API

What is an API

- Application Program Interface
- It is a documented way to execute in an application a function.
- They are many many many API…
- This workshop is only an overview of some i5/OS API's.
- An Api is just a program

CL commands

- Some API are very well known…
- QCMDEXC
- Is used to run a CL command from an HLL program..

Data Queue

- A dataqueue is an object like a message queue.
- Normally when a message is dequeued (read from the queue) the message is deleted from the queue.
- Useful for Asynchronous processing or interprocess communication
- Data Queues can be indexed

DataQueue API

- CRTDTAQ (CL Command)
- QCLRDTAQ Clear Data Queue
- QSNDDTAQ Send message to Queue
- QRCVDTAQ Read message from Queue
- QMHRQQM Read data queue 'no delete
- QDLTDTAQ Delete the data queue

Syntax

- **Receive Data Queue (QRCVDTAQ) API**

Required Parameter Group:

• 1	Data queue name	Input	Char(10)
• 2	Library name	Input	Char(10)
• 3	Length of data	Output	Packed(5,0)
• 4	Data	Output	Char(*)
• 5	Wait time	Input	Packed(5,0)

Syntax

- **Send Data Queue (QRCVDTAQ) API**

Required Parameter Group:

1	Data queue name	Input	Char(10)
2	Library name	Input	Char(10)
3	Length of data	Output	Packed(5,0)
4	Data	Output	Char(*)

User Space

- A user space is the basic i5/OS storage object.
- A user Space is limited to 16MB
- It is something like a data area
- It is accessed through API's

User Spaces API

- QUSCRTUS Create a user Space
- QUSCHGUS Change a user Space
- QUSRTVUS Retrieve data from Space
- QUSDLTUS Delete a User Space
- QUSPTRUS Set a Pointer to a Space

Syntax

- **Create User Space (QUSCRTUS) API**

Required Parameter Group:

1	Qualified user space name	Input	Char(20)
2	Extended attribute	Input	Char(10)
3	Initial size	Input	Binary(4)
4	Initial value	Input	Char(1)
5	Public authority	Input	Char(10)
6	Text description	Input	Char(50)

Optional Parameter Group 1:

7	Replace	Input	Char(10)
8	Error code	I/O	Char(*)

Syntax

- **Change User Space (QUSCHGUS) API**

Required Parameter Group:

1	Qualified user space name	Input	Char(20)
2	Starting Position	Input	Binary(4)
3	Len	Input	Binary(4)
4	Input Data	Input	Char(*)
5	Force Change to Aux Stg	Input	Char(1)

Optional Parameter Group 1:

6	Error code	I/O	Char(*)

Error Code parameter

- Structure (Qusec from qsysinc/qrpglesrc)
  - Bytes provided BIN(4)
  - Bytes available BIN(4)
  - Exception ID CHAR(7)
  - Reserved CHAR(1)
  - Exception dta *

List API

- List objects
- List Spooled Files
- List Jobs

These API's put the list of items in a userspace. Faster than OUTPUT(*OUTFILE)

Sample List of Objects

- **List Objects (QUSLOBJ) API**
- Required Parameter Group:

1	Qualified user space object	Input	Char(20)
2	Format name	Input	Char(8)
3	Object and library name	Input	Char(20)
4	Object type	Input	Char(10)

- Optional Parameter Group 1:

5	Error Code	I/O	Char(*)

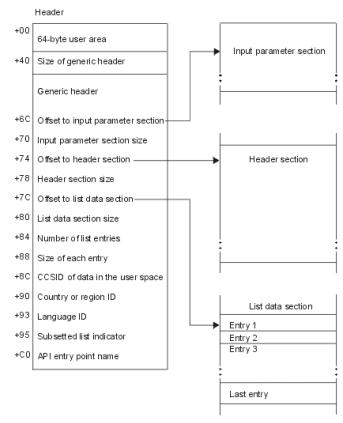
FORMAT

- The name of the Format is the name of the data structure
- see QSYSINC/QRPGLESRC
- OBJL0100

	From	To	
Object Name	1	10	CHAR(10)
Object Library	11	20	CHAR(10)
Object Type	21	30	CHAR(10)

User Space STRUCTURE

- 4 sections:
  - User area
  - Generic Header
  - Input Parm
  - List Data (formattted with the FORMAT)



Usefull Sample

- Change Library Owner CLO00R

```
D  GenDS          DS                  Based(SpcPtr)
D  UserArea                      64
D  GenericHeader                 44
D  Of2InputParm                  10I 0
D  SizeInutParm                  10I 0
D  Of2Header                     10I 0
D  SizeHeader                    10I 0
D  Of2Data                       10I 0
D  SizeData                      10I 0
D  NbrEntries                    10I 0
D  SizeEntry                     10I 0
```

IFS

- IFS is the principal Storage of i5/OS
- Accessed through '/' (WRKLNK)
- Directories and stream files
- /QSYS.LIB.. Hold classical objects and libraries..
- /QDLS for old fashion 'folders' (WRKLFR)

IFS API

IFS is accessed through the standard C library

- Stat
- Open
- Read
- Write
- Close

Sample IFS RPG

- See RedBook (Sorcered guide)
- Sample program COAPI20R
- COPYSRCF command

Math

- C API (the standard C Library)
- BNDDIR(QC2LE)
- All math functions are available
- Example Cosine
  - C definition

```
double cos(double)
```

- RPG prototype

```
* Prototype for cos function
D Cosine   Pr           8F ExtProc('cos')
D Double                8F Value
```

Sample trigo

- Calculate the length of the 3rd side.
- Formula :

$* \; C = A^2 + B^2 - 2AB \sqrt{(COS(\alpha))}$

```
Length3 = ((Length1 ** 2) +
          (Length2 ** 2) –
          (2 * Length1 * Length2 *
              Cosine(Radians)) ** 0.5
```

Sample Math

- See COAPI30R

Async List

- Uses a server job
- Used by iNavigator
- For Spooled files, objects, job log, messages,…
  - QGYOLSPL QGYOLOBJ …
  - QGYGETL
  - QGYCLST
- Very FAST

LAB Environment

- Network : COMMON
- Pass : Luxembourg

- IP : 192.168.0.100
- User COMLABXX
- Pwd COMLABXX
  - Your library is COMLABXX

Exercice

Monitor System Daemon.

```
     Data queue for data collection
 1. Create the data queue
 2. Clear the Data Queue
 3. Start the daemon
 4. Store the data
 5. Reload the parameters
 6. Dump the program
 7. End the Daemon

                 Option...::  00
```

Exercice

- Daemon Logic
- Read Data Queue
  - Retrieve System Status (QWCRSSTS)
  - Store the result in a User Space
  - If Command = STO
    - Store the data from the User Space in a table
  - If Command = END
    - Stop
- Loop