ATM vs. TDM

FACT SHEET

Overall Comparison

Issue	TDM	ATM	Remarks
Cost of ownership	★★	★★★★★	ATM lowers recurring bandwidth and operation costs
Bandwidth efficiency	★	★★★★★	ATM enables different applications to share bandwidth while preserving QoS
Multiservice	★★★	★★★★★	ATM delivers multiservice capability without affecting bandwidth efficiency; TDM provides multiservice capability at the expense of bandwidth efficiency
Quality of service (QoS)	★★★	★★★★	ATM enables QoS without affecting bandwidth efficiency; TDM enables QoS at the expense of bandwidth efficiency
Scalability	★★	★★★★★	ATM networks can evolve to support emerging bandwidth-intensive applications

★ = very poor ★★ = weak ★★★ = fair ★★★★ = good ★★★★★ = excellent

Limitations of TDM

Limitation	Why	Detail
High recurring bandwidth cost	Bandwidth inefficiency	• Bandwidth is wasted with statically mapped CBR-like connections (MCR=SCR=PCR) • During periods of no traffic, bandwidth is not reassigned to other applications • Inability to efficiently accommodate bursty data applications • When all available bandwidth is allocated, additional bandwidth must be procured
Limited application performance	QoS is delivered at the expense of bandwidth; limited bursting capability	• Cannot support bursty data, even during periods of voice silence, because bandwidth is statically allocated
Limited scalability to support traffic growth and new applications	Bandwidth generally limited to T3/E3; no trunking over public ATM services	• Increasing traffic and new applications require a migration path to broadband connectivity • Architecture is not optimal for broadband services, especially for New World IP-based applications • Public ATM services cannot be used for trunking

Advantages of ATM

Advantage	Why	Detail
Savings in recurring bandwidth cost	Bandwidth efficiency gained with statistical multiplexing	• Bandwidth is dynamically shared among all applications • Multiservice integration saves bandwidth • Silence suppression for voice and repetitive pattern suppression for circuit data save bandwidth • Use of public ATM services for trunking provides a cost-effective alternative to leased lines
Enhanced application performance	Efficient traffic management optimizes application throughput	• ABR with VS/VD enables monitoring and adjusting of the cell rate of connections, avoiding congestion • Large dynamically assigned buffers
Guaranteed QoS levels for different applications	User applications firewalled and fair allocation of excess bandwidth provided	QoS is guaranteed with: • Per-virtual circuit queuing • Per-virtual circuit rate scheduling • Multiple classes of services (CoSs), including CBR, RT-VBR, NRT-VBR, UBR, ABR
Scalable architecture to support new applications	Evolution enabled to broadband connectivity	• Traffic growth is accommodated by offering a migration path to broadband networking • Architected specifically for multiservice networks—enabling New World applications
Smooth migration path from TDM	Seamless integration into existing environments	• TDM CoSs and native ATM CoS are supported • Legacy interfaces (X.25, circuit data, voice) and native Frame Relay or ATM are supported

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