IPLOOK MEC-GW PRODUCT INFORMATION

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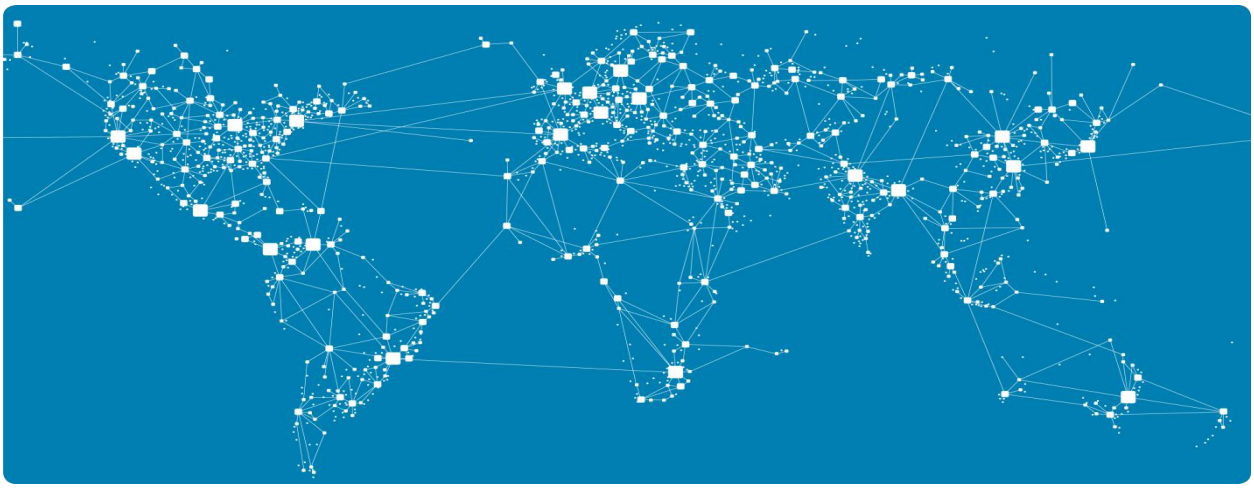

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Table of Contents

1 Introduction

We have entered a digital society, digitalization is the foundation, networking is the carrier, and intelligence is the goal. Data is generated by digitalizing objects such as people, objects, environment, and processes, and the value flow of data is realized through networking, and data is used as a production factor to create economic and social value for various industries through intelligence. Intelligence is based on the intelligent analysis of data, so as to realize intelligent decision-making and intelligent operation, and realize continuous intelligent optimization of business processes through a closed loop.

Mobile communication has shifted from the initial communication between people to the communication between people and things to the communication between things. AR/VR, Internet of Things, industrial automation, unmanned driving and other services have been introduced in large numbers, bringing network requirements for high bandwidth, low latency, and large connections. New services have increasingly demanding requirements for bandwidth, delay, and security, and the centralized deployment of traditional cloud computing has been unable to meet service requirements. Multi-Access Edge Computing (MEC) is just such a powerful platform that can solve the problems of delay, congestion, and security in future networks. Edge computing will effectively integrate wireless networks and the Internet and provide cloud computing capabilities and wireless network capabilities at the edge of the wireless network. Application services and content are deployed at the local edge, which can reduce data transmission links, improve data security, reduce end-to-end delay, reduce bandwidth usage, and reduce power consumption.

IPLOOK's MEC edge gateway is at the edge of the network to improve user service experience and reduce user delay.

2 Product Architecture

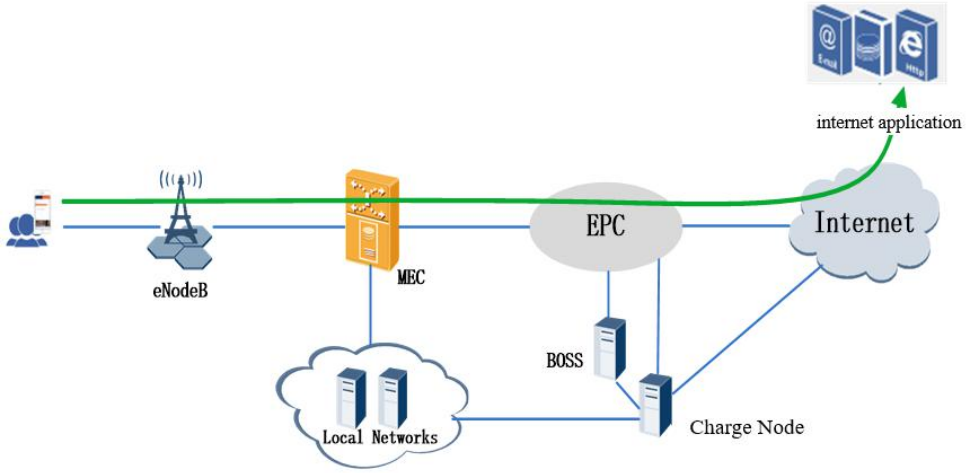

Figure 1: Network Topology

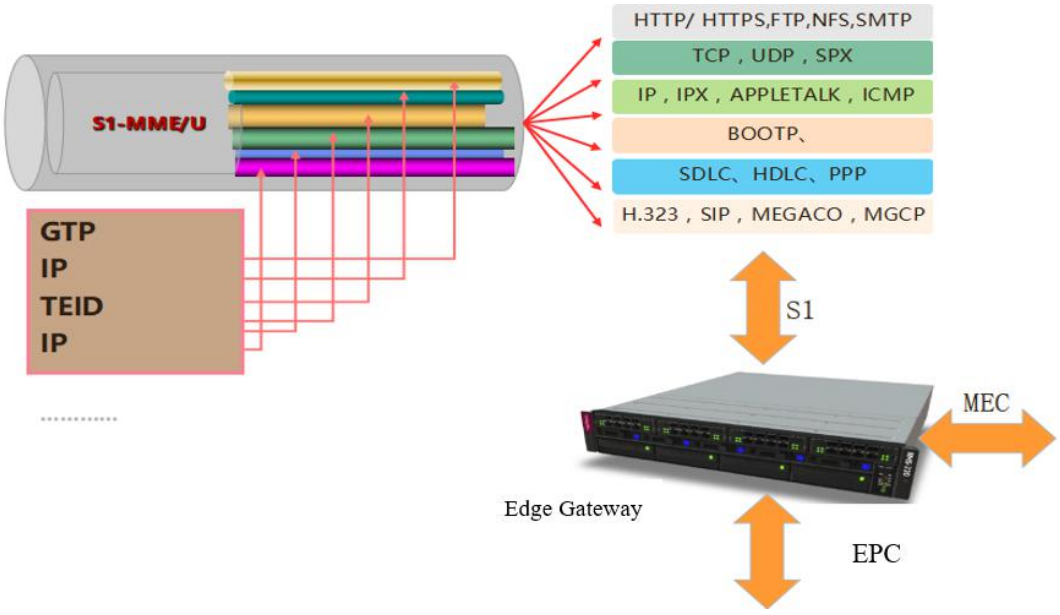

Figure 2: Protocol Architecture

- Flexible and Simple networking.
- Easy to connect with the ISP.

3 Features

- Transparent transmission of S1-MME interface messages
  Transparent transmission of public network service requests, no interference to public network users' normal service
- Analyze upstream packet (data plane)
  Get the destination IP and route according to the configuration. At the same time, the packet that needs to access the public network can be transparently transmitted to the SGW; for the local access, the GTP header is removed and forwarded to the local network
- Downstream packet encapsulation
  The downlink data of the core network can be transparently transmitted to the base station by the MEC gateway; for the data of the local network, the GTP header is encapsulated and forwarded to the base station.
- Radius/dedicated CDR billing

4 Product Configuration

Model	IKMECGW100
Description	Low latency, high availability, high reliability
Configuration	I5/I7, 4 Cores, 3.0GHz； 8G DDR3; 500G HDD; 1G-TX + 1G-FX*2 bypass
Maximum number of cell's quantity	4 Metrocells or 10 small cells
Maximum data plane throughput rate	1 Gbps
Appearance	

5 Performance

- A single device can reach 1Gbps throughput, can connect 4 macro base stations or 10 small cell stations.
- Under the virtualization platform, using DPDK acceleration, the system delay is less than 1ms, and the data plane processing performance of a single server can reach 16Mpps

6 Services Scenarios

6.1 Intelligent Video Acceleration

Using MEC for video acceleration, video providers use MEC's computing, storage, and network functions to analyze user video request data packets to provide sufficient bandwidth for those paid users by providing high resolution video to ensure their watching experience.

6.2 Video Content Analysis

VCA, also known as intelligent video analysis. The objective of the VCA is to understand visual scenes to learn, interpret, and extract meaningful information from the video sequence. For instance, the smart-CCTV (Closed-Circuit Television). VCA has multiple applications, such us human (anomalous behavior) detection, tracking, real-time monitoring, etc.

6.3 AR (Augmented Reality) and VR (Virtual Reality)

MEC can obtain key information conducive to statistical analysis and provide low-latency localized business services. Operators can not only effectively reduce the network load of the core network, but also provide real-time and low-latency AR/VR experience through localized deployment and enhance the AR/VR real-time interaction.

6.4 Assistance for Intensive Computation

The MEC server can be used to host high-performance computation, which can obtain information from multiple sources. Such calculations can be completed in a short time frame, and the results are fed back to the remote device, which may require information to perform further actions. This deployment reduces the need for remote devices not only to perform intensive data processing, but also reduces the need for remote devices to receive information from multiple sources to perform some meaningful calculations.

6.5 Enterprise Deployment

The MEC platform can assist in network selection and control which devices are connected via cellular access and which devices are connected via WLAN. The MEC platform provides functions to perform access control and integrate user/device authorization with the enterprise access control system; classify different levels of services for each end user in the enterprise domain; and provide external Internet connections for visitor access.

6.6 Connected Vehicles

MEC provides a platform for new types of applications that connected vehicles rely on. As vehicles and roadside sensors move and communicate with other connected devices and roadside units, data and applications remain close to them. MEC provides hosting services for applications, thereby reducing application latency. The MEC application can be run on the MEC server deployed on the wireless base station site to provide roadside functions. The MEC application can receive local messages directly from the vehicle and the application in the vehicle.
Roadside sensors analyze and then (with very low latency) spread hazard warnings and other delay-sensitive messages to other cars in the area (as shown in Figure 5). This allows nearby cars to receive data within a few milliseconds, allowing the driver to react immediately.

6.7 IoT gateway

The MEC Server could provide some additional compute and memory and be utilized for the following:

- Aggregation and distribution services;
- device messages analysis;
- Decision logic based on analysis results;
- Database logging;
- Remote provisioning and access control to the end devices.