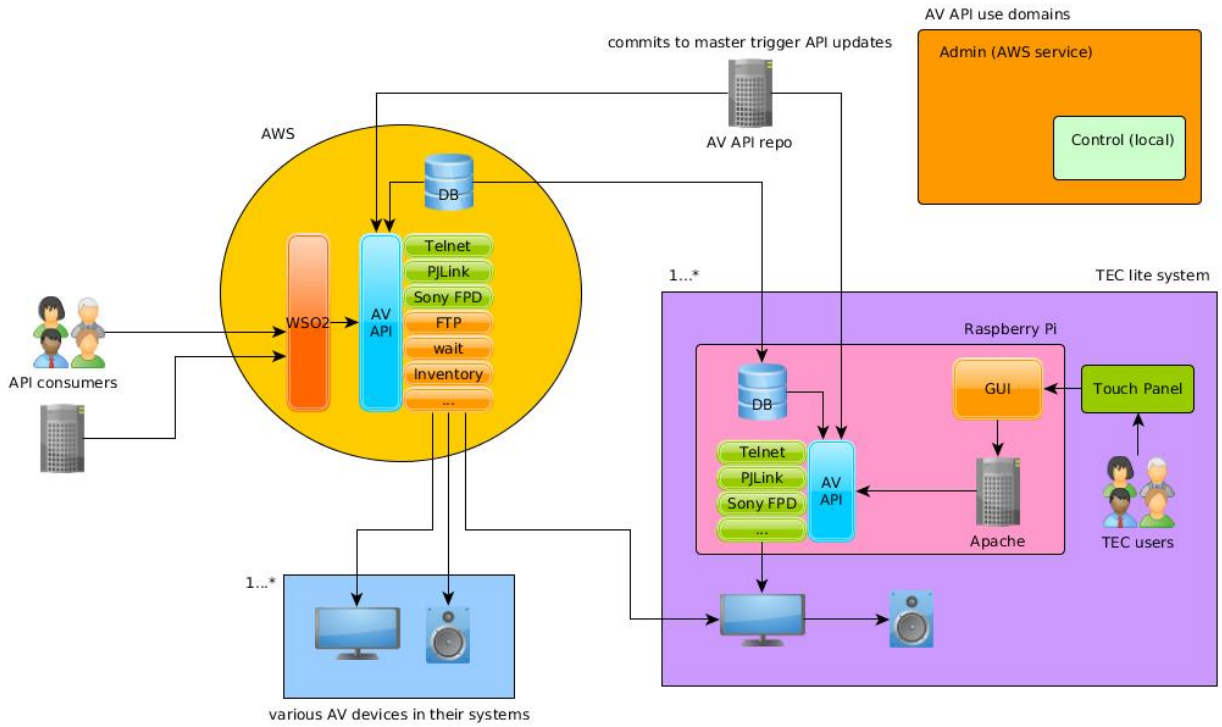
Proposed design for TEC Lite w/ lightweight ARM computer (e.g. Raspberry Pi) & AV API service



AV API Service instances

The ‘master’ AV API service will reside in AWS. This instance includes the full suite of microservices that interact with all participating AV devices and exposes all available functionality the API has to offer; this is the ‘Administrative’ or complete domain of functionality. To account for cases where TEC systems cannot communicate with AWS (e.g. network failure, etc.) local redundancy of a subset of AV API functionality is needed so that the system can still be operated. For this reason, each TEC Lite system will have a local instance of the AV API service and necessary microservices which provide the ‘Control’ subset of functionality, only exposing control of the devices in the given TEC system.

Authentication and Security

Consumers of the master API will first authenticate against WSO2 and be given an authentication token which is then passed to the AV API. The API service then checks the token against predefined security groups and exposes those portions of the API that the user has authorization to use.

Interaction with the TEC-local AV API instances will not authenticate against WSO2 at this stage. Consequently, an alternate security scheme will need to be implemented, such as using an ACL (network Access Control List), limiting access to the API service to localhost, etc. In the future we do want to employ an authentication mechanism to identify users, mainly to provide a customized experience for them, with a default fallback to standard interaction for un-identified users or users who wish to have the ‘standard’ experience with the TEC system.

Data

The authoritative, or ‘master’ database will reside in AWS alongside the AV API service. It will contain a schema that defines objects such as buildings, rooms, devices; their attributes, how to interact with them, etc. This db will be used by the API to identify what type of objects exist, how many of each exist, their status, and functionality exposed through the API. Each TEC system will have a copy of the authoritative DB; it will contain the full schema of the authoritative DB in AWS, but will only contain data on objects relevant to the TEC system, that is to say, devices in the room, etc.

AV API in AWS design

The master AV API service will reside in AWS and expose all available attributes and functionality of all objects. The list of microservices in the diagram is not comprehensive, just illustrative.

TEC Lite system design

A Raspberry Pi and it’s accompanying touch panel will provide both the control processor and user interface, respectively. The RPi will be running a ‘Control’ instance of the AV API service and it’s accompanying ‘Control’ instance of the API DB. A GUI that is presented on the touch panel will drive events to the local API service. The shape and form that the UI and UX takes is TBD.

Plumbing

The code for the AV API resides in public repositories on github.com. Updates pushed to the master branch on GitHub is propagated with CircleCI (an automated build and integration service at circleci.com): the services are compiled, old docker containers are torn down and new docker containers with the latest updates are pushed out to the master and local API instances. A suitable synchronization scheme for synchronizing local DB instances with the master DB will need to be planned as well.