IoT Developments in Connectivity Panel

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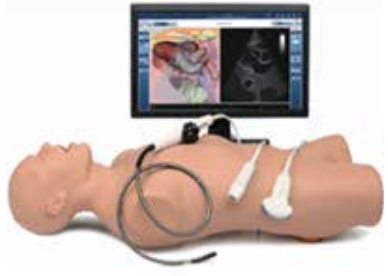

Portable Accessory

Portable Accessory

CONNECTED TO THE CLOUD

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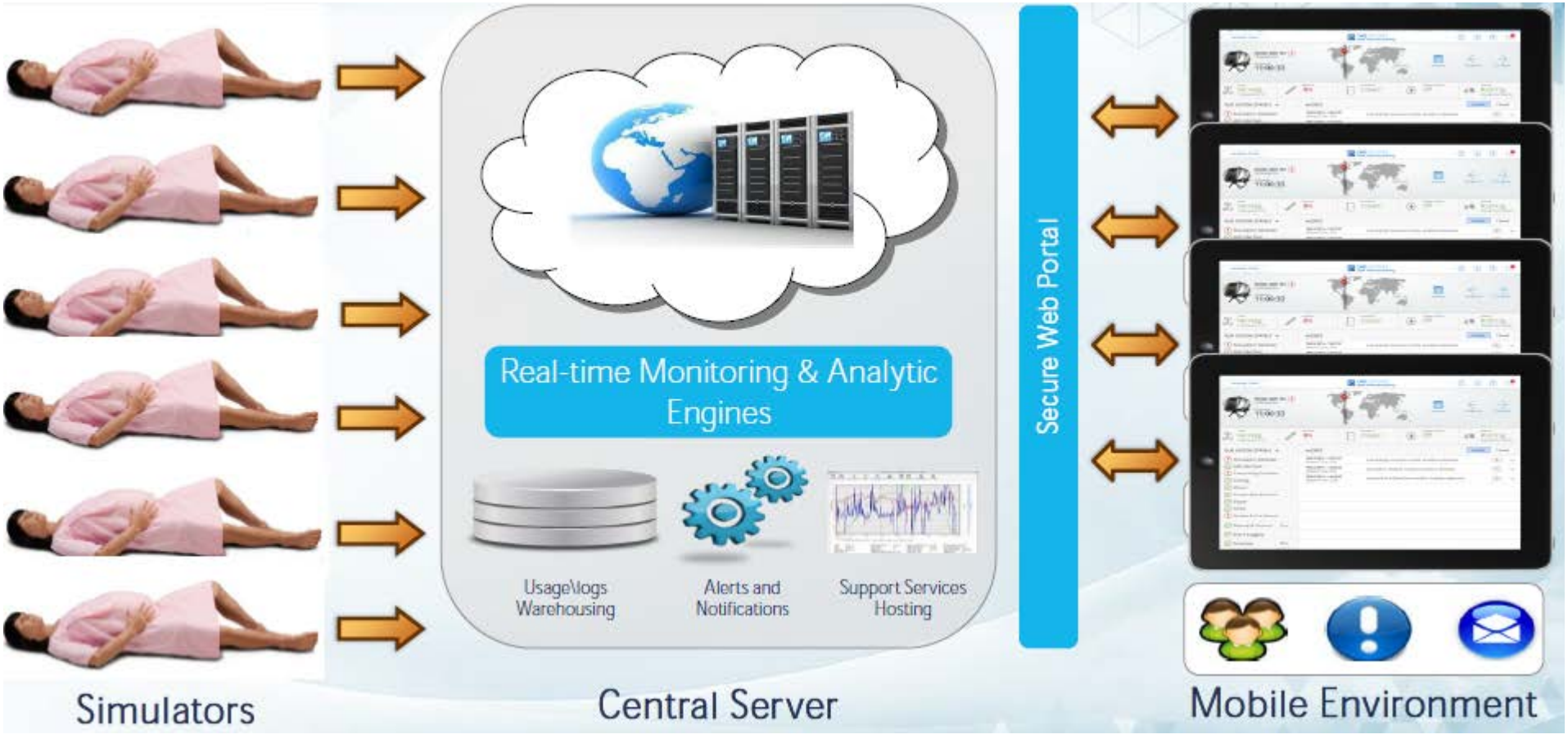
IOT Architecture



CLOUD BASED SERVICE FOR MONITORING AND MAINTAINENANCE

SELECTION OF PAN TECHNOLOGY

- BLE, 802.15.4, WiFi were evaluated for following parameters:

Parameters	BLE	802.15.4	WiFi
Power consumption	Low	Low	High
Cost	$	$	$$
Range	30m	10m	100m
2.4GHz Coexistence	Good	Need to be managed.	Good
STAR topology	YES	YES	YES
Peripheral Access Latency	7.5ms * N sequential	2~3ms concurrent	concurrent
Bi-directional communication	Point to Point with TDMA	Point to Multi-Point CSMA/CA	Point to Multi-Point
Pairing delay	0.1 second	0.5 second	In seconds

- Zigbee and Thread stack were not considered due to need of real-time performance

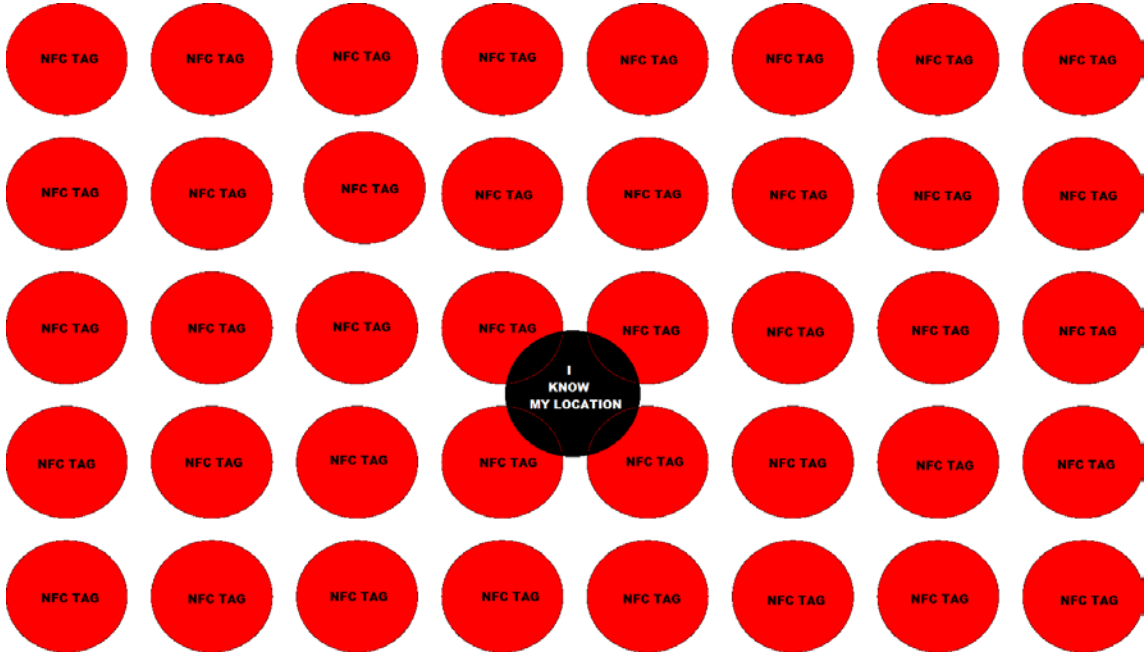
WIRELESS TECHNOLOGY

802.15.4

- Dynamic Pairing
  - Using signal strength of central device
  - Using RFID data
- Static Pairing
  - Using preconfigured device address
- Features selected
  - Non-beacon mode was used
  - Flow control and dynamic channel selection were implemented in software
  - Limited number of channel for quick pairing

NFC APPLICATION
LOCALIZATION

- NFC technology can be used for solving localization.
- Additionally possibility to store product's network and other configurations.



SENSOR TECHNOLOGY

NFC TECHNOLOGY

Localization using NFC

Advantages	Disadvantages
Wet and conductive surfaces should be avoided in proximity. Use of special tags designed for such conditions would help here.	Object to be localized has to be in proximity of tags. Proximity range is limited to dimension and orientation of tag and reader antenna.
Discrete or continuous localization patterns.	Moderate speed of location detection. Depends on tag technology and inventory technique used.
Better noise immunity to surrounding environment compare to other wireless localization technologies.	Possibility of tag collision has to be managed to keep detection delay low.
Low cost.	Tag communication is sensitive to water and metal nearby.
Easy extendibility of features and distance.	Limited localization resolution for continuous tag grid pattern.
	Resolution depends on tag size. Reducing tag size reduces read distance.

- Product configuration on NFC tags
  - Parameters required to join 802.15.4 or other kind of networks can be store in tags for dynamic pairing.
  - Product specific information can also be stored that can be used by service or other add on devices to identify static configurations.

CONCLUSIONS

- CAE Healthcare makes use of IOT Technology
  - Sensors
  - Wireless
  - Cloud
- Our business needs standardized off the shelf solutions with integrated management of the issues discussed in this presentation.

Take-away

Thank you!

CAE Contributors:

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