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AT&T and HPE Bring Low-Latency Edge Computing to Enterprises

As enterprises improve operations, customer experience and competitiveness, AT&T delivers low-latency solutions combining 4G/5G wireless network connectivity and HPE Edgeline Converged Edge Systems powered by Intel® processors

AT&T Business

Hewlett Packard Enterprise

Technologies and applications ranging from cloud computing to augmented reality/virtual reality (AR/VR), streaming video, 5G, artificial intelligence and internet of things (IoT) make it possible for business enterprises to deliver new capabilities and services. Many are just entering mainstream usage with potential to enable businesses to be more responsive, more efficient, more digital and dramatically more competitive.

Businesses are looking for solutions that include:

- Connectivity options that keep proprietary data inside the local network.
- Immersive employee training for complex tasks using AR goggles and video-based learning.
- Automated IoT sensors providing real-time alerts about system, environment or equipment irregularities.
- Remote automation of building/heavy equipment using high-resolution video cameras to operate equipment more safely and precisely.
- Cashless retail experiences and robotic service delivery.
- Remote drone piloting to assess damages in dangerous or hard-to-access areas.
- Real-time security camera video analytics to help detect intruders or other anomalies and immediately alert security personnel.
- Providing high-definition streaming video and real-time analytics to help sporting and entertainment venues manage guest traffic and lines at food kiosks.

Delivering these new services and features optimally requires a reliable, high-capacity wireless network, low-latency computing and enterprise data kept inside the customer's private network.

Edge Computing Using Multi-Access Edge Computing (MEC)

Edge computing is growing in importance because it moves cloud computing closer to where data is generated and/or consumed. Edge computing improves latency, the delay in transmitting data across a network. AT&T's MEC edge solution gives customers greater control by keeping customer-designated enterprise or regulated data inside the local network while allowing non-sensitive data to traverse more broadly as needed. Transporting packets to a remote cloud data center and back adds latency that can vary depending on network conditions. Implementing the AT&T MEC solution can support latency-sensitive applications such as AR/VR, artificial intelligence and real-time analytics to optimize existing and create new business processes and results.

With MEC, the transport component of latency is reduced significantly (see Figure 1) because data is not transported to an offsite data center. This enables near real-time cloud services at the edge, such as content delivery networks or analytics services, so that businesses are able to more quickly analyze data and take action. MEC also keeps designated private data inside the organization's local network for privacy or other regulatory reasons. Data transmitted on the cellular network does not traverse the internet when data is routed through MEC. The local nature of the server can also reduce data security attack surface by eliminating long runs on transport networks.
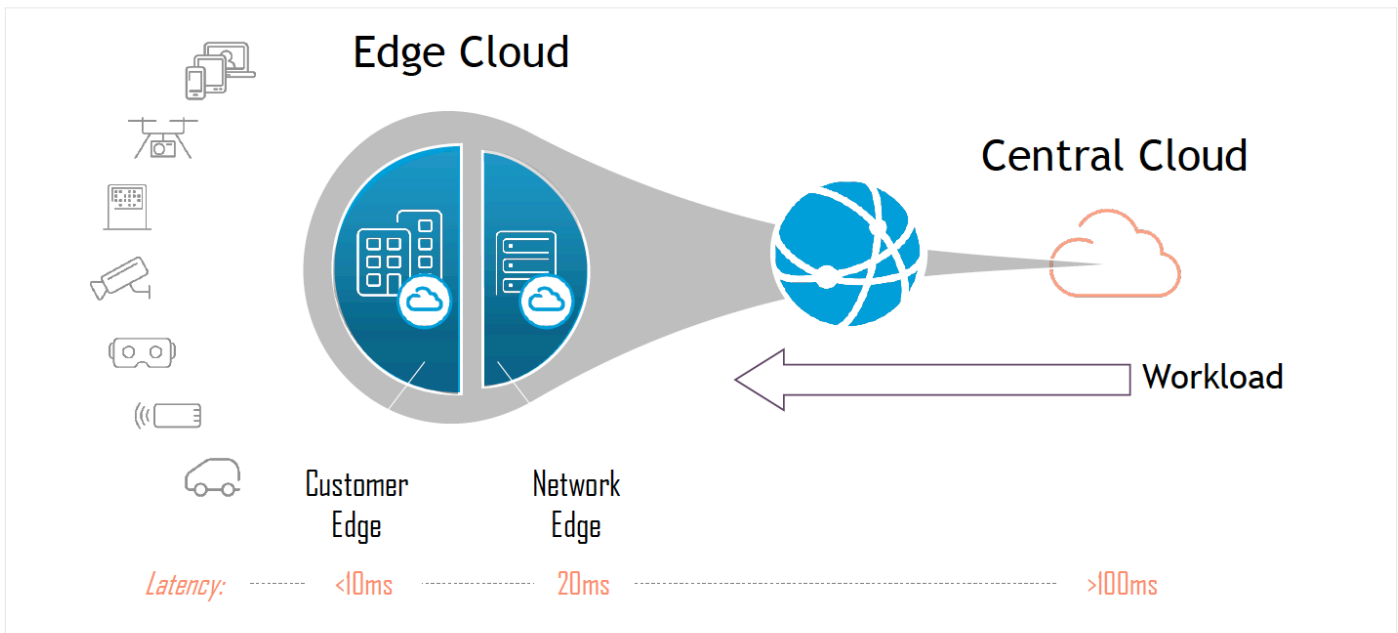

Edge Cloud

Central Cloud

Workload

Customer Edge

Network Edge

Latency: <10ms   20ms   >100ms

Figure 1. Latency reducing benefits of AT&T MEC.[1]

Accelerating New and Innovative Business Opportunities

AT&T MEC helps enable new services that can increase operational efficiency.

The kinds of enterprises that benefit from edge computing are wide-ranging in size and in industry segment (see Figure 2), including manufacturing, retail, transportation, utilities, energy production, venues, higher education institutions, healthcare, finance and others.

Art of the Possible at the Edge: Trial Use Cases

Retail

- Next Generation Customer Experience and Engagement
- Theft Prevention and Store Security
- Integrated Store Management & Supply Chain

Venue/Stadiums

- Integrated Fan Experience
- Immersive Digital Outcomes with AR/VR
- Enhanced Security Solutions with AI/ML

Industrial

- Predictive Service and Maintenance
- Enhanced Field Maintenance with AR/VR
- Integrated Security and Operations Solutions

Healthcare

- Digital foundation for training, patient care and diagnostics
- VR therapy
- Connected Care – mission critical patient engagement

Figure 2. Examples of MEC trial use cases in four industries.

Edge computing provides businesses with a scalable foundation of connectivity, networking, compute, and storage as a service to help them get the benefit of low-latency computing.

Wireless Connectivity

The connectivity aspect of MEC service is important. The speed of 4G/LTE and emerging 5G services makes MEC a game-changing option for organizations with smart phones, tablets and IoT devices that need highly secure wireless connectivity within the customer location. This is especially true for IoT applications where private wireless networks are often the most efficient way to connect sensors on machines spread out across a factory floor, or to connect tracking sensors on vehicles that are in motion.

Converging IT and OT

One important edge networking value proposition for many organizations is converging the separate computing infrastructures built to support informational technology (IT) and operational technology (OT). Edge computing can help converge IT and OT in organizations that don't need a security "air gap" between the two technology domains. OT is part of the direct revenue generating domain of business with IT in a supporting role.

The opportunity to converge OT and IT may allow for efficiency gains, new applications as well as cost savings. One example common in manufacturing operations is technicians investigating an issue with a process, sensor or piece of equipment using wireless diagnostic equipment connected to the OT wireless network. Due to the localized nature of the OT network, the technician may not be able to access critical information or reach additional support without using a separate device on a different network. Edge computing can provide private wireless connectivity that can bridge the two domains. Edge computing can also help enable new applications such as video analytics or virtual over-the-shoulder support of a process or manufacturing line to ensure quality.

Featured Use Cases

Let's take a look at how an advanced MEC service can support business goals for a factory floor and a sports venue.

Supporting Industry 4.0

Smart factories are the goal of "Industry 4.0" or "the fourth industrial revolution" initiatives. Smart factories are primarily "thing centric," connecting machines, devices and applications to the MEC platform to analyze data needed for managing work and troubleshooting issues.

MEC can enable predictive maintenance, production efficiency, inventory management, image recognition and object detection services to help improve quality and prevent unintended outcomes that can cause factory downtime or affect production quality.

Smart factory applications can also deliver increased robotic control of machines. Lower-latency 4G/5G wireless connections are important to access applications wirelessly without introducing lag time that can impact a robot's work.

When downtime means lost revenue, predictive maintenance on machines and devices is critical. MEC can help augment or replace human resources to service, gather and process performance data from machines and devices. Using IoT and MEC, the number of cycles, changes in acceleration, operating temperature or any number of other operational indicators can be collected and analyzed locally in near real time to help enable an immediate response.

One of the highest bandwidth IoT applications today is high-definition video cameras used for monitoring process quality or for physical security. These high-definition cameras can generate 8K video streams, creating a significant amount of data that impacts the network, slows response time and, in some instances, mitigates the desired benefits. Local processing of the data from the video applications via MEC helps deliver the infrastructure and intelligence necessary to achieve the intended business and operational outcomes of video services for a business enterprise.

Supporting the Fan Experience

MEC can also support and enhance the entertainment experience in a modern sports venue where scalable wireless networks are critical. During a sporting event, the network needs to support tens of thousands of people each trying to augment their experience by searching for videos or stats, or socially sharing their experience on their mobile devices. This aspect of the unique fan experience is increasingly desired. But after the event is over, the venue may go days or weeks before needing to host so many people, which makes a managed MEC service much more cost effective than deploying and owning the MEC infrastructure.
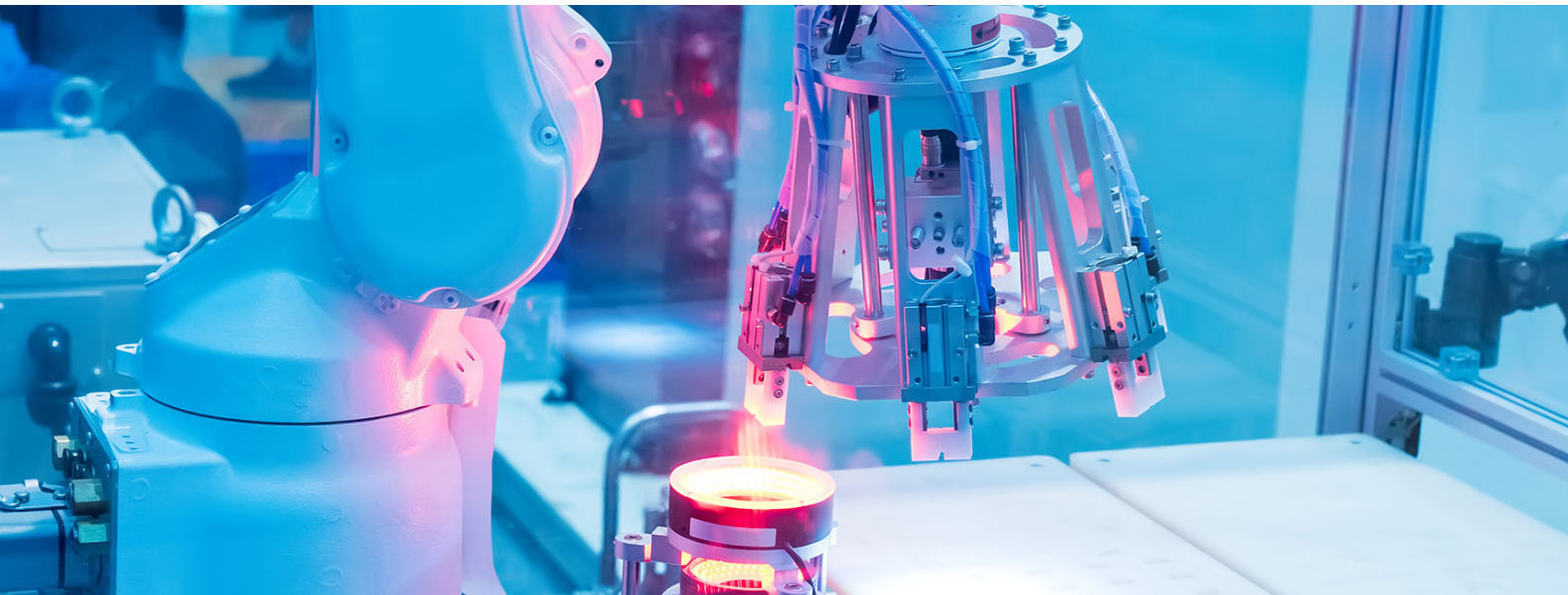
AT&T MEC Pairs Extensive Wireless Connectivity with HPE Servers

AT&T MEC is offered through an alliance that combines AT&T's nationwide 4G/LTE network—and growing 5G network—with HPE's Edgeline Converged Edge Systems and configuration, deployment and integration services.

Together, the two companies can provide a scalable solution and service package that seamlessly integrates into your technology environment to optimize the cellular edge to support your business objectives. This service is one way that AT&T is delivering on a strategic initiative to enable edge computing to help businesses get even more out of 5G.

The AT&T MEC platform supports customer-managed applications and software solutions to enable capabilities like AR/VR, artificial intelligence, cyber security and cloud computing. Data for these kind of applications can be routed through the MEC network edge so data is private and latency is reduced. Customers control what data routes through MEC via an easy-to-use policy management application to manage their MEC data policy.

AT&T also installs the MEC solution at the customer's business location and provides 24/7 managed services and support. The software-based solution includes near real-time diagnostics continuously monitoring the performance of the MEC compute hardware and software. AT&T's expert support team automatically receives alerts if MEC service levels deviate outside normal standards so the teams can make necessary adjustments. AT&T's specialized help desk is also available 24/7 to support the MEC customer.

HPE Edgeline Converged Edge Systems— Purpose-Built for MEC

The HPE Edgeline Converged Edge Systems family was created to fill a need for a new type of server at the network edge. The servers offer the right level of performance and capabilities—powered by Intel® architecture processors—to enable business applications to run unmodified at the edge in fully virtualized or containerized environments.

The servers are environmentally hardened and are designed with the network connectivity and performance needed to connect to OT control systems. HPE has invested in bridging the IT and OT environments, adding value in three main categories:

- **Process convergence—**IT and OT teams collaborate on end-to-end workflows and dataflows.
- **Software and data convergence—**Enterprise IT applications collaborating with OT applications are applied to both traditional enterprise data and data derived at the edge.
- **Physical systems convergence—**IT systems (compute, storage, management and security) integrate in the same system chassis with OT systems (data acquisition systems, control systems and industrial networks).

The HPE Edgeline Converged Edge Systems that have been selected for use in AT&T MEC services are shown in Figure 3.
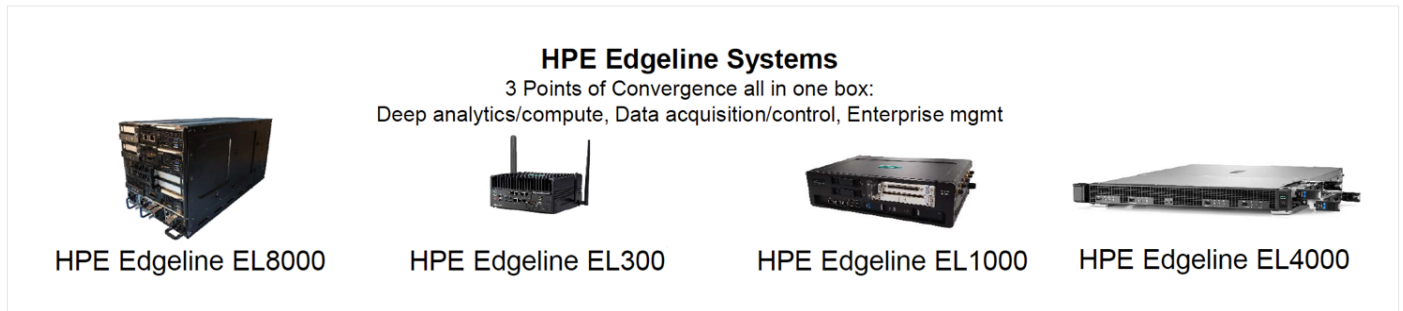

Figure 3. HPE Edgeline systems used in AT&T MEC service.

Intel® Technology Supports AT&T MEC Services

The performance of the HPE Edgeline servers used in AT&T's MEC service is based on Intel technologies, including the following processors:

Intel® Core™ i5 processors
The 10th generation Intel® Core™ i5 processors feature Intel® Iris® Plus graphics to bring broad-scale artificial intelligence (AI) to a cost-efficient edge server. The CPU delivers accelerated AI and graphics performance. The CPU features 4G/LTE and Wi-Fi 6 along with support for the fast and versatile Thunderbolt™ 3 technology.

Intel® Xeon® D Processors
Intel® Xeon® D processors deliver workload optimized performance for space and power constrained environments, including the intelligent edge. These innovative, system-on-a-chip processors support high-density, single-socket network, storage and cloud edge computing solutions with a range of integrated security, network and acceleration capabilities.

Intel® Xeon® Scalable Processors
Intel® Xeon® Scalable processors deliver high performance at the network edge to drive actionable insight, enable hardware-based security and deploy dynamic service delivery. These processors handle the most demanding applications, including in-memory analytics, artificial intelligence, autonomous driving, high performance computing (HPC) and network transformation.
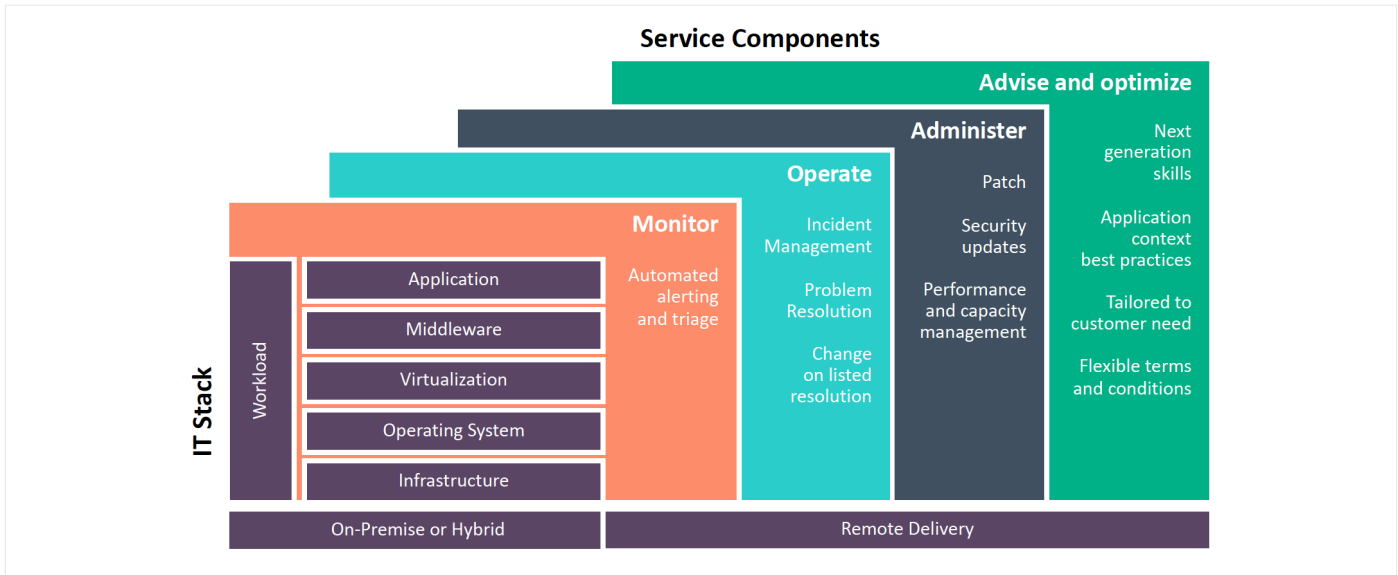
Figure 4. HPE adaptive management services.

HPE Adaptive Management Services

HPE complements the AT&T MEC service with its Adaptive Management Services, which provides operational management of the network during deployment and network operation. These services enable MEC service management and reliability with a global reach. The services available to AT&T MEC customer can be seen in Figure 4.

Conclusion

The combination of AT&T's nationwide wireless connectivity and HPE Edgeline Converged Edge Systems powered by Intel architecture processors offers a MEC service that can meet virtually any businesses' needs for edge computing whether on the factory floor, in a fleet or in a stadium. 4G/LTE and 5G wireless connectivity from AT&T is a lower-latency, highly secure network solution that is ideal for MEC applications that depend on mobile devices. HPE's Edgeline servers offer performance and connectivity options in form factors designed for remote locations. The servers offer computing power and cost-effectiveness for any application. AT&T MEC powered by Intel architecture-based HPE Edgeline servers offers a flexible and scalable edge computing solution for enterprises.

For More Information

AT&T
AT&T Multi-Access Edge Computing
https://att.com/MEC

HPE
HPE Edgeline Converged Edge Systems
https://www.hpe.com/us/en/servers/edgeline-systems.html

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