An Auto-deployment Mechanism for Resource-based Network Services

draft-dang-anima-network-service-auto-deployment-01

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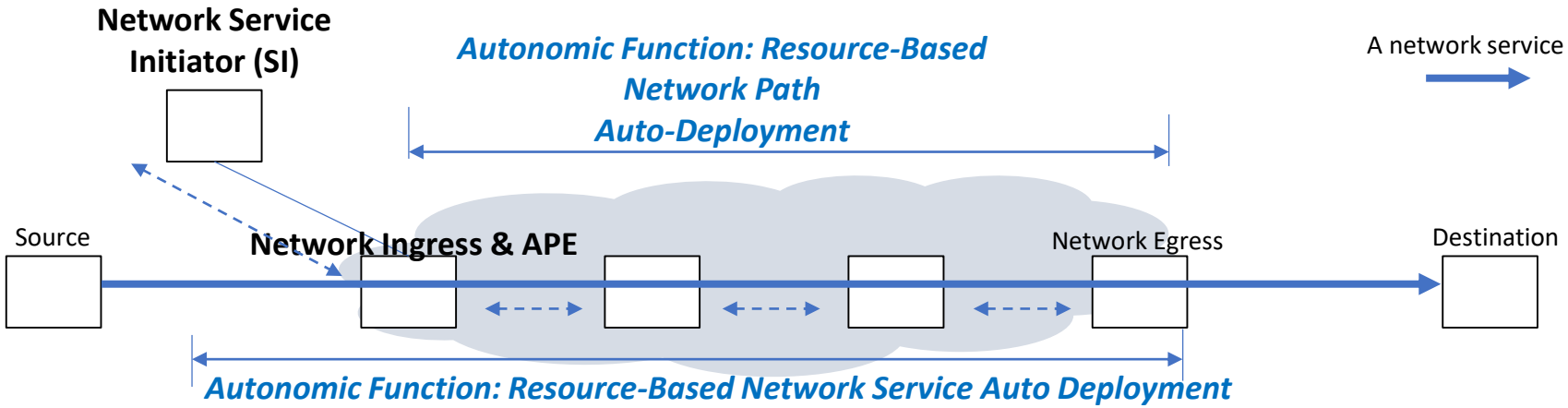
Recall: Problem statement & Overview



This document specifies an auto-deployment mechanism that deploys resource-based network services through the Autonomic Control Plane(ACP) in an Autonomic Network. This mechanism uses the GRASP in [RFC8990] to exchange the information among the autonomic nodes so that the resource among the service path can be coordinated.

- This draft describe to the negotiation between resource-request node to resource-provide node. And It's out of the scope that how the resource-provide node reserved resource hop-by-hop

Major Changes from version 00 to version 01

The new version contains the following modifications

- The draft sorted out the definition of network elements.
- The draft explains more details about the resource process.
- The draft update the Autonomic Resource Management Objectives to make the negotiation more flexible.

Terminology

- **ResourceManager ASA:**

  ResourceManager ASA is a kind of Autonomic Service Agents. It manages the resource in the network.

- **Service Initiator(SI):**

  It may be an end user, a Customer Edge (CE), or a controller that initiates a path-dependent and resource-based network service.

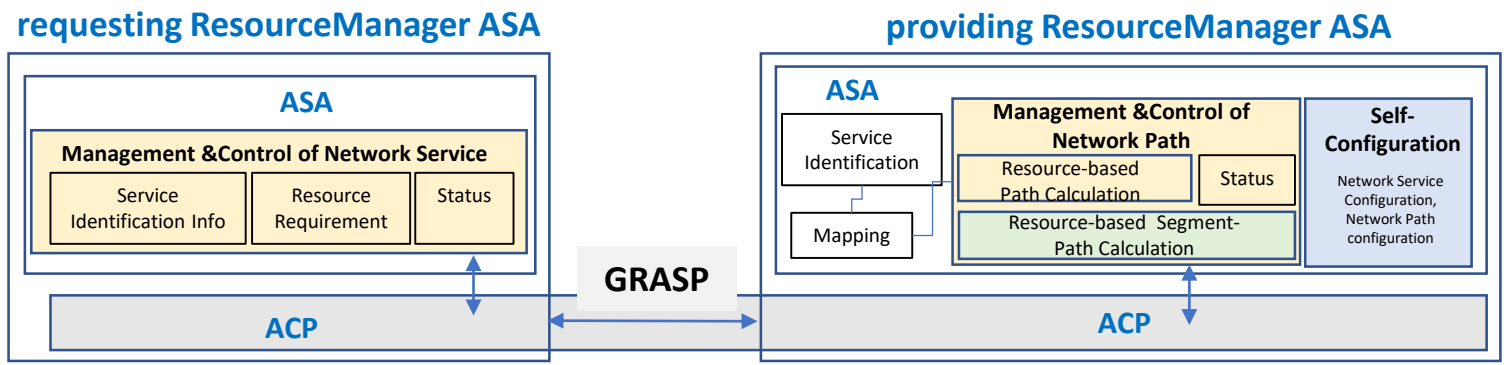
- **Access PE (APE):**

  A first provider edge is where the service initiator connects to the network or where the path-dependent and resource-based network service starts.

- **AS Border Router (ASBR):**

  AS Border Router which is an edge node of the domain in the cross-domain scenario. It may also be a resource provide node.

Resource Process



- **Discovery:**

  Resource Requesting ASA and Resource Providing ASA use GRASP to discovery each other.

- **Resource Negotiation:**

  ASAs negotiation resource by using “ResourceManager” GRASP Objectives.

  Resource negotiation may take place in multiple rounds.

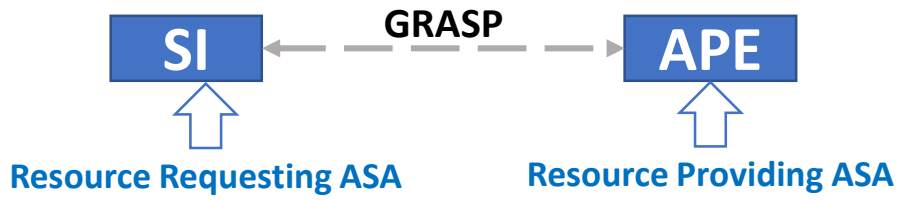
  - The requesting ResourceManager ASA will decide at each round how large resource need to offer.
  - The providing ResourceManager ASA responses how large resource they can offer and reserve enough resource during this negotiation round.

- **Behavior after Negotiation:**

  The resource-provide node removes the acceptable resource from its resource pool and synchronization with other ASAs in the domain by using GRASP flooding message.

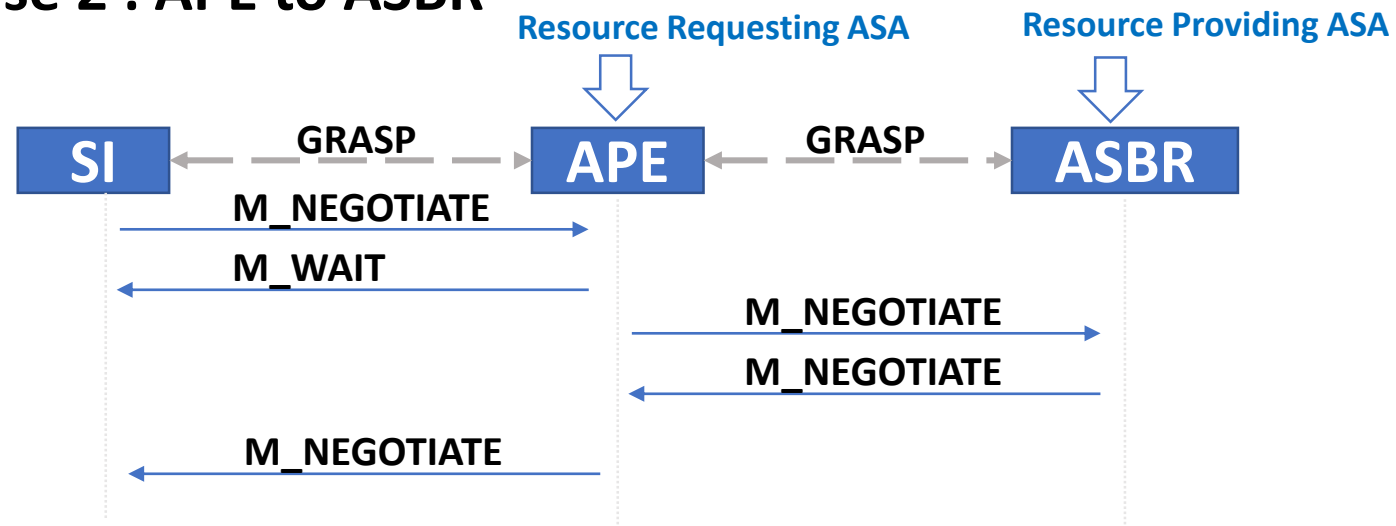
Use Case

- **Case 1 : SI to APE**



SI will act as a GRASP negotiation initiator by sending GRASP message negotiation with APE(which acts as resource-provide node)

- **Case 2 : APE to ASBR**



GRASP Objective Options Update

- **The update GRASP Objective:**
- **Objective = ["ResourceManager", objective-flags, loop-count,[restype, resval]]**

loop-count = 0..255 ; as in the GRASP specification

objective-flags /= ; as in the GRASP

resourcetype /= 0...4; requested or offered resource type, such as bandwidth, latency or jitter.

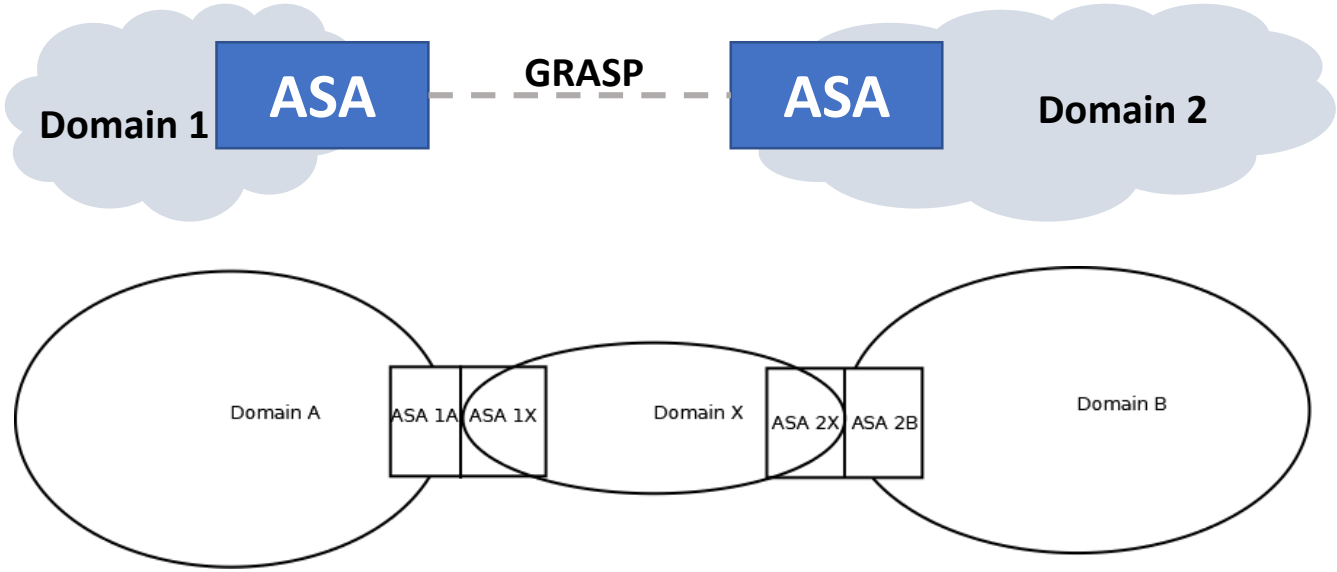
resval /= 1...1000000; If the restype is bandwidth, the value ranges in Mbit/s; If the restype is latency, the value ranges in microsecond; If the restype is jitter, the value ranges in microsecond.

- **The draft defines a new GRASP Objective option names: "ResourceManager" which is need to be added to the "GRASP Objective Names" registry.**
- **Different resource type we can request together. Like ASA can request resources that meet both bandwidth and delay.**

To be discussed

- **Establish an auto-deployment mechanism to release or increase resources when the SI change its need?**
- **If the two ASAs are in a different domain, what are the restrictions we should follow?**

Brian's Suggestion:
If ASAs need to communicate with another domain, it would need to be like the attached diagram, possibly with an extra (virtual?) domain to separate the two security environments.



Next Step

- Further update the current text
- Clarification of further open issues stated in the draft
- Suggestion are welcome to the mailing list
- Is this useful work for ANIMA? And can the draft call for adoption?

Thank you!