

Turn predictability into productivity.

Condition Based Maintenance

To help you rapidly respond to customer demand and compete against rivals, your machinery has to run efficiently.

In the crowded industrial-equipment manufacturing marketplace, you face heavy competition, growing commoditization and reactive approaches to machine maintenance. But if you take advantage of technological advances that help improve service efficiency and operational performance, you can increase customer loyalty and drive new revenue opportunities.

Whether you manage assets that contribute to the performance of a plant, grid, construction site or pipeline, you can't afford to have your operations or your customer's operations interrupted and let maintenance downtime affect the bottom line. To help you rapidly respond to customer demand and compete against rivals, your machinery has to run efficiently. Internet of Things (IoT) technologies and Verizon Condition Based Maintenance (CBM) can help.

Help prevent maintenance fire drills.

Traditionally, equipment maintenance meant reacting to the latest machine breakdown or equipment failure. Sometimes it required halting a production line, or a complete shutdown of operations. Then an original equipment manufacturer (OEM) service technician had to be called and dispatched to get the equipment up and running again.

Condition Based Maintenance from Verizon can help you avoid this reactive and disruptive chain of events. Using a proactive maintenance model, Verizon CBM helps you determine when parts are likely to break down and when machinery and equipment will need service.

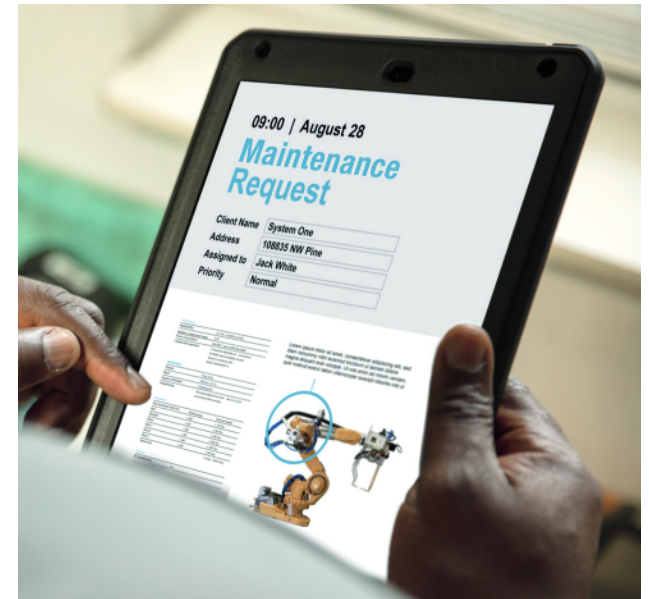
It's an IoT platform as a service that helps industrial OEMs capture, visualize and act on data collected from critical assets. Then, you can provide proactive maintenance and drive new service revenue.

Connect, manage and track all your assets.

The Verizon CBM platform helps you:

- Boost production uptime.
- Control costs and predict maintenance.
- Drive new service revenue streams.
- Increase use and extend equipment life.
- Improve the customer experience.

The Verizon CBM platform interacts with third-party communication hardware or sensors connected to your equipment.



How Verizon CBM works

The Verizon CBM platform interacts with third-party communication hardware or sensors connected to your equipment. The sensors send the equipment's diagnostic data securely using IoT Security Credentialing architecture to our CBM platform.

You can customize our flexible CBM platform with your own branding and application programming interface (API) integration for third-party management apps like workforce automation and predictive data analytics. It's easy to add your building or site diagrams and overlays too. We can help you apply customized dashboard elements and vertical template apps, creating a unique monitoring console with data visualization, tables, charts, graphs, maps, dials and gauges.

Business analysts, product managers and/or mechanical engineers can easily calculate complex aggregations across one or a family of connected devices using CBM's built-in analytics. You can graph the data on your customized dashboard, or choose to display it in your own application.

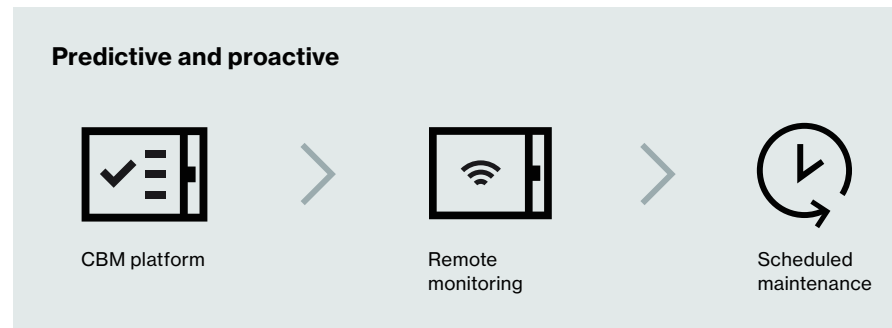
You don't need a coding skill set to use Verizon Condition Based Maintenance.

Configure a custom CBM application to meet your unique monitoring and reporting needs—without the need for software developers. The platform makes it easy to define the logic, workflow and algorithms specific to your operations. You'll also benefit from inherent, rules-based analytical capability, plus multi-level, role-based access for deployment that helps:

- OEMs gain visibility across all levels and all accounts.
- Service providers see geographic region and only customers in their area.
- End customers access and monitor only their own equipment.

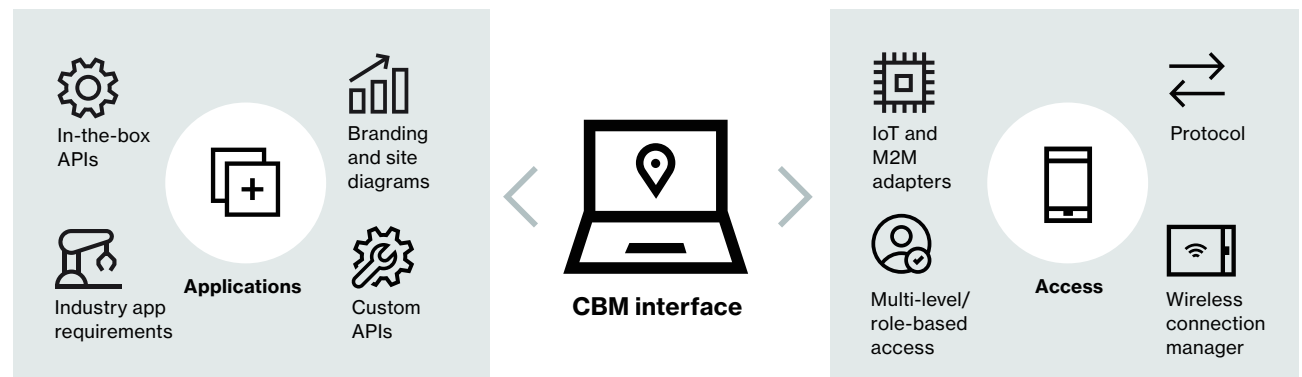
Traditional equipment maintenance vs. Verizon Condition Based Maintenance

Reactive vs. predictive and proactive



Verizon CBM platform as a service

Connect, analyze and manage things without software developers.



Make the right decisions with Big Data analytics.

To create a smart, efficient and integrated product solution, the Verizon cloud-based CBM platform provides two-way communication with connected equipment. This way, you're able to quickly gather and analyze valuable business and operational data—diagnostics, performance, consumption, key performance indicators (KPIs), etc.—so you can plan maintenance and monitor production, while helping to identify and prevent potential problems.

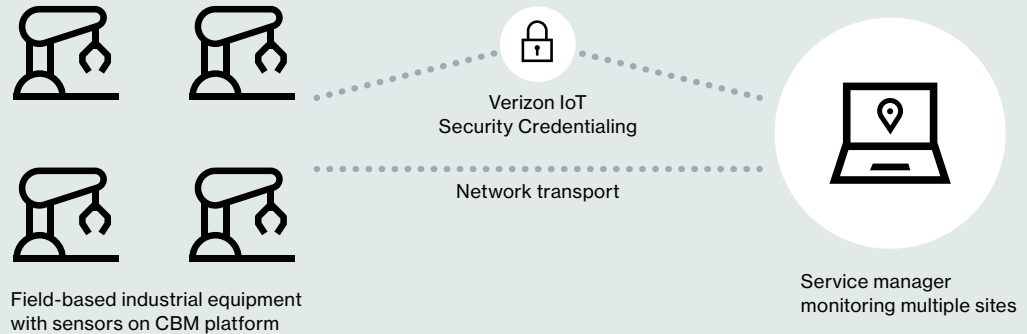
Using a proactive maintenance model, Verizon CBM helps you determine when parts are likely to break down and when machinery and equipment will need service.

A dynamic, proactive approach using Big Data allows Verizon CBM to help you:

- Decrease mean time to repair (MTTR).
- Increase mean time between failure (MTBF).
- Measure overall equipment effectiveness (OEE).
- Maintain overall asset health and performance.
- Take action to prevent equipment failures.

Secure CBM connections.

Monitor equipment and protect data in the cloud.



Get deeper analysis from diagnostic data and predictive insights.

Data analytics and diagnostic information modeling from our CBM platform can help you model physical things, business groupings and events. CBM doesn't require coding to turn physical products and assets into virtualized, software-based models with integrated analytic fields. Diagnostic KPIs like runtime, temperature, kWh and energy use can be aggregated to transform and enrich raw data from equipment, assets and machines into meaningful, actionable information.

Powerful data aggregation delivers intelligence:

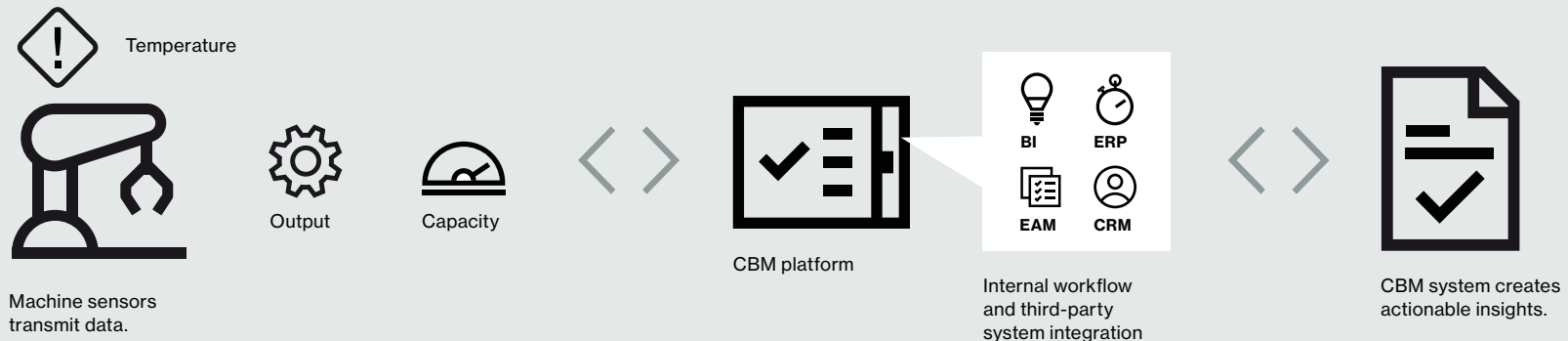
- Full location-based services and a GPS data engine
- API connectors to business intelligence (BI), enterprise resource planning (ERP), enterprise asset management (EAM) and customer relationship management (CRM) systems

With inherent rules engine and data analytics, you get key insights on critical events, statistics, algorithms and KPIs so you can make informed decisions to keep production moving.

Let IoT sensors connected to critical assets tell you how to boost efficiency—in near real time.

With predictive insights, you can know the health of your assets or equipment, and when they need maintenance. Third-party communication hardware or sensors connected to equipment send the diagnostic data securely using IoT Security Credentialing architecture right to the CBM platform, offering the ability to analyze data and unlock product insights.

CBM data analytics diagnostic information modeling



Take advantage of equipment life-cycle and data management with these advanced CBM features:

- ThingSpace Manage—device connectivity manager for wireless
- Data normalization and data storage across different asset types
- Asset data use and diagnostics
- Physical asset tracking and service/warranty management
- API integration with enterprise applications, i.e., service management, CRM, ERP, etc.

Why Verizon

Our expertise in IoT, networking and cloud solutions can help you create a more responsive and predictive CBM solution, customized to your needs. Verizon has been ranked the #1 network in the U.S. nine times in a row according to RootMetrics.¹ Verizon has also received more awards than any other provider in the J.D. Power Wireless Network Quality Study.²

Learn more.

Contact your Verizon Wireless business specialist to learn more about how Verizon CBM can make your business predictable and more reliable.

<https://solutionslab.vzw.com/iot/condition-based-maintenance>

¹ Rankings based on the RootMetrics® U.S. National RootScore® Report: 2H 2017. Tested with best commercially available smartphones on four national mobile networks across all available network types. Results may vary. The RootMetrics award is not an endorsement of Verizon. Visit www.rootmetrics.com for more details.

² Verizon Wireless received the highest numerical score among wireless service providers in the J.D. Power 2017 (V1 & V2) & 2018 (V1) U.S. Wireless Network Quality Performance Studies. 2018 V1 study is based on 38,595 total responses, measuring the network quality experienced by customers with wireless phones, surveyed July-December 2017. Your experiences may vary. Visit jdpower.com.

Network details & coverage maps at vzw.com. © 2018 Verizon. SB580318

