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Virtual Masterclass Series on

Industry4.0
for the Enterprise

Session II on Internet of Things (IoT)

📅 **29th July, 2020**   🕐 **4:00 PM – 5:00 PM (IST)**

Questions Asked	Answers Given
In a Industrial IoT implementation, typically the underlying DCS/SCADA is doing the real time data processing. What is the role of an edge device other than data collection and sending to the cloud?	Edge Computing is beyond data collection from edge devices . Use cases that require real-time analysis and response, or require reduction of data for restricted or costly bandwidth to the cloud will require some sort of local processing which is edge processing orchestrated from cloud For example: crane collision detection or automated driving cars can not wait for round trip latency to the core and back to recognize and respond to urgent events these usecases might need execution of rules, ML model execution or extending business process to edge
What are software and system requirements for kafka?	This is quite generic, please share the additional details about the question. You can find once such example about hardware requirments, generally on internet - https://medium.com/@akash.d.goel/kafka-hardware-requirements-9328886fe88f

How would you differentiate between a IoT device and an EDGE compute device?	There is nothing like IoT Device or Edge Device seperately Edge device is the one with the source of sensor data Any IoT scneario will have a edge device .However if the edge device does the job of just transmitting data to cloud or does it take care of further processing is important. the teminologies edge device and IoT device are used as synonyms . however the catch is , if any of the above mentioned devices allows local processing at the edge node itself - then we call that scenario as edge computing.
How do we optimize the sensors, interms of data and cost and conevenience to the user? Becasue more sensors is more inconvenience to the user even thoough it gives lot of data	Absolutely . In many practical implimentations, some of the data is filtered at edge node itself to avoid sending noise data to cloud as well as to save costs. In many practical implimentations, device cloud or the telco cloud does this job before sending all the data all the way to IoT platform cloud . Another important aspect is, based on the business use case , we need to decide on sensors that are needed to be glued to the asset/device.
Please share some examples where IoT is implemented in Pharma industry.	1. Predictive maintenance of asset that manufactures the drug . Because drug manufacturers cannot afford to have downtime of such machines 2. supply chain monitoring - from the shipment of the drugs/vaccines to transit and delivery into hospitals or pharmacies 3. smart packaging 4. Dispensing the medice via automated kiosks/smart vending machines - especially in the current situations like COVID.

Which is best in Http Request & Socket for continuous data streaming with IoT device?	Web Sockets are better than HTTP for continuous data streaming as Web Sockets use Bidirectional communication in single channel whereas HTTP uses unidirectional communication in a stateless way. Web Sockets provide real time experience and faster than HTTP. to add further - - Web socket examples are instant messaging (IM), Online chatting, online gaming. These apps used lot of bidirectional communication - Http streaming examples are like twitter updates, cricket score, browser notifications where server keep pushing data in single direction - In general if server has to keep processing and acknowledge client for further communication then web sockets can be used
Can I train my ML models on Edge layer and only push the results to Cloud Layer?	Typically ML models are trained on the cloud and trained models are onto Edge device and get executed. The edge computing will take care of the routine within the constraints of the "known," whereas the central cloud system will focus on the business and watch out for the unknown, requiring superior "brain power."
How IOT is linked to SAP S/4 Hana to trigger real time actions? Could you please share some in sights?	This queston is specific to SAP. IoT actions connect IoT with intelligent suite applications via embedded and integration scenarios. SAP IoT has Actions/Backend Integration Service. This service takes care of connecting to backend cloud/on-prem systems . With this capability in place one can trigger a process in the S/4 system or they can update a backend buisness object.
How the integration of IoT with SAP is done is it using BAPI's or what is the underlying thing which is used for integration?	Technically, SAP Cloud Platform Integration iFlows establish the connection between SAP IoT and backend systems

What is silo? Why it is important to the industry? How it is implemented to the industry? After Industry 4.0, IoT in future next version; how its impact on industries activities?	Silos are not specific to IoT. An example was taken in the session for easy understanding Silos exist across Industries for ages which are used to store bulk materials (here is the wikipedia link of Silos - https://en.wikipedia.org/wiki/Silo) Silos are used to store Non perishable goods (e.g. Cement), Perishable goods (e.g. grains, sugar liquid) and Hazardous goods (e.g. chemicals, by products of mining, energy, metal industries, In many cases inventory monotoring of Silos becomes tricky which is often supported by IoT based setup
How Industrail IoT is affecting the Design processes for Mechanical components? Please expalin with one example.	you will get more details about this during the session scheduled for 9th september about - "Enterprise Product Development"
How to collabrate the data's from various IoT devices installed? What tools can be used? Can we optimse the data using a simple database management system? Advice required	Session scheduled for 12th August will share more details about Bigdata topic However here are some inputs There are 2 aspects in this questions 1. how to get data from different devices: One of the key aspect of the "device connectivity" service of an IoT platform is to connect with different devices/assets having sensors belonging to different families . They fundamentally harmonize different sensor types in a semantically aligned model . 2. query about database management system As explained in the system IoT data is huge. So we need an automatic, dynamic bigdata store is needed to manage the storage of IoT data. one better way to manage is to store across multiple stores - hot store (Very high performance, important data which is immediatly needed for applications and visualizations), warm store (High-performance access on single objects with multiple months as retention period), cold store (High-latency access with multiple years of data storage) .

Is a pressure/ temp monitor an IoT as well as an edge devices? And a smartphone with a software to use its accelorometer is an edge device?	Any device equipped with temperature/pressure sensor is considered as edge device and is also called as IoT device Any smartphone equipped with accelorometer sensor is considered as edge device and is also called as IoT device. This is because the teminologies edge device and IoT device are used as synonyms . however the catch is , if any of the above mentioned devices allows local processing at the edge node itself - then we call that scenario as edge computing.
What is the role of Kafka?	an open source software designed to handle massive amounts of data ingestion. Sensor data is passed on to a message broker, which is typically a Kafka-based implementation The message broker's purpose is to make sure all data is reliably buffered in the system even when there are unusual spikes in the number of messages hitting the system from devices, or any of the follow-up components are down. Kafka offers a pub/sub mechanism.
Could you please enlighten us a bit on Connected Cars? Because my client is storing all the data on the edge layer and just want to push the results to cloud layer rather than pushing all the data to cloud too.	That's absolutely ok, only relevant data or results can be pushed to cloud and rest all can be processed at edge device itself. In this example edge device is your car. An interesting business model is - The expenditure will also be tied to the user who benefits (e.g., the storage in a connected car will be funded by the user who buys the car and not by the owner of a data center i.e car manufacturer).

Is Kafka deployed on windows?	an open source software designed to handle massive amounts of data ingestion. Sensor data is passed on to a message broker, which is typically a Kafka-based implementation The message broker's purpose is to make sure all data is reliably buffered in the system even when there are unusual spikes in the number of messages hitting the system from devices, or any of the follow-up components are down. Kafka offers a pub/sub mechanism.
How IOT is helpful in Oil and Gas Industry?	IoT can be applied to Oil and Gas across upstream, midstream, and downstream across multiple scenarios few immediate areas that can be spelled out are - Asset Monitoring - Predictive maintenance - Remote Services - Worker Health and Safety