/10	Filming
	Harry Potter	Rowling and Mary	23/03/10	Filming
	Toy Story 1	Disney-Pixar	01/01/40	Filming
	Toy Story 2	Disney-Pixar	14/06/08	Filming
	Toy Story 3	Disney-Pixar	12/03/09	Filming
	Mike wants you	Disney-Pixar	14/01/10	In Theatres
	Cloudy with a Chance of M	Disney-Pixar	26/11/09	On DVD
	Shrek	DreamWorks	17/02/10	Filming
	Shrek 2	DreamWorks	17/02/10	Filming

RPG OA

The screenshot shows a web browser window with the following elements:

- Browser Title Bar:** look: Work With Movies - Windows Internet Explorer
- Address Bar:** C:\looksoftware 9.0\@UIX\SmartFrame\SmartFrame.htm
- Header:** smartclient™ logo and navigation icons (refresh, help, info).
- Left Sidebar:** Buttons for 'Add' and 'Spool file'.
- Main Content Area:**
 - Title:** Work With Movies
 - Instruction:** Enter option, press Enter.
 - Filter:** Display releases from [dropdown] to [dropdown]
 - Table:** A table with columns: Opt, Movie Name, Company, Rel Date, Status. A pink arrow points to the 'Status' column.
 - Buttons:** Exit and OK buttons at the bottom right.

Opt	Movie Name	Company	Rel Date	Status
	Fargo	Universal	31/05/96	On DVD
	Top Gun	Paramount Pictures	31/07/86	On DVD
	American Beauty	Miramax	4/02/00	On DVD
	Terminator 2	CarolCo Pictures	5/10/91	On DVD
	Shrek The Third	DreamWorks	7/06/07	On DVD
	Transformers 3 : Dark of	Paramount	1/07/11	In Theatres
	Mike wants you	Disney-Pixar	14/01/10	In Theatres
	Toy Story 1	Disney-Pixar	1/01/40	Filming
	Toy Story 3	Disney-Pixar	12/03/09	Filming
	Toy Story 2	Disney-Pixar	14/06/08	Filming
	Leonardo da Vinci	Joconde	15/01/10	Filming
	Shrek	DreamWorks	17/02/10	Filming
	Shrek 2	DreamWorks	17/02/10	Filming

5250 refaced

The screenshot shows a web browser window with the address bar containing 'C:\looksoftware 9.0\@UIX\SmartFrame\SmartFrame.htm'. The page header features the 'smartclient' logo. On the left side, there are two buttons: 'Add' and 'Spool file'. The main content area is titled 'Work With Movies' and includes the instruction 'Enter option, press Enter.' Below this, there is a form labeled 'Display releases from' with two empty input boxes and the word 'to' between them. A large purple arrow points to the right input box. Below the form is a table with the following data:

Opt	Movie Name	Company	Rel Date	Status
	Crocodile Dundee	RimFire Films	01/01/40	On DVD
	Cyrano de Bergerac	Meridienne	24/06/20	On DVD
	William Shakespeare	The Shakespeare Cpny	02/01/03	On DVD
	Ken Follett	Dutton	20/03/10	On DVD
	Leonardo da Vinci	Joconde	15/01/10	Filming
	Harry Potter	Rowling and Mary	23/03/10	Filming
	Toy Story 1	Disney-Pixar	01/01/40	Filming
	Toy Story 2	Disney-Pixar	14/06/08	Filming
	Toy Story 3	Disney-Pixar	12/03/09	Filming
	Mike wants you	Disney-Pixar	14/01/10	In Theatres
	Cloudy with a Chance of M	Disney-Pixar	26/11/09	On DVD
	Shrek	DreamWorks	17/02/10	Filming
	Shrek 2	DreamWorks	17/02/10	Filming

At the bottom right of the application window, there are two buttons: 'Exit' and 'OK'. A yellow brushstroke is visible at the bottom left of the window.

RPG OA

look: Work With Movies - Windows Internet Explorer
C:\looksoftware 9.0\@UIX\SmartFrame\SmartFrame.htm

smartclient

Work With Movies

Add
Spool file

Enter option, press Enter.

Display releases from [] to []

Opt	Movie Name	Company	Rel Date	Status
	Fargo	Universal	31/05/96	On DVD
	Top Gun	Paramount Pictures	31/07/86	On DVD
	American Beauty	Miramax	4/02/00	On DVD
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	Shrek The Third	DreamWorks	7/06/07	On DVD
	Transformers 3 : Dark of	Paramount	1/07/11	In Theatres
	Mike wants you	Disney-Pixar	14/01/10	In Theatres
	Toy Story 1	Disney-Pixar	1/01/40	Filming
	Toy Story 3	Disney-Pixar	12/03/09	Filming
	Toy Story 2	Disney-Pixar	14/06/08	Filming
	Leonardo da Vinci	Joconde	15/01/10	Filming
	Shrek	DreamWorks	17/02/10	Filming
	Shrek 2	DreamWorks	17/02/10	Filming

Exit OK


5250 refaced

The screenshot shows a web browser window with the address bar displaying 'C:\looksoftware 9.0\@UIX\SmartFrame\SmartFrame.htm'. The page features the 'smartclient' logo and a navigation sidebar with 'Add' and 'Spool file' buttons. The main content area is titled 'Work With Movies' and contains the instruction 'Enter option, press Enter.' Below this is a form labeled 'Display releases from' with two empty input boxes separated by 'to'. A pink arrow points to the first input box. A table of movie data is displayed below the form, with columns for 'Opt', 'Movie Name', 'Company', 'Rel Date', and 'Status'. The table lists various movies including 'Crocodile Dundee', 'Cyrano de Bergerac', 'William Shakespeare', 'Ken Follett', 'Leonardo da Vinci', 'Harry Potter', 'Toy Story 1-3', 'Mike wants you', 'Cloudy with a Chance of M', 'Shrek', and 'Shrek 2'. At the bottom right, there are 'Exit' and 'OK' buttons.

Opt	Movie Name	Company	Rel Date	Status
	Crocodile Dundee	RimFire Films	01/01/40	On DVD
	Cyrano de Bergerac	Meridienne	24/06/20	On DVD
	William Shakespeare	The Shakespeare Cpny	02/01/03	On DVD
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	Leonardo da Vinci	Joconde	15/01/10	Filming
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RPG OA


look: Work With Movies - Windows Internet Explorer
C:\looksoftware 9.0\@UIX\SmartFrame\SmartFrame.htm



Work With Movies


Enter option, press Enter.

Display releases from to



Opt	Movie Name	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Year	Status
	Fargo	29	30	1	2	3	4	5	/96	On DVD
	Top Gun	6	7	8	9	10	11	12	/86	On DVD
	American Beauty	13	14	15	16	17	18	19	/00	On DVD
	Terminator 2	20	21	22	23	24	25	26	/91	On DVD
	Shrek The Third	27	28	29	30	31	1	2	/07	On DVD
	Transformers 3 : Dark of	3	4	5	6	7	8	9	/11	In Theatres
	Mike wants you	Today: 20/10/13							/10	In Theatres
	Toy Story 1	Disney-Pixar						1/01/40	Filming	
	Toy Story 3	Disney-Pixar						12/03/09	Filming	
	Toy Story 2	Disney-Pixar						14/06/08	Filming	
	Leonardo da Vinci	Joconde						15/01/10	Filming	
	Shrek	DreamWorks						17/02/10	Filming	
	Shrek 2	DreamWorks						17/02/10	Filming	

Exit OK



What was the benefit?

- RPG code to sort the list no longer needed
 - Reduced maintenance
- Response time – different paradigm

What was the cost?

- RPG code to sort the list no longer needed
- Existing RPG programs did not work with OA handler
 - One-page-replace subfile coding technique

Anti-climax!

- ONE line of code..

```
FDisplay UF E
```

```
F
```

```
WORKSTN
```

```
HANDLER( 'handler-program' )
```

Free format

- ONE line of code..

```
dcl-f Display WORKSTN
      EXTDESC('Display')
      HANDLER('handler-program') ;
```

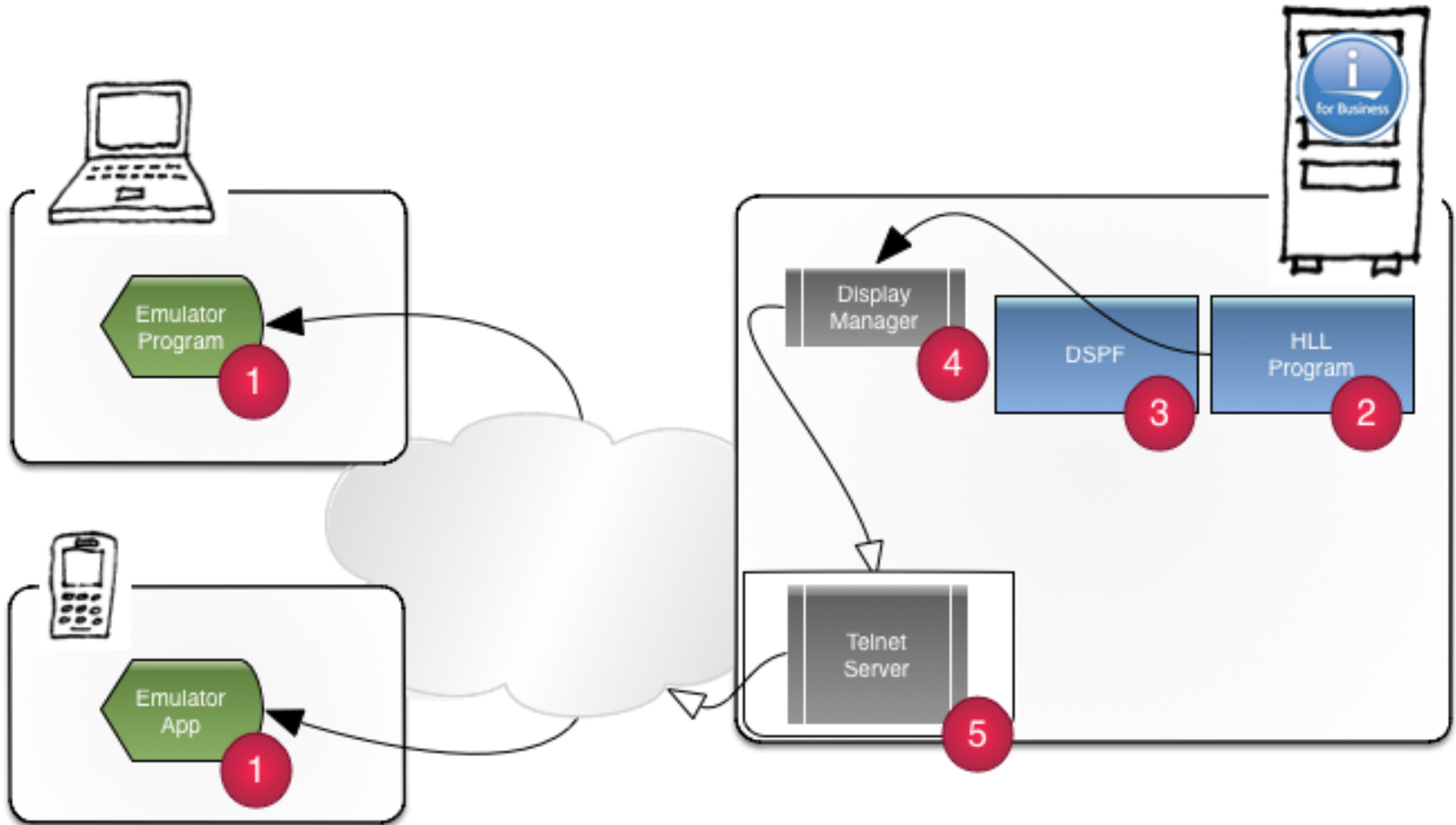


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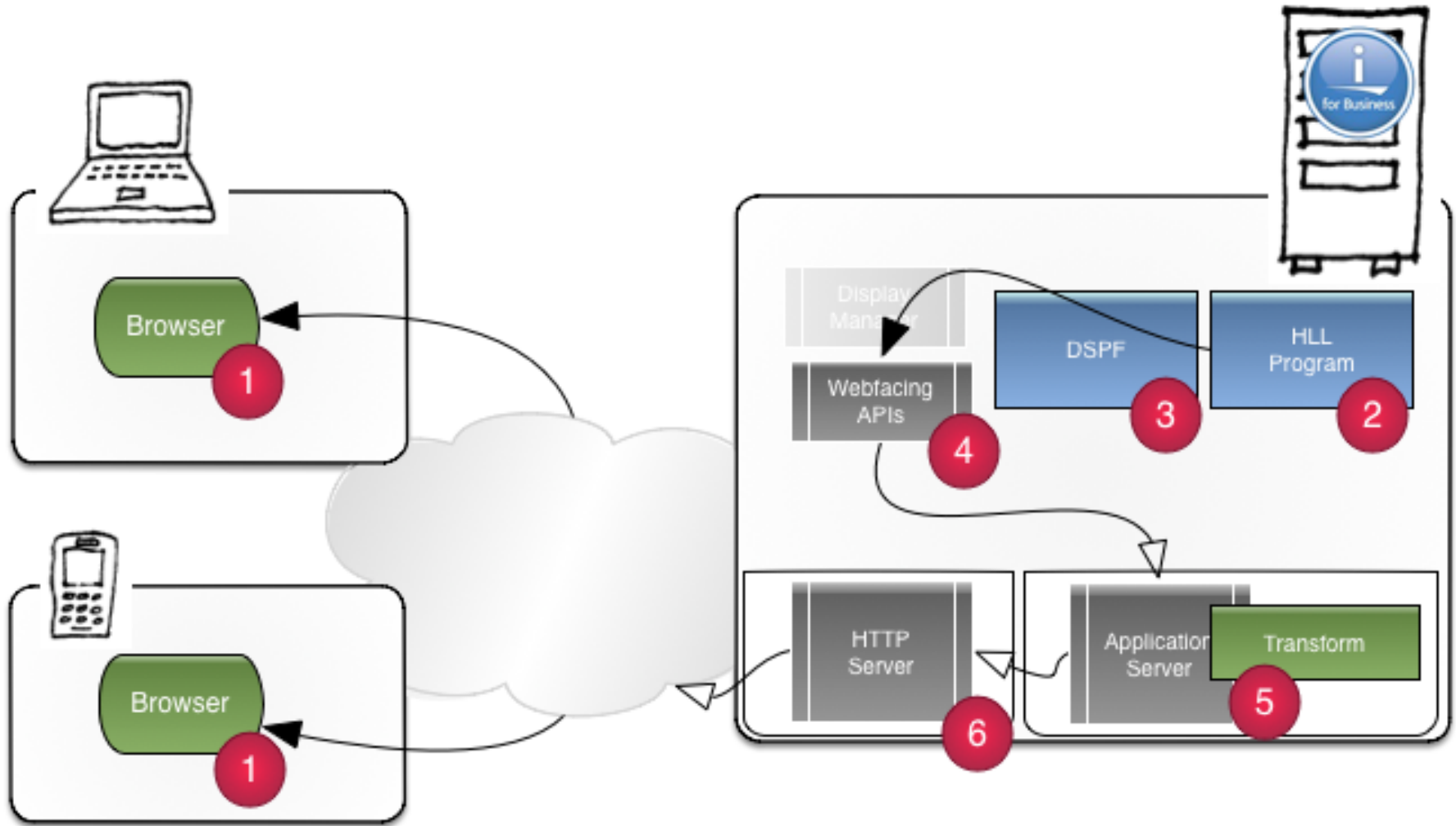


Open Access Architecture

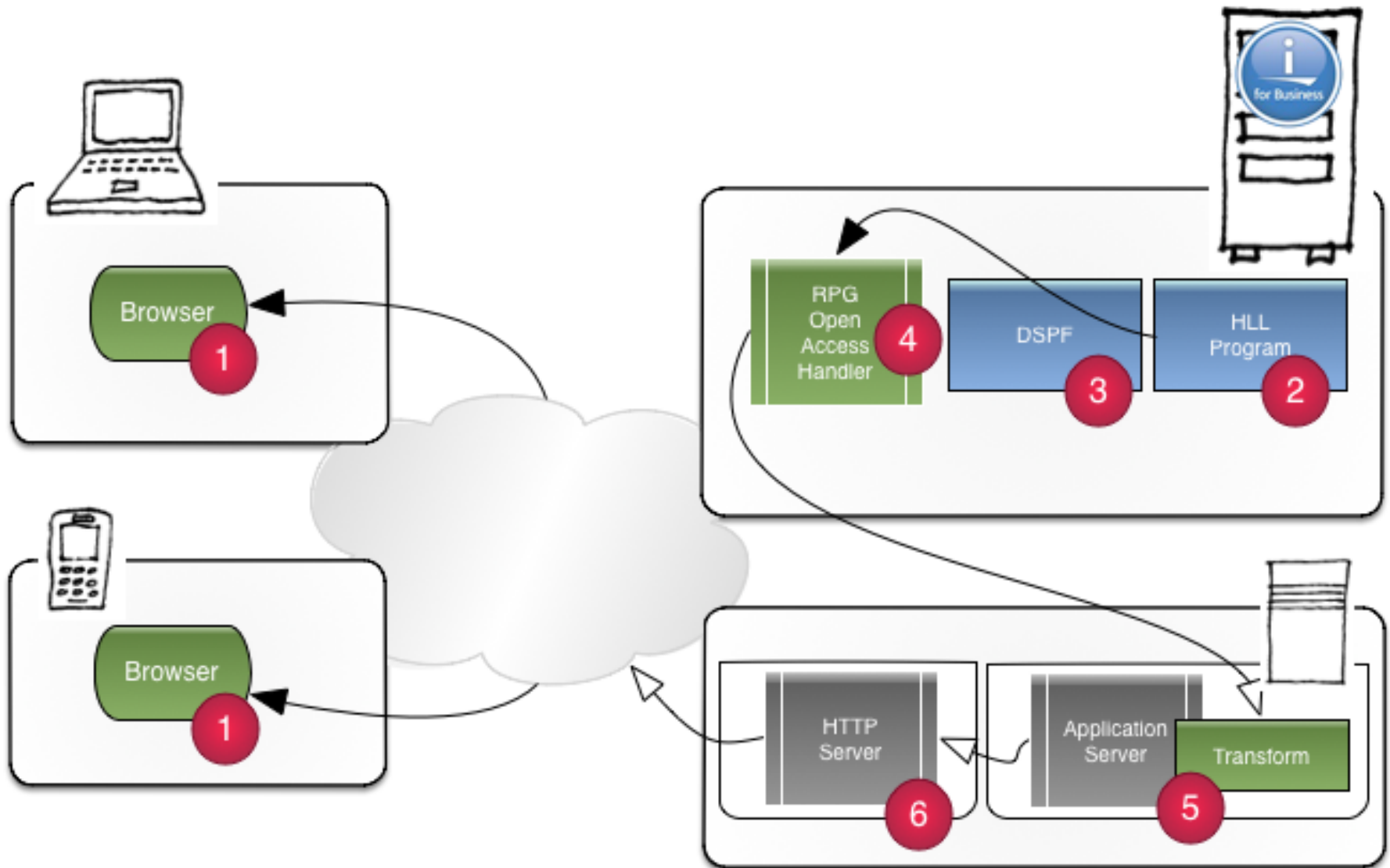
5250 Display



Webfacing APIs



RPG Open Access Handler





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Advantages

What else?

- Drop down combo boxes
 - List built inside RPG program
- Maps, Images, Links
 - Collect data from inside RPG program
- More data
 - Not limited to the size of 24x80 or 27x132 data stream

What else?

- Separation of application and user interface
 - Don't need data collection at glass
 - Extend the application with existing RPG & SQL skills
- How?
 - Fields added to the DDS
 - Can be H(idden) fields
 - Handler can manage more data/fields
 - DDS directive connects fields to GUI properties



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Where do I get it?

Who does it?

- Replace 5250 data stream
 - Profound
 - looksoftware
 - ASNA
 - Rocket

Who does it?

- Replace 5250 data stream
 - Profound
 - looksoftware
 - ASNA
 - Rocket
- IBM Lab Services

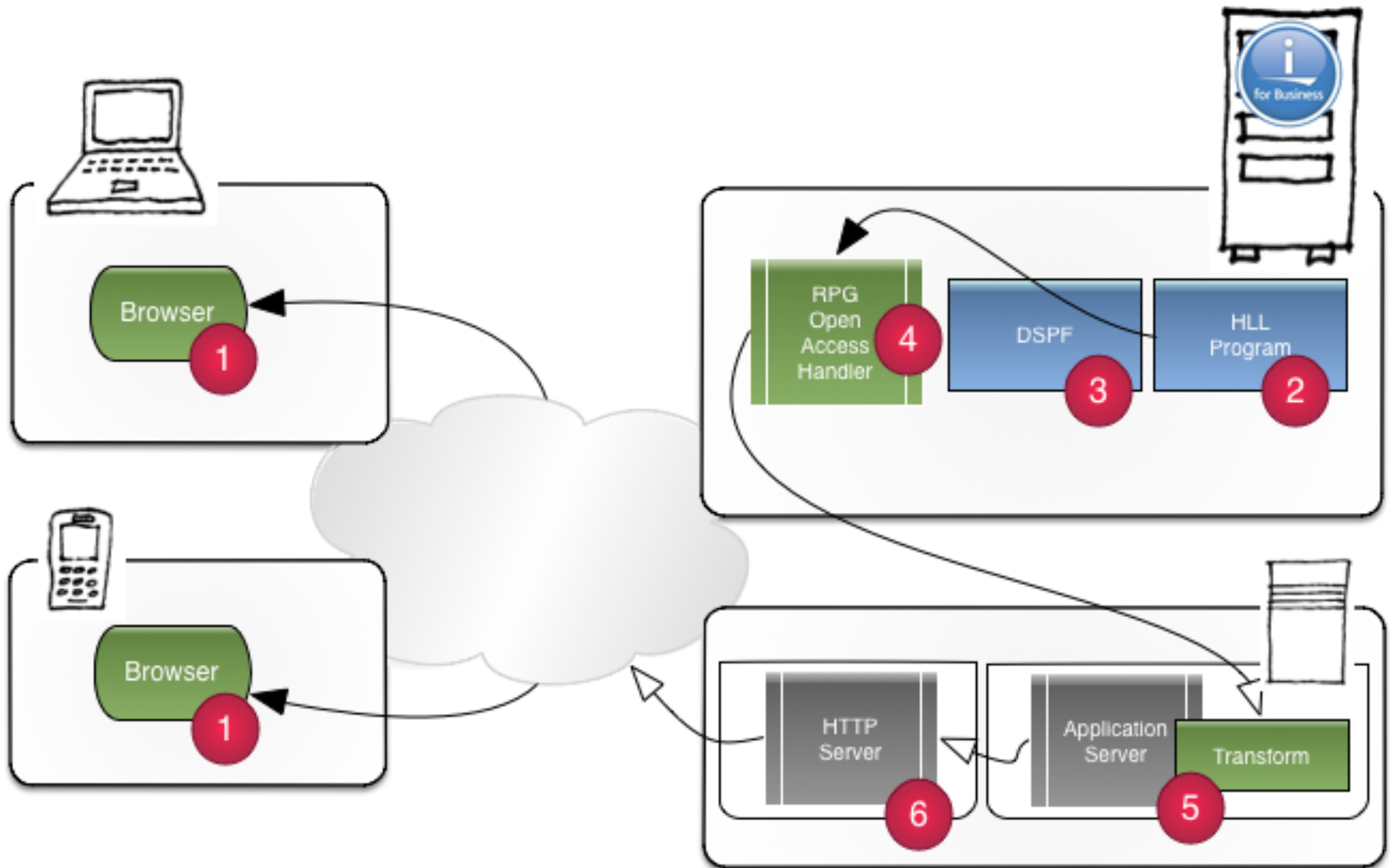
That's it?

- The power of RPG Open Access is purported to be in replacing the 5250 data stream
- Vendors have focused on user interface
- Press has focused on vendor focus
- Vendors are suggesting there are myths

Rational Open Access RPG Edition

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RPG Open Access Handler



So...

- RPG Open Access cannot replace 5250 completely
 - Operating system screens
 - Older green screen applications
 - No source
 - No maintenance allowed
- RPG Open Access for 5250 must be hybrid
- Building your own is complicated
 - Can be done, but...
 - Individual or generic?

Who does it? – part 2!

- Replace 5250 data stream - **devices**
 - Profound
 - looksoftware
 - ASNA
 - Rocket

Who does it? – part 2!

- Replace 5250 data stream - **devices**
 - Profound
 - looksoftware
 - ASNA
 - Rocket
- Something else? - **resources**
 - RJS
 - Rocket

Who does it? – part 2!

- Replace 5250 data stream - **devices**
 - Profound
 - looksoftware
 - ASNA
 - Rocket

- Something else? - **resources**
 - RJS
 - Rocket
 - Me and YOU!

A System *iNEWS* Special Report

Open Access for RPG Special Report: What It Is, How It Works, and Hands-On Experience

by Vern Hamberg

It was the best of ideas; it was the worst of ideas (apologies to Mr. Dickens). Response to IBM's announcement of IBM Rational Open Access: RPG Edition (RPG OA) has certainly run the gamut of these extremes. One may well ask what opportunities are now available to an IBM i shop—and should we step through the door to the future that Open Access for RPG sets before us?

Here we will look at what Open Access is and how the IBM i community has responded to it. We will pursue possible uses for this new technology, as well as what is being done already. Then I will relate my own experience of writing an Open Access handler. Finally, I'll cover the key considerations for deciding whether to adopt Open Access in your shop.

What is Open Access: RPG Edition?

Rational Open Access: RPG Edition is a licensed product (5733-OAR) that extends the reach of RPG developers. With RPG OA, RPG programmers are able to use simple and familiar RPG I/O operations to access devices and

a service program. The HANDLER keyword can be used for any RPG device—DISK, PRINTER, or WORKSTN. The provider of the handler chooses which RPG device type best fits the purposes of the handler. Most of the attention to date has focused on user interface modernization, which corresponds best to WORKSTN files. On the other hand, consuming a Web service could be implemented as a CHAIN to a DISK file, while writing to spreadsheets may correspond to PRINTER files.

Open Access does not itself have any handlers; rather, it is the glue between an RPG program and an Open Access handler. When the RPG program performs a file operation, the RPG runtime calls the handler instead of the system data management function it would normally call.

RPG OA is similar to the SPECIAL file support that has been a part of RPG for years. It can be said that Open Access support is like SPECIAL support on steroids. There are significant differences, as presented in Figure 1.

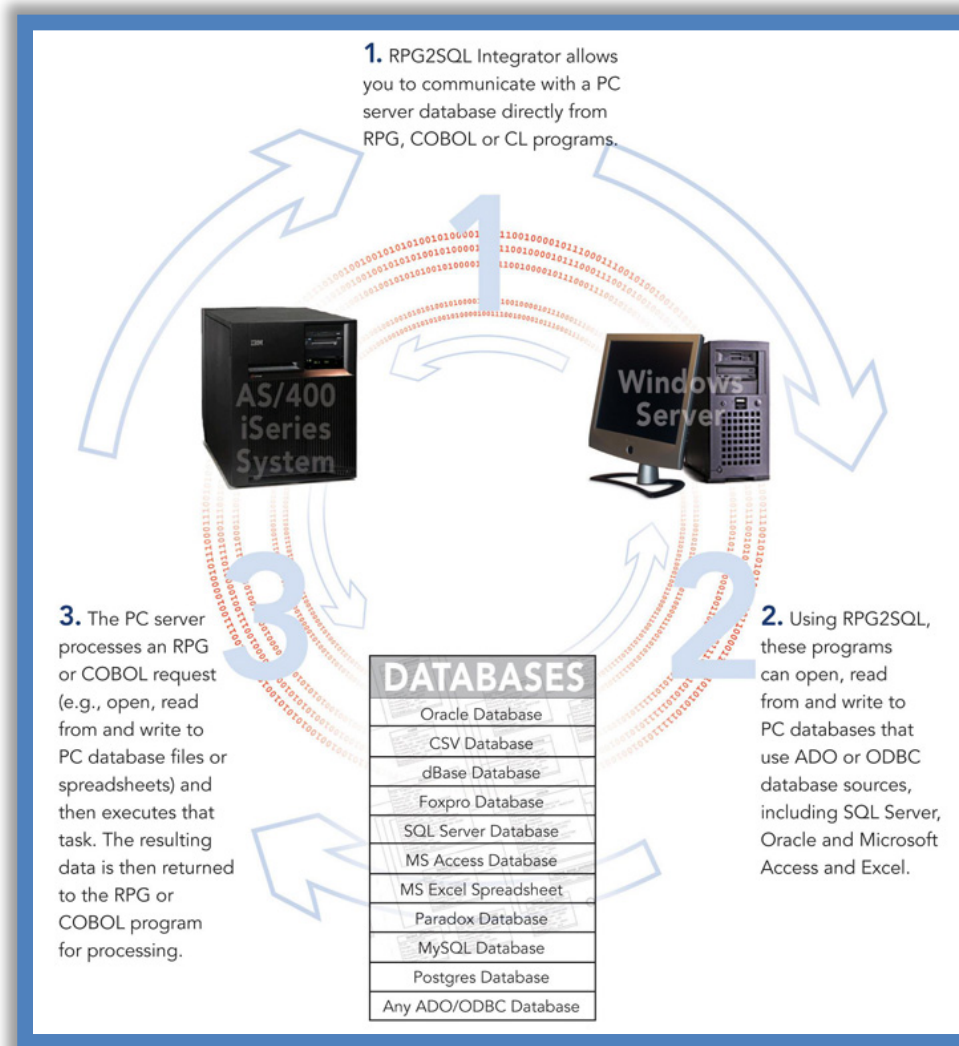
RJS Special Report

- With RPG OA, RPG programmers are able to use simple and familiar RPG I/O operations to access devices and resources that RPG was not originally designed to support using its I/O model.
- These resources include:
 - Browsers
 - Mobile devices
 - Web services
 - XML files
 - External databases
 - Spreadsheets
 - Devices and resources yet unknown

RJS Special Report

- The design of an Open Access application starts with these elements:
 - An RPG program that uses standard I/O code
 - A resource or device which the RPG program will utilize in some way
- The component that binds these elements together is the handler.

RJS OA Handler – RPG2SQL









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Acceptance!

2010 – RPG Open Access announced

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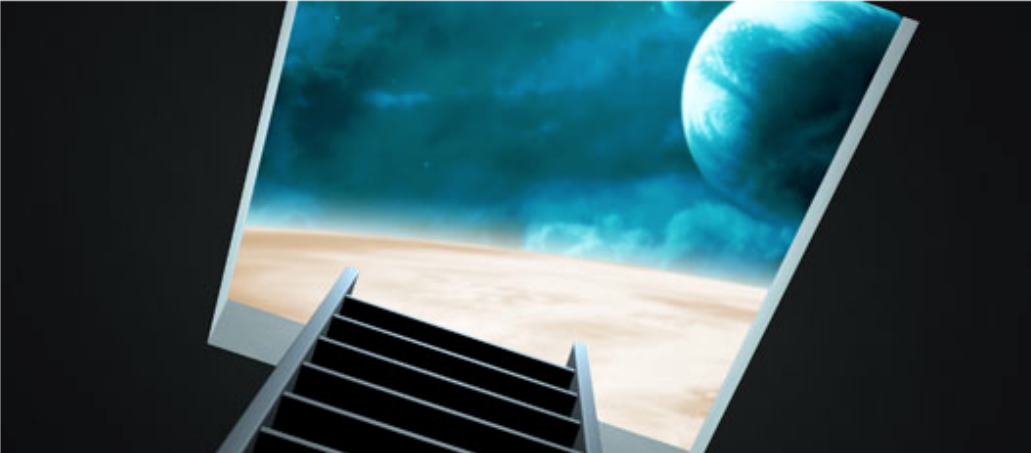
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Four vendors offer immediate Open Access solutions


April 2010 | by Alison Butterill



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2010 – RPG Open Access announced

- IBM consulted with several vendors and industry experts while developing this new interface.
- The four suppliers who will have handlers immediately available are:
 - IBM Lab Services
 - looksoftware
 - Profound Logic
 - VAI

2010 – RPG Open Access denounced



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Volume 19, Number 16 -- April 26, 2010

RPG Open Access Is No Panacea, Say BCD and LANSA

Published: April 26, 2010

by Dan Burger

For every up, there's a down. For every left, there's a right. Two people watch the same movie and one says it was everything I hoped it would be and more while the other says it's a poorly done remake of a movie from 10 years earlier. The just-released IBM i 7.1 operating system, and in particular the feature known as Open Access, already has prompted opinions about what it is and what it can do.

Not everyone thinks it's the greatest thing since Timex determined its watches could take a licking and keep on ticking.

Surprised? You shouldn't be. Differences of opinion among IBM i users grow faster than grass in late April.

Rational Open Access, RPG Edition, is the formal name of the new tool from IBM that is causing all the commotion, and you can get all the details (many of which are not in the IBM announcement letters) [in our story](#) from last week's issue of *The Four Hundred*. It is a tweaked version of the RPG compiler and runtime environment with a set of open APIs that allow companies to create custom

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2010 – Denouncers denounced

Angus: “Shinning (sic) a light” against the future of RPG?

Rational Open Access for RPG (RPGOA) has certainly become the buzz of our industry. I have discovered that when there is this amount of excitement and noise on any subject, positive or negative, the topic is always a game-changer. RPGOA is definitely that.

This morning, I discovered in my inbox, an article from IT Jungle titled [RPG Open Access Is No Panacea, Say BCD and LANSA](#). I truly appreciate IT Jungle's efforts at reporting all the opinions relating to RPG OA, and enjoyed reading the article. However, it seems this is going to be wonderful press for RPGOA, and not so wonderful press for [BCD](#) and [LANSA](#).

From an IBM perspective, RPG has now an ability to converse with any user interface you choose, extending RPG far beyond the traditional 5250 green screen interface. This is an investment by IBM in the future of RPG. From the vendors writing handlers, this is “..great news for the large proportion of the IBM i Community who want to continue using RPG for the long term” and “..perhaps one of the most important IBM i-related announcements in the last decade”. Other vendors are lining up to provide handlers utilizing RPG OA, and I expect soon enough, we will see open source handlers available.

Some comments from the [RPG400-L](#) forum are: “It looks exciting – I hope I get the opportunity to use this new technology”, “I hope to get to use something like this”, “It all looks quite impressive.” Some of the concerned citizens of our community expect that with IBM charging for the RPG OA runtime, adoption will not happen – although that seems not to have dampened any enthusiasm for the product.

From a BCD and LANSA perspective, “both declined to develop products using this technology”. From the article, I read: “they both believe their technologies and methodologies are superior to the ROA path.”. That certainly sounds like they would prefer you to use their technologies and not use RPG for IBM i application development.

Angus the IT Chap



Categories

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- [+ RPG](#)
- [+ YiPs](#)

Authors:

2010 – What was said

- "Other solutions today are so much better," says Eric Figura, director of Marketing at BCD. "RPG Open Access is not like closing the barn door after the horse leaves." It's so outdated, he says, "it's like the horse forgot he was ever in the barn," quips Figura.

2014 – COMMON Annual Conference

NEW

Presto 5.5 now supports RPG Open Access

ITEM*	GROUP	ITEM NUMBER	STATUS
<input type="checkbox"/> GUITAR	CASES	216	A
<input type="checkbox"/> GUITAR	CASES	74	A
<input type="checkbox"/> GUITAR	CASES	75	A
<input type="checkbox"/> GUITAR	CASES	76	A
<input type="checkbox"/> GUITAR	CASES	80	A
<input type="checkbox"/> GUITAR	CASES	81	A
<input type="checkbox"/> GUITAR	CASES	82	A
<input type="checkbox"/> GUITAR	CASES	83	A
<input type="checkbox"/> GUITAR	CLASSICAL	84	A
<input type="checkbox"/> GUITAR	ELECTRIC	303	A

IBM i programmers now have more options to deliver modern web applications:

- ▶ Give existing green screens a web GUI or develop new RPG web applications
- ▶ Automatically transform subfiles into scrollable grids with sortable columns
- ▶ Seamlessly intermingle OA screens with screens that were web-enabled using Presto's 5250 approach
- ▶ Use Presto's Visual Editor to add drop downs, auto-completes, images and much more

RPG OA support is included in Presto at no additional charge. With the option to use the 5250 datastream and OA in a single licensed product, you get to choose the approach that best meets your needs.

Presto™ See a video of RPG OA in Presto at bcdsoftware.com/rpgoa

BCD
A Quadrant Software Company
630-986-0800

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2014 – COMMON Annual Conference

NEW

Presto 5.5 now supports RPG Open Access

Harmonics Wholesale

F3-Exit

F4-Lookup

F5-Refresh

F6-Create

Work With Items

Status: Available

Group:

ITEM	GROUP	ITEM NUMBER	STATUS
------	-------	-------------	--------

Sortable Columns

2010 – What was said

- "I think it's important to recognize that the world has moved on," says Steve Gapp, LANSA president. "Ten years ago, it (RPG Open Access) would have been more relevant," says Gapp.
"The definition of a Web application 10 years ago is totally different from today...we've gone to Web 2.0, AJAX, JSON.... vendors like BCD and LANSA...are working on...rich-Internet applications...we have a whole new level of richness at the client.

2010 – What was said

- We have Silverlight--we have all this stuff coming down the pipe. That's the gold standard now. We need to have tools that RPG developers can use without learning any other of these complex skills to build the next generation of Web applications.
- So this (RPG Open Access) is just so far short of the mark as to be potentially insulting."

2010 – What was said

- "If someone can give one example of something you can do that in the real world you actually need to do, that we can't do with a 5250, we would be on it like a shot," says LANSA's chief operating officer, Martin Fincham.
- "The point is it doesn't do anything new or valuable, therefore, it's not a good thing or a bad thing. It's a nothing. What do you need to do that the 5250 restriction is preventing you from doing? "

2014 – LinkedIn RPGOA group

The screenshot shows the LinkedIn interface for the 'IBM i RPG OA (Open Access)' group. At the top, there is a navigation bar with the LinkedIn logo, a search bar for groups, and icons for messages, flags, and profile. Below the navigation bar, a banner advertises '5 - 15 Offers for JS Devs'. The group header includes the group logo (ROA), the name 'IBM i RPG OA (Open Access)', and '605 members'. A 'Member' button and icons for information and sharing are also present. The main content area features a discussion titled 'RPG Open Access Demo' by Greg Helton, a Java & AS400 Developer at Academy Sports + Outdoors. The discussion text describes an override on file IO opcodes. Below the discussion are interaction options like 'Like', 'Comment', and 'Share'. On the right, a 'Members of this Group' section shows profile pictures of four members, including Martin Fincham, CEO at LANSA. A 'Your group contribution level' section shows a progress bar at the 'Getting Started' stage.

Home Profile Network Jobs Interests Business Services Upgrade

5 - 15 Offers for JS Devs - Let us introduce you to 800+ of the best tech companies in New York!

ROA IBM i RPG OA (Open Access) 605 members Member i ↗

Discussions Promotions Jobs Members Search Manage

RPG Open Access Demo

Greg Helton
Java & AS400 Developer at Academy Sports + Outdoors

I saw a demo of RPG Open Access. I never understood before how it worked. Open Access is basically an override on the file IO opcodes so that the execution of the various opcodes for a file defined with the HANDLER keyword simply performs calls to ILE SRVPGM subprocedures. In the example I saw, the SRVPGM subprocedure called a Java program.

The file for which the IO opcodes perform the calls is a data structure that is populated by the API or read by it.

+ Follow Greg





See publib.boulder.ibm.com/infocenter/iseres/v7r1m0/topic/books/rzasm.pdf

Like (2) • Comment (5) • Share • Follow • Reply Privately • February 22, 2012
Add to Manager's Choice • Close Discussion

Comments

👍 Marinus Van Sandwyk, Terence Connor like this

Members of this Group


   

Martin Fincham
Chief Executive Officer (CEO) at LANSA
[Unfollow Martin](#)

[See all members](#) ▶

Your group contribution level

Start by commenting in a discussion. Group participants get 4x the number of profile views.



Getting Started

Lessons Learned?

- Vendors need to be flexible
- Vendors have to evolve

- IBM is often right

- RPG Open Access IS important



 @ericjooka



What I did!

What I did

- Gave up one evening
- Researched online
- Wrote two RPG programs
 - Database file to printer
 - Database file to database file
- Wrote two handlers
 - Create HTML data
 - Create XML data

Resources

- Home page
 - <http://www-01.ibm.com/software/rational/products/openaccess>
- Prerequisites
 - RPG Open Access
 - <http://tinyurl.com/rpg-oar-ptfs>
 - DB2 For i latest group PTFs
 - <https://www.ibm.com/developerworks/ibmi/techupdates/db2>
- Developer Works – RPG Café
 - <http://tinyurl.com/rpg-open-access>

ibm.com/support/knowledgecenter/api/content/nl/en-us/ssw_ibm_i_72/rzasm/rzasmpdf.pdf



Resources

- IBM Systems Magazine – RPG
- <http://www.ibmssystemsmag.com/ibmi/developer/rpg>
- Jon Paris and Susan Gantner

- July 2010: Getting a Handle on RPG's Open Access
 - <http://partner400.com/examples/openaccessexample1.htm>
- November 2012: RPG Open Access Revisited
- December 2012: Implementing Open Access With RPG
- January 2013: Handling Input Handlers With RPG Open Access

Resources

- iPro Developer
- Rational Open Access: RPG Edition Workshop
- Craig Pelkie
- January 2013: Part 1
 - <http://iprodeveloper.com/application-development/rational-open-access-rpg-edition-workshop-part-1>
- March 2013: Part 2
 - <http://iprodeveloper.com/application-development/rational-open-access-rpg-edition-workshop-part-2>
- May 2013: Part 3
 - <http://iprodeveloper.com/rpg-programming/rational-open-access-rpg-edition-workshop-part-3>

Movies DB2 file program

```
fmovie      IF    E           DISK
flist001    O    E           PRINTER
/free
  read movier;
  dow not %eof;
    write outfmt;
    read movier;
enddo;
*inlr = *on;
/end-free
```

Movies DB2 file program

```
dcl-f movie;  
dcl-f list001 PRINTER;  
  read movier;  
  dow not %eof;  
    write outfmt;  
    read movier;  
enddo;
```

Movies Application

look: Work With Movies - Windows Internet Explorer
C:\looksoftware 9.0\@UIX\SmartFrame\SmartFrame.htm

smartclient™

Work With Movies

Add
Spool file

Enter option, press Enter.

Display releases from to

Opt	Movie Name	Company	Rel Date	Status
	Crocodile Dundee	RimFire Films	01/01/40	On DVD
	Cyrano de Bergerac	Meridienne	24/06/20	On DVD
	William Shakespeare	The Shakespeare Cpny	02/01/03	On DVD
	Ken Follett	Dutton	20/03/10	On DVD
	Leonardo da Vinci	Joconde	15/01/10	Filming
	Harry Potter	Rowling and Mary	23/03/10	Filming
	Toy Story 1	Disney-Pixar	01/01/40	Filming
	Toy Story 2	Disney-Pixar	14/06/08	Filming
	Toy Story 3	Disney-Pixar	12/03/09	Filming
	Mike wants you	Disney-Pixar	14/01/10	In Theatres
	Cloudy with a Chance of M	Disney-Pixar	26/11/09	On DVD
	Shrek	DreamWorks	17/02/10	Filming
	Shrek 2	DreamWorks	17/02/10	Filming

Exit OK

List program 1

```
dcl-f movie;  
dcl-f list001 PRINTER;  
  read movier;  
  dow not %eof;  
    write outfmt;  
    read movier;  
enddo;
```

List printer file 1

A				REF (MOVIE)
A	R	OUTFMT		SPACEB (1)
A		MOVNAME	R	1
A		MOVIMG	R	+2

List 1 output

```
Display Spooled File
File . . . . . : LIST001                Page/Line  1/2
Control . . . . .                Columns    1 - 78
Find . . . . .
*...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+...
Crocodile Dundee                CrocodileDundee.jpg
William Shakespeare              Shakespeare.jpg
Ken Follett                      KenFollett.jpg
Leonardo da Vinci               LeonardoDaVinci.jpg
Harry Potter                    HarryPotter.jpg
Toy Story 1                      ToyStory1.jpg
Toy Story 2                      ToyStory2.jpg
Toy Story 3                      ToyStory3.jpg
Mike wants you                  Mike.jpg
Cloudy with a Chance of Meatballs Cloudy.jpg
Shrek                            Shrek.jpg
Shrek 2                          Shrek2.jpg
Shrek The Third                 Shrek3.jpg
Shrek Forever After             ShrekForeverAfter.jpg
Robin Hood                      RobinHood.jpg
The Princess Bride              ThePrincessBride.jpg
More...

F3=Exit   F12=Cancel   F19=Left   F20=Right   F24=More keys
```

List program 2

```
dcl-f movie;  
dcl-f list002 USAGE(*OUTPUT);  
  read movier;  
  dow not %eof;  
    write outfmt;  
    read movier;  
  enddo;
```

List DB2 output file 2

A				REF (MOVIE)
A	R	OUTFMT		
A		MOVNAME	R	
A		MOVIMG	R	

List 1 output

Display Report

```
Report width . . . . . : 102
Position to line . . . . . Shift to column . . . . .
Line   ....+....1....+....2....+....3....+....4....+....5....+....6....+....7..
      Movie Name                               Cover img
000001 Crocodile Dundee                       CrocodileDundee.jpg
000002 William Shakespeare                     Shakespeare.jpg
000003 Ken Follett                             KenFollett.jpg
000004 Leonardo da Vinci                       LeonardoDaVinci.jpg
000005 Harry Potter                             HarryPotter.jpg
000006 Toy Story 1                             ToyStory1.jpg
000007 Toy Story 2                             ToyStory2.jpg
000008 Toy Story 3                             ToyStory3.jpg
000009 Mike wants you                          Mike.jpg
000010 Cloudy with a Chance of Meatballs       Cloudy.jpg
000011 Shrek                                    Shrek.jpg
000012 Shrek 2                                  Shrek2.jpg
000013 Shrek The Third                          Shrek3.jpg
000014 Shrek Forever After                      ShrekForeverAfter.jp
000015 Robin Hood                               RobinHood.jpg
000016 The Princess Bride                      ThePrincessBride.jpg
                                           More...
F3=Exit      F12=Cancel      F19=Left      F20=Right      F21=Split
```

DB2 output file for HTML

```
CREATE TABLE OALIB.HTMLOUT  
  ( HTML VARCHAR(1024) CCSID 37 NOT NULL DEFAULT '' )  
RCDFMT HTMLFMT;
```

```
LABEL ON TABLE OALIB.HTMLOUT  
  IS 'HTML OUTPUT FILE';
```

DB2 output file for XML

```
CREATE TABLE OALIB.XMLOUT  
  ( XML VARCHAR(1024) CCSID 37 NOT NULL DEFAULT '' )  
RCDFMT XMLFMT;
```

```
LABEL ON TABLE OALIB.XMLOUT  
IS 'XML OUTPUT FILE';
```

Handler for HTML

```
QOA.useNamesValues = '1';
pQOAdata = QOA.namesValues;
HTML +=tagRowStart;
For fieldNum = 1 to QOAdata.num;
    pFieldValue = QOAdata.field(fieldNum).value;
    fieldLength = QOAdata.field(fieldNum).valueLenBytes;
    HTML += tagColStart
        + %trimr(%subst(fieldValue: 1: fieldLength))
        + tagColEnd;
EndFor;
HTML += tagRowEnd;
write htmlfmt;
```

Handler for XML

```
QOA.useNamesValues = '1';
pQOAdata = QOA.namesValues;
XML = tagRowStart;
For fieldNum = 1 to QOAdata.num;
    pFieldValue = QOAdata.field(fieldNum).value;
    fieldName = QOAdata.field(fieldNum).externalName;
    fieldLength = QOAdata.field(fieldNum).valueLenBytes;
    XML += tagElmStart + %trimr(fieldName) + tagElmBack
        + %trimr(%subst(fieldValue: 1: fieldLength))
        + tagElmEnd + %trimr(fieldName) + tagElmBack;
EndFor;
XML += tagRowEnd;
write XMLfmt;
```

List program 1

```
dcl-f movie;  
dcl-f list001 PRINTER handler('HDLR_HTML');  
  read movier;  
  dow not %eof;  
    write outfmt;  
    read movier;  
  enddo;
```

List program 2

```
dcl-f movie;  
dcl-f list002 usage(*OUTPUT) handler('HDLR_HTML');  
  read movier;  
  dow not %eof;  
    write outfmt;  
    read movier;  
enddo;
```

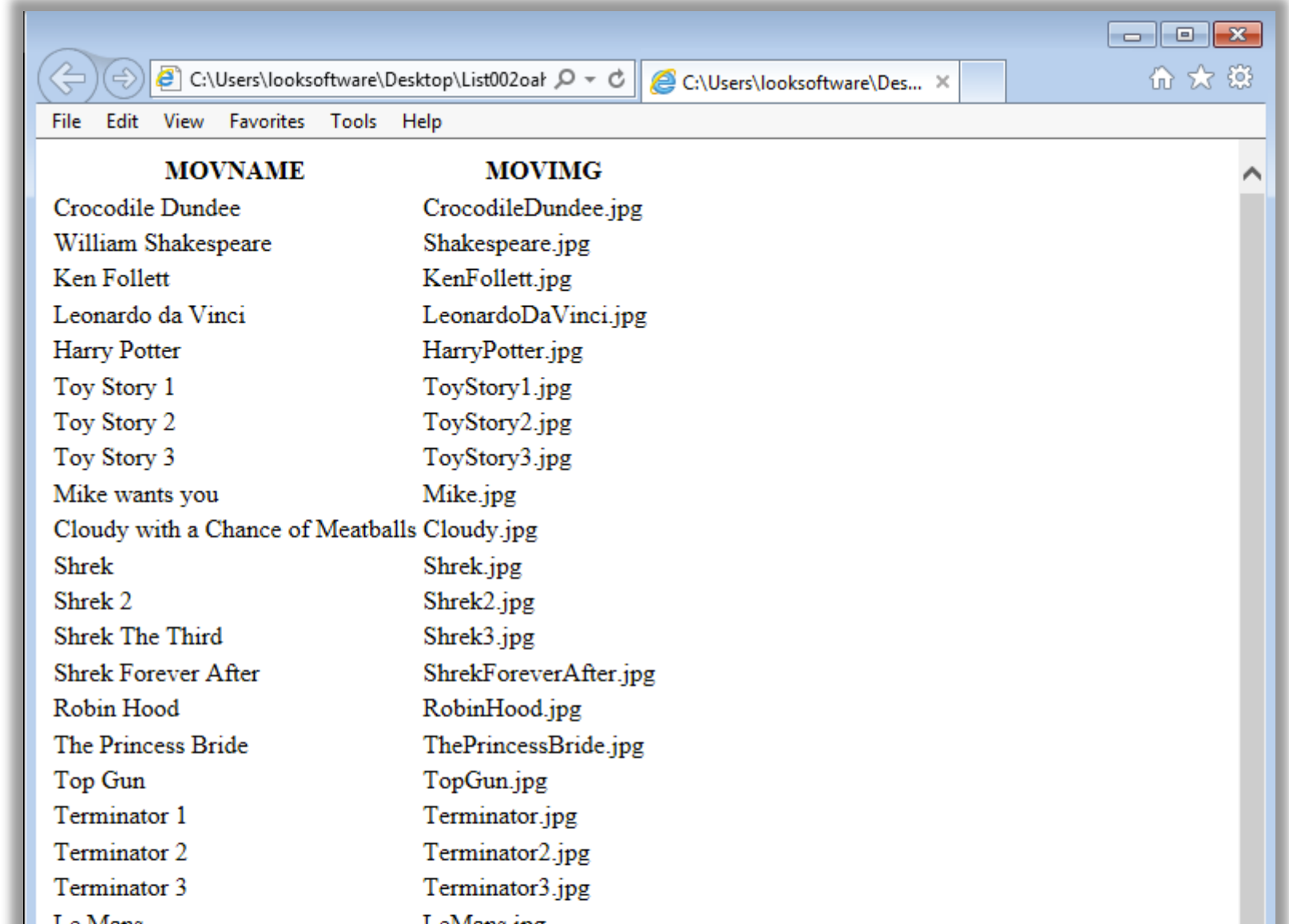
XMLOUT

```
<movies>
  <movie>
    <MOVNAME>Crocodile Dundee</MOVNAME>
    <MOVIMG>CrocodileDundee.jpg</MOVIMG>
  </movie>
  <movie>
    <MOVNAME>William Shakespeare</MOVNAME>
    <MOVIMG>Shakespeare.jpg</MOVIMG>
  </movie>
  <movie>
    <MOVNAME>Ken Follett</MOVNAME>
    <MOVIMG>KenFollett.jpg</MOVIMG>
  </movie>
  ...
</movies>
```

HTMLOUT

```
<table>
<thead><tr><th>MOVNAME</th><th>MOVIMG</th></tr></thead>
<tbody><tr><td>Crocodile
Dundee</td><td>CrocodileDundee.jpg</td></tr>
<tr><td>William Shakespeare</td><td>Shakespeare.jpg</td></tr>
<tr><td>Ken Follett</td><td>KenFollett.jpg</td></tr>
<tr><td>Leonardo da Vinci</td><td>LeonardoDaVinci.jpg</td></tr>
<tr><td>Harry Potter</td><td>HarryPotter.jpg</td></tr>
<tr><td>Toy Story 1</td><td>ToyStory1.jpg</td></tr>
<tr><td>Toy Story 2</td><td>ToyStory2.jpg</td></tr>
<tr><td>Toy Story 3</td><td>ToyStory3.jpg</td></tr>
<tr><td>Mike wants you</td><td>Mike.jpg</td></tr>
...
</tbody></table>
```

HTMLOUT



The screenshot shows a web browser window with a single tab. The address bar contains the path C:\Users\looksoftware\Desktop\List002oa. The browser's menu bar includes File, Edit, View, Favorites, Tools, and Help. The main content area displays an HTML table with two columns: MOVNAME and MOVIMG. The table lists 20 rows of movie titles and their corresponding image filenames. The browser's status bar is visible at the bottom.

MOVNAME	MOVIMG
Crocodile Dundee	CrocodileDundee.jpg
William Shakespeare	Shakespeare.jpg
Ken Follett	KenFollett.jpg
Leonardo da Vinci	LeonardoDaVinci.jpg
Harry Potter	HarryPotter.jpg
Toy Story 1	ToyStory1.jpg
Toy Story 2	ToyStory2.jpg
Toy Story 3	ToyStory3.jpg
Mike wants you	Mike.jpg
Cloudy with a Chance of Meatballs	Cloudy.jpg
Shrek	Shrek.jpg
Shrek 2	Shrek2.jpg
Shrek The Third	Shrek3.jpg
Shrek Forever After	ShrekForeverAfter.jpg
Robin Hood	RobinHood.jpg
The Princess Bride	ThePrincessBride.jpg
Top Gun	TopGun.jpg
Terminator 1	Terminator.jpg
Terminator 2	Terminator2.jpg
Terminator 3	Terminator3.jpg
To Men	ToMen.jpg

XML Handler description

- Parameters
- Operation
- Field names/values

Entry parameters

```
/copy QOAR/QRPGLESRC,QRNOPENACC
```

```
D QOA          ds          likeds(QrnOpenAccess_T)
```

```
C      *ENTRY      PLIST
```

```
C          PARM          QOA
```

Entry parameters – free format

```
/copy QOAR/QRPGLESRC,QRNOPENACC
```

```
dcl-pi entry;
```

```
    QOA LIKEDS (QrnOpenAccess_T) ;
```

```
end-pi;
```

Operation

```
/copy QOAR/QRPGLESRC,QRNOPENACC

dcl-pi entry;
    QOA LIKEDS (QrnOpenAccess_T);
end-pi;
dcl-s opcode LIKE(QOA.rpgOperation);

opcode = QOA.rpgOperation;
if opcode = QrnOperation_OPEN;
    open XMLOUT;
    XML = tagTableStart;
    write XMLfmt;
    return;
EndIf;
```

Operations

- QrnOperation_CHAIN
- QrnOperation_CLOSE
- QrnOperation_DELETE
- QrnOperation_EXFMT
- QrnOperation_FEOD
- QrnOperation_OPEN
- QrnOperation_READ
- QrnOperation_READC
- QrnOperation_READE
- QrnOperation_READP
- QrnOperation_READPE
- QrnOperation_SETGT
- QrnOperation_SETLL
- QrnOperation_UNLOCK
- QrnOperation_UPDATE
- QrnOperation_WRITE
- QrnOperation_DELETE_CURRENT
- QrnOperation_READE_CURRENT
- QrnOperation_READPE_CURRENT
- QrnOperation_POSITION_START
- QrnOperation_POSITION_END

ibm.com/support/knowledgecenter/api/content/nl/en-us/ssw_ibm_i_72/rzasm/rzasmpdf.pdf



Field Names/Values

```
/copy QOAR/QRPGLESRC,QRNOOPENACC
dcl-pi entry;
    QOA LIKEDS (QrnOpenAccess_T);
end-pi;
dcl-ds QOAdata likeds (QrnNamesValues_T) based(pQOAdata);

QOA.useNamesValues = '1';
pQOAdata = QOA.namesValues;
XML = tagRowStart;
For fieldNum = 1 to QOAdata.num;
    pFieldValue = QOAdata.field(fieldNum).value;
    fieldName    = QOAdata.field(fieldNum).externalName;
    fieldLength  = QOAdata.field(fieldNum).valueLenBytes;
    XML += tagElmStart + %trimr(fieldName) + tagElmBack
        + %trimr(%subst(fieldValue: 1: fieldLength))
        + tagElmEnd + %trimr(fieldName) + tagElmBack;
EndFor;
```



 @ericjooka



XML Handler code

XML Handler

```
H option(*srcstmt : *nodebugio)
```

```
H dftactgrp(*no)
```

```
fxmlout      O      E              DISK      usropn
```

```
  /copy QOAR/QRPGLESRC,QRNOOPENACC
```

```
D QOA          ds          likeds(QrnOpenAccess_T)
D QOAdata      ds          likeds(QrnNamesValues_T)
D              based(pQOAdata)
D opcode       s           like(QOA.rpgOperation)
D fieldValue  s           32470a Based(pFieldValue)
D fieldName   s           10
D fieldNum    s           10  0
D fieldLength s           10  0
```

XML Handler

```
d tagTableStart    c    '<movies>'
d tagTableEnd      c    '</movies>'
d tagRowStart      c    '<movie>'
d tagRowEnd        c    '</movie>'
d tagElmStart      c    '<'
d tagElmEnd        c    '</'
d tagElmBack       c    '>'
```

```
C    *ENTRY        PLIST
C                                PARM                QOA
```

```
/free
```

```
XML = '';
QOA.useNamesValues = '1';
```

XML Handler

```
opcode = QOA.rpgOperation;
if opcode = QrnOperation_WRITE;
  pQOAdata = QOA.namesValues;
  XML = tagRowStart;
  For fieldNum = 1 to QOAdata.num;
    pFieldValue = QOAdata.field(fieldNum).value;
    fieldName = QOAdata.field(fieldNum).externalName;
    fieldLength = QOAdata.field(fieldNum).valueLenBytes;
    XML += tagElmStart + %trimr(fieldName) + tagElmBack
      + %trimr(%subst(fieldValue: 1: fieldLength))
      + tagElmEnd + %trimr(fieldName) + tagElmBack;
  EndFor;
  XML += tagRowEnd;
  write XMLfmt;
  return;
EndIf;
```

XML Handler

```
if opcode = QrnOperation_OPEN;
    open XMLOUT;
    XML = tagTableStart;
    write XMLfmt;
    return;
EndIf;
if opcode = QrnOperation_CLOSE;
    XML = tagTableEnd;
    write XMLfmt;
    close XMLOUT;
    return;
EndIf;

return;
/end-free
```



 @ericjooka



What next?

What next?

- Write some handler code!
 - Output
 - Input

- Make some decisions
 - Generic handler
 - Specific handler

- Investigate
 - Third-party handlers

RPG Open Access



Trevor Perry
FrescheThinker

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 @ericjooka

IBMCHAMPION 