



SparkPredict Anomaly Management on Cisco HyperFlex Edge

Reimagine industrial maintenance with AI.



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Benefits

The SparkPredict software provides these benefits to your organization:

- **Increase competitive advantage:** Meet or exceed production targets while reducing unnecessary maintenance costs
- **Codify knowledge and operations:** Continuous learning as assets age and share subject matter expertise across the team
- **Increase operating efficiency:** Simplify operational processes and optimize resource utilization
- **Increase operational reliability:** Improve visibility into asset health at scale and prevent unplanned downtime
- **Accelerate diagnostics and decision-making:** Equip subject matter experts with context to triage and action most alarms in less than 10 minutes

The SparkPredict® software from SparkCognition unlocks the value of industrial sensor data, allowing you to predict and prevent unique catastrophic events, improve operational efficiency, and optimize scheduling and maintenance. Powered by Cisco HyperFlex Edge and optimized for 2nd Generation Intel® Xeon® Scalable processors, this is a predictive maintenance solution that's easy to deploy and seamless to manage.

Overview

Process industries lose billions of dollars to unplanned stoppages caused by undetected and unexpected mechanical equipment failure. With a SparkPredict and Cisco HyperFlex Edge solution you can use your existing sensor data to make accurate and actionable predictions of when a machine will break down so that you can resolve issues before they disrupt production and cause losses.

SparkPredict predictive analytics software uses sophisticated algorithms to predict asset failures, reduce maintenance costs, and improve system efficiency. Next-generation prognostics based on artificial intelligence (AI) learn from sensor and control system data to better understand the future behavior of each asset. The algorithms then raise alerts for sub-optimal operations and identify impending failures long before they occur.

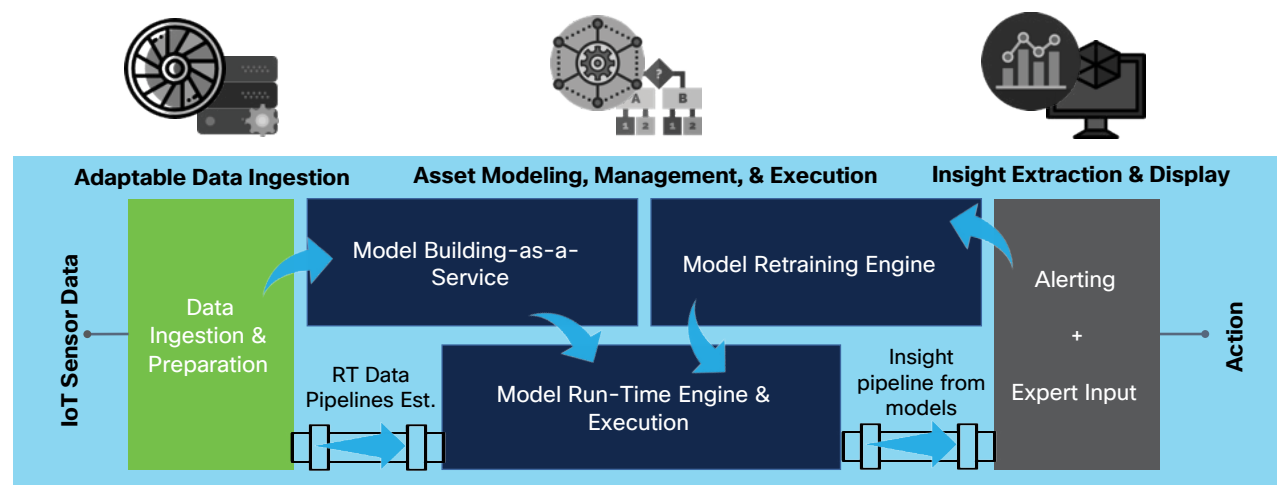


Figure 1. SparkPredict: Built to Deploy at Scale



The need to evolve maintenance programs

Maintenance programs need to evolve. With an accelerated rate of operational change across industrial sectors, emerging gaps in subject matter expertise, and increasing financial pressures, there is no longer room for costly unscheduled downtime, unexpected failures that may put workers at risk, or inefficient operations.

Traditional maintenance programs have a value ceiling. Systems such as visual or instrument-based inspection and real-time condition monitoring generate too many false positive alerts, do not enable timely decisions, are difficult to adapt and modify, and are highly dependent on human expertise. But sensor data and AI, used together, offer the opportunity to evolve your maintenance and analytics model.

How it works

SparkPredict® software is a predictive maintenance and anomaly management product. SparkPredict uses automated model building techniques that employ supervised, unsupervised, and deep learning algorithms to reduce scaled deployment from years to months. SparkPredict takes a customer-first approach and engages with the client to identify the high-value business objectives and the appropriate level of modeling that needs to be performed. SparkPredict can then employ all the tags (as many as a thousand in some cases) that are needed to model a complex asset, a component, a failure mode, a process, or a subsystem. With this approach users get a solution designed for their business and their assets.

Main capabilities

SparkPredict is server based and can be run on-premises, or in a private or public cloud. The goal is an interface that allows a user to perform a 10-minute triage. An alert is generated, and the features contributing to the alert are ranked. The user can delve deeper into the alert and features and see previous alerts that were similar. The user can then quickly identify the root cause.

Power your predictive maintenance with Cisco HyperFlex Edge and 2nd Generation Intel® Xeon® Scalable processors

Cisco HyperFlex Edge and Cisco Intersight management make deploying at a remote location as simple as connecting power and the network. Edge nodes connect to the Cisco Intersight platform through a secure Transport Layer Security (TLS) connection, allowing you to manage your cluster from any location. SparkPredict’s algorithms are optimized to run on 2nd Generation Intel® Xeon® Scalable processors in your Cisco HyperFlex Edge nodes.

Sizing on-premises computing resources for SparkPredict: Base deployment requirements

Server	vCPU/Core	Memory	Disk
Ingestion	8	24GB	1.1TB
Message queue (up to 5)	2	8GB	1.25TB
Pipeline	16	60GB	600GB
Database	8	24GB	600GB
Web	8	16GB	1.1TB

Table 1. Sizing guidelines



Figure 2 provides an overview of the SparkPredict architecture.

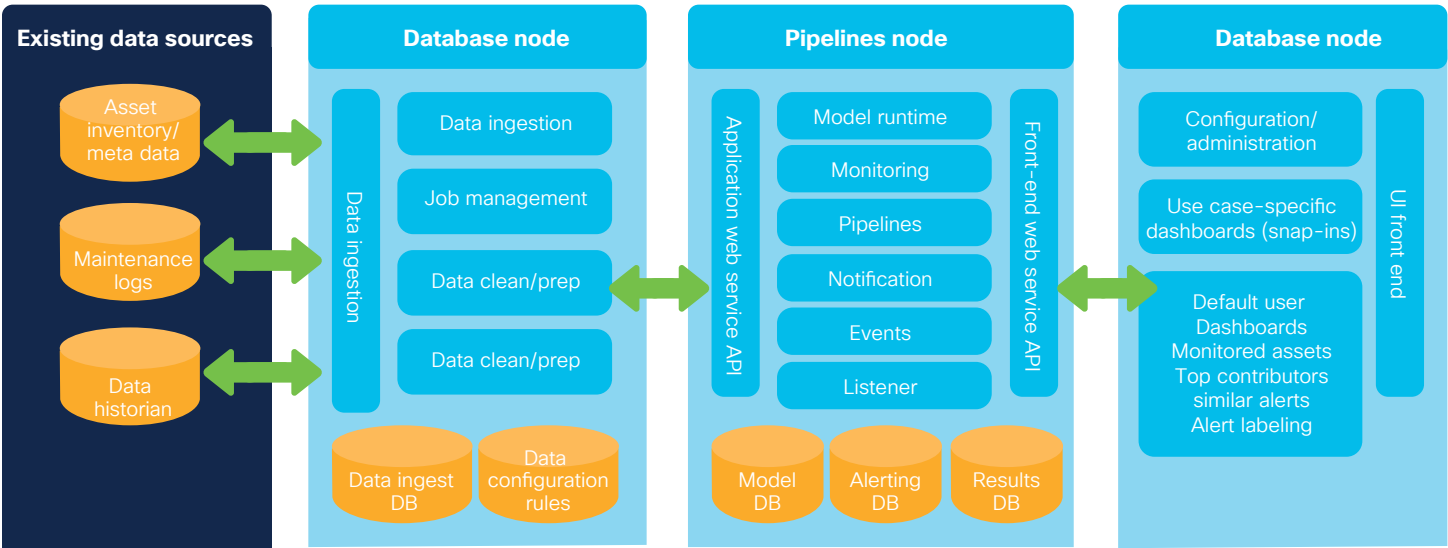


Figure 2 SparkPredict architecture

Use cases

Table 2 describes some typical use cases for the SparkPredict solution.

Industry name	Description
Oil and gas	<ul style="list-style-type: none">▪ Provide advance warning of both known and unknown asset failures or outages.▪ Provide insight into asset failures with anomaly detection.▪ Classify asset operating states and normal behavior.▪ Improve operational efficiency and safety.▪ Plan optimal maintenance scheduling and distribution of parts.
Energy	
Manufacturing	

Table 2 Use cases



Success stories

Improving offshore platform production with AI

Challenge: A major oil and gas company with high-volume offshore platforms needed to increase production potential and improve overall platform safety.

Solution: The company partnered with SparkCognition to deploy AI-powered predictive analytics across multiple critical subsystems as well as the company's fleet to predict impending failures and optimize maintenance activities.

Benefits: By using SparkPredict® AI analytics, software, the customer improved production by 1 to 4 percent, or up to US\$30 million annually per platform.

Read the full case study [here](#).

Identification of vane failure in turbine data

Challenge: After a unique combustion turbine vane failure led to a two-month outage and US\$30 million in lost opportunities, a combustion turbine original equipment manufacturer (OEM) wanted to find a new way to prevent such costly outages.

Solution: The SparkPredict® solution with its asset-centric model was evaluated for its ability to predict failures in advance.

Benefits: The SparkPredict® software provided one month's advance notice of a failure. The solution is now moving into full deployment. The operator expects to reduce costs by 30 percent using this solution.

Read the full case study [here](#).

Cisco Toronto Innovation Center

Digital business is driving transformation and disruption at an unprecedented rate. No industries will be exempt. Organizations need a trusted partner with the expertise to build a smarter, faster, safer business. Cisco is helping bring that vision to life.

At the Cisco® Toronto Innovation Center, our goal is to help businesses experiment, test, and co-create solutions to solve real-world business challenges. The Innovation Center, located in downtown Toronto, is one of 12 state-of-the-art global facilities that aims to inspire organizations and showcase digital innovation and development with real use cases. Along with our global ecosystem of partners, startups and researchers we help businesses solve challenges and thrive in an always-on, ever-changing, constantly connected world by fostering collaboration and empowering organizations of all types and sizes to bring concepts to reality.

At the Cisco Toronto Innovation Center, we are demonstrating how you can bring powerful predictive maintenance capabilities to any location using Cisco HyperFlex Edge featuring 2nd Generation Intel® Xeon® Scalable processors.

To find out more, contact us at TOinnovate@cisco.com.

A member of Intel AI Builders

The Intel AI Builders Program is an ecosystem of industry-leading software and hardware partners who have a shared mission to accelerate the adoption of artificial intelligence across Intel platforms. SparkPredict's predictive algorithms take advantage of Intel's industry-leading, workload-optimized platform with built-in AI acceleration, providing the seamless performance foundation for the data-centric era. The 2nd Gen Intel Xeon Scalable processors enable a new level of consistent, pervasive, and breakthrough performance.



The Cisco Advantage

Cisco HyperFlex Edge provides the reliable, scalable and easy-to-deploy computing capabilities that you need for your mission critical AI solution running at the edge of the network. With the simplicity of Cisco Intersight remote management and powered by 2nd Generation Intel® Xeon® Scalable processors – you have secure and flexible computing power close to your data.

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© Cisco and Intel work together to optimize solutions from the edge, through the network, to the data center. Cisco's innovative UCS servers and HyperFlex hyperconverged solutions, powered by Intel Xeon processors, Intel Optane™ technologies, and Intel Ethernet products, provide high performance with lower TCO, simplified operations, and a modern, more secure data center. Customers can benefit from joint, scalable solutions, designed to solve key market challenges in multiple industries. Together, Cisco and Intel create a trusted ecosystem for hardware, software, and services that bring intelligence and analytics to your business.

Next step

Interpret your valuable data to detect malfunctions and reduce production downtime. With Cisco HyperFlex Edge powered by 2nd Generation Intel® Xeon® Scalable processors and SparkPredict, you have a powerful solution to recognize failures before they happen and create a more efficient and safer operation.

Find out more about the power of Cisco hyperconverged infrastructure at the edge:

- <https://www.cisco.com/c/en/us/products/hyperconverged-infrastructure/hyperflex-solutions.html>
- <https://www.cisco.com/c/dam/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/hyperconvergence-at-the-edge-aag.pdf>

Find out more about SparkPredict:

- <https://www.sparkcognition.com/products/sparkpredict/>

For more information about Cisco® solutions for AI/ML workloads visit:

- <https://www.cisco.com/go/ai-compute>