ST Working Group

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Lou Berger <lberger@bbn.com>
Luca Delgrossi <luca@ibmpa.awda.ibm.com>

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Agenda

- First session, Tuesday 7/26
  - Agenda bashing
  - Status of working group
  - Status of drafts
  - Review of draft
    - » Highlight key changes/additions
    - » Confirm changes codified in new draft
- Second session, Thursday 7/28
  - Work to be done
    - » Sections to be written
    - » Issues to be resolved
  - Discussion on open issues
  - Wrap-up

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Status

- February — Interim meeting at GMU
First drafts issued
- IETF #29 — Seattle IETF
Revised draft issued
- IETF #30 — Confirmation of changes to date
- September — Issue Internet Draft
Intermediate review
- IETF #31 — Final review of draft
Issue RFC

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Status of drafts

- Draft 1: Introduction to ST
  - Needs updating
  - No technical issues to be resolved
- Draft 2: ST Protocol Specification
  - Previous drafts #2 and #3 merged
  - Many areas updated
  - Some areas to be written
  - Some new areas
    - » Groups of streams
    - » Preemption
    - » FlowSpec

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Review of draft

- User service description
  - Documented previously agreed upon changes
  - Key issues:
    - » When data can be sent
    - » Handling of requests
- Stream set-up
  - Clarifications to RFC-1190 (ACK on connect)
- Data transfer
  - Documented previously agreed upon changes
  - Key issues:
    - » When data can be forwarded
    - » MTU handling

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Review of draft (continued)

- Stream modification
  - Stream join to be included (based on written proposal)
  - Open issue: (for discussion next session)
    - » Is CHANGE-REQUEST needed?
- Stream tear-down
  - No changes
- Stream set-up: exceptional cases
  - To be updated:
    - » Time-out handling
    - » Path convergence
  - Updated:
    - » Resource reservation
    - » Stream Options - to be moved to stream set-up

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Review of draft (continued)

- **Failure detection and recovery**
  - Updated for clarification
  - Key issues:
    - » Recovery time-out
    - » Stream preemption
- **Groups of streams**
  - Documented previously agreed upon changes
- **Ancillary functions**
  - To be revised

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Review of draft (continued)

- **FlowSpec**
  - Documented previously agreed upon changes
  - Key Issues:
    - » Null FlowSpec
    - » Uniform FlowSpec across single stream
    - » QoS classes
  - To be updated:
    - » Allocation implication of QoS classes
    - » FlowSpec reconciliation
- **State machines**
  - Updated
  - To be included

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Work to be done

- **Sections to be written/updated:**
  - 2.2.1 Empty target list
  - 2.6[new] MTU discovery
  - 4.1 The origin adding new targets
FlowSpec handling on stream expansion
  - 4.2 A target joining a stream (import)
  - 6.1 Setup failures
Time-out handling
  - 6.2 Further issues
Path convergence
  - 6.3.3 Join authorization (import)
  - 7.1 Failure detection
Recovery time-out

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Work to be done (continued)

- **Issues to be resolved**
  - SCMP fragmentation
  - CHANGE-REQUEST message
  - STATUS / HELLO messages
  - Groups of stream
  - FlowSpec
    - » Jitter / latency range
    - » Definition of parameters with predictive QoS
  - Sub-network usage
  - IP encapsulation / IP multicast
  - Sub-streams / drop priorities
  - Reason codes

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Issues

- **SCMP fragmentation (15 minutes)**
  - Issue: Handling of SCMP messages larger than MTU
  - Sources:
    - Messages: CONNECT, ACCEPT, CHANGE, DISCONNECT, NOTIFY, STATUS-RESPONSE
    - » Large TargetList (due to number of targets or source route)
    - » RecordRoute parameter
    - » UserData parameter
    - » ErroredPDU
  - Alternatives:
    - » Generic SCMP fragmentation
    - » Multiple messages / truncation
  - Conclusion: (from session)
    - » Require multiple messages and truncation

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Issues (continued)

- **CHANGE-REQUEST message** **(5 Minutes)**
  - Issue: End-to-end message only, can be supported out of band
  - Alternatives: Keep or remove
  - Conclusion: (from session)
    - » Delete message
- **STATUS / HELLO messages** **(5 Minutes)**
  - Issue: Message formats very similar, serve different purposes
  - Alternatives: Merge or keep separate messages
  - Conclusion: (from session)
    - » Since handling of messages is completely dissimilar, keep messages separate

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Issues (continued)

- **HELLO message** **(5 Minutes)**
  - Issue: Can HELLO be sent when no streams exist
  - Alternatives:
    - » Allow
    - » Disallow (STATUS message may be used)
  - Conclusion: (from session)
    - » HELLO message may only be used when streams exist
- **Groups of stream** **(10 Minutes)**
  - Issue: Are groups optional
  - Alternatives:
    - » Allow sub-set implementation
    - » Require support of message - group associations are best effort
  - Conclusion: (from session)
    - » Support required, no sub-sets will be included in new document

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Issues (continued)

- **FlowSpec** **(15 Minutes)**
  - Issue #1: Acceptable latency range can not be specified
  - Proposal: Add latency range field
    - » Origin sets maximum acceptable latency range
    - » Each agent adds to minimum and maximum delay, possible latency range is maximum less minimum
  - Conclusion: (from session)
    - » Proposal accepted

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Issues (continued)

- **FlowSpec** (continued)
  - Issue #2: FlowSpec interpretation with predictive QoS
  - Proposal: Predictive interpretation
    - » Size fields represent average size
    - » Message sizes up to MTU permitted
    - » Messages larger than FlowSpec size receive best effort delivery
  - Conclusion: (from session)
    - » Proposal rejected
    - » Alternative accepted
      - Use current size and rate fields as peak values
      - Add new fields for average size and rate values
    - » Will also investigate viability of using other published FlowSpecs and not defining an ST specific FlowSpec

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Issues (continued)

- **Sub-network usage** **(10 Minutes)**
  - Issue: Resource and multicast address management services provided by networks
  - Proposal: All services provided solely by sub-network
    - » Delete MAC address from MulticastAddress parameter
    - » Sub-net issues outside scope of document
  - Conclusion: (from session)
    - » Proposal accepted
    - » Remove sub-network specific references from document

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Issues (continued)

- **IP encapsulation / IP multicast** **(15 Minutes)**

  Issue: Encapsulation and use of IP multicast not in current draft but specified in RFC-1190

  RFC-1190:
  - » Decision to encapsulate made external to ST by routing
  - » When encapsulating, both directions must be encapsulated
  - » NextHop agent is listed as IP destination
  - » IP multicast can be used on IP encapsulated data packets
  - » MulticastAddress parameter must be used in CONNECT message when IP multicast is to be used
  - » Address selection provided outside ST
  - Conclusion: (from session)
    - » No functional changes from 1190
    - » Phrasing should be updated to clarify definition and remove any ambiguities

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Issues
(continued)

- **Sub-streams / drop priorities** **(10 Minutes)**
  - **Issue:** Support not defined in draft
  - **Alternatives:**
    - » Fully define sub-streams
    - » Define drop priorities
    - » Leave bits open for future use
  - **Conclusion:** (from session)
    - » Use 3 bits for drop priority
    - » Leave remaining bits unspecified - not set, not examined, and passed through by routers
- **Reason codes** **(5 Minutes)**
  - **Issue:** Needs updating

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Wrap-up

- **Summary**
- **Review of actions** (from session)
  - Investigate other FlowSpecs
  - Update introduction
  - Document finite state machine diagrams
  - Complete draft specification

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Working Group Information

- **Mail List:**
  st@ibminet.awdpa.ibm.com
- **Request Address:**
  st-request@ibminet.awdpa.ibm.com
- **FTP Server:**
  ibminet.awdpa.ibm.com:/pub/st

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