Intelligent Management for Edge-computing (Network AI Project for NMRG)

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Background – Cloud computing

Emerging paradigm

- Cloud computing has changed the way of using the computing infrastructure

- the resources are provided to the consumer and released by the consumer on the basis of **their demands from the shared pool of resources**
- This on-demand resource provisioning proves **very economical** to the consumer as they are supposed to pay only for the resources they have used and this feature allows the service provider to re-allocate the released resources

- Features like scalability, elasticity, less entry cost, easy to access and subscription and pay per use etc.

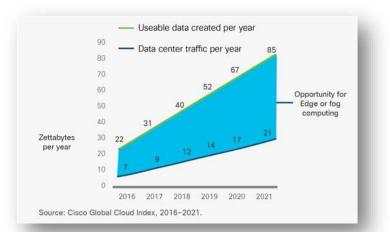
- Compel the businesses and end users to migrate themselves from the traditional platform to the cloud based platform.

Background – Challengeable statement

♦ Zettabytes Era

- Cisco GCI estimates that **nearly 850 ZB** will be generated by all people, machines, and things by 2021

- Much of this ephemeral data is not useful to save,
- but approximately 10 percent is useful
- Useful data also exceeds data center traffic (21 ZB per year)
- Edge or fog computing might help bridge this gap



Ref: Cisco Global Cloud Index: Forecast and Methodology, 2016–2021 White Paper

Background – Limitation of CoT

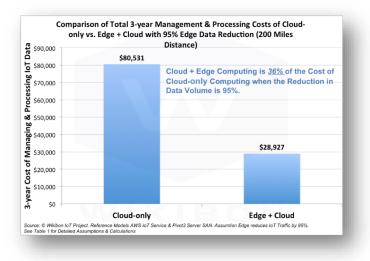
Limitations of IoT-Cloud model

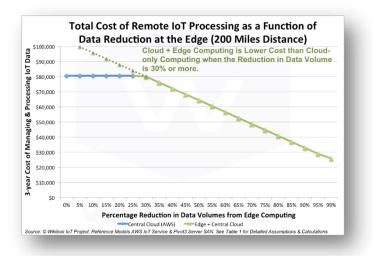
- Explosive growth to various operation technologies (OT)
- Smart decisions at devices
- Need to time-critical application
- Poor of Internet connectivity to Cloud
- Data privacy, security and legal implications

Background - Edge and Cloud computing

◆ IoT management architecture

- Changes Cloud-only to combining edge and cloud architecture





Background – Intelligent Edge

• Summary of MWC 2019

- Gartner survey
 - 59% of organizations believe 5G's ability to support high densities of IoT sensors will be the top use for the next-generation mobile networking technology.
 - Prepare for a 5G IoT explosion
- Intelligent Edge
 - "Computing is no longer confined to a device or even a single datacentre,"
 - "Instead, it's ubiquitous fabric, it's distributed from the cloud to the edge, closer to where data is generated"
 - "an open-source reference it hopes will encourage growth of an ecosystem to create and deploy new edge applications and services"

What is Intelligent Edge Computing ?

♦ AI in Edge computing

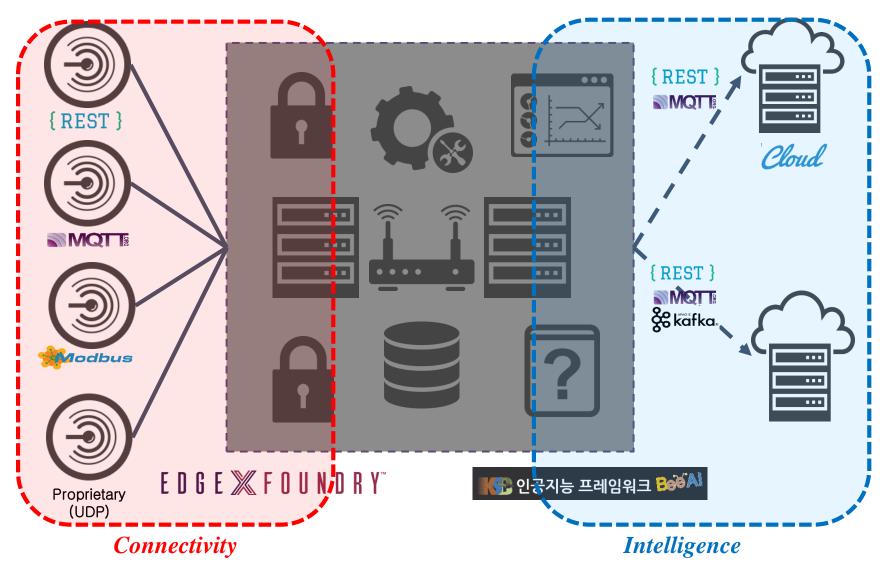
- When Edge computing is extended to the cloud

- it can be managed and consumed as if it were local infrastructure.
- security and privacy challenges may arise.

"Intelligent Edge"

- Edge computing will **not replace** the power of the cloud.
- Collaboration with Cloud computing
 - reduce cloud payloads drastically when used in collaboration with ML.
- Transform the AI's operation model
 - perform routine and time-critical decisions at the edge
 - only refer to the cloud where more intensive computation and historical analysis is needed.

Intelligent Management for Edge Computing (by ETRI)



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Intelligent Edge Computing for Connectivity

EdgeX Foundry [1]

- EdgeX Foundry is a vendor-neutral, open source, loosely-coupled micro-services framework

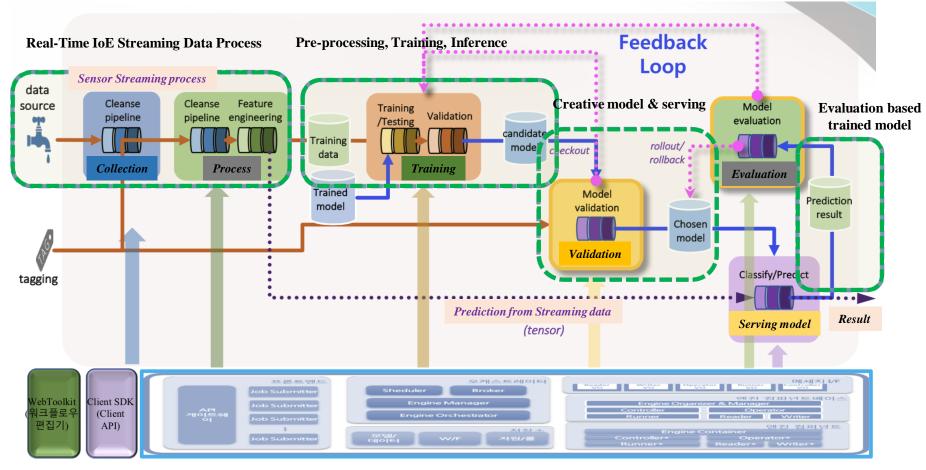
- With a focus on the IoT Edge
 - EdgeX simplifies the process to design, develop and deploy solutions across industrial, enterprise, and consumer applications.



[1] https://edgexfoundry.org



Intelligent Edge Computing for Intelligence



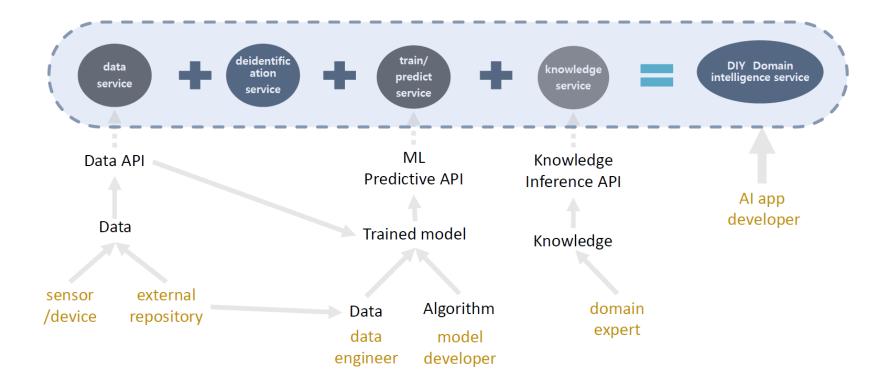
BeeAI Framework overview



Intelligent Edge Computing for Intelligence

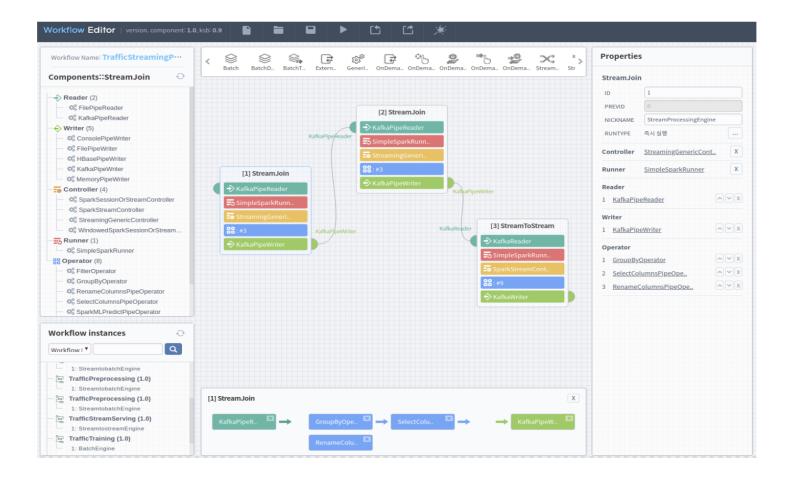
◆ KSB Industrial AI Service Infra Framework

- For application developer, ML developer, S/W developer, etc.
- Knowledge accumulation





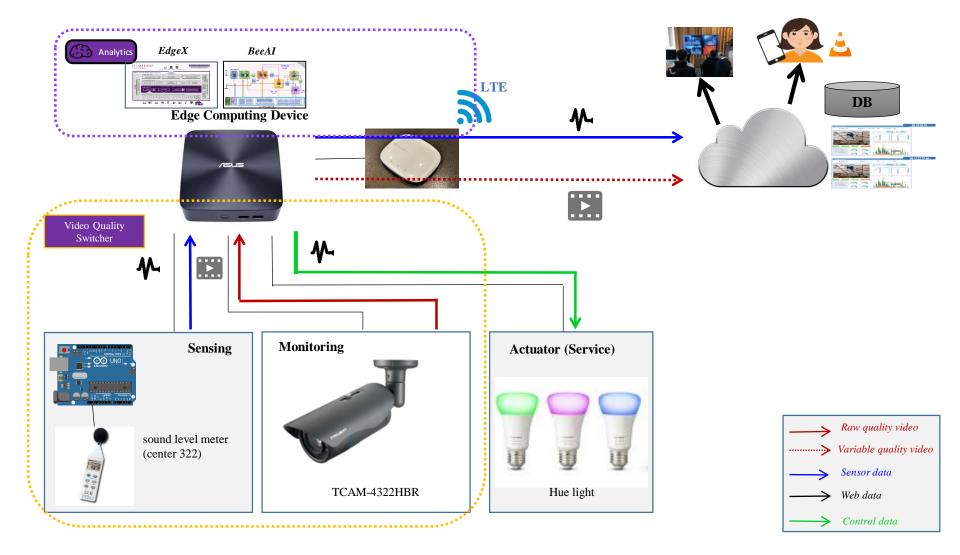
Intelligent Edge Computing for Intelligence (BeeAI Web-toolkit)



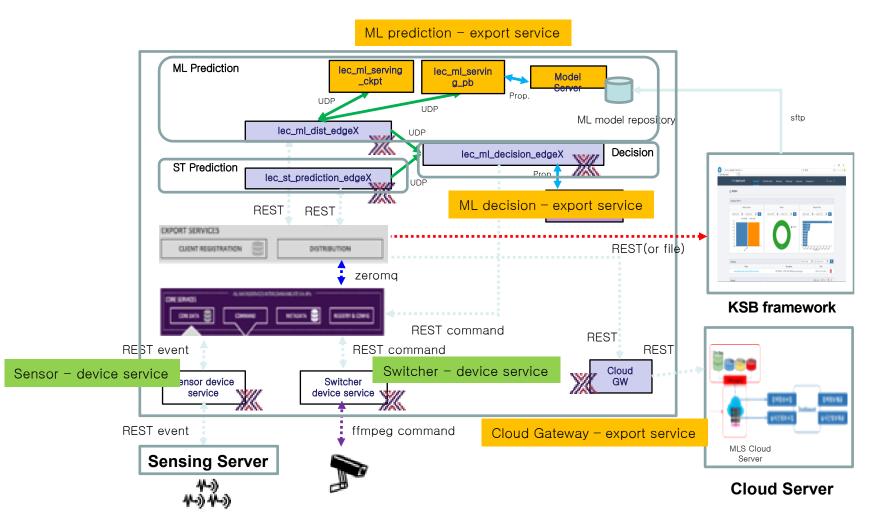
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Intelligent Edge Computing for Intelligence (Use-case for Smart Factory)



Intelligent Edge Computing for Intelligence (Overview of Data Pipeline in use-case)



Thank you

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