

# How Does WiFi Motion Compute Its Data: Edge vs. Cloud Computing?

## The Differences Between Edge vs. Cloud Computing

In the world of modern computing, edge and cloud computing have shown themselves to be the leading data processing technologies due to their efficiency and ability to access computing resources without the limitations of physical infrastructure.



### Edge Computing

Edge computing refers to the decentralized processing of data at or near the source of data generation, typically at the "edge" of the network.

It involves using local computing resources, such as edge servers or IoT devices, to analyze and process data in real-time, reducing latency and improving responsiveness for applications.



### Cloud Computing

Cloud computing, on the other hand, involves accessing and storing data and applications over the internet through remote servers managed by cloud service providers.

It centralizes data processing and storage, allowing users to access computing resources on-demand without the need for physical hardware infrastructure.

## How to Choose the Optimal Balance

Choosing the optimal balance between cloud and edge computing is a strategic decision that requires careful consideration of various factors to meet the specific needs of our customers effectively.

At Cognitive, we designed a specifically collaborative approach to jointly creating Wi-Fi Sensing solutions to offer that needed flexibility and customization, acknowledging that the split between edge and cloud computing may vary based on the unique requirements of each project. In some cases, for example, this emphasis on adaptability allows us to host the cloud infrastructure while enabling ISPs to take on this role in others, ensuring a tailored solution that aligns with operational preferences and capabilities.

**When evaluating the balance between edge and cloud computing, several critical factors come into play:**

- 1. Real-Time Processing Needs:** Certain applications may demand immediate data processing and quick response times, making low latency a critical factor. Edge computing offers advantages in this aspect by processing data closer to its source, reducing latency and enabling real-time analysis. Evaluating the need for real-time processing helps determine the optimal balance between edge and cloud computing.
- 2. Cost Considerations:** Cost considerations are crucial for ISPs and service providers, including initial setup costs, ongoing maintenance expenses, and long-term scalability. Conducting a comprehensive ROI analysis comparing edge and cloud computing helps assess the financial viability of each approach and determine the optimal distribution of resources to achieve cost-effectiveness.
- 3. Resource Management:** Scalability is essential for handling varying workloads and accommodating growth in data processing demands. Evaluating scalability needs helps ensure efficient resource management and the ability to scale infrastructure as needed.
- 4. Security Concerns:** Security considerations encompass data privacy safeguards, access control mechanisms, encryption standards, and compliance with regulatory requirements. ISPs and service providers must implement robust security measures to protect sensitive data, mitigate risks, and adhere to regulations such as GDPR, CCPA, HIPAA, or PCI DSS. Evaluating security measures ensures data protection and regulatory compliance in edge and cloud computing environments.



Ultimately, both edge and cloud technologies complement each other and can be strategically combined to optimize overall system performance and efficiency. Rather than viewing them as competing paradigms, their strategic integration allows for tailored solutions that address the diverse needs of ISPs and service providers. A dynamic balance will ensure optimal system performance, efficiency, and agility, meeting current needs while paving the way for future scalability and innovation in data processing strategies.

