Diameter Congestion And Filter Attributes

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Supplement to
draft-bertz-dime-congestion-flow-attributes-02

RFC 5777 Foundation

- RFC 5777
- Filter–Rule AVP
  - The basis our work.
  - Condition/Action design

```
Filter-Rule ::= < AVP Header: 509 >
        [ Filter-Rule-Precedence ]
        ; Condition part of a Rule
        ; ----------------------
        [ Classifier ]
        * [ Time-Of-Day-Condition ]
        ; Action and Meta-Data
        ; -------------------
        [ Treatment-Action ]
        ; Info about QoS related Actions
        ; ----------------------------
        [ QoS-Semantics ]
        [ QoS-Profile-Template ]
        [ QoS-Parameters ]
        [ Excess-Treatment ]
        ; Extension Point
        ; --------------
        * [ AVP ]
```

Congestion Management

- Filter-Rule does not support ECN in 2 ways
  1. No AVP to add to condition part to Classify ECN marked traffic
  2. No Congestion-Treatment Action Set (RFC has Excess-Treatment and Treatment-Action AVPs)
- We need to build many filters for Congestion Management
  - How do we know they are working? (Is any traffic captured)
  - What can we observe on existing filters in order to remove unused ones OR ones deprecated by new filters?

Progress since IETF88

- 3GPP UPCON is moving forward
  - Still evaluating options
  - Off-path (OAM) Solution is moving forward but is not part of session control plane
  - ECN is present in 3GPP (Emergency calling, IMS, etc.) not part of the core
- Multipath TCP is ramping up
  - Need path level congestion marking
- Lack of ECN adoption in production often cited as a barrier even though UEs and eNodeB must support it for Emergency calls

Questions for Consideration

- When should we add TCP ECE and CWR filters?
- When do we add Classifier support for ECN for RTP over UDP (RFC 6679)?
- What can we do to progress this Draft?

Background

ECN Specific AVPs

- ECN-IP-Codepoint AVP (Enumerated)
  - Specifies the Explicit Congestion Notification codepoint values to match in the IP header.
  - Use: Place in Filter-Rule's Classifier
- Congestion-Treatment AVP (Grouped)
  - Similar in design/use to Excess-Treament AVP
  - NOTE: Criteria for Congestion or traffic under congestion is out of scope of the AVP specification
  - Flow-Count AVP (Unsigned64)
    - Indicates the number of protocol specific flows. The protocol is determined by the filter
  - Packet-Count AVP (Unsigned64)
    - Indicates the number of protocol specific packets.

Filter AVPs for maintenance

- Two AVPs
  - Flow-Count AVP (Unsigned64)
    - Indicates the number of protocol specific flows. The protocol is determined by the filter
  - Packet-Count AVP (Unsigned64)
    - Indicates the number of protocol specific packets.
- Uses
  - Use in accounting/reporting to determine if Filter is working as planned
  - Can be combined with other AVPs to provide rudimentary traffic profile (e.g. bytes per flow, bytes per packet, etc.)
  - Can be sent in Filter-Rule as prescriptive