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Q.1   What is configuration management? How it is applicable to IoT?

ANS.   Configuration Management is the practice of handling changes systematically so that a system maintains its integrity over time. It ensures that the current design and build state of the system is known, good & trusted and doesn't rely on the tacit knowledge of the development team. It allows access to an accurate historical record of system state for project management and audit purposes. Configuration Management overcame the following challenges-

1. Figuring out which components to change when requirements change.

2. Redoing an implementation because the requirements have changed since the last implementation.

3. Reverting to a previous version of the component if you have replaced it with a new but flawed version.

4. Replacing the wrong component because you couldn't accurately determine which component needed replacing.

Q.2   Give full form of

　　　　1. MQTT   2. CoAP   3. REST   4. NETCONF   5. YANG

ANS.   1. MQTT   -   Message Queuing Telemetry Transport

　　　　2. CoAP   -   Constrained Application Protocol

　　　　3. REST   -   Representational State Transfer

　　　　4. NETCONF -   Network Configuration

　　　　5. YANG   -   Yet Another Next Generation

Q.3   What is NETCONF YANG? How it is applicable in IoE.

ANS.   NETCONF (Network Configuration) is a protocol defined by the IETF to "install, manipulate, and delete the configuration of network devices". NETCONF operations are performed via an RPC layer using XML based encoding. YANG (Yet Another Next Generation) is a data modelling language, providing a standardized way to model the operational and configuration data of a network device. YANG, being a language, is being protocol independent, can then be converted into any encoding format, e.g. XML or JSON. With the adoption of network automation increasing (such as SDN) there was a need to standardize and improve the way that networking devices were programmed. The solution to this issue came from the IETF, in the form of NETCONF and YANG. In its simplest form YANG provides a language to describe your desired configuration (or state). NETCONF, on

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the other hand provides the protocol to deliver and perform the required operations in order to achieve the desired state, described within the YANG model.

Q.4　　What is Handover? How it is relevant to IoT?

ANS.　Handover is the changing point of attachment from one network to another. It is of two types- Reactive Handover, which occurs after changing the point of attachment of the mobile node, and Proactive Handover, which is undertaken prior to the mobile node changing its point of attachment. IoT devices are mainly Mobile Nodes (MNs) that require Mobility Management Protocols (MMPs) to be in place, to provide transparent services to users without experiencing interruptions or disconnections. Handover management enables the network to keep active connections during the Mobile Terminal (MT) movement or even balance the network load evenly among different areas. In a network-controlled handover, the network decides based on the measurements of the received radio signal from the MTs at a number of access points.

Q.5　　Compare Apache Storm and Hadoop.

ANS.

Apache Storm	**Hadoop**
It possesses real-time stream processing.	It possesses batch processing.
It has master-slave architecture with ZooKeeper based coordination. The master node is called as **nimbus** and slaves are **supervisors.**	It has master-slave architecture without ZooKeeper based coordination. The master node is called as **Job tracker** and slaves are **task tracker.**
It is stateless.	It is stateful.
Storm topology runs until shutdown by the user or an unexpected unrecoverable failure.	MapReduce jobs are executed in a sequential order and completed eventually.
A Storm streaming process can access tens of thousands of messages per second on cluster.	Hadoop Distributed File System (HDFS) uses MapReduce framework to process the vast amount of data that takes minutes or hours.

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Q.6   What is REST? Compare REST and SOAP.

ANS.   REST stands for Representational State Transfer. It is a stateless software architecture that provides many underlying characteristics and protocols that govern the behavior of clients and servers.

Parameters	REST	SOAP
Style	It has an architectural style.	It is a protocol.
Function	It is data driven, access a resource for data.	It is function driven, transfer structured information.
Data Format	It permits data formats including plain text, HTML, XML and JSON.	It only permits XML.
Security	It supports SSL and HTTPS.	It supports SSL and WS-Security.
Bandwidth	It requires fewer resources and it is lightweight.	It requires more resources and bandwidth.
Data Cache	It can be cached.	It cannot be cached.
Payload Handling	It needs no knowledge of API.	It has a strict communication contract and needs knowledge of everything before any interaction.
ACID compliance	It lacks ACID compliance.	Has built-in ACID compliance to reduce anomalies.
Performance	It has better performance and scalability.	It is not so scalable.