

INTERIOR & EXTERIOR VISUALIZATION
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DIGITAL E-BOOK IT PINTAR

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Mahir dan Professional

ATM (ASYNCHRONOUS
TRANSFER MODE)

vize@telkom.net

Mahir dan professional
ATM (ASYNCHRONOUS
TRANSFER MODE)

Penulis : Muhammad Syahrizal

Kutipan Pasal 44, Ayat 1 dan 2, Undang-Undang Republik Indonesia tentang HAK CIPTA:

Tentang Sanksi Pelanggaran Undang-Undang Nomor 6 Tahun 1982 tentang HAK CIPTA, sebagaimana telah diubah dengan Undang-Undang No.7 Tahun 1987 jo. Undang-Undang No.12 Tahun 1997, bahwa:

1. Barangsiapa dengan sengaja dan tanpa hak mengumumkan atau Memperbanyak suatu ciptaan atau memberi izin untuk itu, dipidana dengan pidana penjara paling lama 7 (tujuh) tahun dan/atau denda paling banyak Rp.100.000.000,- (seratus juta rupiah).
2. Barangsiapa dengan sengaja menyiarkan, memamerkan, mengedarkan, atau menjual kepada umum suatu ciptaan atau barang hasil pelanggaran Hak Cipta sebagaimana dimaksud dalam ayat (1), dipidana dengan pidana penjara paling lama 5 (lima) tahun dan/atau denda paling banyak Rp.50.000.000,- (lima puluh juta rupiah).

Mahir dan Professional

ATM (Asynchronous Transfer Mode)

Muhammad Syahrizal

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Hak cipta dilindungi undang-undang

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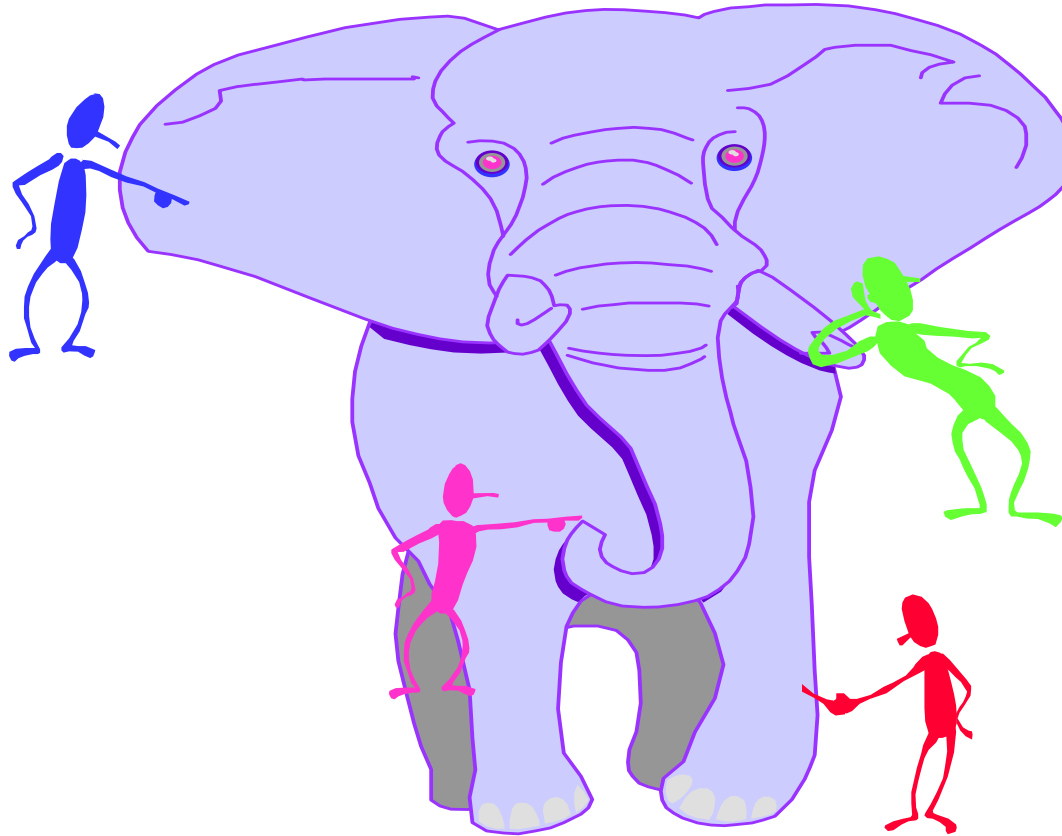
Penerbit Gratech Media Perkasa

Dilarang keras menerjemahkan, memfotokopi, atau memperbanyak sebagian atau seluruh isi buku ini tanpa izin tertulis dari penerbit.

ASYNCHRONOUS TRANSFER MODE



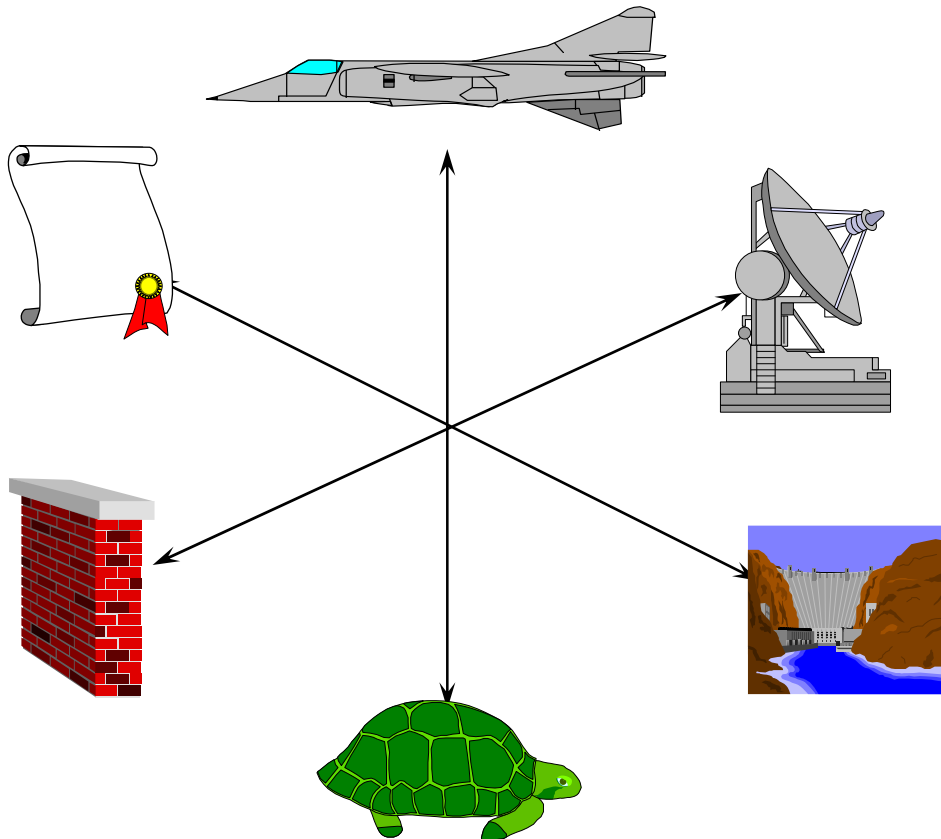
Apakah ATM itu ?



Sudut pandang yang berbeda dari bermacam-macam kepentingan/interes.

ASYNCHRONOUS TRANSFER MODE

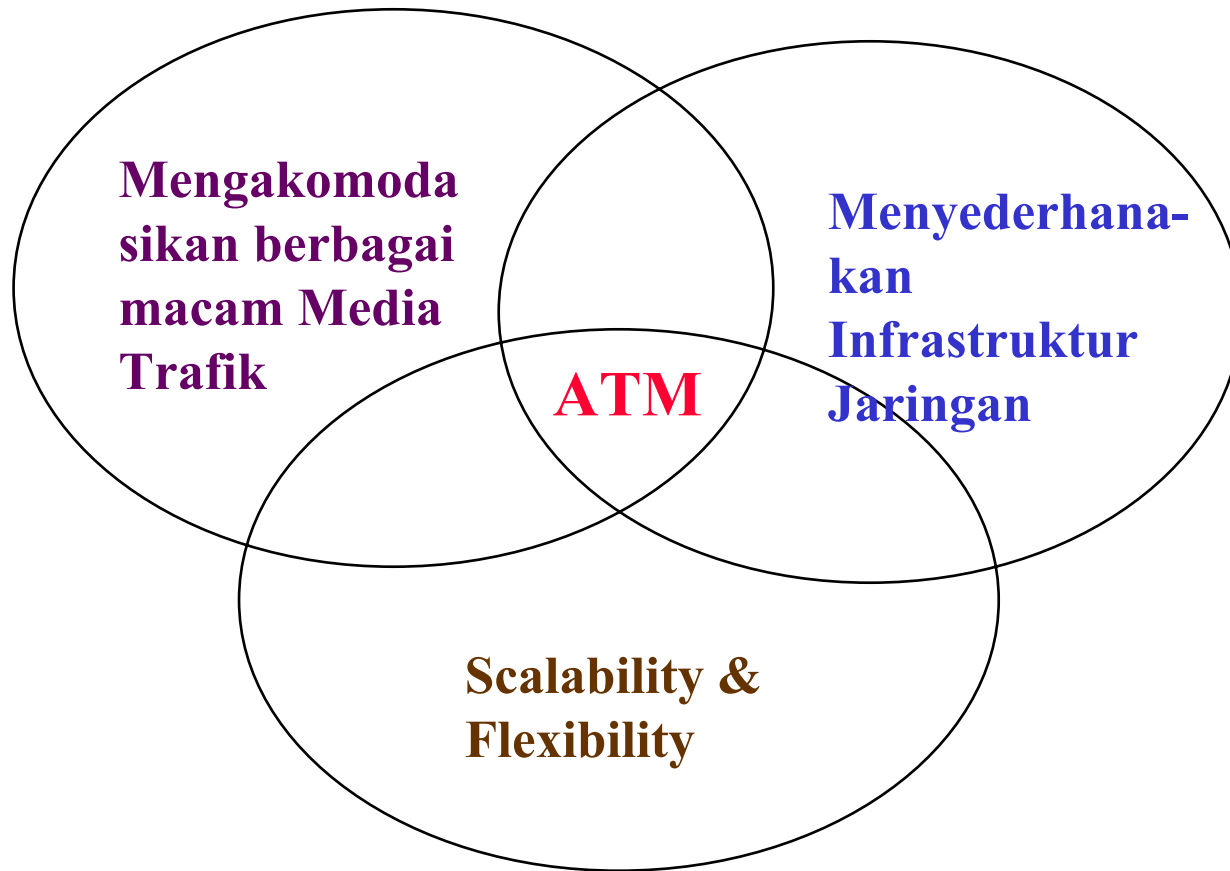
Multi Dimensi ATM



Banyaknya aplikasi yang ditawarkan ATM pada berbagai segmen pasar akan mempercepat implementasi.

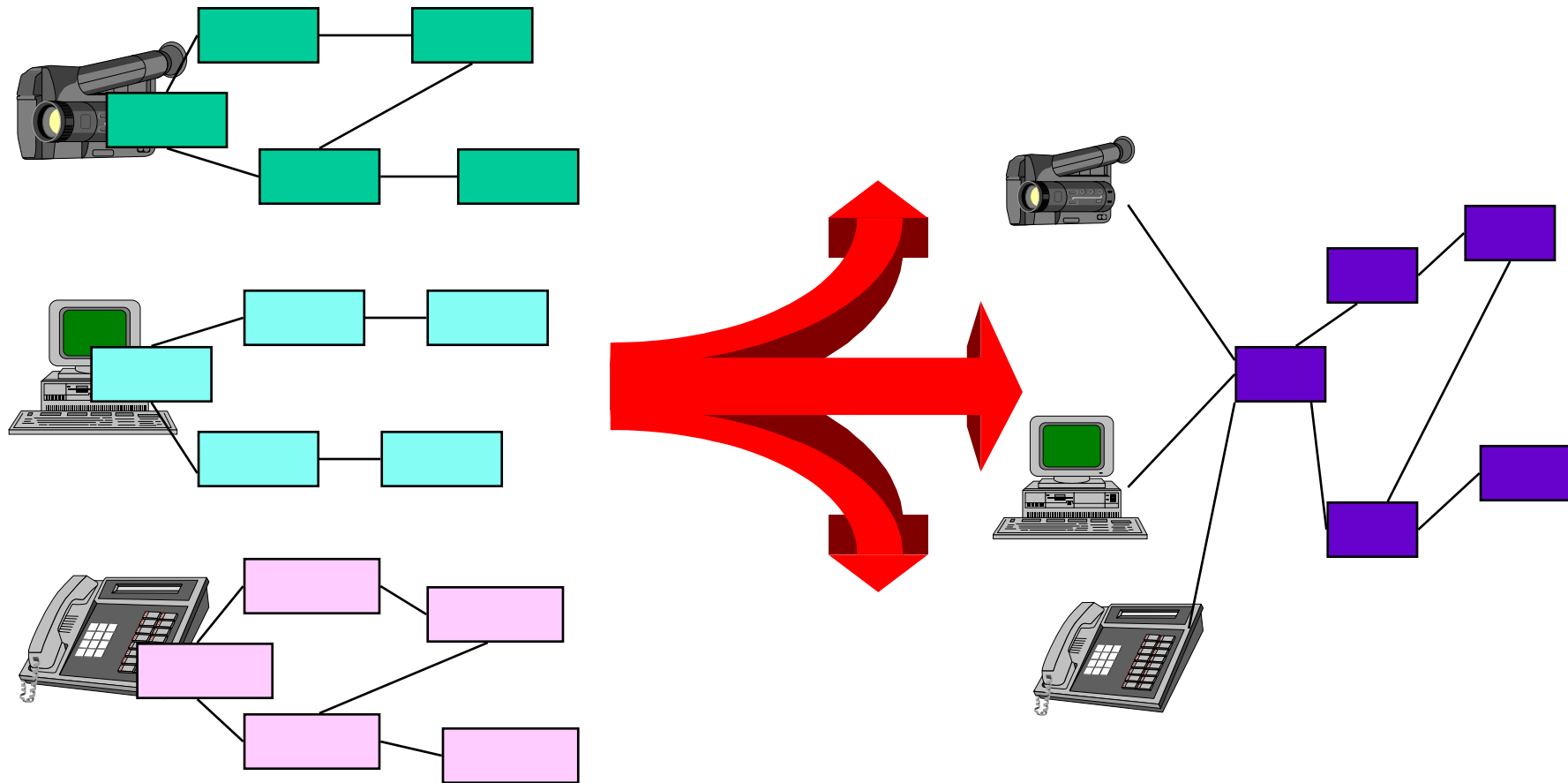
ASYNCHRONOUS TRANSFER MODE

Manfaat ATM



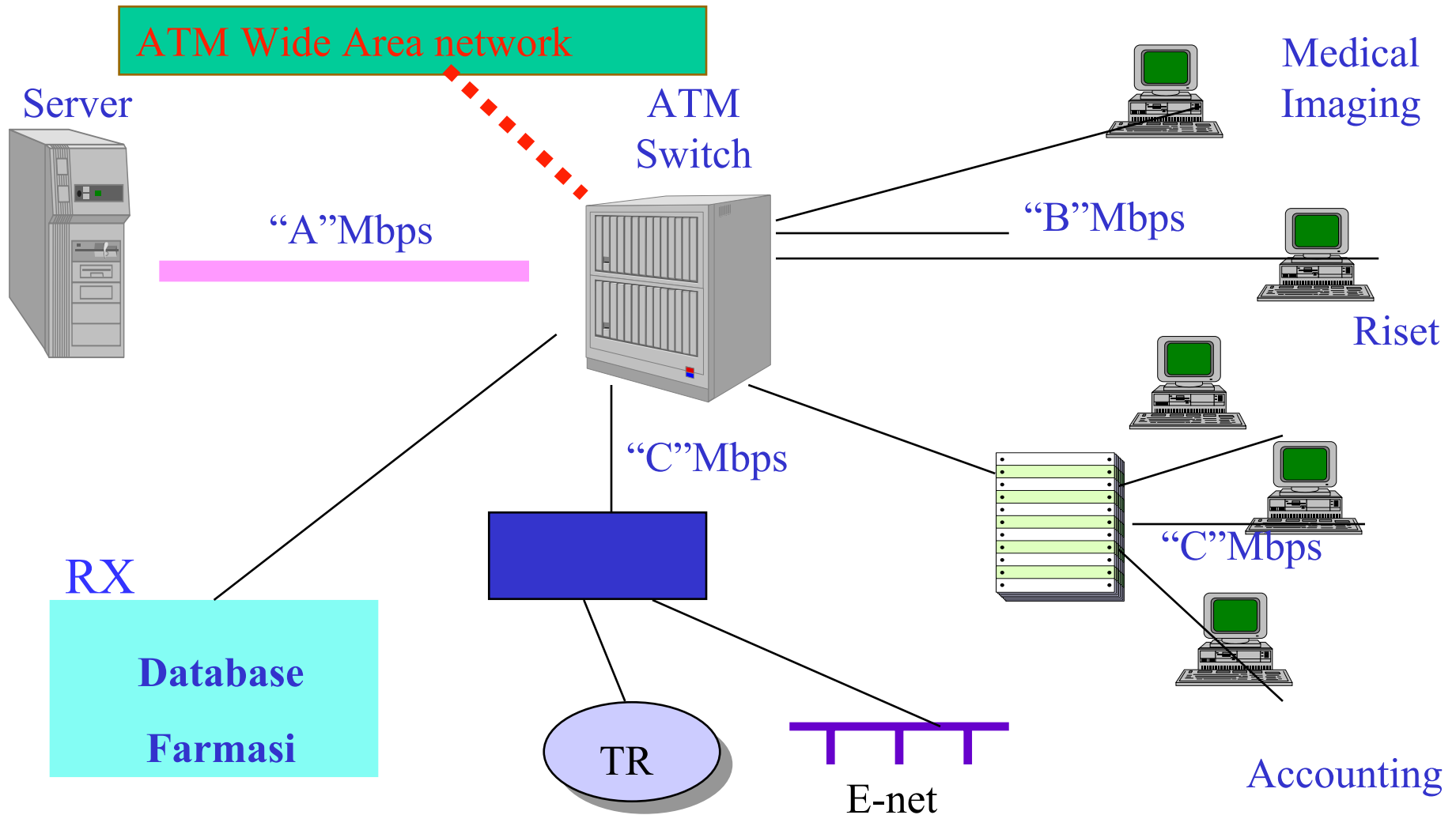
ASYNCHRONOUS TRANSFER MODE

ATM mengakomodasikan berbagai media trafik



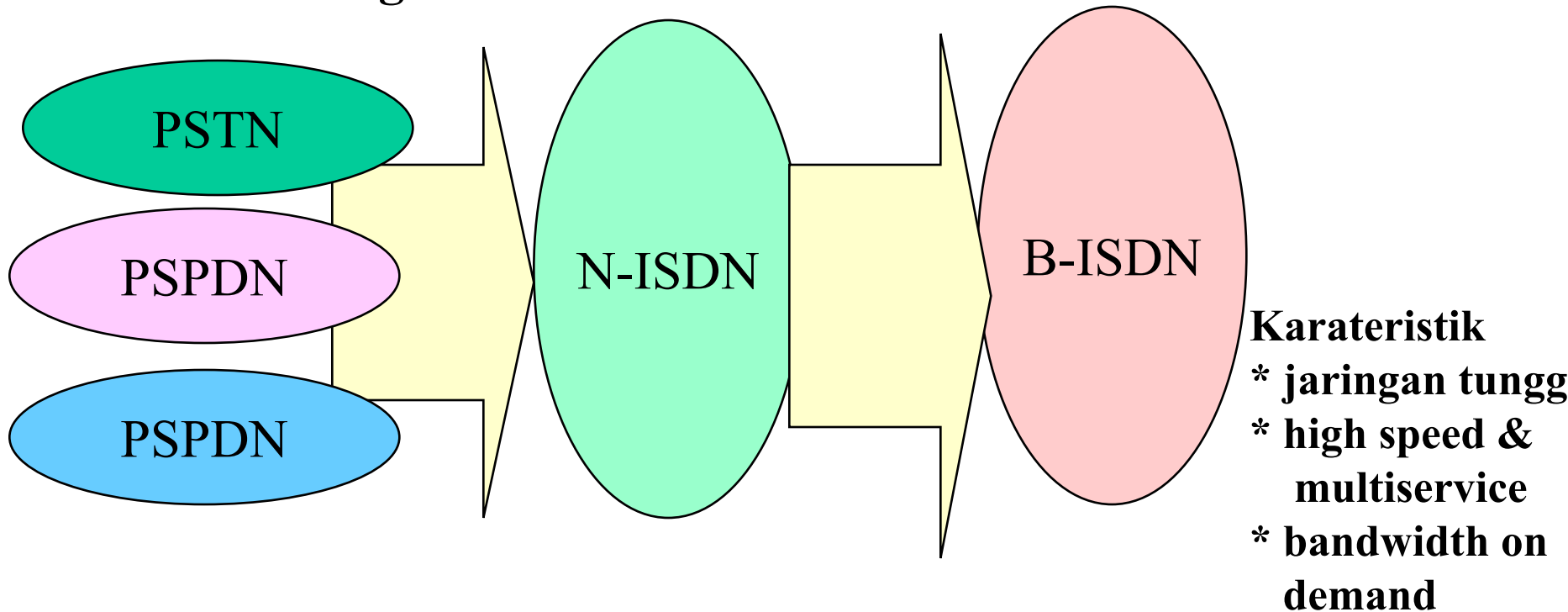
ASYNCHRONOUS TRANSFER MODE

ATM : Scalability and Flexibility

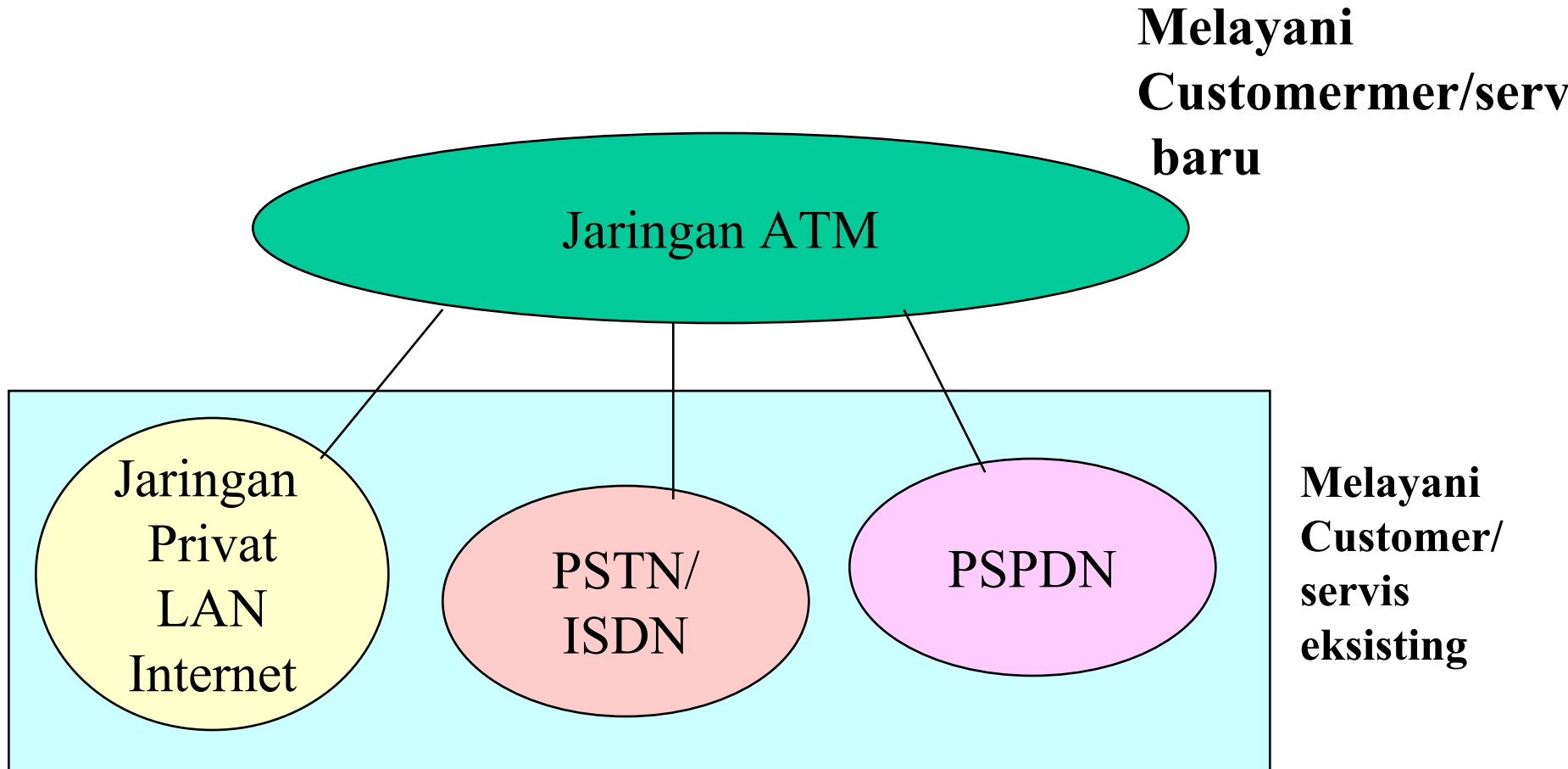


ASYNCHRONOUS TRANSFER MODE

**ATM menyederhanakan infrastruktur jaringan :
ATM merupakan teknologi untuk mengimplementasikan
'integrated broadband services network'**



Integrasi ATM dengan Jaringan Eksist

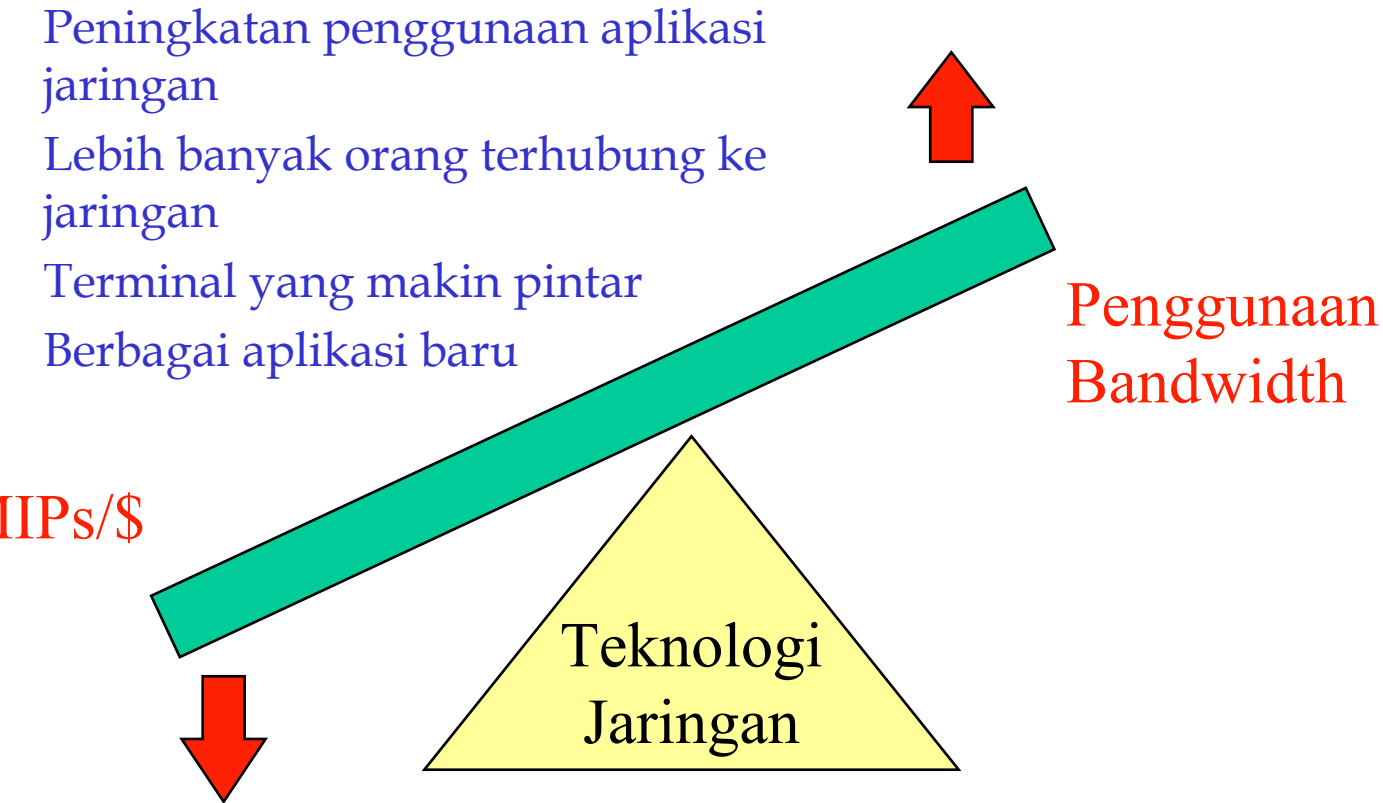


Latar Belakang Implementasi ATM

- Bandwidth Driver
 - Application Driver
 - Service Opportunities
 - Standarisasi
 - Peluang untuk menghemat biaya
-

ASYNCHRONOUS TRANSFER MODE

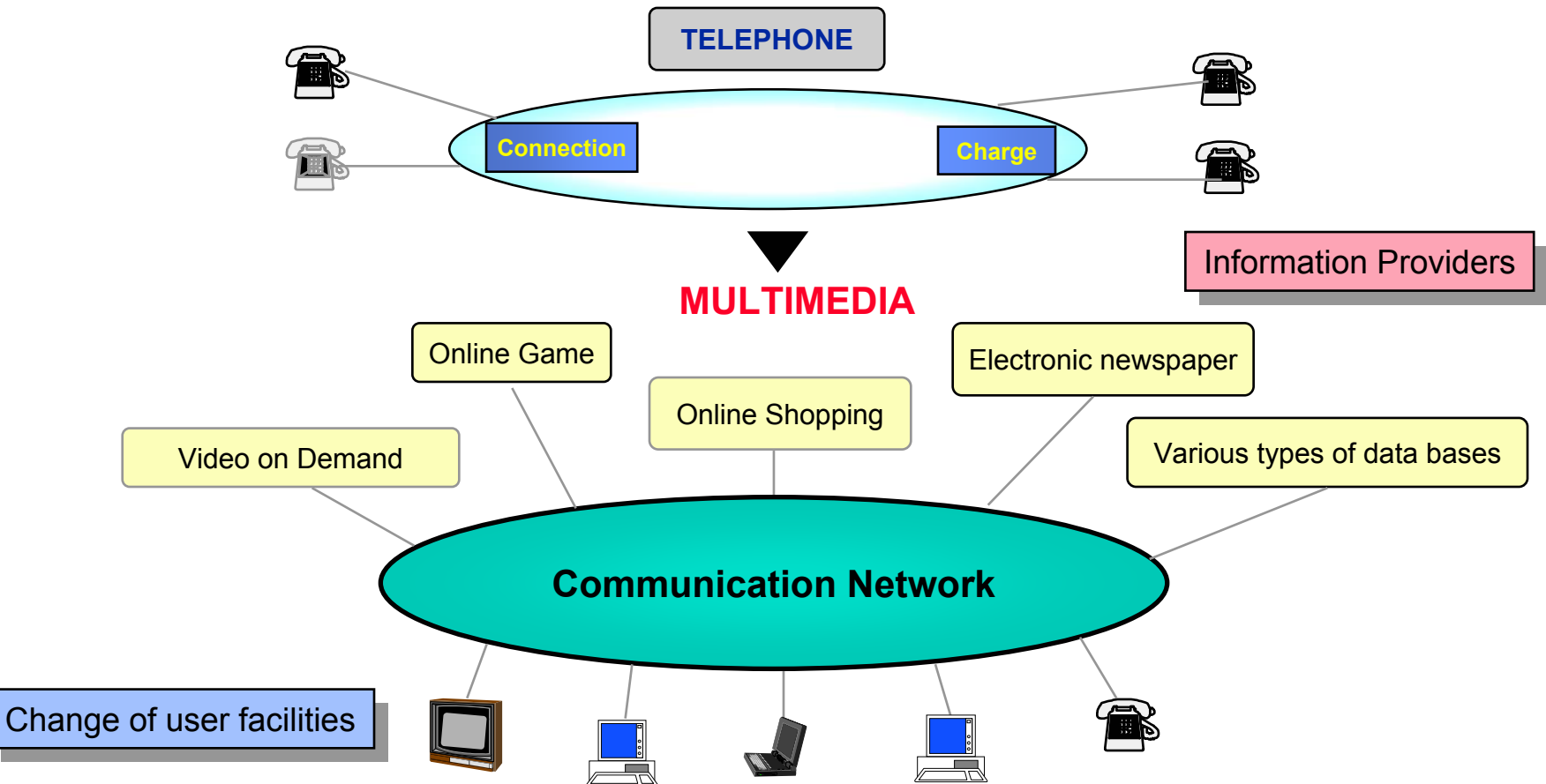
Bandwidth Drivers



MIP=million instructions per minute

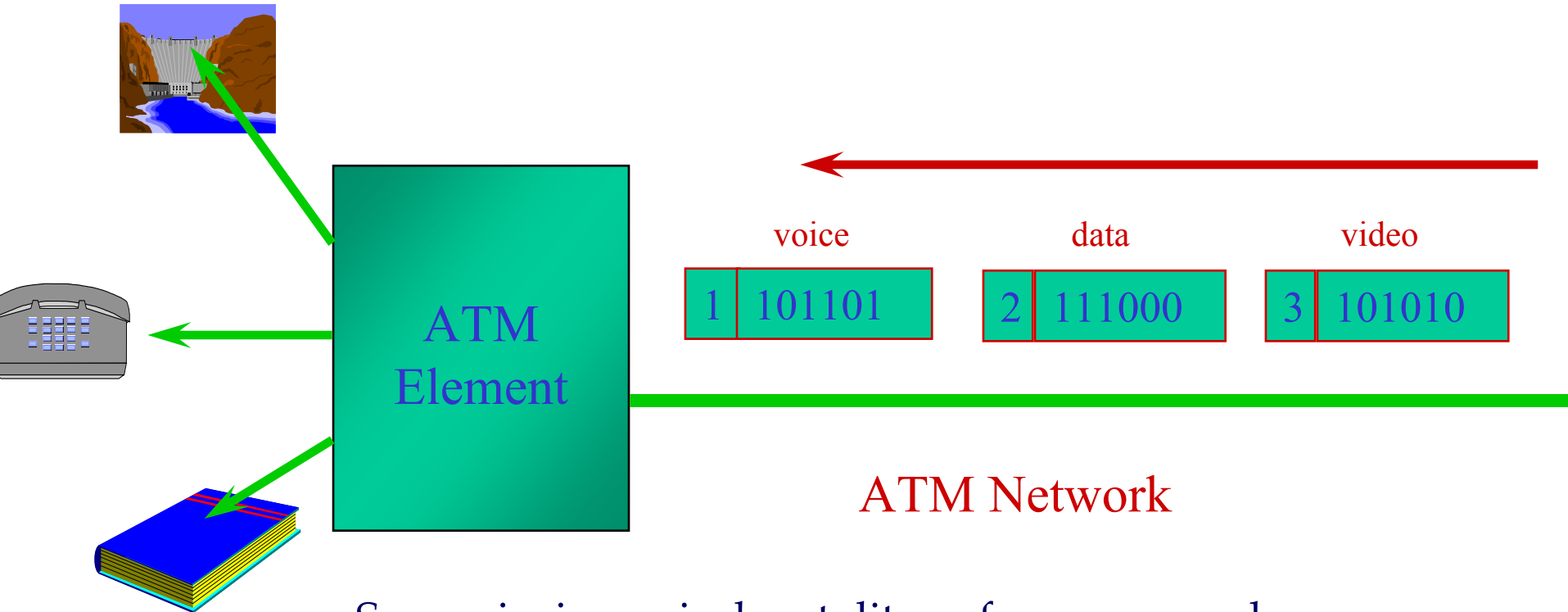
ASYNCHRONOUS TRANSFER MODE

Application Drivers



ASYNCHRONOUS TRANSFER MODE

Service Opportunities



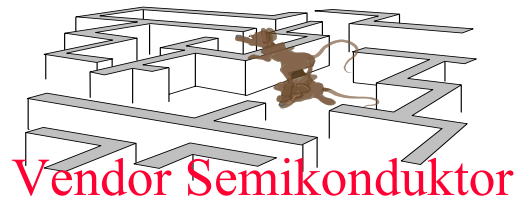
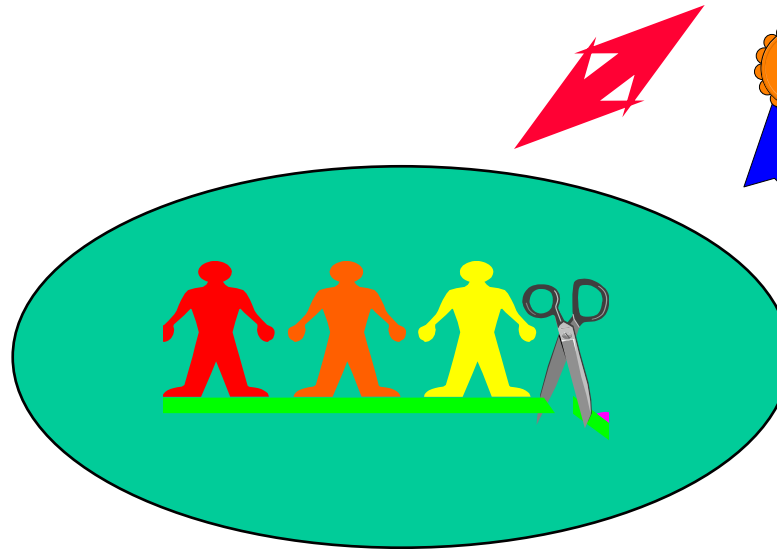
Semua jenis servis dapat ditransfer menggunakan jaringan yang sama dengan jumlah dan kecepatan sesuai yang diinginkan.

ASYNCHRONOUS TRANSFER MODE

Standarisasi ATM

Badan Standarisasi

ITU-TS (CCITT),
ANSI, ETSI,
ATMFORUM,



ASYNCHRONOUS TRANSFER MODE

ATM = Peluang untuk menghemat biaya

Meningkatkan rasio biaya/performansi

Siklus hidup lebih panjang, future proof network



Biaya jaringan mengecil

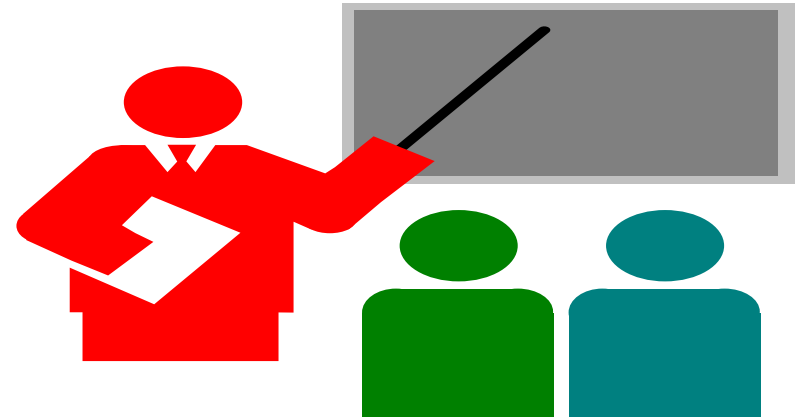
Biaya manajemen jaringan lebih rendah

Teknologi yang seragam untuk LAN=MAN=WAN

ASYNCHRONOUS TRANSFER MODE

ATM adalah

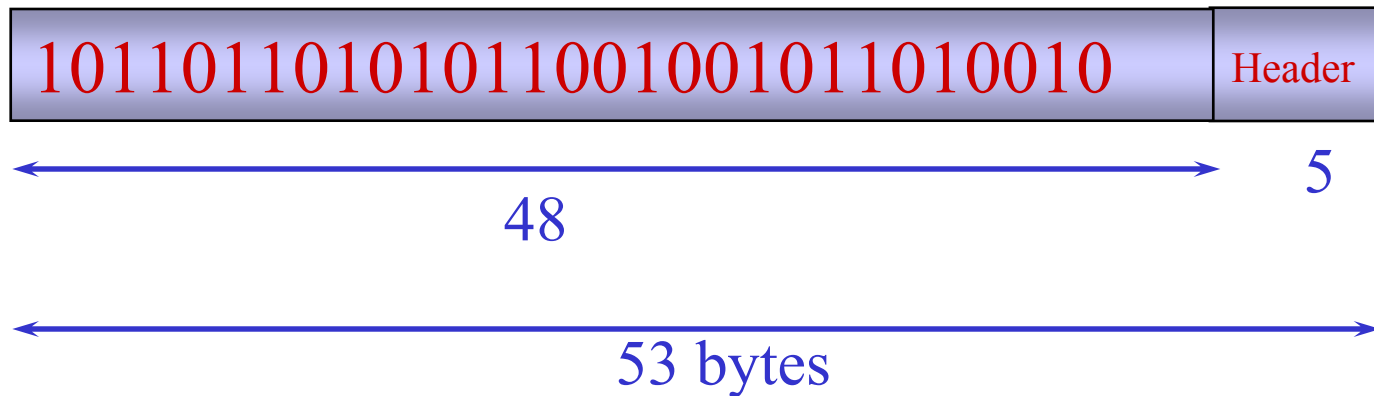
- 📄 Sel-sel yang membawa informasi user; sel tersebut diswitching di jaringan berdasarkan informasi routing yang ada di header.
- 📄 Informasi routing ini merupakan label, bukan merupakan alamat user.
- 📄 Metode untuk multiplexing dan switching sel-sel ini disebut Asynchronous Transfer Mode (ATM)



ASYNCHRONOUS TRANSFER MODE

Jadi ATM adalah.....

Asynchronous transfer mode
suatu standard untuk
mengemas, multiplexing,
switching informasi digital
menggunakan paket dengan
panjang tetap ('fixed length
packet') yang disebut **sel**,
sepanjang 53 byte (oktet).



ASYNCHRONOUS TRANSFER MODE

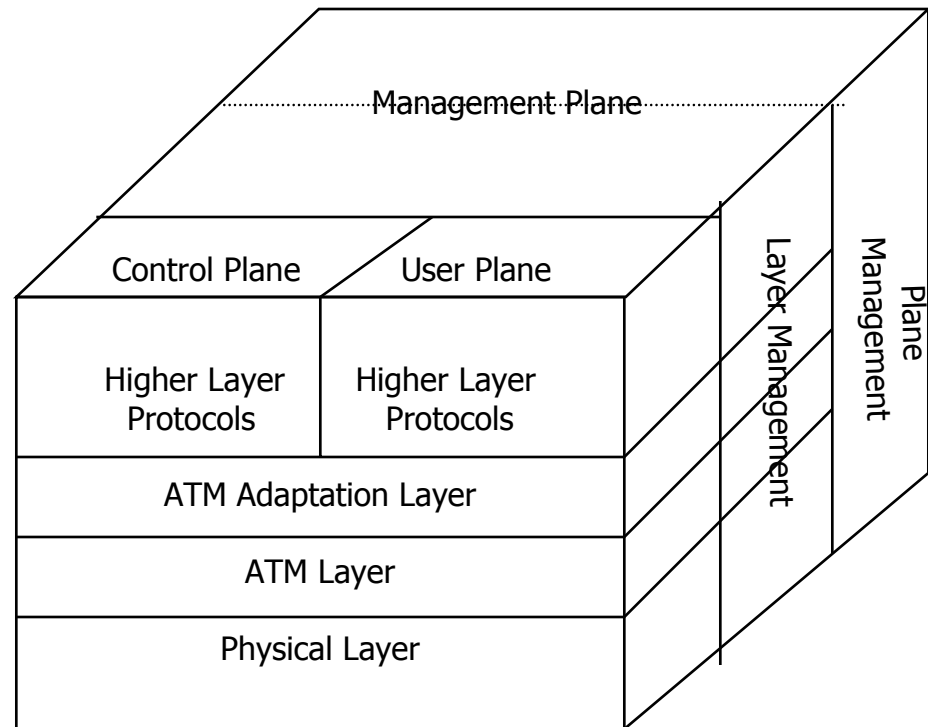
Karakteristik Umum

- a. Pada basis link-by link tidak menggunakan proteksi error dan flow control
- b. Connection oriented mode
- c. Pengurangan fungsi header
- d. Panjang field informasi dalam satu cell relatif kecil

ASYNCHRONOUS TRANSFER MODE

B-ISDN PRM (Protocol Reference Model)

- B-ISDN PRM (I.321) mengikuti prinsip OSI layering, layer service definition, service primitives, modularity, dan independence)
- 3 dimensi : User Plane, Control Plane, dan Management Plane



ASYNCHRONOUS TRANSFER MODE

Pemetaan Protokol ATM vs. 7
Layer OSI

Application
Presentation
Session
Transport
Network
Data Link
Physical

OSI Reference Model

CS	AAL
SAR	
ATM	ATM
TC	PHY
PM	

Protokol ATM

ASYNCHRONOUS TRANSFER MODE

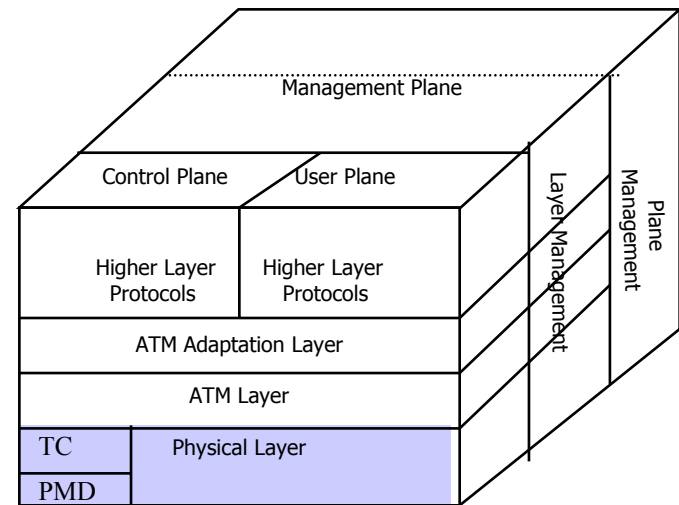
Physical Layer

(1) Physical Medium sublayer

Fungsi :

- medium, line code, connectors
- menggunakan standard dan teknologi yang sudah ada

(2) Transmission Convergence sublayer



ASYNCHRONOUS TRANSFER MODE

Transmission Convergence Sublayer

Fungsi :

- recovery frame transmisi
 - adaptasi frame transmisi
 - cell delineation
 - pembangkitan HEC sequence
 - cell rate decoupling
- specific terhadap PMD

ASYNCHRONOUS TRANSFER MODE

Interface ATM untuk LAN

Interface	Bitrate	Transmission media/ Coding	Jarak Maksimum
4B5B cellstream	25,6 Mbps	UTP-3 (NRZI)	100 m
STS-1	51,84 Mbps	Singlemode / multimode-fiber/ coax-cable	2 km / 2 km / 900 ft
STS-1	51,84 Mbps	UTP-3 (CAP)	100 m
FDDI (TAXI)	100 Mbps	Multimode-fiber	2 km
STS-3c	155,52 Mbps	UTP-5 (NRZ)	100 m
STS-3c	155,52 Mbps	Single-/multimode-fiber/coax-cable	2 km/ 2 km / 450 ft
Cellstream	155,52 Mbps	Multimode-fiber, STP (8B/10B)	2 km
STS-3c	155,52 Mbps	UTP-3	100 m
STS-12	622,08 Mbps	Monomode-fiber	300 m
STS-12	622,08 Mbps	Motimde-figer	300 m

ASYNCHRONOUS TRANSFER MODE

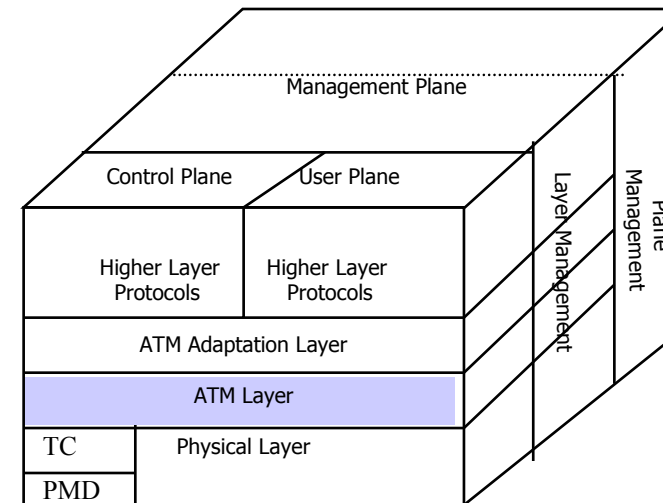
Interface ATM untuk WAN

Interface	Bitrate	Transmission media/ Coding	Jarak Maksimum
DS-1	1,544 Mbps	Twisted Pair	3000 ft
E-1	2,048 Mbps	Twisted Pair, Coax-cable	Undefined
E-3	34 Mbps	Coax-cable pair	Undefined
DS-3	44,736 Mbps	Coax-cable pair	900 ft
STS-1	51,840 Mbps	Monomode-fiber	15 km
STS-3c	155,52 Mbps	Monomode-fiber	15 km
STS-12	622,08 Mbps	Monomode-fiber	15 km
J2	6,312 Mbps	Coax-cable pair	Undefined
NxT1	N X 1,544 Mbps	Twisted	undefined

ASYNCHRONOUS TRANSFER MODE

ATM Layer

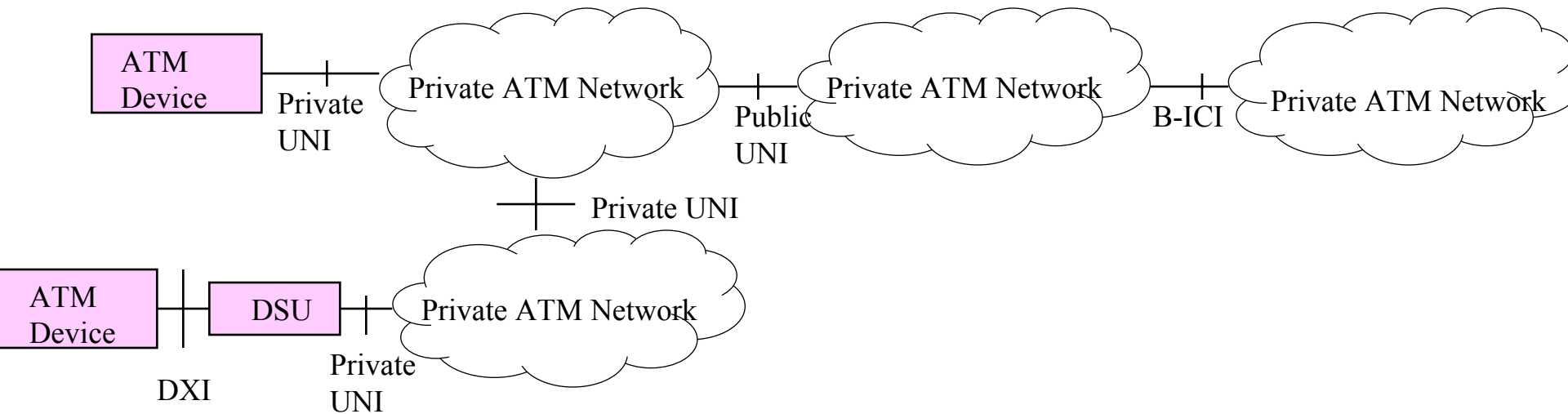
- Cell multiplexing/demultiplexing
- Translasi VPI dan VCI
- Pembangkitan/pemisahan cell header
- Generic flow control



ASYNCHRONOUS TRANSFER MODE

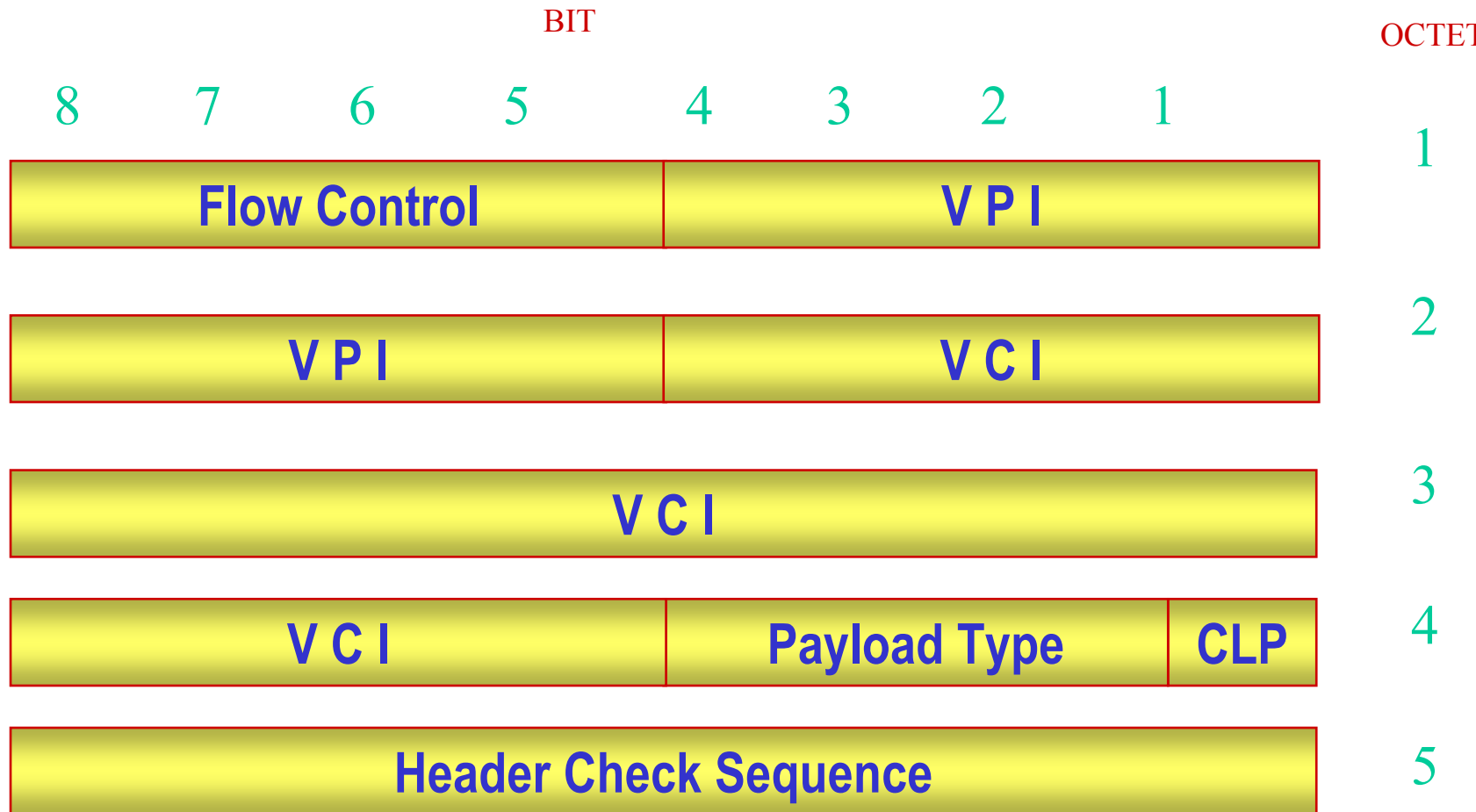
ATM FORUM Network Reference Model

- Standard Interface
 - UNI 3.1 & 4.0
 - B-ICI 2.1
 - PNNI 1.0
 - DXI 2.0



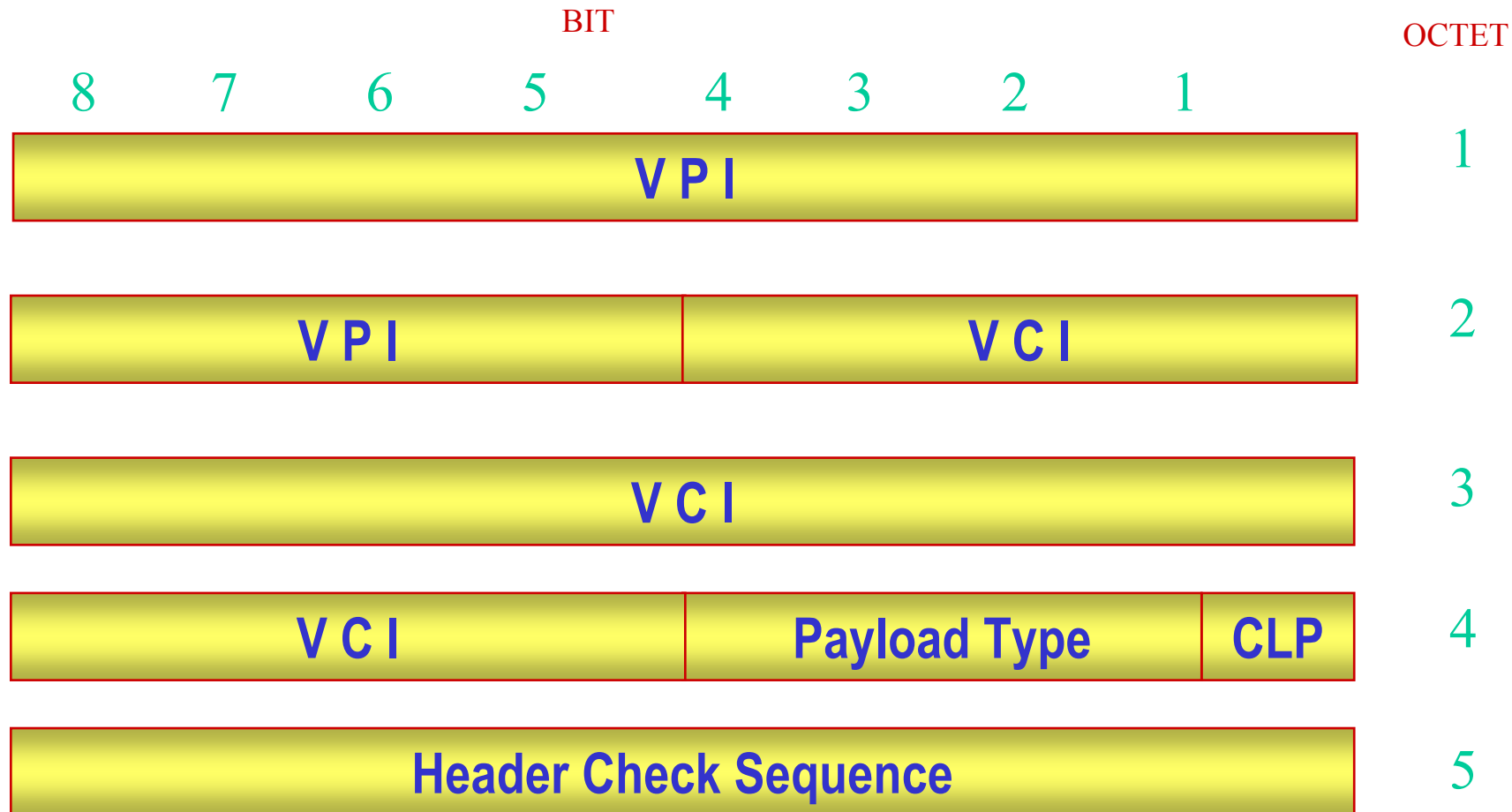
ASYNCHRONOUS TRANSFER MODE

ATM Cell Header at the UNI



ASYNCHRONOUS TRANSFER MODE

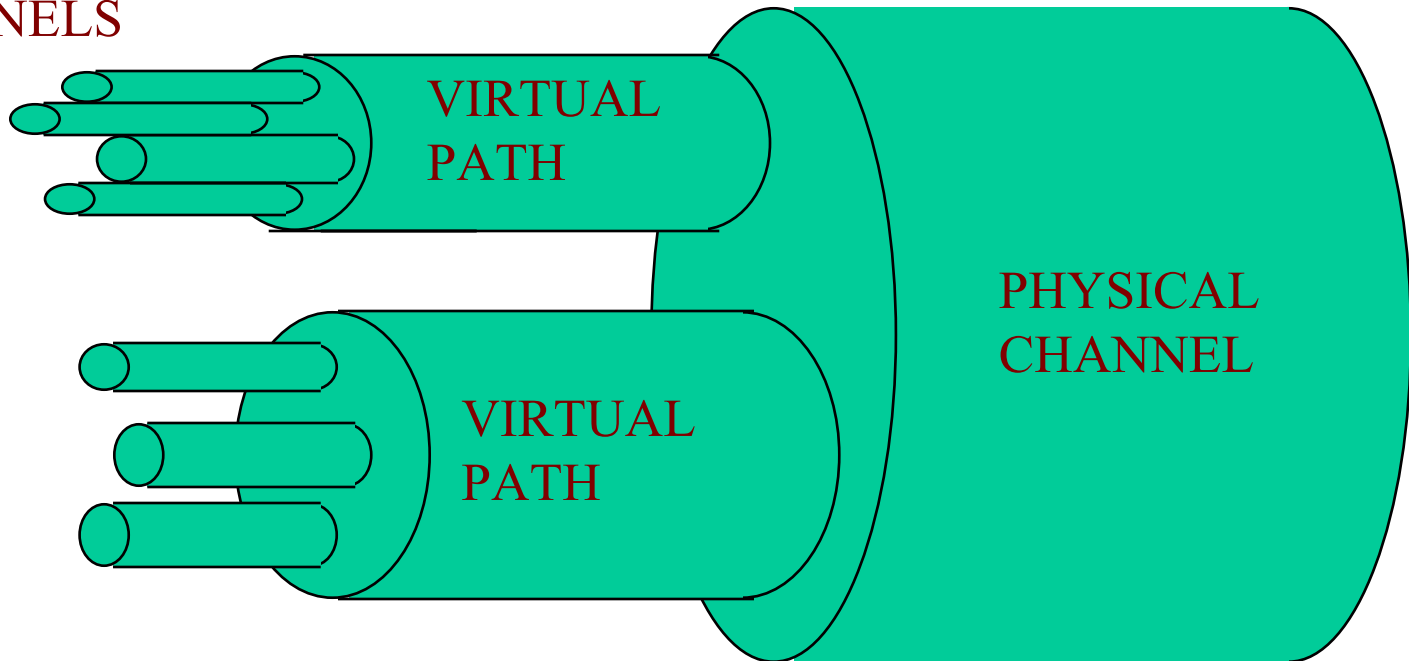
ATM Cell Header at the NNI



ASYNCHRONOUS TRANSFER MODE

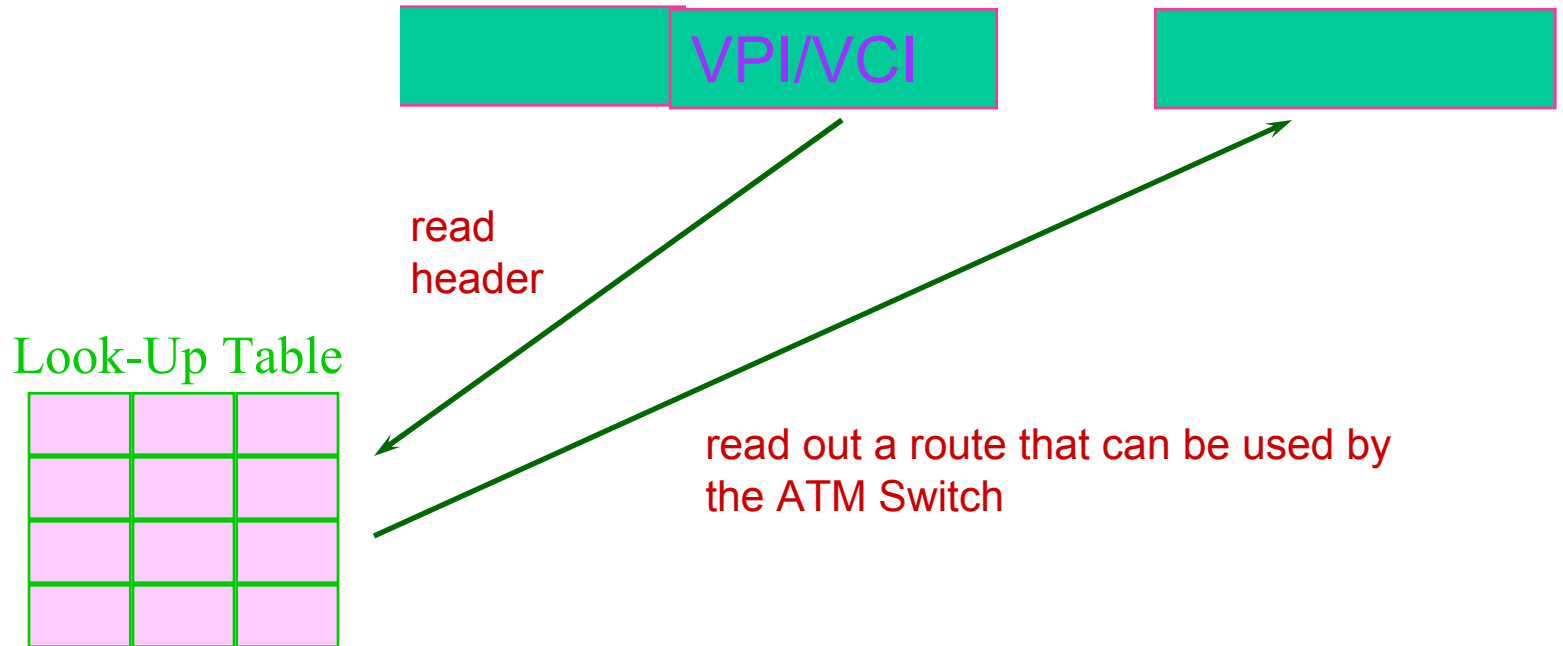
Virtual Channel and Virtual Path

VIRTUAL
CHANNELS



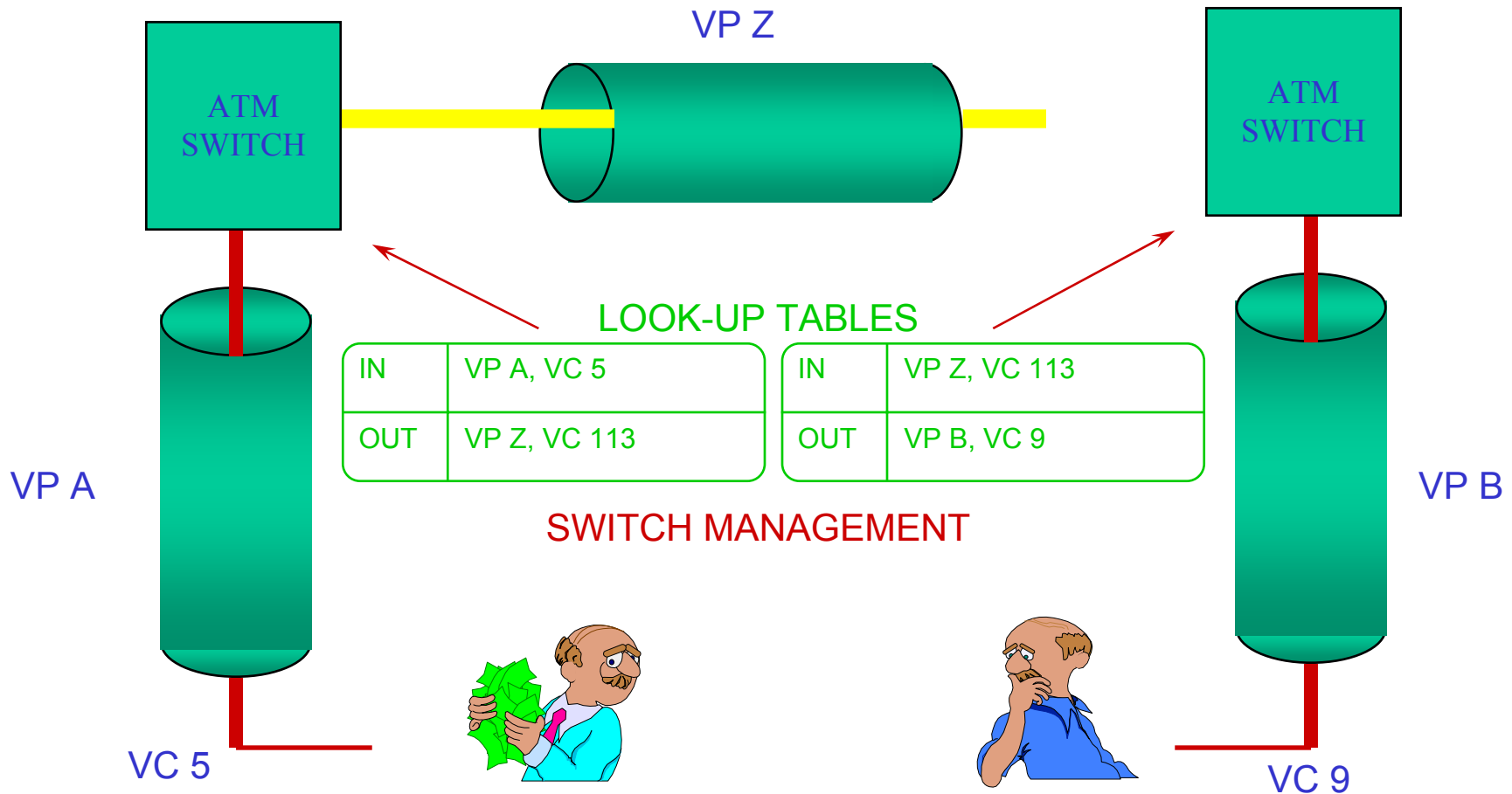
ASYNCHRONOUS TRANSFER MODE

Header Translation



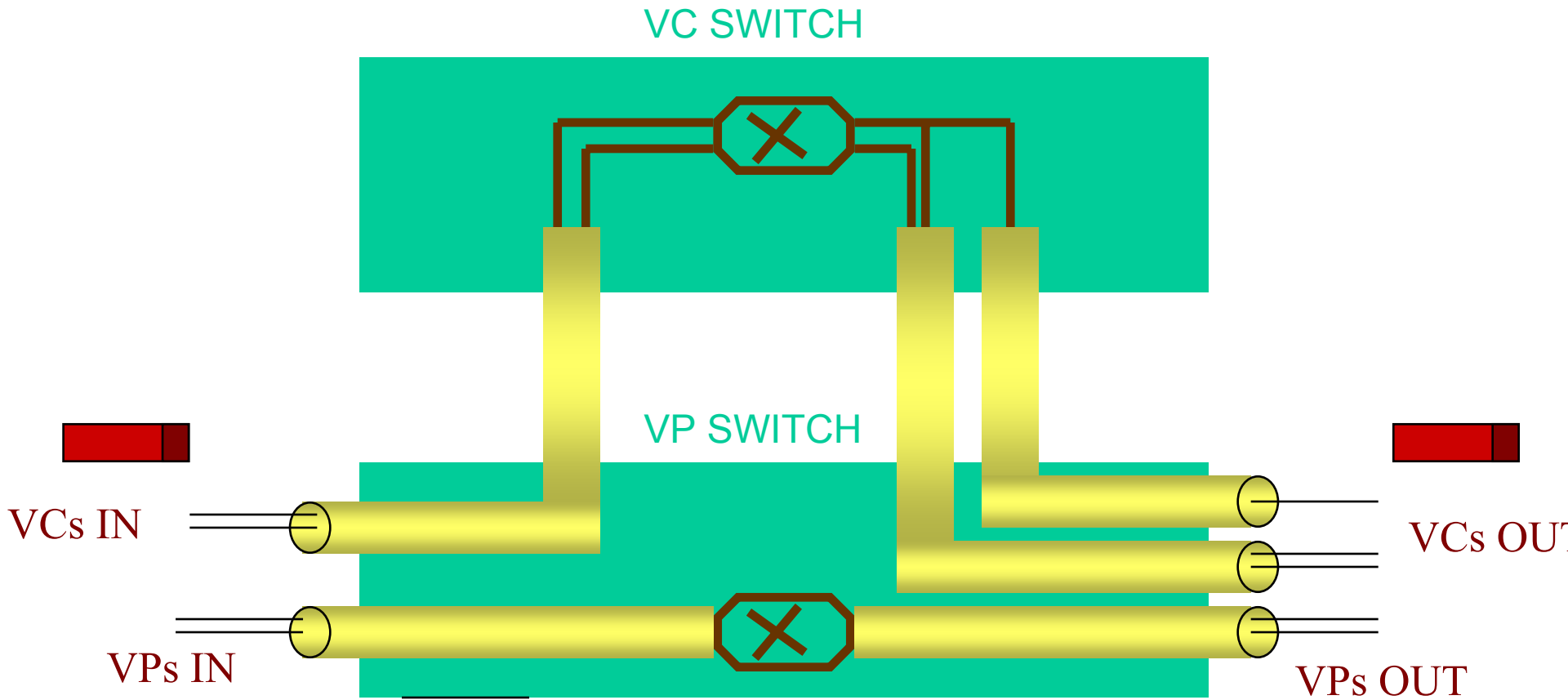
ASYNCHRONOUS TRANSFER MODE

Virtual Channel Connection



ASYNCHRONOUS TRANSFER MODE

VP and VC Switching



ASYNCHRONOUS TRANSFER MODE

Payload Type Identifier (PTI)

PTI	Penjelasan
000	User data cell, tidak ada kongesti, ATM layer-user-to-ATM layer-user indication=0
001	User data cell, tidak ada kongesti ATM layer-user-to-ATM layer-user indication=1
010	User data cell, ada kongesti ATM layer-user-to-ATM layer-user indication=0
011	User data cell, ada kongesti ATM layer-user-to-ATM layer-user indication=1
100	OAM F5 segment associated cell
101	OAM F5 end-to-end associated cell
110	Resource management cell
111	Dicadangkan untuk fungsi-fungsi yang akan datang

ASYNCHRONOUS TRANSFER MODE

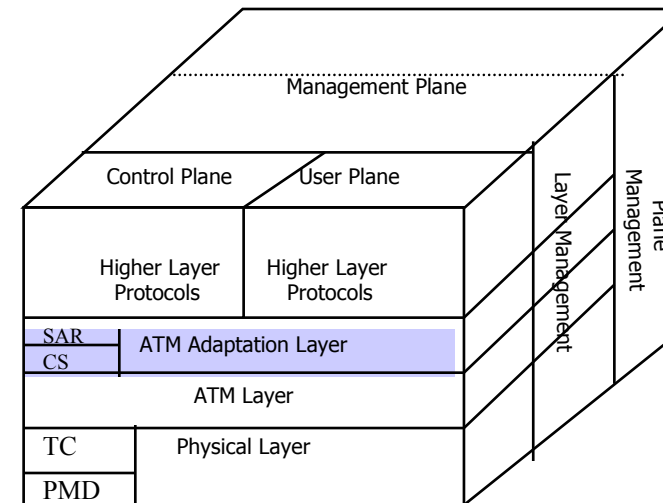
Pre-assign Header Cell

Jenis Cell	VPI	VCI	PTI	CLP
Unassigned cell	0000000	00000000 00000000	-	0
Meta-signalling cell	xxxxxxxx	00000000 00000001	0 A 0	B
General broadcast cell	xxxxxxxx	00000000 00000010	0 A A	B
Point-to-point signalling cell	xxxxxxxx	00000000 00000101	0 A A	B
Segment OAM flow F4 cell	yyyyyyyy	00000000 00000011	0 A 0	A
End-to-end OAM flow F4 cell	yyyyyyyy	00000000 00000100	0 A 0	A
Segment OAM flow F5 cell	yyyyyyyy	zzzzzzzz zzzzzzzz	1 0 0	A
End-to-end OAM flow F5 cell	yyyyyyyy	zzzzzzzz zzzzzzzz	1 0 1	A
Resource management cell	yyyyyyyy	zzzzzzzz zzzzzzzz	1 1 0	A
User information cell	yyyyyyyy	vvvvvvvv vvvvvvvv	0 C U	L

ASYNCHRONOUS TRANSFER MODE

ATM Adaptation Layer

- Segmentation and Reassembly sublayer
segmentasi informasi higher layer/
reassembly cell-cell
- Convergence sublayer
message identification, time/clock recovery
 - common part CS (CPCS)
 - service specific CS (SSCS)



ASYNCHRONOUS TRANSFER MODE

Klasifikasi Servis

	Kelas A	Kelas B	Kelas C	Kelas D
Relasi waktu antara sumber dan tujuan	Diperlukan		Tidak diperlukan	
Bit rate	Konstan	Variabel		
Connection mode	Connection oriented			Connectionless oriented

ASYNCHRONOUS TRANSFER MODE

ATM Adaptation Layer (AAL)

AAL	SERVICE SUPPORTED
TYPE 1	CBR : Video, DS1, DS3, Circuit Emulation
TYPE 2	VBR : Packet Video
TYPE 3/4	VBR, Connection/Connectionless Oriented: SMDS
TYPE 5	VBR, Connection/Connectionless Oriented : Frame Relay, Signaling

Servis ATM

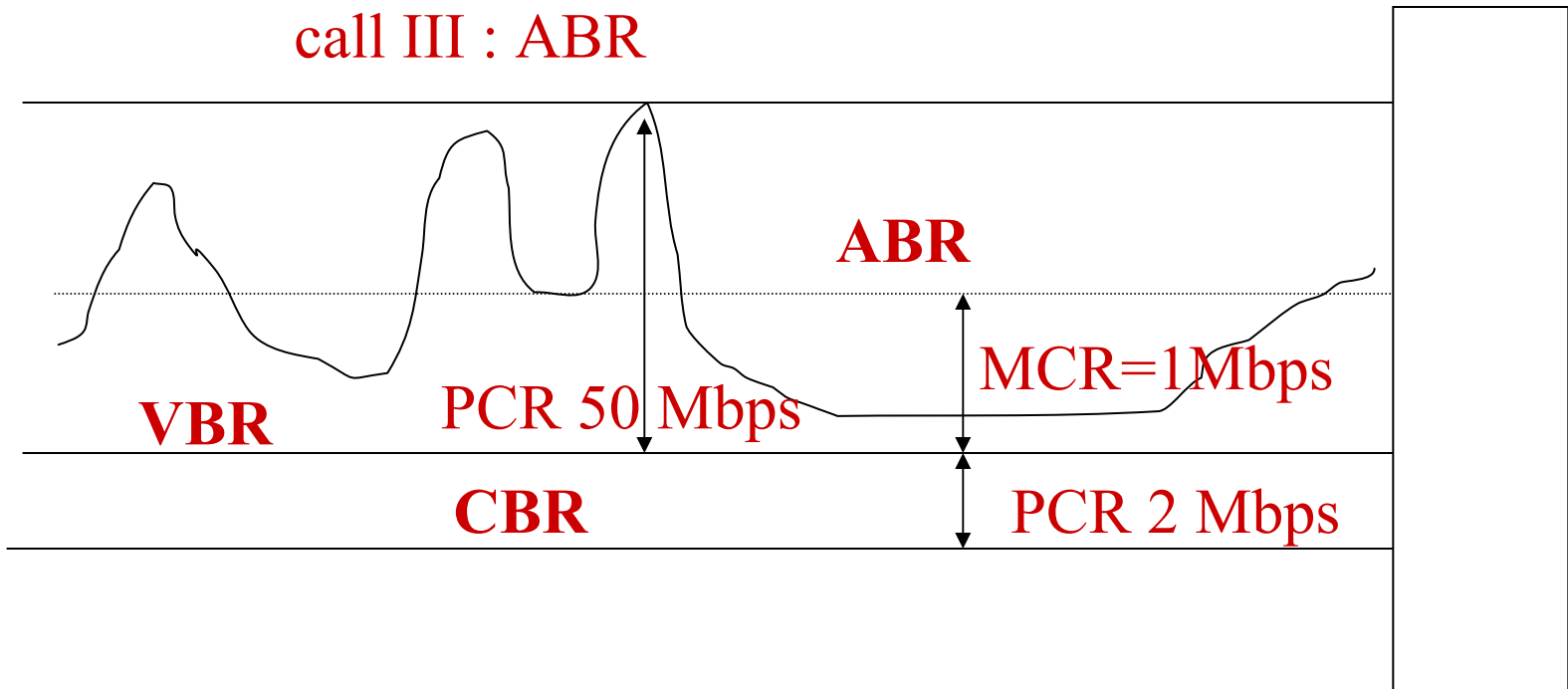
CBR, VBR, dan ABR

Misal : BW=52 MBps

call I : CBR dengan PCR = 2 MBps

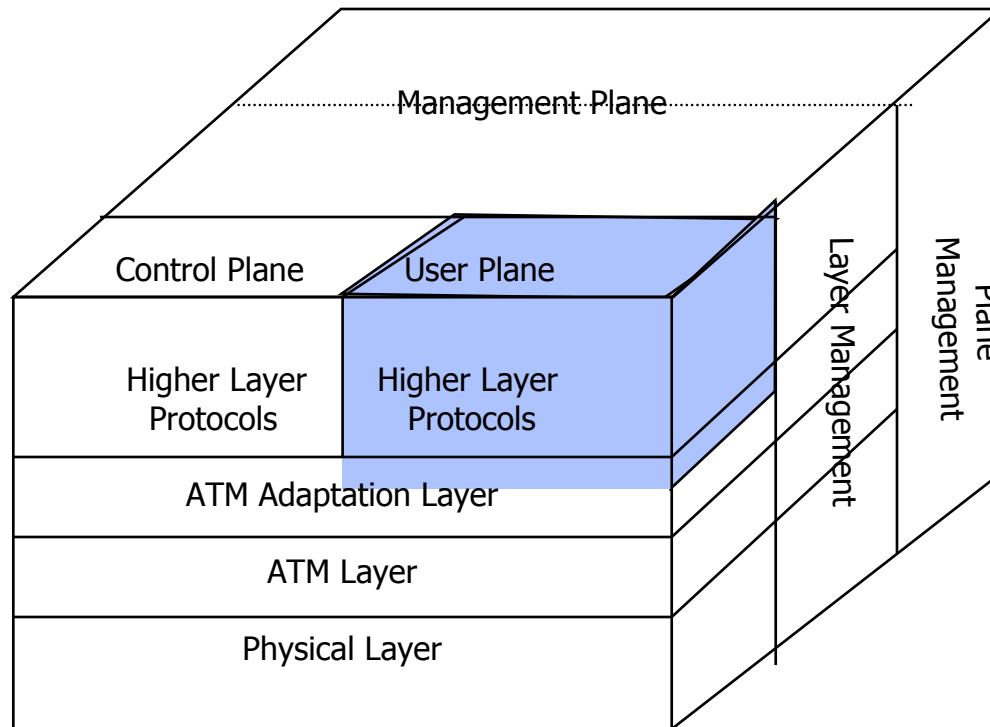
call II : VBR dengan PCR = 50 MBps, MCR = 1 Mbps

call III : ABR



ASYNCHRONOUS TRANSFER MODE

User Plane



AAL (Service Specific Convergence Sublayer : SSCS) dan higher layer menyediakan interface dan service untuk aplikasi end-user.

Misal Frame Relay (FR), Switched Multimegabit Data Service (SMDS), Internet Protocol.

ASYNCHRONOUS TRANSFER MODE

SSCS (Service Specific Convergence Sublayer,

Existing

- Frame Relay SSCS
- SMDS SSCS

Dikembangkan untuk aplikasi user :

- Desktop quality video
- Entertainment quality video
- Multicast LAN support
- LAN Emulation
- Reliability data delivery (seperti kapabilitas pada X.25)
- Interactive, cooperative computing support

ASYNCHRONOUS TRANSFER MODE

User Plane - Higher Layer

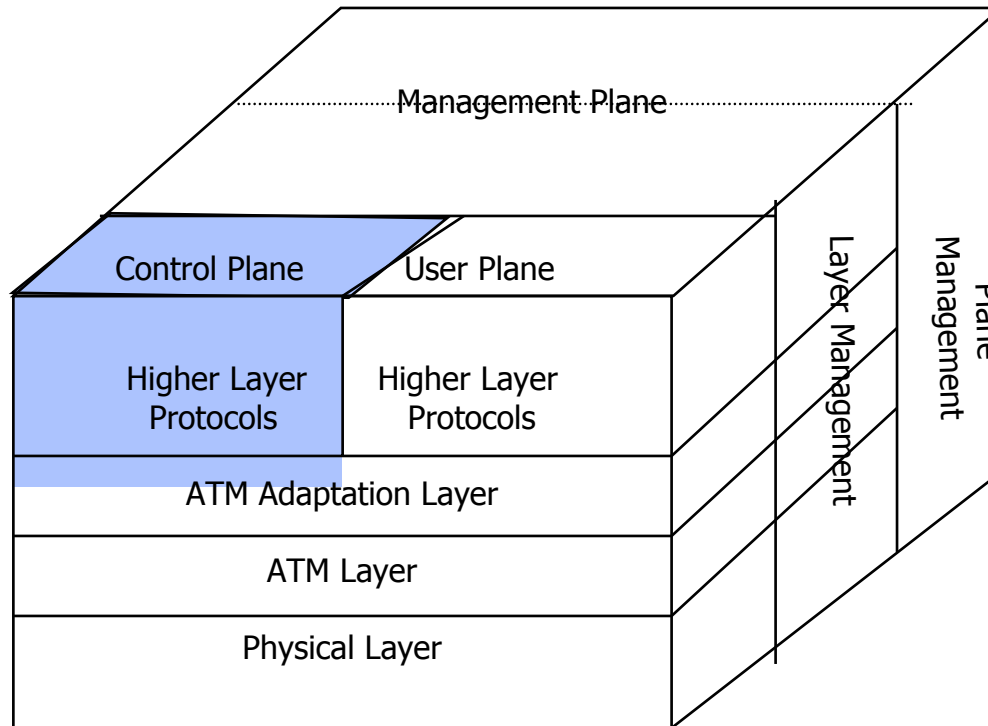
- IETF RFC 1483 : Multiprotocol Encapsulation Over ATM

Aktivitas pengembangan :

- ATM Forum LAN Emulation working group
- ATM Forum System Aspect and Applications (SAA) working group
- ATM Forum Private Network-Network Interface (P-NNI) working group
- IETF work group supporting IP over ATM
- IETF work group for routing over ATM networks

ASYNCHRONOUS TRANSFER MODE

Control Plane



ASYNCHRONOUS TRANSFER MODE

Control Plane

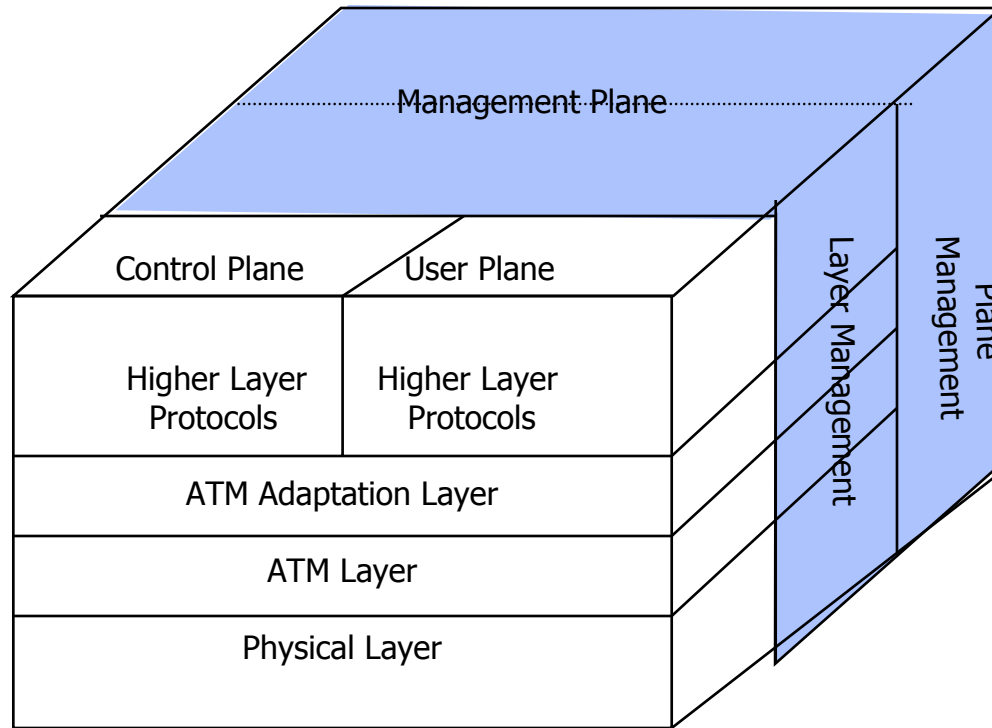
- Addressing dan Routing
- Signaling

Persyaratan skema addressing

- Sederhana
- Automatic assignment
- Penggunaan 'address space' yang efisien
- Mudah manage perubahan alamat
- Extensibility of the addressing scheme

ASYNCHRONOUS TRANSFER MODE

Management Plane



Profil Penulis :

Muhammad Syahrizal, kelahiran Medan 1981 ,meyakini bahwa buku adalah gerbang keberhasilan dan meyakini perubahan hanya soal waktu,zaman tak bisa dilawan.

Masih Kuliah ditiga perguruan tinggi jurusan hukum, management dan Informatika sampai saat ini sambil bekerja dan kuliah. Memiliki pengalaman Pendidikan Informal antara lain:Pelatihan Transaksi Perdagangan Via E-commerce (Juni 2001),Pelatihan Dasar Jaringan dan Satelit (Agustus 2002),Pelatihan Dasar Unix Untuk Umum (September 2000),Pelatihan Kekuatan Hukum dalam Aspek Regional /Internasional (Mei 2003)Pelatihan Product Knowledge dan Product Management,Management Training Materials,Business Skills Training ,Telecommunication Management System Training,IT Investment, IT Budgeting and IT Business Management Training,DMTP - Disaster Management and Training Programme,Financial Management Training,Managing Logistic IT Project / workshop training, Professional Certification Workshop - P3 Behavioral Analyst, Pelatihan Metals Project -Indonesia Australia Partnership For Skills Development (Januari 2004),Pelatihan Robotic Hardware and Software Development (Oktober 2003),Formulas for Quantifying the Value of a Training - Technologies Invesment,Training & Organizational Development, Network and Security Audit (workshop) (16-18 Juni 2004),Next Generation Network (23-25 Juni 2004),Network Planning- High Speed (Broadband) networking infrastructure,Java and Web Service (6-9 July 2004),Pelatihan Teknologi Interactive Voice Response Server (July,2005-Lhokseumawe),Pelatihan Operasional dan Perbaikan Sentral IVR (Oktober,2005-Lhokseumawe),Pelatihan Teknis Sentral IVR untuk Aceh, Padang, Bukit Tinggi, Solok, Padang Sidempuan, Lhokseumawe (Desember,2005-Jakarta),Pelatihan Hacking dan Security oleh Hadi Sri Atmono (January 2006, Medan),Leader Ship Day (Maret,2006 - Jakarta).

Sampai saat ini aktif dibeberapa Organisasi antara lain :Asisten Divisi Pengembangan dan Pengendalian Robotic Population Club (Ohio, Jepang), Ketua Team Level C-4 Research and Development Club (Jakarta),Ketua Network Identification and ID Consentration Club (Singapore), Anggota Team Chemical And BioTechnologies Research Project (Severnaya Rusia), Anggota HMI (Himpunan Mahasiswa Indonesia),Anggota Team Basket Junior Angsapura (1998-2000),Anggota Bidang Olahraga SMU Negeri 7 Medan,Anggota Organisasi Keislaman, Moral dan Mental (BINTAL =Bina Mental) .

Memiliki pengalaman trainer antara lain: Microsoft Exchange 5-5 Series Concepts and Administration PT. Iverson Konsultan Indonesia 2001 ,Designing Windows 2000 Active Directory PT. Metrodata Edukasi Informatika 2001 ,Designing Windows 2000 Network Service PT. Metrodata Edukasi Informatika 2001 ,Ms Windows 2000 Network & Operating System Essentials PT. Schematic PrimaPersada, PT. Executrain 2001 ,Introduction to Deploying Microsoft Windows 2000 Professional for IT Professionals and OEM System Builders PT. Schematic PrimaPersada, PT. Executrain 2001 ,Secure Web Access Using Microsoft Proxy Server 2.0 Preliminary Course Syllabus PT. Schematic PrimaPersada, PT. Executrain 2001 ,Creating and Managing Web Server Using Internet Information Server 4.0 PT. Schematic PrimaPersada, PT. Executrain 2001 ,Install and Configure Windows 2000 as File, Print and Web Server PT. Schematic PrimaPersada, PT. Executrain 2001 ,Introduction to Visual Basic .NET Programming & System Design PT. Yamaha Music Indonesia 2002 ,Analyst and Design Methodologi PT. Sakura Bengawan 2002 ,CIW:Design Methodology and Technology Book 1 & 2 BPK ,E-Commerce Strategies and Practices BPK 2003 , Microsoft Internet & Website Fundamentals PT.Iverson 2003 ,MicrosoftAccess 2002 for Non-Programmers BRI 2003 ,Microsoft Access 2002 Delivery Guide BRI 2003 ,Mastering MFC Fundamental Using Microsoft Visual C++,Bank Indonesia 2003 Beginning Java Programming Using Java SDK 1.4 Limas, Satelindo 2003 Transact-SQL Using SQL Server 2000 Bank Mandiri 2003 ,Java Script Unleashed PT.PLN 2003