Asynchronous Transfer Mode

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An ATM network is designed to be able to transfer many different types of traffic simultaneously, including real-time flows such as voice, video. and bursty TCP flows. Although each such traffic flow is handled as a stream of 53-octet cells traveling through a virtual channel, the way in which each data flow is handled within the network depends on on the characteristics of the traffic flow and the requirements of the application.

ATM Service Categories

The following service categories have been defined by the ATM forum:
1. Real-Time Service
* Constant bit rate(CBR)
* Real-time variable bit rate(rt-VBR)
2. Non-Real-Time Service
* Non-real-time variable bit rate(nrt-VBR)
* Available bit rate(ABR)
* Unspecified bit rate(UBR)
* Guaranteed frame rate(GFR)

REAL-TIME SERVICES
It is used for applications which are very sensitive to delay and jitter(variability of delay).

Constant Bit Rate(CBR)
Examples: Videoconferencing, uncompressed Audio/Video distribution
Real-Time Variable Bit Rate(rt-VBR)
Examples: Compressed audio/video distribution

NON-REAL-TIME SERVICES
These are used for applications that have bursty traffic characteristics and do

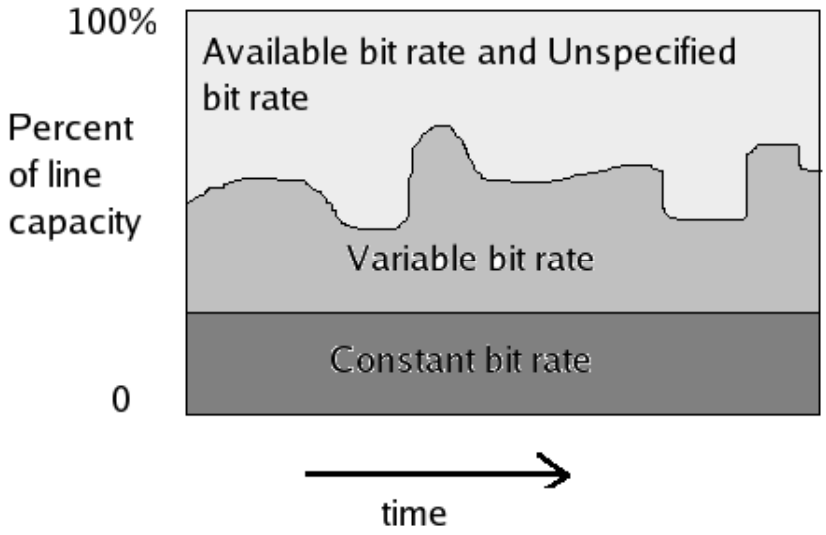

Figure 1: ATM Bit Rate Services

not have tight constraints on delay and variations. Accordingly the network has greater flexibility in handling such traffic flows and can make greater use of statistical multiplexing to increase network efficiency.

Non-Real-Time Variable Bit Rate(nrt-VBR)
Examples: Airline reservations, Banking transactions

Unspecified Bit Rate(UBR)
It uses the capacity which remains unused by CBR and VBR traffic. It is useful for services which can tolerate variable delays and some cell losses.
Examples: Text/data/image transfer, Remote terminal(Telecommuting) **Available Bit Rate(ABR)**
It specifies a peak cell rate(PCR) and a minimum cell rate(MCR). The network allocates resources so that all ABR application receive at least their MCR capacity.
Examples: LAN interconnection

Guaranteed Frame Rate(GFR)
It is extension of ABR and better suited for IP backbone subnetworks. It optimizes handling of frame based traffic and is better in congestion control.

ATM ADAPTATION LAYER
The use of ATM creates the need for an adaptation layer to support information transfer protocols not based on ATM. Two examples are PCM(Pulse Code Modulation) voice and the IP(Internet Protocol). To employ these applications over ATM, it is necessary to assemble the bits into cells and read them out on reception in such a way as to produce a smooth, constant flow of bits to the receiver. By allowing the use of IP over ATM, all the existing IP infrastructure can be used over an ATM network.

AAL Servies
* Handling of transmission errors
* Segmentation and reassembly, to enable larger blocks of data to be carried in the information field of ATM cells
* Handling of lost and misinserted cell conditions
* Flow control and timing control

The AAL layer is organized into two logical sublayers: the convergence sublayer(CS) and the segmentation and reassembly sublayer(SAR). The convergence sublayer provides the functions needed to support specific applications using AAL. Each AAL user attaches to AAL at a Service Access Point(SAP),

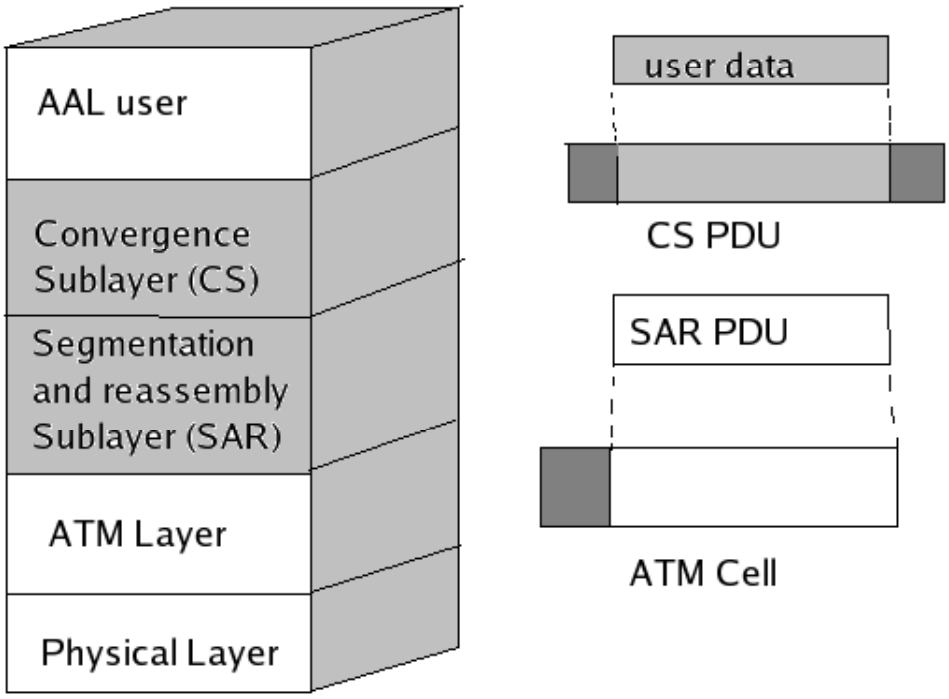

Figure 2: AAL Protocols and PDUs

which is simply the address of the application. This sublayer is thus service dependent.