What is edge computing?

Cloud

overview Things to consider Key capabilities The future

What is edge computing?

Edge computing is a distributed computing framework that brings enterprise applications closer to data sources such as IoT devices or local edge servers. This proximity to data at its source can deliver strong business benefits, including faster insights, improved response times and better bandwidth availability.

The explosive growth and increasing computing power of IoT devices has resulted in unprecedented volumes of data. And data volumes continue to grow as 5G networks increase the number of connected mobile devices.

In the past, the promise of cloud and AI was to automate and speed up innovation by driving actionable insight from data. But the unprecedented scale and complexity of data that's created by connected devices has outpaced network and infrastructure capabilities.

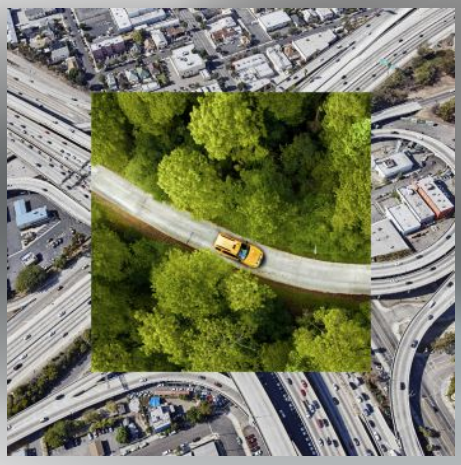
Sending all device-generated data to a centralized data center or to the cloud causes bandwidth and latency issues. Edge computing offers a more efficient alternative; data is processed and analyzed closer to the point where it's created. Because data does not traverse over a network to a cloud or data center to be processed, latency is reduced. Edge computing—and mobile edge computing on 5G networks—enables faster and more comprehensive data analysis, creating the opportunity for deeper insights, faster response times and improved customer experiences.

Devices at the edge: Harnessing

From connected vehicles to intelligent bots on the factory flo devices being generated in our world is higher than ever befo is not used at all. For example, a McKinsey & Company study generates data from 30,000 sensors—but less than one perc used to make decisions.[1]

Edge computing harnesses growing in-device computing cap insights and predictive analysis in near-real time. This increased analytics capability in edge devices can power innovation to improve quality and enhance value. It also raises important strategic questions: How do you manage the deployment of workloads that perform these types of actions in the presence of increased compute capacity? How can you use the embedded intelligence in devices to influence operational processes for your employees, your customers and your business more responsively? In order to extract the

most value from all those devices, significant volumes of computation must move to the edge.



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Your journey to edge computing: Things to consider

Edge computing helps you unlock the potential of the vast u
by connected devices. You can uncover new business opport
efficiency and provide faster, more reliable and consistent ex
customers. The best edge computing models can help you a
analyzing data locally. A well-considered approach to edge c
workloads up-to-date according to predefined policies, can h
adhere to data residency laws and regulations.

But this process is not without its challenges. An effective ed
address network security risks, management complexities a
and bandwidth. A viable model should help you:

- Manage your workloads across all clouds and on any number of devices
- Deploy applications to all edge locations reliably and seamlessly
- Maintain openness and flexibility to adopt to evolving needs
- Operate more securely and with confidence

Key capabilities for edge computing

No matter which variety of edge computing interests you—cloud edge, IoT edge or mobile edge—be sure that you find a solution that can help you accomplish the following goals.

Manage the distribution of software at massive scale

Reduce unnecessary administrators, save the associated costs and deploy software where and when it's needed.

Leverage open-source technology

Leverage an edge computing solution that nurtures the ability to innovate and can handle the diversity of equipment and devices in today's marketplace.

Address security concerns

Know that the right workloads are on the right machine at the right time. Make sure there's an easy way to govern and enforce the policies of your enterprise.

Engage a trusted partner with deep industry expertise

Find a vendor with a proven multicloud platform and a comprehensive portfolio of services designed to increase scalability, accelerate performance and strengthen security in your edge deployments. Ask your vendor about extended services that maximize intelligence and performance at the edge.

The future of edge computing in your industry

CIOs in banking, mining, retail or just about any other industry are building strategies designed to personalize customer experiences, generate faster insights and actions and maintain continuous operations. This can be achieved by adopting a massively

decentralized computing architecture, otherwise known as edge computing. However, within each industry are particular use cases that drive the need for edge IT.

Banks might need edge to analyze ATM video feeds in real-time in order to increase consumer safety. Mining companies can use their data to optimize their operations, improve worker safety, reduce energy consumption and increase productivity. Retailers can personalize the shopping experiences for their customers and rapidly communicate specialized offers. Companies that use kiosk services can automate the remote distribution and management of their kiosk-based applications, helping to ensure they continue to operate even when they aren't connected or have poor network connectivity.

Footnotes

[1] "The Internet of Things: Mapping the Value Beyond the Hype ", McKinsey Global Institute, McKinsey & Company, June 2015.

Ebook

Maximize hybrid cloud value in the generative AI era

Only 1 in 4 enterprises achieve a solid ROI from cloud transformation efforts. Learn how to amplify hybrid cloud and AI value across business needs.

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Resources

Article

Why edge computing needs autonomous management

Discover how autonomous edge management empowers CIOs to increase revenue and cost savings across industries, revolutionizing edge computing approaches.

Read the article →

Article

Discover Innovative Edge Computing Solutions

Learn how edge computing can revolutionize data management for industries operating in remote locations. Explore IBM's solutions to

manage data efficiently and securely at the edge, reducing latency and enhancing operational efficiency.

Read the article →

Case study

Innocens BV: AI Breakthroughs in Neonatal Care

Discover how Innocens BV, in collaboration with IBM Cloud, uses predictive AI to drastically reduce the time needed to identify at-risk newborns for sepsis. This cutting-edge solution enhances neonatal care, providing earlier intervention and saving lives.

Read the case study →

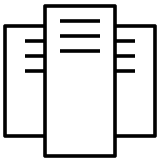
Product

Edge Computing Solutions

Automate operations, improve experiences, and enhance safety measures with edge computing solutions from IBM.

Explore Edge Computing →

Related solutions



IBM Power Servers
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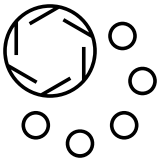
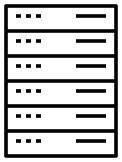
Explore IBM Power →



IBM Cloud Pak for Network Automation
IBM Cloud Pak for Network Automation is a Cloud Pak that enables the automation and orchestration of network infrastructure operations.

Explore Cloud Pak Automation →



Enterprise server solutions
Built to handle mission-critical workloads while maintaining security, reliability and control of your entire IT infrastructure.

Explore server solutions →

Take the next step

Understand the fundamentals of edge computing and how it brings data processing closer to where it’s generated. Explore how edge computing

enhances operational efficiency, reduces latency, and enables smarter decision-making in real-time across industries.

Explore Edge Computing Solutions →

Explore 5G and Edge Solutions →