

# Ensemble Cloudlet

The road to hybrid workload clouds at the customer edge

## Benefits

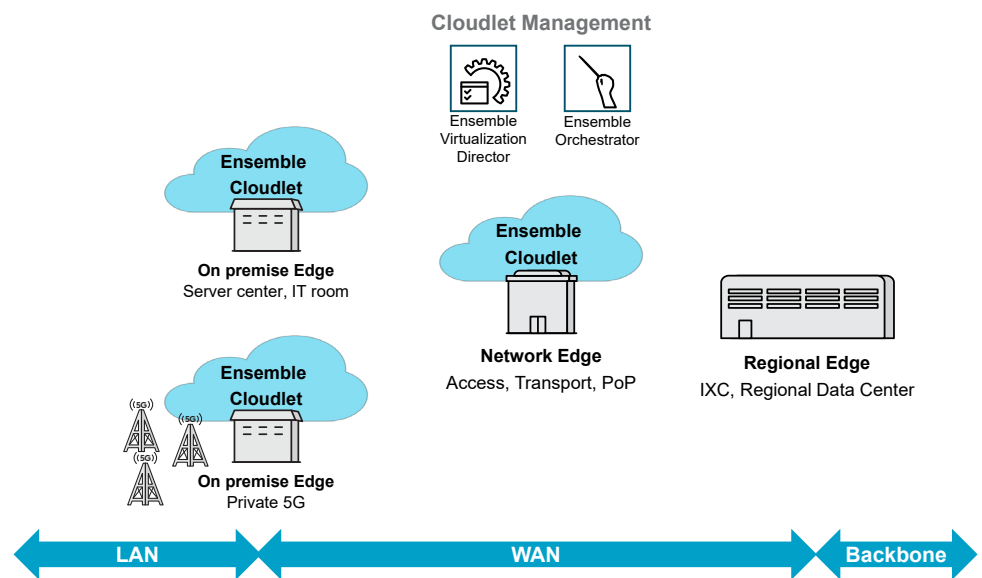
- Optimized for the edge**  
 Small, resilient and cost-effective clouds for the network edge that can grow from a single node
- Simplified management**  
 Centralized and automated deployment, management and monitoring of all aspects of Cloudlet with Ensemble MANO
- Zero-touch provisioning (ZTP)**  
 Architected for easy ZTP installation and management. Users can manage and deploy with low-skilled staff
- Open platform**  
 Support for the industry's largest selection of COTS servers, including hardware acceleration, and support for any workload: container or VM, VNF or application
- Migration, backup and recovery**  
 Delivers high availability for all levels of failure, from a single workload, to a single compute node, to an entire Cloudlet
- Management scalability**  
 Field-proven platform with support for up to 10,000 Cloudlets
- Integration with other systems**  
 Open API support for integration with other systems

## Overview

**Cloudlet makes it easy to deploy a scalable, resilient cloud at the network edge.**

Communications service providers (CSPs) and enterprises demand the low latency, standalone resiliency and data sovereignty of hosting workloads at the customer premises on the network edge. And they need support for applications that deliver mission-critical solutions such as private 5G, video analytics, AI/ML data processing and IoT. Our Ensemble Cloudlet is an essential step in the evolution of cloud technology at the network edge. Users are no longer limited to clouds hosted in large, centralized data centers.

Ensemble Cloudlet software delivers flexible local cloud control and redundant management access to each node. And edge compute services are always on, even with the loss of network connectivity. Ensemble Cloudlet software can reduce backhauling costs compared to a centralized hyper-scale cloud. It enables low latency and manages security and privacy to meet data sovereignty. Moreover, Ensemble Cloudlet creates an entirely new use case for uCPE that easily deploys for edge applications. It provides customers with an edge cloud that starts small, meets all operational requirements and is cost-effective from day 1.



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## High-level technical specifications

### Simplicity

- Manage both uCPE and Cloudlet deployments from a single MANO environment
- Automatic discovery of new nodes and addition to the cloudlet
- Scales from one-to-many nodes in a single cloud
- Deployment resource and compatibility pre-checks
- Comprehensive status of all components

### Resiliency

- Redundant remote management tunnels
- High-availability local cloud controller
- Backup and incremental snapshots
- Ability to move workloads for maintenance activities
- Failover and migration policies that automatically relaunch workloads in response to VM or node failure
  - Auto-recovery of physical node
  - Auto-recovery of workloads
- Live workload migration that minimizes service downtime for maintenance

### Automation

- ZTP deployment of head nodes and compute nodes
- Cloudlet MANO API for automation and integration
- Easy scale in /out of Cloudlet

### Application handling

- Dynamic tracking of resources and quota management at Cloudlet and node level
- Day-1 and day-N configuration for workloads, including service chain template and VNF initialization
- Onboarding, service design, service deployment
- VNF/VM and container lifecycle operations

### Management

- End-end ZTP including integration with third-party VNF managers
- Cloudlet dashboard for status-at-a-glance, fault events and performance stats, and troubleshooting
- Multi-tenant management
- Management access of Cloudlet switch
- Centralized upgrade and patching

### Compute node

- High-speed data throughput using SR-IOV
- Offload computationally intensive workloads (like AI/ML) to hardware accelerators
- Small and optimized cloud control footprint
- Industry's broadest range of x86 COTS servers
- Automatic creation of secure Cloudlet management tunnels

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## Applications in your network

### On-premises cloud grows beyond a few nodes

- Provides ZTP user interface and APIs
- Faults, events and performance stats, operational dashboard, troubleshooting
- Jobs management for all kinds of bulk operations
- Node recovery – restore the last known Connector image
- Configuration, keys/certs in case of hardware failure

