Collaborative and Coordinated Integrative Cloud Services for Sustainable Development

Dulei
Huawei Cloud
Huawei: Leading Global Provider of ICT Infrastructure and Smart Devices

188,000 Employees
80,000+ R&D employees
170+ Countries and regions
68 in Interbrand's Top 100 Best Global Brands
72 in Fortune Global 500

Information Distribution & Presentation
Smart devices
Connectivity
Cloud
Information Learning and Inference
+Intelligence

Information Transmission

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HUAWEI CLOUD Global Footprints
Stable, Reliable, and Accessible Worldwide

- 20 Regions
- 36 Availability Zones
- 1500+ CDN nodes

Regions:
- Europe
- South Africa
- East China
- West China
- North China
- Hong Kong
- South China
- Asia Pacific
- Russia
- Thailand
- Singapore
- Asia Pacific
- Peru
- Brazil
- Chile
- Northern Latin America
- South America
- Argentina
- To Europe

Timeline:
- 2018.3: Hong Kong, Russia
- 2018.9: Thailand
- 2018.11: South Africa
- 2019.2: Singapore
HUawei CLOUD Services Are Growing Fast

18 categories, 160+ services have been launched.

<table>
<thead>
<tr>
<th>Applications in Marketplace</th>
<th>Enterprise users and developers</th>
<th>Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>2800+</td>
<td>1000000+</td>
<td>6000+</td>
</tr>
<tr>
<td>Computer: ECS, Computing, GACS, FACS, BMS, Dart, As</td>
<td>Application service: CSE, SMN, DMS, APM, APIG, CPS</td>
<td>Software development service: CodeCheck, TestMan, CloudPipeline, CodeC, MobileTest, DecCloud</td>
</tr>
<tr>
<td>Network: Network, VPC, ELS, NAT, Gateway, DNS, CMS, CAN, HTTPDNS</td>
<td>Management deployment: CES, LTS, iam, CTS, TMS</td>
<td>Video: Media Processing Center, Video on Demand, Live, Convergent Video</td>
</tr>
<tr>
<td>Database: Database, PostgreSQL, SQL, Server, RDS, Mysql, RDS, mySQL+, geopds, opentsdb</td>
<td>Cloud communication: Meeting, Wi, CloudPBX, CloudPCC, VoiceCall, MSSMS</td>
<td>Migration: OMS, CDM, CMC, SMS</td>
</tr>
<tr>
<td>Security: WAF, AAD, Anti-DDoS, Web-shan, HSS, DRS, DNS, NVD, NAF, SLD</td>
<td>EI: MLS, DLS, GES, Cis, Mts, TTS, NLP, Logistics, lWater, SmartRetail, SmartTraffic, Action, prediction, Image, DDF, Ds, VCT, VCM, ASR, AIP, Power, Analysis, DAPS, vision service</td>
<td></td>
</tr>
<tr>
<td>Edge cloud service: EP, Enterprise application: Workspace, CloudVC</td>
<td>lot: IoT Platform, iEF, Dec</td>
<td>Enterprise network: HCS, DCC, DSS, DESS, BMS</td>
</tr>
</tbody>
</table>

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HUAWEI CLOUD Remote Sensing Big Data Solution

**Application System**
- Disaster prevention
- Land classification
- Environmental protection
- Logistics
- Agriculture

**Application Service**
- Thematic mapping
- Statistical Chart
- 2D and 3D visualization
- Online editor
- ......
- Data exploration
- Data mart
- Multi-mode search
- Knowledge model
- Case Scenario

**GIS+AI Center**
- Data Extract
- Element Label
- Image segmentation
- Model Training
- Object detection
- Object tracking
- Clutter classification
- Change detection

**Data Governance**
- Image Tile
- Image Format Conversion
- Data Cataloging Integration
- OBS
- Cloud Table
- RDS
- DWS

**Data Infra**
- Compute: Kunpeng 920 (ARM-based CPU)
- Management: Hi1710 (Intelligent management chip)
- AI: Ascend 310/910 (AI chip)
- Storage: Hi1812 (Intelligent SSD controller chip)
- Transmit: Hi1822 (intelligent network chip)
OBS Service: Superb Performance and High Availability

Level 1: Media reliability
Bad sectors and slow disks (3.78%)

Level 2: Server reliability
FRU faults (3.4%)

Level 3: Cabinet reliability
PDU and switch faults (0.1%)

Level 4: Data center reliability
Wind, fire, water, and electricity faults (1.8%)

Level 5: Regional reliability
Earthquake, flood, war (0.1%)

Cross-region replication
Multi-AZ
Cross-AZ EC
Cabinet-level redundancy
EC
Partition
GC restoration
Detection of slow disks
Bad sector detection

Availability: 99.995%, durability: 99.9999999999%

OBS 3.0
Unlimited capacity
100 billions+ objects
10 millions+ TPS
100 Tbps throughput capacity
2.4 Gbps single-stream bandwidth
Latency as low as 10 ms
HUAWEI CLOUD EI: a New Engine for Intelligent Industry Upgrade

General APIs
- ASR
- Image Recognition
- FRS
- OCR
- TTS
- NLP
- Content Moderation

Advanced APIs
- Task-oriented Conversational Bot
- Moderation (Video)
- Video Guard Service (VGS)
- Video Content Recognition (VCR)
- ImageSearch
- Video Content Tagging (VCT)
- Video Content Comprehension (VCC)

Pre-integrated Solutions
- City
- Internet
- Home
- IoT
- Logistics
- Healthcare
- Campus
- Manufacturing

Basic Platform Services
- ModelArts
- MindSpore
- Ascend
- Kunpeng

Data Lake
- General APIs
- Advanced APIs
- Pre-integrated Solutions

59 services
- 21 platform services
- 22 visual services
- 12 language services
- 4 decision-making services

159 functions
- 52 platforms
- 99 APIs
- 8 pre-integrated solutions

As of Dec 31, 2018
ModelArts reduces the model training duration by half. Fast.ai used to be the fastest training platform. Now, ModelArts reduces the training time by half. A training acceleration ratio of over 0.8 for a cluster with 1,000 GPUs. Simplified hyperparameter tuning, simplified coding, and algorithm optimization.

- Fast.ai on AWS: 18 minutes
- ModelArts: 10 minutes

Fast.ai used to be the fastest training platform. Uses the same 128 GPUs to train millions of images with ImageNet.
Delivering Pervasive Intelligence Through Chip-Inspired Innovations

- 16 x 16 x N scalable cubes
- Simultaneous support for tensor, vector, and scalar units
- All scenarios: devices, edge, and cloud
"Siwei Earth" Building a Remote Sensing Industrial Cloud to Offer Internet+ Services for the Remote Sensing Industry

<table>
<thead>
<tr>
<th>Natural resources</th>
<th>Water conservancy/environmental protection</th>
<th>Territory supervision</th>
<th>Finance/insurance</th>
<th>Logistics/e-commerce</th>
<th>Agriculture, forestry, water, and grass</th>
<th>Disaster prevention/mitigation</th>
</tr>
</thead>
</table>

**Siwei Earth**

### Common Product Services
- Base map
- Daily map

### Intelligent Information Product Services
- Regional map
- Customized base map
- Clutter classification
- Change detection

### Application Development Services
- Object detection
- Standard interface

### Data storage
- EVS
- OBS
- SFS

### Data access
- BMS
- ECS

### Image processing
- ECS
- Kunpeng
- BMS
- AS

### Image analysis/IAI analysis
- BMS
- ECS
- CCE/CCI
- MRS

**Key Metrics**
- 30 min: fault detection time
- 90%+: recognition accuracy
- 2 tpm: detection frequency
Common Product Services: Making Remote Sensing Data Inclusive on Demand and in Quasi Real-Time

- Orthophoto Fusion: 100% Coverage
- Quasi-Real-Time Publishing: 2 hours Time
- Long Time Series: 2 decades Lasting

Base map
Daily map
Regional map
Use AI Technologies to Gain Instantaneous Perceptions of Clutter Changes

- **Clutter classification**
  - Precision: > 90%

- **Automatic Selection of Cloud Amount**
  - Cloud amount: < 30%

- **Geometric Positioning Accuracy**
  - Precision: 10 m

- **Clutter classification**
- **Object detection**
- **Change detection**
Remote Sensing Data on the Cloud Ensuring Accurate and Timely Disaster Warning

PB-level remote sensing data on the cloud

Massive volumes of data

Real-time obtaining

Information sharing and collaborative operation
HUAWEI CLOUD Support 3rd China Land Survey, Build Fundamental Data for Sustainable Development

**Hybrid cloud management**
- Application
- Inference
- Produce & Deploy
- Production site
- Disaster recovery
- Application
- EI
- DevOps
- Develop & Test
- DR site
- Training
- Market Place

**Data Compliance with hybrid architecture**

**OBS support massive data**

www.huawei.com
Saving the Rainforest by Listening
Tech for all. Pass it on.

科技普及天下