

White Paper

Connectivity considerations for the modern business



If humans were the only consumers of data, there would be little need for a discussion about connectivity. Adding a few megabits per second here, shaving a millisecond of latency here doesn't typically affect the reading or viewing experience of a person.

However, the hungriest consumers of data are machines. Connected devices or high-powered software are designed to process vast amounts of information at high speeds, which makes the quality of connectivity critical. Take, for example, the data transmission to and from a jet engine to the cockpit of a plane, or the high-frequency trading application that makes millions of decisions a second based on a slew of fast-changing market metrics. These actions require far higher standards of connectivity than, say, a human resources employee worker who needs to pull an employee's file from a database.

As such, the suitability of connectivity depends on the requirements of an organisation. When choosing a data centre provider, users need to consider a variety of factors to determine the type of connectivity that's most suitable. Whether a facility is carrier-centric or carrier neutral, how data centres are connected, access to Internet exchanges, and how organisations connect to cloud service providers, are considerations reviewed in this paper.



Carrier-neutrality v. carrier-centric

Carrier-neutral data centres aren't tied to a particular telecoms provider, which means that buyers typically have greater diversity and flexibility when making decisions. Users of these facilities can, therefore, select services from a wide array of carriers, giving them a broader selection of bandwidth services. A variety of carriers also creates healthy competition, so prices stay low.

Colocation providers with carrier-centric facilities, by contrast, typically are owned and managed by carriers. Their preference is that all users of the facility use their network services. While these facilities usually have other carriers available on site, the choice is limited and using the alternatives might involve additional fees. Fewer carriers might mean less fibre fed in to the building, which also means carrier-centric facilities cannot offer the same level of resiliency as a carrier-neutral facility.

Edge v. core

Physical proximity to the users of your data or applications is a crucial factor in the selection process of a data centre partner. The Internet of Things (IoT) applications, instantaneous financial transactions, the connected home and driverless cars are drivers of edge computing, where vital data and applications are located as physically close as possible to the devices that depend on them.

However, data centres close to big city centres are often smaller than those further away. Outside city centres, more land is available at a lower cost, which can mean larger data centres offering colocation at lower price points. Massive cloud providers, sometimes known as the "hyperscalers" often use larger data centres for core compute purposes. The type of computing conducted at such facilities by hyperscalers may be less sensitive to latency and need not be as close to users as workloads in edge locations. Many large organisations need to colocation in edge and core locations. Organisations colocate at core locations to achieve scale and low prices. Edge locations, conversely, are used for the workloads that should be close to users and require the best connectivity.

Internet Exchanges

One crucial connectivity consideration is the availability of Internet exchanges or IXs. An internet exchange is physical infrastructure where carriers, internet service providers and content providers exchange traffic, making the internet faster, more efficient and cost-effective for exchange participants. The internet is a network of networks, and internet exchanges are vital to the movement of traffic between networks through peering which facilitates the conduit of direct exchange of traffic, at lower latency levels and higher speeds on a more cost-effective basis. Representative IXs in Europe are London Internet Exchange (LINX) in the UK, Espana Internet Exchange (Espanix) in Spain and Deutscher Commercial Internet Exchange (DECIX) in Germany.

Having an IX in a data centre can be a great benefit for customers colocating in the same location. Direct connectivity to an IX helps organisations reduce the complexity and cost of connectivity. Previously, internet service providers, content distribution networks, smaller carriers and big media companies mainly perform this function. However, any organisation with a highly-trafficked website can benefit. Connecting to an internet exchange helps reduce the cost of internet connectivity, or "transit", which is a significant expense. A connection to an IX can provide resiliency as it allows for routes to several other network providers, and can even help against security threats such as DDOS attacks.

Private v. public connectivity

Many organisations have adopted cloud services. As they move more mission-critical applications to a cloud environment, the importance of cloud connectivity has increased. Connecting via the public internet is no longer good enough. The traditional route is no longer good enough as internet traffic can result in upstream bottlenecks, unknown routing, and higher latency. As a result, cloud service providers have partnered with carrier and data centre providers to offer private connectivity, which gives users improved security and guaranteed performance.



Most organisations run some applications on their equipment in a data centre, whilst others are in the cloud as part of a so-called 'hybrid-cloud' model.

Previously, it was best to connect these two environments by colocating equipment in the same location where the connection point of the cloud service providers can be found. As such, colocation providers who had the cloud service providers in their data centres had a significant benefit to offer.

However, it is possible to connect remotely; many carriers offer such a service from carrier-neutral data centres. Some organisations, such as Megaport, provide this type of connectivity, which is often called network-as-a-service. The connectivity commercial model has evolved too; some providers offer flexible, pay-per-use connectivity as well in the same manner that users access cloud services. For example, a 1 Gbps connection might be used for a single hour, rather than purchased on a three-year contract. Given the broader array of options, decision makers should evaluate a range of cloud connectivity options from the sites under consideration during the purchasing process.

Many data centre operators will claim to be all things to all people. Business decision makers are best to interrogate these providers about their connectivity services, and how they will help their organisation.

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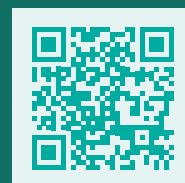
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