

What is distributed computing?

Distributed computing is a key concept when referring to edge and cloud computing. The north star is a future where workloads are easily moved across edges and cloud, across the distribute computing continuum. This article seeks to explain what distributed computing is all about.

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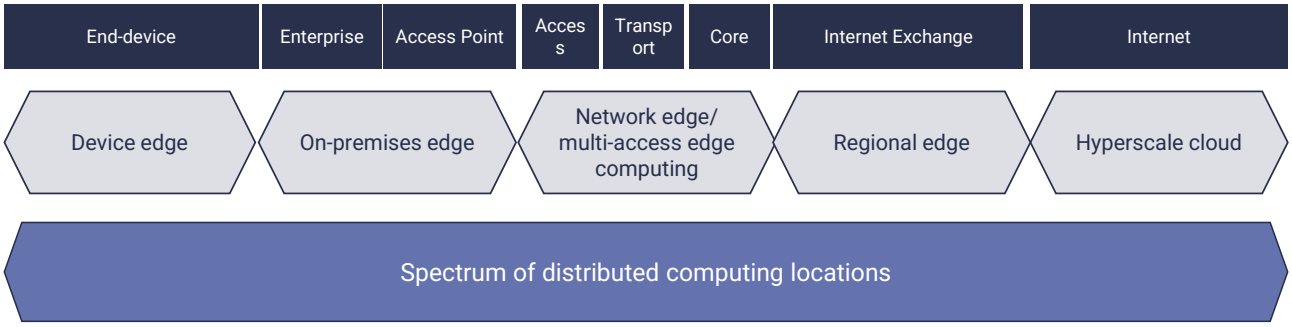
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What is distributed computing?

Distributed computing refers to the ability to move workloads across different locations across the distributed compute spectrum. As seen below, this includes locations in the traditional cloud (private or public), the edge and potentially end-devices.

Figure 1: Distributed computing locations



Source: STL Partners

Some of the key enablers for distributed computing include:

- **Availability of edge locations**: Distributed computing will come to life when customers are able to place workloads at locations across the world that best suit the application's needs.
- **Cloud-native technology**: Containers, microservices and dynamic orchestration are important technologies to allow developers and enterprises to build and run applications across different clouds and edges, with the full flexibility that comes with cloud.
- **Distributed, cloud-based networking**: The network links between edges and clouds will become ever more critical to ensure application run optimally.

Distributed computing use cases

Distributed computing use cases can include one of the following:

- **Data sovereignty**: A multi-national organisation needs to comply with local data laws, which means that data cannot always be stored in a single, hyperscale data centre.
- **Application requirements**: Some applications need low latency, some require high processing computing, some do not have strict requirements and can use any scalable cloud. This diversity is difficult to be met by a single cloud or data centre.
- **Security**: Certain industry sectors and companies have stringent security policies which inhibit their use of public cloud. These enterprises are looking to a mix of edge computing and private cloud to meet their needs.
- **SaaS applications**: SaaS providers or ISVs do not always allow their customers to determine where their applications are hosted; the SaaS provider will choose a cloud platform that works best for its application.

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What is the difference between distributed computing vs. cloud computing vs. edge computing vs. mobile edge computing?

The main difference between distributed computing and cloud or edge computing is that the latter refer to locations where processing can occur, whereas distributed computing refers to the overall spectrum of location and the ability to move processing across these. The definitions of these key terms are explained:

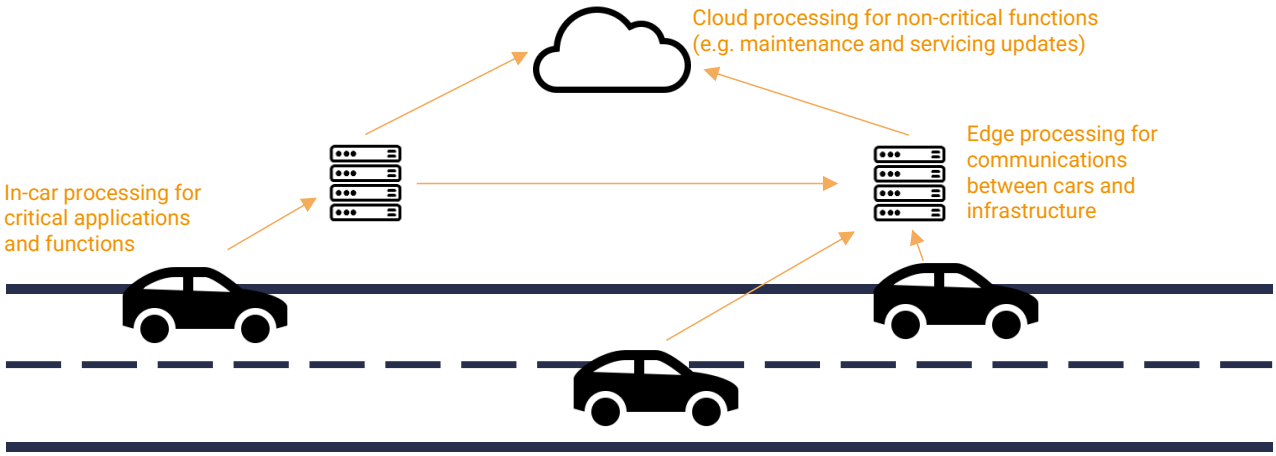
- **Edge computing**: Processing occurring at edge computing locations – on customer premises, regional data centres or network edge locations.
- **Mobile edge computing**: Edge computing at locations on the mobile network – these are often small data centre sites historically used for telecoms networking, now repurposed to serve third parties. More on this can be found in our article *(MEC): What is Mobile Edge Computing?*
- **Cloud computing**: Processing occurring at remote data centres (often hyperscale) and may use shared infrastructure (public cloud).
- **Distributed computing**: Processing occurring across multiple edges and clouds.

What is an example of distributed computing?

Most edge computing use cases provide good examples for distributed computing, as they often need to be dynamic and interact with the cloud.

One example of this is in connected and autonomous vehicles, which require data to be processed at different points. The cars themselves provide an important computing resource for mission critical functions; the edge to enable alerts and communications between cars and infrastructure and the cloud for longer term processing.

Figure 2: Distributed computing example – connected and autonomous vehicles



Source: STL Partners

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Telstra has joined the ranks of Vodafone, Verizon, SKT and KDDI in announcing a partnership with AWS. Since Telstra already has a strategic partnership with Microsoft Azure it will be interesting to see what this means for Telstra going foward. Will they be one of the first telcos to build an edge computing ecosystem without all their eggs in one hyperscalers' basket?

The other major announcement comes from another edge computing heavyweight, SK Telecom. They have announced a collaboration with Dell Technologies and VMware to deliver a "MEC in a box" solution, combining on-premise edge computing with a private 5G network. We explore its technical and commcercial implications in our featured research report this month.

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