

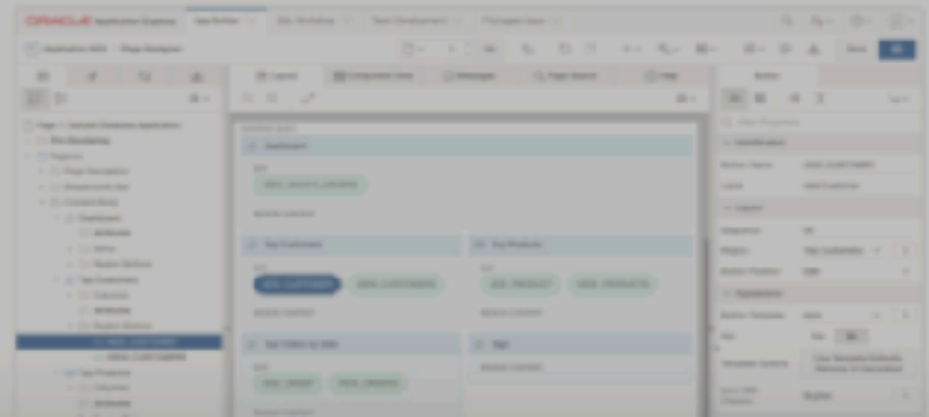
ORACLE®

# Application Express ... ... and the REST of the world!

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Oracle Application Express enables you to design, develop and deploy beautiful, responsive, database-driven applications using only your web browser. See how you can take advantage of this fully-supported,





# Carsten Czarski

## Consulting Member of technical Staff

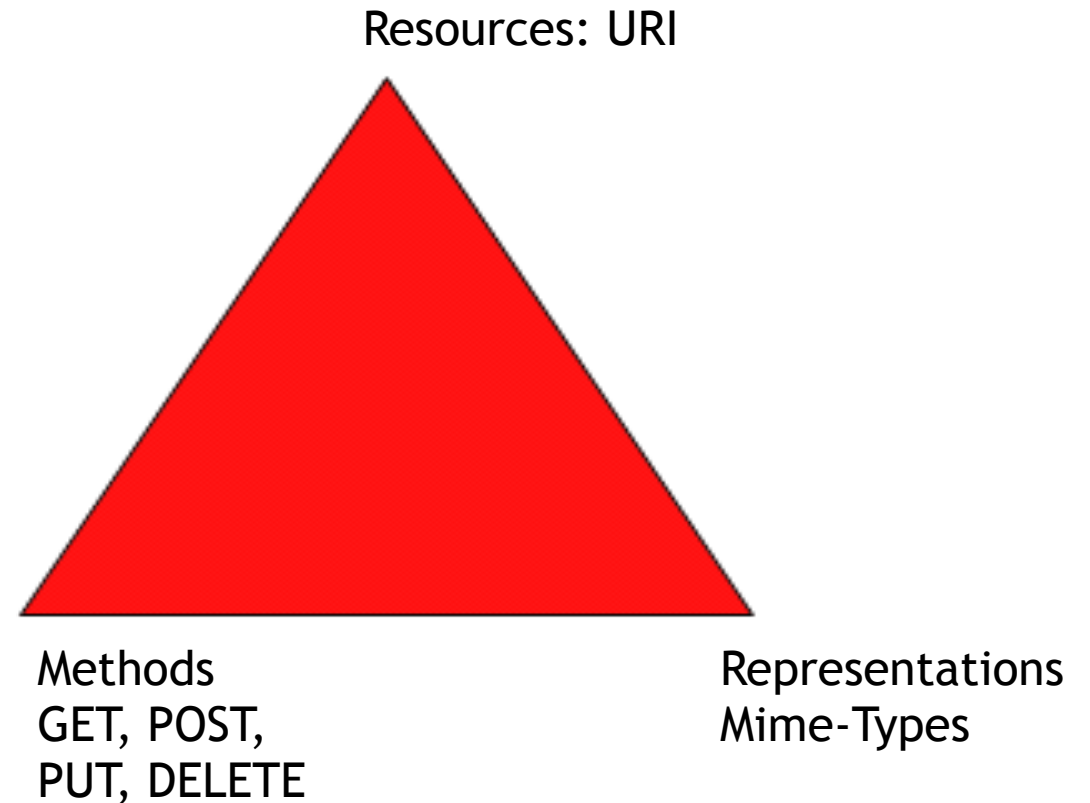
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- Member of the APEX development team since 2016
  
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- APEX on Twitter: #ORCLAPEX
- Blogs:  
[http://blogs.oracle.com/apexcommunity\\_deutsch](http://blogs.oracle.com/apexcommunity_deutsch)  
<http://sql-plsql-de.blogspot.com>

# REST: Representational State Transfer

- Architectural style for interoperating computer systems
  - Web Services adhering to REST architectural constraints are called RESTful
- Architectural Constraints for a RESTful system
  - Client Server
  - Stateless
  - Cacheable (at least for GET requests)
- Most web sites on the internet are actually REST services

# RESTful HTTP Services interface

- An HTTP based REST interface
  - Resources
  - Methods
  - Representations



# REST Web Services in the enterprise

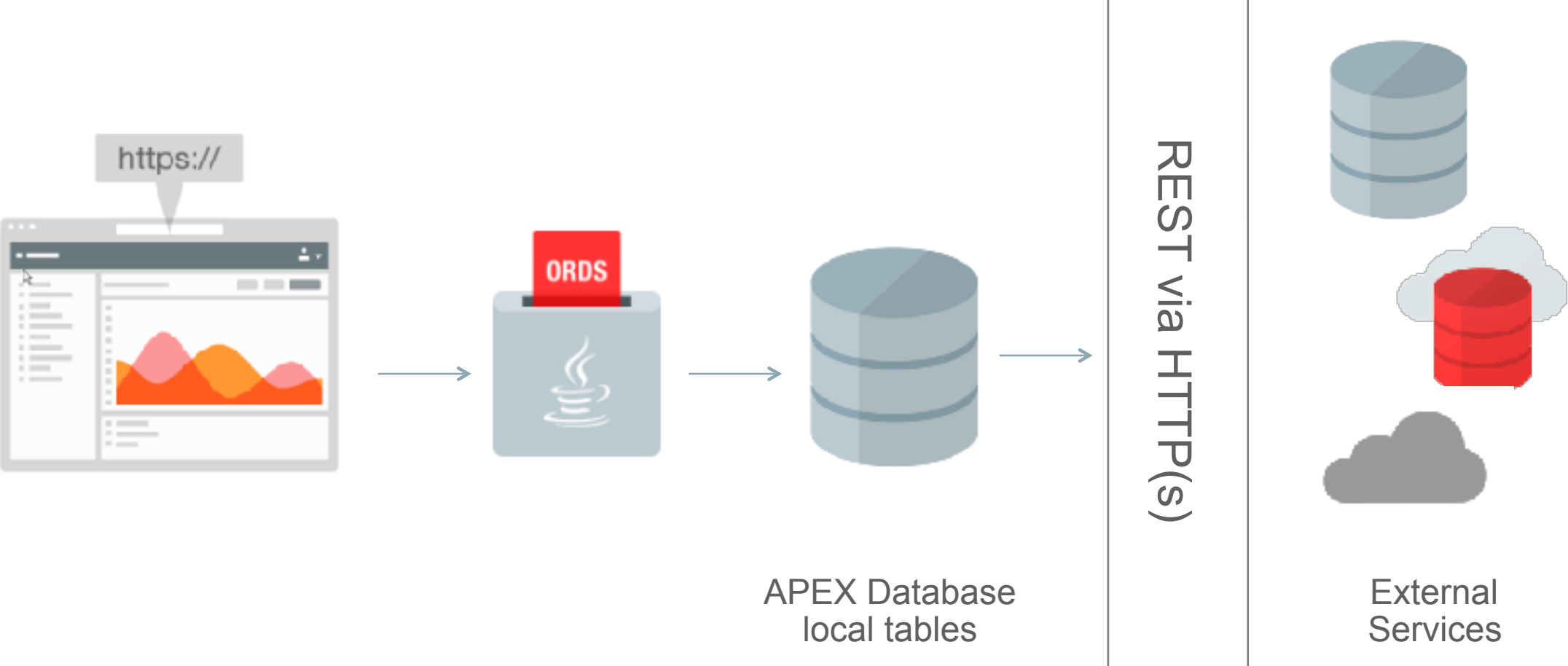
- Resource ... HTTP-URL
  - Customers
  - Employees
  - Facilities
- Method ... HTTP
  - GET to read a resource
  - POST to create a resource
  - PUT to change a resource
  - DELETE ...
- Representation ... JSON
  - Other formats ...

```
localhost:38080/ords/oracode/emp/7839
1 // 20170502131835
2 // http://localhost:38080/ords/oracode/emp/7839
3
4 {
5   "empno": 7839,
6   "ename": "KING",
7   "job": "PRESIDENT",
8   "mgr": null,
9   "hiredate": "1981-11-17T08:00:00Z",
10  "sal": 5000,
11  "comm": null,
12  "deptno": 10,
13  "links": [
14    {
15      "rel": "self",
16      "href": "http://localhost:38080/ords/oracode/emp/7839"
17    },
18    {
19      "rel": "edit",
20      "href": "http://localhost:38080/ords/oracode/emp/7839"
21    },
22    {
23      "rel": "describedby",
24      "href": "http://localhost:38080/ords/oracode/emp/7839"
25    }
26  ]
27 }
```

# HTTP methods used for REST services

Method	Meaning	URI points to single Resource	URI => Collection
GET	Read a resource	Read single resource	Read full collection
POST	Create	N/A	Create a new collection member
PUT	Replace	Replace resource	N/A
DELETE	Remove	Remove single resource	Remove many or all resources
PATCH	Change	Change resource attributes	Change attributes of all collection members

# REST Services and Application Express





# A simple REST example: USGS Earthquake service



**USGS**  
science for a changing world

Earthquake Hazards Program

Feeds & Notifications

Real-time Feeds

- ATOM
- KML
- Spreadsheet
- QuakeML

Real-time Notifications

- Earthquake Notification

## GeoJSON

### Description

GeoJSON is a format for representing a collection of geographic features in a simple, text-based structure. A GeoJSON file is a collection of features. A GeoJSON file can be used to represent a single feature or a collection of features. The GeoJSON format is a subset of JSON and is designed to be easy to use and understand. The GeoJSON format is used to represent geographic features in a simple, text-based structure. The GeoJSON format is used to represent geographic features in a simple, text-based structure. The GeoJSON format is used to represent geographic features in a simple, text-based structure.

This feed adheres to the [GeoJSON site](#) for more information.

### Usage

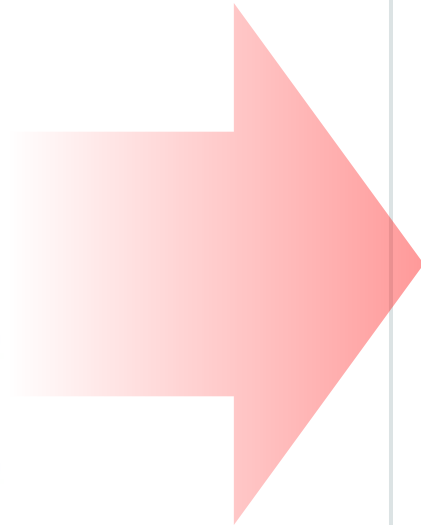
GeoJSON is intended for use with a variety of applications and services. The GeoJSON format is used to represent geographic features in a simple, text-based structure. The GeoJSON format is used to represent geographic features in a simple, text-based structure. The GeoJSON format is used to represent geographic features in a simple, text-based structure.

```
{
  type: "FeatureCollection",
  metadata: {
    generated: 1465998098000,
    url: "http://earthquake.usgs.gov/earthquakes/feed/v1.0/summary/1.0_geojson",
    title: "USGS Magnitude 1.0+ Earthquakes, Past Hour",
    status: 200,
    api: "1.5.2",
    count: 4
  },
  features: [
    {
      type: "Feature",
      properties: {
        mag: 2.25,
        place: "25km ENE of Greenfield, California",
        time: 1465998204000,
        update: 1465998482500,
        tz: -420,
        url: "http://earthquake.usgs.gov/earthquakes/eventpage/nc72651646",
        detail: "http://earthquake.usgs.gov/earthquakes/feed/v1.0/detail/nc72651646.geojson",
        felt: null,
        cdi: null,
        mmi: null,
        alert: null,
        status: "automatic",
        tsunami: 0,
        sig: 70,
        net: "nc",
        code: "72651646",
        ids: "66-770000000"
      }
    }
  ]
}
```

<http://earthquake.usgs.gov/earthquakes/feed/v1.0/geojson.php>

# Use the USGS Earthquake service in APEX

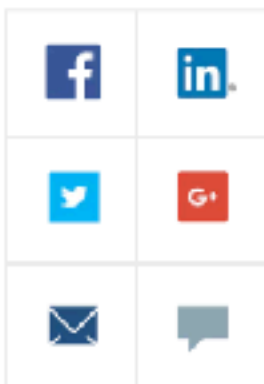
```
localhost:38080/orcs/oracode/emp/?limit=3
1 // 20170502133501
2 // http://localhost:38080/orcs/oracode/emp/?limit=3
3
4 {
5   'items': [
6     {++},
22    {++},
38    {++}
54  ],
55  'hasMore': true,
56  'limit': 3,
57  'offset': 0,
58  'count': 3,
59  'links': [
60    {
61      'rel': 'self',
62      'href': 'http://localhost:38080/orcs/oracode/emp/'
63    },
64    {
65      'rel': 'edit',
66      'href': 'http://localhost:38080/orcs/oracode/emp/'
67    },
68    {
69      'rel': 'describedby',
70      'href': 'http://localhost:38080/orcs/oracode/metadata-catalog/emp/'
71    },
72    {
73      'rel': 'next',
74      'href': 'http://localhost:38080/orcs/oracode/emp/?limit=3&offset=3'
75    }
76  ]
77 }
```



Type ↑	Mag	Place	Time	
Feature	1.9	93km WNW of Skagway, Alaska	1493726592008	M 1.
Feature	1.5	83km WSW of Cantwell, Alaska	1493726384342	M 1.
Feature	1.9	35km W of Anchorage, Alaska	1493726320993	M 1.
Feature	.65	7km NNW of Fontana, California	1493726178800	M 0.
Feature	.85	12km N of Valley Center, California	1493725551300	M 0.
Feature	1.9	94km WNW of Skagway, Alaska	1493725314804	M 1.
Feature	1.8	91km WNW of Skagway, Alaska	1493724663365	M 1.
Feature	1.8	93km WNW of Skagway, Alaska	1493723871794	M 1.
Feature	2.8	82km WNW of Skagway, Alaska	1493722994096	M 2.
Feature	1.35	1km NW of Justin, California	1493722185260	M 1.

# Use REST Services in APEX 5.1 ...

Share



WEDNESDAY, APRIL 12, 2017

## REST Services and Application Express 5.1 - Part 1

By: [Carsten Czarski](#) | Consulting Member of technical Staff



More and more Application Express developers are faced with the requirement to integrate REST services or HTTP/JSON data feeds into their applications. Application Express provides great support for SOAP web services, but for REST services using JSON to exchange data, the

<https://blogs.oracle.com/apex/rest-services-and-application-express-51-part-1>

# APEX 5.2

## *Statement of Direction*

<http://www.oracle.com/technetwork/developer-tools/apex/application-express/apex-sod-087560.html>

## Safe Harbor Statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

# Demo

Application Express 5.2  
REST and Remote SQL



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# Integrated Cloud

Applications & Platform Services



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