BCI433 - IBM i Business Computing

Week 1: Introduction to IBM i & Writing CLLE Programs

Agenda

- Welcome – Course introduction
- Intro to IBM i
  - What is IBM i?
  - Basic operations in ACS
- Definitions
- Write CLLE Programs
- Lab 1
- QuickCheck (Questions)

Lesson Objectives

The objectives of the lecture and lab 1:

- To familiarize you with basic IBM i (OS) operations in 5250 Emulator, i.e. green/white screen environment.
- Explain the definitions: library lists, system values, and more
- Introduction to tradition IBM i development environment, and write/run your first CL program(s)
- Introduction to printing
- Install ACS and RDi on your PC

Welcome

- Welcome to BCI433

- Course introduction
  - On Blackboard
  - Course outline
  - Course website
  - IBM i 7.4 Documentations

IBM i – A Midrange System

IBM's product offerings/lines

- System z
  - Mainframes!
- **System i / IBM i on Power System**
  - i means integration
  - IBM's midrange server line designed to grow with a business
- System p
  - (formerly RS/6000) AIX and Linux on **Power System**
  - IBM's RISC/UNIX-based server and workstation line designed to accommodate small to medium size businesses
- System x
  - PCs!!

Power Systems

- In April 2008, IBM officially merged System i and System p under the same name – Power Systems with identical hardware and a choice of operating systems.
  - Being as System i, Power Systems run IBM i.
  - Being as System p, Power Systems run AIX or Linux.
- BCI433 covers mainly the System i part of IBM Power Systems, so we mix the usage of IBM i and Power Systems.

IBM i

Developed by IBM to support medium to large scales business

i means iNTEGRATION!

A server designed for the on-demand challenges of Web and e-business, as well as core On-line Transaction Processing (OLTP) workloads, with support for multiple operating and application environments.

The History of IBM i

	System 3	1969 - 1985
	System 32	1975 - 1984
	System 34	1977 - 1985
1983 - 1994	System 36	
	System 38	1980 - 1994
	AS/400	1988 - present
	iSeries	2000 - present
	System i	2006 - 2007
	IBM i on Power Systems	2008 -

A Naming Nightmare

- The operating systems for IBM's midrange server line:
  - IBM i – runs on Power Systems or System i.
  - i5/OS (OS/400 V5R3)– runs on iServers (i5, i Series).
  - OS/400 – runs on AS/400.
  - CPF – runs on System 38.
  - ……
- IBM i, i5/OS and OS/400 are basically the same.

IBM i – A Business System

- Used by Banks, Retailers, …, e.g.
  - McDonald's Canada
  - Canadian Tire (head office and one in every store)
  - Kraft Foods
  - Loblaws
  - Holt Renfrew
  - Coca Cola

  - more…

IBM i – A Database System

- Database is built in...not added on
- All data accessed through integrated data base
- DB2 UDB for IBM i does not have a data base package
- IBM i is a data base machine
- IBM i was designed with a relational database

RELIABLE – Why we need IBM i

- "Platform Availability: Can You Spare a Minute" Gartner Group study

Platform	Outages/Server/ Year	Availability (24x365 basis)
iSeries	5.2 hours	99.94%
S/390	8.9 hours	99.90%
VAX	18.9 hours	99.78%
UNIX (all)	23.64 hours	99.73%
NT server	224.5 hours	97.44%

Power System in Seneca

- Server name: ZEUS
- Installed: in January, 2009.
- Model: IBM Power 520 Express
- URL: zeus.senecac.on.ca

PowerVM Partitioning IBM AIX, IBM i, and Linux on a Single POWER6 System

Connectivity Tools

- Access Client Solutions (ACS)
  - 5250 Emulator, Navigator for i
  - Production Environment
- Rational Developer for i (RDi)
  - The Eclipse-based Rational IDE
- MochaSoft
  - 5250 Emulator
- Websphere Devbelopment Studio Client (WDSC) (large install)

Let's sign on!

- Using IBM i ACS (5250 Emulator, Green/White Screen)
  - Find the Handouts file ACS_Setup-2197.pdf, then follow the instruction to install ACS.
  - Your IBM i (Zeus) server userid/password can be found in the Grade Center on Blackboard

IBM 3486 Terminal with 5250 functionality, From Wikipedia

Simple CL Commands

- Sign off: SIGNOFF
- Run a menu "main": GO MAIN
- Send message "HELLO" to yourself, e.g. DS433A35:
  SNDMSG MSG(HELLO) TOUSR(DS433A35)
- Display message: DSPMSG
- Run program STRJOB: CALL StrJob
- Run program STRJOB which is in library QGPL:
  Call QGPL/STRJOB

Commonly Used Function Keys

Function Key	Function
F1	Help
F3	Exit
F4	Prompt
F5	Refresh Screen
F9	Retrieve Previous Command
F12	Cancel
F23 (Shift+F11)	More options
F24 (Shift+F12)	More function keys

Definitions

Objects

- Everything on the IBM i that has a name and takes up space in storage and is not temporary – object
- On IBM i, everything is an object
  - on Unix/Windows, everything is a file
- On IBM i, objects have types.
  - The object type determines what programs are allowed to act upon that object
- The object types used in Lab 1:
  - *USRPRF, *LIB, *CMD, *MSGQ, *OUTQ, *FILE and *PGM

Libraries

- **Library**: an object whose purpose is to 'store' and index other **objects.**
  - i.e. objects are 'stored' in libraries.
  - like a directory in Unix/Windows
- Object Type is *LIB
- QSYS is the only library that can contain other libraries
- Allowing access to an object additionally requires allowing access to the library that contains the object

About Your Student Library

- Your 'student library' is the library which has the same name as your Userid or profile.
- What Objects Do You Have (in your course library)?
  - An Output Queue which has the same name as your userid.
  - All objects which you create will be stored in your current library which is your student library by default.

Library List

- Used when an object is referred to without including the library name where it is stored
- Library List consists of:
  - System portion of library list, which is QSYSLIBL and usually is a list of IBM libraries with IBM objects
  - Current library, which is your student library
  - User Portion of library list, which is QUSRLIBL and usually contains libraries with commonly shared user objects
- A system administrator decides what libraries are included
- Library Lists are built when you sign on and are deleted when you signoff

System Values

- Variables maintained by the operating system to set up IBM i.
- Examples:
  - QSYSLIBL – System libraries for library list
  - QUSRLIBL – User libraries form library list
- The command to display a system value:

  DSPSYSVAL QSYSLIBL

User Profiles

- Each **Userid** has a **User Profile** which describes the **user** and user's authorities
- **User Profile** Contains information such as
  - Current Library,
  - default output queue and message queue
  - password,
  - class of user

Work With Active Jobs

- A '**job**' is any and every piece of work on the IBM i.
  - Jobs run in subsystems rather than directly in IBM i
  - Two types:
    - interactive jobs – start when a user signs on
    - batch jobs – background, e.g. compile a program
- Command WRKACTJOB shows you:
  - all the jobs that are currently running in IBM i
  - jobs' status.
  - the option to end jobs

Output Queues & Spooled files

- A **queue** is a line-up! A place (object) where things wait.
- Examples of IBM i queues:
  - job queues: where batch jobs wait
  - message queues: where messages wait
  - output queues: where spooled files wait to print
    - Object type?
- Spooled files: Formatted output (in output queue) ready for printing

Source Physical Files

- Source physical file – object that stores program source code
- Object type: *FILE
- A source file may have many members.
- Each member of a source physical file is a separate program (code).
- When a member, e.g. a CLLE code, is successfully compiled a new program object (*PGM) is placed in a library (usually your current library)

PDM

- Program Development Manager (used in green/ white screen)
- The tool that gives easy access to a programmer's stuff (libraries, files, and members)
  - WRKLIBPDM *LIBL
  - WRKOBJPDM DS433A35
  - WRKMBRPDM QCLLESRC
- "WRK", i.e. work
  - What is the Unix/Linux command or English word that is equivalent to "WRK" in IBM i?

Creating CL Program

- About CL
  - What does CL stand for?
  - CL program type: CLLE
  - CL Code is between : PGM and ENDPGM
- To list all members in source physical file QCLLESRC:
  - WRKMBRPDM QCLLESRC
- To work with compiled CL program - *PGM object:
  - WRKOBJPDM DS433E35
- To see your compiler listing
  - WRKSPLF, or
  - Use Printer Output from ACS – in pdf

LPEX / SEU Editor Commands

Command (on line #)	Operation
I	Insert a line
D	Delete a line
C	Copy a line
M	Move a line
A	Paste After
B	Paste Before
CC, CC	Copy multiple lines
DD, DD	Delete multiple lines
MM, MM	Move multiple lines

Lab 1 demo

Homework

- Review lecture notes.
- Setup ACS on your PC
- Complete Lab 1
- Install RDi 9.6 (for Lab 2 in next week)

The End