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# SIMPLIFY AND ACCELERATE EDGE TRANSFORMATION

Introducing HPE Edge Orchestrator



The coming decade promises dynamic new experiences for consumers and businesses—and transformational economics for communications service providers (CSPs). To capitalize, you'll need to bring cloud application intelligence, which today mostly lives in centralized data centers, closer to where services are consumed. Hewlett Packard Enterprise makes it easy with HPE Edge Orchestrator. Now, you can deliver a variety of new edge computing use cases and enterprise services. You can unlock new revenue streams and business partnerships that weren't possible before.

#### TOMORROW'S DYNAMIC SERVICES START AT THE EDGE

Edge computing entails running applications at the edge of Wi-Fi and service provider access networks. It can include deploying compute capabilities at edge locations in wireline and 4G/5G mobile networks, at remote operator sites (central offices, radio towers, and other point of presence (POP locations), or even directly at the customer premises. And, it plays a central role in the new services and business models that operators want to deliver in the coming years, especially for enterprise customers. By positioning application intelligence out at the edge, your customers can realize:

- Lower latency: When applications can process requests locally, instead of routing them to a data center hundreds of miles away, they can deliver much better performance. This translates to a better user experience for any business application. For the new generation of ultra-low-latency use cases that operators want to monetize—like augmented reality and industrial automation—short round-trip times are essential.
- Bandwidth optimization: Along those lines, positioning application intelligence out at the edge—doing number-crunching closer to where the numbers are generated—greatly reduces the wide-area network (WAN) bandwidth the application requires. This translates to lower WAN costs for businesses and less traffic congestion in CSP's core and metro networks. Applications such as cloud-based video analytics become more efficient and, as a result, are applicable to use cases that might not have been viable in the past. These edge capabilities can also enable new services based on content delivery networks (CDNs) and artificial intelligence applications such as augmented reality to optimize your services and subscriber experiences.
- **Improved security and privacy:** Any time businesses transmit data over a network, they're potentially exposing it to security threats. For the most sensitive information, some businesses want the ability to keep everything on-site. In regions with strict privacy protections, such as the European Union, some applications may simply not be viable, unless they can process all personally identifiable information (PII) locally.

Today, CSPs do significant enterprise business, but they are often seen as little more than bandwidth providers, competing mostly on price. With new edge computing capabilities, you'll be able to offer all manner of differentiated, high-value enterprise services (see sidebar), as well as new edge services for your own subscribers and services. And, you can compete more effectively with cloud and over-the-top (OTT) competitors.

Edge computing unlocks a broad range of new enterprise services and revenue streams. HPE Edge Orchestrator makes it easy to manage the full spectrum of new edge capabilities across hundreds of locations. You can:

- Develop new enterprise edge computing solutions and use cases
- Partner with third-party application providers to deliver specialized edge services targeting specific enterprise verticals
- Host new edge applications for your customers
- Reduce startup and operating costs by automating the deployment of edge computing across hundreds or thousands of sites
- Empower enterprise customers to deploy and manage their edge applications with self-service portals
- Compete more effectively with cloud and over-the-top providers, by delivering converged edge services (for example, provide private LTE or 5G by combining edge computing with 4G/5G traffic breakout)

## WHAT'S NEEDED TO ENABLE NEW EDGE COMPUTING USE CASES?

The key to making new edge computing investments successful—for both CSPs and their customers—is to ensure that applications running at the edge are easy to deploy and manage across many sites. But this is not a straightforward proposition.

Edge computing offerings for businesses require more sophisticated technical interaction between CSPs and their enterprise customers than in the past. Solutions must bridge the gap between the enterprise world, rooted in IT tools and cloud-native principles, and the Network Functions Virtualization (NFV) frameworks used to manage and orchestrate CSP networks. This requires capabilities that go beyond the NFV processes used in CSP core networks today. In enterprise edge computing deployments, workloads are:

- Enterprise IT-based and provided with standard IT tools: Workloads won't come with virtual network functions (VNFs) descriptors in the Tosca or Yang modelling languages that CSPs are familiar with, nor will they include Heat templates for OpenStack. Instead, to configure edge devices and services, you need to be familiar with cloud-native tools such as Helm charts for Kubernetes, or with configuring virtual machines (VMs).
- **Highly customized:** The most powerful edge computing use cases are those delivering applications tailored to specific industry segments, or even to individual enterprises. This customization allows for true competitive differentiation, but it adds significant complexity for CSP operations teams.
- **Highly distributed:** Your network teams must be able to manage diverse edge computing workloads across hundreds, potentially thousands of distributed sites.
- **Self-service:** Enterprises expect to onboard and manage the end-to-end lifecycle of their workloads on their own.



FIGURE 1. Solution overview—video analytics use case



#### Edge computing in action

What kinds of new business models become possible with edge computing?

For example, video analytics—think of an energy company with gas stations across a national market. The company already uses video surveillance to monitor gas pumps, cash registers, and product aisles at each location. Now, they'd like to introduce a new video analytics solution that can monitor the video feeds, detect issues, and generate alerts that allow local employees, corporate security, or law enforcement to respond in real time.

Today, the video feeds are streamed to digital recording platforms at each location. Routing those streams to a centralized data center for analysis from 10 or more cameras at hundreds of locations—would be hugely impractical and expensive.

With edge computing, the company can run the analytics application locally. They can use a self-service portal from their CSP, to onboard the application to an edge computing node located on-site. The CSP orchestrates the entire solution, enabling self-service deployment and comprehensive management across hundreds of sites.

Meanwhile, the edge computing node provides a platform for future revenuegenerating services and targeted enterprise applications that the CSP can now provide to this customer. They can be integrated into a single architecture that's easy for CSP network teams to manage and easy for enterprise customers to consume as a service.

### INTRODUCING HPE EDGE ORCHESTRATOR

HPE makes it easy to launch a wide range of new revenue-generating edge computingbased services with HPE Edge Orchestrator. With multitenant, intent-based edge orchestration, you can deliver new, targeted vertical solutions and enterprise applications each of them centrally manageable across hundreds of distributed locations through simple self-service tools. You can:

- **Deliver and consume edge computing as a service:** HPE Edge Orchestrator bridges ETSI Multi-access Edge Computing (MEC) capabilities with large-scale application management—the core requirements for enabling edge computing as a service. These MEC capabilities can enable a wide range of enterprise use cases, as well as edge applications for your own subscribers and services, such as CDN.
- Streamline and automate edge services: New consumer and enterprise use cases require CSPs to deploy hundreds, even thousands of workloads at the edge—for both customers and their edge services. HPE Edge Orchestrator enables large-scale automation to consistently deploy and manage workloads across many different edge locations.
- Simplify operations with self-service portals and APIs: For large-scale edge computing offers to be viable—much less profitable—they must be easy to deploy and to manage across many sites, both for enterprise customers and CSPs themselves. HPE Edge Orchestrator enables comprehensive management and orchestration of edge services, with the ability to accomplish management functions with one click. It also allows unified management and operation, using either the solution's portal or through existing systems via an open northbound API.
- **Support private 4G/5G networks:** You can retain an important advantage on OTT competitors, with the ability to integrate cellular services with edge computing use cases, including private 4G/5G networks.
- Bridge the gap between traditional CSP and cloud-native enterprise technologies: HPE Edge Orchestrator is built on <u>HPE Service Director's</u> world-class, intent-based orchestration engine. As a result, you can take advantage of HPE's advanced automation features, including a wide range of ready-to-use southbound APIs. This framework can help you bridge the gap between the IT tools enterprises use to orchestrate their cloud-native applications, such as Kubernetes and Helm charts, and virtualized or containerized CSP workloads—in a same platform.

#### **INSIDE HPE EDGE ORCHESTRATOR**

New edge computing offerings star t with compute platforms deployed at the customer premises or, in some cases, at nearby POPs or radio towers. These platforms host the various components needed for full management and orchestration of the edge computing solution, running in containers or VMs.

Virtualized components include the enterprise workloads themselves, as well as the networking intelligence needed to connect to them, either locally (such as via Wi-Fi) or to central sites (such as via SD-WAN). This can be accomplished via intelligent routing, for example, of LAN/WAN traffic. Edge devices can also host local breakout applications to support users and devices over LTE or 5G networks—capabilities that no OTT cloud provider can offer.

Together, these components and capabilities can make edge devices and services extraordinarily complex. HPE Edge Orchestrator provides a centralized, comprehensive orchestration platform to provision, configure, and perform general management functions for all components of the solution. HPE Edge Orchestrator is also multitenant by design. You can give diverse enterprise customers their private interfaces to manage their workloads, sites, edge devices, and services, while your teams manage the entire CSP edge computing portfolio as a single system.

You (and your enterprise customers) can use the management and orchestration capabilities of HPE Edge Orchestrator on an as-a-service basis. You can consume HPE Edge Orchestrator services hosted in a public cloud (Amazon Web Services) or deployed on-premises in a private data center. In both cases, HPE manages the platform for you, helping eliminate the need for your team to handle software updates and support. This as-a-service model also means that you can deploy HPE Edge Orchestrator quickly and immediately start providing revenue-generating services to customers.



FIGURE 2. Deployment topology—Customer premise equipment (CPE) use case





FIGURE 3. Zero-touch service management—self-service on-demand enterprise services

#### DEPLOYING EDGE COMPUTING SERVICES

HPE Edge Orchestrator gives you and your customers a comprehensive self-service solution for deploying and managing applications at distributed remote sites. A core component is the customer-facing application catalog (or marketplace) where enterprise customers can access the edge applications on offer and even upload new ones.

CSPs control the master application catalog, with the edge computing solutions available to all the customers (tenants). In addition to the CSP catalog, the solution provides each tenant with their own application catalog, where they can access, upload, and manage their applications.

You can give each enterprise customer total control over their edge applications, with the ability to install, upgrade, and manage new applications at remote sites in an entirely self-service manner. HPE Edge Orchestrator also features a northbound REST API that you can use to integrate the entire solution with your existing portal and operations systems. And, it includes comprehensive monitoring and reporting.

#### **GROW YOUR EDGE CAPABILITIES**

CSPs aren't the only ones bringing new edge computing experiences to enterprises. Cloud and OTT application providers are looking to compete in this space too. But CSPs—with their extensive transport infrastructures and 5G/LTE capabilities—can do things that OTT players just can't. CSPs are looking to leverage this by combining edge compute with other services such as managed Wi-Fi, managed security, and SD-WAN.

HPE Edge Orchestrator provides advanced intelligence to orchestrate complex edge service offerings. Today, it supports MEC local breakout aligned with the ETSI MEC framework, including comprehensive orchestration capabilities for a MEC platform. This enables you to perform intelligent traffic breakout—including mobile traffic breakout—for a wide range of edge computing applications.

The platform is also designed to be extensible, with an architecture that can support additional edge use cases in the future. When combined with other HPE capabilities for next-generation services—HPE 5G Core, Aruba Wi-Fi, new solutions for industrial IoT, video analytics, and more—you gain a versatile platform to launch new offerings and differentiate from the competition.

## START YOUR EDGE TRANSFORMATION

Edge computing can unleash a new world of high-value enterprise service offerings and revenue streams and give CSPs powerful new capabilities to stand out from the competition. To capitalize, you need the ability to deploy and manage complex edge devices across thousands of locations. With HPE Edge Orchestrator, you can introduce new edge computing offerings much more easily.

HPE provides:

- Industry-leading orchestration: CSPs around the world rely on HPE Service Director for end-to-end, multivendor, and intent-based orchestration for CSP networks. Where some approaches may get highly complex or lock you into a closed ecosystem, HPE provides simple, open orchestration from the edge to the cloud, including 5G. Now, we can help you extend that same simplicity and flexibility to the edge.
- **Proven industry leadership:** HPE is leading the industry in CSP transformation with the HPE 5G Core Stack. When used in conjunction with other HPE solutions—advanced edge compute capabilities, industry-leading Aruba Wi-Fi, and others—operators gain powerful tools to launch new revenue-generating services. At the same time, HPE solutions are built to embrace new cloud-native architectures and development models.
- **Open, flexible solutions:** Like the rest of the technology world, CSP networks are becoming far more cloud-driven and multivendor. More than ever, you want to retain the freedom to work with multiple vendors, so you can innovate your network and services how and when you choose. HPE builds CSP solutions designed for open, multivendor environments from the ground up.

Let HPE help you launch a new era of edge computing services that are easy to deploy and manage, without adding new startup and operating costs. We can help you transform the edge to generate new revenues and compete in ways that were not possible before.

#### COMMUNICATIONS AND MEDIA SOLUTIONS, HEWLETT PACKARD ENTERPRISE

Communications and Media Solutions is the business unit at HPE that provides vertical solutions to the communications and media industry. With over 30 years of experience in the industry, HPE has over 50 solutions and over 1500 active contracts, with more than 300 telco customers in 160 countries. HPE provides software and services capabilities to enable your digital transformation, automate your operations, and help you grow your business with innovative cloud-native network solutions and digital, 5G-ready services.

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