
ORACLE
University
Oracle Cloud Infrastructure
CI/CD for APEX and Oracle Database Developers
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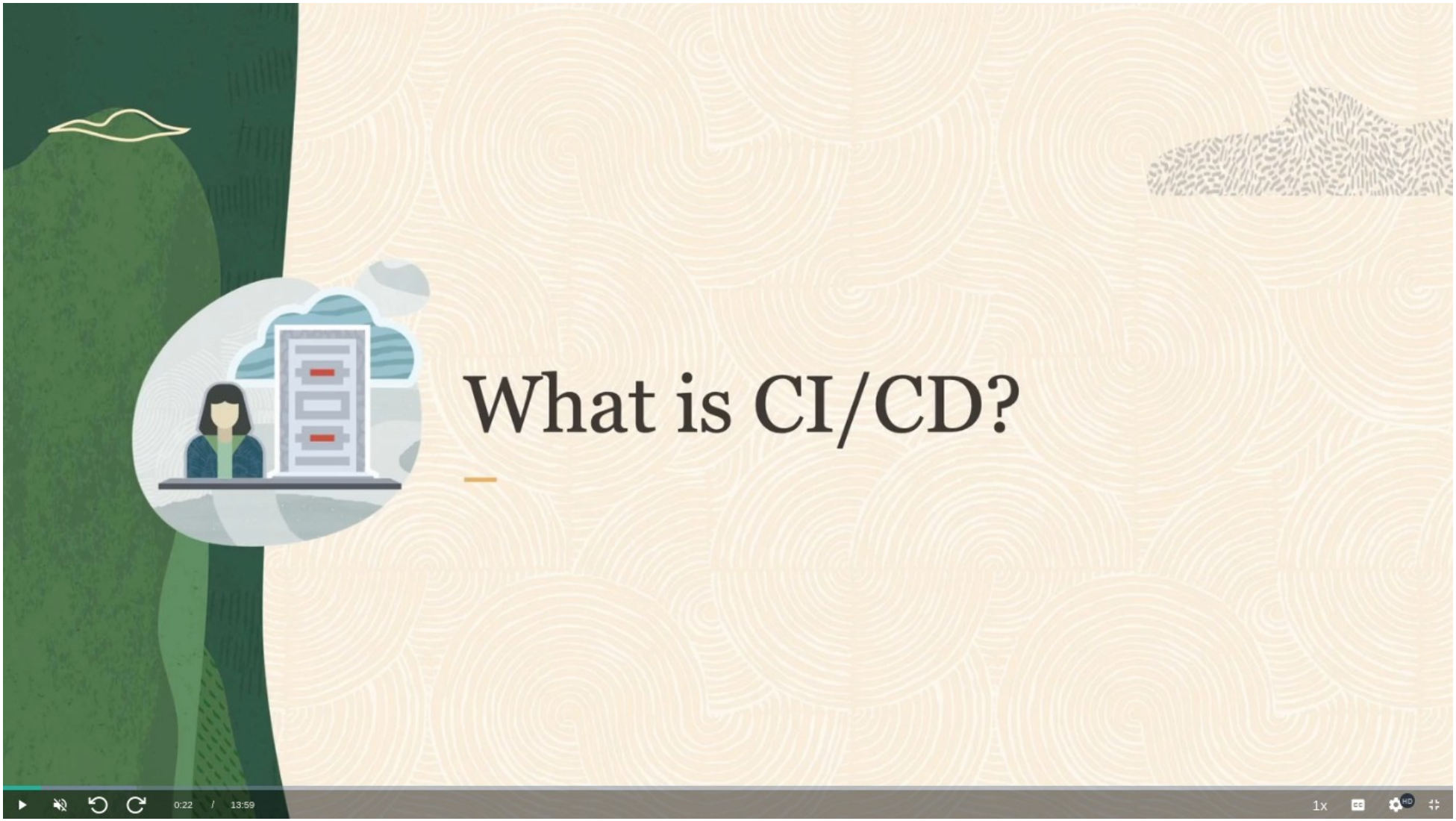
What is CI/CD?
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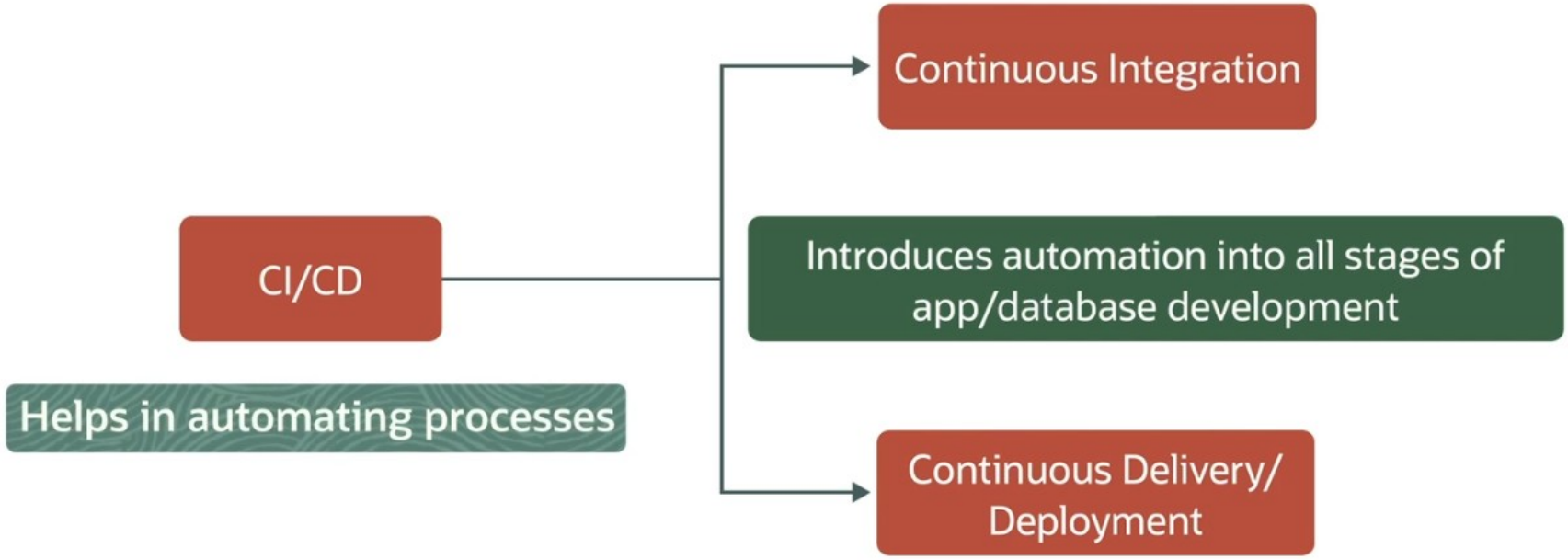
What is CI/CD and why do we need it?



What is CI/CD and why do we need it?

CI automates

Merging the Codes

Unit Testing and Functional Testing

Repository

What is CI/CD and why do we need it?

Repository

Consistency

Everyone's on same page

What is CI/CD and why do we need it?

Merging the Codes

Repository

Are they following coding/ security standards ?

What is CI/CD and why do we need it?

Repository

Find quality Issues a lot faster

What is CI/CD and why do we need it?

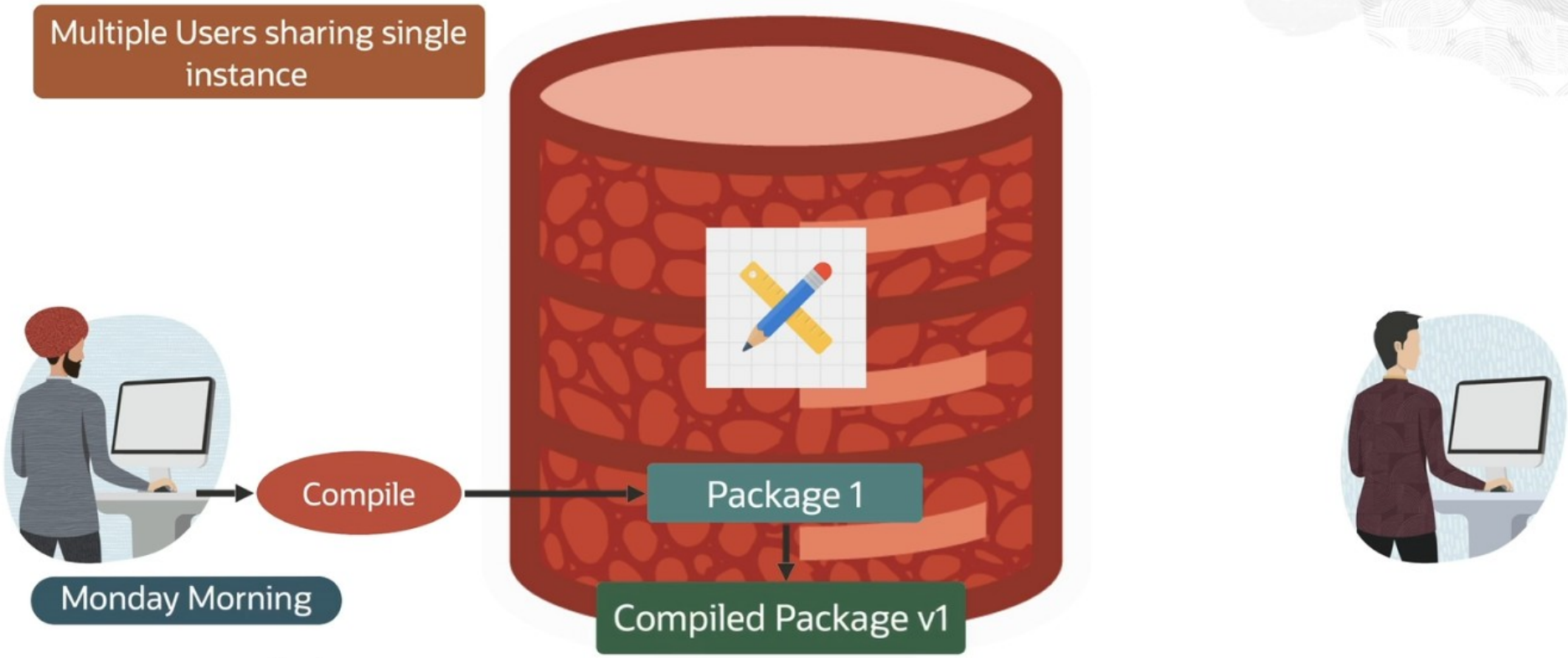
CD automates

Testing on pre-prod env followed by testing on prod env

Repository

Completely automated way

CI/CD with the database and APEX?



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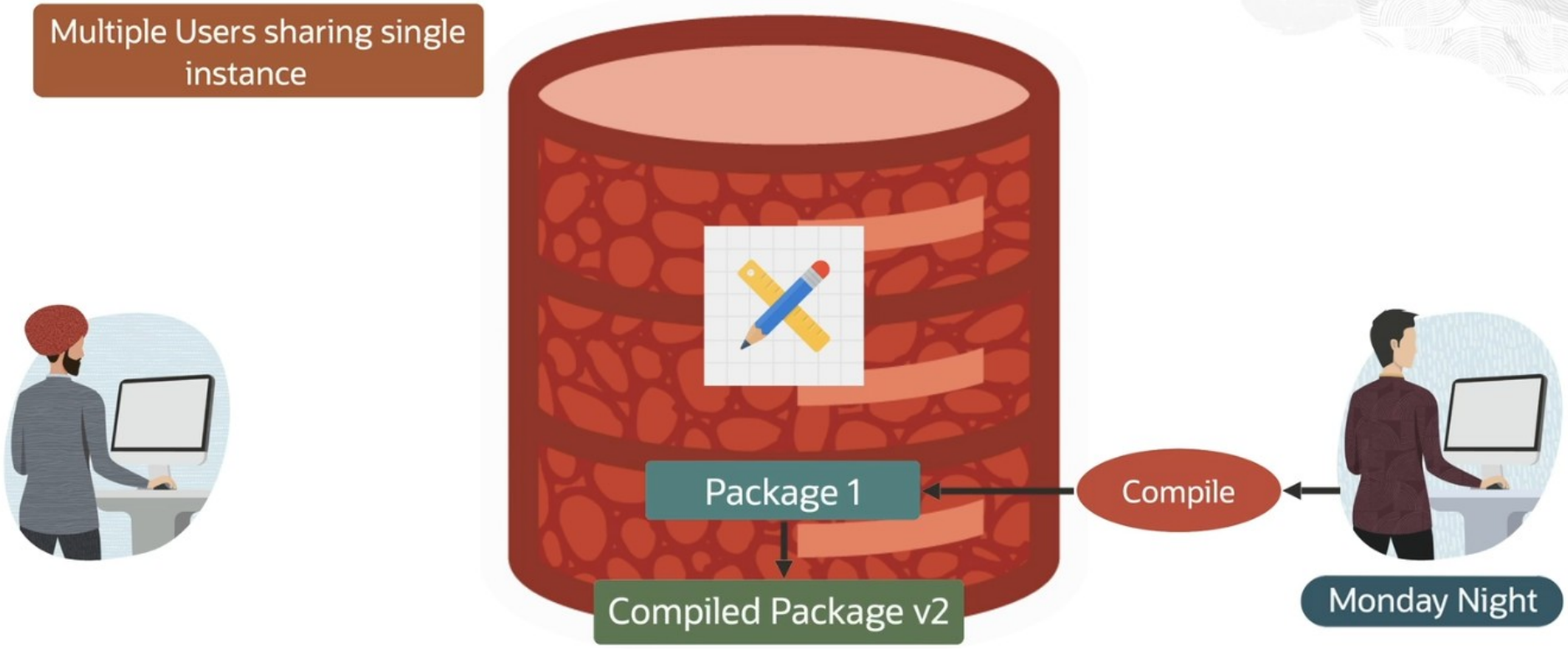
CI/CD with the database and APEX?



CI/CD with the database and APEX?

Multiple Users sharing single instance

Tuesday Morning

?

Search for v1

CI/CD with the database and APEX?

Its not always easy to
create multiple Oracle Databases

CI/CD with the database and APEX?

- Licensing issues
- Dev instances can be expensive
- Hardware is Available?
- Ability to clone?
- Sufficient space is available in Array?

CI/CD with the database and APEX?

Database in the apex flow is a lot different

Stateful versus Stateless

CI/CD with the database and APEX?

Bring up doc containers

Pilot it

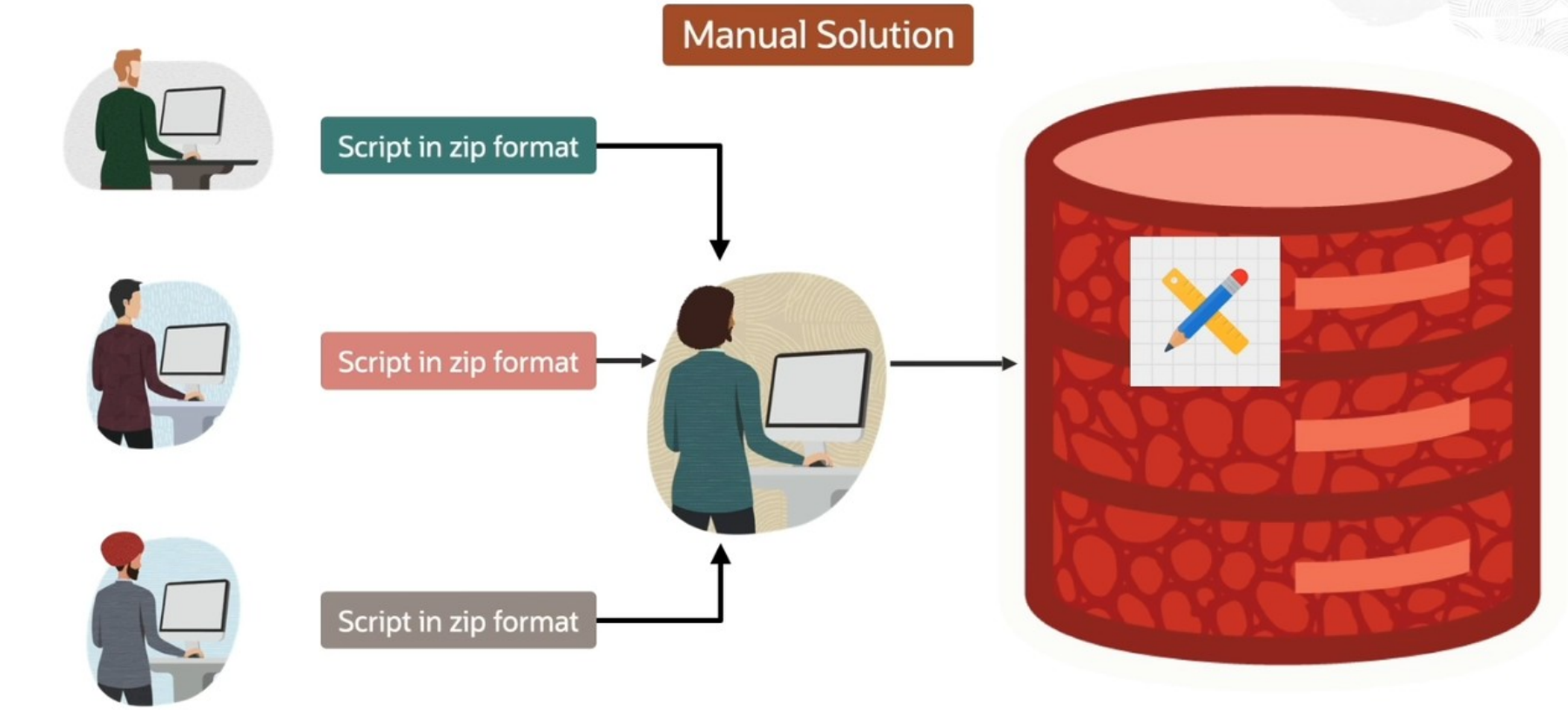
Push it

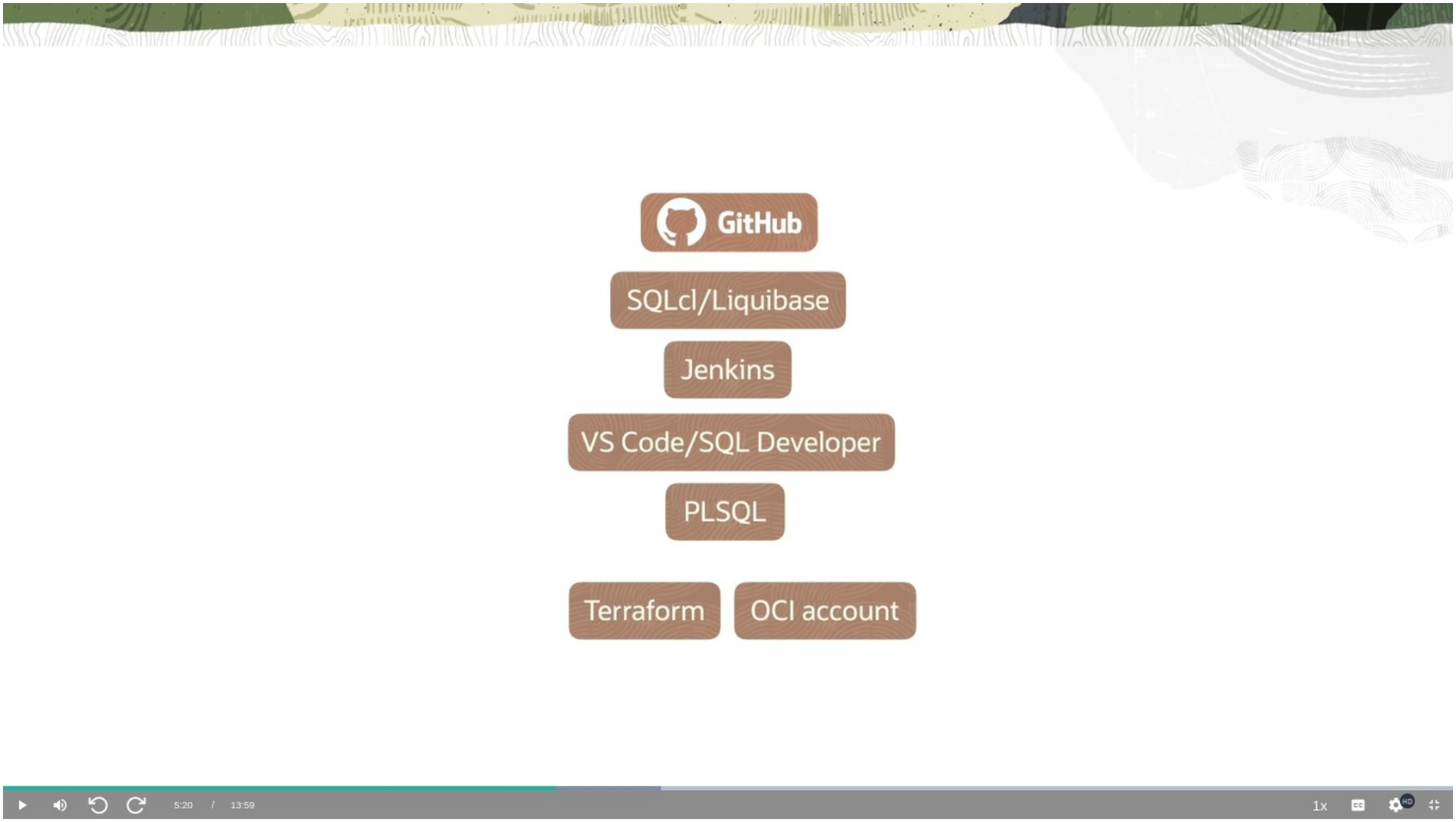
Done

CI/CD with the database and APEX?

Manual Solution

CI/CD with the database and APEX?




GitHub
SQLcl/Liquibase
Jenkins
VS Code/SQL Developer
PLSQL
Terraform
OCI account
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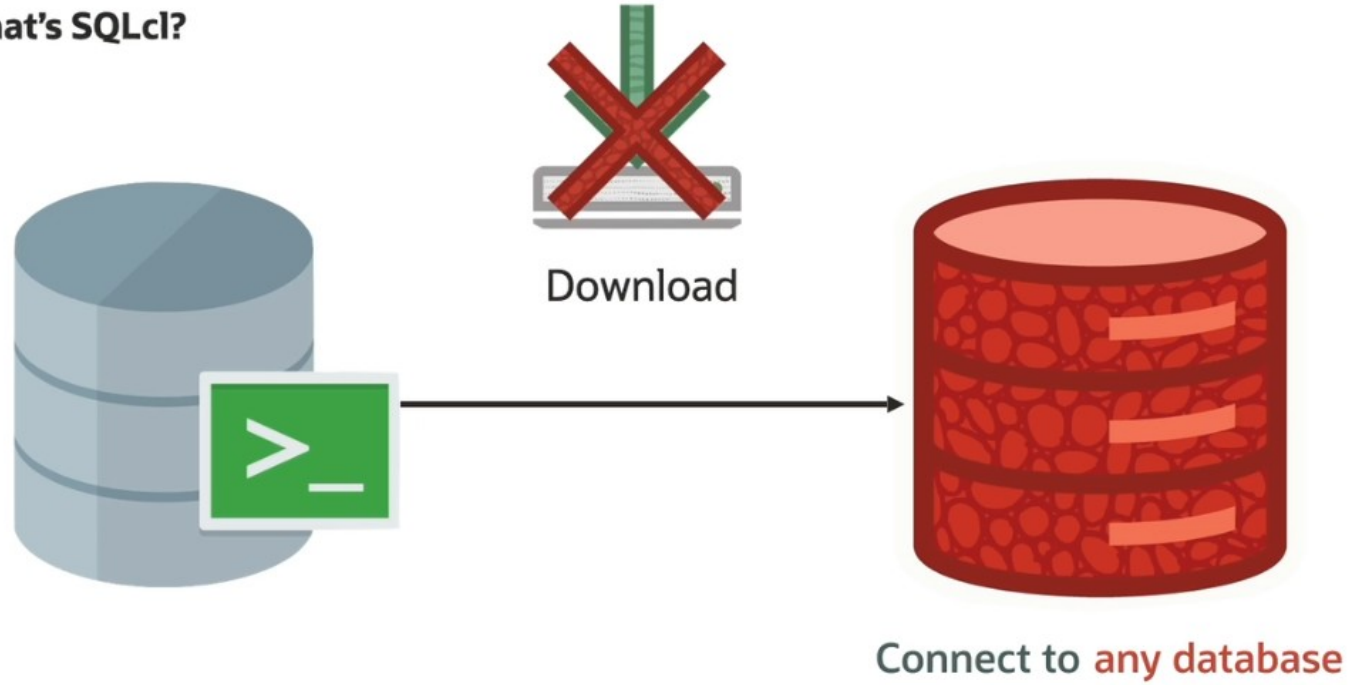
SQLcl and Liquibase

What's SQLcl?

Command line SQL Plus tool

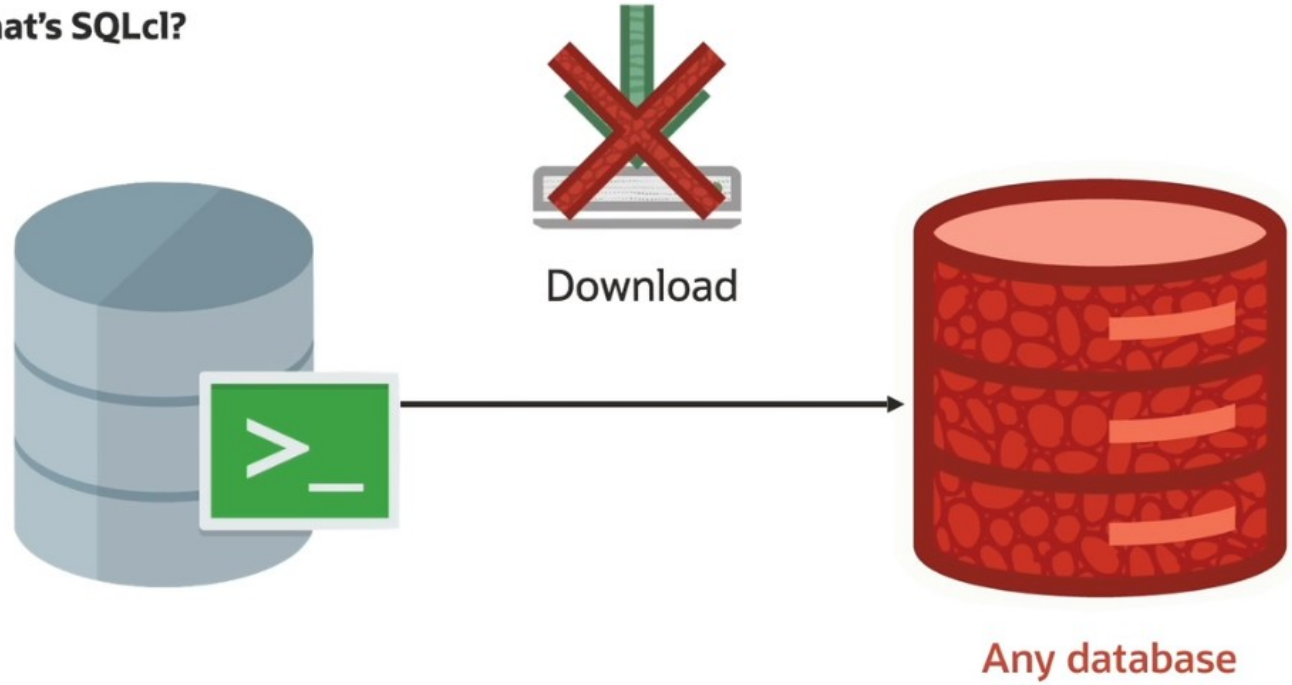
SQLcl and Liquibase

What's SQLcl?



SQLcl and Liquibase

What's SQLcl?



SQLcl and Liquibase

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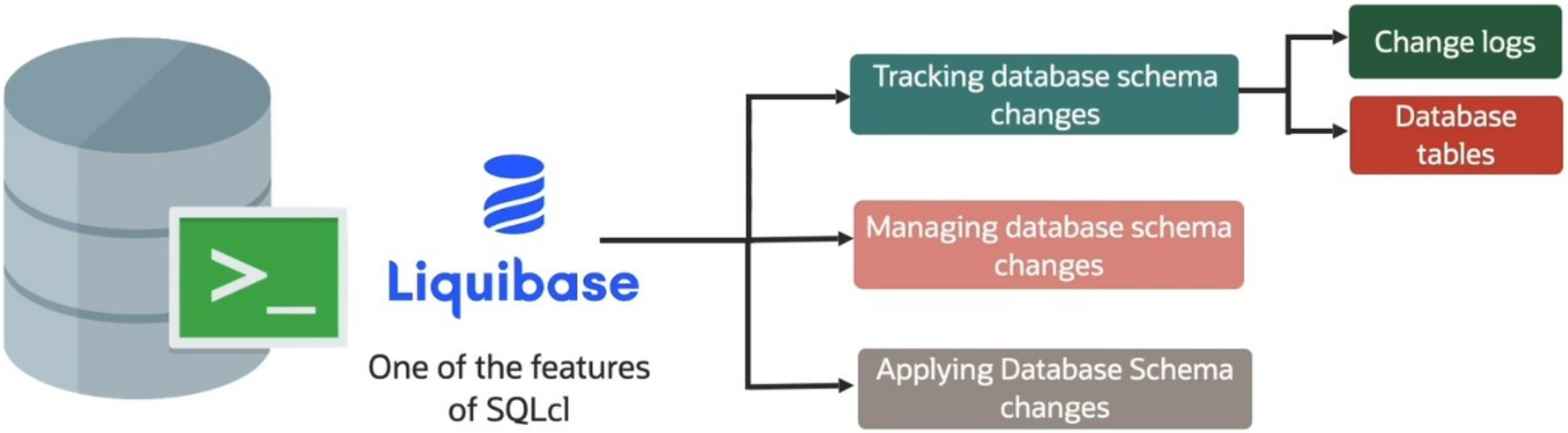

SQLcl and Liquibase

What's SQLcl?

Environment to environment in a manual or automated way

Liquibase

One of the features of SQLcl

- Tracking database schema changes
  - Change logs
  - Database tables
- Managing database schema changes
- Applying Database Schema changes

SQLcl and Liquibase

What's SQLcl?

Liquibase

One of the features of SQLcl

Gets updated frequently

- Tracking database schema changes
  - Change logs
  - Database tables
- Managing database schema changes
- Applying Database Schema changes

Liquibase and SQLcl

DATABASECHANGELOG_DETAILS is a view that consolidates information from the DATABASECHANGELOG and DATABASECHANGELOG_ACTIONS tables.

DATABASECHANGELOG_ACTIONS

	id	sequence	sql	sxml	author	filename
1	f02ae6a5d04c968...	0	CREATE TABLE "M...	(null)	(GARY)-Generated	may2018_table.xml
2	708012af706c7da...		CREATE TABLE "E...	(null)	(GARY)-Generated	emps_table.xml
3	f02ae6a5d04c968...		--skipped	--skipped	(GARY)-Generated	may2018_table.xml

Emp table created with thousands of record on Sunday

Emp id	First_name	Last_name	Dept id	Salary
100	Alan	Bell	10	4000
101	Ben	Pollock	10	3500
102	Chris	Ryan	12	4250
⋮				
901670	Brian	Mox	12	

Liquibase and SQLcl

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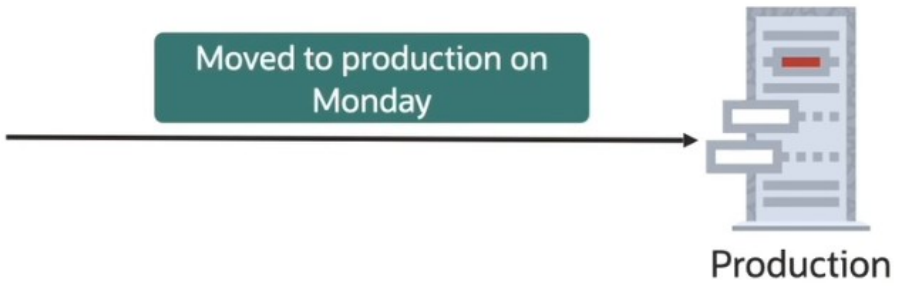

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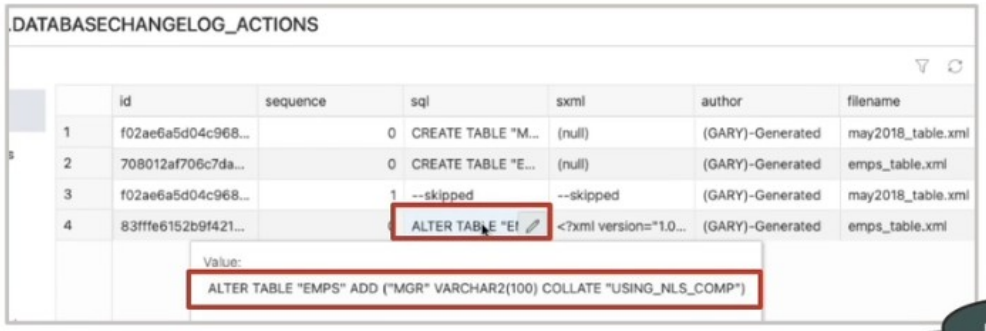

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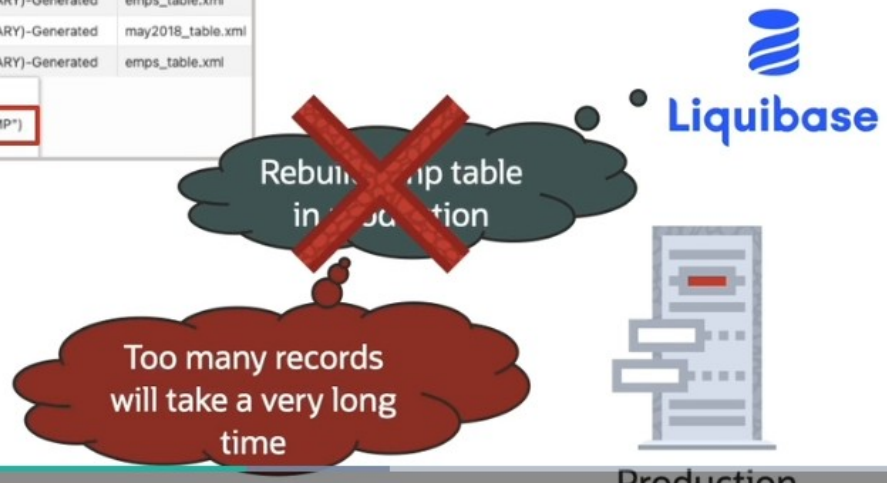

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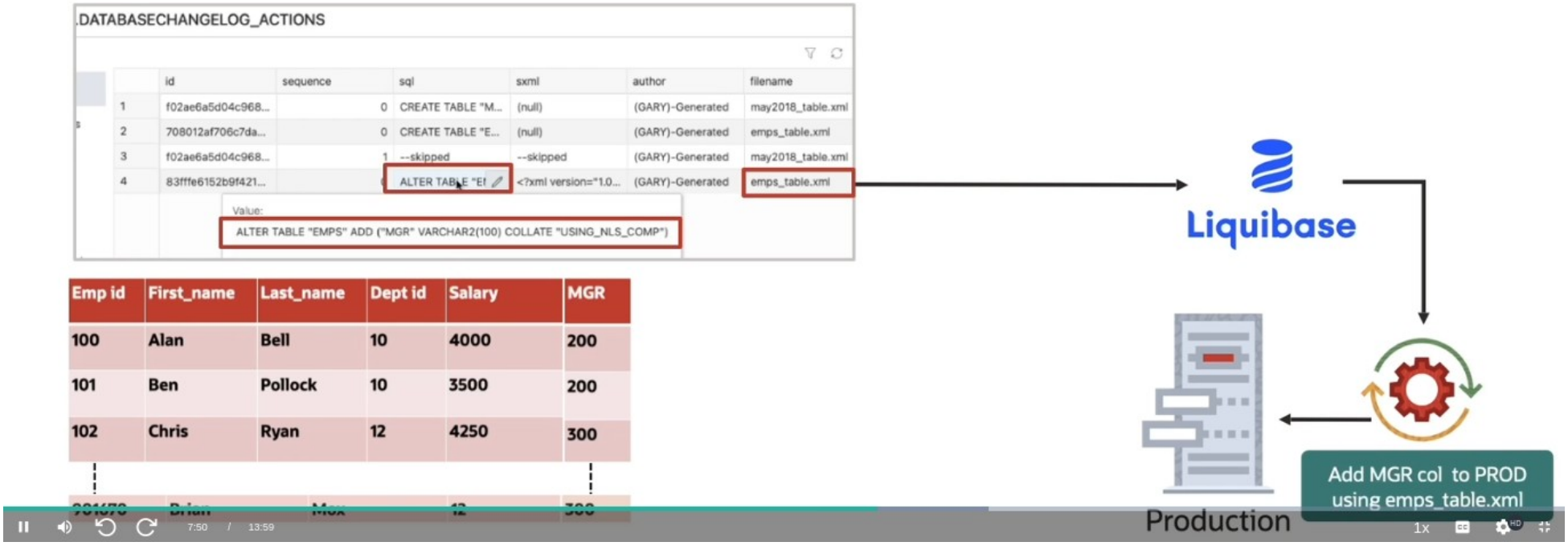

SQLcl and Liquibase: APEX

```
SQL> lb genobject -type apex -applicationid 101
```

Creates a single f101.xml file for your application

```
SQL> lb genobject -type apex -applicationid 101 -split
```

Creates multiple folders/files per component and an install file (like with the database)

NOTE: Liquibase will only update the new/altered files when exporting so that your repository only reflects the changes.

Important flags for change management:

```
-skipExportDate -expOriginalIds -split
```

Create a single file

```
SQL> lb update -changelog f101.xml
```

To install the single file

```
SQL> lb update -changelog controller.xml
```

To install multiple files

SQLcl and Liquibase: APEX

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Export will have new ids and dates

Shows up as changes in git repo

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Without these changes management becomes difficult

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Liquibase can identify:

- What changed and what didn't change
- Push to git repository only those that changed

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Track:

- Accountability
- Following security standards
- Following coding standards

SQLcl and Liquibase: APEX

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Pipeline:

- Get and setup environment
- Apply new database objects
- Instal APEX app into the environment

SQLcl and Liquibase: Table Data

What about data???

You can pull data using Liquibase

Not meant for huge amount of data

ORDS used to move data

Use data pump for huge amount of data

SQLcl and Liquibase: Table Data

Liquibase export is great for Metadata tables

Table has only few hundred rows

```
SQL> lb data -object TABLE_NAME,TABLE_NAME...
```

Exports the data from the indicated table(s)

```
SQL> lb update -changelog data.xml
```

Imports the data into the table(s)

Best for Metadata tables or smaller tables

Terraform and OCI

Terraform and OCI

Terraform can be used to:

- Build OCI infrastructure
- Modify OCI infrastructure
- Version OCI infrastructure

Terraform and OCI

```
resource "oci_database_autonomous_database" "new_autonomous_database" {
      #Required
      compartment_id = var.compartment_ocid
      cpu_core_count = "1"
      data_storage_size_in_tbs = "1"
      db_name = "TESTDB${random_string.db_name.result}"
      admin_password = random_string.password.result
      db_workload = "OLTP"
      display_name = "TESTDB${random_string.db_name.result}"
}
```

Terraform and OCI

OCI CLI and Terraform can be used to create VMs and other OCI resources

Terraform and OCI

Autonomous Database:

- Pay for it by the second you use
- Very helpful for testing purpose