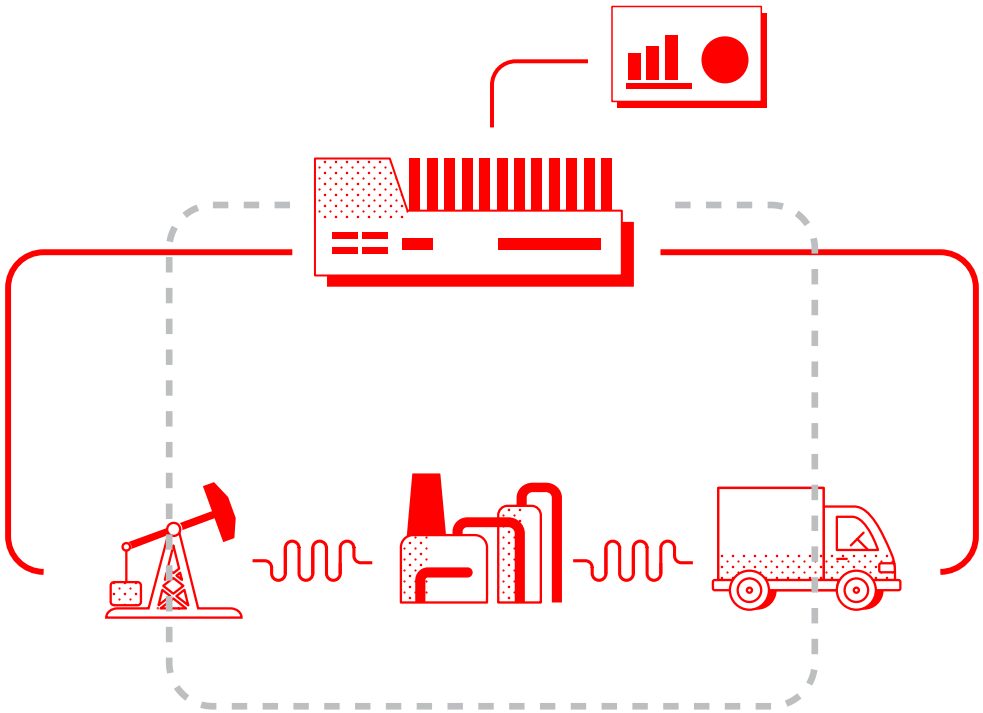
Red Hat | ONLOGIC

Activate insights at the far edge

How to bring resilient, stable, and flexible computing to harsh edge environments



Red Hat

The far edge is nearest to the action

Data-driven innovations are no longer happening only in pristine, temperature-controlled computer rooms. Whether you call it the far edge, the operational edge, the rugged edge, or something else entirely, this is where the rubber hits the road—sometimes literally.

Far edge computing provides the power for applications to gather and process data as quickly as possible—and as close to the devices generating it as possible. With this power at the far edge, operational data-derived insights can be delivered quickly and used to pursue new opportunities, minimize risks, conserve resources, and even save lives.

The challenge lies in the fact that far edge infrastructure—by definition—is far away from the controlled environment of the datacenter. We're not talking about your typical near edge environments, like remote offices, branch offices, or retail locations. We're talking about IT equipment that may be installed on a dusty factory floor, on an oil rig in the middle of the ocean, under a seat on an ambulance, and many other locations with harsh, unpredictable environments.

If you deploy the wrong hardware in one of these environments, it can end up costing a lot in terms of downtime. Standard, off the shelf computers aren't designed to run 24×7, let alone in less than ideal conditions. Recent research shows that over 60% of downtime incidents result in at least $100,000 in losses, and 15% cost close to $1,000,000.[1]

To provide actionable insight into business operations when and where they are needed, far edge infrastructure needs to be resilient to maintain security and uptime, stable to deliver the expected benefits at enterprise scale, and flexible to power the incredibly diverse and specialized computing needs at the far edge.

US$1,000,000

The cost of a downtime incident at the edge can cost from US$100,000 up to US$1,000,000.[1]

Industries excelling at the far edge

Every industry and every organization within that industry has its own unique requirements when it comes to far edge computing. However, they do have a few things in common. They all need to collect, control, compose, and act on data being generated by devices and users at the far edge, with the capability to connect back to the cloud, core, or near edge for further analysis.

Energy

Because energy companies often operate in incredibly remote areas, far edge computing has become essential to safe and efficient operations. For example, the increasing capacity, performance, and connectivity of far edge infrastructure allows oil and gas operators to analyze real-time data everywhere from the upstream at the borehole to the pipeline to the downstream facility. Far edge computing and modern, cloud-native applications can give these operators insights into the performance of drilling, delivery, and process equipment, as well as allow them to control various processes remotely.

1 Business Wire, Uptime Institute's 2022 Outage Analysis Finds Downtime Costs and Consequences Worsening as Industry Efforts to Curb Outage Frequency Fall Short, June 2022.

Manufacturing

Manufacturers need to reduce plant emissions, support resilient supply chains, minimize downtime, and detect problems before they impact production. Far edge computing powering modern, cloud-native applications allows manufacturers to implement automation across factory floor and supply chain processes through advanced robotics and machine-to-machine communication closer to the source, rather than sending data to the cloud or off-site datacenter for analysis and response. Gathering, analyzing, and acting on data on the factory floor in real time offers profound benefits, including higher yield, reduced waste, increased throughput, and lower overall costs.

Smart cities

Municipal governments are increasingly using far edge computing to swiftly identify and remediate problems affecting public safety, citizen satisfaction, and environmental sustainability. Because so many smart functions within cities rely on internet-connected devices like sensors, meters, lights, and cameras, reliable connectivity is a necessity. Examples include traffic flow monitoring, transportation management, optimized street lighting, and emergency response. Putting data collection and cloud-native applications at the far edge makes it possible to analyze data at the source so that automated systems or city employees can respond to events in near real time.

How far edge infrastructure needs are different

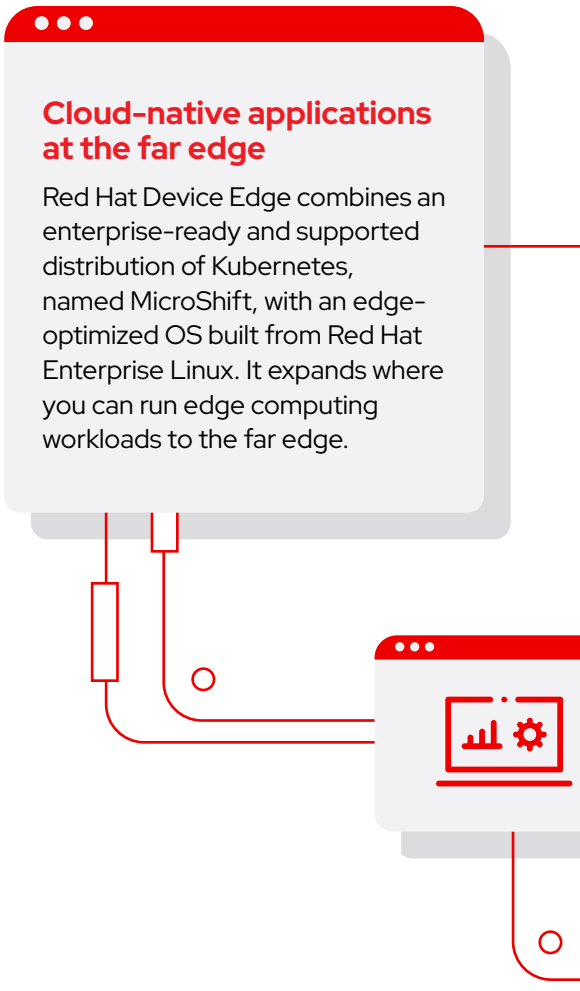
Infrastructure decisions at the far edge call for more than just finding the right balance between performance and price. The environments in far edge computing locations can create a variety of challenges, such as:

- **Size:** Far edge infrastructure may be deployed nearly anywhere, from a small enclosure to under the seat of a vehicle.
- **Power:** Locations may or may not be wired for clean, stable AC power. Vehicle-deployed servers need to be able to draw power from the battery without draining it when the vehicle is off.
- **Device connectivity:** Edge computers need to connect to a variety of specialized local devices with different protocols and requirements.
- **Internet connectivity:** Far edge deployments may have unreliable or nonexistent wired or WiFi access. The option for cellular connectivity is key for reliable data transfer.
- **Dust and debris:** Factory floors, construction vehicles, and other far edge environments are often dirty, which can damage equipment and shorten its lifespan.
- **Temperature:** Inability to tightly control the ambient temperature can degrade performance and reduce hardware lifespan.
- **Shock and vibration:** The typical shock and vibration in far edge environments will negatively impact equipment that isn't designed and certified to withstand it.

To solve these challenges, hardware needs to be tailored to your specific use case and environment.

Cloud-native applications at the far edge

Red Hat Device Edge combines an enterprise-ready and supported distribution of Kubernetes, named MicroShift, with an edge-optimized OS built from Red Hat Enterprise Linux. It expands where you can run edge computing workloads to the far edge.



Why Red Hat and OnLogic for far edge computing

Together, Red Hat and OnLogic deliver far edge computing solutions that are resilient, stable, and flexible to meet the challenges of harsh edge environments. Rugged edge computers from OnLogic are engineered for today's most extreme far edge environments, with a compact, ultra-durable, easy to integrate footprint and certifications for Red Hat technologies.

Resiliency

Far edge deployments require physical and digital features designed to protect your data and maintain business resiliency. Red Hat® Enterprise Linux® is built to meet enterprise security requirements with a layered, defense-in-depth approach that takes advantage of the capabilities of each layer in their environment—from physical hardware to applications—as well as the development and operations processes in between.

Red Hat OpenShift® monitors security throughout the application life cycle and software supply chain to make clusters and applications more stable without reducing developer productivity.

OnLogic hardware features add to your security stance, with Intel Platform Trust Technology radically shrinking the attack surface for systems that often sit unattended in remote or public spaces. To further aid business resiliency, OnLogic provides options for integrating 4G connectivity with wired and wireless options to provide failover capabilities for mission critical equipment. Ruggedized hardware is shock and vibration rated, and uses fanless cooling paired with solid state drives to protect against dust and debris while supporting wide operating temperature variations.

Stability

Red Hat Enterprise Linux is built for long-term stability. You can create edge-optimized operating system (OS) images, minimize workload interruptions caused by OS updates, transfer system updates more efficiently, and have confidence in automatic health checks and rollbacks. Red Hat OpenShift provides enterprise-ready enhancements to Kubernetes, including integrated Red Hat technologies that have been tested and certified.

Running Red Hat technologies on OnLogic hardware adds to the stability of your far edge environments. OnLogic puts its rugged computers through a battery of tests that push a system to its limits, subjecting it to conditions that are usually more extreme than in the real world. To further enhance stability, all new OnLogic developments are certified for Red Hat Enterprise Linux out of the box.

Flexibility

Interoperability within a multivendor hardware and software environment is essential for far edge solutions. Red Hat Enterprise Linux allows you to standardize on a full portfolio of capabilities that go beyond the OS, such as container orchestration with Red Hat OpenShift and automation with Red Hat Ansible® Automation Platform, along with management, middleware, storage, and a broad ecosystem of certified technology service partners capable of delivering a fully optimized edge solution.

OnLogic specializes in tailoring solutions for your unique needs, quickly and responsively. Everything about your solution is configurable, with no minimum order requirements. OnLogic solutions support up to Intel Core I7 or Intel Xeon scalable processors as well as a variety of accelerators for your most data-intensive workloads. Multiple power options, including variable power input, power over ethernet (PoE), and ignition sensing address your unique power requirements.

Empower your far edge, today

Don't wait to start empowering your far edge with resilient, stable, and flexible solutions from Red Hat and OnLogic. Learn more about OnLogic's RHEL-certified hardware and reach out for more information at **onlogic.com/rhel**.

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