

Empowering the Manufacturing Edge

Benefits of VMware Edge Compute Stack

- Transform operations at the manufacturing edge with a software-defined approach leveraging purpose-built solution.
- Extend the power of IT automation and software defined capabilities to OT applications and infrastructure.
- Leverage an agnostic platform to implement key use cases such as Digital Twins and Virtual Programmable Logic Controllers (vPLC).

Manufacturing has been affected by changes in demand caused by shifts in consumer preference, geopolitical tensions, and an uncertain economic environment. In a globally interconnected economy, manufacturing companies also must contend with supply chain issues such as semiconductor and other raw material shortages. Manufacturers need greater efficiencies in manufacturing and delivering products, increasing equipment and production uptime, and optimizing the supply chain, all while meeting sustainability goals. They also need flexibility and resilience to cope with unforeseen circumstances. To meet these needs, manufacturers are embracing digital transformation.

However, manufacturers are leveraging a patchwork of legacy and modern technologies and an island of devices to drive digital transformation goals. These technologies often have proprietary interfaces and cannot communicate with one another, limiting manufacturers' access to data and insights to optimize existing processes. Furthermore, with these disparate technologies, it is a nightmare for IT teams to manage systems and OT teams to add new operational capabilities or scale existing operations.

Manufacturing edge needs a platform approach

In the era of Industry 4.0, with Industry 5.0 on the horizon, new shop floor and machine technologies and HD video cameras drive significant volumes of data at the manufacturing edge. To truly leverage the benefits of real-time data availability, manufacturers have started to build AI/ML capabilities and improve process automation through AR/VR and additional robotics intelligence. Moving this data from machine to cloud has not been feasible because of latency, IP protection and high costs. Driving true operational efficiencies with data requires computing power close to the edge so decisions can be made in real time.

According to [VMware research](#), Edge is the fastest growing workload category. Manufacturers need an edge compute solution to support these workloads.

Learn more

- VMware Edge Compute Stack, www.vmware.com/products/edge-compute-stack.html

However, not all edge compute solutions are created equal. Manufacturers can transform operations at the edge with a software-defined approach powered by VMware Edge Compute Stack, a purpose-built solution for running VM and container-based workloads on the edge that delivers:

- Enterprise-grade reliability, performance, and availability
- Real-time support for running low-latency workloads such as Virtual PLC
- Infrastructure to share GPU resources for AI/ML or computer vision workloads
- Telemetry and analytics for visibility into application and network performance
- Ability to easily scale workloads up and down

Many manufacturers already run all their enterprise workloads, network, and server infrastructure on VMware. With VMware Edge Compute Stack, manufacturers can now extend the power of IT automation and software-defined capabilities to OT applications and infrastructure. VMware offers an agnostic platform from the manufacturing edge to multi-cloud environments that provides a solid, flexible, secure, and scalable foundation.

VMware Edge Compute Stack powers key edge use cases for the smart manufacturer

- **Predictive maintenance:** With real-time or near real-time data inferencing at the edge from smart sensors connected to IoT platforms, proactively receive alerts about future maintenance needs and gain up to 40% reduction in maintenance costs and 50% reduction in total machine downtime.
- **Digital twins:** Simulate new materials to view recyclability, performance, and stability, learn more about customer interaction with products, and improve features and functionality. Simulate production flows and production process improvements. Increase speed of critical processes by up to 30% and reduce rework.
- **Quality inspection:** Detect defects on production lines using automated visual inspection tools, increasing product quality and yield with better accuracy and consistency. In many cases, manufacturers can eliminate the need for human inspection and redirect employees to work on complex quality issues.
- **Infrastructure consolidation:** Consolidate hardware across the factory and orchestrate shop floor applications on a single platform to simplify manageability, improve security posture, and lower energy costs and carbon footprint.
- **Software-defined PLC:** Commission, manage, and monitor PLCs in real time with software as virtual PLCs (vPLCs) from VMware Edge Compute Stack by decoupling the functionality from hardware. Eliminate manual intervention to manage PLCs and improve productivity, resilience and security while gaining independence from vendor-specific hardware.