



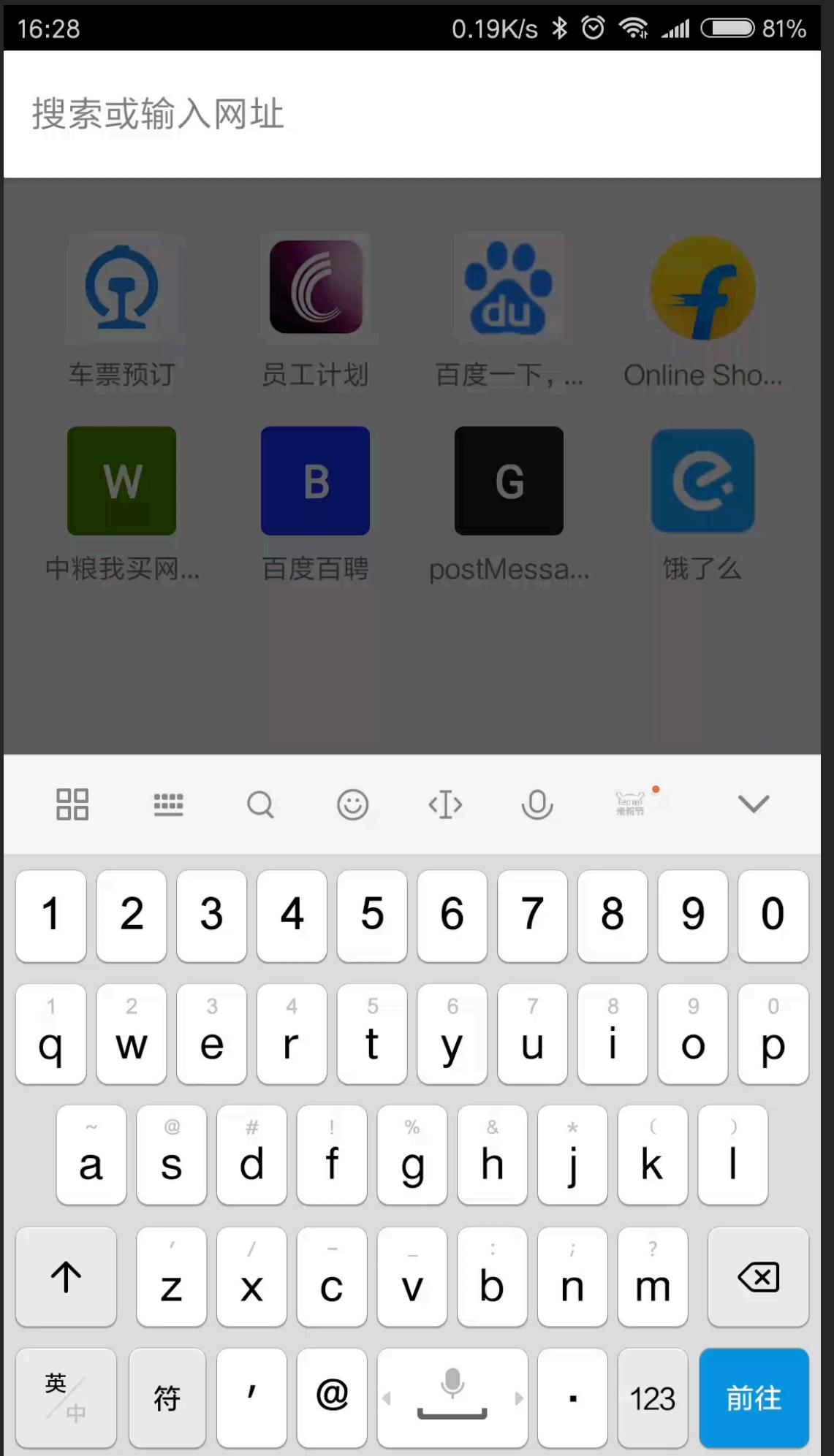
# 深入理解 Service Worker



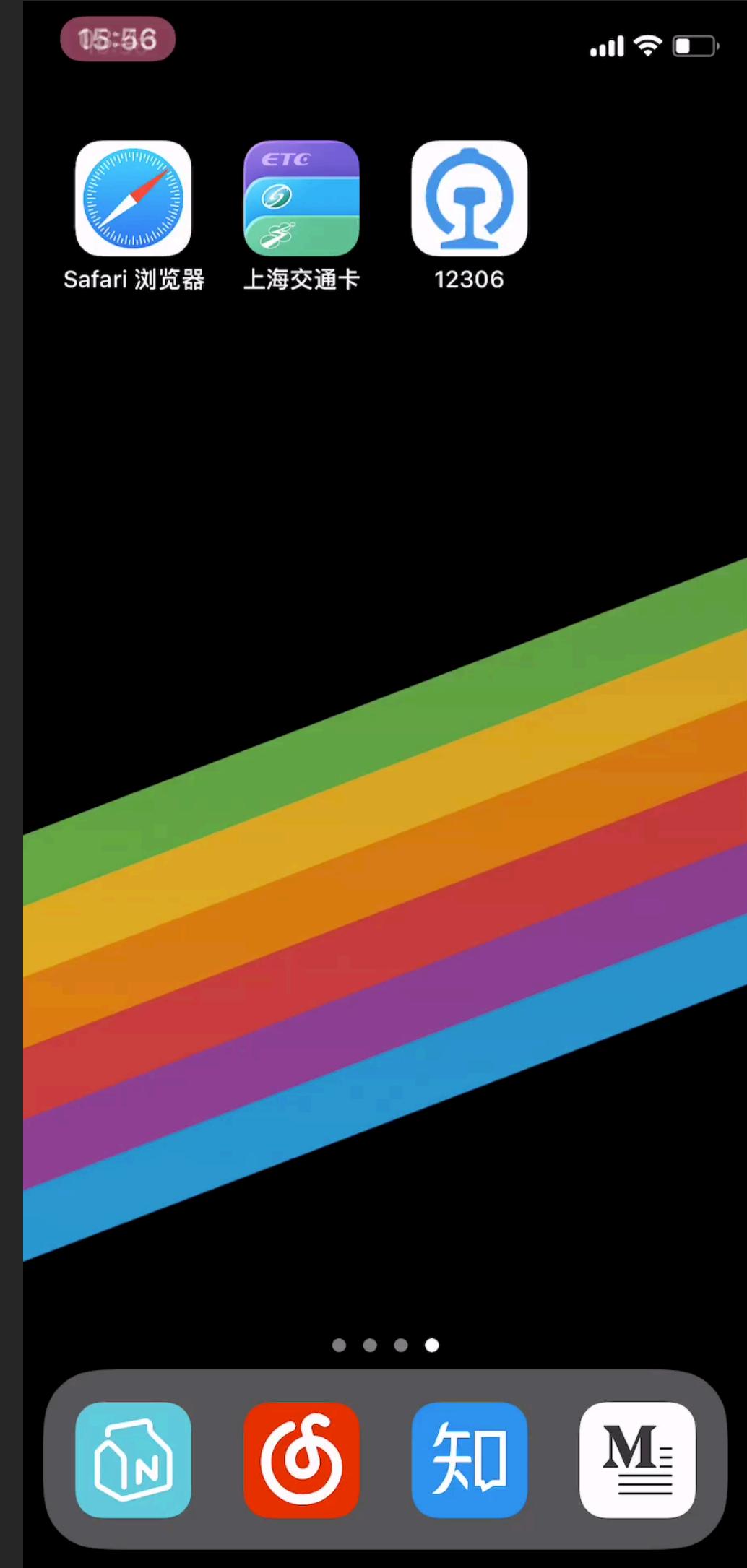
彭星

百度资深前端工程师

# 什么是 PWA



Android Chrome



iOS Safari



Lavas 官网  
<https://lavas.baidu.com/>

# PWA 的主要特性

- Web App Manifest (主屏图标)
- Service Worker (离线可用)
- Notification API & Push API (离线通知)
- ...

Progressive Web Apps  
are  
Progressive

Progressive Web Apps  
are  
Progressive

用户体验才是核心

# PWA 还有什么

- App Shell & App Skeleton 设计模型
- PRPL Pattern (Push, Render, Pre-cache, Lazy-load)
- 安全 HTTPS
- 交互 & 动画
- ...

# Cache APIs

# Cache APIs

## Key-Value 存储

URL

<https://lavas.baidu.com/>

RESPONSE

<!doctype html>

<https://lavas.baidu.com/api/>

{status: 0}

# Cache Storage

存储 URL 敏感的内容

---

# IndexedDB

存储其他数据

# fetch

# fetch

```
// fetch example

fetch('https://example.com/movies.json')
  .then(function (response) {
    return response.json();
})
  .then(function (myJson) {
    console.log(myJson);
});
```

# 什么是 Service Worker

# 什么是 Service Worker

- 它是一种 Web Worker
- 它是一个外链的 JS 文件
- 它是一种特殊的 Web Worker，能够拦截网络请求
- 它只能运行在 HTTPS 协议上
- 它还能接受推送消息和处理后台同步
- 它一旦被注册就永远存在，除非显示 unregister



我们的目标是



『消灭恐龙』



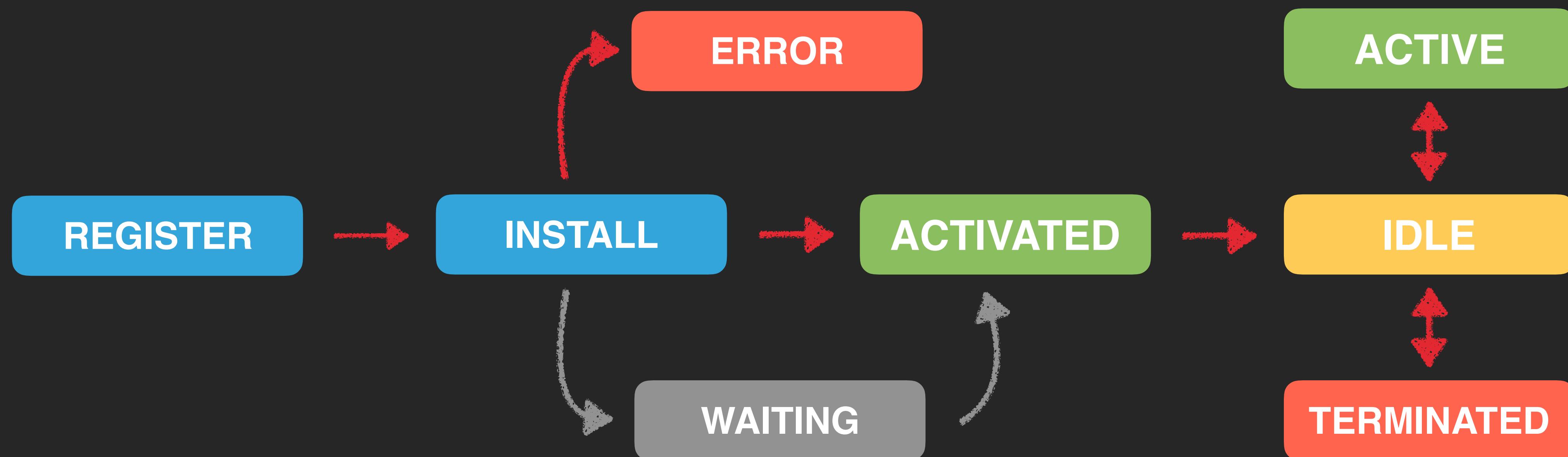
IOS 11.3 已经发布，支持 PWA

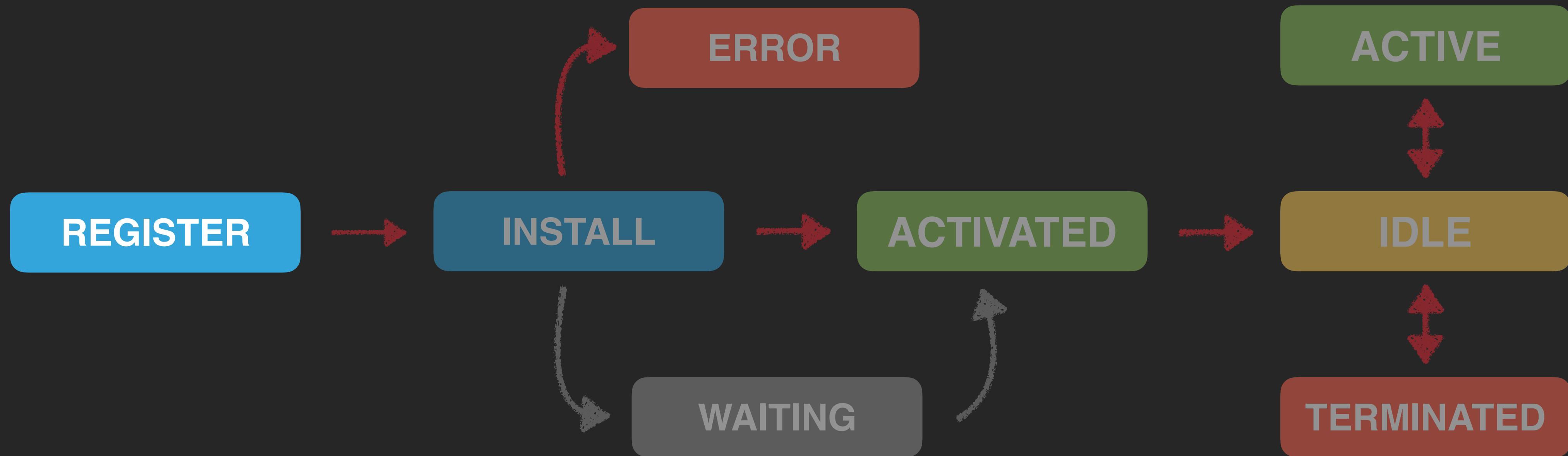


<https://lavas.baidu.com/ready?lang=zh>

Tencent 腾讯

# 生命周期





```
// register the service worker

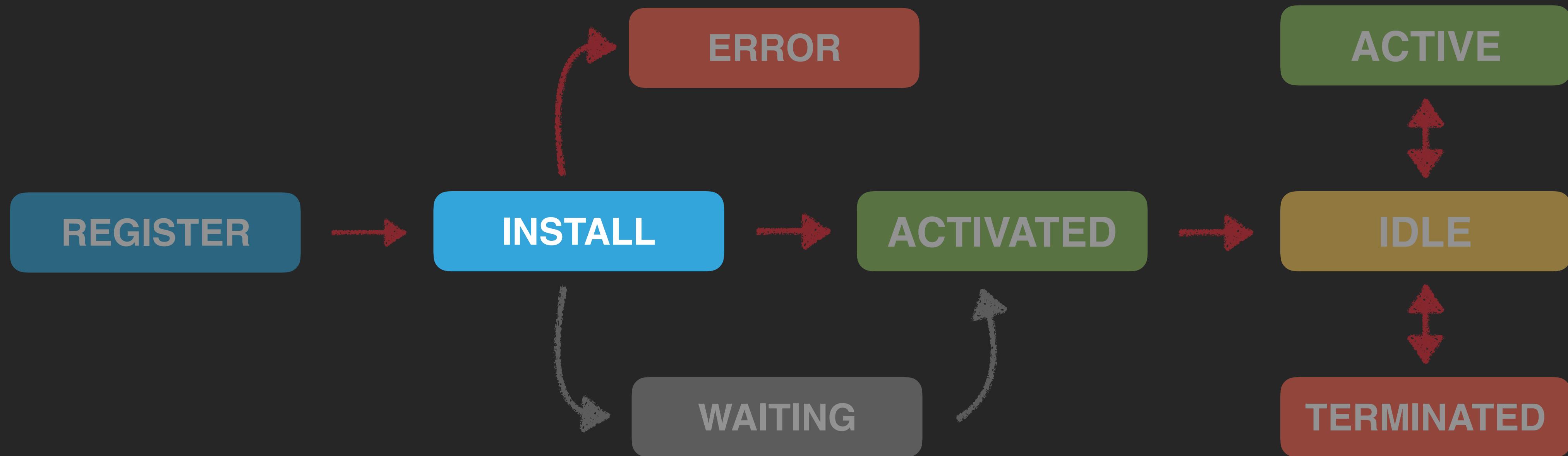
// index.html
if ('serviceWorker' in navigator) {
  navigator.serviceWorker.register('/service-worker.js')
    .then(function (reg) {
      console.log('Service Worker registered', reg);
    })
    .catch(function (error) {
      console.error('Error registering Service Worker', error);
  });
}
```

# 作用域

`https://xxx.com/foo/bar.html`

-  `navigator.serviceWorker.register('/sw.js', {scope: '/'})`
-  `navigator.serviceWorker.register('/foo/sw.js', {scope: '/foo'})`
-  `navigator.serviceWorker.register('/foo/sw.js', {scope: '/'})`

PS: Service-Worker-Allowed 指定的路径可以设置最大 scope

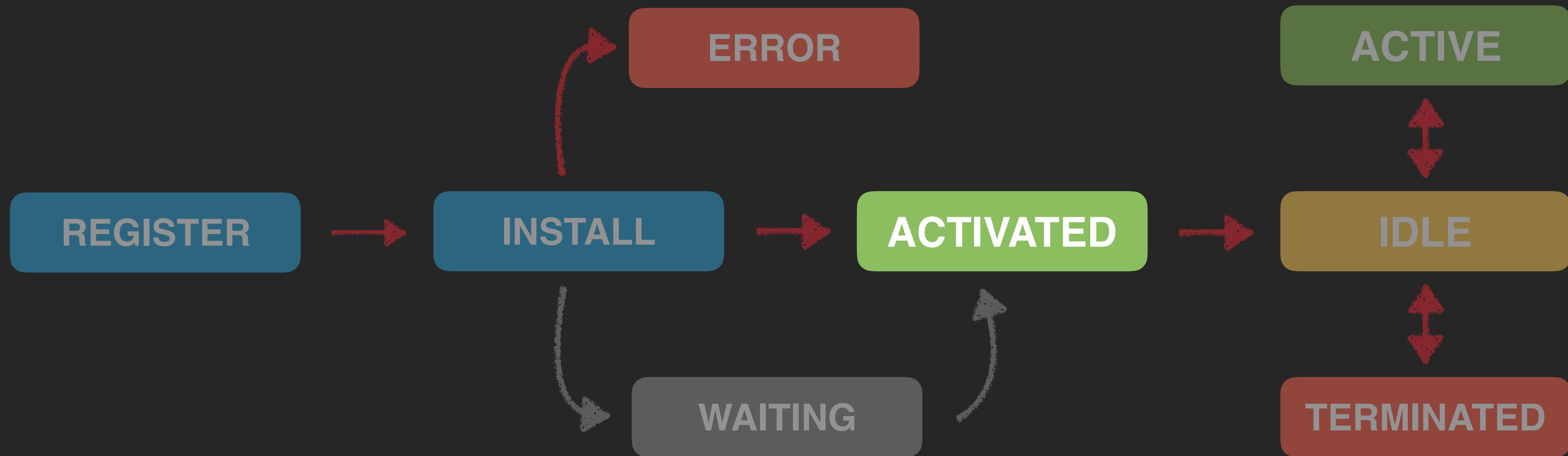


```
// lifecycle install  
  
// service-worker.js  
self.addEventListener('install', function (event) {  
  return self.skipWaiting();  
});
```

```
// lifecycle install - 预缓存文件

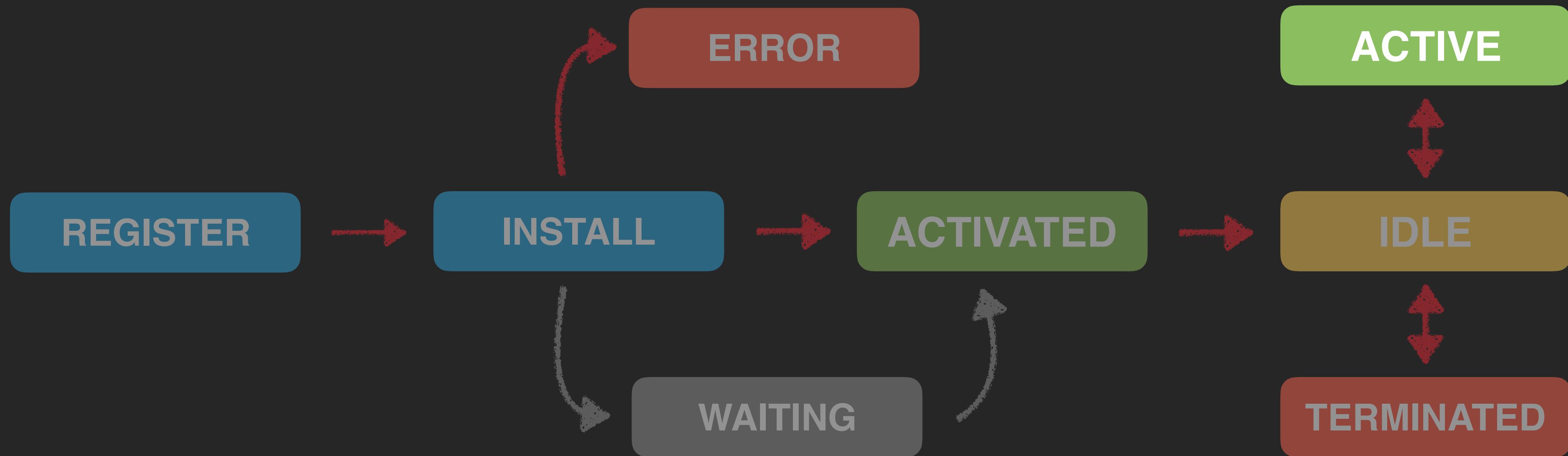
// service-worker.js
const CACHE_NAME = 'app-shell-cache-v1';
const filesToCache = [ '/', '/index.html', 'index.js'];

self.addEventListener('install', function (event) {
  event.waitUntil(
    caches.open(CACHE_NAME).then(function (cache) {
      return cache.addAll(filesToCache);
    })
    .then(function () {
      return self.skipWaiting();
    })
  );
});
```



```
// lifecycle activated

// service-worker.js
self.addEventListener('active', function (event) {
  event.waitUntil(caches.open(CACHE_NAME).then(function (cache) {
    return cache.keys().then(function (keys) {
      return Promise.all(keys.map(function (key) {
        return cache.delete(key);
      }));
    });
  }));
}).then(function () {
  return self.clients.claim();
});
});
```



```
// lifecycle active

// service-worker.js
self.addEventListener('fetch', function (event) {
  event.respondWith(
    caches.match(event.request).then(function (response) {
      return response || fetch(e.request);
    })
  );
});
```

# 缓存策略

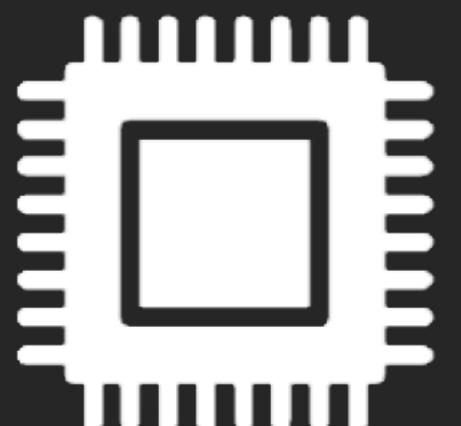
- networkFirst
- cacheFirst
- networkOnly
- cacheOnly
- fastest
- ...



Page



Cache



ServiceWorker



Network

# 调试工具和方法

- 127.0.0.1 / localhost
- chrome://serviceworker-internals/
- Chrome Developer Tools

Audits   Network   Performance   **Application**   Security   Avast Passwords   ✖ 1 ⚠ 1 | ⋮ ×

## Service Workers

Offline  Update on reload  Bypass for network

**lavas.baidu.com** [Update](#) [Unregister](#)

Source [service-worker.js](#)  
Received 6/20/2018, 8:39:13 AM

Status ● #27953 activated and is running [stop](#)

Clients <https://lavas.baidu.com/> [focus](#)

Push  Push

Sync  Sync

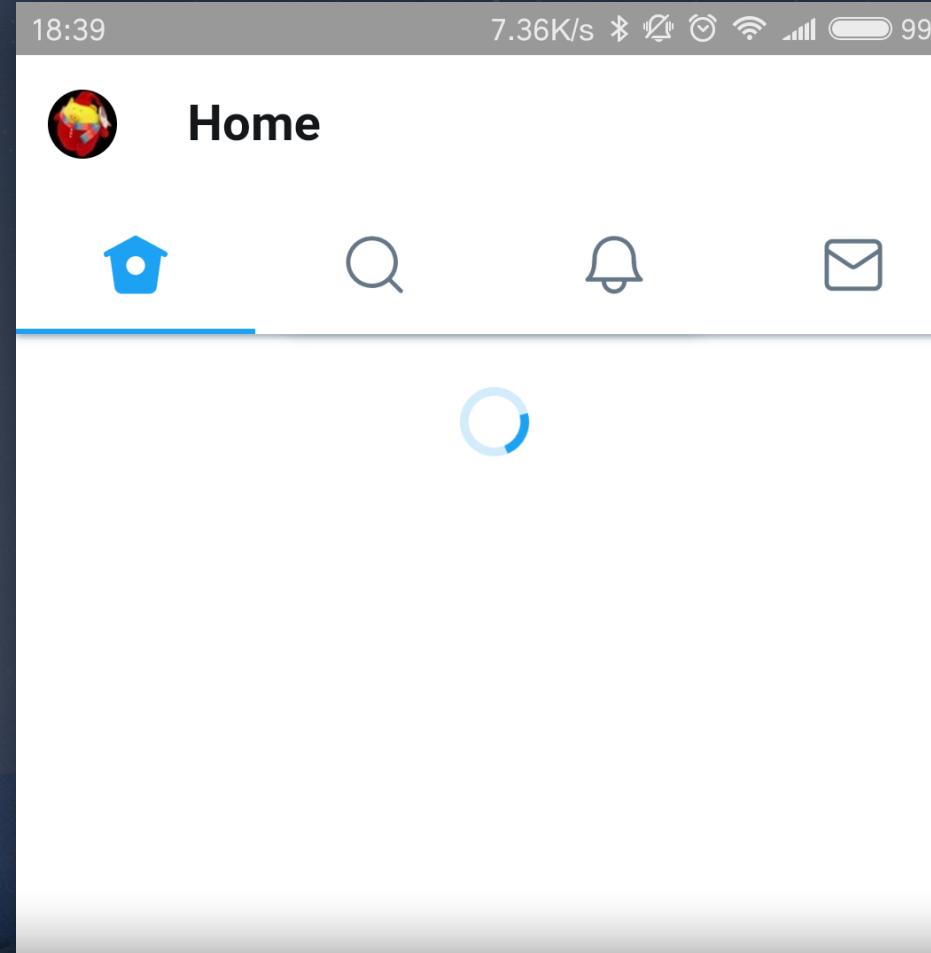
▶ Service workers from other domains

你已经学会如何使用 Service Worker 了

你已经学会如何使用 Service Worker 了

吗？

# 用户体验方面的考慮



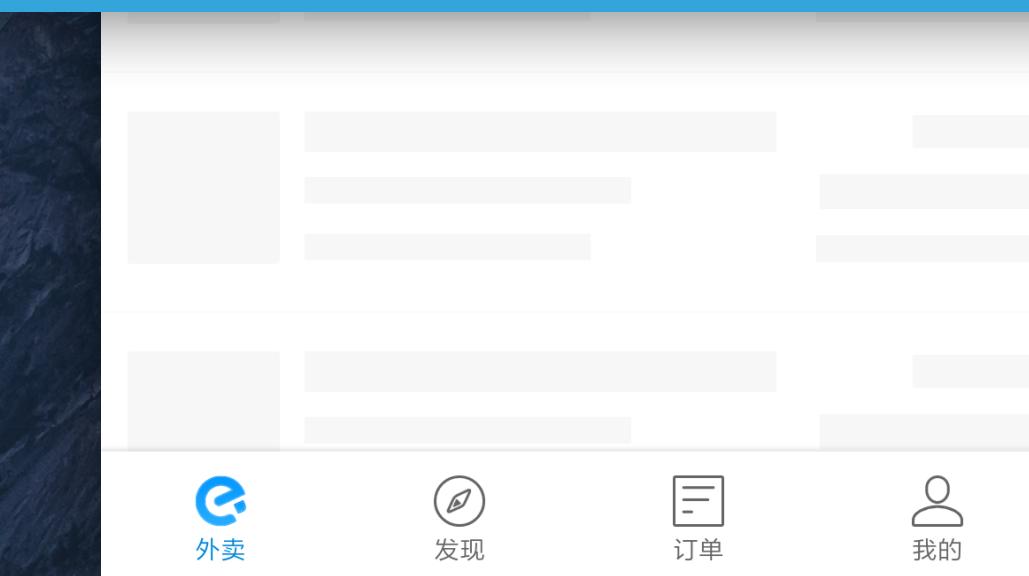
APP SHELL 的设计模型



APP SKELETON 作为首屏



提醒用户网络离线或恢复





APP SHELL 的设计模型

PWA 通常是 SPA

PWA 通常是 SPA  
且通常采用 App Shell 设计模型



# Service Worker 缓存 App Shell

# App Shell 怎么更新

# Service Worker 更新机制

- 浏览器每天至少更新一次 Service Worker
- 注册新的 Service Worker，带上版本号，如：/sw.js?t=180704
- 手动更新 `registration.update()`
- 逐字节对比新的 sw 文件和旧的 sw，有区别才更新

# App Shell 更新滞后



```
// index.html
navigator.serviceWorker.addEventListener('message',
function (e) {
  if (e.data === 'sw.update') {
    // 提醒用户刷新
  }
});
```

```
// sw.js
self.clients.matchAll().then(function(clients) {
  if (clients && clients.length) {
    clients.forEach(function (client) {
      client.postMessage('sw.update');
    })
  }
});
```

PWA 既然多是 SPA, 那 SEO 怎么做?

# PWA 既然多是 SPA, 那 SEO 怎么做?

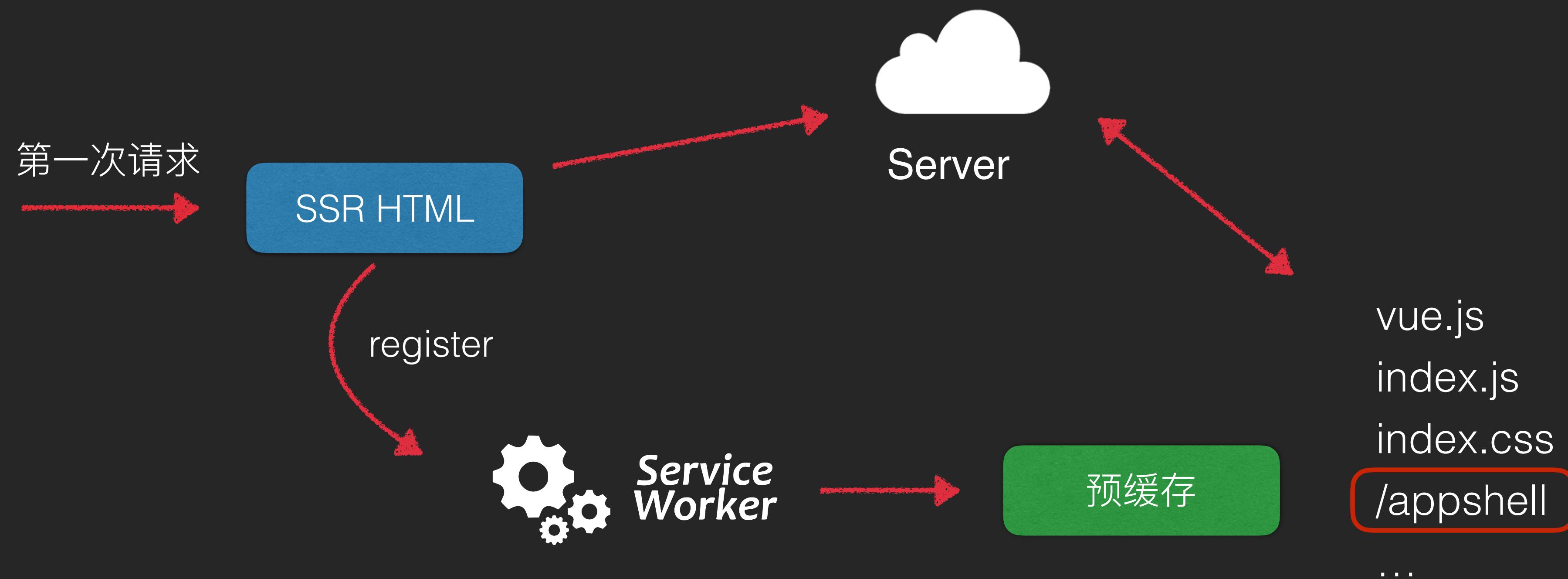
Server Side Rendering(SSR)

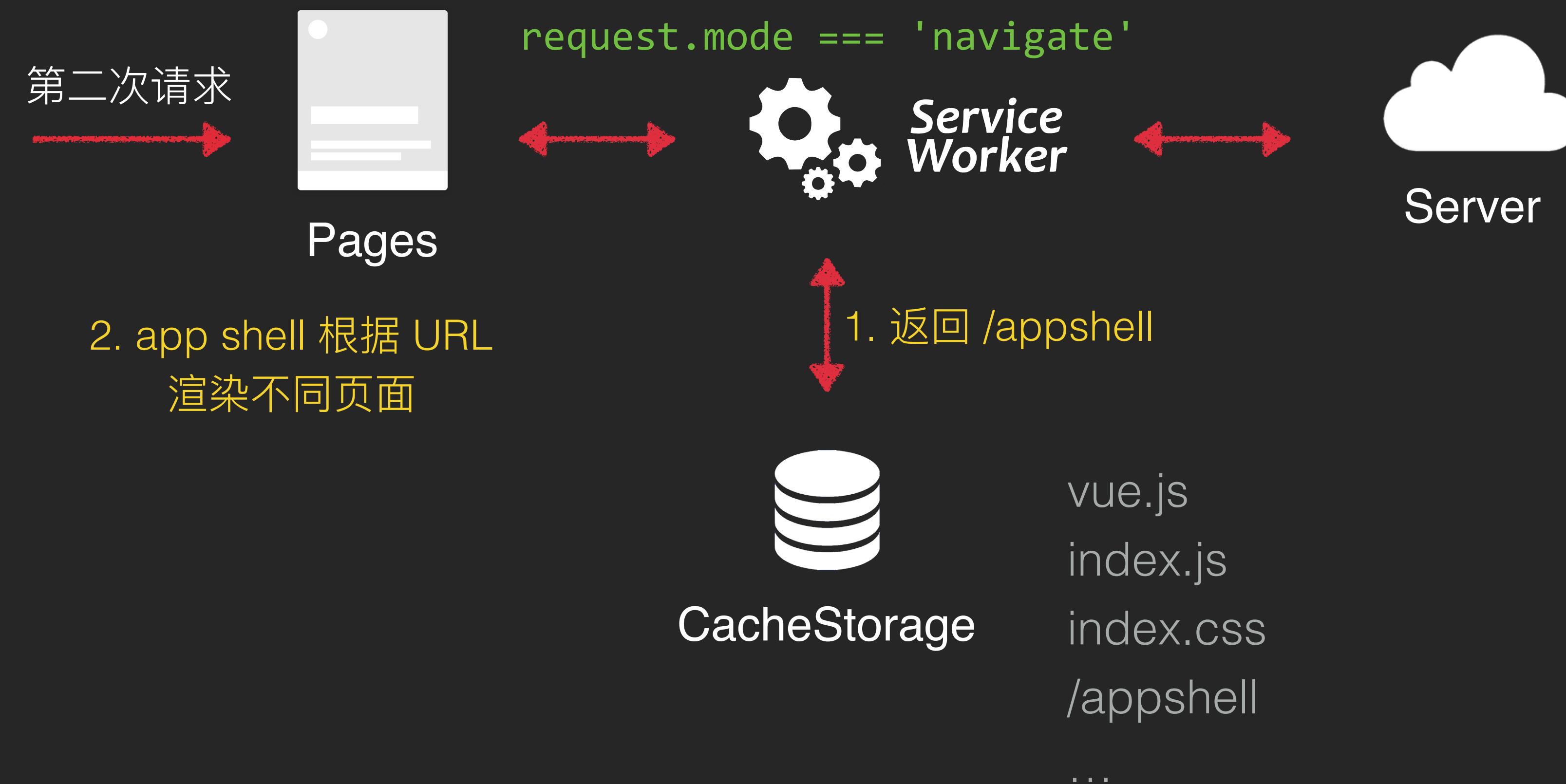
Server Side Rendering(SSR)

Service Worker 如何离线 SSR 站点?

# SSR 如何使用 Service Worker

# SSR + Service Worker + App Shell





# SSR + Service Worker + App Shell

- 采用 SSR 的站点也能完全离线
- 缩短白屏时间
- 解决 SEO 的问题
- 大幅降低服务器的压力

# 学习资源

- <https://www.w3.org/TR/service-workers-1>
- <https://developers.google.com/web/fundamentals/getting-started/primers/service-workers>
- <https://lava.baidu.com/doc/offline-and-cache-loading/service-worker/service-worker-introduction>
- <https://lava.baidu.com/guide/vue/doc/vue/webpack/sw-register-webpack-plugin>
- <https://github.com/GoogleChrome/workbox>



GitHub  
[lavas-project/lavas](https://github.com/lavas-project/lavas)



开发者QQ群  
655433298



官方网站  
<https://lavas.baidu.com/>



Thanks!