Smart Building Demo

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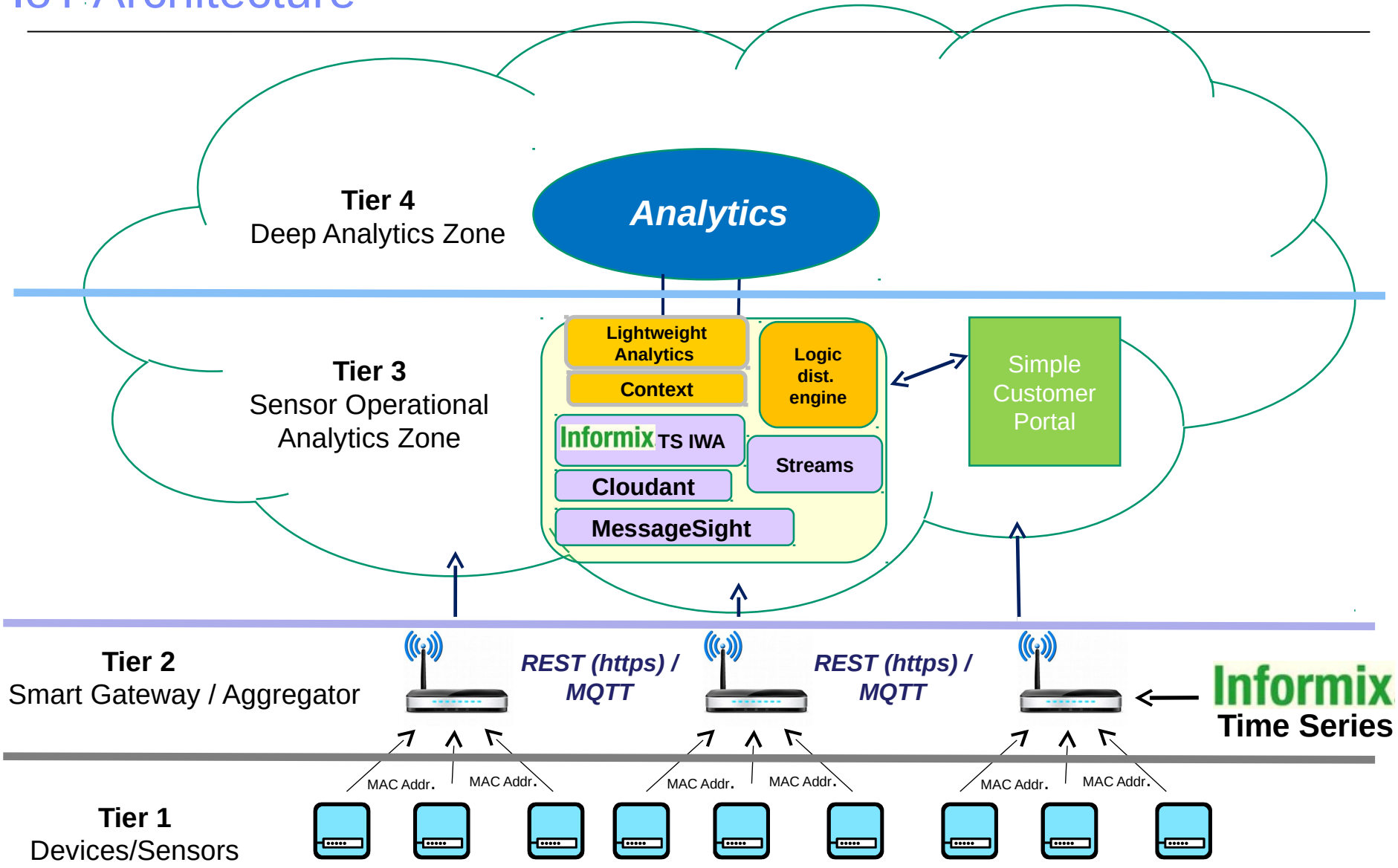
IoT Architecture



IBM Pitch

- The Intel Pitch has a focus on systems working with one another. The emergency system working with the lighting, hvac. The Solar panels working with the smart glass, etc.

- As IBM Informix we want to place more focus on why a database is necessary on the gateway, and the benefits of having a database on the edge.

IBM Informix Gateway

- Why A database on the gateway
  - Ability to take immediate intelligent action at the edge (Edge of the Internet of Things) (Near)Real Time Analytics where the data is collected
  - Leave some of the Data local (Privacy Concerns)
  - Discard outliers
  - Send aggregated data to cloud, instead of everything. Save storage resources in cloud and network resources based on amount of data being sent to the cloud.
- Why Informix
  - Enterprise class relational database that is highly embeddable.
  - Timeseries/spatial Capabilities

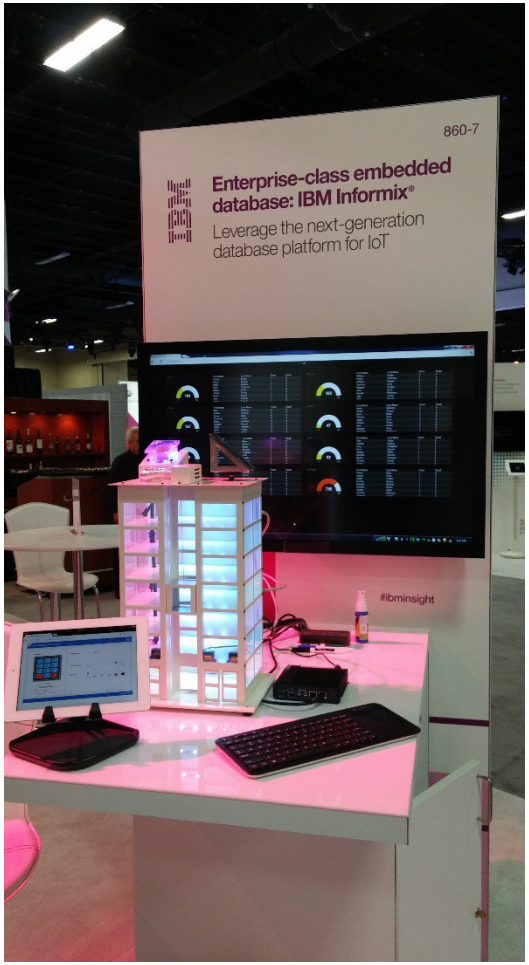
IBM – Smart Building Events

IBM – Intel Microevent

https://www.youtube.com/watch?v=q5_

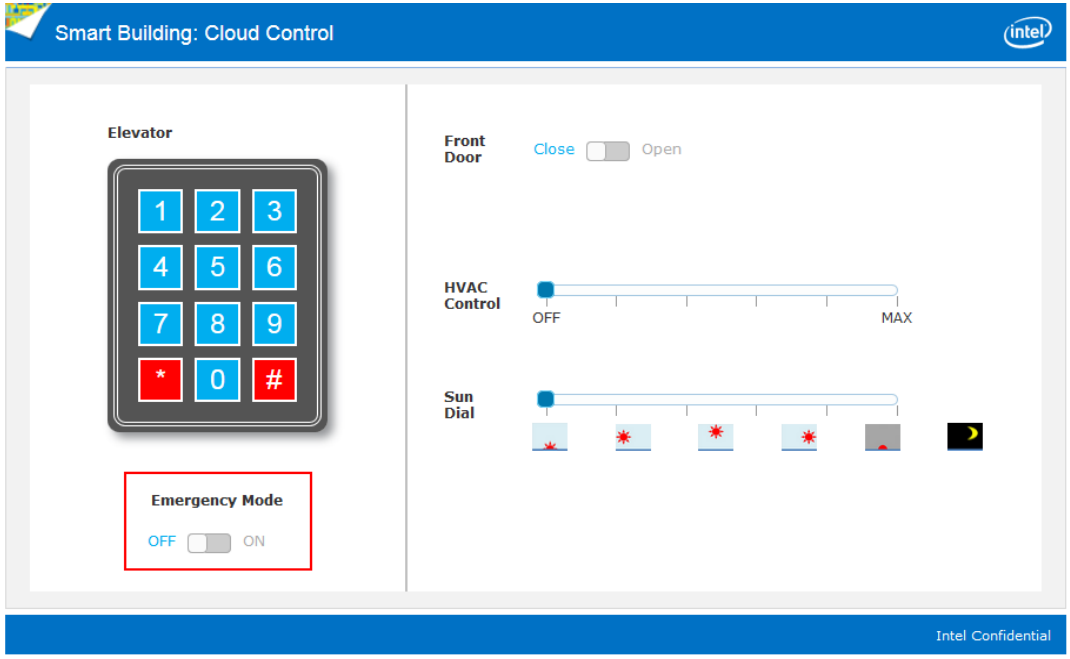
- IBM – Marvel (CES 2016)

- Insight 2015

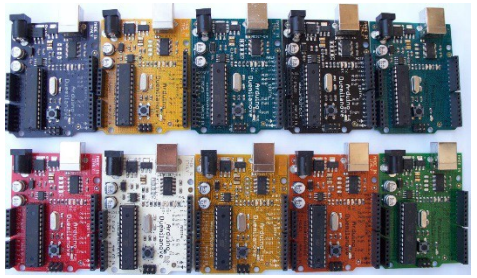


Technical Details – Building UI

- Interaction with the Building systems. HVAC, elevator, doors, solar panels
- Publish MQTT messages to the message broker to control the various systems on the building



Technical Details – The Building (Arduino's)



- Back of the Smart Building – various Arduino's/Galileo

- The arduino's have sketches (programs) that connect to a message broker running on the gateway at 10.0.68.69. (Well known IP address).

- They publish and subscribe to topics on this Mosquito message broker.

Technical Details – Gateway

- Intel based DK300
  - SSD Drive, 2GB Memory, Dual core
  - Wind River OS

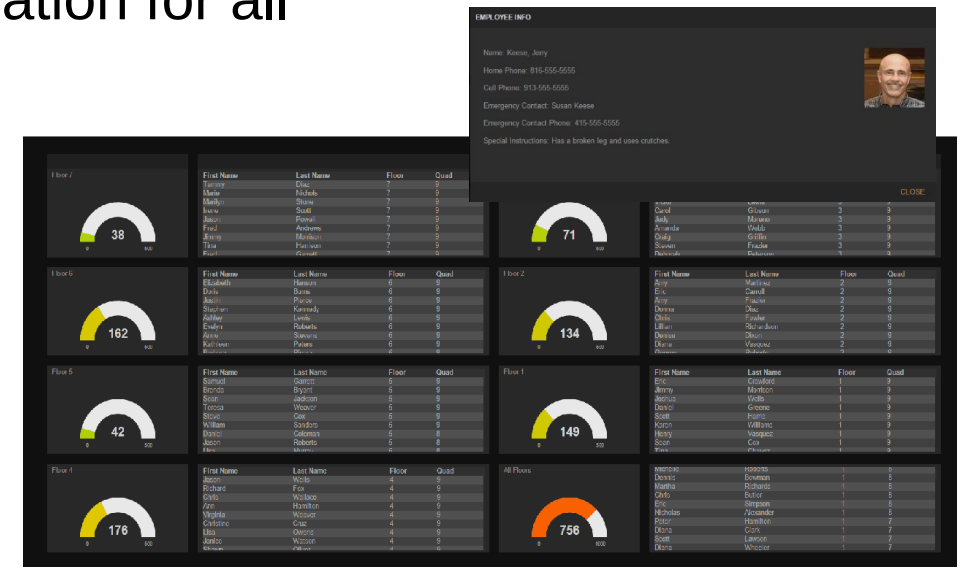
  - Informix Database Running (Tracking location of employees in the building
  - Mosquito Message Broker
  - Node.js Web UI Application
  - Evacuation Simulation Program (Python)
  - Freeboard Dashboard
- Other Gateway Devices

Technical Details – Evacuation Simulation

- Simulation Program (Python)
  - Uses REST to interact with the database.
  - Uses MQTT subscribe to topic to recognize when an emergency has been started.
  - During non-emergency the simulation will move employees throughout the building randomly.
  - During emergency situation, the simulation program will begin to move all employees from their current location towards the exit on the 1st floor.
  - We randomly leave 3-10 employees in the building.

Technical Details – Gateway Visualization

- Freeboard Application (javascript)
- Uses REST to access database to display up to date information
- Simulate tracking employee movement on the local gateway via the Informix database.
- Database tracking employee information/metadata in the cloud. Up to date information for all employees.
  - Drill down on to employee



Pushing Information to First Responders

- This information can then be passed on to the first responders for pro-active engagement.
- The Evacuation simulation program also uses Google message api to send messages to a mobile device.
- Keeping a First Responder up to date on the number of people in the build, and/or the people left in the building with special circumstances.
- This could just as easily be done with MQTT pushing data out, or REST.

Questions?

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