





Cookie Cutter APEX Applications

Photo by [D&L](#) on [Unsplash](#)

a

 @alexnujiten
nuijten.blogspot.com



Notes on Oracle

Oracle Things I Got to Remember Not to Forget

RegExp: Constraint to prevent spaces at the beginning or end of a string, any spaces in the middle will fail.
All spaces that need to be handled by the application, but it must also be implemented in the database. Using a check constraint with a regular expression will prevent the end user from entering unwanted data.

To try things out, let's just start with a simple table with a single column.


```
CREATE TABLE TEST (
  COL1 VARCHAR2(100));
```


Now we might just add a check constraint using a regular expression

```
ALTER TABLE TEST ADD CONSTRAINT C1 CHECK (COL1 REGEXP '^[^ ]+$');
```

The regular expression result: The string should start (the first caret) with any character which is not a space character (space), followed by one or more characters (the period) and it should end with the dollar sign character as long as it's not in the character class of space.

UPDATE - 07-Sept-2016





Oracle APEX Best Practices
Accelerate Oracle APEX development


Real World SQL & PL/SQL
Advice from the Experts

Modern Oracle Database Programming
Level Up Your SQL: Set to Oracle's Latest and Most Powerful Features in SQL, PL/SQL, and JSON

John Nuijten
Patrick Hant
Foreword by Tim Swan

APRESS

← **Roel Hartman** 🧐
9,386 Tweets




Roel Hartman 🧐
@RoelH

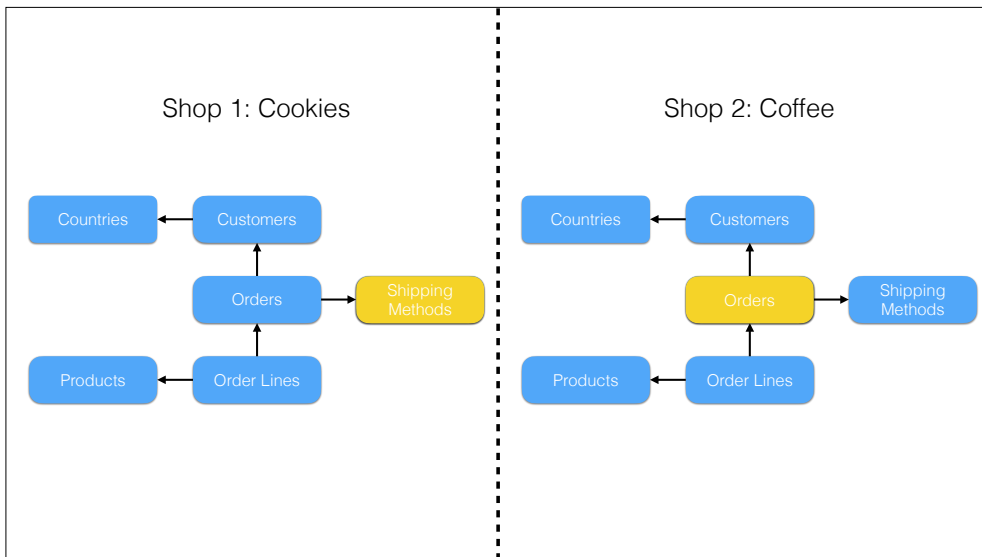
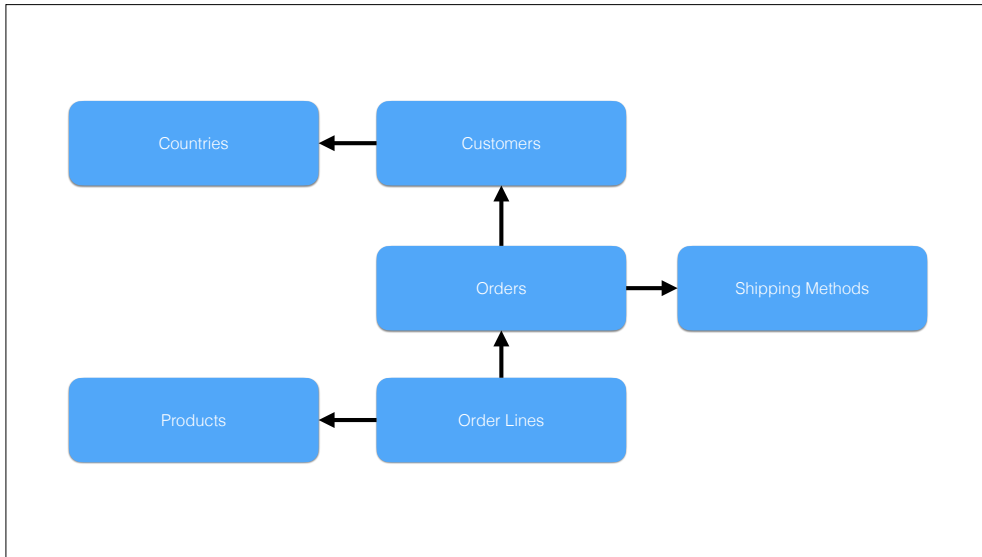
Director at APEX Consulting.
Oracle ACE Director.
Director at ODTUG.
[Translate bio](#)

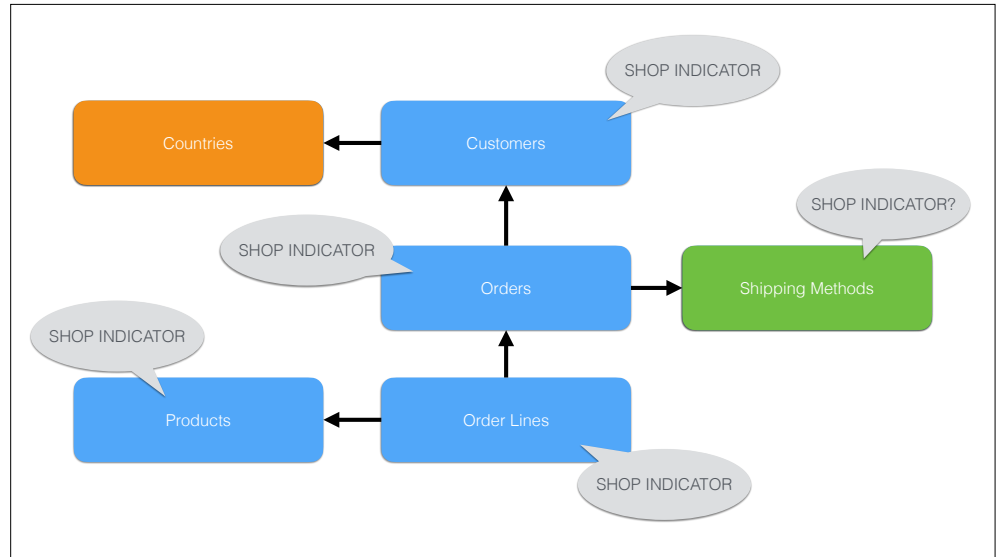
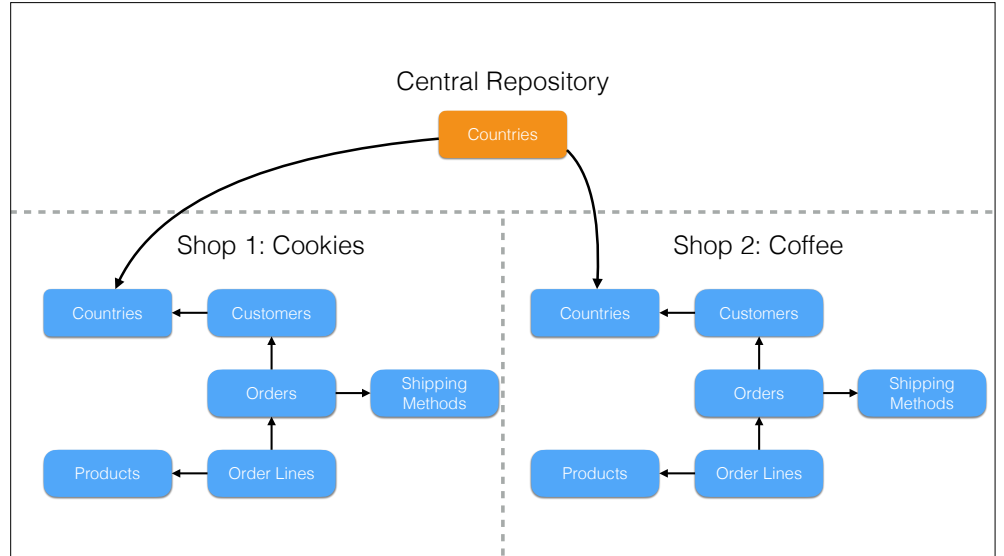
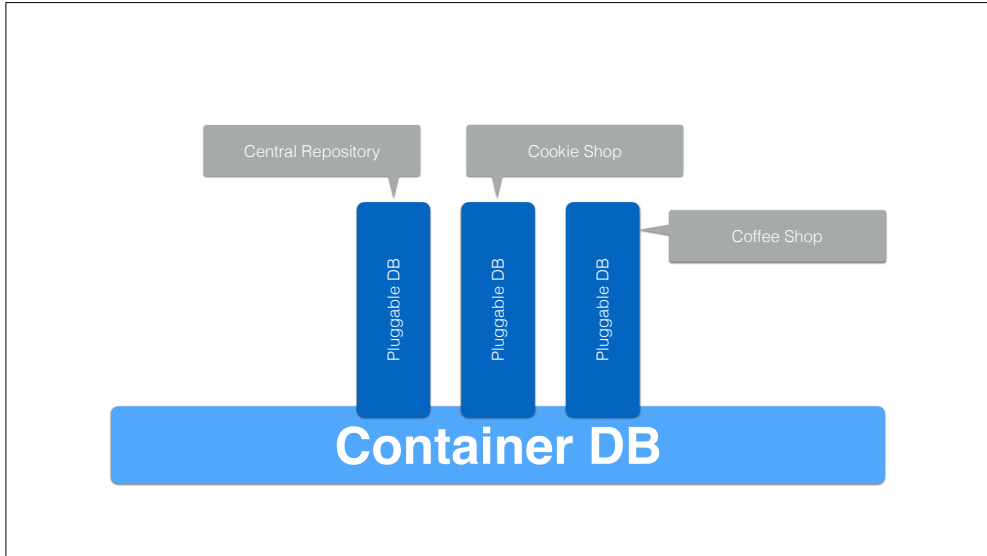
📍 The Netherlands 🌐 [roelhartman.blogspot.com](#) 🎂 Born June 10, 1965
📅 Joined March 2007

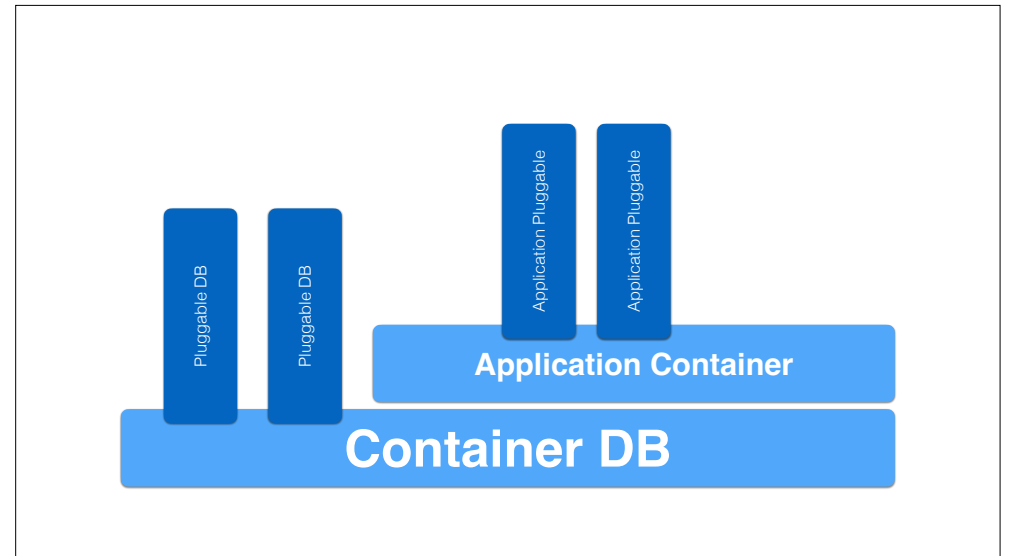
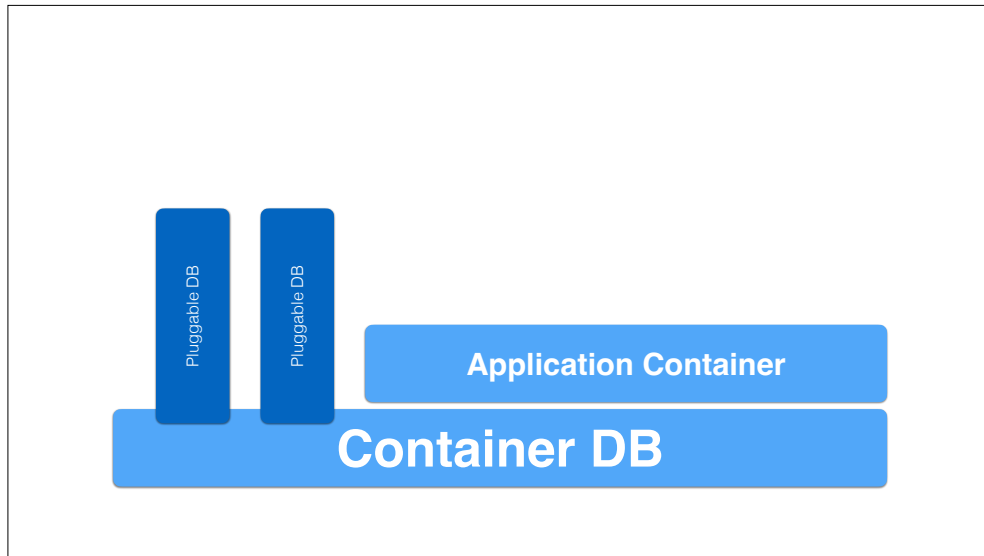
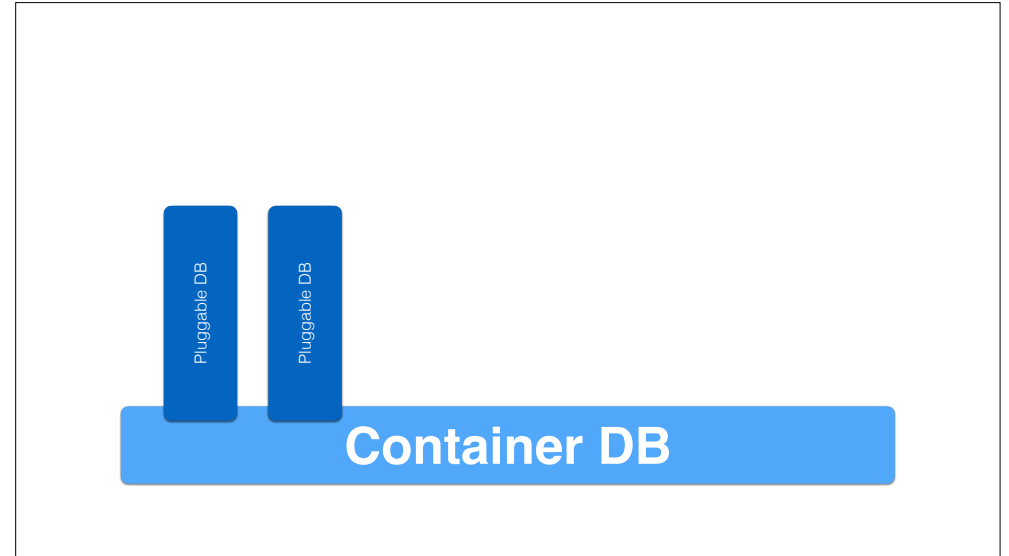
318 Following 3,915 Followers

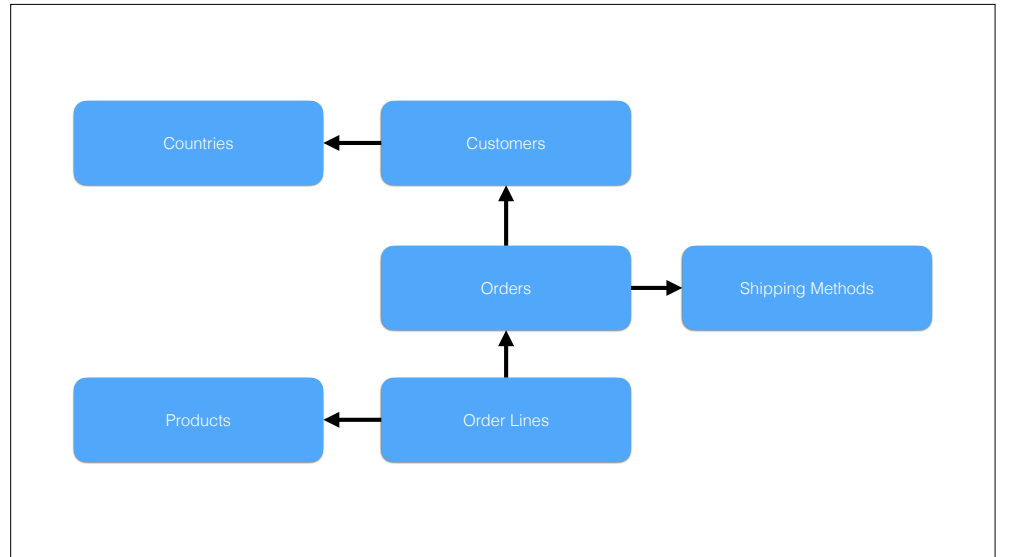
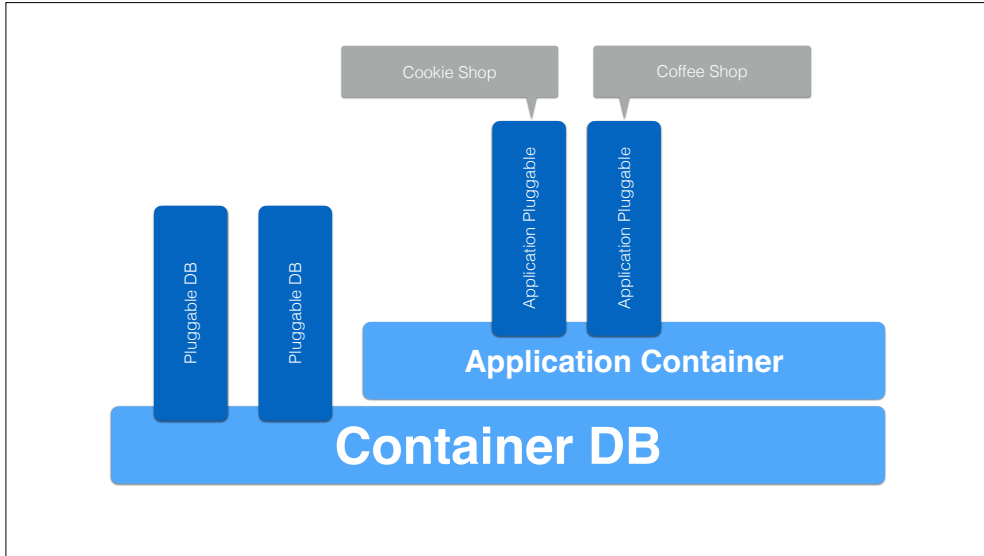


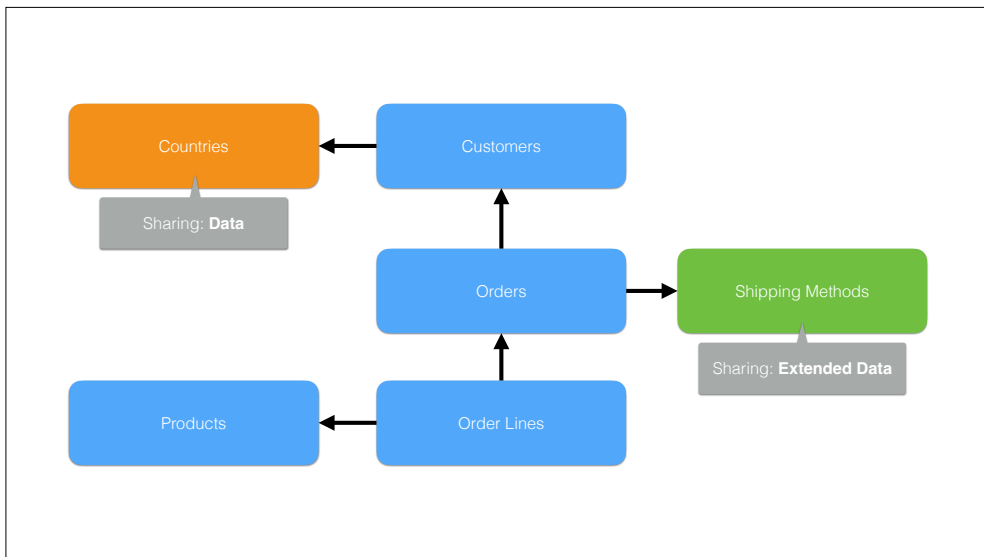
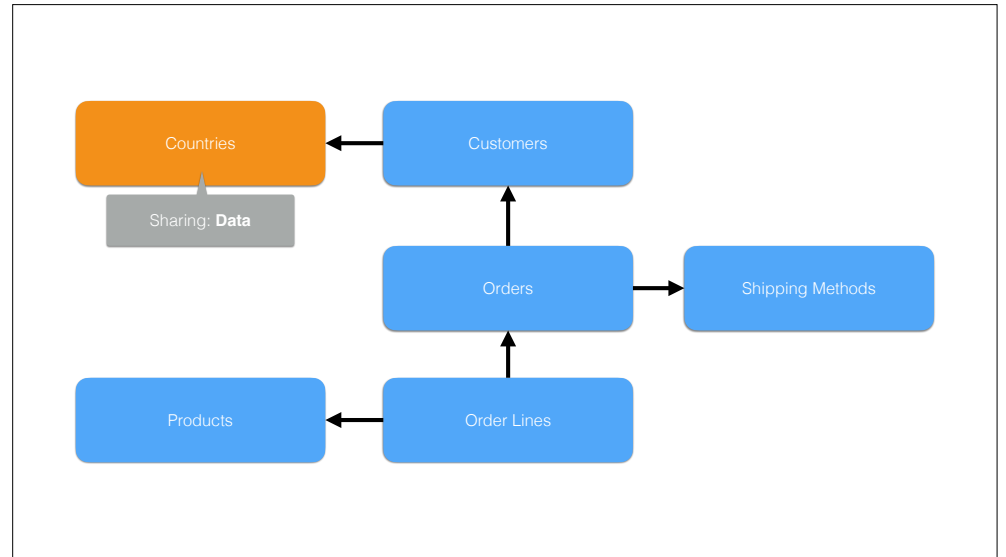
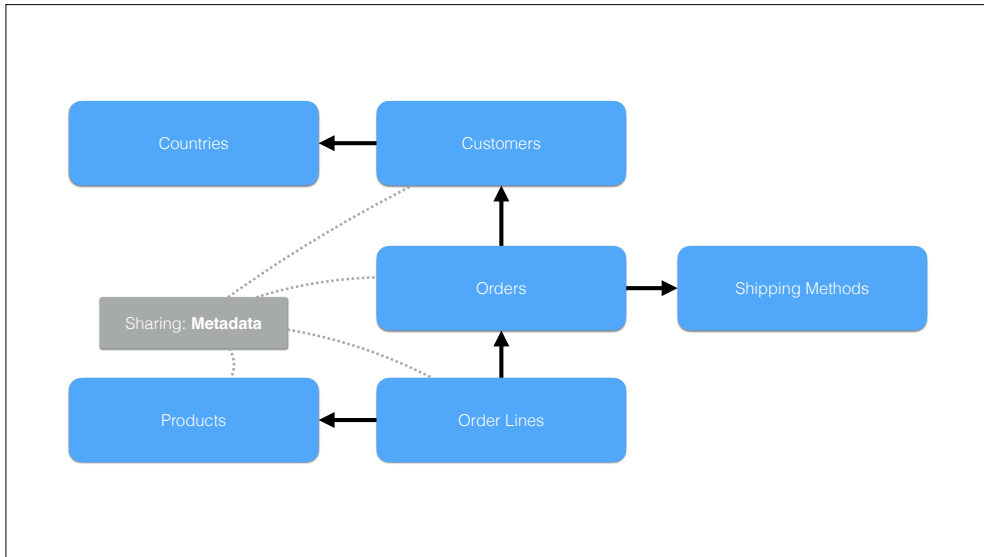
Business Case:
Web Shop Hub











CDB Root

```
SQL> connect sys/oracle@free as sysdba
Connected.
```

CDB Root

```
SQL> create pluggable database shop_container as application container
2* admin user app_admin identified by oracle;

Pluggable database SHOP_CONTAINER created.
```

CDB Root

```
SQL> create pluggable database shop_container as application container
2* admin user app_admin identified by oracle;

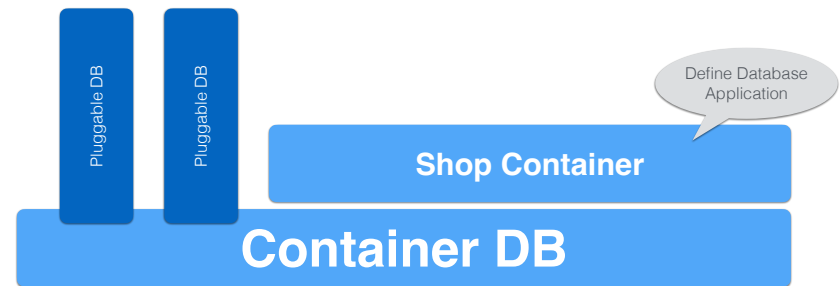
Pluggable database SHOP_CONTAINER created.

SQL> alter pluggable database shop_container open;

Pluggable database SHOP_CONTAINER altered.

SQL> alter pluggable database shop_container save state;

Pluggable database SHOP_CONTAINER altered.
```



Application Container

```
SQL> alter session set container = shop_container;
Session altered.

SQL> show con_name
CON_NAME
-----
SHOP_CONTAINER
```

Application Container

Name of the Application

```
SQL> alter pluggable database application webshops begin install 'v1.0';
Pluggable database APPLICATION altered.
```

Application Container

```
SQL> alter pluggable database application webshops begin install 'v1.0';
Pluggable database APPLICATION altered.
```

Create User, Grants, DDL, DML

Application Container

```
SQL> alter pluggable database application webshops begin install 'v1.0';
Pluggable database APPLICATION altered.
```

Create User, Grants, DDL, DML

```
SQL> alter pluggable database application webshops end install;
Pluggable database APPLICATION altered.
```


Application Container

```
SQL> create tablespace users;

Tablespace USERS created.

SQL> create user shop_owner identified by oracle
 2  default tablespace users
 3  quota unlimited on users
 4* temporary tablespace temp;

User SHOP_OWNER created.

SQL> grant db_developer_role to shop_owner;

Grant succeeded.
```

New in 23c

Application Container

```
create table shop_owner.countries sharing = data
(id          number generated always as identity
 ,name      varchar2(150) not null
 ,constraint cty_pk primary key (id)
 );
```

Identity Column
can be used

Application Container

```
create table shop_owner.customers sharing = metadata
(id          number generated always as identity
 ,name      varchar2(50) not null
 ,country_id number not null
 ,constraint ctr_pk primary key (id)
 ,constraint ctr_cty_fk foreign key (country_id) references shop_owner.countries (id)
 );
```

Application Container

```
create sequence shop_owner.smd_seq sharing = data
/
create table shop_owner.shippingmethods sharing = extended data
(id          number default shop_owner.smd_seq.nextval
 ,name      varchar2(25) not null
 ,constraint smd_pk primary key (id)
 );
```

Don't use
Identity Column

Application Container

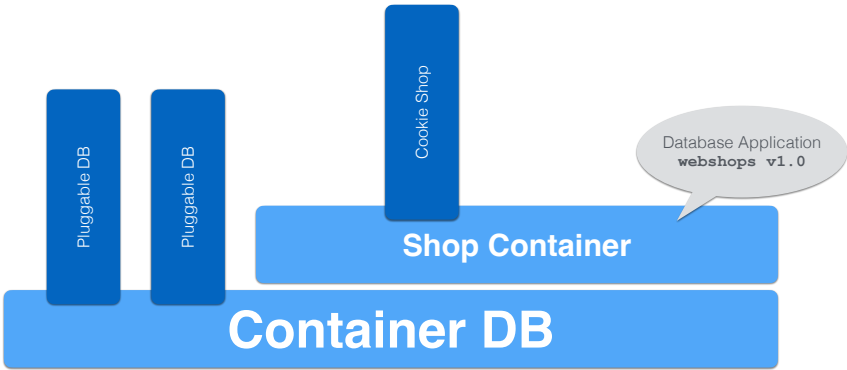
```
create table shop_owner.customers sharing = metadata
(id number generated always as identity
,name varchar2(50) not null
,country_id number not null
,constraint ctr_pk primary key (id)
,constraint ctr_cty_fk foreign key (country_id) references shop_owner.countries (id)
);
```

Sharing: Data

Application Container

```
.. Create Shop tables and sequences
Table SHOP_OWNER.COUNTRIES created.
Table SHOP_OWNER.CUSTOMERS created.
Sequence SHOP_OWNER.SMD_SEQ created.
Table SHOP_OWNER.SHIPPINGMETHODS created.
Table SHOP_OWNER.ORDERS created.
Table SHOP_OWNER.PRODUCTS created.
Table SHOP_OWNER.ORDERLINES created.
```

```
SQL> @shop_seed_data.sql
.. Populate Countries
1 row inserted.
1 row inserted.
1 row inserted.
.. Shipping Methods
1 row inserted.
1 row inserted.
Commit complete.
```



Application Container

```
SQL> create pluggable database cookie_shop
      2* admin user shop_admin identified by oracle;

Pluggable database COOKIE_SHOP created.

SQL> alter pluggable database cookie_shop open;

Pluggable database COOKIE_SHOP altered.

SQL> alter pluggable database cookie_shop save state;

Pluggable database COOKIE_SHOP altered.
```

Application Pluggable

```
SQL> alter session set container = cookie_shop;

Session altered.
```

Application Pluggable

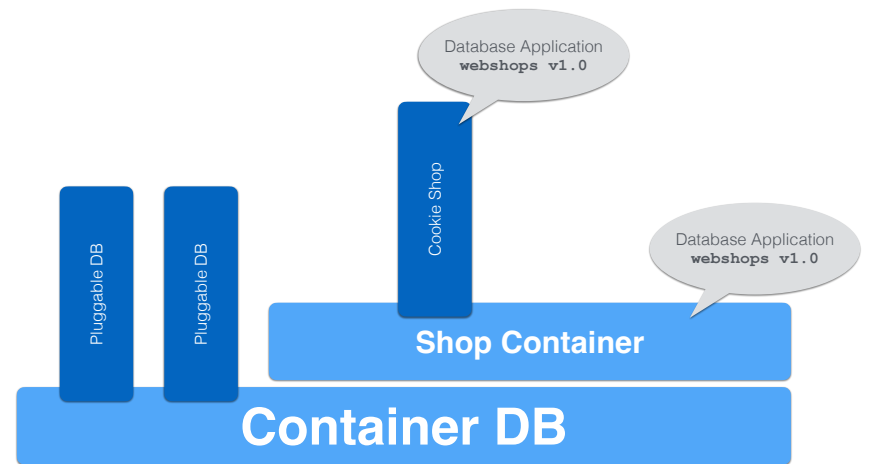
```
SQL> alter session set container = cookie_shop;

Session altered.

SQL> alter pluggable database application webshops sync;

Pluggable database APPLICATION altered.
```

To Sync Multiple Applications, use **all**



Application Container

```
SQL> create pluggable database coffee_shop
2* admin user shop_admin identified by oracle;

Pluggable database COFFEE_SHOP created.

SQL> alter pluggable database coffee_shop open;

Pluggable database COFFEE_SHOP altered.
```

Application Pluggable

```
SQL> create pluggable database coffee_shop
2* admin user shop_admin identified by oracle;

Pluggable database COFFEE_SHOP created.

SQL> alter pluggable database coffee_shop open;

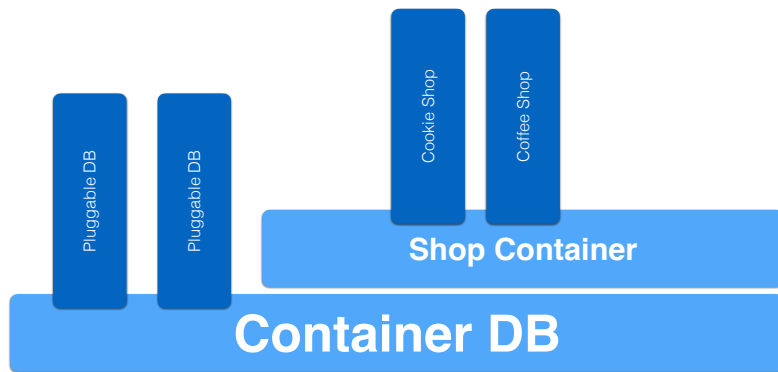
Pluggable database COFFEE_SHOP altered.

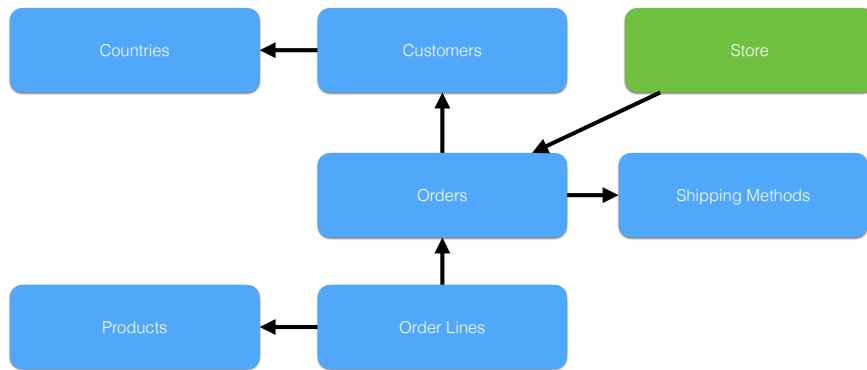
SQL> alter session set container = coffee_shop;

Session altered.

SQL> alter pluggable database application webshops sync;

Pluggable database APPLICATION altered.
```





Application Container

```

SQL> alter session set container = shop_container
2* /

Session altered.
  
```

Application Container

```

SQL> alter session set container = shop_container
2* /

Session altered.

SQL> alter pluggable database application webshops
2 begin upgrade 'v1.0' to 'v2.0'
3 comment 'physical stores added to data model'
4* /

Pluggable database APPLICATION altered.
  
```

Application Container

```

SQL> create table shop_owner.stores sharing = metadata
2 (id number generated always as identity
3 ,store_name varchar2(255 char) not null
4 ,web_address varchar2(100 char)
5 ,physical_address varchar2(512 char)
6 ,latitude number
7 ,longitude number
8 ,constraint ste_pk primary key (id)
9 )
10* /

Table SHOP_OWNER.STORES created.

SQL> alter table shop_owner.orders
2 add (store_id integer)
3* /

Table SHOP_OWNER.ORDERS altered.

SQL> alter table shop_owner.orders
2 add constraint odr_ste_fk foreign key (store_id) references shop_owner.stores (id)
3* /

Table SHOP_OWNER.ORDERS altered.
  
```

Application Container

```
SQL> alter pluggable database application webshops end upgrade to 'v2.0'
2* /

Pluggable database APPLICATION altered.
```

Application Container

```
SQL> select app_id
2      ,app_name
3      ,app_version
4      ,app_status
5      ,app_capture_service
6      ,con_id
7*   from cdb_applications;
```

APP_ID	APP_NAME	APP_VERSION	APP_STATUS	APP_CAPTURE_SER	CON_ID
3	WEBSHOPS	v2.0	NORMAL	shop_container	5
2	WEBSHOPS	v1.0	NORMAL	coffee_shop	4
2	WEBSHOPS	v1.0	NORMAL	cookie_shop	6

Application Container

```
SQL> select app_id
2      ,app_name
3      ,app_version
4      ,app_status
5      ,app_capture_service
6      ,con_id
7*   from cdb_applications;
```

APP_ID	APP_NAME	APP_VERSION	APP_STATUS	APP_CAPTURE_SER	CON_ID
3	WEBSHOPS	v2.0	NORMAL	shop_container	5
2	WEBSHOPS	v1.0	NORMAL	coffee_shop	4
2	WEBSHOPS	v1.0	NORMAL	cookie_shop	6

Application Pluggable

```
SQL> alter session set container = cookie_shop
2* /

Session altered.

SQL> alter pluggable database application webshops sync;

Pluggable database APPLICATION altered.
```

Application Container

```
SQL> select app_id
2      ,app_name
3      ,app_version
4      ,app_status
5      ,app_capture_service
6      ,con_id
7*   from cdb_applications;
```

APP_ID	APP_NAME	APP_VERSION	APP_STATUS	APP_CAPTURE_SER	CON_ID
3	WEBSHOPS	v2.0	NORMAL	shop_container	5
2	WEBSHOPS	v1.0	NORMAL	coffee_shop	4
2	WEBSHOPS	v2.0	NORMAL	cookie_shop	6

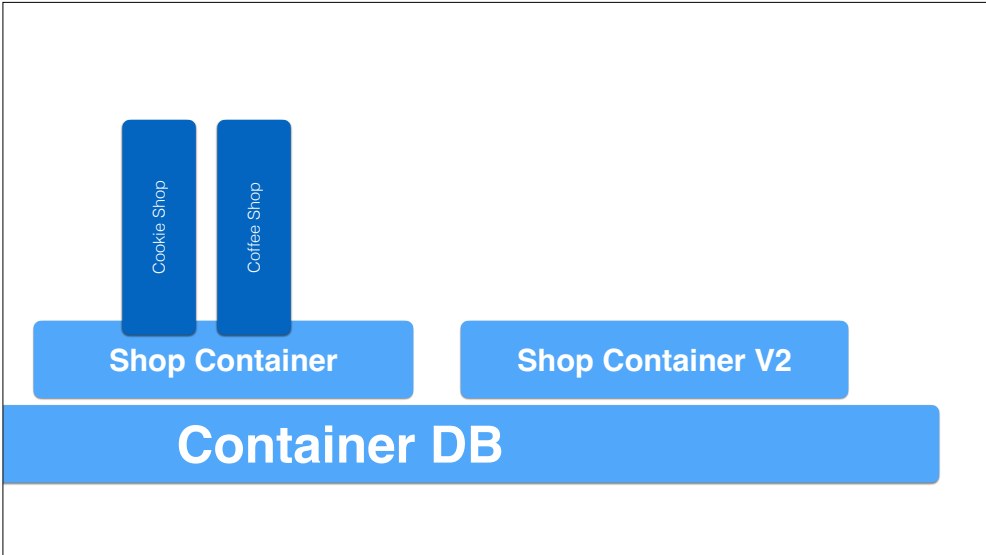
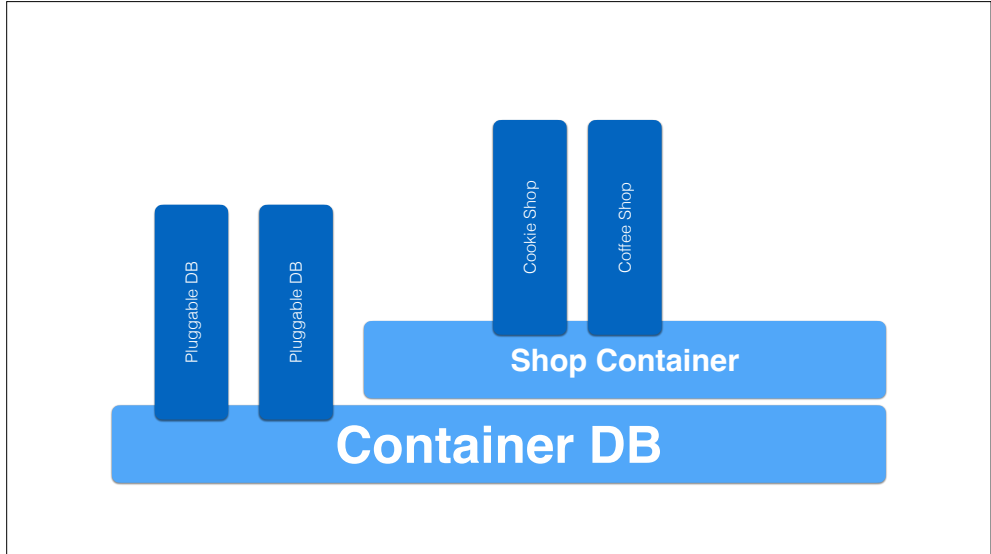


Photo by Gicoyland Design: <https://www.pexels.com/photo/close-up-photo-of-a-mouth-watering-plate-of-stroopwafels-6627267/>

Application Container

```
SQL> alter session set container = shop_container
2* /

Session altered.
```

Application Container

```
SQL> alter session set container = shop_container
2* /

Session altered.

SQL> alter pluggable database application webshops begin patch 42 minimum version 'v2.0'
2* /

Pluggable database APPLICATION altered.
```

Application Container

```
SQL> alter session set container = shop_container
2* /

Session altered.

SQL> alter pluggable database application webshops begin patch 42 minimum version 'v2.0'
2* /

Pluggable database APPLICATION altered.

SQL> alter table shop_owner.customers
2 add (phone varchar2(25))
3* /

Table SHOP_OWNER.CUSTOMERS altered.
```

Application Container

```
SQL> alter session set container = shop_container
2* /

Session altered.

SQL> alter pluggable database application webshops begin patch 42 minimum version 'v2.0'
2* /

Pluggable database APPLICATION altered.

SQL> alter table shop_owner.customers
2 add (phone varchar2(25))
3* /

Table SHOP_OWNER.CUSTOMERS altered.

SQL> alter pluggable database application webshops end patch 42
2* /

Pluggable database APPLICATION altered.
```


Application Pluggable

```
SQL> alter session set container = cookie_shop  
2* /
```

Session altered.

```
SQL> desc shop_owner.customers  
Name          Null?    Type  
-----  
ID             NOT NULL NUMBER  
NAME           NOT NULL VARCHAR2(50)  
COUNTRY_ID    NOT NULL NUMBER
```

Application Pluggable

```
SQL> alter session set container = cookie_shop  
2* /
```

Session altered.

```
SQL> desc shop_owner.customers  
Name          Null?    Type  
-----  
ID             NOT NULL NUMBER  
NAME           NOT NULL VARCHAR2(50)  
COUNTRY_ID    NOT NULL NUMBER
```

```
SQL> alter pluggable database application webshops sync to patch 42;
```

Pluggable database APPLICATION altered.

```
SQL> desc shop_owner.customers  
Name          Null?    Type  
-----  
ID             NOT NULL NUMBER  
NAME           NOT NULL VARCHAR2(50)  
COUNTRY_ID    NOT NULL NUMBER  
PHONE         VARCHAR2(25)
```

Application Pluggable

```
SQL> select app_name  
2      ,patch_number  
3      ,patch_min_version  
4      ,patch_status  
5      from dba_app_patches  
6* /
```

APP_NAME	PATCH_NUMBER	PATCH_MIN_VERSION	PATCH_STAT
WEBSHOPS	42	v2.0	INSTALLED





Install components (in Application Root Container)

APEX

Oracle® APEX

Installation Guide
Release 22.2
F57836-02
December 2022

- 5 Utilizing the Multitenant Architecture in Oracle Database 12c or Later
 - 5.1 Understanding the Installation Choices
 - 5.2 Installing APEX into an Application Container
 - 5.2.1 About Application Containers
 - 5.2.2 Creating an Application Container
 - 5.2.3 Installing or Upgrading APEX in an Application Container
 - 5.2.4 Verifying the Application Container Installation
 - 5.2.5 Creating an Application Seed
 - 5.2.6 Creating an Application PDB from the Application Root Seed
 - 5.2.7 Configure HTTP Access to the Application PDB

Application Container

```
@apxappcon SYS AUX SYS AUX TEMP /i/ oracle
```

Application Container

```
SYS> select app_id  
2 , app_name  
3 , app_version  
4 , app_status  
5 , app_capture_service  
6 , con_id  
7 from cdb_applications  
8* where app_implicit='N';
```

APP_ID	APP_NAME	APP_VERSION	APP_STATUS	APP_CAPTURE_SERVICE	CON_ID
3	WEBSHOPS	v1.0	NORMAL	shop_container	7
4	APEX	23.1	NORMAL	shop_container	7

ORDS



- 7 Using the Multitenant Architecture with Oracle REST Data Services
 - 7.1 Setting Up ORDS in a CDB Environment
 - 7.2 Setting Up ORDS in an Application Container
 - 7.3 Making All PDBs Addressable by Oracle REST Data Services (Pluggable Mapping)

Application Container

```
@ords_app_con_install.sql /log-folder/ SYSAUX TEMP SYSAUX TEMP oracle /scripts-path
```

Application Container

Unzip the war file >
unzip the jar file

```
@ords_app_con_install.sql /log-folder/ SYSAUX TEMP SYSAUX TEMP oracle /scripts-path
```

Application Container

ORDS schema
Default Tablespace

```
@ords_app_con_install.sql /log-folder/ SYSAUX TEMP SYSAUX TEMP oracle /scripts-path
```

Application Container

ORDS proxy schema
Default Tablespace

```
@ords_app_con_install.sql /log-folder/ SYSAUX TEMP SYSAUX TEMP oracle /scripts-path
```


Application Container

```
SYS> select app_id
2 ,      app_name
3 ,      app_version
4 ,      app_status
5 ,      app_capture_service
6 ,      con_id
7 from   cdb_applications
8* where app_implicit='N';
```

APP_ID	APP_NAME	APP_VERSION	APP_STATUS	APP_CAPTURE_SERVICE	CON_ID
3	WEBSHOPS	v1.0	NORMAL	shop_container	7
4	APEX	23.1	NORMAL	shop_container	7
21	ORDS	23.2.2.r2081534	NORMAL	shop_container	7

UPGRADE & PATCH



Application Container

```
SQL> alter pluggable database application APEX begin patch 1 comment 'Fix APEX/ORDS setup';
```

Pluggable database APPLICATION altered.

```
SQL> alter user APEX_PUBLIC_USER grant connect through ORDS_PUBLIC_USER;
```

User APEX_PUBLIC_USER altered.

```
SQL> begin
2   ords_admin.config_plsql_gateway(
3     p_runtime_user => 'ORDS_PUBLIC_USER',
4     p_plsql_gateway_user => 'APEX_PUBLIC_USER',
5     p_comments      => 'APEX proxied to ORDS');
6   commit;
7 end;
8* /
```

PL/SQL procedure successfully completed.

```
SQL> @@create_apex_workspace.sql
```

```
SQL> alter pluggable database application APEX end patch 1;
```

Pluggable database APPLICATION altered.

Application Container

```
SQL> select app_name
2 ,      patch_number
3 ,      patch_min_version
4 ,      patch_status
5 ,      patch_comment
6 from   dba_app_patches
7* /
```

APP_NAME	PATCH_NUMBER	PATCH_MIN_VERSION	PATCH_STATUS	PATCH_COMMENT
APEX	1	23.1	INSTALLED	Fix APEX/ORDS setup



Webshop Application

Application Container

```
SQL> alter pluggable database application webshops_app begin install '1.0';  
Pluggable database APPLICATION altered.  
  
SQL> @@create_apex_application.sql  
:~::~:  
  
SQL> alter pluggable database application webshops_app end install;  
Pluggable database APPLICATION altered.
```

Application Container

```
SQL> select app_id  
2 , app_name  
3 , app_version  
4 , app_status  
5 , app_capture_service  
6 , con_id  
7 from cdb_applications  
8* where app_implicit='N';
```

APP_ID	APP_NAME	APP_VERSION	APP_STATUS	APP_CAPTURE_SERVICE	CON_ID
3	WEBSHOPS	v1.0	NORMAL	shop_container	7
4	APEX	23.1	NORMAL	shop_container	7
21	ORDS	23.2.2.r2081534	NORMAL	shop_container	7
41	WEBSHOPS_APP	V1.0	NORMAL	shop_container	7

Create Seed



Application Container

```
SQL> create pluggable database as seed
Admin user shop_admin identified by oracle;

Pluggable database created.

SQL> alter pluggable database shop_container$seed open;

Pluggable database SHOP_CONTAINER$SEED altered.

SQL> alter pluggable database shop_container$seed save state;

Pluggable database SHOP_CONTAINER$SEED altered.
```

Application Pluggable

```
SQL> alter session set container = shop_container$seed;
Session altered.

SQL> alter pluggable database application webshops sync;
Pluggable database APPLICATION altered.

SQL> alter pluggable database application ords sync;
Pluggable database APPLICATION altered.

SQL> alter pluggable database application apex sync;
Pluggable database APPLICATION altered.

SQL> alter pluggable database application webshops_app sync;
Pluggable database APPLICATION altered.
```



Application Pluggable

```
SQL> select app_id
2 , app_name
3 , app_version
4 , app_status
5 , app_capture_service
6 , con_id
7 from cdb_applications
8* where app_implicit='N';
```

APP_ID	APP_NAME	APP_VERSION	APP_STATUS	APP_CAPTURE_SERVICE	CON_ID
2	WEBSHOPS	v1.0	NORMAL	shop_container\$seed	5
3	ORDS	23.2.2.r2081534	NORMAL	shop_container\$seed	5
4	APEX	23.1	NORMAL	shop_container\$seed	5
21	WEBSHOPS_APP	v1.0	NORMAL	shop_container\$seed	5

Create a Cookie Shop Application



Application Pluggable

```
SQL> alter session set container = shop_container;
Session altered.

SQL> create pluggable database cookieshop;
Pluggable database created.

SQL> alter pluggable database cookieshop open;
Pluggable database altered.

SQL> alter pluggable database cookieshop save state;
Pluggable database altered.
```



Application Container

```
SQL> select app_id
2 , app_name
3 , app_version
4 , app_status
5 , app_capture_service
6 , con_id
7 from cdb_applications
8* where app_implicit='N';
```

APP_ID	APP_NAME	APP_VERSION	APP_STATUS	APP_CAPTURE_SERVICE	CON_ID
2	WEBSHOPS	v1.0	NORMAL	shop_container\$seed	6
3	ORDS	23.2.2.r2081534	NORMAL	shop_container\$seed	6
4	APEX	23.1	NORMAL	shop_container\$seed	6
21	WEBSHOPS_APP	v1.0	NORMAL	shop_container\$seed	6

<http://localhost:8080/app/cookieshop/r/webshops/webshops/login>



Application Pluggable



Photo by Chevaron Photography: <https://www.pexels.com/photo/woman-pouring-coffee-into-cup-102896/>



Photo by Aytegin Akdas: <https://www.pexels.com/photo/woman-holding-cookies-in-basket-14314899/>

Take Away

Should you use Application Containers?



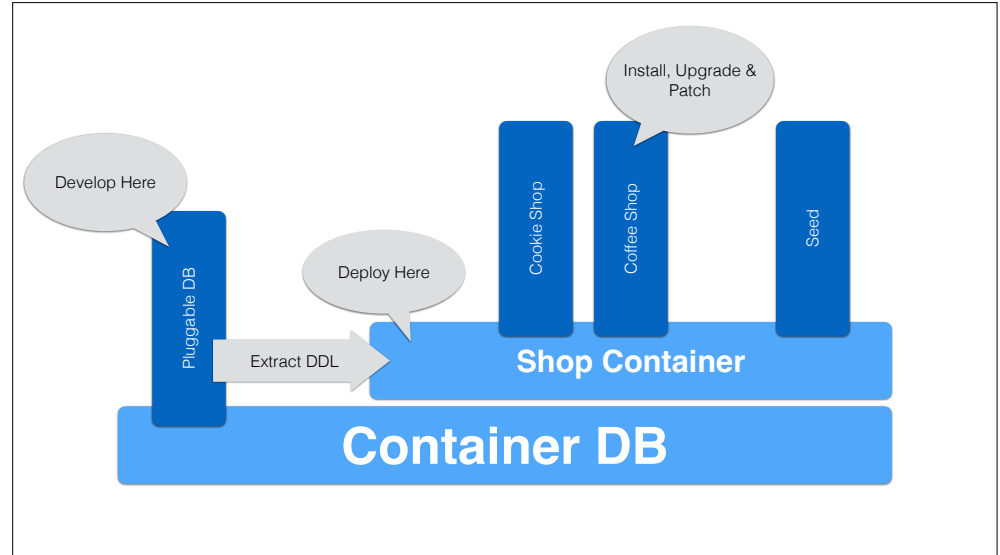
SAAS Provider

Data Shared across Applications

Clean Development and Deployment



⚠ Don't Develop in Application Container ⚠



Installation not 100% trivial

Enhancements Underway

Oracle Database 19c | Up to 3 PDBs per CDB Without Licensing Multitenant

October 29, 2019 | 1 minute read

William Hardie
Vice President

3 PDBs Might not be Sufficient

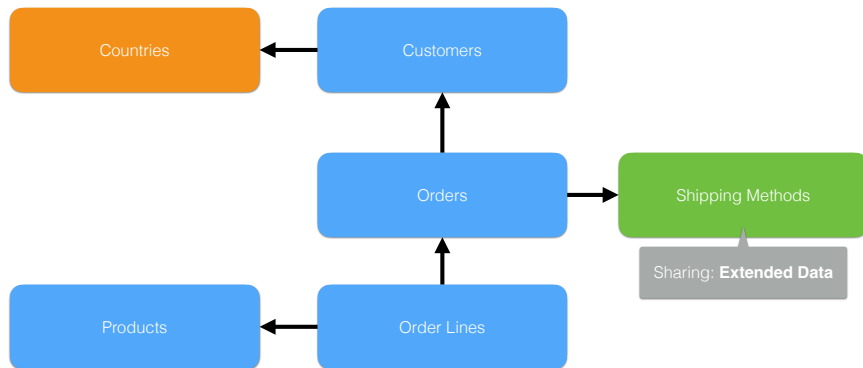
Questions?



Trivia



Photo by Alizee Marchand: <https://www.pexels.com/photo/yellow-macarons-947802/>



Application Pluggable

```
SQL> alter session set container = coffee_shop;
Session altered.
SQL> insert into shop_owner.shippingmethods (name) values ('Express 2 Day');
1 row inserted.
SQL> commit;
Commit complete.
```

Application Pluggable

```
SQL> select *  
2 from shop_owner.shippingmethods  
3* ;
```

ID NAME

```
-----  
1 One Day Delivery  
2 Two Day Delivery  
5 Express 2 Day
```

Container

Application Pluggable

```
SQL> select *  
2 from shop_owner.shippingmethods  
3* ;
```

ID NAME

```
-----  
1 One Day Delivery  
2 Two Day Delivery  
5 Express 2 Day
```

Pluggable

Application Pluggable

```
SQL> truncate table shop_owner.shippingmethods  
2* /
```

Table SHOP_OWNER.SHIPPINGMETHODS truncated.

Application Pluggable

```
SQL> truncate table shop_owner.shippingmethods  
2* /
```

Table SHOP_OWNER.SHIPPINGMETHODS truncated.

```
SQL> select *  
2 from shop_owner.shippingmethods  
3* /
```

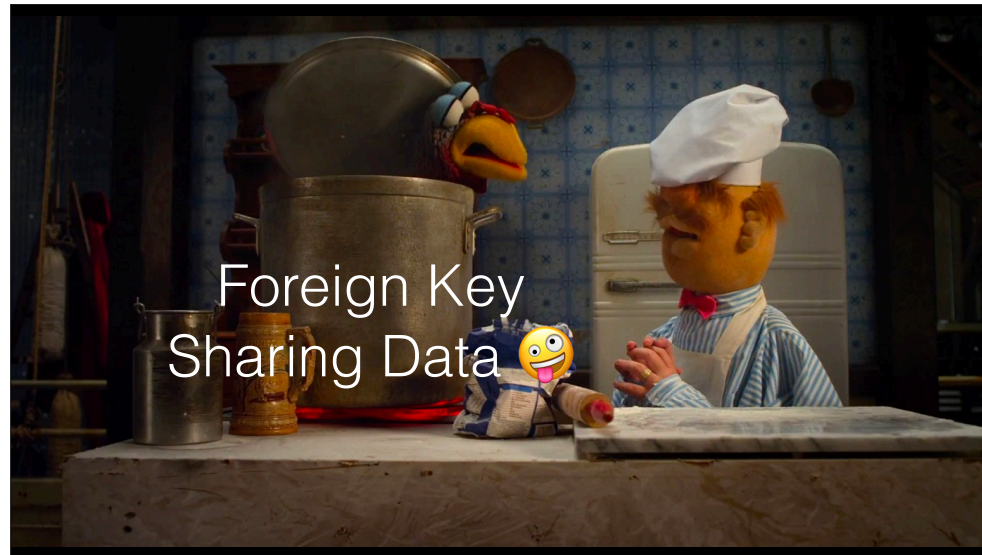
Application Pluggable

```
SQL> truncate table shop_owner.shippingmethods
2* /

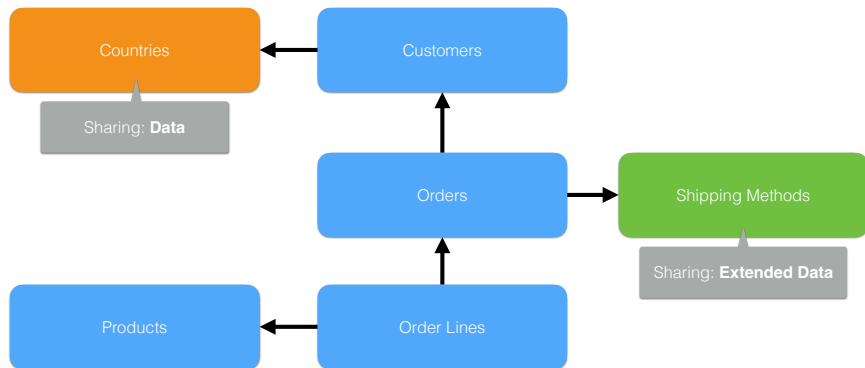
Table SHOP_OWNER.SHIPPINGMETHODS truncated.

SQL> select *
2 from shop_owner.shippingmethods
3* /

-----
ID NAME
-----
1 One Day Delivery
2 Two Day Delivery
```



Foreign Key Sharing Data



Application Container

```
SQL> select *
2 from shop_owner.countries
3* /

-----
ID NAME
-----
1 Netherlands
2 United Kingdom
3 United States
```

Application Container

```
SQL> select *
  2   from shop_owner.countries
  3* /
```

```
-----
ID NAME
-----
 1 Netherlands
 2 United Kingdom
 3 United States
```

```
SQL> select name
  2   ,country_id
  3   from containers (shop_owner.customers)
  4   order by country_id
  5* /
```

```
-----
NAME                COUNTRY_ID
-----
Alex                 1
Roel                 1
Mick Jagger          2
Keith Richards       2
Ronnie Wood          2
John Lennon          2
Paul McCartney       2
George Harrison      2
Ringo Star           2
Jennifer             3
```

10 rows selected.

Application Container

```
SQL> select *
  2   from shop_owner.countries
  3* /
```

```
-----
ID NAME
-----
 1 Netherlands
 2 United Kingdom
 3 United States
```

```
SQL> select name
  2   ,country_id
  3   from containers (shop_owner.customers)
  4   order by country_id
  5* /
```

```
-----
NAME                COUNTRY_ID
-----
Alex                1
Roel                1
Mick Jagger          2
Keith Richards       2
Ronnie Wood          2
John Lennon          2
Paul McCartney       2
George Harrison      2
Ringo Star           2
Jennifer             3
```

10 rows selected.

Application Container

```
SQL> desc shop_owner.customers
```

```
Name      Null?  Type
-----
ID         NOT NULL NUMBER
NAME      NOT NULL VARCHAR2(50)
COUNTRY_ID NOT NULL NUMBER
PHONE     VARCHAR2(25)
```

Application Container

```
SQL> delete
  2   from shop_owner.countries
  3   where id = 1
  4* /
```

Application Container

```
SQL> delete
  2   from shop_owner.countries
  3   where id = 1
  4* /

1 row deleted.

SQL> commit;

Commit complete.
```

Application Container

```
SQL> select name
  2   ,country_id
  3   from containers (shop_owner.customers)
  4   order by country_id
  5* /
```

Application Container

```
SQL> select name
  2   ,country_id
  3   from containers (shop_owner.customers)
  4   order by country_id
  5* /
```

NAME	COUNTRY_ID
Alex	1
Roel	1
Mick Jagger	2
Keith Richards	2
Ronnie Wood	2
John Lennon	2
Paul McCartney	2
George Harrison	2
Ringo Star	2
Jennifer	3

10 rows selected.

Application Pluggable

```
SQL> alter session set container = cookie_shop

Session altered.

SQL> select ctr.name
  2   ,cty.name
  3   from shop_owner.customers ctr
  4   join shop_owner.countries cty
  5   on ctr.country_id = cty.id
  6* /
```

NAME	NAME
Mick Jagger	United Kingdom
Keith Richards	United Kingdom
Ronnie Wood	United Kingdom
John Lennon	United Kingdom
Paul McCartney	United Kingdom
George Harrison	United Kingdom
Ringo Star	United Kingdom
Jennifer	United States

8 rows selected.

Application Pluggable

```
SQL> select ctr.name
2      ,cty.name
3      from shop_owner.customers ctr
4      left outer
5      join shop_owner.countries cty
6      on ctr.country_id = cty.id
7* /
```

NAME	NAME
Mick Jagger	United Kingdom
Keith Richards	United Kingdom
Ronnie Wood	United Kingdom
John Lennon	United Kingdom
Paul McCartney	United Kingdom
George Harrison	United Kingdom
Ringo Star	United Kingdom
Jennifer	United States
Alex	
Roel	

10 rows selected.

Application Container

```
SQL> alter session set container = shop_container
2* /
```

Session altered.

```
SQL> alter pluggable database application webshops begin patch 43 minimum version 'v2.0'
2* /
```

Pluggable database APPLICATION altered.

```
SQL> alter table shop_owner.countries
2      read only
3* /
```

Table SHOP_OWNER.COUNTRIES altered.

```
SQL> alter pluggable database application webshops end patch 43
2* /
```

Pluggable database APPLICATION altered.