



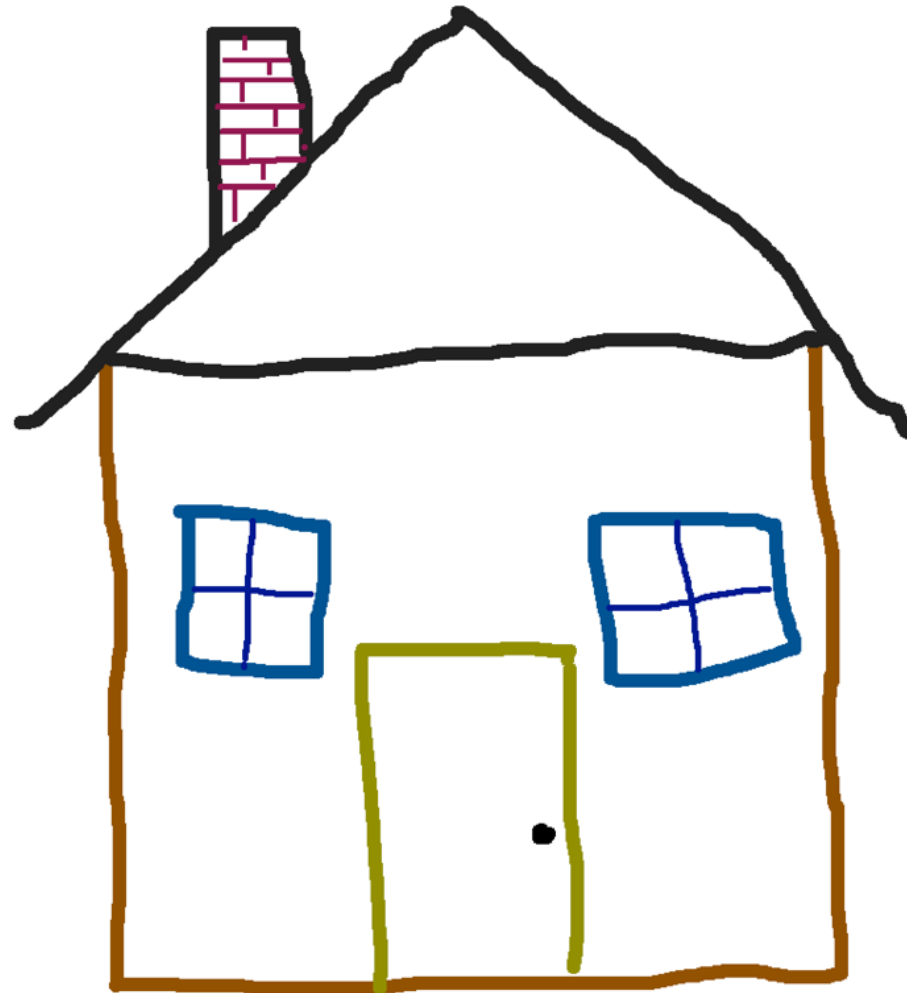
What is Modernization on IBM i ?

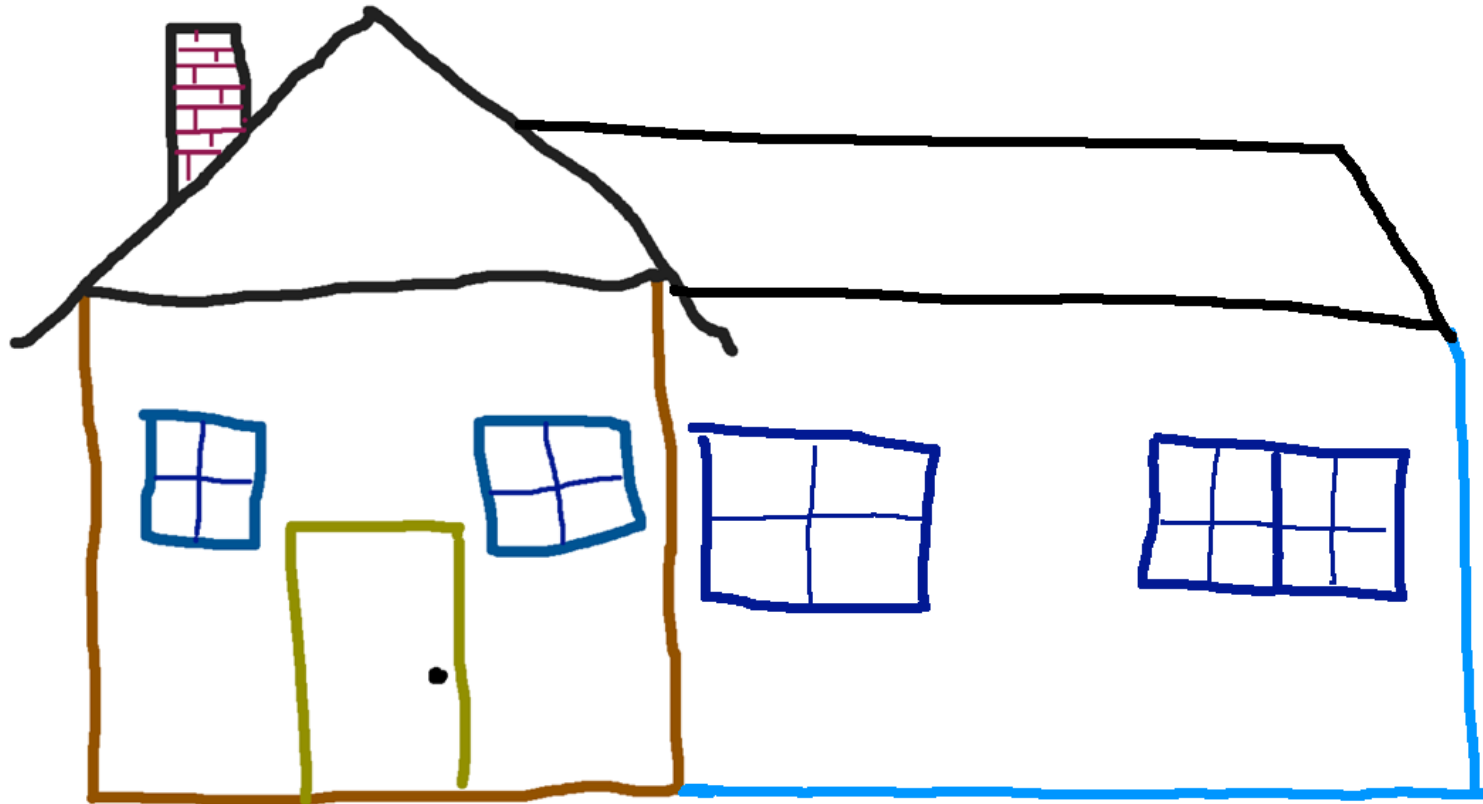
Tim Rowe- timmr@us.ibm.com
Business Architect Application Development

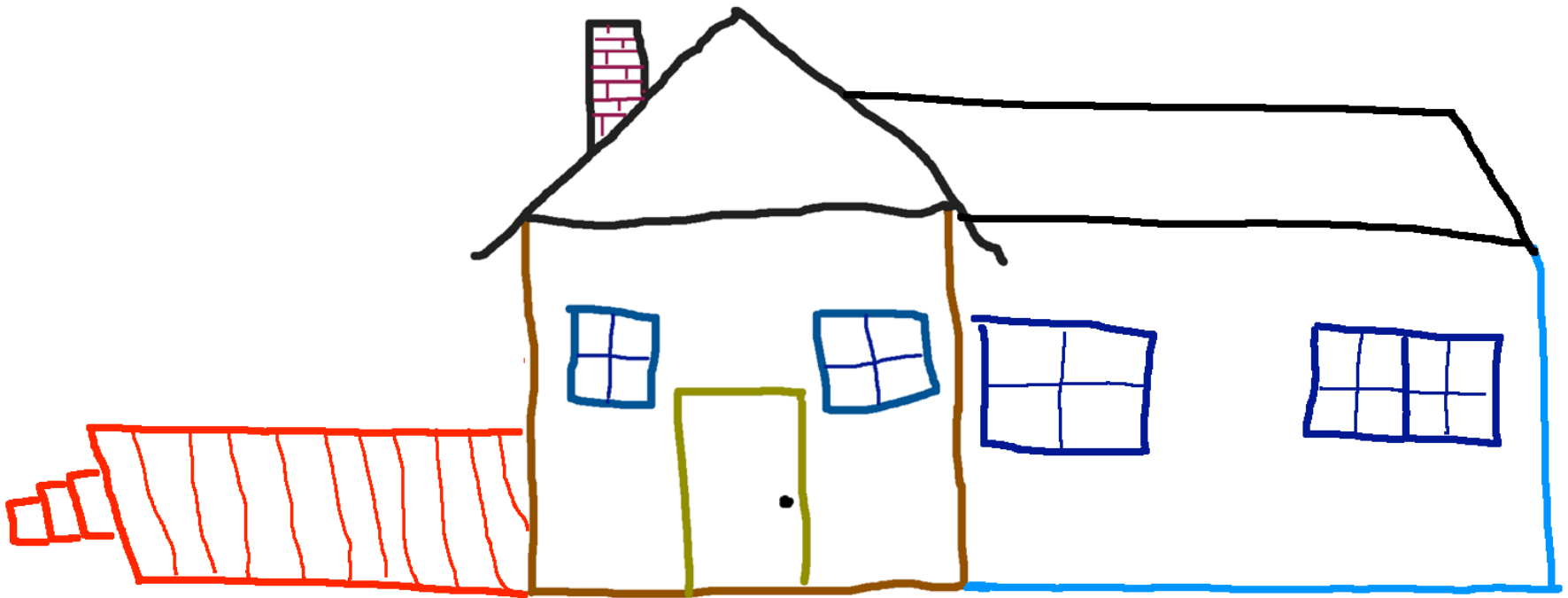


Modernization on IBM i

- Who are your developers ?
- What are the tools you use ?
- How are you doing development today ?
- Are you using the 'best' building blocks ?
- Building your self ? Leveraging Partners ?
- How is the IBM i team helping you move into the future ?









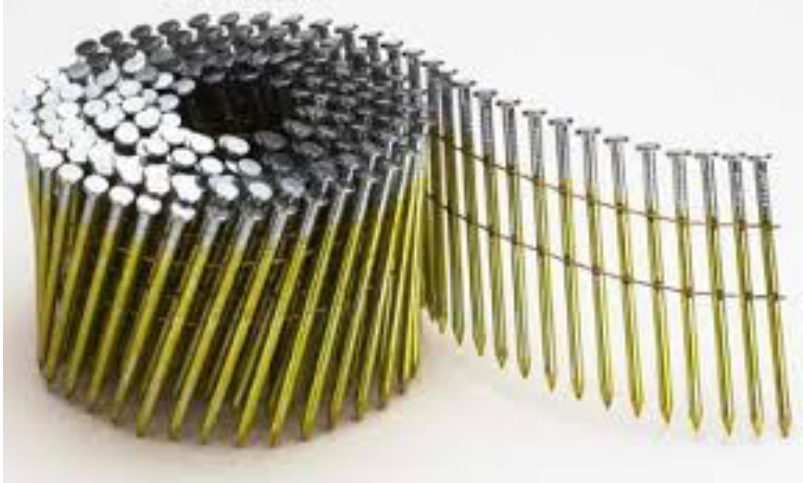
IBM



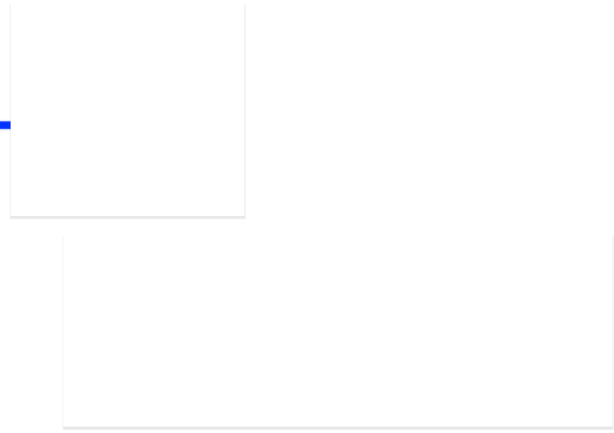
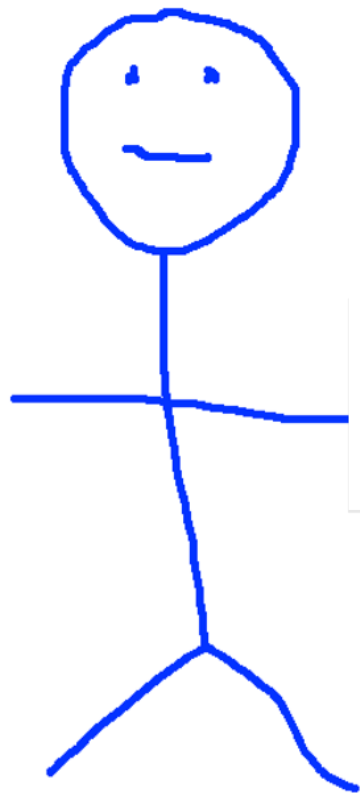
How do you avoid these types of mess ups ??

- Do you have a Site plan
- Have a BEFORE blueprint
- Have an AFTER blueprint
- Understand the plan before you start
- Use the correct material
- Use the right Tools!!!!
- Right people

What's the Plan??



Joe Carpenter



Modernize Applications.....

- Move to 'Modern Language'
- Self Documenting Code
- Testing anyone?
- Leverage Today's Developers
- Transition from Monolithic to Modular
 - Impact Analysis
 - Get a Blueprint
 - Data Maps
- Interactive User Interfaces
- Connecting to the Data
- Agile development and deployment

**ART OF
THE
POSSIBLE**

Languages of IBM i

C/C++

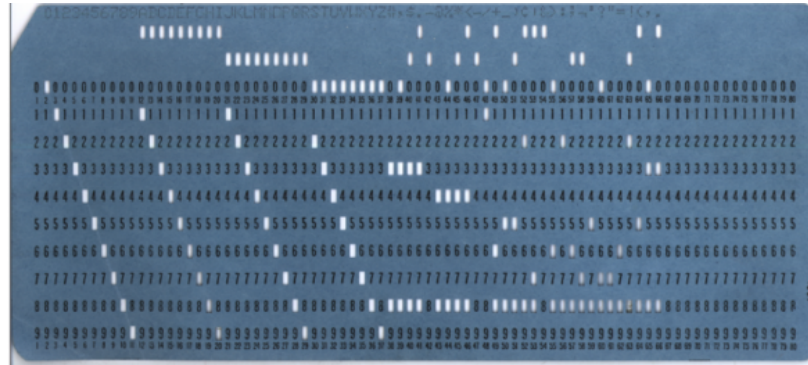
COBOL



Modern RPG



Modern RPG – Constant Transformation



RPG IV - A Modern Business Language

- Interoperability
 - o Java
 - o XML
 - o SQL
- Readability
 - o Free form
 - o Blank lines
 - o Comments
- Functionality
 - o Procedures
 - o Data areas
 - o Data structures
 - o More data types
 - o Extended file support
- Modern Tools
 - o RD i, RTC, ARCAD
Power Pack

```
read file; // Get next record
dow not %eof(file); // Keep looping with record
  if %error;
    dsply 'The read failed';
    leave;
  else;
    chain(n) name database data;
    time = hours * num_employees
          + overtime_saved;
    pos = %scan ('\,' : name);
    name = %xlate(upper : lower : name);
    exsr handle_record;
    read file;
  endif;
enddo;
begsr handle_record;
eval(h) time = time + total_hours_array (empno);
temp_hours = total_hours - excess_hours;
record_transaction();
endsr;
```

```
ctl-opt bnddir('ACCRCV');

dcl-f custfile usage(*update);
dcl-ds custDs;
dcl-f report printer;

read custfile custDs;
dow not %eof;
  if dueDate > %date(); // overdue?
    sendOverdueNotice ();
    write reportFmt;
    exec sql insert :name, :duedate into
      mylib/myfile;
  endif;
  read custfile custDs;
enddo;
inlr = '1';

dcl-proc sendOverdueNotice;
  /copy invoices
  sendInvoice (custDs : IS_OVERDUE);
end-proc;
```

Compiler Options

File Definitions

Data Definitions

Procedure Definitions

Calc Specs

Modern RPG

- 8-80 Column restriction now **gone**
- Nested Data Structures
- %MIN & %MAX
- ALIGN(*FULL)

- New requirements
 - Continue to adopt object oriented principles in RPG
 - Deal with JSON in a Native manner
 - Simply dealing with arrays
 - RPG is driven by you...
 - RFE community is where you get a voice
 - And where we get work to do!!!



https://www.ibm.com/developerworks/rfe/execute?use_case=changeRequestLanding

How is this changing the game?

Hear how Modern
RPG and Tools
allows a 23 year old
developer to be
success today!

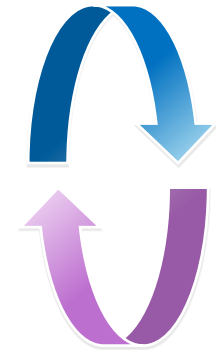


<http://bit.ly/1WhM7uT>

How Do I Convert to Modern RPG ??

April 2017 Announce...

ARCAD Converter is now included in EES
ARCAD Converted for i - 5733-AC1



- Plugs into RDi
- Green Screen interface for MASS conversion
 - Convert your entire source file at once

<https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?infotype=AN&subtype=CA&htmlfid=897/ENUS217-151&appname=lenovous&language=en>

Input Specs and Data Structures -> Declarations

```

FRS002.RPGLE
Line 49      Column 50      Replace
.....1.....2.....3.....4.....5.....6.....7.....8.....+
000900      //
001000      Dcl-C @F01          CONST('X'31');
001100      Dcl-C @F02          CONST('X'32');
001200      Dcl-C @F03          CONST('X'33');
001300      Dcl-C @F04          CONST('X'34');
001400      Dcl-C @F05          CONST('X'35');
001500      Dcl-C @F06          CONST('X'36');
001600      Dcl-C @F07          CONST('X'37');
001700      Dcl-C @F09          CONST('X'39');
001800      Dcl-C @F10         CONST('X'3A');
001900      Dcl-C @F12         CONST('X'3C');
002000      Dcl-C @ENTER      CONST('X'F1');
002100      Dcl-C @HELP       CONST('X'F3');
002200      Dcl-C @PRINT     CONST('X'F6');
002300      //
002400      Dcl-C @OFF        CONST('0');
002500      Dcl-C @ON         CONST('1');
002600      //
002700      Dcl-C @FALSE     CONST('0');
002800      Dcl-C @TRUE      CONST('1');
002900      //
003000      Dcl-C CHARS      CONST('ABCDEFGHIJKLMNOPQRST-
003100      UVWXYZabcdefghijlmn-
003200      opqrstuvwxyz ');
003300      //
003400      Dcl-Ds *n PSDS;
003500      @PGM             Char(10)    Pos(1);           //
003600      @STAT            Zoned(5:0)  Pos(11);           //
003700      @PARMS           Zoned(3:0)  Pos(37);           //
003800      @MSGID           Char(7)     Pos(40);           //
003900      @DATA            Char(79)    Pos(91);           //
004000      @JOBNA           Char(10)    Pos(244);          //
004100      @USRNA           Char(10)    Pos(254);          //
004200      @JOBNO           Char(6)     Pos(264);          //
004300      @SRCL            Char(10)    Pos(304);          //
004400      @SRCL            Char(10)    Pos(314);          //
004500      @SRCL            Char(10)    Pos(314);          //
004501      @SRCL            Char(10)    Pos(324);          //
004501      End-Ds;

FRS002.RPG
Line 54      Column 1      Replace
.....I.....Namedconstant+++++++C.....Const.....*****
004200      I*
004300      I          X'31'          C          @F01
004400      I          X'32'          C          @F02
004500      I          X'33'          C          @F03
004600      I          X'34'          C          @F04
004700      I          X'35'          C          @F05
004800      I          X'36'          C          @F06
004900      I          X'37'          C          @F07
005000      I          X'39'          C          @F09
005100      I          X'3A'          C          @F10
005200      I          X'3C'          C          @F12
005300      I          X'F1'          C          @ENTER
005400      I          X'F3'          C          @HELP
005500      I          X'F6'          C          @PRINT
005600      I*
005700      I          '0'            C          @OFF
005800      I          '1'            C          @ON
005900      I*
006000      I          '0'            C          @FALSE
006100      I          '1'            C          @TRUE
006200      I*
006300      I          'ABCDEFGHIJKLMNOPQRST-C  CHARS
006400      I          'UVWXYZabcdefghijlmn-
006500      I          'opqrstuvwxyz '
006600      I*
006700      I          SDS
006800      I          1 10 @PGM          _E
006900      I          11 150 @STAT        _E
007000      I          37 390 @PARMS      _E
007100      I          40 46 @MSGID        _E
007200      I          91 169 @DATA        _E
007300      I          244 253 @JOBNA      _E
007400      I          254 263 @USRNA    _E
007500      I          264 269 @JOBNO      _E
007600      I          304 313 @SRCL      _E
007700      I          314 323 @SRCL      _E
007800      I          324 333 @SRCL      _E
007900      I*
  
```

Creates Case Statements

```

021600 INZSR();
021700 //
021800 DoU @EXIT = @TRUE;
021900 //
022000 Write MSGCTL; //
022100 Exfmt FRSUPD; //
022200 //
022201 Select; //
022300 When KEY = @F02; //
022301 @F02SR(); //
022400 When KEY = @F03; //
022401 @F03SR(); //
022500 When KEY = @F04; //
022501 @F04SR(); //
022600 When KEY = @F05; //
022601 @F05SR(); //
022700 When KEY = @F07; //
022701 @F07SR(); //
022800 When KEY = @F09; //
022801 @F09SR(); //
022900 When KEY = @F12; //
022901 @F12SR(); //
023000 Other; //
023001 @ERRCK(); //
023100 EndSl; //
023200 //
023300 If KEY = @F06 //
023400 and *IN50 = *OFF; //
023500 @F06SR(); //
023600 EndIf; //
023700 //
023800 If KEY = @F10 //
023900 and *INLR <> *ON //
024000 and *IN50 = *OFF; //
024100 @F10SR(); //
024200 EndIf; //
024300 //
024400 EndDo; //
024500 //
024700 //
024800 *INLR = *ON; //
083000 //
083100 //

```

```

021600 C EXSR INZSR
021700 C*
021800 C @EXIT DOUEQ@TRUE
021900 C*
022000 C WRITEMSGCTL * WRITE MSGCTL
022100 C EXFMTFRSUPD * DISPLAY SCREEN
022200 C*
022300 C KEY CASEQ@F02 @F02SR * F02 REFRESH
022400 C KEY CASEQ@F03 @F03SR * F03 EXIT
022500 C KEY CASEQ@F04 @F04SR * F03 EXIT
022600 C KEY CASEQ@F05 @F05SR * F03 EXIT
022700 C KEY CASEQ@F07 @F07SR * F03 EXIT
022800 C KEY CASEQ@F09 @F09SR * F03 EXIT
022900 C KEY CASEQ@F12 @F12SR * F12 CANCEL
023000 C CAS @ERRCK * CK FOR ERRORS
023100 C ENDCS
023200 C*
023300 C KEY IFEQ @F06 * F03 EXIT
023400 C *IN50 ANDEQ*OFF * 50 OFF=NO ERRS
023500 C EXSR @F06SR * CREATE RECRD
023600 C ENDFIF * END IF
023700 C*
023800 C KEY IFEQ @F10 * F10 PRESSED
023900 C *INLR ANDNE*ON * F10 PRESSED
024000 C *IN50 ANDEQ*OFF * 50 OFF=NO ERRS
024100 C EXSR @F10SR * CREATE RECRD
024200 C ENDFIF * END IF
024300 C*
024400 C ENDDO * END DO
024500 C*
024600 C END TAG
024700 C*
024800 C MOVE *ON *INLR * LAST RECORD=ON
024900 C*
025000 C*
025100 C*
025200 C INZSR BEGSR * SET OUTPT SCREE
025300 C*
025400 C SETOF 39 * UNPROT TIL F6
025500 C SETOF 404450 * ERROR IND. SC 1
025600 C SETOF 515253 * ERROR IND. SC 1
025700 C SETOF 545556 * ERROR IND. SC 1
025800 C*

```

Subroutines converted to Procedures

```

Dcl-Proc INZSR; // ^
//
*IN39 = '0'; //
*IN40 = '0'; //
*IN44 = '0'; //
*IN50 = '0'; //
*IN51 = '0'; //
*IN52 = '0'; //
*IN53 = '0'; //
*IN54 = '0'; //
*IN55 = '0'; //
*IN56 = '0'; //
//
%Subst(MSGID:7:1) = ' ';
MSGDTA = *Blanks;
MSGQUE = @PGM;
//
@EXIT = @FALSE;
PGMQ = @PGM;
//
ORDNUM = PORDER; //
//
Chain ORDNUM ORDNAME;
*IN44 = not %Found;
//
FILDPK = DEPART;
DOFYR = %Dec(%XLate(' ': '0':
FILYY):4:0);
DOFMON = %Dec(%XLate(' ': '0':
FILMM):2:0);
DOFDAY = %Dec(%XLate(' ': '0':
FILDD):2:0);
//
CUSTKY = CNAME;
CUSNAM = CUSTNM;
//
CLASSK = CLASS;
//
COSFIR = ' ';
COSBUS = ' ';
COSECO = ' ';
If CLASSN = '1'; //
COSFIR = 'X';

```

025200	C	INZSR	BEGSR		* SET OUTPT SCREE
025300	C*				
025400	C		SETOF		39 * UNPROT TIL F6
025500	C		SETOF		404450 * ERROR IND. SC J
025600	C		SETOF		515253 * ERROR IND. SC J
025700	C		SETOF		545556 * ERROR IND. SC J
025800	C*				
025900	C		MOVE ' '	MSGID 7	
026000	C		MOVE *BLANKS	MSGDTA 80	
026100	C		MOVE @PGM	MSGQUE 10	
026200	C*				
026300	C		MOVE @FALSE	@EXIT 1	
026400	C		MOVE @PGM	PGMQ	
026500	C*				
026600	C		Z-ADDPORDER	ORDNUM	ACTIVE
026700	C*				
026800	C	ORDNUM	CHAINORDNAME		44
026900	C*				
027000	C		MOVE DEPART	FILDPK	
027100	C		MOVE FILYY	DOFYR	
027200	C		MOVE FILMM	DOFMON	
027300	C		MOVE FILDD	DOFDAY	
027400	C*				
027500	C		MOVE CNAME	CUSTKY	
027600	C		MOVELCUSTNM	CUSNAM	
027700	C*				
027800	C		MOVE CLASS	CLASSK	
027900	C*				
028000	C		MOVE ' '	COSFIR	
028100	C		MOVE ' '	COSBUS	
028200	C		MOVE ' '	COSECO	
028300	C	CLASSN	IFEQ '1'		* RUN INTERACTIVE
028400	C		MOVE 'X'	COSFIR	
028500	C		ENDIF		
028600	C	CLASSN	IFEQ '2'		* RUN INTERACTIVE
028700	C		MOVE 'X'	COSBUS	
028800	C		ENDIF		
028900	C	CLASSN	IFEQ '3'		* RUN INTERACTIVE
029000	C		MOVE 'X'	COSECO	
029100	C		ENDIF		
029200	C*				
029300	C		Z-ADDTCKTNO	TICKETS	ACTIVE
029400	C*				

Latest in SQL

New in Apr 2016

Updates from the original

Many of the same expert
Authors, plus a few New ones!

<http://www.redbooks.ibm.com/abstracts/sg248326.html?Open>



SQL Procedures, Triggers, and Functions on IBM DB2 for i

Jim Bainbridge
Hernando Bedoya
Rob Bestgen
Mike Cain
Dan Cruikshank
Jim Denton
Doug Mack
Tom McKinley
Simona Pacchiarini



Power Systems



Redbooks

Modern RPG

New in Dec 2016

Updated from the original book
from 2000

Many of the same expert
Authors, plus a few New ones!

<https://www.redbooks.ibm.com/redbooks/pdfs/sg245402.pdf>



Who Knew You Could Do That with RPG IV? Modern RPG for the Modern Programmer

Rich Diedrich
Jim Diephuis
Susan Gartner
Jeff Minette
Jon Paris
Kody Robinson
Tim Rowe
Paul Tuohy



Power Systems



Redbooks

Modern IBM i Application from
the Database up to the User
Interface and Everything in
Between

New in June 2014

Many Experts from the IBM i
Community

<http://www.redbooks.ibm.com/redbooks/pdfs/sg248185.pdf>

22,000 + Downloads!!!!

Modernizing IBM i Applications from the Database up to the User Interface and Everything in Between

Learn about preferred practices for
modern development

Use modern tools for a
modern world

Incorporate data-centric
programming for success



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John Eberhard
Mark Evans
Antonio Florez
Susan Gantner
Jesse Gorzinski
Isaac Ramirez Herrera



Development tools....



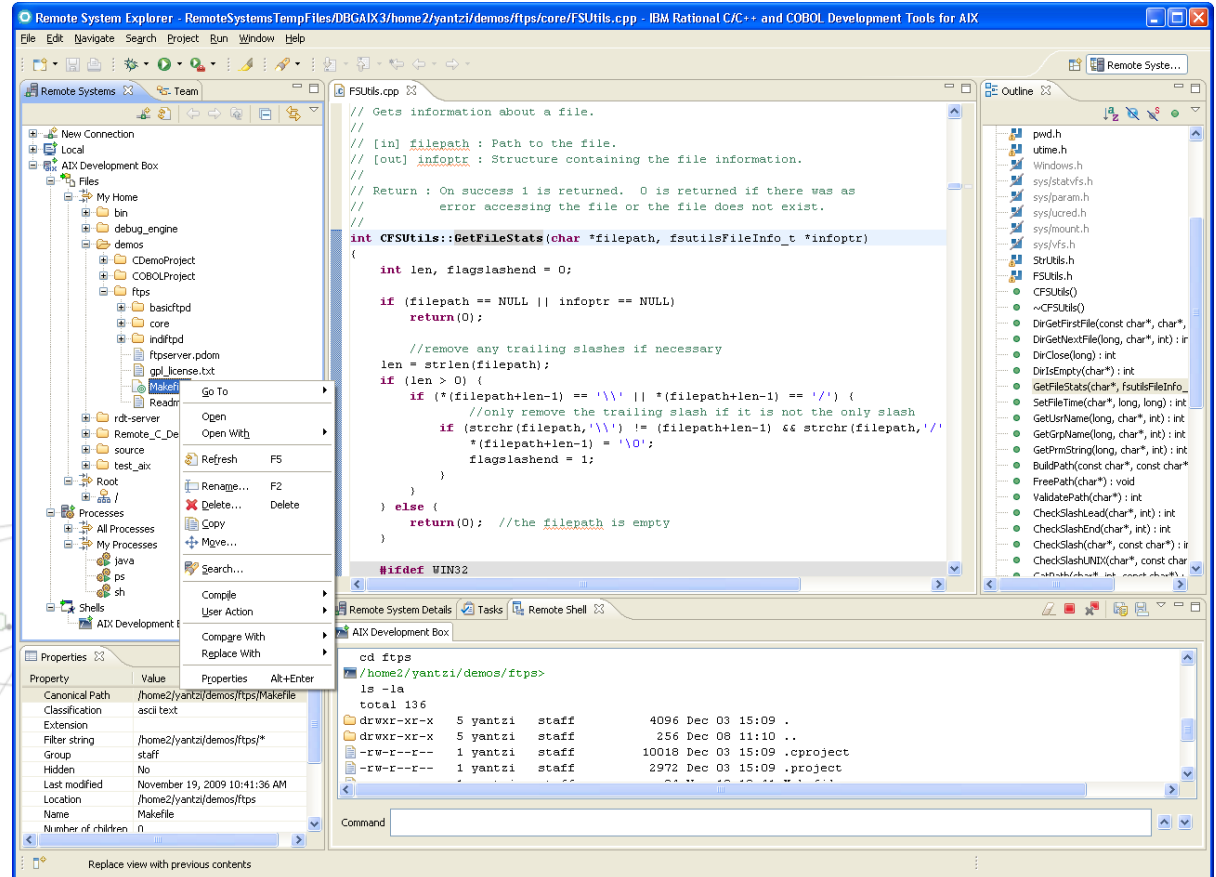
```
Session A - [24 x 80]
Columns . . . : 6 76      Edit      YANTZI/QRPGLESRC
SEU=>
FMT *   *. 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+.
***** Beginning of data *****
0001.00
0002.00 *-----*
0003.00 *
0004.00 * Program: ORDENTR
0005.00 *
0006.00 * This program allows a user to enter and confirm an order. It sends
0007.00 * a print request to a batch job via a data queue. The program only
0008.00 * handles District 1 and Warehouse '0001'.
0009.00 *
0010.00 * Don was here
0011.00 *
0012.00 * INDICATOR USAGE:
0013.00 * 03 - F3=Exit
0014.00 * 04 - F4=Prompt
0015.00 * 06 - F6=Accept order
0016.00 * 12 - F12=Cancel

F3=Exit  F4=Prompt  F5=Refresh  F9=Retrieve  F10=Cursor  F11=Toggle
F16=Repeat find  F17=Repeat change  F24=More keys
(C) COPYRIGHT IBM CORP. 1981, 2005.
MA a MW 02/009
```

Tried and True, Yes but also SLOW, OLD, No new features

Rational Developer for i

- Modern
- Integrated
- Analysis
- Debugger
- Visual
- Supports RPG, COBOL, CL, C, C++, SQL, DDM



Developer Productivity

- Return on Investment
- Better able to respond to the needs of the business
- Higher quality
- Positioned to adopt new talent

20% → 50% Productivity
improvement

RDl Latest and Greatest 9.5.1

SSO 
Kerbrose



Run SQL Scripts

Format SQL

Visual Explain

RPGILE Outline
O-Spec I-Spec
Indicators
Unreferenced

Synchronize IFS Projects

Comments



RD_i Latest and Greatest 9.5.1.2

- Fix pack, so easy to install
- Nested Data Structures
- %MIN, %MAX
- Align(*FULL)
- Trim Leading spaces on line join ALT-J
- Kerberos Updates
- Content Assist updates
- Outline view updates

Rational Developer for i

RD*i* 9.5.1.2

Delivers **Name** Refactoring

Renaming

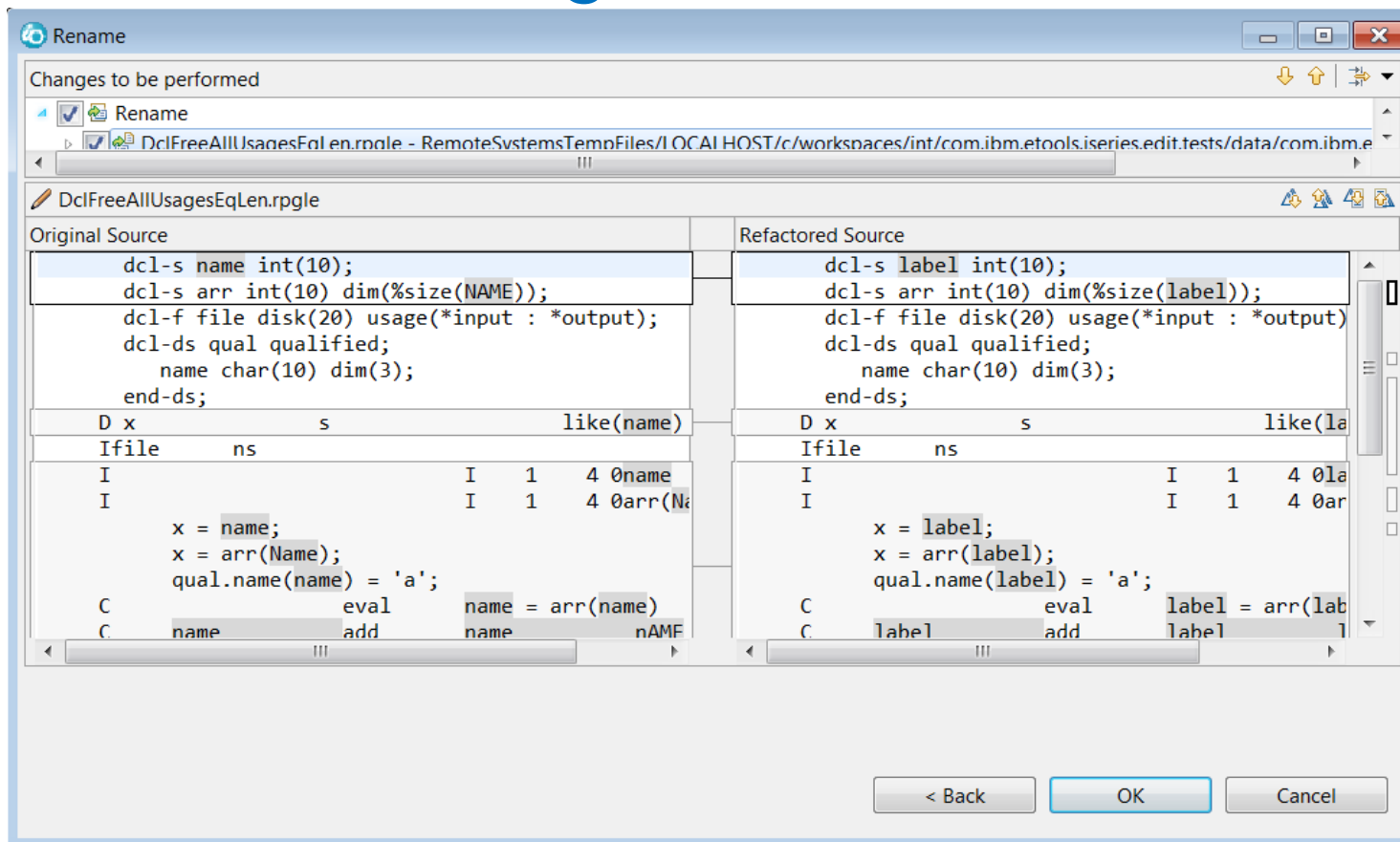
Any fool can write code a computer can understand.... Good programmers write code that a human can understand.

Martin Fowler

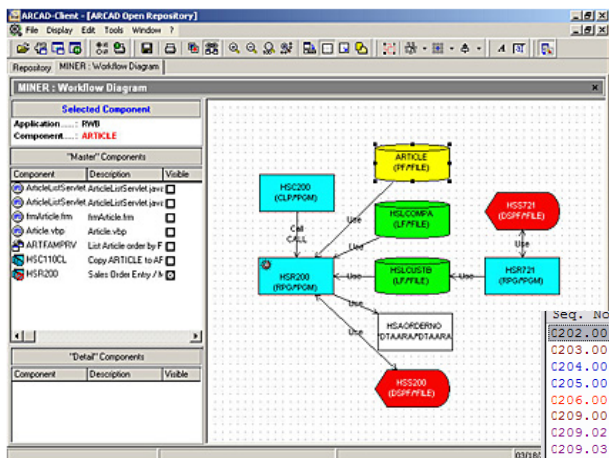
Names

- Names are critical to
 - Revealing the programmer's intent
 - Provides meaning
 - Making the code read like prose
 - Maintainability
- Changing code without changing the function
- Since the tool makes renaming easy and error-free there is no excuse to tolerate cryptic or out-of-date names any more
- It works within fixed, free and fully free (**FREE) source
- Better than Find -> Replace

Rename Refactoring

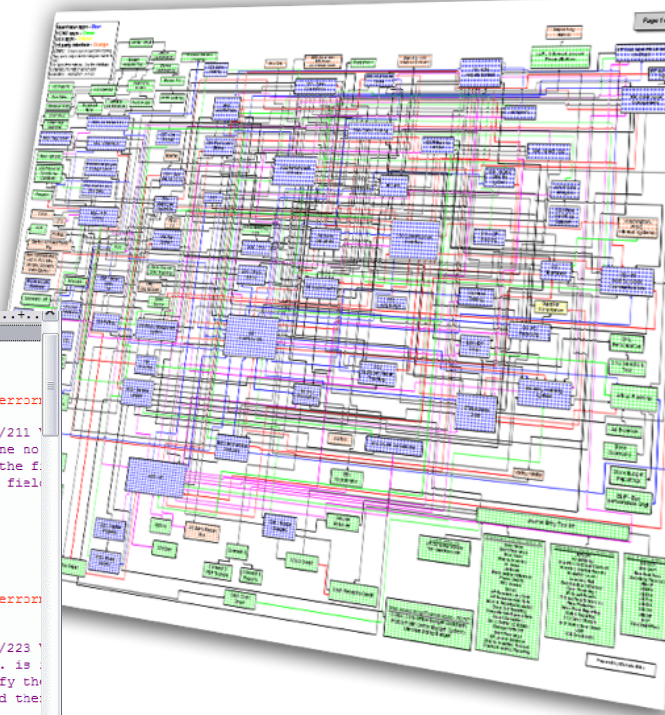


Tools for Program Understanding



```

Seq. No. 1 2 3 4 5
G202.00 C *?Customer name
G203.00 C if CNAME = *blanks
G204.00 C eval *in32 = *on
G205.00 C eval msgid = 'OEM0012'
G206.00 C callp(e) rtnmsgtxt(msgid:error
endif
G209.02 ?#!BRC* Business Rule No. XRAPPS/QRPGLESRC/CUSFMINT/211
G209.03 ?#!BRC* V00002 CUSF TELNO The telephone no
G209.04 ?#!BRC* If the field "Phone" is not blank , verify the f
G209.05 ?#!BRC* 0123456789'. If other values found then the field
G211.00 C *?Telephone number
G212.00 C if TELNO <> *blanks
G213.00 C ' 0123456789' check TELNO z1
G214.00 C if %found
G215.00 C eval *in34 = *on
G216.00 C eval msgid = 'OEM0014'
G217.00 C callp(e) rtnmsgtxt(msgid:error
endif
G220.00 C
G221.00 C
G221.02 ?#!BRC* Business Rule No. XRAPPS/QRPGLESRC/CUSFMINT/223
G221.03 ?#!BRC* V00003 CUSF FAXNO The fax. no. is
G221.04 ?#!BRC* If the field "Fax. No." is not blank , verify the
G221.05 ?#!BRC* against ' 0123456789'. If other values found then
G221.06 ?#!BRC* is invalid.
G223.00 C *?Fax number
G224.00 C if FAXNO <> *blanks
G225.00 C ' 0123456789' check FAXNO z1
    
```



ARCAD – Observer
 FRESCHÉ – X-Analysis

<http://arcadsoftware.com/products/arcad-observer-application-analysis/>

Why a Tool for Analysis?

- Rapid analysis for hot fixes
- Application Change Studies (cost estimation)
- Redesign/re-architecting/SOA
- Extraction of business rules
- Application modernization
- Skill transfer
 - Help new people learn the application
- Generation of documentation required by regulatory constraints



Provides the
Blueprint

Time to start understanding your code

April 2017 Announce...

ARCAD Observer is now included in EES
ARCAD Observer for i - 5733-A01

- Plugs into RDi

<https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?infotype=AN&subtype=CA&htmlfid=897/ENUS217-151&appname=lenovous&language=en>



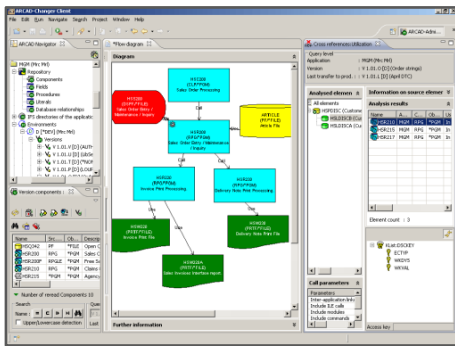
ARCAD-Observer

Application analysis

OBSERVER
Application Analysis



Summarize application components in an easy to digest way



More than 50% of developers time is spent understanding application's

An immediate solution for missing or obsolete documentation

- Diagrams: I/O, database relationship, chain
 - Observe and analyze applications with diagrams
- Flowcharts
 - Observe and analyze applications with flowcharts
- Macroscopic views
 - Drill down to all dependencies between components
- Source code analyzer
 - Enhance source code graphically
- List manager
 - Analyze custom groups of components
- Documenter
 - Automatically generate diagrams, documentation & HTML
- Eclipse based RDi Plug-in
 - Accessible directly from RDi
- Ready for Rational
 - IBM validated integration with RDi



Data & Data Access



Why Modernize Your Reporting Environment

- Turn DATA into INTELLIGENCE
- Delivered at the right time, in the right formats
- Take advantage of SQL Capabilities
- Document the database, and standardize on data meaning (single version of the truth)

- Get I/T out of the Report Writing Business
 - With self service reporting solutions
- Eliminate redundancy
- Adapt more quickly to changes in the operational systems/databases
- Deploy reports in a variety of highly intuitive ways
 - Mobile, Excel, Dashboards, OLAP

- Improve the perception of the “AS/400”

Parameters

Country: France Germany United States

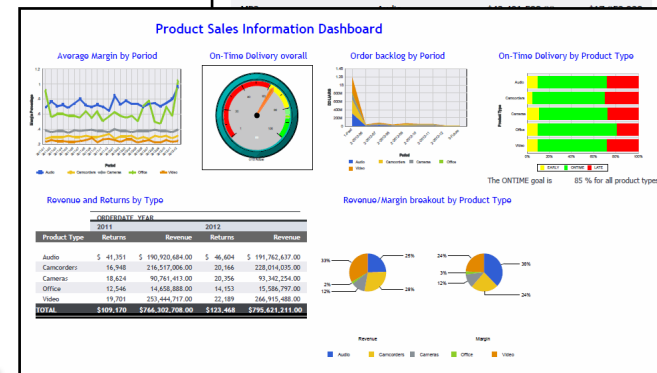
Product Type: No Selection Audio Camcorders Cameras

Run in a new window

Revenue by Country and Product Type

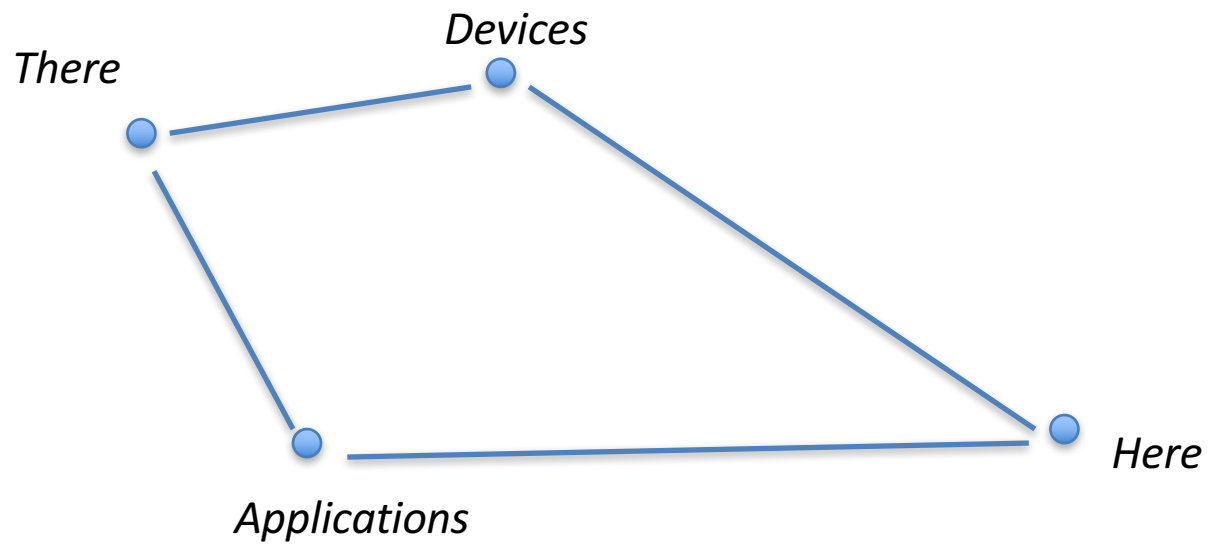
3e - PDF Revenue Summary by Product Category

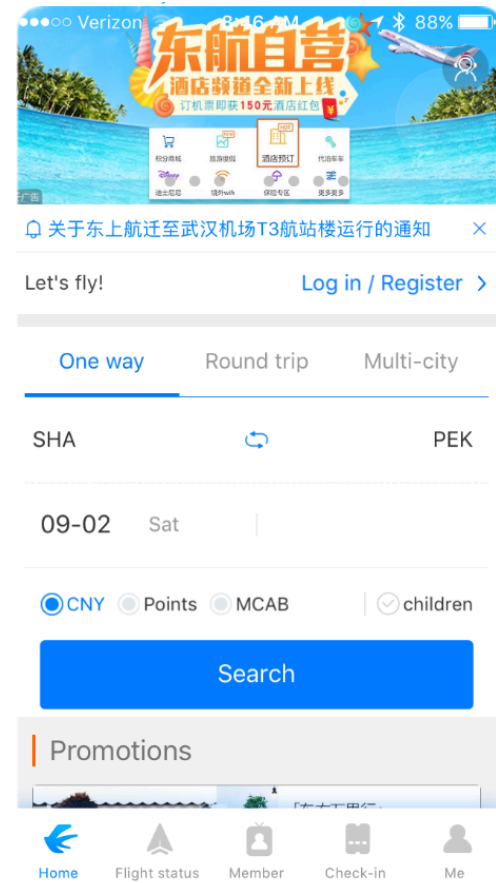
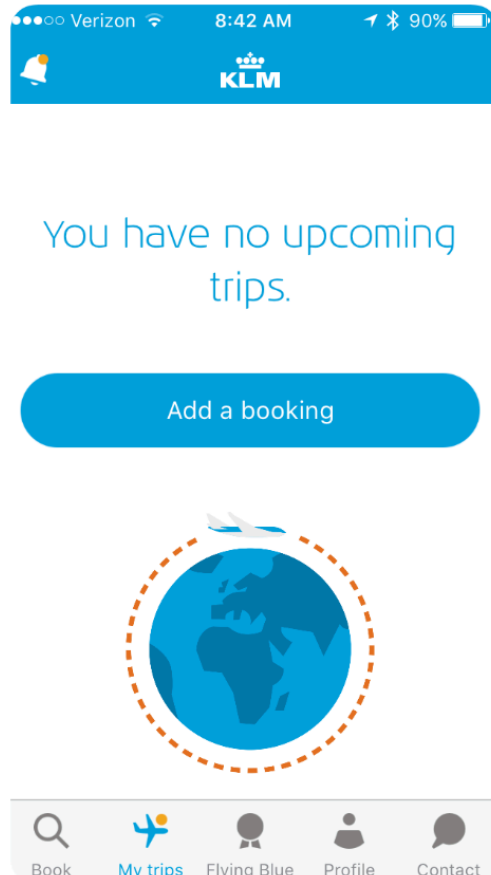
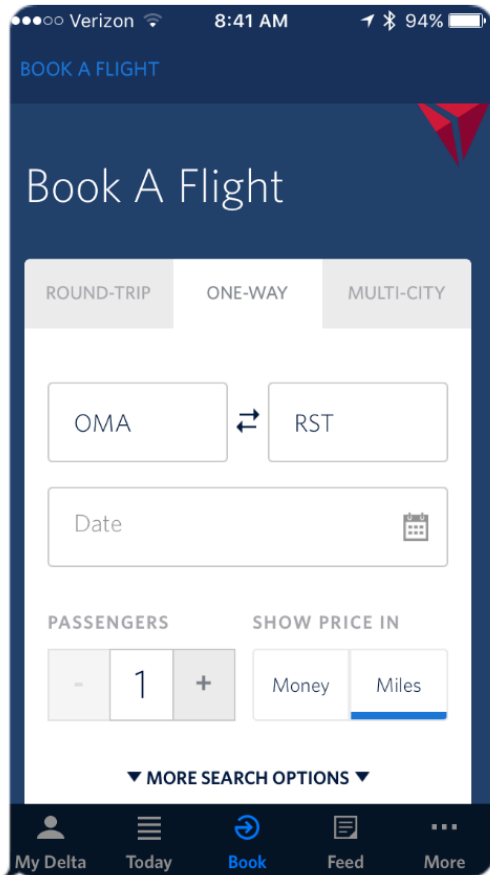
Product Category	Product Type	Revenue	Gross_Profit
Amplifiers/PreAmps/Tuners	Audio	\$42,374,428.00	\$16,634,858
Audio Systems	Audio	\$122,345,680.00	\$40,062,860
CD Players and Recorders	Audio	\$53,847,459.00	\$16,008,999
Digital Cameras	Cameras	\$184,103,667.00	\$50,774,837
Digital Camcorders	Camcorders	\$13,614,953.00	\$7,102,353
DVD	Video	\$329,872,045.00	\$81,103,145
DVD Camcorders	Camcorders	\$379,376,637.00	\$79,003,287
Handheld and PDA	Office	\$18,533,190.00	\$4,465,779
MiniDV Camcorders	Camcorders	\$51,539,451.00	\$17,411,091



DB2 Web Query

Connections





API Definition

Application

Programming

Interface



API Definition

Application programming interface

From Wikipedia, the free encyclopedia

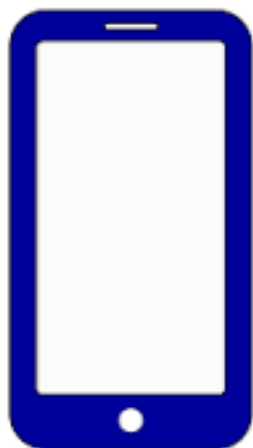
"API" redirects here. For other uses, see [API \(disambiguation\)](#).

In [computer programming](#), an **Application Programming Interface (API)** is a set of [subroutine](#) definitions, protocols, and tools for building [application software](#). In general terms, it is a set of clearly defined methods of communication between various software components. A good API makes it easier to develop a [computer program](#) by providing all the building blocks, which are then put together by the [programmer](#). An API may be for a web-based system, [operating system](#), [database system](#), [computer hardware](#) or [software library](#). An API specification can take many forms, but often includes specifications for [routines](#), [data structures](#), [object classes](#), [variables](#) or [remote calls](#). [POSIX](#), [Microsoft Windows API](#), the [C++ Standard Template Library](#) and [Java APIs](#) are examples of different forms of APIs. Documentation for the API is usually provided to facilitate usage.

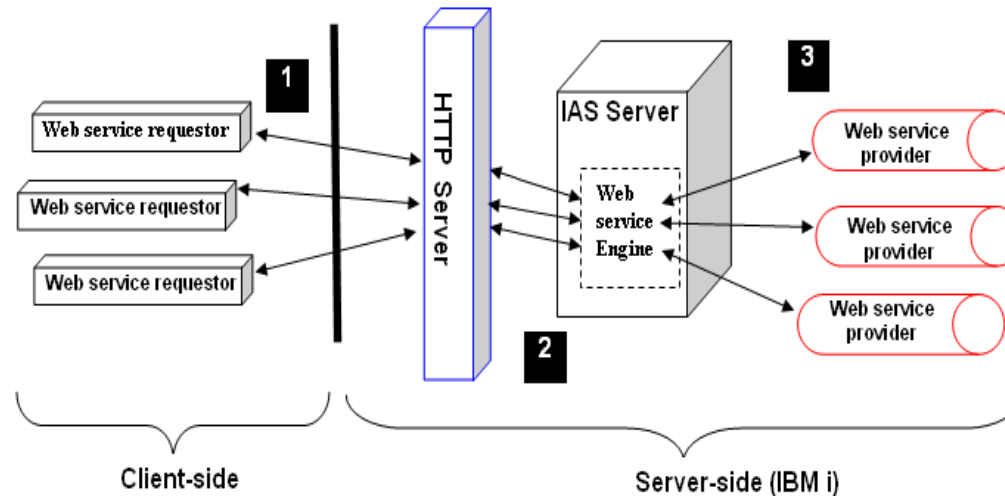


APIs - Simple

Simple way to connect endpoints. Send a request and receive a response.



Web service client/server flow does not change



- Create and Host APIs – IWS Server
 - SOAP Web Services (JAX-WS)
 - REST Web Services (JAX-RS)
- Call Web Services from your native RPG/COBOL. - IWS Client

<http://www.ibm.com/systems/i/software/iws/>

How do you access IBM i Information ?

Past

- Write code to call
 - CL Commands
 - System APIs
- Write more code to sort, filter, find what you are after

Today with SQL Services

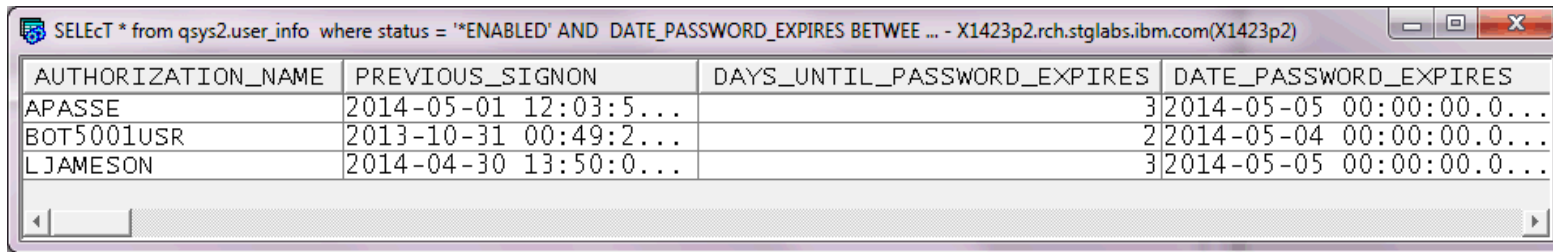
- With a single SQL statement
 - Retrieve information
 - Leveraging the power of SQL
 - Sort, Filter, find what you are after



Built in DB2 Services – Use SQL to get info from the system!

Who's password is about to expire

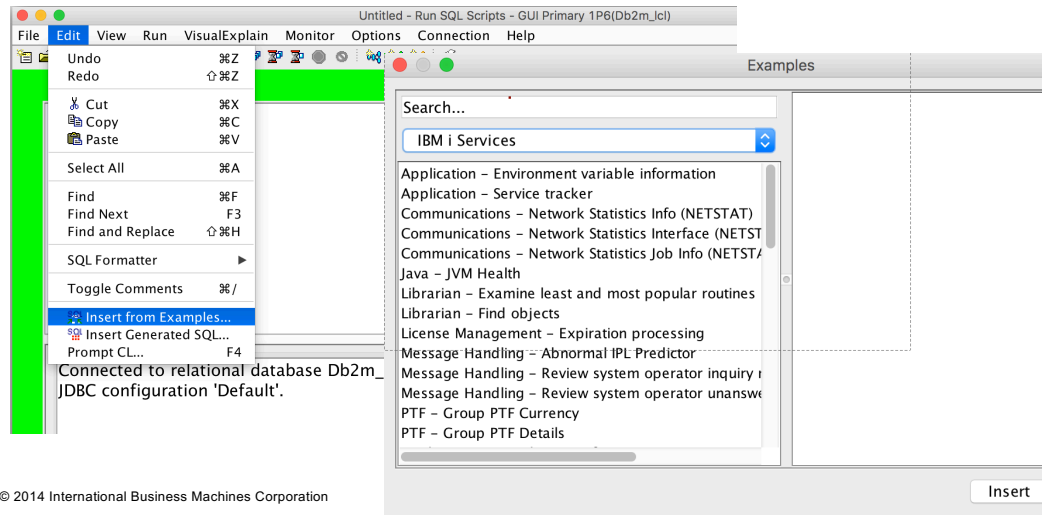
```
SELECT * from qsys2.user_info where status = '*ENABLED' AND DATE_PASSWORD_EXPIRES BETWEEN CURRENT TIMESTAMP AND CURRENT TIMESTAMP + 7 DAYS;
```



AUTHORIZATION_NAME	PREVIOUS_SIGNON	DAYS_UNTIL_PASSWORD_EXPIRES	DATE_PASSWORD_EXPIRES
APASSE	2014-05-01 12:03:5...	3	2014-05-05 00:00:00.0...
BOT5001USR	2013-10-31 00:49:2...	2	2014-05-04 00:00:00.0...
LJAMESON	2014-04-30 13:50:0...	3	2014-05-05 00:00:00.0...

Examples included in ACS

<http://ibm.biz/DB2foriServices>



Untitled - Run SQL Scripts - GUI Primary 1P6(Db2m_lcl)

File Edit View Run Visual Explain Monitor Options Connection Help

Undo %Z
Redo ⇧%Z
Cut %X
Copy %C
Paste %V
Select All %A
Find %F
Find Next F3
Find and Replace ⇧%H
SQL Formatter
Toggle Comments %/
Insert from Examples...
Insert Generated SQL...
Prompt CL... F4

Connected to relational database Db2m_ JDBRC configuration 'Default'.

Examples

Search...
IBM i Services

- Application - Environment variable information
- Application - Service tracker
- Communications - Network Statistics Info (NETSTAT)
- Communications - Network Statistics Interface (NETST
- Communications - Network Statistics Job Info (NETSTA
- Java - JVM Health
- Librarian - Examine least and most popular routines
- Librarian - Find objects
- License Management - Expiration processing
- Message Handling - Abnormal IPL Predictor
- Message Handling - Review system operator inquiry r
- Message Handling - Review system operator unanswe
- PTF - Group PTF Currency
- PTF - Group PTF Details

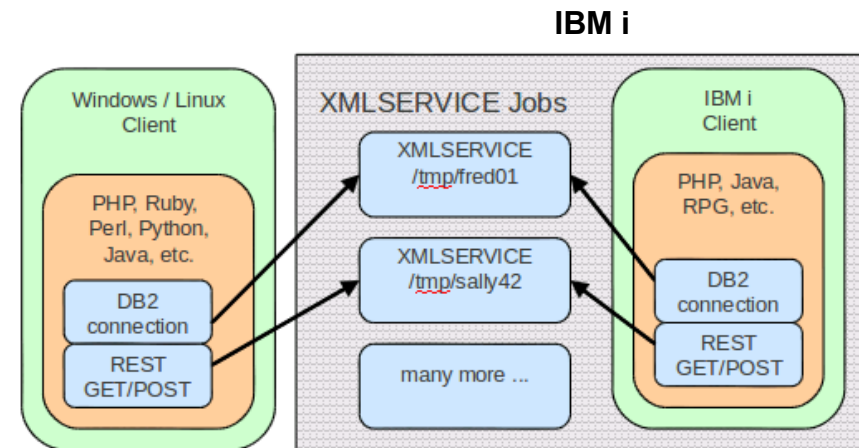
Insert

XML Service

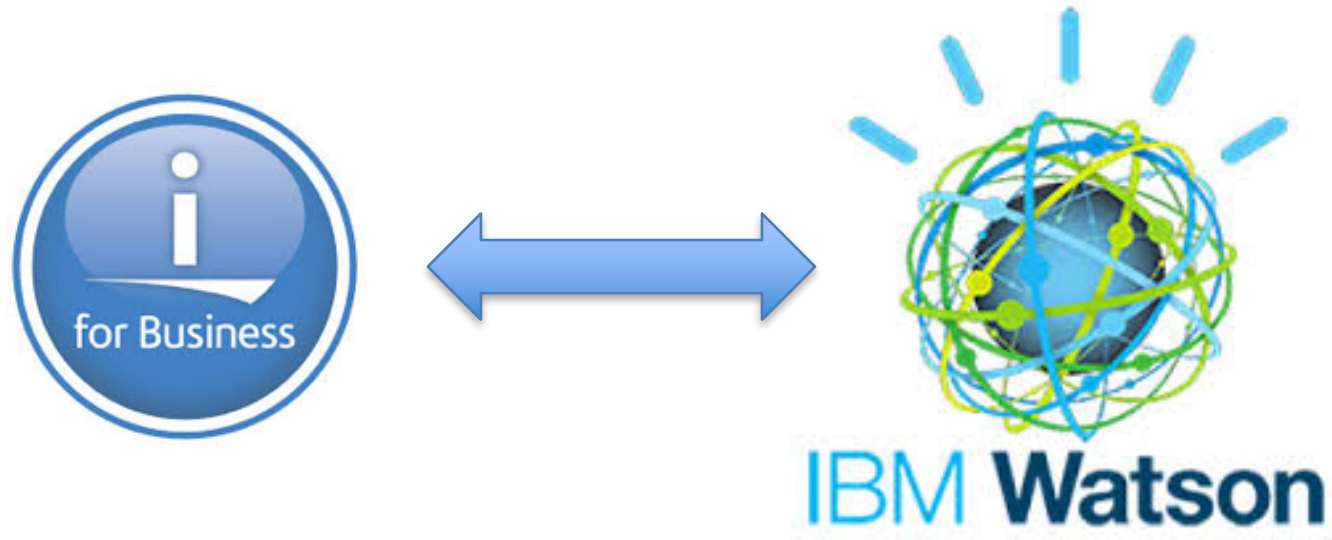
Easy access to IBM i data and resources from PHP

(similar to IBM ToolBox for Java)

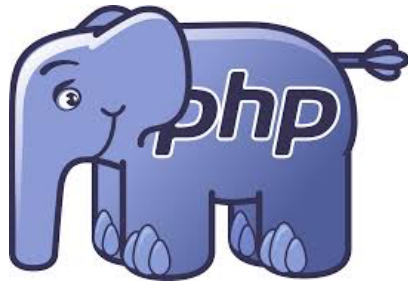
- DB2 for i – SQL and Native
- Program call
- Procedure call
- Data Area
- Data Queue
- Message Queue
- Commands
- System values
- Spool files



<http://www.youngprofessionals.com/wiki/index.php/XMLSERVICE/XMLSERVICE>



Some Key Open Source Technologies



What are our Customers Doing with it ?

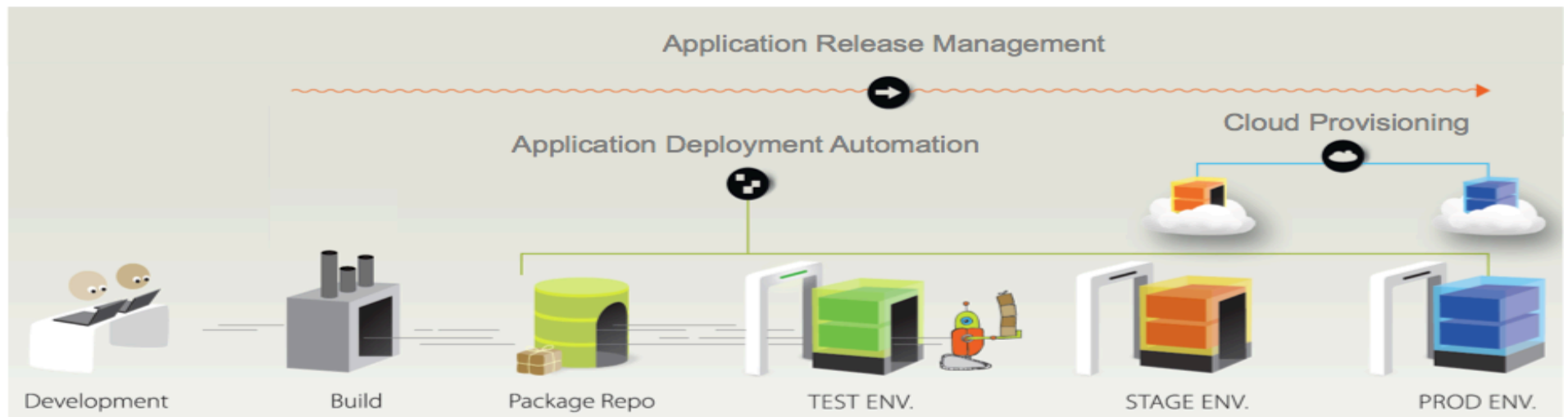
- New ways to leverage their data
- Modern UI
- Opening new Markets or expanding existing



<https://is.alliedrefrigeration.com/arhome.php>

DevOps

Helping development meet the needs of the business at the speed of business



What is DevOps

**Accelerate
software delivery –
*for faster time to value***

**Balance speed, cost, quality and risk
*for increased capacity to innovate***

**Reduce time to customer feedback
– *for improved customer experience***

Process

Culture

Technology

DevOps

To learn more visit:
<https://www.ibm.com/devops/method>



The Systems is NOT Old....its what
you have choosen to do with the
system that defines its 'Age'

Art of the Possible

IBM i 7.1 Concerns

- IBM i 7.1 has been out for 7 years
- Many parts are getting very long in the tooth....



SMB1

WebSphere®

Application Server

SSL/TLS

IBM i 7.1 Concerns

- **Java**

- Default version of Java is Java 6
- Just announced - Java 6 will reach EOL Dec 2017
 - No more fixes
 - No more security patches
 - Only option is to move to newer version of Java
- Oracle ended Java 6 (for premium customers) Dec 2016
- IBM went an additional year with support



IBM i 7.1 Concerns

- **Apache**
 - DG1 – HTTP Server Powered by Apache
 - Ships Apache 2.2
 - Apache Foundation announced EOL for 2.2 for Dec 2017
 - No more security patches available
 - This applies even if you purchase extended service
 - Only option – Move to new IBM i OS



IBM i 7.1 Concerns

SMB1

- **SMB1**
 - Recent US-CERT and Microsoft advisories recommend disabling SMB1
 - Internal MAD vulnerability scan failures based on the advisories
 - Microsoft plans to uninstall SMB1 in future builds of Windows 10
- This effects
 - QNTC
 - NetServer
- Resolution – Move to newer IBM i OS release

System SSL - New in 7.2 (PTFs back to 7.1)

- Transport Layer Security version 1.1 & 1.2 protocol (TLSv1.1 and TLSv1.2) RFC 4346 & RFC 5246
 - SHA2 support

WARNING: Payment Card Industry (PCI) will require TLS 1.1 or TLS 1.2 in June, 2018. IBM i 6.1 does not support TLS 1.1 or TLS 1.2.

- TLS1.2 is the current “gold” standard
 - PCI requirement in June 2018 (TLS 1.1 or TLS 1.2)
 - TLS 1.1 & 1.2 support exists in 7.1 and 7.2
 - IBM i 6.1 and earlier will not meet PCI requirements in 2018
 - Latest support has been PTFed to 7.1

NOTE: All versions of SSL and TLS 1.0 have been deemed unsecure and should never be used!

Questions and Answers



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