Consultingwerk
software architecture and development

API first - Building ABL Clients based on Swagger

Mike Fechner, Consultingwerk

The full stack modernization framework
SmartComponent Library
by Consultingwerk

Mike Fechner

- Director, Lead Modernization Architect and Product Manager, Architect of the SmartComponent Library and WinKit
- Specialized on object-oriented design, software architecture, desktop user interfaces and web technologies
- 34 years of Progress experience (V5 … OE12)
- Active member of the OpenEdge community
- Frequent speaker at OpenEdge related conferences around the world

Consultingwerk Software Services Ltd.

- Independent IT consulting organization
- Focusing on **OpenEdge** and **related technology**
- Located in Cologne, Germany, subsidiaries in UK, USA and Romania
- Customers in Europe, North America, Australia and South Africa
- Vendor of developer tools and consulting services
- Specialized in GUI for .NET, Angular, OO, Software Architecture, Application Integration
- Experts in OpenEdge Application Modernization

Sample Swagger use-cases

- Consumption of 3rd party API‘s
  - “What is the URL of your Swagger file?“
- Integration projects
  - applications may provide Swagger file that needs to be implemented by other application
  - e.g. standard WMS and bespoke ERP system
  - document API requirements for bespoke ERP
  - test ERP API by ERP developer and WMS provider

Sample Swagger use-cases

- Document REST or RESTful API‘s
- Bringing the WSDL of SOAP to REST (less strict)
- Simplify tests of API‘s by the developers, simpler to use than Postman, no need to build a client application
- Can be imported into Postman and similar tools
- Generation of API clients and server stubs

REST/RESTful in the SmartComponent Library

- Standard protocol for application integration and UI flexibility
- SmartComponent Library provides the simplest and most flexible method of implementing REST or RESTful services with OpenEdge
- Typical use-cases
  - Implement new functionality as RESTful services
  - Provide existing (legacy) functionality as RESTful service
- Open API / Swagger documentation / test suite out of the box, generated automatically
- No need to deploy services, code declares the API
- Sophisticated authentication and authorization features

REST/RESTful – new Features

- Full support for JSON schema / Open API 3.0 – supporting implementation of every interface
- API-first design – implement service based on Open API specification; typical requirement in integration projects
- Generation of ABL clients for existing REST services
- Full support for ABL legacy code remaining like SHARED/GLOBAL SHARED variables when using OOABL (e.g. database trigger or executed legacy procedures)

Agenda

- **What is Swagger / OpenAPI**
- Understanding the Swagger File
- Foundation for building ABL Clients
- Introducing an ABL based templating engine
- Sample ABL Client
- Future

What is OpenAPI

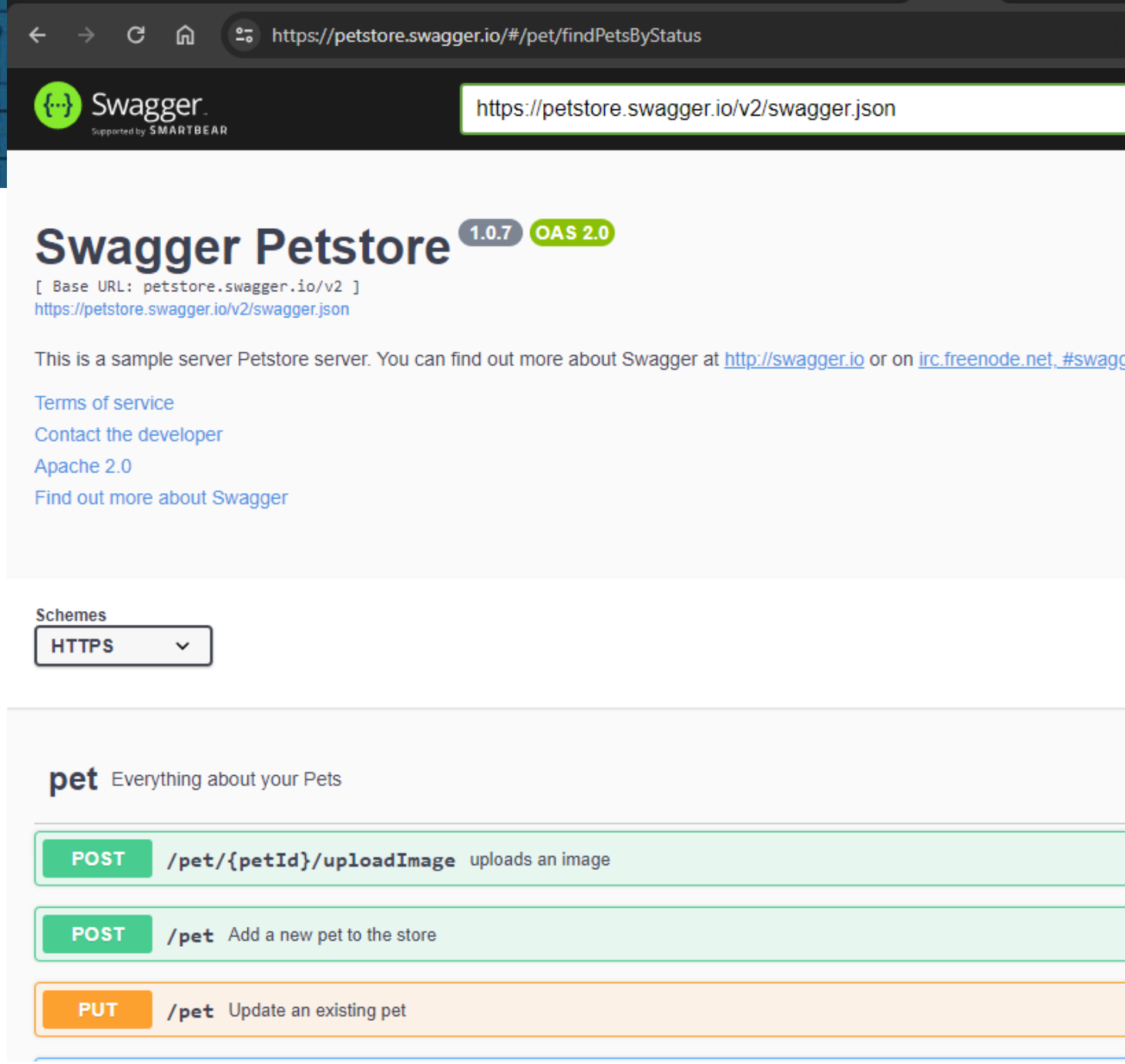
- Formerly known as Swagger Specification
- Standard for describing synchronous HTTP API‘s
- Related standard for async API’s: AsyncAPI
- Swagger ca. 2011
- OpenAPI Initiative 2016, members include Atlassian, Google, IBM, PayPal, SAP, …
- https://www.openapis.org/

What is Swagger

- Today: Collection of tools supporting work with OpenAPI specs
- Swagger and OpenAPI often used as synonyms
- Swagger Editor (Online)
- Swagger Codegen
- Swagger UI (Online documentation and test)
- Swagger Hub
- Swagger Inspector

Demo Swagger

- https://petstore.swagger.io/



GET /pet/findByStatus Finds Pets by status

Multiple status values can be provided with comma separated strings

Parameters Cancel

Name	Description
status * required array[string] *(query)*	Status values that need to be considered for filter available pending sold

Execute Clear

Responses Response content type application/json

Curl

```
curl -X 'GET' \
  'https://petstore.swagger.io/v2/pet/findByStatus?status=sold' \
  -H 'accept: application/json'
```

Request URL

```
https://petstore.swagger.io/v2/pet/findByStatus?status=sold
```

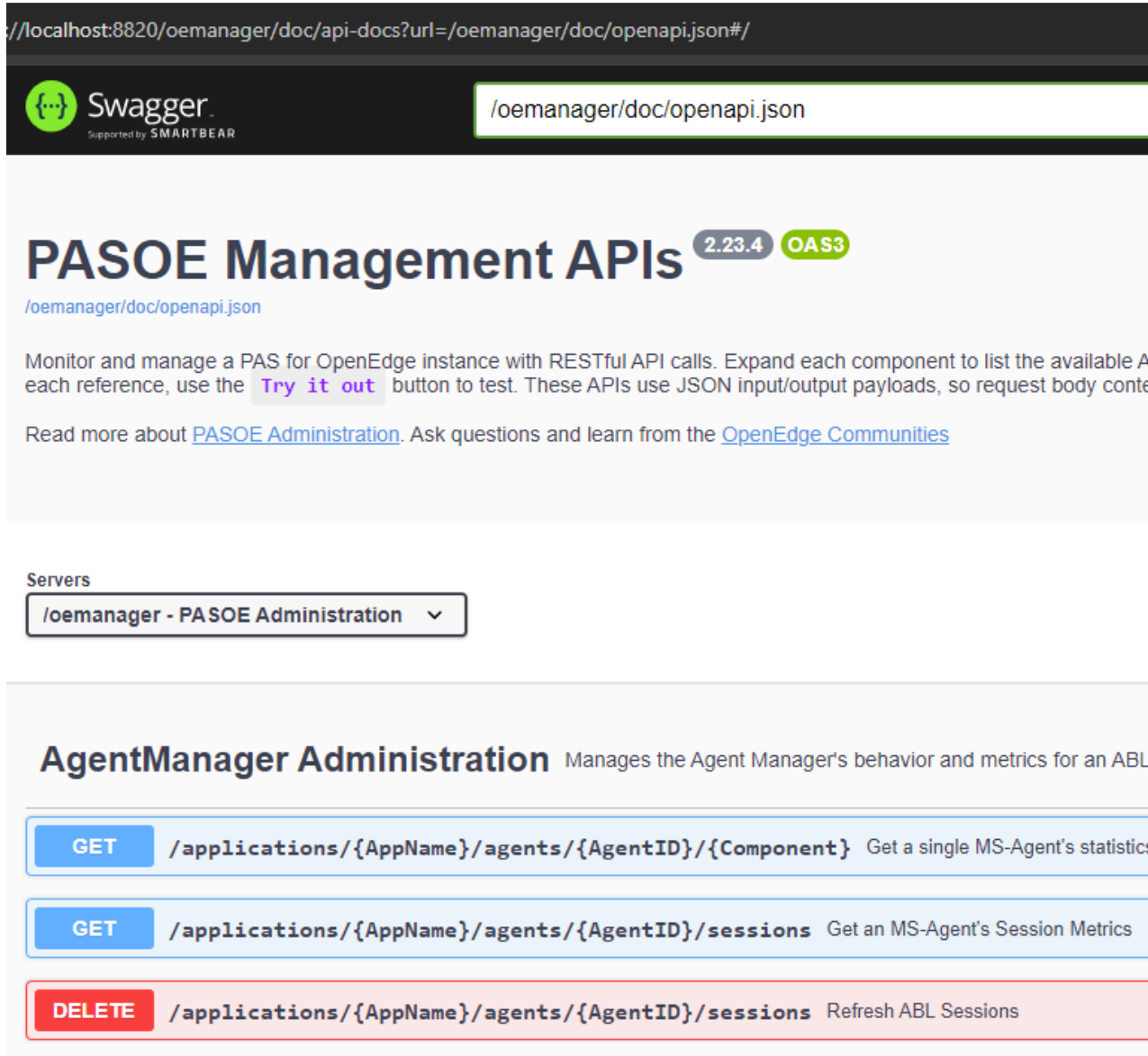
Server response

Code	Details
200	Response body


```
[
  {
    "id": 234735,
    "category": {
      "id": 713633,
      "name": "yOdpqh"
    },
    "name": "WZjOnj",
    "photoUrls": [
      "1GpOIG"
    ],
    "tags": [
      {
        "id": 502437,
        "name": "ctevUN"
      }
    ],
    "status": "sold"
  },
```

Demo Swagger

- OpenEdge OEManager (PASOE)
- List endpoints for managing PASOE instance
- http://localhost:8820/oemanager/
- oemanager.war needs to be deployed
- Swagger enabled by default in OpenEdge 12
- Needs to be enabled in 11.7



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Understanding the Swagger File

- https://swagger.io/docs/specification/basic-structure/
- JSON or YAML (Yet another markup language)
- OpenAPI documentation in YAML “but JSON works equally well”
- *We* prefer JSON due to ABL language support and coolness factor
- YAML and JSON can be converted back and forth

Sections of the Swagger File

- Metadata (Version, Title, Description)
- Tags (grouping of endpoints, links to documentation)
- Servers (for test and real)
- Paths (the definition of endpoints, relative URL, method, parameters, request body, responses)
- Component Schema (reusable types for request and responses)
- Authentication

Describing Data Models (schema)

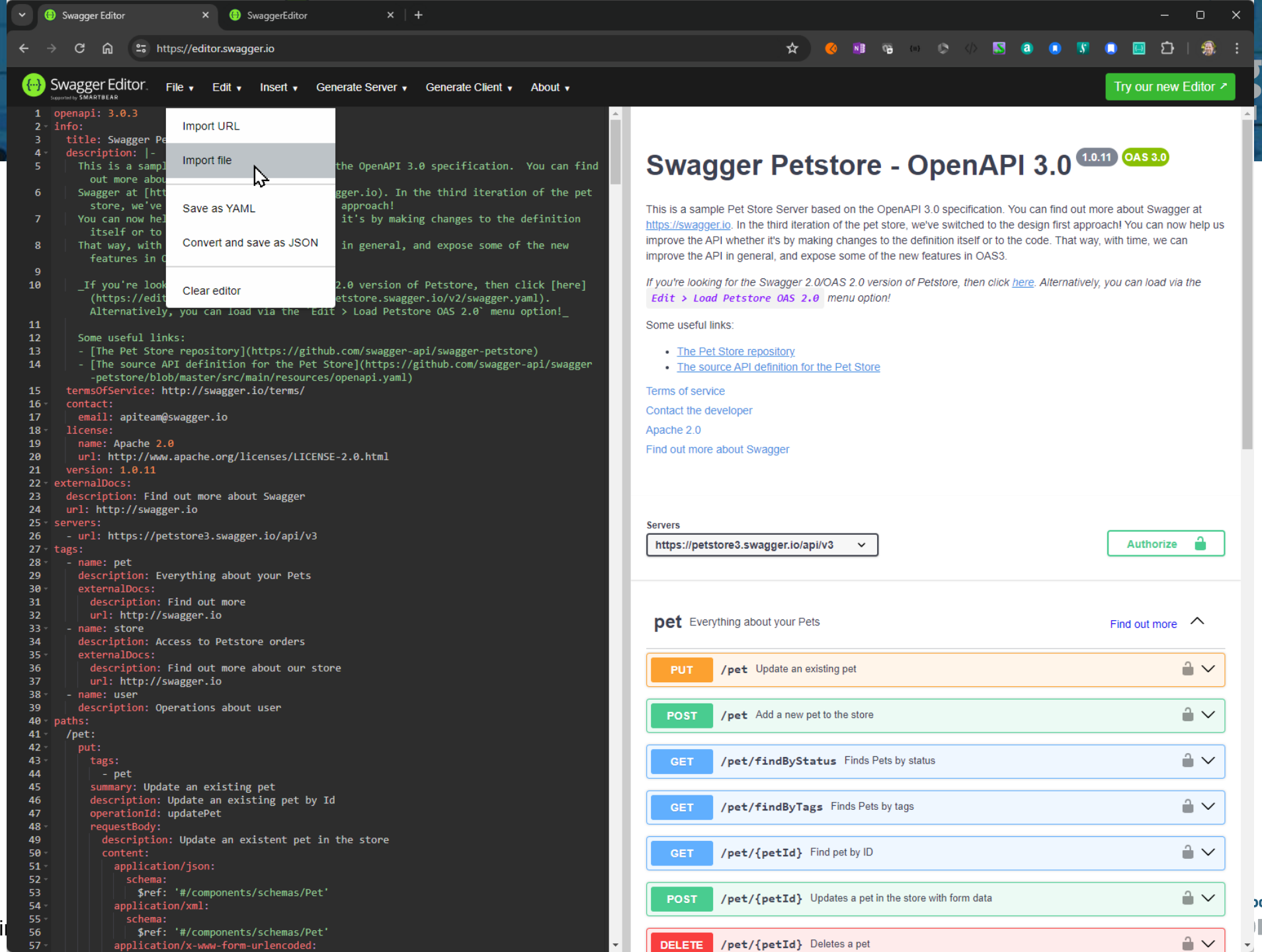
- https://swagger.io/docs/specification/data-models/
- OpenAPI data types are based on an extended subset of JSON schema
  - Objects
  - Arrays of objects
  - Property types and formats
  - Enums
  - Property descriptions, sample values
  - Validation (required, min/maxLength, min/maxValue, …)

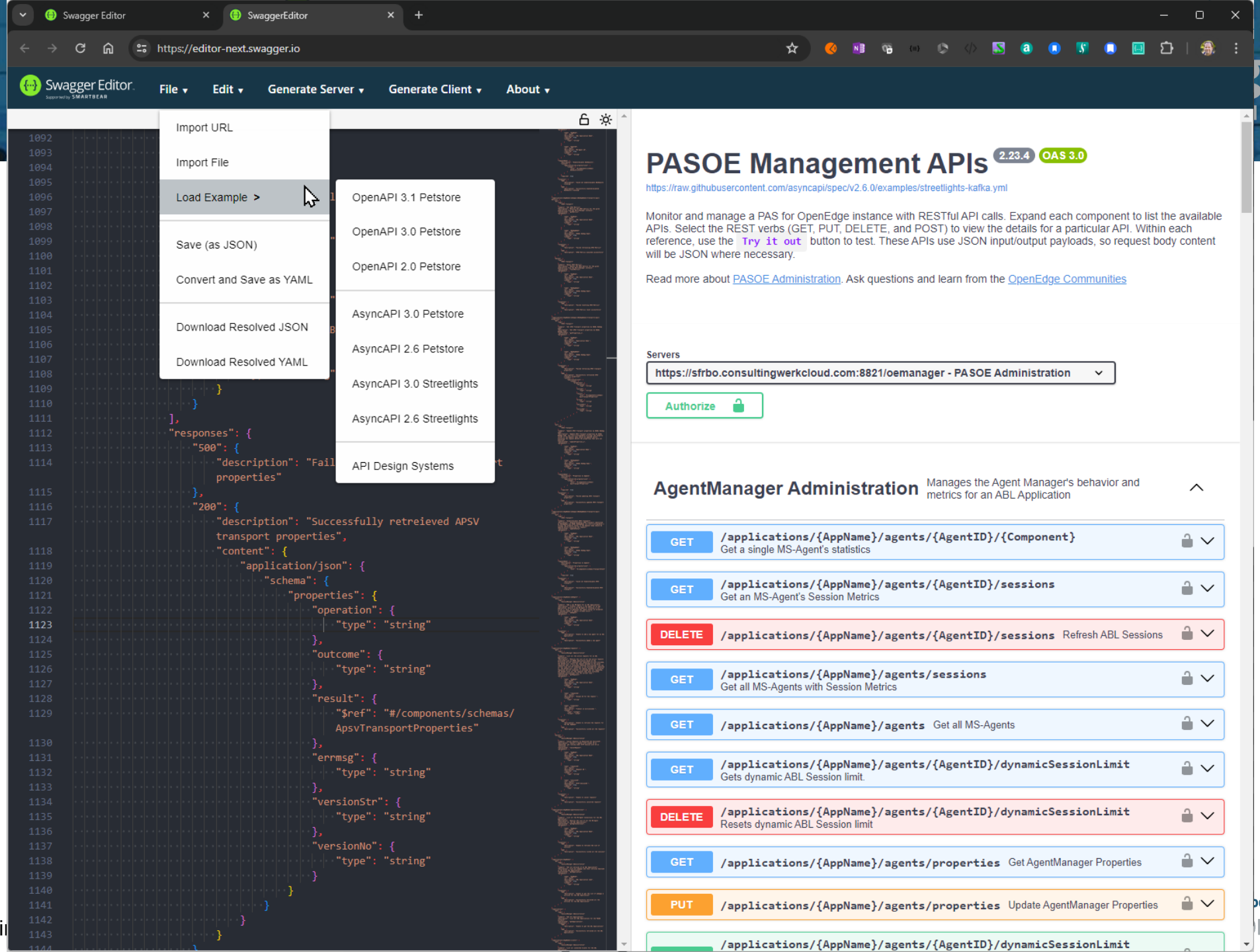
Sample Swagger File

- Review OEManager OpenAPI spec

Online editor and validation

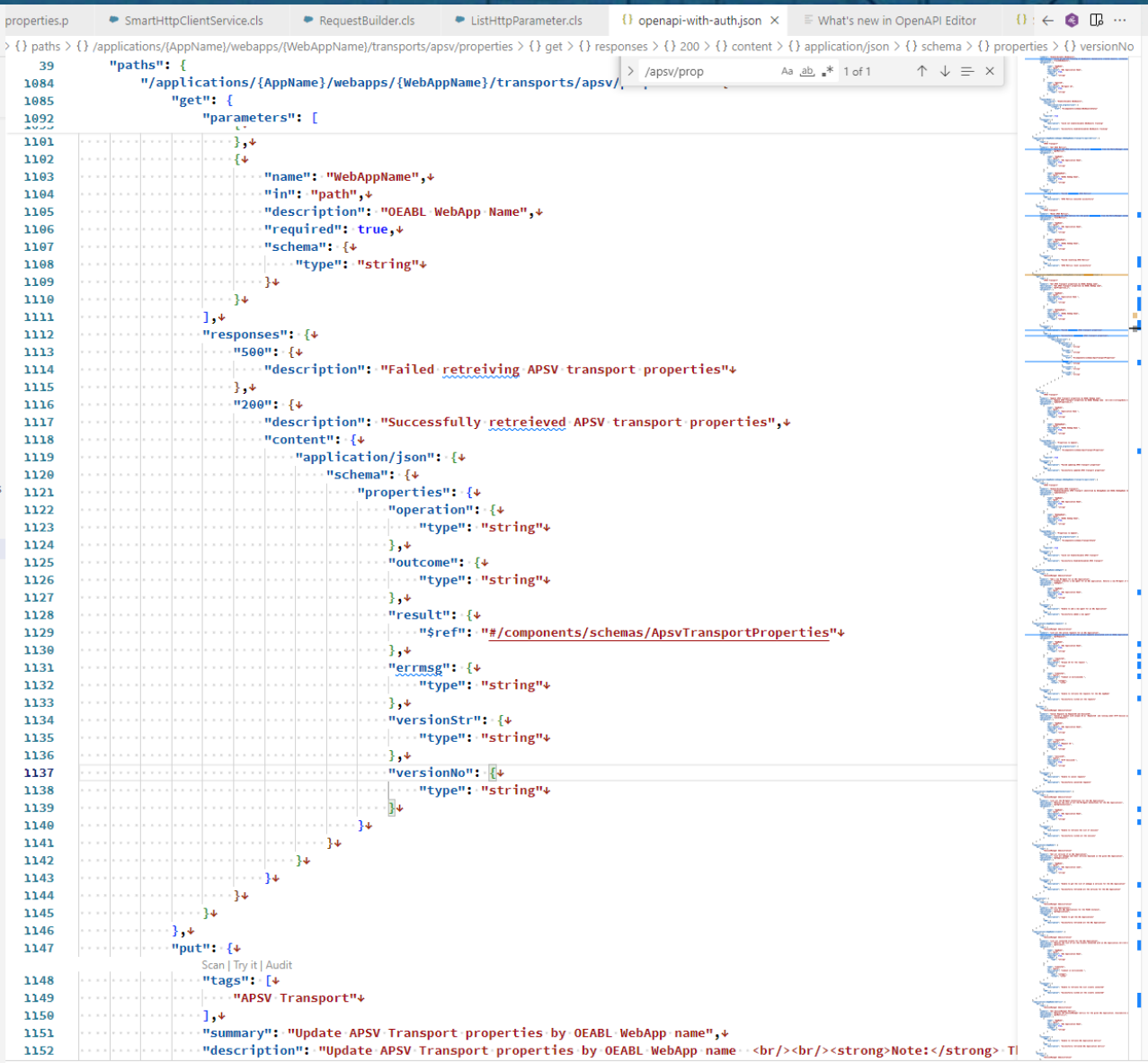
- „Current“ Swagger Editor https://editor.swagger.io/
- „Next“ SwaggerEditor https://editor-next.swagger.io/

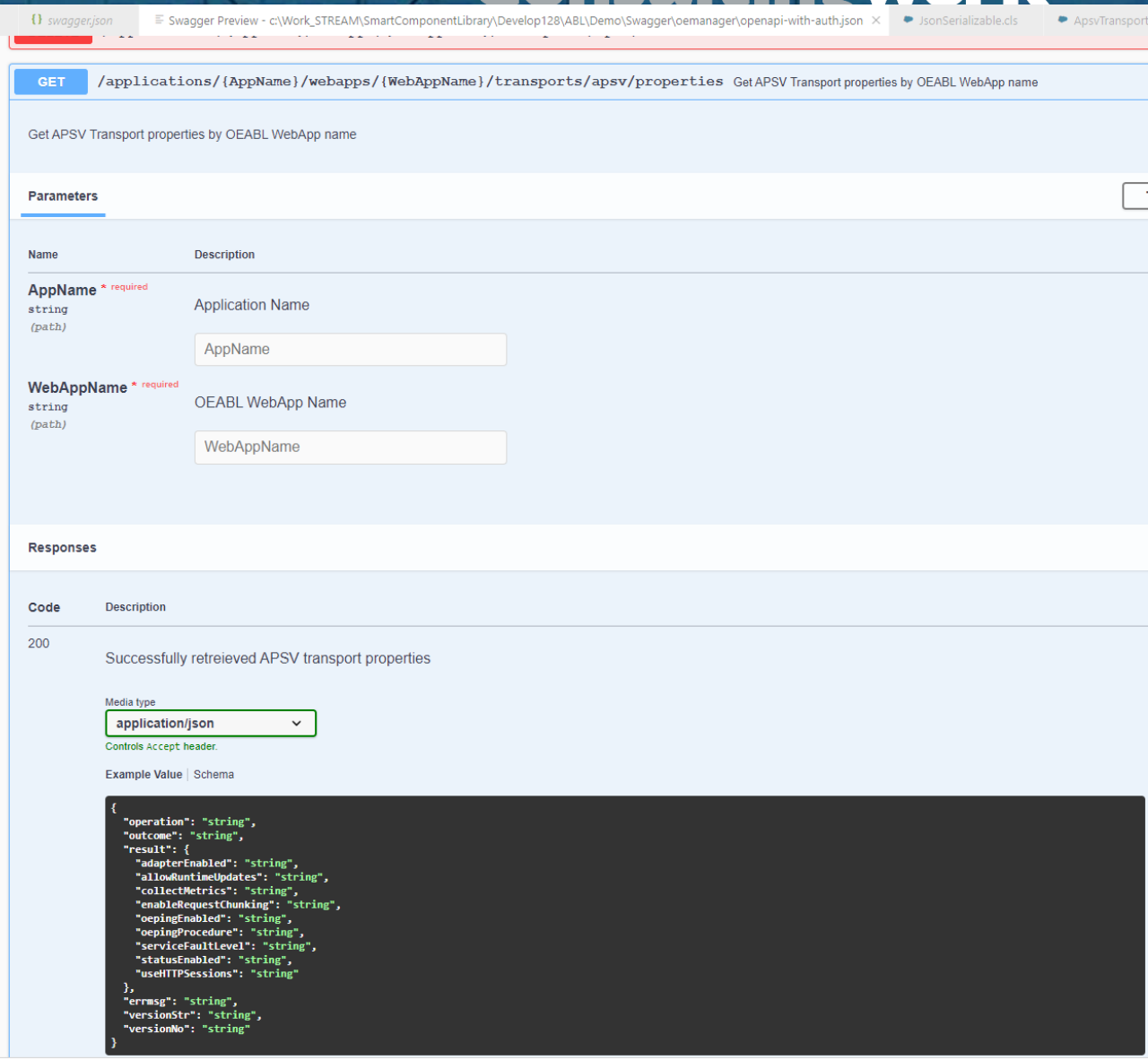




VS Code Plugins

- There are plenty in the marketplace
- Examples https://marketplace.visualstudio.com/items?itemName=42Crunch.vscode-openapi
- https://marketplace.visualstudio.com/items?itemName=Arjun.swagger-viewer





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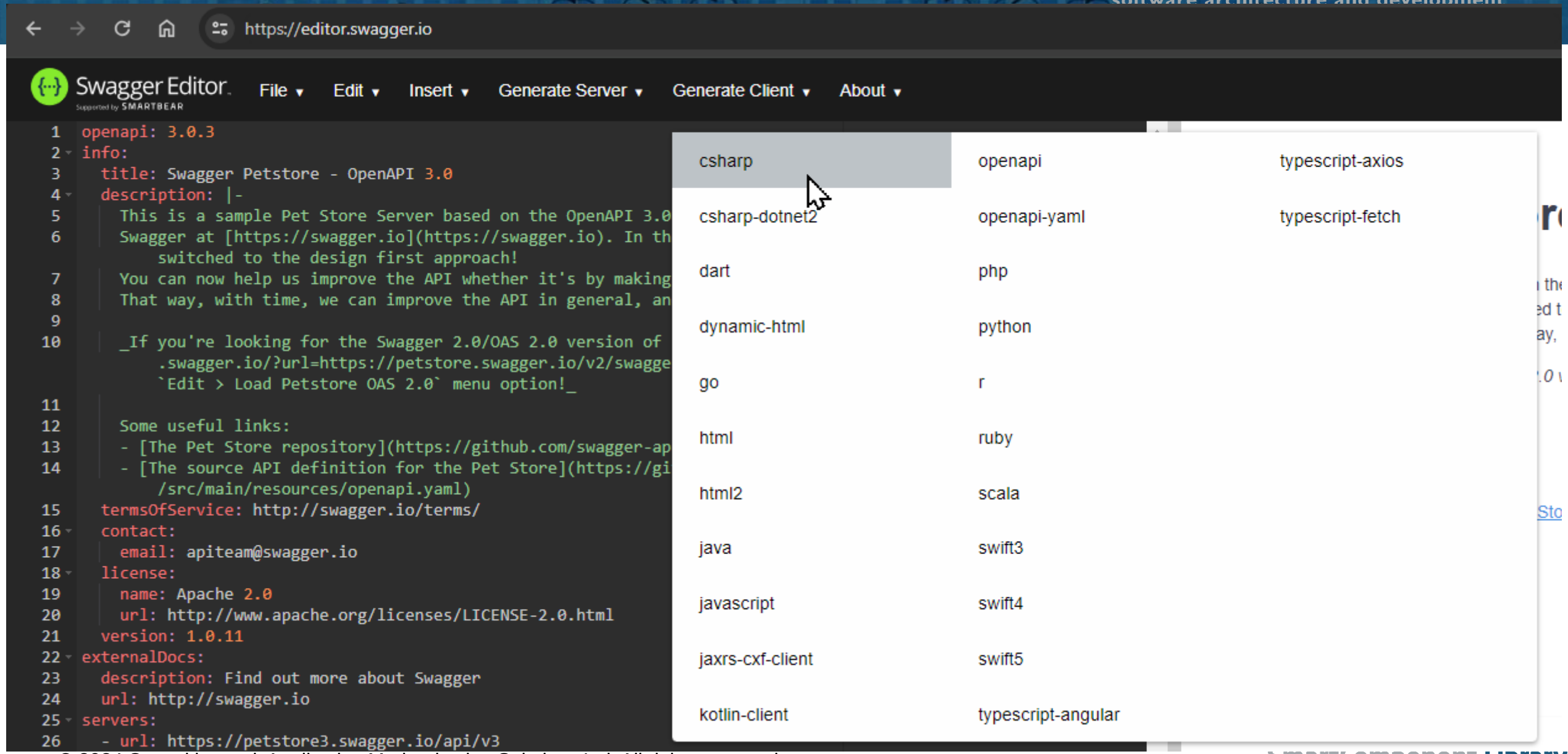

Foundation for building ABL Clients

- No ABL Client (or Server) generator on swagger.io
- Foundation for writing clients is in the “box”
- OpenEdge HTTP Client – available since OpenEdge 11.5 (11.7 preferred)
- Progress.Json.ObjectModel.JsonObject & Co.
- Temp-Table & ProDataset READ-JSON / WRITE-JSON
  - Nice to have – not always practical as many JSON structures don’t match the flat array that’s used to expose a Temp-Table

The ABL HTTP Client

- A class library that provides support for HTTP(S)
  - Designed for API use
  - HttpClient, URI, HttpHeader, Cookie, HttpRequest, HttpResponse all in OpenEdge.Net packages
  - Supports much of HTTP 1.1 spec
  - Shipped in $DLC/[src|tty|gui]/netlib/OpenEdge.Net.pl … make sure to add to PROPATH
- Simple, extensible programming interface
- Platform-portable (built on ABL sockets)
- Limitations
  - No streaming
  - Synchronous

- API doc at https://documentation.progress.com/output/oehttpclient/index.html (11.6.0+)

Fetching data aka GET requests

```
define variable oClient   as IHttpClient        no-undo.
define variable oRequest  as IHttpRequest       no-undo.
define variable oResponse as IHttpResponse      no-undo.
define variable oLib      as IHttpClientLibrary no-undo.
define variable cSSLProtocols as character extent 2 no-undo
               initial ['TLSv1.2','TLSv1.1'].

oLib = ClientLibraryBuilder:Build()
    /* With incorrect protocols, request times out */
                :SetSSLProtocols(cSSLProtocols)
                :Library.
oClient = ClientBuilder:Build()
                :UsingLibrary(oLib)
                :Client.
oRequest = RequestBuilder:Get("https://bbc.com"):Request.
oResponse = oClient:Execute(oRequest).
if oResponse:StatusCode eq 200 then
    message "Completed" view-as alert-box information.
else
    message "Error" oResponse:StatusReason view-as alert-box.
```

1. Create an HTTP client
   - Optional client library allows SSL configuration
2. Create a request object
   - Must have a method and URL
   - Headers, request body, cookies optional
3. Run the request
4. Process the response
   - Status code
   - Entity / response body

Updating data aka PUT requests

```
define temp-table eCustomer like Sports2000.Customer.

create eCustomer.
/* assign field values */

oJsonBody = new JsonObject().
oJsonBody:Read(buffer eCustomer:handle).

oReq = RequestBuilder:Put("http://example.com/web/Entities/Customers", oJsonBody)
            :ContentType("application/vnd.company+json")
            :AddHeader("Authorization", substitute("Bearer &1", cJwt))
            :AcceptJson()
            :Request.

/* Reuse a HTTP Client */
oResp = oHttpClient:Execute(oReq).
```

- RequestBuilder can specify cookies, HTTP basic authentication, various headers, authentication callbacks etc

JSON in ABL

- WRITE-JSON introduced in 10.2B for temp-tables, datasets
  - Updated to add "JsonObject" and "JsonArray" as output destinations
- SERIALIZE-ROW() and WRITE-JSON() updates
  - Optionally exclude envelope (i.e. temp-table name)
- General purpose Progress.Json.* classes introduced in 11.0
- Populated via
  - NEW JsonObject() / JsonArray()
  - ObjectModelParser:Parse() and ParseFile()
  - JsonConstruct :Read() and :Write() methods

JsonObject

```
using Progress.Json.ObjectModel.* from propath.
define variable oJsonObject as JsonObject no-undo.
define variable oChildObject as JsonObject no-undo.

oJsonObject = new JsonObject().
oJsonObject:Add("itemDescription", "A parcel for you").
oJsonObject:Add("itemWeight", 13.4).
oJsonObject:Add("itemHeight", 42).
oJsonObject:Add("itemWidth", 22).
oJsonObject:Add("itemDepth", 17).

oChildObject = new JsonObject().
oJsonObject:Add("units", oChildObject).

oChildObject:Add("height", "cm").
oChildObject:Add("width", "cm").
oChildObject:Add("depth", "cm").
oChildObject:Add("weight", "kg").

oJsonObject:WriteFile("object.json", true).
```

object.json:

```
{
  "itemDescription": "A parcel for you",
  "itemWeight": 13.4,
  "itemHeight": 42,
  "itemWidth": 22,
  "itemDepth": 17,
  "units": {
    "height": "cm",
    "width": "cm",
    "depth": "cm",
    "weight": "kg"
  }
}
```

JsonArray

```
using Progress.Json.ObjectModel.* from propath.

define variable oJsonArray as JsonArray no-undo.


oJsonArray = new JsonArray().
/* oJsonObject from previous example */
oJsonArray:Add(oJsonObject).
oJsonArray:Add(now).

message oJsonArray:Length.      /* 2 */

oJsonArray:WriteFile("array.json", true).

oJsonArray:Set(1, "replace the item object").
```

array.json:

```
[
  {
    "itemDescription": "A parcel for you",
    "itemWeight": 13.4,
    "itemHeight": 42,
    "itemWidth": 22,
    "itemDepth": 17,
    "units": {
      "height": "cm",
      "width": "cm",
      "depth": "cm",
      "weight": "kg"
    }
  },
  // array items have different datatypes
  "2024-06-11T14:01:20.619-04:00"
]
```

Progress.Json.ObjectModel.ObjectModelParser

- Read JSON using Parse() and ParseFile() methods
  - Return JsonConstruct, which can be cast down to JsonObject or JsonArray

```
define variable oParser as ObjectModelParser no-undo.
define variable oConstruct as JsonConstruct no-undo.
define variable oObject  as JsonObject no-undo.
define variable oArray  as JsonArray no-undo.

oParser = new ObjectModelParser().

oConstruct = cast(oParser:Parse("~{~"p1~":42}"),
                  JsonObject).

/* Probably safer */
oConstruct = oParser:Parse("~{~"p1~":42}").

if type-of(oConstruct, JsonObject) then
    oObject = cast(oConstruct, JsonObject).
else
    oArray  = cast(oConstruct, JsonArray).
```

Consultingwerk.JsonSerializable

- Base class (INHERITS) for ABL classes supporting flexible JSON serialization and deserialization
- Will be used in samples in this presentation
- https://github.com/consultingwerk/ListsAndEnumSamples/blob/master/Consultingwerk/JsonSerializable.cls

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Components that should be generated

- Response and Request parameter classes (types, schema)
- Enums
- Interfaces for anyOf kind references
- Clients

Sample ApsvTransportProperties

- Part of OEManager OpenAPI spec
- 9 string/Character properties
- “1”/”0” for logical values ☹


```
"ApsvTransportProperties": {
    "type": "object",
    "properties": {
        "adapterEnabled": {
            "type": "string"
        },
        "allowRuntimeUpdates": {
            "type": "string"
        },
        "collectMetrics": {
            "type": "string"
        },
        "enableRequestChunking": {
            "type": "string"
        },
        "oepingEnabled": {
            "type": "string"
        },
        "oepingProcedure": {
            "type": "string"
        },
        "serviceFaultLevel": {
            "type": "string"
        },
        "statusEnabled": {
            "type": "string"
        },
        "useHTTPSessions": {
            "type": "string"
        }
    }
},
```

ABL Class

- Straightforward ABL class
- 9 Character Properties
- INHERITS JsonSerializable

```
CLASS Demo.Swagger.oemanager.Client.ApsvTransportProperties
    INHERITS JsonSerializable
    SERIALIZABLE:

    DEFINE PUBLIC PROPERTY adapterEnabled AS CHARACTER NO-UNDO
    GET.
    SET.

    DEFINE PUBLIC PROPERTY allowRuntimeUpdates AS CHARACTER NO-UNDO
    GET.
    SET.

    DEFINE PUBLIC PROPERTY collectMetrics AS CHARACTER NO-UNDO
    GET.
    SET.

    DEFINE PUBLIC PROPERTY enableRequestChunking AS CHARACTER NO-UNDO
    GET.
    SET.

    DEFINE PUBLIC PROPERTY oepingEnabled AS CHARACTER NO-UNDO
    GET.
    SET.

    DEFINE PUBLIC PROPERTY oepingProcedure AS CHARACTER NO-UNDO
    GET.
    SET.

    DEFINE PUBLIC PROPERTY serviceFaultLevel AS CHARACTER NO-UNDO
    GET.
    SET.
```

ApsvTransportResponse

- Missing in official spec from OpenEdge
- 5 string/Character properties
- 1 object reference of type ApsvTransportProperties

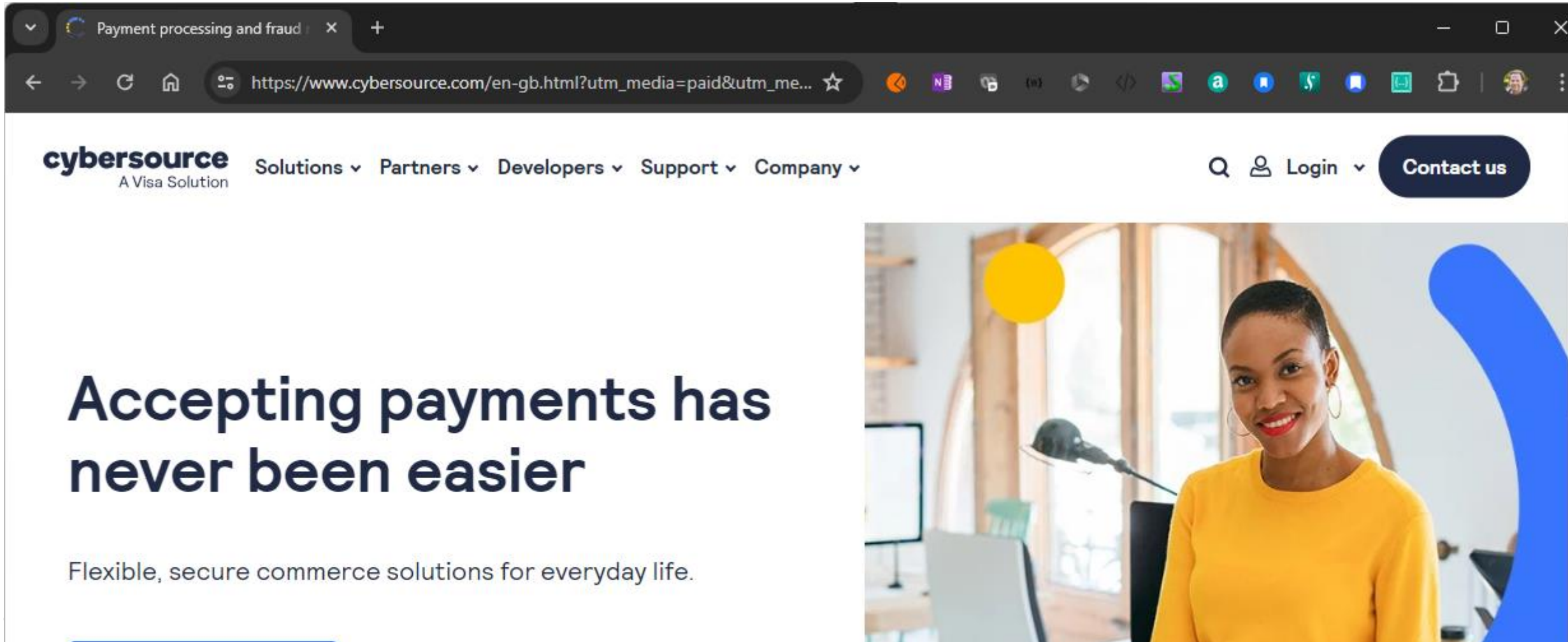
```
"200": {
    "description": "Successfully retreieved APSV transport properties",
    "content": {
        "application/json": {
            "schema": {
                "properties": {
                    "operation": {
                        "type": "string"
                    },
                    "outcome": {
                        "type": "string"
                    },
                    "result": {
                        "$ref": "#/components/schemas/ApsvTransportProperties"
                    },
                    "errmsg": {
                        "type": "string"
                    },
                    "versionStr": {
                        "type": "string"
                    },
                    "versionNo": {
                        "type": "string"
                    }
                }
            }
        }
    }
```

ABL Class

- Straight forward ABL class
- 5 Character Properties
- 1 Property of type previously shown ABL class
- INHERITS JsonSerializable

```
class Demo.Swagger.oemanager.Client.ApsvTransportResponse
    inherits JsonSerializable
    serializable:

    define public property operation as character no-undo
    get.
    set.

    define public property outcome as character no-undo
    get.
    set.

    define public property result as ApsvTransportProperties no-u
    get.
    set.

    define public property errmsg as character no-undo
    get.
    set.

    define public property versionStr as character no-undo
    get.
    set.

    define public property versionNo as integer no-undo
    get.
    set.
```

Cybersource – A Visa Solution



Cybersource API

- VISA Solution for accepting online payments
- Real world use case from a customer project (USA)
- Largest wholesale retailer for flowers in North-East USA
- API Spec provided as Swagger 2.0
  - 110.000 lines …
  - Massive number of endpoints and types
  - Validation rules provided (mandatory fields, value ranges, Enums, …)
- Conversion to OpenAPI 3.0 using online Swagger tooling failed
- Conversion using NodeJS api (from Github) succeeded

ABL Classes …

- 193 types generated for the createPayment Request/Response API alone

```
CLASS Dvflora.Payment.CyberSource.Api.Payments.createPaymentBody
    INHERITS ParameterObject
    IMPLEMENTS IValueObjectValidatorWithMessages
    SERIALIZABLE:

    DEFINE PUBLIC PROPERTY clientReferenceInformation AS createPaymentBodyClientReferenceInformation NO-UNDO
    GET.
    SET.

    DEFINE PUBLIC PROPERTY processingInformation AS createPaymentBodyProcessingInformation NO-UNDO
    GET.
    SET.

    DEFINE PUBLIC PROPERTY issuerInformation AS createPaymentBodyIssuerInformation NO-UNDO
    GET.
    SET.

    DEFINE PUBLIC PROPERTY paymentInformation AS createPaymentBodyPaymentInformation NO-UNDO
    GET.
    SET.
```

Houston, we have a problem…

- How many interns does it take to code those 193 classes effectively?
  - Classes
  - Interfaces (anyOf, oneOf)
  - Enums
- time = total effort / # of interns * frustration level
- 193 * 10 minutes = 32:10 hours … close to a week and a mental crisis
- Testing? Code-Review? Updates when spec changes?

We need a code generator!

Sample code generator

- OpenEdge provides a code generator „out-of-the-box“
- Originally implemented as part of WebSpeed “Embedded SpeedScript” (E4GL)
- Similar to active templates, like
  - Eclipse JET Templates
  - ASP.NET
  - …

onsultingwerk > Studio > SwaggerToAbl > Templates > parameterclass.template

```
<% DEFINE VARIABLE i              AS INTEGER          NO-UNDO. %>
<% DEFINE VARIABLE iCount         AS INTEGER          NO-UNDO. %>
<% DEFINE VARIABLE cProperties    AS CHARACTER EXTENT NO-UNDO. %>
<% DEFINE VARIABLE oProperties    AS JsonObject       NO-UNDO. %>
<% DEFINE VARIABLE oProperty      AS JsonObject       NO-UNDO. %>
<% DEFINE VARIABLE lcDescription  AS LONGCHAR         NO-UNDO. %>
<% DEFINE VARIABLE lcDescription2 AS LONGCHAR EXTENT  NO-UNDO. %>
<% FIX-CODEPAGE(lcDescription) = "UTF-8":U. %>
<% oProperties = SwaggerToAblHelper:GetProperties (poSchema) . %>
<% cProperties = oProperties:GetNames() . %>
<% iCount = EXTENT (cProperties) . %>
<% EXTENT (lcDescription2) = iCount . %>
/*------------------------------------------------------------------------
    File        : <%= poClassName:ClassName SKIP(0) %>
    Purpose     :
    Syntax      :
    Description :
    Author(s)   :
    Created     : <%= STRING(NOW, "99.99.9999 HH:MM:SS") SKIP(0) %>
    Notes       :
  ----------------------------------------------------------------------*/<%= SKIP(1) %>
<%= '' SKIP %>
BLOCK-LEVEL ON ERROR UNDO, THROW.
<%= '' SKIP %>
{Consultingwerk/products.i}<%= SKIP(1) %>
<%= '' SKIP %>
USING Consultingwerk.*                          FROM PROPATH .
USING Consultingwerk.Framework.Collections.*    FROM PROPATH .
USING <%= poClassName:PackageName %>.*<%= FILL (' ', MAX (1, 40 - LENGTH (poClassName:PackageName, "CHARACTER"))) %>FROM PI
USING Progress.Lang.*                           FROM PROPATH .
<%= '' SKIP %>
CLASS <%= poClassName:PackageName %>.<%= poClassName:ClassName SKIP (0) %>
    INHERITS ParameterObject
    IMPLEMENTS IValueObjectValidatorWithMessages
    SERIALIZABLE:
```

Escape the source code

- Text in the Template will be pasted into generated file
- <%= cValue %> - Expression escape
- <% DEFINE VARIABLE %> - Statement escape
- Statement escapes support Loops

Properties loop

```
<% DO i = 1 TO iCount: %>
<%    ASSIGN oProperty = oProperties:GetJsonObject(cProperties[i]) . %>
<%    IF oProperty:Has ("description":u) THEN DO: %>
<%       ASSIGN lcDescription  = oProperty:GetLongchar ("description":u) no-error.  %>
<%       IF ERROR-STATUS:ERROR THEN %>
<%          ASSIGN lcDescription  = oProperty:GetJsonText ("description":u) . %>

<%       ASSIGN lcDescription2[i] = substring(StringHelper:Indent(replace(replace(replace (CodepageHelper:ConvertToCodePag
                                                                                            "\n":u, "~n":u),
                                                                                            "/*":u, "/ *":u),
                                                                                            "*/":u, "* /":u),
                                                                                            16),
                                                                                            17, -1, "character") . %>
   /**
    * Purpose: <%= right-trim(STRING(lcDescription2[i])) SKIP(0) %>
    */
<%    END. %>
   DEFINE PUBLIC PROPERTY <%= cProperties[i] %> AS <%= AblDataType (cProperties[i], oProperties) %> NO-UNDO
   GET.
   SET.
<%= '' SKIP %>
<% END. %>
```

Validation method

```
    METHOD PUBLIC CharacterDictionary IsValid (poValueObject AS Progress.Lang.Object):
<%= '' SKIP %>
        DEFINE VARIABLE oMessages AS CharacterDictionary NO-UNDO.
        DEFINE VARIABLE oObject   AS <%= poClassName:ClassName %> NO-UNDO.
<%= '' SKIP %>
        ASSIGN oObject = CAST (poValueObject, <%= poClassName:ClassName %>).
<%= '' SKIP %>
<% DO i = 1 TO iCount:
        ASSIGN oProperty = oProperties:GetJsonObject(cProperties[i]) .

        IF oProperty:Has ("type") THEN DO:
            CASE oProperty:GetCharacter ("type"):
                WHEN "string" THEN DO:
                    IF oProperty:Has ("maxLength") THEN DO: %>
        IF LENGTH (oObject:<%= cProperties[i] %>, "CHARACTER":U) > <%= oProperty:GetInteger ("maxLength") %> THEN
            oMessages:Add ("<%= cProperties[i] %>":u, "Exceeds <%= oProperty:GetInteger ("maxLength") %> characters."{&tra
<%                  END.
                END.
            END CASE .
        END.
    END.
```

Generating code from the template

- JSON schema of current object passed as input parameter
- Recursive generation for nested types
- Resolving schema references ($ref)
- Templates executed by customized version of e4glgen.p
  https://github.com/consultingwerk/ADE-Sourcecode/blob/master/src/webutil/e4gl-gen.p
- Template will be converted into ABL procedure using {&OUT}
- Standard include file pasted into template ABL source

```
block-level on error undo, throw.

using Consultingwerk.*                          from propath.
using Consultingwerk.Studio.SwaggerToAbl.*      from propath.
using Consultingwerk.Util.*                     from propath.
using Consultingwerk.Util.LoggingStream.*       from propath.
using Progress.Json.ObjectModel.*               from propath.

&global-define OUT put stream out unformatted

define input  parameter poClassName          as ClassName                no-undo.
define input  parameter poSchema             as JsonObject               no-undo.
define input  parameter poApiSpec            as JsonObject               no-undo.
define input  parameter poGeneratorParameter as SwaggerGeneratorParameter no-undo.
define input  parameter poLoggingStream      as ILoggingStream           no-undo.
define output parameter pcOutputFile         as character                no-undo.

define stream out .

/* ************************  Main Block  ************************ */

assign pcOutputFile = substitute ("&1~\&2.cls":U,
                                  replace (poClassName:PackageName, ".":u, "/":u),
                                  poClassName:ClassName) .

if valid-object (poLoggingStream) then
    poLoggingStream:WriteFormattedMessage("Writing to: &1 &2":U, poClassName:ClassName, pcOutputFile) .

output stream out to value (pcOutputFile) .

function AblDataType returns character
    (pcPropertyName as character,
     oProperties as JsonObject):

    return SwaggerToAblHelper:ToAblDataType (poClassName:ClassName, pcPropertyName, oProperties, poApiSpec) .

end function.
```

Agenda

- What is Swagger / OpenAPI
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- **Sample ABL Client**
- Future

Review Sample ABL Client

- JSON based Get APSV Transport Properties
- JSON based Update APSV Transport Properties
- Strong Typed Get APSV Transport Properties
- Strong Typed Update APSV Transport Properties

```
oClient = new OeManagerTransportsApsvClient-TYPED ().

oResponse = oClient:getProperties_1 (new Credentials("oemanager":u, "tomcat":u, "tomcat":u),
                                     "smartpas_stream":u,
                                     "ROOT":u) .

message oResponse:operation skip (2)
        "Adapter enabled?" oResponse:result:adapterEnabled view-as alert-box.

assign oProperties                 = oResponse:result
       oProperties:adapterEnabled = "0":u.

oResponse = oClient:updateProperties_1 (new Credentials("oemanager":u, "tomcat":u, "tomcat":u),
                                        "smartpas_stream":u,
                                        "ROOT":u,
                                        oProperties) .

message oResponse:operation skip (2)
        "Adapter enabled?" oResponse:result:adapterEnabled view-as alert-box.
```

Fixing OEManager OpenAPI spec

- OpenEdge's OEManager's Swaggerfile deserves more TLC
  - Adding response schema
  - Defining basic authentication
  - Providing servers
  - Better proposed methods names: GetProperties_1 … GetProperties_5
- Personally, not happy with "1" and "0" as string representation for logical values …
  - Does not match an Enum as ABL Enum members need to start with a character value
  - So not really a cure for that issue

Adding response schemas

- Provided by OpenEdge like this – no schema for HTTP responses
- Schema required for generation of strong typed API clients

```
"/applications/{AppName}/webapps/{WebAppName}/transports/apsv/properties" : {
  "get" : {
      Scan | Try it | Audit
    "tags" : [ "APSV Transport" ],
    "summary" : "Get APSV Transport properties by OEABL WebApp name",
    "description" : "Get APSV Transport properties by OEABL WebApp name",
    "operationId" : "getProperties_1",
    "parameters" : [ {…
    }, {…
    } ],
    "responses" : {
      "500" : {
        "description" : "Failed retreiving APSV transport properties"
      },
      "200" : {
        "description" : "Successfully retreieved APSV transport properties"
      }
    }
  },
```

```
"200": {
    "description": "Successfully retreieved APSV transport properties",
    "content": {
        "application/json": {
            "schema": {
                "properties": {
                    "operation": {
                        "type": "string"
                    },
                    "outcome": {
                        "type": "string"
                    },
                    "result": {
                        "$ref": "#/components/schemas/ApsvTransportProperties"
                    },
                    "errmsg": {
                        "type": "string"
                    },
                    "versionStr": {
                        "type": "string"
                    },
                    "versionNo": {
                        "type": "string"
                    }
                }
            }
        }
    }
```

Provided by OpenEdge as request body for set properties request

Authentication

- By default, basic Authentication used („tomcat“, „tomcat“)
- May depend on PASOE configuration
- Required for client generation

California sales tax REST service

- REST service to provide sales tax rate based on address or geo coordinates
- Website: https://services.maps.cdtfa.ca.gov/
- Swagger Document: https://services.maps.cdtfa.ca.gov/swagger/LibraryOpenAPISpecification/swagger.json

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Fixing OEManager OpenAPI file

- Discussion with Progress product management if we can release a fixed (improved) version of the OEManager OpenAPI spec on Github
  - Basic authentication scheme
  - Definition of response schema
  - Enumerations
  - Better names for reused methods (GetProperties_5)
  - Further documentation
  - Community effort to keep it up to date with new OpenEdge releases …
- Alternatively log issues in OpenEdge as issues with tech support

Open sourcing parts of the implementation

- Plans to release on Github
  - the template engine (based on E4GL template engine)
  - the templates for the schema types
  - necessary helper code
  - sample for clients
- Planned to be available for workshops at PUG Challenge 2024

Next events with Consultingwerk

- PUG Challenge Prague, September 18th-20th, 2024
- PUG Challenge Boston, September 29th-October 2nd, 2024
- Further webinars planned during the fall/winter