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:
\[ Xrm = N \times PCR \times RTTQ / Nrm \]
where
N = number of active sources
RTTQ = Maximum Round Trip Time including propagation, 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 accommodating long round trip time networks, we propose a 32 bit field for Xrm.

Simulation results will be presented at the meeting.