

Virtual Masterclass Series on
Industry4.0
for the Enterprise
Session IV on Edge Computing and Mobility

📅 26th August, 2020 ⌚ 4:00 PM – 5:00 PM (IST)

Questions Asked	Answers Given
<p>What is a difference between IoT and CPS? Can you explain with a simple example?</p>	<p>They have very similar meaning in that IoT is connecting "Things" or any machine or object to the internet and by that to each other that are built from, and depend upon, the seamless integration of computational algorithms and physical components. There is very little info with us to really differentiate these 2 except that IoT is seen as an enabler for CPS.</p>
<p>Is any embargo applicable for sensitive manufacturing industries on cloud?</p>	<p>These are dependent on the laws of the land and also on the changing geo-political climate.</p>
<p>I work in Appliance Industry... What are possible applications of Edge Computation in the appliances itself and not in back end like Digital Mfg etc.?</p>	<p>The appliances are becoming smart. If you want to monitor the appliances health then maybe an Edge device will help you do that if the appliances are being operated in remote geographies.</p>
<p>What could be a typical sizing (computing capacity) of the Edge?</p>	<p>Example: MSFT Azure Stack Edge provides a 2TB hardware with 64GB RAM (configurable) for operating edge. More to come in the future...</p>
<p>What is the Edge? How can you physically describe it? Data center? Single machine? Network of machines?</p>	<p>It is not a data center. It is more like a cluster server. Example: Azure ASE is a hardware with Kubernetes installed on it to manage the cluster.</p>

<p>Can you provide some kind of statistics at a high level as from your existing experience as to how much productivity can we achieve when we introduce the Edge into the scheme of things?</p>	<p>Productivity gains depends on the industry. In the utilities industry, with which I am associated with, productivity gains are huge. For example, in a day, an inspection team could inspect at most two pylons, but with IoT and edge computing, they could inspect 10 to 12 pylons in a day!</p>
<p>How is fail-safety taken care of?</p>	<p>This is provided by adding High Availability using container technologies and K8S</p>
<p>What kind of experience is expected, when cloud migration between service provider is opted, in terms of outage and reworks?</p>	<p>This depends on the providers you are switching from and to. Most prominent ones have very similar SLAs and downtimes should be low. Rework depends on how much of the hyperscaler native functions were used. More this is, the rework will be higher. You can minimize this by choosing options that are usually provided by most hyperscalars like Postgres as DB. However, this also means that you miss out on some of the fancy features that the providers offer for their own solutions. Most pragmatic approach would be to choose one of the most prominent provider and stick with them.</p>
<p>Can edge be named as gateway like Raspberry Pi or an edge server in plant premises?</p>	<p>Edge is the national space between OP and Cloud with qualities of both. In the end, it is a physical server within the WAN of the company if not on the plant itself.</p>
<p>What is edge computing actually?</p>	<p>To be precise, computing happens close to the machine or facility to minimize the risk of low latency (or faster response).</p>
<p>Edge devices like Raspberry Pi can be used to even execute predictive algorithms in real-time. Hence, edge is much more than being shared in the presentation in my opinion. Your views, pls.</p>	<p>Absolutely! It is much more and also evolving. Raspberry Pi is an edge device so is our Fire Stick or Chromecast, Amazon Echo, etc. We wanted to focus on Industry use cases.</p>

<p>If 5G is introduced than would Edge computing come into picture?</p>	<p>5G will push Edge use cases even further by introducing larger bandwidths thus, allowing even more data transfer between cloud and the edge devices at higher speeds. This will allow complex operations to be performed on the edge.</p>
<p>What different supply chain risks can occur due to implementation of Industry 4.0?</p>	<p>Industry 4.0 is paradigm in the evolution of manufacturing industries. In this digital transformation journey, there are quite a few risks if the transformation is not well planned. The risk can arise due to lack of skills or motivation to change, network security, lack of adequate capital, etc.</p>
<p>Where Edge Stores data on Cloud/Device?</p>	<p>It is stored in the device</p>
<p>Are Edge services provided by the same Cloud Service providers like AWS / Microsoft etc. or are they predominantly On-Prem? Which would be a popular implementation?</p>	<p>This is usually provided by Cloud Providers to provide better cloud edge interoperability. However, other HW vendors like HP and Fujitsu are also working on solutions that work with all cloud vendors.</p>
<p>Do we need to setup the same environment on EDGE which I already have on the cloud?</p>	<p>No, you should not. You should only setup the processes that absolutely need real time low latency processing. Others should remain on the cloud.</p>
<p>What is minimum response, that could be expected using eDge, as transactional speed of manufacturing is real fast?</p>	<p>It still depends on many things like the type of transaction, the application used, LAN speed etc. However, for simple transactions this can be sub second.</p>
<p>A question on fail-safety: High fail-safety is high availability; but how is it achieved?</p>	<p>Using Docker Containers and K8S on the software level, where if a container goes down another is spawned, if the HW fails there should a fail over cluster added.</p>
<p>How frequently data will be sync between EDGE and Cloud?</p>	<p>In most cases, real time when connection is up. When connection is down, it should buffer the data and sync as soon as connectivity is up.</p>
<p>I have a health band that uses BLE to connect to my phone. Phone in turn connects to cloud. In this case, I can say my phone is an edge device is it?</p>	<p>Yes, it is however for limited use cases. In the session, we focussed on industrial use cases where buying/installing new hardware is not always possible</p>

<p>If the mobile solution is offline & maintenance order is generated for monitoring, how the central system (ppl at centre) will be aware of the change? When & how the central system will be synced with mobile system - Is this the reg the Drone use case discussed.</p>	<p>Typically, in the case of routine maintenance inspections, the maintenance order is generated in the central system. These orders are synced to the mobile device. The mobile solution can work online or offline. The drone streams normal video as well as thermal images to the mobile device. The mobile solution has ML/AI based algorithms which can identify the defects from the images and creates maintenance notifications. When the mobile device connects back to the central system, the notifications are synced. The maintenance planner then analyzes the defects and creates reactive maintenance order to address the defect.</p>
<p>The power line Inspection business case, where does the Edge come in that? And if there was a normal Cloud implementation, then what difference would it make.</p>	<p>Here, the Edge is the device itself which provides offline and online capabilities.</p>
<p>If we setup a MQTT broker better way at edge, will it have the data buffered which can then be stored in DB?</p>	<p>Yes, in most cases the Microservices will talk to each other using a message/event broker.</p>
<p>a) Have the industry been able to define/agree on communication protocol standardisation for Edge devices? (b) What is Fog Computing - would you please share if this concept is evolved to something beyond academic research?</p>	<p>Fog Computing is another name for the Edge Computing. For communication protocol, I am not aware of a complete standardization but most vendors use https for communication.</p>
<p>How Geographical restrictions (Privacy) issues are solved by Edge since again clouds comes in to picture?</p>	<p>If there is data that cannot be sent to cloud then you can keep it only on the Edge and not sync it. Sync to cloud is only an option.</p>
<p>Is Edge a better solution for real time tracking kind of applications? In my case, it is IoT based tracking real time locations, which continuously sends data to cloud.</p>	<p>If connectivity is not an issue then you do not need edge. Also, if the device that tracks the location has storage, you do not need separate edge.</p>
<p>How are the pricing models evolving?</p>	<p>This is dependent on hyperscalars.</p>

<p>How it will be useful for automotive/industrial products engineering services and manufacturing industries, especially for experienced mechanical engineers?</p>	<p>Edge computing has lot of industrial applications. Take for example, the use case of connected cars. Connected cars need to interact with lot of devices in real time for smooth risk free navigation. This means we should have computing power close to the place where the action happens. So, there is a need for rich resource machine in the car that analyzes the data coming from the interconnected devices using AI algorithms and provides instanteneous response with low latency.</p>
<p>In rural area, as the use case of powerline, are you on LORA or other GPRS?</p>	<p>UAVs explained in the business case used LORA.</p>
<p>Who owns the EDGE? Is it implemented on Premises so that customer / local LAN/WAN owns?</p>	<p>Typically, the EDGE device is owned by the customer or can be subscribed. This depends on the commercial model of various vendors.</p>

