



*Overview of optical and
wireless communication
R&D in the 863 Program*

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The background features a dark blue field with several large, semi-transparent gears of various shades of blue. On the left side, there is a vertical strip with a colorful, abstract, and somewhat pixelated texture in shades of orange, yellow, and brown.

The National High Technology Research and Development Program

- ✦ Launched in March 1986 (863 Program)
- ✦ Aimed at enhancing China's international competitiveness and improving China's overall capability of R&D in high technology
- ✦ Covers 20 subject topics selected from eight priority areas

Priority areas

- ✦ Information technology
- ✦ Biological & advanced agricultural technology
- ✦ Advanced materials
- ✦ Advanced manufacturing & automation technology
- ✦ Energy technology
- ✦ Resource & environmental technology
- ✦ Space Technology
- ✦ Laser technology

Information technology sub-areas

- ✦ Computer software & hardware technology
- ✦ Communication technology
- ✦ Information acquisition and processing technology
- ✦ Information security technology



communication technology

- ✦ New generation information network
- ✦ Optical communication technology
- ✦ Personal communication technology



New generation information network

New generation network structure, new generation internet and new generation soft switch key technology



Optical communication technology

O-TIME (Optical Technology for IP with Multi-wavelength Environment) Project:

Establishment of new generation optical network demonstration system, providing high speed, broadband, agile, high efficiency and intelligent physical platform, laying a sound foundation for the realization of next generation optical network in China

O-TIME Project

- ★ WDM(Wavelength Division Multiplex)super long distance optical transmission technique
- ★ 1 Gbit/s ethernet based wide band passive optical network system
- ★ 10 Gbit/s very short distance parallel optical transmission model and experimental system
- ★ Fibre PMD(Polarization Mode Dispersion) compensation technique
- ★ Automous switch optical network

WDM super long distance optical transmission technique

- ✦ Research & realisation of big capacity super long distance optical transmission system
- ✦ Optimization & realisation of multi-wavelength pump photosource
- ✦ Research & realisation of RFA (Raman Fibre Amplifier)
- ✦ Reduction of RFA noise
- ✦ Cascade technology of RFA and EDFA

1 Gbit/s ethernet based wide band passive optical network system

- ★ Standardization and norm of EPON (Ethernet Passive Optical Network)
- ★ Research of EPON upstream realization technique
- ★ Framing and realization of ethernet on PON
- ★ Dynamic EPON bandwidth distribution algorithm
- ★ EPON management function and realization
- ★ Solution of high quality/price EPON

10 Gbit/s very short distance parallel optical transmission model and experimental system

- ✦ Research for VSR application reference model and standard
- ✦ Research for parallel light emission and reception
- ✦ Research for chips for parallel interface adaptor conversion
- ✦ Realization of low price and miniaturization of key opto-electronic devices

Fibre PMD compensation technique

- ✦ PMD measurement method
- ✦ PMD simulator realization
- ✦ PMD automatic tracking compensation mechanism and realization
- ✦ PMD compensation mechanism and realization
- ✦ PMD compensation in WDM system

Autonomous switch optical network

- ✦ ASON networking structure model
- ✦ Optical network protocol
- ✦ dynamic wavelength routing and link type
- ✦ Automatic topology discovery and resource allocation

Personal communication technology

FuTURE (Future Technology for Universal Radio Environment) Project:

Establishment of an integrated universal wireless environment composed of a regional communication (including WLAN\HAN\VAN\PAN), new generation cell mobile communication(B3G) and high attitude communication platform, supporting man-machine interaction, machine-machine interaction, automatic and autonomous future multimedia business, with transmission rate up to 20Mbps、100Mbps and 1Gbps.

FuTURE Project

- ★ New generation cell mobile communication system wireless transmission link technique
- ★ Multi-antenna and distributed wireless communication technique
- ★ Wireless mobile self-structure internet technique and experimental system

Phase 1

Key technologies for air interface of beyond 3G system was researched and demo systems for verification of the key technologies developed; demonstration of various future wireless services on the demo system carried out; some corresponding proposals submitted to ITU.

Phase 2

Key technologies for air interface of beyond 3G system has become mature. Research on systematic technologies (including technologies on the inter-connectivity with Ad hoc networks, nomadic wireless access network, etc.) was carried on; field trial of the demo system with ability to bear beyond 3G services inter-connected with other external networks was carried out; preliminary standardization documentation draft for beyond 3G systems submitted to ITU.

Phase 3

The structure standardization research of universal radio environment and their corresponding practical application research has been implemented. Large-scale field trial was launched and the prototype system for commercialisation implemented.



FuTURE

International cooperation

FuTURE expert group has organized specialists both home and abroad to carry out research for the B3G system, network structure, and operational demands. It has also organized macro research for the development strategy and technological demands of B3G technology.



Thanks !

