Indonesia Internet Exchange (IIX)

Johar Alam
Admin of the IIX
APJII

The Birth of Internet in Indonesia

- Pioneered by the University
- University of Indonesia (UI) as the administration of ccTLD-ID appointed by IANA
- Mostly used for E-mail
- Protocol used is UUCP

Internet Service Provider in Indonesia

- Indonet is the first operational ISP
- Start operating in 1994
- Has been operating before the ISP license regulation from the government
- Using modem 9600bps dial-up SLI to Singapore
- Service given by TELNET and IRC

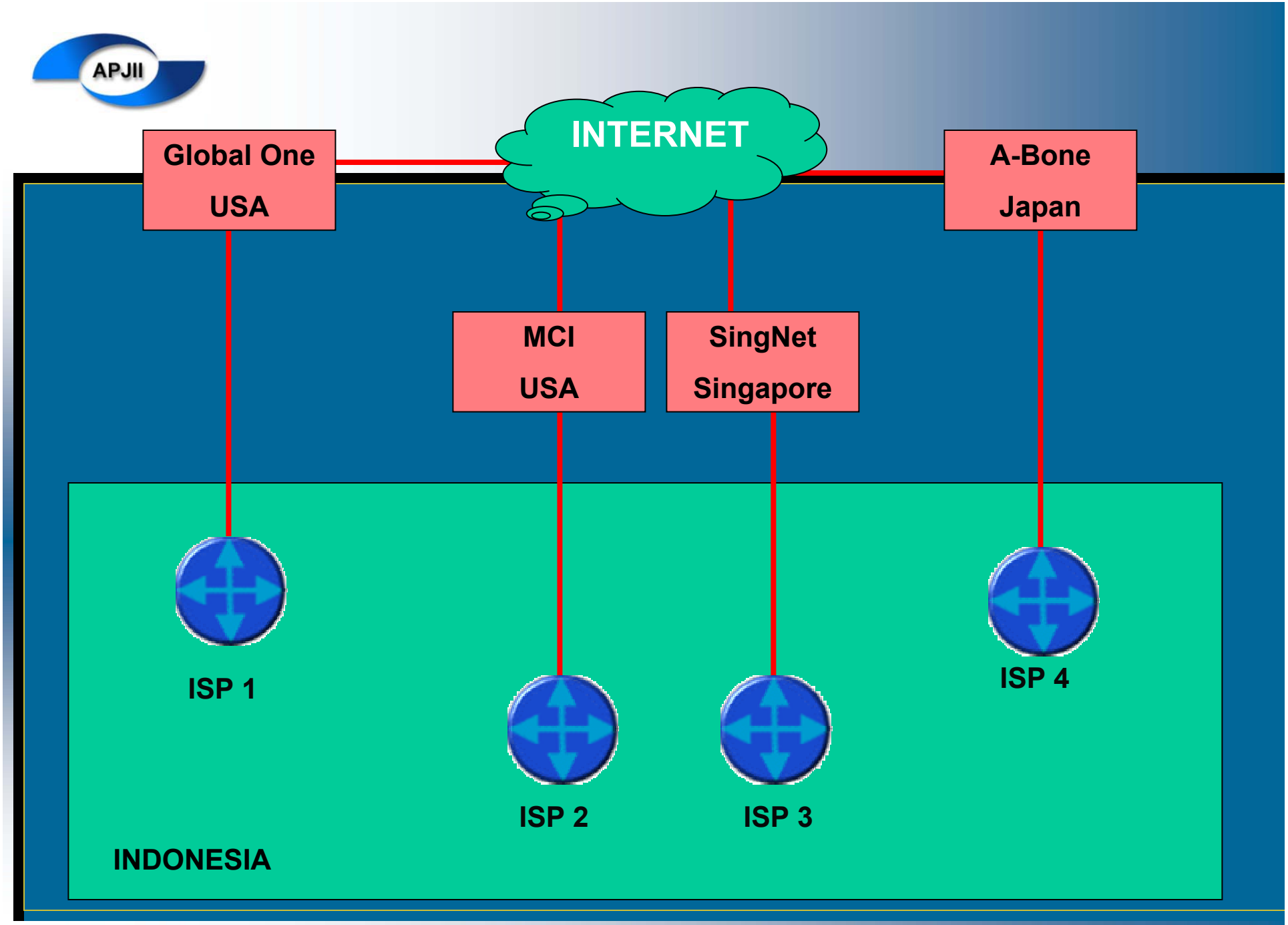
indo.net

Internet Service Provider in Indonesia

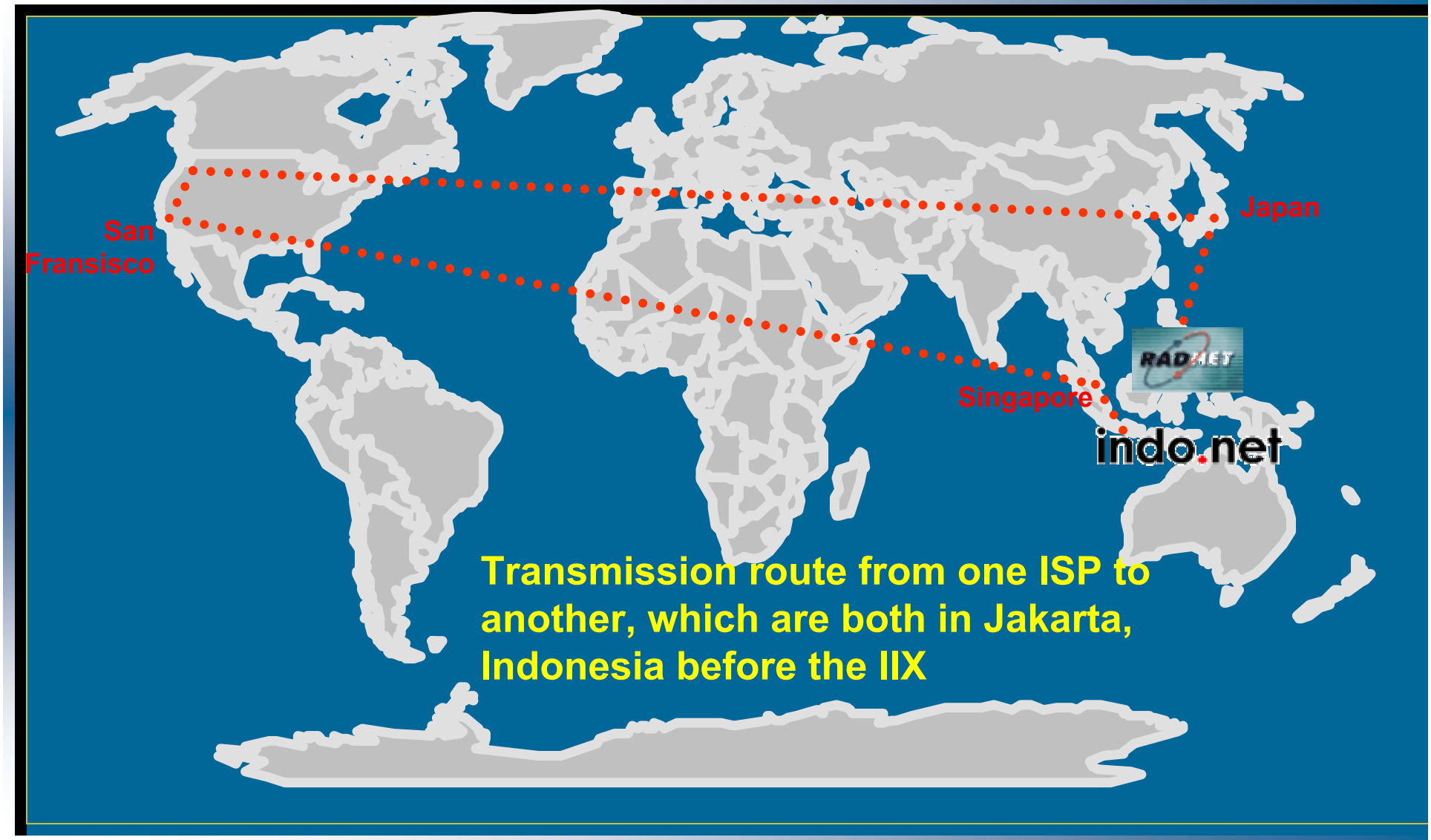
- RadNet is the first licensed ISP
  - Start operating since 1995
  - Introducing World Wide Web (WWW)
  - Using dedicated Internet channel
  - Consumers are charged for the subscription fee
  - Indonet is taking the same step
  - The Government published 27 licensed ISP

APJII – Asosiasi Penyelenggara Jasa Internet Indonesia [Indonesian ISP Association]

- Internet Provider Association
- Non-profit organization
- Established on March 1996 at the first Munas held in Jakarta
- The members comprise the 27 ISP with privileged members from Indosat, Telkom, Satelindo, UI and ITB

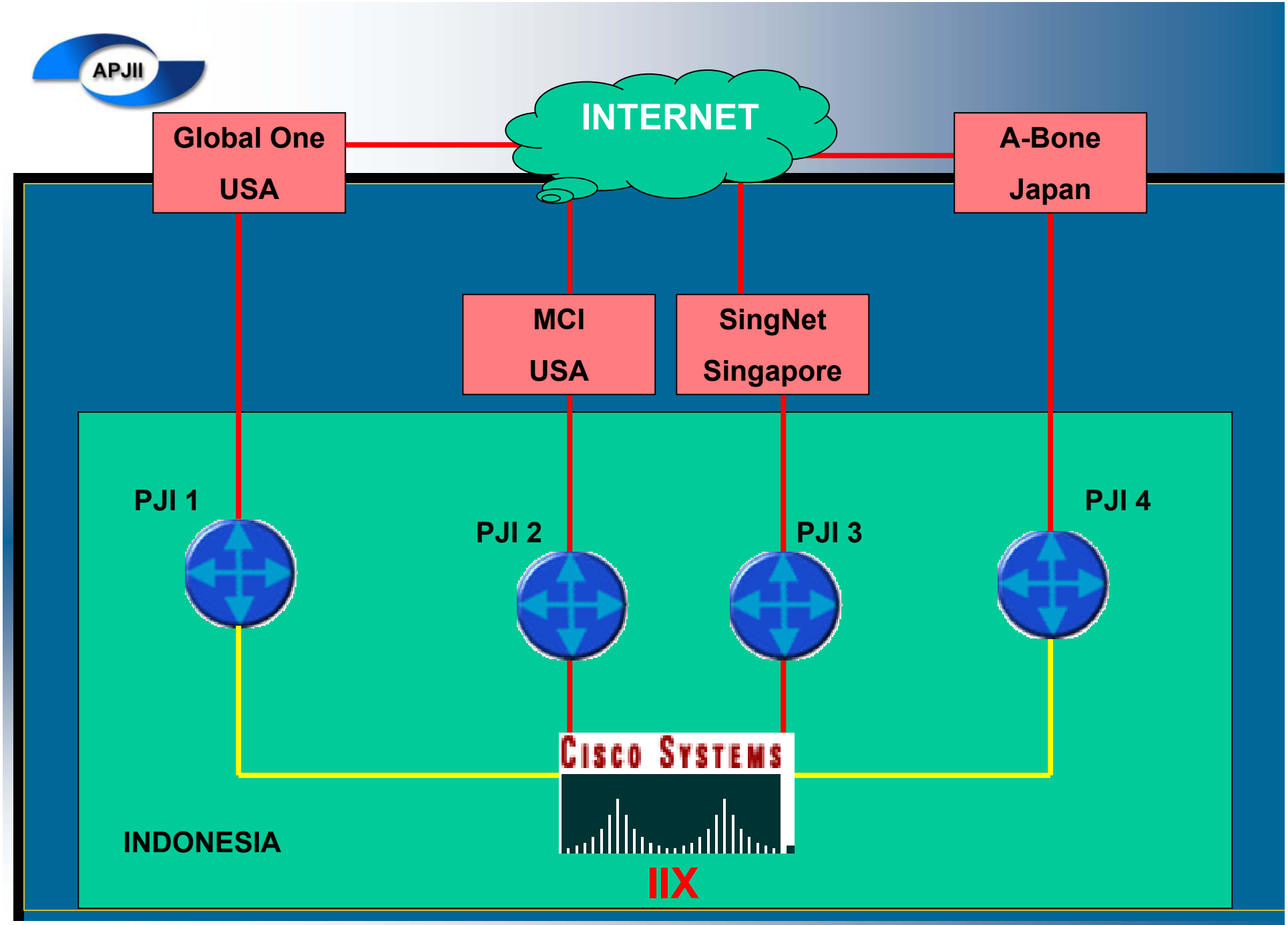

APJII
INTERNET
Global One
USA
MCI
USA
SingNet
Singapore
A-Bone
Japan
ISP 1
ISP 2
ISP 3
ISP 4
INDONESIA

Route from Jakarta to Jakarta



The Birth of Indonesia Internet Exchange (IIX)

- Pioneered by APJII since 1996
- No funds from the Government
- Configuration by CISCO (USA) and APJII
- All ISP participated
- Router is granted by CISCO
- Modem Leased Line is granted by RAD
- Server is granted by HP and Intel
- Operating on August 1997


APJII
INTERNET
Global One
USA
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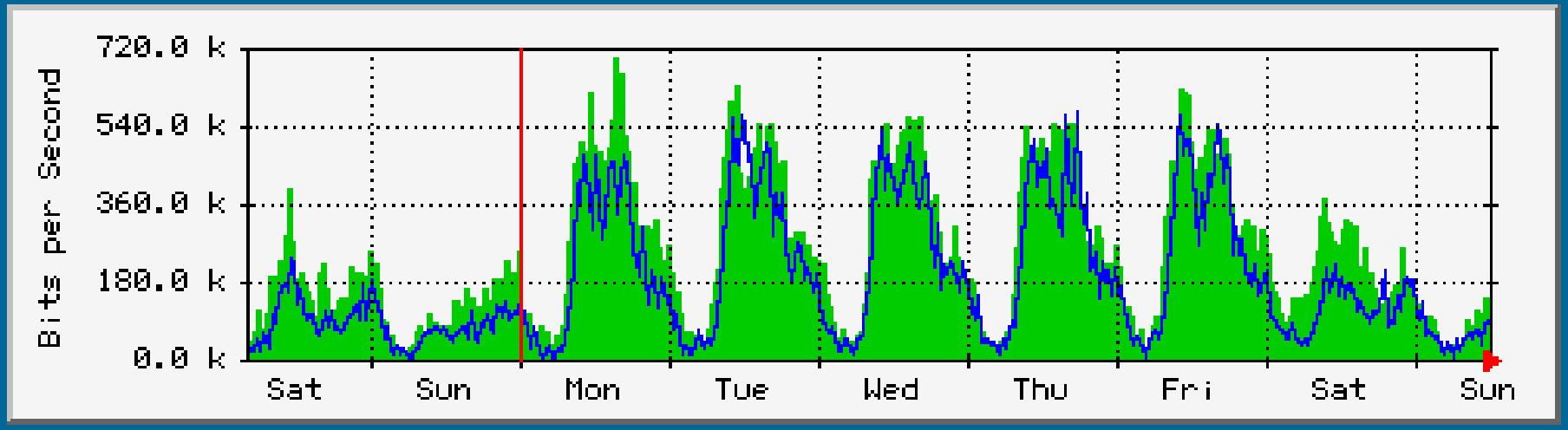
Japan
MCI
USA
SingNet
Singapore
PJI 1
PJI 2
PJI 3
PJI 4
Cisco Systems
INDONESIA
IIX

The Role of IIX during the Monetary Crisis

- The monetary Crisis started few months after the operation of IIX in 1997
- US$ rose up to 800% towards Rupiah
- The international bandwidth fee in US$, ISP is predicted to be closed down

The Role of IIX during the Monetary Crisis

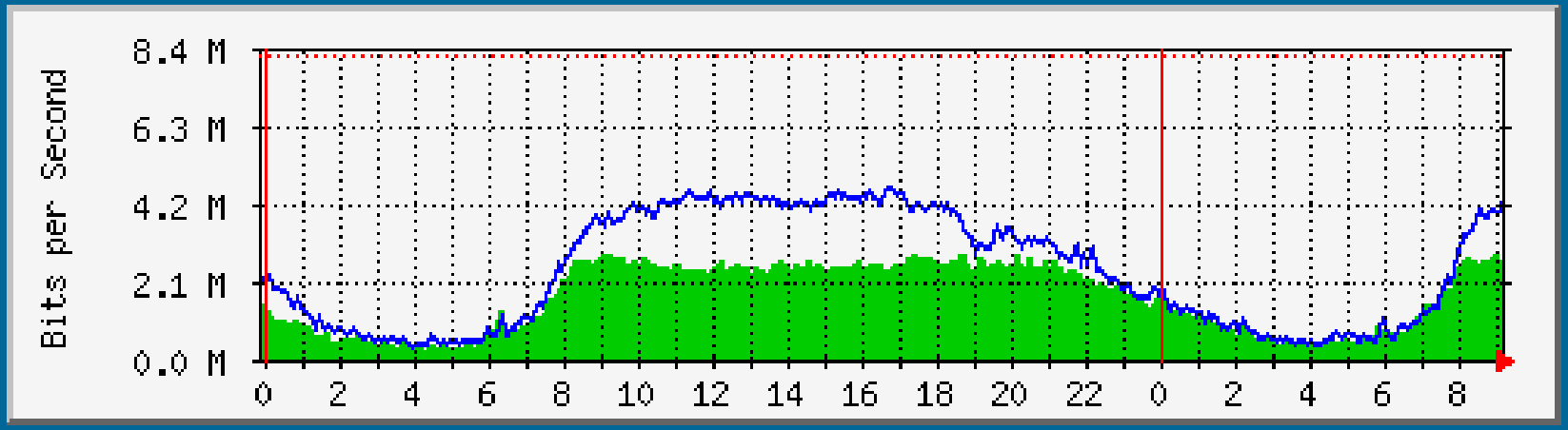


- Local Bandwidth from one ISP to IIX is 512KBps
- Not using the international route, ISP has saved the monthly costs

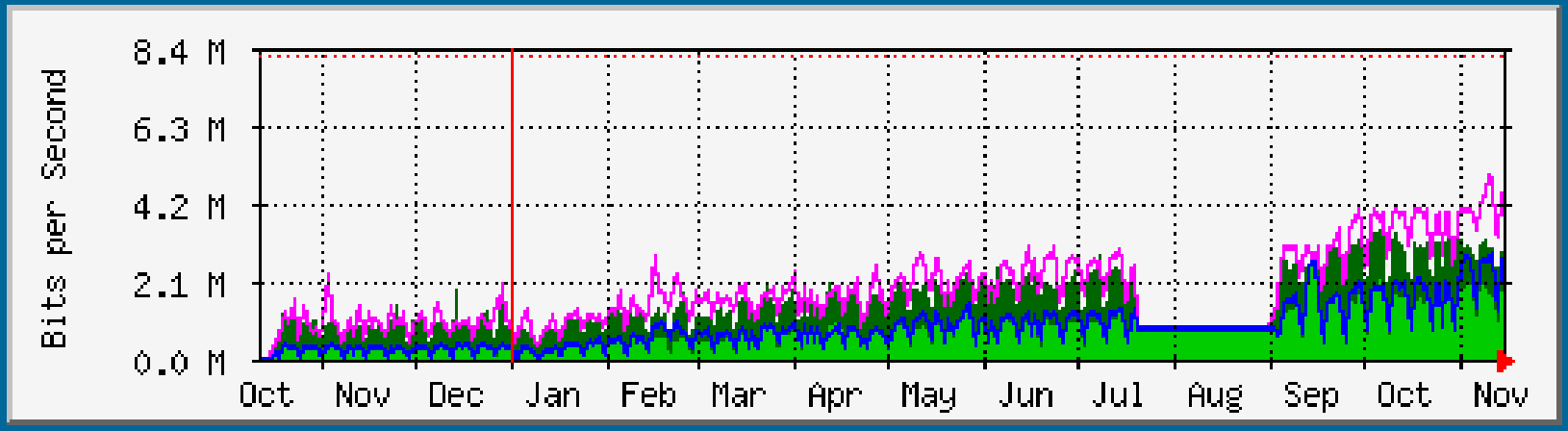
The Role of IIX during the Monetary Crisis

- ISP whose international connection has been disconnected, informed its customers to get an access to local sites in Indonesia
- IIX is used to connect one ISP member to another ISP ‘s proxy server
- Give more time to ISPs to restore their international bandwidth
- Not one ISP was closed during the crisis

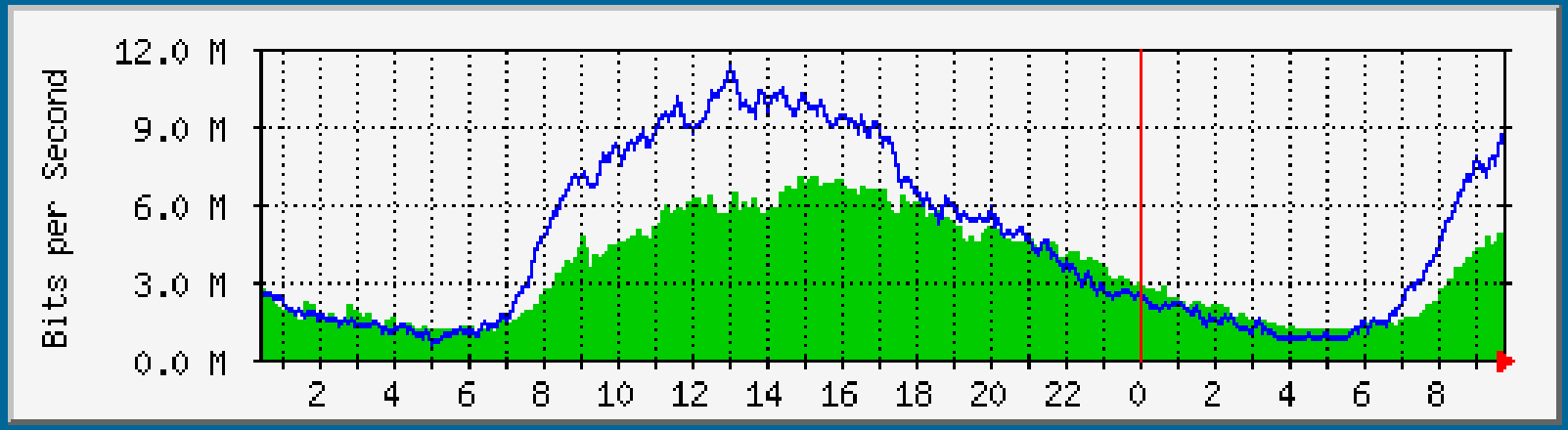
Local Traffic in IIX



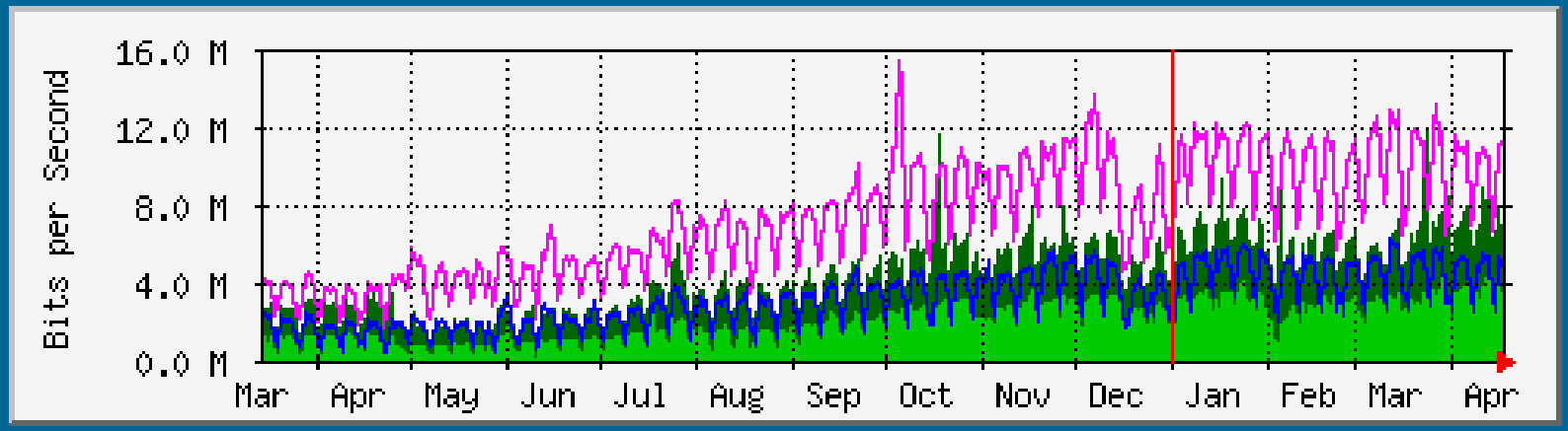
Traffic's Condition 9 months later



Local Traffic in IIX



ISP 1



ISP 1

Internet Growth in Indonesia

- The issuance of more than 100 licences of new ISP
- The issuance of more than 15 NAP licences
- The growth of Portals in the country
- *Warnet* (internet café) phenomenon
- The growth of corporate domain from 3530 on January 2000 to nearly 8000 in the beginning of 2002.

IIX Status in the year 2000

- IIX Node JKT-1 has reached its full capacity
- Portals in Indonesia has grown rapidly since February 2000
- 2MBps Leased Line capacity is not sufficient anymore for an ISP to be connected to IIX
- A new IIX node is built at the Data Center
- A new node enables the 100Mbps connection to each ISP

Connection Capacity of the IIX

JKT-2

CBN	100 MBps
LinkNet	100 MBps
M-Web	100 MBps
Indonet	100 MBps
IndosatNet	100 MBps
InfoAsia	100 MBps
Satelindo	100 MBps
Trikomsel	100 MBps
Rainbow2u	100 MBps
PSN	100 MBps
JetComs	100 MBps
Infokom	100 MBps
BolehNet	100 MBps
IDnet	100 MBps
NEPJ	100 MBps
NTT Indonesia	100 MBps
THE.NET	100 MBps
Elga	10 MBps
SpeedNet	10 MBps
ProNet	2 MBps
Exelcom	2 MBps
D~Net	2 MBps
Metronet	2 MBps
CircleCom	2 MBps
Patrakom	2 MBps
Idola	2 MBps
BizNet	512 KBps
Iptek Net	100 MBps
AsiaNet	100 Mbps
EzyNet	10 Mbps

EzyNet	10 MBps
Jasnita	10 MBps
SpotNet	10 MBps
TripleGate	10 MBps
UBnet	10 MBps
IPnet	10 MBps
Melsa	100 MBps
Nap Info	100 Mbps
Napsindo	100 Mbps
JII	100 Mbps
QitaNet	100 Mbps
Icon+ (PLN)	100 Mbps
SatNet	100 Mbps
Multidata	100 Mbps
PrimaNet	100 Mbps
AsiaNet	100 Mbps

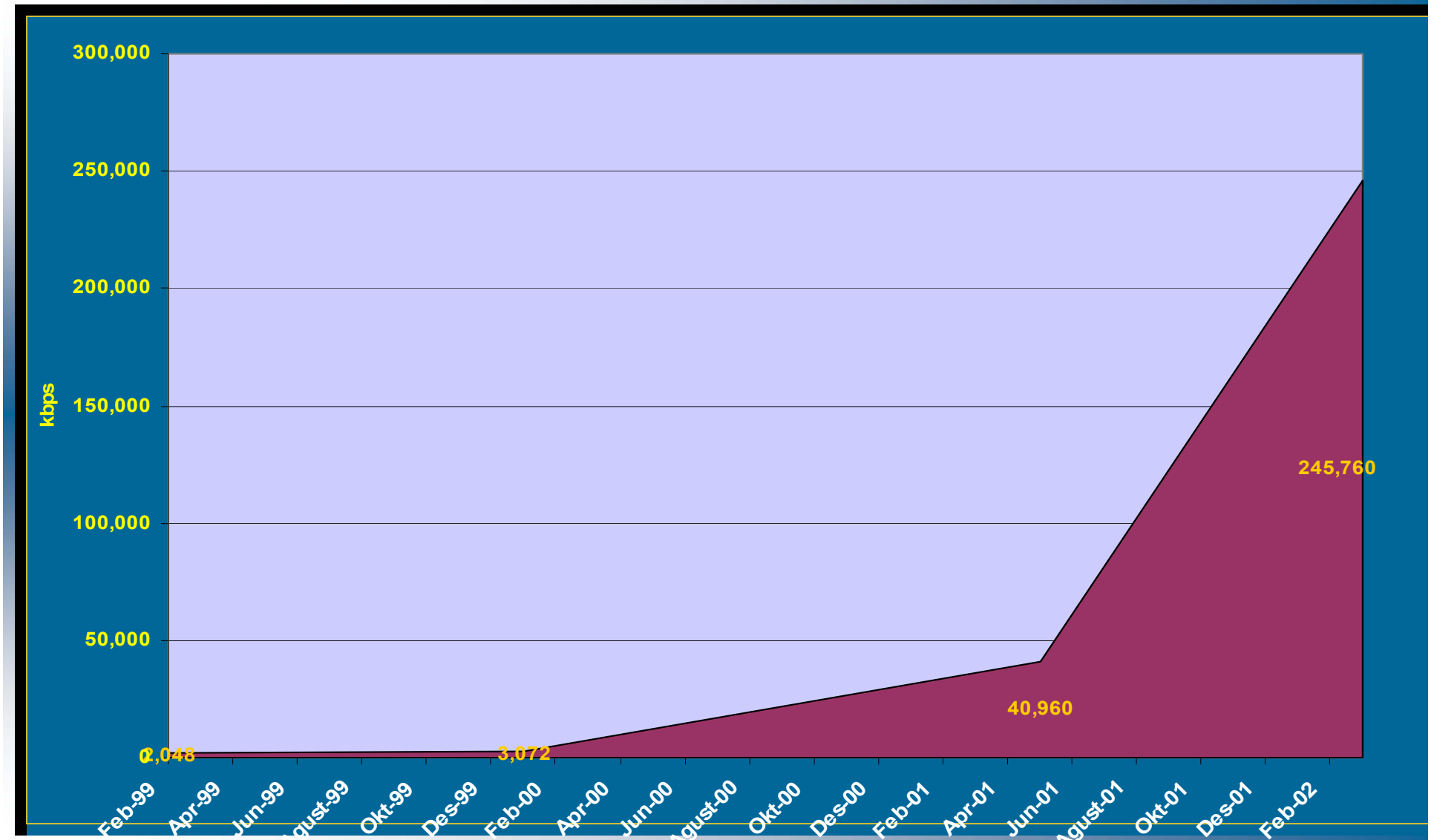
JKT-1

AccessNet	10 MBps
SpotNet	10 MBps
Central-On-Line	10 MBps
RadNet	10 MBps
Centrin	10 MBps
SigNet	10 MBps
TelkomNet	10 MBps
Pacific	10 Mbps
Sistelindo (AT&T / IBM)	2 MBps
Wasantara	512 KBps
Meganet	512 KBps

IIX Effects towards the Internet community

- The access capacity improvement towards the local internet network from approximately 700ms ping time to approximately 7ms
- Enable the growth and the development of local internet application because of the ensured access rapidity among servers
- The growth of local content in Indonesia
- The growth of e-commerce with secured network
- The application of e-gov using local internet network
- Cheaper and reliable access towards the internet, locally and globally

Peak Development of Indonesia Internet Traffic



IIX Operational Implementation

- Has 3 Administrators from three different ISPs
- The three Administrators are never announced publicly
- Use of point-to-point IP addresses which cannot be accessed from outside of Indonesia
- Use own AS number
- Use BGP4 routing and static to facilitate the connected ISP
- A 24-7 monitoring by the IIX and ISP Administrator

ROUTING CONFIGURATION

- IIX is a layer 2 and 3 infrastructure.
- Routed more than 1300 lines routing announcements (prefixes) received from it's members.
  - BGP Announcements: 68 ASN
  - Router utilisation : 22%.

ROUTING CONFIGURATION

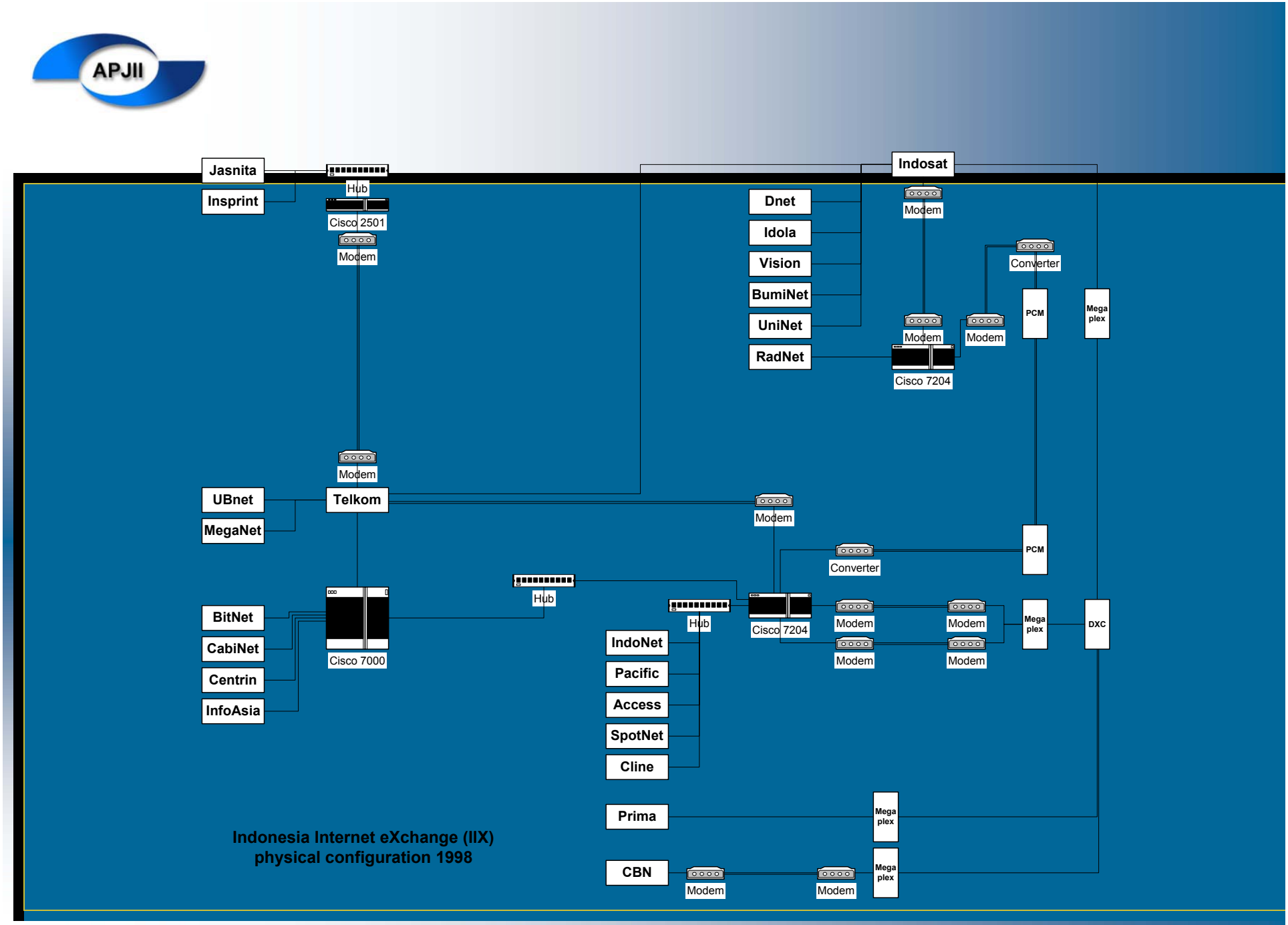
- Having their own IP Address (Both IPv4 and IPv6 Address) and ASN assigned by APNIC.
- The benefits of this kind of configuration:
  - ISP's only announce the IP Address and ASN of the IIX on their routing policy.
  - Conserve more space on the ISP's routing table.
  - Minimize the operational cost for ISP's.

IIX Connection Capacity August 1997

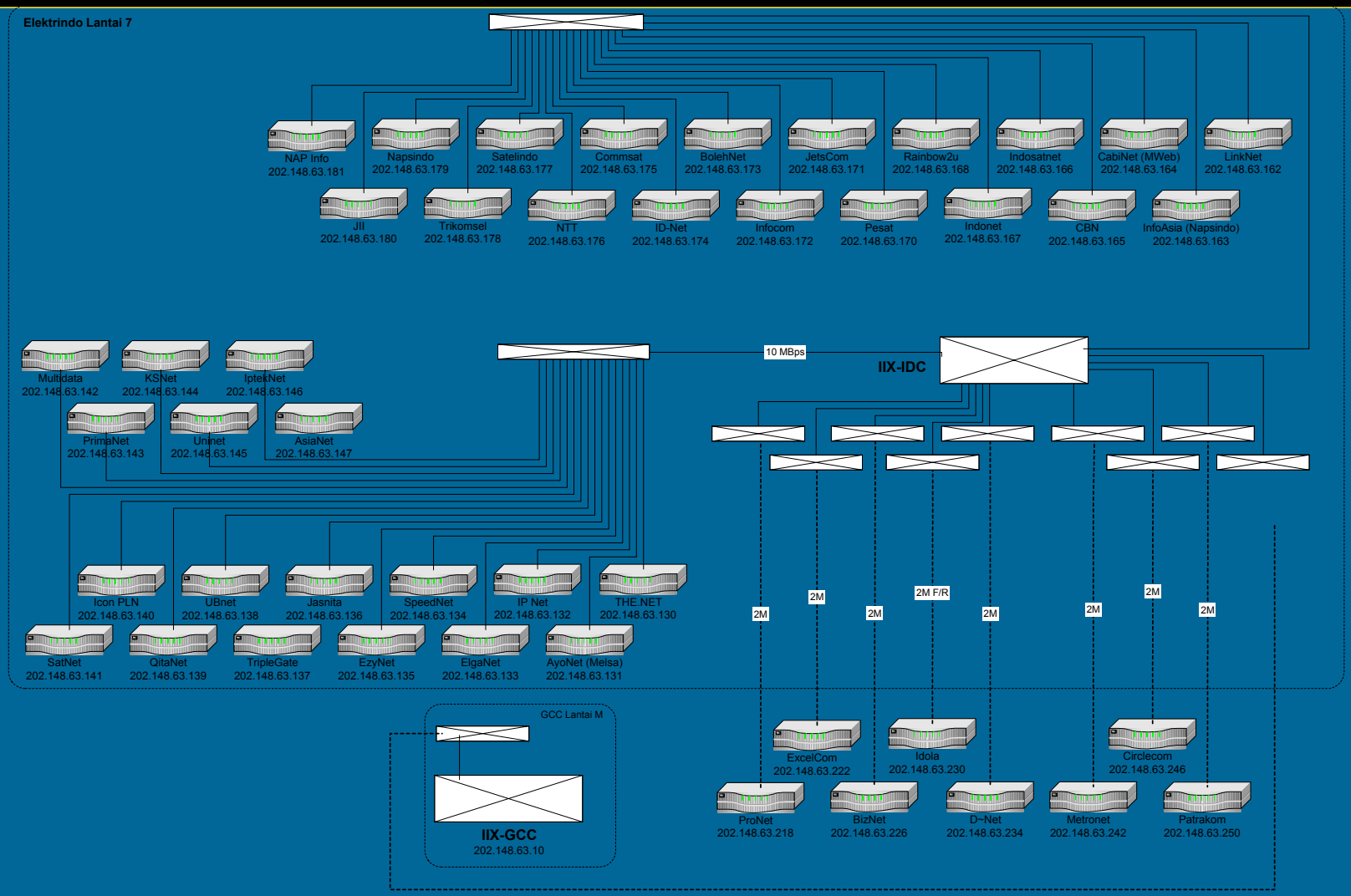
- IIX connected 5 ISPs from 20 active ones
- Resulted in less than 0.5 Mbps peak traffic every day
- The network capacity connected to the IIX on August 1997 is 30Mbps

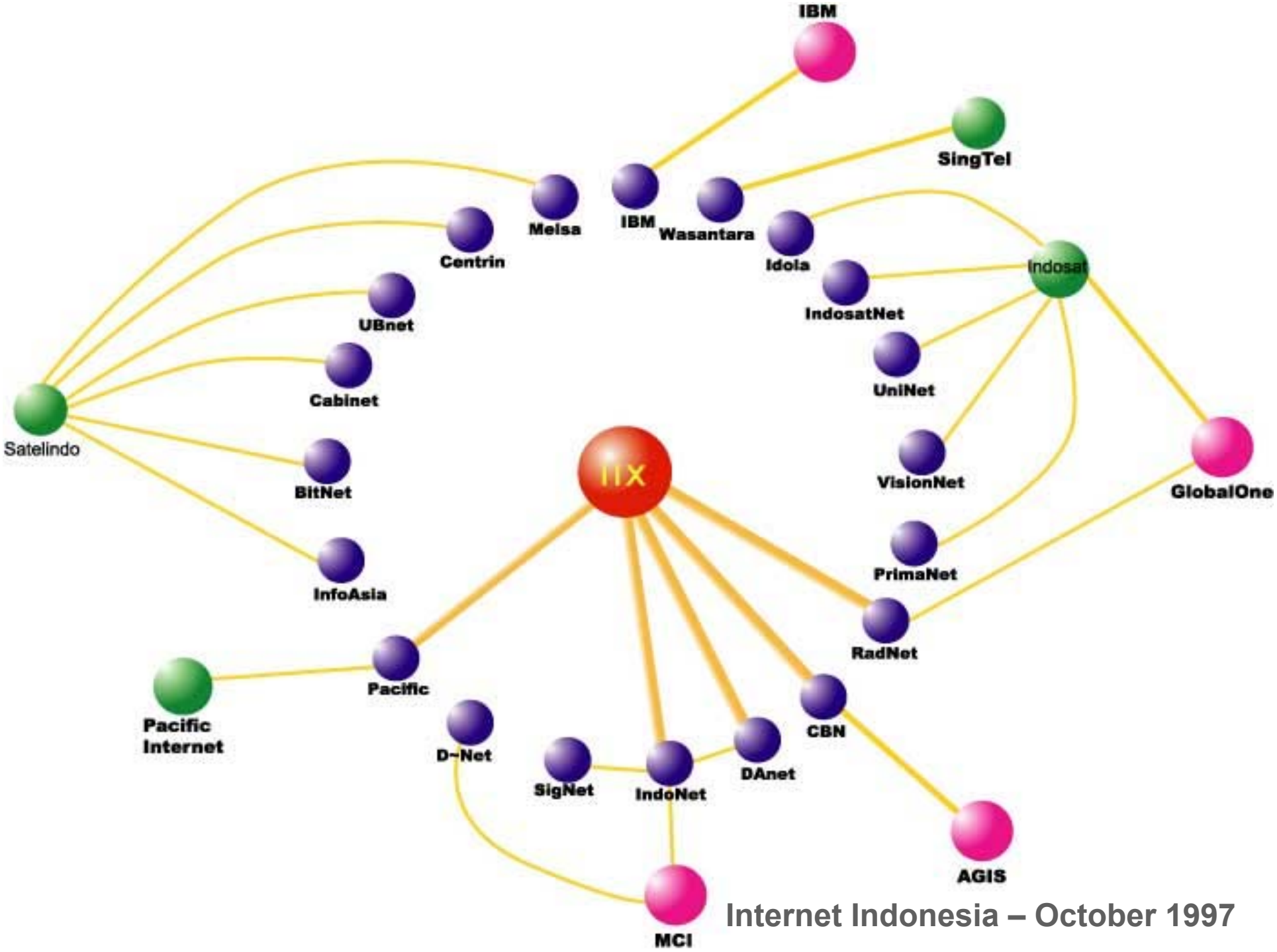
IIX Connection Capacity – Dec 2003

- IIX connected 70 ISPs from 130 active ones
- Resulted in more than 1 Gbps peak traffic every day
- The network capacity connected to the IIX until Dec 2003 is 4.3 Giga

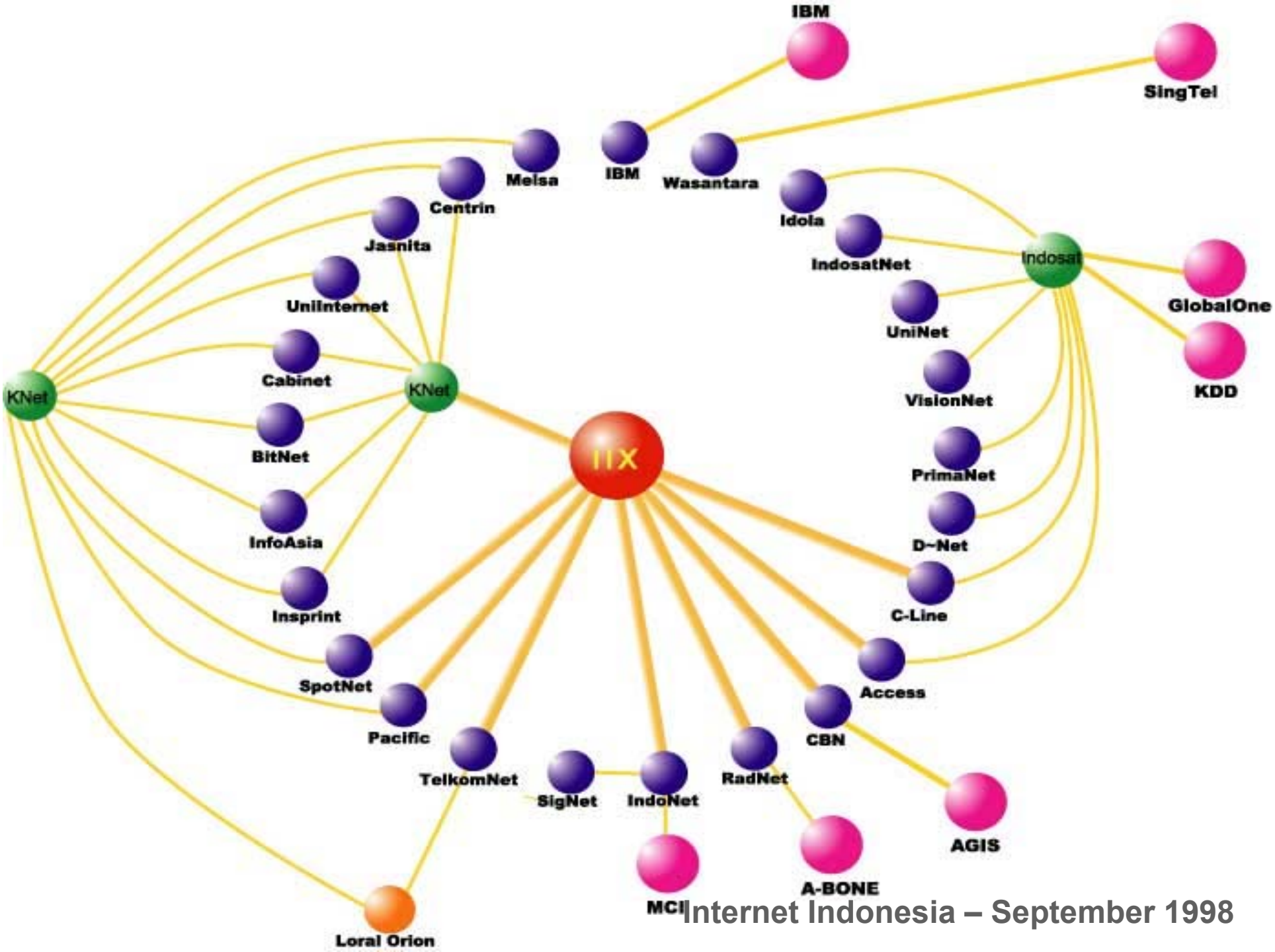

Jasnita
Insprint
Hub
Cisco 2501
Modem
Indosat
Modem
Converter
PCM
Mega plex
Dnet
Idola
Vision
BumiNet
UniNet
RadNet
Modem
Modem
Modem
Cisco 7204
Modem
UBnet
MegaNet
Telkom
Modem
Converter
PCM
Hub
BitNet
CabiNet
Centrin
InfoAsia
Cisco 7000
Hub
Cisco 7204
Modem
Modem
Modem
Modem
Mega plex
DXC
IndoNet
Pacific
Access
SpotNet
Cline
Prima
Mega plex
CBN
Modem
Modem
Mega plex
Indonesia Internet eXchange (IIX)
physical configuration 1998

Indonesia Internet eXchange -Elektrindo February 2002

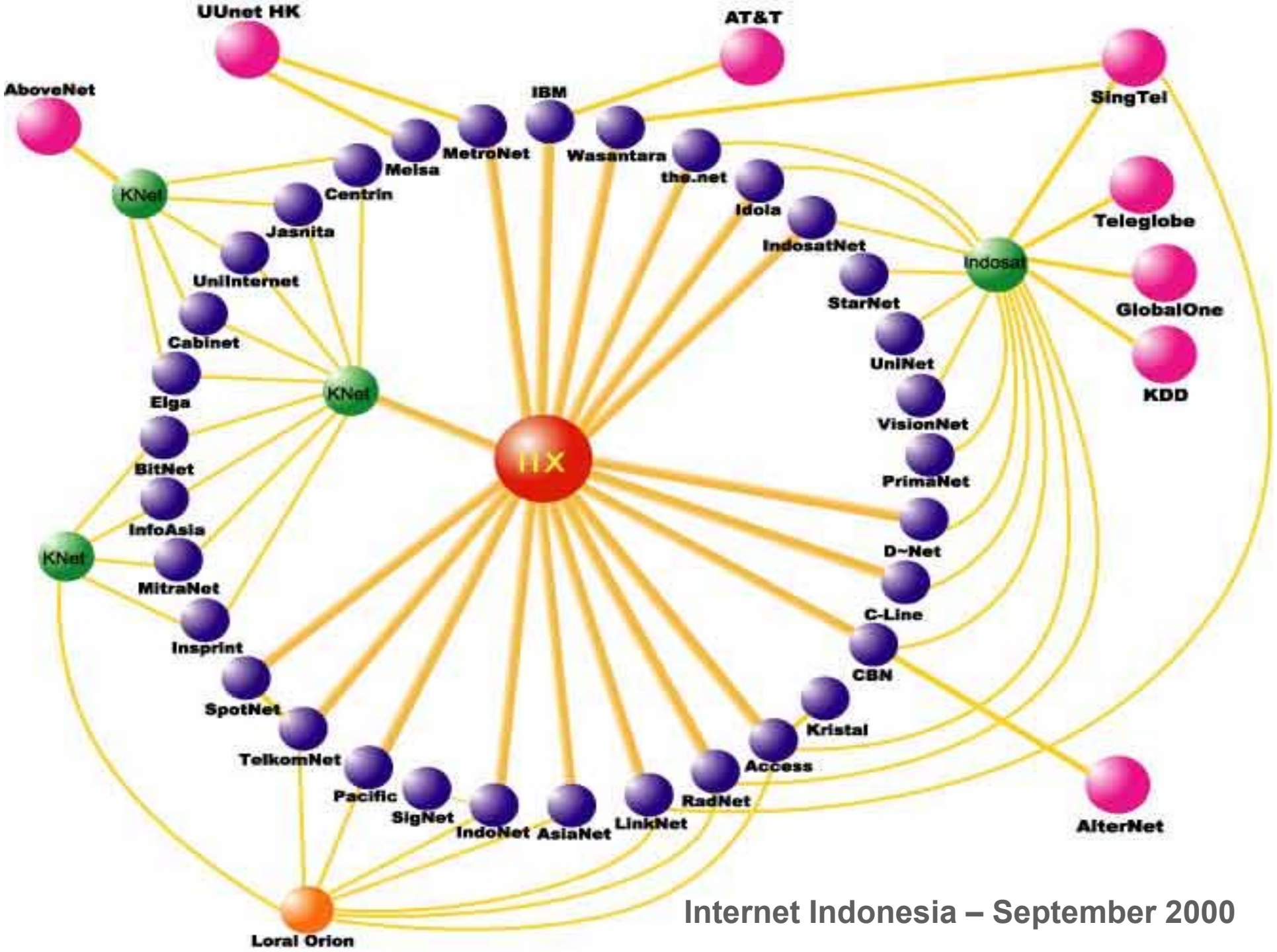




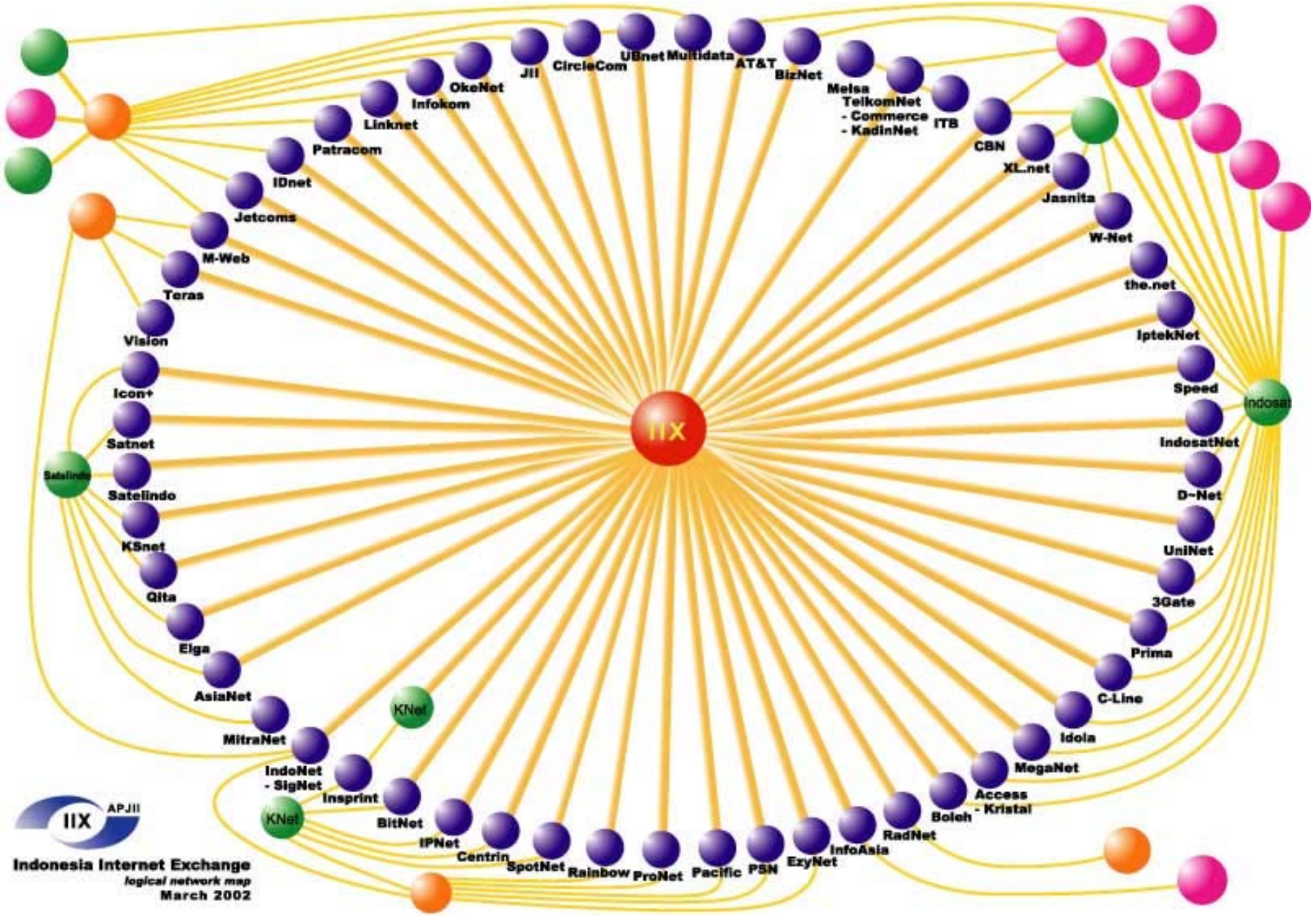
Internet Indonesia – October 1997



Internet Indonesia – September 1998



Internet Indonesia – September 2000



Internet Indonesia – Maret 2002