**QoS Policy Parameter Proposal (Jonathan Wilmot, Simon Singh)**

1. Proposal is to have QoS determined by selecting a set of policy parameters at each network layer in the end-to-end communication stacks. These parameters affect latency, reliability, and traffic shaping of ADU transfers in the DTN service network and are selected by a combination of local and Network DTN policy. The policy would be applied based on the Primary header Source EID.
2. Propose an emergency service request flag in Primary header. Only source node will know if it’s an emergency. (Call 911). Service Request is still subject to policy constraints based on source EID.

It is the role of DTN Network Management to set, monitor and distribute these parameters. Mission operations centers may control the end node interfaces for the parameters.

**Parameters used for QoS instantiation**

* Latency
  + Node queuing
    - At node egress high, medium, low priority queues are defined
      * Queue interleaving defined by policy
      * Assume CLA/CL sequenced in BPA egress order (LTP?)
  + Route using shortest path to destination (Hop count and RTLT considerations)
  + Route using highest bandwidth path
  + Window size setting for reliable traffic
* Reliability
  + ADU End-to-end (Flag in primary)
  + BP End-to-end (no such service in RFC)
  + BP hop to custody hop
  + CLA hop to hop (LTP, SCTP, TCP)
    - LTP has Red and Green
  + BP Best Effort (BE) (avoid arbitrary data drops)
  + Multi transmission from source (data replication) to improve probability of receipt (Call 911 or critical landing telemetry use cases?)
    - BE source broadcast to multiple nodes
  + One or more of the above
* ADU sequencing
  + In-order with gaps
  + In-order without gaps
    - Impacts latency based on packet loss
  + Duplicate suppression
  + Each of the above has an operational “window” size that can be adjusted
* Bandwidth allocations
* Multi-destination
  + Distribution service

Examples:

* Near real-time streaming selection (Lunar distance) (Can be applied to video, audio, telemetry, science data, alerts, crew health telemetry)
  1. BP Best Effort
  2. 2 second latency
     1. High priority node queuing
     2. Route set to shortest light time and fewest hops
     3. Window set to 2 seconds
  3. Option for In-Order with gaps based on window size.
* Streaming selection (Mars distance) (Can be applied to video, audio, telemetry, science data, alerts
  1. BP Best Effort
  2. 20ish minute latency
     1. High priority node queuing
     2. Route set to shortest light time and fewest hops
     3. Window disabled
  3. Option for In-Order with gaps if window size is greater than RTLT