Experiment No. 8

Aim : To code and register a service worker, and complete the install and activation process for a new service worker for the E-commerce PWA.

Theory :

Service Worker

Service Worker is a script that works on browser background without user interaction independently. Also, It resembles a proxy that works on the user side. With this script, you can track network traffic of the page, manage push notifications and develop “offline first” web applications with Cache API.

1. Network Proxy:

    - Service workers act as an intermediary between your web page and the network.
    - They intercept all outgoing HTTP requests made by your application.They can choose how to handle these requests:
    - Serve content from a local cache if available.

2. Offline Capabilities:

    - Service workers enable offline functionality by allowing caching of essential application resources (HTML, CSS, JavaScript, images).
    - When a user is offline, the service worker can retrieve the requested content from the cache, providing a seamless experience even without an internet connection.

3. HTTPS Requirement:

    - Due to security concerns, service workers can only function on HTTPS connections.

- This ensures secure communication between the service worker, your application, and the server.

What can we do with Service Workers?

- You can dominate Network Traffic

You can manage all network traffic of the page and do any manipulations. For example, when the page requests a CSS file, you can send plain text as a response or when the page requests an HTML file, you can send a png file as a response. You can also send a true response too.

- You can Cache

You can cache any request/response pair with Service Worker and Cache API and you can access these offline content anytime.

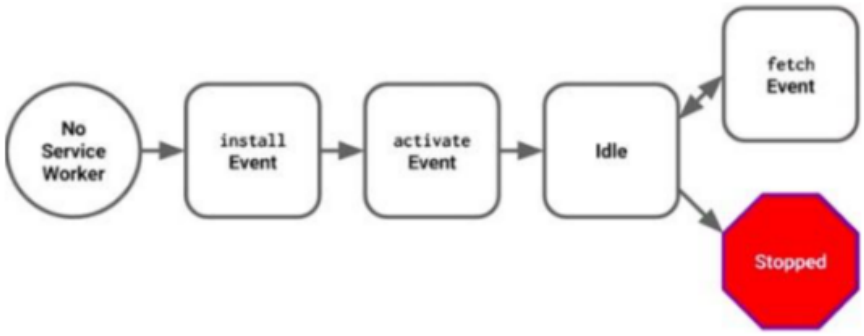
- You can manage Push Notifications

You can manage push notifications with Service Worker and show any information message to the user.

- You can Continue

Although Internet connection is broken, you can start any process with Background Sync of Service Worker.

Service Worker Cycle



Steps for coding and registering a service worker for your E-commerce PWA completing the install and activation process:

1. Create the Service Worker File (sw.js):

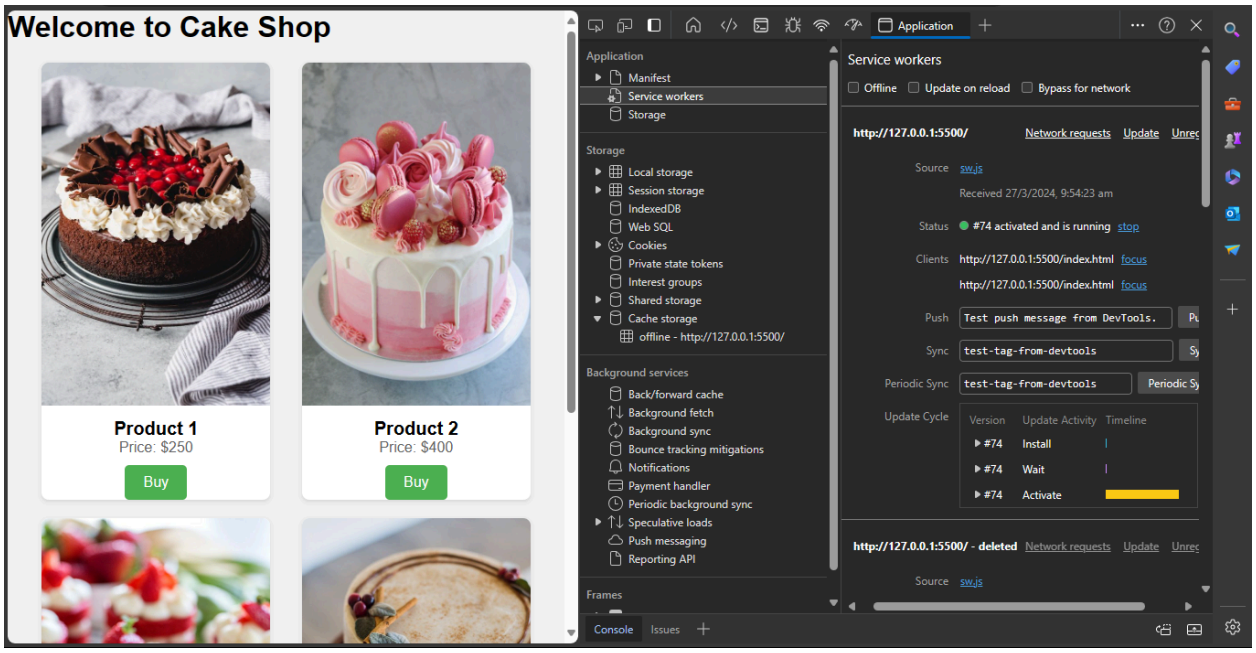
```
JS sw.js > ...
1   self.addEventListener("install", function (event) { event.waitUntil(preLoad());
2   });
3
4   var filesToCache = ['/index.html',
5   ];
6
7   var preLoad = function () {
8   return caches.open("offline").then(function (cache) {
9   // caching index and important routes
10  return cache.addAll(filesToCache);
11  });
12  };
13
14  self.addEventListener("fetch", function (event) { event.respondWith(checkResponse(event.request).
15  return returnFromCache(event.request);
16  }));
17  event.waitUntil(addToCache(event.request));
18  });
19
20  var checkResponse = function (request) { return new Promise(function (fulfill, reject) {
21  fetch(request).then(function (response) { if (response.status !== 404) {
22  fulfill(response);
23
24
25  } else {
26  reject();
27  }
28  } reject);
```

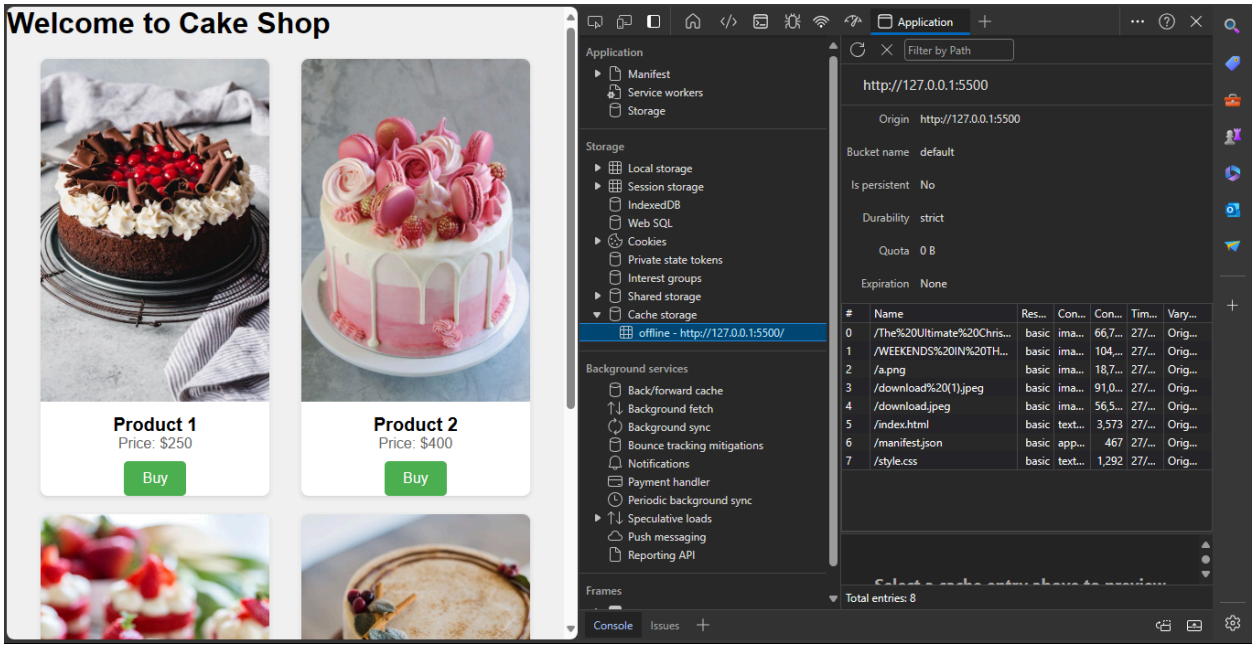
2. Register the Service Worker:

In your main JavaScript file (e.g., main.js or app.js), add the following code:

```
// Check if browser supports service workers
if (navigator.serviceWorker) {
    console.log("Service Worker Supported");

    // Start registration process on page load
    window.addEventListener("load", () => {
        navigator.serviceWorker

            // The register function takes as argument
            // the file path to the worker's file
            .register("./sw.js")

            // Gives us registration object
            .then(reg => console.log("Service Worker Registered"))
            .catch(swErr => console.log(
              `Service Worker Error: ${swErr}}`));
    });
}
```

Output





Conclusion : I have understood and successfully registered a service worker, and completed the install and activation process for a new service worker for the E-commerce PWA.