Diameter Policy Grouping and Membership

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IETF 96, Berlin

Agenda

- Purpose
- Provisioning Patterns
- Why Support Patterns?
- Concepts
- Policy Membership Matching
- Examples
- Next Steps

Purpose

- Provide ability to Group Policy Rules into a common name
  - Already have some Identifiers
    - Filter-Ids (UTF-8 Strings) in RFC 7155,
      - It is a list of Filter-Identifiers
      - if RADIUS support is NOT required IPFilterRule is recommended
    - Classifier-ID (OctetString) in RFC 5777
    - No consistent Rule-Id support (some in 3GPP but not all Rule Types get Rule-Ids)
  - Grouping is supported by hierarchy in 3GPP through use of Base-Name < Adopted in this proposal
- Provide an efficient mechanism for applying groups of Policy Rules that appear in multiple heirarchies
  - Akin to Charging-Characteristics used in 3GPP
  - Generalized
  - Meant to be leveraged for provisioning patterns

Provisioning Patterns

- Quite often a common grouping of Rules applies to an Authorized User based upon their
  - Domains they are subscribed to
  - Service they are being provided
  - State, paid, needs top-up, etc. with respect to the Service
- Base-Name is insufficient in such cases
  - It is top-down hierarchy
  - If a Rule appears in more than one group it must be copied and set to distinct base names
- Solutions such as arbitrary depth of hierarchy are not ideal

Why support Patterns?

- Speed in provisioning
- Reduced OTW representation
- Ability for Diameter Clients to capitalize on common filters and Rules
  - Reduction in redundant TFTs a rules
- For example, an Operator with 60M users and 3 default rules for users in post-paid, pre-paid and hotlined (un-paid bill) can signal the 3 rules then
  - Refer to them as a single bit (provisioning pattern) for all users
  - Re-arrange the rules as 3 common TFTs with the same filter (any / any) but entirely different outcomes based upon the user's 'bit' (state) set
- In today's designs the ability to capitalize on common provisioning patterns is not obvious

Policy Grouping Concepts

- Base-Name
  - known and straight forward
  - Single Tier Grouping
- Membership
  - Consists of
    - Optional Domain
    - Value
    - Optional Base-Name
  - Users are assigned a Policy-Membership
  - Policy Entities are given 1 or more Membership-Assignments
    - Includes a Match-Type

Policy Membership (Matching)

- To determine if a Rule is assigned to the User the following conditions MUST be true at least one Membership-Assignments must exist where
  - Policy-Membership's Membership-Domain = Membership-Assignments Membership-Domain
  - Policy-Membership's Membership-Value MUST satisfy the Match-Type for the Membership-Assignments' Membership-Value
- Match-Type represents all set relationships and only one is permitted per Membership-Assignments Membership-Domain/Base-Name pair. It reflects all Set relationships
  - Equals
  - Subset
  - Proper Subset
  - Superset
  - Proper Superset
  - Overlapping
  - No intersection

Examples

- Rule applies to any user who has a bit set in position 3 or 5 (of 8) '00101000' – use ANDNZ Match-Type to look for non-zero value
  - e.g. User with pattern '00110111' and '00101000'
- Rule applies to only user who has a bit set in position 3 or 5 (of 8) '00101000' – use INVANDZ Match-Type
  - This process inverts the Rule's Membership-Value '00101000', binary 'AND' with the inverted value and the User's Membership-Value, then tests to see if the result is non-zero.
  - e.g. User with pattern '00100000' and '00101000' but not '00110111'

Next Steps

- Read the draft please & comment
- Will ask for WG adoption once sufficient folks have read it

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