GSAC "Prototype 15" Database Schema Notes

6 Jan 2015

About GSAC, see the GSAC web site
http://www.unavco.org/software/data-management/gsac/gsac.html.

Showing table descriptions and example rows with column values. The fundamental tables are **station**, **equip_config** containing information about equipment sessions at stations, and **datafile**. The other tables are lookup tables; some of them are (normally) unchanging such as access; some are added to as new stations are added such as table antenna.

```
mysql> use Prototype15_GSAC;

mysql> show tables;
+--------------------------+
| Tables_in_Prototype15_GSAC|
+--------------------------+
| access                   |
| agency                   |
| antenna                  |
| nation                   |
| datafile                 |
| datafile_type            |
| ellipsoid                |
| equip_config             |
| locale                   |
| metpack                  |
| monument_style           |
| province_state           |
| radome                   |
| receiver_firmware        |
| station                  |
| station_status           |
| station_style            |
+--------------------------+


mysql> desc station;
+---------------------------+-----------------+------+-----+--------
| Field                     | Type            | Null | Key | Default |
+---------------------------+-----------------+------+-----+--------
| station_id                | int(6) unsigned | NO   | PRI | NULL    |
| four_char_name            | char(4)         | NO   |     | NULL    |
| station_name              | varchar(50)     | NO   |     | NULL    |
| latitude_north            | double          | NO   |     | NULL    |
| longitude_east            | double          | NO   |     | NULL    |
| height_ellips             | float           | YES  |     | NULL    |
| installed_date            | datetime        | YES  |     | NULL    |
| retired_date              | datetime        | YES  |     | NULL    |
| agency_id                 | int(3) unsigned | YES  | MUL | NULL    |
| access_id                 | int(3) unsigned | YES  | MUL | NULL    |
| style_id                  | int(3) unsigned | NO   | MUL | NULL    |
```

```
| status_id                  | int(3) unsigned | NO   | MUL | NULL    |
| monument_style_id          | int(3) unsigned | NO   | MUL | NULL    |
| nation_id                  | int(3) unsigned | NO   | MUL | NULL    |
| province_state_id          | int(3) unsigned | YES  |     | NULL    |
| locale_id                  | int(3) unsigned | NO   | MUL | NULL    |
| ellipsoid_id               | int(1) unsigned | NO   | MUL | NULL    |
| networks                   | varchar(2000)   | YES  |     | NULL    |
| iers_domes                 | char(9)         | YES  |     | NULL    |
| station_photo_URL          | varchar(100)    | YES  |     | NULL    |
| time_series_plot_image_URL | varchar(100)    | YES  |     | NULL    |
| embargo_duration_hours     | int(6) unsigned | YES  |     | NULL    |
| embargo_after_date         | datetime        | YES  |     | NULL    |
+----------------------------+-----------------+------+-----+--------

mysql> select * from station;
+------------+----------------+
| station_id | four_char_name | station_name | latitude_north | longitude_east
| height_ellips | installed_date      | retired_date | agency_id | access_id |
style_id | status_id | monument_style_id | nation_id | province_state_id |
locale_id | ellipsoid_id | networks | iers_domes | station_photo_URL
| time_series_plot_image_URL |  embargo_duration_hours | embargo_after_date |
+------------+----------------+
|          1 | STA1           | STA1 name    |        19.1187 |       -98.6552
|          3992 | 2014-08-15 14:30:30 | NULL         |         2 |         2 |
1 |         1 |                 1 |          1 |                 1 |         1
|           1 | RENAG,RGP,IGS  | 19725M001 | http://www.myrepos.org/data/
gnss/lib/images/station_images/STA1.jpg | NULL  |  0  |  NULL |
+----------------------------+
Add one new row for each new station. []_id values must already exist in the
database.


mysql> desc equip_config;
+-------------------------+-----------------+------+-----+----------
| Field                   | Type            | Null | Key | Default |
+-------------------------+-----------------+------+-----+----------
| equip_config_id         | int(6) unsigned | NO   | PRI | NULL auto_increment
| station_id              | int(6) unsigned | NO   | MUL | NULL    |
| equip_config_start_time | datetime        | NO   |     | NULL    |
| equip_config_stop_time  | datetime        | YES  |     | NULL    |
| db_update_time          | datetime        | NO   |     | NULL    |
| antenna_id              | int(3) unsigned | NO   | MUL | NULL    |
| antenna_serial_number   | varchar(20)     | YES  |     | NULL    |
| antenna_height          | float           | YES  |     | NULL    |
| metpack_id              | int(3) unsigned | YES  | MUL | NULL    |
| metpack_serial_number   | varchar(20)     | YES  |     | NULL    |
| radome_id               | int(3) unsigned | NO   | MUL | NULL    |
| radome_serial_number    | varchar(20)     | YES  |     | NULL    |
| receiver_firmware_id    | int(3) unsigned | NO   | MUL | NULL    |
| receiver_serial_number  | varchar(20)     | NO   |     | NULL    |
| satellite_system        | varchar(20)     | YES  |     | NULL    |
| sample_interval         | float           | YES  |     | NULL    |
+-------------------------+-----------------+------+-----+----------

mysql> select * from  equip_config;
```

```
+-----------------+------------+-----------------------+
| equip_config_id | station_id | equip_config_start_time |
equip_config_stop_time | db_update_time      | antenna_id |
antenna_serial_number | antenna_height | metpack_id | metpack_serial_number |
radome_id | radome_serial_number | receiver_firmware_id |
receiver_serial_number | satellite_system | sample_interval |
+-----------------+------------+-----------------------+
|               1 |          2 | 2014-09-04 00:00:00     | 2014-12-17 23:59:45
| 2014-11-15 00:17:41 |          2 | 5343354885            |         0.0083 |
2 | K2630028              |         2 |                       |
1 | 5250K40670             | GPS,GLONASS               |              15 |
|               2 |          1 | 2014-08-15 14:30:30     | 2014-12-16 23:59:45
| 2014-11-15 00:17:41 |          1 | 5000112724            |           0.5 |
2 |                       |         1 |                       |
1 | 5137K78333             | GPS,GLONASS               |              15.0 |
+-----------------+------------+-----------------------+
Each row is for one station and one 'equipment session' a time interval when
the observing and recording installation has no changes.  Add one new row for
each new equipment session. []_id values must already exist in the database.


mysql> desc datafile;
+------------------------+-----------------+------+-----+--------
| Field                  | Type            | Null | Key | Default |
+------------------------+-----------------+------+-----+--------
| datafile_id            | int(9) unsigned | NO   | PRI | NULL auto_increment
| station_id             | int(6) unsigned | NO   | MUL | NULL    |
| equip_config_id        | int(6) unsigned | YES  | MUL | NULL    |
| datafile_name          | varchar(120)    | NO   |     | NULL    |
| original_datafile_name | varchar(100)    | YES  |     | NULL    |
| datafile_type_id       | int(3) unsigned | NO   | MUL | NULL    |
| sample_interval        | float           | YES  |     | NULL    |
| datafile_start_time    | datetime        | NO   |     | NULL    |
| datafile_stop_time     | datetime        | NO   |     | NULL    |
| year                   | year(4)         | NO   |     | NULL    |
| day_of_year            | int(3)          | NO   |     | NULL    |
| published_time         | datetime        | NO   |     | NULL    |
| size_bytes             | int(10)         | NO   |     | NULL    |
| MD5                    | char(32)        | NO   |     | NULL    |
| URL_path_protocol      | varchar(7)      | YES  |     | NULL    |
| URL_path_domain        | varchar(50)     | YES  |     | NULL    |
| URL_path_dirs          | varchar(70)     | YES  |     | NULL    |
| URL_all                | varchar(120)    | YES  |     | NULL    |
+------------------------+-----------------+------+-----+--------
Add one new row for each new data file. []_id values must already exist in the
database. URL is the location to download the file, if any.

mysql> select * from datafile limit 3;
+-------------+------------+-----------------+----------------------+
| datafile_id | station_id | equip_config_id | datafile_name  |
original_datafile_name | datafile_type_id | sample_interval |
datafile_start_time | datafile_stop_time  | year | day_of_year |
published_time      | size_bytes | MD5     | URL_path_protocol |
URL_path_domain | URL_path_dirs | URL_all |
+-------------+------------+-----------------+-------------------+
```

```
|           1 |          4 |              38 | sta12100.14d.Z | sta12100.14d.Z
|               2 |             15 | 2014-07-29 00:00:00 | 2014-07-29
23:59:45 | 2014 |         210 | 2014-07-30 00:00:00 |     759583 |
d80c8149bf08e1687adb207df28460b9 | ftp:// | dataworks.tlalocnet.mx |
/rinex/obs/2014/210/ |
ftp://dataworks.tlalocnet.mx/rinex/obs/2014/210/sta12100.14d.Z |
|           2 |          4 |              38 | sta12100.14n.Z | sta12100.14n.Z
|               3 |             15 | 2014-07-29 00:00:00 | 2014-07-29
23:59:45 | 2014 |         210 | 2014-07-30 00:00:00 |      36215 |
124b2a2942d61e2b31bd04e9471bd61e | ftp:// | dataworks.tlalocnet.mx |
/rinex/obs/2014/210/ |
ftp://dataworks.tlalocnet.mx/rinex/nav/2014/210/sta12100.14n.Z |
|           3 |          4 |              38 | sta12100.14m.Z | sta12100.14m.Z
|               6 |             15 | 2014-07-29 00:00:00 | 2014-07-29
23:59:45 | 2014 |         210 | 2014-07-30 00:00:00 |      18983 |
c09bfd911ba75da1561288fd9888df6c | ftp:// | dataworks.tlalocnet.mx |
/rinex/obs/2014/210/ |
ftp://dataworks.tlalocnet.mx/rinex/met/2014/210/sta12100.14m.Z |
+-------------+------------+-----------------+--------------------+
```

Lookup tables

```
mysql> desc access;
+-----------------------+-----------------+------+-----+--------
| Field                 | Type            | Null | Key | Default | Extra
|
+-----------------------+-----------------+------+-----+--------
| access_id             | int(3) unsigned | NO   | PRI | NULL  auto_increment
| access_description    | varchar(80)     | NO   |     | NULL    |
+-----------------------+-----------------+------+-----+--------

mysql> select * from access;
+-------------------+
| access_id | access_description                                          |
|         1 | no public access allowed
|         2 | public access allowed for station metadata, instrument metadata,
and data files
|         3 | public access allowed for station and instrument metadata only
+-------------------+


mysql> desc agency;
+-------------+-----------------+------+-----+---------+----------------+
| Field       | Type            | Null | Key | Default | Extra          |
+-------------+-----------------+------+-----+---------+----------------+
| agency_id   | int(4) unsigned | NO   | PRI | NULL    | auto_increment |
| agency_name | varchar(100)    | NO   |     | NULL    |                |
+-------------+-----------------+------+-----+---------+----------------+

mysql> select * from agency ;
+-----------+-------------+
| agency_id | agency_name |
+-----------+-------------+
```

```
|         1 | Agency1     |
|         2 | Agency2     |
+-----------+-------------+ Can add new rows.
```

```
mysql> desc antenna;
+--------------+-----------------+------+-----+---------+----------------+
| Field        | Type            | Null | Key | Default | Extra          |
+--------------+-----------------+------+-----+---------+----------------+
| antenna_id   | int(3) unsigned | NO   | PRI | NULL    | auto_increment |
| antenna_name | varchar(15)     | NO   |     | NULL    |                |
| igs_defined  | char(1)         | NO   |     | N       |                |
+--------------+-----------------+------+-----+---------+----------------+

mysql> select * from antenna;
+------------+----------------+-------------+
| antenna_id | antenna_name   | igs_defined |
+------------+----------------+-------------+
|          1 | TRM57971.00    | Y           |
|          2 | TRM59800.00    | Y           |
|          3 | ASH701945B_M   | Y           |
|          4 | TRM55971.00    | Y           |
+------------+----------------+-------------+
Table antenna is about the observational data sensor. IGS refers to GNSS
units' defined names for GNSS antennas.  Can add new rows.
```

```
mysql> desc datafile_type;
+---------------------------+-----------------+------+-----+--------+
| Field                     | Type            | Null | Key | Default | Extra
|
+---------------------------+-----------------+------+-----+--------+
| datafile_type_id          | int(3) unsigned | NO   | PRI | NULL auto_increment
| datafile_type_name        | varchar(50)     | NO   |     | NULL    |
| datafile_type_description| varchar(50)     | NO   |     | NULL    |
+---------------------------+-----------------+------+-----+--------

mysql> select * from datafile_type;
+------------------+-------------------------------+
| datafile_type_id | datafile_type_name            | datafile_type_description
+------------------+-------------------------------+
|                1 | instrument data file          | Any type or format of
native, raw, or binary file  |
|                2 | RINEX observation file        | a RINEX 'o' obs file; may
be compressed            |
|                3 | RINEX GPS navigation file     | a RINEX 'n' nav file; may
be compressed            |
|                4 | RINEX Galileo navigation file | a RINEX 'e' nav file; may
be compressed            |
|                5 | RINEX GLONASS navigation file | a RINEX 'g' nav file; may
be compressed            |
|                6 | RINEX meteorology file        | a RINEX 'm' met file; may
be compressed            |
|                7 | RINEX QZSS navigation file    | a RINEX 'j' nav file; may
```

```
be compressed            |
|                8 | RINEX Beidou navigation file  | a RINEX 'c' nav file; may
be compressed            |
+-----------------+-------------------------------+
```
Can add any name for an observational or product file type or format.

```
mysql> desc ellipsoid;
+----------------------+-----------------+------+-----+---------+----------------+
| Field                | Type            | Null | Key | Default | Extra          |
+----------------------+-----------------+------+-----+---------+----------------+
| ellipsoid_id         | int(4) unsigned | NO   | PRI | NULL    |auto_increment
| ellipsoid_name       | varchar(45)     | NO   |     | NULL    |
| ellipsoid_short_name | varchar(10)     | YES  |     | NULL    |
+----------------------+-----------------+------+-----+---------+----------------+

mysql> select * from ellipsoid;
+--------------+----------------+----------------------+
| ellipsoid_id | ellipsoid_name | ellipsoid_short_name |
+--------------+----------------+----------------------+
|            1 | WGS 84         | WGS 84               |
|            2 | GRS 80         | GRS 80               |
|            3 | PZ-90          | PZ-90                |
+--------------+----------------+----------------------+
```
For GNSS coordinates.

```
mysql> desc locale;
+-------------+-----------------+------+-----+---------+----------------+
| Field       | Type            | Null | Key | Default | Extra          |
+-------------+-----------------+------+-----+---------+----------------+
| locale_id   | int(3) unsigned | NO   | PRI | NULL    | auto_increment |
| locale_name | varchar(70)     | NO   |     | NULL    |                |
+-------------+-----------------+------+-----+---------+----------------+

mysql> select * from locale;
+-----------+------------------+
| locale_id | locale_name      |
+-----------+------------------+
|         1 | Altzomoni        |
|         2 | Hermosillo       |
+-----------+------------------+
```
Locale is city name or other place name. Can add new rows.

```
desc metpack;
+--------------+-----------------+------+-----+---------+----------------+
| Field        | Type            | Null | Key | Default | Extra          |
+--------------+-----------------+------+-----+---------+----------------+
| metpack_id   | int(5) unsigned | NO   | PRI | NULL    | auto_increment |
| metpack_name | varchar(15)     | NO   |     | NULL    |                |
+--------------+-----------------+------+-----+---------+----------------+

mysql> select * from metpack;
```

```
+------------+--------------+
| metpack_id | metpack_name |
+------------+--------------+
|          1 | WXT510       |
|          2 | WXT520       |
+------------+--------------+
```
A 'metpack' is a meteorology sensor. Can add new rows.

```
mysql> desc monument_style;
+----------------------------+-----------------+------+-----+---------+
| Field                      | Type            | Null | Key | Default | Extra
+----------------------------+-----------------+------+-----+---------+
| monument_style_id       | int(3) unsigned | NO   | PRI | NULL auto_increment
| monument_style_description | varchar(70)     | NO   |     | NULL    |
+----------------------------+-----------------+------+-----+---------+

mysql> select * from monument_style;
+-------------------+----------------------------+
| monument_style_id | monument_style_description |
+-------------------+----------------------------+
|                 1 | shallow foundation pillar  |
|                 2 | building roof              |
|                 3 | deep-drilled braced        |
|                 4 | shallow-drilled braced     |
+-------------------+----------------------------+
```
Table monument_style has free-form words for sensor mounting type. Can add new rows.

```
mysql> desc nation;
+--------------+-----------------+------+-----+---------+----------------+
| Field        | Type            | Null | Key | Default | Extra          |
+--------------+-----------------+------+-----+---------+----------------+
| nation_id    | int(3) unsigned | NO   | PRI | NULL    | auto_increment |
| nation_name  | varchar(70)     | NO   |     | NULL    |                |
+--------------+-----------------+------+-----+---------+----------------+

mysql> select * from nation;
+------------+--------------+
| nation_id  | nation_name  |
+------------+--------------+
|          1 | Mexico       |
+------------+--------------+
```
Can add new rows.

```
mysql> desc province_state;
+---------------------+-----------------+------+-----+---------+
| Field               | Type            | Null | Key | Default | Extra
+---------------------+-----------------+------+-----+---------+
| province_state_id   | int(3) unsigned | NO   | PRI | NULL    |auto_increment
| province_state_name | varchar(70)     | NO   |     | NULL    |
+---------------------+-----------------+------+-----+---------+
```

```
mysql> select * from province_state;
+-------------------+---------------------+
| province_state_id | province_state_name |
+-------------------+---------------------+
|                 1 | Chiapas             |
+-------------------+---------------------+
Can add new rows.


mysql> desc radome;
+-------------+-----------------+------+-----+---------+----------------+
| Field       | Type            | Null | Key | Default | Extra          |
+-------------+-----------------+------+-----+---------+----------------+
| radome_id   | int(5) unsigned | NO   | PRI | NULL    | auto_increment |
| radome_name | varchar(15)     | NO   |     | NULL    |                |
| igs_defined | char(1)         | NO   |     | N       |                |
+-------------+-----------------+------+-----+---------+----------------+

mysql> select * from radome;
+-----------+-------------+-------------+
| radome_id | radome_name | igs_defined |
+-----------+-------------+-------------+
|         1 | NONE        | Y           |
|         2 | SCIT        | Y           |
+-----------+-------------+-------------+
Table radome defines the type of the cover on the sensor, if needed. Can be
NONE.  Can add new rows.


mysql> desc receiver_firmware;
+----------------------+-----------------+------+-----+----------+
| Field                | Type            | Null | Key | Default  | Extra
+----------------------+-----------------+------+-----+----------+
| receiver_firmware_id | int(5) unsigned | NO   | PRI | NULL    auto_increment
| receiver_name        | varchar(20)     | NO   |     | NULL     |
| receiver_firmware    | varchar(20)     | NO   |     | NULL     |
| igs_defined          | char(1)         | NO   |     | N        |
+----------------------+-----------------+------+-----+----------+

mysql> select * from receiver_firmware;
+----------------------+-------------------+-------------------+-------------+
| receiver_firmware_id | receiver_name     | receiver_firmware | igs_defined |
+----------------------+-------------------+-------------------+-------------+
|                    1 | TRIMBLE NETR9     | 4.85              | Y           |
|                    2 | TRIMBLE 4000SSI   | 7.19b             | Y           |
|                    3 | TRIMBLE NETRS     | 1.1-1             | Y           |
|                    4 | TRIMBLE NETRS     | 1.1-2             | Y           |
+----------------------+-------------------+-------------------+-------------+
Table receiver_firmware defines the data logger type and any firmware version.
Can add new rows.


mysql> desc station_status;
+------------------+-----------------+------+-----+---------+-------------+
| Field            | Type            | Null | Key | Default | Extra
```

```
+-------------------+-----------------+------+-----+---------+---------------+
| station_status_id | int(3) unsigned | NO   | PRI | NULL    | auto_increment
| station_status    | varchar(80)     | NO   |     | NULL    |
+-------------------+-----------------+------+-----+---------+---------------+

mysql> select * from station_status;
+-------------------+----------------------+
| station_status_id | station_status       |
+-------------------+----------------------+
|                 1 | Active               |
|                 2 | Inactive/intermittent |
|                 3 | Retired              |
|                 4 | Pending              |
+-------------------+----------------------+
Can add new rows.


mysql> desc station_style;
+--------------------------+-----------------+------+-----+----------+
| Field                    | Type            | Null | Key | Default | Extra
|
+--------------------------+-----------------+------+-----+----------+
| station_style_id         | int(3) unsigned | NO | PRI | NULL auto_increment
| station_style_description | varchar(80)     | NO   |     | NULL    |
+--------------------------+-----------------+------+-----+----------+

mysql> select * from station_style;
+------------------+---------------------------+
| station_style_id | station_style_description |
+------------------+---------------------------+
|                1 | GPS/GNSS Continuous       |
|                2 | GPS/GNSS Campaign         |
|                3 | GPS/GNSS Mobile           |
+------------------+---------------------------+
Table station_style defines the type of observing instrumentation (for
example, tide gage), and optionally the operational style. Can add new rows.

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```