



How Gravity³ Drives Next-Gen Compute and Service Capability Demands

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According to IDC, 2020 was a tipping point, in part driven by the global COVID pandemic and digital maturity. 2020 was a critical moment for digital spend, more digital spend than non-digital—for the first time in history. Demographics have shifted, impacted by work from anywhere (WFA) and expansive network (e.g. 5G and fiber-to-the-home) access and it is impacting the network topologies and data processing architectures.

In 2021, according to nadatacenters.com, 68% of the largest colocation purchases were at the edge, not the core (Tier 1 markets which are large metropolitan areas with a large data center presence, traditionally on the west and east coast of the United States). While large metropolitan areas have historically been hubs for data creation, consumption and storage, today, people are moving to the smaller cities and suburbs for an improved cost of living and quality of life. COVID-19 added to this trend by forcing people to work, learn and socialize from home.

Regardless of where people live or work, technology is likely a crucial component of their professional and personal lives. As more services transition to the edge, so follows data creation. Low-latency and real-time processing, transmissions and decision making—which powers live video conferencing, real-time collaboration platforms, streaming services and artificial intelligence (AI)-enabled devices—are becoming more integrated in everyday digital experiences.

To achieve lag-free communications in Tier 2 and Tier 3 markets, enterprises and providers need to build IT architectures that can ensure positive user experiences and the required business outcomes. An edge architecture is very literally positioned to deliver this speed and performance and support digital transformation. Yet, the edge is relative. To be effective, enterprises and providers must understand where people are located and what services they require.

In the data center world, “data gravity” has been a term for many years. As more data gets collected, the more it pulls resources into proximity. Speed of light still affects time to value—the closer the processing, the faster “time to value”

Data Age – The Global Datasphere 2025

Trends & data-readiness from edge to core

175 Zettabytes

The global datasphere will grow from 33 zettabytes in 2018 to 175 zettabytes by 2025. IoT devices are expected to create over 90 zettabytes of data in 2025.



49%

By 2025, 49% of all data worldwide will reside in public cloud environments as cloud becomes the new core.



30%

In 2025 nearly 30% of the world's data will need real-time processing as the role of the edge continues to grow.

IDC & Seagate Data Age 2025 - www.seagate.com/gb/en/our-story/date-age-2025/

and often lower cost. Data gravity is now being influenced not only by network, access to fiber and high speed 5G, but also by people.

During the pandemic and beyond, content delivery networks are playing a huge role, enabling our ability to binge watch the latest season of *Stranger Things* while “work from anywhere”-ing on Zoom calls and online-gaming.

We call this “Gravity³” – the intersection between People, Networks and Data.

This dynamic has shifted the focus of resource placement from the traditional data gravity of the Tier 1 environment to “Gravity³,” which integrates people gravity, network gravity and data gravity to solve next-generation compute and service capability demands.

Data Gravity Gives Way to Gravity³ in a Distributed Environment

The concept of Gravity³ is designed to build an IT ecosystem that supports specific latency requirements and strengthens network capabilities.

People Gravity

People gravity represents the area where clusters of people live and work. By identifying people gravity, organizations can place edge nodes nearby to support real-time processing

and decision making. This is especially critical to reduce transactional latency as people (and organizations) rely more on digital infrastructure and services. Networks can only support so much density and speed. Ultimately workloads need to move closer to the users.

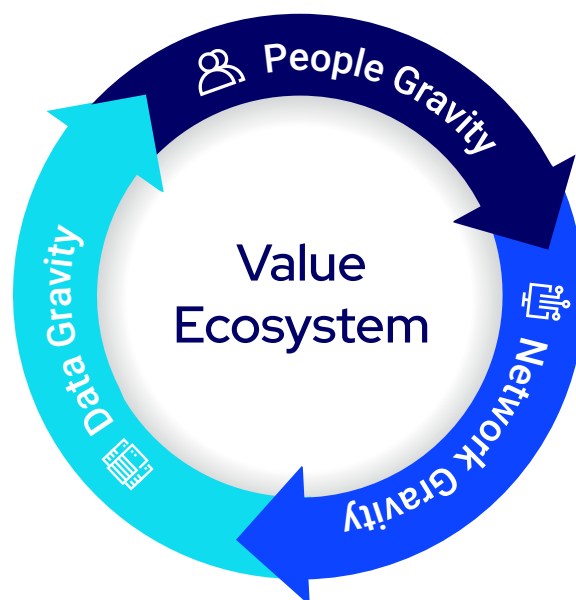
Network Gravity

As people gravity becomes denser in certain locations, more networks, resources and partners flock to those areas to deliver their services with lower latency. This creates a network gravity that enables and continually expands digital capabilities.

Hyperscalers and Content Delivery Networks (CDNs) are both following people gravity and deploying edge nodes in Tier 2 and Tier 3 markets to allow users to access their services more locally. The power of the hyperscale market also brings additional workloads with it as organizations want to leverage hyperscaler resources from a more proximate location. This pull continues to build network gravity and improves the value of the network per Reed's Law by increasing both the number of nodes and users on the network.

Data Gravity

Despite growth in Tier 2 and Tier 3 markets, the data gravity of core data centers remains a key piece of the IT infrastructure solution. Data is growing exponentially, and Tier 1 data centers will continue to offer long-term storage for compliance purposes and data warehousing for AI and machine learning training models. They will also remain cost-effective environments for applications without latency sensitivities.



68% of the top 35 wholesale deployments in 2021 went edge vs core.

OCBC Bank

Edge Data Centers Enable Real-time Business Results

Edge deployments position compute closer to where content is being created and consumed to drive real-time decisions and live interactions. Edge can be a city or metro-area, like Denver or Boise. It can be on a cell tower to enable enhanced telemetry for vehicle communications or traffic management. Real-time applications do not have time to travel between the end user and the core data center. In the autonomous vehicles market, a 50-millisecond delay as data traverses between the vehicle and the core environment can have catastrophic consequences. The same can be said for a manufacturing plant that uses live feeds to support safe operations. The reality is, acting upon AI-enabled inferences from the core data center simply takes too long. Such real-time use cases require local nodes to ensure ultra-low-latency connections.

In addition to speeding transmissions, edge architectures support the network. While data production is intensifying, the network does not grow as quickly. This makes it easy to saturate the core network. By deploying edge nodes near clusters of users, enterprises can alleviate some of this strain to improve connectivity results.

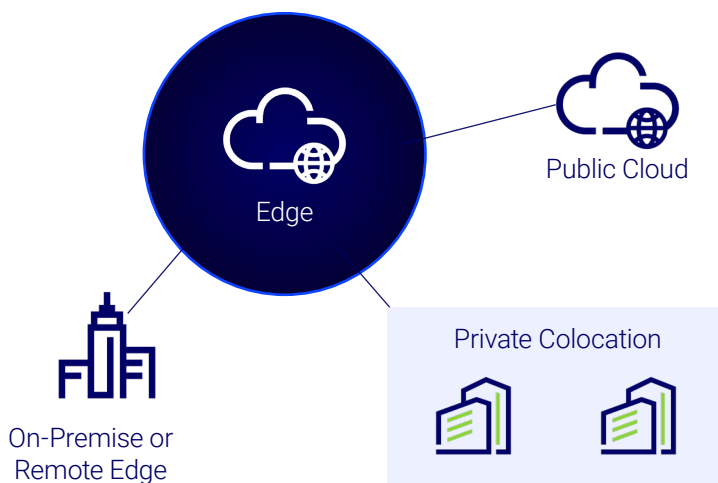
Gravity³ Enables Network Connected Value Ecosystems

IT has been in “consumption” mode for the last decade. Look at cloud computing and its significant growth rate. There’s still tremendous waste—10 to 35% of cloud spend is wasted, according to IDC. Transparency of how resources are used, ease of turning resources on (how many Kindle books do you buy and not read?), and lack of well architected governance programs are key concerns that drive this waste. In fact, nearly 1/3 of organizations surveyed have now invested in “FinOps”—a team or a person focused on helping reduce this waste.

We are pivoting from consumption to outcomes-based decision making in our IT use. IT’s maturity of expecting “everything-as-a-service” will develop into a multi-dimensional multi-way / multicloud approach focused on improving business outcomes, versus simply consuming more resources and launching new features. Supply chain, global risk and growing complexity are driving the value chain—the value ecosystem. Companies that can embrace as-a-service and capture higher growth by broader IT integration into the new digital (now predominant) value chain will grow faster, reduce risks and develop tighter customer relationships.

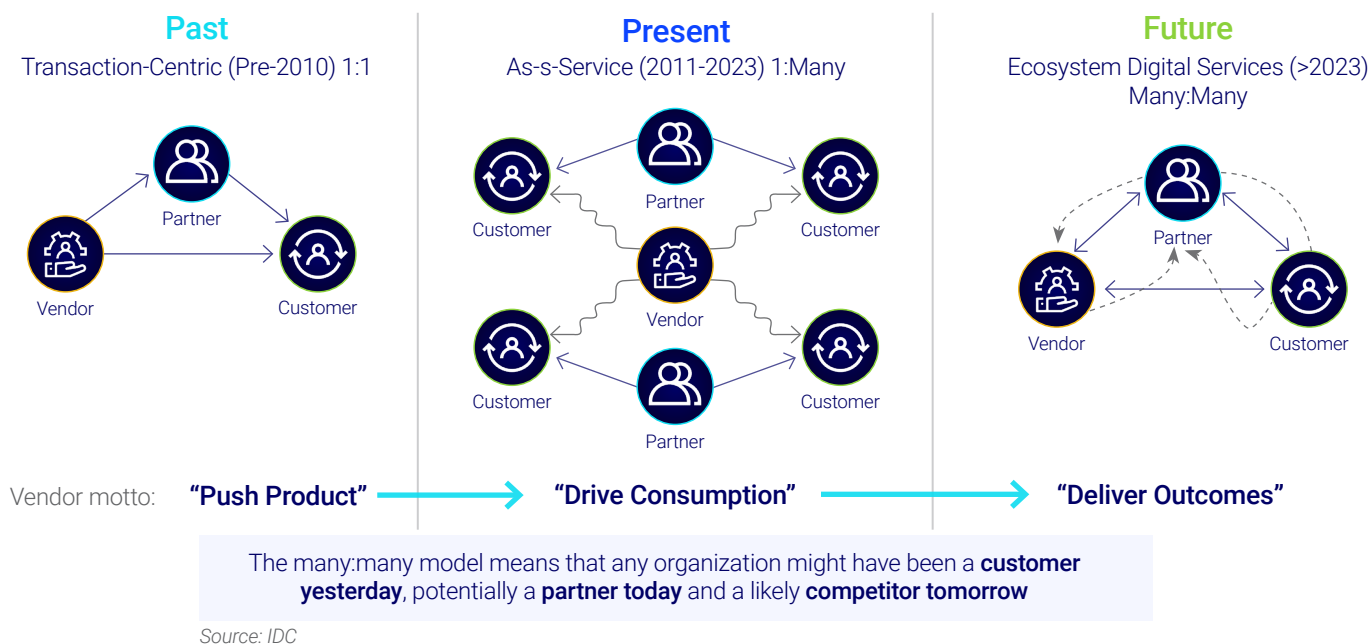
Total number of edge locations globally in 2025					
	100 billion +	100 million +	10,000s	1,000s	100s
Major Species	Device Edge	Enterprise Edge	Network Edge	Internet Edge	Cloud
Sub-Species	Sensors Raspberry Pis Cameras Geotags Drones Embedded Smartphones	Micro-Datacenters Edge S/GW/R HCI MEC Hyperscale Edge	Edge Brokers Content Delivery Edge Hyperscale Edge	MDC Edge IP/Peering Edge	
	1m	1km	50km	500km	1,500km
Typical distance from device users					

Source: 451 Research



This many-to-many relationships framework will require companies to consider how people, network, and data work together to improve their next generation business outcomes. An example: An automobile manufacturer in the Midwest may be using a combination of public cloud and private cloud colocation, enhanced by local edge processing for enhanced robotics controls. To achieve faster, on-time customer deliveries, they will integrate their entire supply chain, shipping and logistics into their IT platforms, leveraging their factory (people and Robotic Process Automation/robotics), network (both from the ecosystem sense and the technological sense) and data.

Sustainable Digital Business: The Race to Outcomes



Taking the Next Step to Support Distributed Users

To build an effective edge strategy, enterprises need a data enter partner like Flexential that can offer the scale, locations, network investments and connections to leading cloud service providers. With 40 data centers across 19 regional markets, Flexential offers opportunities to develop and implement edge strategies that meet specific requirements and achieve specific results. The high-density processing capabilities within Flexential facilities also speed time to value for compute-intense applications.

The data center network is also critical to the success of edge deployments. Flexential's private, reliable network connects its portfolio of data centers to provide more secure, high-performing connections. Flexential's Cloud Fabric also enables direct, low-latency access to leading cloud service providers such as AWS, Microsoft Azure and Google Cloud from distributed regions.

As people continue to work and live outside of Tier 1 markets, edge deployments will become increasingly integral elements of the overall IT strategy. Addressing Gravity³ will help define this architecture and ensure the IT environment can deliver the speed and performance necessary to support the AI-enabled applications and real-time processing and decision-making capabilities that will continue to impact the way people do business and engage with others.