

APIs by Example: Analyze Activation Groups

[System iNetwork](#)

System iNEWS Staff

Thu, 02/10/2005 (All day)

For this installment of APIs by Example, I have written a utility based on two Open List APIs: "Open List of Activation Group Attributes" and "Open List of Activation Attributes." The utility is presented in the form of the Analyze Activation Groups (ANZACTGRP) command.

The Open List APIs topic has been discussed earlier in APIs by Example, in the following article of July 15, 2004: <http://iseries.pentontech.com/t?ctl=196B:103C2>

Activation groups are an aspect of the ILE (Integrated Language Environment) runtime and constitute a substructure of any job on the iSeries. The activation group contains the resources that are necessary to run a program, including static program variables, dynamic storage, open files (ODPs), SQL cursors, and many more.

You can control which activation groups your ILE programs run in by specifying the ACTGRP parameter on the Create Program (CRTPGM), Create Bound Program (CRTBNDxxx), or Create Service Program (CRTSRVPGM) command. The following screen shot shows where you specify the activation group on the CRTPGM command:

```

=====
                          Create Program (CRTPGM)
Type choices, press Enter.
Program . . . . . Name
Library . . . . . *CURLIB Name, *CURLIB
Module . . . . . *PGM Name, generic*, *PGM, *ALL
Library . . . . . Name, *LIBL, *CURLIB...
+ for more values
Text 'description' . . . *ENTMODTXT

Activation group . . . . QILE Name, *NEW, *CALLER

=====

```

For OPM programs, the system creates two default activation groups for each job on the system and names them *DFTACTGRP. Running the command WRKJOB OPTION(*ACTGRP) produces the following panel:

```

=====
                          Display Activation Group
Job:   QPADEV000D   User:   JAN   System:   S4004122
Number:   129706
-----Activation Group-----
Number      Name          In Use Indicator
0000000001  *DFTACTGRP             Yes
0000000002  *DFTACTGRP             Yes
0000000480  QILE                   No
0000000588  QLGLOCAL               No

=====

```

Activation groups 1 and 2 are the default activation groups that provide the scope of an OPM program's runtime resources. In the above example, the named activation groups QILE and QLGLOCAL are created as a result of calling an ILE program or service program that has been assigned to one of those activation groups.

The "In Use Indicator" column specifies whether the activation group is currently in use or not. An activation group that's not in use can be reclaimed using the Reclaim Activation Group (RCLACTGRP) command.

Use this command with great caution! Programs in other activation groups could still have a pointer to an activation of a service program in the activation group being reclaimed. This will cause a subsequent call to that program to generate an MCH3402 exception: "Tried to refer to all or part of an object that no longer exists."

Although you are able to find out what activation groups are currently active within a given job using the WRKJOB or DSPJOB OPTION(*ACTGRP) command, there is no facility available to display which programs are activated within each individual activation group.

That's where the Analyze Activation Groups (ANZACTGRP) command comes into play -- here's the command prompt:

```

=====
                        Analyze Activation Groups (ANZACTGRP)
Type choices, press Enter.
Job name . . . . . *          Name, *
  User . . . . .          Name
  Number . . . . .          000000-999999
Activation group name . . . *ALL      Name, *ALL, *DFTACTGRP

=====
```

The command's help text offers more details about the command's individual parameters. The output from the command is directed to a spooled file and placed on the default output queue of the job that runs the command.

For each activation group that is included in the list, a number of activation group attributes are presented. These include, among others, the group name and number, a variety of storage information, and the name and type of the program that caused the activation group to be created.

Following each activation group is a list of all of the programs that are currently activated within the activation group. The following is an example of what part of the list might look like:

```

=====

2/04/05  19:43:37          Job activation group attributes

Job name . . . : QPADEV000D      User . . . . . : JAN

Group name      Number  Activations   Heaps  Static stg.  Heap stg.
QTESAGRP        2531      44           1    4886528      94208

Activation nbr.  Static stg.  Program    Library    Type
-----
      2532        262.144    QTEMODN    QSYS       *PGM
      2533      5,242.880    QC2UTIL1   QSYS       *SRVPGM
      2534        196.608    QC2LOCAL   QSYS       *SRVPGM
      2535      3,145.728    QLEAWI     QSYS       *SRVPGM

=====
```

The activation group concept and activation group management is documented in great detail in the ILE Concepts manual (SC41-5606) that can be found at <http://iseries.pentontech.com/t?ctl=1967:103C2>.

Specifically, chapter 3 (starting with page 29) and chapter 6 offer a lot of information on the subject of activation groups.

The Analyze Activation Groups utility demonstrates the following APIs:

Open List of Activation Group Attributes (QWVOLAGP) API: <http://iseries.pentontech.com/t?ctl=1960:103C2>

Open List of Activation Attributes (QWVOLACT) API: <http://iseries.pentontech.com/t?ctl=195F:103C2>

Get List Entries (QGYGTLE) API: <http://iseries.pentontech.com/t?ctl=1962:103C2>

Close List (QGYCLST) API: <http://iseries.pentontech.com/t?ctl=1963:103C2>

Send Program Message (QMHSNDPM) API: <http://iseries.pentontech.com/t?ctl=1966:103C2>

You can retrieve the source code for this utility from <http://iseries.pentontech.com/t?ctl=1961:103C2> .

The above article was written by Carsten Flensburg. If you have any questions, you can contact Carsten at <mailto:flensburg@novasol.dk> .

Source URL: <http://iprodeveloper.com/rpg-programming/apis-example-analyze-activation-groups>