

1.1 Description of Microservices architecture Style

In regards to the architecture, the parts that act as components are the services and similar. These provide the functionality of the system in which each service provides one function. This being the case, multiple instances of services is allowed to overcome the limitation of each service only implementing one function. The usage of multiple instances increases the capabilities of the system. The connection between the services comes as service requests and replies. This communication is how the various services communicate and improve functionality by cooperating. It is important to note that these connections between services can be instigated either at an un time or as and when required.

1.2 Key Features of the Required System

Distribution: The ability to distribute the system to customers is vital when selling products and services. In the case of the home hub, distributing the actual hub to the customer is wildly important as well as providing the software/tools to work with the system. In regards to this system, the software can be done via a website the customer accesses of via software they download, again from a website.

SaaS: Tied into distribution, customers are paying for the software alongside the physical hub in order to use it. As stated above, the software in question would likely come as a website the user accesses. This would be able to connect to the home hub and allow functionality. It is important that customers are able to use the client as it is part of the product being sold to them. This is implemented with the combination of the website client as well as users accounts related to the purchases of products.

Large Volume of Data: With the system, the amount of data being moved around and stored is important to take into consideration. This is important to address in regards to both the storage and movement. Connections between areas must be able to accommodate the transfer of the data. The storage of data is important as the amount of data that needs to be stored is massive due to the amount of customers and all the information they need. The system can support said feature with the appropriate server implementation and database to accommodate the data.

Interactive: With such a system, it is important that the user can use and interact with the system in a way to take advantage of the functionality. By having the system be developed in a way to allow users to interact and use it well provides better usage of the system for users. This also comes with customizability, by not limiting what the user can alter, means they have more control of the system, improving the quality for them. Not limiting what users can do is possible thanks to how the home hub and client are developed and communicate.

Mobile: The implementation of a mobile version of the product is important as mobile usage has become more important with the times and also provides mobility when using the product. The development of a mobile client that also connects to the system will provide said functionality required. This may come in the form of an app downloaded onto a mobile device or with the implementation of a mobile version of the website. Either solution works and is easily added with the system presented as it is just adapting the interface of the client to work on a different device.

1.3 Key Quality Requirements

Scalability: The system in question will need to be able to handle a growing scale of implementation. This comes as the expansion of server capability to accommodate increasing customers and accounts. This is also relevant in the smaller scale of a home network in a home so that it is able to support an increase in devices and services a home can support at one time. The architecture of the system should easily support such expansions with the implementation of increased memory storage as the system needs it.

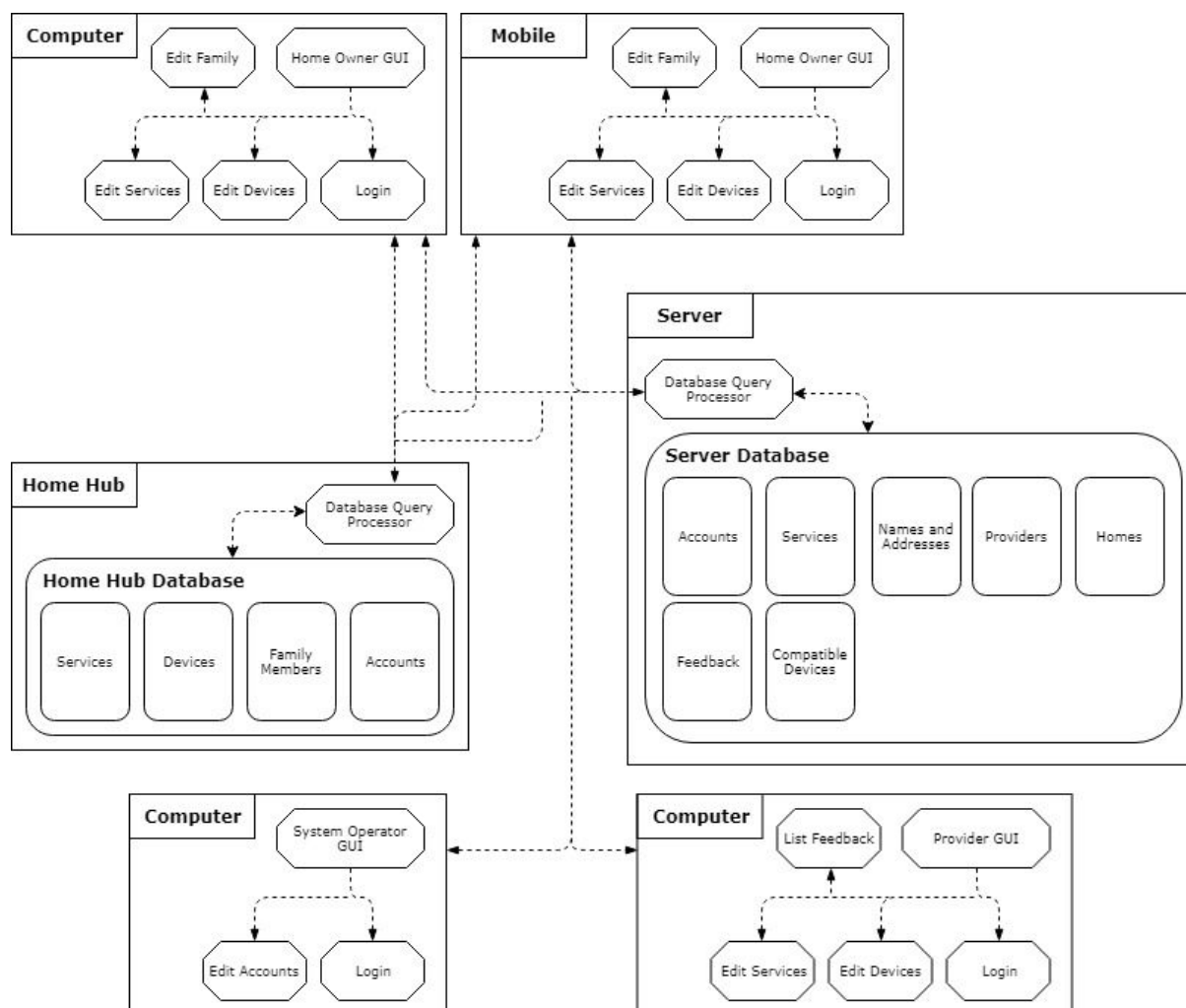
Security: As with any system, security is a key area to do correctly. With the storage of user accounts which contain personal information such as billing, address, and name, the system is required to be very secure. The distribution of said information should not be possible and the information should be securely stored to stop illegal access. Accommodating this within the architecture would require the appropriate resources spent to maintain a safe and secure database which holds all the relevant information.

Reliability It is important for the system to be available for a vast majority of the time, only being inaccessible under specific conditions and only for a short period of time. The uptime of the system should be within the 90% range, with 99% being the goal. The same applies to the home hub, which requires this amount of uptime with the only downtime being maintenance. The architecture should support this, but this requirement is more reliant on physical hardware that is reliable in its own right as well.

User Friendliness: It is important for the system to be easy to use and understand for the user. This requires the usage of the functionality of the system to be easy to use and easy to access. This may be in the form of a suitable GUI that portrays the functionality. The usage of functions should also be simple and not too complex as to avoid the users feeling overwhelmed by what they need to do. This can be easily fulfilled with the implementation of the appropriate form of user interface to represent the functions appropriately.

Maintainability: It is required that the methods to maintain the system are available and not disruptive towards the system. This includes maintenance, updates, and fixes. All these aspects are required of the system to make sure it is consistent and reliable. Tied into reliability, such actions should not heavily impact the reliability of the system so as to avoid unnecessary downtime. With the architecture of the system, it should be quite easy to implement severide maintenance and similar to avoid excessive downtime. This is possible due to the communication possible between areas of the system and their connections.

2.1 Architectural Structure



2.2 Description of Components

The components of the system consists of primarily Computers to work with the system. The other components being the Server and the Home Hub. The Server is the central hub for the connections as well as the central storage of the relevant information such as accounts, providers, homes, etc. The server is where connections primarily go to and from. This component is at the centre and is the most important.

The computers are the next component and vary roughly between the user in question. For instance, the computer for the Operator is about editing accounts. The computer components focus on the connection to the server and editing/listing/searching the database and the data stored by the system depending on what the user in question can do. The home owner computers are partially different in that they also have a connection to the home hub.

The home hub component is like a smaller server except it is dedicated to the home it is installed in, storing details and data of the services it has, the devices connected, and the

family members connected to it. The home hub also communicates with the server to supply relevant information back and forth, but only homeowner computers have access to the functionality.

The only additional component in this design is a mobile component for homeowners. This provides the same functionality as the computer for the home owner except using a mobile device.

2.3 Description of Connectors

The connections within the design are primarily back and forth between a computer/mobile and the server. This is mostly as queries to send and receive data. With the server holding the main database, whenever editing or viewing data stored, users have to supply a connection to the server first. These connections are opened up as users login into an account. The connection is adjusted based on user permissions. The connection is then used based on when and what function a user/component uses. Calling 'edit accounts' for instance, uses the opened connection between the server and component to send the relevant data back and forth.

There are no direct connections between computers/mobiles primarily because such a connection is not important enough to implement. In the event the connection between computers becomes needed, though unlikely, the server will act as a midpoint to allow an indirect connection between computers which will then allow the communication required.

The other connection includes the connection of homeowner computers. This connection functions in a manner similar to the computer to server connection. It mostly handles the editing and similar of data relevant to the home hub, from the homeowner. Like above, the connections are opened on login and used when functions are called to send data to and from each end.

The final connection in the design is from homehub to the server. This connection is opened as soon as the homehub comes online. From there, the connection is used when data is changed in the home hub or related data is changed in the server. There are no direct functions to call that use this connection but are indirectly used when other functions change data in either component.