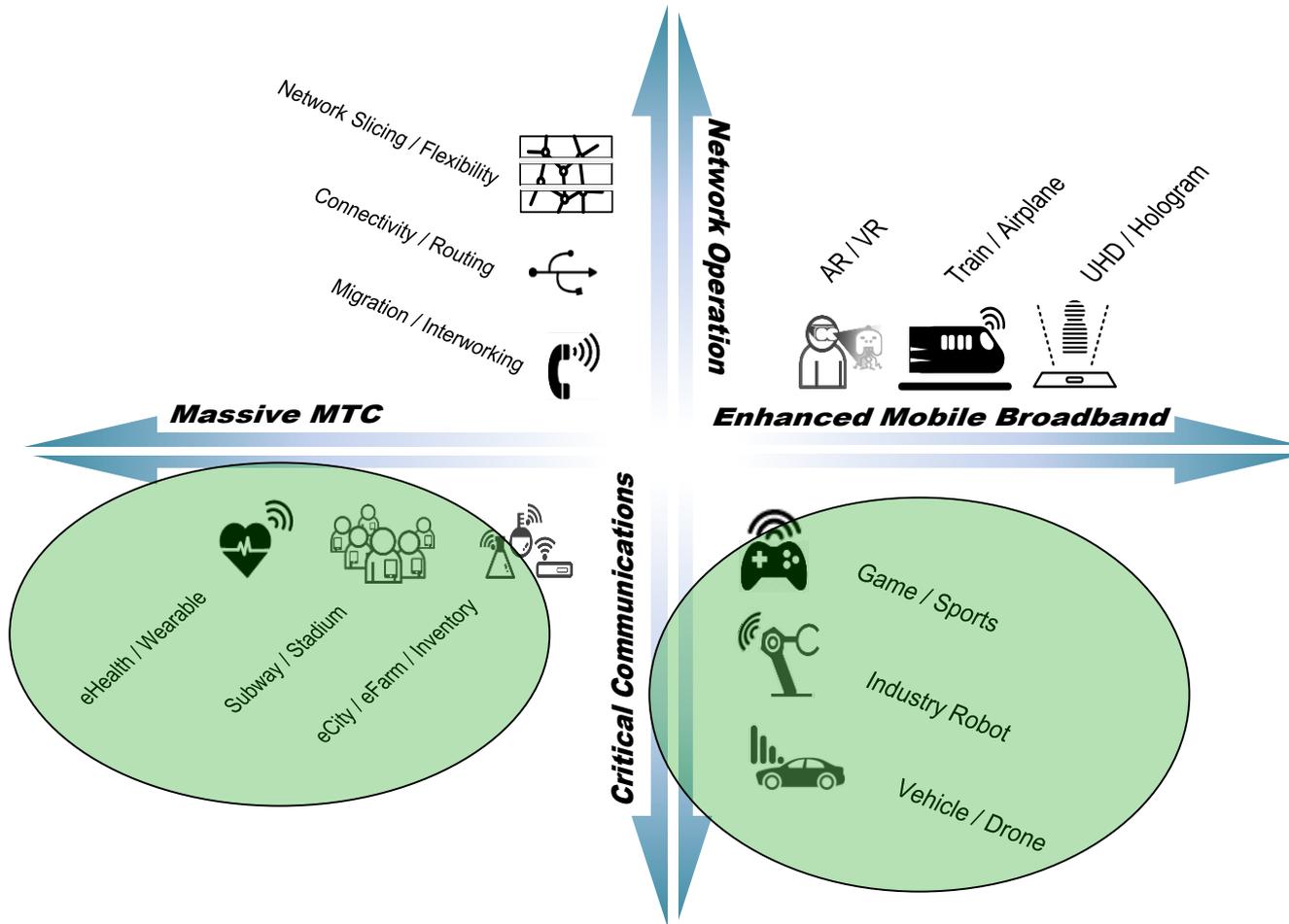


Multimedia Codecs, Formats and Protocols for Internet of Things

January 19, 2016

Internet of Things (IoT) Usages in 3GPP



- Rel-14 use cases and requirements related to internet of things defined in TR 22.891 as part of the ongoing study item on “New Services and Markets Technology Enablers” (SMARTER)

3GPP IoT-related Use Cases in TR 22.891

- Connectivity for drones
- Industrial Control
- Tactile Internet
- Localized real-time control
- Extreme real-time communications and tactile internet
- Remote control
- Wide area sensor monitoring and event driven alarms
- Bio-connectivity
- Wearable device communication
- Domestic home monitoring
- Cloud robotics
- Local UAV collaboration
- Moving ambulance and bio-connectivity
- Telemedicine support

Media Handling Examples for IoT

- **Connected Drones:** Analyze, in real time, the video and infrared imaging of the fields that are streamed from the cameras and sensors. Broadcast live outdoor events like marathon, F1 auto racing.
- **Industrial Control:** Deliver uplink live video stream over a high bandwidth connection to a physical operator for real-time analytics and control
- **Remote control:** UAV (unmanned aerial vehicle) shoots real-time pictures or video along the road and sends the content back to the manipulator.
- **Bio-connectivity, telemedicine and remote health care:** Patient examination performed remotely supported by a video stream
- **Domestic home monitoring:** Video monitoring and surveillance for home security, where captured videos are delivered to an aggregation point
- **Cloud robotics:** Robot sends captured video/audio/data collected to the cloud in real time, receiving in return action instructions.
- **Wearable device communication:** VoLTE call using a smartwatch

Proposed Scope of SA4 Study on Media Handling Aspects of the IoT Usages

- Codec requirements, e.g., for low complexity audio / video encoding
- Media formats and protocols, e.g.,
 - for uploading captured audio / video / image contents to a central or edge server, e.g., related file formats, delivery protocols, service-layer definitions, etc.
 - for exchanging metadata / descriptors for events, detected objects, pattern recognition, region-of-interest (ROI), gesture detection or other relevant information that relies on content analytics
- Performance-related aspects such as media adaptation, QoE / QoS handling, energy efficiency, etc.
- Relevance and potential reuse of components in existing 3GPP multimedia services (e.g., PSS, MBMS, MTSI, MMS, etc.) in the context of IoT usages, e.g.,
 - use of MTSI features for supporting video calls using IoT devices
 - applicability of 3GP file format for captured content uploads, etc.
 - use of 3GPP DASH formats for adaptive media delivery