

Heroku - Create Data Link

Heroku Data Link set up and configure Foreign Data Wrappers (postgres_fdw). It allows a psql DB to talk to another psql DB as a foreign server. In addition to Data Link, foreign table(s) need to be created in order to query the remote table. A foreign table has no storage in the target psql DB.

Step-by-step guide

1. identify the 'secure' server info:

```
07:28 PM:~$ HEROKU PG:INFO -A DYNAMARTAPP-SECURE
tkrumeich@DT-191W3M3:~$ heroku pg:info -a dynamartapp-secure
=== DATABASE_URL, PYTHON_URL
Plan:                Private 2
Status:              Available
HA Status:           Available
Data Size:           48 MB
Tables:              9
PG Version:          14.5
Connections:         14/400
Connection Pooling:  Available
Credentials:         2
Fork/Follow:         Available
Rollback:            earliest from 2022-08-26 11:33 UTC
Created:             2022-08-16 19:01
Region:              virginia
Data Encryption:     In Use
Continuous Protection: On
Enhanced Certificates: Off
Mutual TLS:          Disabled
Maintenance:         not required
Maintenance window:  Wednesdays 20:00 to Thursdays 00:00 UTC
Add-on:              postgresql-shallow-73234
```

2. identify the 'dev' server info:

```
07:29 PM:~$ HEROKU PG:INFO -A DYNAMARTAPP-DEV
tkrumeich@DT-191W3M3:~$ heroku pg:info -a dynamartapp-dev
=== DATABASE_URL
Plan:                Private 2
Status:              Available
HA Status:           Available
Data Size:           5.73 GB
Tables:              109
PG Version:          14.4
Connections:         15/400
Connection Pooling:  Available
Credentials:         4
Fork/Follow:         Available
Rollback:            earliest from 2022-08-26 11:34 UTC
Created:             2022-08-03 20:09
Region:              virginia
Data Encryption:     In Use
Continuous Protection: On
Enhanced Certificates: Off
Mutual TLS:          Disabled
Maintenance:         not required
Maintenance window:  Tuesdays 18:00 to 22:00 UTC
Add-on:              postgresql-graceful-89609
```

3. verify if 'data link' already exists:

```
07:30 PM:~$ HEROKU PG:LINKS -A DYNAMARTAPP-DEV
=== postgresql-graceful-89609
No data sources are linked into this database
```

```
07:31 PM:~$ HEROKU PG:LINKS -A DYNAMARTAPP-SECURE
=== postgresql-shallow-73234
No data sources are linked into this database
```

4. Create 'data link' between 'secure' (source) and 'dev' (target)

Note: the database config variable for 'secure' and 'dev' is DATABASE_URL

```
08:03 PM:~$ HEROKU PG:LINKS:CREATE DYNAMARTAPP-SECURE::DATABASE_URL DATABASE_URL --AS DATALINK_SECURE -A DYNAMARTAPP-DEV
Adding link from postgresql-shallow-73234 to postgresql-graceful-89609... done, datalink_secure
```

5. Verify the new data link 'datalink_secure' has been created.

Note: we verify the link in the target app

```
08:03 PM:~$ HEROKU PG:LINKS -A DYNAMARTAPP-DEV
=== postgresql-graceful-89609

* datalink_secure
created_at: 2022-08-29T00:03:28.755+00:00
remote:    DATABASE_URL (postgresql-shallow-73234)
remote_name: postgresql_shallow_73234
```

6. Create foreign tables

-> Run DML in postgresql-shallow-73234 to output the column definitions.

```
SELECT '(' || pg_catalog.array_to_string(pg_catalog.array_agg(pg_catalog.quote_ident(a.attname) || ' ' || pg_catalog.quote_ident(t.typname)), ', ' )
FROM pg_class c, pg_attribute a, pg_type t, pg_namespace n
WHERE c.relname = '<TABLE_NAME>' AND
a.attnum > 0 AND
```

```
a.attrelid = c.oid AND
a.atttypid = t.oid AND
n.oid = c.relnamespace AND
c.relkind in ('r', 'v');
```

outcome:

```
(employeenumber "varchar", sfid "varchar", firstname "varchar", lastname "varchar", name "varchar", email "varchar", mobilephone "varchar", countrycode
"varchar", country "varchar", title "varchar", usertype "varchar", user_type__c "varchar", department "varchar", department_chris__c "varchar", hire_date__c
date, termination_date__c date, createddate "timestamp", lastmodifieddate "timestamp")
```

-> Run DDL in postgresql-graceful-89609 to create the foreign table

template:

```
create foreign table if not exists <LINK_NAME>.<TABLE_NAME>(<COLUMNS_DEFINITION>) server <SERVER_NAME> options (schema_name
'<ORIGINAL_SCHEMA_NAME>', table_name '<TABLE_NAME>');
alter foreign table <LINK_NAME>.<TABLE_NAME> owner to <USER_NAME>;
```

Note: replace the server hyphen with underscore character

example:

```
create foreign table if not exists datalink_secure.stg_user(employeenumber "varchar", sfid "varchar", firstname "varchar", lastname "varchar", name "varchar",
email "varchar", mobilephone "varchar", countrycode "varchar", country "varchar", title "varchar", usertype "varchar", user_type__c "varchar", department
"varchar", department_chris__c "varchar", hire_date__c date, termination_date__c date, createddate "timestamp", lastmodifieddate "timestamp") server
postgresql_shallow_73234 options (schema_name 'dbt_tkrumeich', table_name 'stg_user');
```

-> [OPTIONAL] Run DDL in postgresql-graceful-89609 to alter the rights to the foreign table.

Note: by default the foreign table will be own by the user issuing the command.

template:

```
alter foreign table <LINK_NAME>.<TABLE_NAME> owner to <USER_NAME>;
```

example:

```
alter foreign table datalink_secure.stg_user owner to pii_admin;
```

7. [Optional] Destroy a datalink

template:

```
HEROKU PG:LINKS:DESTROY DATABASE_URL DATALINK_SECURE -A DYNAMARTAPP-DEV
```

Reference

[Heroku Data Link](#)

[Postgres Create Foreign Table](#)



Related articles

[Heroku - Environments](#)

[How to Analyze and Optimize Postgres](#)

[Encrypt and Decrypt using PGCRYPTO](#)

[Heroku - Create Data Link](#)

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