Mobile Application Development

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Database

Overview – What is it?

- The **Firebase Realtime Database** is a cloud-hosted database
- Data is stored as JSON (NOSQL db) and synchronized in *real-time* to every connected client
- When you build cross-platform apps with their iOS, Android, and JavaScript SDKs, all of your clients share one Realtime Database instance and automatically receive updates with the newest data
- Data even remains available when your app goes offline

Overview – Key Capabilities

- Realtime
  - Instead of typical HTTP requests, the Firebase Realtime Database uses data synchronization—every time data changes, any connected device receives that update within milliseconds. Provide collaborative and immersive experiences without thinking about networking code
- Offline
  - Firebase apps remain responsive even when offline because the Firebase Realtime Database SDK persists your data to disk. Once connectivity is reestablished, the client device receives any changes it missed, synchronizing it with the current server state

Overview – Key Capabilities

- Accessible from Client Devices
  - The Firebase Realtime Database can be accessed directly from a mobile device or web browser; there's no need for an application server. Security and data validation are available through the Firebase Realtime Database Security Rules, expression-based rules that are executed when data is read or written.
- Scale across multiple Databases (Blaze Pricing Plan)
  - Support your app's data needs at scale by splitting your data across multiple database instances in the same Project. Streamline authentication with Firebase Auth on your project and authenticate users across your database instances. Control access to the data in each database with custom Rules for each database instance.

Overview – How it Works

- The Firebase Realtime Database lets you build rich, collaborative applications by allowing secure access to the database directly from client-side code
- Data is persisted locally, and even while offline, real-time events continue to fire, giving the end user a responsive experience
- When the device regains connection, the Realtime Database synchronizes the local data changes with the remote updates that occurred while the client was offline, merging any conflicts automatically

Implementation Pathway (Generally)

- Integrate the Firebase Realtime Database SDKs
  - Quickly include clients via Gradle
- Create Realtime Database References
  - Reference your JSON data, to set data or subscribe to data changes
- Set Data and Listen for Changes
  - Use these references to write data or subscribe to changes
- Enable Offline Persistence
  - Allow data to be written locally so it can be available while offline
- Secure your data
  - Use Firebase Realtime Database Security Rules to secure your data.

In a Nutshell

- Unlike RDBMS, data is stored as JSON. It is a no-SQL JSON database
- What makes it real time it its ability to notify listeners of any change in data
- Whenever any change is made in the JSON database structure, the firebase SDK notifies all connected devices
- You can forget about REST API calls, connectivity checks, 3rd party libraries and polling

The Core Magic Of Firebase

References

https://console.firebase.google.com/
https://firebase.google.com/
https://github.com/firebase/quickstart-android


Thanks.