MOBIGOGO

Work at the speed of *mobility*

IBM i

Go Mobile without Creating a Mobile App

Your Presenter

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- **I eat new technology for breakfast**
- 30+ years of IBM i and multi-platform development
- Founded and sold RJS Software Systems
- Created automated report distribution, document management, forms, workflow and app integration software
- **MOBIGOGO – multiplatform app development and consulting**
- Process automation, web and mobile app development and integration consulting
- App modernization and open-source training
- **iForGit – Eliminate Awkward Git Integration on IBM i**
- Open-source contributor
- **Learn something new every day**

Session Topics

- Why do we need mobile apps ?
- What types of mobile apps are there
- How to create mobile apps without becoming a mobile expert
- Sample app use cases
- Demo

Reasons for Mobile Enabled Apps

- Field service
- Order entry
- Equipment inspections
- Property inspections
- Deliveries
- Improve efficiency/lower costs

For IBM i Sites

- Need to modernize existing green screen apps
- Want to create browser-based apps
- May need mobile apps – warehouse, field service, etc.
- Re-use existing database and RPG/CL/COBOL logic
- Create new business logic in new languages – Python, Node, PHP, etc.
- Provide better overall user experience

Types of Mobile Access

- Always Online
- Partially Online
- Always Offline

Always Online

- Standard web site programming
- HTML/CSS/JavaScript
- Use responsive framework such as (Bootstrap)
- Internet always available
- Mobile hotspot or wi-fi access

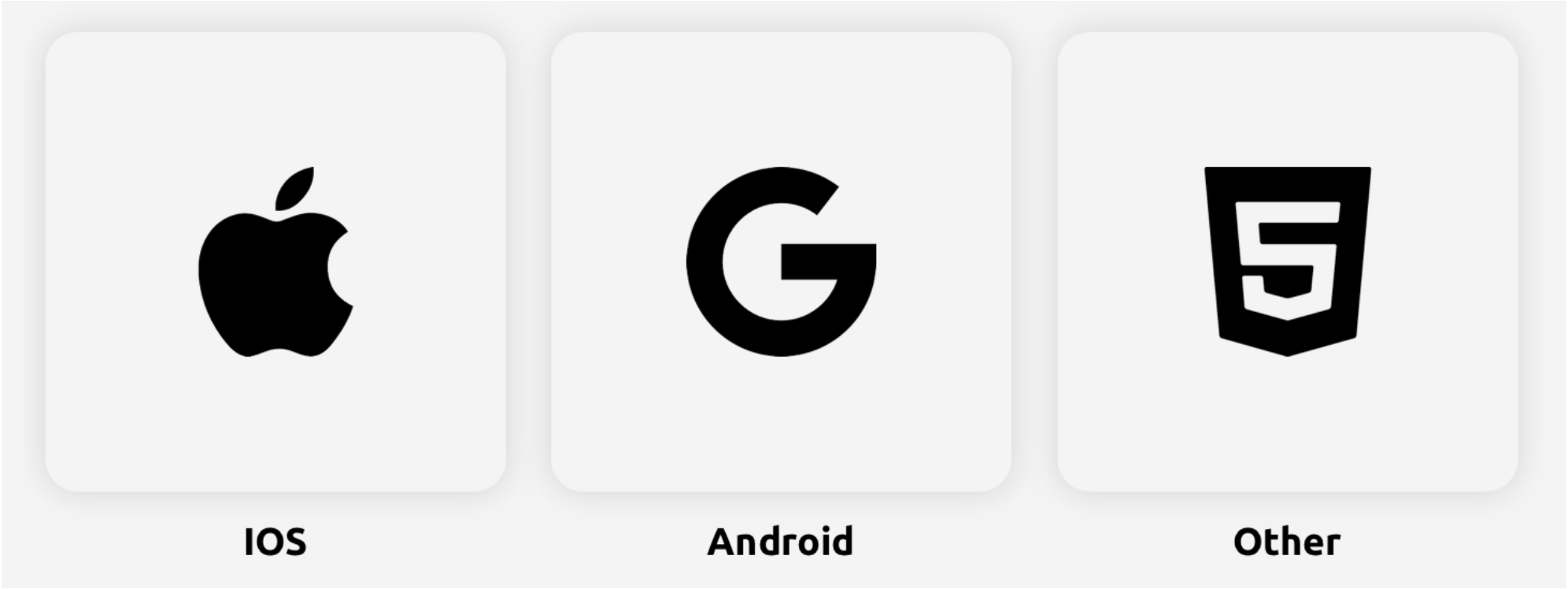
Partially Online

- Need to load information to device
- Store changes temporarily
- Sync changes when online
- Standard web site programming or device specific
- Internet NOT always available

Almost Always Offline

- Need to load information to device
- Store changes up to 24 hours or longer
- Sync changes when online
- Perform work fully offline
- Standard web site programming or device specific
- Internet NOT always available

Which Device Platforms to Support ?



Desktops, Laptops, Chromebooks

Types of Mobile Apps

- Native Mobile Apps/Platform Specific
- Native Cross Platform Development
- Web Apps
- Progressive Web Apps
- Hybrid Apps (Web and Mobile)

Native App Frameworks

- Objective C
- Swift
- Flutter
- React Native
- Ionic
- Xamarin/.Net Maui
- Mobile Angular
- Phonegap/Cordova

HTML App Frameworks

- React
- Vue
- Angular
- Bootstrap
- .Net Blazor
- HTML/CSS/JS
- Others

Mobile App Categories

- **Native Apps:** A Native App is an application specifically designed for a particular platform or device.
- **Web Apps:** A Web App is concerned with an application that is designed to deliver web pages on different web platforms for any device.
- **Hybrid Apps:** A Hybrid App is a combination of both native & web applications. It can be developed for any platform from a single code base.

For Today's Discussion

- **Web Apps:** A Web App is concerned with an application that is designed to deliver web pages on different web platforms for any device.

- **Hybrid Apps:** A Hybrid App is a combination of both native & web applications. It can be developed for any platform from a single code base.

- Hybrid web apps are generally HTML sites wrapped to use **WebView control** on device

Offline Friendly Web Apps

- **Single Page Apps (SPA):**
  High performance, low maintenance, offline functionality

- **Progressive Web App (PWA) :**
  Fast, cost-effective, offline access, auto-updates, easy installation.

- Similar, but **offline capability** is common thread

- We will focus on PWA apps for this discussion

Progressive Web Apps (PWAs)

- Applications that you build by using **web technologies**.
- Can be installed and can run on all devices, from **one codebase**.
- Provide **native-like experiences** to your users on supported devices
- **Adapt** to the capabilities supported by each device
- **Can** also **run in web browsers**, like websites.

PWA Benefits

PWAs have access to advanced capabilities. For example:

- PWAs can continue working when the device is **offline**.
- PWAs support **push notifications**.
- PWAs can perform **periodic updates** even when the application is not running.
- PWAs can access **hardware features**.

Web Related Advantages

PWAs can run in web browsers, just like web sites. Advantages:

- PWAs can be **indexed** by search engines.
- PWAs can be shared and launched from a **standard web link**.
- PWAs are safe for users because they use secure **HTTPS endpoints** and other user safeguards.
- PWAs **adapt** to the user's screen size or orientation, and input method.
- PWAs can use **advanced web APIs** such as WebBluetooth, WebUSB, WebPayment, WebAuthn, or WebAssembly and your own services.

Lower Development Costs

- PWAs have a **much lower cross-platform development cost** than compiled apps
- Single codebase vs native apps.
- Native apps have codebase for **Android, iOS, desktop OS**, etc.
- With a PWA, you can use a **single codebase** that's shared between your website, mobile app, and desktop app (across operating systems).

Cross Device Compatability

- PWA apps Built using **HTML, CSS, and JavaScript**
- Hosted on **web servers**
- Run in **web browsers** like web site
- Can download and **install on a device**

Developing Mobile Web Apps

- Microsoft VS Code
- Microsoft Visual Studio 2022
- Web Storm
  https://www.jetbrains.com
- NSB/AppStudio
  https://www.appstudio.dev

Compiling Hybrid Apps

- Adobe Phonegap
- Apache Cordova
- CapacitorJS
- Volt.Builder
- Outputs native Android and iOS apps

Database/Local Storage/Offline

- SQLite/Wasm
- IndexedDB
- Local Storage
- Session Storage
- 10 mb max unless compiled native
- I believe native compiled HTML apps can use **unlimited storage**

Mobile Web Apps

- Easy to create
- Use HTML, CSS and JS
- Assumption of always being on-line

Native Mobile Apps

- Have to use specific toolsets
- Objective C
- Flutter
- Android Studio
- Etc…….

Hybrid Mobile Apps

- Easy to create
- Use HTML, CSS and JS
- Use Cordova or Capacitor to native compile
- Can use all native phone features
- iOS or Android

Hybrid Web Apps-PWA

- Progressive Web Apps
- Use HTML, CSS and JS
- Can be online or offline
- Data can be cached locally

Sample PWA Mobile App Use Cases

Mobile App Deployment Scenarios

- Talk directly to back-end system like IBM i
- Talk to cloud server and have IBM i pick up data from cloud site
- Perform all work in cloud and file transfer data to IBM i
- Some customers don’t want to expose IBM I directly to web

Mobile Dishwasher Servicing

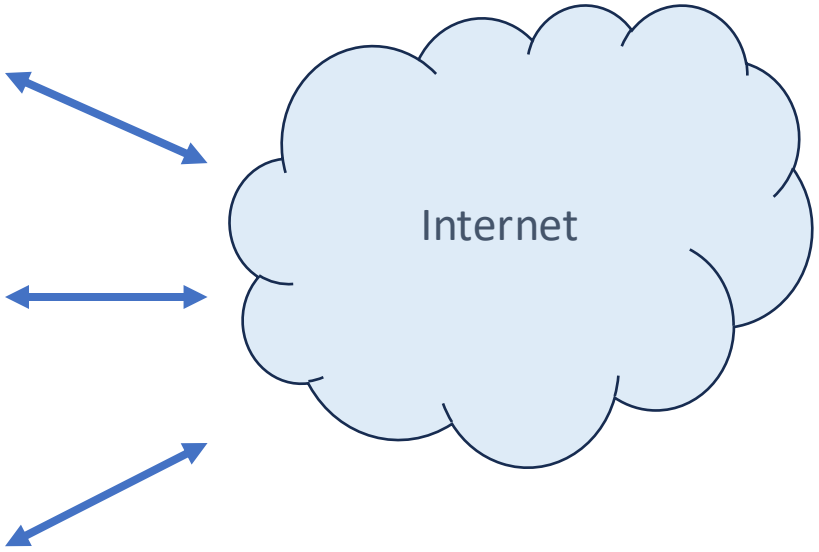
- Employee goes to customer site
- Reviews chemical usage
- Enters usage numbers
- Data saved temporarily to device
- Or data immediately sent back to IBM i (if online)
- Used to be done with paperwork
- Keying validated and invoicing delays eliminated

MOBIGOGO
Work at the speed of *mobility*

IBM i

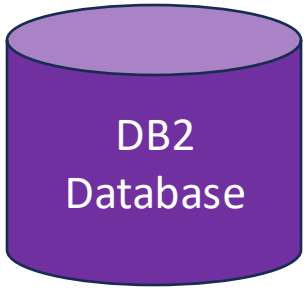
Mobile Dishwasher Servicing

Windows
Laptops



https

Web Service Server
NGINX
Python Fast API



Mobile Route Servicing

- Employee loads route information to their device
- Goes to each site and does delivery and pickup
- Today they fill out paperwork
- Paperwork gets shipped back to corporate HQ
- Information currently keyed into IBM i billing system
- Creating an app to allow all route entry to happen offline
- Data can be synced. On demand.
- Paperwork and paperwork shipping costs will be eliminated

Mobile Route Servicing

Android
Tablets

Internet

https/sftp

RPG/CL Making Outbound
https or sftp Calls
IBM i Not Exposed to Web

DB2
Database

https/sftp

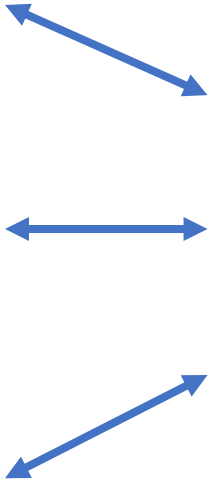
Devices talk to cloud
IBM i talks to cloud

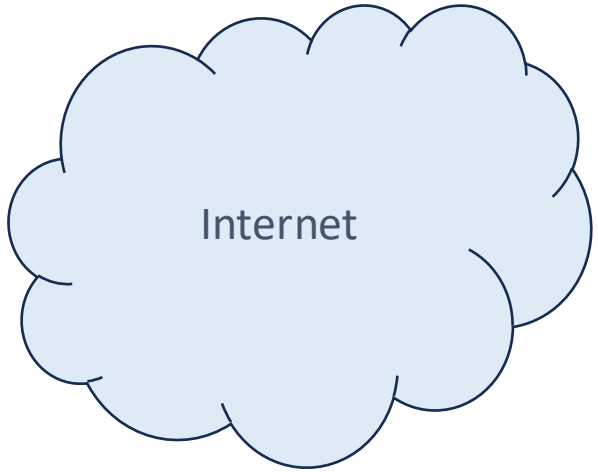
Postgres or
MariaDB
Database

Sample App Demo

Single Page App

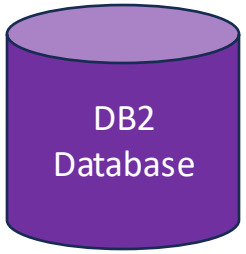
HTML Single Page App
Tablets, Phones
Desktop Browsers



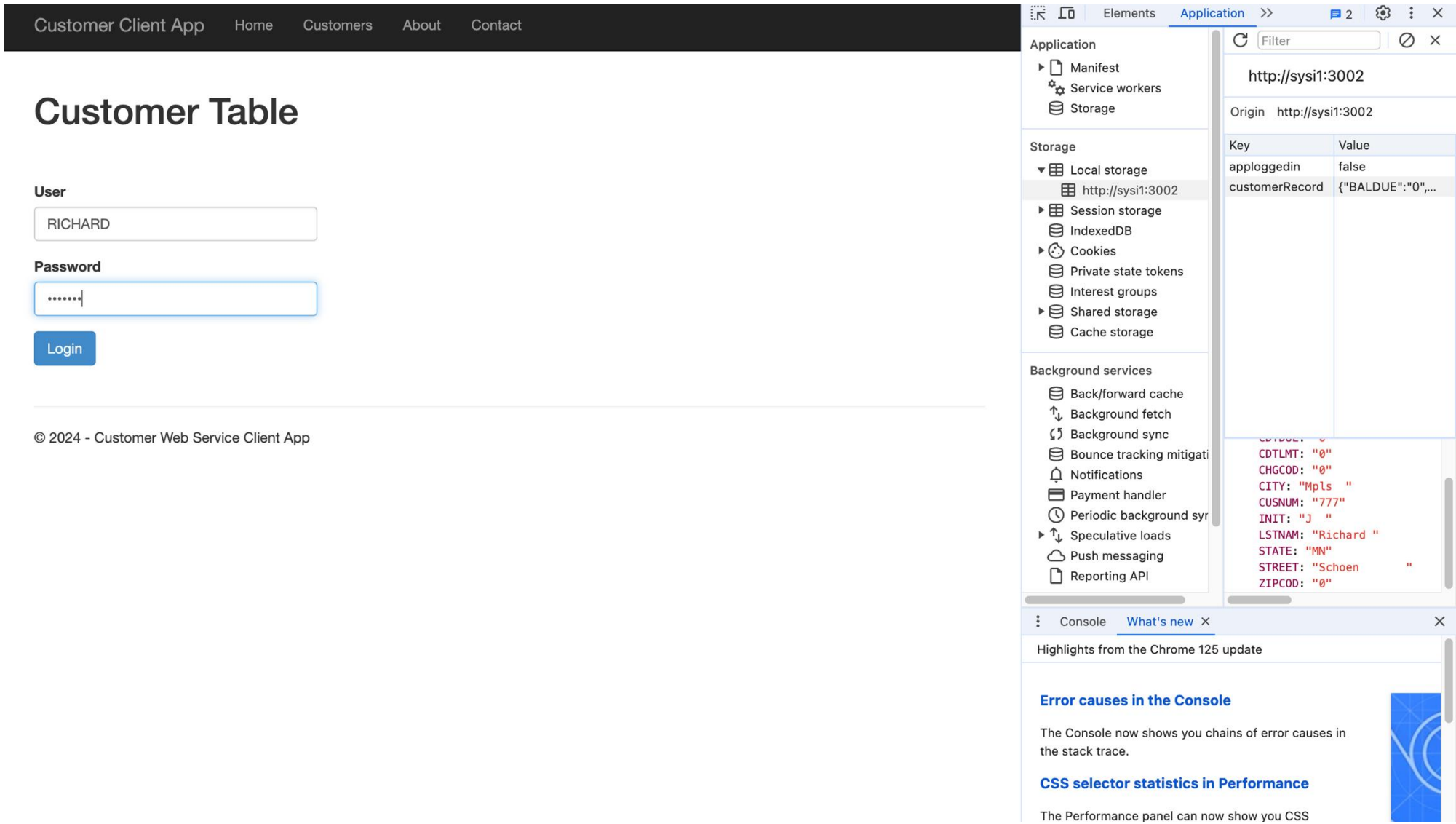


App Served on
http port 3002
Web Service on
http port 3001

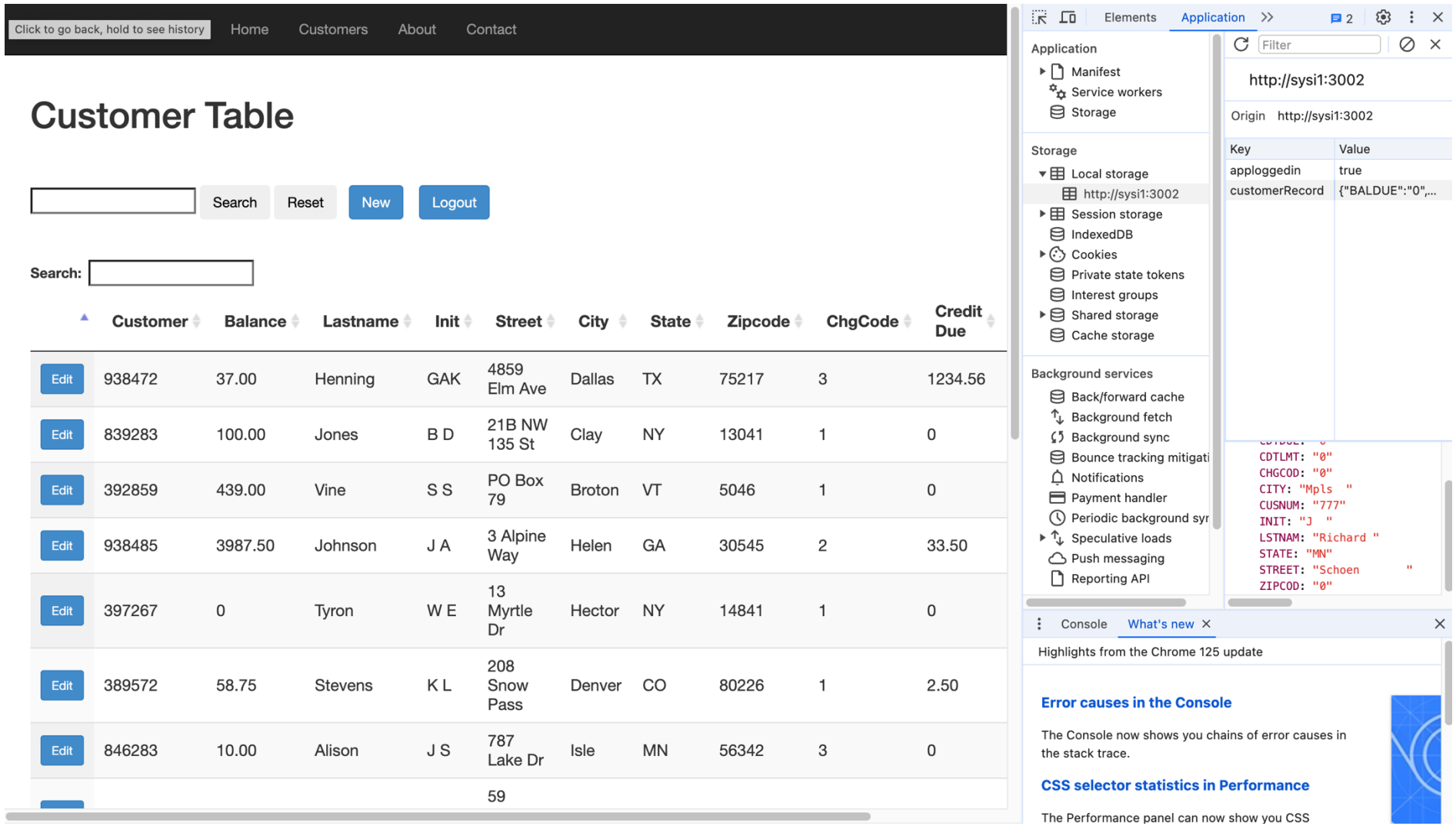
2 Python Services
One Serving Web Service
One Serving the HTML App



Log in


Customer Client App
Home
Customers
About
Contact
Customer Table
User
RICHARD
Password
Login
© 2024 - Customer Web Service Client App
Elements
Application
Application
Manifest
Service workers
Storage
Storage
Local storage
http://sysi1:3002
Session storage
IndexedDB
Cookies
Private state tokens
Interest groups
Shared storage
Cache storage
Background services
Back/forward cache
Background fetch
Background sync
Bounce tracking mitigati
Notifications
Payment handler
Periodic background syr
Speculative loads
Push messaging
Reporting API
Filter
http://sysi1:3002
Origin http://sysi1:3002
Key
Value
apploggedin
false
customerRecord
{"BALDUE":"0",...
CDTLMT: "0"
CHGCOD: "0"
CITY: "Mpls "
CUSNUM: "777"
INIT: "J "
LSTNAM: "Richard "
STATE: "MN"
STREET: "Schoen "
ZIPCOD: "0"
Console
What's new
Highlights from the Chrome 125 update
Error causes in the Console
The Console now shows you chains of error causes in the stack trace.
CSS selector statistics in Performance
The Performance panel can now show you CSS

Logged In


Click to go back, hold to see history
Home
Customers
About
Contact
Customer Table
Search
Reset
New
Logout
Search:
Customer
Balance
Lastname
Init
Street
City
State
Zipcode
ChgCode
Credit Due
Edit 938472 37.00 Henning GAK 4859 Elm Ave Dallas TX 75217 3 1234.56
Edit 839283 100.00 Jones B D 21B NW 135 St Clay NY 13041 1 0
Edit 392859 439.00 Vine S S PO Box 79 Broton VT 5046 1 0
Edit 938485 3987.50 Johnson J A 3 Alpine Way Helen GA 30545 2 33.50
Edit 397267 0 Tyron W E 13 Myrtle Dr Hector NY 14841 1 0
Edit 389572 58.75 Stevens K L 208 Snow Pass Denver CO 80226 1 2.50
Edit 846283 10.00 Alison J S 787 Lake Dr Isle MN 56342 3 0
59
Elements
Application
Application
Manifest
Service workers
Storage
Storage
Local storage
http://sysi1:3002
Session storage
IndexedDB
Cookies
Private state tokens
Interest groups
Shared storage
Cache storage
Background services
Back/forward cache
Background fetch
Background sync
Bounce tracking mitigati
Notifications
Payment handler
Periodic background syr
Speculative loads
Push messaging
Reporting API
Filter
http://sysi1:3002
Origin http://sysi1:3002
Key
Value
apploggedin
true
customerRecord
{"BALDUE":"0",...
CDTLMT: "0"
CHGCOD: "0"
CITY: "Mpls "
CUSNUM: "777"
INIT: "J "
LSTNAM: "Richard "
STATE: "MN"
STREET: "Schoen "
ZIPCOD: "0"
Console
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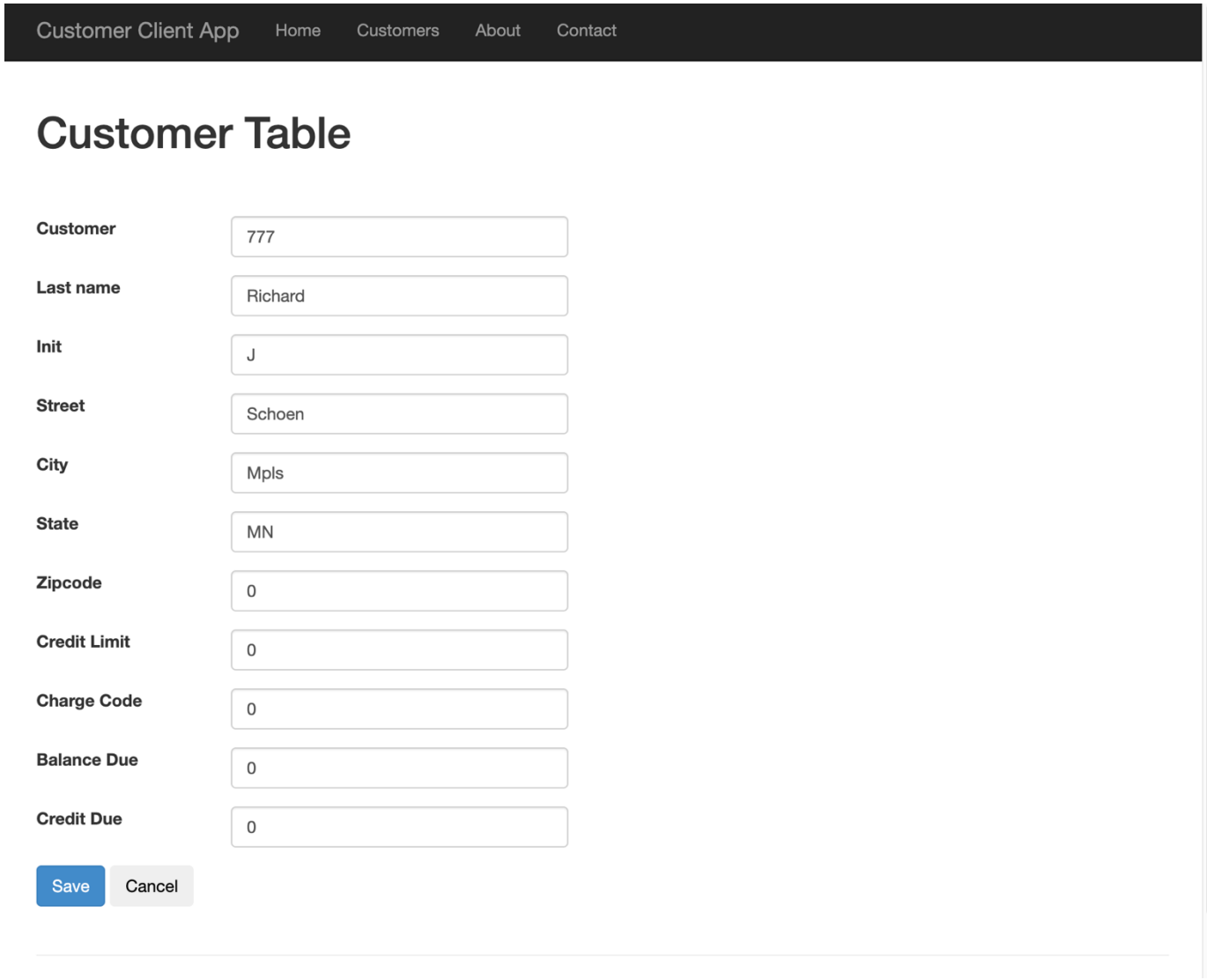
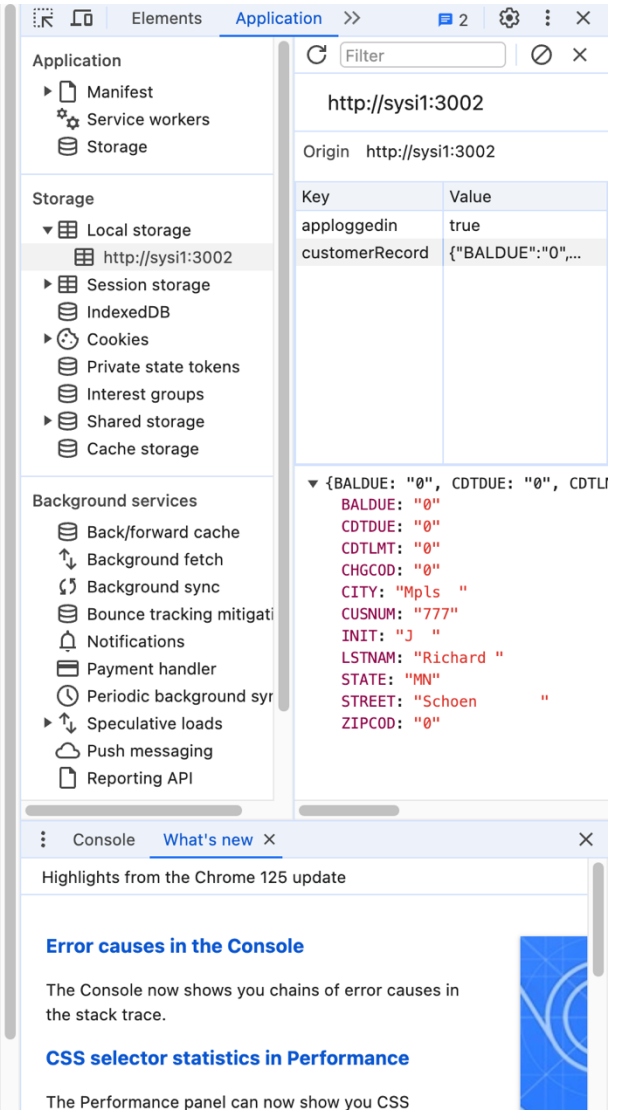
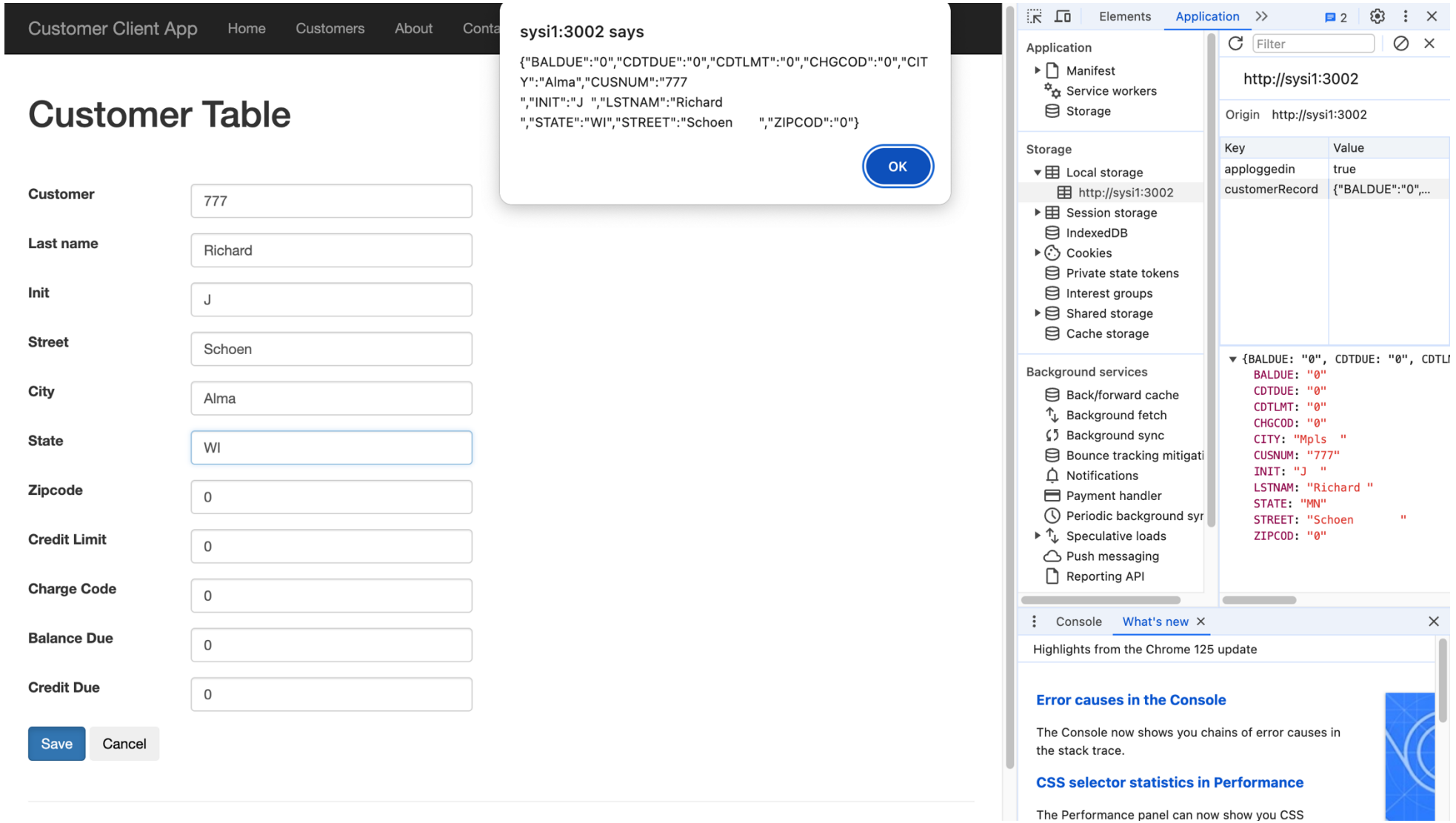
Selected Record Loaded to Local Storage



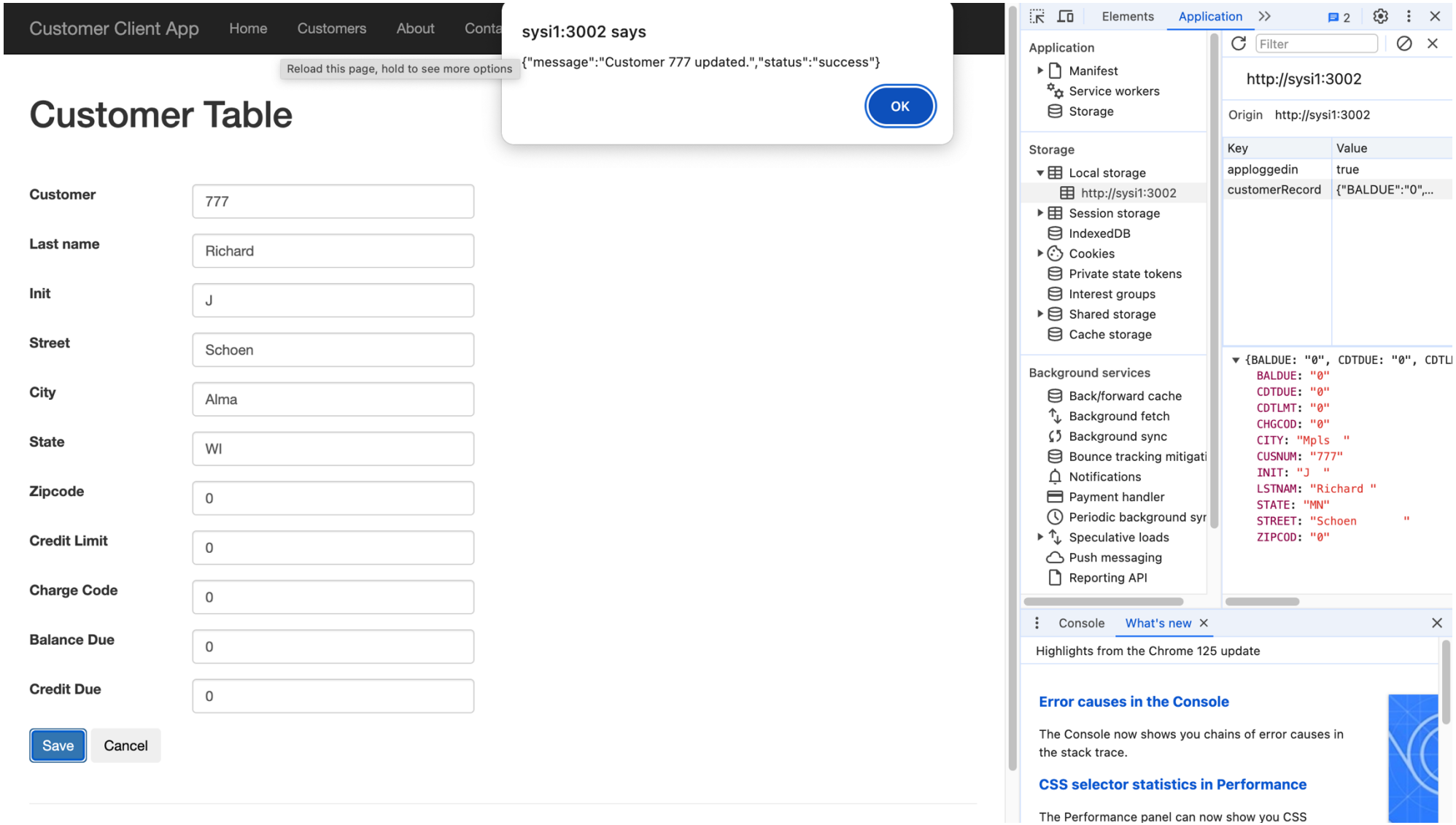


IBM i

JSON Data Update to IBM i



JSON API Response After Update

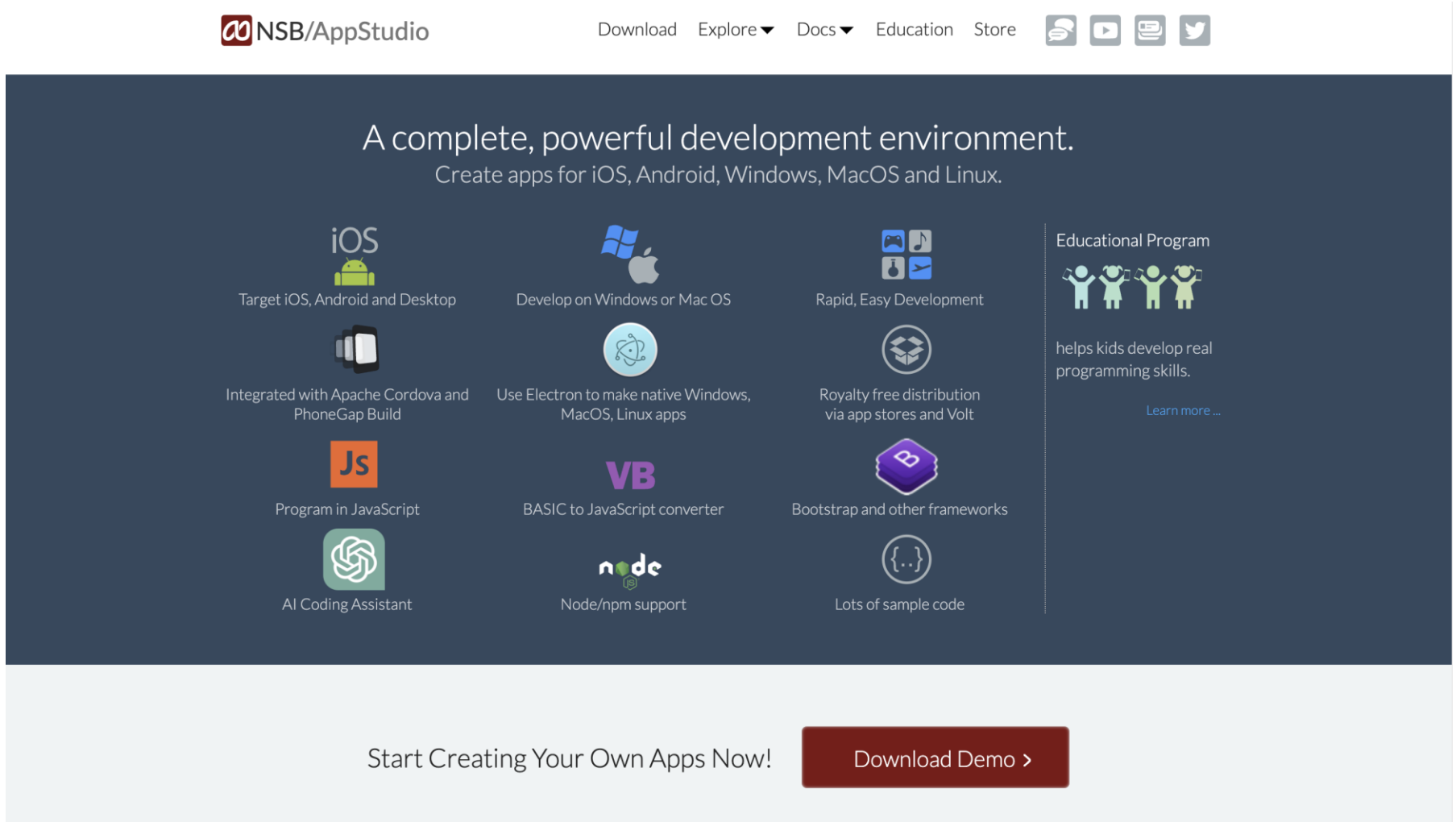


Sample App Summary

- Uses browser local storage to cache data
- Local storage caches login session info
- IBM i stores login info in session table
- Could be configured to be served fully offline by storing data in local storage

App Studio Demo

App Studio

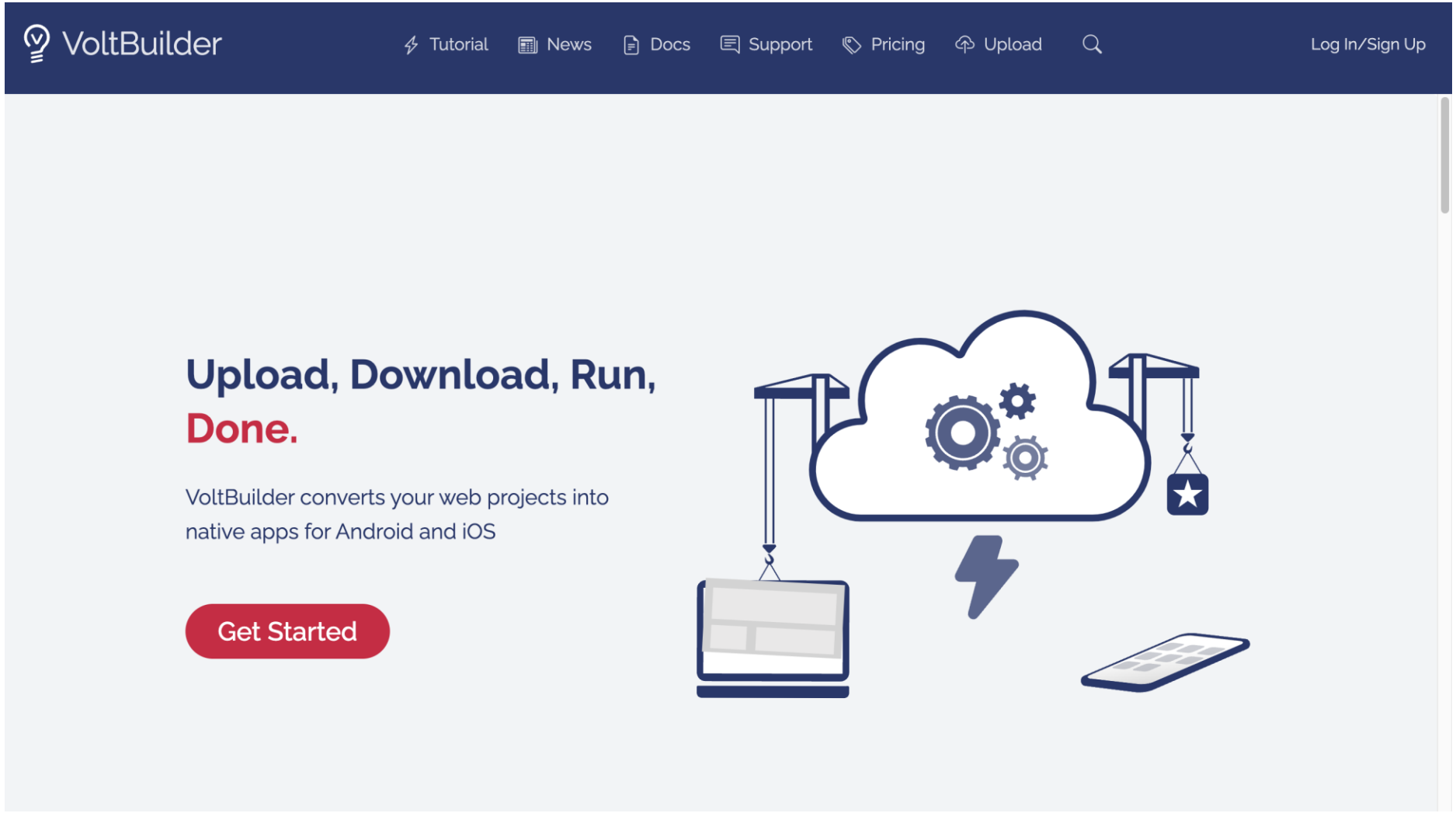


https://appstudio.dev

App Studio

- Visually create apps for multiple platforms
- Target Android, iOS and Desktop
- Create Electron Native Apps
- Bootstrap framework
- Bring your own custom javascript and components
- Low monthly subscription

Volt Builder



https://volt.build

Learning Links

- Search: **pwa app development learning**
- PWA Tutorials from Google
  https://developers.google.com/web
- MDN hs great new PWA guides (+ regular docs)
  https://developer.mozilla.org/enUS/docs/Web/Progressive_web_apps
- Service Worker Cookbook (copy/paste examples)
  https://serviceworke.rs/#google_vignette
- Microsoft – PWA Presentations
  https://microsoft.github.io/workshop-library/full/mood-journal-progressive-web-app/1-create-pwa.html

Let's Connect on Social Media

- Github: http://github.com/richardschoen
- MobiGoGo Business site: http://www.mobigogo.net

  (PWA web app training, Consulting or iForGit 5250 git client for managing classic RPG and CL source versioning)
- Personal site: http://www.richardschoen.net
- LinkedIn: https://www.linkedin.com/in/richardschoen
- Twitter/X: @richardschoen
- Blog: http://blog.richardschoen.net
- iForgit IBM i Git Client for SEU/PDM, RDI and VS Code: http://www.iforgit.com
- Email: richard@richardschoen.net –or- richard@mobigogo.net

What You Learned

- Intro to Progressive web apps for offline and partially offline web apps
- Things to consider for PWA development
- Can use standard HTML/CSS/JS skillsets
- Reach out with questions or mobile consulting needs

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