

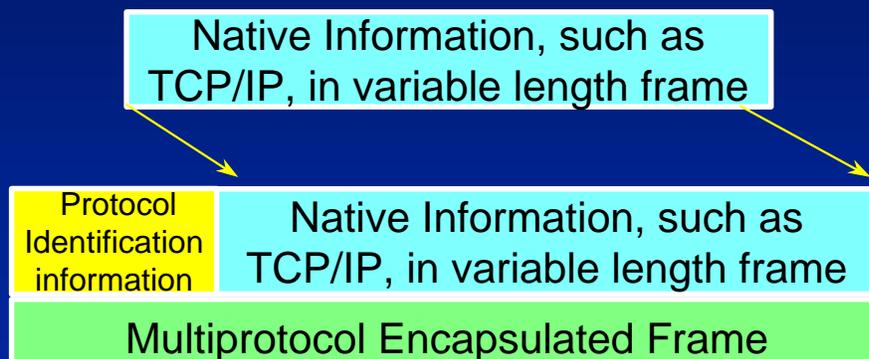
ATM Details: Adaptation Layers

Section 3



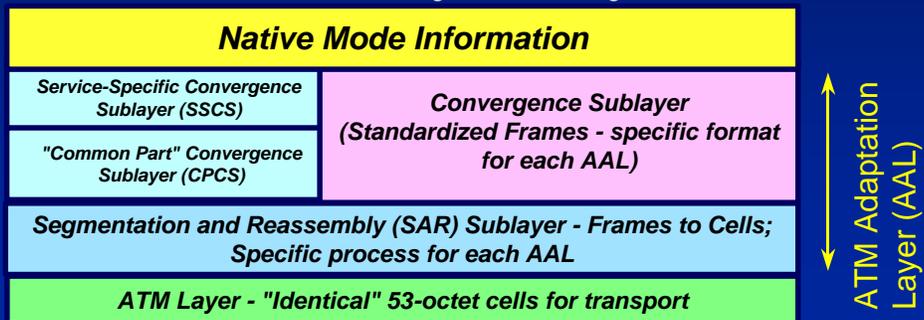
Multiprotocol Encapsulation

- ◆ Various data formats are identified



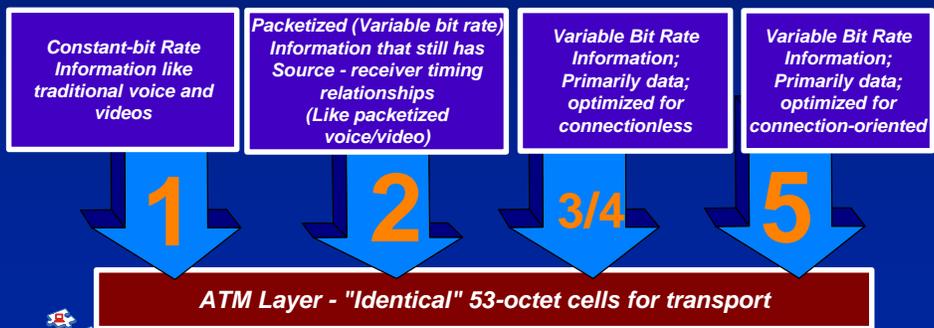
ATM Layers

- ▼ The "ATM Layer" is only one of the multiple layers in the entire process of data transmission.
- ▼ The CS and SAR Sublayers are key.



ATM Layers

- ◆ The adaptation process also includes "PMD" (Physical Media Dependent) and TC (Transmission Convergence) sublayers



ATM Adaptation Layers

- ▼ Many of the most important characteristics of an ATM transmission are determined in the "Adaptation Layers" - or AALs
- ▼ The AALs determine how the native information is formatted into CS-PDUs and how the CS-PDUs are segmented into cells
- ▼ There are currently three primary AALs
 - ▼ Three more are (or have been) under development
 - ▼ Roughly align to classes of service, but not exactly now



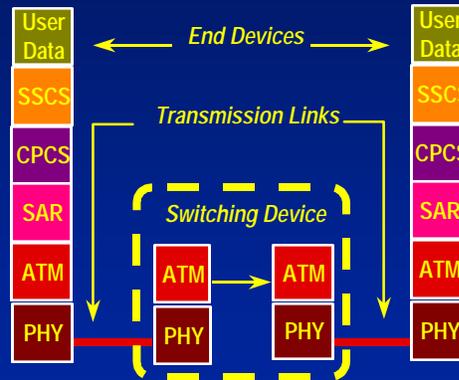
Primary ATM Adaptation Layers

Service Class	ATM Adaptation Layer	Primary Type of Traffic	Source - Dest Timing Relation?	Current Interest Level	Complexity	Example
A	1	CBR Connect. Oriented	Yes	High	Low	CBR Voice & Video (Circuit Emulation)
D	3/4 (or 5)	VBR Conn'less	No	Medium (SMDS)	High	Conn'less Data
C	5 (or 3/4)	VBR Connect. oriented	No	High	Low	Connection Oriented Data



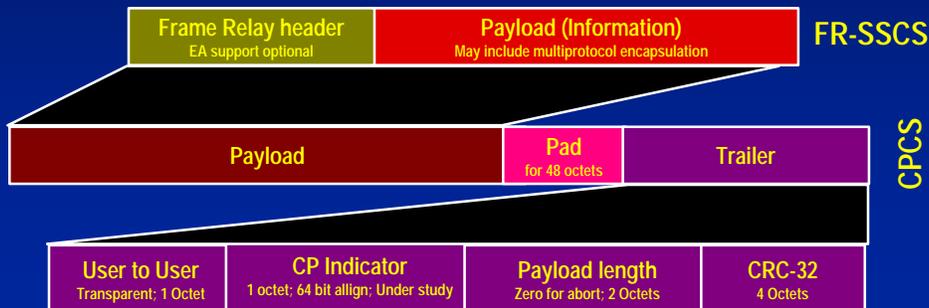
AAL-5 (SEAL)

- ▼ "Simple & Efficient Adaptation Layer"
- ▼ Connection-oriented data
- ▼ All 48 cell payload octets for "user information"
- ▼ Convergence sublayer
 - ▼ CPCS - "Common Part Convergences Sub-Layer"
 - ▼ SSCS - "Service Specific CS"

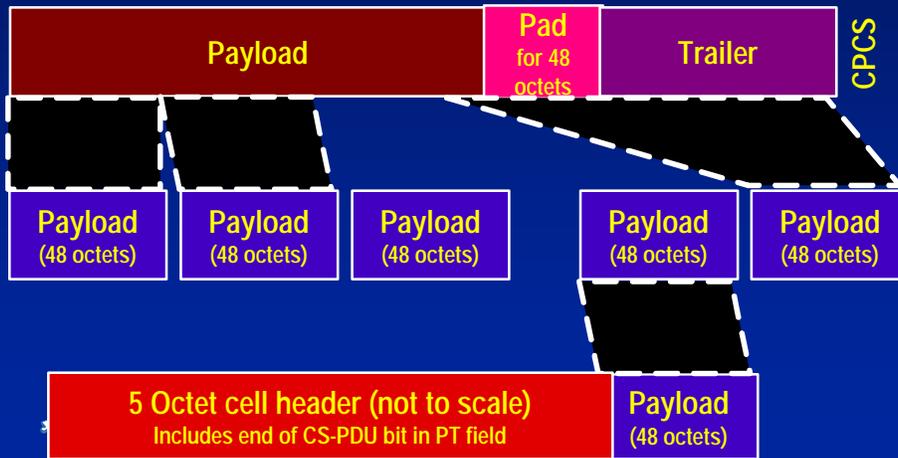


AAL-5 (SEAL) Convergence Sublayer

- ▼ SSCS may or may not be null
- ▼ FR-SSCS is used for Frame Relay interoperability



AAL-5 (SEAL) SAR PDU

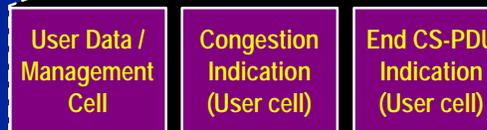
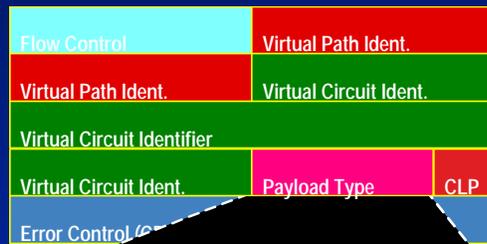


Details of ATM Cell Header "Payload Type"

▼ First bit indicates User or Management cell

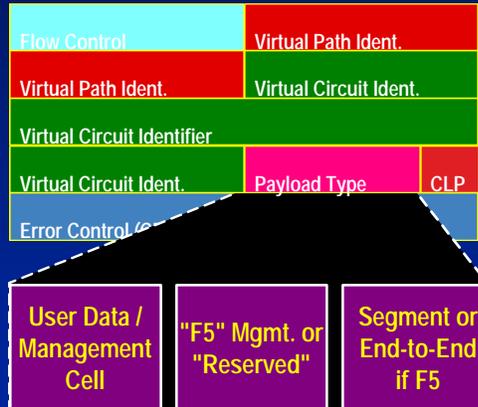
▼ User cells:

- ▼ Congestion indication: "FECN"-like
- ▼ End of CS-PDU useful if each process has unique VPI/VCI
- ▼ "0" indicates end; Parameter actually a "More"



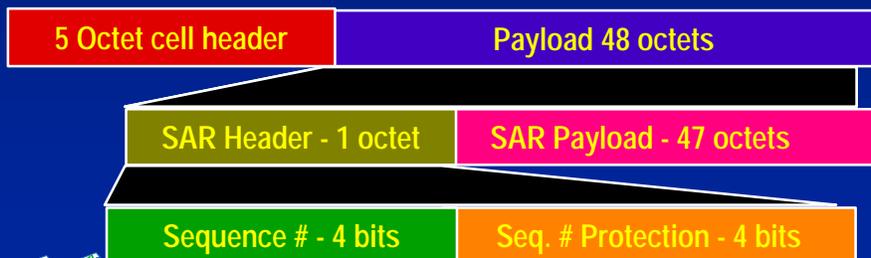
Details of ATM Cell Header "Payload Type"

- ▼ First bit indicates User or Management cell
- ▼ Management cells:
 - ▼ "F5" manages VCIs
 - ▼ "F4" manages VPIs
 - ▼ Special VCIs reserved for VPI management



AAL-1 SAR PDU Format

- ▼ Used for Constant Bit Rate traffic; "CES" (Circuit Emulation Service)
- ▼ Essentially a null convergence sublayer; nothing really added

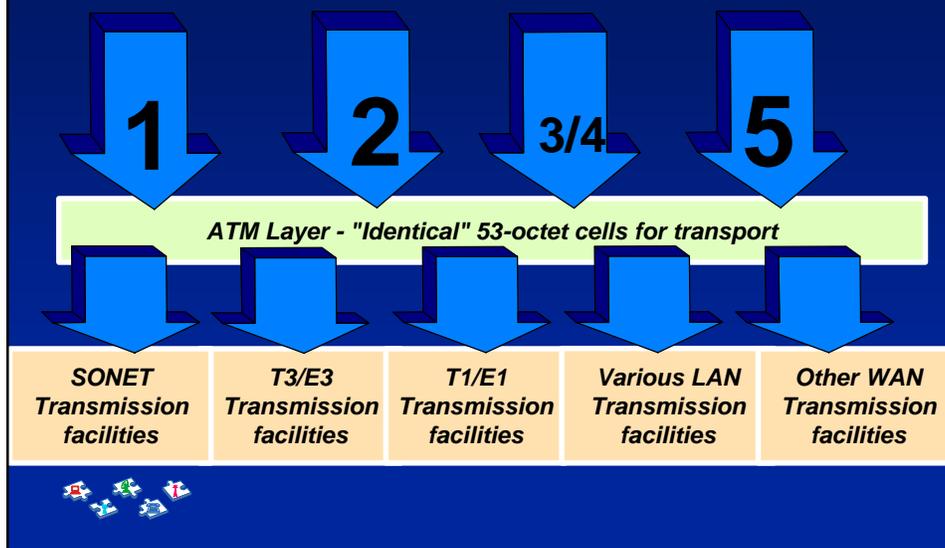


Additional Classes of ATM Service

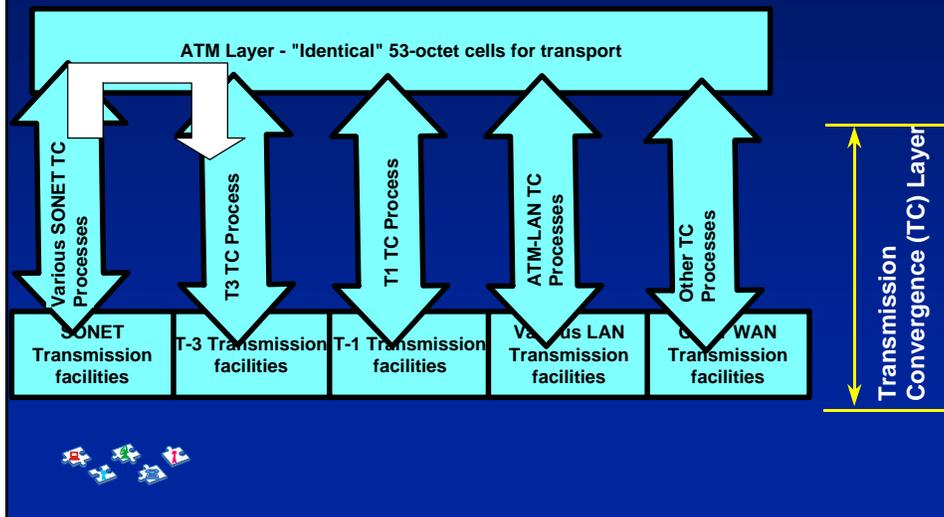
Service Class	ATM Adaptation Layer	Type of Traffic	Source - Dest Timing Relation?	Current Interest Level	Complexity	Example
Y - ABR	5?	VBR - Low Cell Loss	No	High	Medium High	LAN Emulation
X - UBR	5 Core	Raw cell delivery	No	Medium	Low	Cell delivery inside service
B	2 (or possibly 5)	Variable Bit Rate (Conn. Oriented)	Yes	Medium	Medium	Packet Voice & Video



Physical & Transmission Convergence Layers

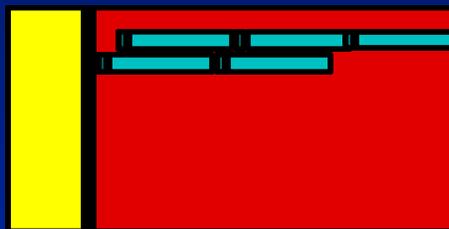


Transmission Convergence



ATM Transmission Process (TC)

- ▼ Once the information is divided into cells, it is formatted for transmission on a physical facility.
 - There are different TC formats for each type of facility (LANs, SONET, T3/E3, T1/E1, etc.)
 - ATM cells as SONET payload



Sonet Transport of Cells

- ▼ Current specs perform cell alignment via HEC
- ▼ COSET used with X-OR due to null cells
 - Still allows method for cell delineation
 - COSET X-OR'ed twice yields original

Original	0	0	1	1
COSET	1	0	1	0
XOR	1	0	0	1
COSET	1	0	1	0
XOR	0	0	1	1

