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ATM Forum Document Number: ATM Forum/95-972

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Title: Parameter Values for Satellite Links.

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Abstract:
We show that Xrm is the key parameter which affects performance
on satellite links. With current 8-bit XRM field, the maximum
throughput on satellite links is limited to a few Mbps even on
155 or 622 Mbps links.  The problem can be fixed by extending the
field size to 32 bits.
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The ABR specification is designed for LANs, WANs as well as ATM
over Satellite networks. The effects of the round trip delay
become clear in satellite networks.

We have simulated a bidirectional one-source configuration with a
satellite link. Of the parameters Xrm, XDF, TOF and RDF, Xrm is
the most significant parameter and the other parameters, notably
XDF have little or no effect in such networks.

Xrm is designed to protect against a broken network. But, at
small values like 32 or 256 (the maximum value allowed
currently), the ACR goes down to zero almost vertically and
exhibits oscillations in the steady state.

From simulation, Xrm follows the relationship:

$$Xrm = N * PCR * RTTQ / Nrm$$

where
N = number of active sources
RTTQ = Maximum Round Trip Time including propogation,
transmission and queueing.

Hence, Xrm needs to be chosen considering one round trip delay.
The optimum values for satellite links are not even allowed in
the current specification which allows only an 8-bit field for
Xrm.

We note, that increasing Nrm to compensate for Xrm only reduces
the frequency of feedback from the network. Hence, with a view to
accomodating long round trip time networks, we propose a 32 bit
field for Xrm.

Simulation results will be presented at the meeting.