

**WEATHER – CLIMATE – WATER**



**WMO**

**WMO Information System**

**WIS**

**WMO  
OMM**

# Current situation

**Information exchange**  
**Multiplicity of procedures**  
**real-time and non-real time**

**Information management**  
**Multiplicity of data formats,**  
**uncoordinated metadata and catalogues**

5 GAW World Data Centres

GCOS Data Centres

Global Run-off Data Centre



IRI and other climate research institutes

Universities

Regional Climate Centres



International Organizations  
 (IAEA, CTBTO, UNEP,  
 FAO, ...)



World Radiation Centre



Regional Instrument  
 Centres

WMO World Data  
 Centres



Other centres

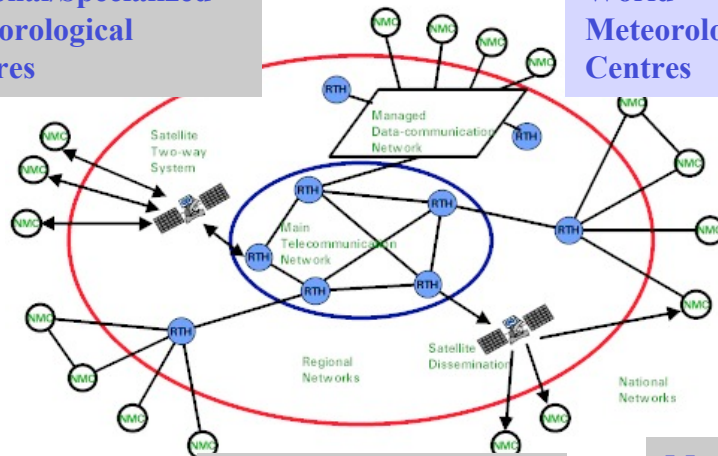
Commercial Service  
 Providers



## WWW GLOBAL TELECOMMUNICATIONS SYSTEM

Regional/Specialized  
 Meteorological  
 Centres

World  
 Meteorological  
 Centres



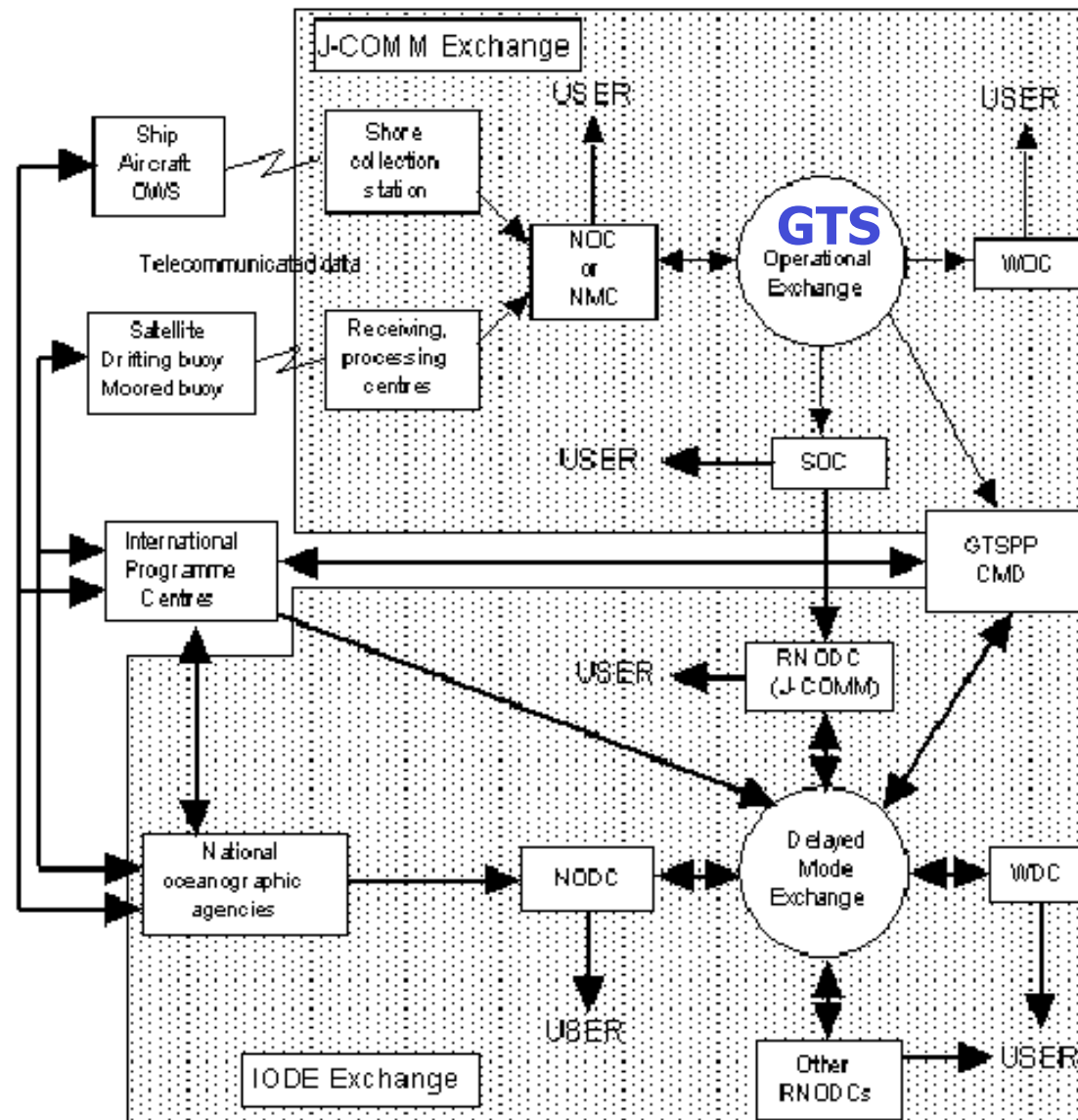
National Meteorological  
 Centres

Meteorological and R&D Satellite  
 Operators Centres

INTERNET



# But encouraging examples of inter-operability



**JCOMM/IODE DATA FLOW**

# Cg-XIV (2003):

The multiplicity of systems of the different Programmes causes incompatibilities, inefficiencies, duplication of efforts and higher overall costs.

Congress approved the concept of the Future WMO Information System (FWIS), which will provide **a single coordinated global infrastructure** for the collection and sharing of information in support of **all WMO and related international programmes.**

# WIS brings new features and opportunities

- Common to all WMO programmes
- Inter-disciplinary locating, retrieval and exchange of information in real and non-real time
- On-line catalogues using metadata based on ISO 19100 (geographic information standard)
- Industry standards and off-the-shelf hardware and software systems to ensure cost-effectiveness and inter-operability

# Structure of WIS

- National Centres (NC)
- Global Information System Centres (GISC)
- Data Collection and Production Centres (DCPC)
- Data communication networks

## National Centre (NC)

- Exchange information collected or generated in the country with the GISC or DCPC
- Serve as portal for national users and administrate their access to WIS
- Several NCs in a country are possible (not just the NMC)

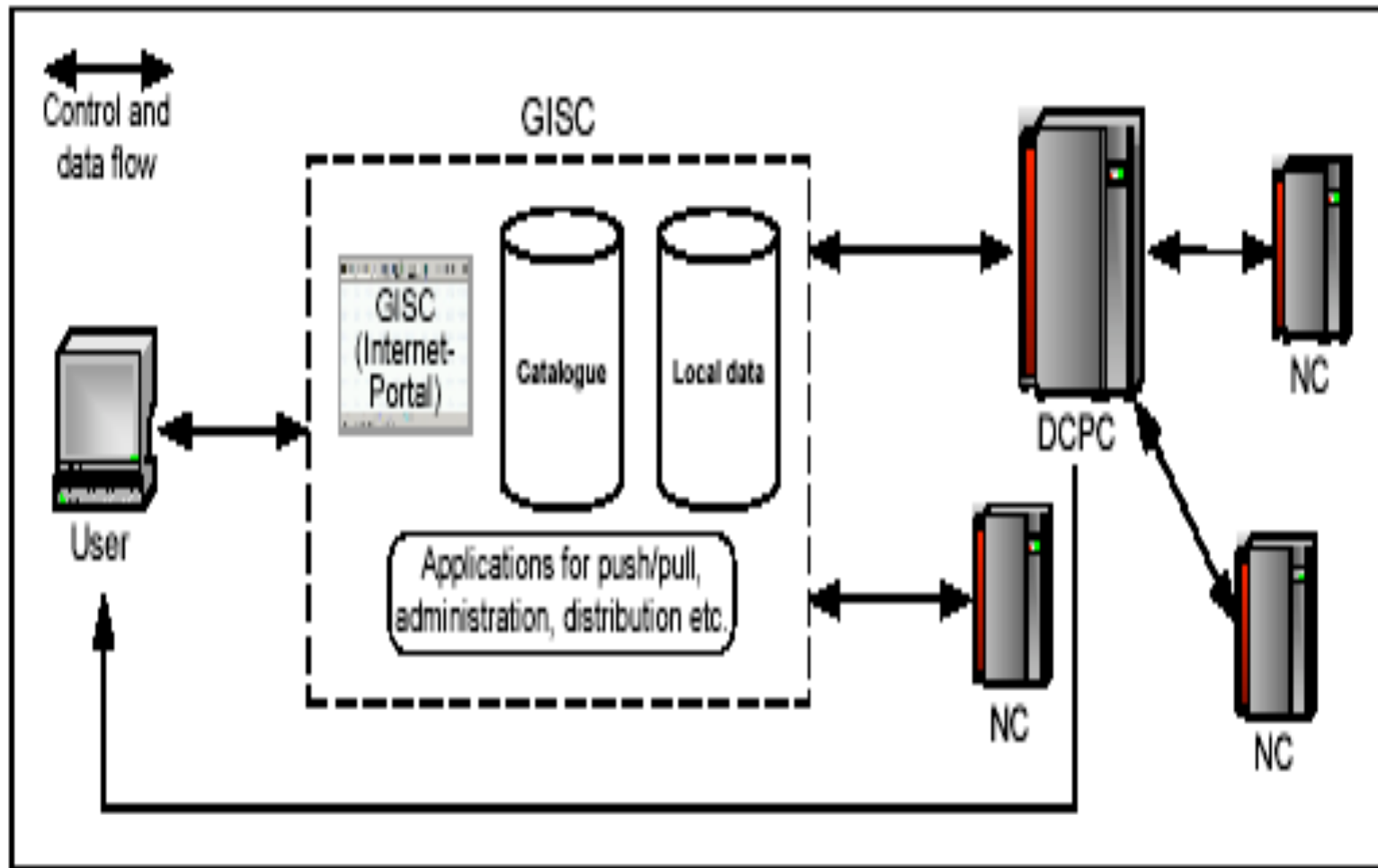
## Data Collection and Production Centre (DCPC)

- Serve as information production facilities in response to stated requirements: Produce regional or specialized data and products
- Facilitate access/exchange from/with NCs and GISCs
- Support information “Push” and “Pull” mechanisms
- Generate, maintain and provide metadata catalogues of their information

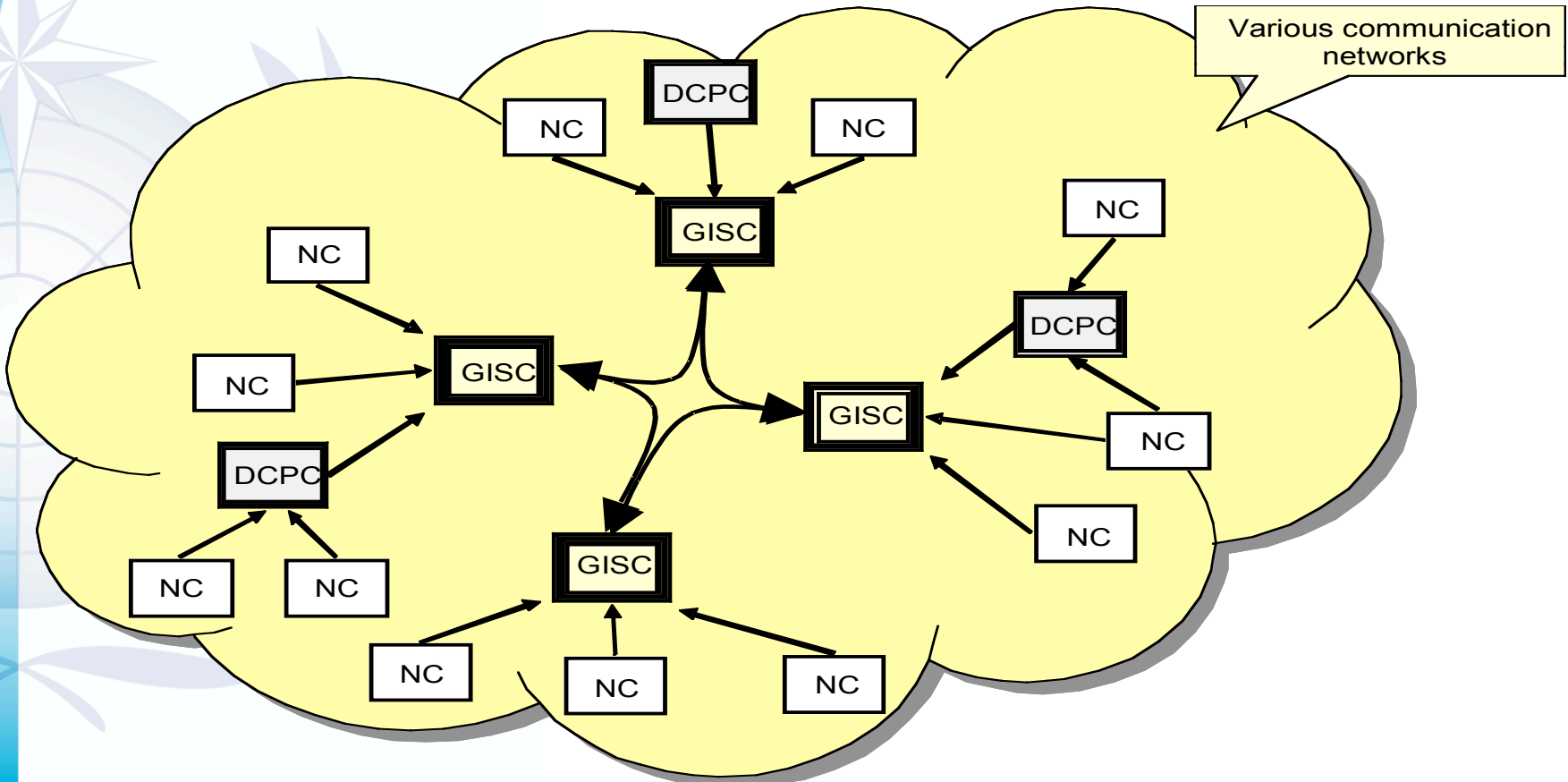
# Global Information System Centre (GISC)

- Receive information from NCs and DCPCs
- Exchange information with other GISCs
- Disseminate, within its area of responsibility, the entire set of data and products for routine global exchange
- Make the set of data and products available via request/reply ("Pull") mechanisms
- Maintain metadata catalogues
- Ensure around-the-clock, reliable and secure operations

# WIS design concept



# Information collection - data flow -



Global Information System Centre

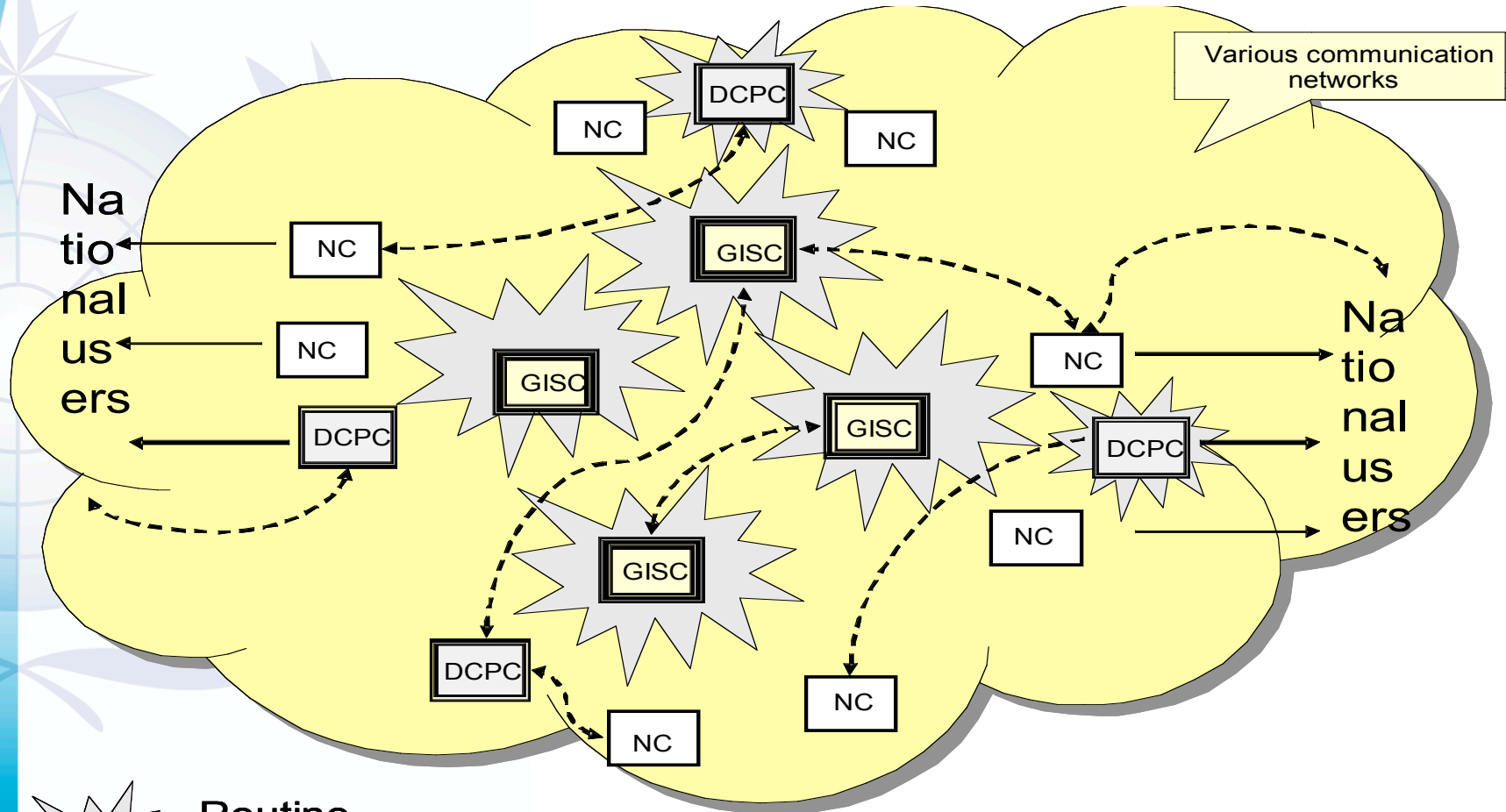


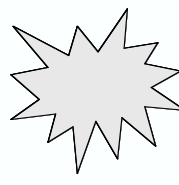
Data Collection or Product Centre



National Centre

# Information distribution - data flow -




 Routine dissemination private network, etc.

 National dissemination  
 Request reply (Internet)

# WIS implementation

- Build upon the most successful components of existing WMO systems and prepare a smooth and coordinated transition
- Map existing WMO Programme centres into the functional WIS centres (e.g. WWW/RSMC <=>DCPC)
- Evaluate functions, technologies and architectures through pilots project and prototype solutions
- Ensure a flexible system structure that can respond to a growth of requirements and to technological progress

# WIS implementation

**Several current pilot projects test and evaluate various functional concepts and architectures and thus spearhead the implementation of WIS**

- RA VI VGISC : Exeter, Offenbach, Toulouse, ECMWF and EUMETSAT are developing a distributed GISC
- EUMETNET - UNIDART: data portal
- RA II & V VPN Project: VPNs via Internet linking NMCs in the Regions
- Roshydromet CliWare project (CCI)
- Cooperation with Earth Sciences Portal, NCAR, DMAC of IOOS...
- WAMIS (CAgM)
- Test and evaluation of WMO Core Metadata standard coordinated by focal points of the TCs

## Main challenges:

- Development of interoperability through active involvement and contribution of all WMO Programmes and Technical Commissions
- Promotion and support of pilot projects and prototype solutions
- Regional and sub-regional development and implementation planning

# Interoperability of Information Systems

- Ability to share information in distributed computing environments, in particular:
  - To find and get information, independent of physical location.
  - To understand and use the discovered information, no matter what platform supports them, whether local or remote.

# The GTS (Global Telecommunication System) towards the FWIS core network

- Expanding bandwidth
- Flexible connectivity
- Saving recurrent costs

- Internet like applications
- Flexible services
- Saving implementation costs and human resources

Use of  
cost-effective  
networks

Migration to  
TCP/IP

Leased circuits

Legacy protocols

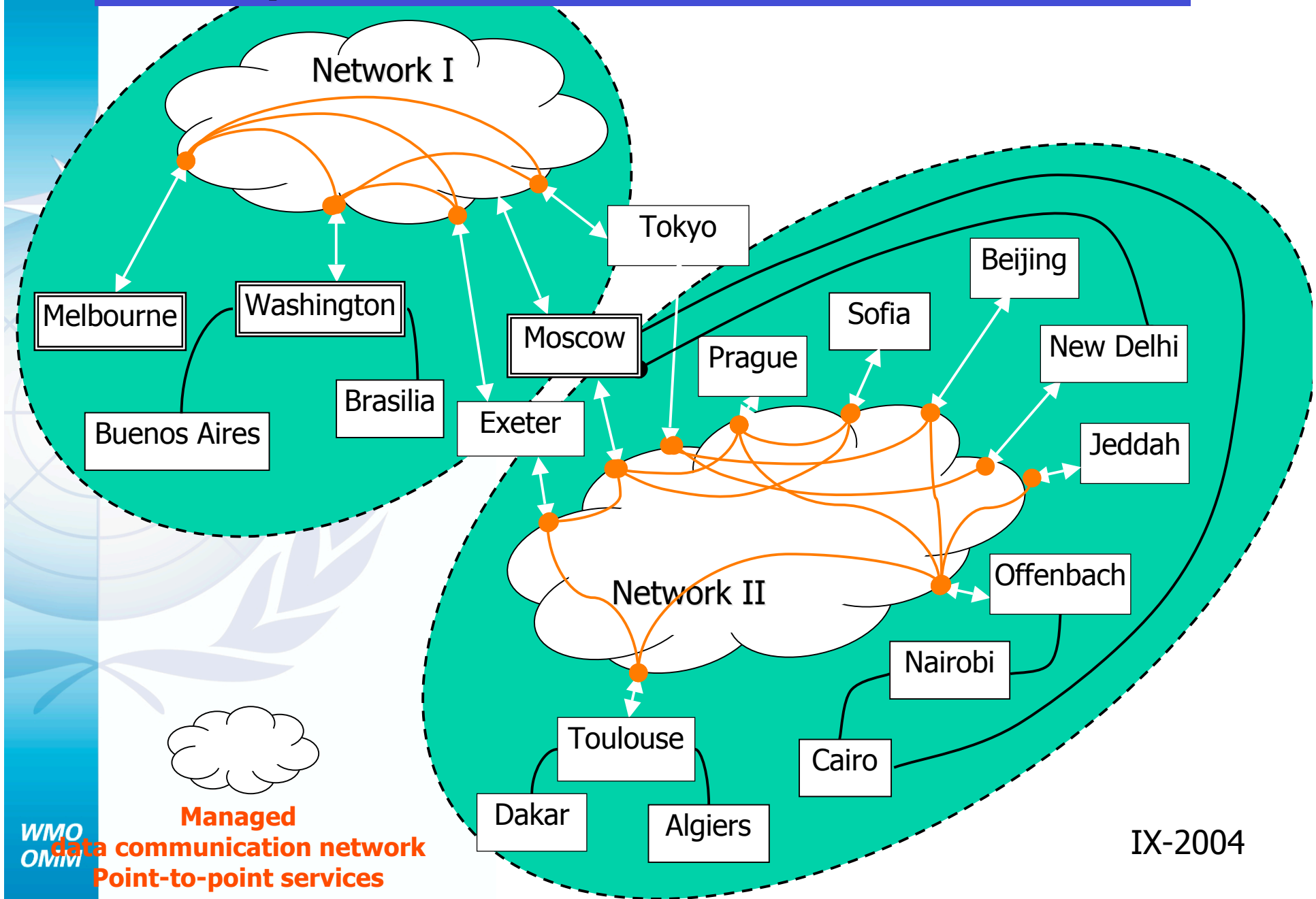
Improved GTS

Strategies

Legacy GTS

Strengthen GTS capabilities  
benefit from technology opportunities

# The Improved Main Telecommunication Network



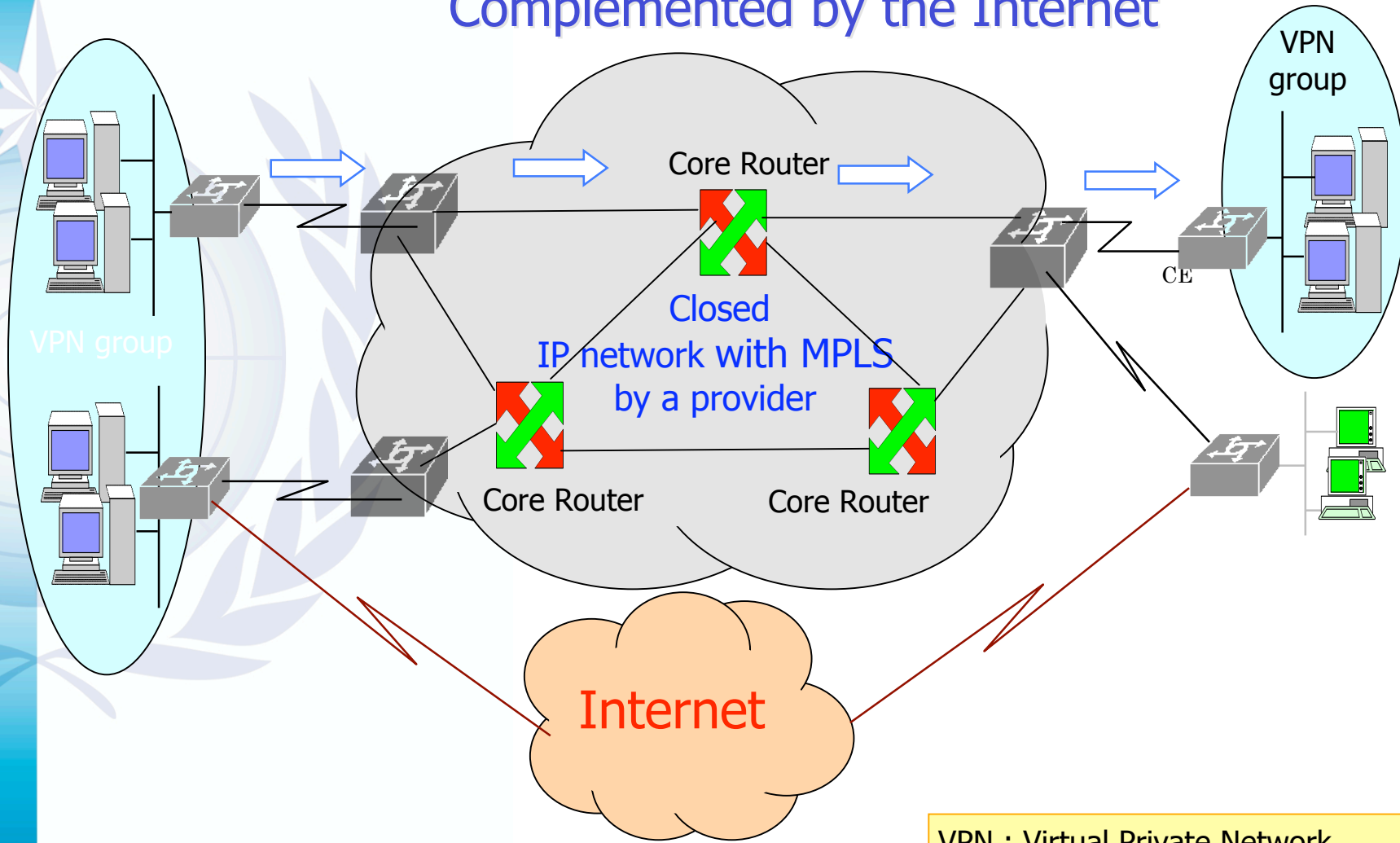
WMO  
OMIM

**Managed**  
data communication network  
Point-to-point services

IX-2004

# Evolution to IP-VPN through provider's network

## Complemented by the Internet



VPN : Virtual Private Network  
MPLS : Multi Protocol Label Switching

# Impact on and benefits for WMO

- WIS concerns only information exchange and data management functions of the WMO Programme and does not affect their data processing components.
- WIS maximizes cross-programme standardization related to data and data connectivity between all applications
- WIS information cataloguing and metadata ensure finding, access and retrieval of all information by each programme
- WIS provides a single entry point for any data request, on a scheduled basis or ad-hoc
- WIS is a cost-effective comprehensive solution for developing countries to actively participate in the WMO Programmes

# Inter-commission Coordination Group on (F)WIS

- Established by EC-LVI as a strong, high-level coordination and collaboration mechanism spanning across the technical commissions and reporting to EC
- Includes TCs' representatives and other ad-hoc experts
- Facilitates sharing of knowledge, resources and commitment to strengthen the WIS development and implementation processes
- EC-LVI emphasized that WIS should be a backbone building block within GEOSS

*Thank you*



WMO  
OMM