

Digital Campus over IP, Smart Education over Cloud

- Huawei "Smart University" Solution

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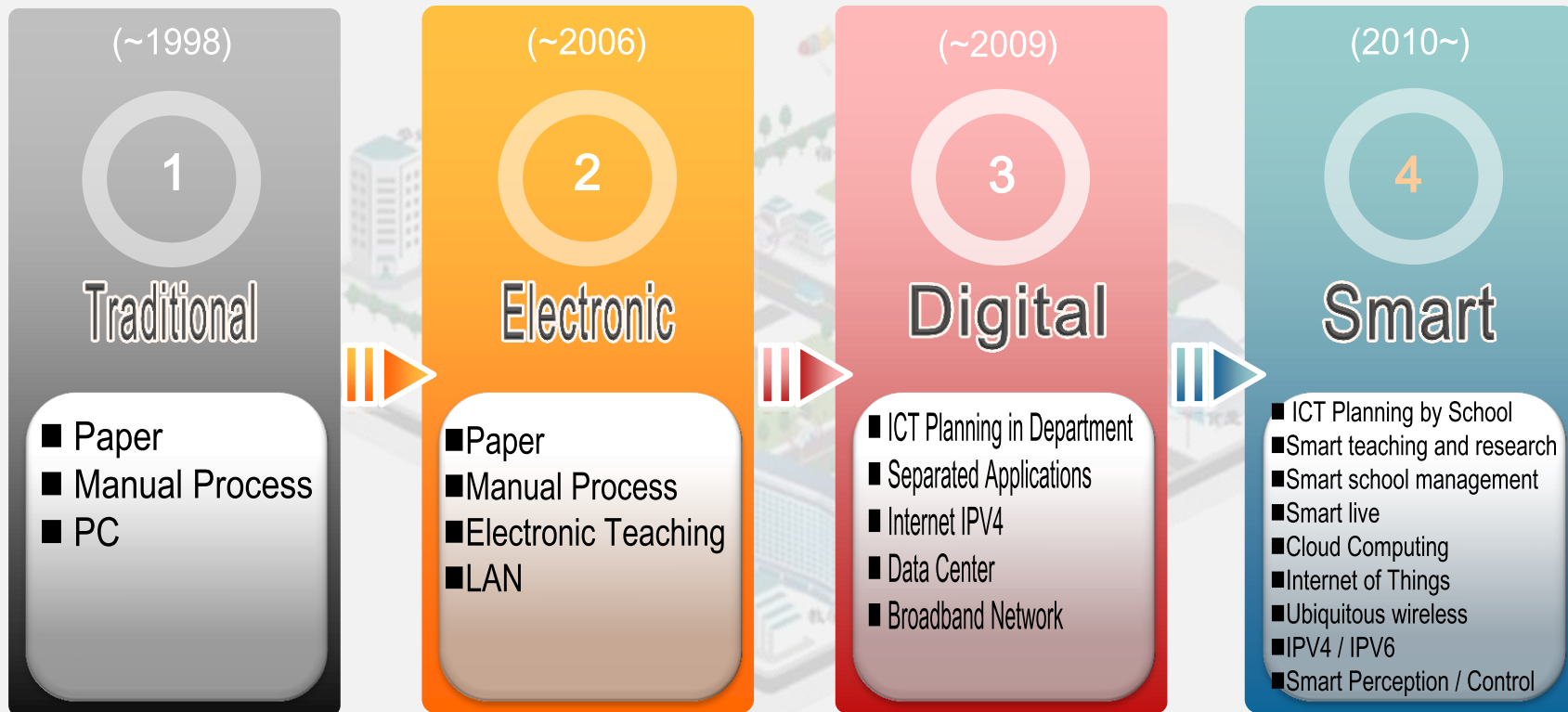


Understanding

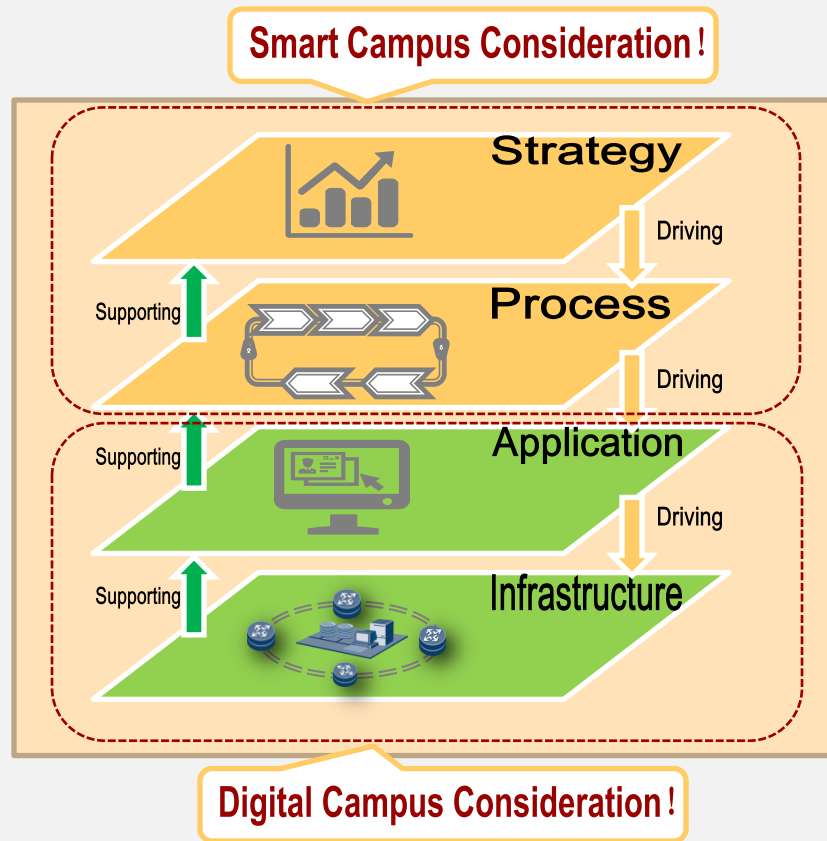
ICT is changing the traditional education ...



“Smart” to be the future trend of University Informatization



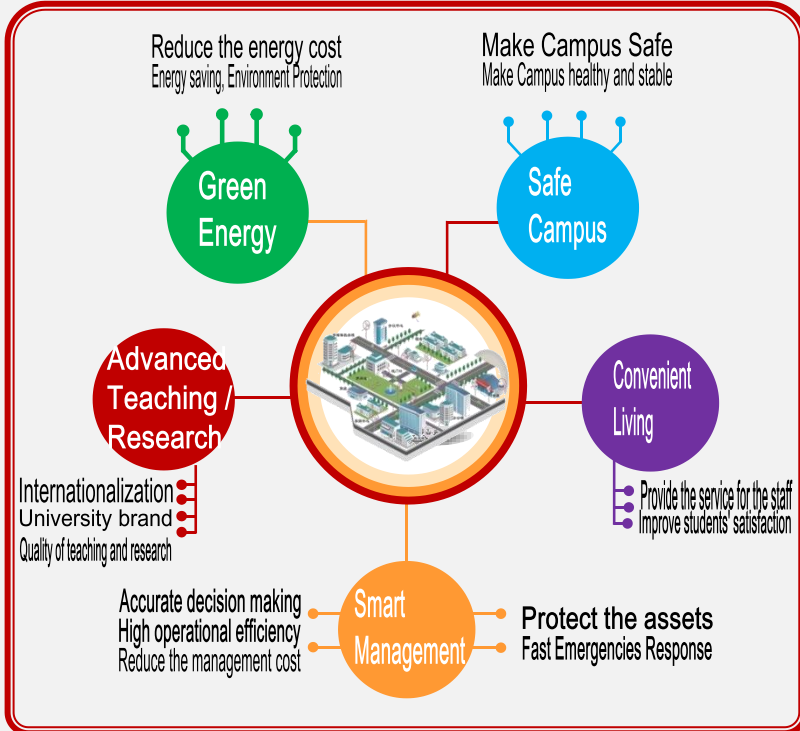
Comparison between “Digital Campus” and “Smart Campus”



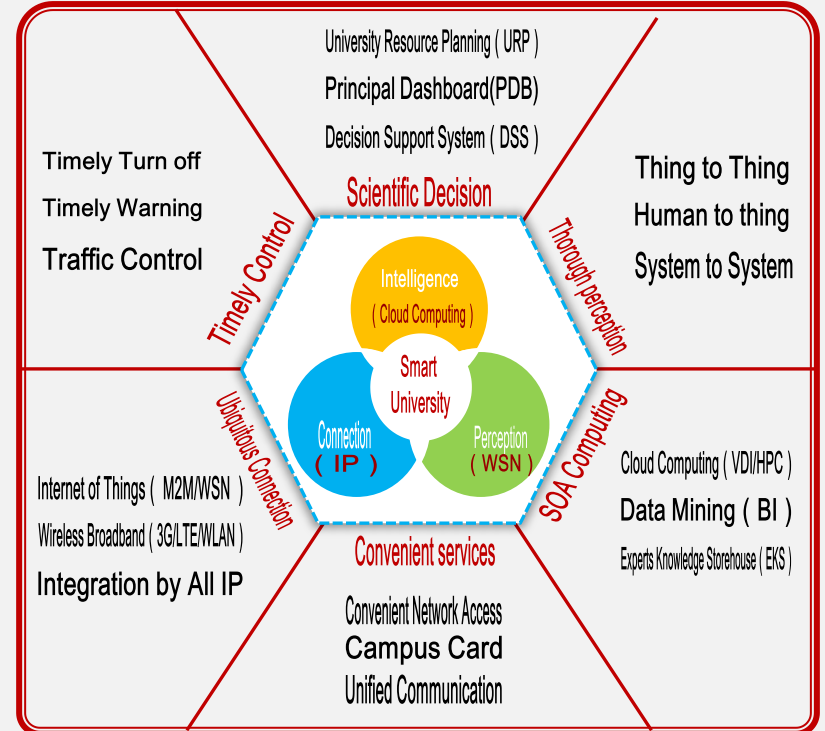
Digital Campus	Smart Campus
Management-Based	Service-Based
Department Level	School Level
Passive Supporting	Active Optimization

Features and ICT elements of Smart University

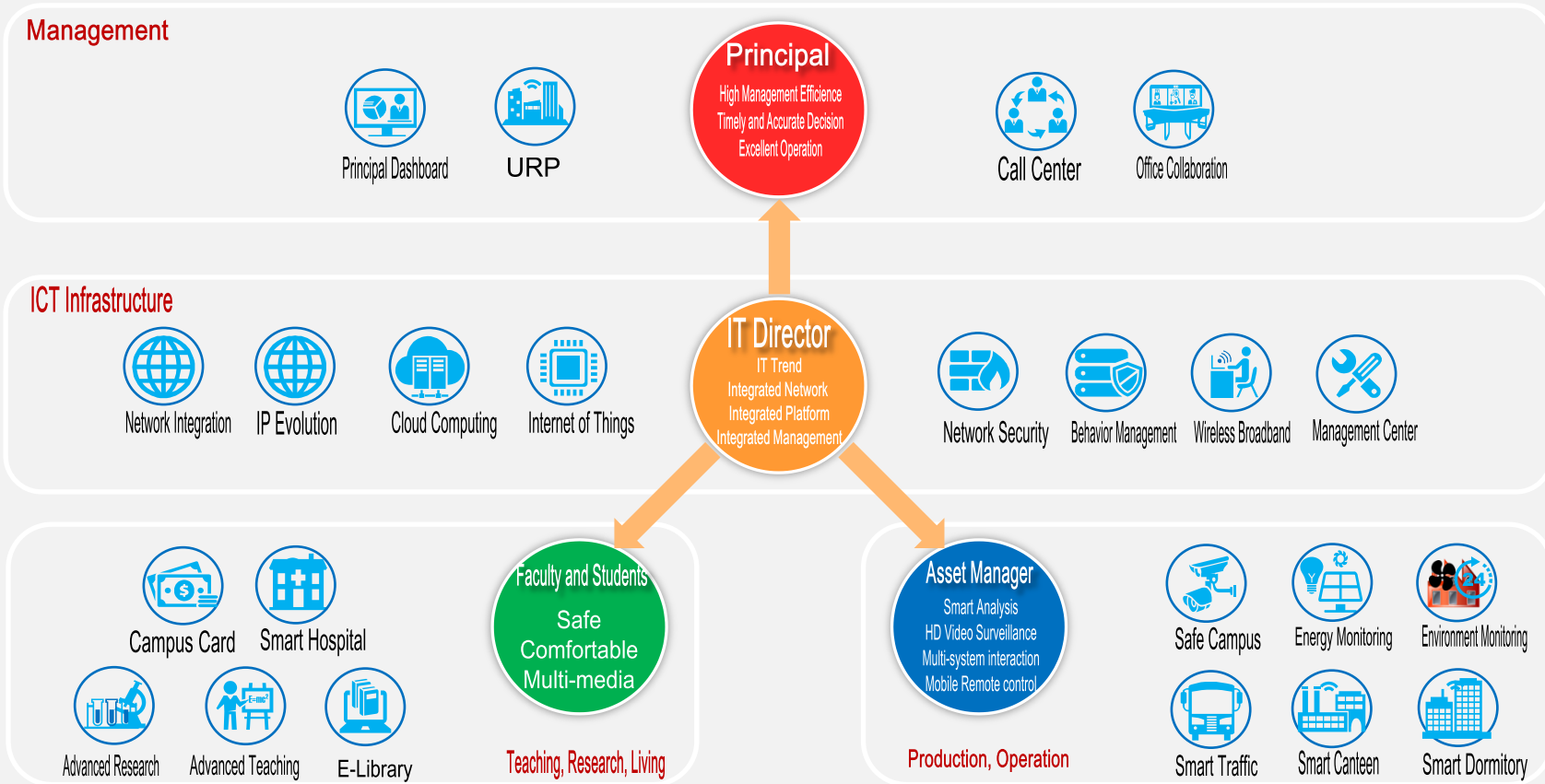
Features of Smart University



ICT elements of Smart University



Smart Elements in University



"Smart" Practices of International Universities

"Smart" Construction

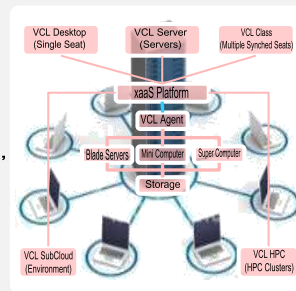
- Multiple applications' integration through RFID: Student Card, building access control, library service, school bus service, electric consumption, network authentication and payment.
- Integration of PennyCard and mobile SIM card: Convenient mobile service of PennyCard's replacement.
- Integration with bank card functions: PennyCash, supporting small payment; Using as a debit card; with PNC Bank magnetic stripe;
- Being a souvenir card after graduation: After graduation, PennyCard could become alumni card, a discount card;



Campus card of Pennsylvania University

"Smart" Construction

- Integrate the campus resource, establish a "cloud computing" platform;
- On demand service: Desktop, Class, Server, Subcloud, HPC, etc.;
- Free services of providing the teaching resource, application software, and online storage to the faculty and students.



Highlights

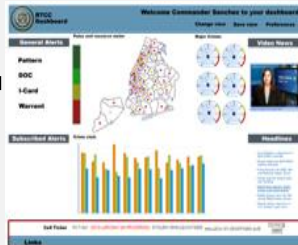
- Low cost: 75% cost reduction of the software License, and 150% utilization rate increasing of the applications;
- Flexibility: More flexible transferring among teaching, research, management, and better satisfaction;
- High efficiency: improve the utilization of the server and computer;

Cloud Research of North Carolina State University

"Smart" Construction

- Ubiquitous Network: " Internet of things", real-time sensing the core business operation;
- BI system: Integration of all campus data, mining, and trend prediction;
- DSS platform: In emergencies, DSS supports the scientific decision through the intuitive dashboard panel.

Principal dashboard of California University



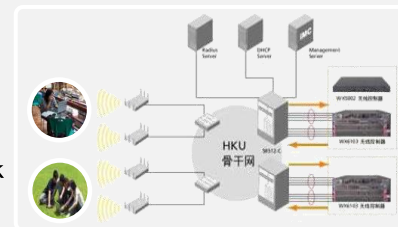
Highlights

- Crisis management: Crisis prevention, response and disposal;
- Innovative applications: The fine management and service through the real-time perception of student information, such as: Alarming when a student doesn't appear in the campus over 48 hours.
- Potential benefits: Better risk rating.

Smart University

- Wireless connection at a high-speed: 802.11n upgrading, 6 times of wireless access rate, to realize the ubiquitous and broadband campus;
- Intelligent unified management: Unified management over wired and wireless accessing, user accessing, service identification, and the backbone network equipment, to improve management efficiency and reduce TCO.

Broadband wireless campus of Hong Kong University



The typical development ideas from the universities



- **Perception:** To present the knowledge and the decision through the analysis among the perception information from the participants in organization environment.
- **Philosophy:** From " Resource-based view " + " Information-based view " to " knowledge-based view" and " management-based view "
- **Applications:** E-Learning, E-Research, E-Management, E-Service, E- Living
- **Sharing:** Isolated information islands are better than dead information islands.

Tsinghua University: KM-based "5E"



Tongji University: Smart Tongji

- **Intelligence:** logically judgment by the analysis of the elements, such as high temperature, high power consumption
- **Perception:** Obtaining the basic information from the neural elements, such as ambient temperature, energy consumption
- **Control :** Controlling by the defined interactive and controlling policy, such as temperature adjustment, energy adjustment.



Zhejiang University: Smart Campus

- "Three Networks" Convergence and wireless campus
- Perception and Control over the campus equipment
- Smart application system.
- Smart Campus to be a part of Smart City

Fudan University : One-Stop Service

- **Service Method:** One-Stop Service.
- **Service Features:**
 - ◆ Individual Service;
 - ◆ Multiple Access;
 - ◆ Low cost and high quality service

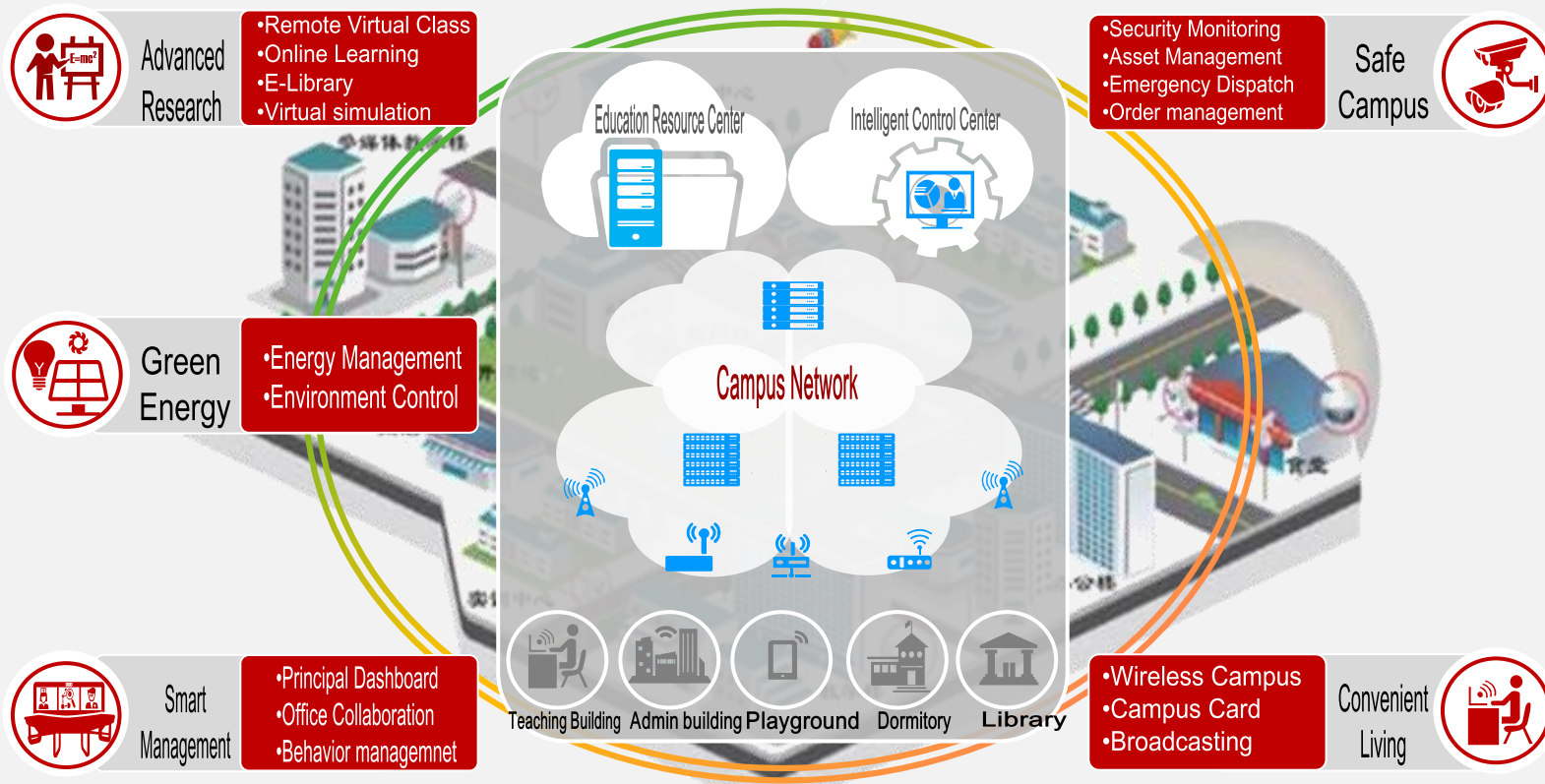




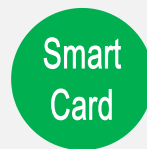
Solution

Digital Campus over IP, Smart Education over Cloud

E2E Smart University Solution



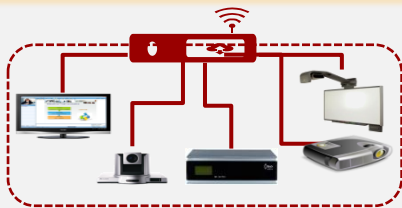
Solutions: Smart Applications in University



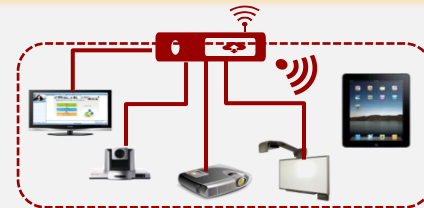
Smart Classroom to Support Smart Teaching



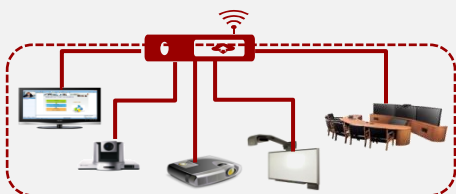
Basic Multimedia Class



Recording Multimedia Class



Mobile Multimedia Class



Telepresence Class

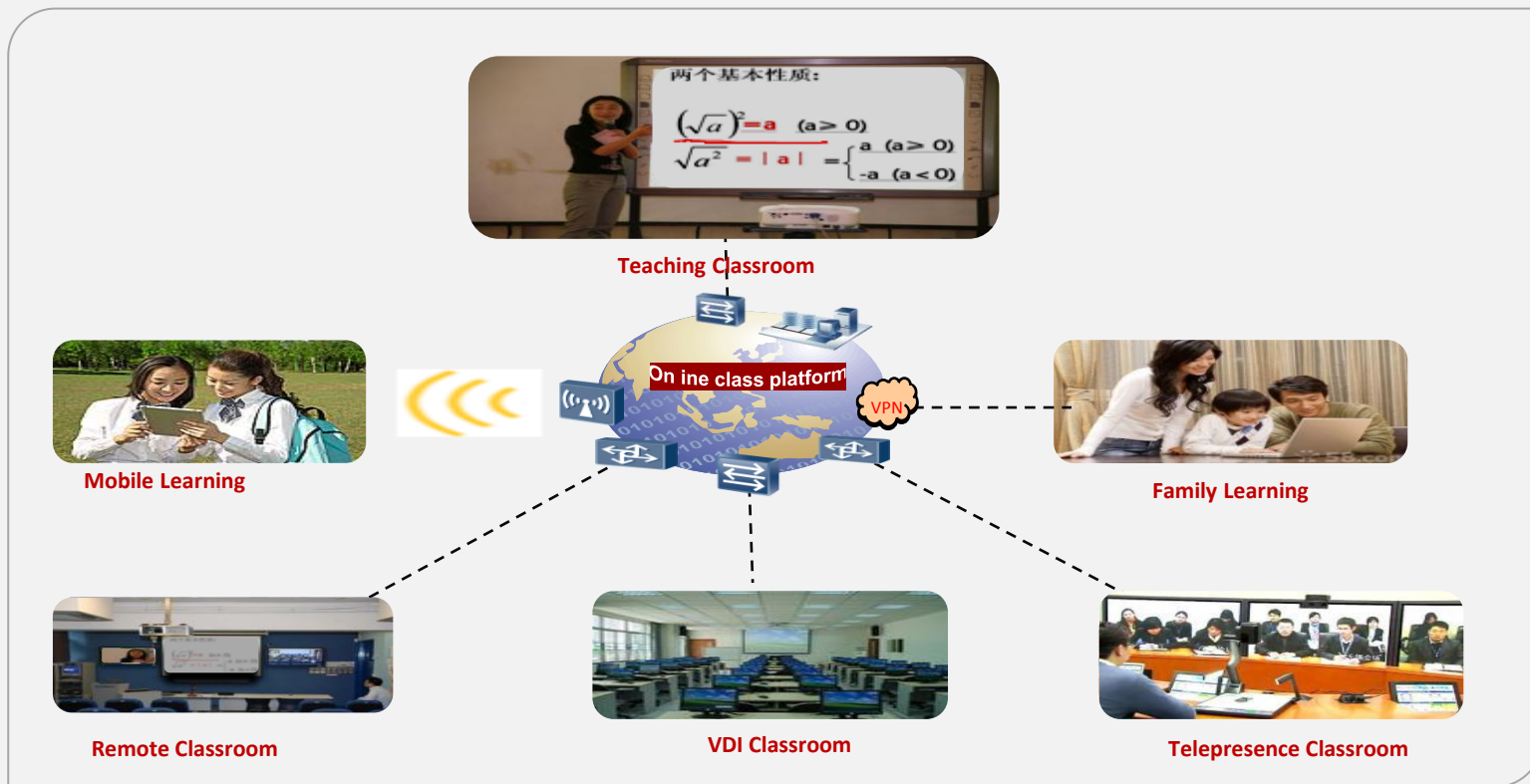


Intelligent Class



VDI Class

Smart Classroom: *Providing the Real-time and interactive remote classroom.*



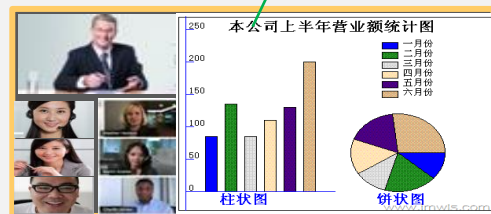
Smart Office Solution to Enable “One office” at Anytime and Anywhere(1/2)



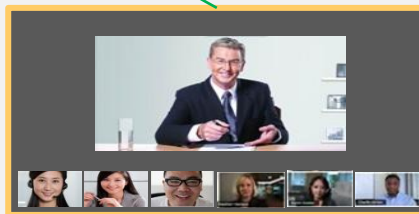
TP Meeting Room



Pad Client



PC (Data + Video)



PC (Full Video Mode)

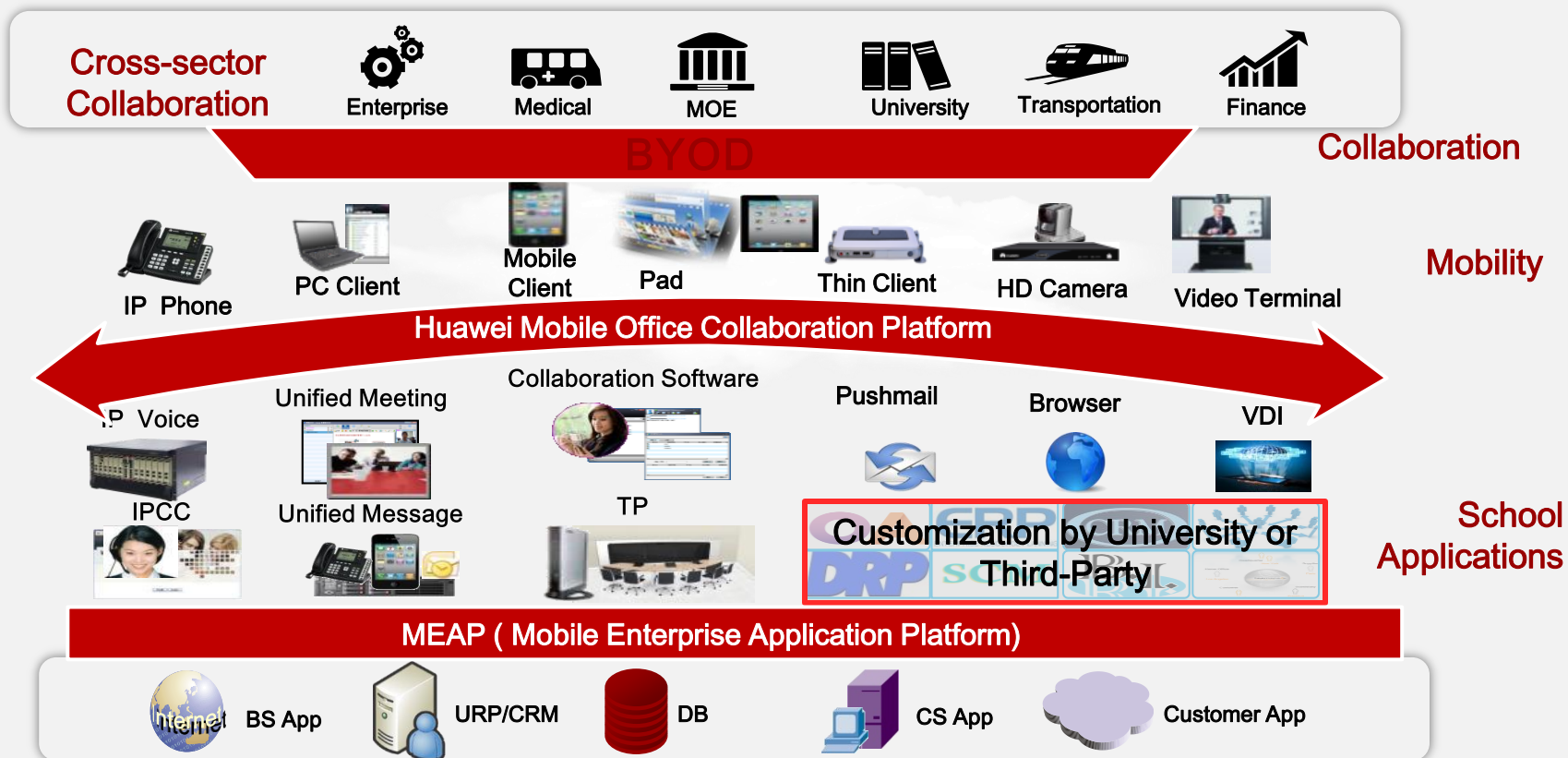


Mobile Client

1. Integrate UC and TP, to implement the collaboration of voice, data, video and high-definition video .

2. Consistent video experience of phone, Pad, IP phone, PC and TP, to enable the peer-to-peer video communication.

Huawei Mobile Office Collaboration Platform(2/2)



School Card Services Overview (1/2)



School Card Services

Shopping Services	Canteen, Health Care, Power and Water Charge School Bus, Shopping, Parking Charge
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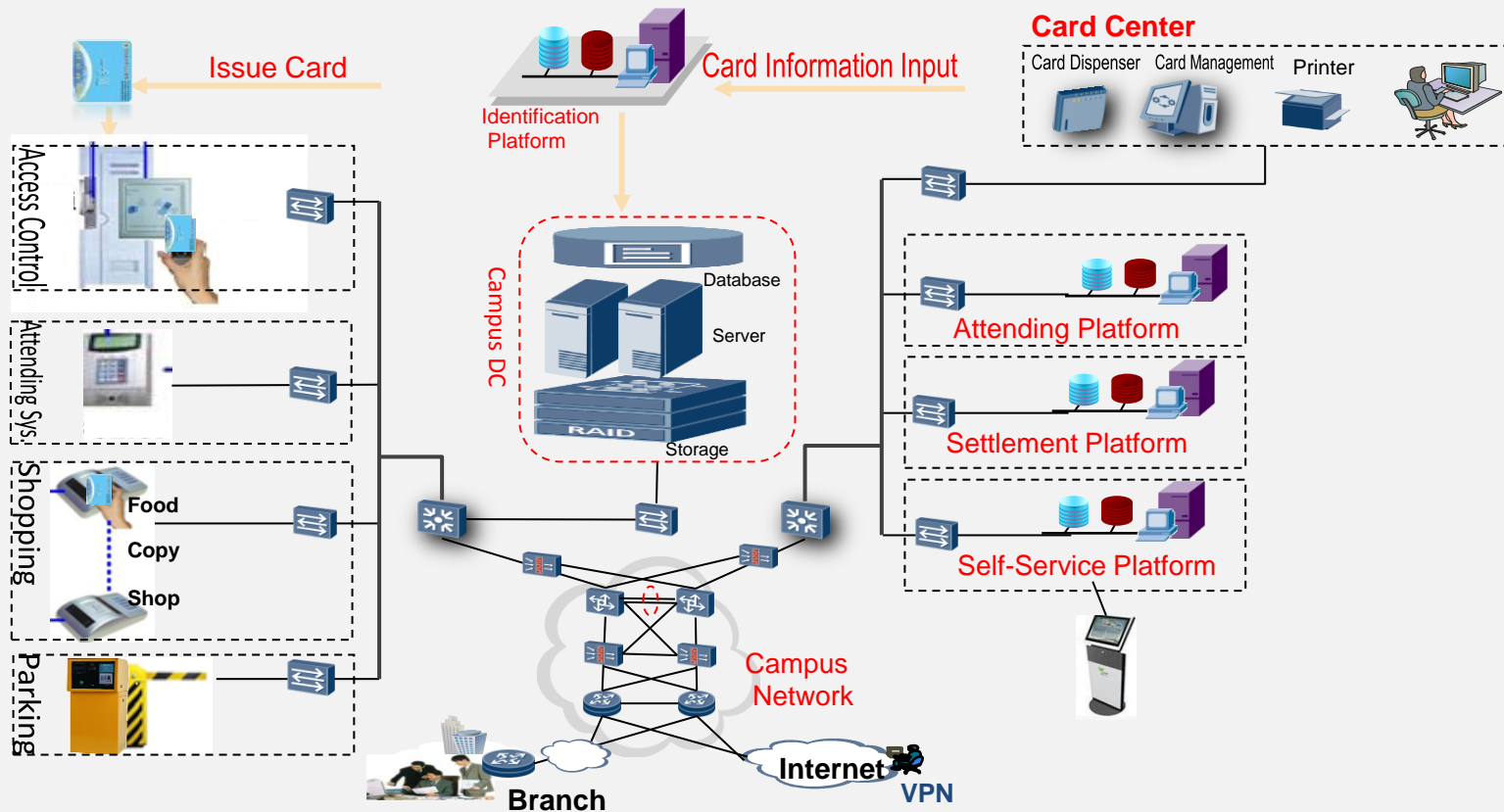
Id Checking	Access Control, Attending, Sign In Book Borrowing, Lab Checking
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Integrated Services	Repayment, Payment, SMS, Card Management Students Management, School Fairs, Teaching Management
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Self Service	Telephone Charging, Touch-Screen Searching, Web Service Smart Terminals, PC Terminals
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System Management	System, User, Card Management Account, Communication, User Management
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School Card Solution(2/2)




Smart Energy (1/2) : Energy monitoring, to build a green campus

Key areas monitoring



- Real-time monitoring
- Monitoring over equipment operation
- Real-time control energy consumption
- The critical event log


Lab



- To monitor the energy consumption
- Identification of abnormal energy consumption


Data Center

Key load monitoring



- Real-time load monitoring of energy consumption
- Analysis of dynamic load energy consumption
- Load management control
- Fine power management


Lighting



- Energy monitoring of key equipment in Campus
- Electric power data supporting at peak period


HAVC

Energy warning system



- Predefine energy warning value
- Automatic warning
- Integrate with OA, eSpace

Warning



- Obtain the latest status about the energy excessive consumption
- Timely adjust the energy consumption structure
- Enhance energy management efficiency

Notification

Scenario

- Mainly used in the classroom, office space, data center;
- Areas without the accurate statistics of energy consumption.
- Low unit informatization about the energy consumption
- Unable to identify abnormal energy consumption

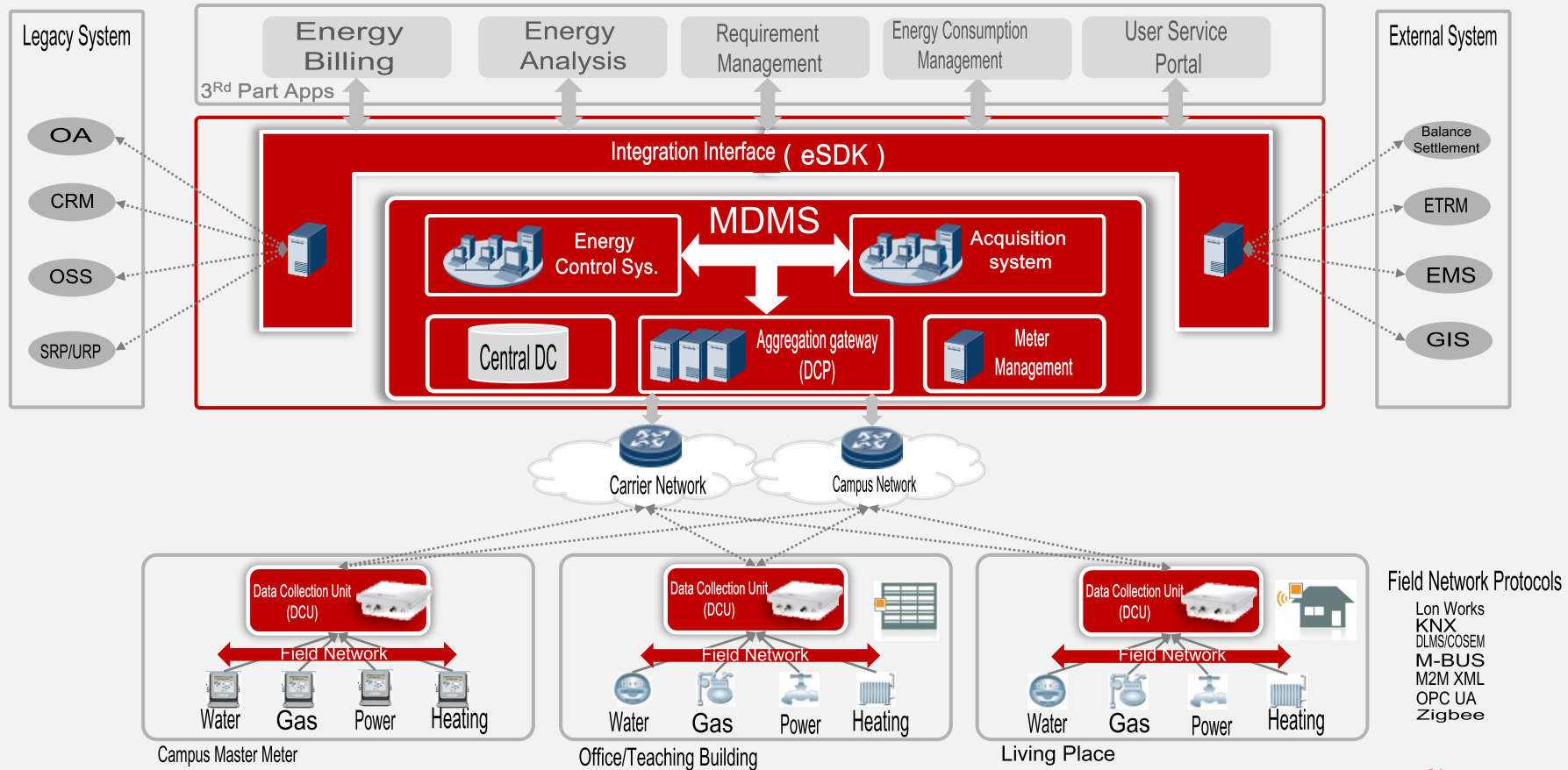
Solution

Achieve green energy through energy consumption monitoring and energy efficiency management over the key equipment in key areas in campus based on AMI and data network.

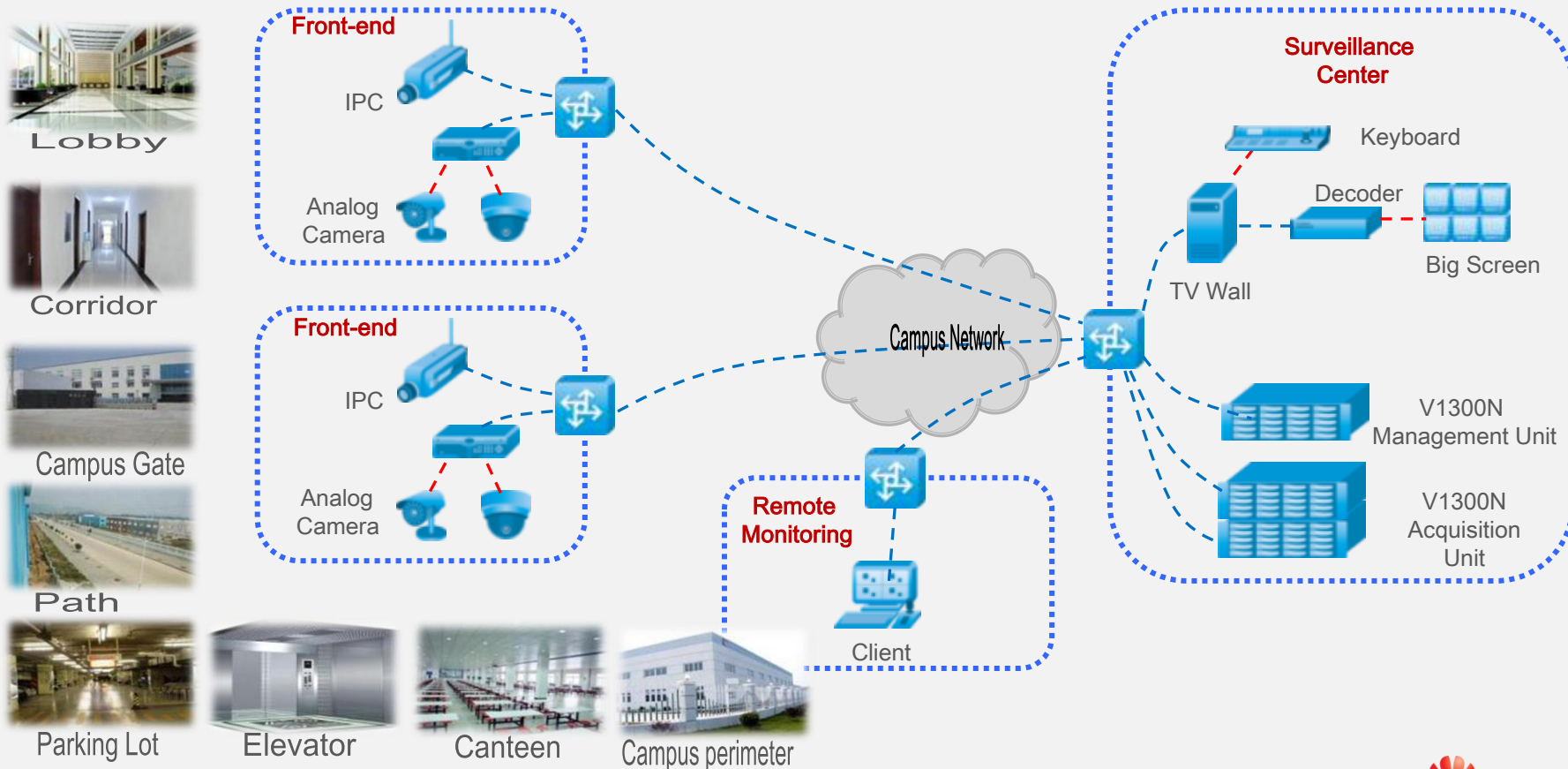
Customer Value

- Master the energy consumption, and improve energy efficiency
- Effectively achieve energy conservation, and lower operating costs
- Identify abnormal energy consumption, and improve energy management

Smart Energy (2/2) : Campus energy monitoring solution



Safe Campus (1/2) : HD Video Surveillance Network



Safe Campus (2/2) : Intelligence

Intelligent recognition

- Fast image recognition, image feature information extraction, and image quality diagnosis
- **Face detection and recognition (In the recommended scenario, accurate rate $\geq 95\%$, false alarm rate $\leq 5\%$)**



Counting



Tracking

Intelligent Storage

- Intelligent storage with ROI enhanced code
- Long time video data fading from the storage to **save storage space 30%** ;



Gathering



Boundary

Intelligent Searching

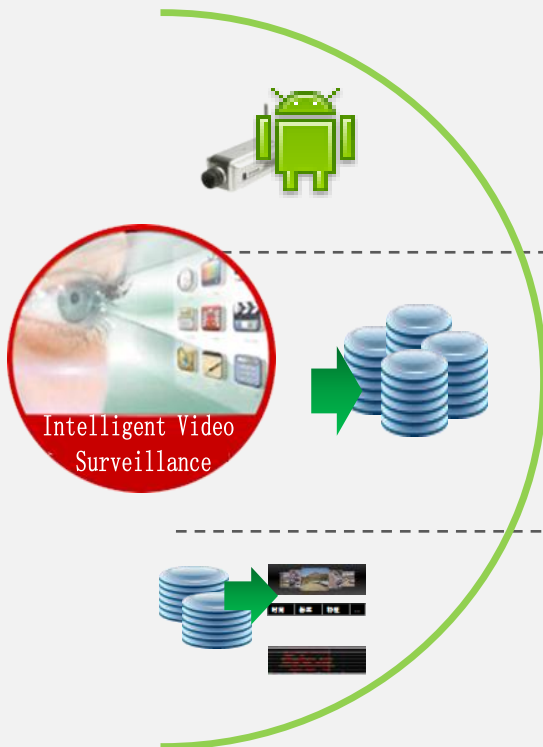
- Video extracting according to time, events, features, etc;
- Associate the multiple key information in database, and search by the multiple associations;



Intrusion



Losing



To Enable: Advanced ICT architecture boosters Smart Campus

Intelligent

(Cloud Computing)

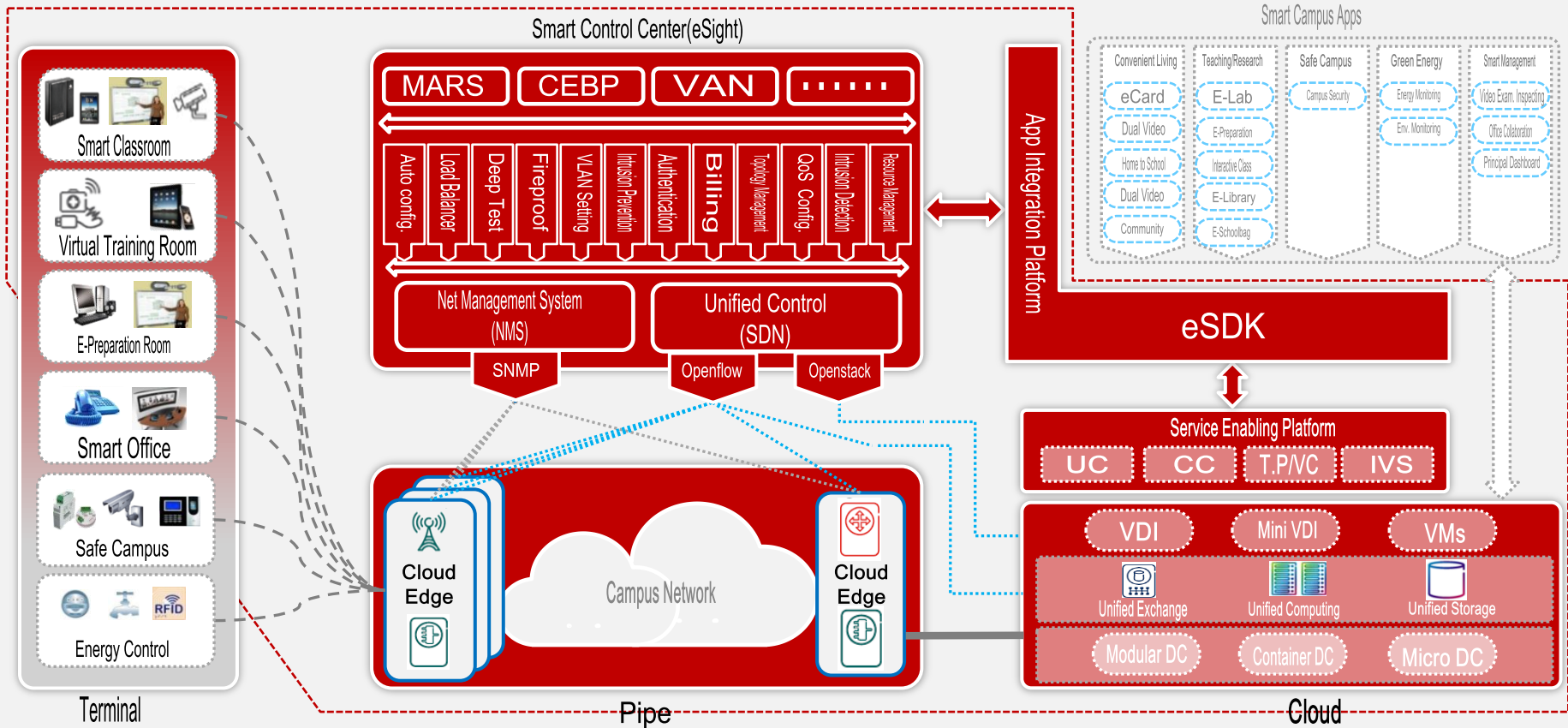
Connected

(Ubiquitous Broadband)

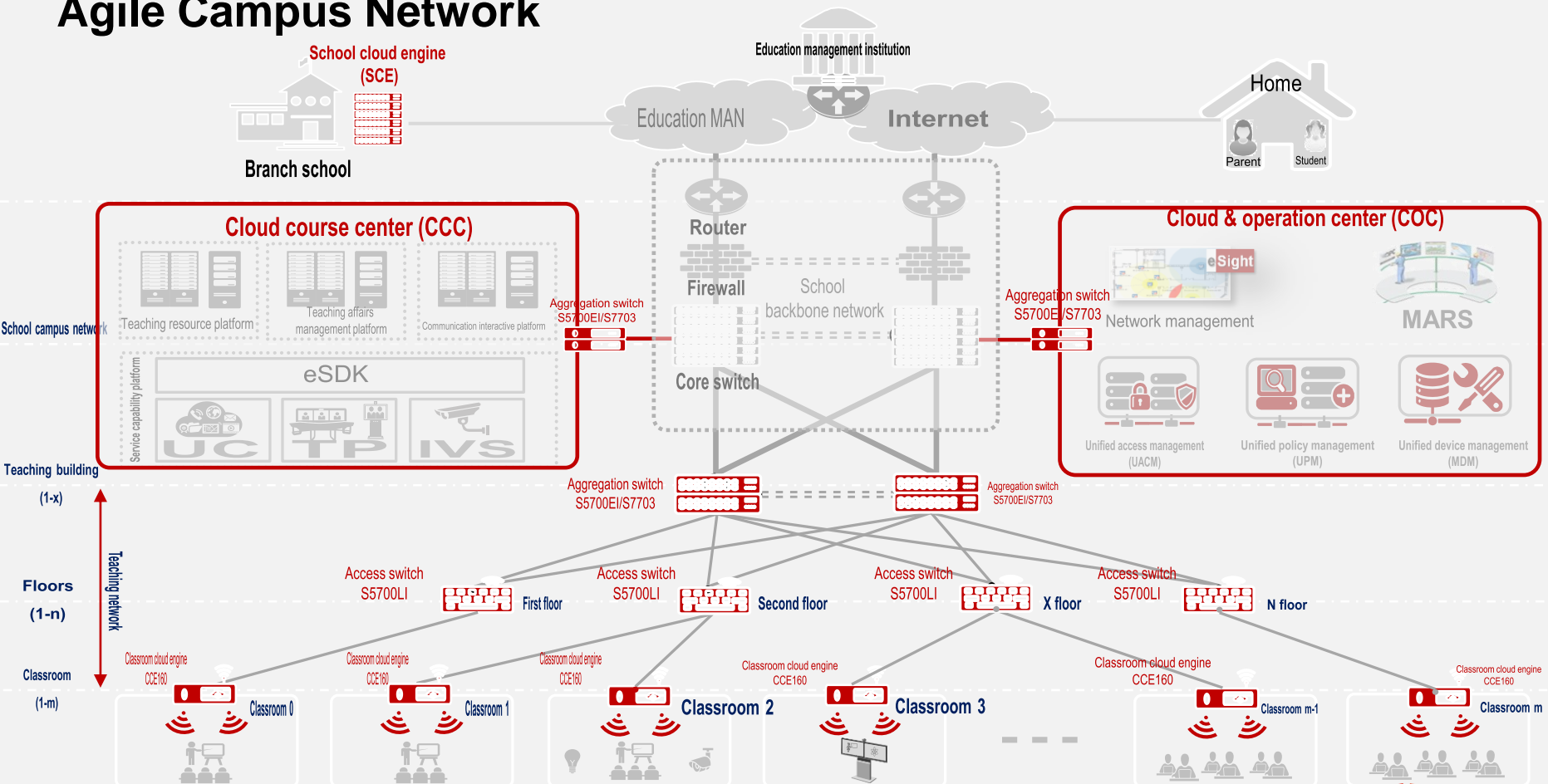
Perceptible

(Internet of Things)

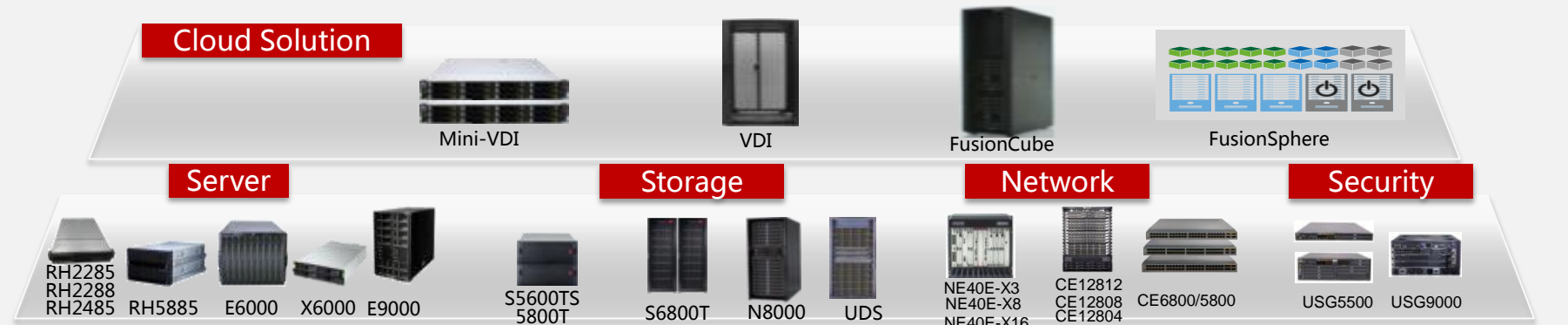
"Terminal-Pipe-Cloud" Architecture to Enable Smart University



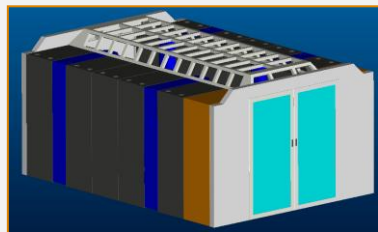
Agile Campus Network



Agile DC Solutions



Micro Data Center



Modular Data Center



Container Data Center



Land-Based Data Center

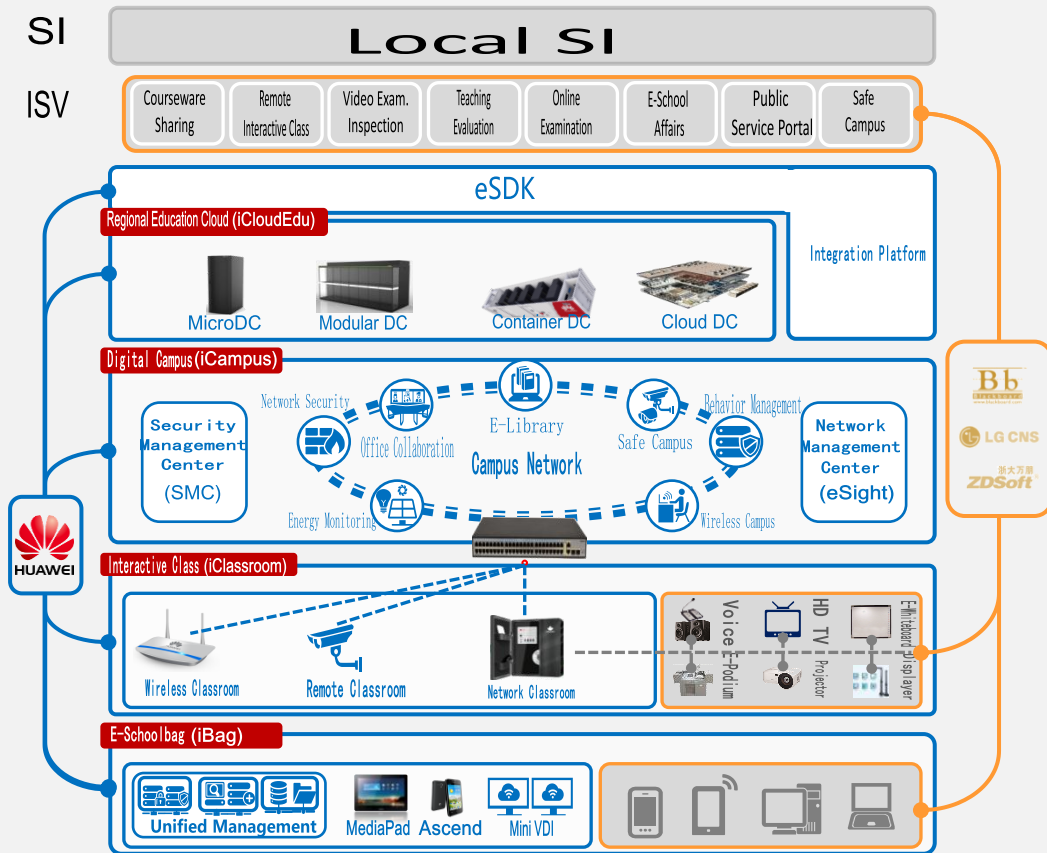
On-Demand Path

Trust

Working together , Building Smart Campus together !



To provide E2E Smart University Solution with Partners

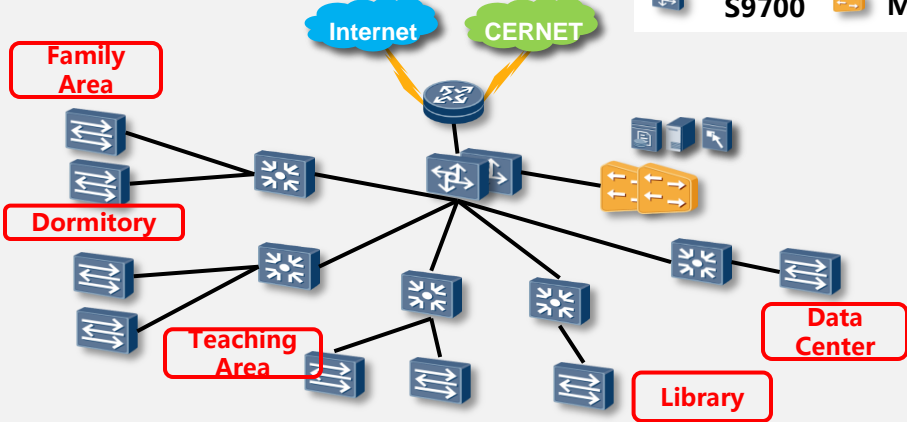


Partner: Localized education applications and application platforms, system integration, the top-level design;

Huawei: Focusing on the repeatable education ICT infrastructure and public platform;

Huawei ICT Solutions in University

Hubei University of Technology: Fine Operation Network Upgrade



1. Network export: 2 ME60-X8 equipments support the multiple authentications, such as PPPOE, IPOE, Portal and leased line, and bear all the authentication and accounting business.
2. Using Sx7 Switch in Access and Aggregation network layer to achieve fine management over campus users to enhance the user experience.
3. Fully support IPV6, IPV4 dual-plane



Fudan University



Beijing Normal University



Nanjing University of Aeronautics and Astronautics



Shanghai University of Finance & Economics



Southwest Jiaotong University



Shanghai Jiao Tong University



Xidian University

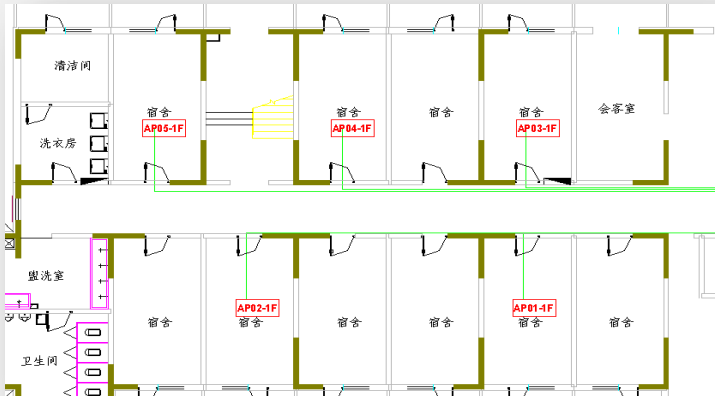


Hubei University of Technology

Wireless coverage in Tianjin University City

Challenges

- High internet concurrency
- Concentrated coverage, serious interference
- Complex wireless environment, harsh installation, hard deployment
- Unified Service bearing



Campus WLAN coverage

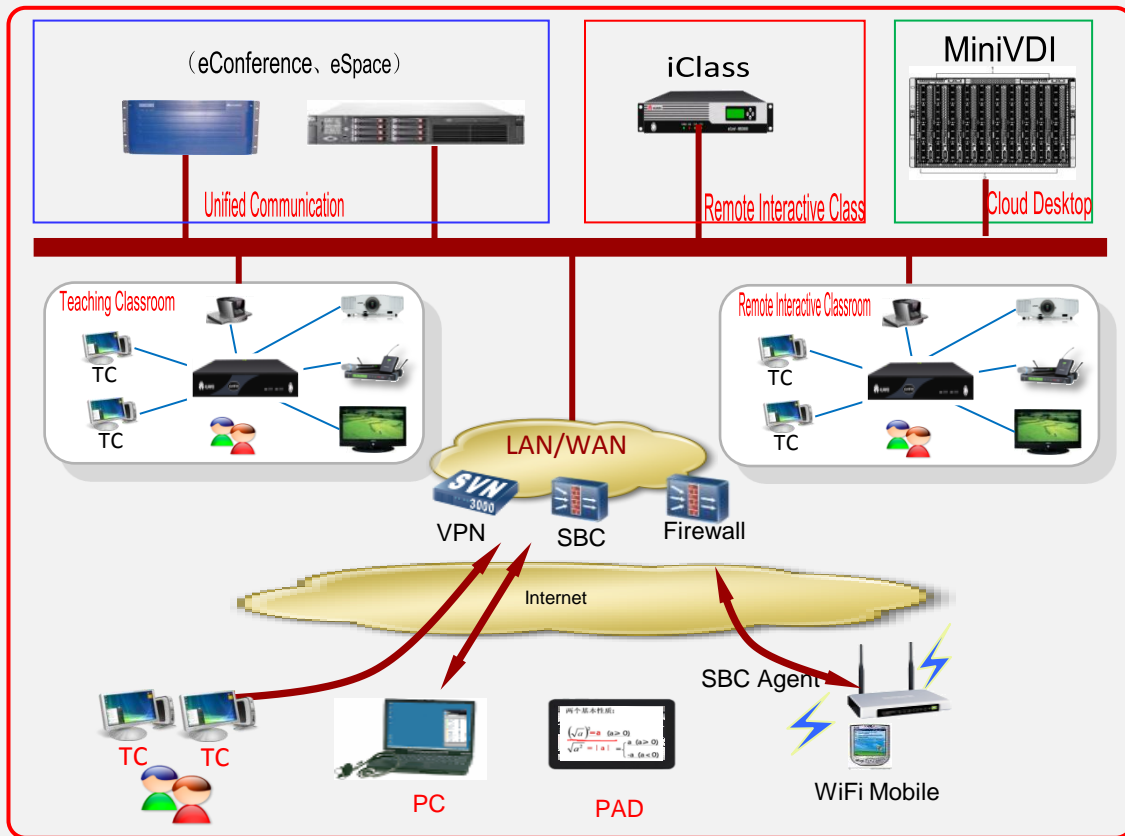
Huawei WLAN Solution

- Providing PON + WLAN access solutions, as well as the AP, ONU, the OLT, the AC, BRAS end-to-end solutions; 7 schools, total 4000 AP equipment deployment;
- Considering the user density, adopt 1 mounting AP without antenna system / per dormitory to meet deep coverage and volume requirements;
- Pre-service training and customized solutions to ensure the successful delivery; Onsite communication to speed up the delivery

Customer Value

- Kick off in May in 2011, and open 400 accounts for students.
- Binding network C and Wlan, to improve the user experience of network C
- One AP available in two network meets the requirement of logging on campus network and MAN network at the simultaneously.

Education Cloud Solution in East China Normal University



Requirements

- Traditional blackboard lags behind the application needs from Information age.
- Low internal communication efficiency because of shortage of necessary communication tools
- Hard to maintain the old PC in the classroom.

Solution

- Overall solution containing the platform layer (UC, remote interactive teaching, Desktop Cloud) and terminal layer (multi-media classrooms, PAD terminal, TC)

Customer Value

- Students could join the remote course teaching in the classroom.
- Students could have a real-time and interactive online-class by the multi-media ways.
- UCC effectively improves the internal communication.
- Cloud desktop greatly decrease the maintenance cost.

Desktop cloud helps education and scientific research

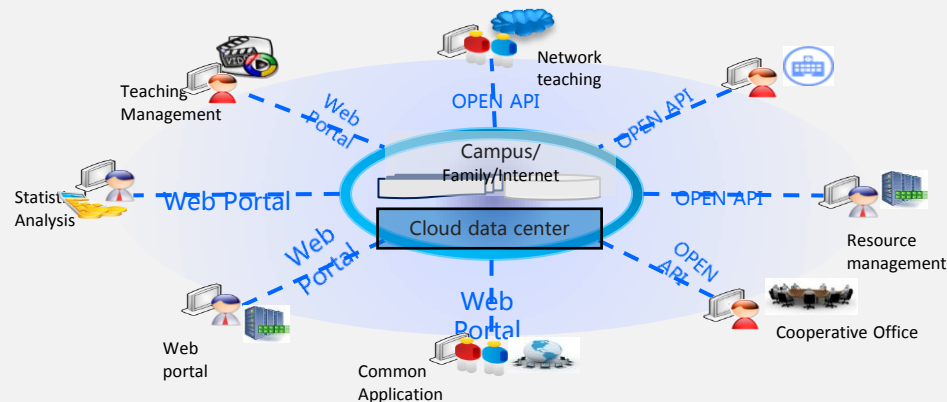


Customer Benefits:

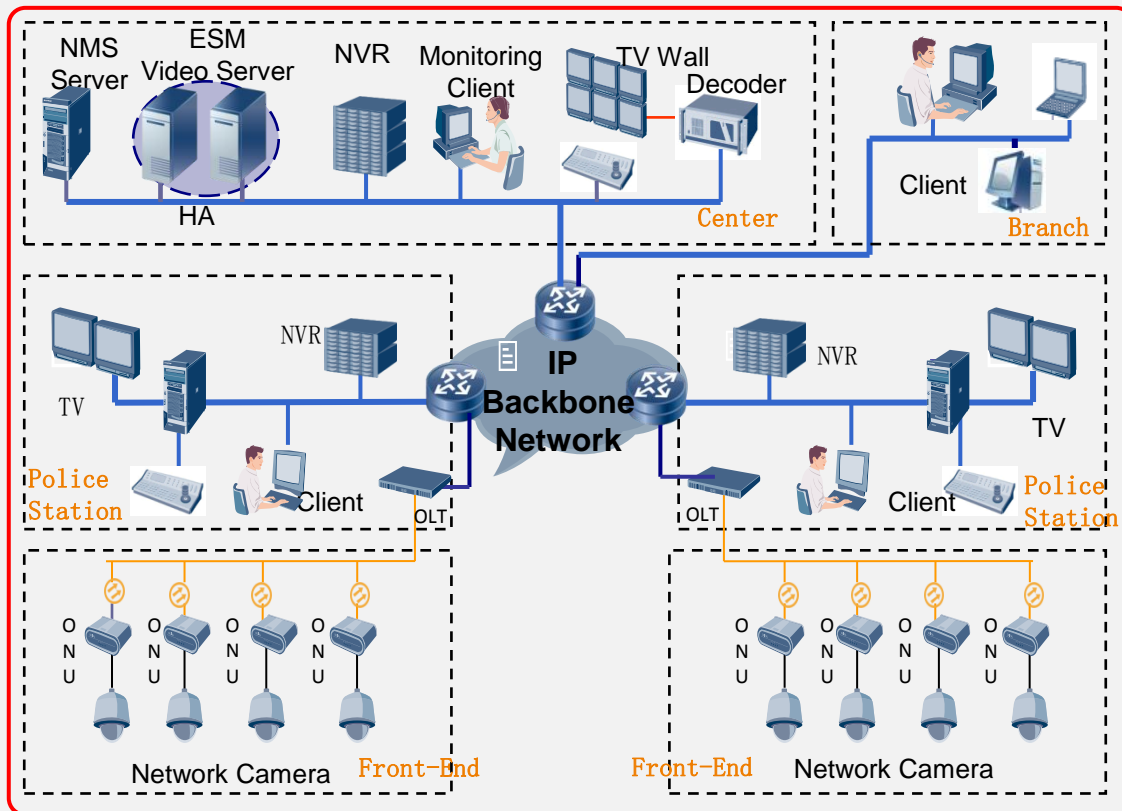
- Operation and maintenance efficiency increase by 90%
- Resource utilization increased dramatically
- Successful implementation of distance education and online learning and examination

Customer Challenges:

- Low efficiency of the operation and maintenance: PC system failure repair cycles 2 to 4 hours
- Resource utilization is low: only 10% of the average hardware utilization
- Lack of distance education programs



Safe Campus in Hefei City



Requirements

- In order to protect the safety of people's property, and to build a safe environment, Hefei city plans to make the public security monitoring system as a strategy to improve public security, and to build a harmonious society

Solution

- Overall surveillance solution: Huawei server, USG5350 Firewall, monitoring platform software, V1300N storage
- Covering 58 Police Stations, 7 Branch Office, about 1000 monitoring points

Customer Value

- Low network complexity, and low multiple points network failure
- Intelligent analysis enables active warning before emergency.

Huawei, your best choice !

Full range of ICT Infrastructure

Over 20 years' ICT innovation

"Open" Strategy, Partner Alliance

Best Product Performance, Best Cost Performance

