

# How oneM2M fits into the landscape of IoT technologies

3<sup>rd</sup> oneM2M Industry Day

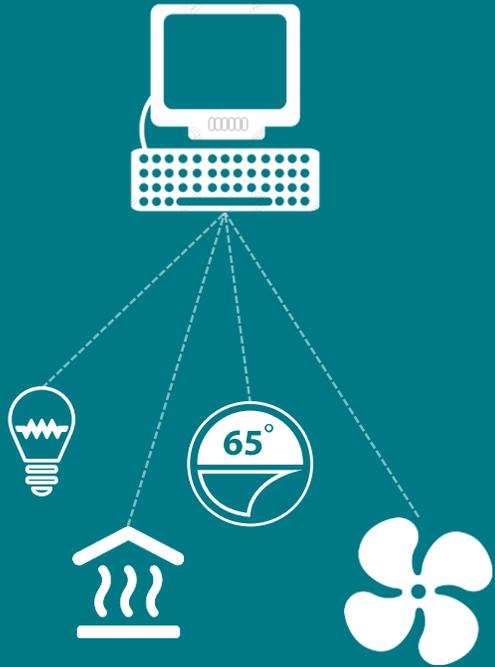
Bangalore, September 20<sup>th</sup> 2017

Dr. Josef J. Blanz



# M2M / IoT Evolution

Master/Slave



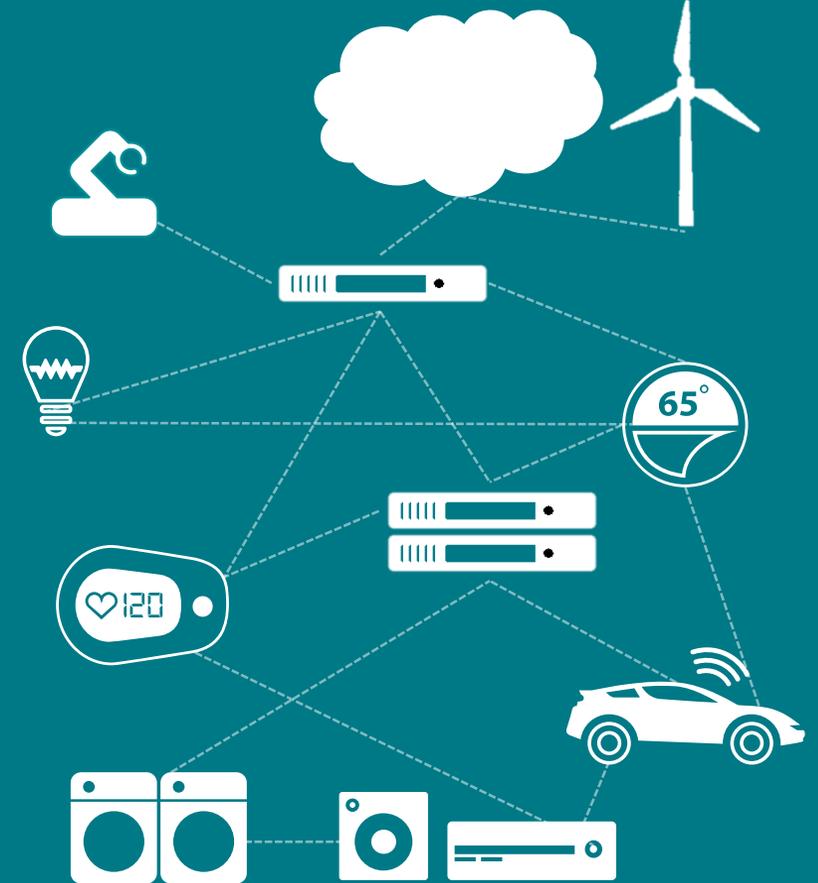
Yesterday

Proximal ↔ Cloud



Today

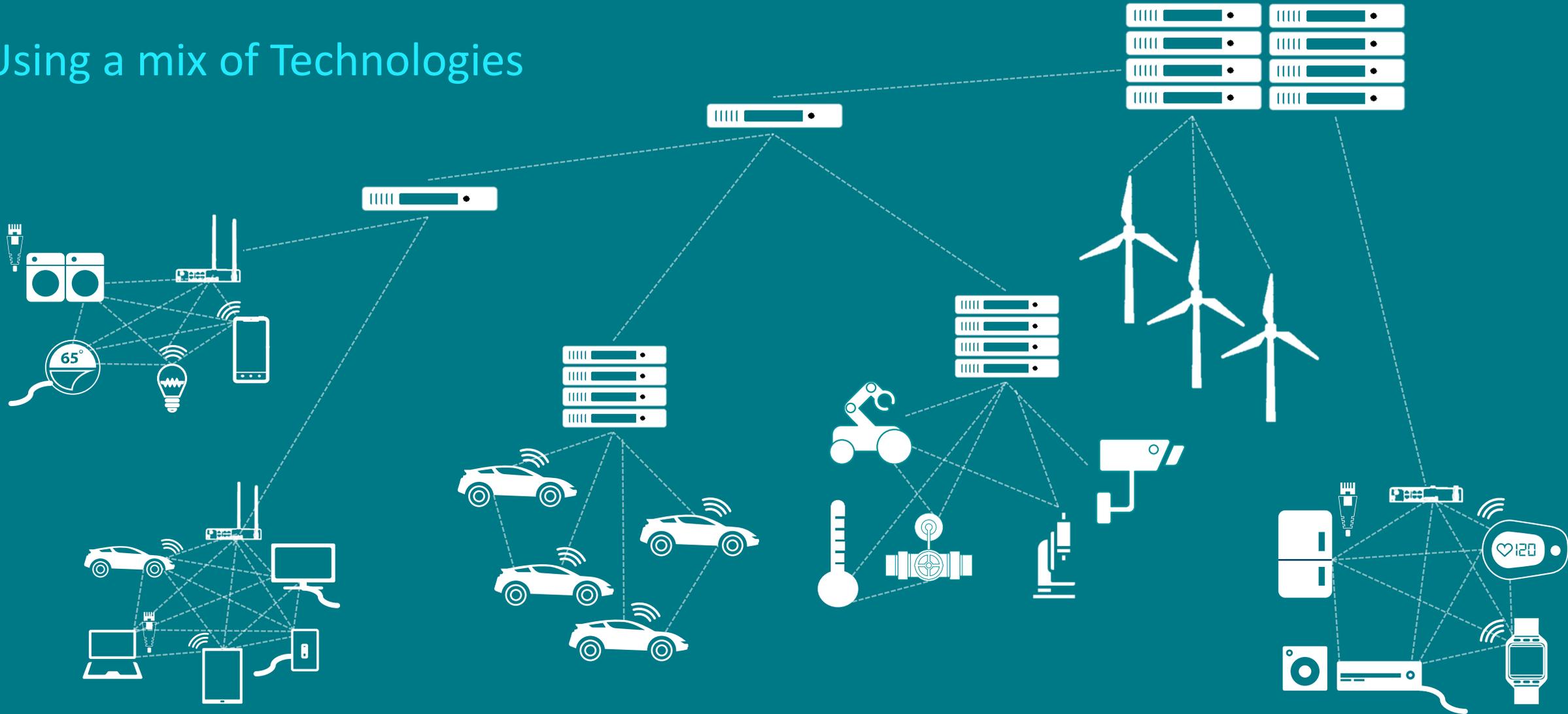
Distributed



Tomorrow

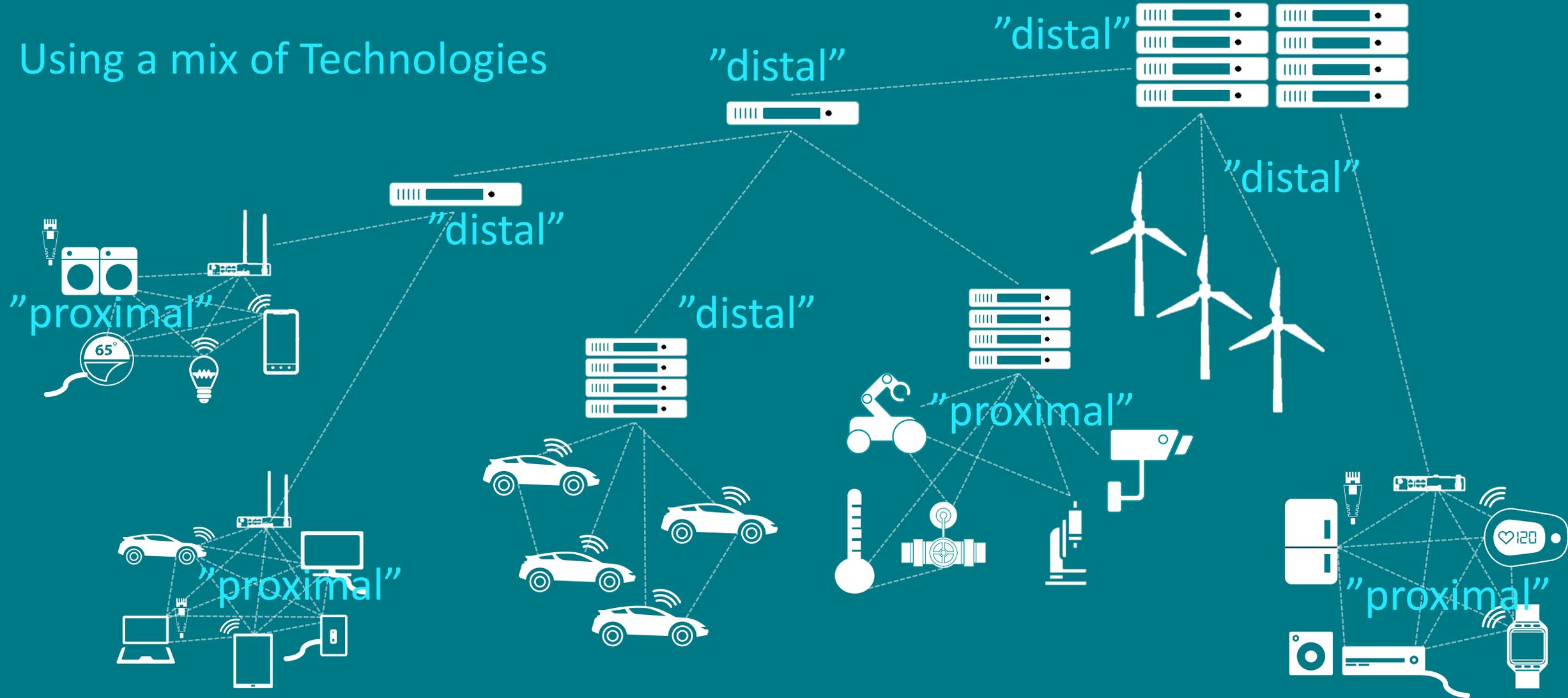
# Trend to Distributed Configurations

Using a mix of Technologies



# Trend to Distributed Configurations

Using a mix of Technologies



# “Proximal” IoT

- Technologies in IoT with a focus on “proximal” functionality
  - Targeting mostly smart home / building automation / proximal network
  - Simplify connecting “things” in proximity (e.g. in building), monitor, control, automate, less focus on cloud or hierarchical structures
  - Enablers: Discovery, Advertisement, Introspection, On-Boarding
  - Need for multi-cast techniques to implement discovery & advertisement
  - A “user” is still in the center of this “proximal” paradigm (onboarding, usage)
- Examples
  - OCF (OIC, AllJoyn) with Open Source, Specifications
  - Several proprietary or open Home Automation technologies
  - Industrial space: OPC-UA (client/server), DDS (bus)

# “Distal” IoT

- Technologies in IoT with a focus on “distal” functionality
  - Targeting larger scale deployments of M2M/IoT devices in an overlay network
  - Hiding complexity of network usage / routing / access control / sharing etc
  - Storing & sharing of data in distributed, hierarchical topology
  - Enablers: Proven security, access control, selective communications, addressing
  - Agnostic to underlying NW technology,
  - Desirable: Utilize optimizations for M2M / IoT, better efficiency in WAN usage
- Examples
  - **oneM2M** (open partnership of SDOs), specification openly available
  - Cloud components of proprietary or open Home Automation technologies
  - Proprietary platforms

# Common Issues in “Proximal” IoT

- Focus on tying things in a proximal network together so that a user/controller can interact or control them, use rule engines etc.
  - More “human user” and “home” centric (consumer space) or production floor centric (industrial space)
- No built-in functionality to drive communication based on policies regarding WAN selectivity / scheduling / event categorization
- No direct interactions between multiple “proximal” islands
  - No concepts for overlaying a middleware over multiple “proximal” networks
  - Might need to interact between a very large number of distributed islands
- No large scale device management integration
- Difficult to scale to larger deployments, private clouds etc.

# Synergies of “Proximal” and “Distal” IoT

- Functionality to drive communication based on policies regarding WAN selectivity / scheduling / event categorization
- Addressing of “things” across many different locations / areas
  - Supporting a hierarchically organized overlay network that transports messages to/from the right “things”
- Data and function sharing across different domains
- Support of interactions between multiple “proximal” islands
- Integration of proven large scale device management technologies
- Robust security functions (authentication, authorization, access control, encryption)

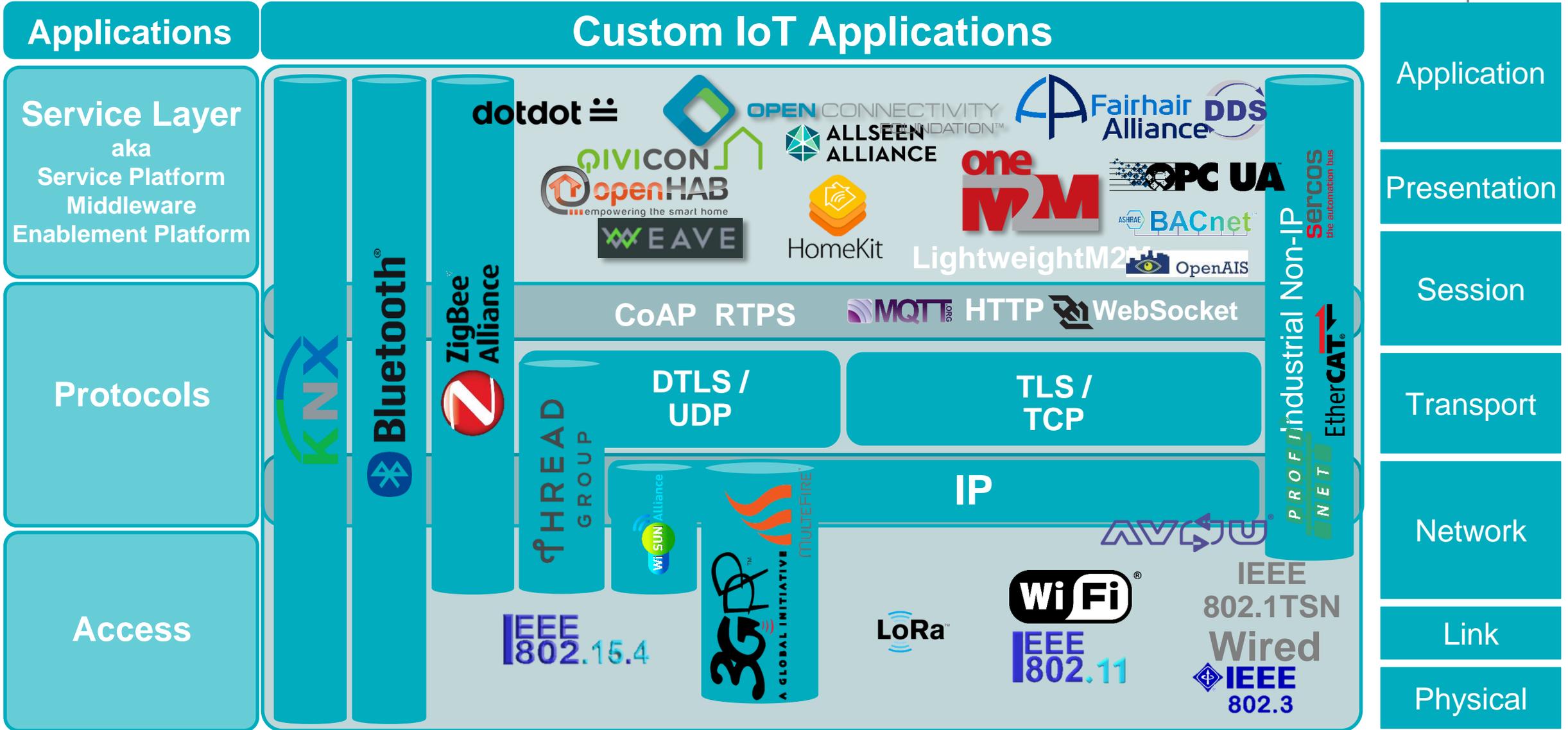
# Jungle of Technologies, Standards, Consortia, OSS Projects

- Which groups actually specify technology, which are just doing marketing & promotion?
- Which technologies are used / will be used in M2M/IoT?
- Which technologies are overlapping or complementing each other?

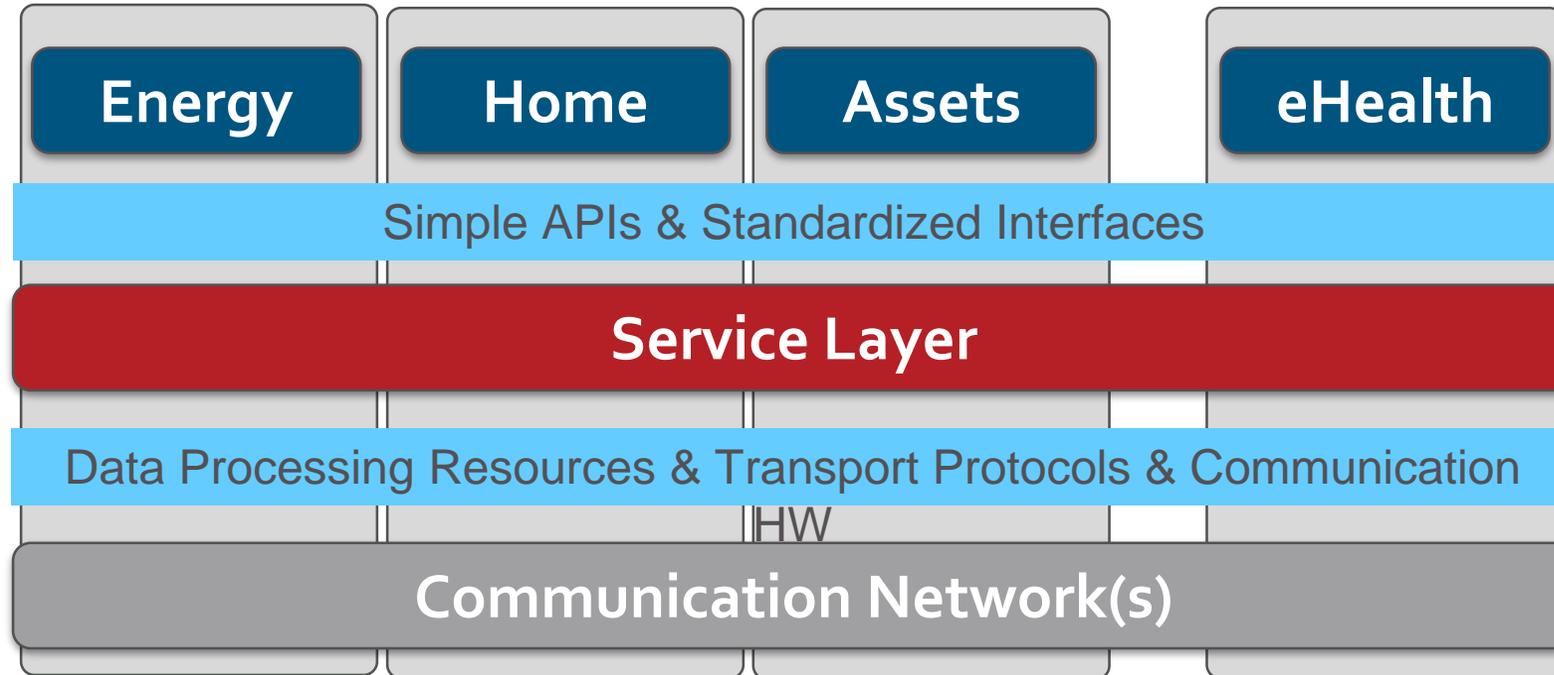


# Technologies in IoT Stack

“OSI equivalent”



# oneM2M: Open Standard for M2M / IoT

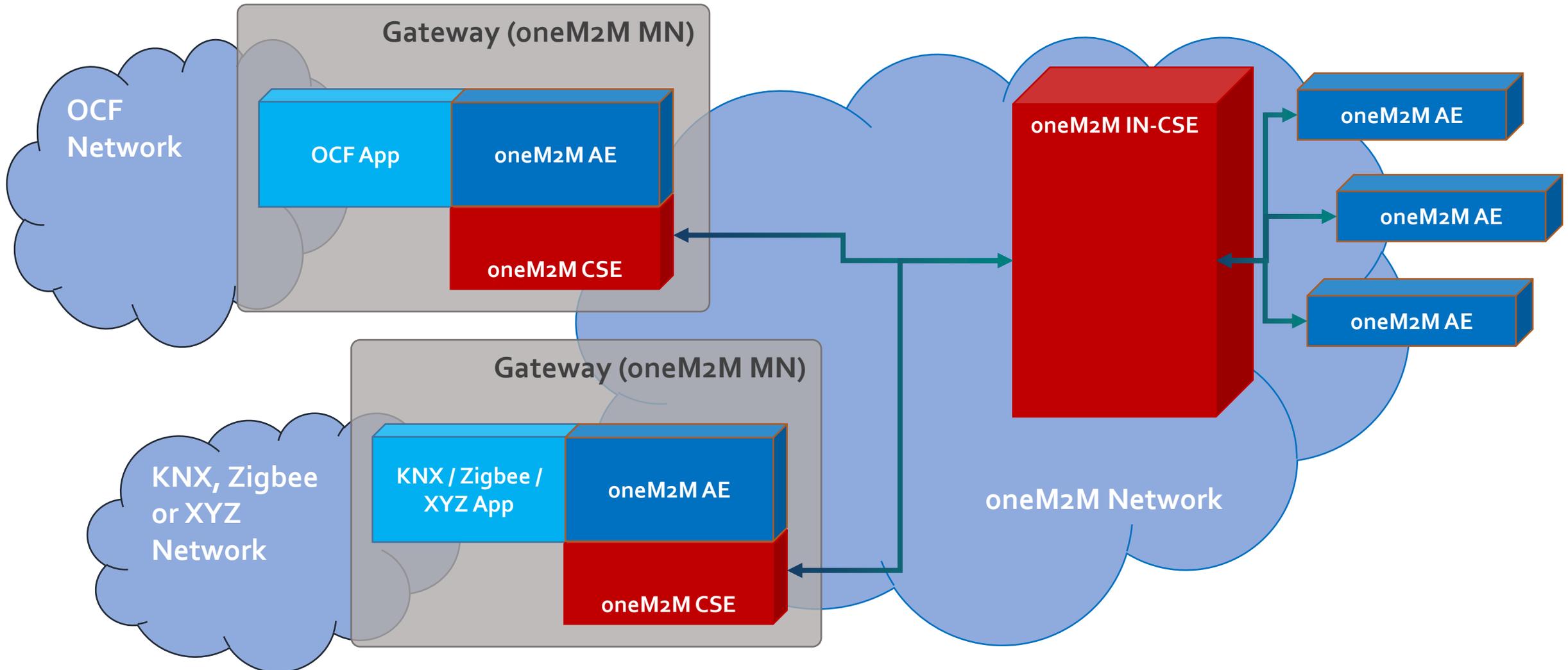


- Standard for a middleware platform
- Sits between applications and processing/communication HW
- On sensors, actors, gateways, cloud
- Authentication/authorization/encryption
- Connects producers/consumers securely
- Hides complexity of NW usage from apps
- Controls when communication happens
- Increases efficiency of data transport
- Stores and shares data
- Supports access control
- Notifies about events
- Talks to groups of things
- Manages devices on large scale

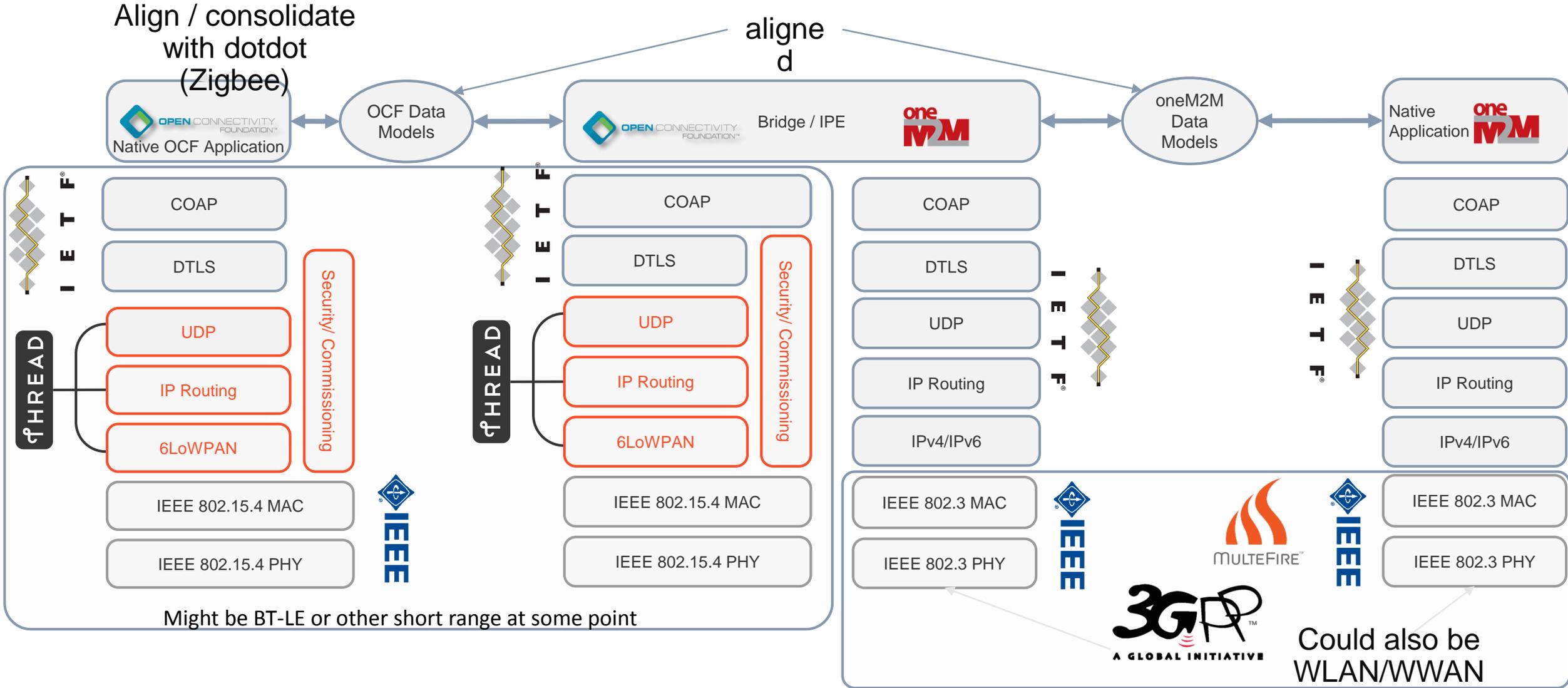
**Horizontal layer of functions commonly needed across different market segments / not segment-specific**

**Similar to generic versus use case-specific computer/OS in early times of computers**

# Proximal IoT Interworking oneM2M value & applicability



# Example: Make it work together



# Combine oneM2M & "proximal" IoT

