EdgeGallery Introduction
Table of Contents

- EdgeGallery Positioning and Scope
- EdgeGallery Technical Architecture
- EdgeGallery Community Progress
5G ToB Ecosystem Depends on MEC Industry Application Ecosystem Prosperity
Lack of a unified platform to build a unified platform for enterprise digital transformation to accelerate knowledge transformation.
EdgeGallery Positioning and Scope: Build a Unified MEC Ecosystem and Accelerate the Commercial Use of MEC

**Project Positioning**

- Carrier-led edge computing architecture and capability openness de facto standards
- Lower the threshold for enterprise application deployment, build a scale, and build a 2B business ecosystem.

**Open Source Scope**

**Common platform of carrier MEC:**

1. **MEP running state:** supports heterogeneous hardware and virtual computing platforms, unified application and service management, unified network capability openness APIs, and unified MEP management interfaces.
2. **MEC management orchestration:** unified application lifecycle management and resource and application monitoring
3. **App Store Federation:** Unified App Repository and Smooth Interconnection with Commercial App Markets
4. **MEC application development tool:** provides code integration of standard MEP APIs to package and test applications.

Build an open-source edge computing project that is most compatible with "connection + computing" in the telecom industry.
EdgeGallery Positioning and Scope: Accelerating Enterprise Digitalization and Knowledge Transformation

MEC Developer Platform
- Development
- Test
- Packing
- Tool chain

Developers

App Market
- 80+ apps go online
- Edge Application Scenario
  - Smart park, industrial manufacturing, transportation and logistics, and games

Tenants and operators

MEC management plane
- Capability exposure APIs
- Network capability
- Ecological capability
- Cloud Connector
- Service registration

MEP

Production environment

Development Environment

Smart Campus

Industrial manufacturing

Traffic

Games

Security
Positioning and Scope of EdgeGallery: Accelerating Application Development Integration and Rollout

- Focus on high-value scenarios and quickly integrate valuable applications
- E2E integration within days based on the "terminal + network + application" real environment
- E2E tool chain, enabling quick application rollout from the lab environment to live network production environment
Table of Contents

◆ EdgeGallery Positioning and Scope
◆ **EdgeGallery Technical Architecture**
◆ EdgeGallery Community Progress
EdgeGallery Technology Vision: Making 5G Capabilities at the Edge

Native 5G connectivity
Bringing 5G capabilities within reach

- Interconnection with the latest 5G network
- 3GPP/ETSI-compliant 5G capability invoking wireless information, location, terminal identity, and bandwidth management
- Efficient network data plane and latency-sensitive network TSN
- Built-in value-added network functions

Edge native platform architecture
Reliable and manageable edge services

- Edge Native Open Platform Framework
- Lightweight resource management
- Full-stack security mechanism
- Highly trusted management and operation: MEC mesh scheduling, blockchain ledger, etc.
- Edge AI

Diversified open edge ecosystem
Commercially replicable

- Simplified application development and application migration tool chain support
- Convenient application verification: online simulation sandbox and 5G experimental network
- Unified application entry: Unified authentication, interworking, and migration from the AppGallery
- Multi-ecosystem sharing: Integrate with the public cloud and interoperate with the commercial platform.

EdgeGallery Introduction Video
**EdgeGallery Edge Native Architecture**

**Application Design State**
- Edge Developer Platform
- Application Test Design
- Application package design
- Application image design
- Application development capability design
- SDK/API
- Application Test Platform (ATP)

**Application distribution status**
- Application repository
- Application distribution
- Application Experience
- Application package management
- Resource management
- Warehouse interworking
- API/Capability repository
- Image repository (remote/local)

**Management plane orchestrator**
- Application orchestration
- Application Package Management
- Application Rule Management
- Resource management
- Pluggable network management
- Cloud Connector
- Intent-Driven Policy Framework

**Application running status**
- Containerized applications
- Application Manager
- Application Lifecycle Management
- VM application
- Application Agent
- Application Rule Manager
- API Gateway
- Container/VM orchestration
- Security/Audit/Log/Load balancing/Monitoring
- Open Capabilities
- Public cloud capability integration and openness
- Local Open Capabilities (Hardware capability, 5G network capability, and third-party ecosystem capability)
- Data plane
- Multiple network planes (Calico and Cilium)
- Network Programmable Interface

**Public services**
- User Management
- Integration/Integration Testing
- Time/Work Team Testing
- Security/Workgroup Security
- Time/Work Team Testing

**Infrastructure Management**
- Kubernetes/MicroK8S/K3S/OpenStack...

**Operating System**
- CentOS/Ubuntu/OpenEuler/...

**OS optimization**
- (eBPF/XDP)

**Heterogeneous hardware**
- X86, ARM, GPU, NIC/.....

**Public cloud/Local development environment**
- Private cloud/Enterprise DC

**Chocolate Release**

**Architecture Design Principles**

- **Industry-friendly:** Model-driven, scenario-specific, and code-free/low-code applications...
  - Troubleshooting Application Replication

- **Developer-friendly:** full-journey design for developer experience, including development design, deployment and commissioning, and installation and rollout
  - Addressing high development barriers

- **Business-friendly:** unified authentication, distributed federation, and integrated DevSecOps edge security development and O&M
  - Resolve the problem of difficult commercial monetization

- **User-friendly deployment:** Infrastructure independent, modular design, on-demand deployment, meeting different application scenarios
  - Addressing Industry Deployment Diversification
Top 10 Native Edge Native Technologies Enable Digital Transformation in the 5G Network Industry

- Edge Infrastructure EdgeInfra
- Edge Network EdgeNetwork
- EdgeOrchestratorEdgeOrchestrator
- Edge Collaboration Edge Collaboration
- Edge AI
- Edge SecurityEdgeSecurity
- Edge Mesh EdgeMesh
- Edge Storage EdgeData
- EdgeFramework EdgeFramework
- Edge Security Agile Development EdgeDevSecOps
EdgeGallery supports hierarchical deployment of different edge applications.

**Use Cases**

1. Cloud VR splicing: Multi-channel video access to the nearest MEC for VR cloud splicing
2. Live guide: Multimedia editing.
3. Dynamic streaming: According to the distribution of users to dynamically streaming.
4. Caching Sinking: Caching to the edge to save bandwidth and enhance the experience

**Benefits**

- Lightweight field equipment replacing expensive professional broadcast truck.
- Improve user experience and reduce terminal equipment costs.
- On-demand deployment, transcoding, and streaming to reduce bandwidth costs
EdgeGallery in Lighthouse Factory

Applications:
- Advanced Analytics
- Processes digitalization
- Agile Innovation

Applications:
- Advanced Analytics
- Synchronized operations
- Collaborative

Applications:
- Predictive Maintenance
- Augmented Reality
- Operational Intelligence

Applications:
- Data aggregation
- M2M, Quality Control
- Collaborative Processes
1. Elastic lossless compression: The combination of software and hardware (secondary coding residual result) and controllable quantization matrix (different from human eye input and meeting machine input) accurately controls the high-frequency information of the original image (all details are reserved). The compression ratio is 3 to 6 times.

2. Cell-level centralized bandwidth scheduling: Improves the overall cell bandwidth utilization, avoids congestion during proactive scheduling, and improves production efficiency by 10% to 20%.
# EdgeGallery Roadmap Introduction

| R0 Beta  
(2020-3)  
Framework verification | Amber Seed Code  
(2020 - 6)  
Basic Features | Blue Version  
(2020 - 9)  
Security optimization | Chocolate Version  
(2020 - 12)  
E2E optimization | Dove Version (  
2021 - 3)  
Capability Multiplication | EverGreen Version  
(2021 - 6)  
Experience opt. |
|---|---|---|---|---|---|
| - Microservice governance framework  
- Capability exposure framework  
- Codeless integration of applications  
- Application image packaging  
- Container and VM management  
- CI/CD Basic Framework | - The MEP platform provides the LB capability.  
- x86-to-ARM migration integration  
- App verification tool framework  
- Cloud Connector Framework  
- Integrated public cloud edge agent  
- Code trustworthiness and security | - Optimization of 9 security dimensions  
- App Scaling Management  
- Enhanced graphics, visualization, and automation capabilities  
- Enhancements such as resource usage visibility  
- Interconnecting with Third-Party Public Clouds  
- The MEP provides the DNS capability. | - Competence Center  
- Security integration capability  
- Local application deployment  
- The GUI is optimized and the usability is improved.  
- App Market Federation  
- APP Test and Certification Center  
- Visualized Traffic Distribution Rule Configuration  
- MEP local microservice portal | - AI open capability integration  
- Application integration  
- Support the implementation of innovative applications (enhance the application integration platform)  
- Implement key technologies such as Edge AI and applets.  
- Implement the capability center shelf. | - AI image restoration, edge detection, cartoon image generation, image coloring, object classification, target detection, etc  
- Cross-platform support supports the incubation integration of virtual machine applications based on openstack and container applications based on k8s  
- IAAs / PAAS / applications support on-demand deployment and automatic generation of application frameworkSecurity, user management |
Key Features of the EdgeGallery Version

Application development platform
- API Competence Center: Provides more open capabilities for app developers.
- Development and commissioning environment change: Provide the 5G MEC development and commissioning sandbox and field environment.
- 5G network integration: UPF interconnection and DNS and traffic rule configuration capabilities

App repository
- Third-party app store management: provides the registration management function for third-party app stores.
- App Store distributed federation: implements app push and sharing with third-party app repositories.
- APP ID card: provides an APP authentication platform for carriers to customize test cases.

Orchestration Management (MECM)
- GIS management of edge nodes: provides online map-based edge node and resource management, and provides detailed street-level MEP topologies.
- 5G UPF traffic distribution rule configuration: visualized configuration of UPF traffic forwarding rules and DNS rules

Edge PaaS (MEP)
- Local portal: The MEP single-node management page is added to manage applications and services and implement basic service governance visualization.
- Node service governance: provides health check for single-node services, multi-node service isolation, and 5G network integration capabilities
EdgeGallery application federated push process

**Application integration:**
- Creating an Image
- Deployment and commissioning

**Application automatic test and certification platform ATP**
- Test case management, which can be customized
- Visualized test process

**Application push:**
- One-click push and free application sharing
- App repository federated sharing
- App authentication report display
- Pushing apps between app repositories

---

1. 5G sandbox
2. Certification Test
3. 3rd APP store
4. Carrier App Store
5. EdgeGallery Community Application repository
6. Carrier App Store
One-stop deployment and release of EdgeGallery application development and service governance

- Wizard-based application development process
- Abundant API capabilities
- Multi-language development support
- Visualized application/service governance
Table of Contents

♦ EdgeGallery Positioning and Scope
♦ EdgeGallery Technical Architecture
♦ EdgeGallery Community Progress
Preparation for EdgeGallery

EdgeGallery Beta R0 Release
30 March

EdgeGallery Open recruitment of internal testing partners
15 April

EdgeGallery Online Live Open Class
19 / 23 April

Two sessions of internal test training
15 / 21 May

EdgeGallery prepares for closed-door discussion
June 4 / Beijing

EdgeGallery Core partner member signing MOU
30 June

EdgeGallery At-Large Recruitment (Application partner)
July 20

First Board of Directors and press release
30 July

It was officially released on August 6, 2020, and has 25 community members in March 2021.
EdgeGallery Innovation Incubation Base, Facilitating Industry Digital Transformation

EdgeGallery Implementation: Deployment of 25+ Innovation Incubation Bases

Five Cities City-tour Developers Offline Salon 2020, Continued in 2021

- August 28 @ Xian
- September 26 @ Shanghai
- October 28 @ Nanjing
- November 7 @ Beijing
- December 19 @ Dongguan

Huawei’s commercial version focuses on industries such as industrial manufacturing, port mining, and pan-media, 120+ commercial deployment and 30+ POC verification.
EdgeGallery works extensively with upstream and downstream industry organizations.

- Huawei/CMCC/Tencent/ARM lead Akraino 5G MEC BP family
- Aim to run as a LF Edge project later this year

- As Operator Platform Telco Edge Computing reference implementation
  - Joint define OP - MEC resource manager Interface

- Architecture align with ETSI MEC standards.
  - Implement ETSI API (location/bandwidth/RNIS...)

- Jointly build 5G field innovation network for application developers
  - Manage MEC by EdgeGallery

- Jointly setup EdgeGallery community labs.
  - Future Networking Research projects

- EdgeGallery as 5G DNA innovation test lab
  - 5G DNA Deterministic Network feature implementation
EdgeGallery Actively Expands Community Members and Aggregates Industry Applications

- **8 senior members**
- **19 ordinary members**

### 150 + Apps

<table>
<thead>
<tr>
<th>Classification</th>
<th>Quantity</th>
<th>Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2B</td>
<td>65 +</td>
<td>Safety, Transportation, Robotics</td>
</tr>
<tr>
<td>B2C</td>
<td>85 +</td>
<td>Gaming, VR</td>
</tr>
</tbody>
</table>

### Developer participation

- 50+ organizations, 300+ people in the community
- 500,000+ visitors to the official website, with a total of over 200,000+ visitors. Distributed in 40+ countries and regions, covering 33 provinces and cities in China

### Focus on 5 industry scenarios

- Smart Campus
- Industrial Manufacturing
- Transportation and Logistics
- Game athletics
- Safety and Other

### 25+ Innovation incubation base deployment

25+ innovation incubation base deployment, including locations such as Nanjing, Xi’an, etc.
## EdgeGallery Websites and Communication Platforms

<table>
<thead>
<tr>
<th>Category</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Website</td>
<td><a href="http://www.edgegallery.org">www.edgegallery.org</a></td>
</tr>
<tr>
<td>Mail-list</td>
<td><a href="https://groups.io/g/edgegallery">https://groups.io/g/edgegallery</a></td>
</tr>
<tr>
<td>Codes</td>
<td><a href="https://github.com/EdgeGallery">https://github.com/EdgeGallery</a></td>
</tr>
<tr>
<td></td>
<td><a href="https://gitee.com/EdgeGallery">https://gitee.com/EdgeGallery</a></td>
</tr>
<tr>
<td>Video</td>
<td><a href="https://www.youtube.com/watch?v=CovSM57JUyc">https://www.youtube.com/watch?v=CovSM57JUyc</a></td>
</tr>
<tr>
<td>Offline Installation</td>
<td><a href="https://release.edgegallery.org/">https://release.edgegallery.org/</a></td>
</tr>
<tr>
<td>Demo</td>
<td><a href="https://gitee.com/edgegallery/community/blob/master/TSC/Release/v0.9/EdgeGallery%20Demo%20Recording.mp4">https://gitee.com/edgegallery/community/blob/master/TSC/Release/v0.9/EdgeGallery%20Demo%20Recording.mp4</a></td>
</tr>
<tr>
<td>Document</td>
<td><a href="http://docs.edgegallery.org/zh_CN/latest/">http://docs.edgegallery.org/zh_CN/latest/</a></td>
</tr>
</tbody>
</table>
Thank you.