

Progress to MySQL conversion routines

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Pro2My

Version 3.0
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Product Overview

Pro2My is a simple group of PROGRESS source code routines that can be run against any PROGRESS database to produce a series of files containing MySQL format SQL statements. These files can be used to produce a MySQL database that is a mirror of the PROGRESS database. The routines provide a method of:

- Extracting the data schema from the PROGRESS database
- Checking and converting PROGRESS data to prevent MySQL database load errors.
- Extracting the data from the PROGRESS database.
- Extracting the Security information from the database schema.
- Importing the schema, data and security into MySQL using the *mysql* command.

System Requirements

PROGRESS

The Pro2My conversion routines dynamically create and run PROGRESS programs. They also include routines that update data in the database. To run these routines, a PROGRESS development license version 6 or higher be installed on the machine from which the routines are run.

The client should be started with the "-tok 1600 -inp 32000" parameters.

MySQL

The Pro2My programs are qualified against MySQL version 3 through version 5

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Changes in Pro2My Version 3

- Changes the way the data is exported to allow tables with more fields to be dumped. Thanks to Scott Auge.
- Change to MYSQL specific commands to improve speed of load into MySQL database.
- Fixes to index creation issues.
- Fixes to handling of large text fields.
- Improvements to application usage in UNIX environments

Transferring the Schema

Chapter

2

The schema dump routines are designed to create an SQL file that can be used to create a MySQL database of the same name with the same tables.

Limitations of the schema dump

There are certain limitations of the schema dump, mostly related to limitations of the MySQL database.

1. MySQL does not currently support triggers, so no trigger information is dumped.
2. MySQL does not support sequences, although a limited replication can be achieved using auto-increment table fields.
3. MySQL requires a NON-NULL, UNIQUE, primary index. In order to ensure this, the Pro2My routines create a new primary index based on the PROGRESS recid. This ensures that the data is loaded cleanly into MySQL, but requires specific routines to manage after the data is converted. An alternative approach would be to create an auto-increment variable for the primary index.
4. MySQL does not support validation routines inside the database, so any PROGRESS data validation stored in the database is ignored.
5. View information is currently ignored.
6. The dump routines do not distinguish between 4GL and SQL tables.
7. Extended information in PROGRESS version 9 (SYS tables) is ignored.
8. Tables with a large number of fields may cause the PROGRESS client to fail. There is no current resolution for this problem.

Data Type Conversion

Note that integer and decimal conversions are determined based on the display format in the dictionary, not just on the data type. If the database contains values in an integer or decimal field that is greater than the display format, the data may fail to load into the MySQL database because the field type will have been defined too small.

Progress data type	MySQL data type	Notes
Character with a field length less than or equal to 255	Varchar of equivalent size	
Character with a field length greater than 255 characters.	Text	See also MySQL BLOB format
Date	Date	MySQL dates are stored in ISO format. A PROGRESS Date field could easily be migrated to a MySQL Datetime field for additional functionality.
Logical	Tinyint	False = 0 True = 1.
Decimal	Decimal	
Integer less than 3 digits	Tinyint	
Integer between 3 and 4 digits	Smallint	
Integer between 4 and 6 digits	MediumInt	
Integer over 6 digits	Integer	Mysql Integer and Bigint are equivalent
Recid (Version 9)	Bigint	
Raw	Blob	The data in raw fields is currently not converted.

Index conversion.

There are some specific index conversion items

1. The creation of a new non-null primary index (see above).
2. Word indexes are converted to the MySQL FULLTEXT format.
3. Indexes that contain elements of arrays are ignored.
4. Indexes that contain fields that are converted to text type are ignored.

All other indices are converted as-is.

Other schema items

Mandatory fields are written into MySQL as NOT NULL

Default values are written directly into the MySQL database with the equivalent value, except for the PROGRESS unknown value, which is written as blank for character and date fields, and zero for numbers.

Arrays

The Pro2My routines expand array variables into individual fields. Each field is named as follows:

Array[1], array[2],array[3],.....array[n]

Becomes

Array__1,array__2,array__3,.....array__n

It should however be noted that in most languages that are used to develop programs against mySQL databases such as PERL or PHP, arrays and loops normally start at value 0. To achieve this, modify the code, where marked, in ptmsch.p

Field and File Name conversion

The Pro2My routines make various changes to the field and file names to ensure they are compliant with MySQL naming conventions. These changes are made in the include file d2us.i. The following rules are applied:

1. All field/file/database names are converted to upper case. Depending on your requirements, change the code in d2us.i to convert them to lower case, but in any case, be consistent.
2. All occurrences of the "-"(minus) character are converted to an "_"(underscore).
3. The resulting variable name is compared against a list of MySQL reserved words. If the variable is a reserved word, it is prefixed with "X_", which will at least allow the schema to load into MySQL. The MySQL reserved words are held in the include file mysqlr.i which can be modified as necessary.

To see all these features in action, run the ptmsch.p program against the SPORTS database, and view the output. Note that the Order table has been renamed X_ORDER.

TIP In case of problems, is far easier to change the PROGRESS database using the dictionary tools before dumping, than to dump the database and try to manipulate the schema using the MySQL tools.

Preparing the data for dumping

Earlier versions of pro2my required special character conversion prior to extracting the data. This is now handled at run-time. You can modify the program cwrite.p to add you own string conversions

Dumping the data

The ptmd.p routines provide a way to dump data out of the PROGRESS database in a format that is acceptable to the fast load format of MySQL. The fast load format provides a rapid method of populating a MySQL database, for example, a mid-range Linux system can load the SPORTS database in under a minute.

Limitations of the data dump.

The data dump currently cannot process raw data fields. Data in fields defined as raw format is replaced by a null value.

Transferring user security

Chapter

4

The *ptmsec.p* extracts the security data from the schema, and converts it to MySQL GRANT / REVOKE statements. The format that uses is as follows:

1. For each user in the PROGRESS _user file, a GRANT usage record on the database is created. This usage is only granted @localhost. In order to change this, modify the functions *AddPriv* and *RevokePriv* in ptmsec.p.
2. Privileges on all tables in the schema are revoked using REVOKE ALL PRIVILEGES.
3. For each table in the database, the following actions are taken:
 - a. The _can-* records are parsed, and a list of inclusions and exclusions are built.
 - b. For each user that does have access to a particular function, a grant record is added to the security File.
 - c. For _can-create, an INSERT record is created
 - d. For _can-read a SELECT record is created.
 - e. For _can-write, an UPDATE record is created.
 - f. For _can-delete a DELETE record is created.
 - g. Currently _can-dump and _can-load privileges are ignored. There are no direct equivalents in MySQL, although there is some correlation with the FILE privilege. To associate one of these PROGRESS privileges with FILE, modify the ptmsec.p routine.
4. Column security is currently ignored.

The output appears in the file DBNAME_SECURITY.SQL

Using the Routines

Chapter

5

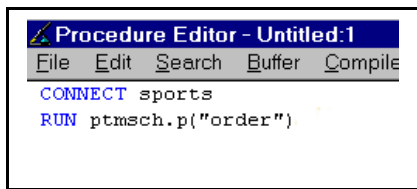
There are 4 routines to call from the command line.

Ptmsch.p

To dump the schema, run ptmsch.p from the progress command line, passing an input parameter of either

- "ALL" to dump the schema for all tables.
- "TABLENAME" to dump the schema for an individual table.

e.g. to dump the "order" schema from the SPORTS database, from the command line, run:



A file will be created in the current directory named SCH_ORDER.SQL. The file looks like this:

```
## Warning ORDER is a MySQL reserved word.Its value was changed to
X_ORDER
DROP TABLE IF EXISTS X_ORDER;
CREATE TABLE X_ORDER(
  PROGRESS_RECID bigint NOT NULL,
  CARRIER varchar(5) DEFAULT "",
  CUST_NUM          mediumint DEFAULT 0,
  INSTRUCTIONS      varchar(5) DEFAULT "",
  ORDER_DATE        date,
  ORDER_NUM          mediumint DEFAULT 0,
  PO                 varchar(5) DEFAULT "",
  PROMISE_DATE       date,
  SALES_REP          varchar(4) DEFAULT "",
  SHIP_DATE          date,
  TERMS              varchar(5) DEFAULT "Net30",
  primary key        CONV_PRIMARY (PROGRESS_RECID),
  key CUST_ORDER (
    CUST_NUM,
    ORDER_NUM),
  key ORDER_DATE (
    ORDER_DATE),
## The PROGRESS database primary index
  key ORDER_NUM (
    ORDER_NUM),
  key SALES_REP (
    SALES_REP)
)
comment = "Order header information";
```

In addition, a file called errors.txt is created in the directory. This contains further information about any changes that will be made to the schema.

When dumping the complete schema, the file would be MYSQL_"dbname".SQL. The file begins with the following example lines:

```
DROP DATABASE IF EXISTS SPORTS;  
CREATE DATABASE SPORTS;  
USE SPORTS;
```

Take care when merging the schema with an existing database, as this syntax will cause MySQL to drop the existing database without checking to see if it contains any data.

To load the schema into the MySQL database use a db administrator login such as root, and use the following syntax

```
mysql -u root < MYSQL_SPORTS.SQL.
```

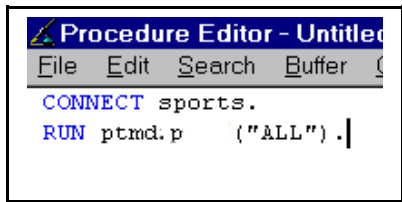
This should only take a few seconds to load the schema.

Ptmd.p

To dump the data from a PROGRESS database, run ***ptmd.p*** , passing an input parameter of either:

- "ALL" to dump the data for all tables.
- "TABLENAME" to dump the data for an individual table.

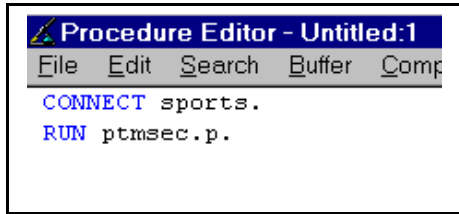
e.g. to dump the data from all tables in the SPORTS database, from the command line, run:



For each table dumped, the data will appear in a file named <TABLENAME>_DATA.SQL. In addition, if the 'ALL' option is selected, a batch file, called ***mysqld.bat*** will be created , with a mysql command for each table. To modify the command, modify the variable ***mysqlcmd*** in the ***ptmd.p*** file

Ptmsec.p

To dump security definitions from the database, run ptmsec.p from the command line.



```
Procedure Editor - Untitled:1
File Edit Search Buffer Comp
CONNECT sports.
RUN ptmsec.p.
```

The output will appear similar to the sample below.

```
## Security definitions dump for database SPORTS
GRANT USAGE ON SPORTS.* TO admin@localhost;
GRANT USAGE ON SPORTS.* TO test1@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.CUSTOMER FROM admin@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.INVOICE FROM admin@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.ITEM FROM admin@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.LOCAL_DEFAULT FROM admin@localhost;
## Warning ORDER is a MySQL reserved word.Its value was changed to X_ORDER
REVOKE ALL PRIVILEGES ON SPORTS.X_ORDER FROM admin@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.ORDER_LINE FROM admin@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.REF_CALL FROM admin@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.SALESREP FROM admin@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.STATE FROM admin@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.CUSTOMER FROM test1@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.INVOICE FROM test1@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.ITEM FROM test1@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.LOCAL_DEFAULT FROM test1@localhost;
## Warning ORDER is a MySQL reserved word.Its value was changed to X_ORDER
REVOKE ALL PRIVILEGES ON SPORTS.X_ORDER FROM test1@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.ORDER_LINE FROM test1@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.REF_CALL FROM test1@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.SALESREP FROM test1@localhost;
REVOKE ALL PRIVILEGES ON SPORTS.STATE FROM test1@localhost;
GRANT SELECT ON SPORTS.CUSTOMER TO admin@localhost;
GRANT SELECT ON SPORTS.CUSTOMER TO test1@localhost;
GRANT INSERT ON SPORTS.CUSTOMER TO admin@localhost;
GRANT INSERT ON SPORTS.CUSTOMER TO test1@localhost;
```

The GPL license

Appendix

A

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Version 2, June 1991

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Change Log

Appendix

B

Version 1.2

Description	Thanks to
Converted field names containing the special character # to HASH, and issued warning	
Ignored and warned about indices that would contain TEXT type fields.	

Version 3.0

Description	Thanks to
Fixed index issues with array fields	
Fixed index issues with text fields	
Improvements to large table handling	Scott Auge