

White Paper

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Innovate at the Edge with SUSE

Edge computing has become an increasingly influential concept as we strive to better understand, automate and control the world around us. It plays an important role in the digital transformation strategy of organisations seeking to launch new services, improve customer experience, increase productivity, save costs, and gain competitive advantages.

The digital economy is creating new business opportunities for organizations that can quickly adapt their business models by leveraging the power of technology. A new generation of IT platforms is enabling innovation all the way from the core, to the cloud, and at the edge. Organizations are digitizing their products – from cars to medical devices to consumer products – to make them more intelligent, and to delight customers. Edge computing helps to improve the compute power of the actual products, allowing decisions and analytics to take place where data is originating, avoiding high-latency data transfers, driving better experiences and enabling faster business outcomes.

Moving all of the data to the cloud or to traditional datacenters for processing is simply too slow, inefficient or costly. Issues surrounding network reliability, bandwidth, latency, and security make doing so impracticable. Edge computing solves these problems by placing compute resources

close to where the people or things produce or use data. A network of remote micro data centers can host applications, store and process critical data. This enables decisions to be made locally and actions to be taken promptly – often in real-time.

Marketing at a Glance

Organisations want smarter, digitized products and new innovative ways to interact with customers and other products. Key products need to become more intelligent and deliver excellent customer experiences.

50%

of new enterprise IT infrastructure will be deployed at the edge rather than in corporate data centers by 2023¹

800%

Increase from today's levels of the number of applications deployed at the edge by 2024²

80%

80% of all embedded devices that use an OS rely on a Linux kernel, proving that open source plays a leading role in edge computing³

Building at the Edge

Edge technologies, whether designed with IoT in mind or otherwise, are offering organisations new possibilities from localized data collation, management and processing. But the practicalities of multiple, massively scalable edge deployments are matters that require careful thought. Edge installations might also be termed remote locations, and therefore setting up, managing, and developing each one needs very special capabilities. The technology enabling all the edge's advantages should:

- Be easy to install, repair and configure
- Have a unified orchestration system (to keep maintenance and management costs down)

- Be interoperable with other systems and networks
- Be easy to scale⁴

Edge computing doesn't supersede or replace the need for cloud computing or data centers. Rather, it's an extension or enhancement of the cloud and data center ecosystem.

Edge Computing in Action

Edge computing opens up a huge amount of scope for new digitized services and applications. Some of these are aimed purely at consumer markets, but others address more critical and enterprise-centric solutions.

Healthcare	Smart Cities	Energy & Utilities	Automotive
Processing critical-care data reliability and in real-time, enables more innovation treatments and better outcomes.	<p>The key to enabling a smart city is the capability to analyse large amounts of data, with near real-time automated actions.</p> <p>Today, edge computing solutions are being used for public safety and police monitoring; traffic and transport management; smart metering for utilities; automated street lighting; and much more. It's also being used for detecting emergencies and triggering the fast deployment of first responders, medical teams and firefighters to the scene to handle the situation.</p>	<p>Analytics at the edge helps in managing remote systems such as wind farms, oil rigs, utility companies and data center equipment.</p> <p>Process sensor data from rig equipment is used to optimise operations and reduce damage incidents. Energy smart grids - powered by AI/ML - continuously collect overwhelming amounts of data from millions of smart sensors nationwide to make timely decisions on how to best allocate energy resources.</p>	<p>Building a well connected, data-centric software-defined vehicle requires a powerful open software platform at the edge for real-time analytics and quick decisions.</p> <p>Modern cars have morphed into something more closely resembling a mobile data center. Cameras, sensors, silicon and computer systems are collecting and analysing data for everything from engine management, assisted driving, safety systems, and entertainment packages and that's before we even get to fully autonomous vehicles, as we surely will over the next few years.</p>

The SUSE Difference

As the world's first provider of an enterprise Linux distribution, SUSE is also the premier provider of open source solutions for edge computing. SUSE's portfolio provides lean, optimised and highly manageable enterprise Linux products ideally suited for embedded devices, x86 or Arm hardware architectures, and containerized application environments. SUSE also delivers versatile software-defined storage, High Performance Computing solutions, Kubernetes-based container orchestration platforms, and comprehensive management tools. Our focus is always on delivering consistency, performance, reliability, security and the highest standards of support – all of which are vitally important elements in edge computing environments.

One of the biggest challenges of creating intelligent products is ensuring they can respond in real time. Moving large data sets from edge devices to the cloud introduces latency and strains bandwidth, limiting your ability to act on insights when they are most valuable. SUSE delivers solutions with embedded Linux and containers at the edge so you gain faster analytics, avoid high-latency data transfers, and reduce network congestion. As a result, you can reduce costs and latency associated with centralised computing and scale your applications when needed.

For many applications, the value of insights you can generate with new information goes hand-in-hand with security concerns about gathering and analysing new sources of data. SUSE edge computing solutions deliver tools and processes with security front and centre. Our enterprise-grade Linux systems create layers of defence, provide transparency into how issues are tracked and resolved, and provide focused access to a dedicated team of security experts. Our commitment to security means we provide fixes to our partners quickly, reducing exposure and risk for embedded operating systems and hardware.

Whether it is a remote location that requires intelligent monitoring to avoid downtime, or a factory floor transforming itself to be fully automated, the challenge becomes how to interact with the end devices, how to auto-exchange information amongst the devices, and how to do this at a scale.

SUSE enables you to create a smart edge infrastructure so you can bring new capabilities to your products or equipment used in remote locations by deploying smart edge applications. In addition, SUSE helps you to support, maintain and update the platform and the applications over many years – so your products always stay secure and evolve with new capabilities over their lifespan.

Simplify

SUSE helps you to reduce complexity by having one edge platform to digitize your products. You can trust a modular enterprise Linux with industry-leading interoperability, designed for fast and easy deployment, support and management in diverse or remote IT environments.

Modernize

Build and run services and smart solutions at the edge to improve customer experience, address new markets, lower costs and gain competitive advantage. This enables you to introduce new services and capabilities, which you can constantly evolve over the lifetime of your products.

Accelerate

We are your trusted partner to help you adopt Linux for a huge variety of sensors, devices and products – supporting your new business models and helping you to address new markets and bring differentiated products to market. Gain first mover advantage by investing in edge applications that improve productivity, provide better insights and enhance customer experiences.

SUSE Solutions for Edge Computing

SUSE Emebedded

Built on the SUSE Enterprise Linux server, SUSE Embedded systems allow developers

and engineers to select only the packages that are optimal to the functionality and requirements of the product. As a result, SUSE is able to provide embedded customers and partners with enterprise-level benefits designed to help organisations go-to-market faster, improve efficiencies in development and management, and keep costs down.

SUSE Manager

A best-in-class open source infrastructure management solution for enterprise DevOps and IT Operations teams to more easily manage assets over software-defined infrastructure. SUSE Manager was designed to help your enterprise DevOps and IT Operations teams reduce complexity and regain control of your IT assets with a single tool to manage Linux systems across a variety of hardware architectures, hypervisors as well as container, IoT and cloud platforms. It automates Linux server and IoT device provisioning, patching and configuration for faster, consistent and repeatable server deployment helping to optimise operations and reduce costs and with automated monitoring, tracking, auditing and reporting of your systems, VMs, and containers across your development, test and production environments, you can ensure compliance with internal security policies and external regulations.

“We have very strict IT security controls in place, so using a community-supported Linux distribution as the operating system was not an option for us. Such a solution would not provide the required infrastructure and support, leaving our network at risk. We wanted an enterprise-grade solution, and SUSE was the obvious choice to build an IoT platform that will collect data from manufacturing machines in real time. Our goal is to implement the IoT solution in all our facilities worldwide.”

Helmut Triller
IT Director
Knorr-Bremse

- <https://www.idc.com/getdoc.jsp?containerId=US45599219>
- https://www.embedded.com/wp-content/uploads/2019/11/EETimes_Embedded_2019_Embedded_Markets_Study.pdf
- T_HQ technology and business @ Hybrid.co “Reaching for new possibilities at the edge, with SUSE”, 30 January 2020

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Thank You