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What don't I know about the system

What data is being received from the endpoints in real time?
 How will we monitor endpoint connectivity?
 How do we provide reliability if one of the endpoints goes offline?
 What config file type will be uploaded to configure each endpoint?
 How will we keep Raspberry PI OS fresh?
 How will the endpoint notify the server if it goes offline? (Through data on the server)
 What data is being received from the wifi signals? Are there associated values, or simply the strength of the signal?
 What to do if the device positions get changed without updating the system
 How will the heatmap be configured to portray the density of people in an area?
 How will we display endpoint health through our UI?
 How will we change the shape of the heatmap to correctly fill out a certain floor plan? (If our project is on display at Trask but was tested in a different room, how do we make the program update automatically?) What file type for the floorplan will the user upload?
 Uploading the wrong file type may crash the program with improper code.
 What information is in "best-known"? Online/offline? Strength of signal? Timestamp?
 What qualifies as the best known status? -> The most recent scan with at least 3 end point signals?
 Is any encrypted protocol acceptable? Are there any that we are not allowed to use?
 How will we verify that the correct endpoints are connected to the server?
 How will the application handle static WIFI signals?
 How is the WIFI, MAC, and RSSI data going to be presented?

What data is computed upon

Data must be sent to the database and inspected using HTTPS/TLS when transmitted
 User can upload a floorplan image/coordinates, and heat map will be applied to that image
 When the endpoints are configured, the interface must show the endpoints on the map
 Must show the "best-known" status of the endpoints
 When the information is available, the location proximity must be shown as a heat map
 Instead of best known status, it should be current status used to confirm the system health

What can go wrong with the data or the computation

What to do if there is a data transitioning error
 What to do if the time does not match correctly for scan records
 What to do if the data cannot be transmitted correctly
 What to do if the web application cannot access the server
 What to do if the endpoint and/or client cannot connect to server
 What to do if the database is down
 What to do if the location of an endpoint cannot be accessed
 What will happen if some of the data is missing? For instance, the server only receives signals from 2 of the 4 end points?
 What if the scanners are offline or have some other issue while the OS is booting and it can't run on startup?

Domain Model

Model (noun)	Fields
User	email (str), password (str/bytes), salt (int)
EndPoint	x-position (int), y-position (int), z-position (int), id (str or int), status_code (int), status_msg (str)

WifiScan	Timestamp (timestamp), rssi (float), MAC (str/bytes), EndPoint*										
DevicePosition	Timestamp (timestamp), X-position (int), y-position (int), z-position (int)										
Heatmap	Not sure yet										
Preferences	Language (str), darkmode (boolean), User*										
API specification											
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 == True						
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 video			FALSE	accessibilityButton == True						
Server											
Component Name	Responsibility			Call server API	Data needed						
ping	Creates a query for location and time stamp for coordinates			TRUE	location, timestamp						
status_check	Monitor endpoint health			TRUE	endpoint.status						
detect_restore	Detects database restarts and restores last valid state of user progress			TRUE	user_progress, db_status						
check_time	End session after certain amount of time of inactivity, track last activity timestamp, manage session			TRUE	last_activity, session_length						
Server API											
Function	Signature										
CREATE	createUser(email, password)										
READ	getEndpointStatus(endpointID)										
READ	getHeatmap(floorplanID)										
UPDATE	updateFloorMap(file)										
DELETE	removeEndpoint(endpointID)										
Endpoint											
Component Name	Responsibility			Call Server API	Data Needed						
config	Load the configuration data of the endpoint from a local file			FALSE	endpoint_ID, server_URL, API_key						
scanner	Captures Wi-Fi scan data and packages it			FALSE	MAC, RSSI, timestamp						
health_monitor	Detects the devices current health			FALSE	Dongle_presence, disk_usage, CPU_stats, memory_stats, online_status						
local_log	Contains operational events			FALSE	Auth_events, errors						
auth_system	Verifies endpoint successfully connects to the server			TRUE	API_key						