

Accelerate the Digital Journey of Higher Education in Bulgaria

August 2022



01

Huawei in Bulgaria



20 years Dedication in Bulgaria, For Bulgaria

20 years Dedication in Europe, For Europe

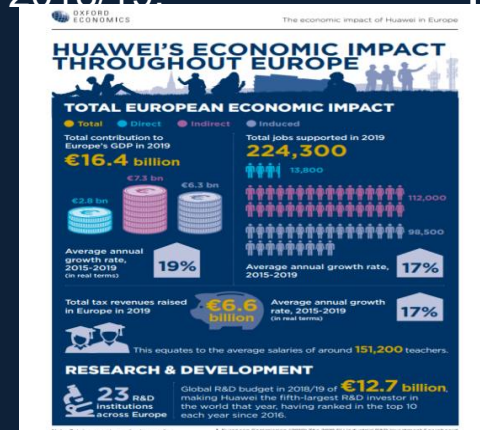
Europe is the 2nd HQ of Huawei

- ✓ **12,200+** employees, including **2,383** R&D staff, **74%+** of local staff
- ✓ **6.4B USD** procurement amount in 2018, **37.7B USD** accumulated purchasing amount from 2009 to 2018, **14.5B USD** revenue in 2018
- ✓ **2** Regional headquarters (Dusseldorf, Warsaw), **47** offices
- ✓ **23** Research Institutes distributed in **14** European countries
- ✓ **20** Joint Innovation Centers, **2** Supply Centers, **7** Customer Training Centers:
- ✓ **4** European Cybersecurity Centers



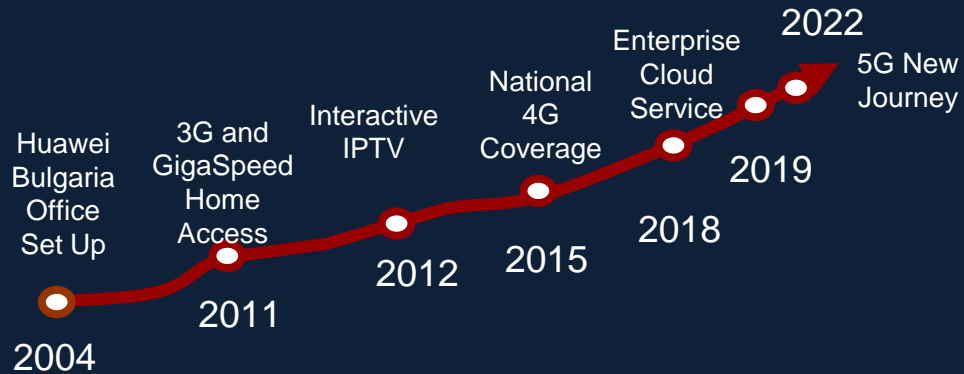
Huawei's Economic Impact Throughout Europe

- ✓ **€16.4billion** contribution to Europe's GDP
- ✓ **224.300** jobs supported
- ✓ **€6.6billion** Tax revenues raised, average annual growth rate, 2015-2019 17%
- ✓ **23 R&D institutions** across Europe
- ✓ **€12.7billion** Global R&D budget in 2018/19.



Huawei Bulgaria 18 years Journey: in Bulgaria, for Bulgaria

- Been in Bulgaria for **over 18 years**
- **110+** employees more than **80%** are locals
- Indirectly provides more than **1000+** jobs
- **44M €** contribution to GDP and continue innovation



Leading ICT



Best Network

- cover **99%** population
- Leading local and EU market



- **Top 3** Device Sales
- **94%** Brand Awareness

Contributing locally



Seeds for the Future

10 Bulgarian students each year on study trip to China



1000 Dreams

donated tablets to the children's wards of the hospital



SFTF Scholarship

100K € in Total for 50 winners of the SFTF Scholarship Program



COVID-19 Masks Donation

180K Masks donation to Bulgarian Red Cross and 10+ Bulgarian Municipalities

Safeguarding Bulgaria Cyber Security

100%

“100% Compliance”

100% Compliance for all projects/solution in Bulgaria

Zero

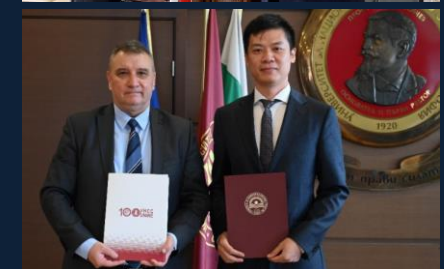
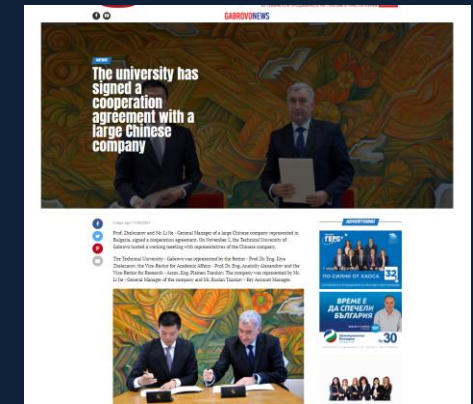
“Zero bad record”

Zero bad security record in Bulgaria past 17 years

SFTF scholarship program: support young students together with universities, to inspire innovation and more talents in Bulgaria

In order to provide assistance and development opportunities for local ICT talents, Huawei start the Bulgaria ICT Talents Training – **Huawei Seeds for the Future (SFTF) Scholarship Program** to promote the training of talents in the ICT field in Bulgaria and to support innovation development of the country.

- **100K € in Total for 50 students**, who selected as winners of the SFTF Scholarship Program, as well as internship opportunities for 10 outstanding winners.
- **Long-term partnership with TOP local universities**, including but not limited to Sofia University, Technical University of Sofia, Varna Economic University, Gabrovo University, University of Library Studies and Information Technologies and University of National and World Economy etc.
- **250+ applications submitted** by students, 77,000+ had shared and following the topics.

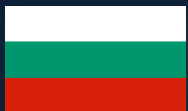


ICT Talents are Required to Develop Digital Transformation.

Huawei Collaborate with 10+ Universities to Train 2,000 ICT Students till 2025



Focuses on digital talents and digital upskills, setting targets in the digital education action plan to ensure that 70% of adults have basic digital skills by 2025.



All the up coming political key candidates priorities and goals to develop the digital skills of Bulgaria society, including increased investment in the talents cultivation, availability and accessibility of education and training programs, etc.

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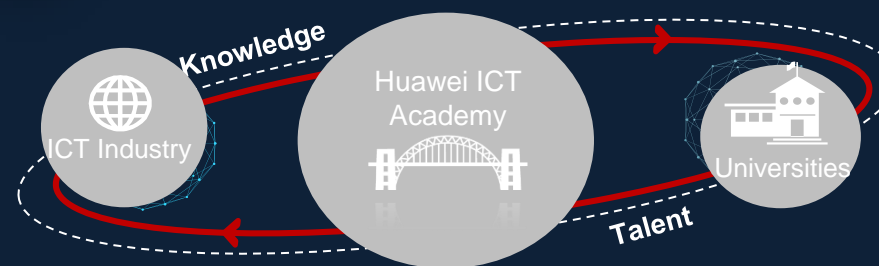
Seeds For the Future

- ✓ First launch in 2014, collaborating with top Bulgaria universities and have cultivated 100+ ICT talents



02

ICT Academy



- ✓ First launch in 2020. By end of 2021 there will be **7+** cooperative universities, **10** online courses, and **250** students.
- ✓ Objective: Collaborate with **10+** universities till 2025 to train **50** university lecturers and **2,000+** ICT students

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€300+K Scholarship Package for the Top and Outstanding 200+ ICT Students in Bulgaria



02

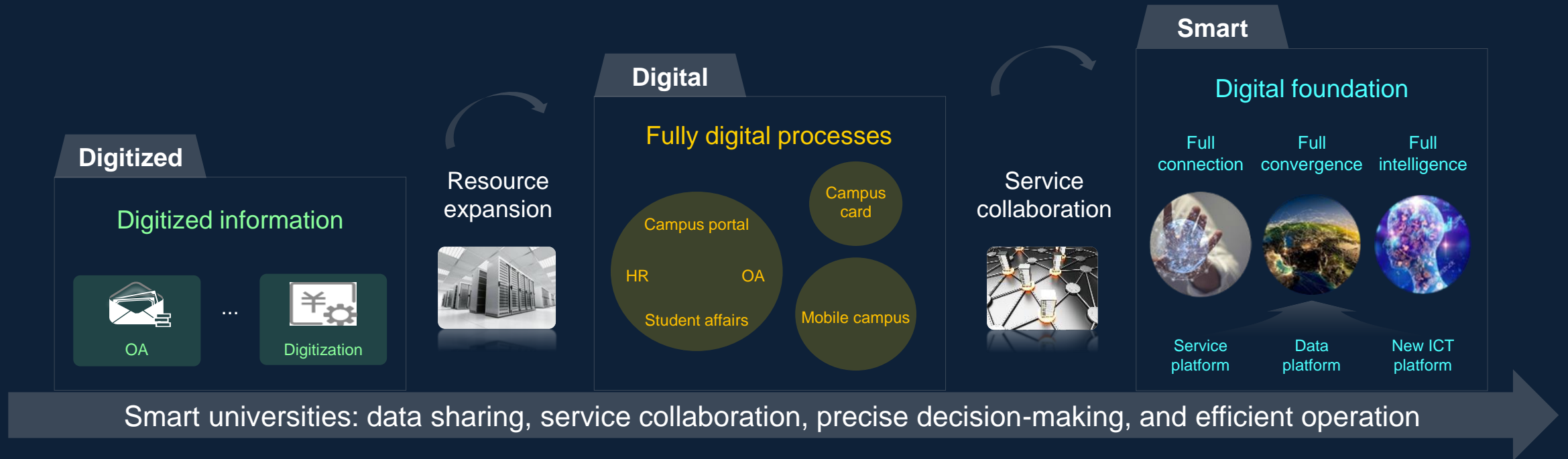
ICT Development Trends in Higher Education



Teaching service trends and ICT trends

Numerous smart terminal access, multi-network convergence, and innovative teaching modes, posing challenges to higher education

Smart Transformation and Evolution of Universities



Smart University: Talent Cultivation, Innovative Research, Teacher & Student Service, and Campus Management

Teaching Center — Online Teaching | Immersive Teaching | Ubiquitous Learning

- 5x online learning in the post-pandemic era
- Access from any location and terminal, 2.5 terminals per person
- XR online lab/teaching for immersive experience



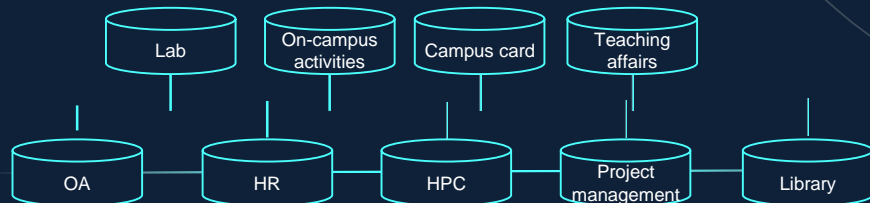
In school



outside school

Service Center — Consolidate ICT Infrastructure to Serve Teachers and Students

- One network is used for multiple purposes to facilitate data sharing, building high-quality networks.
- The SDN network implements inter-campus interconnection and fast provisioning or construction of teaching services.



Transforming Education with Technology

Talent cultivation

Innovative research

Teacher & student service

Campus management

Research Center — HPC | AI | Big Data

- HPC is urgently needed in domains such as engineering application, bioanalysis, and chemical calculation.
- HPC resources are shared across departments and disciplines.
- New ICT majors such as AI and big data are added in universities.

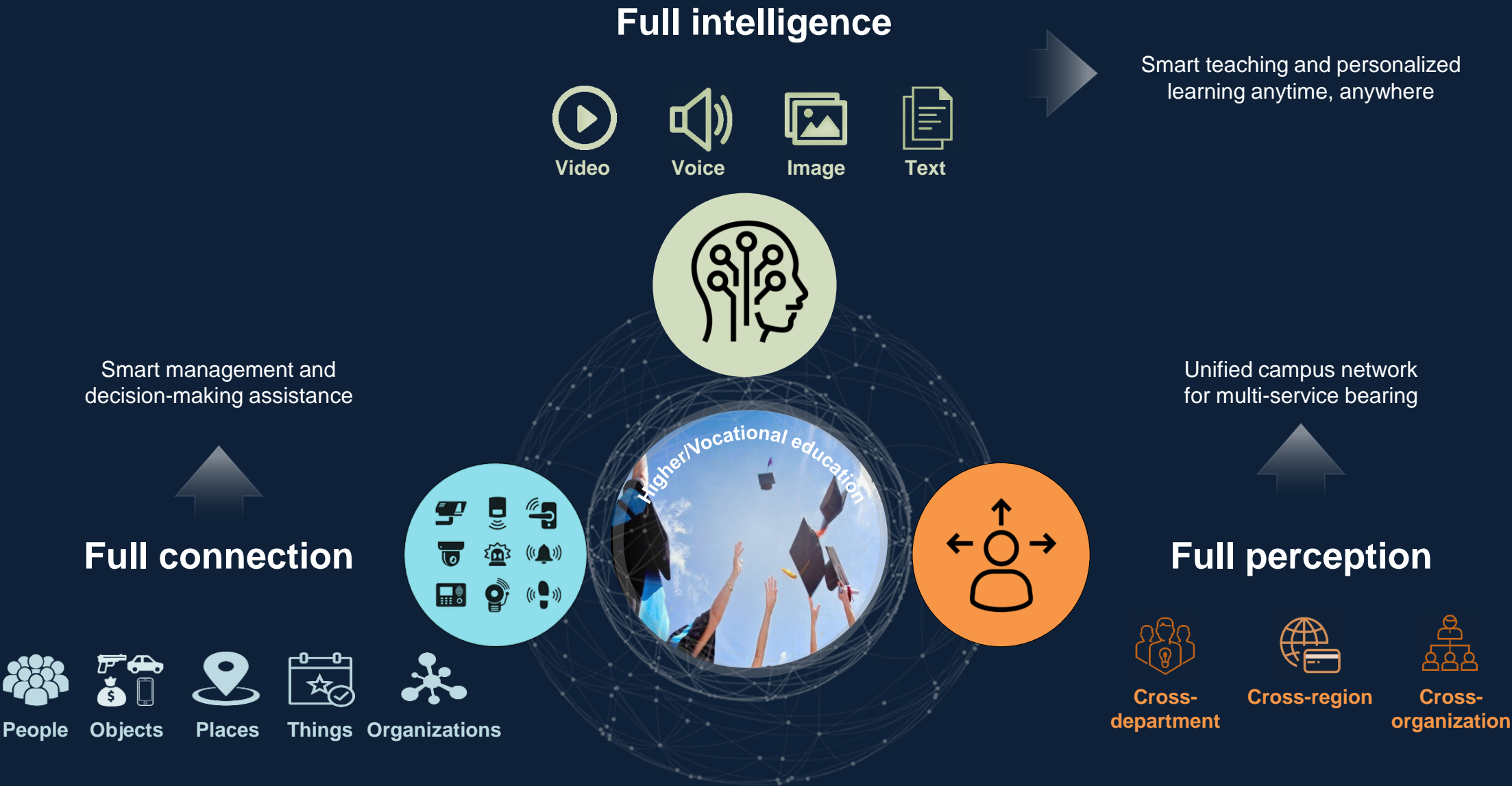


Management Center — Smart Campus with Refined Management

- Proper access to campus resources for teachers, students, and visitors
- Numerous ICT infrastructure management and quick troubleshooting
- Situational awareness of integrated campus operation



ICT Requirements by University Services





03

Accelerate the Digital Transformation of Education



Huawei Intelligent Higher Education Solution

Huawei Intelligent Higher Education Solution Panorama

Smart classroom

Students-centric
Extends the classroom
boundary.



Hybrid learning
Online Merge Offline



Collaborative classroom
Group-based teaching +
Multi-screen sharing



Digital classroom
Multi-media & interactive teaching

Smart campus

Simplifies campus management, improving
management efficiency and resource availability.



Safe campus
Access control and
perimeter security

Smart campus network
All-optical, wireless,
and intelligent O&M

Intelligent collaboration
Collaboration of teaching,
research, and office



Scientific research

Improves research and
shares information.



HPC
Powerful computing, AI, and
high performance network



NREN
Intelligent, simplified, secure,
and ultra-broadband

Talent development

Collaborates with
industries for talent
development.



Huawei



Universities



Students

1500+ academies
3000+ certified trainers
60,000+ students/year



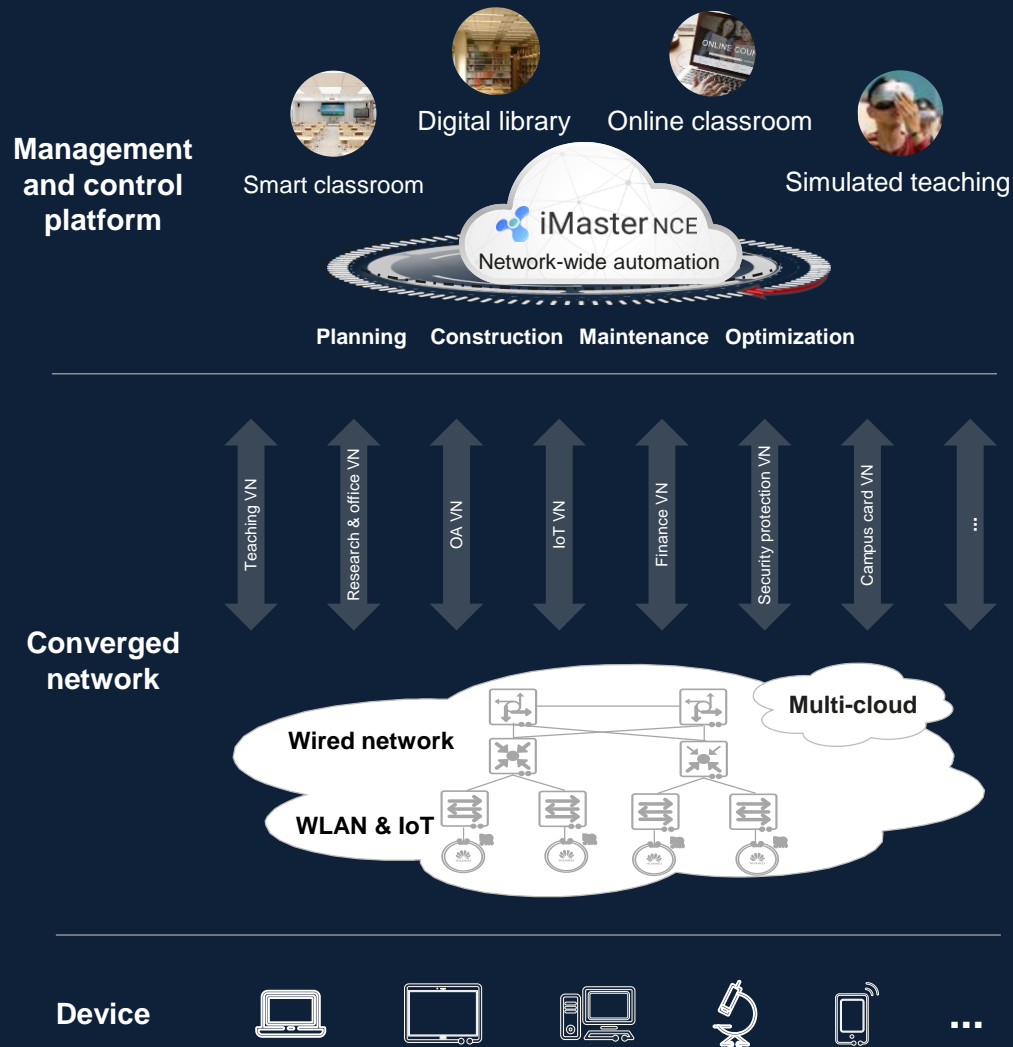
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Accelerate the Digital Transformation of Education



Smart Campus Network

Huawei Smart Campus Network Solution for Universities




Learning anywhere
Learning anytime

Full-wireless campus: mobile and seamless access

- Exclusive 3D network planning, **coverage without blind spots**
- Exclusive 4-element smart antenna for **20% longer** coverage distance
- Exclusive AI smart roaming for **uninterrupted roaming handover**
- Fastest Wi-Fi 6 based on industry's exclusive **16T16R**


One network for multiple purposes
Free mobility

Converged campus network, accelerating service system integration with network normalization

- One physical network carries multiple virtual networks, reducing repeated construction and lowering TCO by **50%**.
- **Unified authentication for free mobility** ensures consistent network access permissions anytime and anywhere.
- **IP + POL** convergence helps build a green and sustainable campus network.


Seamless fault demarcation

Network-wide automation, efficient deployment and O&M

- Industry's only solution for **full-lifecycle management** (planning, simulation, configuration, optimization, and security)
- **Proactive O&M**, intelligently identifying 85% of potential faults
- Multi-dimensional data analysis on the dashboard for real-time visualization of user experience

Wireless Coverage in All Scenarios for Ubiquitous Access

Outdoors

Distributed users and wide coverage



Outdoor AP coverage

- Industrial AP, IP68, fully built-in surge protector, and 5 kA surge protection for antennas
- 700-meter radius, improving coverage by 40%

Office and library

Access of different types of devices



Indoor settlement

- Each AP supports 60 concurrent users.
- Smart antennas, improving coverage distance by 20%

Student apartment

Large number of rooms and complex layout



Agile distributed Wi-Fi

- Remote radio access, full coverage, and zero roaming
- 90% fewer management nodes

Large classroom

Numerous persons, high concurrency



High-density deployment

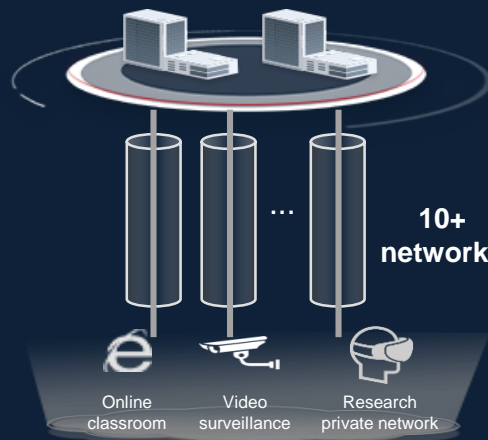
- Triple radio AP, one 2.4 GHz + two 5 GHz tunable radios
- Supports more than 100 concurrent users, increasing the number of access users by 30%.

Unified Campus Network and Network Virtualization for Multi-service Bearing and High-quality Campus Networks

AS-IS

Information digitalization

Systems of each department



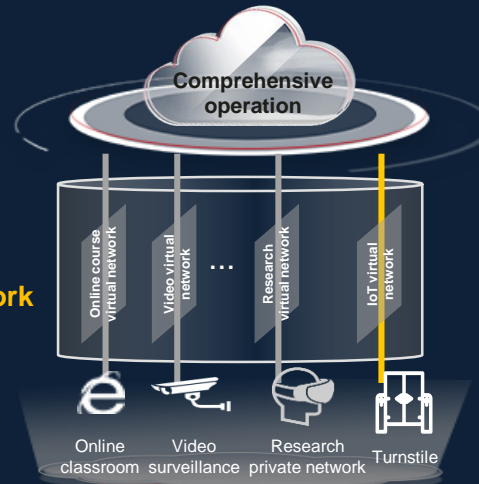
Independent network construction and data silos



Multi-layer overpass needed

TO-BE

Business digitalization



One network for multiple purposes and data sharing



Dedicated lanes, no traffic jams

VS

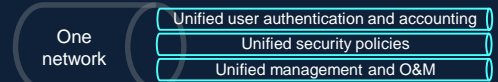
Highlights and benefits

One network for multiple purposes
Reduced TCO



Unified network for multi-service bearing,
reducing network construction costs

Unified management
One-network architecture



Multiple schools, one network

Fast
deployment
in 20 min

4-step
configuration
and
deployment

6-
dimensional
policy control

Cloud-based management
One-click deployment

Automatic network deployment
and policy provisioning

Free mobility
experience



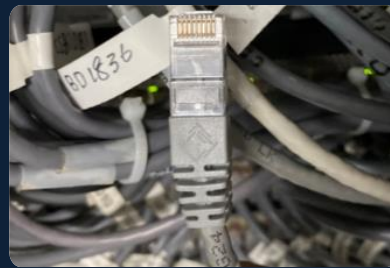
Consistent access rights regardless of
where and when the network is accessed

Intelligent O&M for Campus Networks

As-Is



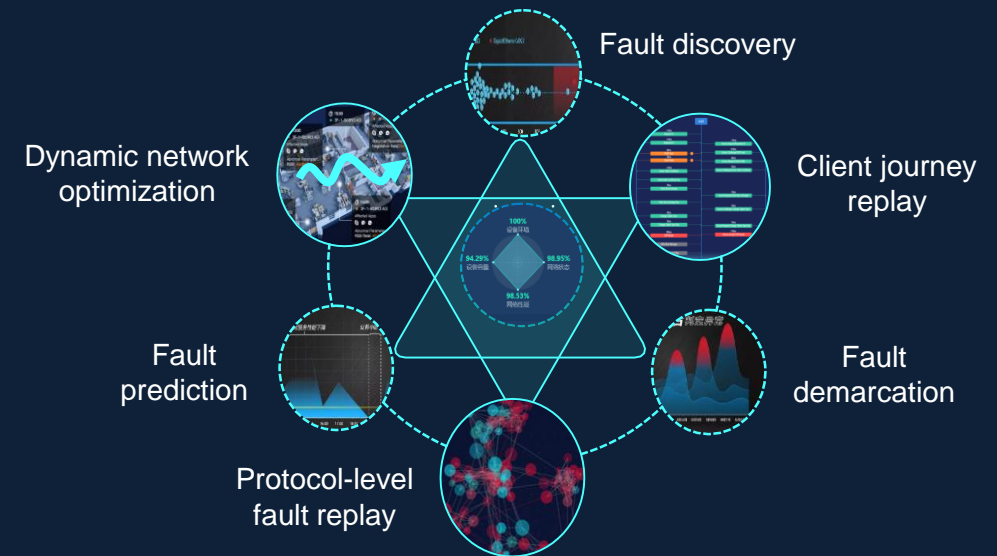
- Numerous wireless users
- Complex wireless scenarios



- Numerous switching ports
- Complex networks



To-Be



Passive response

4 hours
Fault rectification

162 Mbps
Average bandwidth

Post-event troubleshooting

> 4 hours
Post-event troubleshooting

1650+
Network faults

Proactive fault detection

10 minutes
Fault rectification

58%
Network-wide performance increased

Pre-event health check

10 minutes
Pre-event prevention

85%
Potential faults reduced

Greece GRNET

-- Huawei Enable 56 University Connected as One Campus Network



Solution

- Wired and wireless solution converged solution.
- 100G high-speed interconnection between the campus network and data center.
- WIFI for student apartment, connected to campus.

Benefits

- Simplify the network management for 56 university campus.
- Support students learn at anytime and anywhere.
- High ROI, supporting evolution in the future 10 years.

Newcastle University, UK

— World's First 100G Campus Network



Solution

- 100G high-speed interconnection between the campus network and data center
- 2000+ wireless APs deployed, implementing full-coverage in all scenarios
- Integrated HPC solution



Benefits

- High benefit-cost ratio and reduced CAPEX
- High ROI, supporting evolution in the future 10 years
- Improved ranking in The Times Higher Education World Reputation Rankings

Switzerland

— Federal Institute of Technology

The logo of ETH zürich, featuring the text "ETH zürich" in white on a yellow circular background.

Ranked **6th** in the 2021 QS
World University Rankings

Solution

- 2 campuses, 180 buildings with wireless coverage
- 3000+ AP high-speed access
- One-click planning and OAM
- Customized Remote Fault Diagnosis Solution

Benefits

- High reliability & quality network
- Optimal access experiences
- Greatly reducing OAM costs

- Accelerates the university's strategy of "learning anytime, anywhere" and maintains its world-class quality of education and research prospects.
- Enables more students to complete online learning and exams.

Wi-Fi 6 Enhances Wireless Network Experience at Mondragon University in Spain



Customer Value

- All-scenario wireless campus network provides a brand-new experience for users.
- The Wi-Fi 6 network better meets the needs of high-density access and the increasing diversity of teaching applications.
- Digital talent training in colleges and universities is no longer hindered by network limitations such as bandwidth and latency. Diversified and personalized teaching experiences are available campus-wide.

Solution: Campus network (AirEngine Wi-Fi 6, wireless network planning, and CloudCampus)

Project Background

- Mondragon University, located in Gipuzkoa in Spain, was founded in 1997 and is part of the Mondragon Corporation.
- As of February 2016, the university had about 4000 students and offered 22 undergraduate programs and 13 master's programs.
- The project resolves bottlenecks encountered by traditional networks in teaching method innovation and upgrades the wireless network.

Solution Advantages

- Huawei offers a campus-wide wireless campus solution.
- Huawei offers full-scenario network coverage with seamless roaming, high bandwidth, and low latency.



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Accelerate the Digital Transformation of Education



Smart Classroom

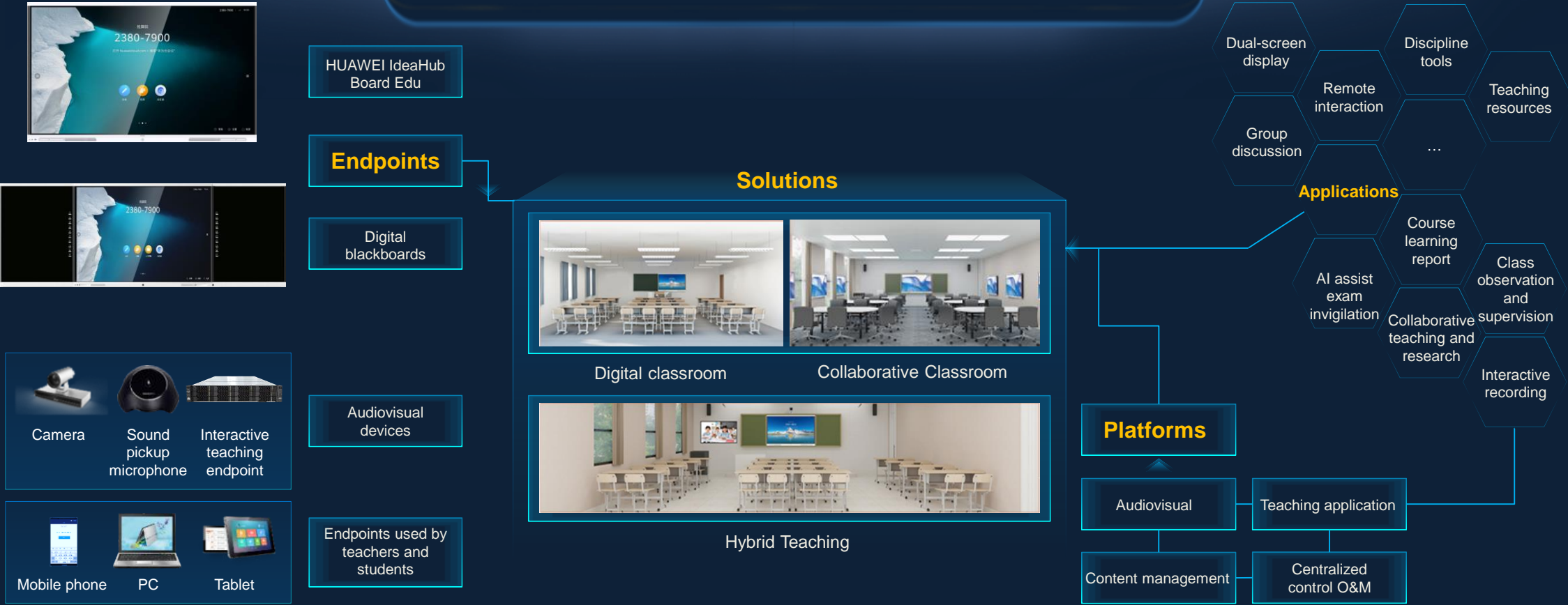
HUAWEI Smart Classroom Solution Summary



Smart Classroom Video

Huawei Smart Classroom

Bring Digital to Every Classroom for Flexible Teaching and High-Quality Learning



- Safe teaching environment with eye comfort
- Boundless teaching
- Simplified, efficient teaching applications
- Extensive, diverse teaching content

Digital Classroom, Combining Traditional and Information-based Teaching, and Technology Drives Interactive Innovation in Teaching



Helping the teacher

- Keep away from dust and protect your health
- Rich subject tools for digital teaching
- HD teaching plan, one-second scanning
- Shared screen, two-way collaboration
- Banshu Enters the Interactive Teaching Era

Helping students

- Protecting Eye Health
- Two sides of the blackboard, large screen synchronous display
- Active classrooms, ultimate experience
- Record on board and share at any time
- Keep courseware and review after class

Hybrid Teaching: Audiovisual Interaction and Bidirectional Data Collaboration for Flawless Face-to-Face Communication

The solution can run on HUAWEI CLOUD or third-party public cloud or on premise deployment, for an immersive online merge offline teaching environment.



Collaborative Classroom, Multi-Screen/Multi-Endpoint Real-Time Interactive Teaching, Stimulating Learning Enthusiasm



Omnimedia courseware display
PPT, video, blackboard writing, etc.



Three-screen interaction
Screen broadcast, and projection/demonstration of the student's/group's screen



Interactive teaching activities
Quiz, random question, and toss-up question



Teaching tools
Blackboard, screenshot, magnifier, spotlight, and mind map

The group seminar classroom is a highly integrated learning environment that integrates teaching interaction, multi-screen collaboration, and teaching management.

Huawei & North Macedonia MoEd enhancing equity in education

*About North Macedonia Education

Education in North Macedonia is compulsory for 9 years throughout the country. About 3.6% of GDP was spent on education. There were 192,000 students enrolled in primary schools (primary and lower secondary schools) and 83,000 students enrolled in secondary schools (high schools, vocational schools) in North Macedonia

Challenges

- Hundred schools **lacks of connection** between the schools;
- **Good teaching resources are only located in the capital Skopje**, while remote students could not access to good knowledge.
- **Traditional teaching methods are commonly used** across the country, with teachers teaching inefficient way.

Solution

- ◆ **E2E cloud DC solution**, including container, racks, UPS, storage, DCN, cloud platform.
- ◆ **Interactive education system** are deployed at every school, which could work locally and managed centrally.
- ◆ **Remote education system** support remote teaching and office meeting.
- ◆ Campus Wi-Fi planning and design by professional team according to the onsite schools location and requirement.
- ◆ Huawei eSight and Campus Insight **manages all wired and wireless equipment**.

Benefit

- ✓ **Improving the resource usage.**
- ✓ Interactive education system **improves student interest and learning efficiency.**
- ✓ Remote education system helps remote schools share resource from capital, **enhancing equity in education.**



Cloud DC



Interactive Education



Remote Education



All in one meeting terminal



Campus Network & OM System

Hybrid Learning Helps the Education Dept. of Kwazulu-Natal in South Africa Improve Teaching Quality



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

Customer Value

- Delivers innovative teaching methods and improves teaching efficiency through the use of multimedia.
- Enables remote education between teacher development centers and schools, and provides remote access for local students.
- Improves teaching quality and promotes a fair and inclusive education.

Solution: Hybrid learning (IdeaHub and Ulearning)

Project Background

- The Department of Education in KZN, South Africa manages more than 6,000 primary and secondary schools and 38 teacher development centers.
- Smart whiteboards are used to deliver multimedia teaching and improve teaching efficiency.
- It is hoped that remote education can be developed between teacher development centers and schools so that students can learn remotely.

Solution Advantages

- Huawei offers IdeaHub with its 35 ms ultra-smooth writing capability, which feels as effortless as writing on paper.
- Huawei offers multiple deployment modes, data center or cloud platform construction, and online and offline interaction of remote learning, improving teaching efficiency and quality.

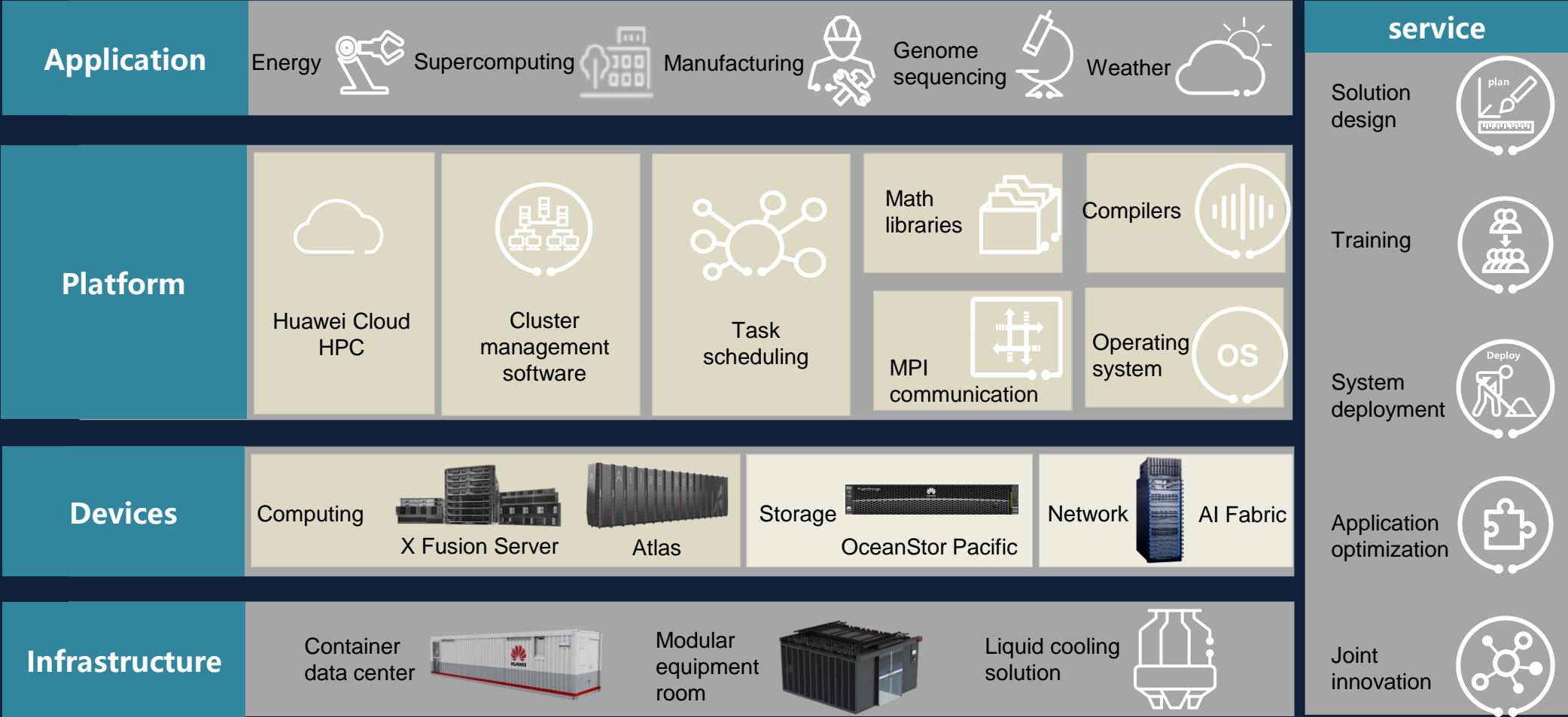
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Accelerate the Digital Transformation of Education

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HPC & HPDA

High-Performance Computing(HPC) Facilitates Efficient Scientific Research



Pacific Next-Gen Storage for HPDA



High-density design

Overall cost optimization



Hybrid-workloads oriented

All-scenario acceleration



Multi-protocol interworking

Worry-free service evolution

Huawei HPC Develops Poland Poznan Supercomputing and Networking Center (PCSS) into a Global Top 100 Supercomputing Cluster



Customer Value

- Makes PCSS a top 100 supercomputing cluster.
- Improves the overall high-performance computing capability of PCSS, making it a key participant in the construction of high-performance computing infrastructure in Europe.
- Computing density is increased by **52%**, the floor area is reduced by **32%**, and the energy load is reduced by **25%**.

Solution: HPC (X86/ARM server, storage, datacom, and product like liquid-cooled cabinet)

Project Background

- PCSS is one of the five supercomputing nodes in Poland and is managed by the Ministry of Higher Education. It is responsible for building a national backbone network for higher education and leading the construction of the national supercomputing center.
- The project builds a national supercomputing center to facilitate industrial incubation and improve the country's scientific research influence.

Solution Advantages

- Huawei improves computing capability of a single cabinet in limited space, offering ultra-high-density computing and more efficient heat dissipation
- Huawei leverages space in the equipment room and its power supply capability.
- Resource backup is considered for each resource module of HPC, storage, liquid cooling, and network.

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Accelerate the Digital Transformation of Education

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Smart Management

Collaborative Office, Improving Communication and Collaboration Efficiency

All-Scenario



One-Stop Platform



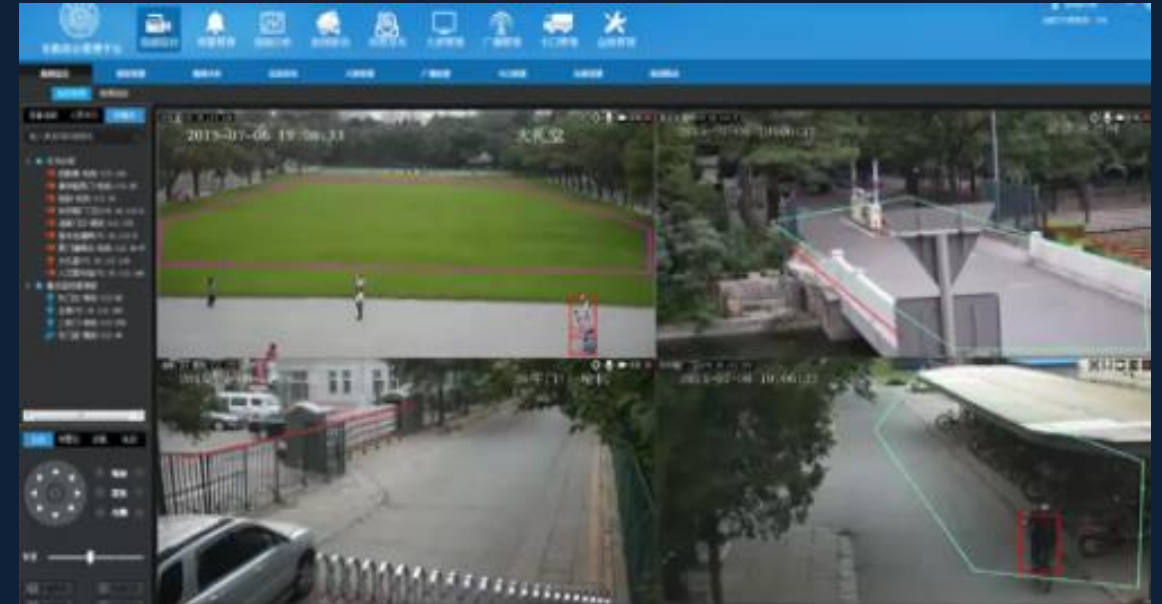
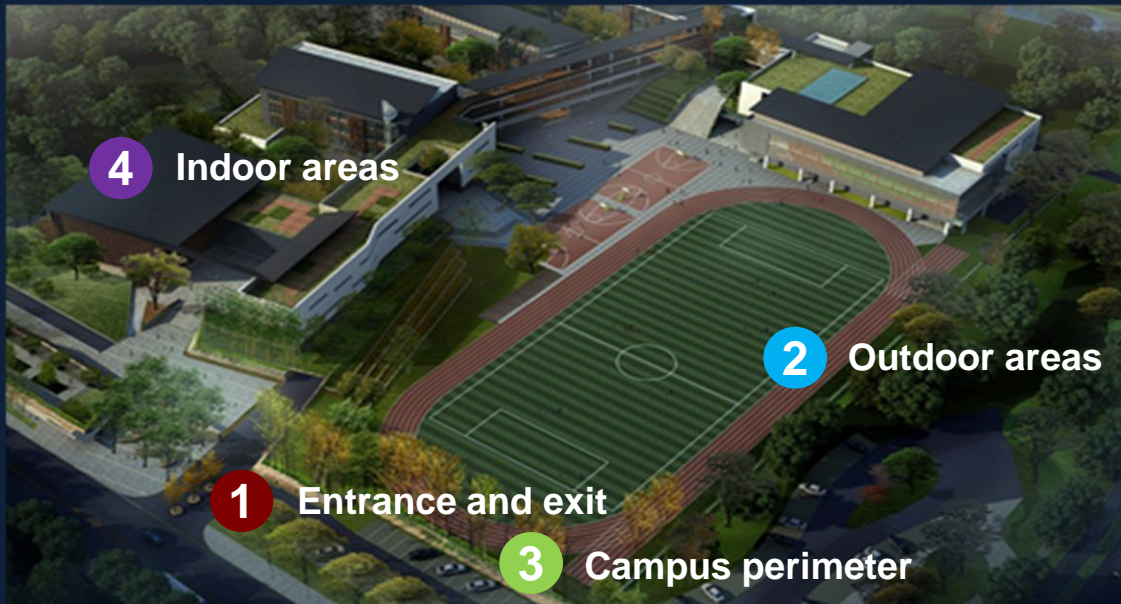
On-Premises & Cloud Platform

All Series of Endpoints



Huawei Safe Campus Solution Enables Visualized and Intelligent Campus Security Protection

AI-assisted + video, covering every corner of the campus



Safer

Covers various areas to provide all-around security protection.

Cost effective

Convenient O&M saves maintenance manpower.

More efficient

One person can manage four to six areas at the same time.

Intelligent

Long-tail algorithms accelerate risk identification.

Security Management and Command Center



**Emergency
response**

**Contingency plan
management**

Video invoking

Videoconferencing

An Open Platform and a Vibrant Ecosystem

Partner Ecosystem of 60+



Open "fertile soil" to partners, aggregate data into "lakes", and build a vibrant ecosystem



04

Global Success Stories



Serving more than 700 cities across over 100 countries and regions

Huawei Has Built Smart Campuses for Global Universities



Source: QS world university rankings@2021

70+ countries and regions

2600+ universities and
research institutions

32+ QS100 universities

Next Steps

THANK YOU

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