



Xponent Databases

The background of the slide features a dark blue and purple gradient with several dandelion seeds in various stages of flight. A prominent diagonal band of a lighter blue-purple color runs from the top right towards the bottom left. The text 'Training Overview' is centered in a white, sans-serif font.

Training Overview

Databases – Learning Outcomes

- ◀ Xponent Supported Databases
- ◀ Creating a Database Connection
- ◀ Creating a Read Adaptor
- ◀ Creating a Write Adaptor
- ◀ Creating and control a Listen Adaptor
- ◀ Creating a Delete Adaptor
- ◀ Debugging Common Database errors
- ◀ Certification

Xponent Personas & Target Audience

Client

CHLOE



- Defines Business Requirements
- Defines KPIs, Goals and Metrics to track
- Tracks progress against goals on Journey Insights

Secondary

Strategy

SOPHIE



- Translates business requirements into Journeys Map
- Captures journey details, metrics and goals

Primary

Solution Design
&
Configuration

CHARLES



- Solution Design
- Identifies data sources
- Configures rules
- Creates outcomes
- Develop and test
- Deploy

Primary

Technical
&
Support

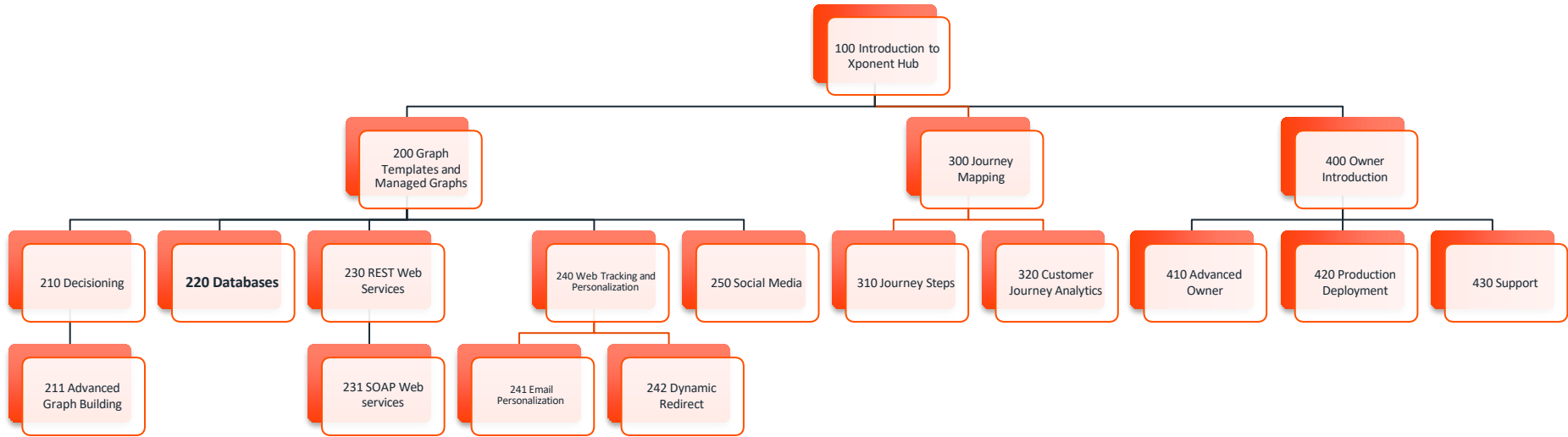
THOMAS



- Enable tech environment - servers, database
- Handle security and internet facing services
- Support accounts and projects

Secondary

Training Course Overview



Prerequisites

- ◀ A Database Instance:
 - ◀ Postgres SQL version 9.x
 - ◀ MySQL Version 5.6 (includes Amazon Web Services Aurora)
 - ◀ Microsoft SQL Server 2008 and above
 - ◀ Oracle 10i
- ◀ Database client tool
 - ◀ MySQL Workbench
 - ◀ Toad
 - ◀ SQL Server Studio

Databases – Learning Outcomes

- ◀ Database Model
- ◀ Xponent Supported Databases
- ◀ Creating a Database Connection
- ◀ Creating a Read Adaptor
- ◀ Creating a Write Adaptor
- ◀ Creating and control a Listen Adaptor
- ◀ Creating a Delete Adaptor
- ◀ Debugging Common Database errors
- ◀ Certification



Database Integration

Xponent Supported Databases



- ◀ Connections are made via SQLAlchemy Python Library using parameterized SQL
- ◀ Parameters are all of the form `%%paramName%%`

Creating and Testing a Database Connection

- ◀ Admin Console
- ◀ Add a Connection
 - ◀ Choose DB Type
 - ◀ User Name
 - ◀ Password
 - ◀ Host Name
 - ◀ Port
 - ◀ Postgres - 5432
 - ◀ MySQL - 3306
 - ◀ MSSQL - 1433
 - ◀ Oracle - 1521
 - ◀ Database Name
- ◀ Save
- ◀ Test
- ◀ Note on service accounts



your_db_name > Development

Type
MySQL

User Name
User Name

Password
Password

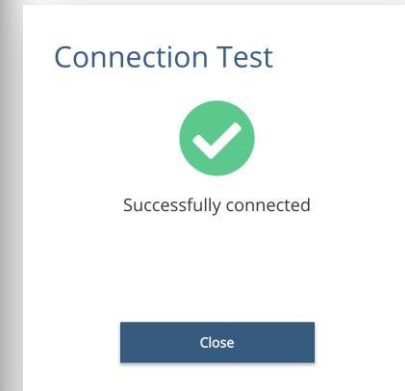
Host Name
Host Name

Port
Port


Database Name
Database Name

Save Edits


Save Edits to Enable Test



Xponent Supported Operations: Read

Connection:  ⚠ Validate


Adaptor Action:

Database Read Options 

Read Query


```
1 SELECT column1, column2, ... FROM table_name WHERE expression;
```

Parameters Output


Name	Source	Content	Destination
		Records Selected	<input type="text" value="(Please Define a Source)"/> 

[W3schools.com](https://www.w3schools.com)

Xponent Supported Operations: Write (Insert/Update)

Connection:  ⚠ Validate


Adaptor Action:

Database Write Options 

Write Query


```
1 INSERT INTO table_name (column1, column2, column3, ...)
2 VALUES (value1, value2, value3, ...);
```

Parameters Output


Name	Source	Content	Destination
		Records Changed	<input type="text" value="(Please Define a Source)"/> 

[W3schools.com](https://www.w3schools.com)

Xponent Supported Operations: Write (Insert/Update)

Connection:  ⚠ Validate


Adaptor Action:

Database Write Options 

Write Query


```
1 UPDATE table_name
2 SET column1 = value1, column2 = value2, ...
3 WHERE condition;
```

Parameters Output


Name	Source	Content	Destination
		Records Changed	<input type="text" value="(Please Define a Source)"/> 

[W3schools.com](https://www.w3schools.com)

Xponent Supported Operations: Delete


Connection:  ⚠ Validate

Adaptor Action:

Database Delete Options 

Delete Query



```
1 DELETE FROM table_name WHERE condition;
```

Parameters		Output	
Name	Source	Content	Destination
		Records Changed	<input type="text" value="(Please Define a Source)"/> 

[W3schools.com](https://www.w3schools.com)

Xponent Supported Operations: Listen

Listener Editor

Listener Type	Connection
 Database >	CDM > 

Database Listener Options ⓘ

Listen Interval: Max Record Count:


Listen Query

```
1 SELECT column1, column2, ... FROM table_name where condition;
```

Set Statement (applied to returned results of listen query)

```
1 set column1 = val1, column2 = val2, ...
```

Output

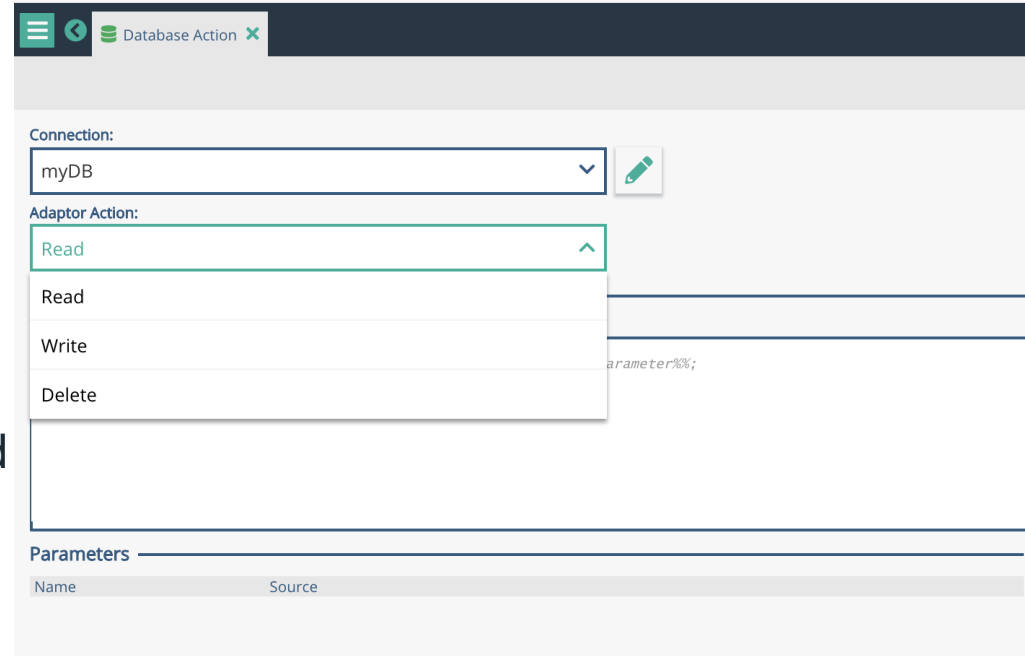
Content	Destination
Records Selected	<input type="text" value="(schema)"/> 

Database Exercise Customer Entity

- ◀ Design a Customer Entity
 - ◀ firstName, lastName, date of birth, etc
- ◀ Create Database Table
- ◀ Create CRUD Adaptors
 - ◀ Create – INSERT – database WRITE method
 - ◀ Read – SELECT – database READ method
 - ◀ Update – UPDATE – database WRITE method
 - ◀ Delete – DELETE – database DELETE method
- ◀ Create CRUD Test Graph
 - ◀ Call Create, Read, Update, Read, Delete, and Read to test all of the adaptors

Create a Database Adaptor

- ◀ Choose a database connection
- ◀ Choose an action (read, write, delete)
- ◀ Write the SQL
 - ◀ Use **%%param%%** to define parameters from schema locations
- ◀ Output will be the rows selected (select) or the number of rows affected (write, delete, or update)



The screenshot shows a web-based configuration interface for a 'Database Action'. The interface includes a header with a menu icon and a title 'Database Action x'. Below the header, there are several sections:

- Connection:** A dropdown menu showing 'myDB' with a pencil icon to its right.
- Adaptor Action:** A dropdown menu with 'Read' selected, and a list of options: 'Read', 'Write', and 'Delete'.
- Parameters:** A table with two columns: 'Name' and 'Source'. The table is currently empty.

Partial text 'parameter%%;' is visible on the right side of the interface.

Read from a Database

- ◀ Choose the database connection
- ◀ Choose 'Read' as the action
- ◀ Write a 'SELECT' statement in proper format
- ◀ Extra clauses such as 'where' are optional
- ◀ Output will be the rows that are selected, they will be stored in the schema location chosen.
- ◀ The output data will overwrite any other nested information in that schema location.

The screenshot shows a web-based configuration interface for a 'Database Action'. At the top, there is a title bar with a menu icon, a refresh icon, and the text 'Database Action' with a close button. Below this, the 'Connection' field is set to 'myDB' with a dropdown arrow and a pencil icon. To the right is a yellow 'Validate' button with a warning icon. The 'Adaptor Action' field is set to 'Read' with a dropdown arrow. Below this is a section for 'Database Read Options' with a help icon. The 'Read Query' field contains the SQL statement: `1 select firstName, lastName, emailAddress from customer where id = 331000`. At the bottom, there are two sections: 'Parameters' and 'Output'. The 'Parameters' section has a table with columns 'Name' and 'Source', containing one row: 'id' with source '(schema)/profile/id'. The 'Output' section has a table with columns 'Content' and 'Destination', containing one row: 'Records Selected' with destination '(schema)/customer'. Both tables have a green arrow icon to the right of the 'Source' and 'Destination' fields.

Write to a Database

- ◀ Choose the database connection
- ◀ Choose 'write' as the action
- ◀ Write an 'INSERT' or 'UPDATE' statement in the proper format
- ◀ Output will be the number of rows changed or inserted in the database

Database Action

Connection: myDB Validate

Adaptor Action: Write

Database Write Options

Write Query

```
1 insert into customer (firstName, lastName) values (%%firstName%%, %%lastName%%)
```

Parameters

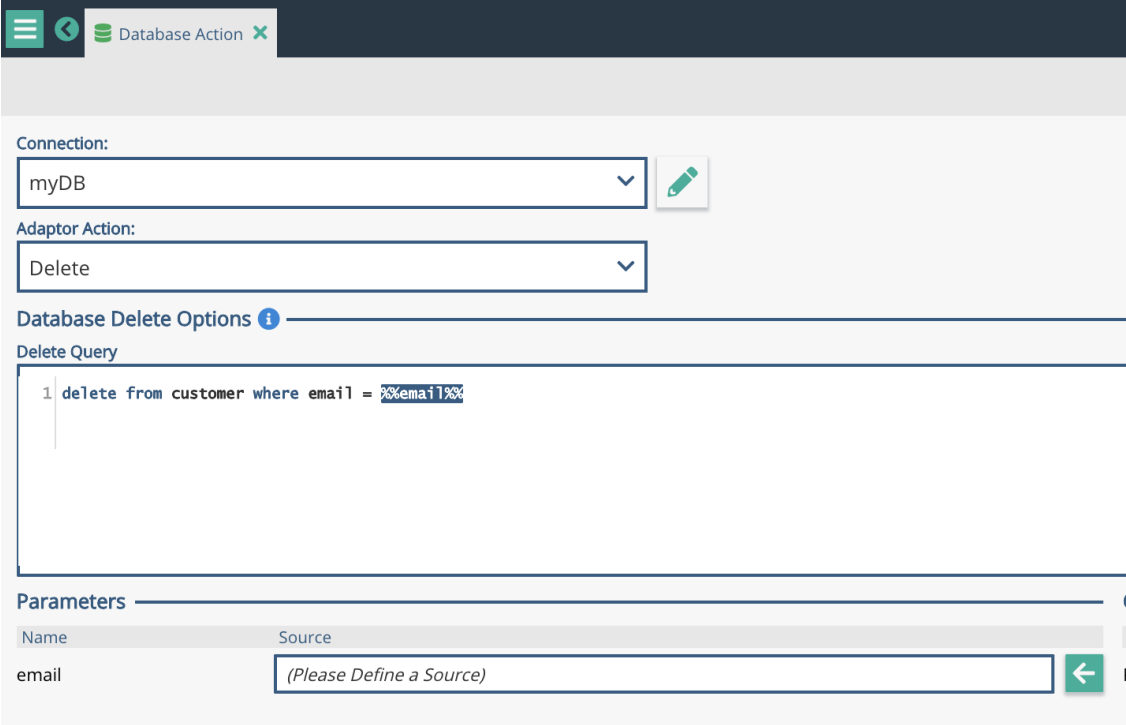
Name	Source
firstName	(Please Define a Source)
lastName	(Please Define a Source)

Output

Content	Destination
Records Changed	(schema)/customer

Delete from a Database

- ◀ Choose the database connection
- ◀ Choose 'delete' as the action
- ◀ Write a 'DELETE' statement in proper format
- ◀ Output will be the number of rows deleted in the database



The screenshot shows a web-based configuration interface for a database action. At the top, there is a dark header with a menu icon, a back arrow, and the text "Database Action" with a close button. Below the header, the interface is divided into several sections:

- Connection:** A dropdown menu showing "myDB" with a small edit icon to its right.
- Adaptor Action:** A dropdown menu showing "Delete".
- Database Delete Options:** A section with an information icon and a sub-section for "Delete Query".
- Delete Query:** A text area containing the SQL statement: `1 delete from customer where email = %%email%%`.
- Parameters:** A table with two columns: "Name" and "Source".

Name	Source
email	<input type="text" value="(Please Define a Source)"/>

Listen to a Database

- ◀ Add a listener to a graph
- ◀ Choose the database connection
- ◀ Write the read statement
 - ◀ Use a flag value to select rows
- ◀ SET to update the flag value
- ◀ Define a location in the schema
- ◀ Polls the database every 'Listen Interval' seconds and will select a max rows of 'Max Record Count' every time
- ◀ Many rows can be selected at once
 - ◀ The graph runs each row through the graph one at a time

Listener Editor

Listener Type	Database	Connection (Environment)	myDB
Database Listener Options ⓘ			
Listen Interval:	1	Max Record Count:	1
Listen Query			
<pre>1 select firstName, lastName, email from customer where processed='N'</pre>			
Set Statement (applied to returned results of listen query)			
<pre>1 set processed='Y'</pre>			
Output			
Content	Destination		
Records Selected	(schema)/customer		

Database Troubleshooting

- ◀ Connection error – test the connection from the admin page to make sure the connection is working, check credentials and the database to make sure it's awake and running properly
- ◀ Connections come from the Xponent engine - is access allowed?
- ◀ Syntax error – make sure the SQL is using table and field names that actually exist
- ◀ Syntax error – make sure the '%%param%%' fields are properly filled in the schema when the database adaptor runs
- ◀ Malformed statement – make sure the SQL statement is properly formatted with all the conditionals it needs
- ◀ Use 'standard' SQL - don't write database specific statements



Certification

Questions

- ⌄ What databases does Xponent Support?
- ⌄ Where can those databases be?
- ⌄ What kind of queries does Xponent support?
- ⌄ Is * supported in a SELECT?
- ⌄ Is Delete supported?
- ⌄ Are stored procedures supported?
- ⌄ Are upserts supported?
- ⌄ Does Xponent provide me with a development database?
- ⌄ Can I connect to more than one database in a single graph?
- ⌄ How do you know how many records have been retrieved?
- ⌄ How do you know how many records have been updated?
- ⌄ Can I perform roll-back transactions?



Thank You