

Domain Model

Model	Fields
User	id (str), email (str), password (str), salt (str), role (str)
Preferences	user* (User), language (str), darkMode (bool)
Endpoint	id (str), name (str), X-position (float), Y-position (float), Z-position (float), status_code (int), status_msg (str), apiKey (str), online (bool)
SignalReading	id (str), endpoint* (Endpoint), timeStamp (int), rssi (float), freqMHz (float), channel (int)
DevicePosition	Timestamp (timestamp), X-position (float), Y-position (float), Z-position (float)

Component Analysis

Endpoint

Component	Component Name	Responsibility	Call Server API	Data Needed
Endpoint	config	Load the configuration data of the endpoint from a local file	FALSE	endpoint_ID, server_URL, API_key
Endpoint	scanner	Captures Wi-Fi scan data and packages it	FALSE	MAC, RSSI, timestamp
Endpoint	health_monitor	Detects the devices current health	FALSE	Dongle_presence, disk_usage, CPU_stats, memory_stats, online_status
Endpoint	local_log	Contains operational events	FALSE	Auth_events, errors
Endpoint	auth_system	Verifies endpoint successfully connects to the server	TRUE	API_key

Endpoint	scanner_report	Sends the scanner package to the server	TRUE	scanner_package
Endpoint	error_report	Generates error numbers, logs the event, and sends the error status to the server	TRUE	Error_type, timestamp, device_ID
Endpoint	device_status	Sends the monitored health data to the server	TRUE	health, device_ID

Server

Component Name	Responsibility	Data Needed
authentication_service	authenticate users, validate endpoint credentials, handle password reset, enforce HTTPS	user, session, endpointAuth
data_ingestion	receive WiFi scans, receive endpoint errors, validate each request, queue logic to avoid data loss	WiFiScan, ErrorReport, Endpoint
status_monitor	accept health updates from endpoints, mark endpoints online/offline	healthStatus, endPoint
location_processor	transform recent scans and known endpoint coordinates into estimated device positions	WifiScan, endpointLocation, FloorplanConfig

Client

Component Name	Responsibility	Call Server API	Data Needed
loginStatus	Displays login status with user credentials	False	validateUser == True
validateUser	Validates user credentials before using the system	True	User.credentials
unauthUser	Displays an error message for an unauthorized user	False	validateUser == False
endpointStatus	Displays endpoint status based on data	True	Endpoint.status
floorMapChange	Changes floor map based on the file upload	True	Client.floormap
accessibilityOptions	Applies alternative text to images and videos	False	accessibilityButton == True
displayMap	Displays a heatmap of device locations	True	Endpoint.scanner

Server API

CREATE	createUser	createUser(email, password
CREATE	createSession(login)	createSession(email, password)
DELETE	deleteSession(logout)	deleteSession(token)

UPDATE	resetPassword	resetPassword(email)
CREATE	authenticateEndpoint	authenticateEndpoint(endpointID, apiKey)
CREATE	ingestScans	ingestScans(endpointID, scans[{{mac, rssi, timestamp}}])
CREATE	reportError	reportError(endpointID, type, message, timestamp)
CREATE	sendHeartbeat	sendHeartbeat(endpointID, disk, cpu, mem, timestamp)
READ	getEndpointStatus	getEndpointStatus(endpointID)
READ	listEndpointStatus	listEndpointStatus()
READ	getHeatmap (current)	getHeatmap(floorplanID)
READ	getHeatmapWindow	getHeatmapWindow(floorplanID, fromTime, toTime)
UPDATE	updateFloorPlan	updateFloorPlan(file, coordinateMap)
READ	getFloorPlan	getFloorPlan()
UPDATE	updateEndpointPosition	updateEndpointPosition(endpointID , x, y, z)
DELETE	removeEndpoint	removeEndpoint(endpointID)