Experiment No. 9

Aim: To implement Service Worker events like fetch, sync, and push for an E-commerce Progressive Web Application (PWA).

Theory:

Service Worker:
A Service Worker is a script operating in the background of a browser without user interaction, akin to a proxy on the user's side. It facilitates tracking network traffic, managing push notifications, and developing "offline-first" web applications using Cache API.

Key Points about Service Worker:

- It acts as a programmable network proxy to control how page network requests are handled.
- Service workers function exclusively over HTTPS to mitigate potential "man-in-the-middle" attacks.
- They become idle when not in use and restart when needed. Global states do not persist between events, but IndexedDB databases can be utilized for persistent data.
- Extensive use of promises is made, making familiarity with promises crucial for effective implementation.

Fetch Event:
This event enables tracking and management of page network traffic. It offers flexibility in managing "cache first" and "network first" requests.

- CacheFirst: If the requested content is cached, the cached response is returned; otherwise, a new response is fetched from the network.
- NetworkFirst: Attempts to retrieve an updated response from the network; if unsuccessful, checks for cached responses. If no cache exists, customizable actions can be taken, such as returning dummy content or informational messages.

Sync Event:
Background Sync, a Web API, defers processes until a stable internet connection is available. This concept can be likened to sending an email in an email client application when the internet connection is unreliable.

Push Event:
Handles push notifications received from the server. The example demonstrates a straightforward approach of displaying a notification when a "pushMessage" method is received.

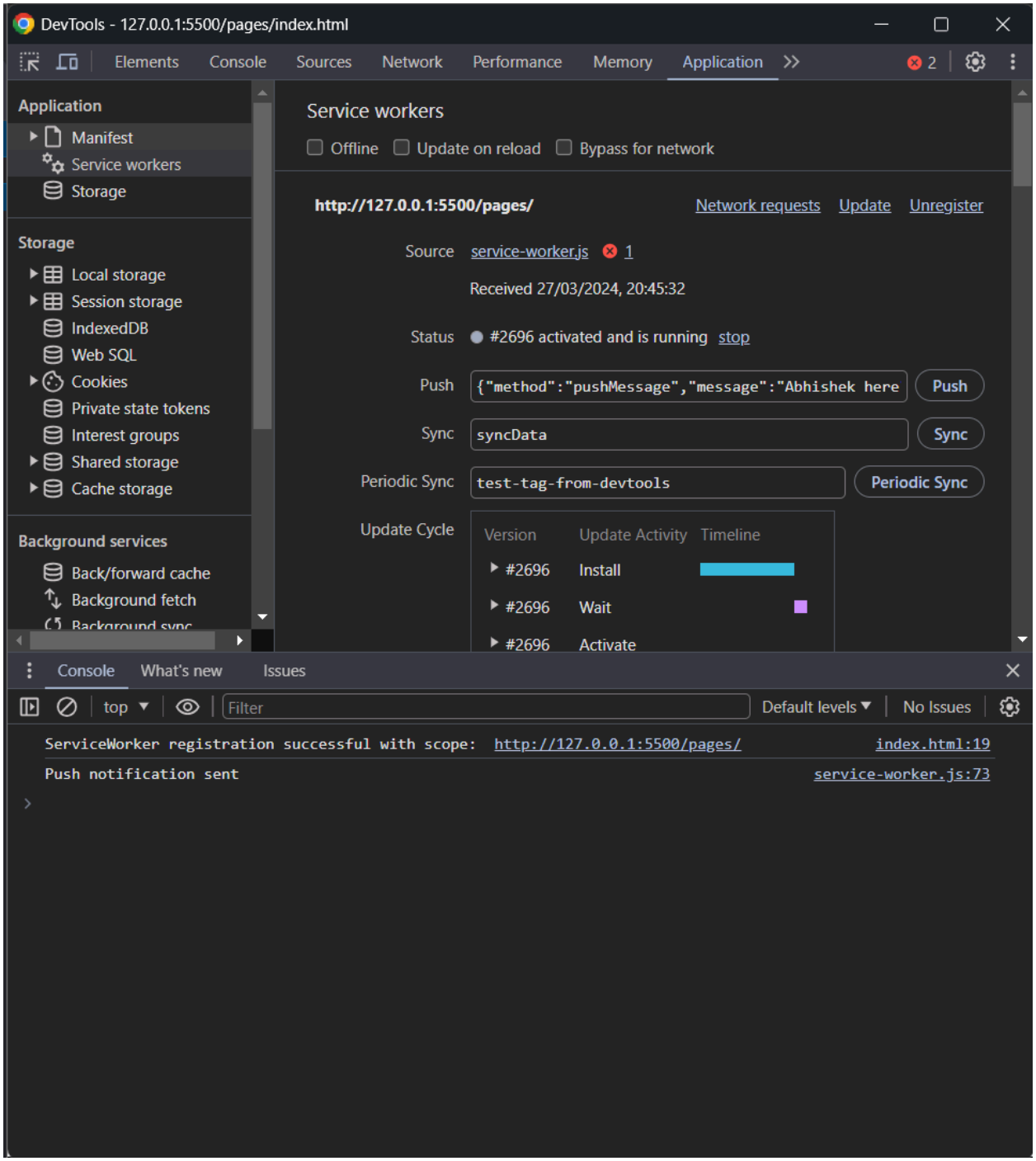
Code: sw.js

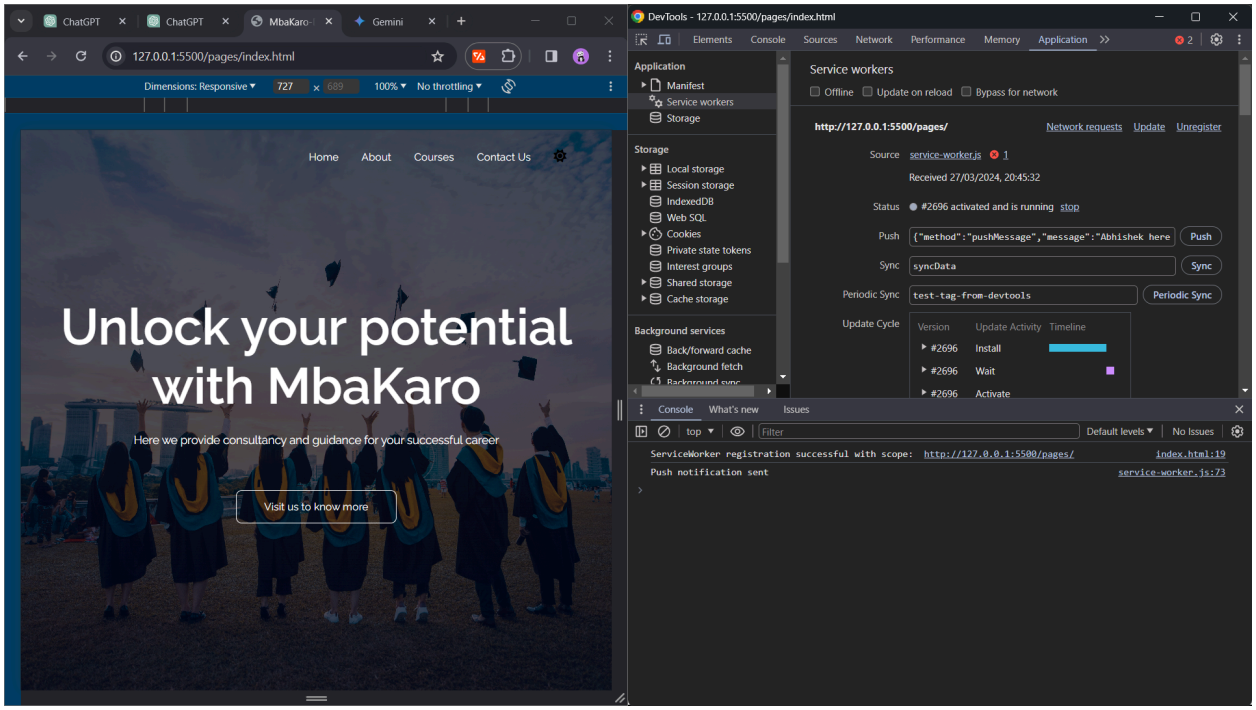
```
var filesToCache = [
    '/pages/index.html',
    '/styles/style.css',
    '/images/Work.png',
    '/manifest.json',
    '/offline.html', // Add the offline page to be cached
    // Add other files and routes you want to cache here
];

// Function to cache files during installation
var preLoad = function() {
    return caches.open("ecommerce-app").then(function(cache) {
        return cache.addAll(filesToCache);
    });
};

// Service Worker installation event
self.addEventListener("install", function(event) {
    event.waitUntil(preLoad());
});

// Service Worker fetch event// Service Worker fetch event
self.addEventListener("fetch", function(event) {
    event.respondWith(
        // Check if request is in cache
        caches.match(event.request).then(function(response) {
            // If request is found in cache, return it
            if (response) {
                return response;
            }
            // If request is not found in cache, fetch it from the network
            return fetch(event.request).then(function(response) {
                // Check if the request URL scheme is supported for caching
                if (!event.request.url.startsWith('http')) {
                    return response;
                }
                // Clone the response to cache it
                var responseToCache = response.clone();
                // Cache the fetched response for future use
                caches.open("ecommerce-app").then(function(cache) {
                    cache.put(event.request, responseToCache);
```

```
            });
            return response;
        }).catch(function() {
            // If fetching from network fails, return the offline page
            return caches.match("/offline.html");
        });
    })
  );
});


// Service Worker sync event
self.addEventListener('sync', function(event) {
  if (event.tag === 'syncData') {
    event.waitUntil(syncData());
  }
});

// Function to synchronize data in the background
function syncData() {
  // Implement data synchronization logic here
  // For example, send pending orders to the server
}

// Service Worker push event
// Service Worker push event
self.addEventListener('push', function(event) {
  if (event && event.data) {
    var data = event.data.json();
    if (data.method === "pushMessage") {
      console.log("Push notification sent");
      // Request permission to show notifications
      self.registration.showNotification("Abhishek's MBAKAro", {
        body: data.message
      });
    }
  }
});
```

Output:
- Fetch event
- Sync event
- Push event

o/p:


DevTools - 127.0.0.1:5500/pages/index.html
Elements
Console
Sources
Network
Performance
Memory
Application
Application
Manifest
Service workers
Storage
Storage
Local storage
Session storage
IndexedDB
Web SQL
Cookies
Private state tokens
Interest groups
Shared storage
Cache storage
Background services
Back/forward cache
Background fetch
Service workers
Offline
Update on reload
Bypass for network
http://127.0.0.1:5500/pages/
Network requests
Update
Unregister
Source
service-worker.js
1
Received 27/03/2024, 20:45:32
Status
#2696 activated and is running
stop
Push
{"method":"pushMessage","message":"Abhishek here
Push
Sync
syncData
Sync
Periodic Sync
test-tag-from-devtools
Periodic Sync
Update Cycle
Version
Update Activity
Timeline
#2696
Install
#2696
Wait
#2696
Activate
Console
What's new
Issues
top
Filter
Default levels
No Issues
ServiceWorker registration successful with scope: http://127.0.0.1:5500/pages/
index.html:19
Push notification sent
service-worker.js:73



Conclusion:

The implementation and understanding of Service Worker events like fetch, push, and sync have been successfully achieved for our e-commerce PWA.