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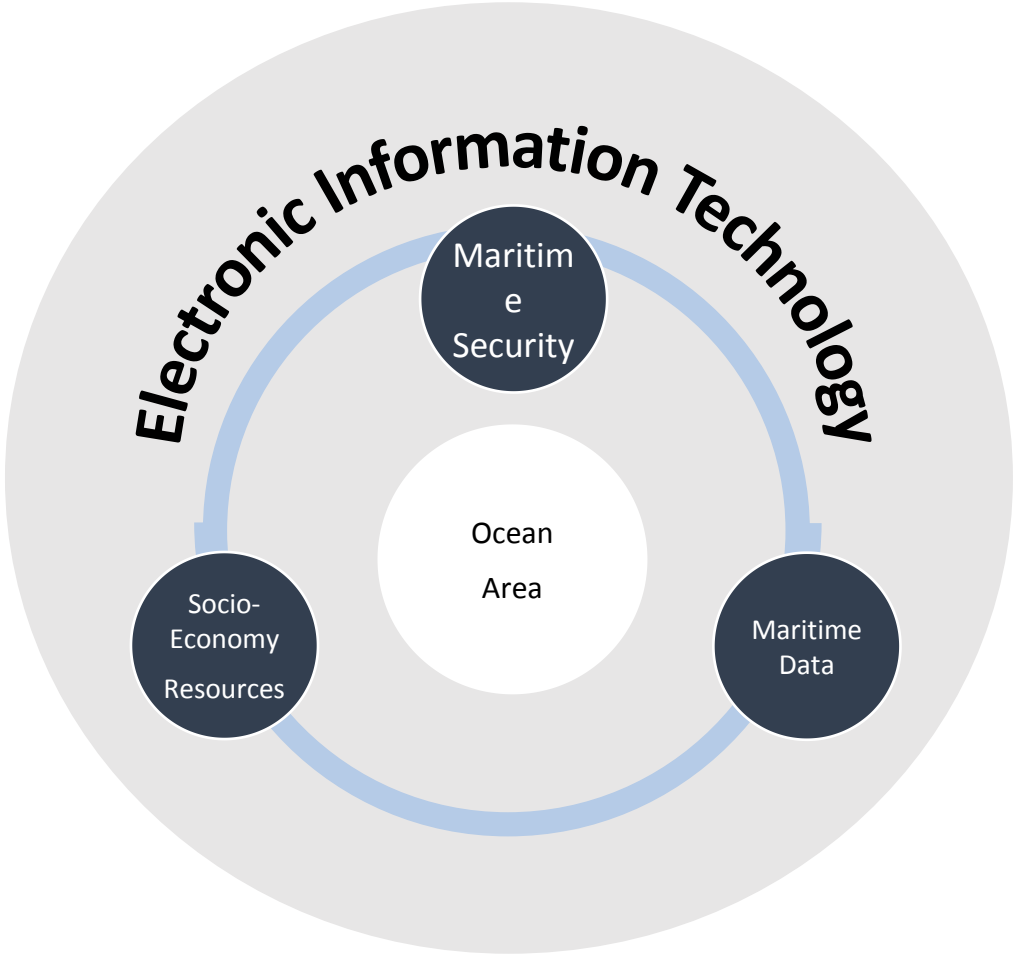
Electronic Information Technology Application in Maritime Governance and Management

CETC International
November 2016

ASEAN and Application Scenarios

- Vast ocean area contains massive resources, also raise the difficulty and complexity of Maritime governance and management.
- Electronic Information technology could provide a easy and high-efficient solution.



ASEAN and Application Scenarios

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Potential Problem

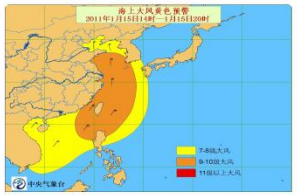
Law Enforcement

Terrorist

Transnational Criminal Organization

Illegal Immigrants

Environment



Weather Forecasting

Disaster Response

Transportation

Port Traffic

Fisheries

Locate and Rescue

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Solution

- Coast Guard System
- Meteorology System
- Disaster Management System
- Port Vessel Traffic System
- Fishing Management System

.....

CETC Introduction--Overview

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About Us

- State-owned military enterprises established in 2002
- 58 subordinate research institute
- 543 third level and under subordinate companies
- 8 listed companies
- Nearly 150 thousand employees (56% technical experts)
- 2015 main business income of 165.1 billion 100 million RMB
- Ranking 408th on 2016 Fortune 500

Electronic Science and Technology Strength

- Covering all fields of electronics information
- Provide full range information equipment for army, navy and air
- Provide all kinds of core components for a variety of platforms
- The most powerful stated-owned enterprise in the network information system planning and construction, information equipment development and production and network information services

R & D Capability

- 10 national center for research and innovation
- 14 key laboratory of provincial and group
- 18 national key laboratories
- 4 national engineering center
- 20 post doctoral stations
- 21 national quality inspection center
- 11 academicians

18619 patents (12972 Invention patents)

- Academician Wang Xiaomo won the National Science and Technology Award in 2012

International Market

■More than 30 offices across the world

■Business in more than 110 countries around the world

■Widely carried out various types of international business

- •International Trade
- •International Investment
- •International
- •International Cooperation
- • engineering

Enterprise Mission

■ **Leading electronics science and technology**

Committed to the forefront of electronics information technology

Constantly break through the new height of electronics information technology

Push and lead the trend of electronics information science and technology progress

■ **Constructing national network**

CETC regard building national security system, and smart city network as our mission

■ **Cast Safety Foundation**

With advanced electronics information technology to defend national security, national network security, information security and social security

■ **Creating a smart era**

Committed to achieving the interaction between human and environment, material and intelligent to build the smart ecology, smart world and smart future

CETC Introduction—National Key Projects

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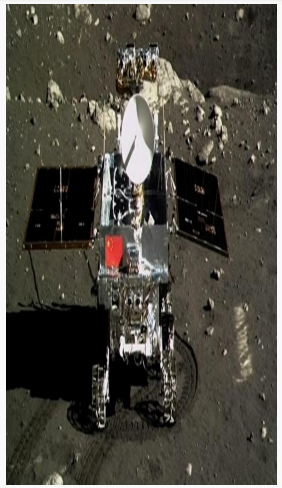
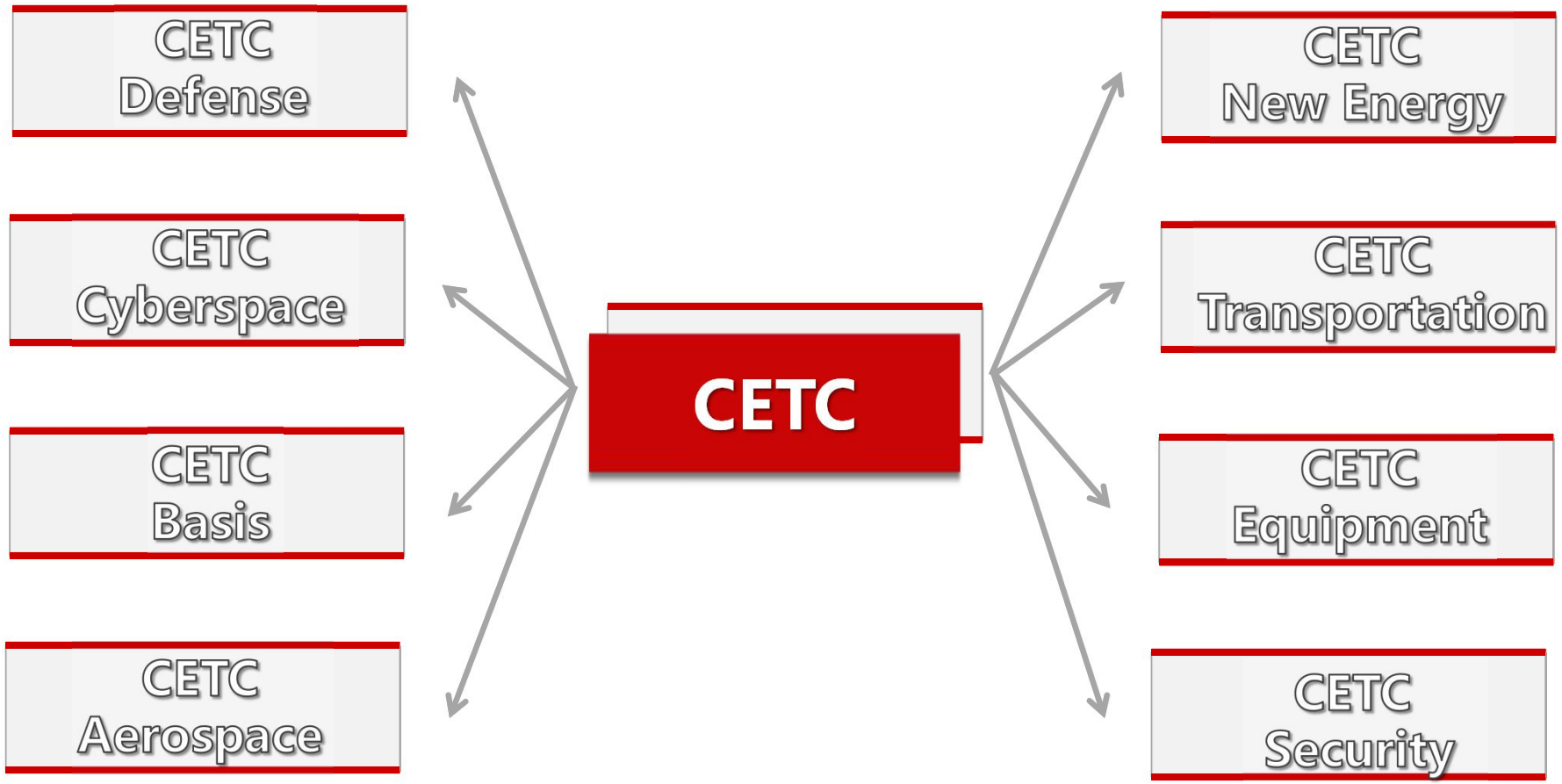
In a number of National Key Projects and National Science and Technology Major Projects, CETC has successfully completed various major tasks such as the overall design, the development of key system and production of key component, and has made outstanding contributions to the final success of all participating projects.

National Day Parade	BeiDou Navigation	Manned Space Flight	Lunar Exploration Program
			
➢KJ—2000AEWC ➢KJ—200AEWC ➢KJ—500AEWC ➢Radar Array ➢Communication Array	➢Integrated service system ➢power supply system ➢Ground monitoring system ➢Ground terminal system ➢Testing and certification services	➢Deputy commander in chief ➢Measurement and control communication system ➢Radar detection system ➢Solar cell ➢Key components	➢Deputy commander in chief ➢Transmitting field system ➢Communication measurement and control system ➢Ground application system ➢Key components

Eight Major Industrial Sector



CETC Introduction-- CETC Defense

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Command & Control (C4I)

Intelligence, Surveillance and Reconnaissance

Radar System

Electronic Warfare

CETC Introduction-- CETC Cyberspace

CETC China Cyber Security

◆ CETC Group established a cyber security industrial platform and created an industry leading position of cyber technology & talents by integrating the internal and external resources;

◆ It supports the national cyberspace security strategy, leading technology innovation and promoting industrial development;

◆ **Top-level information security qualification in China**;

◆ **The best R&D team in cyber security.**

Beijing Base

Industrial Marketing Center

China Cyber Security Branch

Taiyuan Base

North China Marketing Center

33th Institute

Pengyue Company,

Tezhuang Company

East China Marketing Center

ShangHai 30wish information security Limited

Yaxun Company

Chengdu Headquarters -West China Marketing Center

CETC Cyber Security Industrial Park

30th Institute, Weston, Kaitian, Purui, Guoxinan

South China Marketing Center

CETC Introduction-- CETC Cyberspace

China Cyber Security has provided professional communication and information security total solution to major national events and activities.

Command and communication support for "9.3 National Parade"

Communication support for manned-space flight

Information security support for Shanghai EXPO

Information security support for Beijing Olympics

Communication support for the convoy at the Gulf of Aden

Network information security support for the second world internet conference

Communication support for anti-quake relief work

CETC Introduction-- CETC Basis

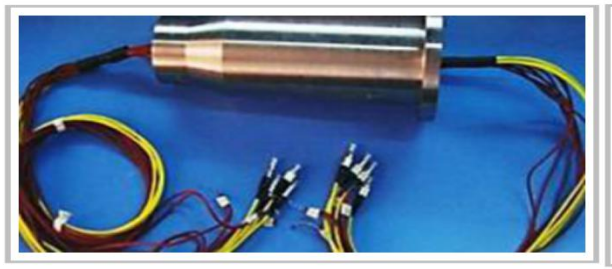
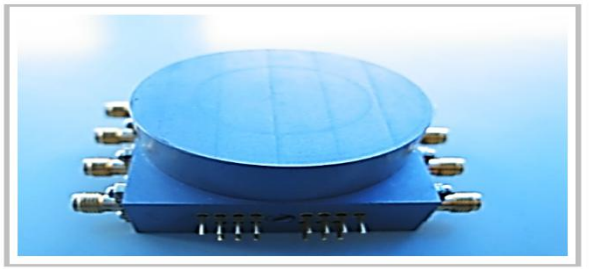
CETC have produced many " First" in China :

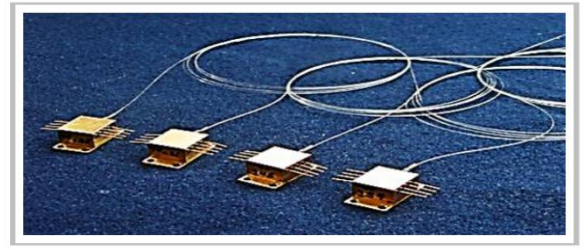
- ✓The first transistor
- ✓The first silicon integrated circuit
- ✓The first GaAsFET transistor

CETC have a comprehensive high-end electronics components R&D system, our products have been widely in:

- ✓ Warning detection
- ✓ Intelligence and reconnaissance
- ✓ Precision attack
- ✓ Aviation and astronautics





CETC Introduction-- CETC Basis

Comprehensive electronic components pedigree:

- ✓RF microwave components
- ✓special components
- ✓optoelectronic components
- ✓cable and connect components

RF Microwave Components


Microwave Components

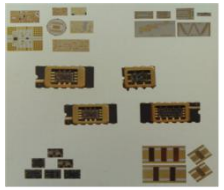

RF Components


Millimeter wave device

Special Components


Micro Motor


Acoustic surface device


Thin film Device

Optoelectronic Components


LED component


Photoelectric sensor


Infrared Device

Cable and Connect Components


RF connector


Specific waveguide


Special optical fiber

CETC Introduction-- CETC Aerospace

Important equipment and system suppliers in China Aerospace Industry

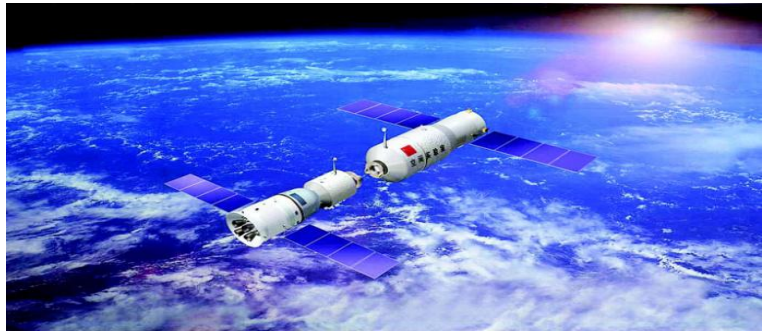
- Aerospace mission load and power
- Aerospace ground measurement control and communication
- Aerospace application and Space Science
- Airborne equipment
- UAV, general aircraft
- Flight training simulation

Important equipment and system suppliers in China Aerospace Industry

◆ Space
- A variety of sensors and task load
- Space power system

◆ Ground
- Communication and measurement and control system
- Ground station and control center

◆ Space application and space science research
- satellite communication
- satellite navigation
- Earth observation
- Deep space exploration
- Space environment monitoring



CETC Introduction-- CETC New Energy

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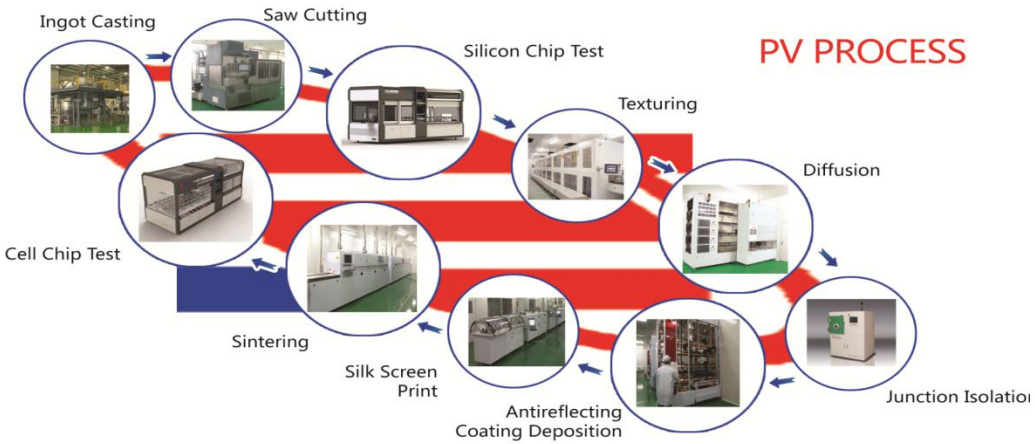
R&D of first space solar system to China’s spaceship and satellite.

- No. 1 in space solar power system
- The **only** National PV Equipment Engineering Research Center approved by Ministry of Science and Technology of China.

World’s TOP 10 solar equipment suppliers

- **No 1** in magnetic material equipment supply , 70% market share
- **No 1** in supplying with PV manufacturing equipment, 80% market in China

CETC’s manufacture capability covers the whole photovoltaic industry chain



Complete design, construction and operational qualification for photovoltaic power station

CETC Introduction-- CETC New Energy

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- International case on large terrestrial photovoltaic power plant: a total of 300MW of the international large-scale photovoltaic power plant project has been completed by now.

CETC Introduction-- CETC New Energy

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◆ Domestic cases on large-scale terrestrial photovoltaic power plant: a total of 400MW of the international large-scale photovoltaic power plant project has been completed by now.

Inner Mongolia large-scale terrestrial photovoltaic power plant
December,2013 105MW

Beijing Zhongke Roof photovoltaic power plant
October, 2013 15MW

Hunan photoelectric Co., Ltd. Roof photovoltaic power plant
October 2010 12.82MW

◆ Photovoltaic application system case

Photovoltaic water quality detection ship

Qatar 21.6kw pure off-grid PV system

Qatar 60W street lamp

3 sets of 20kW network system in Sri Lanka

CETC Introduction-- CETC Transportation

Road Traffic

- Traffic flow guidance display
- Traffic checkpoint system
- Intelligent traffic microwave testing
- Video detector
- Traffic signal controller
- Electronic police system
- Intelligent vehicle monitoring and recording system
- GIS etc.

Air Traffic Control

- Low-altitude air traffic control
- Communication navigation system
- General aircraft avionics system and device

Rail Transit

- Trunking dispatch system

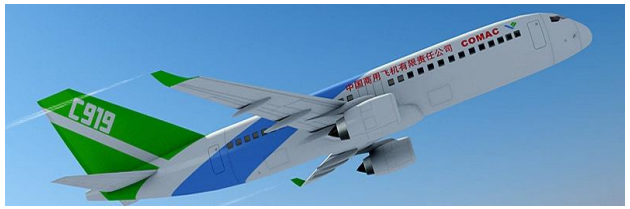
✓Nanjing subway south-north line phase1
✓Beijing subway Batong line
✓Beijing subway line 5
✓Beijing subway line 1 modification project
✓Beijing subway line 2 modification project
✓Beijing subway line 1 modification project
✓Beijing subway line 2 modification project
✓Beijing rail transit airport line
✓Beijing subway line 10
✓Shenyang subway line 1
✓Beijing subway line 1 and 2 special telephone line system
✓Beijing subway line 10 special telephone line system
✓Shenzhen subway line 4 office and special telephone system
✓Shenzhen subway line 2 office and special telephone system
✓Nanjing subway line 2 phase 1 telephone system

- Rail transit project contracting

✓ Karachi Mass Transit Line 1 EPC (300million USD)
✓ Amman Light Rail System EPC Contract (150million USD)
✓ Lima Line 1 BOT Project (470million USD)
✓ Nanjing-Tianchang Intercity Rail Transit Line BT Project (1.5billion USD)
✓ Nanjing subway airport line communication system contract (22million USD)
✓ Nanjing Qilin trams line 1 BT project (196million USD)
✓ Nanjing Hexi trams BT project (166million USD)
✓ Harbin line 2 BOT (2.9bilion USD)
✓ Nanjing subway line 1 traction system maintenance project

CETC Introduction-- CETC Transportation

Air Traffic Control



Major/Regional airline

- Airborne aviation electronic system
  - Communication navigation system
  - Cabin system
  - Information system
- Flight simulation training
  - Simulation training system
  - Training center

Aviation maintenance and ground support service

General aviation

- General Avionics system
- General airplane
- Special aircraft/UAV system
- Operation system
- Aircraft engine

CETC Introduction-- CETC Transportation

Rail Transit

◆ General Contracting(PMC、EPC、BT、BOT、PPP)

- General contracting of overall system of the whole line (civil works + rolling stock + electro-mechanical systems)
- all the electro-mechanical equipment systems (including or excluding rolling stock)

◆ Specialty Systems Contracting

- communication system
- integrated automation system
- Traction system

◆ Consulting

- Construction
- Project Management
- Design
- Costing
- Operation

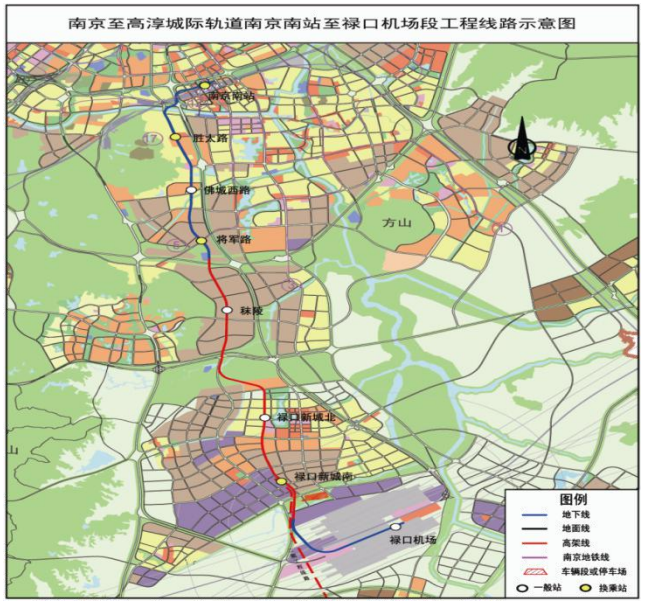
◆ Mass Transit Product

- Communication system (TETRA trunking system)
- Comprehensive automatic system (core software and application software
- Traction system (propulsion & control system etc.)
- Subway video-audio information system
- Subway automatic ticket system
- Rail transit vehicle inspection and maintenance system
- Rail transit video monitoring system integration, monitoring device manufacture
- Rail transit comprehensive information system

CETC Introduction-- CETC Transportation

Nanjing subway airport line communication system

- Key transportation project of the second World Youth Olympics
- Total length 35.7km
- Tender awarded in September of 2012, 22 million USD
- First application of full HD monitoring camera, providing strong security support



Nanjing Hexi trams BT project

- Key transportation project of the second World Youth Olympics
- Total length 7.54km
- Total investment around 166 million USD

Harbin line 2 BOT project

- Total length 28.45km, 21 underground stations
- Total investment around 2.9 billion USD
- Construction period 5 years （2014—2019）
- The project capital is 30% of the total investment, around 870 million USD
- BOT（build-operate-transfer）

CETC Introduction-- CETC Equipment

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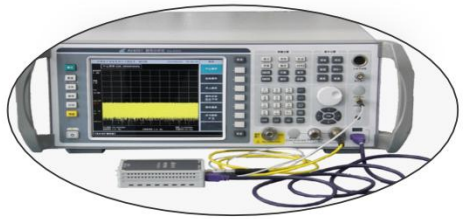
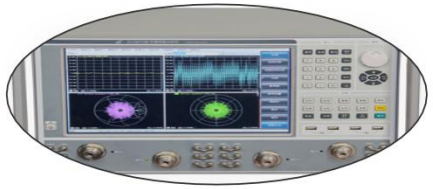
Our main products have covered many high-end areas including microwave and millimeter wave, mobile communication, optoelectronic and special equipment, we have achieved many key technical breakthroughs and the main technical indicators of which have reached or exceeded the international advanced level

Microwave and Millimeter Wave Test





Mobile Communication Test

Photoelectric System Test

Special Equipment Test

CETC Introduction-- CETC Equipment

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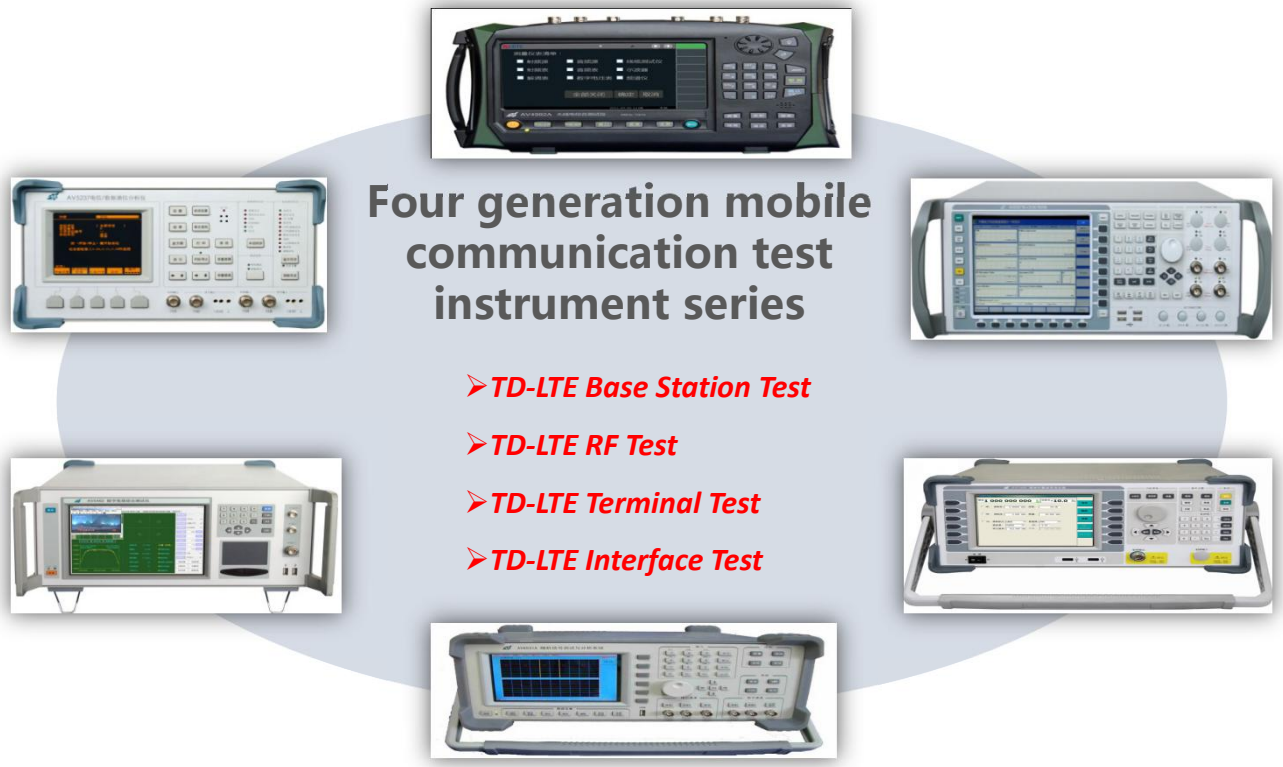
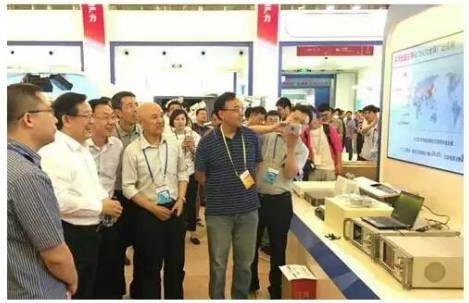
After enduring research and accumulation, CETC has developed product pedigree of mobile communication testing with independent knowledge right, and accomplished many key testing missions of 4G Network in our country, which greatly promote China’ s independent LTE standard and industrialization. CETC makes great contribution of forming comprehensive LTE industry chain and improving the development of 4G even 5G Network in the future in China.



Four generation mobile communication test instrument series

- ***TD-LTE Base Station Test***
- ***TD-LTE RF Test***
- ***TD-LTE Terminal Test***
- ***TD-LTE Interface Test***

Related achievements showed in 12th Five-Year science and Technology Achievements Exhibition



CETC Introduction-- CETC Security

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Overview

◆CETC is a **leading supplier** of public security system and equipment in both Chinese and international market.

◆CETC could supply public security equipments and services in the following civil industries:

- ➢National or city public security solution;
- ➢National or regional intelligence system solution;
- ➢Important event security system;
- ➢VIP protection system;
- ➢Intelligence collection and analysis system;
- ➢Radio spectrum surveillance system;
- ➢Network surveillance and control system;
- ➢Network protection system;
- ➢City surveillance and control system;
- ➢Police command and control system;
- ➢Emergency communication system;
- ➢Boarder and coast surveillance system;
- ➢Devices for police application.

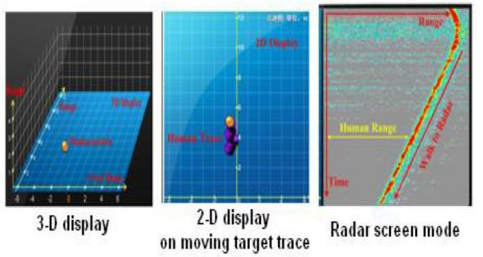
Product Examples

Portable ground penetrating radar (GPR)

Handheld metal detector

Metal detector

Portable through wall detection radar



High-intensity acoustic low-lethal equipment

Public security door

Vehicle chassis explosive detector

Product Examples

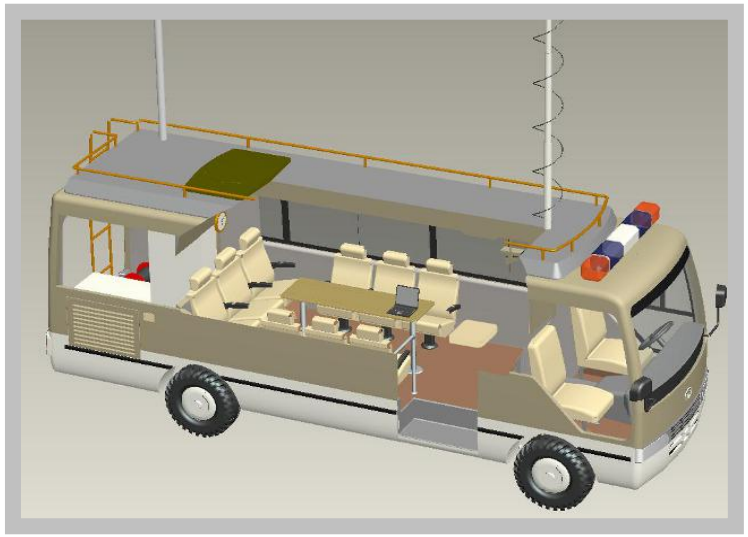
Vehicle-borne Counter RC-IED Jamming System

Man-pack jammer

Suitcase-type jammer

Portable jammer

Mobile command and communication system



Functions:

◆Kinds of communication modes such as mobile comm., satellite comm., ground broadband network and etc;

◆Collection of on-site voice and image, access and upload of audio and video signals;

◆Fast load and remote call of platform database;

◆GPS positioning and geo information analysis;

◆Information processing and definite capability of situation analysis, prediction and early-warning;

◆Independent work and cooperation with vehicles of communication, power supply, trunk communication and etc;

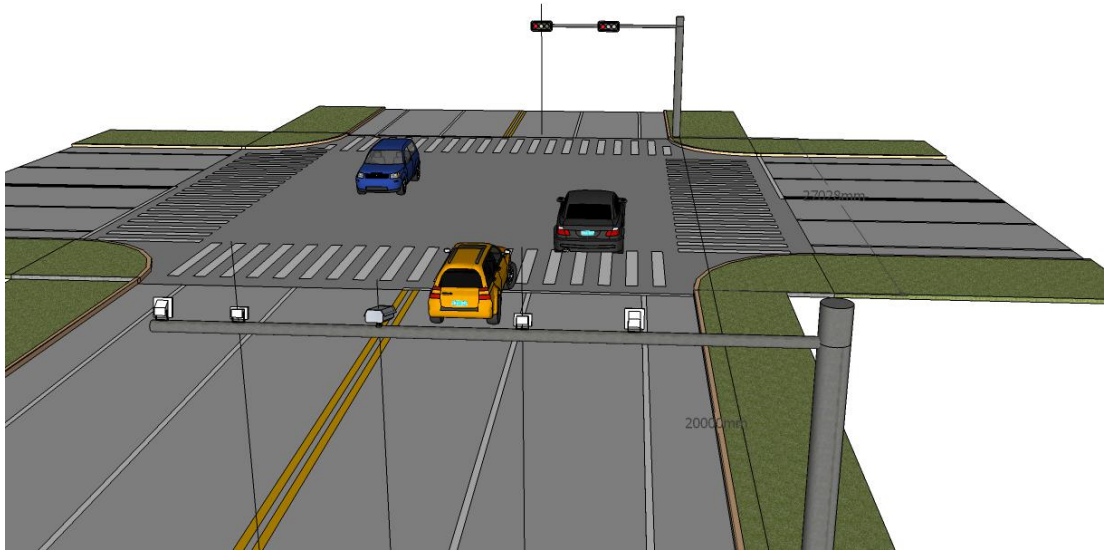
◆Capability of information encryptionn and video conference.

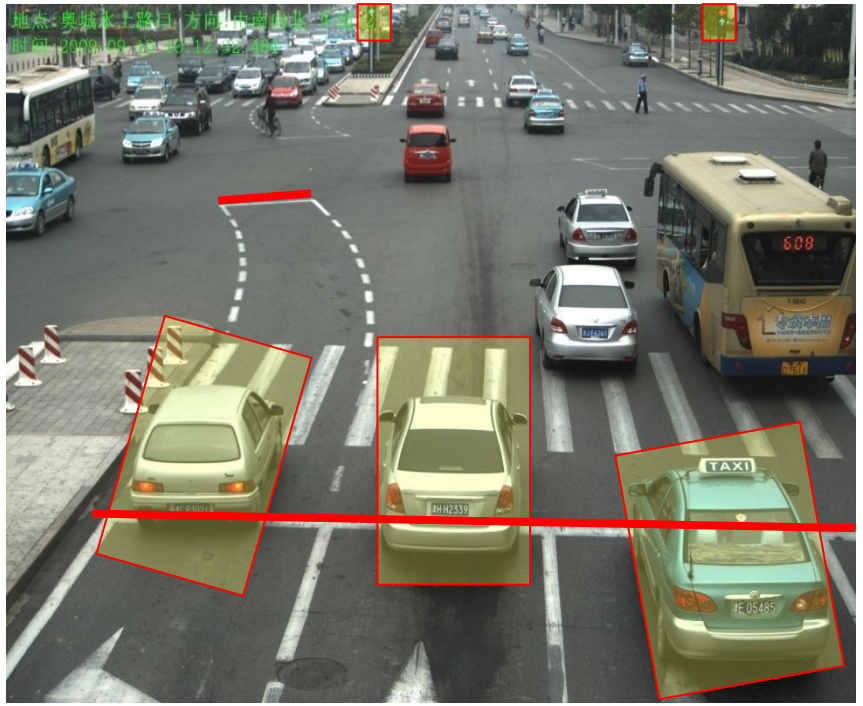
Command & Dispatch System

In application, the system integrate the following subsystems:

- Police GIS application system
- GPS-based vehicle monitoring system
- City video monitoring system
- Intelligent vehicle/person checkpoint system
- E-police system
- “911” alarm receiving & handling system
- Private communication system
- Police information database
- Intelligence surveillance system
- TV wall, public broadcasting system, decision-making room, computer network, etc.

Command & Dispatch System ：E-Police System

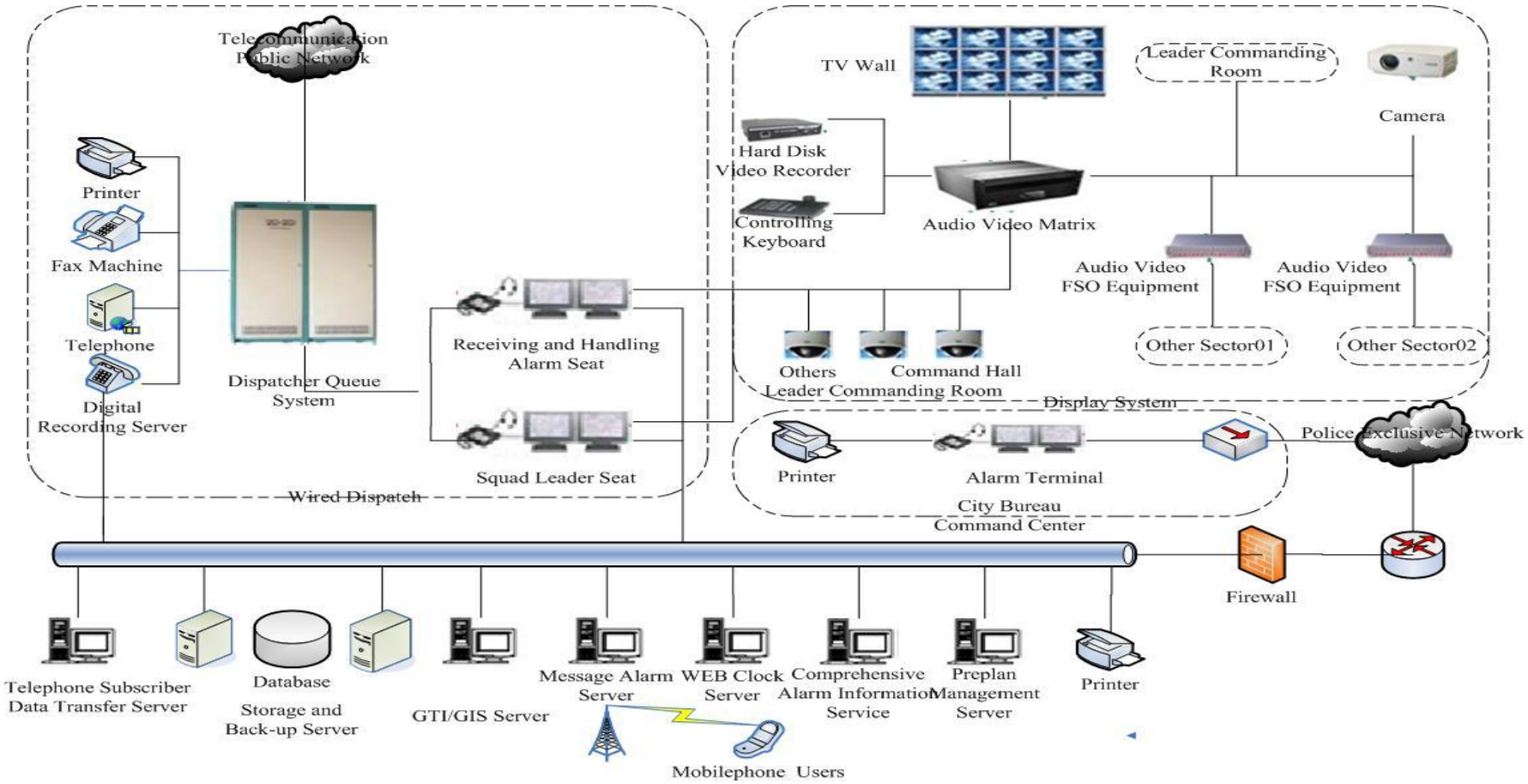




Command & Dispatch System ： “911” Alarm Receiving & Handling System

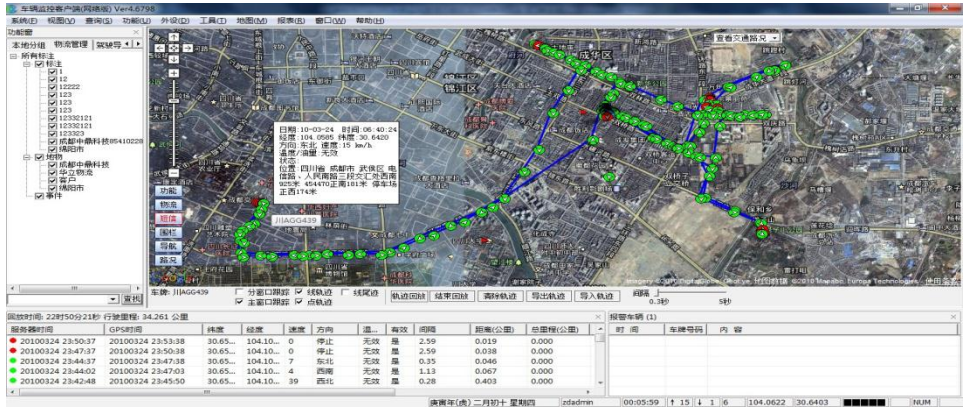
Function

- •Call receiving & handling
- •Information collection & possessing
- • Caller information: number, name, address…
- • Queue of incoming calls
- • Assistant decision-making
- • Command & dispatch
- • Etc.



Command & Dispatch System ： GPS-based Vehicle Monitoring System

Real-time locating & tracking

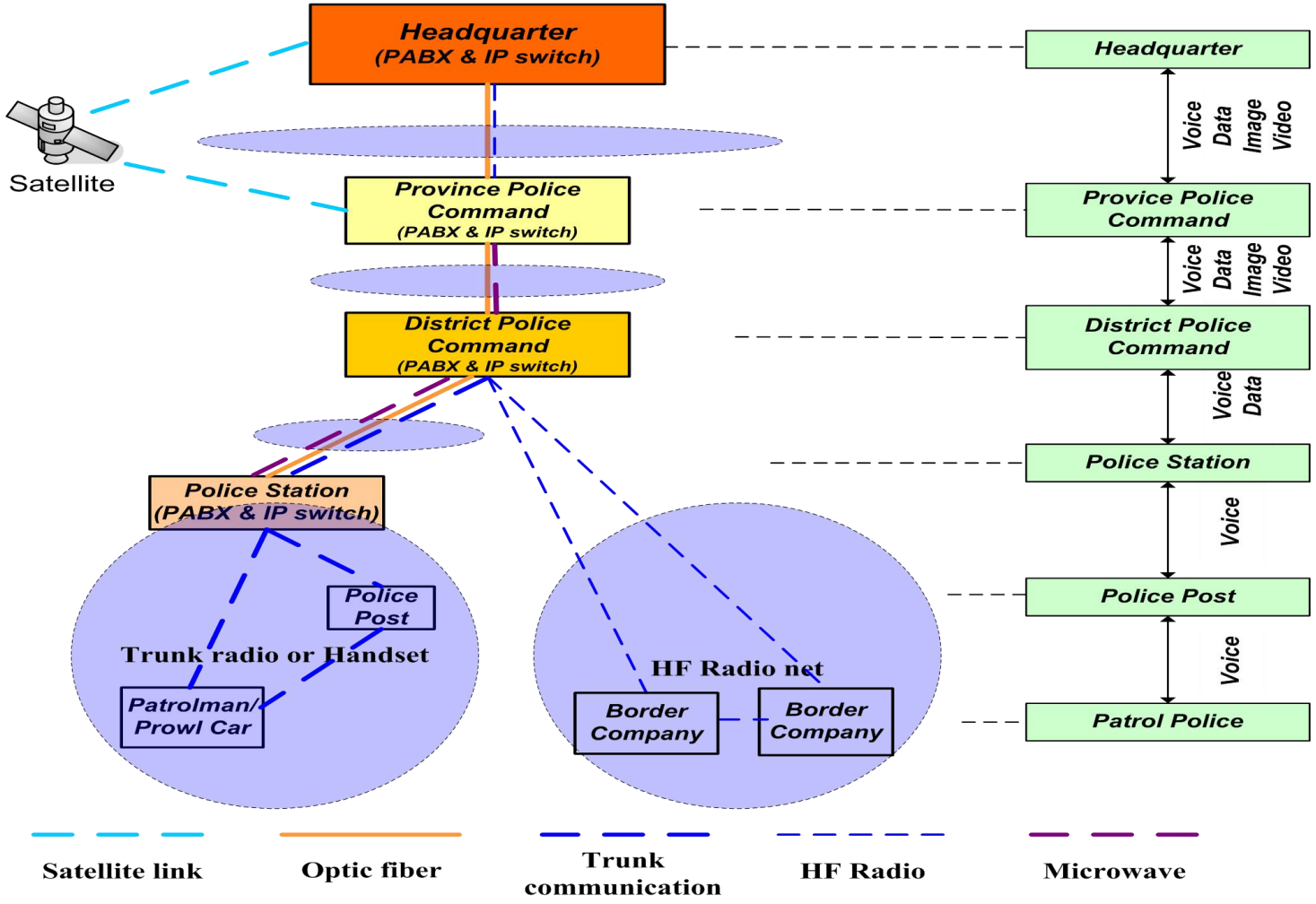


Track record & play back

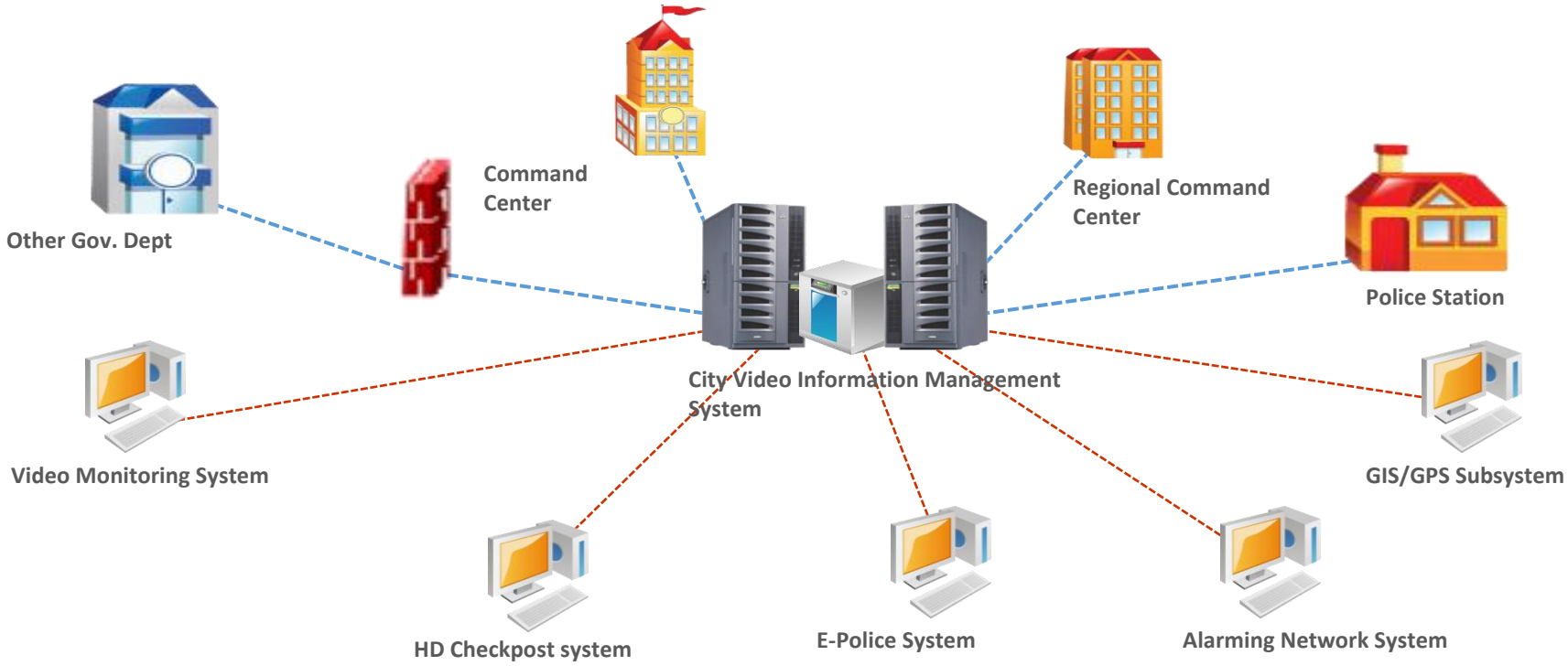
Off boundary alert

Command & Dispatch System ： Private Communication System

- Wired communication
  - Optical fiber
  - PABX
- Wireless trunk communication
- dispatch
- HF/VHF radio network
- SATCOM
- Microwave communication
- Integrated communication
- platform



City Area Monitoring & Alarming Network System

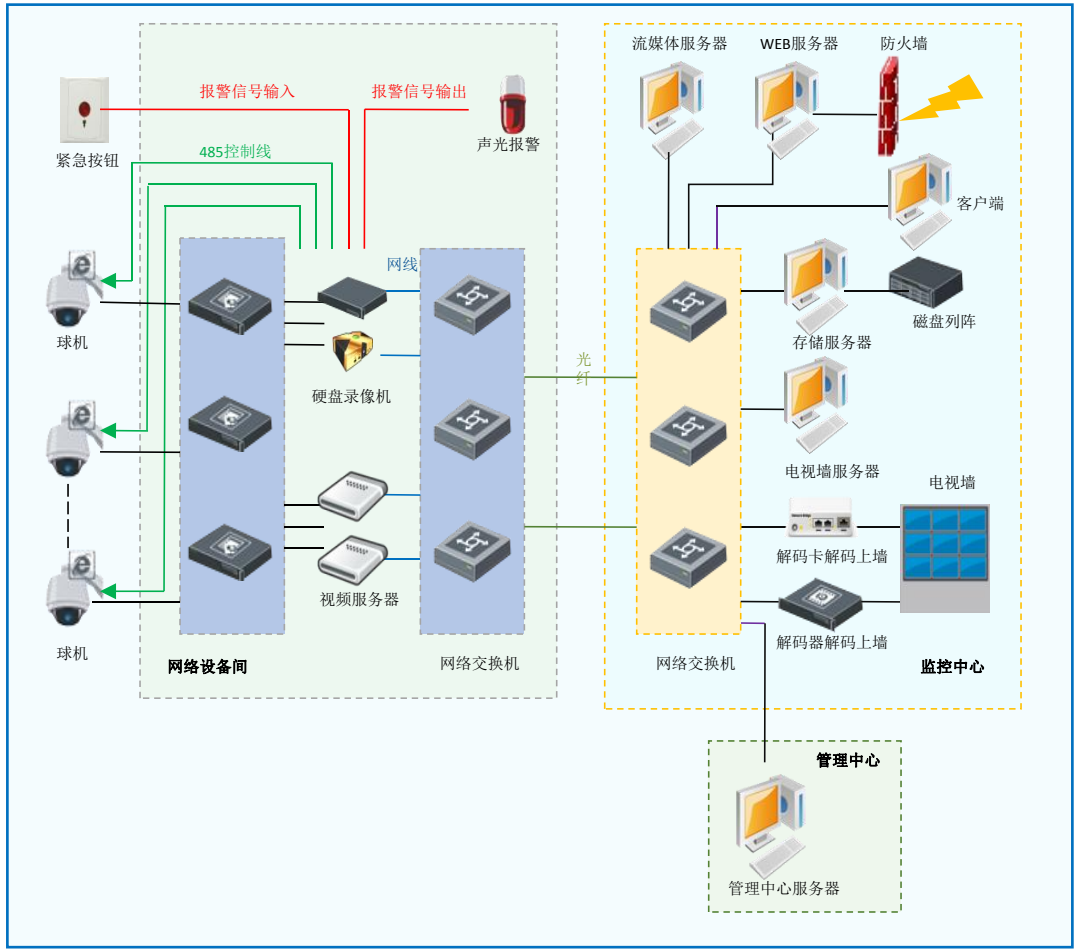


CETC concluded many years experience of security industry and the city video construction, presented a new generation of urban video integrated solution that truly enables video encoding, matrix switch, mass storage, video decoding and urban management application business integration.

Security Cases

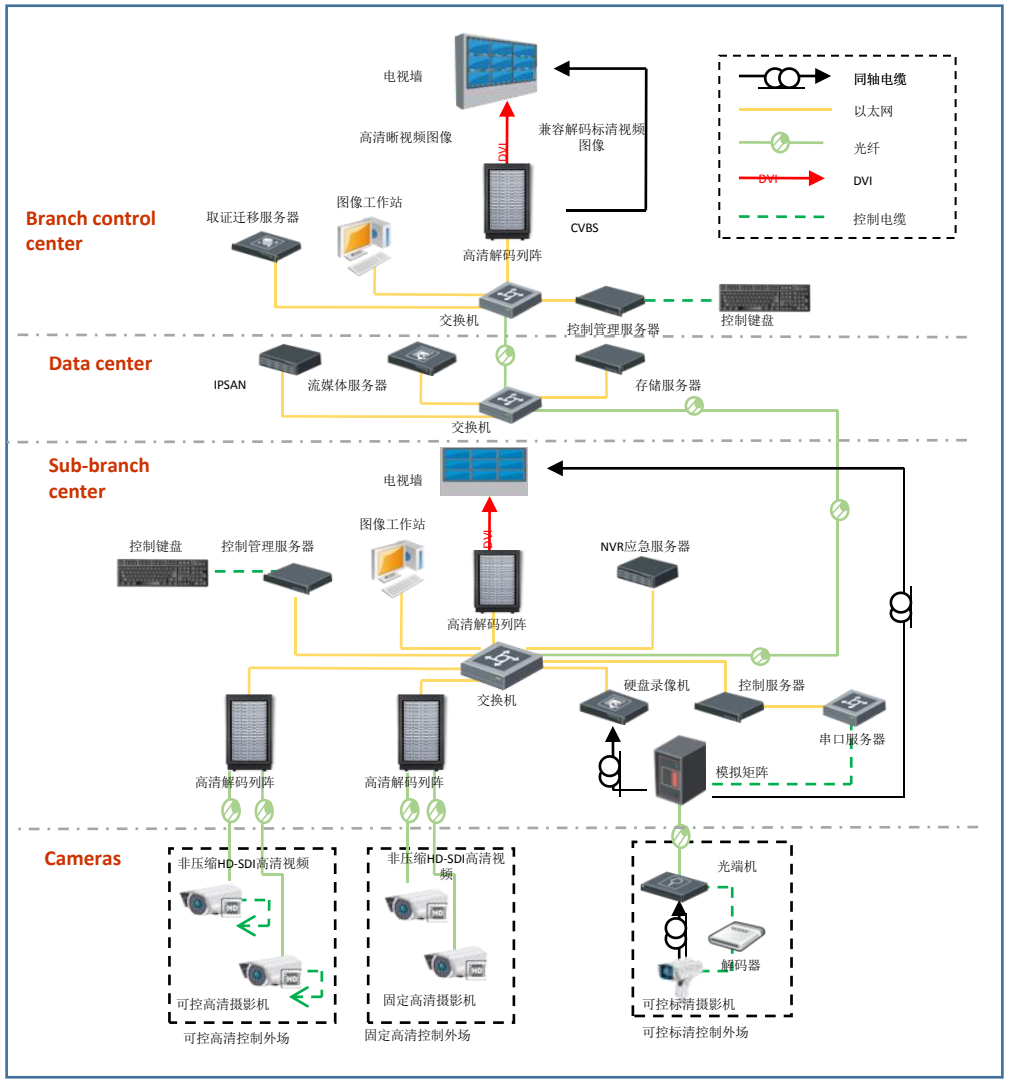
Beijing 2008 Olympic Games

CETC was the largest supplier for security program of Beijing Olympic Games in 2008. CETC participated into the security system construction and integration for 31 Olympic sport venues



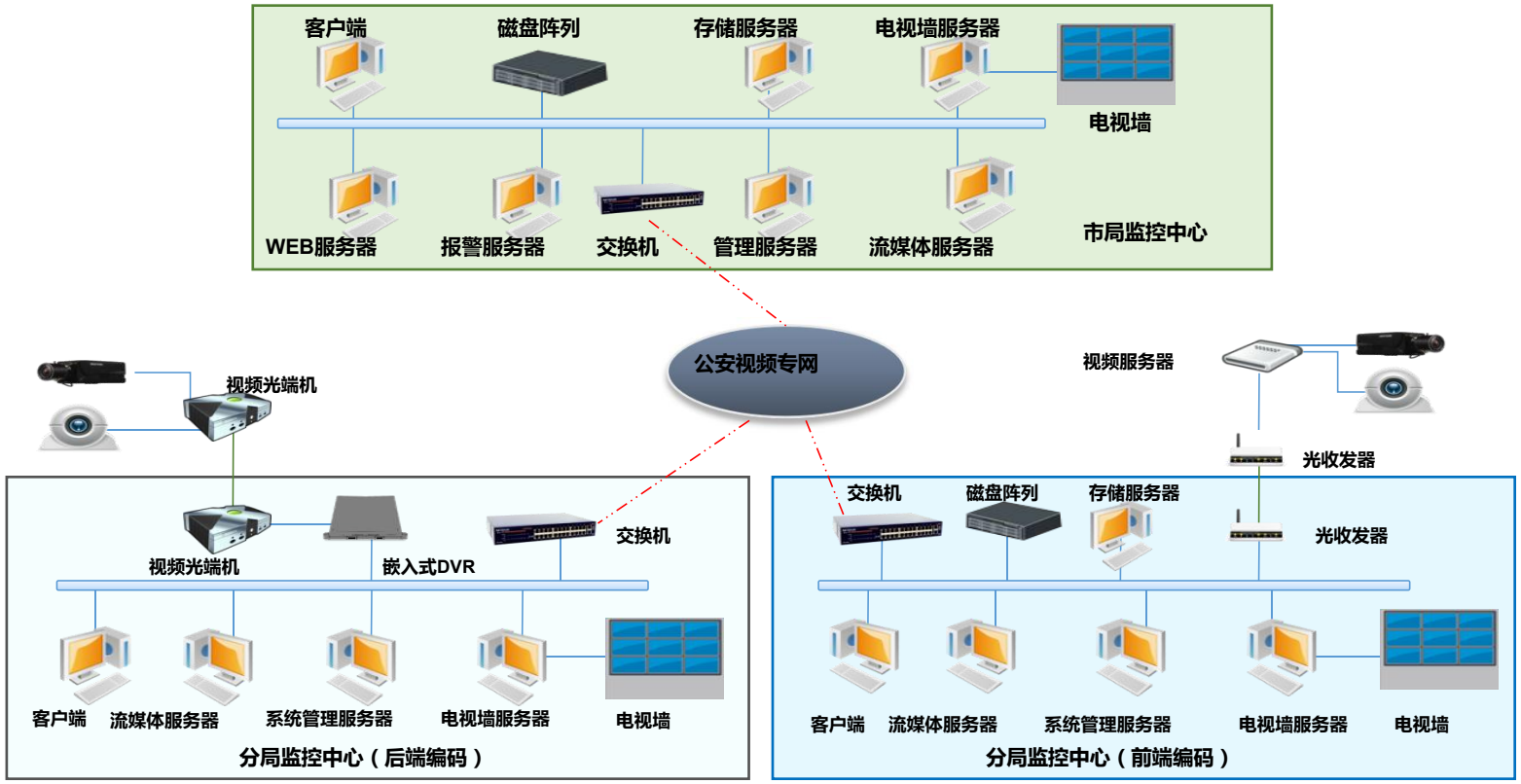
Shanghai World Expo 2010

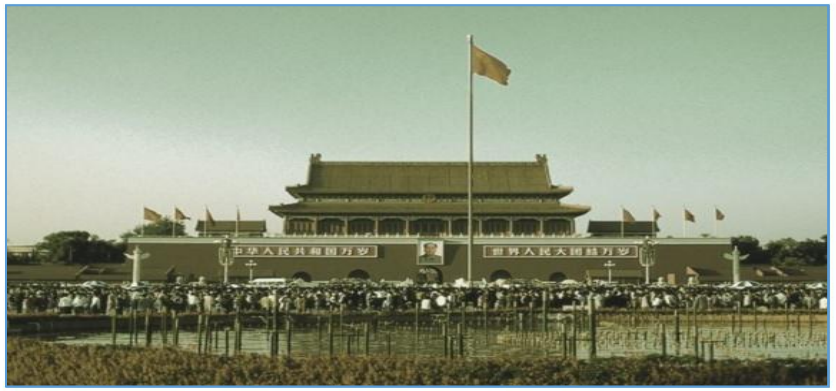
CETC provides more than 7,000 two mega pixel high-definition digital video cameras and more than 5,000 high-definition encoders for the protection of 13,000 building control points for Shanghai World Expo 2010 .

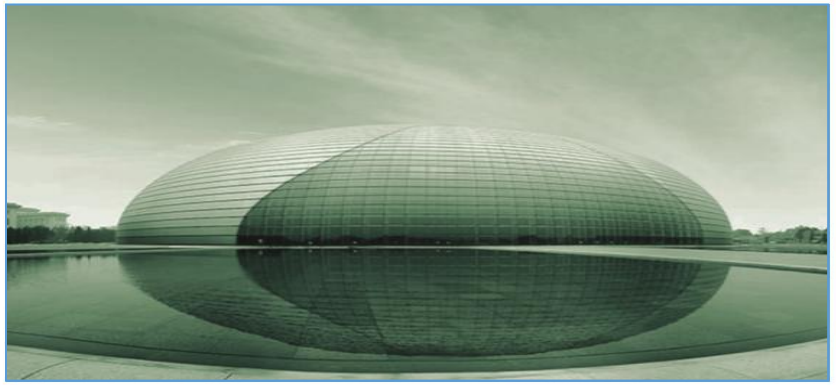


Beijing

CETC has offered high-performance products and professional technical solutions to over 400 domestic and overseas cities.





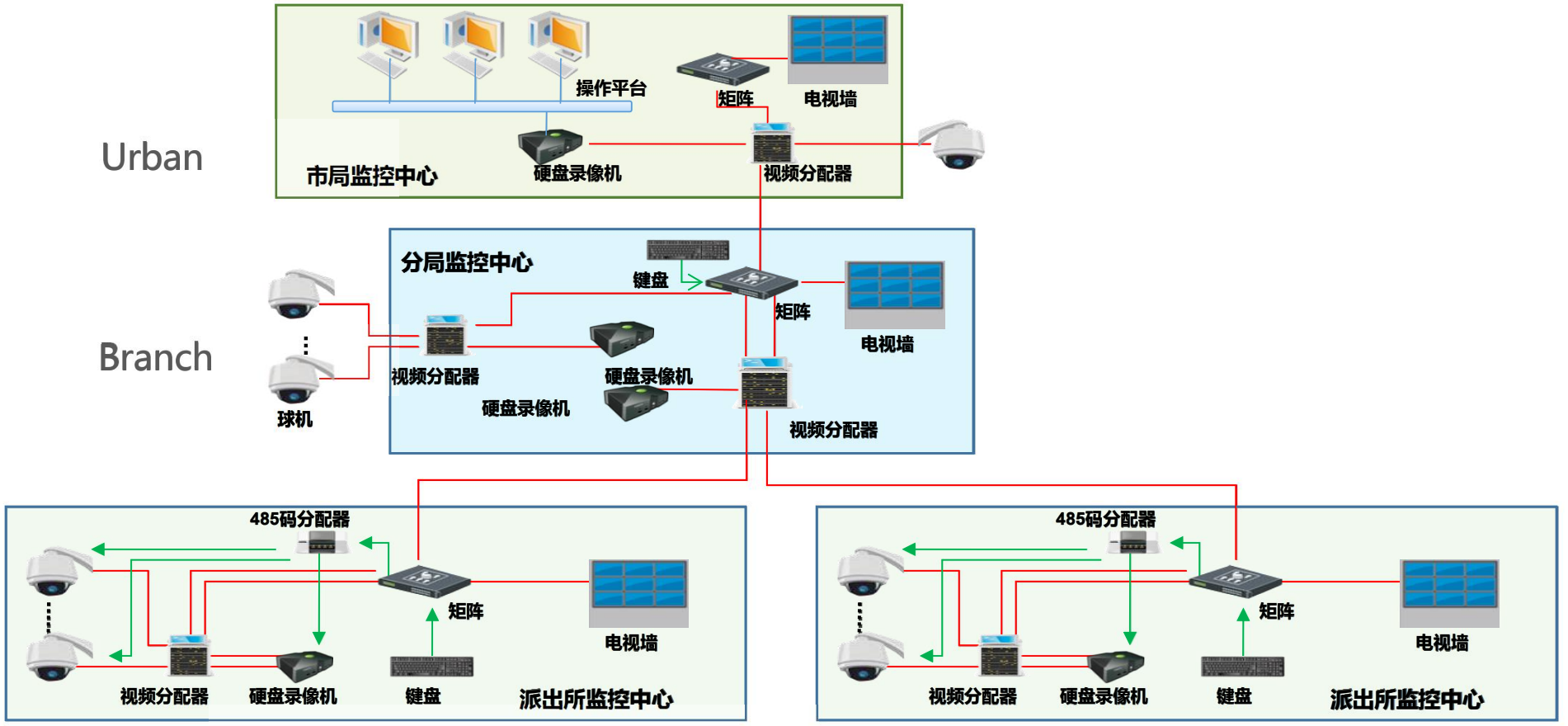


Shanghai

Shanghai Green City with a typical Police Station, District Branch, Urban 3 monitor mode.

Urban

Branch



Police station

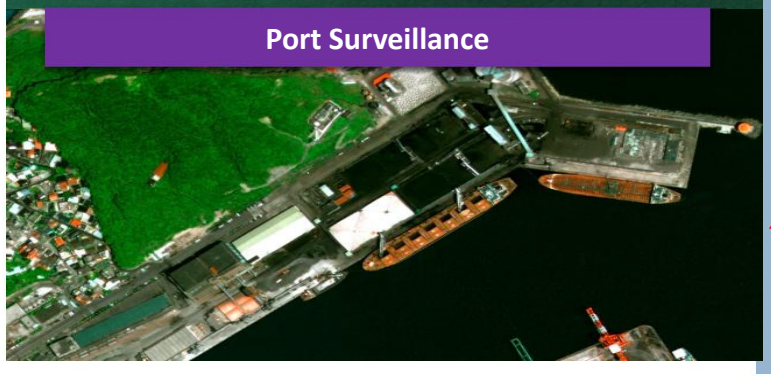
Marine Integrated Test Vessel

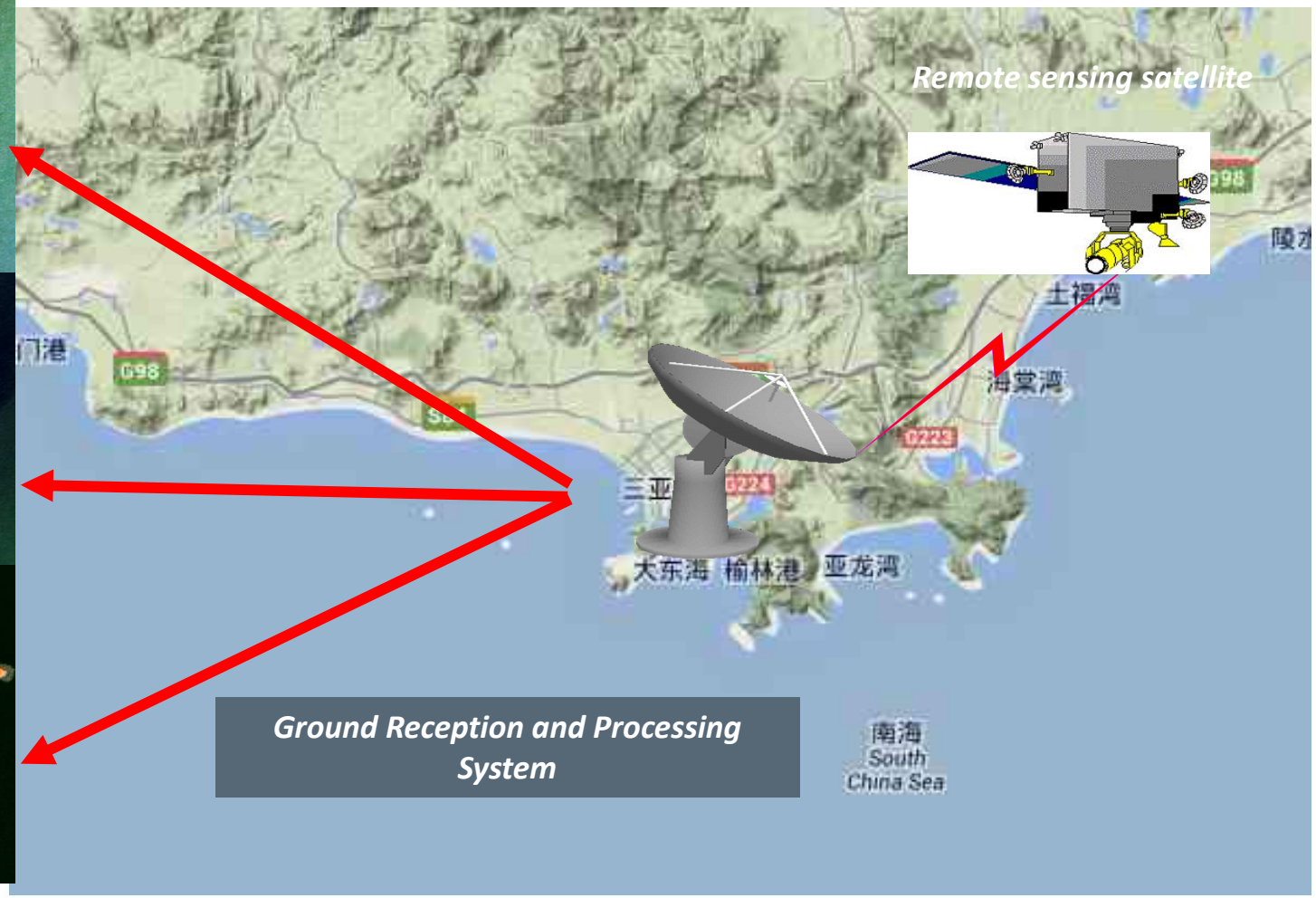
◆CETCNo.1 is an integrated marine test vessel with the design advantages of electronic information system of CETC. It is not only the mobile node of the marine information network, but also the incubator platform of the ocean information technology innovation

◆This is the first attempt to adapt the ship according to the application of electronic information system, so as to meet the demand for the use of open mission of electronics system and provide better service of maritime mobile information

- Maritime information hub
- Comprehensive test
- Application service
- Marine engineering operation and maintenance
- Marine experiment, research and teaching

Maritime Electronic Information Technology Application--Remote Sensing System



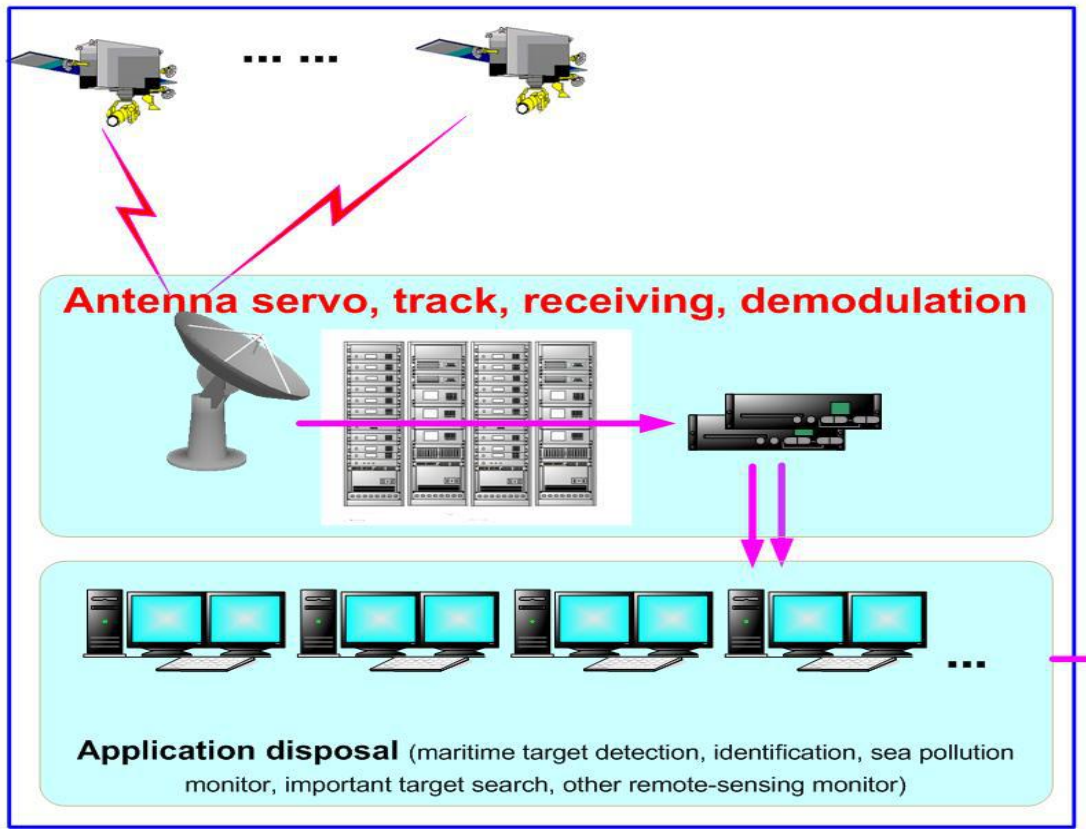


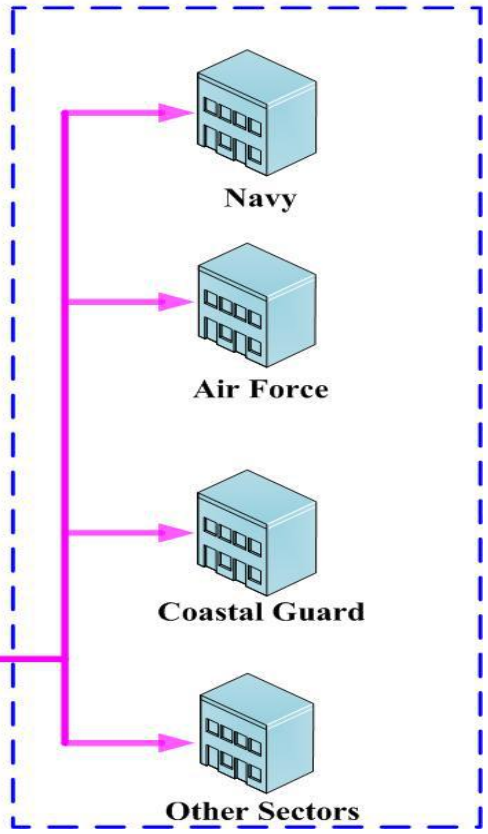
Main Functions

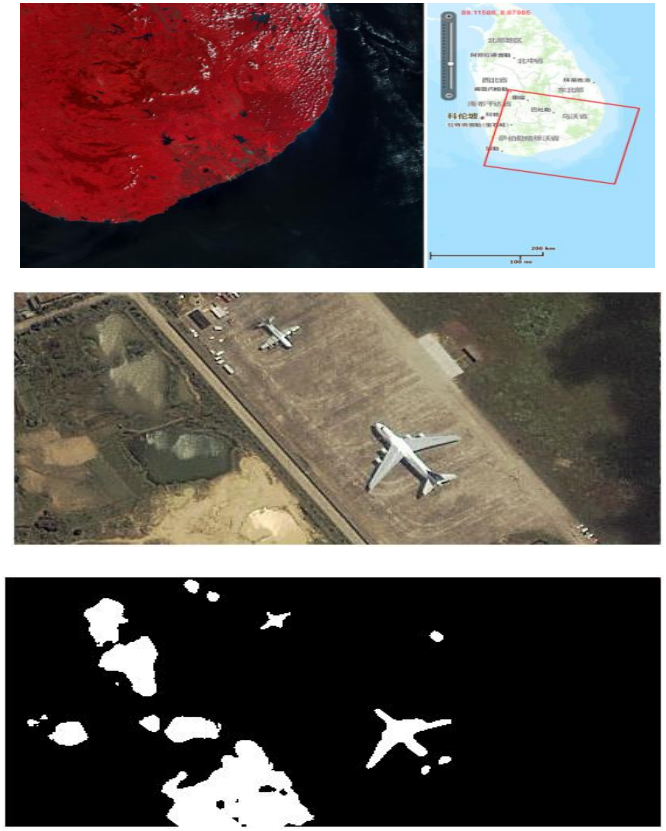
Agency	Function	Agency	Function
Navy	• Vessel detection • Vessel type identification • Manual recognition and marking • Maritime target situation map	**Fisheries & Aquatic Resources**	• Illegal fishing monitor • Illegal fishing tracking
Air force	• Aviation remote-sensing operation platform • Loading CCD camera and video equipment • Image processing system • Data downlink transmission	**Ports Authority**	• Overall situation of vessels within harbor area, approaching channel and waiting area
Coast guard	• Coastal target searching • Coastal illegal construction identification	**Disaster Management Centre**	• Emergency monitor • Disaster analysis
Environmental authority	• Illegal rubbish dumping identification • Sewage disposal monitor • Marine pollution monitor	**Department of Meteorology**	• Meteorology cloud pictures
CC & CR Management	• Coastal illegal construction identification • Coastal sewage disposal monitor • Coastal rubbish dumping identification		

Remote-sensing Ground Station

It consists of data ground reception system and data application system. Downlink data of remote-sensing satellite are received and processed to generate related application products for departments .

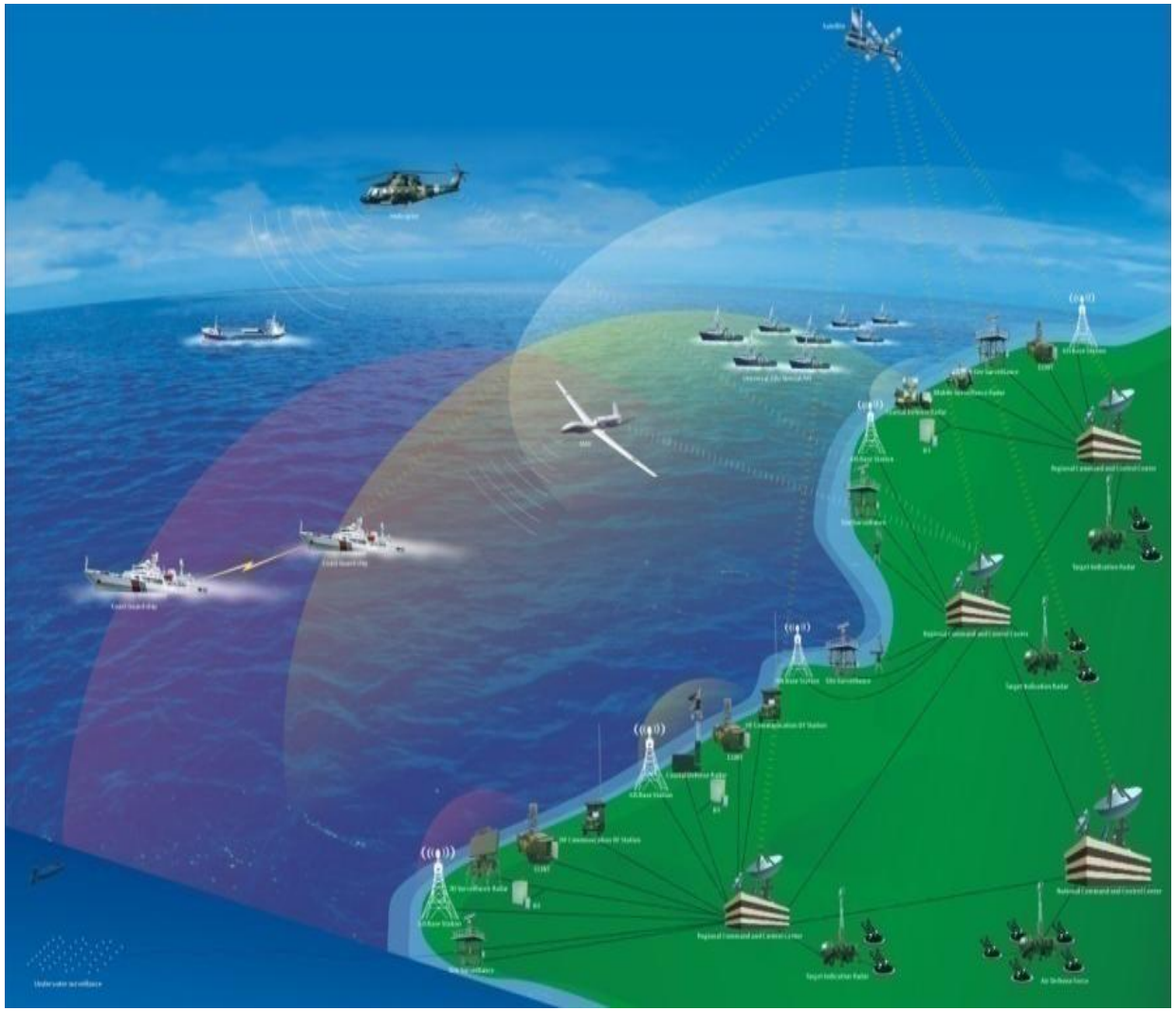






Remote-sensing Application

Maritime Electronic Information Technology Application—Navy System



■ **Mission:**

- Master comprehensive marine situation
- Support operations at sea
- Ensure national maritime safety

■ **Implementation:**

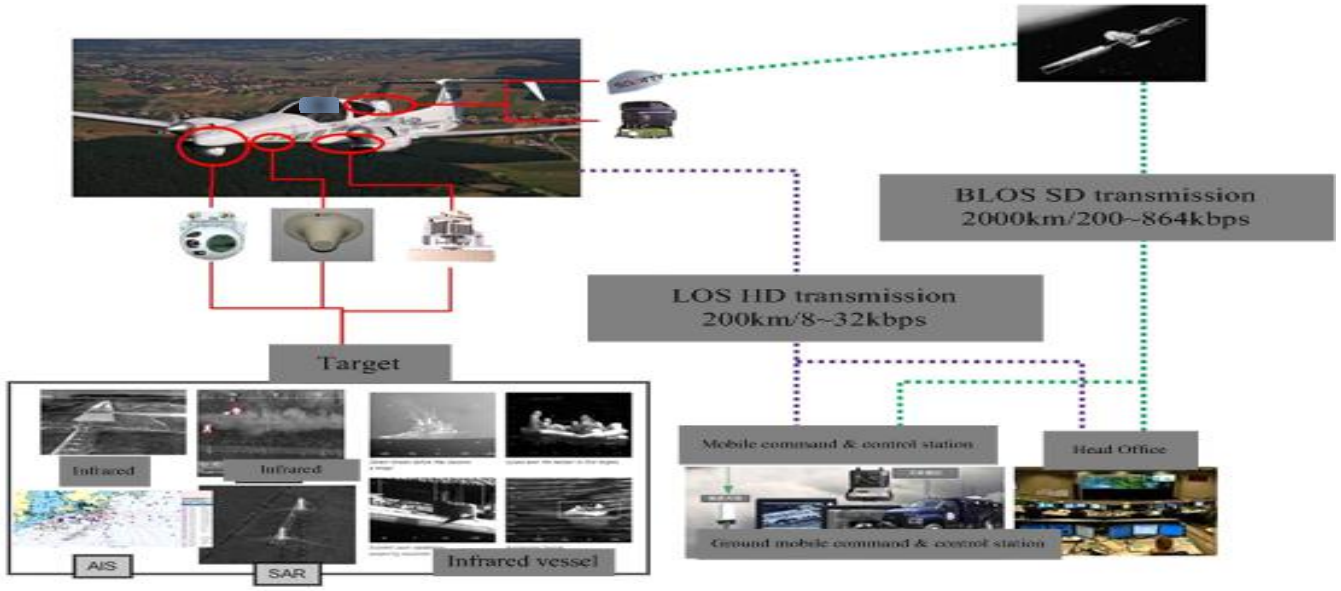
➢ Coastal Radar

- RESM & CESM
- OPV equipped with radar, EO/IR and AIS
- MPA
- Remote sensing Satellite
- Information from other sectors

■ **Communication:**

- Optical fiber
- Microwave communication
- HF\VHF\UHF
- Satellite communication

Multi-function UAV



■ **Technical Features**

- Dual-engine for safety and reliability
- Modular-type installation of mission load
- EASA/FAA certificated
- Outstanding low-speed performance
- GARMIN G1000 avionic suite
- BLOS/LOS datalink
- MTOW: 1900kg
- Max payload: 640kg
- Min operation altitude: 300m
- Operation ceiling: 5486 m
- Max height: 5486m
- Max Endurance: 12h
- Voyage: 1283Km/1961Km
- Engine: AE300 Engine

Maritime Electronic Information Technology Application--Coast Guard System

■ **Mission**

- Law enforcement in coastal areas
- Prevention of illegal activities, such as smuggling, human trafficking, piracy
- Cooperating with army forces
- Participating in search and rescue operation

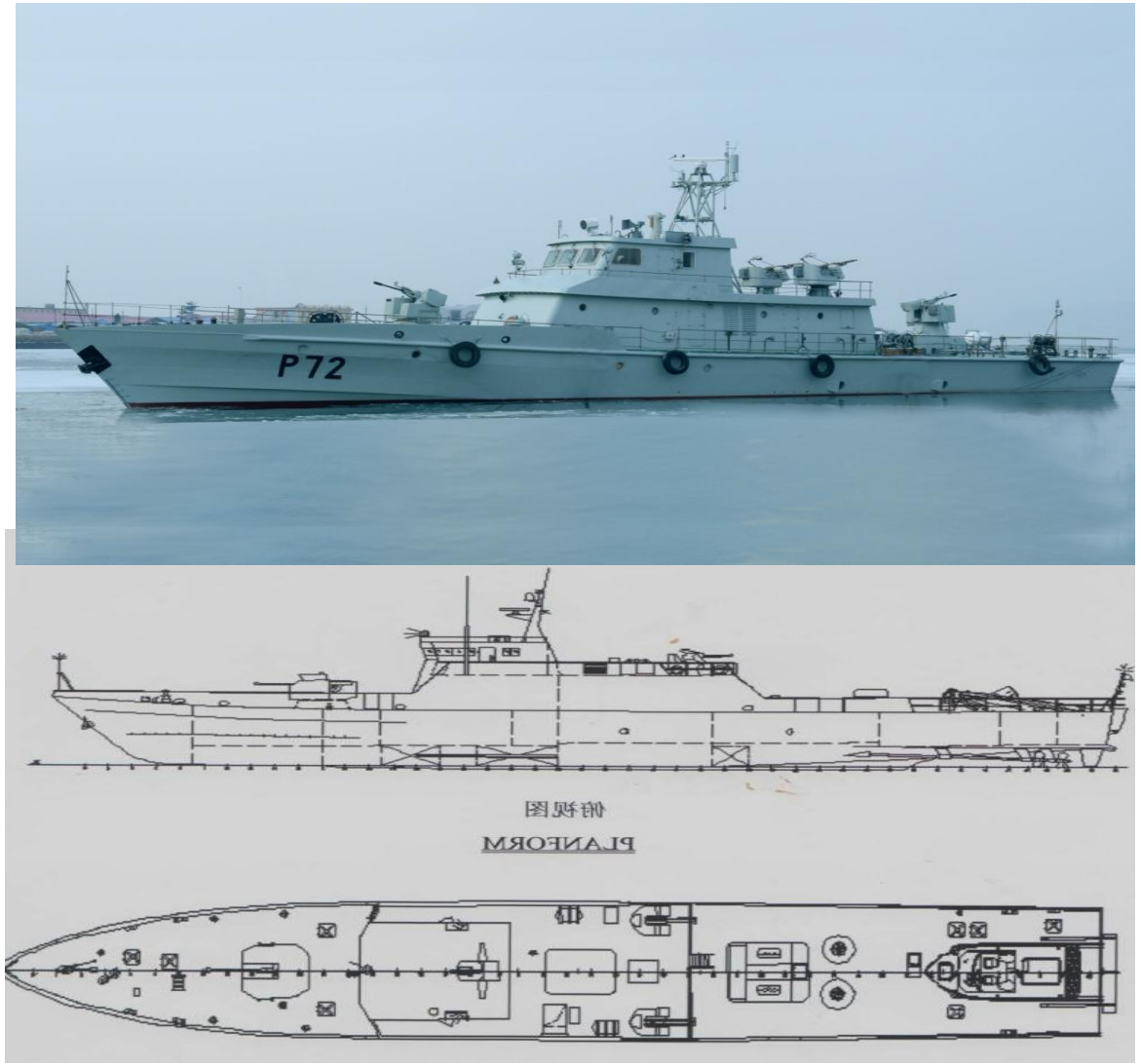
■ **Implementation**

- Patrol vessel equipped with EO/IR/AIS

■ **Communication**

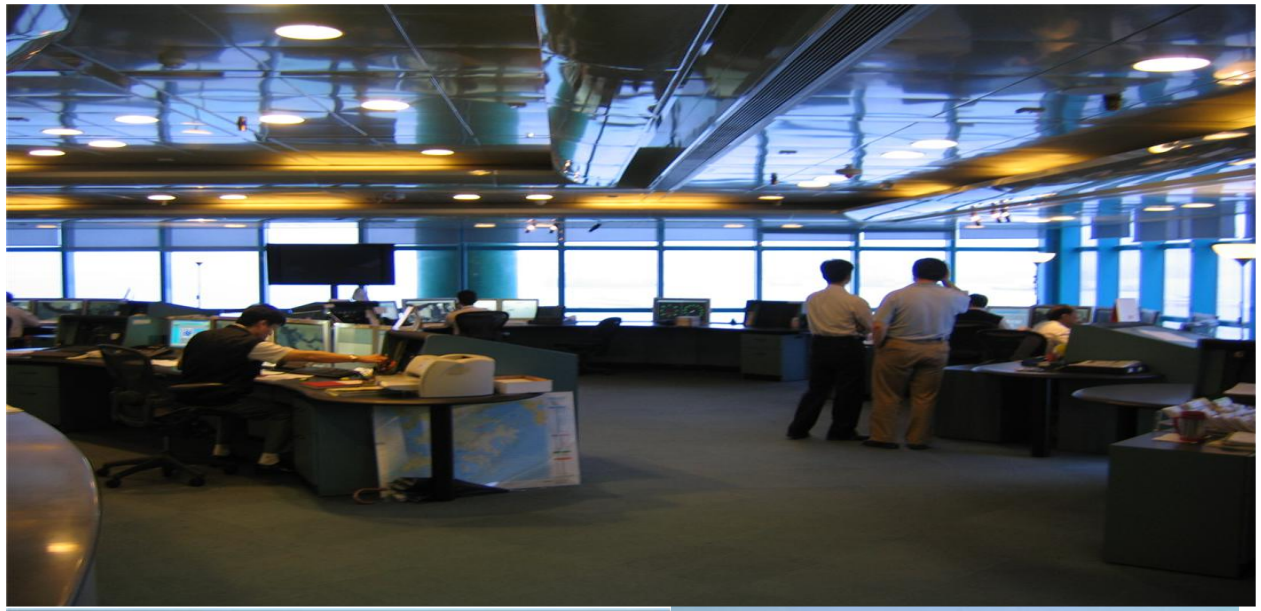
- HF/VHF/UHF
- Satellite communication

Coastal Patrol Vessel



■ **Technical Features**

- Length overall: 41m
- Breadth moulded: 6.6m
- Depth moulded: 3.2m
- Displacement: 165.0t
- Max speed: 28kn
- Endurance: 800 nmile
- Self-supportability: 7 Days & Nights
- Complement: 23 people/crew
- Gun: 30mm*2, 14.5mm*2



Port Vessel Traffic System (VTS)

■ **Main Missions**

- Ensuring sailing safety
- Improving sailing efficiency
- Protecting waterway environment
- Assisting security activities

■ **Main Components**

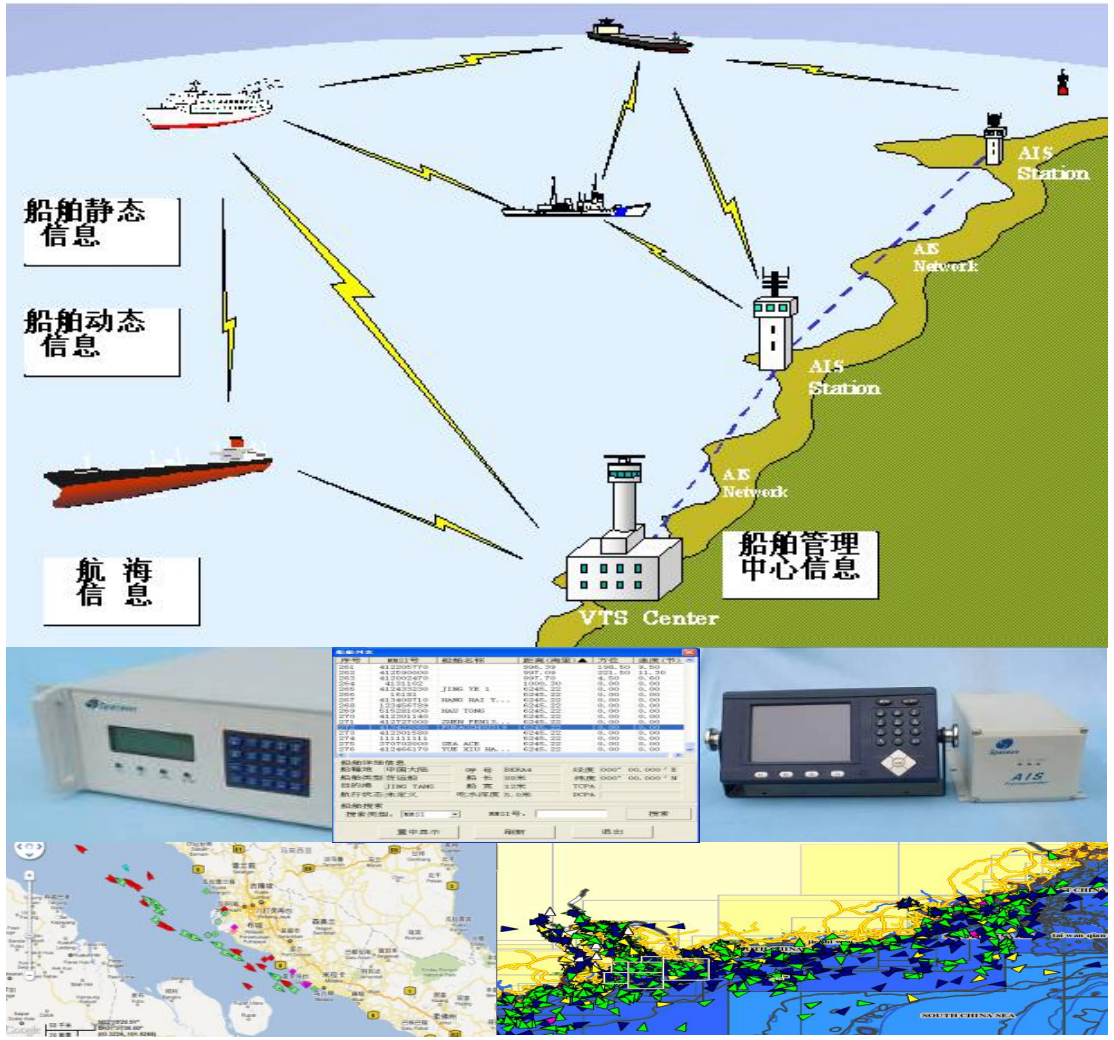
- VTS radar
- AIS base station
- VHF communication
- VHF DF
- CCTV
- Hydro/meteorology sensor
- VTC center

VTS Radar

■ **Technical Features**

- Frequency: X band
- Solid-state transmitter
- Coherent and advanced digital signal processing
- Operate under all weather conditions
- Detection range ≥ 24nm
- Azimuth coverage: 0°～360°
- Accuracy: 15m(Range)/0.5°(Azimuth)
- Resolution: 15m(Range)/ 0.5°(Azimuth)
- Peak transmit power: 100W
- Working wind speed ≤ 45m/s
- MTBF ≥3500h
- Meet IALA V128 standard

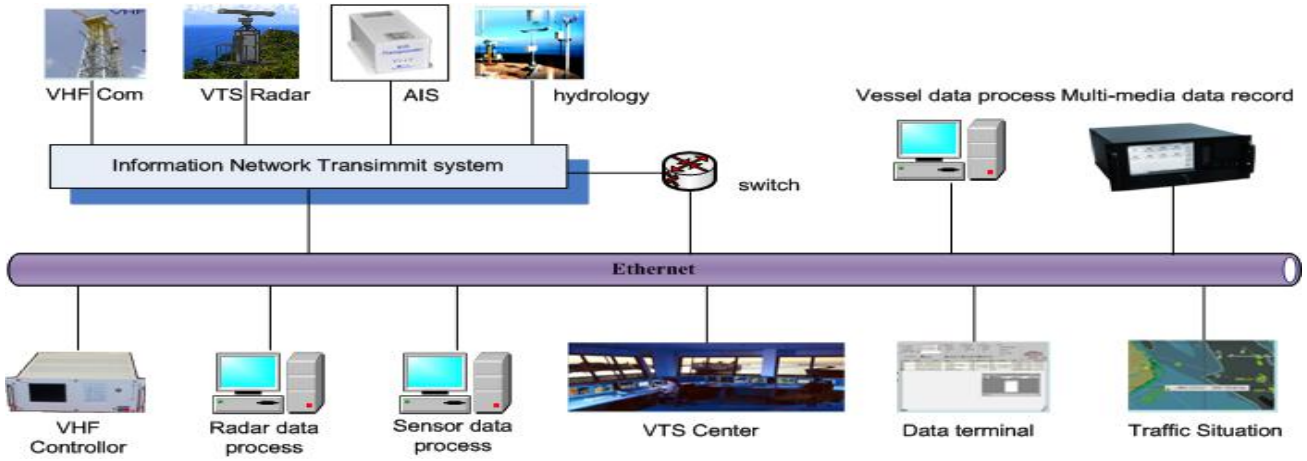
AIS Base Station



■ **Technical Features**

- Automatically receiving the AIS information and uploading the information to the Command and Control Center
- Transfer the command of Maritime Administrative Authority to the ship
- Meeting ITU-R M.1371-3/IEC61162-1/2/IEC61993/IEC60945/IEC62287/IEC62320-1
- Coverage: ≥ 30NM
- Frequency:156.025MHz ~ 162.025MHz
- Working mode: GMSK/FM
- Operation temperature:－15℃～＋55℃

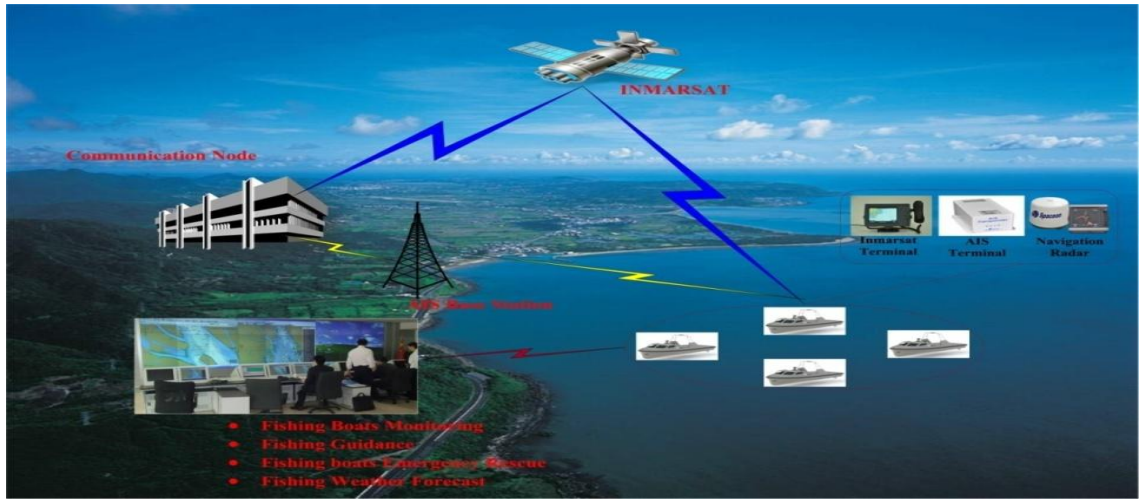
VTS Command and Control System



■ **Main functions**

- Ensure sailing safety in the port region
- Improve sailing efficiency
- Protect port environment
- Protect public infrastructure
- Assist maritime security protection activity
- Promote related activity efficiency

Maritime Electronic Information Technology Application--Fishing Management



■ **Main Missions**

- Fishing boats monitor and control
- Fishing boats emergency rescue
- Public information service
- Hydrology and weather information service

■ **Main Components**

- AIS
- VHF
- Optical Camera
- GPS
- Inmarsat
- ECDIS

Shipborne Inmarst Terminal

■ **Technical Features**

- Transmitting frequency: 1626.5MHz~1660.5MHz
- Receiving frequency: 1525.0MHz~1559.0MHz
- Output power gain: 34.5dBm
- Antenna impedance: 50Ω
- Antenna gain: 2dBi
- Beam width: 160°
- Power voltage: 24V DC
- Stand-by mode consumption: 20W
- Working Temperature:

Inside cabin unit: -15℃~+55℃

Outside cabin unit: -25℃~+55℃

Maritime Electronic Information Technology Application—Search & Rescue system

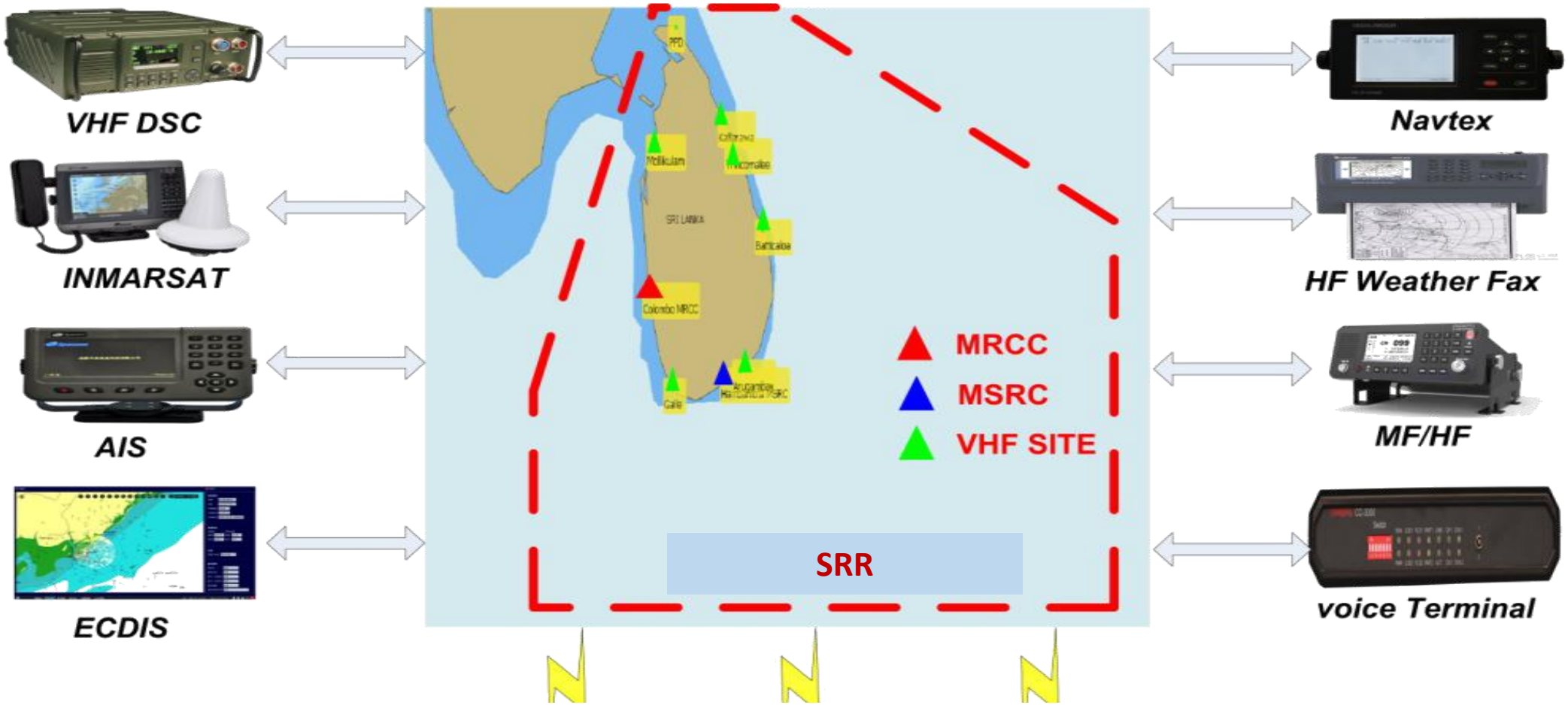
■ **Main Missions**

- Search and rescue
- Disaster detection
- Emergency communication

■ **Implementation**

- Marine search and rescue center
- AIS
- Inmarsat fleet broadband terminal
- Weather fax receiver
- Navtex receiver
- MF/HF transceiver
- ECDIS

Marine Search and Rescue Center



Maritime Electronic Information Technology Application--Metrology System

■ Main Missions

- Maritime hydrological environment monitor
- Maritime disaster early warning
- Maritime hydrological information guarantee
- Maritime Hydro meteorology research

■ Implementation

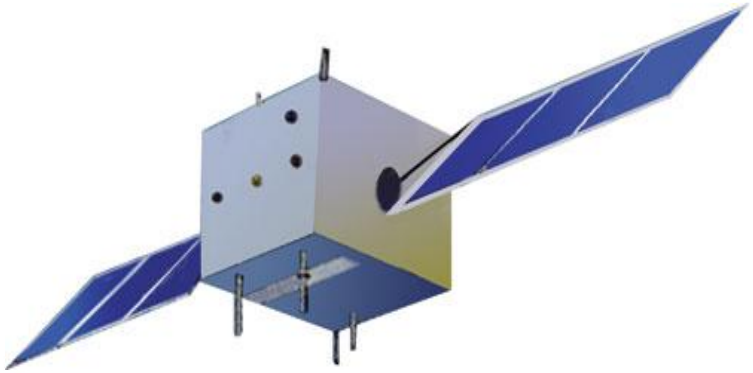
- Meteorological satellite reception station
- Shore-based station (including tide station)
- anchorage buoy/subsurface buoy
- HF ground wave radar
- Vessel

Meteorological Satellite Receipt Station

- **Maritime meteorological detection**
  - cloud detection
  - atmospheric perceptible water
  - cloud-top temperature
  - cloud height
  - ocean color
  - ocean surface temperature
- **Maritime dynamic environment detection**
- **Ocean surface monitoring**, including ocean wind field, ocean surface height, wave height, ocean surface temperature ocean wind and wave field, storm surge inundation, internal wave, oil spilling
- 1650MHz ～1720MHz(L band)/ 7950MHz ～8950MHz(X band)
- Data receiving code rate: 0.5Mbps～150Mbps
- Data storage capability ≥50TB

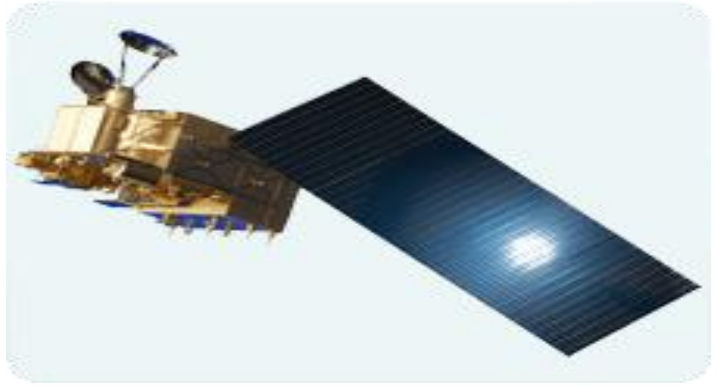
Available Meteorological Satellite Resource

NOAA Satellite

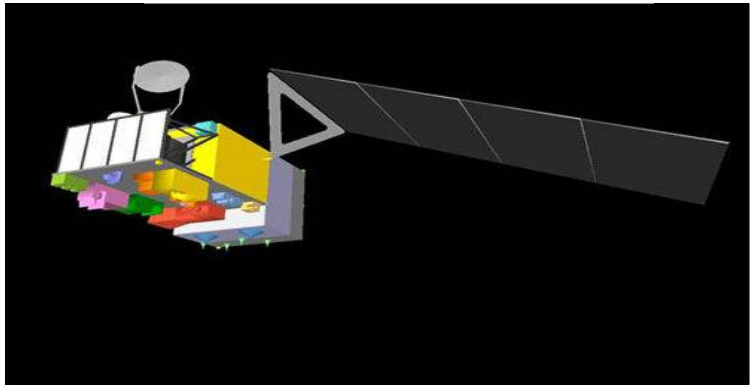


HY-1 Satellite

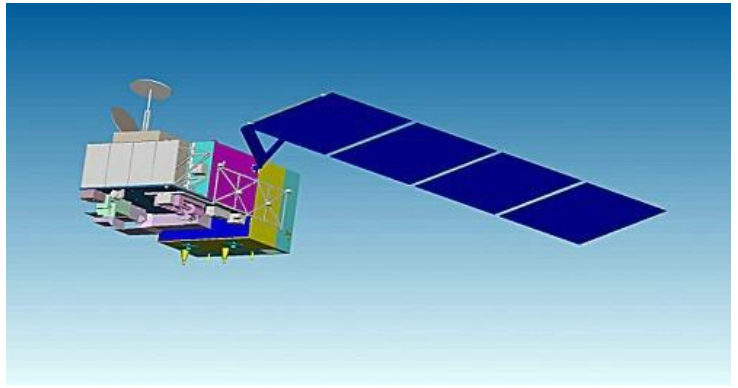
HY-2 Satellite



FY-1 Satellite

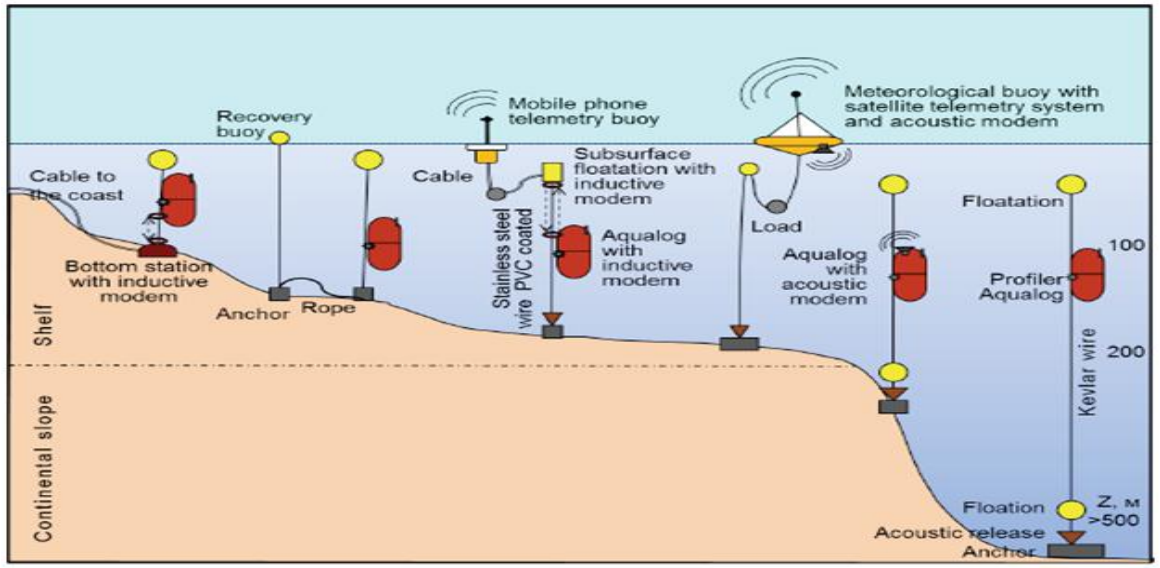


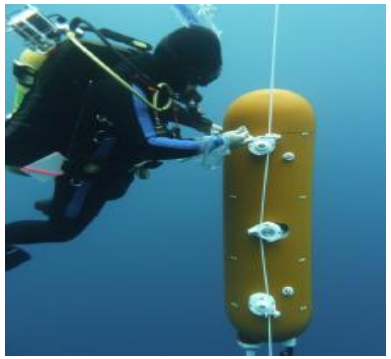
FY-2 Satellite



FY-3 Satellite

Anchorage Buoy/Subsurface Buoy





- **Maritime meteorological and hydrology monitor**
  - wind speed
  - wind direction
  - humidity
  - air pressure
  - surface temperature
  - Salinity
  - section temperature
  - salinity
  - current profiler
  - …
- **Layout depth: 0~2000m**

Shore-based Station

- Detecting tide
- Configured with multiple detectors
- Detecting multiple maritime hydrology element, including sound, light, temperature, density and dynamics

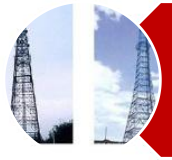
Fixed Monitoring Vessel

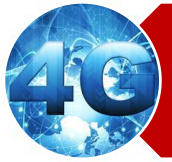
- Standardized water quality sampling at fixed time, date and quantity
- Movable on-line water quality monitor
- Drawing water quality space distribution map
- Rapidly locking on pollution source location
- Terrain mapping and channel survey

Maritime Electronic Information Technology Application--Communication System


SATCOM


Tropo. Comm.


MW, HF, VHF



LTE


Optical Comm.

Comm. System

- Comm. network is constructed according to application scene and distance;
- Giving full play to multiple comm. means and scientifically planning;
- Comm. system is featured by advancement, expandability and maintainability.

Maritime Electronic Information Technology Application--Communication System

Tropo Comm.

- Remote comm in area with poor infrastructure
- Maximum transmission capacity 34mbps
- Hundreds of kilometers transmission distance

MW Comm.

- LOS communication
- Supporting link or star networking
- Information transmission between fixed sensors and centers

Optical Comm.

- Wired connection within island or along the coast
- wideband channel for offshore sensor or terminals
- Submarine optical cable

SATCOM

- Wireless transmission within remote-distance
- Vessels, terminal in complicated terrain and upper command post communication

Radio Comm.

- VHF for internal comm among vessel and voice/data comm between port and vessels
- HF for long-distance emergency connection

Mobile Wideband Access

- Daily wideband wireless access within shore or island and provides comm.
- Service for coasting vessel, public network access, cruise and reconnaissance

Maritime Electronic Information Technology Application--Communication System

Tropo. Comm.

SATCOM

HF/VHF Comm.

MW Comm.

Wired Comm.

LTE

Case Study-- Coast Surveillance System in X Country

- Multi Level Surveillance Structure, Early-warning, and Real Time monitoring
- Integrated Command Control & Communication
- Intelligence Sharing among key stakeholders

Case Study-- Coast Surveillance Solution in X Country

Command & Control

- Fixed & Mobile Command & Control System

Surveillance Systems

- Thermal Optical Imaging Video Surveillance System
- Radar Surveillance System

Communication Systems

- Secure Terrestrial Wireless, Wired and Satellite Communication Systems
- Trunk Radio Communication System

Unmanned Aerial System

- Unmanned Aerial Vehicle (UAV)

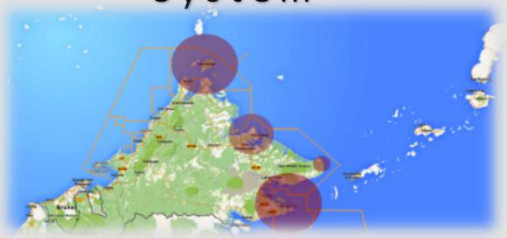
Supporting Systems

- Biometric System
- Portable Drug Detector
- Metal Detector
- Portable Liquid Detector
- Portable Explosive Detector
- HAZMAT System

Case Study-- Coast Surveillance Solution in X Country

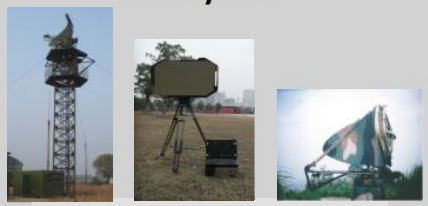
CETC 中国电科

Coast Surveillance System



Electro & Thermal Optical Imaging Surveillance System

Radar System



Unmanned Aerial System

Unmanned Aerial Vehicle

Command & Control System

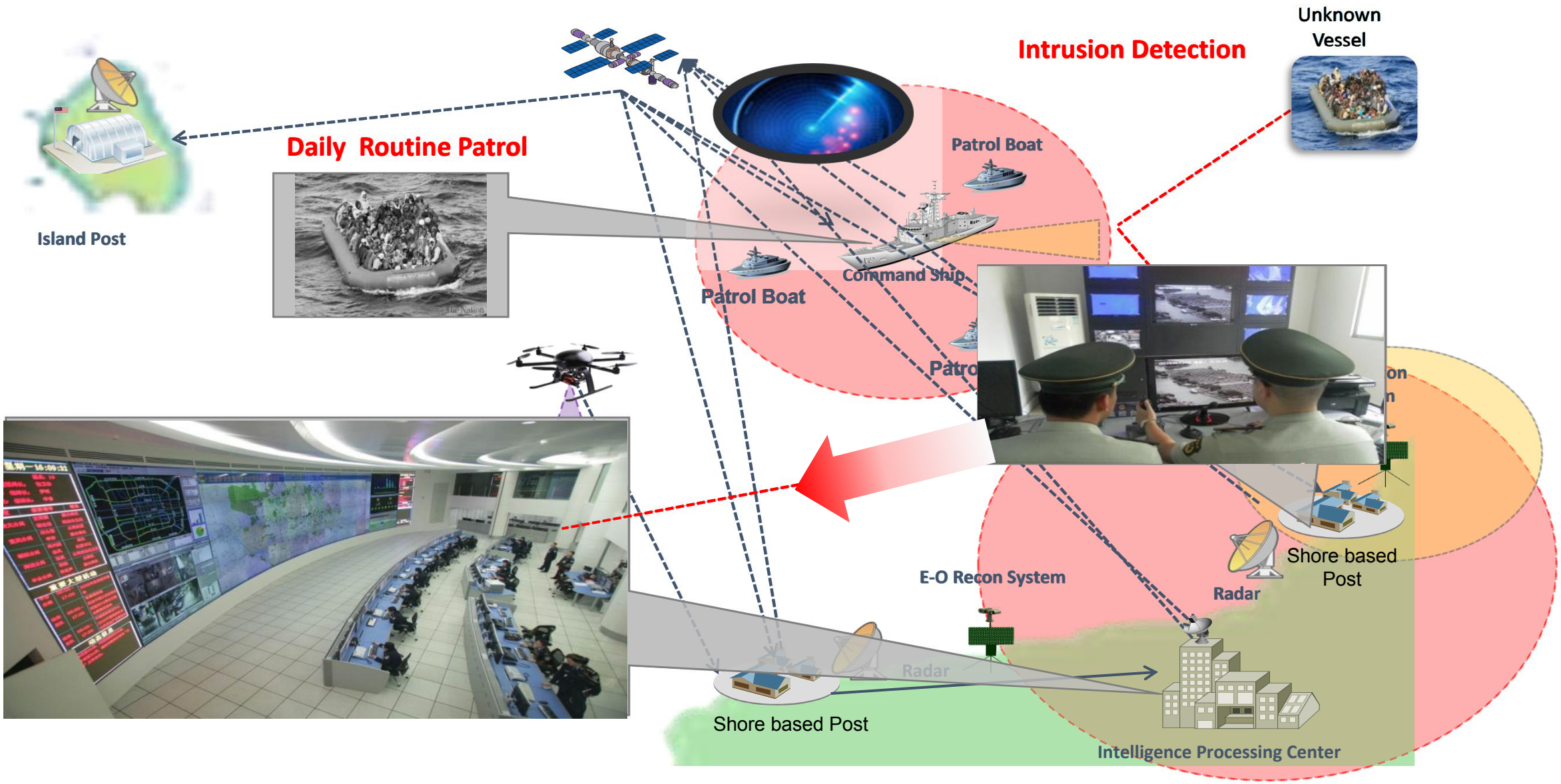
Communication System

Supporting System

- GIS
- Internal Management System
- Communication Network
- Biometric System
- Portable Drug Detector
- Metal Detector
- Portable Liquid Detector
- Portable Explosive Detector
- HAZMAT System

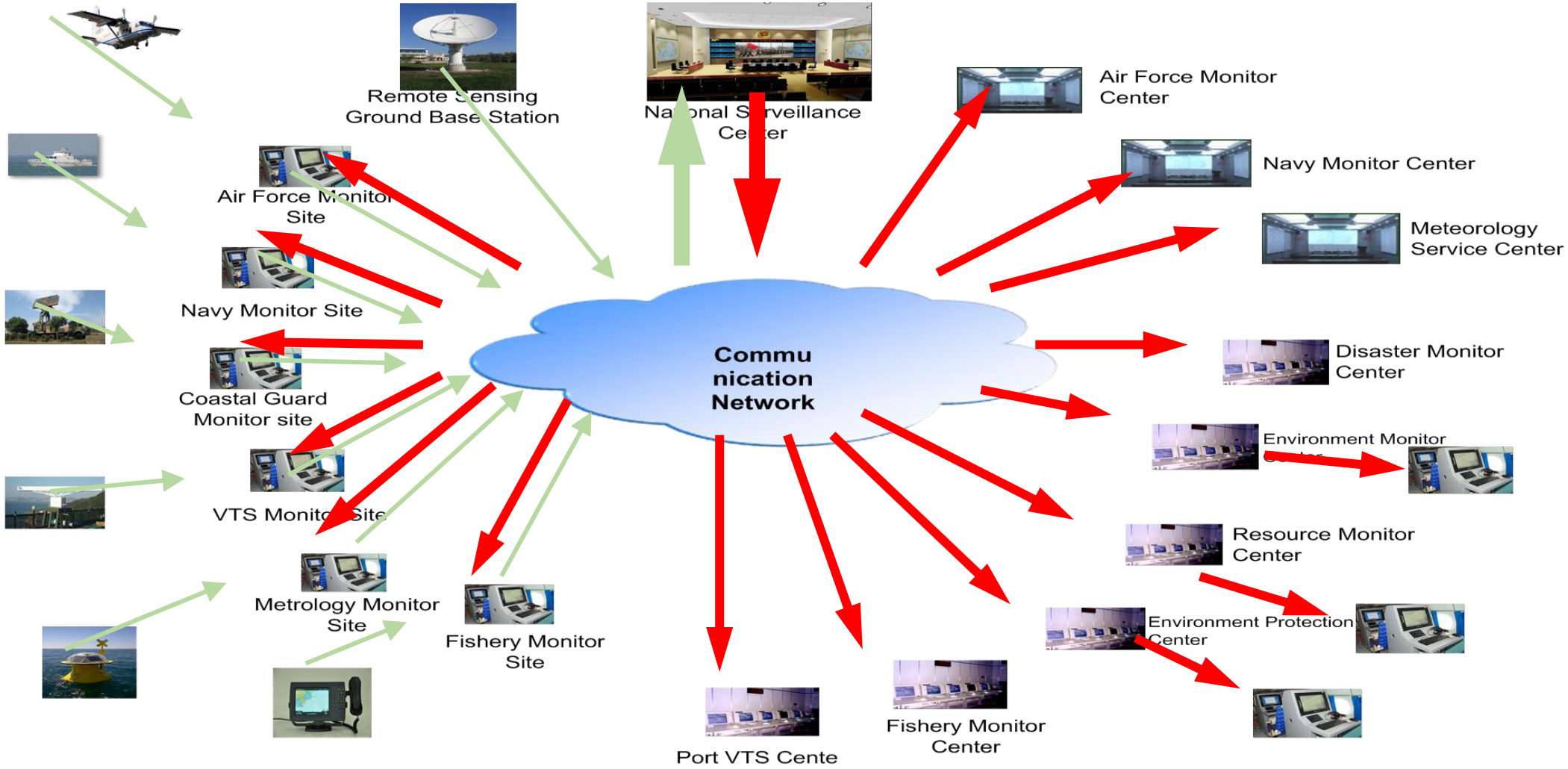
Case Study-- Coast Surveillance Solution in X Country

CETC 中国电科



Case Study– Integrated Maritime Surveillance System in X Country

Integrate all maritime management subjects and share information.

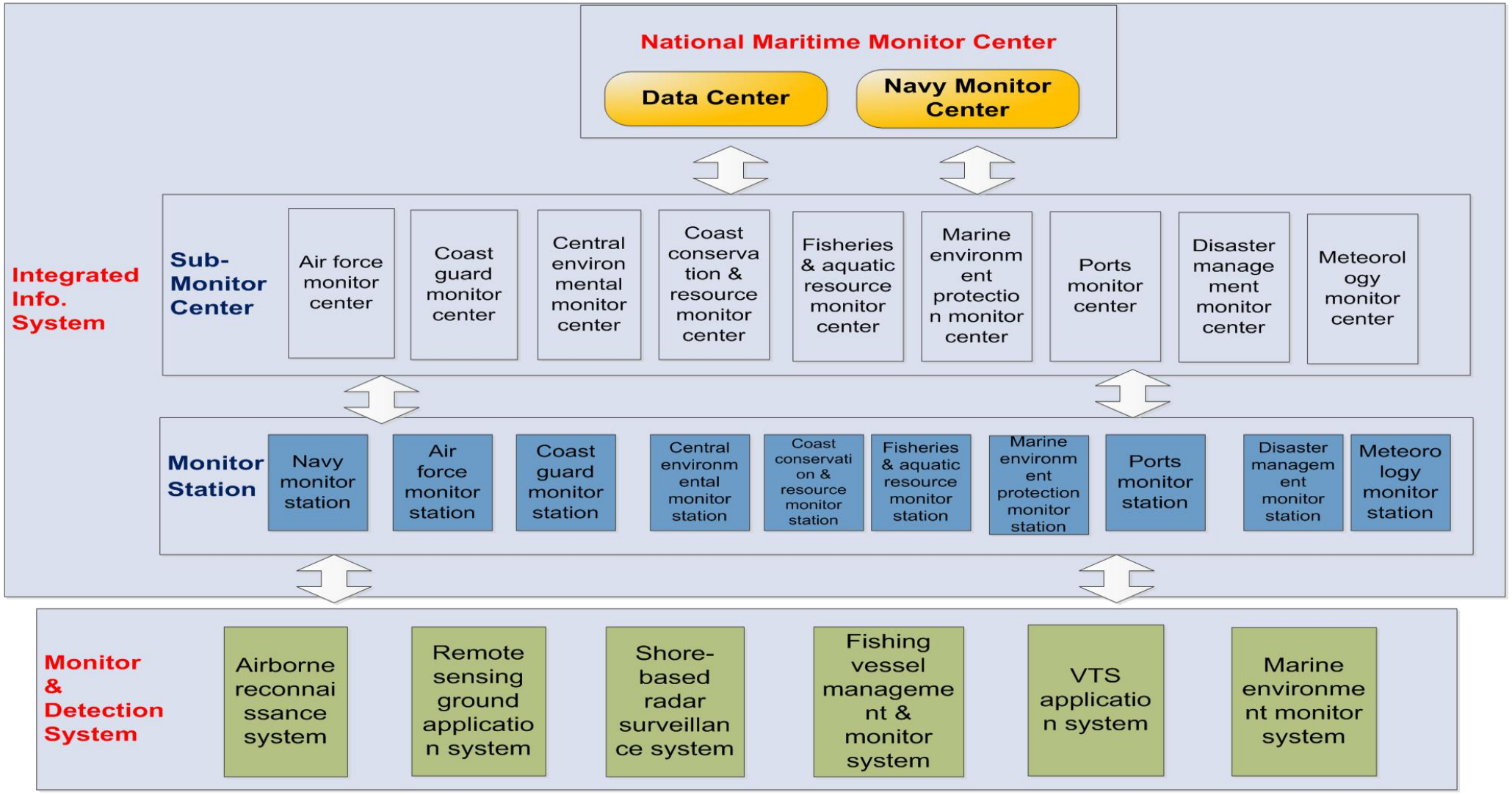


Information Flow

Case Study– Integrated Maritime Surveillance System in X Country

CETC 中国电科

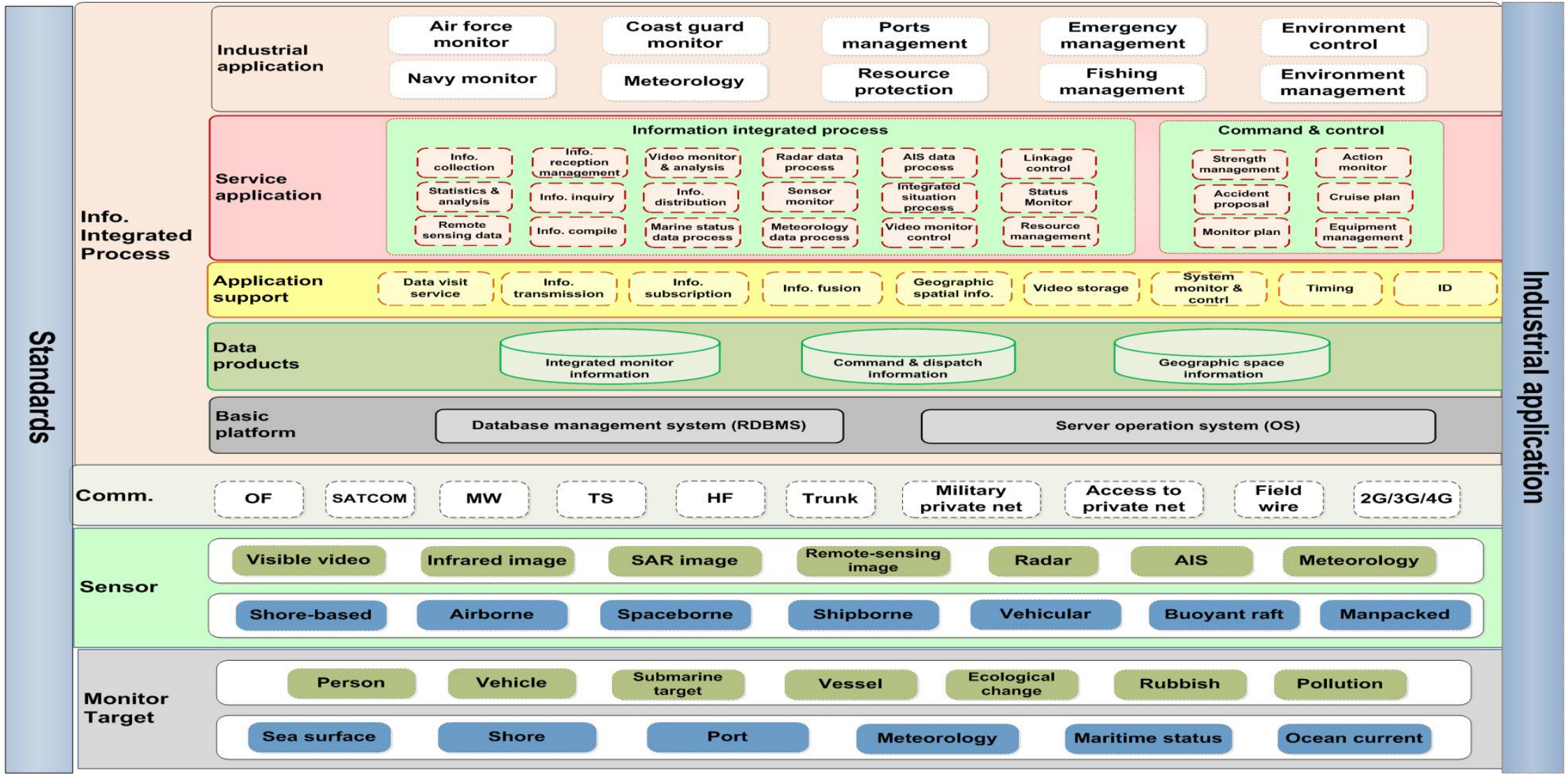
System Framework



Case Study– Integrated Maritime Surveillance System in X Country

CETC 中国电科

Technical Structure



Case Study– Integrated Maritime Surveillance System in X Country

- Remove barriers between departments
- Information exchange between public authorities:
  - Defense
  - Law enforcement
  - Environment
  - Pollution prevention
  - Fisheries
  - Transportation
  - Border control
- Get useful information in real time;
- Low cost and more effective maritime management

Thank you!