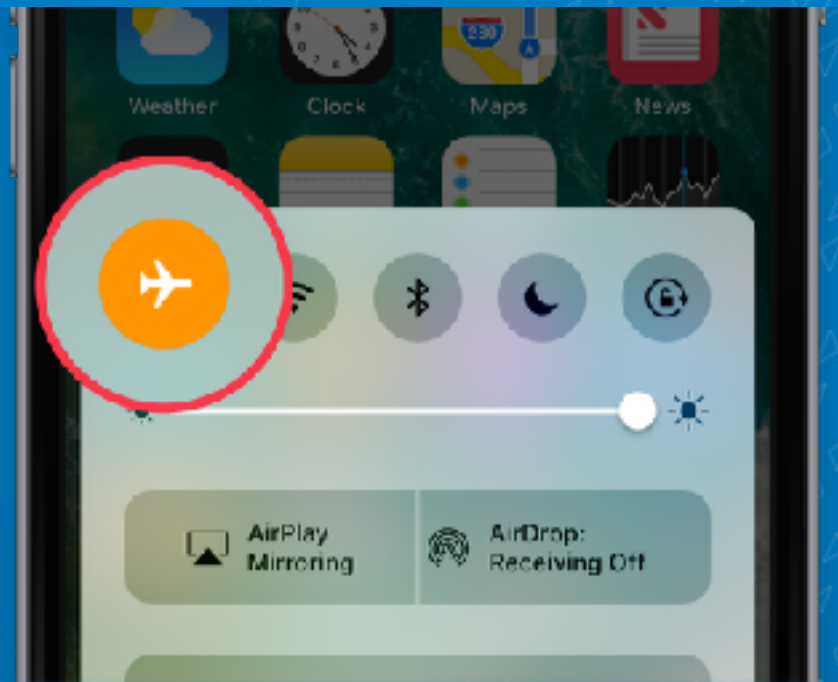
FORGE DevCon 2018

FDC196412 - Creating Flexible Offline Workflows Using Autodesk Forge



November, 2018

AUTODESK UNIVERSITY

Introductions

FORGE

Michael Beale
Forge Developer Advocate
Autodesk

Honeywell

Michael Ponti
Software Engineer
Honeywell

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Why ‘offline’ ?

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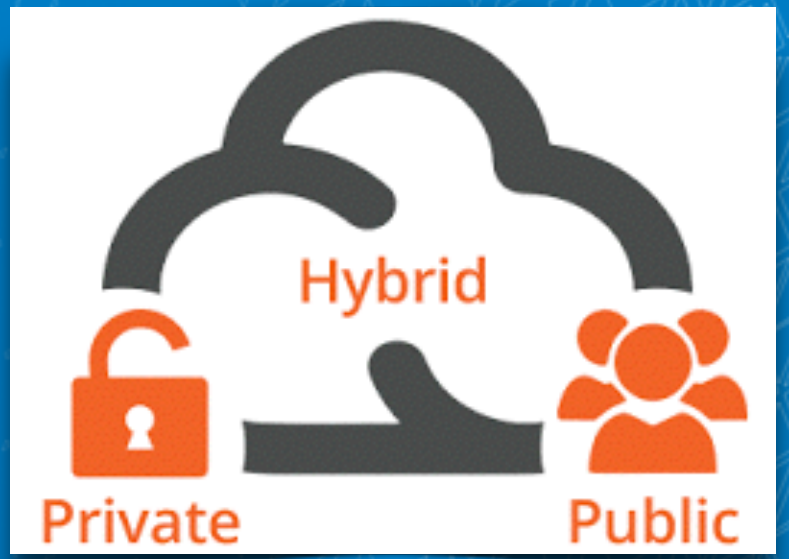
Why ?

Out in the Field



On Premises

*and speed

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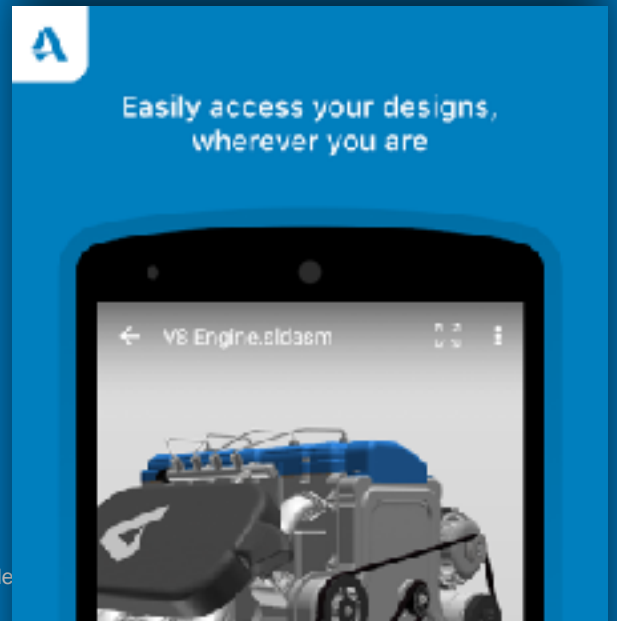
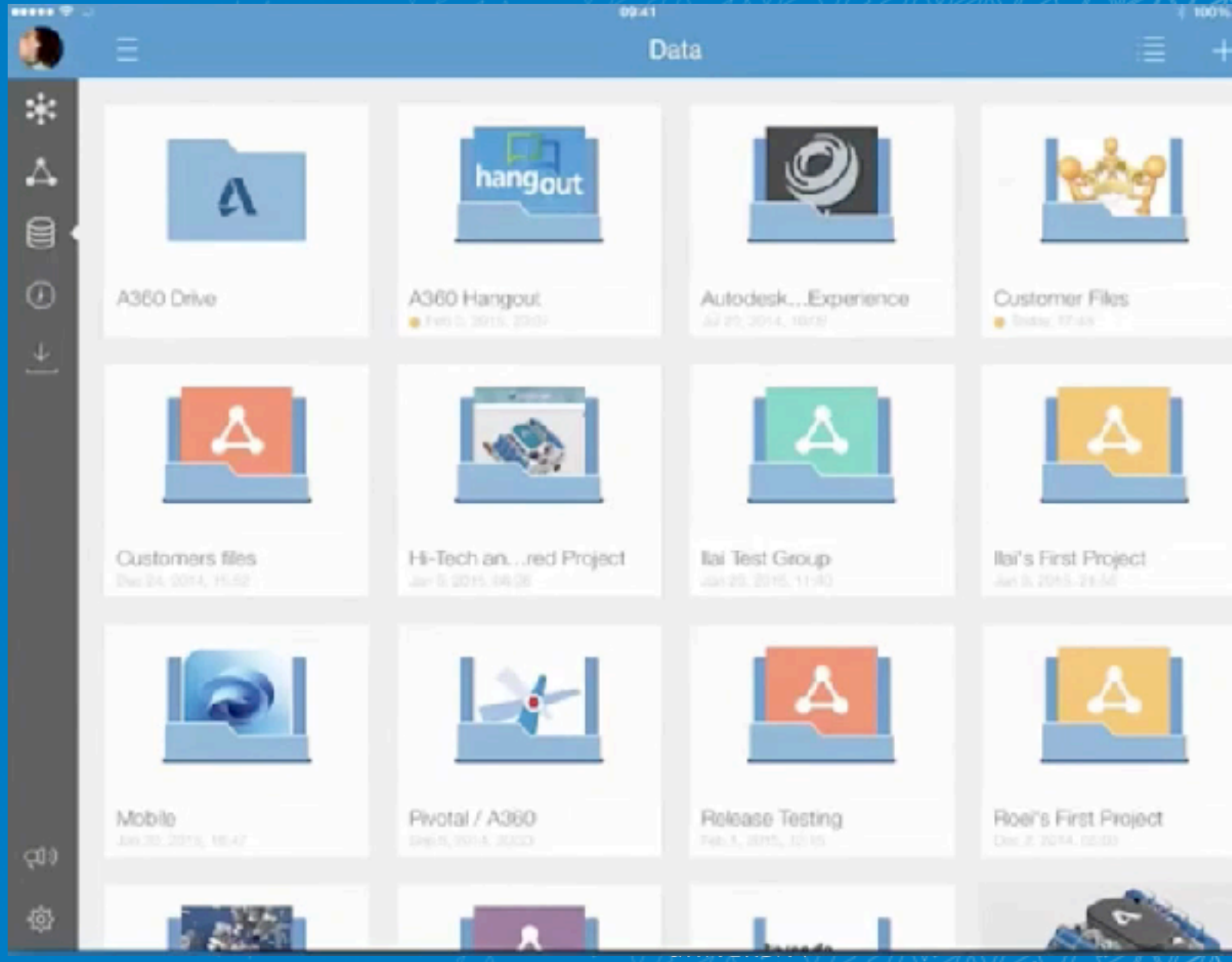
Case in point: A360, Field & BIM360 iPad App's

- User can select which designs to take offline
- Saved to IOS disk
- SVF's pulled from Network without Forge viewer3D.js
- Navis 3D engine (C++)





© Autode

‘How’ to go offline ?

* with Forge

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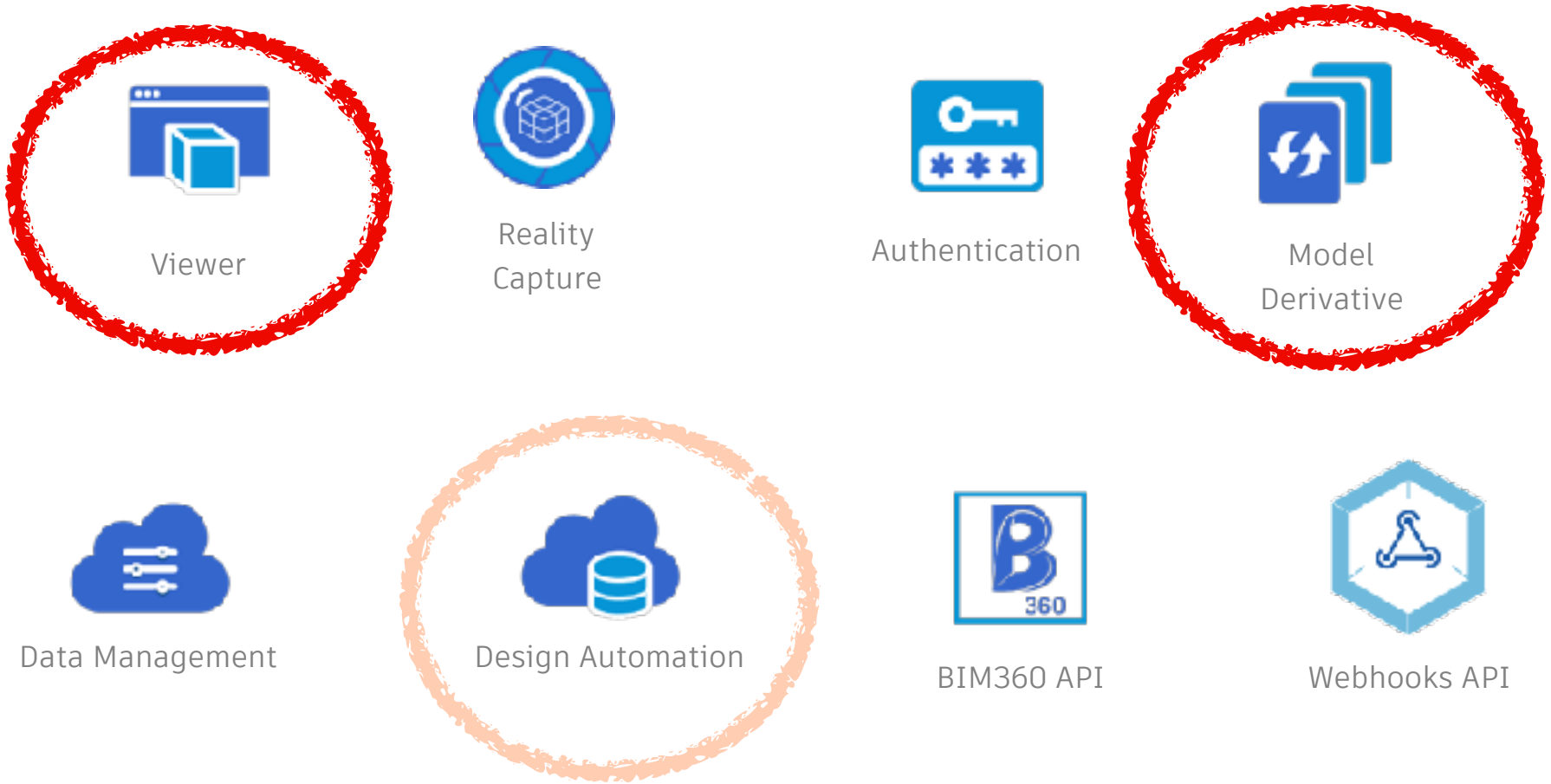
But first… where/when are SVF files created?



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Let’s Peek inside the SVF file…

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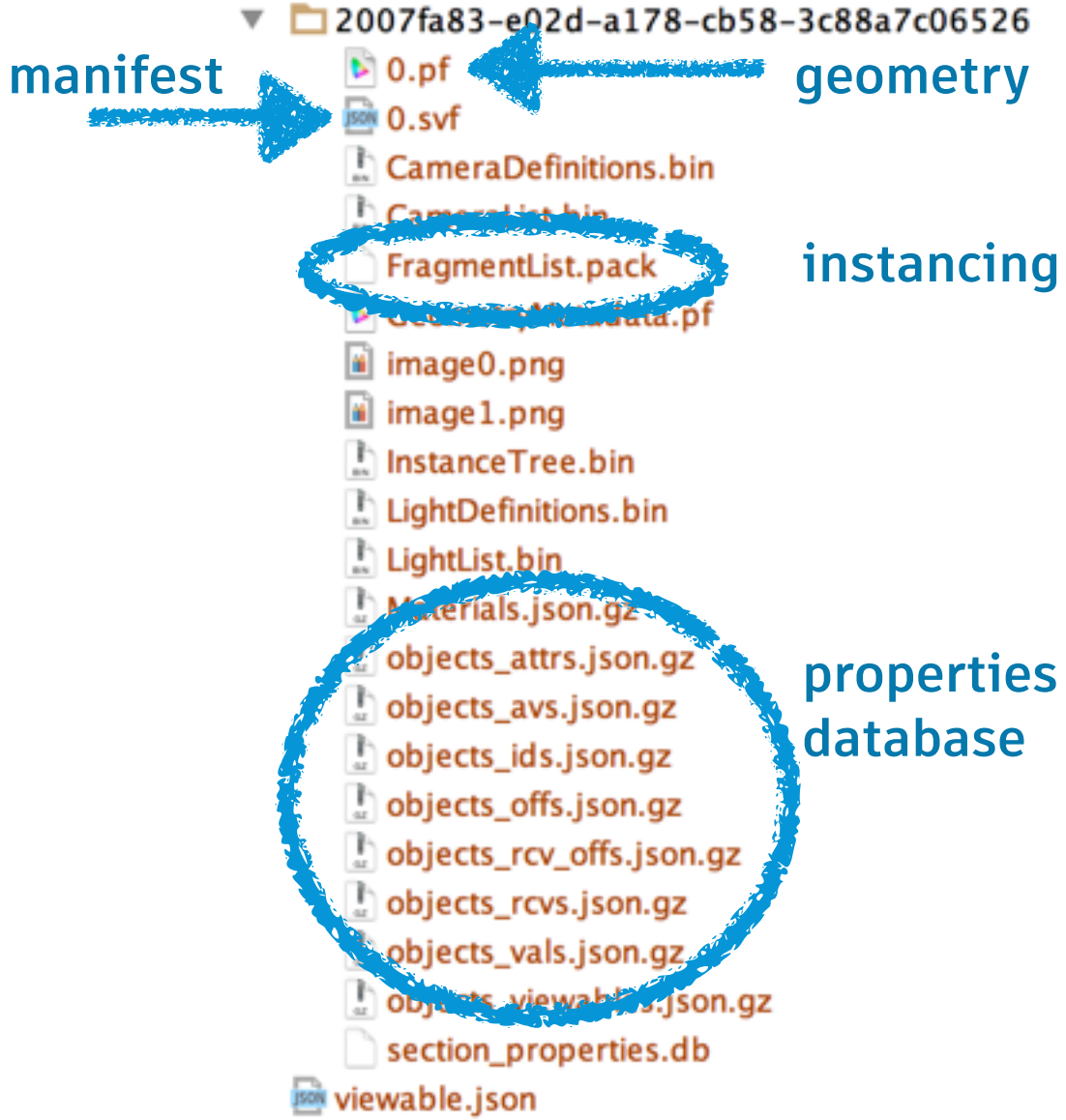
SVF contents…

- https://forge.autodesk.com/cloud_and_mobile/2015/10/offline-support-with-view-data-api.html
-



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Server side Scripts to help...

Some friendly blog posts to help you download SVF files...

Node.js

XiaoDong - https://forge.autodesk.com/blog/simple-sample-consumes-process-extracting-svf-package-nodejs

Philippe - https://forge.autodesk.com/blog/forge-svf-extractor-nodejs

- https://forge.autodesk.com/cloud_and_mobile/2015/10/offline-support-with-view-data-api.html

.NET

Augusto - https://forge.autodesk.com/blog/forge-svf-extractor-c-net

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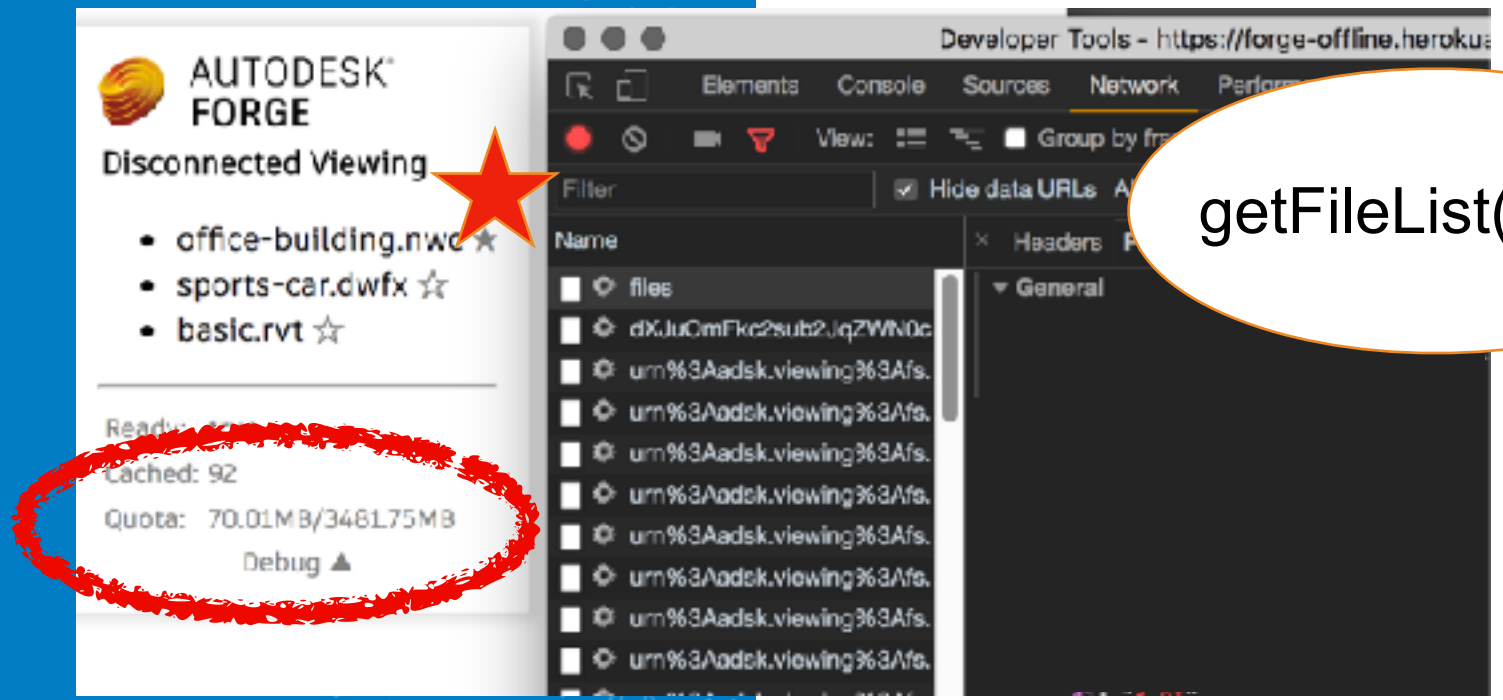
SVF contents size?
...ask the cloud !

- How big is the SVF?
- limited iPad Storage quota
- no Forge viewer3D.js required

http:// github.com/petrbroz/forge-disconnected



getFileList(URN)

calculate
.SVF contents

AWS Cloud

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DEMO

http:// github.com/petrbroz/forge-disconnected

Disconnected Viewing

- office-building.nwc ★
- sports-car.dwfx ☆
- basic.rvt ☆

Ready: true

Cached: 92

Quota: 70.01MB/3481.75MB

Debug ▲

Developer Tools - https://forge-offline.herokua

Elements Console Sources Network Performance Memory

View: Group by frame Preserve log

Filter Hide data URLs All XHR JS CSS Img Media

Name

files

dXJuOmFkc2sub2JqZWN0c..

urn%3Aadsk.viewing%3Afs..

urn%3Aadsk.viewing%3Afs..

urn%3Aadsk.viewing%3Afs..

urn%3Aadsk.viewing%3Afs..

urn%3Aadsk.viewing%3Afs..

urn%3Aadsk.viewing%3Afs..

urn%3Aadsk.viewing%3Afs..

urn%3Aadsk.viewing%3Afs..

Headers Preview Response Timing

General

Request URL: https://forge-offline.
ub2JqZWN0czpvcy5vYmplY3Q6Zm9yZ2Utb2
5ud2M/files

```
32: "objects_offs.json.gz"
33: "objects_avs.json.gz"
34: "ProteinMaterials.json.gz"
35: "Materials.json.gz"
36: "CameraDefinitions.bin"
37: "LightDefinitions.bin"
38: "0.pf"
39: "1.pf"
40: "2.pf"
```

A Brief History of ‘Offline’

*within the Forge Team

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History of trying ‘Offline’

“Autodesk A360 App”
Offline mode

“HTML 5 cache manifest”
built-in the browser

.NET and Node.js
“scripts”

“Extract.autodesk.io”
by Cyrille Fauvel

React Native
with offline

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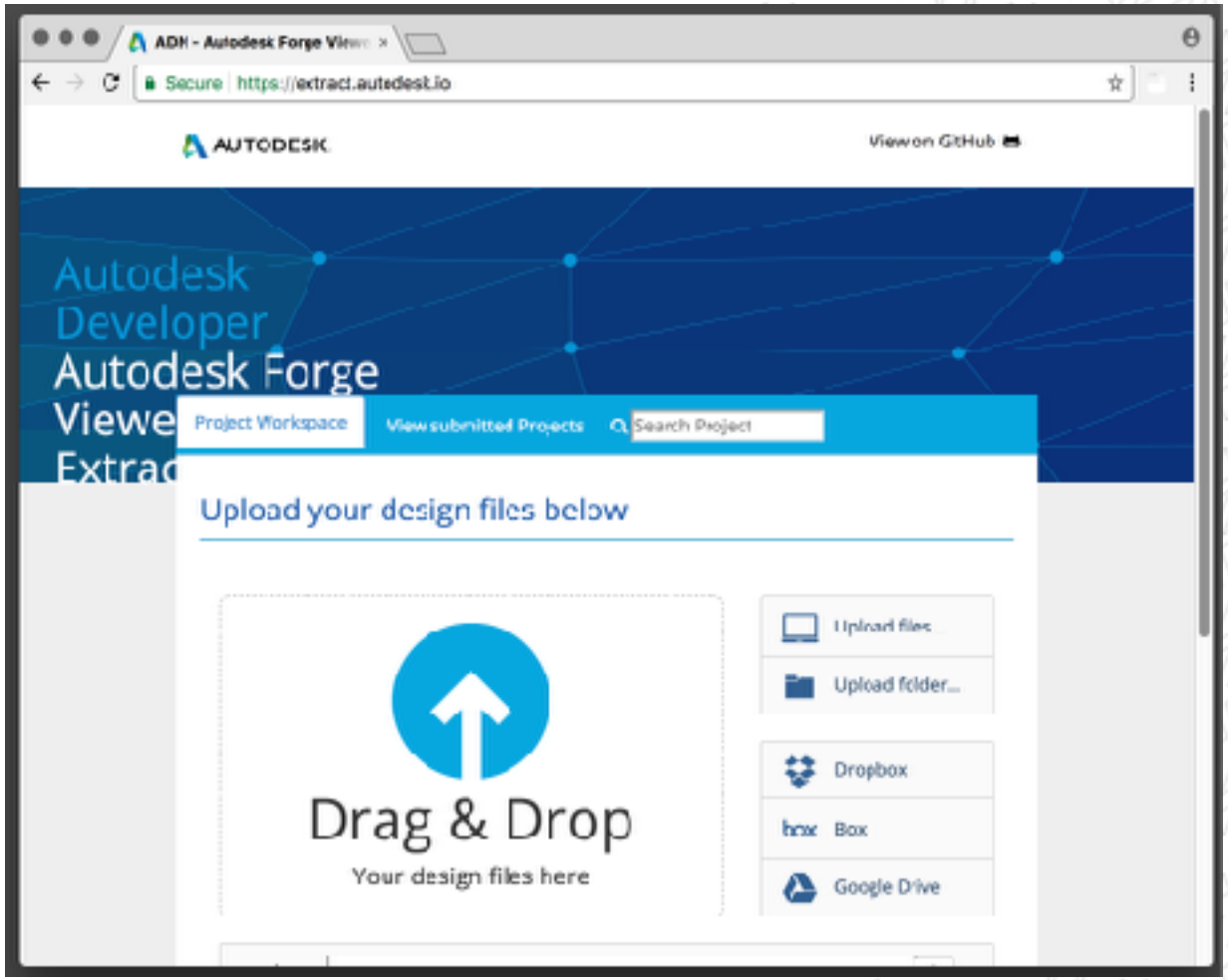
extract.autodesk.io



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WebView > ‘micro’ webServer > local files

iPhone/Android - Cordova

Standalone App of Forge Viewer on iOS without Internet by Cordova

Xiaodong Liang

January 1, 2017

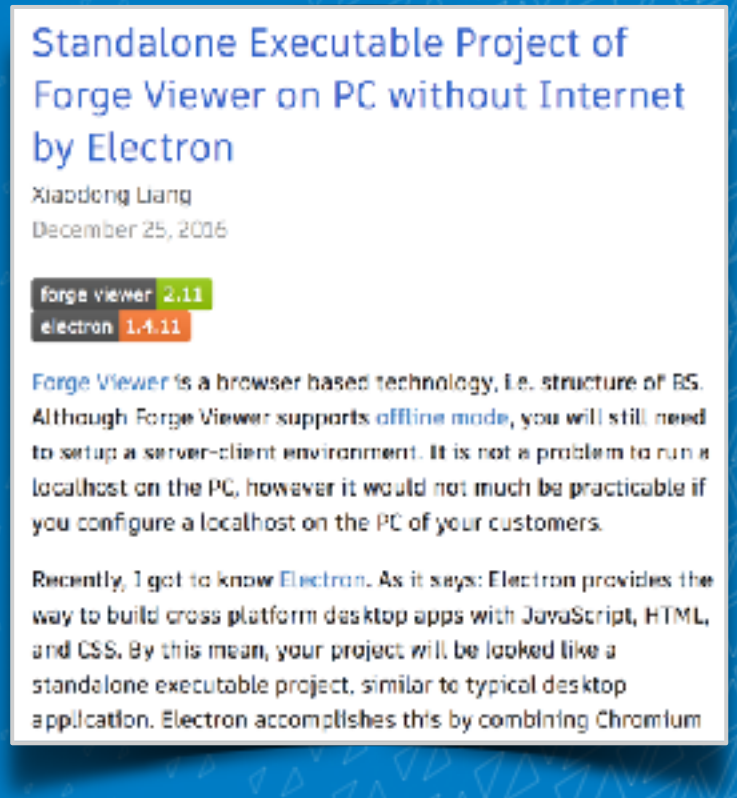
Xiaodong Liang

Xiaodong Liang has been with Autodesk since 2007, focu
on providing programming support, consulting, training
evangelism to external developers.

Happy New Year!

In the last post, I introduced how to produce a standalone executable application for Forge Viewer. At that time, I was also looking for the way t can apply to mobile OS. Apache Cordova is one of the approaches I was investigating. The practice proved my choice is correct :) By Cordova, the is successfully running on my iPhone (no internet connection).

Electron - WebView



Standalone Executable Project of Forge Viewer on PC without Internet by Electron

Xiaodong Liang

December 25, 2016

forge viewer 2.11
electron 1.4.11

Forge Viewer is a browser based technology, i.e. structure of BS. Although Forge Viewer supports offline mode, you will still need to setup a server-client environment. It is not a problem to run a localhost on the PC, however it would not much be practicable if you configure a localhost on the PC of your customers.

Recently, I got to know Electron. As it says: Electron provides the way to build cross platform desktop apps with JavaScript, HTML, and CSS. By this mean, your project will be looked like a standalone executable project, similar to typical desktop application. Electron accomplishes this by combining Chromium

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React Native Offline

Philippe's Blog:

https://forge.autodesk.com/blog/running-forge-viewer-react-native-offline

- open source packaged called…

react-native-static-server does the heavy lifting to serve a folder as a web-server on iPhone/Android.

- Just copy your viewer.js and SVFs into the folder

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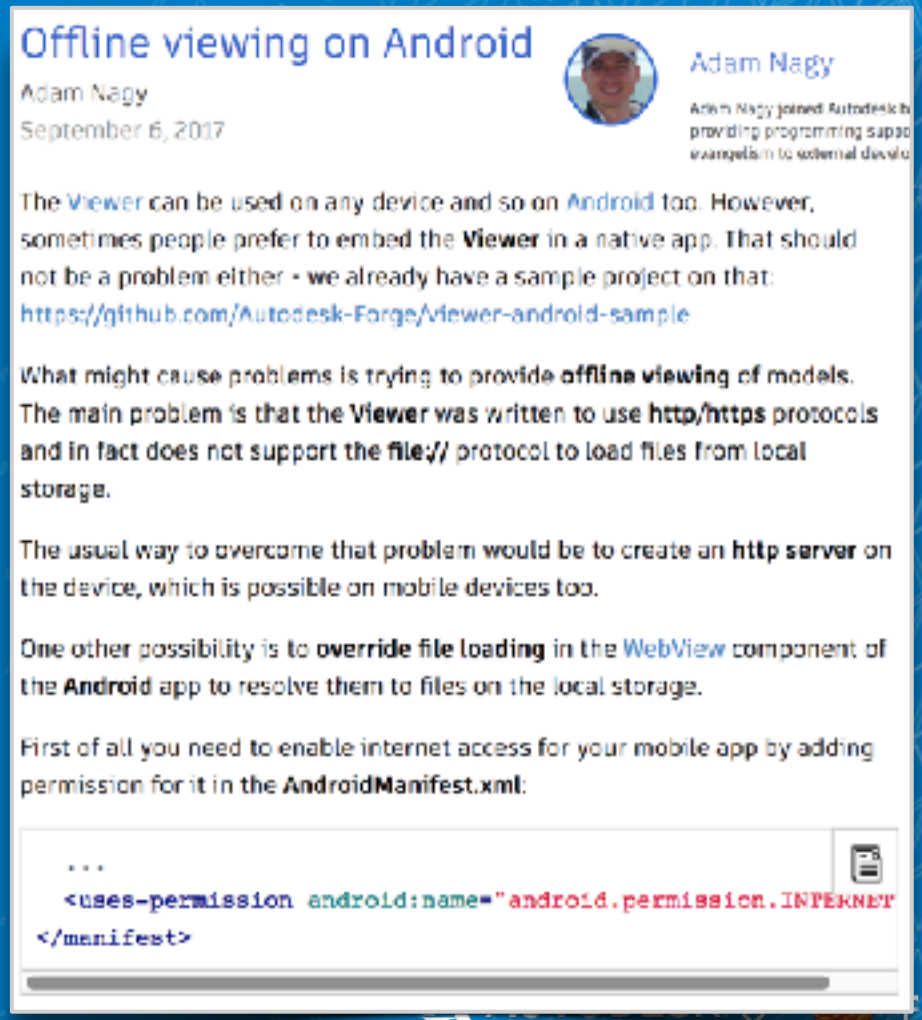
WebView > Files:// (Android only)

Adam's blog post:

Pro's: No 'micro' Server required

How? Rename .pf files to .mp3
(fool Android into decompressing zip stream)

Android - WebView



Offline viewing on Android

Adam Nagy

September 6, 2017

Adam Nagy

The Viewer can be used on any device and so on Android too. However, sometimes people prefer to embed the **Viewer** in a native app. That should not be a problem either - we already have a sample project on that: https://github.com/Autodesk-Forge/viewer-android-sample

What might cause problems is trying to provide **offline viewing** of models. The main problem is that the **Viewer** was written to use **http/https** protocols and in fact does not support the **file://** protocol to load files from local storage.

The usual way to overcome that problem would be to create an **http server** on the device, which is possible on mobile devices too.

One other possibility is to **override file loading** in the WebView component of the **Android** app to resolve them to files on the local storage.

First of all you need to enable internet access for your mobile app by adding permission for it in the **AndroidManifest.xml**:

```
...
<uses-permission android:name="android.permission.INTERNET
</manifest>
```

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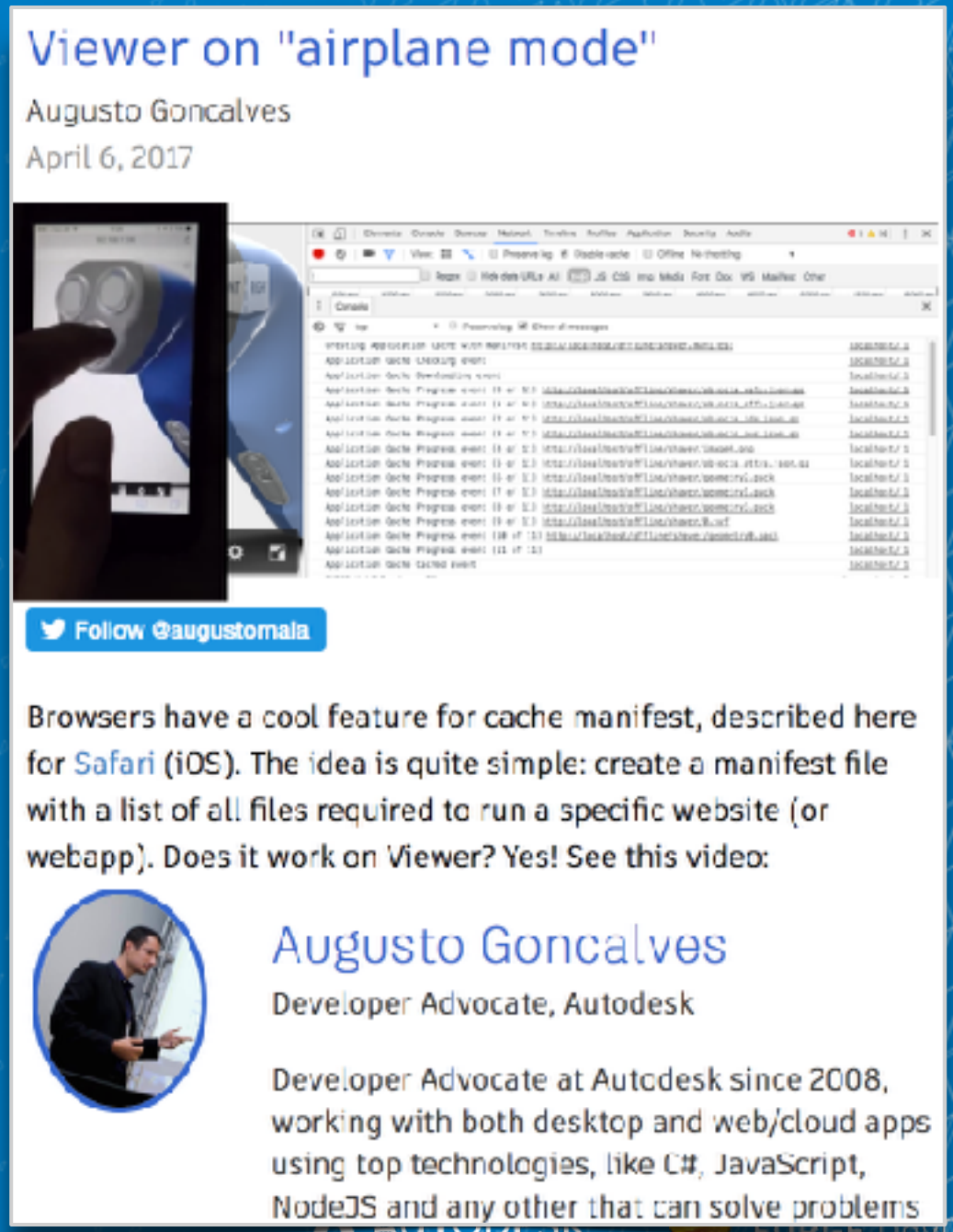
WebView > HTML5's cache.manifest

Augusto's blog post:

https://forge.autodesk.com/blog/viewer-airplane-mode



Viewer on "airplane mode"

Augusto Goncalves

April 6, 2017

Follow @augustomaia

Browsers have a cool feature for cache manifest, described here for Safari (iOS). The idea is quite simple: create a manifest file with a list of all files required to run a specific website (or webapp). Does it work on Viewer? Yes! See this video:

Augusto Goncalves

Developer Advocate, Autodesk

Developer Advocate at Autodesk since 2008, working with both desktop and web/cloud apps using top technologies, like C#, JavaScript, NodeJS and any other that can solve problems

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‘Disconnected’ is the new ‘offline’

Petr Broz Blog: https:// forge.autodesk.com/blog/disconnected-workflows

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PWA - a new HTML5 approach

* Progressive Web Apps

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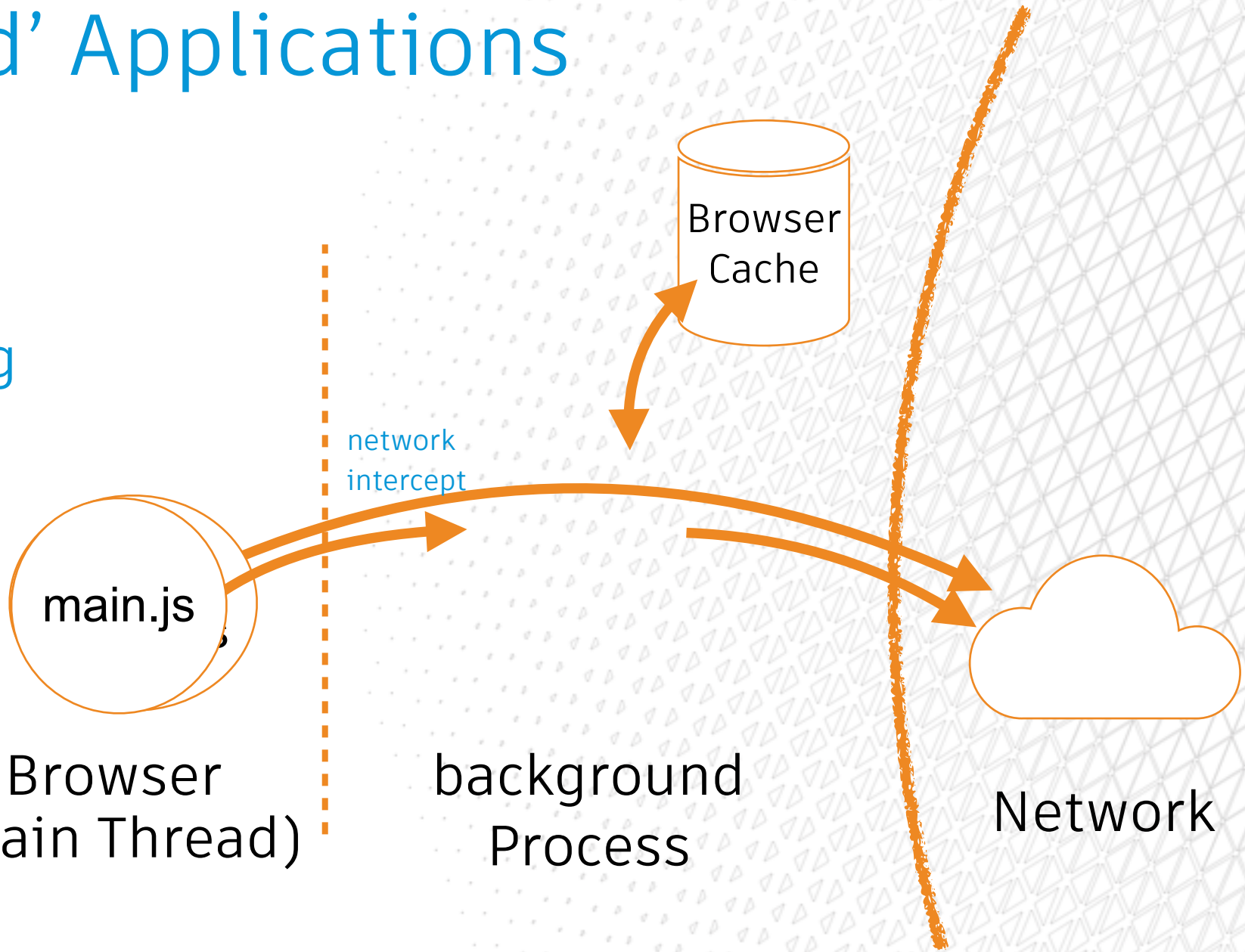
‘Disconnected’ Applications

Concepts:

- Service Workers
- Channel Messaging
- Cache Strategy



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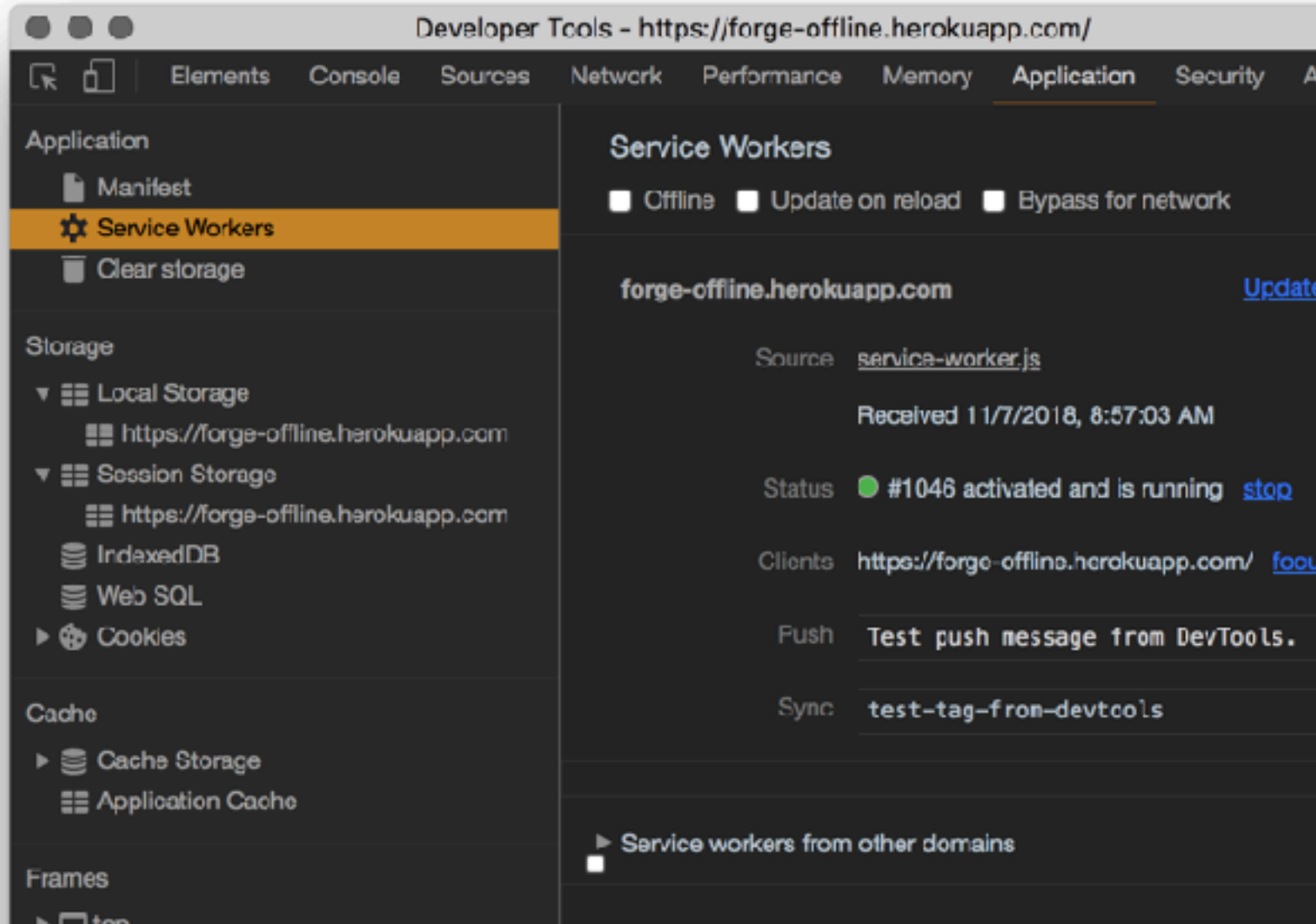
New Tools

> Chrome Dev Console

Manage:

- Background Processes
- Clear Storage
- IndexDB



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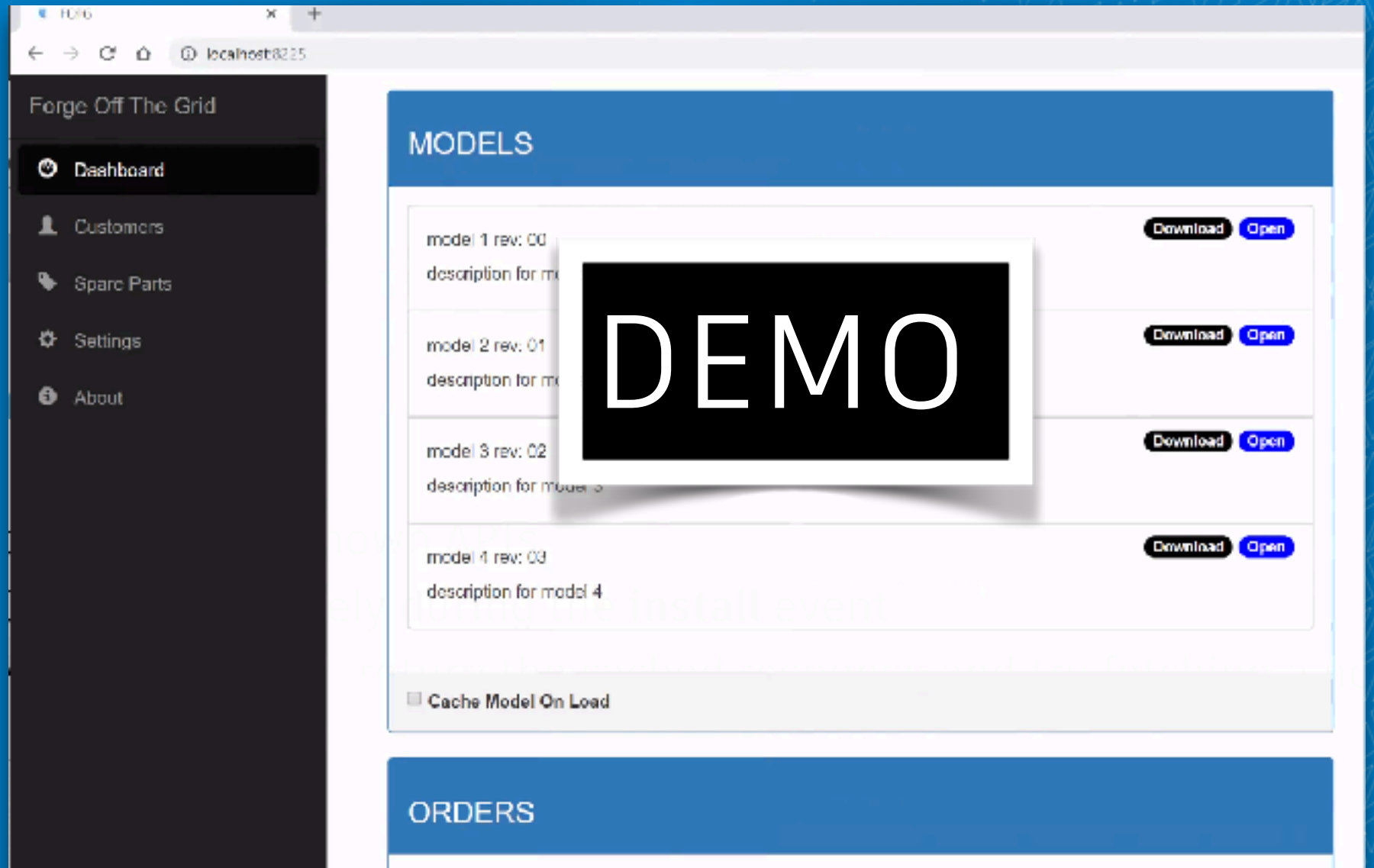
Honeywell

Building an offline parts catalog



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Let’s review…

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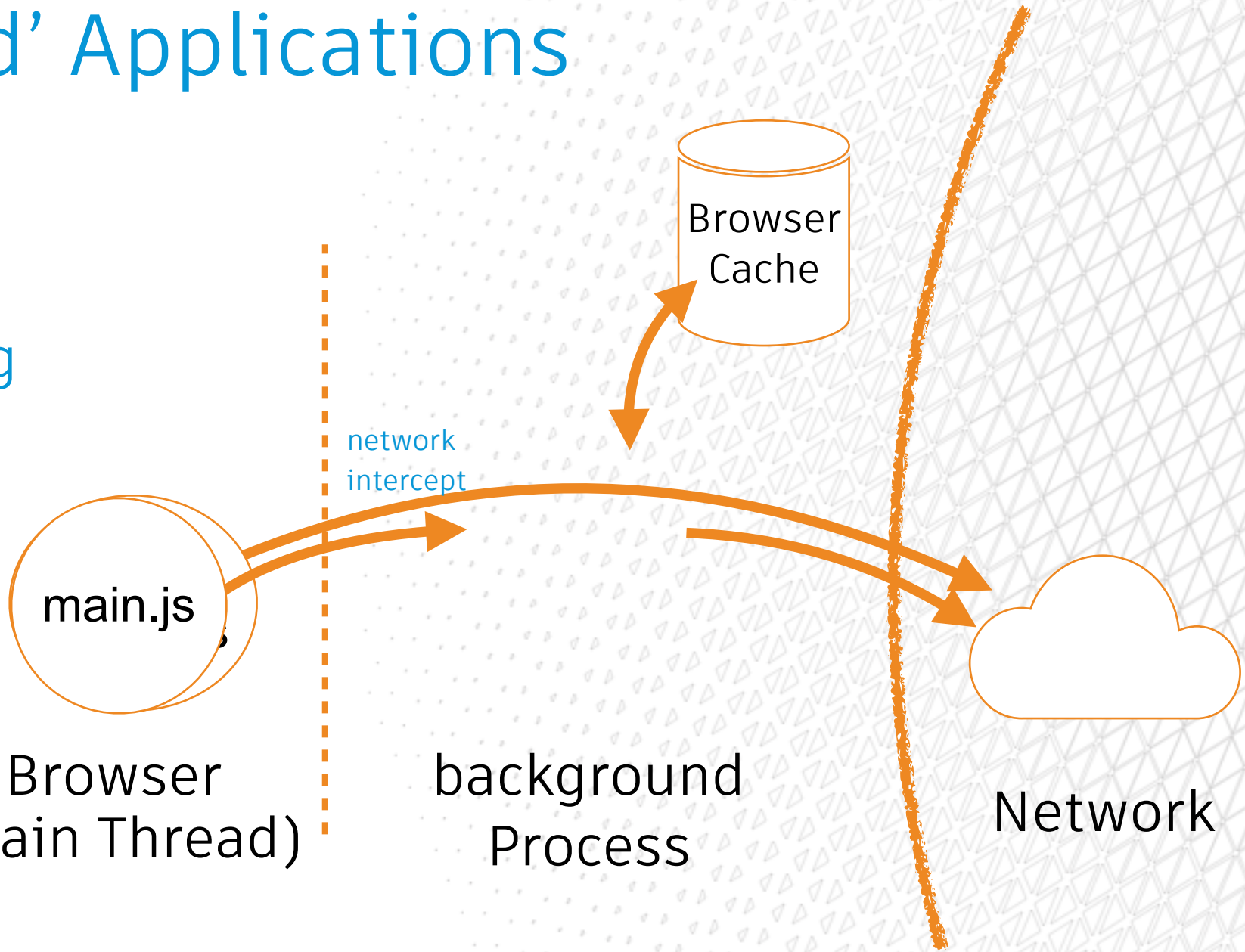
‘Disconnected’ Applications

Concepts:

- Service Workers
- Channel Messaging
- Cache Strategy



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Step2 - add ‘Forge Viewer’

* How to handle ‘Auth Tokens’ ?
* What is a Cache Strategy ?

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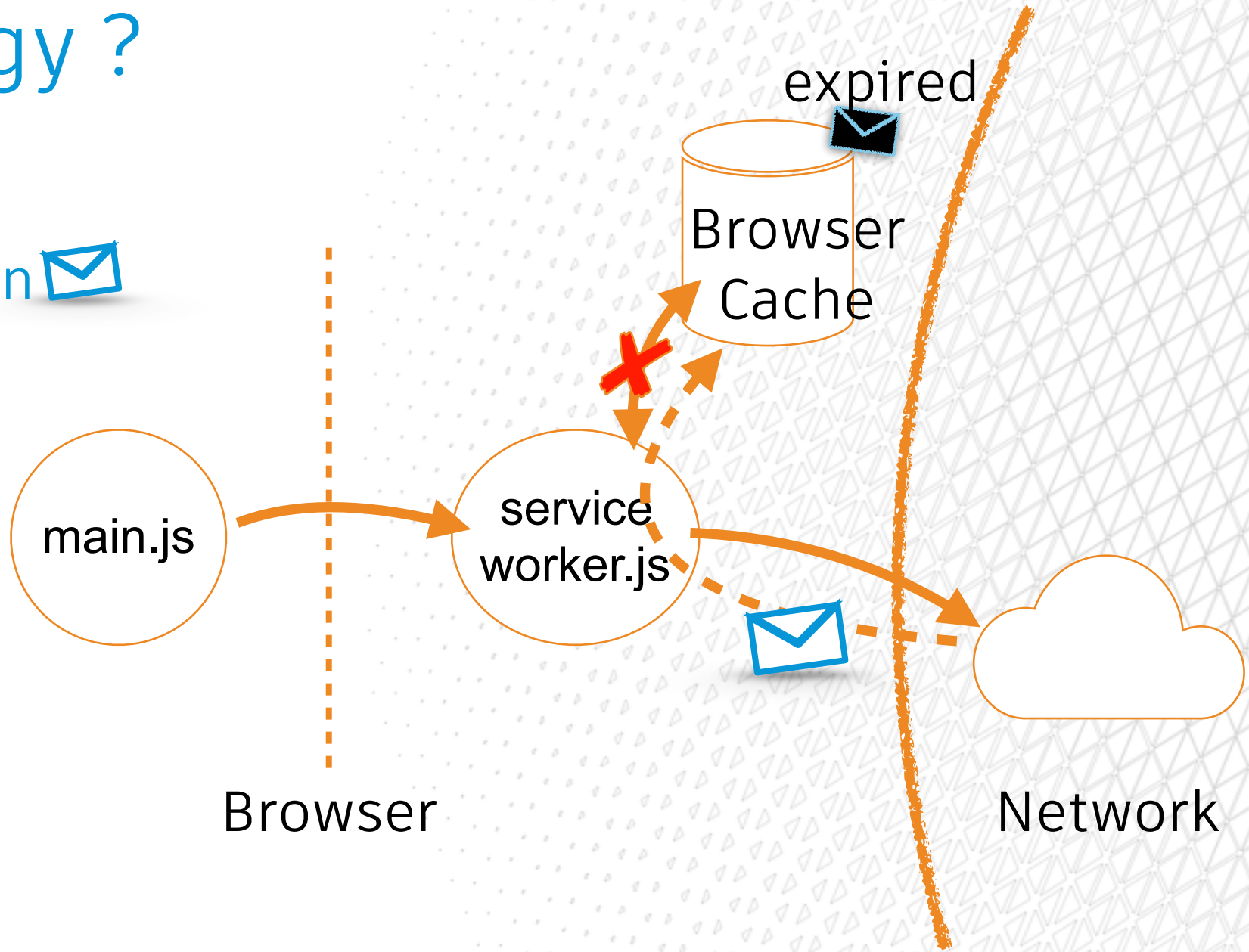
Cache Strategy ?

Business Logic
- freshest Auth Token
- expired Old Files
- etc



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Step3 - Messaging

* What is the “Message Channel” ?

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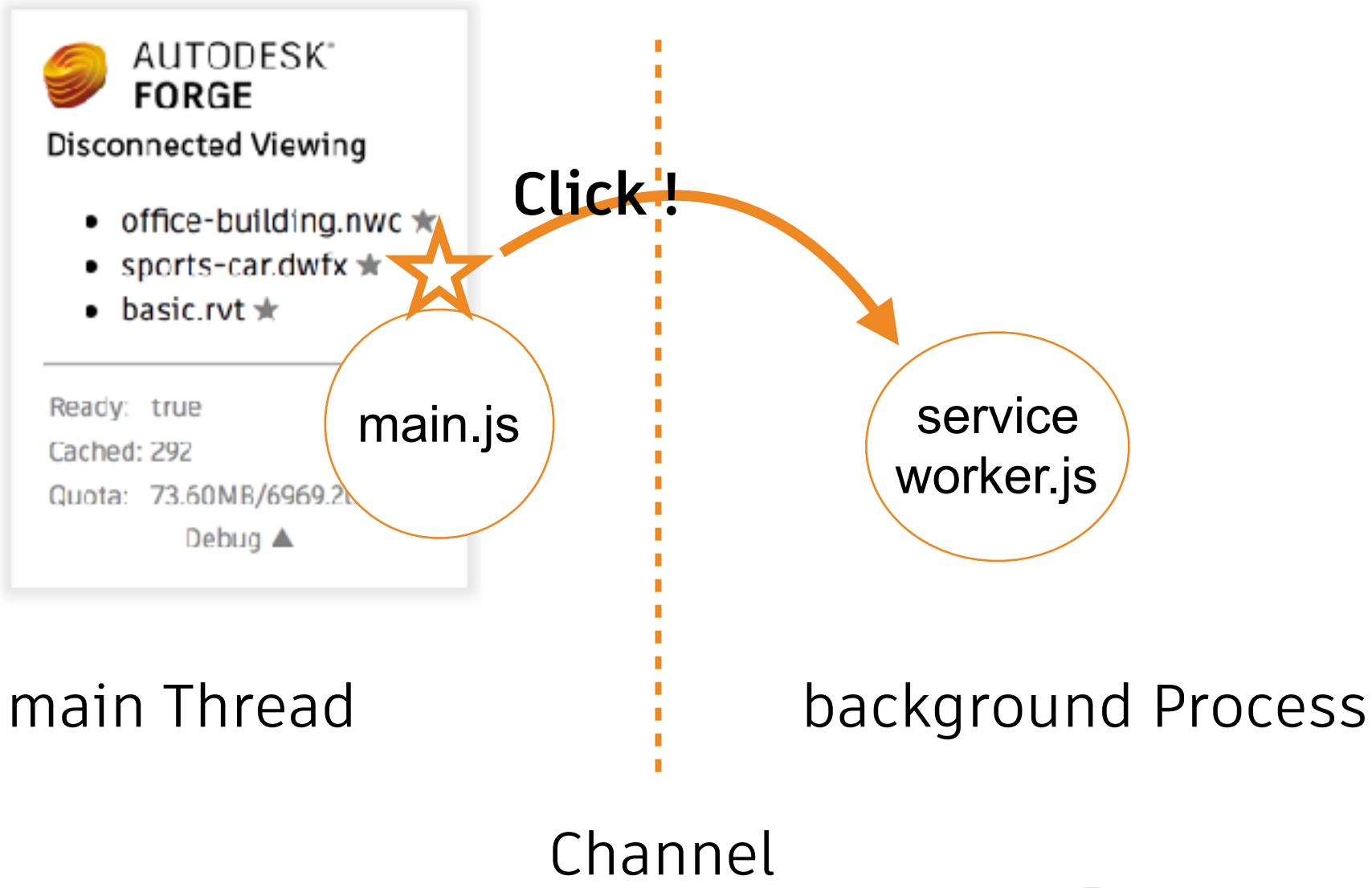
Messaging



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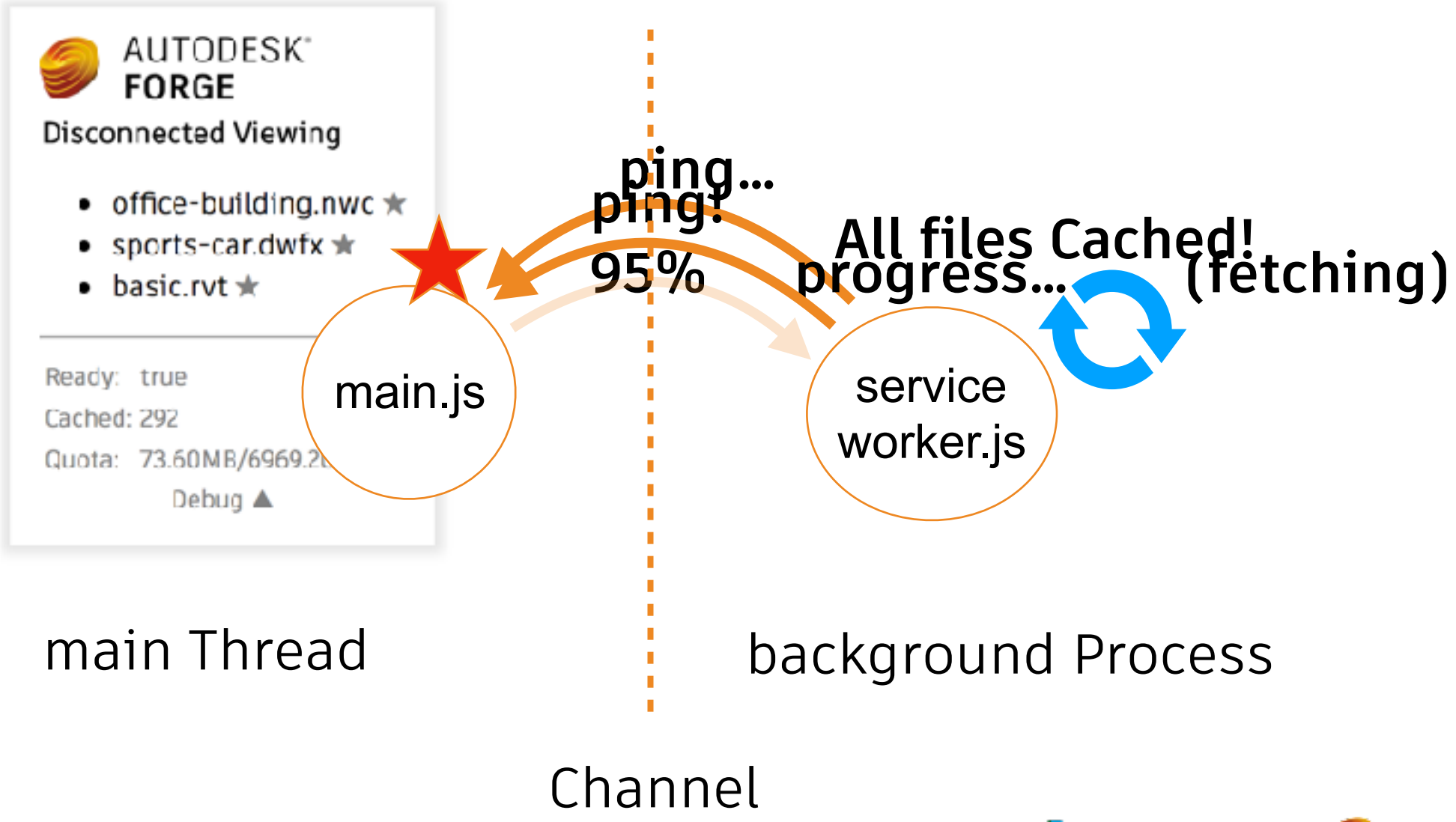
Messaging



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Step4 - browser storage

* How to track what's in my cache ?

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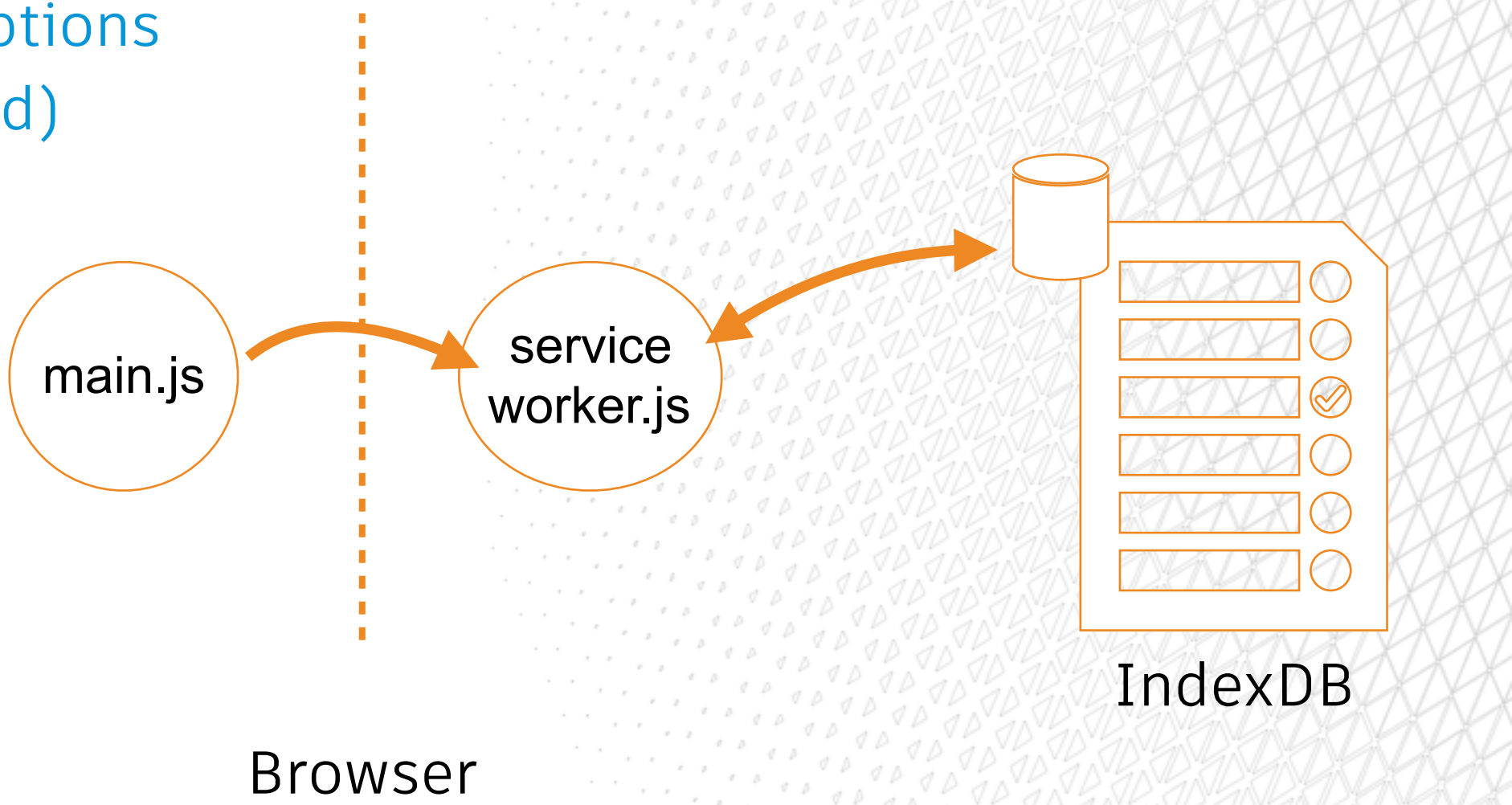
Browser Storage

HTTP5 storage options
- indexDB (shared)
- localStorage*
- webSQL*



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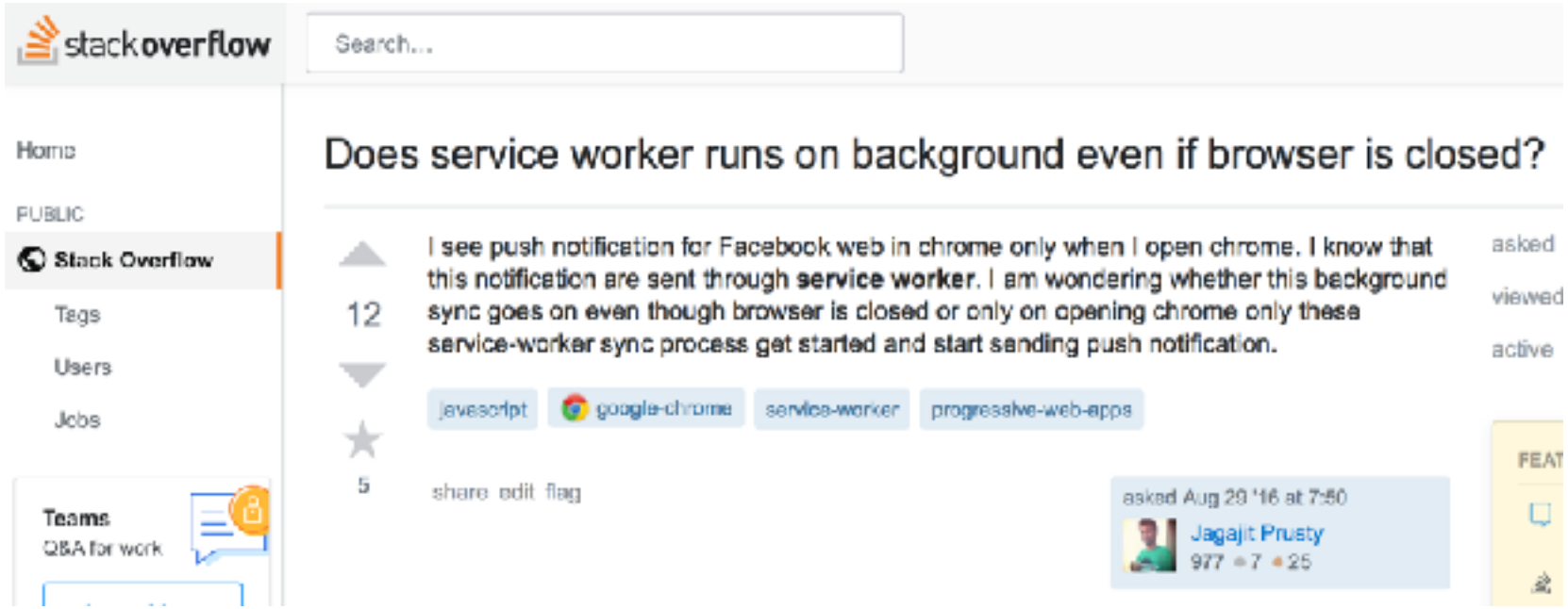
Gotchas

- Service workers only enabled in HTTPS context (with localhost as an exception)
  - At one point, http://localhost not working in Google Chrome, but fine now
- Service workers only intercepting local requests under their scope



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Questions ?

https:// github.com/michaelponti/pwaforgedevcon2018

@micbeale

@michaelponti1

FORGE DevLab

- Tuesday, November 13, 1:30 p.m. – 5:30 p.m. in Galileo 1002 (Level 1)
- Drop-in workshop / informal lab for software developers of all skill levels - come and g
- Get one-to-one help and advice on using the Forge APIs
- DevLab is open to all Forge DevCon and Autodesk University attendees
- Book a 30 minute slot in the Class Catalog (enter Forge DevLab in the search bar) or
- Forge experts available all afternoon to answer your questions or help you get started

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