

ATM vs. TDM

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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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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