

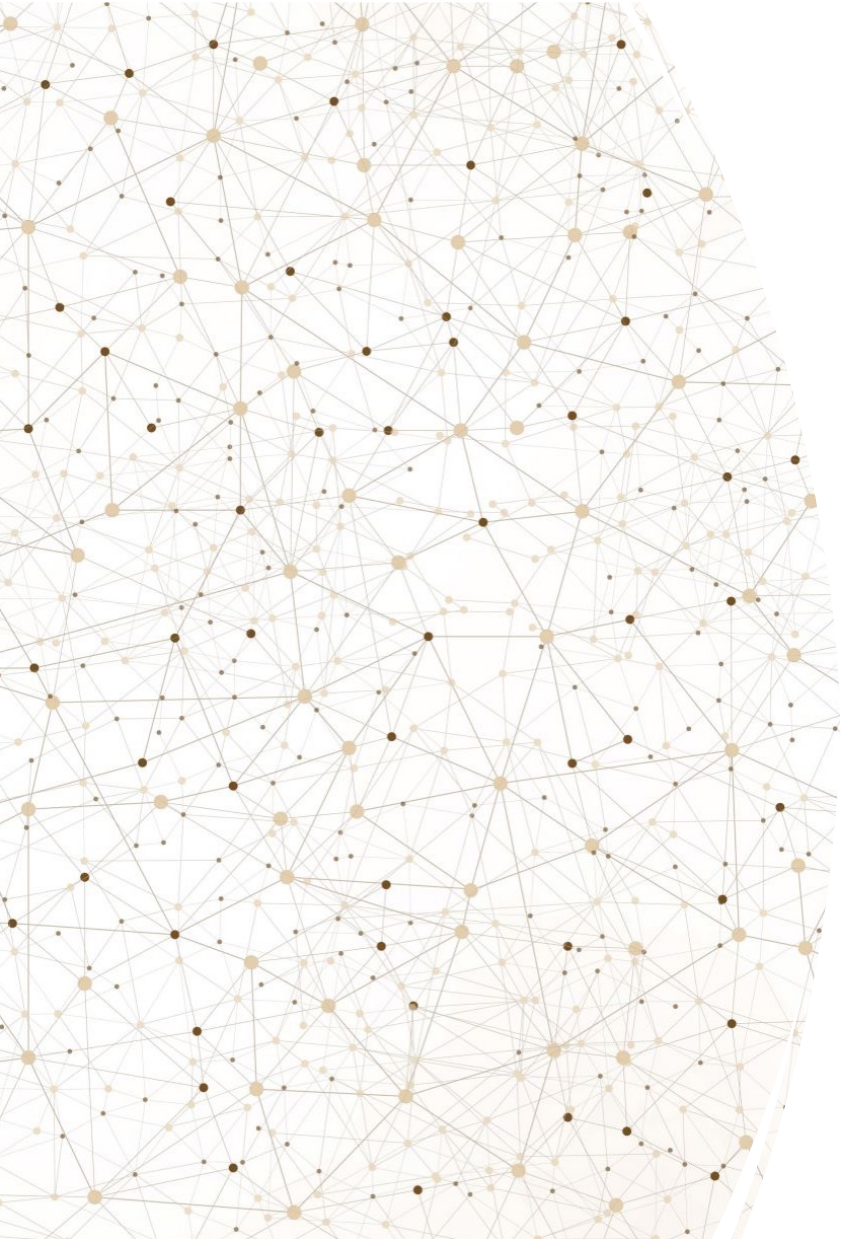
A wide-angle photograph of the Nashville skyline at dusk. The sky is a deep blue with some light clouds. The city lights are visible, including the prominent blue and white spire of the AT&T Building. A large bridge with a white steel truss structure spans the river in the foreground. The river reflects the city lights and the bridge. The text 'ODTUG Kscope24' is overlaid in the center. 'ODTUG' is in white, 'Kscope' is in white, and '24' is in a colorful, multi-colored font. Below the main title, the text 'nashville, tn' and 'july 14 - 18' are displayed in white. At the bottom center, the word 'Welcome' is written in white.

ODTUG Kscope24

nashville, tn

july 14 - 18

Welcome



OData REST Source integration made easy!

KScope 2024

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Dimitri Gielis

- Founder & CEO of **United Codes**
- 25+ years of Oracle Experience (OCP & APEX Certified)
- Oracle ACE Director
- “APEX Developer of the year 2009” by Oracle Magazine
- “Oracle Developer Choice award (ORDS)” in 2015
- Author Expert **Oracle APEX**
- Presenter at Conferences



Extend APEX like a PRO



APEX Office Print

Printing & Reporting
built for APEX



APEX Media Extension

Image processing for the
Oracle Database.



APEX Office Edit

Document management
for APEX



Plug-ins Pro

Document management
for APEX

APEX Message Service

Real-time communication
for Oracle APEX



APEX Project Eye

Productivity, Quality Assurance,
and Security tool for APEX



REST ... and OData?

REST

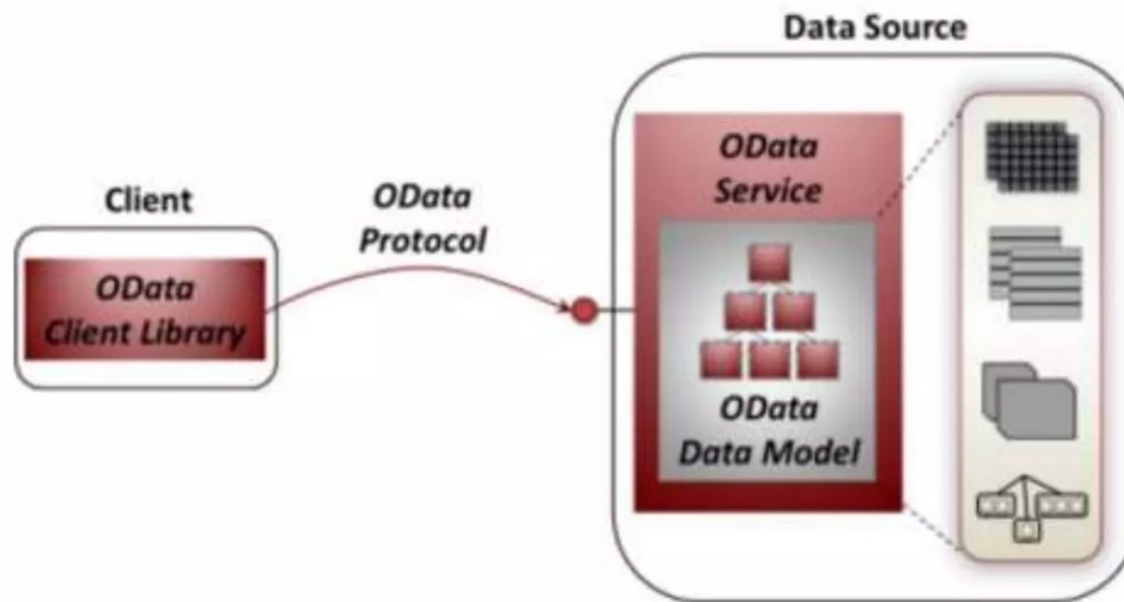
- Is an architectural style, not a standard
- Design decision?
 - Name of resources
 - Pagination
 - Query data
 - Status codes
 - ...

What is OData?

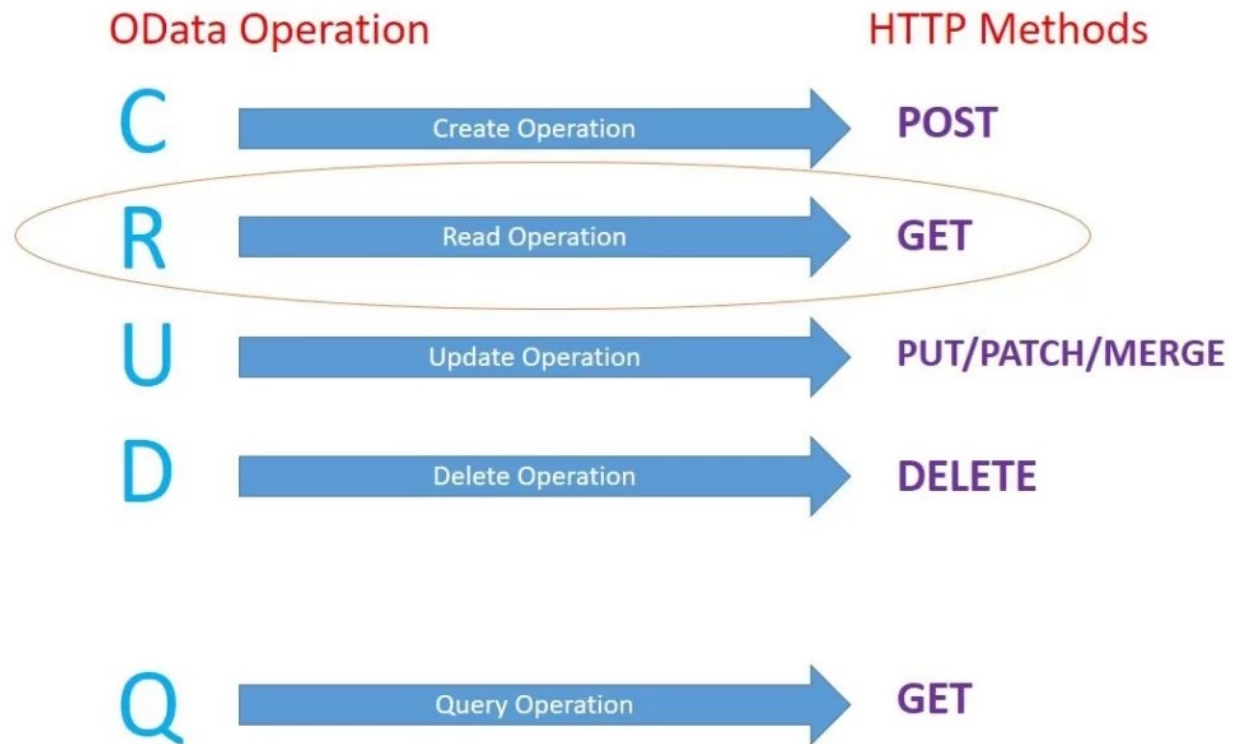
- OData (Open Data Protocol) is an ISO/IEC-approved OASIS **standard** for building and consuming RESTful APIs
- Started by Microsoft in 2007 → Standard in 2017
- Adopted by SAP, IBM and many others



OData four main parts



Protocol



OData URL structure

- Requesting resources

GET <https://services.odata.org/v4/TripPinServiceRW/People>

- Requesting an individual resource

GET [https://services.odata.org/v4/TripPinServiceRW/People\('russellwhyte'\)](https://services.odata.org/v4/TripPinServiceRW/People('russellwhyte'))

- Queries

GET [https://services.odata.org/v4/TripPinServiceRW/People?\\$top=2 & \\$select=FirstName, LastName & \\$filter=Trips/any\(d:d/Budget gt 3](https://services.odata.org/v4/TripPinServiceRW/People?$top=2 & $select=FirstName, LastName & $filter=Trips/any(d:d/Budget gt 3)

OData URL structure

- Creating a new resource

POST [https://services.odata.org/v4/\(S\(xxx\)\)/TripPinServiceRW/People](https://services.odata.org/v4/(S(xxx))/TripPinServiceRW/People)

- Relating resources

POST

[https://services.odata.org/v4/\(S\(xxx\)\)/TripPinServiceRW/People\('lewisblack'\)/Trips/\\$ref](https://services.odata.org/v4/(S(xxx))/TripPinServiceRW/People('lewisblack')/Trips/$ref)

- Invoking a function

GET

[https://services.odata.org/v4/\(S\(xxx\)\)/TripPinServiceRW/People\('russellwhyte'\)/Trips\(0\)/Microsoft.OData.SampleService.Models.TripPin.GetInvolvedPeople\(\)](https://services.odata.org/v4/(S(xxx))/TripPinServiceRW/People('russellwhyte')/Trips(0)/Microsoft.OData.SampleService.Models.TripPin.GetInvolvedPeople())

OData Resource representation

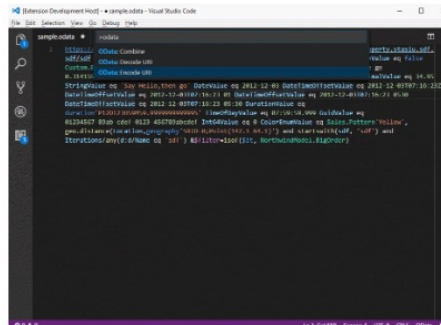
- Data: JSON, Atom (XML)

<URL>

- Data Model: CSDL (Common Schema Definition Language)

<URL>/*\$metadata*

Tools



Visual Studio Code for OData

OData for Visual Studio Code is a Visual Studio Code extension that adds rich support for the OData query language

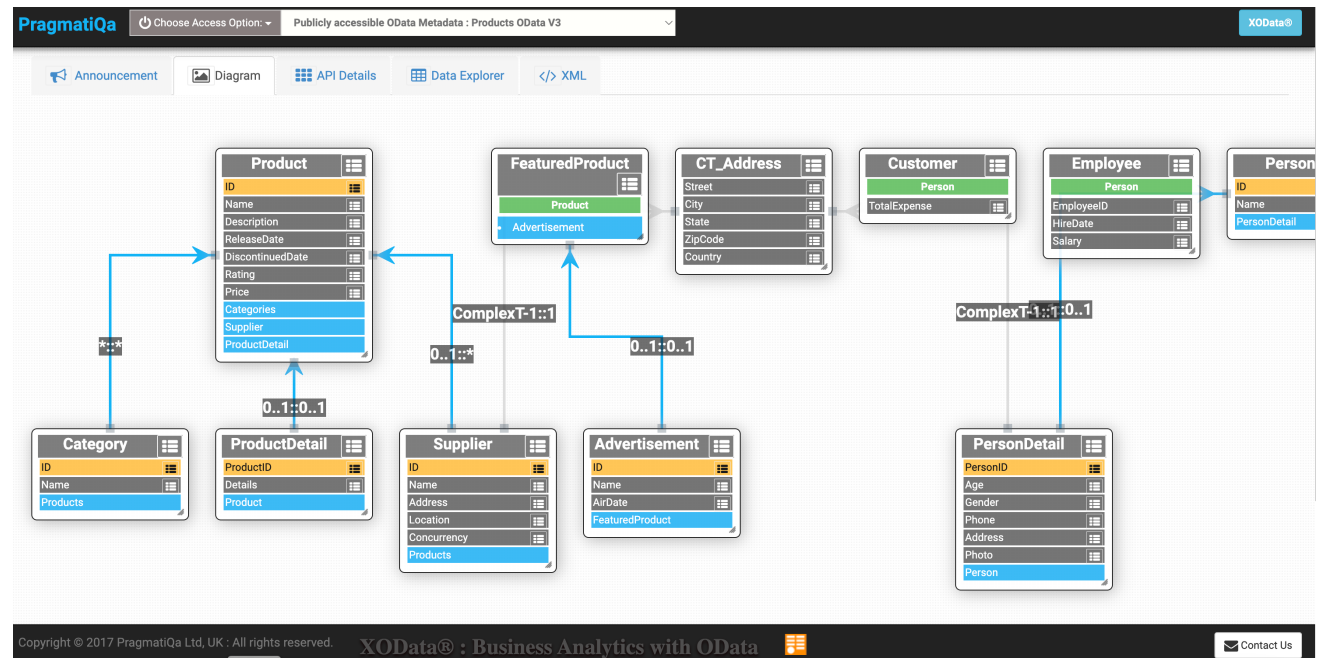


XOData

XOData is a generic online OData API/Service visualizer and explorer. It assists in rapid prototyping, verification, testing, and documentation of OData APIs. With XOData Chrome App it's also possible to explore OData Services deployed locally or on private networks.

<https://marketplace.visualstudio.com/items?itemName=stansw.vscode-odata>

XOData



<https://pragmatika.com/xodata/>

Example NASA data-set

PragmatiQa Choose Access Option: Get Details XOData®

Open URL

Get Data Reset

Show 10 entries Search: Save as Favourite Get All Data Export Graph Expand

Links	_id	eva	country	crew	vehicle	date	duration	purpose
	row-38hb~ht9z~4m35	40	USA	Owen Garriott Jack Lousma	Skylab 3	1973-08-06T00:00:00.000	6:31	Constructed/deployed twin-pole thermal shield t
	row-hpx9-6292-7ftq	41	USA	Owen Garriott Jack Lousma	Skylab 3	1973-08-24T00:00:00.000	4:31	Installed cable for backup gyro package. Exchan
	row-fjvv~7euy-rfp7	42	USA	Owen Garriott Allen Bean	Skylab 3	1973-09-22T00:00:00.000	2:41	Recovered telescope camera film, material samp
	row-sf6a_mnxx.umjs	43	USA	Ed Gibson Bill Pogue	Skylab 4	1973-11-22T00:00:00.000	6:33	Photographed earth atmosphere. Deployed spac
	row-82dw~2rjx_ntnj	44	USA	Gerald Carr Bill Pogue	Skylab 4	1973-12-25T00:00:00.000	7:01	Photographed comet Kohoutek, reloaded telescc
	row-edd4.yytK_5vcc	45	USA	Gerald Carr Ed Gibson	Skylab 4	1973-12-29T00:00:00.000	3:29	Photographed comet Kohoutek. Retrieved sampl
	row-3h84-23wy-ydca	46	USA	Gerald Carr Ed Gibson	Skylab 4	1974-02-03T00:00:00.000	5:19	Retrieved telescope camera film and installed m
	row-kvmf_y25g.n3h4		USA	Bill Lenoir Joe Allen	STS-5	1982-11-14T00:00:00.000	0:00	Suit fan and O2 regulator failures prevented first

Demo

OData REST Source - Northwind

Oracle APEX 23.2 New Feature

Native support for OData

Create REST Data Source

General

REST Data Source Type: OData REST Service ?

* Name: ?

* URL Endpoint: ?

Create REST Data Source (1)

Create REST Data Source

General

REST Data Source Type: OData REST Service

Name: NASA 9kcy-zwvn

URL Endpoint: https://data.nasa.gov/api/odata/v4/

HTTPS Host Name:

Next >

Create REST Data Source (2)

Back

Create REST Data Source - Remote Server

✕

✓

Remote Server

Remote Server data-nasa-gov-api-odata ?

Base URL https://data.nasa.gov/api/odata/ ?

* Service URL Path v4/ ?

<Next >

Create REST Data Source (3)

Create REST Data Source - Settings

✓

✓

●

●

●

Settings

* Resource Path

Parameter Default Values

<

Next >

Create REST Data Source (4)

Authentication

✓

✓

✓

●

Authentication

* Authentication Required ☐

[<](#) [Back To 1945](#) [Create REST Source Manually](#) [Advanced >](#) [Discover >](#)

Create REST Data Source (5)

REST Data Source Discovery

Preview

Data

Data Profile

Response Body

_Id ↑	Vehicle	Crew	Duration	Date	Country	Purpose	Eva
row-22mg.hvzn_94mn	STS-98/5A	Tom Jones Bob Curbeam	6:50	2001-02-12T00:00:00.000	USA	Connect lab-PMA2 APAS cables. Install lab vent valve, trunnion pin covers, handrails, PDGF, VSC and window cover. Wrong bolt heads on vent cover	105
row-28gy-isfn.26j5	Soyuz TM-20 Mir 19	Anatoly Solovyev Nikola Budarin	3:06	1995-07-19T00:00:00.000	Russia	Recover TREK. Install Komplast. Recover SKK-4, SKK-12, Platan, Stuk. H2O cooling problem on one suit prevented Miras installation	298
row-2en8~7k56~4jqt	STS-131/19A	Rick Mastracchio Clayton Anderson	7:26	2010-04-11T00:00:00.000	USA	ISS based EVA. Removed old NH3 tank and temp stowed on CETA cart. Overcame a troublesome bolt and installed new NH3 tank/cables. Installed 2 radiator grapple beams and relocated a foot restraint	212
row-2hub_s2nc-5nzi	Skylab 2	Pete Conrad Joe Kerwin	3:25	1973-06-07T00:00:00.000	USA	Without body restraint, initially unable to attach 25ft pole/cutter jaws to aluminum scrap holding jammed solar panel. Improvised body restraint with suit tether to unexpected vehicle U bolt for 3 pt stance to enable pole positioning and cut. After debris cut, attached pole as translation path to solar array. Rope hooked between airlock solar array cover structure as means to overcome frozen hydraulic damper of solar array hinge. Both crew stood under rope and pushed until array freed suddenly which caused both crew to drift free until hauled themselves back in via umbilicals. Hardest task was restowing umbilicals into stow sphere at end of day	38
row-2hvh_9nwy.cuq9	Apollo 16	Tom Mattingly	1:23	1972-04-25T00:00:00.000	USA	Transearth EVA to retrieve camera film and expose microbial response experiment	31
row-2ije.zka3-pma5	Apollo 14	Ed Mitchell Alan Shepard	4:34	1971-02-06T00:00:00.000	USA	Sought but did not quite reach crater. Golf demo	19
		Mike Smith				ISS based EVA. Established permanent configuration of the electrical and fluid lines of the loop A	

<

More Detail

Create REST Data Source

Edit REST Data Source

↑ Application 109 \ Shared Components \ REST Data Sources \ NASA 9kcy-zwvn

REST Data Source

Show All REST Data Source Settings Authentication Data Profile Operations Parameters Subscription Advanced

REST Data Source

* Name NASA 9kcy-zwvn ?

* REST Data Source Type OData REST Service ?

* Remote Server data-nasa-gov-api-odata ?

Base URL https://data.nasa.gov/api/odata/

* URL Path Prefix v4/ ?

Settings

* Resource Path /9kcy-zwvn ?

Parameter Default Values ?

Supported OData Options

- ☒ Return Sorted Results ?
- ☒ Return only Specific Columns
- ☒ Row Search
- ☒ Results Pagination

Supported OData Filters ☐ Contains ?

Demo

OData REST Source in Oracle APEX – NASA data set

PERFECT WORLD

?



Demo

OData REST Source in Oracle APEX – Office 365

A man with short brown hair, a beard, and glasses is looking directly at the camera. He is wearing a dark blue t-shirt. The background shows a room with a beige wall, a brown jacket hanging on the wall to the left, and two white doors to the right. A ceiling fan is visible in the upper right corner.

THIS IS AWESOME DUDE



Jon?

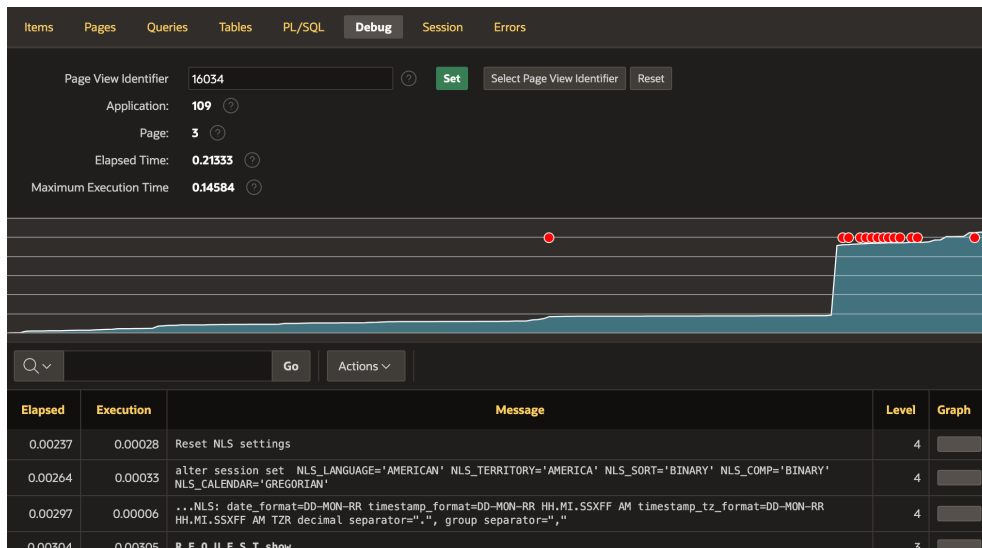


Moritz?



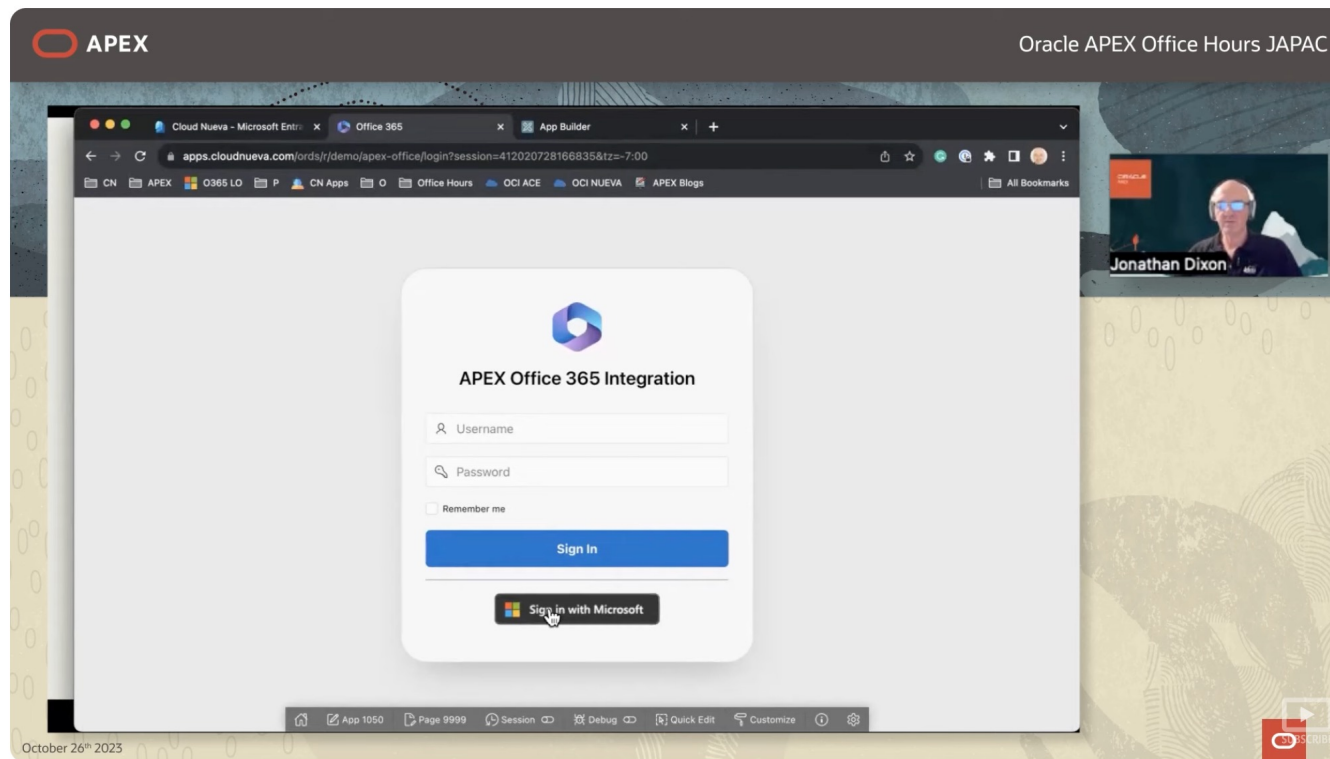
What if things go wrong?

- App Builder > Debug mode
- Monitor Activity > Web Service Activity Log



URL	HTTP Method	Content Length	Status Code	Resp Content Length	Elapsed Sec	Application User	Request Date	AI Remote Server ID	Total Tokens
https://data.cityofnewyork.us/api/odata/v4/	GET	0	200	-	2.21	DIMI	06/30/2024	-	-

Office 365 integration in APEX – step-by-step



<https://www.youtube.com/watch?v=xaCrRbbVPWE>

What I learned using OData REST Sources

- Great to get data from other systems
- Try with Postman first
- In APEX, when auto-discovery fails, upload JSON Sample Response
- Remove unused columns in Data Profile
- Set up Caching

Resources

- OData REST in APEX
https://asktom.oracle.com/ords/r/tech/catalog/session-landing-page?p2_oh_id=19326
- OData home page
<https://www.odata.org/>
- Introduction to OData
https://www.youtube.com/watch?v=z06bl_K6Ckc
- Intro into Odata
<https://www.slideshare.net/slideshow/introduction-to-odata/49155387#2>
- Microsoft Graph API
<https://learn.microsoft.com/en-us/graph/use-the-api>
- MS Office 365 integration in APEX
<https://www.youtube.com/watch?v=xaCrRbbVPWE>

Q&A

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Website: www.united-codes.com



ODTUG Kscope24

nashville, tn july 14 - 18



Don't Forget To Fill Out Your Evals