Optimizing Manufacturing Performance through 5G Edge Computing and Machine Vision

- Haier Intelligent Factory MEC Project
Officially launched in July 2019, the world's first AI+5G interconnected factory leverages 5GDN for implementing complex scenarios, such as 5GDN+machine vision, 5GDN+smart devices, and 5GDN+AR man-machine collaboration, etc.
5GDNA was Launched in June 2019 (80+ Members)

Founded on June 26, 2019, "5G Deterministic Networking Alliance", is with an English abbreviation of "5GDNA".

The 5GDN is based on a cloud-native hyper-distributed architecture. Key technologies:

- Super-performance heterogeneous MEC
- Dynamic intelligent network slicing
- Cloud is used to meet the differentiated network requirements and deterministic SLAs
Connectivity + Computing + X: Build Next Generation MEC Solution

**Ubiquitous Connectivity**
- On-demand Service Continuity
- Policy Based Traffic Distribution: ULCL, IPv6
- Multi-homing (BP), and LADN
- Layered protection, building secure and trusted connections
- Edge UPF is deployed with one-off installation and plug-and-play

**Ultra-high Performance and Heterogeneous Computing**
- High Integration, High Performance E9000H
- Heterogeneous Hardware Computing
- Simplified Networking, Free Of Switch

**Innovation (+X) in Anytime and Anywhere**
- Open platform and fast provision for 3rd applications
- Central/edge synergy, one-site innovation, network-wide replication
- Build industry ecosystem and promote commercial launch

*Connectivity/Management/Application /Ecosystem Collaboration*

**Unified Application Integration Management**

**Easy Integration, Fast Application Rollout**

**5G Control Plane**
- Cloud OS
- Hardware

**Internet**
Capabilities of 5G MEC to Satisfy Haier Machine Vision Requirements

Huawei 5G MEC opens up powerful capabilities for machine vision partners

**BW Connectivity**
- Support high bandwidth capability of 5G, with single user bandwidth of Gbps level

**BW Management**
- Real-time bandwidth mgmt ensures stable terminal bandwidth and continuous transmission of a large number of high-definition pictures

**APP Enablement**
- Support rapid launch of apps, life cycle management, and unified operation and maintenance

**AI Capability**
- Service identification, intelligent service management and experience enhancement based on AI capabilities

Complete machine inspection | Box body inspection | Inner case inspection
Advantages of 5G MEC+Machine Vision Solution to Tackle Pain-points

- **Long deployment cycle:** >1Month
- **Limited cable length:** <30m

- **Large space taking:** 2-4㎡/IPC
- **Limited processing power:** 4GPU/IPC

- **Complex O&M, heavy workload**
- **Application updates are not flexible**

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Industrial cameras and IPCs are connected by **wired cables**

One-to-one deployment of inspection points and industrial computers

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Industrial cameras and MEC nodes are connected via 5G

Unified control and management of the MEC node

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- **Fast deployment: day level**
- **No distance limitation**

- **“0” IPC space taking**
- **Cloud-based processing capabilities**

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Industrial computers need updated one by one

5G MEC

Unified automatic update by MEC nodes

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- **Automated unified operation and maintenance**
- **More flexible application updates**
China Mobile “Pioneer 300” Action

In MWC 2019, China Mobile launched the "Pioneer 300" Action

100+ nodes deploying edge computing

100+ edge computing API

- Smart Manufactory
- Live Games
- Internet of Vehicles
- smart city
- Video acceleration
- Smart building
- Data Collection
- Smart Light Pole
- Protocol Conversion
- Assisted driving
- Tsn
- Native codec
- Smart Store
- Smart parking

100+ Partners of Edge Computing Open Laboratory

- Established 62 MEC deployment Trials in 12 provinces, including the Haier Smart Factory Project
- "Haier Smart Factory project successfully applied for GSMA POC"
- Hosted MEC Development Competition

China Mobile Edge Computing Open Laboratory

Relying on the China Mobile Edge Computing Open Laboratory to cooperate with partners such as Haier.
China Mobile Edge Computing Development Strategy

Develop A Full-stack Edge Computing System

Open and Harmonized Cloud-network Integration Platform

Application Ecology of Intelligent Industrial Integration

OICT Industrial Innovation Application

Edge Computing Technology System Framework of China Mobile

- NFVO+/CM: unified resource management
- ECM: unified operation
- ECP + ECI: unified structure

local traffic diversion
China Mobile to launch Edge Computing Open Beta Test in 2020

5 first cities building open beta test zone

Components of Open Beta launch

- Network: ULCL/DNN/ Slicing
- ECM: API/APP/Resource management
- ECP: 100+ API
- ECI: Virtual Machine/Container/GPU...

The Goal of this Open Beta Test

- Invite developers and other third parties to rapidly test and innovate with us
- Find the right services and the right business value in this ecosystem
- Explore potential business models for developers and other third parties

How to apply?

- The registration system will go live in Q3
- It's open to any developers or 3rd parties
- *Places are limited
5G MEC+Machine Vision Deployment Milestones and Achievements

- World’s first AI+5G Interconnected factory launched
- 5G base-station installed
- World’s first “5G MEC+machine vision” solution published
- Machine vision solution confirmed and MEC deployed
- Industrial camera installed
- MIIT 2nd “Zhanfang Cup” 5G application contest first prize
- MEC smart factory panels in MBBF
- Deploy in Haier factory Phase II and replicate in other factories……
- Won the "MEC best case award 2019" of ICT dragon and tiger list
Thank you.