



Internet of Things (IoT)

How does the Internet of Things Apply in a Tactical Environment

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Definition of IoT

“The Internet of Things is the network of physical objects that contains embedded technology to communicate and sense or interact with the objects' internal state or the external environment.”

Gartner

“...there's been no single standard definition of IoT solutions since the possibilities of Internet of Things was first discussed...”

Forrester

**IoT connects the analog
world to the digital world**

“... as a network connecting—either wired or wireless—devices, or 'things,' that is characterized by autonomous provisioning, management, and monitoring.”

IDC

The Internet of things is enabled by any-to-any connectivity.

SANS Institute

Earlier Generation - IoT



Pervasive Connectivity

Smart Device Expansion

Explosion of Information

IT is Rapidly Changing

Connected devices and data volumes are exploding

2013



212 Billion Internet of Things



Pervasive Connectivity

Smart Device Expansion

Explosion of Information

By 2020

30 Billion⁽¹⁾
Devices

40 Trillion GB⁽²⁾

DATA

10 Million⁽³⁾
Mobile Apps

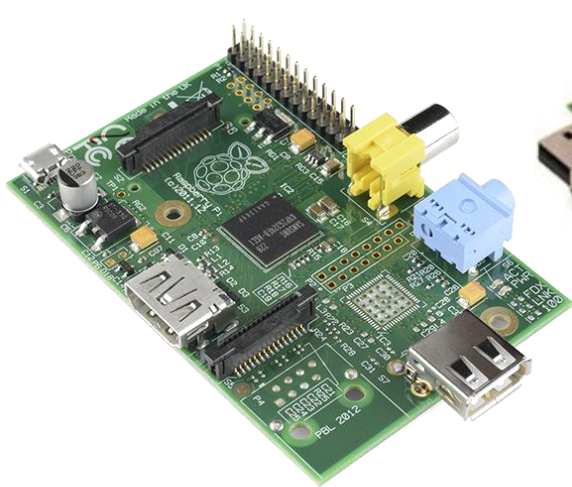
... for 8 Billion⁽⁴⁾



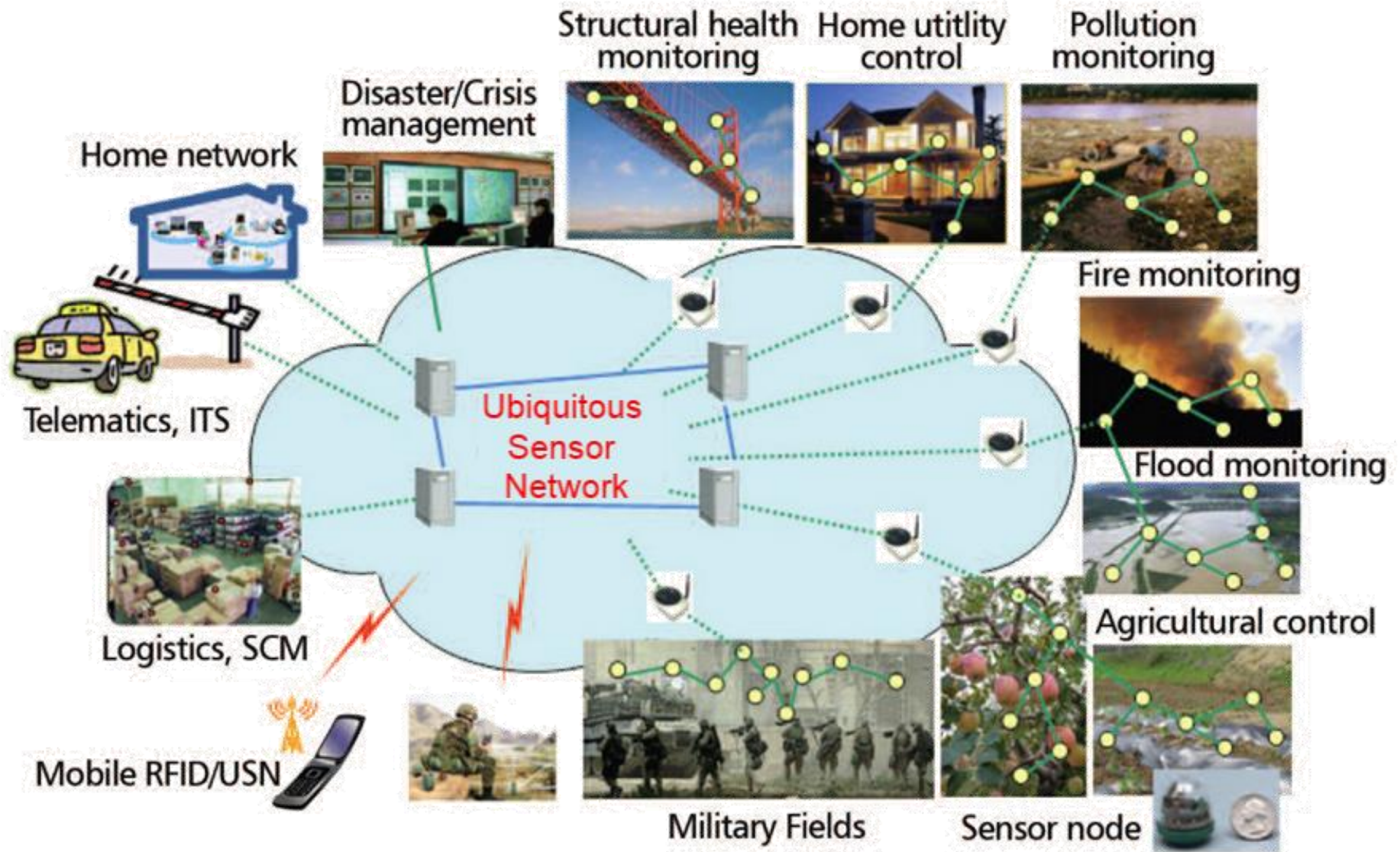
(1) IDC Directions 2013: Why the Datacenter of the Future Will Leverage a Converged Infrastructure, March 2013, Matt Eastwood ; (2) & (3) IDC Predictions 2012: Competing for 2020, Document 231720, December 2011, Frank Gens; (4) <http://en.wikipedia.org>

Components of IIOT (Sensors & Things)

- Programmable devices
- Off-the-shelf gadgets/tools
- Built into products



Components of IoT (Networks)

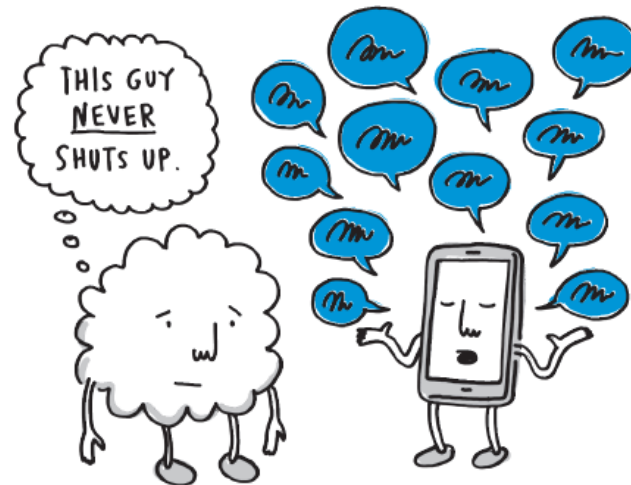


IoT characteristics

- Connected
 - To the Internet by itself
 - Via a gateway/data concentrator (synchronous or asynchronous)
 - To each other - Bluetooth, WiFi, Cellular
- Cheap and lots of them
 - many devices with “some” processing power
 - mass market applications (it is just built in)
- Many sensors are user-focused
- Low power
- Always on



Botanicallys.com



Source: Sensor Wireless

Next generation – aim, click, share!

Expansion beyond tablets and smart phones

An explosion of devices

- Sensors
- RFID tags
- Medical devices
- Wearables
- Consumer devices
- Climate control systems

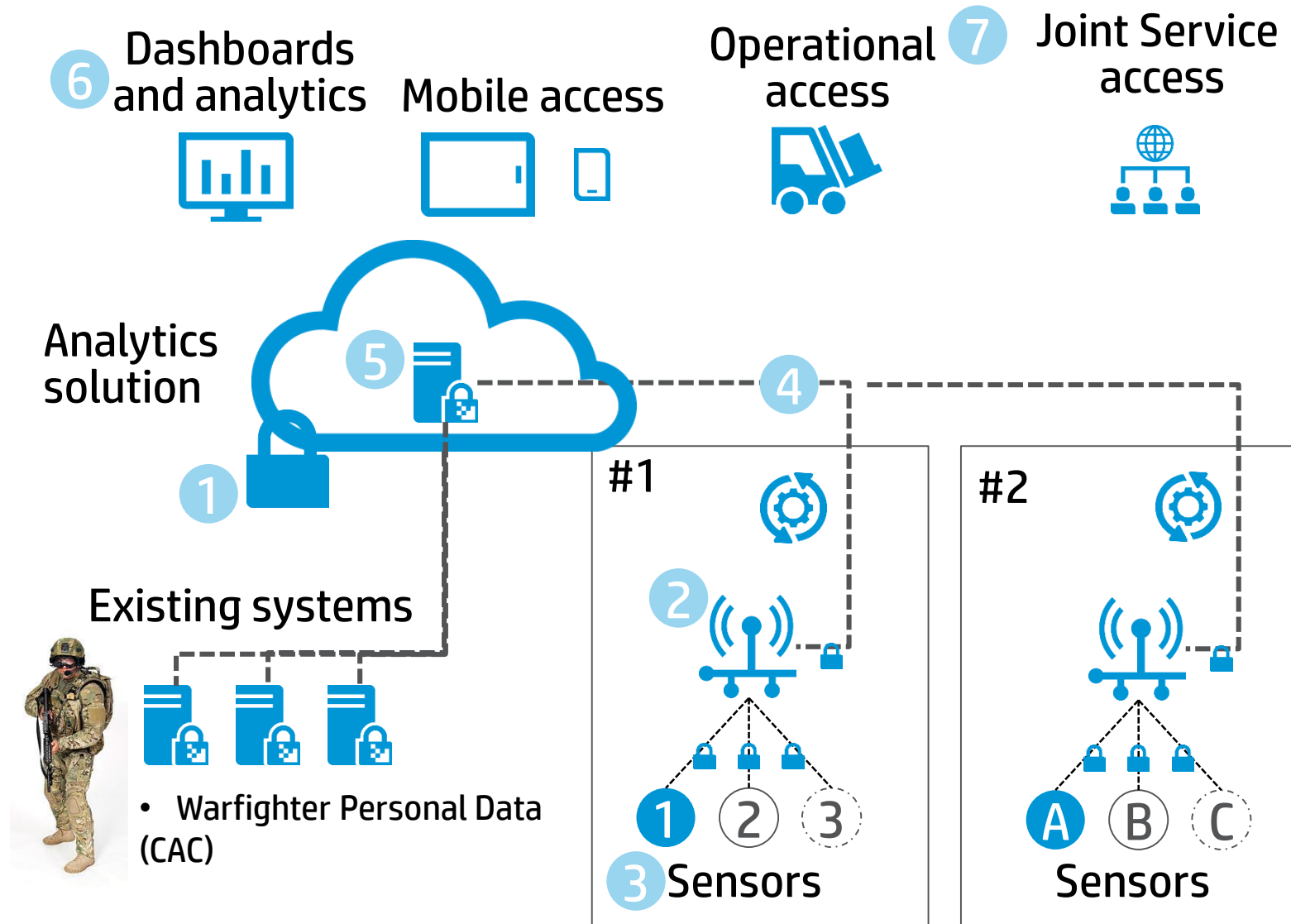


Internet of things uniqueness

- Embedded systems and software
- Limited to no user authentication
- Automated functionality
- Device to device communication
- Differing platforms
- Proprietary systems

Manufacturer's of "things" will be expected to provide secure solutions

Military use case



Mission considerations

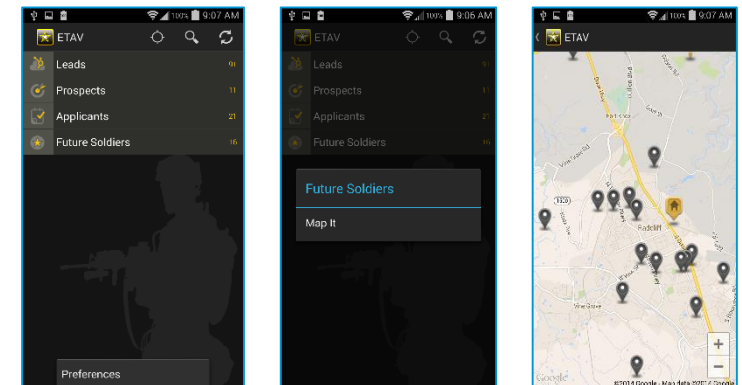
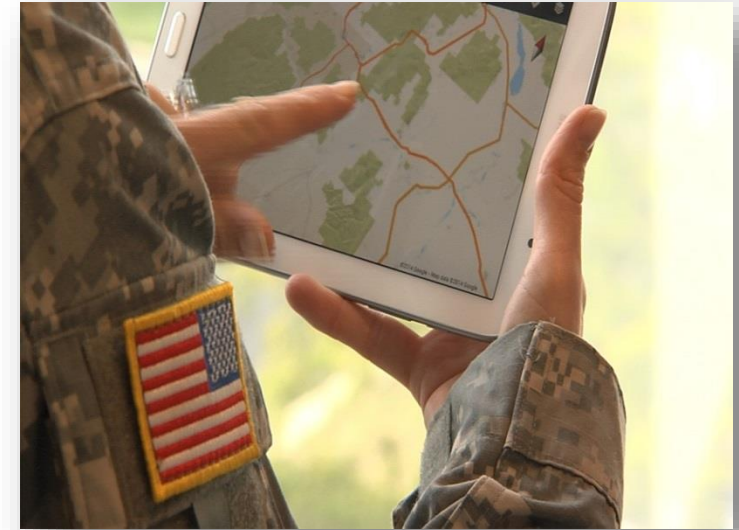
- 1 Security/privacy issues
- 2 Wireless networks insufficient for volume
- 3 Sensors may not work as advertised
- 4 Enterprise service bus
- 5 Data storage capacity was insufficient (speed, volume, cost)
- 6 Analytics and dashboards required
- 7 Joint Service access

Army Recruitment

Client wanted an application to streamline candidate recruitment process.

Application that locates a recruiter using the GPS on a mobile phone and reaches into back-end systems to pull candidate data and displays on a Google map relative to the recruiter's current location. The map pinpoints the home of record for leads, candidates and future soldiers, so recruiters realize better time management.

Results: Enhanced time management and data efficiencies of Army Recruiters while ensuring PII security compliance.



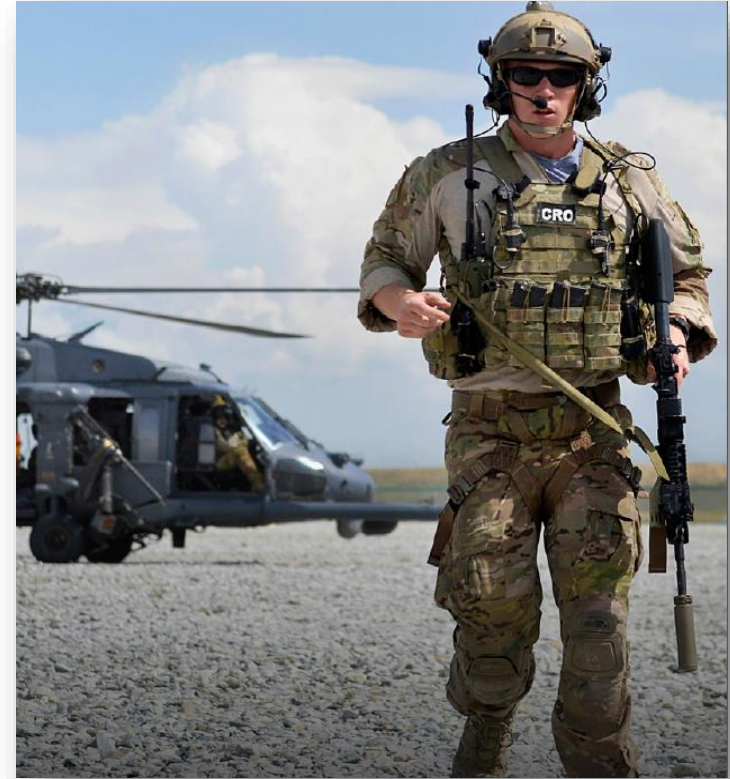
Soldier Location Alert in a tactical environment



Situational awareness of peer soldiers and equipment in a combat zone
(shown on tablet, watch, or small communications device)

Military Operations and the future IoT

- Service members culture & expectations
 - Combat experienced
 - What works and doesn't work
 - Rely on IT based equipment and weapons systems
 - Actions and results drive innovation
- IoT will inherit the complexity of the current internet only at a larger scale!



IoT is expected to provide improved survivability and lethality

Questions???



Thank you!



Make it matter.

