



When will edge private cloud supplant colocation?

Colocation and private cloud are data centre solutions that allow companies to manage their compute and storage requirements in a third-party facility.

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This article will outline the core differences between edge colocation and edge private cloud, explore the (perceived) merits and demerits of each, and outline which is suitable for specific use cases. We will also hypothesise how and when the demand for colocation will reduce and when it will become superseded by private (and public) cloud.

Defining colocation and private cloud.


When a company **co-locates** in a third-party data centre it uses its own compute and storage infrastructure, such as servers and networking equipment. To be defined as edge colocation, the data centre must be physically located close to the end users. This ensures latency is minimised and data sovereignty is assured. The company not only provides the servers but is responsible for their maintenance and updates, and for the cyber-security that protects them. The data centre owner provides amenities such as power, cooling, and physical security and the company pays a fee to use these resources. Colocation allows companies to reduce their capital expenditures by leveraging the infrastructure and resources of the data centre. The term 'co' within colocation describes the fact that a company shares the data centre with other companies – it is not the only user.

With **private cloud** the servers and other equipment is also provided by the data centre provider although they are, logically at least, dedicated to one company – a single tenant cloud solution. The company retains control over security and has flexibility as to how compute is deployed but does not need to pay the capital expenditure for compute infrastructure – this is provided by the data centre owner on an as-as-service basis. Private cloud, therefore, further reduces a company's capital expenditure as it is traded for ongoing operating expenditure instead.

As well as colocation and private cloud, companies can also **host their own on-premises compute** and storage solutions or leverage **public cloud** solutions offered by the hyperscalers. The latter involves servers and networking equipment being shared by more than one company – a multi-tenant cloud solution – which reduces operating expenditure compared with private cloud but places some limits on how compute and storage can be deployed and how security is implemented.

Colocation and private cloud within the broader compute universe

In essence, therefore, companies have four compute and storage options available – outlined below: from owning and managing everything themselves (company own on-premises compute) to pushing compute and storage out to the hyperscale public cloud.

Types of edge computing	Company own on-premises compute	Colocation	Private cloud	Public cloud
What is it?	Company hosts its own compute and storage infrastructure on its own premises	Enterprise's own compute & storage infrastructure hosted in third-party data centre	Third-party data centre provides dedicated compute & storage infrastructure for the enterprise	Third-party (hyperscaler) provides shared compute and storage infrastructure for the enterprise
Benefits	<ul style="list-style-type: none"> + Company retains full control over policies and security + Ultra low latency + Data protection & sovereignty 	<ul style="list-style-type: none"> + Reduced premises capital and operating costs vs on-prem + Data protection & sovereignty 	<ul style="list-style-type: none"> + Lower compute infrastructure capital costs vs Colocation + Data protection & sovereignty + Scalability – dial up and down 	<ul style="list-style-type: none"> + Lower compute infrastructure capital costs vs Private cloud + Access to hyperscaler tech + Scalability – dial up and down
Downsides	<ul style="list-style-type: none"> - High capital & operating costs - Difficult to future-proof: easy to be out of date - Tough to build in-house skills 	<ul style="list-style-type: none"> - Compute and storage infrastructure costs remain high - Future-proofing compute & storage technology & building skills still tough 	<ul style="list-style-type: none"> - Compute and storage infrastructure costs still high (dedicated infrastructure) 	<ul style="list-style-type: none"> - Reliance on hyperscaler business model & pricing - Data sovereignty risk
Applicable use cases	<ul style="list-style-type: none"> • Mission critical operations where need to scale is limited and the need for close, real-time control outweighs cost-savings, e.g. in-hospital patient monitoring 	<ul style="list-style-type: none"> • Important applications where on-premises investment is not viable but demand could scale and company wants to retain control over compute, e.g. video analytics, disaster recovery 	<ul style="list-style-type: none"> • Applications where scalability and cost management is important but responsiveness (inc. latency) & customisation remain important, e.g. cloud gaming, disaster recovery 	<ul style="list-style-type: none"> • Business support where the need to reduce cost and manage scalability is compelling and (perceived) risk of data sovereignty is low, e.g. Chatbots, disaster recovery
				

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Most enterprises will need a hybrid compute strategy

As you can see, the general direction in travel for most enterprises is from 100% ownership on premises towards public cloud owing to the scalability and cost benefits offered. But this is a little simplistic. Most companies will have a hybrid cloud strategy where the nature of their edge compute solution will be determined by the nature of their use cases:

- Mission critical use cases that require real time responses and where data sovereignty and security is paramount, are likely to remain on-premises at least for the foreseeable future.
- Use cases which have low cost and high scalability requirements, and where the need for data protection/sovereignty and low latency is lower, are likely to shift to colocation, and private and public cloud.

Factors determining how quickly enterprises move use cases to private and public cloud

Although individual use cases will affect where enterprises chose to run workloads, can still make different choices for the same use case. For example, as you can see in the table above, for **disaster recovery** an enterprise could chose a co-location solution, or private cloud, or public cloud depending on the specific needs and perception of risk of the management team.

Beyond the nature of the use cases, there are 2 other demand-side factors that determine how quickly a management team will embrace private (and public) cloud:

1. **The degree to which the IT team can influence operational technology (OT) decisions.** Many organisations have already adopted public and private cloud for managing their IT but OT has typically remained on-premises. OT teams are typically more sceptical of adopting cloud owing to the 'higher stakes' associated with operational technology – it is the 'secret sauce' that enables the company to compete and differentiate itself. Managing operational technology, and the large teams required to do so, carries huge social status within many organisations. Shifting work loads to cloud is potentially seen as 'outsourcing' this capability and may be resisted by OT teams. If the IT team, which is more familiar with cloud, holds significant sway over OT decisions then the move to private and public cloud will be faster.
2. **The compute and storage architecture driver.** Enterprise teams that take an application-led approach to their compute and storage architecture are more likely to stick with an on-prem or co-location solutions whereas those that

want to consolidate their workloads on to a single integrated platform are more likely to embrace private or public cloud.

Additionally, the speed of adoption of private and public cloud is also contingent on what is offered by the private and public cloud providers:

1. **Level of industry verticalization.** If cloud providers stick with horizontal platforms with little industry specialisation, then the move to private and public cloud will be limited. Where they either buy or build industry expertise, then their credibility will rise and they have a much higher chance of winning over OT teams. Telecoms is a case in point here. The hyperscale cloud providers have worked hard to build up their telco expertise – e.g. AWS organically and Azure via acquisitions – and they are starting to gain traction in providing the compute infrastructure for telcos to run their networks. Dish and AT&T are using hyperscalers to run some of their virtual network and cloud network functions.
2. **Hardware.** Many OT use cases are currently run on specialist hardware – either on the enterprises own premises or in a third-party data centre. If cloud providers only offer common off-the-shelf (COTS) hardware then they are unlikely to attract OT use cases that need specialist hardware. As they offer a broader range of hardware – e.g. GPUs for video analytics use cases – they will begin to address a wider range of enterprise needs.
3. **Nature of SI and ISV relationships.** Cloud providers that develop joint propositions and go-to-market with specialist SIs and ISVs that deliver OT solutions into verticals will be much more successful than those that adopt a horizontal product-led strategy with weak partnerships.



Demand-side (determined by enterprise customer)	Criticality of use cases	Mission-critical: Mission critical or custom applications will need specialist platforms and infrastructure, as well as the industry expertise, that the HCPs don't yet have	Non-critical: HCPs have strong offerings for IoT data analysis, particularly when coupled with AI/ML capabilities
	OT receptivity to cloud & edge	Sceptic: OT teams are unfamiliar and uncomfortable with using cloud platforms, and are concerned about relinquishing control around data visibility, security and privacy	Advocate: OT teams who see the value of adopting more IT-like practices are generally more willing to adopt new technologies to drive scale, visibility and efficiency
	Architecture driver	Application-led: If architectural decisions are made separately for each use case, the infrastructure chosen will be specialised and more likely to come from an existing OT supplier	Infrastructure-led: Enterprises who want to leverage a single, standard infrastructure platform for multiple use cases, which plays to the HCP strengths
Supply-side (determined by cloud provider)	Level of industry verticalisation	Horizontal: HCP platforms that mainly target web/IT developers will not be easily adopted by industrial enterprises	Vertical: PaaS tools and vertical solutions allow industrial customers to leverage HCP platforms and focus on applications not infrastructure
	Hardware	General purpose: Generic hardware platforms will not serve many industrial use cases with stricter requirements	Industrial-grade: HCPs can expand the addressable use cases they serve by offering industrial-grade hardware
	Relationships with SIs and ISVs	Weak relationships: Relationships only with IT/networking-centric SIs that do not leverage cloud platforms effectively	Strong relationships: Joint propositions and go-to-market with industrial specialists that offer OT solutions

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The shift from colocation to private cloud

In some ways, the delineation between colocation and private cloud is limited – both involve workloads being run in a third-party data centre. With colocation, the enterprise owns and manages the hardware. Whereas in private cloud, the hardware becomes the responsibility of the cloud provider. Both will clearly coexist for the foreseeable future. And it is not yet clear when private cloud will grow bigger than colocation. Nevertheless, our guess is that:

1. In the **US**, private cloud will grow rapidly in the next 3 years and start to challenge colocation as the choice for many OT applications for enterprises.
2. In **Europe and other relatively mature cloud markets**, colocation will remain important for the next 5 years and the ramp up of private cloud will be gradual.
3. In **developing markets**, where many compute and storage solutions are still enterprise owned on premises, it may well be that many enterprises leapfrog colocation in the next 5+ years and move straight to private or public cloud. This is particular true, of course, where the hyperscale cloud providers are building infrastructure in a market.

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