

Dimitri Gielis

Service Workers & APEX



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Dimitri Gielis

- ❖ Founder & CEO of APEX R&D
- ❖ 18+ 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 Application Express
- ❖ Presenter at Oracle Conferences (OOW, ODTUG, OGh, UKOUG, ...)



Workshop - tomorrow 4.15 pm (Jazz 1)



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Dimitri Gielis Blog (Oracle Application Express - APEX)
I created this Blog to share my knowledge especially in Oracle Application Express (APEX) and my feelings ...

FRIDAY, SEPTEMBER 26, 2014

APEX 4.2.6 patch available
Oracle released [APEX 4.2.6](#) yesterday, it's also available from My Oracle Support as a patch set 19595896.

Here's the table of bug fixes.

Table 6 Bugs Fixed in the Oracle Application Express 4.2.6.00.03 Patch Set

Bug Number	Description
18393429	Importing pre-4.2 application with data loading results in runtime error
18609856	APEX_WEB_SERVICE.CLOBBASE642BLOB converts incorrectly
18658967	Corrupted HTML mail messages are created from APEX_MAIL.SEND
18719750	ORA-01858 during application import
18733989	Errors picking up session with cookie when TOP CALL is not F, SHOW, or ACCEPT
19021052	Oracle Application Express 4.2.4 throwing error while generating check boxes
19313700	Check box fails with ORA-06502 after upgrade from release 4.0 to 4.2.4
19482775	ORA-06502 when importing application containing translations

Applying the patch took less than 7 minutes.

```
Session altered.  
...Validating Application Express  
...Database user "SYS", database schema "APEX_040200", user# "186" 20:48:40  
...Compiled 0 out of 3014 objects considered, 0 failed compilation 20:48:40  
...271 packages  
...263 package bodies  
...452 tables  
...11 functions  
...16 procedures  
...3 sequences  
...457 triggers  
...1320 indexes  
...211 views  
...0 libraries  
...6 types  
...0 type bodies  
...0 operators  
...0 index types
```

My next public appearances:

- Oracle Open World: 27-SEP/2-OCT-2014
- ORCLAPEX-BE Meetup: 19-NOV-2014
- ODTUG KScope: 21/25-JUN-2015

About Me



Dimitri Gielis

Passionate about Oracle and especially Oracle Application Express (APEX). Building applications with love @ APEX R&D.
[View my complete profile](#)



ORACLE
ACE Director

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Rich offline experience

Periodic background syncs

Push notifications

Geofencing

Agenda

- ❖ What are Service Workers
- ❖ What do they solve
- ❖ Service Worker Life Cycle
- ❖ Example of a Service Worker
- ❖ Use cases in APEX

Service Workers

A service worker is a **script** that stands between
your website and the network

A service worker is a **script** that is run by your browser in the background, separate from a web page, opening the door to features which don't need a web page or user interaction.

Rich offline experience

Periodic background syncs

Push notifications

Geofencing

What is a Service Worker

- ❖ It's a **JavaScript Worker**, so it can't access the DOM directly
- ❖ Service worker is a **programmable network proxy**, allowing you to control how network requests from your page are handled.
- ❖ It will be terminated when not in use, and restarted when it's next needed
- ❖ Service Workers have access to the IndexedDB API
- ❖ Service workers are **asynchronous** and make extensive use of **promises**
- ❖ Service workers require content to be served via **https**

JavaScript Promises

- ❖ JavaScript is single threaded
- ❖ We want multithreaded
- ❖ Async success/failure



JavaScript Promises

```
img1.callThisIfLoadedOrWhenLoaded(function() {  
    // loaded  
}).orIfFailedCallThis(function() {  
    // failed  
});  
  
// and...  
whenAllTheseHaveLoaded([img1, img2]).callThis(function() {  
    // all loaded  
}).orIfSomeFailedCallThis(function() {  
    // one or more failed  
});
```

Service Workers solve

- ❖ Offline usage (Offline-first)
 - ❖ Programmable cache control
 - ❖ Custom response
- ❖ Background processing
 - ❖ Push notifications
 - ❖ BackgroundSync
 - ❖ Alarms (Task Scheduler)



Service Worker Life Cycle

No Service
Worker

Register

Installing

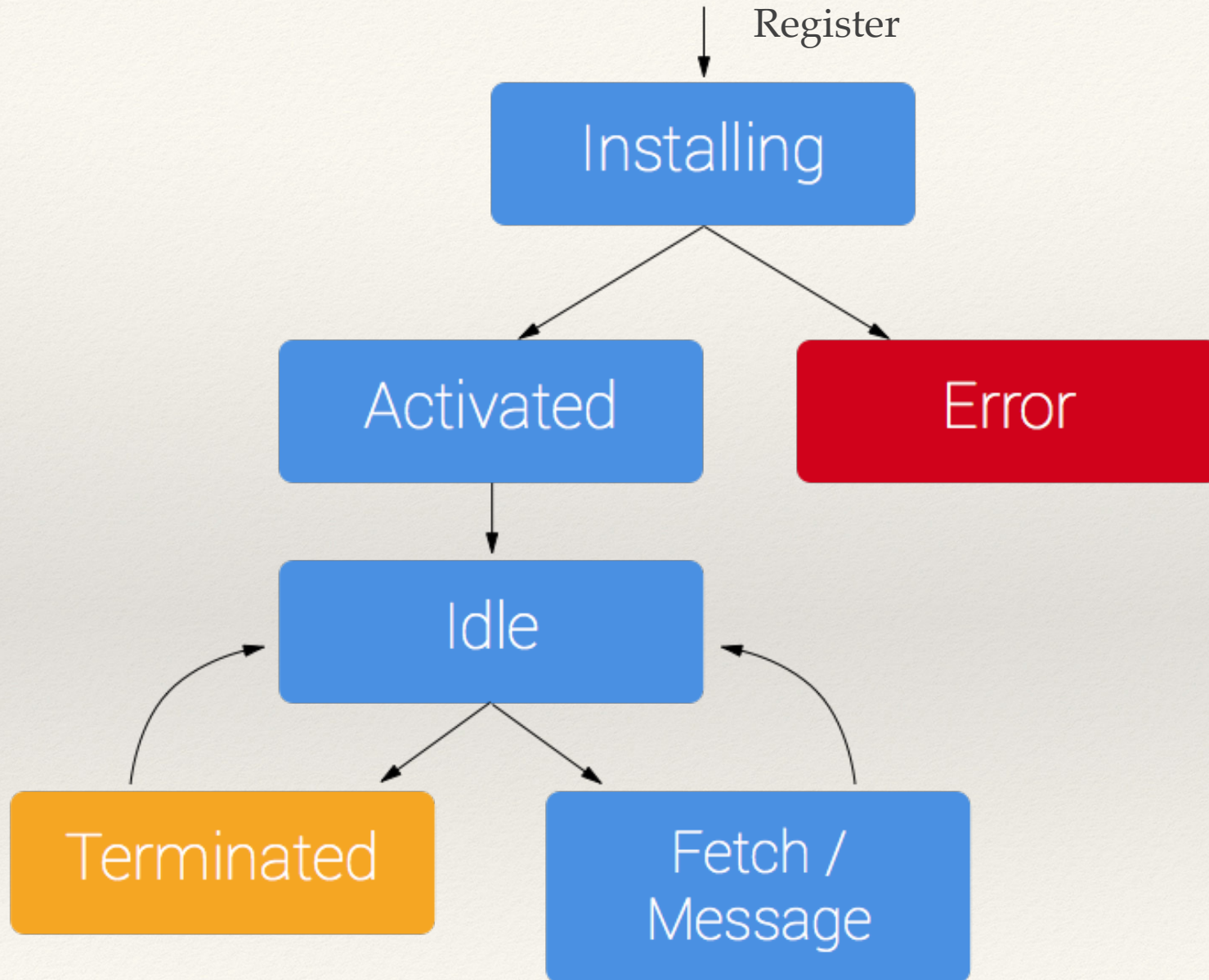
Activated

Error

Idle

Terminated

Fetch /
Message



Using Service Worker

Register a Service Worker

```
if ('serviceWorker' in navigator) {  
  
  navigator.serviceWorker.register('/sw.js').then(function(registration)  
  {  
    // Registration was successful  
    console.log('ServiceWorker registration successful with scope: ',  
registration.scope);  
  }).catch(function(err) {  
    // registration failed :(  
    console.log('ServiceWorker registration failed: ', err);  
  });  
}
```

No Service
Worker

Register

Installing

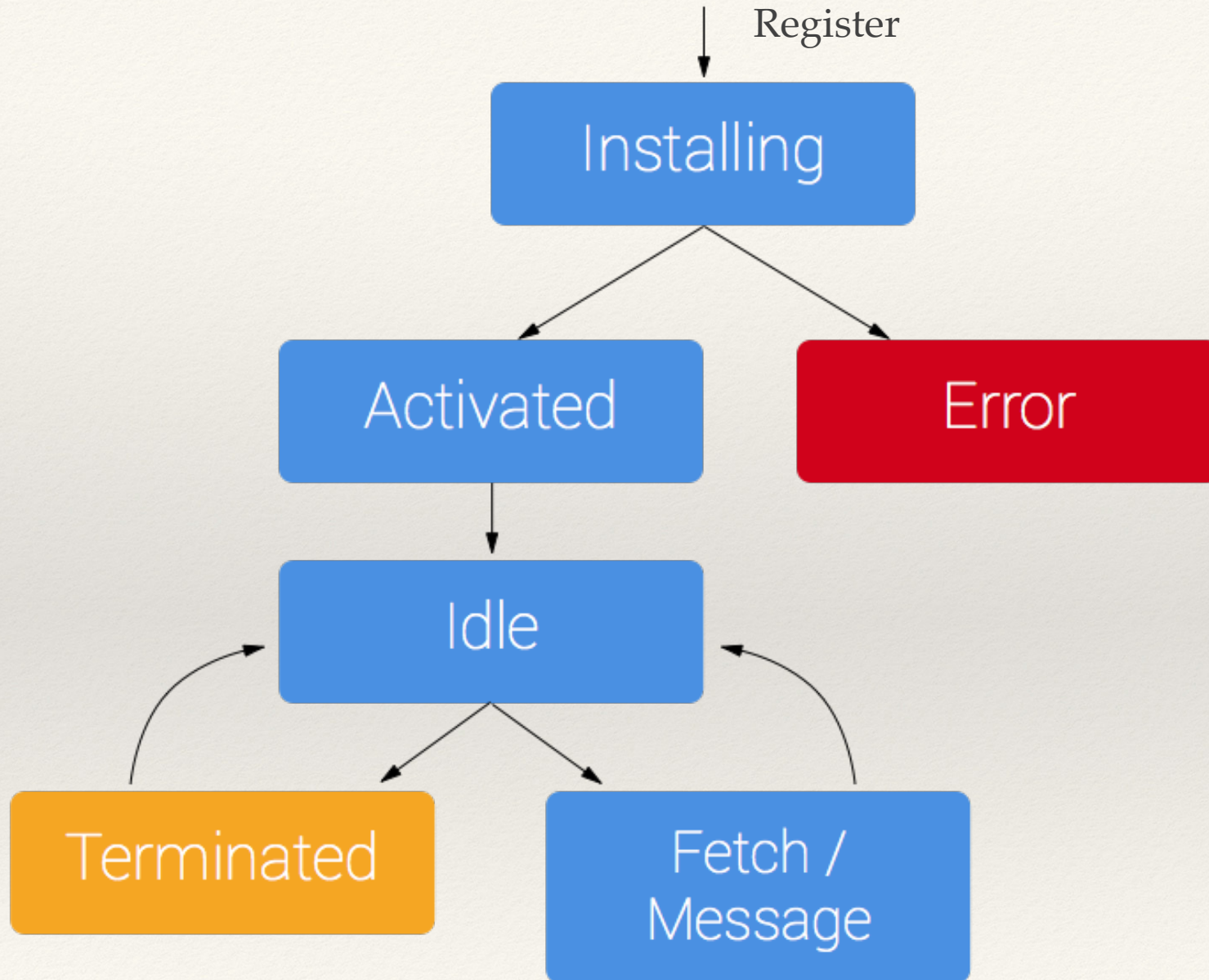
Activated

Error

Idle

Terminated

Fetch /
Message



Install a Service Worker

```
// Set the callback for the install step  
self.addEventListener('install', function(event) {  
    // Perform install steps  
});
```

No Service
Worker

Register

Installing

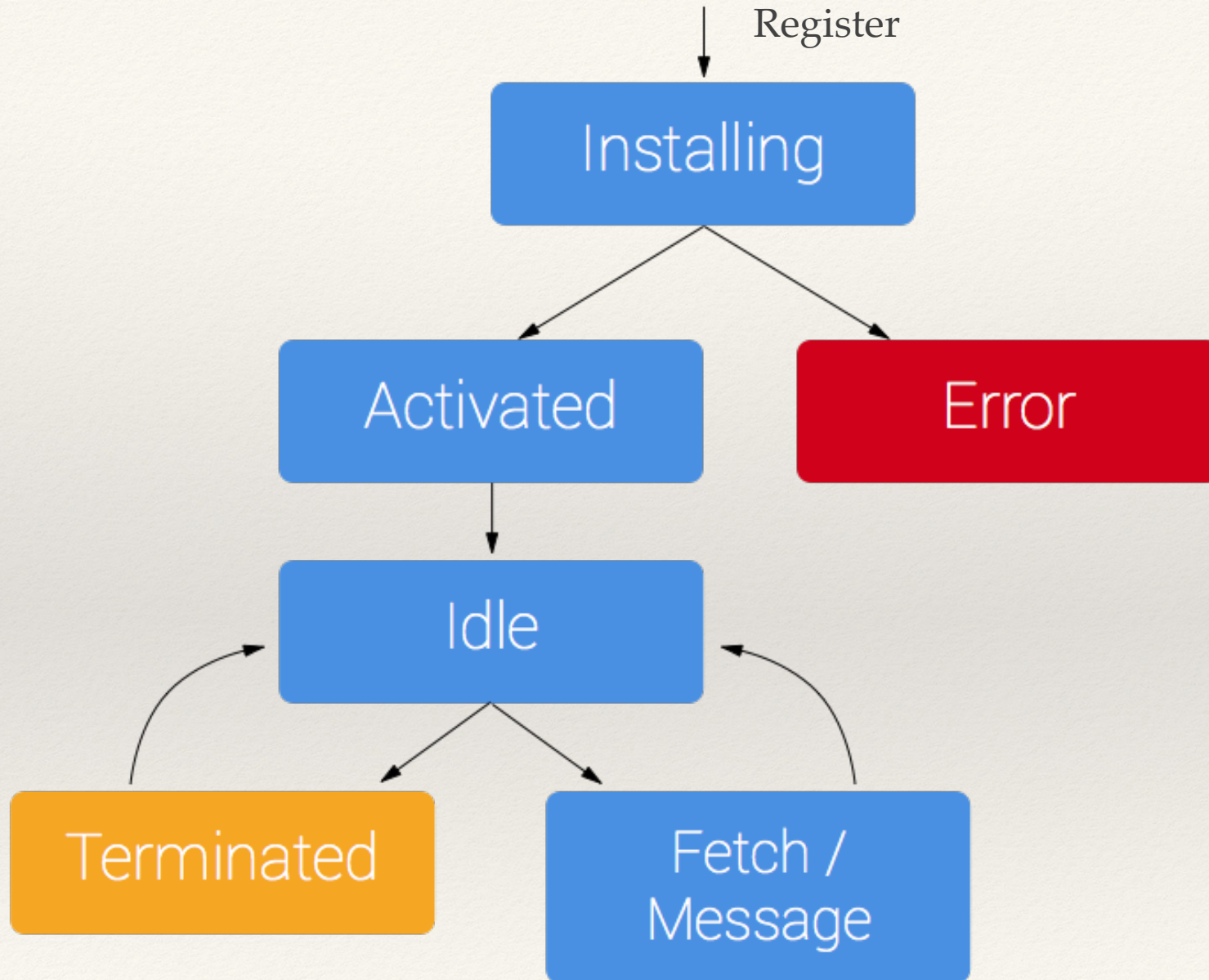
Activated

Error

Idle

Terminated

Fetch /
Message



Fetch a Service Worker

```
self.addEventListener('fetch', function(event) {  
  event.respondWith(  
    caches.match(event.request)  
      .then(function(response) {  
        // Cache hit - return response  
        if (response) {  
          return response;  
        }  
  
        return fetch(event.request);  
      })  
  )  
});
```

No Service
Worker

Register

Installing

Activated

Error

Idle

Terminated

Fetch /
Message



Update & Activate a Service Worker

```
self.addEventListener('activate', function(event) {  
  
    var cacheWhitelist = ['pages-cache-v1', 'blog-posts-cache-v1'];  
  
    event.waitUntil(  
        caches.keys().then(function(cacheNames) {  
            return Promise.all(  
                cacheNames.map(function(cacheName) {  
                    if (cacheWhitelist.indexOf(cacheName) === -1) {  
                        return caches.delete(cacheName);  
                    }  
                })  
            );  
        })  
    );  
});
```

No Service
Worker

Register

Installing

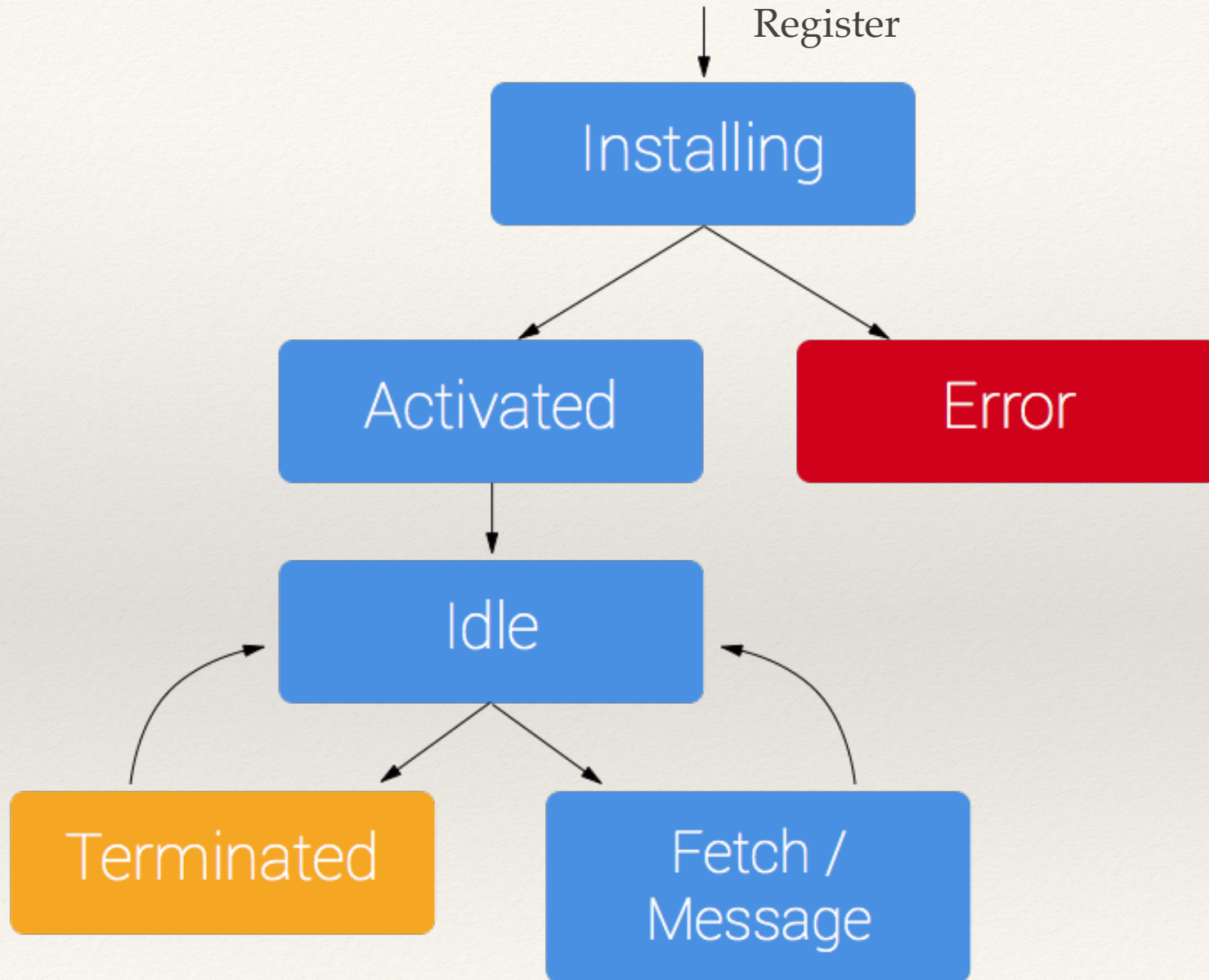
Activated

Error

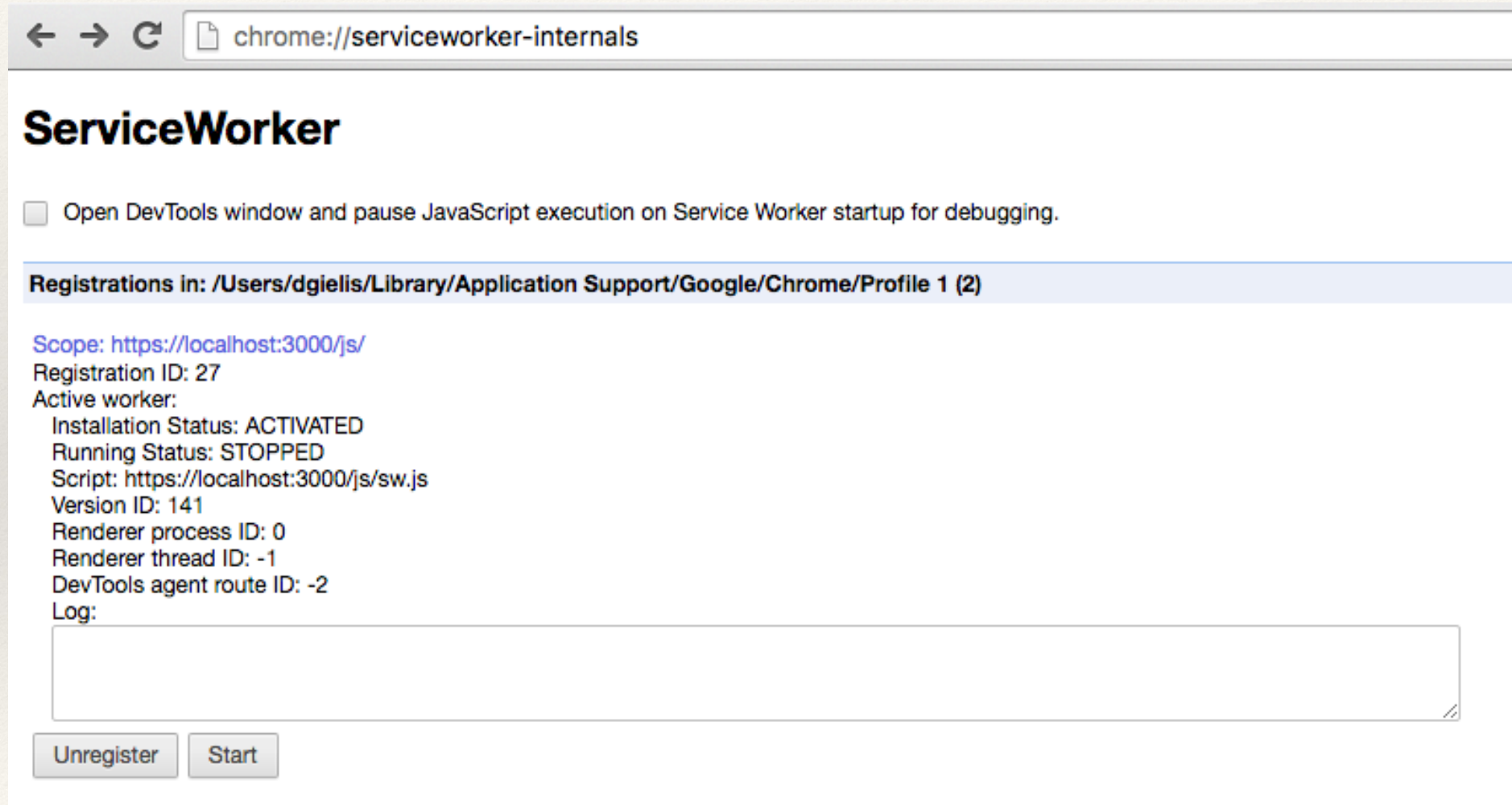
Idle

Terminated

Fetch /
Message



Viewing/Debug a Service Worker



chrome://inspect/#service-workers

(old: chrome://serviceworker-internals/)

Demo SW in APEX

Lessons learned

- ❖ JavaScript knowledge important (Promise)
- ❖ Get sample working locally first
- ❖ Replicate in Oracle APEX
- ❖ Unregister SW and close tab
- ❖ Use Chrome Dev Tools to debug

Browser Support?

#

Service Workers 📄 - WD

Global

0% + 53.5% = 53.5%

Method that enables applications to take advantage of persistent background processing, including hooks to enable bootstrapping of web applications while offline.

Current aligned	Usage relative	Show all							
IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
			47					4.3	
8			48					4.4	
9		44	49	9		8.4		4.4.4	
11	13	45	50	9.1	36	9.2	8	47	49
	14	46	51	TP	37	9.3			
		47	52		38				
		48	53						

Notes

Known issues (0)

Resources (8)

Feedback

Details on partial support can be found on [is ServiceWorker Ready?](#)

MS Edge status: [Under Consideration](#)

WebKit status: [Under Consideration](#)

¹ Partial support can be enabled in Firefox with the `dom.serviceWorkers.enabled` flag.

■ = Supported
 ■ = Not supported
 ■ = Partial support
 ■ = Support unknown

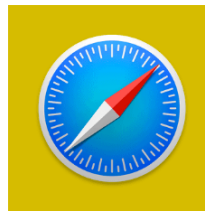
<http://caniuse.com/#feat=serviceworkers>

is SERVICEWORKER ready?

Status * Spec * Intro * Resources * GitHub

ServiceWorker enthusiasm

The first thing any implementation needs.



Chrome: Shipped.

Firefox: Shipped.

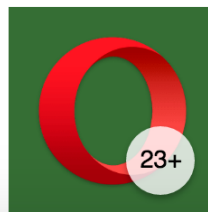
Safari: [Under consideration](#), Brief positive signals in [five year plan](#).

Edge: [High priority](#), [work has begun](#).

Support does not include iOS versions of third-party browsers on that platform (see Safari support).

Promises

Not ServiceWorker-specific, but required by ServiceWorker. [Spec](#).



References

- ❖ https://developer.mozilla.org/en-US/docs/Web/API/Service_Worker_API
- ❖ <http://www.html5rocks.com/en/tutorials/service-worker/introduction/>
- ❖ https://www.talater.com/upup/?utm_source=the-webdesigner.co&utm_medium=newsletter
- ❖ <https://www.smashingmagazine.com/2016/02/making-a-service-worker/>
- ❖ <https://css-tricks.com/serviceworker-for-offline/>
- ❖ <https://developers.google.com/web/fundamentals/getting-started/>
- ❖ <https://aarontgrogg.com/blog/2015/07/20/the-difference-between-service-workers-web-workers-and-websockets/>
- ❖ <https://jakearchibald.github.io/isserviceworkerready/>

Recap

- ❖ What are Service Workers
- ❖ What do they solve
- ❖ Service Worker Life Cycle
- ❖ Example of a Service Worker
- ❖ Use cases in APEX

Q&A



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