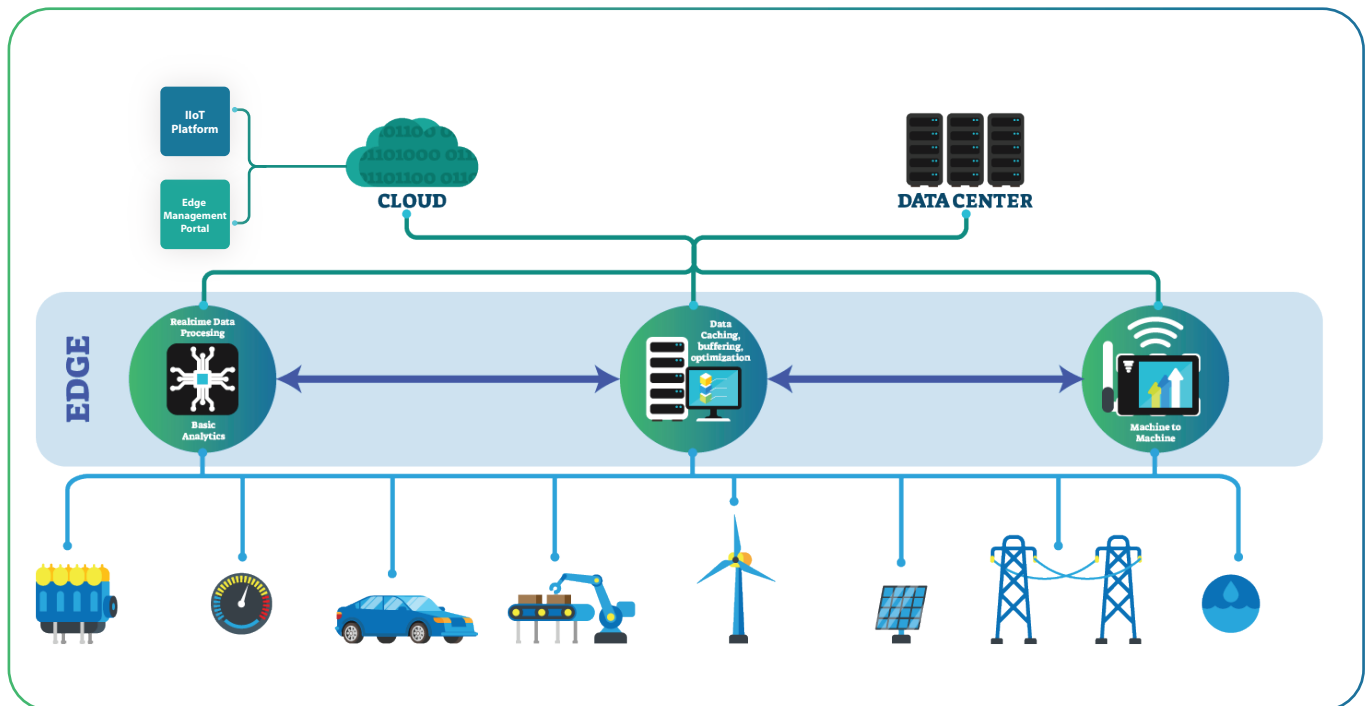


Top 7 Features to Consider Before Choosing an Edge Device Manager



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Power of Edge Gateways in Industrial Automation

Manufacturing industries are constantly evolving with smarter technologies to support and simplify complex operations. In this renaissance of the industry, call it Industry 4.0, edge devices are playing a pivotal role in regulating the ever-increasing data volume. The growing importance of IIoT connectivity has made industrial plants deploy edge devices. By keeping the data close to the source, edge devices reduce latency, increase performance, and improve responsiveness.

Edge devices play an important role in managing industrial assets. Keeping track of the health of field assets, gathering critical operational data, and generating keys alerts are some of the crucial tasks performed by the industrial edges.

Gartner forecasts that about 75% of the enterprise-generated data will be created and processed outside the conventional centralized data center or cloud.

With industries becoming more data-centric, field data is critical for making rational decisions. With edge devices acting as the doorway to the IT world, keeping them in check is important. However, managing these edge devices manually is not a trivial task and can be very expensive. As such having a central platform with connectivity to each edge device can be a solution. That's where we enter into the realm of an Edge Device Manager.



Why do You Need an Edge Device Manager?

With a huge installed base of field/OT devices, the plants require several edge devices across plants and geographies to keep the field data flowing. These edge devices also require regular monitoring, maintenance, and diagnostic activities to avoid any disruptions. Following are the common challenges that industries face in the absence of a central edge device management platform:

- **Manual Provisioning:** Conventionally, a network engineer on-boards and deploys each and every edge device manually irrespective of the geographic location of the plant. This also includes registering and authenticating the edge devices and installing the applications that will run on them. Clearly, this approach is not very cost-effective and requires expert supervision.
- **Manual Updating:** For edge devices to keep functioning, various firmware, applications, and security updates are required to be installed periodically. Conventionally, these updates are installed manually on each device, which demands time, cost, and manual effort. However, there are times, when the software on these devices becomes outdated that can cause serious bottlenecks in operations.
- **High Operational Cost:** Inspecting the edge devices at plants, often distributed across geographies, is not only an extremely time-consuming process but also raises the operational cost by a substantial factor.
- **Security Threats :** Edge devices possess critical field information, which if leaked or snooped upon can be potentially disastrous. The connectivity of multiple edge devices over public networks like internet can pose serious security threats to critical device information.

Pre-requisites to Consider Before Choosing an Edge Device Manager

Choosing the right edge device manager is essential to ensure the proper functioning of the IIoT value chain for any industrial enterprise. Some of the features that you should consider while choosing the right edge device manager are given below:

1# Edge Lifecycle Management

Industrial edge devices are the bridge between the OT and the IT world. Therefore, keeping a check on device health and status is of utmost importance. In an industrial plant, edge devices are deployed, commissioned, configured, and replaced sporadically. In order to perform all these activities remotely, the edge device manager should be capable of device bootstrapping, device configuration, raise alerts as part of incident management, etc. It also includes exhibiting the versions of applications installed across the fleet of edge nodes so that bulk updates/rollbacks can be performed.

2# Scalability

Edge devices do not operate in a silo. There are numerous edge gateways deployed and connected with the field devices and IT domain to pass on information from all the field devices. Therefore, keeping track of all the edge devices across all the plant locations becomes a huge challenge. A suitable edge device manager should be able to break this barrier by being able to operate at scale. The right edge device manager should be able to manage all the distributed edge nodes remotely irrespective of their geographic locations.



3# Cyber Security

Edge Devices interact with multiple field devices over public or private networks. In both cases, the probabilities of exposing device information to unwanted receivers always pose a security threat. A secure way to deal with this scenario is to have an edge management application that is secure by design. The best way to ensure device information safety is to implement certificate-based authentication and TLS-based transportation and credentials-based storage. Another critical measurement is employing Role-Based Access Control (RBAC) to manage the users effectively.

4# Hardware-Agnostic

Industrial hardware can be extremely heterogeneous based on the locations they are deployed in, such as remote locations like oil rigs, factory floor, inside the wind turbines, etc. An ideal edge device management platform should be deployable on any kind of hardware architecture (CPU, GPU, FPGA) with diverse form factors.

5# On-Prem/Cloud Support

An important element that companies look forward to is the flexibility of a solution. With edge device managers, industrial enterprises seek to achieve the desired tractability through its ability to be deployed on-premise or on-cloud. This way companies can access required information from anywhere, anytime. This also calls for the edge manager to be cloud and database-agnostic.

6# Bulk Application Deployment

Edge device managers allow developing containerized applications to be deployed on the distributed edge nodes. The users can deploy, manage, update, and configure the applications with a single click. This allows deploying edge applications in bulk with convenience and complete security.

7# Support for Legacy and Cloud-based Solutions

Any industrial plant's edge infrastructure may have a large footprint of legacy applications that can be critical for business but are not compatible with containerization. Therefore, a suitable edge device manager should be able to support both legacy and cloud-native applications to ensure smooth operations.

Use Cases of Edge Device Manager

Given the disparate types of industries, from traditional manufacturing/process plants to automotive, or remote solar farms, or even oil pipelines spread across countries, or moving vehicles, edge devices and hence edge device management has utility in several deployment scenarios. To cover a few:

An oilfield service provider may deploy multiple edge devices across distributed well pads to keep track of the health of field devices. However, monitoring and diagnosing the health of these edge devices can be easily performed with the help of an edge device manager that can display the status of each device including hardware, firmware, and the applications. This will help the enterprise orchestrate the entire edge layer from a remote location with end-to-end security.

Similarly, an industrial asset management company may want to deploy an edge device manager to update the security patches periodically so as to protect the crucial field data from getting leaked from the edge devices.



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contact@utthunga.com

Conclusion

The industrial world is becoming more reliant on intelligent devices and applications that push mammoth data volume to the cloud. To supplement the cloud, lower the bandwidth consumption, and reduce the latency, industries are increasingly leveraging the power of edge computing. With clear end-to-end visibility, control, and security, edge device managers facilitate the network managers with all the abilities to coordinate and manage the edge devices in a prompt fashion.

Zero-effort provisioning, remote monitoring, over-the-air updates, scalability, and end-to-end security are some of the potential benefits that have made industries from across the globe to pursue effective edge device management strategies. The flexibility to be deployed on any hardware and integrate with cloud/on-premise platform of choice makes an EDM solution truly appealing.

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