Xref Analysis Tool

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License

Introduction

One of the overlooked tools available to the Progress ABL (4GL) programmer is the xref file that can be created by the COMPILE statement. It can help identify table scanning searches, include files used, tables used, etc. in an easy to read manner.

When combined with the xref files of other programs in an application, a bigger picture can appear of what is happening. For example, if you change an include file – which programs use that include file which will require re-compiling? If you are making changes to how a table works – which programs use that table? Making changes to a program? Which programs call that program so a testing scheme can be worked out?

When you look at this tool, you will immediately realize that it is not a Progress Database nor a Progress language but the PostgreSQL[1] open source database and the PHP[2] open source language. Why didn't I choose Progress? One reason is that I wanted it to be web based as a centralized repository and not everyone has Webspeed available for use in that way. Another reason is that I use an Apple most of the time and it is convenient to have tools available on it when Progress apps don't run on it. (I remote desktop[3] into a Windows computer to access Progress.)

1 http://www.postgresql.org/ This is a pretty popular DB and one can see some of it's users at http://www.postgresql.org/about/users
2 http://www.php.net
3 http://www.rdesktop.org

Installation

Install PostgreSQL

First you need to install PostgreSQL if you have not already done so. This is actually pretty quick if you are familiar with it and might take half a day or so if you need to learn how to do it. It is pretty forgiving on configurations. One should see the documentation that is available for PostgreSQL for these instructions.

Install PHP

Once you have PostgreSQL installed, you will need to insure PHP is installed. PHP does not automatically come linked with the PostgreSQL clients. Here is how I configured PHP on my machine (you will see it is very light):

```
'./configure' '--with-apxs2=/usr/local/apache2/bin/apxs' '--with-curl' '--
enable-ftp' '--with-mysql=/usr/local/mysql-test' '--with-pgsql' '--enable-
soap' '--enable-sockets' '—with-pear'
```

The important parts are –with-apxs which identifies which entry points in the version of Apache you have available as well as –with-pgsql which assumes it is installed in /usr/local/pgsql.

Important: When you are compiling PHP or installing PHP binaries, be sure the command line tools are made available since we will be running PHP scripts from the command line!

All of these tools are available for Windows but I cannot give such instructions since I run UNIX.

Install Xref Analysis

Once you have those configured, download the zip file containing the application[4]. It

4 Often you can find this in http://www.amduus.com/OpenSrc/SrcLib/XRefAnalysis

will be named xref.yyyyjjjhhmmss.zip where:

yyyy represents the year of the distribution

jjj represents the day of the year of the distribution

hh represents the hour of the distribution

mm represents the minute of the distribution

ss represents the seconds of the distribution.

Unzip this file in a directory of your web server's DocumentRoot.

Creating the XREF database in PostgreSQL

Once you have the PostgreSQL database server up and running, you will need to create a database and load the schema SQL into it. Here are some commands to do so:

```
postgres@gaius:/appl/php/xref/sql> /usr/local/pgsql/bin/createdb -O scottauge
-h gaius -p 5432 xref1
```

which should reply:

```
CREATE DATABASE
```

This creates a database named xref1 on a machine named gaius for a server running on port 5432 which is owned by scottauge.

Next we load a schema into the database:

```
postgres@gaius:/appl/php/xref/sql> /usr/local/pgsql/bin/psql -d xref1 -h
gaius -p 5432 < postgresql.sql
```

which should reply:

```
SET
SET
SET
SET
SET
SET
CREATE TABLE
ALTER TABLE
COMMENT
COMMENT
```

```
COMMENT
COMMENT
COMMENT
COMMENT
COMMENT
COMMENT
ALTER TABLE
CREATE INDEX
```

As a check, logging into the DB[5] via

```
postgres@gaius:/appl/php/xref/sql> /usr/local/pgsql/bin/psql -d xref1 -h
gaius -p 5432
```

which says log into database xref1 found on server gaius on port 5432 (aka mpro -db xref1 -H gaius -S 5432 -N TCP in the Progress world) and then issuing the command

```
xref1-# \d
```

You should see:

```
           List of relations
 Schema |   Name   | Type  |   Owner
--------+----------+-------+-----------
 public | xref_raw | table | scottauge
(1 row)
```

The database should be good to go, now we need to tell the program how to talk to it.

Configuring DB Connection for Xref Analysis

Under the /src directory of the unzipped file for xref analysis you should see a config.php file. It will have a line similar to:

```
$dsn = 'pgsql://username:password@tcp+hostname:port/dbname';
```

For example, using our examples, it would read

```
$dsn = 'pgsql://scottauge:secret@tcp+gaius:5432/xref1';
```

5 Using a GUI tool like http://www.pgadmin.org/screenshots/ or a web based tool like http://phppgadmin.sourceforge.net/index.php can make this much easier if you are unfamiliar with a command line tool.

This basically instructs the PHP code how to connect to the proper database you have set up.

Once you have the database set up and the Xref Analysis PHP code configured to talk with it, you can start loading it up.

Loading The Database

The first thing you will need to do is create your XREF files. This can be done manually or by a tool like Zammi[6] which walks the propath given generating r-code, listings, and xref files as told to.

Once you have your list of xref files, you need to load them into the database. Under the /script directory is a command to do so. An example invocation is:

```
./ldxref -delete -appl test -propath "/appl/schdeve/work:/appl/schdeve/source"
```

Which basically says, delete all entries in the database for an application named test and load with xrefs found in the propath /appl/schedeve/work:/appl/schdeve/source.

If you do not have php as part of your path, you will need to change the line

```
php ldxref.php $@
```

in ldxref to use the absolute path to the php command line interpreter.

You must cd into the /scripts directory for any scripts that might call this automatically (such as cron.)

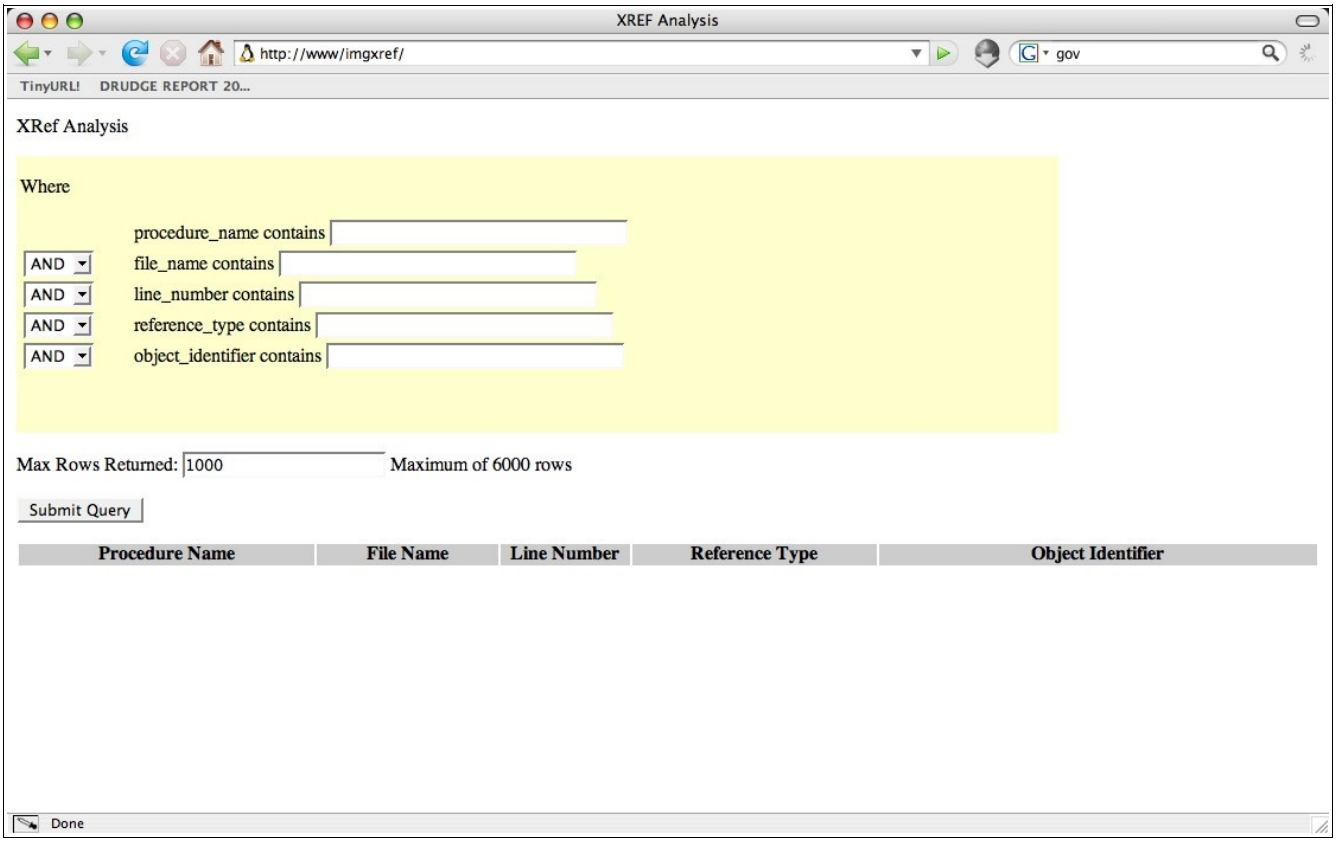
Be aware that loading large applications may take a couple of hours. A 771,201 line application took one and half hours to load on a dual 3MHz Pentium 4 CPU.

As you can imagine, using Zammi and Xref Analysis, you can nightly compile and load xrefs via a scheduler such as cron or what have you.

6 http://www.amduus.com/OpenSrc/SrcLib/Zammi/

Querying The Database

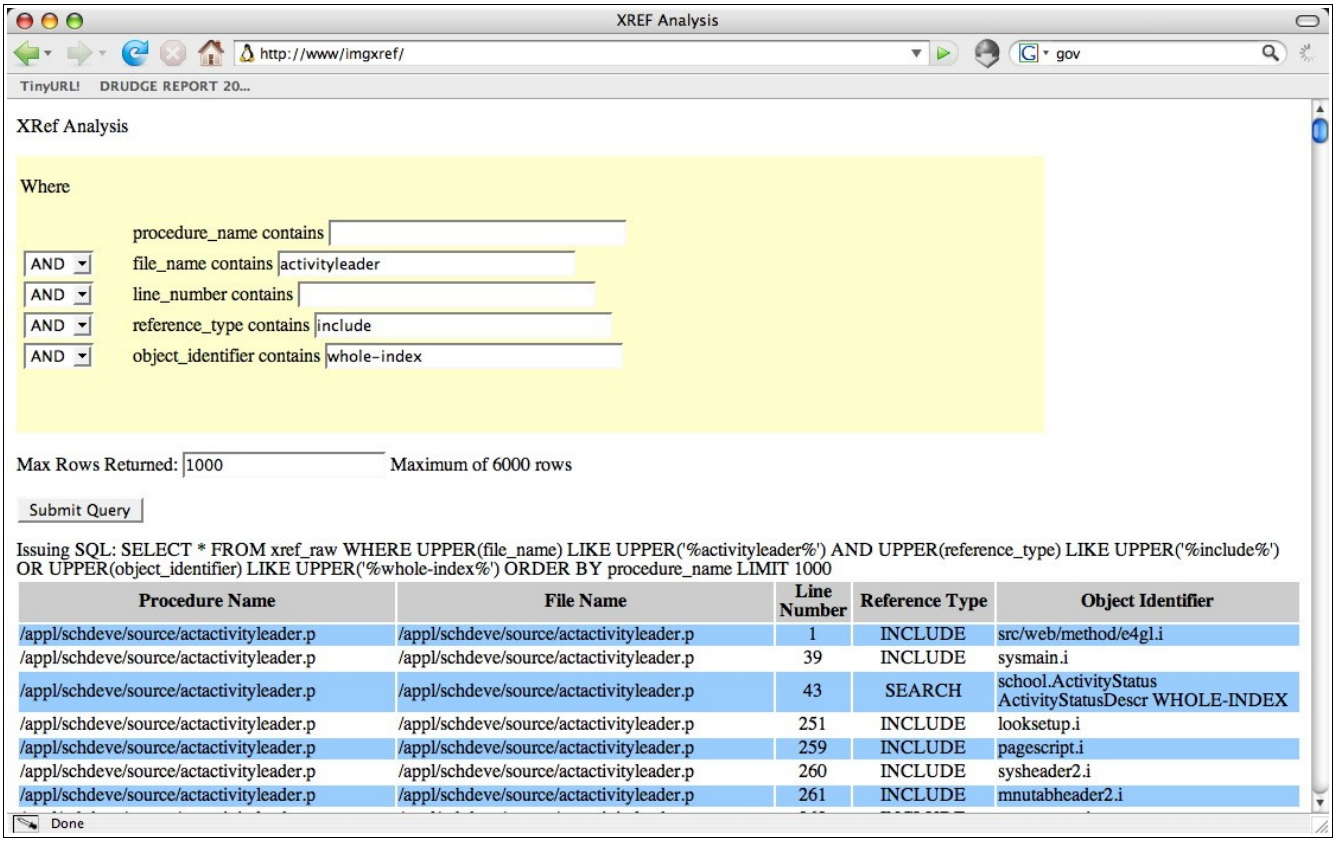
When you first access the query tool, you will receive a page similar to the following:



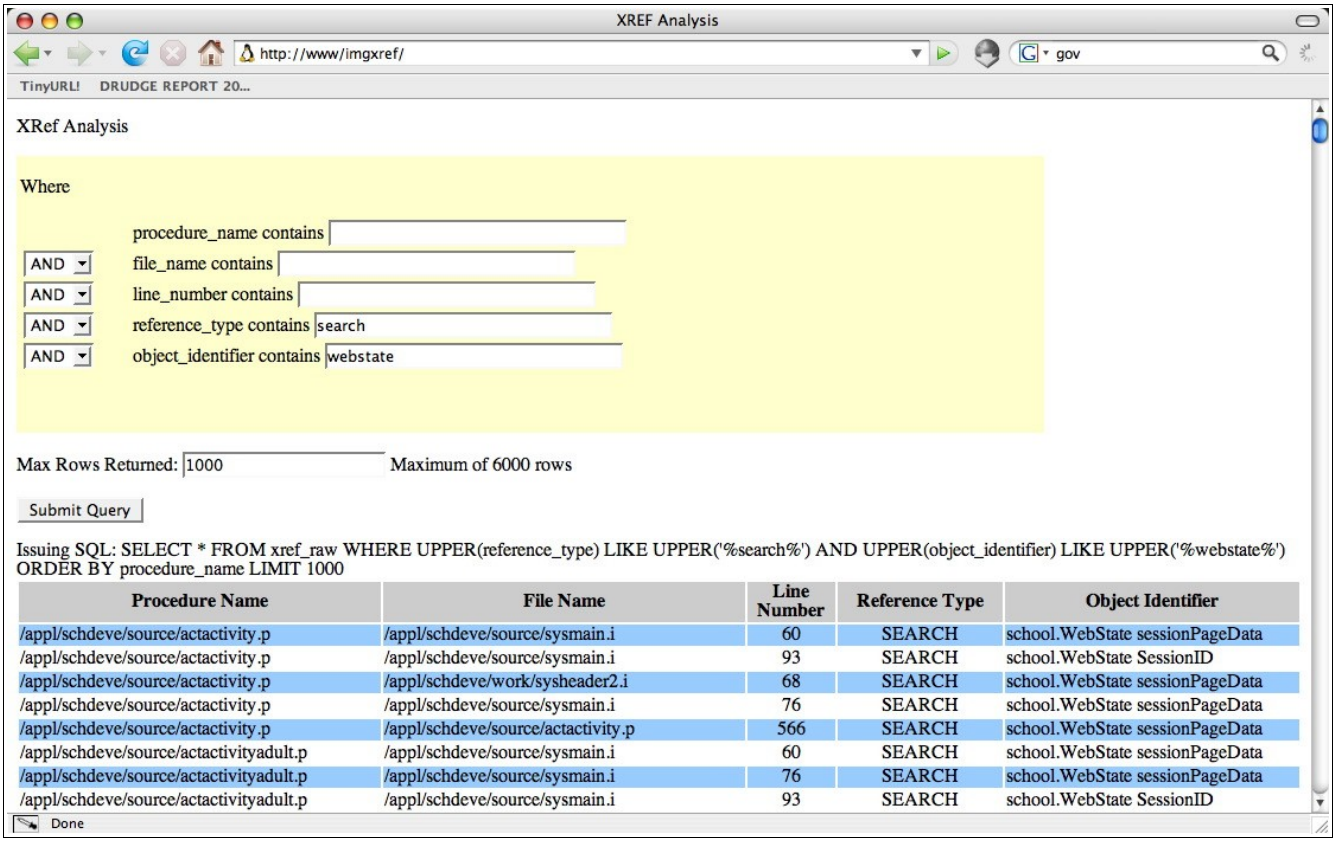
This screen allows you to search on the major components of an Xref file. If you leave the entry blank, it is ignored. If you wish to combine some entries do so by filling in the blank and choosing the conjunction to use.

Sometimes you can get a lot of entries returned – you can specify the maximum number[7] of rows to return so you don't over-run your web browser.

7 If you need more than 6000 rows to be returned, update the line 189 (or there abouts) in index.php that reads "if ($Limit > 5000) $Limit = 6000;" to the number you wish to max out at.



In this example, for the program named activityleader, tell us the INCLUDE files used as well as denote any table scans occurring (the whole-index keyword.)



In the above example, we examine all the programs that do a search (FIND or FOR EACH or Dynamic Query) on the webstate table in the application.

Examine the COMPILE statement in the Language Reference Guide for additional terms to search on in the Reference Type and Object Identifier areas.