LITMUS

Deployment Guide

How an Edge-to-Cloud Data Platform Works

Rapid and secure data flow between factory and enterprise cloud systems.

Edge-to-Cloud Ready Platforms | Microsoft | Google Cloud | aws | CLOUDERA

Cloud adoption has accelerated rapidly over the past several years, but enterprise cloud platforms are only as good as the data that feeds them. Edge and cloud platforms must operate as one in order for large-scale manufacturing companies to successfully leverage machine learning systems to improve operations at scale.

At Litmus, the biggest challenge our customers face is access to the data they need to fuel machine learning and analytics models. We see it over and over again – large scale manufacturers come to Litmus looking for the fastest way to connect to their assets and send data to the cloud – and we can help.

Companies not only need to send data to the cloud to create machine learning models, they also need to deploy those models back at the edge with a unified edge-to-cloud platform. This paper will show you how Litmus helps customers achieve data connectivity at the edge, feed machine learning models with normalized, ready-to-use data, and complete the feedback loop by running new models at the asset for continuous optimization.

Why the Edge

Many companies have taken a cloud-first approach to digital transformation, without properly considering the importance of the edge. Explosive growth in the number of IoT devices means the same for data, and higher volumes of data being sent to the cloud means increased latency and costs. The edge not only complements the cloud by offsetting some of those challenges, but also activates key use cases and applications that are better hosted on-premise.

Faster Insights

Cloud has its place for long-term analysis, but the value of edge computing lies in making use of the data at the asset, where it has the greatest impact and zero latency.

Immediate Action

Collect data, analyze it at the edge, and then take immediate action to solve maintenance problems, increase efficiency, improve production, and more.

Preserve Bandwidth

Networks and infrastructure haven't quite caught up to the data explosion, so utilizing edge computing to only send the data that is needed to the cloud saves time and money.

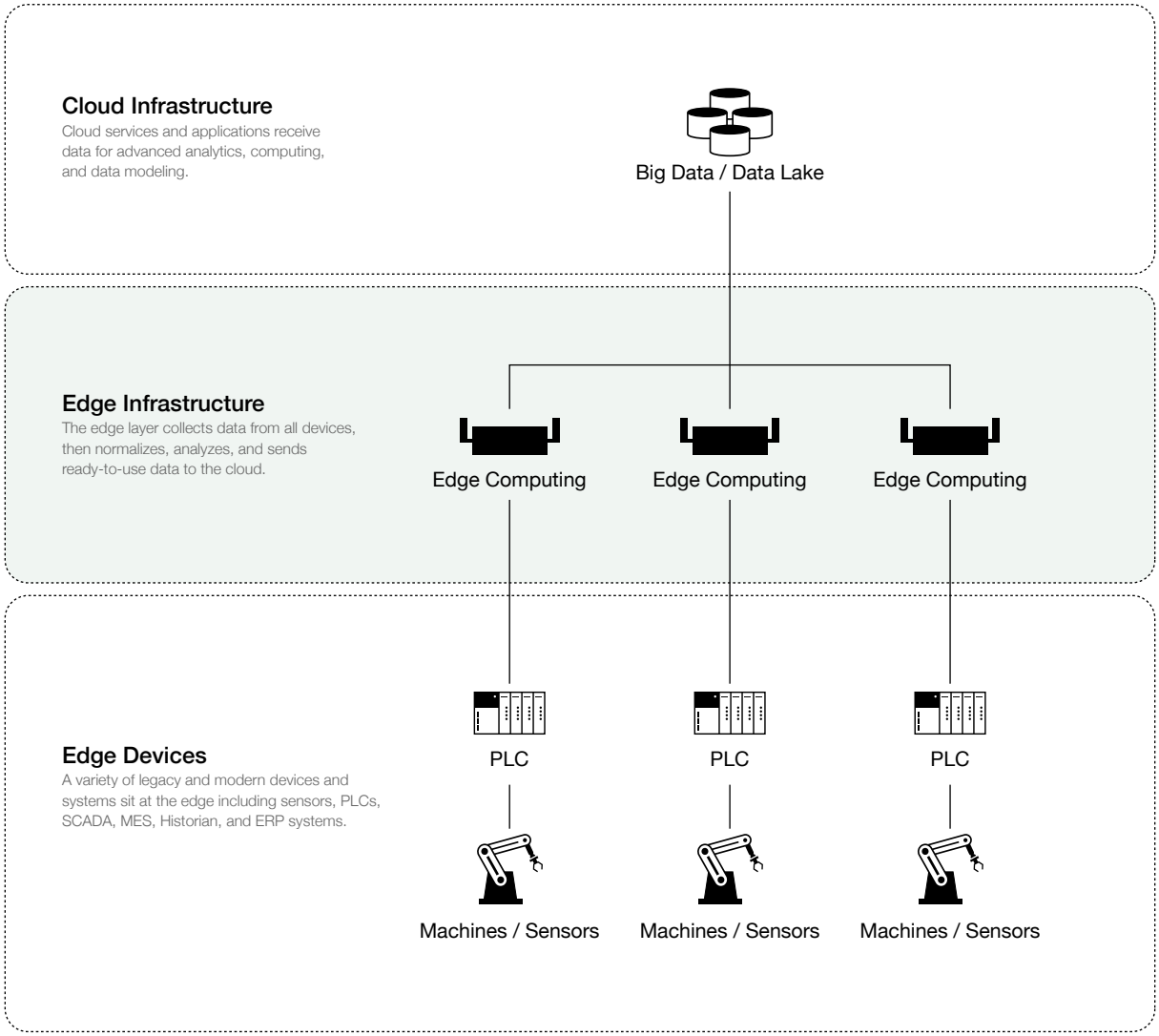
On-Premise Use Cases

The cloud makes sense for machine learning and other long-term or big data analysis, but the edge activates on-premise use cases like condition-based monitoring and OEE for quick ROI.

75% **Gartner estimates that by 2025, 75% of data will be processed outside the traditional data center or cloud.**

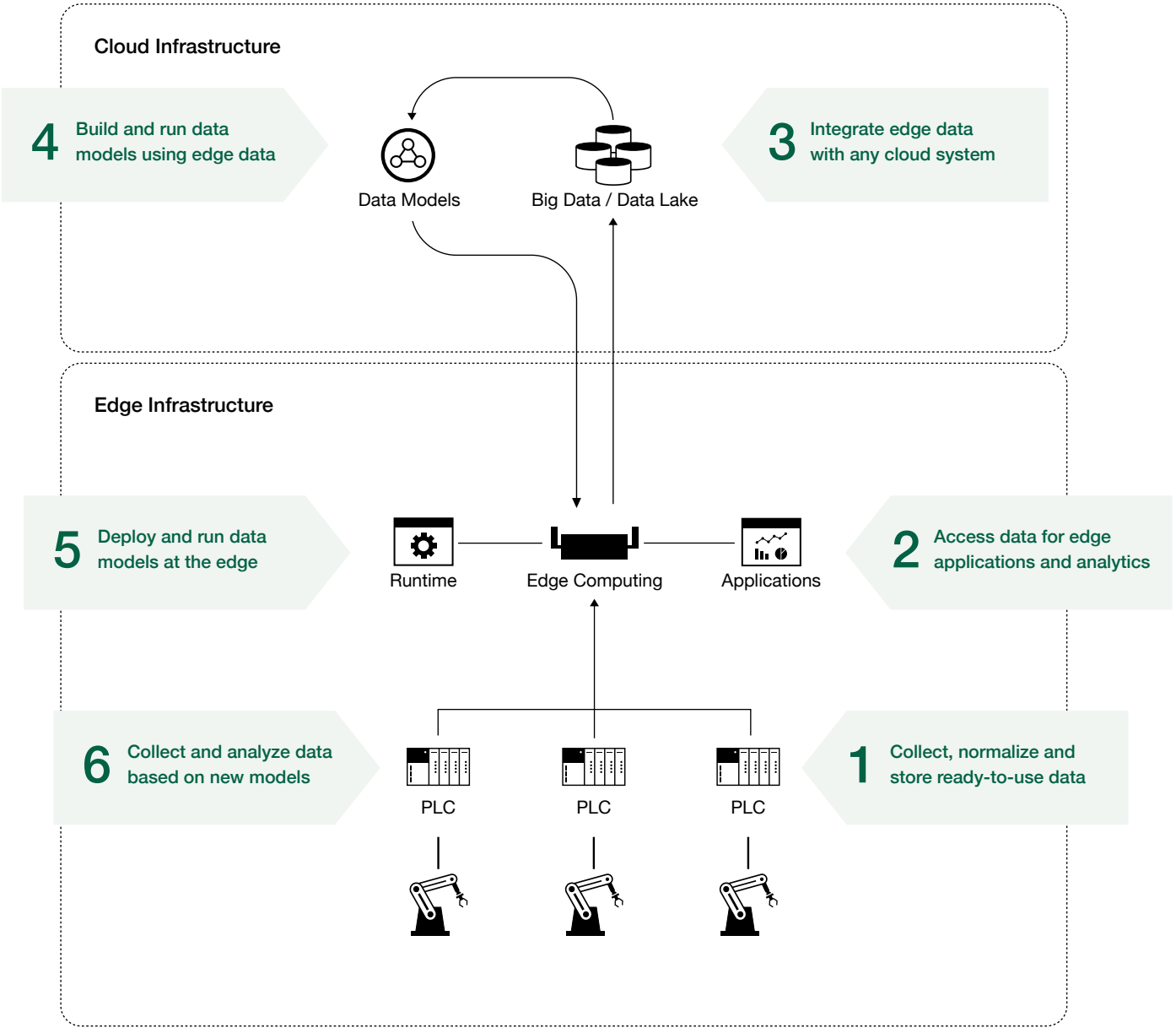
What is a Unified Edge-to-Cloud Data Connectivity Platform?

A unified edge-to-cloud data connectivity platform bridges the gap between industrial devices at the edge and big data and machine learning systems in the cloud. The platform is deployed on edge computing devices and is designed to collect and structure data into a common data format. A unified edge-to-cloud platform acts as a data broker, enabling applications and analytics at the edge, and big data and machine learning in the cloud.



How Does an Edge-to-Cloud Platform Work?

Litmus is deployed as an edge computing platform next to the industrial assets – collecting and normalizing data at the source. Ready-to-use data is managed at the edge for local analytics and sent to cloud and big data systems for more complex processing. Data models are deployed back at the edge to complete the cycle.



Use Cases

As Litmus works with leading industrial companies, we see use cases fall into four major categories day after day. Edge-to-cloud projects often start with simple data visualization and local analytics, then over time move to more advanced machine learning and continuous optimization use cases. These are the main use case categories required by customers and enabled by Litmus Edge.

Data Visualization

Once edge devices are connected, users can create visualizations, BI dashboards and custom SQL-scripted analytics with just a few clicks. They can perform simple data manipulation and visualization for a baseline of what is happening on the shop floor such as uptime and downtime. Many companies start with the goal to achieve this kind of basic visibility into their assets and systems on the factory floor.

Machine Learning and AI

Machine learning and AI starts with connectivity at the edge, then Litmus feeds big data and cloud systems with ready-to-use data. Customers ready for this level of analytics typically use a Litmus partner to build models in the cloud, and leverage Litmus Edge's ability to provide ready-to-use data from all disparate data sources for robust and well-rounded models with stronger prediction capabilities.

Edge Analytics

Once machines are connected and data is being collected, customers need to monitor real-time asset data and set up alerts for various thresholds to understand how assets are performing. Litmus offers ready analytics to optimize operations based on common KPIs such as OEE, anomaly detection and more. Local analytics allow customers to set up condition-based monitoring and get real-time value at the edge, before sending any data to cloud systems.

Continuous Optimization

The most advanced edge-to-cloud projects complete the feedback loop for continuous optimization. Litmus enables the rapid deployment of machine learning runtimes at the edge, providing the edge-to-cloud intelligence needed for continuous optimization. The result is increased quality and improved operations due to both product analytics and real-time data collected and shared in a continuous loop for ongoing process improvement.

Litmus Platform Capabilities

Litmus Edge brings four essential capabilities together into one platform for complete edge-to-cloud data flow.

Device Connectivity

Litmus Edge offers rapid data connectivity to all modern and legacy industrial systems with just a few clicks – enabling data collection and structuring data in a ready-to-use format by any edge or enterprise application.

- 250+ pre-loaded device drivers
- No programming required
- Data collection
- Data normalization
- Data access and storage

Edge Analytics

Get immediate value at the edge with pre-built data visualizations and analytics for common KPIs to realize rapid time-to-value. Run data models created in the cloud back at the edge for closed loop edge-to-cloud operations.

- Zero setup analytics
- Pre-built KPIs: uptime/downtime, OEE
- Video processing
- Statistical and analytical queries
- Time series data

Application Deployment

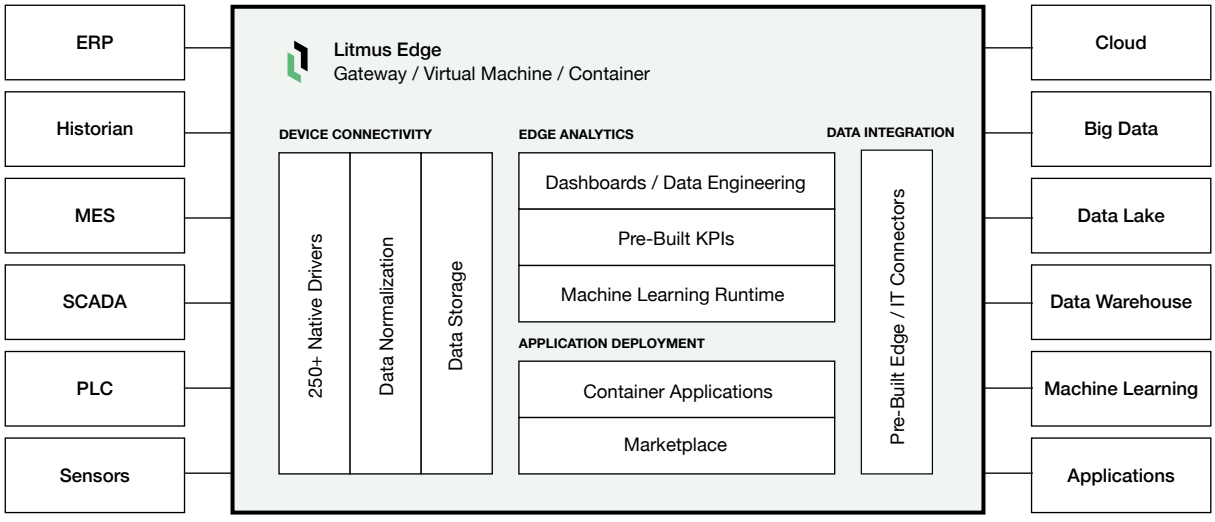
Host and access public or private applications in a centralized repository with the ability to rapidly and securely deploy and run applications at the edge. Stream normalized and structured data to any pre-built or custom application.

- One-click application orchestration
- Docker container-based
- Default set of applications
- Deploy to many edge devices
- Zero-touch provisioning

Data Integration

Immediately feed valuable and ready-to-use data to any cloud or enterprise application to achieve a complete data picture from OT to IT. Activate machine learning and advanced analytics use cases with bi-directional integration from edge to cloud.

- Stream ready-to-use data
- Pre-built connectors
- Integrate easily with leading cloud providers
- Feed big data implementations

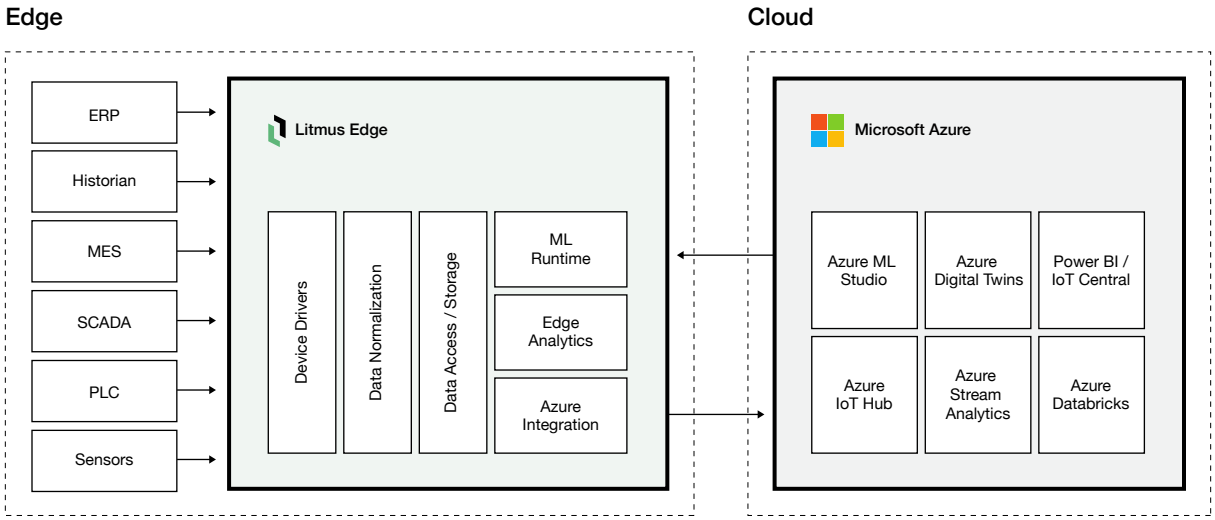


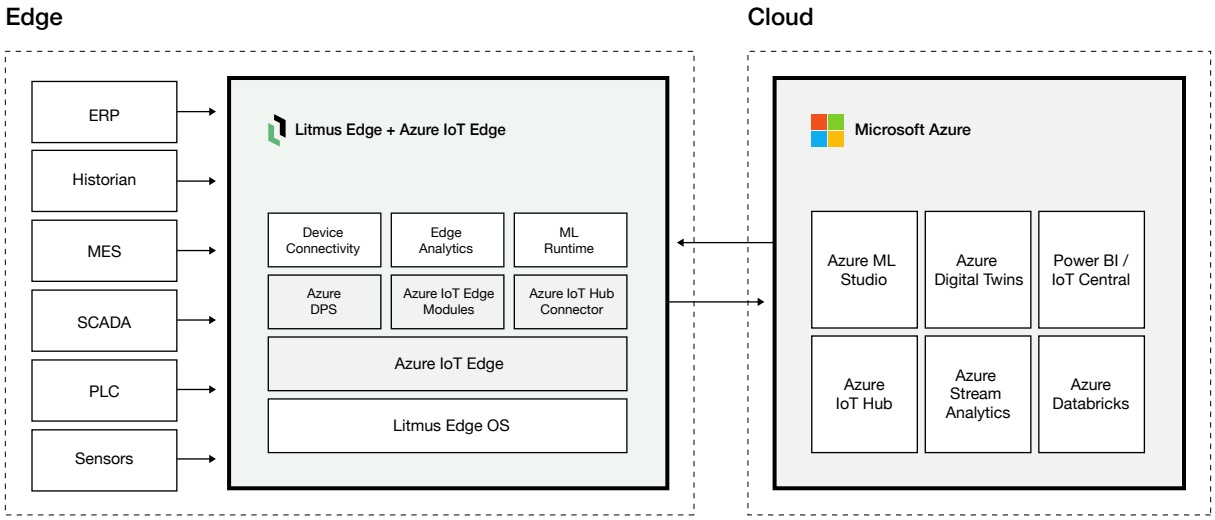
Edge-to-Cloud Deployments

A vast majority of companies are standardizing on one of these major cloud platforms – Microsoft Azure, Google Cloud, AWS, or Cloudera. We have built great relationships and pre-integrated Litmus Edge with these and other vendors – so no matter who you choose to work with in the cloud, Litmus Edge can enable your complete edge-to-cloud solution for IIoT.

Litmus-to-Azure

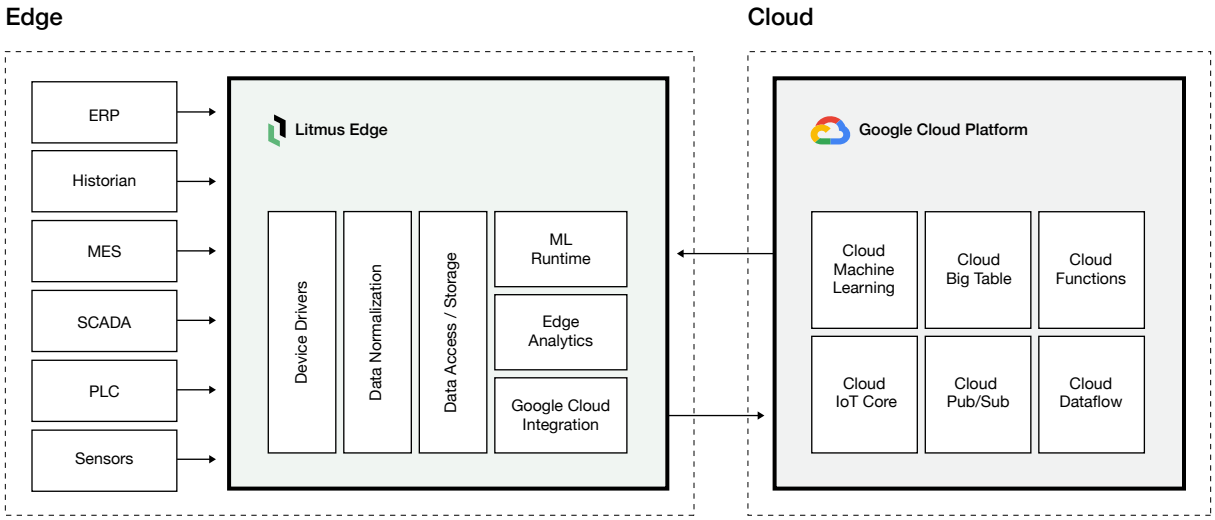
The Litmus and Azure solution accelerates and enables Azure deployment, consumption and usage. Litmus Edge can send data directly to Azure IoT Hub, or run Microsoft Azure IoT Edge on Litmus Edge. Litmus collects, normalizes and sends data from any asset to Azure for advanced analytics and machine learning, and then Azure models can be deployed back at Litmus Edge via the Azure Container for continuous process improvement.





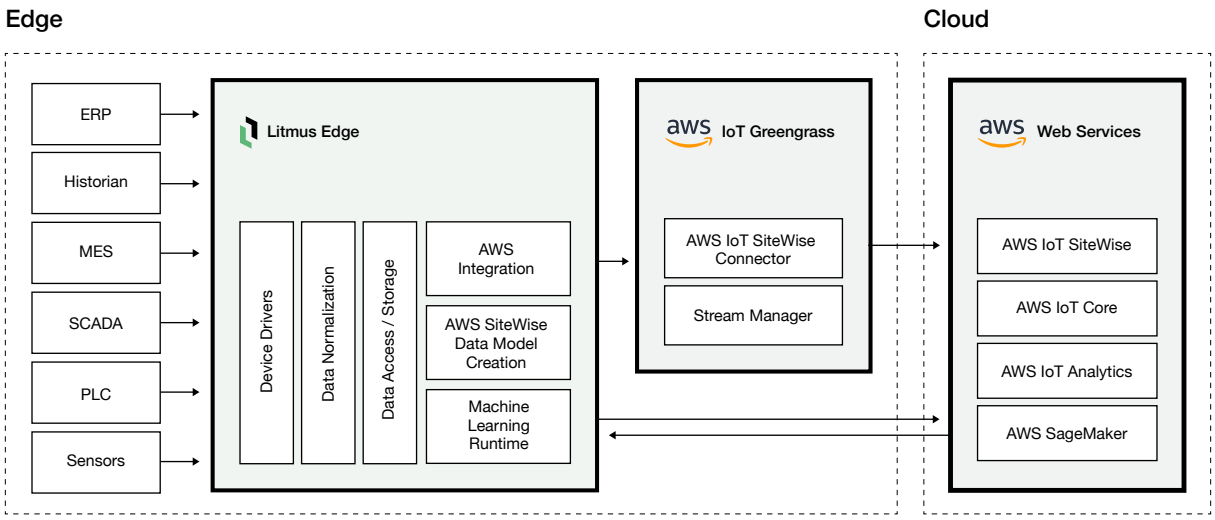
Litmus-to-Google Cloud Platform

Litmus Edge is integrated with the Google Cloud Platform to allow customers to connect and collect industrial data from any asset and send it directly to the Google Cloud Platform for immediate use. Litmus and Google have partnered together to accelerate application deployment at the network edge, making it easy to deploy an application once and scale it across networks to the edge.



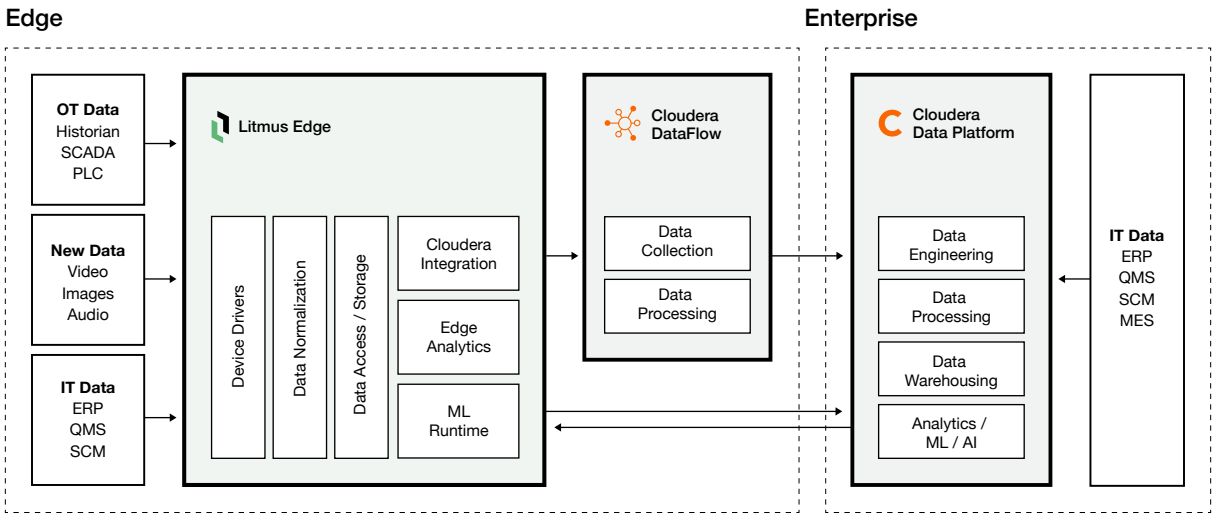
Litmus-to-AWS

Litmus Edge is flexible enough to collect and send machine data to AWS IoT Greengrass at the edge, or to AWS Web Services in the cloud. Litmus provides pre-built device drivers to connect to any edge data source, has a data collection and normalization engine that structures and stores data into a ready-to-use format for AWS, and has an embedded machine learning runtime that can run any AWS data model at the edge.



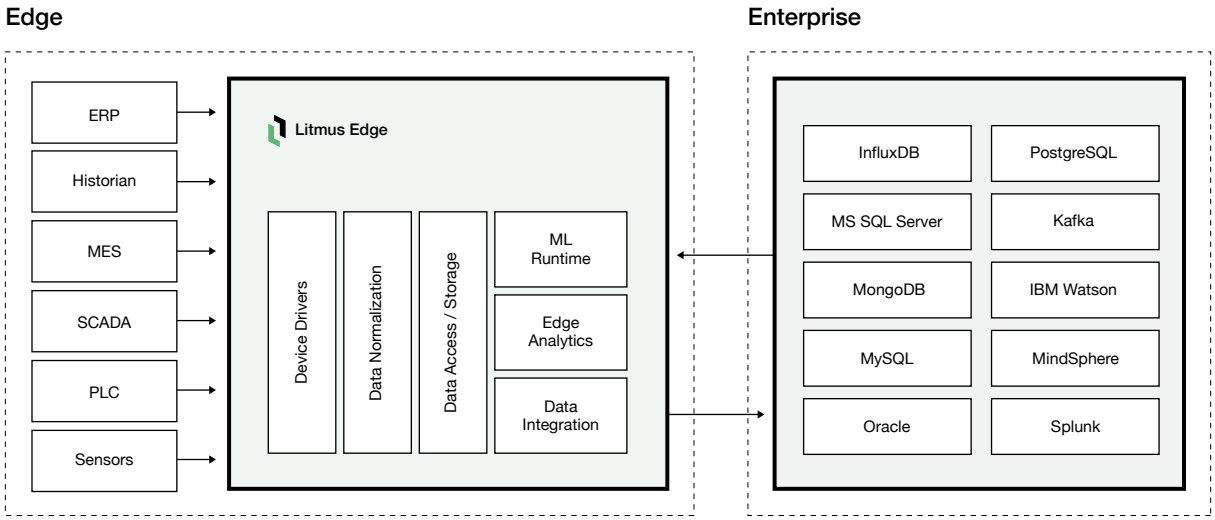
Litmus-to-Cloudera

Litmus manages edge data, applications and devices from a central location, and sends normalized data to the Cloudera Data Platform for insights, analytics and machine learning. Litmus Edge can send data either to Cloudera DataFlow at the factory level or the Cloudera Data Platform in the cloud, and machine learning models can be deployed and run back at the edge via Litmus Edge.



Other Integrations

Litmus has pre-built connectors for most enterprise systems and can develop others for customers as needed. Litmus Edge connects via MQTT, REST API, native Kafka and native database interface for a flexible, easy to deploy edge-to-cloud solution. The following integrations are ready to deploy:



Getting Started

An edge-to-cloud platform is the only way to successfully implement machine learning and analytics in the cloud for continuous optimization and efficiency gains. No matter which cloud platform a company chooses to standardize on, Litmus is the best data connectivity engine to collect, normalize, store, and integrate valuable data into the cloud. As a result, companies can seamlessly move data from the edge to the cloud, and back, to run models and improve operations at scale.

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Read the Smart Manufacturing Deployment Guide
https://litmus.io/resource/smart-manufacturing-deployment-guide/

Watch the How to Enable Machine Learning Webinar
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The Modern Edge Platform for Industry

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