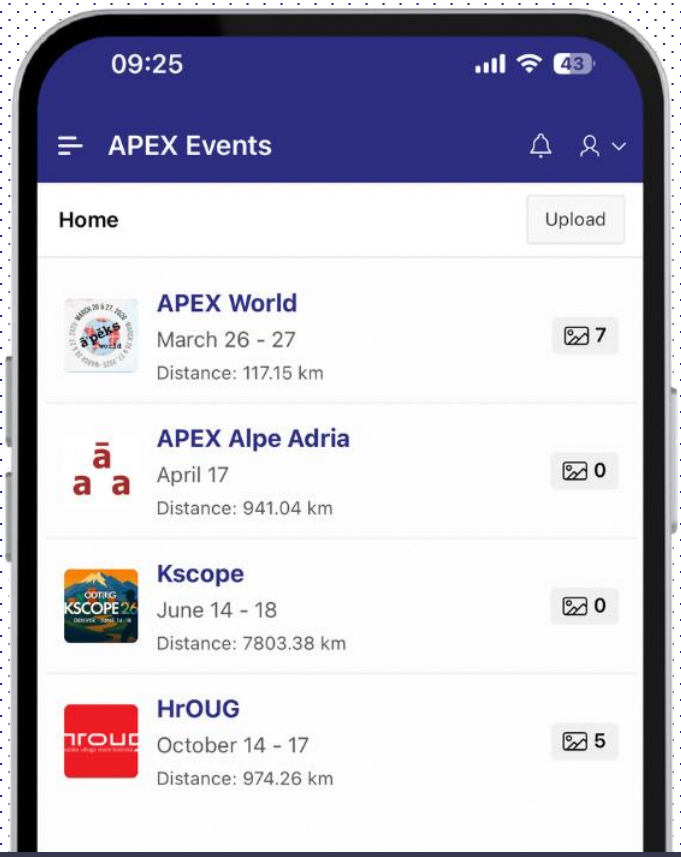
PWA



Mobile first: Building a PWA in APEX

Kevin Thyssen

March 27 – Ede, The Netherlands

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
Highly requested features
and functionality to
extend APEX

APEX Message Service
Real-time communication
for Oracle APEX

APEX Project Eye
Productivity, Quality Assurance,
and Security tool for APEX

Oracle ACE Associate

Senior APEX consultant @ United Codes

Located in Belgium

15+ years experience in Oracle APEX

Cycling enthousiast

@kthyssen.bsky.social

@kevinthyssen

kevin.thyssen@united-codes.com

kevinthyssen

Progressive Web App

PWA

Can operate both as a website and mobile app

Built using common web technologies
JavaScript, CSS & HTML

Can take take advantage of native mobile device features
without requiring an app store

PWA - APEX


Declarative PWA
Improved performance
APEX app installable
Custom offline page
21.2
Application icon
Persistent authentication
PWA in Shared Components
Service Worker enhancements
22.1
Feature detection
App screenshots & shortcuts
Device geolocation
Web share
Declarative meta tags
Improved install dialog
22.2

PWA - APEX

Push Notifications

Improved application icon fidelity

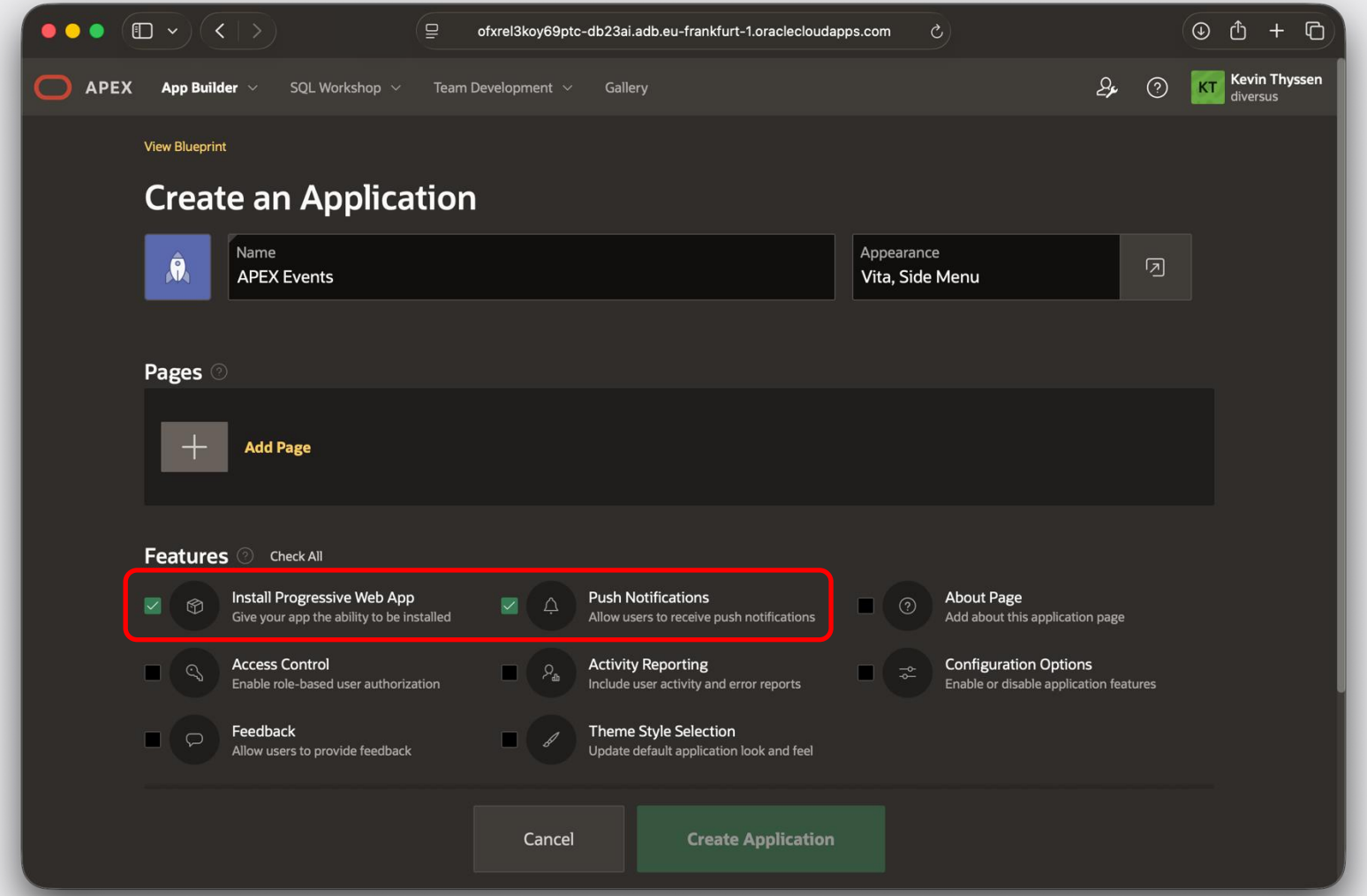
23.1

QR Code Generator

Image Upload

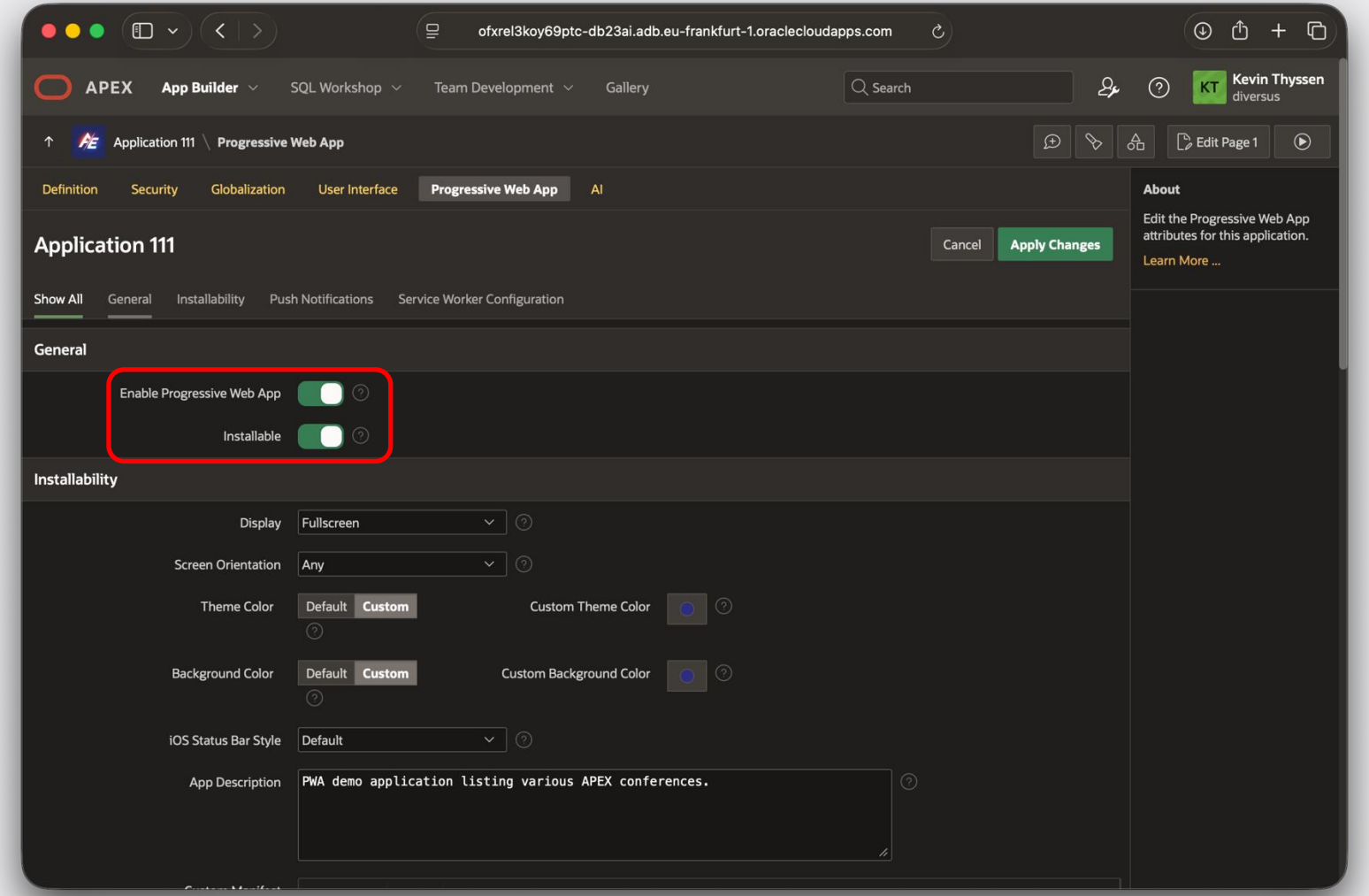
23.2

PWA – APEX – Create Application



PWA – APEX – Existing Application

Application → Shared Components → Progressive Web App



PWA – (APEX) Requirements

Served using HTTPS

Enable Friendly URLs

The web app must have a web manifest file

A service worker must be registered

PWA – Web Manifest

JSON file that tells the browser about your PWA

How it should behave when installed on
the user's desktop or mobile device

Includes app name, icons, start url,
shortcuts, screenshots, …

```
// Default manifest.json from APEX

{
 "id": "111",
 "name": "APEX Events",
 "start_url": "/ords/r/diversus/apex-events/home",
 "display": "fullscreen",
 "orientation": "any",
 "description": "PWA demo application listing various APEX conferences.",
 "theme_color": "#2d2e82",
 "background_color": "#2d2e82",
 "dir": "ltr",
 "lang": "en",
 "icons": [{
  "src": "/ords/r/diversus/111/files/static/v61/icons/app-icon-512.png",
  "sizes": "512x512",
  "type": "image/png",
  "purpose": "any"
 }],
 "screenshots": [{
  "src": "/ords/r/diversus/111/files/static/v61/pwa/ae-screen-1-bg.png",
  "type": "image/png",
  "label": "Startup Screen"
 }],
 "shortcuts": [{
  "name": "QR Code",
  "description": "Get the QR Code for this App",
  "url": "/ords/r/diversus/apex-events/home",
  "icons": [{
   "src": "/ords/r/diversus/111/files/static/v61/pwa/shortcut-icon-10.png",
   "sizes": "192x192"
  }]
 }]
},
...
```

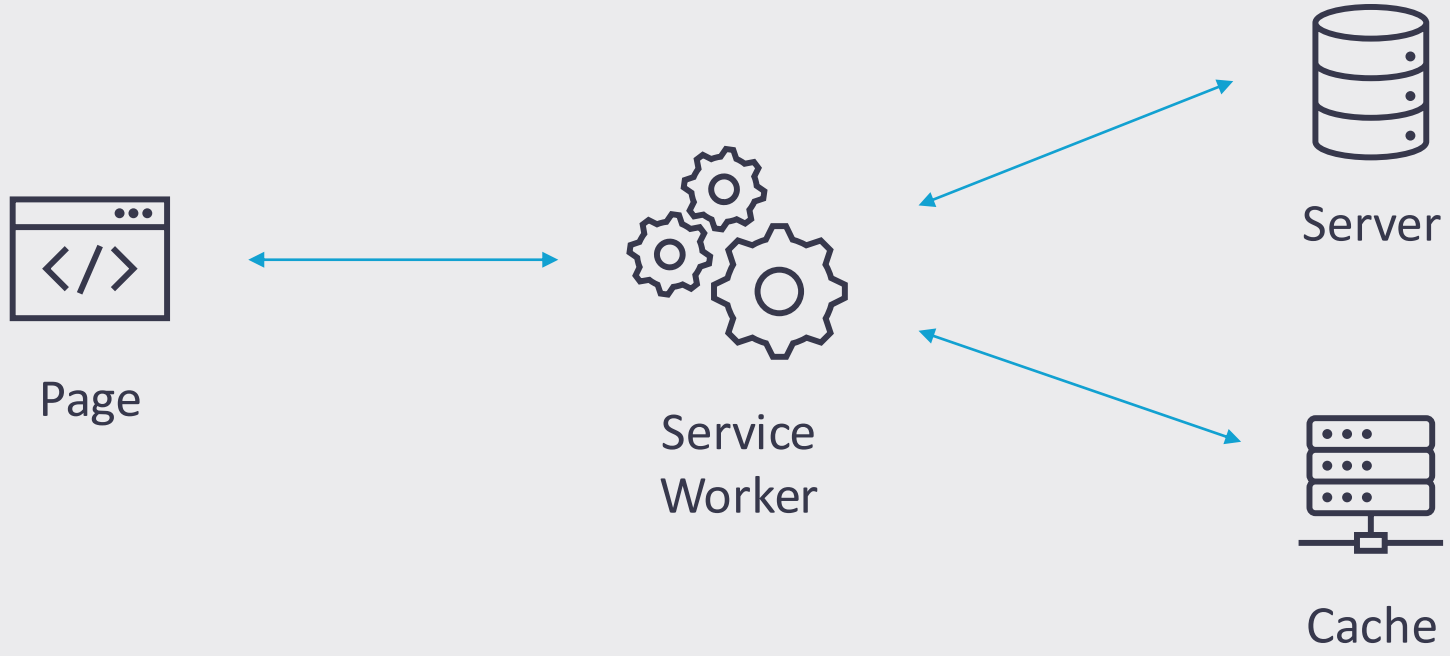
PWA – Service Worker

Foundation of your PWA, written in JavaScript

Allows intercepting and control of network requests
and asset caching from the web browser

Can execute JavaScript code even when the app is not in use

PWA – Service Worker



PWA – Service Worker - APEX

Install and activate the service worker

Serve resources from cache if cache exists

Otherwise serve from network, then put resource in cache

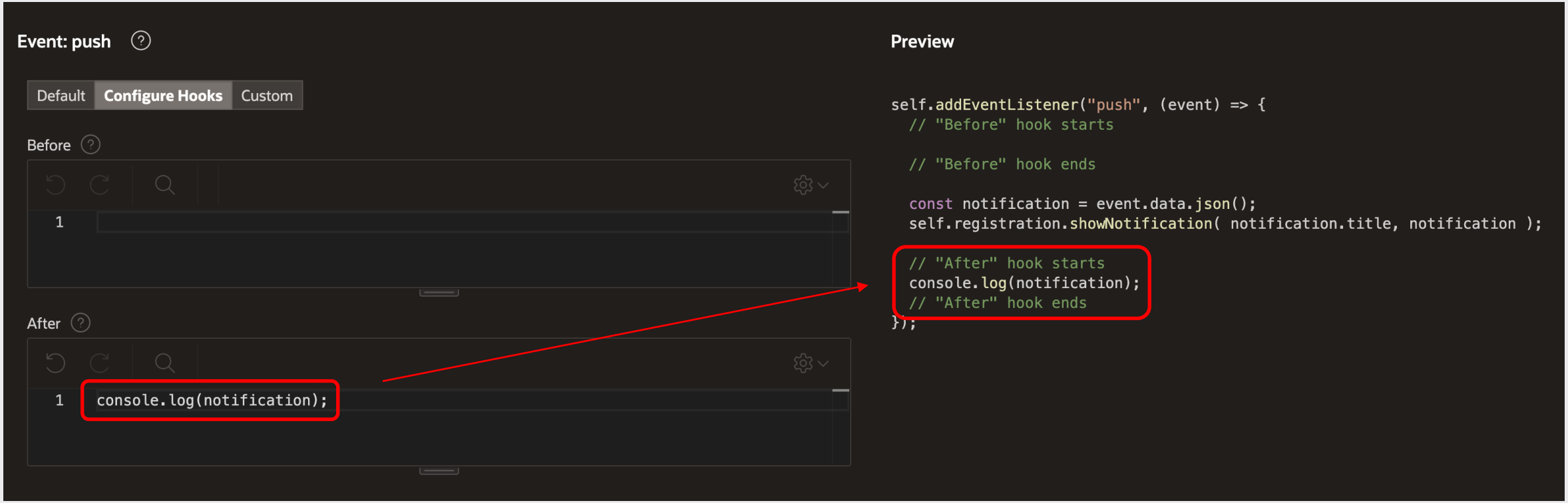
Serve an offline page if network fails

PWA – Service Worker - Hooks

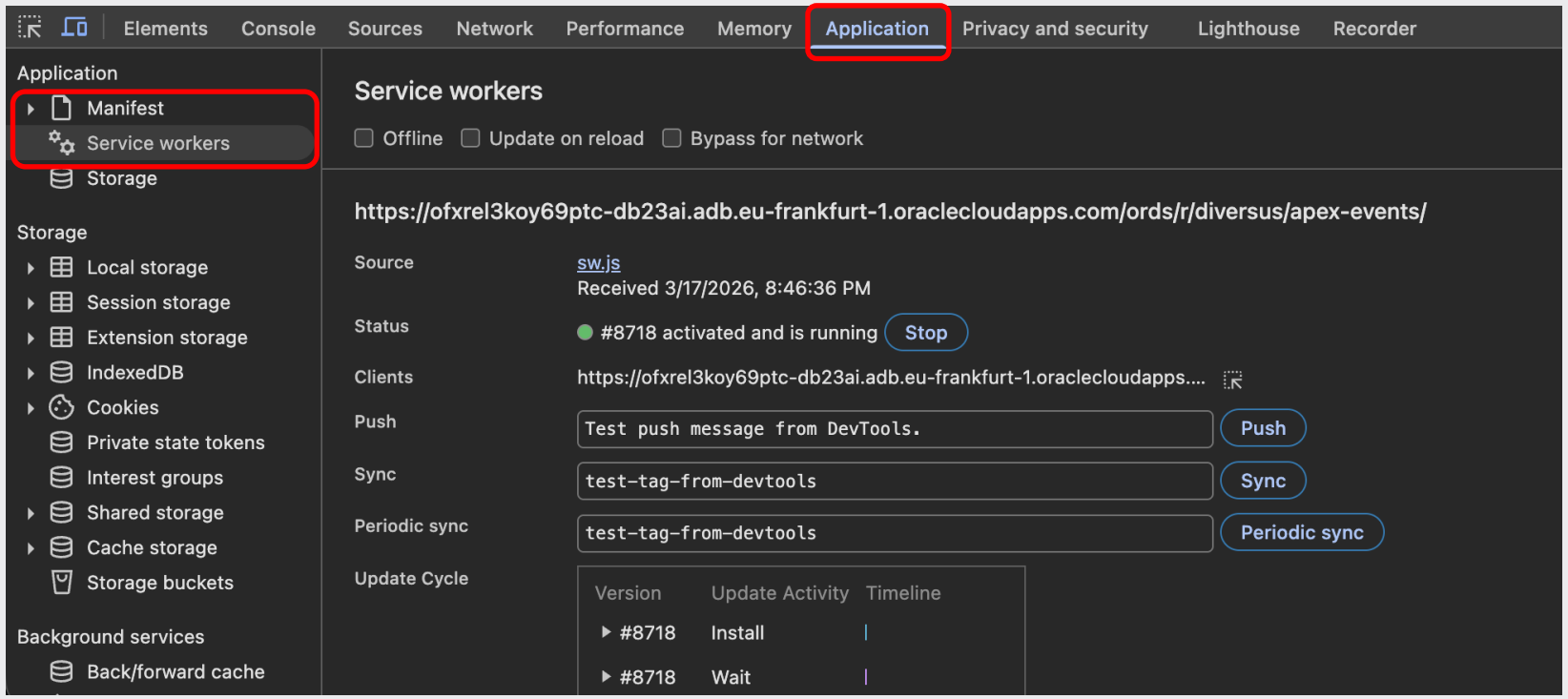
Allows developers to modify or extend the Service Worker

Add code to existing events:
install, activate, fetch, push, …

PWA – Service Worker - Hooks

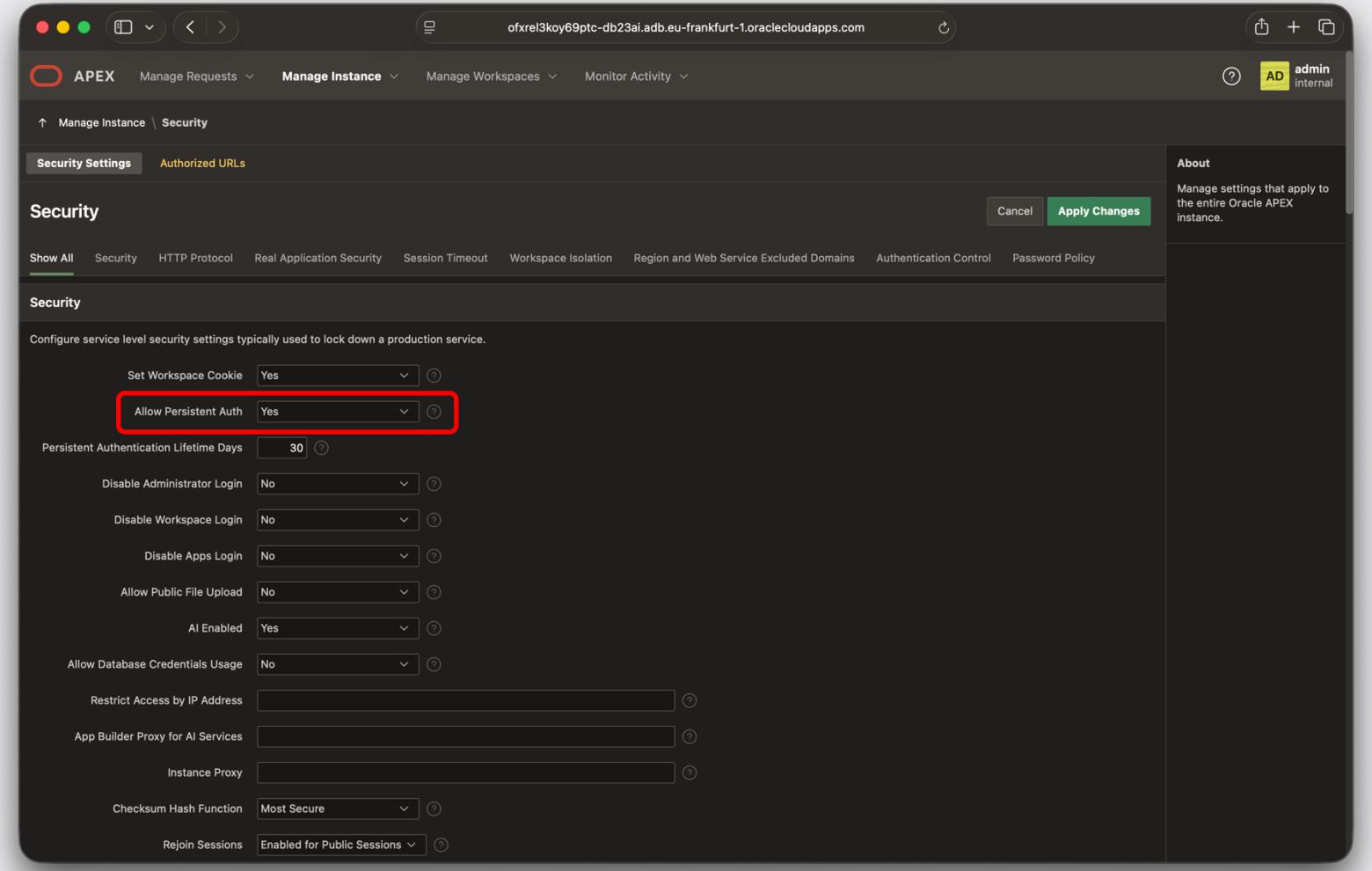


PWA – Console


Elements
Console
Sources
Network
Performance
Memory
Application
Privacy and security
Lighthouse
Recorder
Application
Manifest
Service workers
Storage
Storage
Local storage
Session storage
Extension storage
IndexedDB
Cookies
Private state tokens
Interest groups
Shared storage
Cache storage
Storage buckets
Background services
Back/forward cache
Service workers
Offline
Update on reload
Bypass for network
https://ofxrel3koy69ptc-db23ai.adb.eu-frankfurt-1.oraclecloudapps.com/ords/r/diversus/apex-events/
Source
sw.js
Received 3/17/2026, 8:46:36 PM
Status
#8718 activated and is running
Stop
Clients
https://ofxrel3koy69ptc-db23ai.adb.eu-frankfurt-1.oraclecloudapps....
Push
Test push message from DevTools.
Push
Sync
test-tag-from-devtools
Sync
Periodic sync
test-tag-from-devtools
Periodic sync
Update Cycle
Version
Update Activity
Timeline
#8718
Install
#8718
Wait

PWA – Persistent Authentication

Internal Workspace → Manage Instance → Security



Push Notifications

PWA – Push Notifications (23.1)

Can be enabled declaratively in Shared Components

Push Notifications Feature pages with settings and user preferences

Send notifications using a native Page Process or APEX_PWA API

APEX views for user subscriptions and queue

PWA – Pros

No App Store required

Cross-platform compatibility

Offline functionality *

Automatic updates

Secure

PWA – Cons

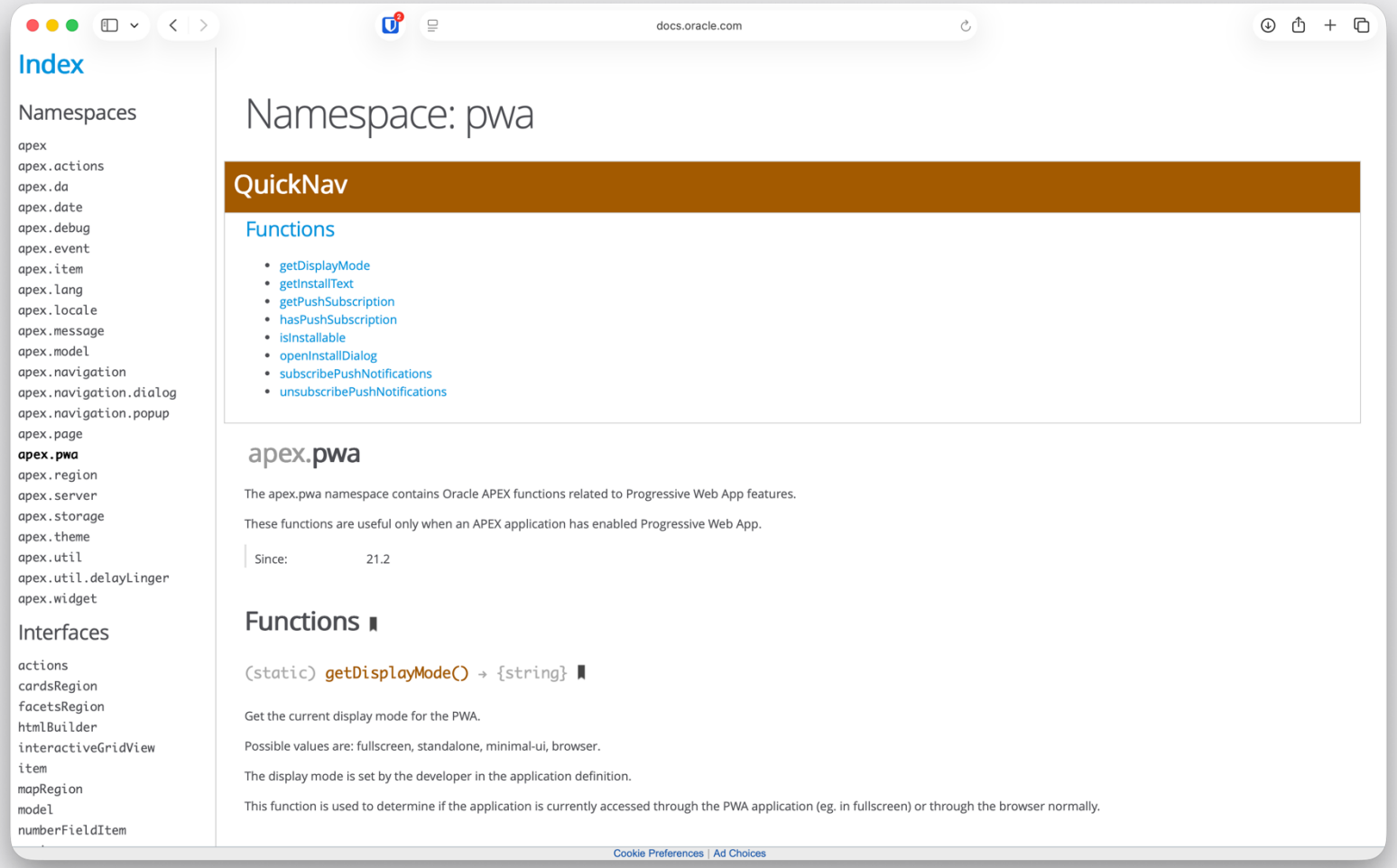
Limited iOS support (improving lately, but still behind)

Reduced access to device features

Performance limitations (e.g.: heavy animations)

Browser dependency

https://oracleapex.com/jsapi



Demo

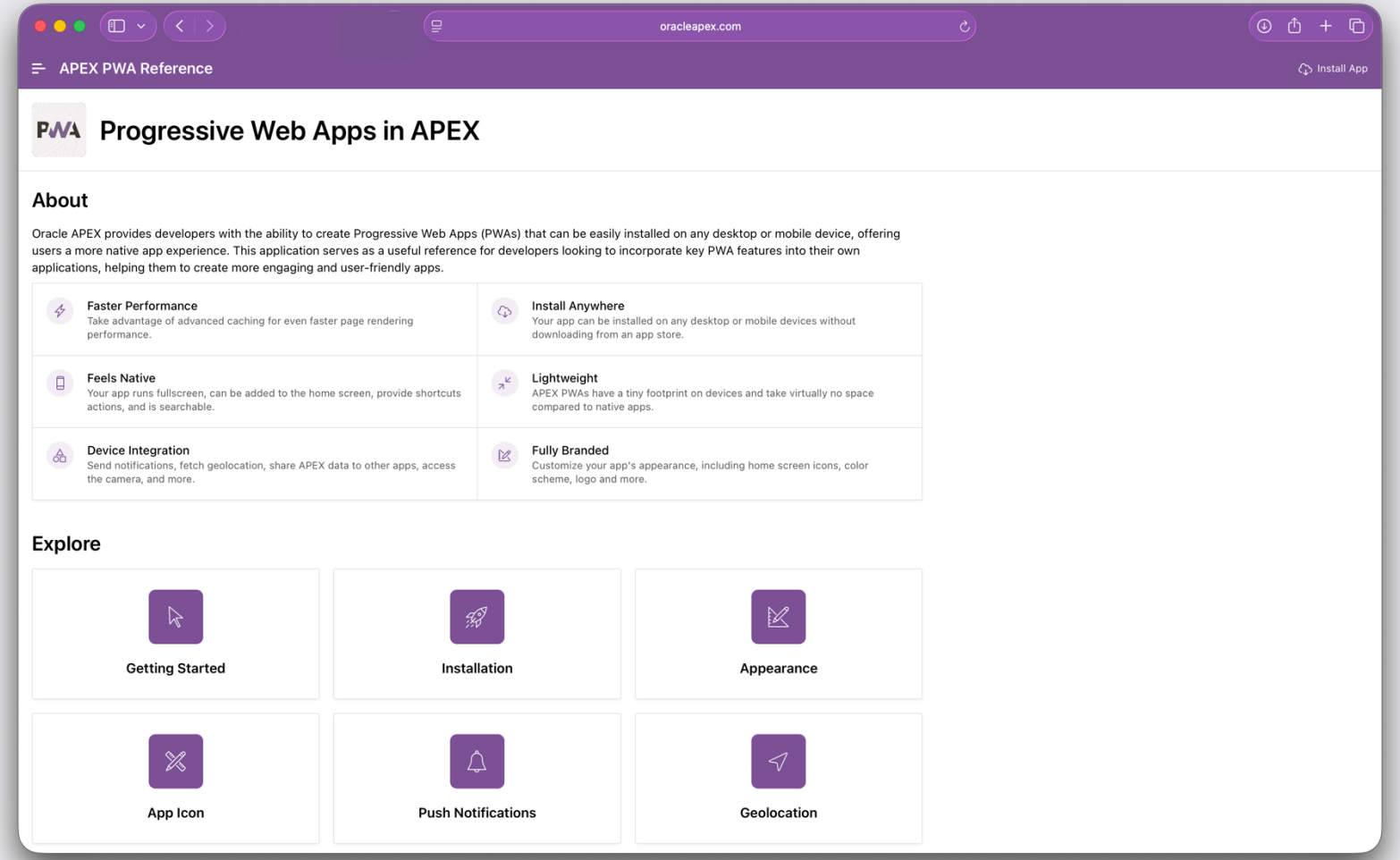
Overview of PWA features in APEX

Geolocation

Uploading Images using MLE

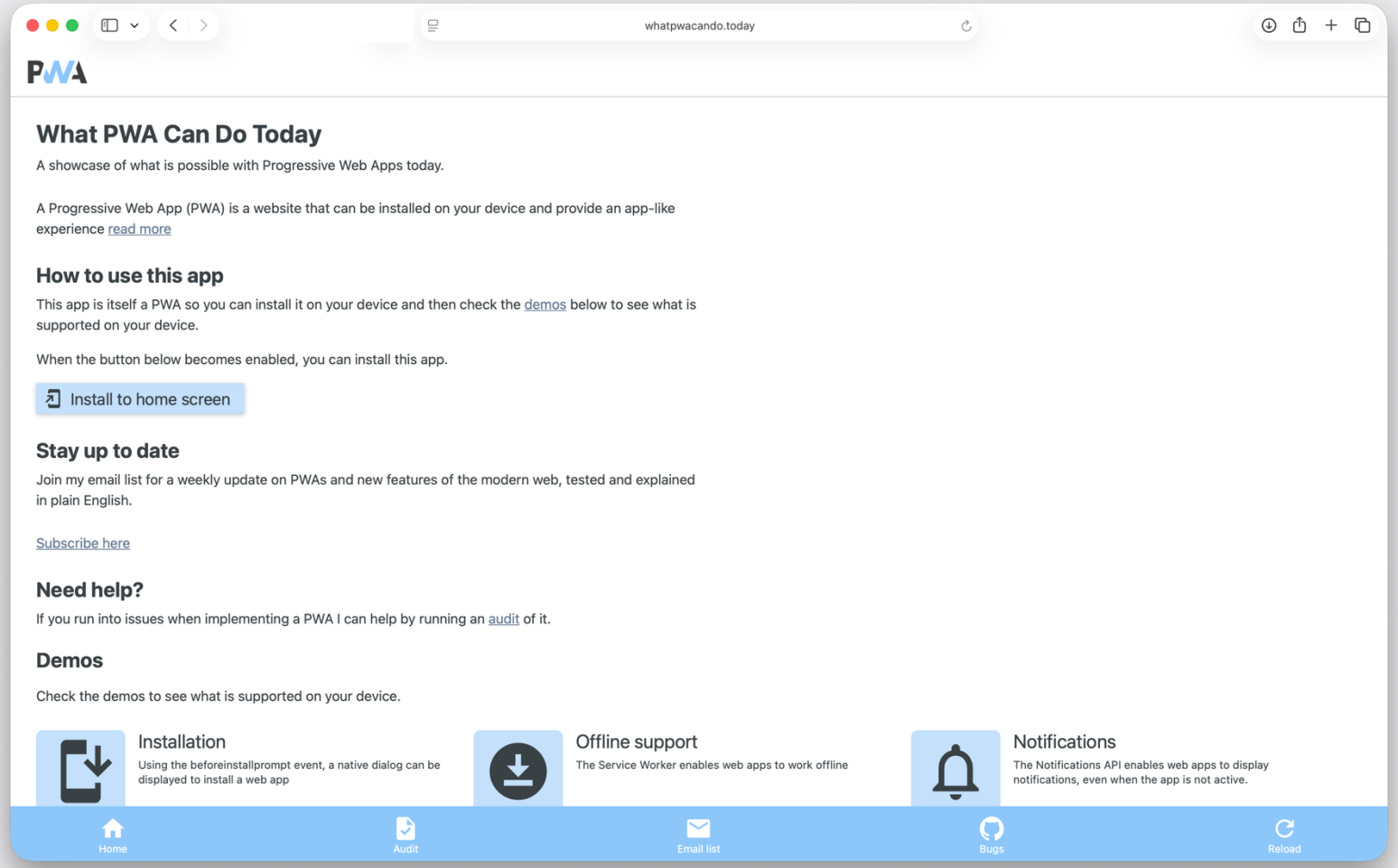
Sending Push Notifications

https://oracleapex.com/pwa

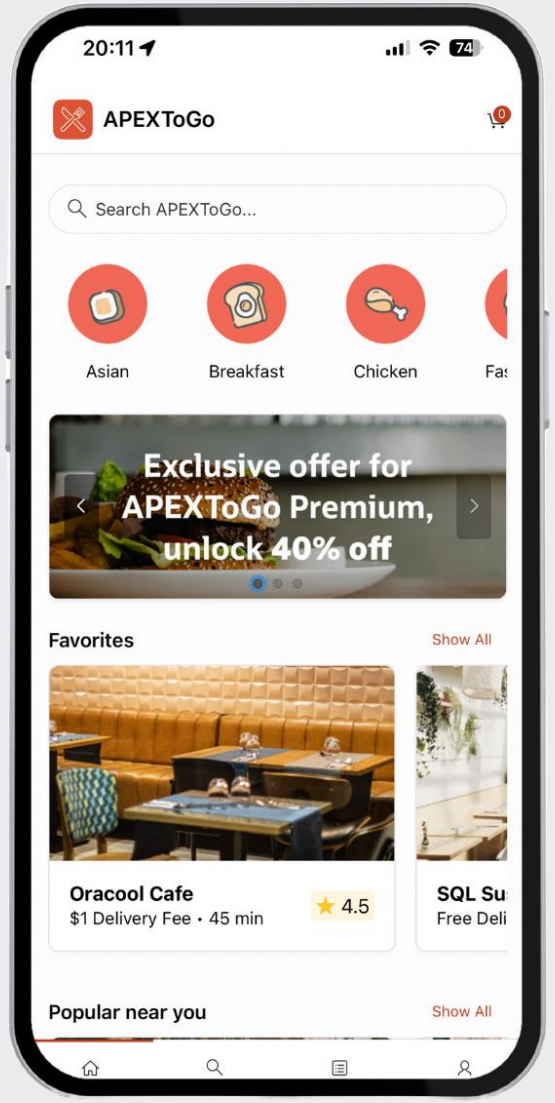


https://whatpwacando.today

Danny Moerkerke – Member of the APEX DEV Team



https://oracleapex.com/ords/r/apex_pm/apextogo

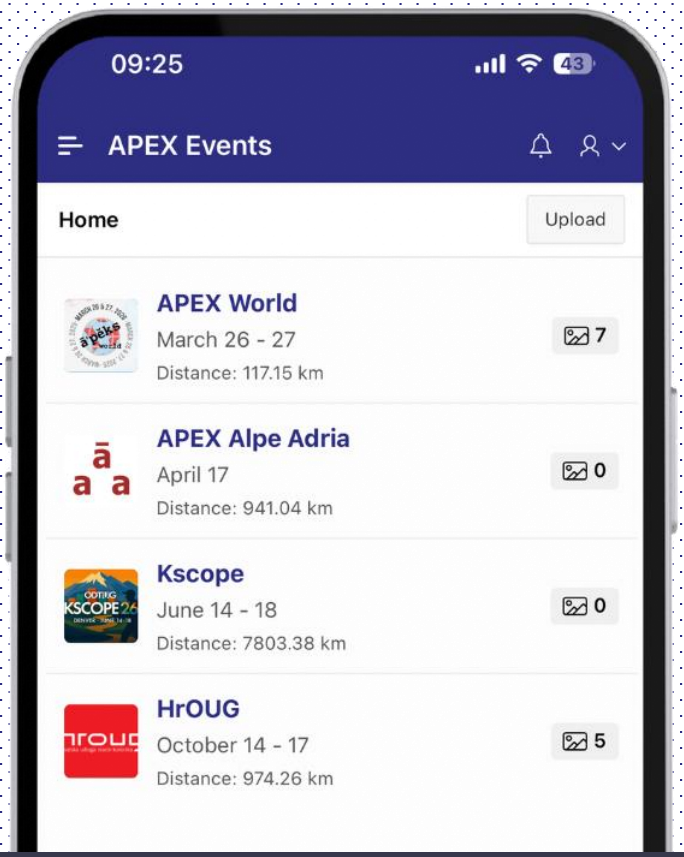


MLE Blog Posts

How to Use Server-Side JavaScript in Oracle APEX with Oracle 23ai #JoelKallmanDay
https://lmoreaux.hashnode.dev/how-to-use-server-side-javascript-in-oracle-apex-with-oracle-23ai-joelkallmanday
Louis Moreaux

Using the MLE PL/SQL Foreign Function Interface in APEX
https://martincarstenbach.com/2025/11/16/using-the-mle-pl-sql-foreign-function-interface-in-apex/
Martin Bach

PWA



Thank you!

kevin.thyssen@united-codes.com