



Week 2: Development Tasks

## Unit 7: Testing

## Protocol-Level Testing

- Test code calls the app as a black box on the protocol level
- Allows for testing the contract towards the (OData) client

### Test utilities:

- `cds.serve()` to expose your services
- `'supertest'` for assertions against HTTP responses

```
const cds = require('@sap/cds')

describe('Bookshop on OData-level', () => {
  const app = require('express')()
  const request = require('supertest')(app)

  beforeAll(async () => {
    await cds.serve('CatalogService')
      .from(__dirname+'../../srv/cat-service').in(app)
  })

  test('GET with $select', async () => {
    const response = await request
      .get('/browse/Books?$select=ID,title')
      .expect('Content-Type', /^application\/json/)
      .expect(200)

    expect(response.body.value).toEqual([
      { ID: 201, title: 'Wuthering Heights' },
      { ID: 207, title: 'Jane Eyre' },
      { ID: 251, title: 'The Raven' },
      { ID: 252, title: 'Eleonora' },
      { ID: 271, title: 'Catweazle' }
    ])
  })
})
```

# CDS Service-Level Testing

- Allows for fine-grained white-box tests
- Use [cds.qi](#) APIs to test models and custom handlers
- No express server needed

```
const cds = require('@sap/cds')

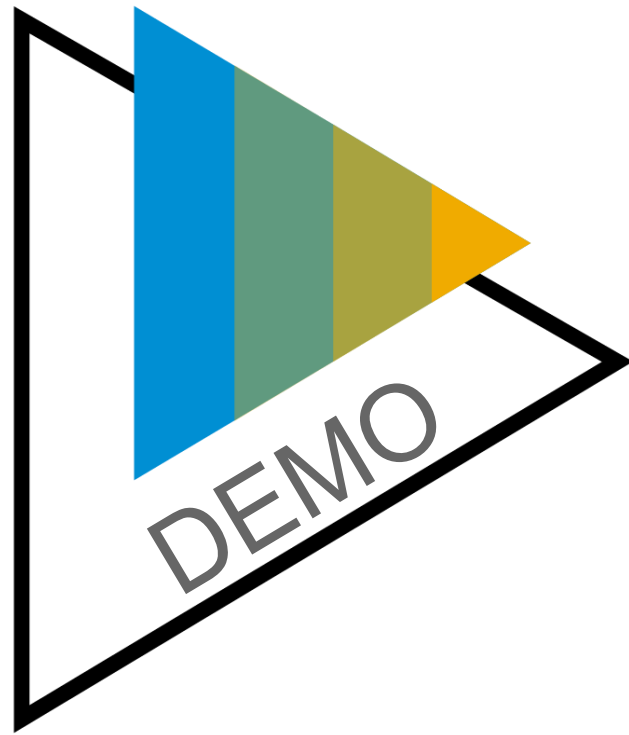
describe('Bookshop on CDS service-level', () => {
  let srv, Books

  beforeAll(async () => {
    srv = await cds.serve('CatalogService')
      .from(__dirname+'/browse')
    Books = srv.entities.Books
    expect(Books).toBeDefined()
  })

  test('GET all books', async () => {
    const books = await srv.read (
      Books, b=>{ b.ID, b.title }
    )

    expect(books).toMatchObject([
      { ID: 201, title: 'Wuthering Heights' },
      { ID: 207, title: 'Jane Eyre' },
      { ID: 251, title: 'The Raven' },
      { ID: 252, title: 'Eleonora' },
      { ID: 271, title: 'Catweazle' }
    ])
  })
})
```

# Testing Demo



# Testing

## REST client for Visual Studio Code <sup>[1]</sup>

HTTP language support **.http** and **.rest** file extension

Quick clickable test

Easy to maintain multiple requests with payloads

```
rest.http
packages > bookstore > test > rest.http > POST /catalog/Orders
Send Request
1 GET http://localhost:4004/catalog/Books HTTP/1.1
2 ###
3
4 Send Request
5 POST http://localhost:4004/catalog/Orders HTTP/1.1
6 Content-Type: application/json;IEEE754Compatible=true
7 {
8   "ID": 1111,
9   "OrderNo": "3",
10  "Items": [{
11    "ID" : 304,
12    "amount" : 2,
13    "netAmount" : "20",
14    "book_ID" : "252"
15  }]
16 }
```

```
Response(57ms) X
1 HTTP/1.1 201 Created
2 X-Powered-By: Express
3 OData-Version: 4.0
4 content-type: application/json;odata.metadata=minimal
5 Location: Orders(1111)
6 Date: Sat, 23 Nov 2019 00:07:35 GMT
7 Connection: close
8 Content-Length: 362
9
10 {
11   "@odata.context": "$metadata#Orders(Items())/Entities",
12   "@odata.metadataEtag": "W/\"spJc0oESGRpQLHkIZzH5/1U:cF3G58VIlAg=\\",
13   "modifiedAt": null,
14   "createdAt": "2019-11-23T00:07:35Z",
15   "createdBy": "anonymous",
16   "modifiedBy": null,
```

View response in VS Code

[1] See [documentation](#). Also available in SAP Business Application Studio

## Testing

# Enable Debug Switch

Enable debug switch for detailed traces

```
bash-3.2$ DEBUG=true cds run
[cds] - connect to datasource - sqlite:sqlite.db
[cds] - serving CatalogService at /catalog
[cds] - service definitions loaded from:

  srv/cat-service.cds
  db/schema.cds
  node_modules/@sap/cds/common.cds

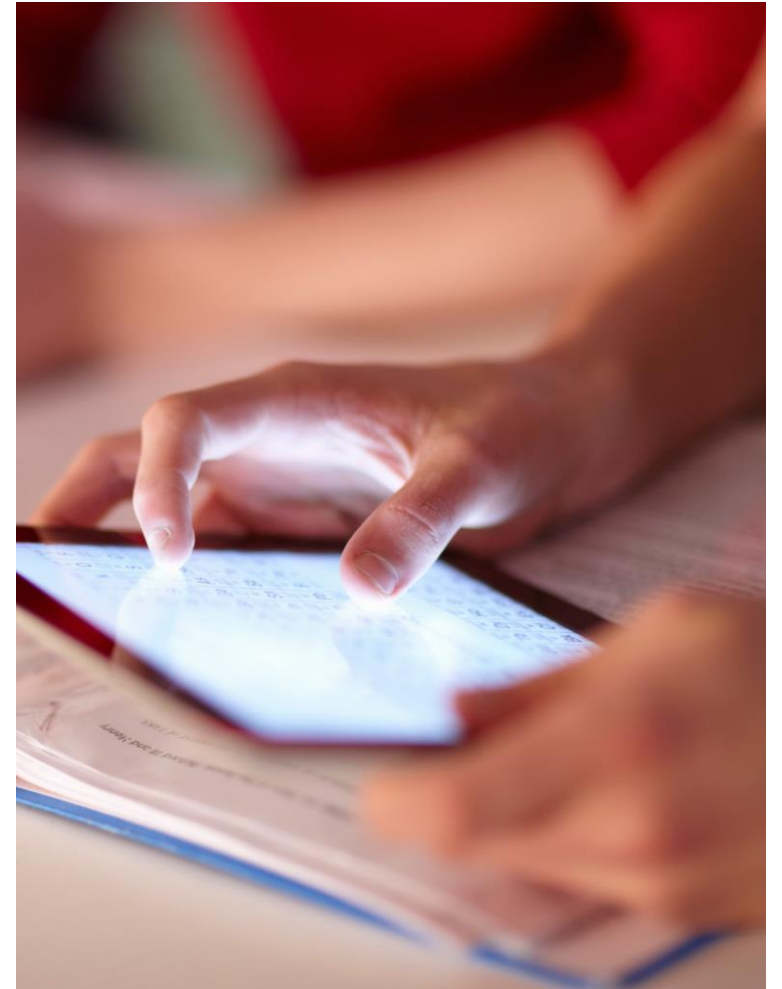
[cds] - launched in: 710.697ms
[cds] - server listening on http://localhost:4004 ...
[ terminate with ^C ]

GET /catalog/Books
[cql] - acquire connection
[cql] - SELECT ID, title, stock, author_ID FROM localized_CatalogService_Books LIMIT 1000 []
[cql] - release connection
```

### What you've learned in this unit

- How to write unit tests on protocol and service level
- The pros and cons of these approaches
- How to use REST client to test your service
- How to use CDS debug switch for troubleshooting

Also see week 4, unit 4 on how these tests can be executed in a continuous integration environment.



# Thank you.

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