Comparison of SQL/DDL (Data Definition Language) Statements Between Infx and psql

Note: In the text below, "psql" is used as an abbreviation for PostgreSQL. It does not signify the utility for executing ad hoc queries.

- Basic CREATE TABLE statements same as Infx
    - psql does not recognize “username.” before tablename
    - psql does not recognize “{}” as comments - generates parse error AND CONTINUES (psql does recognize "--" as a comment as does Infx)
    - in psql, "CREATE TABLE tablename (column1 ..." generates syntax error
        - extra space not allowed between “(“ and column1

- ALTER TABLE tablename MODIFY columnname
    - available in psql but with different syntax
    - psql: ALTER TABLE tablename ALTER columnname
    - Infx allows the data type of the column to be changed using "MODIFY"
    - psql does not allow the data type to be changed using "MODIFY"

- ALTER TABLE location ADD CONSTRAINT PRIMARY KEY (lid) CONSTRAINT loc_pk;
    - available in psql but with different syntax
    - Infx: ALTER TABLE location ADD CONSTRAINT PRIMARY KEY (lid) CONSTRAINT loc_pk;
    - psql: ALTER TABLE location ADD CONSTRAINT loc_pk PRIMARY KEY (lid);
    - can also name constraint from within CREATE TABLE statement as:
        - Infx: PRIMARY KEY (lid) CONSTRAINT location_pk;
        - psql: CONSTRAINT location_pk PRIMARY KEY (lid);

    - psql automatically defines columns in a primary key as NOT NULL
    - psql: max number of chars in constraint name = 63

- ALTER TABLE tablename ADD CONSTRAINT FOREIGN KEY ...
    - available in psql but with different syntax
    - Infx: ALTER TABLE location ADD CONSTRAINT FOREIGN KEY (tzone) REFERENCES TimeZone CONSTRAINT location_tz_fk;
    - psql: ALTER TABLE location ADD CONSTRAINT location_tz_fk FOREIGN KEY (tzone) REFERENCES TimeZone(tzone) MATCH FULL;
    - psql syntax needs additional field name which is not always part of Infx statement
        - in hd_ob5xxx, constraints counties_primbk_fk and counties_secbk_fk have different column names in the tables being referenced (counties.primary_back and counties.secondary_back reference wfo.wfo)

- ALTER TABLE … SET STATISTICS …

    - available in psql to determine "bucket size" for statistics on a column
    - can influence scan method

- RENAME DATABASE oldname TO newname;
    - available in psql but with different syntax
    - psql: ALTER DATABASE oldname RENAME TO newname;
    - user must be owner of db AND have CREATEUSER privilege

- GRANT/REVOKE statements
    - psql and Infx have same statement syntax
    - database level privileges differ between Infx and psql
        - in psql, if user A creates a db, then user B automatically has access to it
            - Note: users A and B must be known to psql through the createuser command
        - in Infx: if user A creates a db, then user B does NOT have access to it unless granted CONNECT, RESOURCE or DBA privilege by user A
    - table level privileges also differ
        - in Infx, if user A creates a table, all users have all privileges on the table (unless they are revoked)
        - in psql, if user A creates a table, users have NO privileges on the table (unless they are granted) (see Douglas pp741-742)

Data Types in psql

- DATE, TIME and INTERVAL data types available
- no DATETIME data type
    - TIMESTAMP data type for date/time exists
        - SELECT CURRENT_TIMESTAMP generates current time
        - assumes yyyymmddhhmmss
        - includes a time zone
        - psql data type TIMESTAMP WITHOUT TIME ZONE is equivalent to Infx data type DATETIME
        - data type TIMESTAMP defaults to TIMESTAMP WITHOUT TIME ZONE
        - all psql date/time types have precision of microseconds
- Infx DATETIME value = “08-01” is not allowed in psql – must specify year to create valid DATE field

- Infx FLOAT corresponds to psql FLOAT8
- Infx SMALLFLOAT corresponds to psql FLOAT4
- in psql, FLOAT is the same as FLOAT8

- Infx: SELECT … WHERE … column_name =   CURRENT
- psql: SELECT … WHERE … column_name =   CURRENT_TIMESTAMP

Date/Time Functions

Infx: select * from precip where obstime > today;

- where today translates into hour = 0 date = today's date
psql: select * from precip where obstime > 'today';
- today surrounded by single quotes
Infx: select * from TextProduct where (CURRENT - postingtime) < 5 UNIT DAY;

psql: select * from TextProduct
where EXTRACT (DAY from CURRENT_TIMESTAMP - postingtime) < 5;

Infx: select * from … where CURRENT - INTERVAL 5 DAY TO DAY;
psql: select * from … where CURRENT_TIMESTAMP - INTERVAL 5 DAY;
Note: The above Infx syntax is not caught by the psql syntax checker. Instead, the following error message is generated in the postgres log:

ERROR: syntax error at or near "DAY" at character …

see Schonig pp 620 - 626 for info on TIMESTAMP, INTERVAL types and examples of
manipulating TIMESTAMP values using INTERVAL values

Infx/esqlc has functions dttofmtasc and dttoasc
in psql/ecpg, recommend using dttoasc only - dttofmtasc exists but does not work the same as in Infx

- psql has no BYTE data type but has a BYTEA data type

- psql has an OID (Object ID) which is similar to Informix's rowid
  - every row in a postgres db has a unique OID
  - in Oracle and Informix, rowid is the fastest possible way to get to a record
  - according to Douglas p 102, this is NOT true in postgres

Infx SMALLINT – psql INT2
Infx SMALLFLOAT – psql FLOAT4

Infx DECIMAL - psql NUMERIC
  - according to the psql documentation, numeric type is equivalent to decimal type
  - histdata db uses DECIMAL type
  - DECIMAL type also appears in dbgen

Column Naming
- column names must begin with a letter or underscore
- max of 64 char

OUTER JOIN
Infx: OUTER xxx
psql: LEFT/RIGHT/FULL OUTER JOIN xxx
  - psql uses ANSI standard format for OUTER join (Infx does not)
- 8 out of 16 views in hd_ob6xxx contain keyword OUTER

- Example:
    - Infx: CREATE VIEW locview (...

      ```
      SELECT ...
      FROM location x0, outer riverstat x1
      WHERE x0.lid = x1.lid ;
      ```

    - psql: CREATE VIEW locview (...

      ```
      SELECT ...
      FROM  location x0   left outer join  riverstat x1
      ON x0.lid = x1.lid
      WHERE  … ;
      ```

        - comma between tables removed
        - “WHERE” replaced with “ON”

- result sets from FpInfo and LocView views (both with OUTER keyword) between Infx and psql were compared and found to be the same

Infx: SET LOCK MODE TO WAIT nn;
- where nn = number of seconds
- can be set on a "transaction-by-transaction" basis

psql: SET STATEMENT_TIMEOUT TO nn;
- where nn = number of milliseconds
- server run-time configuration parameter
- value of 0 (default) turns off timer
- see Section 16.4.7.1 of PostGreSQL 7.4.2 Documentation

psql has upper limit of 1600 columns for a table
- dropping a column actually hides the column from the user but still counts towards the 1600 column limit
- adding and dropping a column 1600 times will begin to show errors concerning the 1600 column limit

Cursors

Infx has EXEC SQL CLOSE and EXEC SQL FREE statements to close a cursor and free its resources

psql has EXEC SQL CLOSE statement which closes the cursor and frees all resources related to the cursor
psql has no FREE statement

psql has no "WHERE CURRENT OF … " clause for cursors (will have in future release)

Infx allows an open cursor to be reopened without executing a CLOSE first - in psql, this results in a 42P03 error - in psql, must close a cursor before reopening it

Checking Query Plans

```
Infx:  SET EXPLAIN ON;
          SELECT …. ;
        SET EXPLAIN OFF;

psql:  EXPLAIN SELECT … ;
psql:  EXPLAIN  ANALYZE SELECT …;
```

Character Strings

- psql: character strings in SQL statements must be denoted by single quotes (‘)
- Infx: accepts both single and double quotes

Example:

```
psql: SELECT * FROM height WHERE lid =  'ABCD1';
Infx: SELECT * FROM height WHERE lid = "ABCD1";
```

Other SQL syntax Differences

Returning only the first 10 records of a SELECT:

```
Infx:  SELECT   FIRST  10  *  FROM …;
psql:  SELECT  *  FROM … LIMIT  10;

Infx:  SELECT  UNIQUE    lid FROM CurPP;
psql   SELECT  DISTINCT lid FROM CurPP;
```

Note that Infx recognizes DISTINCT as a synonym to UNIQUE

ROUND function in psql requires first parameter to be numeric type - Infx requires that first parameter be double precision type

Example:

```
Infx:  SELECT  … WHERE lid = 'BLUO2  AND ROUND(stage,2)  > 3.53;
psql:  SELECT …  WHERE lid = 'BLUO2' AND ROUND(cast (stage as numeric), 2) > 3.53 ;
```

Temp tables

psql allows the user to create a temp table with the same name as a real table - the temp table will "mask" the real table during the session - temp table is dropped at the end of the session - idea can be used for testing

Cascading Updates and Deletes

as part of a CREATE TABLE statement, a column can be defined as "ON UPDATE CASCADE" - this will cause updates to "cascade" from parent table to child table - can also be set up for deletes - see Momjian pp161, 162

Locking Tables

Infx has LOCK and UNLOCK statements

psql has a LOCK statement but has no UNLOCK statement - ending the transaction unlocks the table