Demystify OpenEdge REST Services

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- 25 October 2018

Agenda

- Why bother? How REST applies to business applications
- What is REST?
- What are the options to ‘RESTify’ OpenEdge applications
- Which approach(es) should I use?
- How to implement each approach?
  - (aka live demos that will doubtless go horribly wrong…)

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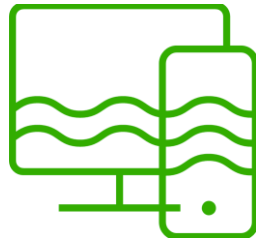
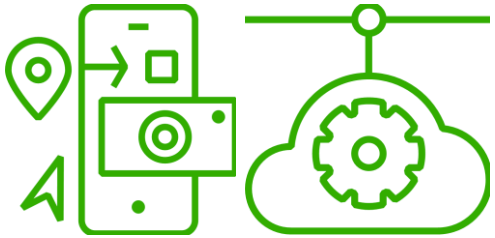
Why is REST Important?

REST Use Cases

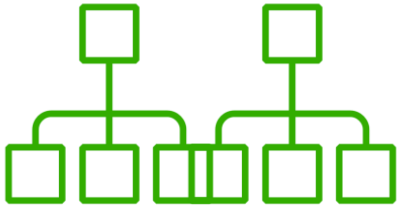


Modern Web Interfaces



Mobile Apps

Emerging Technologies

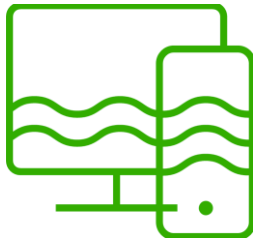


Application Integration

Modularization through Microservices

Self-Service BI and Analytics

REST Use Cases



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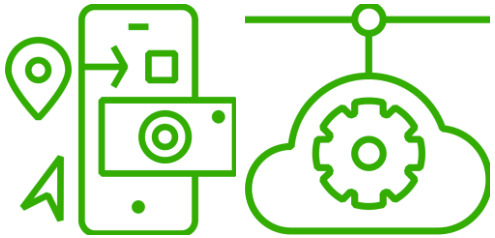
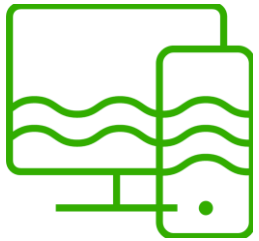


Mobile Apps

Service Catalog driven tooling integration

REST Use Cases



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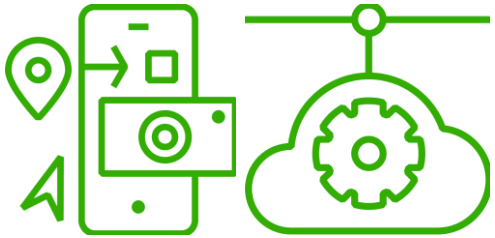
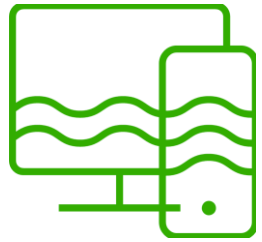


Mobile Apps

Emerging Technologies

Modern languages

REST Use Cases



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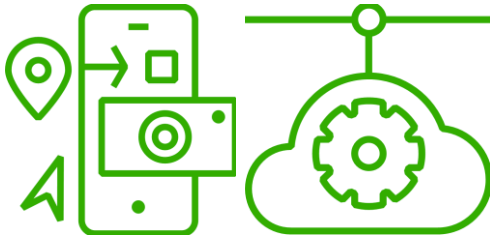
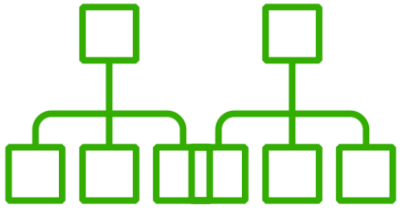


Mobile Apps

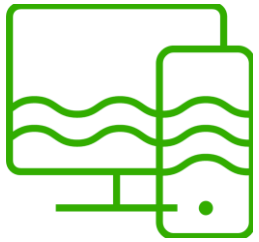
Emerging Technologies



Application Integration

Custom & Standardized

REST Use Cases



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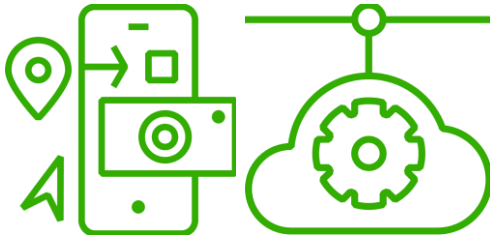
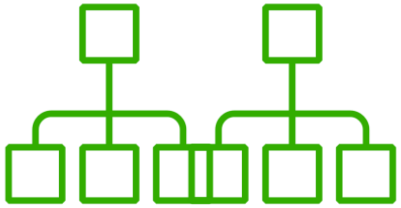


Mobile Apps

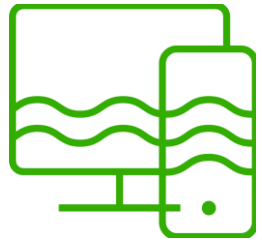
Emerging Technologies



Application Integration

Modularization through Microservices

REST Use Cases



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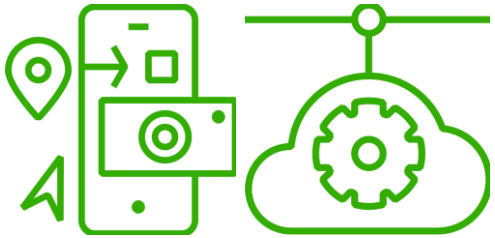

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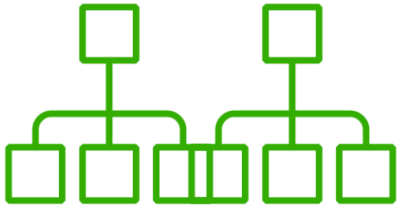


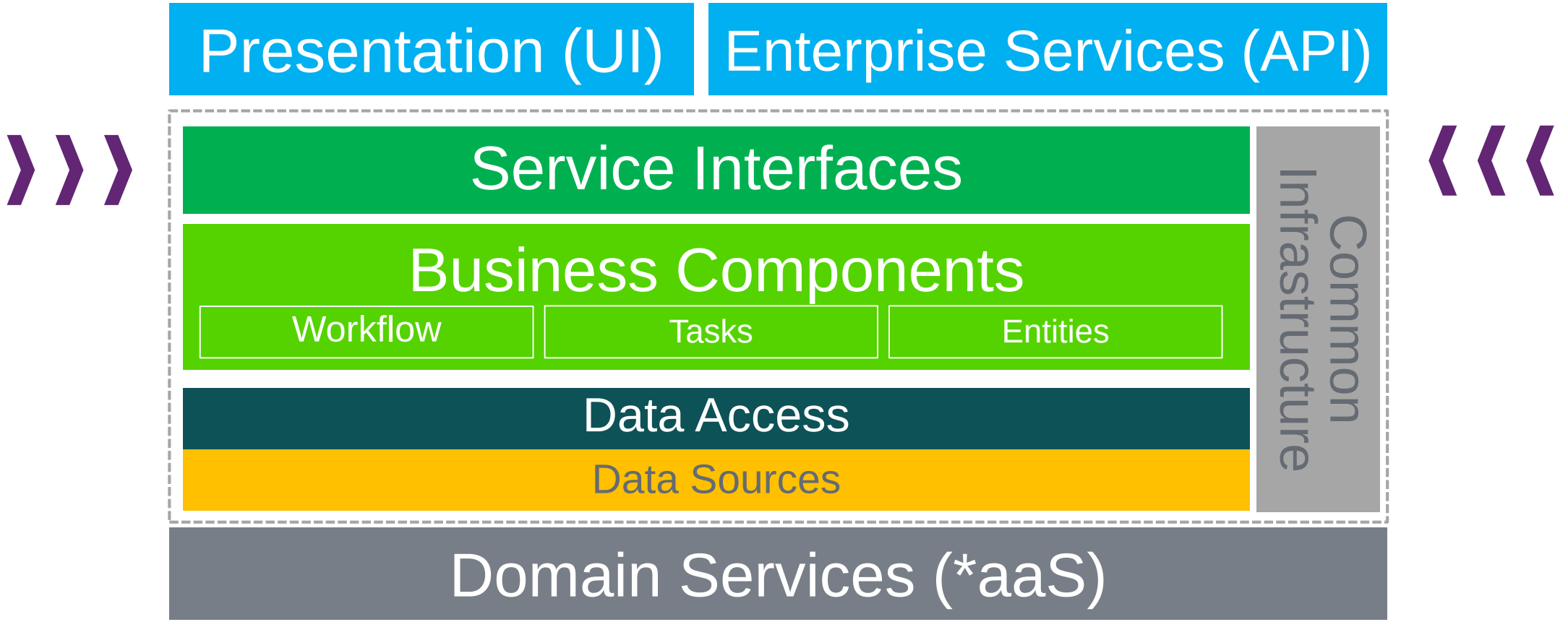
Application Integration

Modularization through Microservices

Self-Service BI and Analytics

Standardized REST

OpenEdge Reference Architecture



SI layer provides: Mapping, Translation and Auth*

- SI is separate from biz logic
- Can be multiple SIs to the same biz logic

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What is REST?

What is REST?

REST = **RE**presentational **S**tate **T**ransfer

REST is an architectural style for network based software that requires stateless, cacheable, client-server communication via a uniform interface between components.

"HTTP with strong constraints"

- Resources are named using a URL
- Supports many representations of data: **JSON,** XML, multi-part
- Uniform interface of HTTP Verbs: GET, PUT, POST, DELETE…etc.
- Stateless, no client context between requests
- Designed for performance & scalability, i.e. supports caching
- In practice there are 'degrees of RESTfulness'

The Web Is Built on REST

- Browser requests are GETs:
- Type www.progress.com/next in your browser, and what gets sent is this:

```
GET /next HTTP/1.1\r\n
Accept: text/html, application/xhtml+xml, */*\r\n
Accept-Language: en-US\r\n
Accept-Encoding: gzip, deflate\r\n
Host: www.progress.com\r\n
```

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What Options are There to ‘RESTify’ OpenEdge?

REST Service Interface Options for OpenEdge

- Data Object Services (using REST transport)
- Data Object Services (using WEB transport)

- Mapped RPC REST Service (using REST transport)
- Custom/DIY WebHandler (using WEB transport)
- Data Object Handler WebHandler (using WEB transport)

- OData view of OpenEdge DB (using Hybrid Data Pipeline)

Data Object Services Options

- **Data Object Services (using REST transport)**
- **Data Object Services (using WEB transport)**

- Mapped RPC REST Service (using REST transport)
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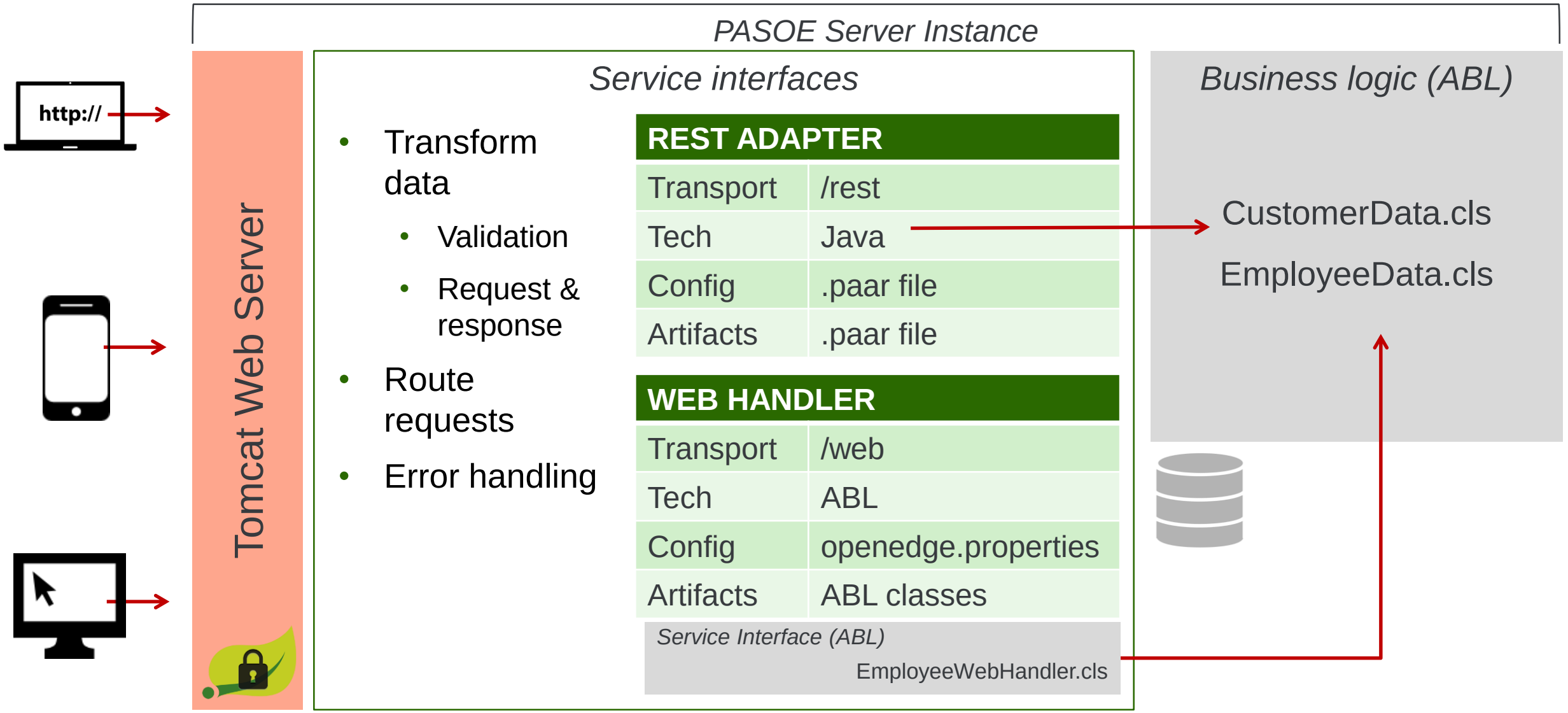
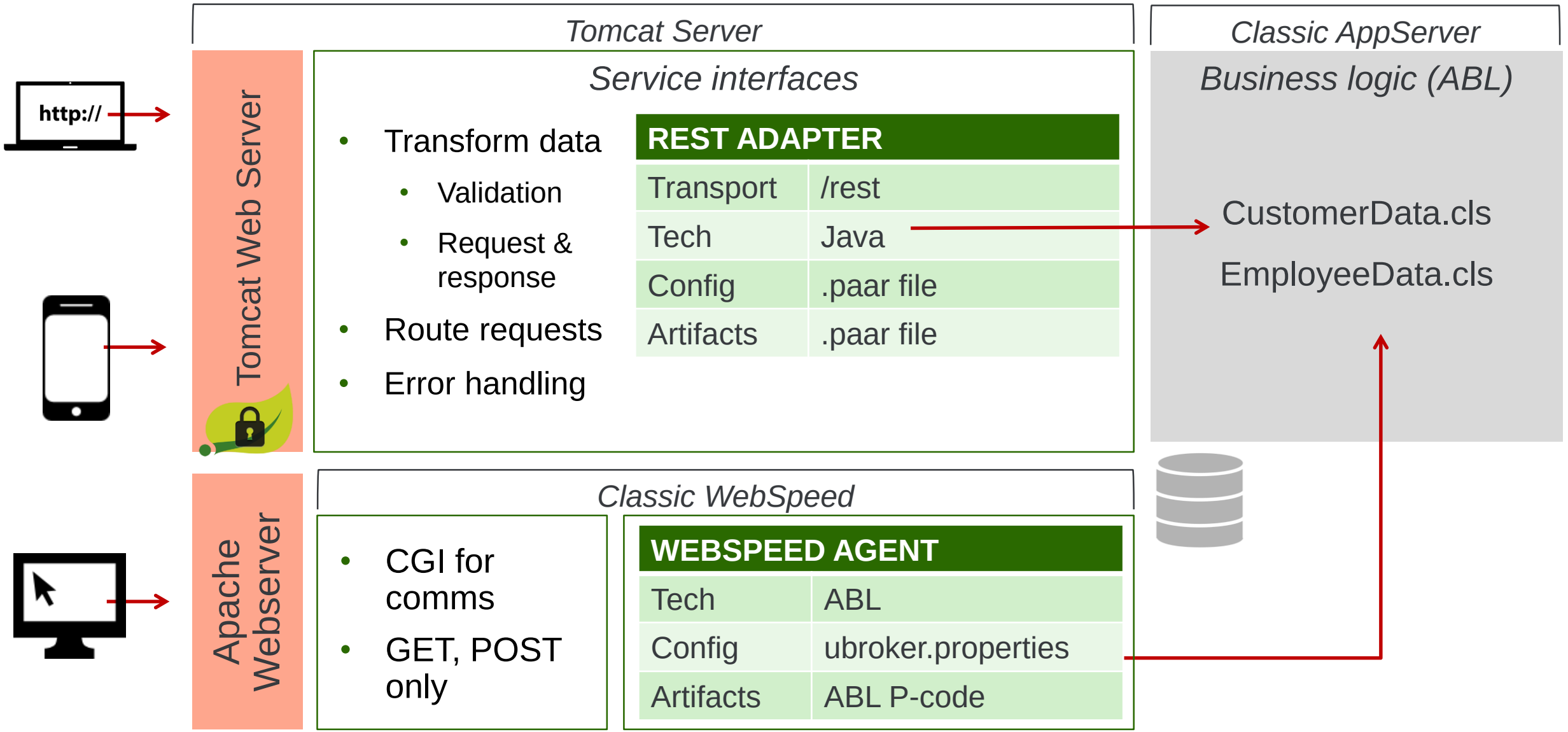
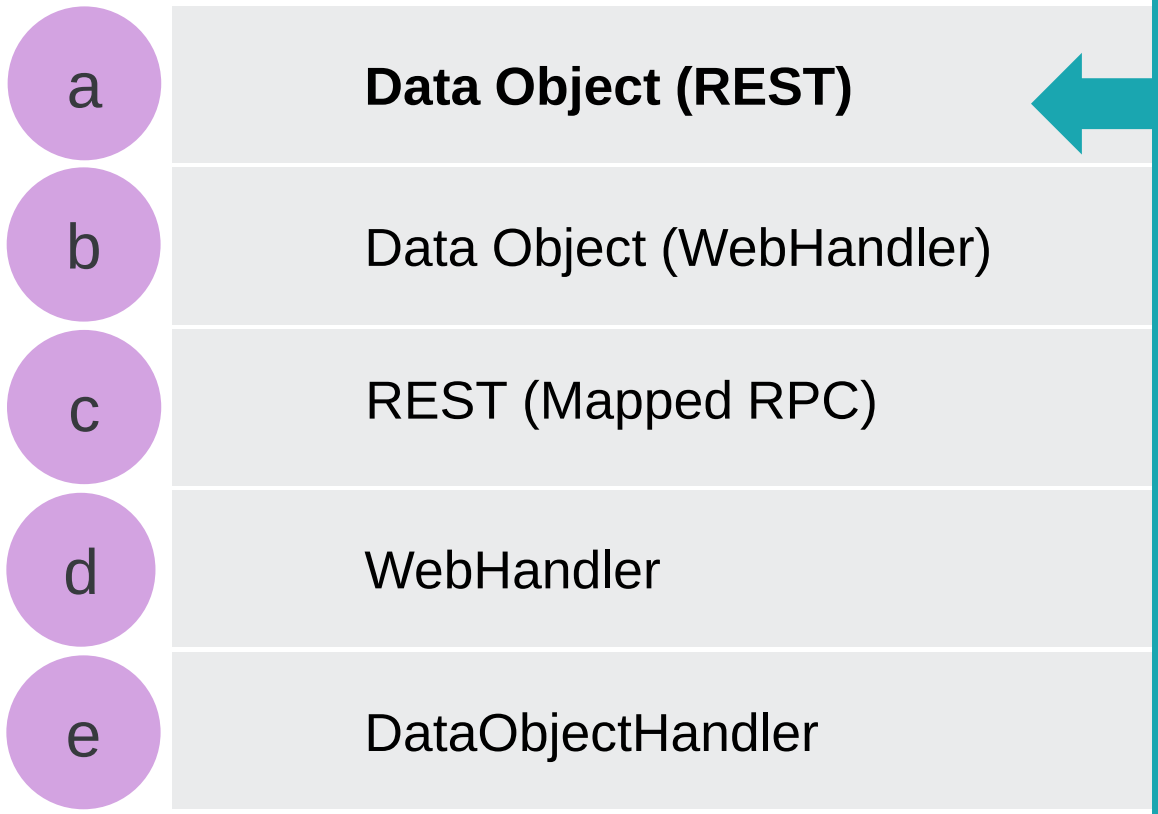
PAS for OpenEdge Architecture (v11.6+)



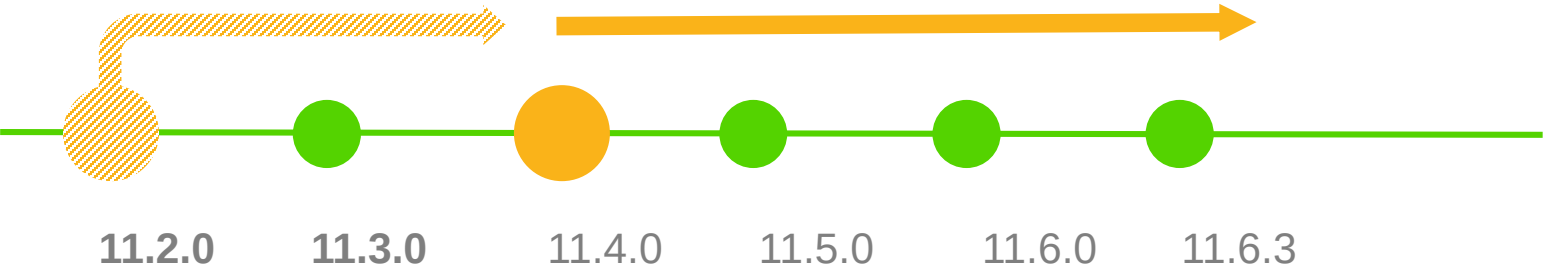
Non-PAS Architectures & PASOE 11.5



Service Interface Approaches



- Formerly Mobile Services
- Annotate certain methods (w/ particular signatures)
- Very prescriptive
  - Programming model
  - URI paths
- Uses REST transport
- Creates Data Service Catalog as public API



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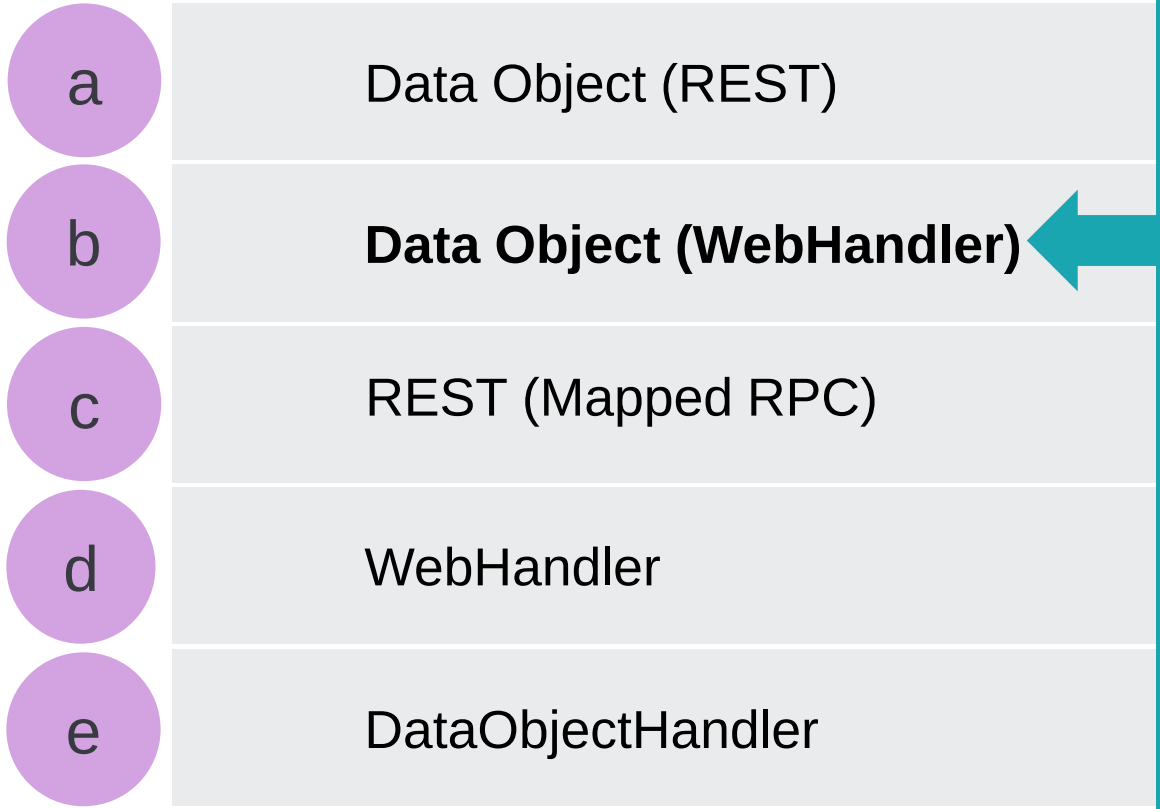
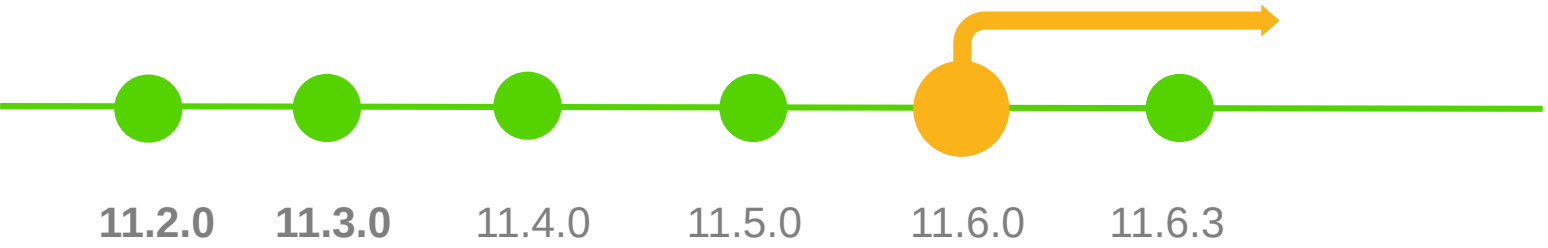
Service Interface Approaches



- As of 11.6.3
- Annotate certain methods (w/ particular signatures)
- Quite prescriptive
- More flexibility in mapping
- Uses WEB transport
- Requires PAS for OpenEdge
- Creates Data Service Catalog as public API



Conference - ERD

A

Speaker

submits a

Talk

which is scheduled to a

Timeslot

in a

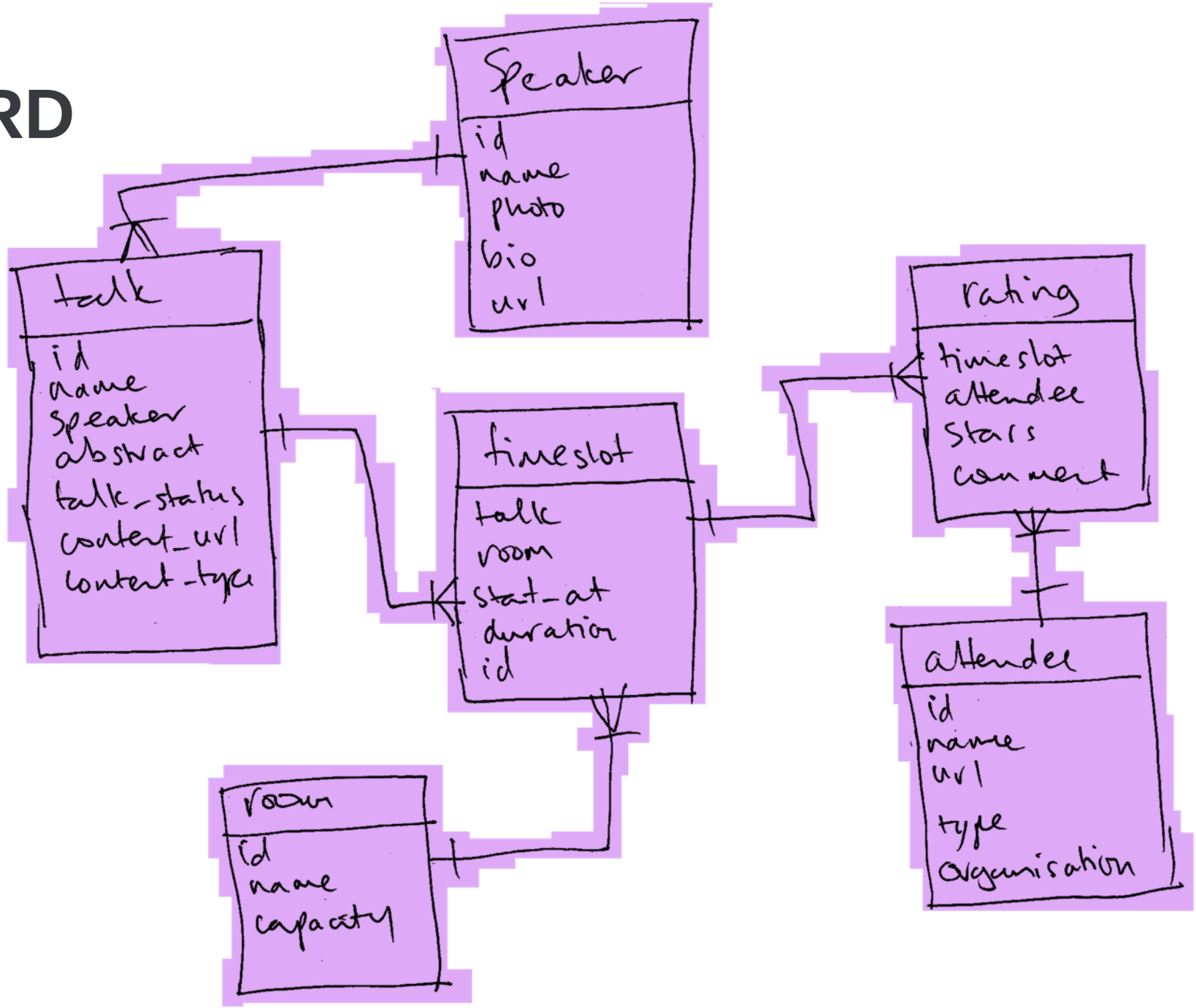
Room

and is given a

Rating

by an

Attendee



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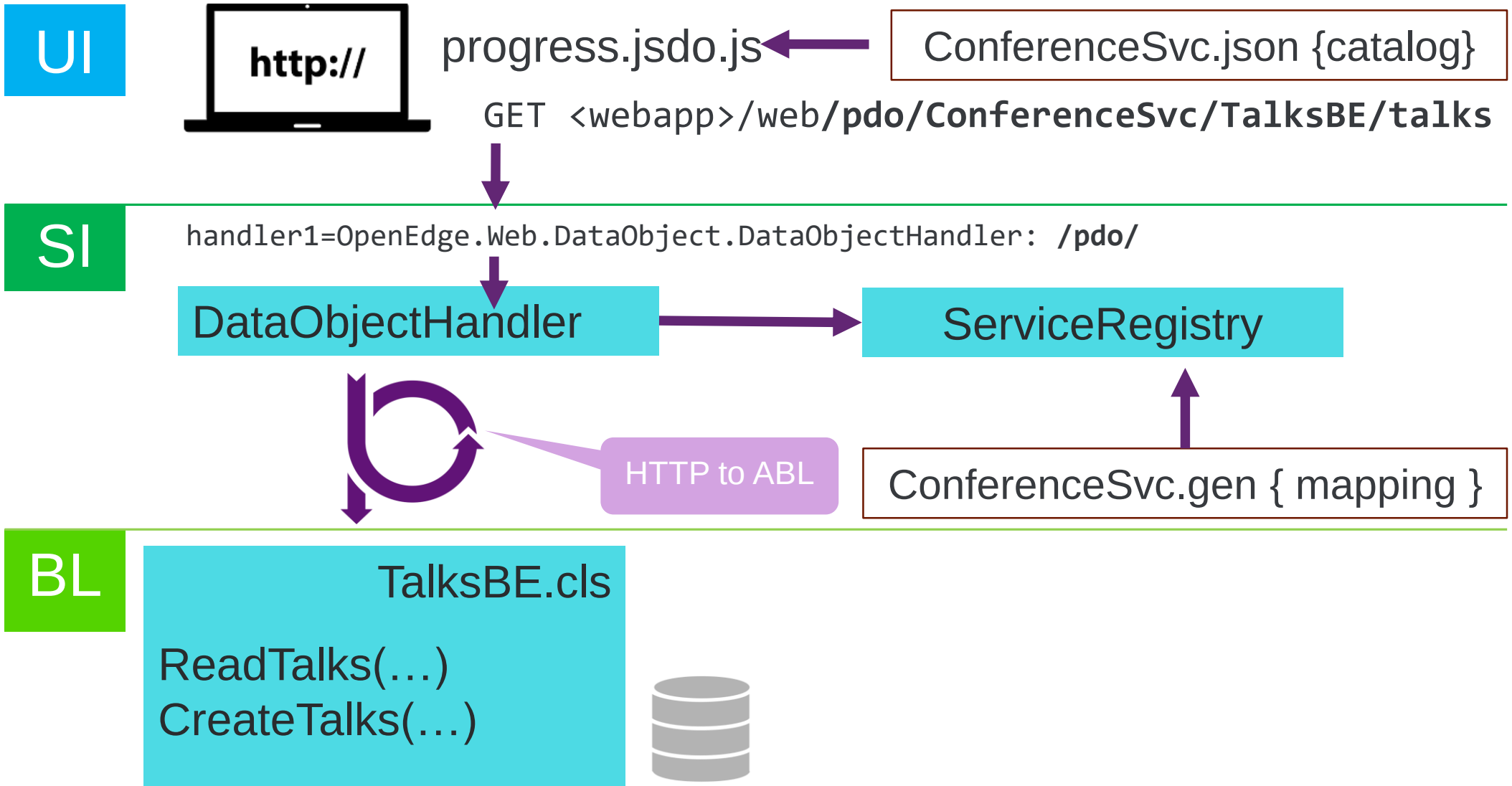
Demo 1: Data Object Service

Data Object Service Interaction



Custom REST Service Interface Options

- Data Object Services (using REST transport)
- Data Object Services (using WEB transport)

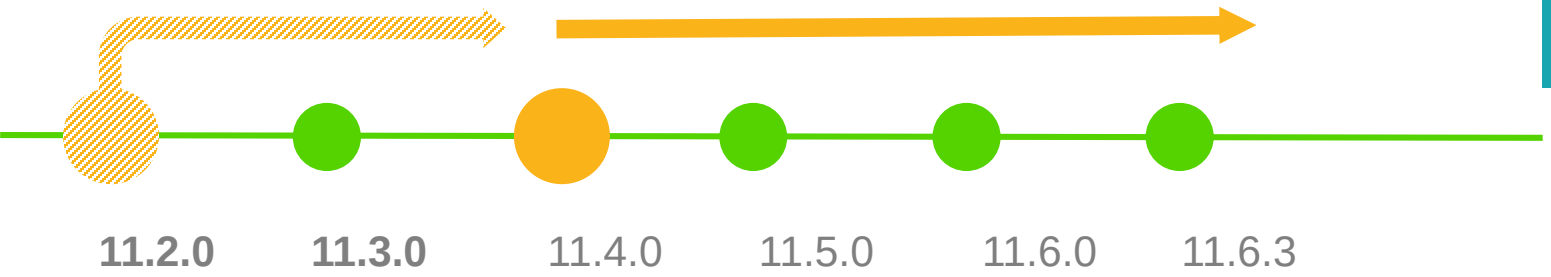
- **Mapped RPC REST Service (using REST transport)**
- **Custom/DIY WebHandler (using WEB transport)**
- **Data Object Handler WebHandler (using WEB transport)**

- OData view of OpenEdge DB (using Hybrid Data Pipeline)

Service Interface Approaches

a	Data Object (REST)
b	Data Object (WebHandler)
c	**REST (Mapped RPC)**
d	WebHandler
e	DataObjectHandler

- Formerly REST Services
- Graphical mapping tool
- Uses REST transport
- Flexible in URI paths



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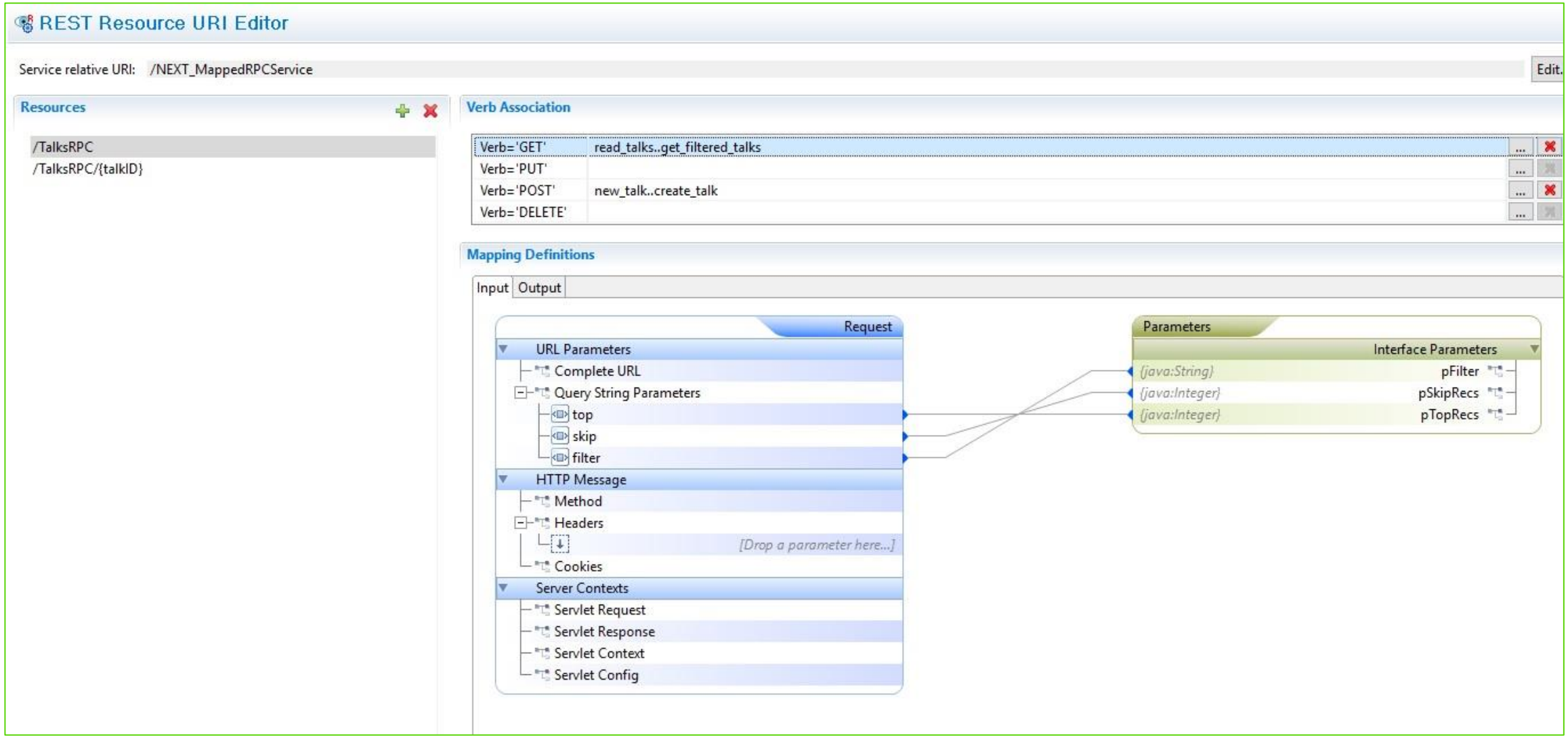
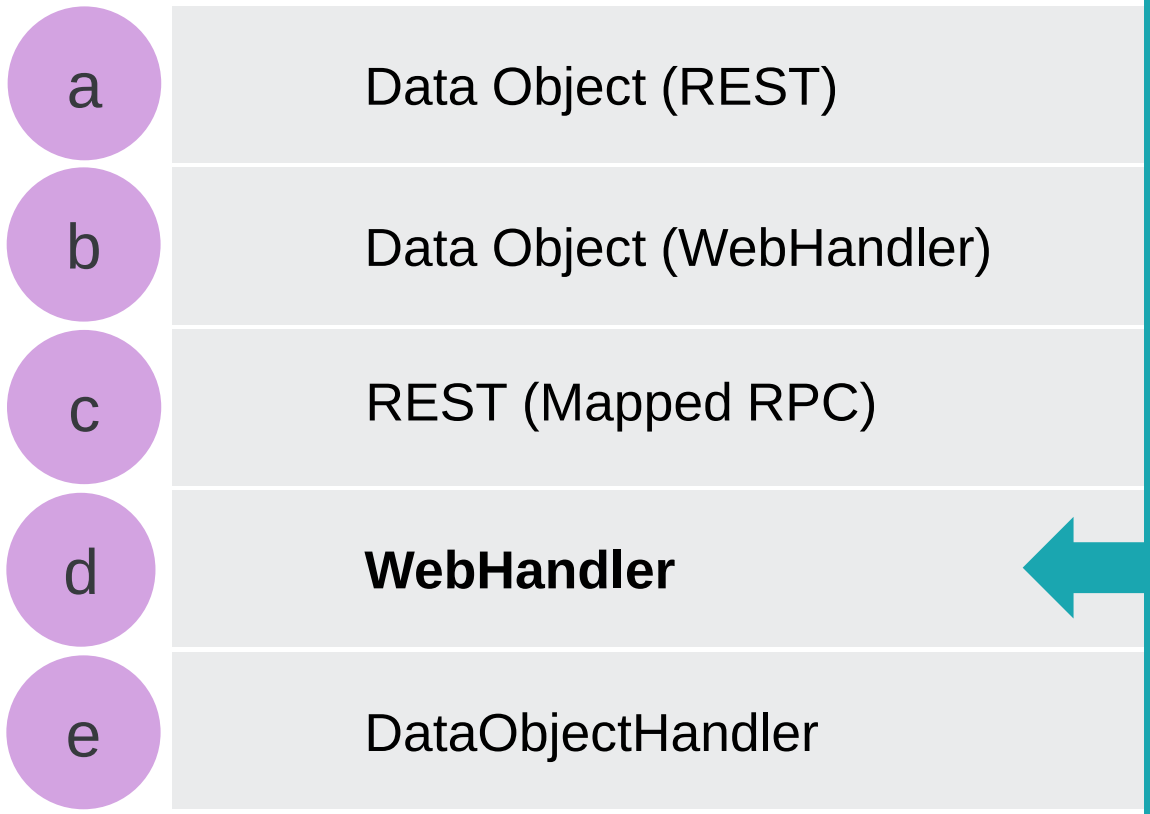
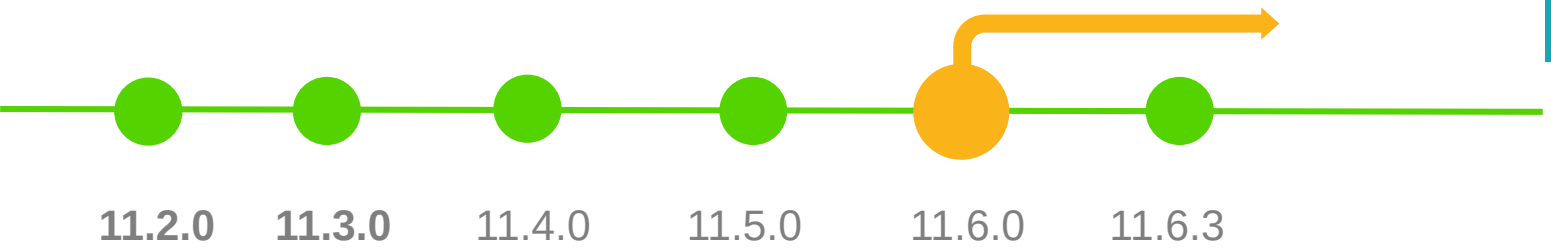
MappedRPC REST Graphical Mapper



Service Interface Approaches



- Associate an OOABL WebHandler class with a URI pattern
- Uses WEB transport
- Requires PAS for OpenEdge
- VERY flexible, URI is all yours
- Do whatever you want in code/ABL
- In-the-box versions
  - **OpenEdge.Web.WebHandler**
  - OpenEdge.Web.CompatibilityHandler
  - OpenEdge.Web.DefaultHandler



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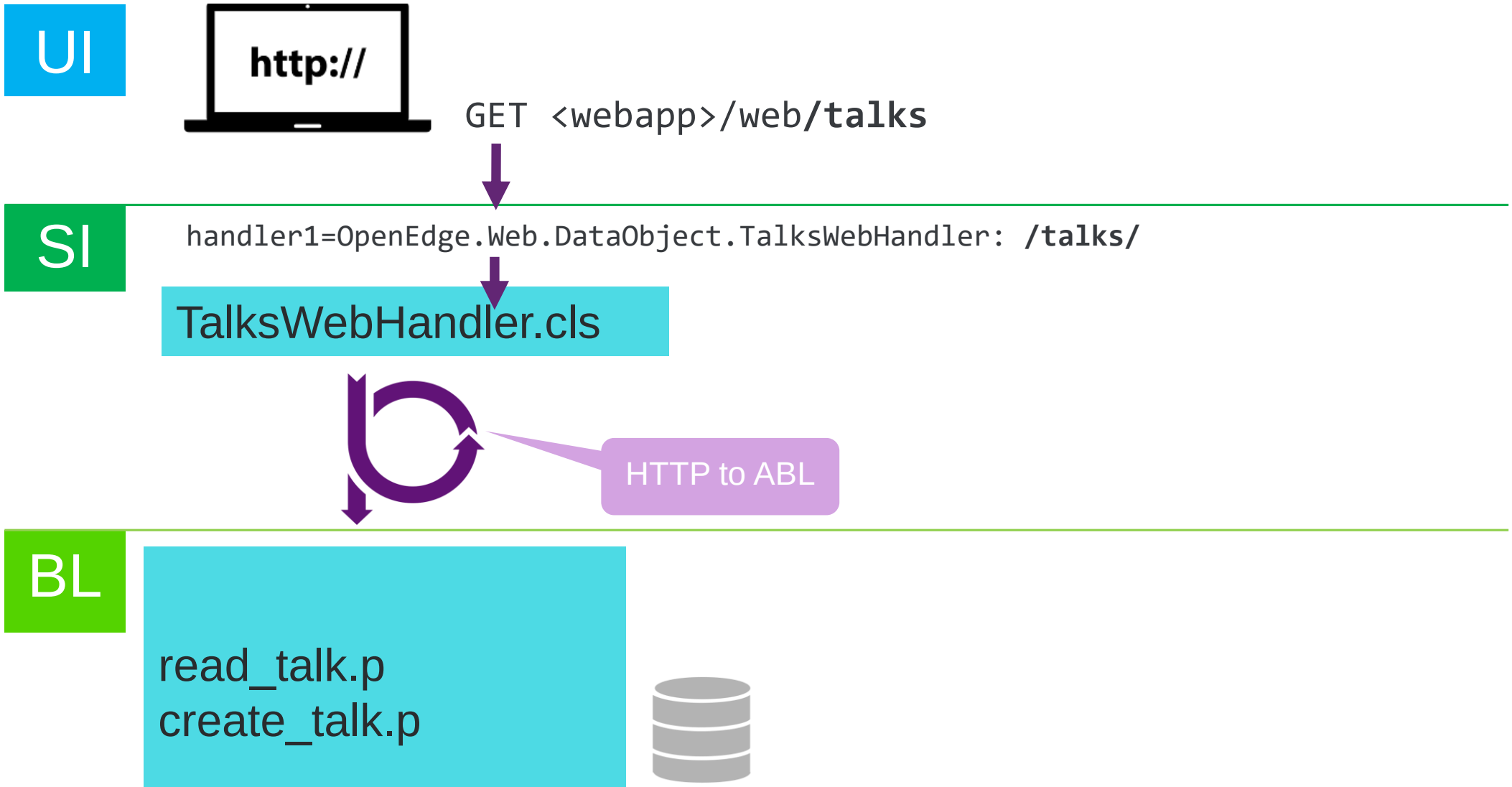
Demo 2: DIY WebHandler

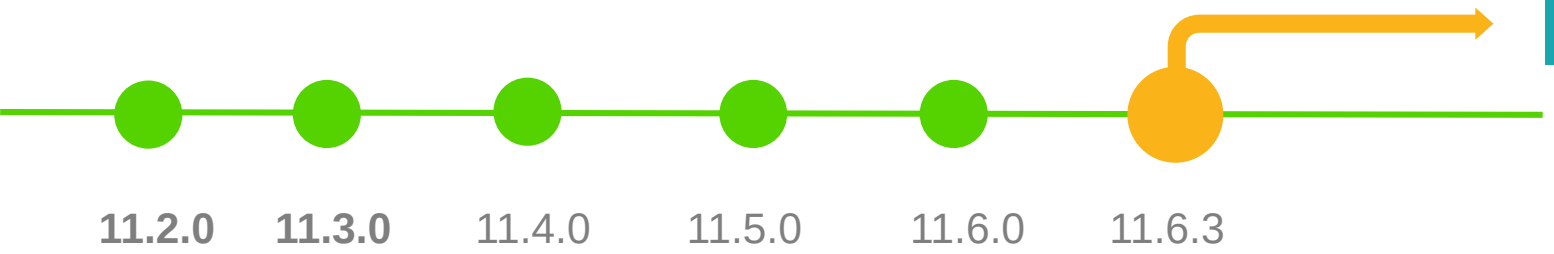
DIY WebHandler Interaction



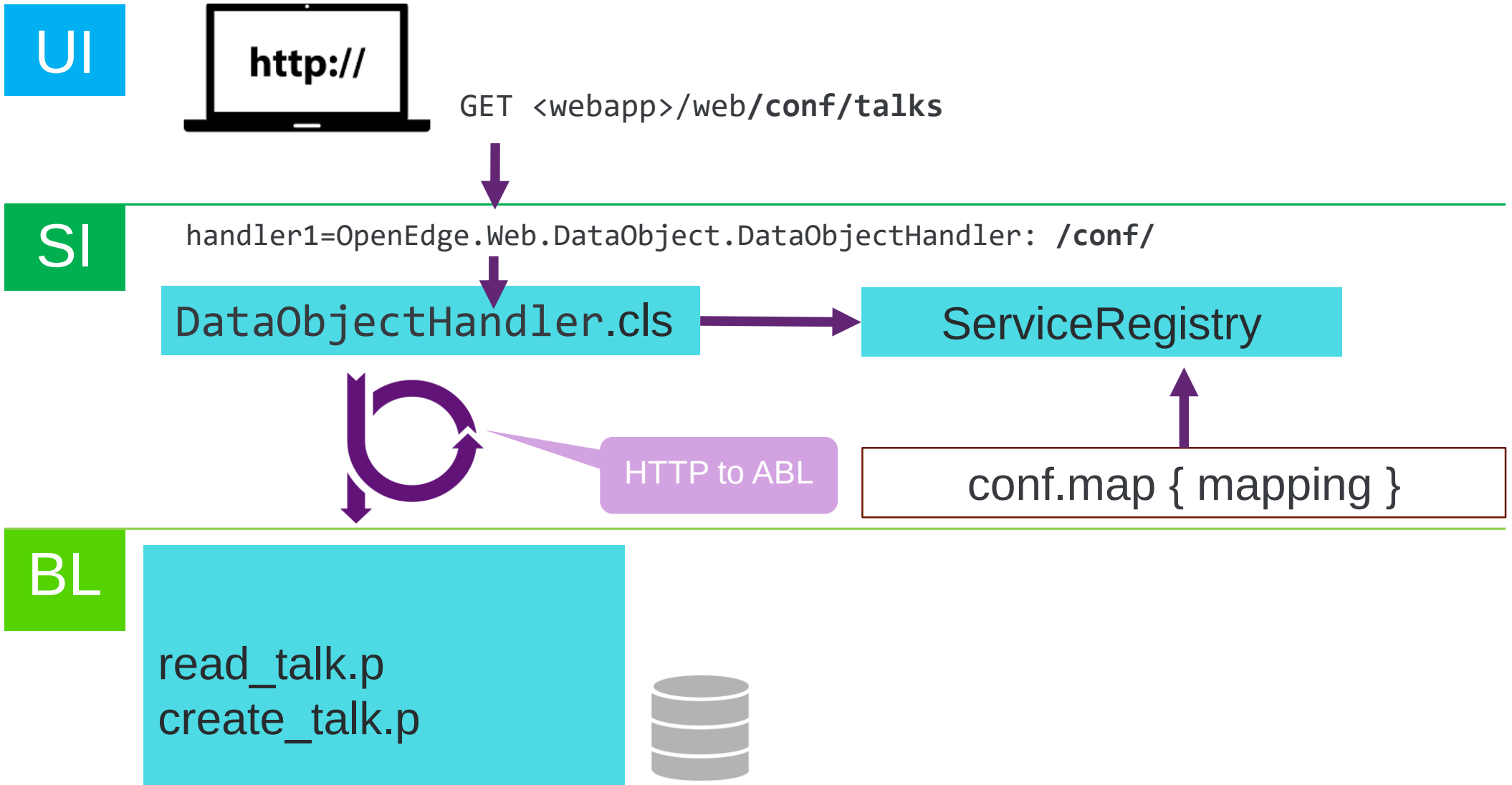
Service Interface Approaches

a	Data Object (REST)
b	Data Object (WebHandler)
c	REST (Mapped RPC)
d	WebHandler
e	**DataObjectHandler**

- Pre-built generic WebHandler
- Mapping defined in JSON file
- VERY Flexible
- Requires PAS for OpenEdge
- Not fully documented YET



DataObjectHandler WebHandler Interaction



DataObjectHandler: What can I map?

```
"/talks/{talk-id}": {
  "POST": {
    "contentType": "application/json",
    "statusCode": 201,
    "options": {
      "responseEnvelope": true
    },
    "entity": {
      "name": "logic/talk/new_talk.p",
      "function": "add_talk",
      "arg": [ {
        "ablName": "ttTalk",
        "ioMode" : "INPUT",
        "ablType": "table",
        "msgElem": { "type": "body",
                     "name": null }
      }, {
        "ablName": "pcChar",
        "ioMode" : "output",
        "ablType": "character",
        "msgElem": { "type": "header",
                     "name": "location" }
} } ] } } },
```

URI mapping

```
/talks
/{service}/data/{resource}
/{collection}/{coll-id}
```

Status codes

```
202 / Accepted
418 / I'm a teapot
```

Envelopes

```
requestEnvelope : "input"
errorEnvelope   : "oops"
```

IO Modes

```
"input" "output" "input-output" "return"
```

ABL data types (also `extent` variants)

```
"character", "longchar", "integer", "int64", "decimal",
"logical", "rowid", "recid", "date", "datetime", "datetime-tz",
"raw", "memptr", "dataset", "temp-table",
"class <ooabl.type.name>"
```

HTTP Message elements

Request-only	`"path", "query", "httpMethod", "request", "constant"`
Response-only	`"none", "statusCode", "statusReason"`
Both	`"cookie", "header", "field", "body"`

Standardized REST Service Interface Options

- Data Object Services (using REST transport)
- Data Object Services (using WEB transport)

- Mapped RPC REST Service (using REST transport)
- Custom/DIY WebHandler (using WEB transport)
- Data Object Handler WebHandler (using WEB transport)

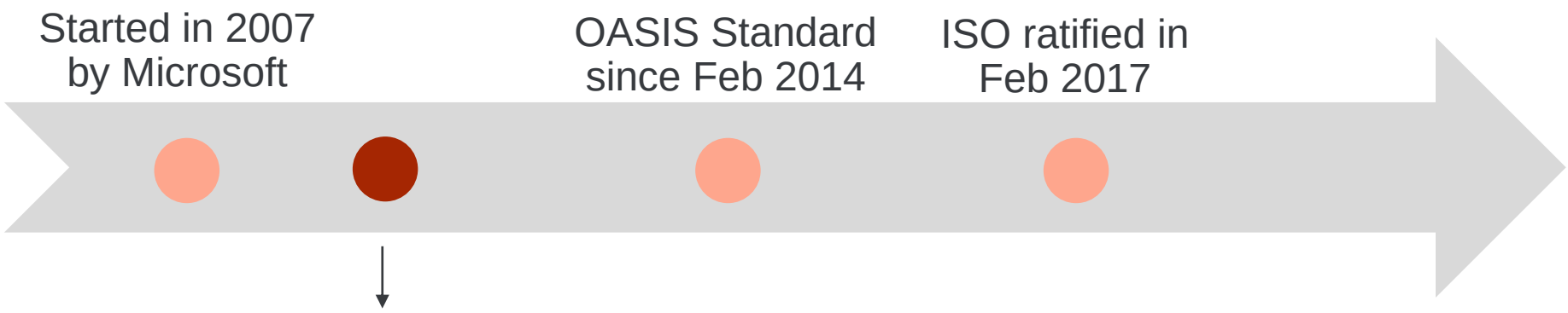
- **OData view of OpenEdge DB (using Hybrid Data Pipeline)**

Standardized REST: OData

An **open protocol** to allow the creation and consumption of **queryable** and **interoperable RESTful APIs** in a **simple** and **standard** way.

OASIS Standard REST API *("SQL for the web")*

- *Uniform URL conventions*
- *Standard Query String operations*
- *Surface metadata in standard way*
- *Operations built on REST principles*

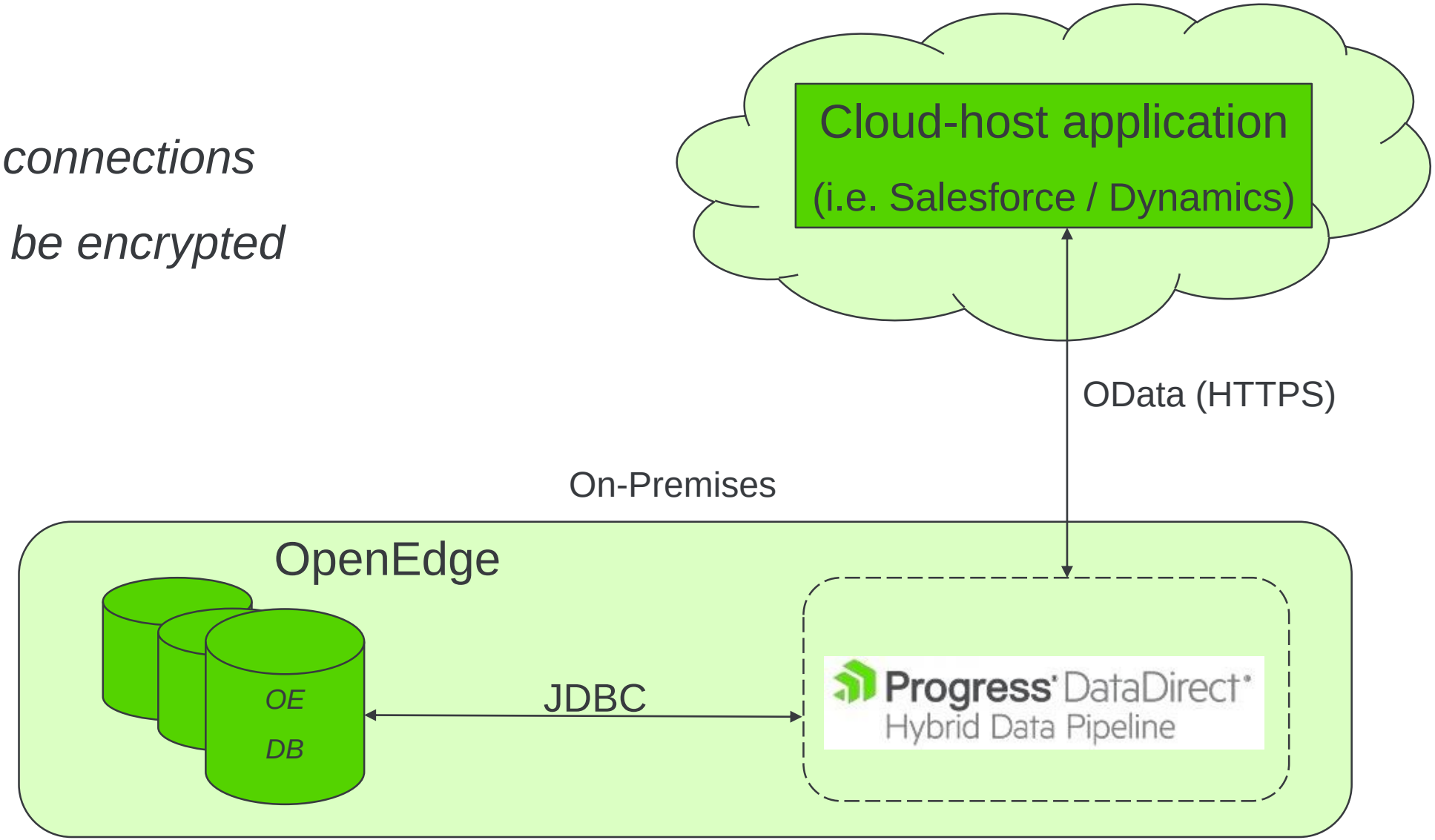


Progress DataDirect the first member to join OData Technical Committee

OData access to OpenEdge – Direct to Database

All connections

can be encrypted



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Which option(s) should I choose?

If you are building Web or Mobile UIs…

Then we recommend…

- **Data Object Services (using WEB transport) & PAS for OpenEdge**
- **Data Object Services (using REST transport) if Classic AS**

- Data Object Handler WebHandler (WEB) & PAS for OpenEdge
- DIY WebHandler (using WEB transport) & PAS for OpenEdge
- Mapped RPC REST Service (using REST transport)

- OData view of OpenEdge DB (using Hybrid Data Pipeline)

If you are building a custom B2B REST API?

- Data Object Services (using WEB transport) & PAS for OpenEdge
- Data Object Services (using REST transport) if Classic AS

Then we recommend…

- **DIY WebHandler (using WEB transport) & PAS for OpenEdge**
- **DataObjectHandler WebHandler (WEB) & PAS for OpenEdge**
- **Mapped RPC REST Service (using REST transport) if Classic AS**

- OData view of OpenEdge DB (using Hybrid Data Pipeline)

If you need to expose ‘standardized’ REST?

- Data Object Services (using WEB transport) & PASOE
- Data Object Services (using REST transport) if Classic AS

- DataObjectHandler WebHandler (WEB) & PAS for OpenEdge
- DIY WebHandler (using WEB transport) & PAS for OpenEdge
- Mapped RPC REST Service (using REST transport) if Classic AS

- **OData view of OpenEdge DB (using Hybrid Data Pipeline)**


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