

Internet : Next Steps

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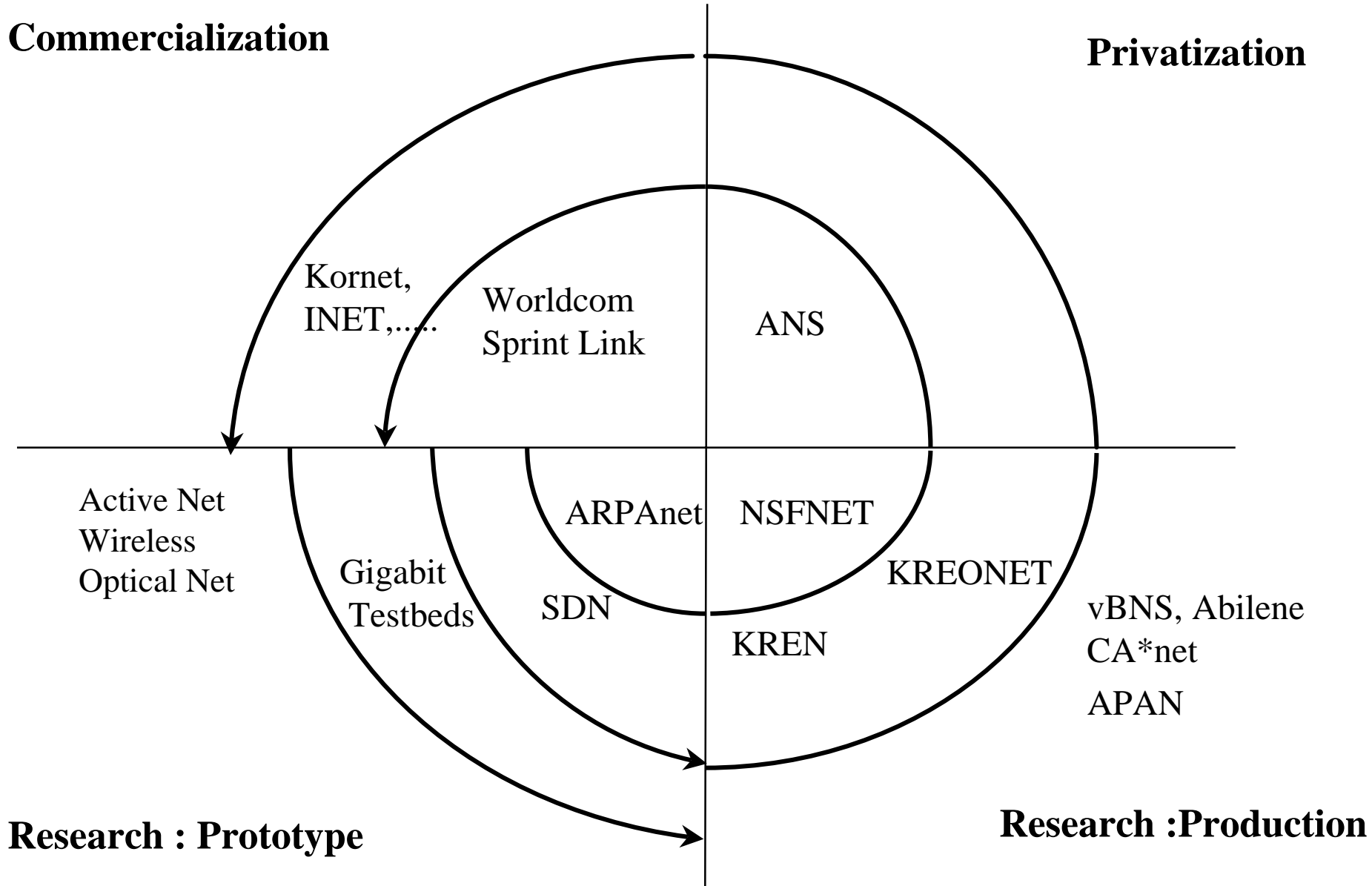
“The Internet will almost certainly have a stronger impact than PC ... a reasonable guess might put it ahead of the telephone and television but behind the printing press.”

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%

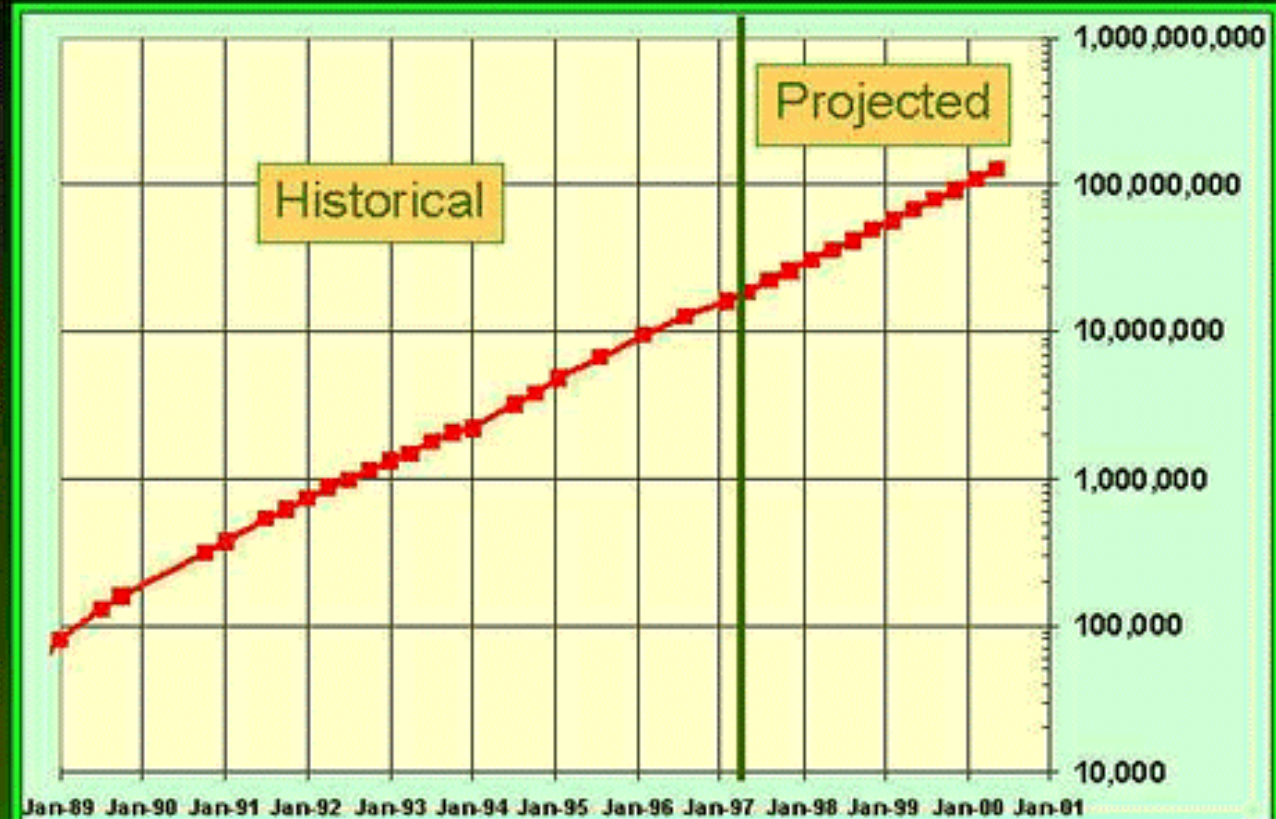
243 Countries

<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>

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)

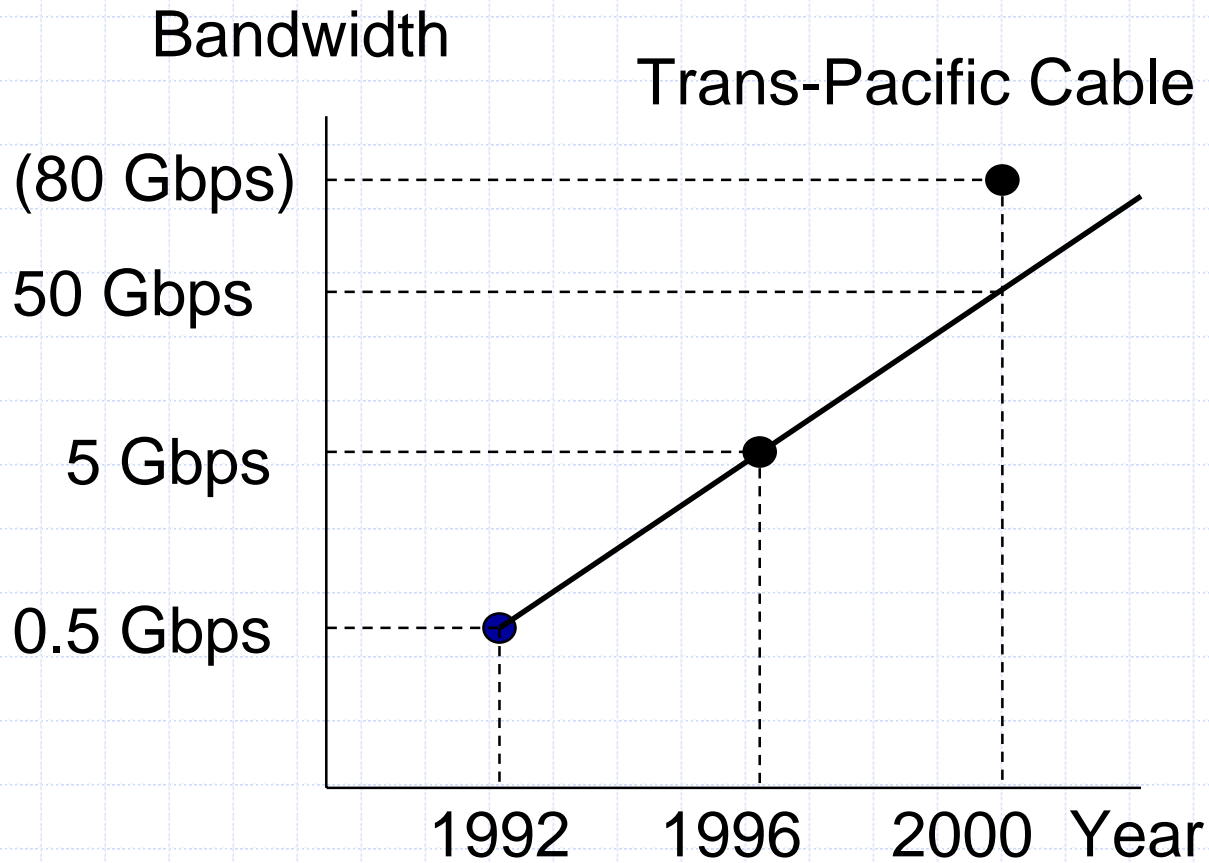
5. Recent Technology Development

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

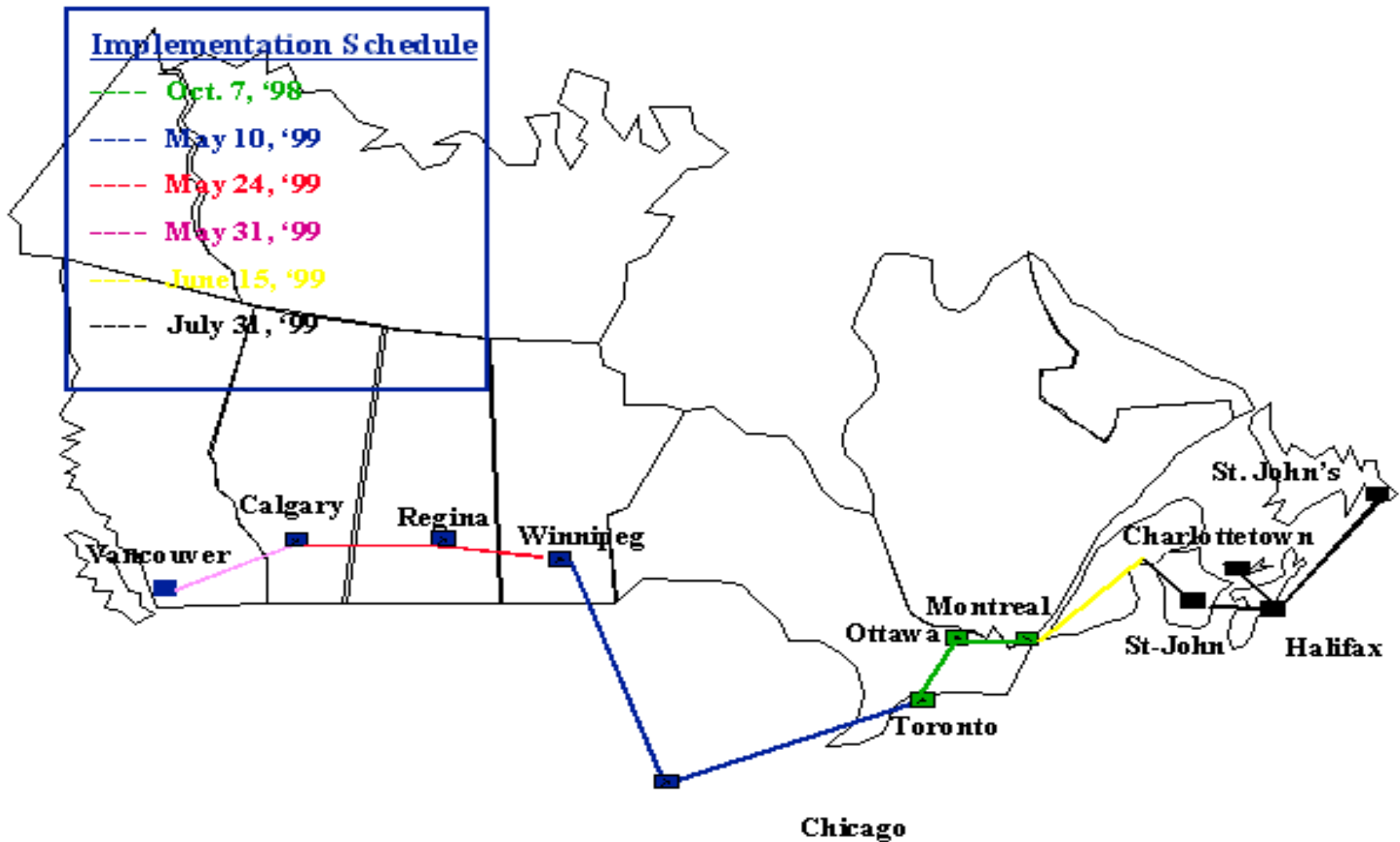
Mission-oriented research networks(Esnet, NREN,DREN)

Supernet

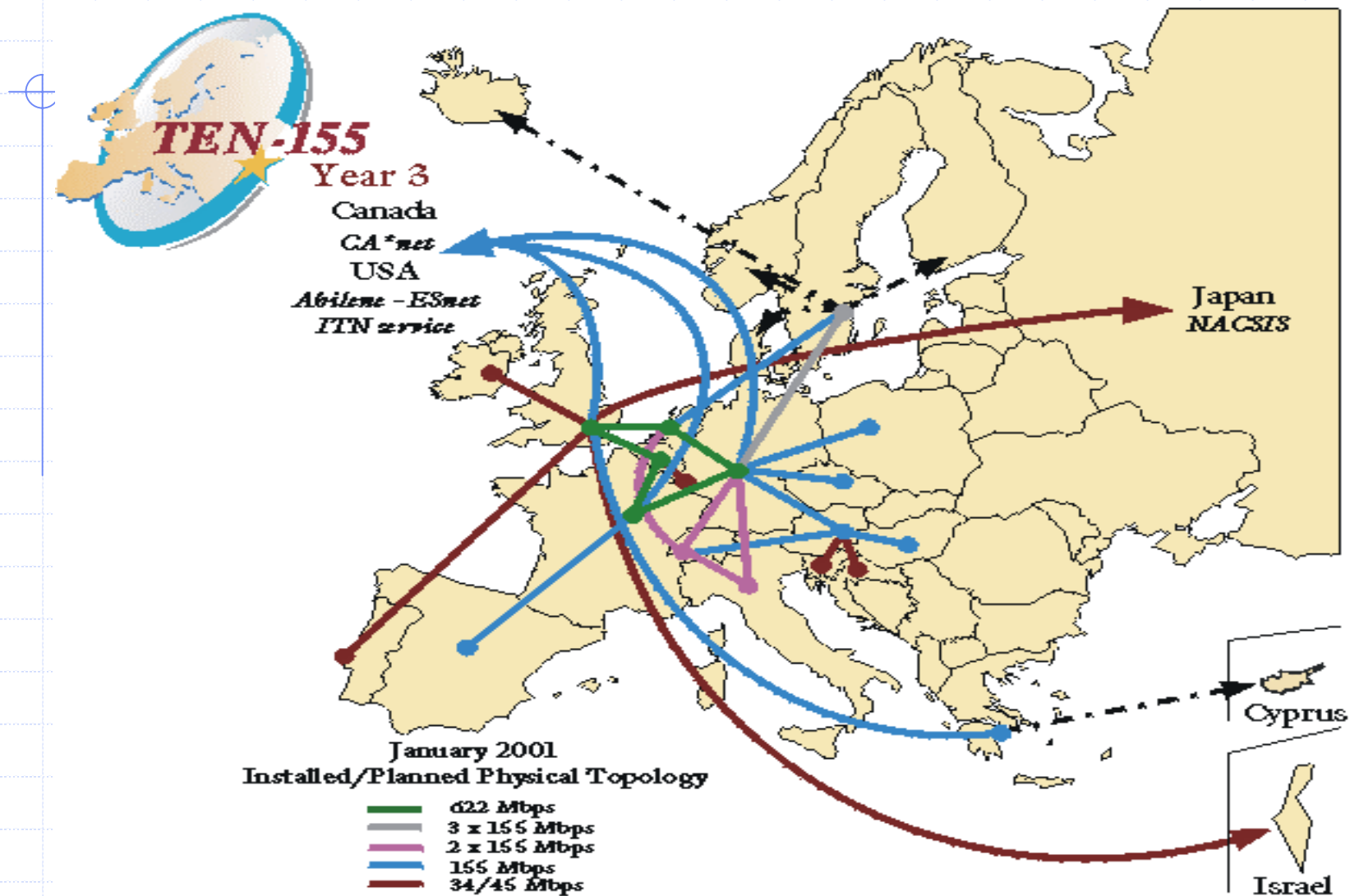
8.2 Research Network – Canada

(CA*net3, CA*net4)

CA*net 3 Implementation Schedule

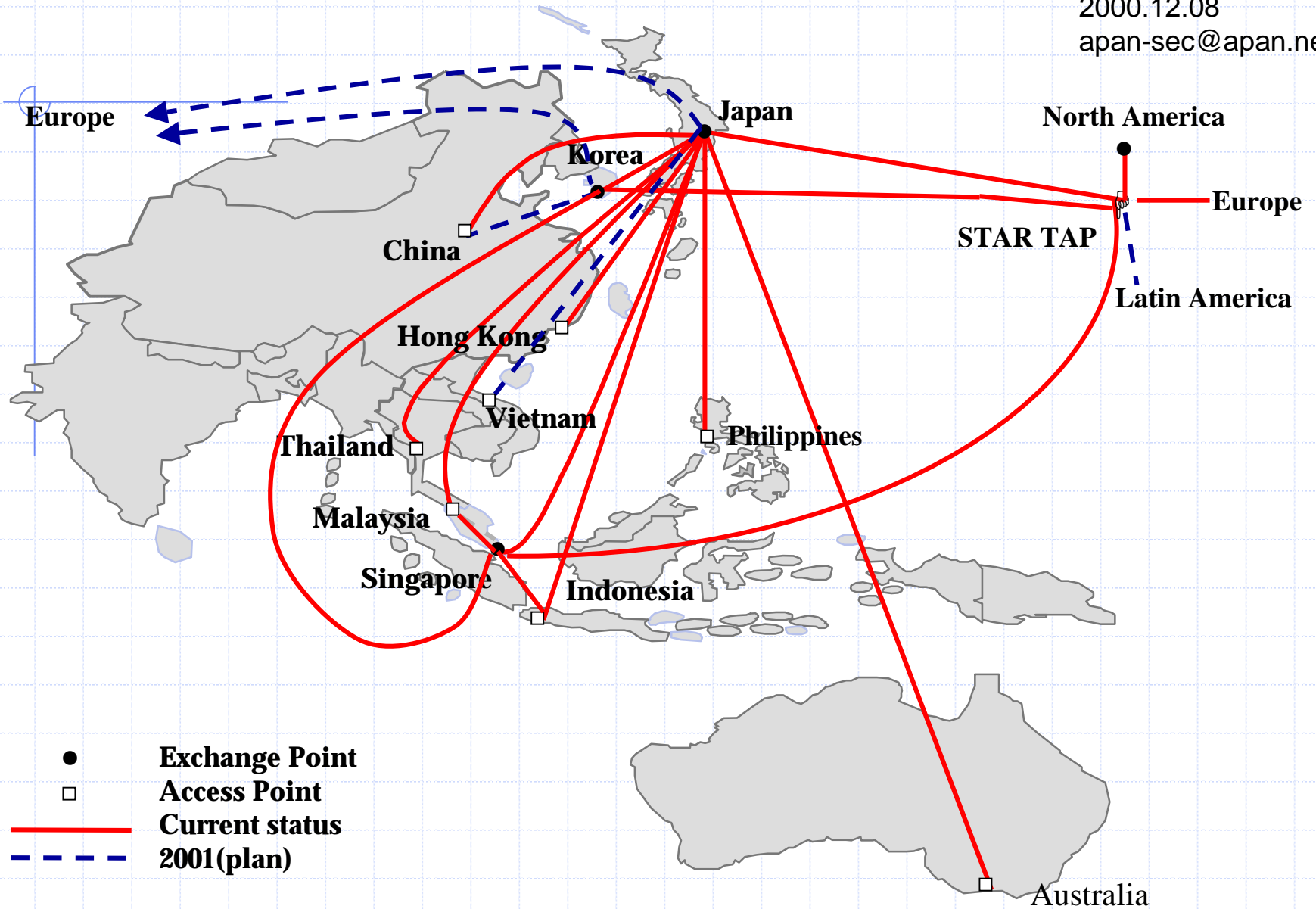


8.3 Research Network - Europe(TEN-155,GEANT)

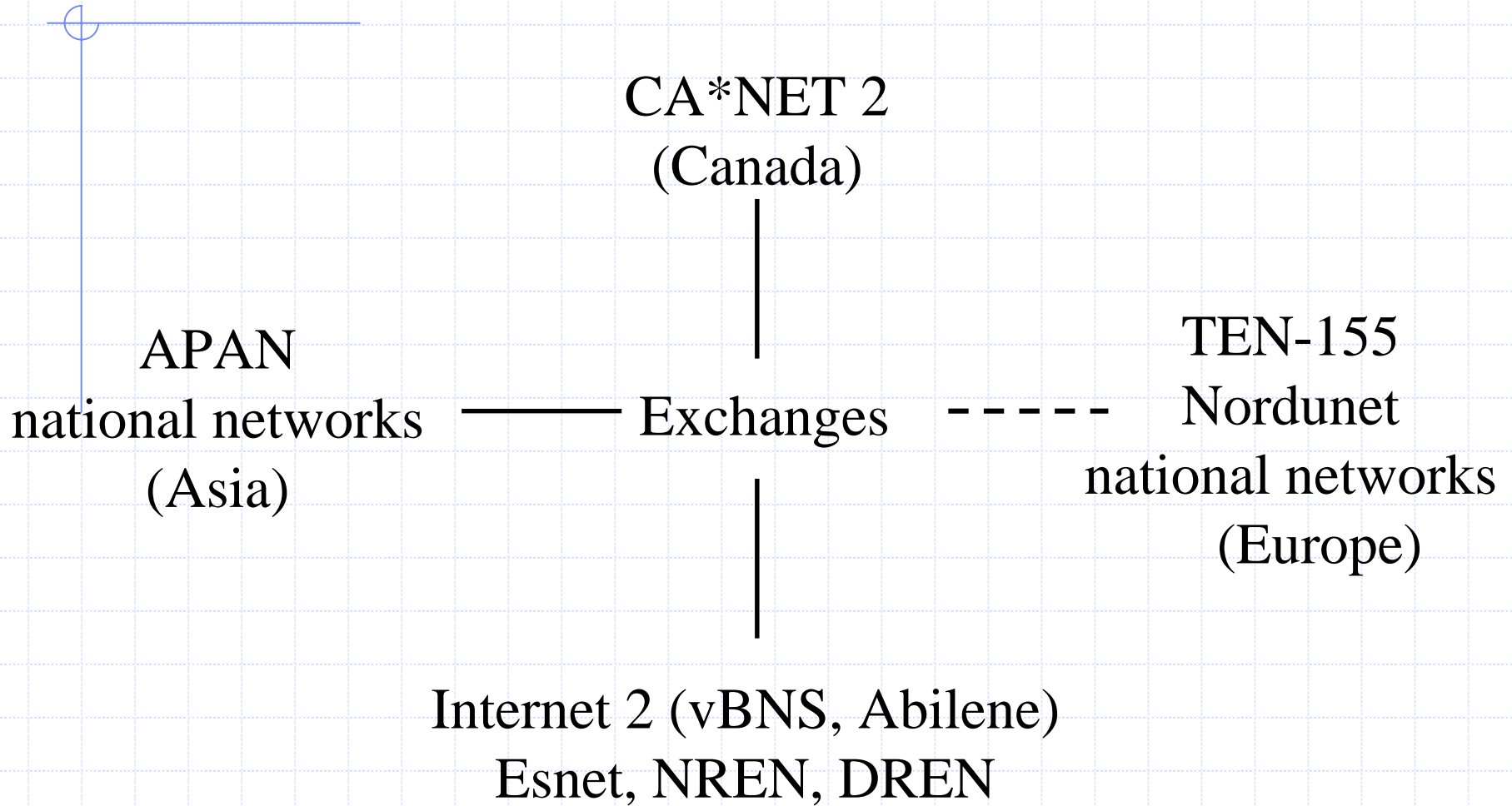


8.4 APAN Network Topology

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>