

# Internet : Next Steps

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전길남


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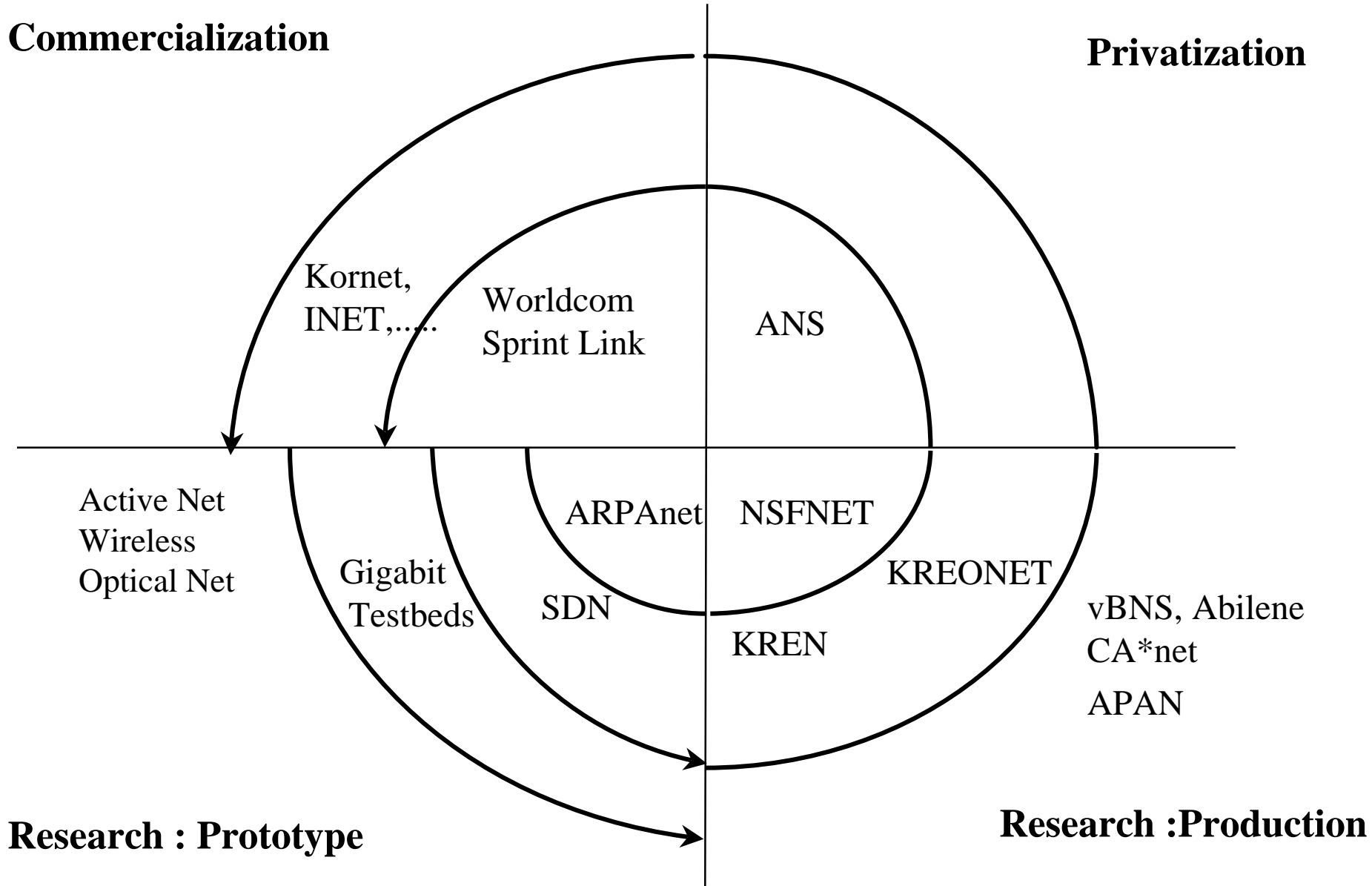
“The Internet will almost certainly have a stronger impact than PC ... a reasonable guess might put it ahead of the telephone and television but behind the printing press.”

The Economist, 1 July 1995

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# 1. Technology Spiral



## 2. Applications

### Basic Service

EMail

File Transfer

Telnet

News

WWW

### Advanced Service

Video

Voice

Transaction

## 3. Current Status

93 Million (Advertised) Computers

Growth Rate: 50 ~60%

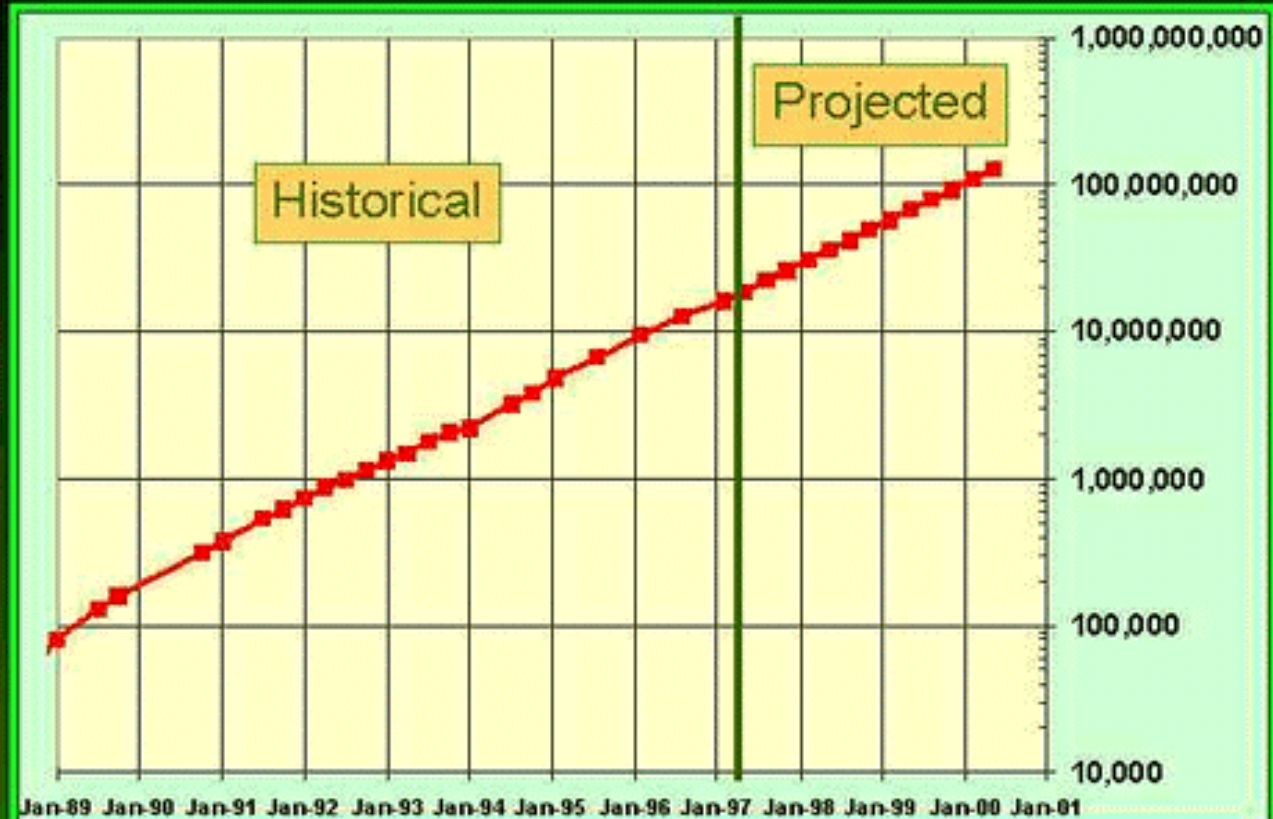
243 Countries

<http://www.nw.com>

( 2000. 7 )

# 3.1 Internet Hosts: Overall Trend

## Internet Hosts - Overall Trend



Source data:  
M. Lottor  
Network Wizards  
<[www.nw.com](http://www.nw.com)>

# 4. Problems of Current Internet

## Too Slow

It takes too much time to browse web and download files.

## Poor Multimedia Handling

Video and audio do not work well on the Internet.

## Too Expensive

Domestic and International links

## Poor Security

Need better security for network and application

## Limited Scalability

Need to be ready for billion users

## Too Fast Traffic Growth

Double Every 100 Days (USA)



# 5. Recent Technology Development

## High Performance Networking

networks with quality of service

## New Protocols

quality of service

multicast

IPv6

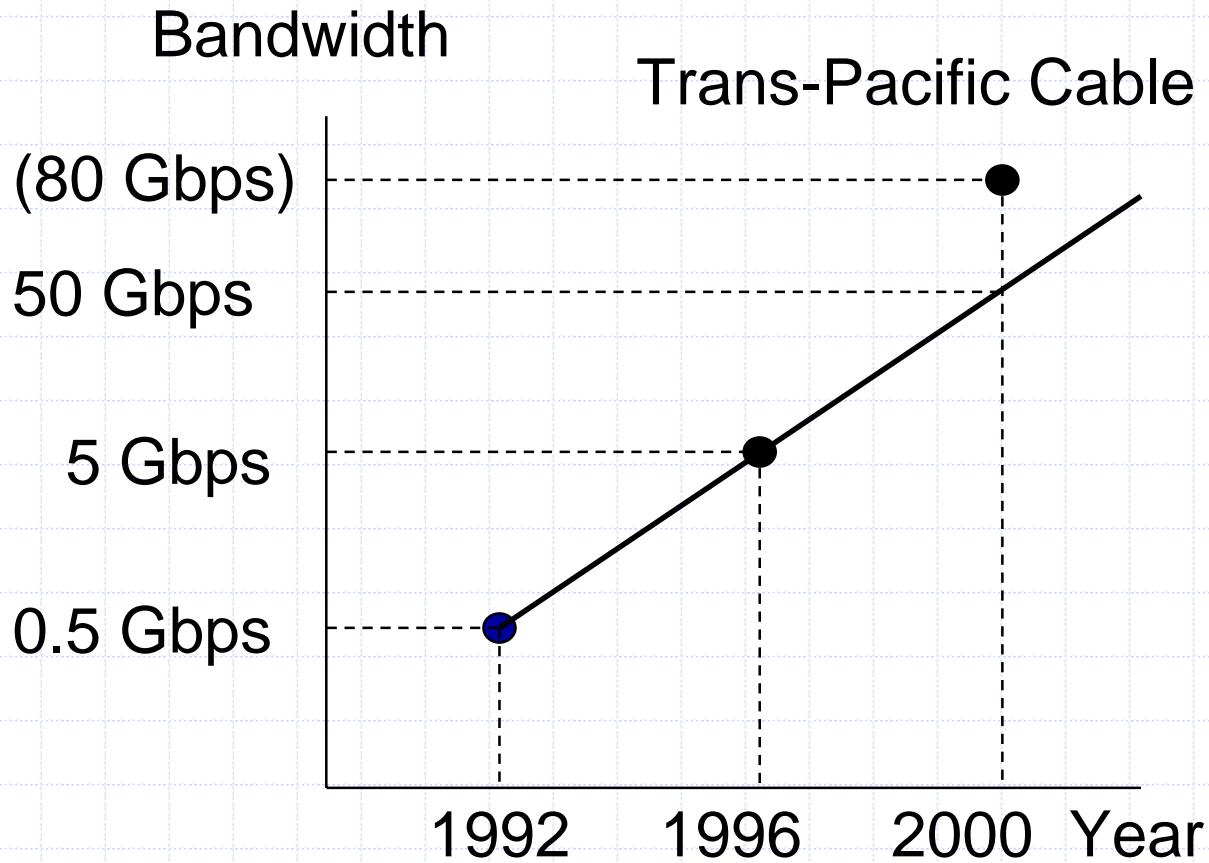
## New Application Technology

multimedia handling

cache/replication

secure transaction

# 6. Bandwidth Growth and Usage



# 7. User Requirement

Research Community : high performance

Education Community :scalability, low cost

Home : video/audio, ease of use

Company : intranet support

Commercial : secure and reliable transaction

# 8. Research Network

N. America: Internet 2 (vBNS, Abilene)

Supernet /Next Generation Internet Program

CA\*NET 3/ CA\*NET 4

Europe: TEN-155/GEANT

national networks

Asia-Pacific: Asia-Pacific Advanced Network(APAN)

national networks

# 8.1 Research Network - USA

vBNS : ATM-based

Abilene : SONET-based

Internet 2 : Private initiative for universities

Next Generation Internet : Federal government initiative

Exchange Points : STAR TAP

GigaPoP

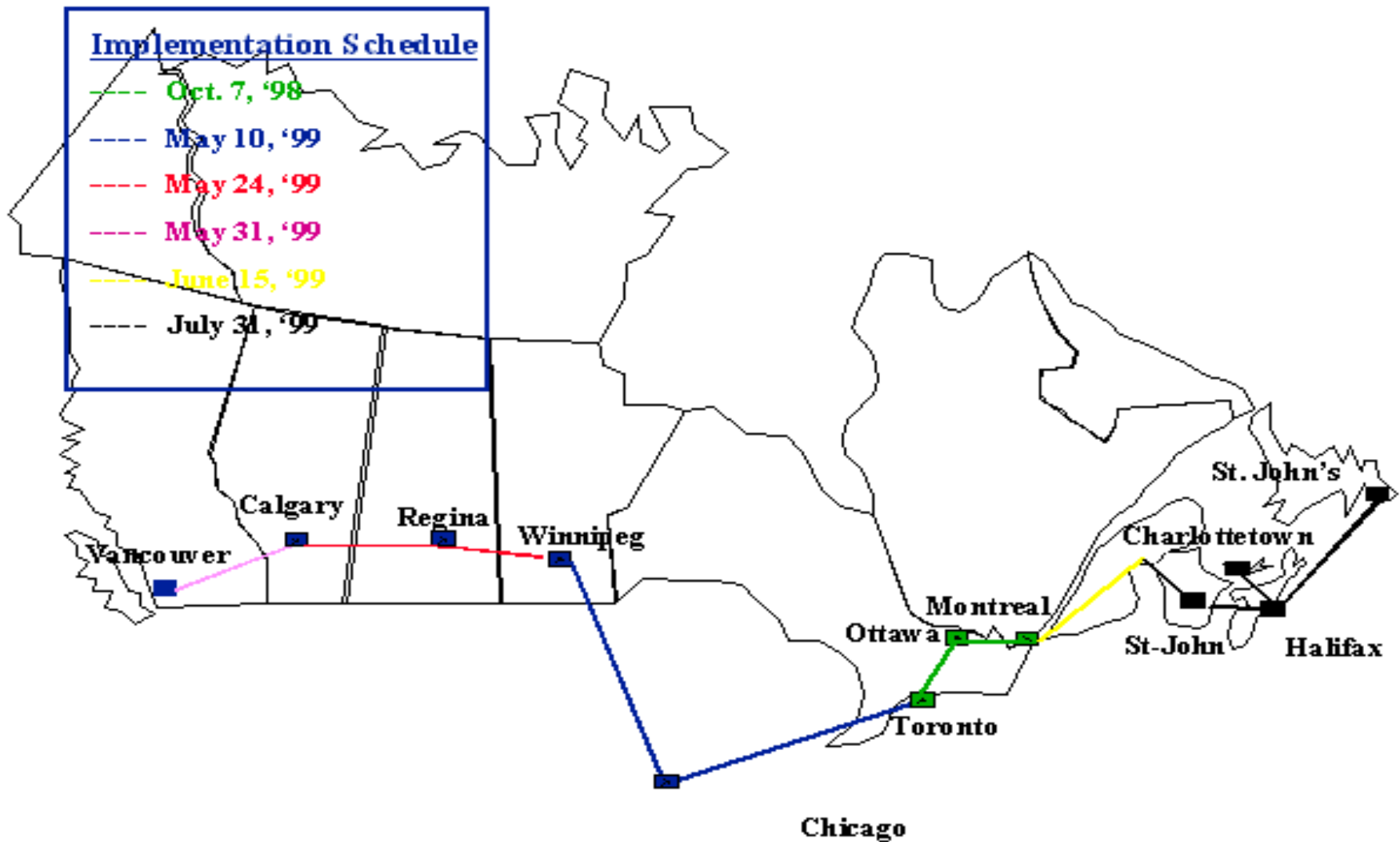
Mission-oriented research networks(Esnet, NREN,DREN)

Supernet

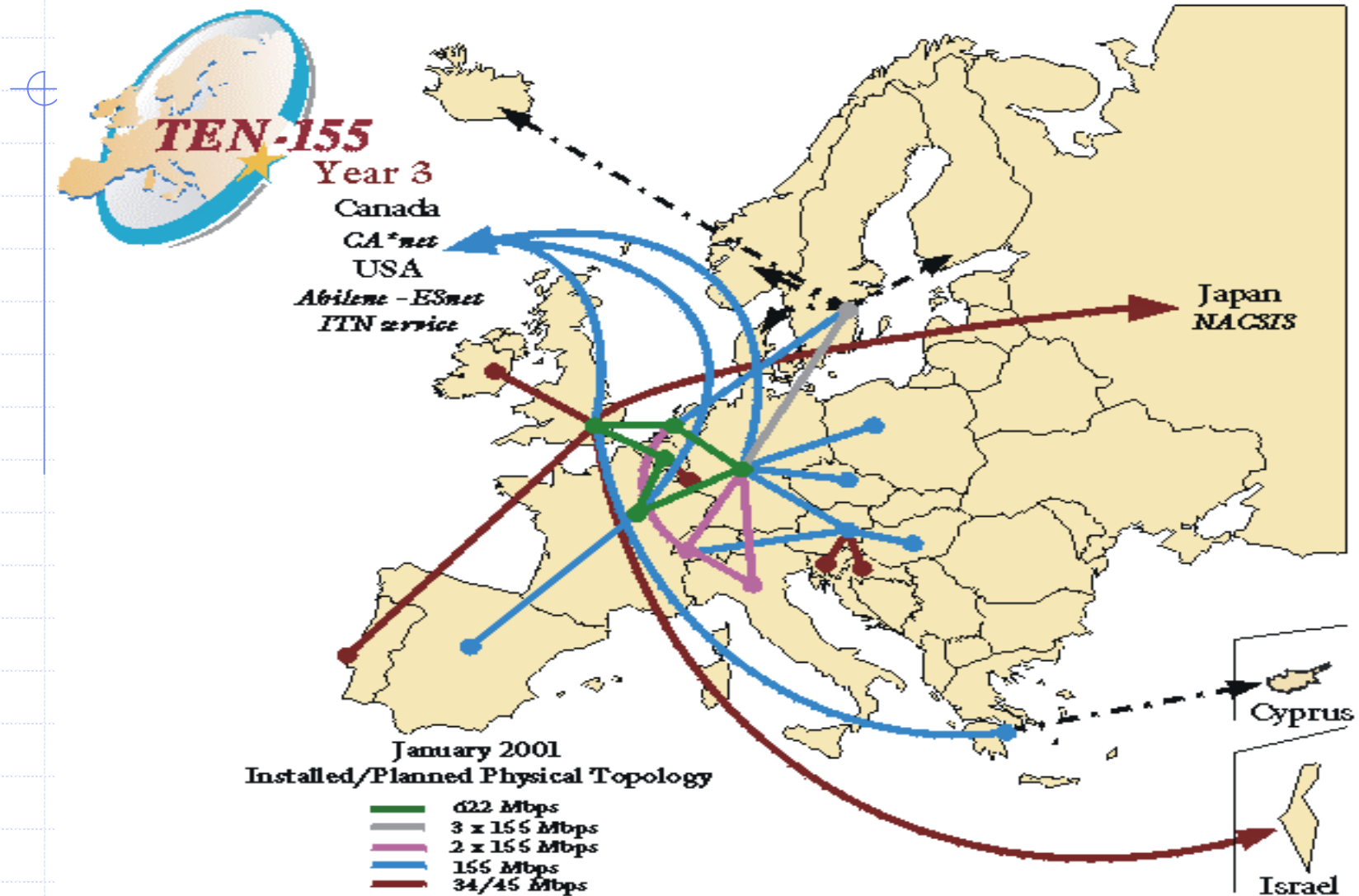
# 8.2 Research Network – Canada

(CA\*net3, CA\*net4)

## CA\*net 3 Implementation Schedule

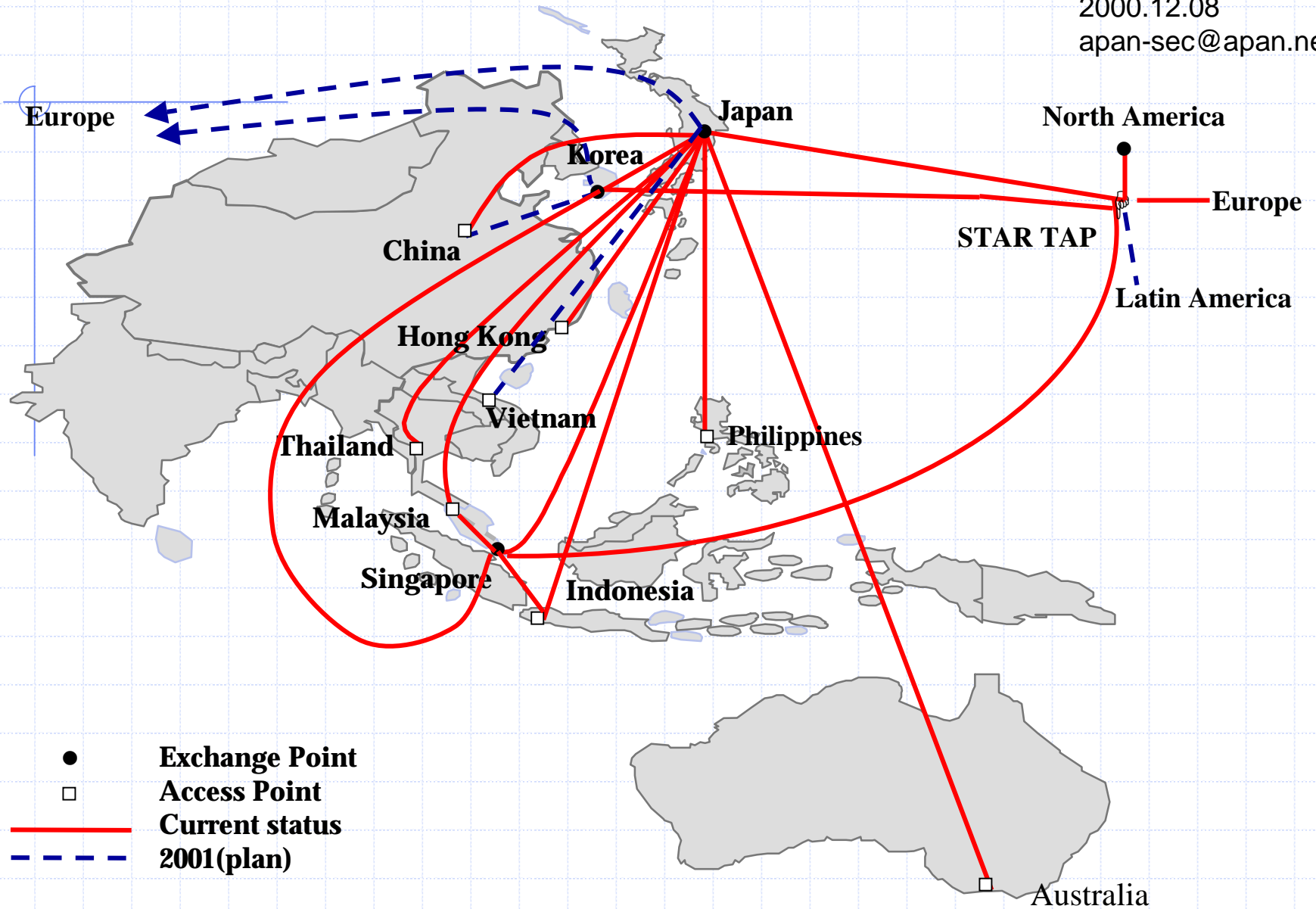


## 8.3 Research Network - Europe(TEN-155,GEANT)



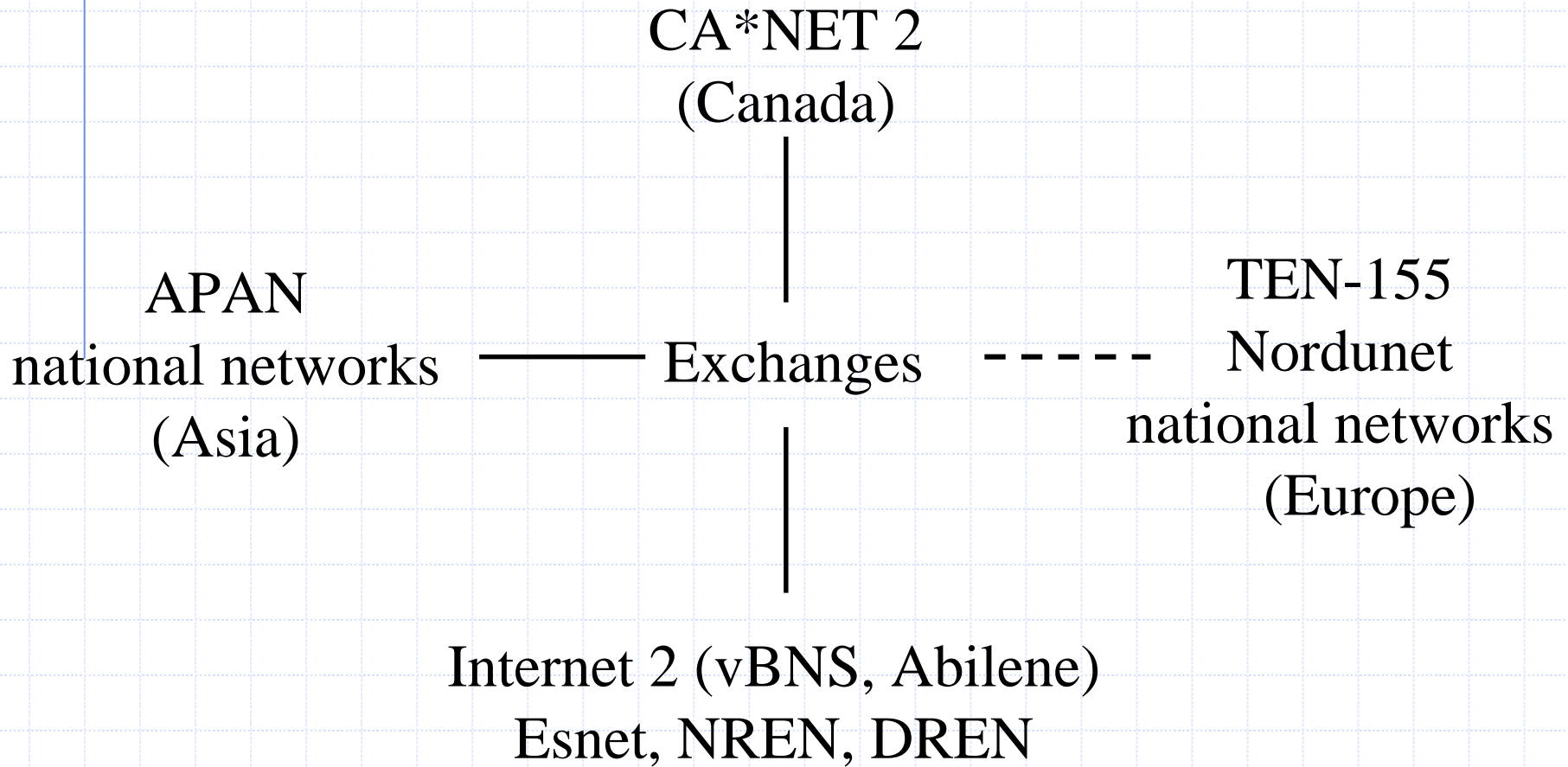
# 8.4 APAN Network Topology

2000.12.08  
apan-sec@apan.net





## 8.5 Global Interconnection of Research Networks



## 9. Home

Digital Video(TV, News, Interactive, ..) with  
cable

30 Mbps downstream(750 Kbps upstream)

telephone line(DSL)

1~10 Mbps downstream(64-2000 Kbps upstream)

wireless

14Kbps~2Mbps

fiber

100Mbps ~ 1Gbps

# 10. Company

Intranet with

Email / Unified Mail

Bulletin Board

WWW

Video Conferencing

Archive

Transaction

VoIP

# 11. Education (and Public Sectors)

Scalability (>10,000 organizations)

Ease of Use

Low Cost

# 12. Commercial Backbone Networks

National Commercial Backbone Networking  
NSPs

Regional Commercial Backbone Networking(Asia)  
Abone  
KDD  
Singapore Telecomm

Global Commercial Backbone Networking  
ATT, Worldcom, Sprint  
Qwest, Teleglobe,...

# 13. Remarks and Issues

User Community

Application

Content

Caching and Replication

Multicasting

GigaPoP

# Reference

APAN

<http://www.apan.net>

CA\*NET

<http://www.canarie.ca>

Internet 2

<http://www.internet2.edu>

Next Generation Internet

<http://www.ngi.gov>

STAR TAP

<http://www.startap.net>

TEN-155,GEANT

<http://www.dante.net>

vBNS

<http://www.vbns.net>