

Kyndryl Steers Enterprise Drive to the Edge

Edge computing is opening up new dimensions for enterprises to leverage technology in ways they hadn't been able to before.

While a few years ago only a low, single-digit percentage of applications had any kind of low-latency requirements, enterprises are now seeing more applications that need low-latency connectivity to function.

According to Paul Savill, Global Practice Leader for Kyndryl's Network and Edge group, analysts predict roughly half of all applications used in enterprise environments soon will have some kind of low-latency need. As digital transformation use cases proliferate in the enterprise, edge computing will allow processing data close to its source to generate insight and action in real time.

The first generation of edge applications saw data collected locally at the edge and transmitted to the cloud for further processing or archiving, employing public cloud frameworks to do so. The second generation of applications, which many enterprises are now looking to employ, leverage a dedicated edge compute platform to perform computation closer to where data is being generated, making use of the low-latency characteristics of the local environment to support real-time applications.

EDGE USE CASES

There are a multitude of possible industry applications for edge computing. Take for example modern-day warehousing, where mobile robots are driving the need for increased levels of automation. Their everyday tasks might be disrupted if they have to interact with faraway cloud environments. These cases will benefit from the low-latency response environment made possible with edge computing.

Nikos Anerousis, Distinguished Engineer at Kyndryl, points to chemical manufacturing plants, airports, and wind farms as other potential beneficiaries of edge computing. Such operations can require thousands of sensors and devices across their facilities. These devices can be used to collect information and generate safety alerts.

Another factor driving edge computing is the need to keep data localized, Savill explained. Government regulations around how data is stored and where it physically can reside have played a part in pushing enterprises toward the edge.

Savill points to one extreme case where a Kyndryl customer operating in the U.S. had their business located on a state line. With part of their business in one state and the other in a different state they had to deal with

an odd data management situation because of local compliance laws. This challenge, Savill said, was mitigated by edge compute.

Even fast food restaurants are employing edge through the use of advanced video analytics to predict flow of customers through their restaurant chains. "All of these new ways to use technology – enabled by IoT, AI, machine learning, video analytics, advanced robotics – are bringing that requirement of placing compute close to the point of digital interaction," Savill said.

EDGE AUTOMATION

Enterprises have broad footprints, and each has the potential for thousands of edge environments needing deployment and management. Every manufacturing floor, every distribution hub, warehouse, or airport terminal counts as a single edge environment.

The task of managing a large number of environments – and a large number of devices in each – requires continuous lifecycle management that cannot be done without automation.

Automation capabilities for every stage of the workload lifecycle include capturing millions of data points, recognizing defects using AI prediction models, and taking preventive remediation steps, all without the need for a human operator to intervene.

"You cannot put, like we used to in the old times, a person in front of the screen looking at things and clicking buttons," Anerousis said. "We have developed extensive automation capabilities for every stage of the workload lifecycle from development and deployment, where we use the DevOps approach with tooling and automation frameworks to manage these environments at steady state."

EDGE IN A CONTAINER

The volume of different edge environments results in many unique requirements, including the seamless and frequent distribution of workloads from the core to the edge. Most often these workloads involve AI models that power mission-critical functions in these edge environments.

These models are continuously trained in the cloud with new data retrieved from the edge and pushed back to be integrated into the produc-

tion environment. The use of containerization throughout this process has helped accelerate the adoption of edge computing technologies.

"In the old days, when developers wrote applications they had to understand what the operating system was that they were going to run it on and the underlying compute storage processing infrastructure that was involved that the application was going to run on top of," Savill explained.

Now, containerization technologies are enabling developers to write in standardized formats. Containers act as universal adapters in many ways and allow developers to run their software in different environments.

Containers can be the ideal technology to support a rapid development and deployment cycle, and also operate at scale from one central location to many edge locations.

SECURE EDGE ENVIRONMENTS

Stakeholders in manufacturing have traditionally been wary of the edge because of security vulnerabilities that might emerge from connecting their equipment to external processing. Edge is often employed for critical control functions, making it paramount to secure these environments.

"If you're not securing that environment extremely well then all we have to do is read the news these days to see that there are bad actors out there who really have no qualms about trying to break in and interrupt these really important operations," Savill explained.

Following an upward trend in recent years, 2021 saw [ransomware and other major cyberthreats](#) start to stack up on cybersecurity teams. IT is a complex space, making it difficult to secure. To do so in edge environments, Anerousis said Kyndryl follows a layer-by-layer isolation approach.

"There are ways to implement these single, unidirectional flows, we call them data diodes, and secure every layer individually – every layer of processing and data storage individually. And we do this as we design these systems from the start, not as an afterthought," he explained.

KYNDRYL'S PART IN EDGE DEPLOYMENT

Implementing edge solutions can be a daunting task, even for an enterprise with abundant resources. The skill sets required to leverage an edge solution requires knowledge of the latest orchestration techniques for managing applications and how applications can be built.

"Since these types of technologies have only recently been evolved and developed over the last few years, there's still an under-resourced skill set in the industry to be able to support those types of development environments," Savill said.

Kyndryl is positioned to help customers with these transformations, Savill explained. Kyndryl's Global Network Edge Compute Practice provides customer solutions by working with clients to understand the data processing and response time requirements of their digital transformation goals.

Additionally, there are a range of ways to use edge and many moving-parts that have to be integrated and tied together in order for it to work efficiently. Edge computing involves different technologies across many layers of the application stack, like specialized compute infrastructure, wireless network connectivity – which can be Wi-Fi or 5G – IoT devices, data acquisition protocols, and lifecycle management tools.

"It can't be one vendor that can address all of these. It's always a multi-vendor solution," Anerousis said, adding that the success of an enterprise's solution depends on the ability to integrate different technologies.

To assist with this, Kyndryl acts as a full-stack integrator and managed services provider, interconnecting elements in all the application layers, connecting with the major cloud providers, and managing the entire solution using AI-powered automation.

"We have helped several large enterprise clients on edge computing projects, with use cases, from personal safety, to manufacturing automation, and we look forward to learning and dealing with even more complex problems," Anerousis added.

To learn more about private enterprise network services from Kyndryl, visit [their website](#).