

Information Distribution in Autonomic Networking

(draft-liu-anima-grasp-distribution-05)

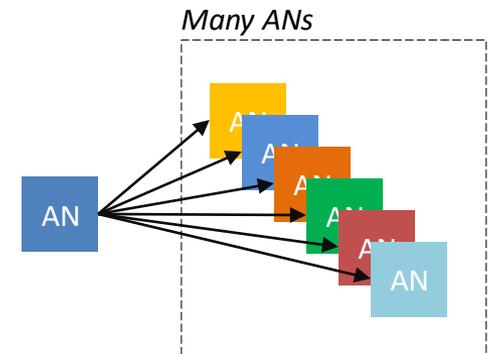
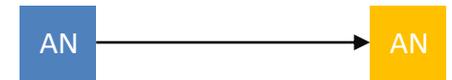
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@Anima WG, ietf101, March 2018

Reminder

- Information distribution is a function to handle different patterns of information exchange between autonomic nodes
 - Proposing GRASP as bearing protocol
- 05 version merged draft-xiao-anima-event-service
 - New co-authors
 - Comprehensive analysis on scenarios and requirements
 - Discussions of a GRASP extension to support information distribution

Basic Scenarios of Information Distribution

- One to One (1:1)
 - Request/Response (client server model)
 - + Notification (agent manager model)
 - E.g. push something to the neighbors that were sleeping/offline
- One-to-Many (1:n)
 - Full distribution ($n=N$)
 - Some data that in principle all nodes are interested in (e.g. Policies, “Intent”)
 - Partial distribution ($n < N$)
 - To a subset of nodes (e.g. “shut down all the light bulbs”)



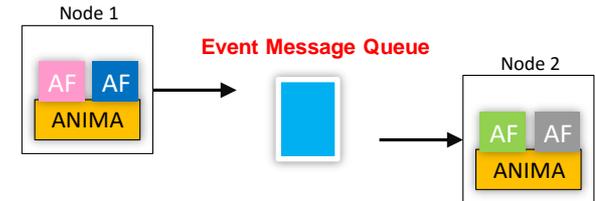
$\#\{AN\} = N$

Two Communication Models

- Instant (Synchronous)
 - The sender delivers the message *directly* to the receiver(s) and **waits** for the response.
- Asynchronous
 - The sender delivers the message directly to the receiver(s) and **doesn't wait** for any response.
 - The sender delivers the message **indirectly** to the receiver(s) via a certain module/struct (e.g. Event Queue).



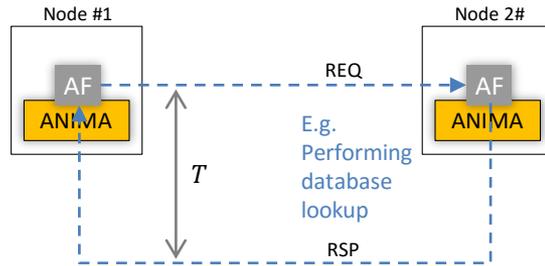
Instant



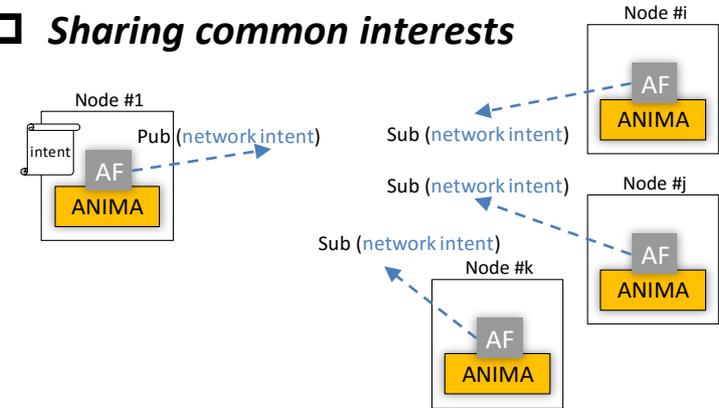
Asynchronous

Possible Asynchronous Scenarios in Autonomic Networking

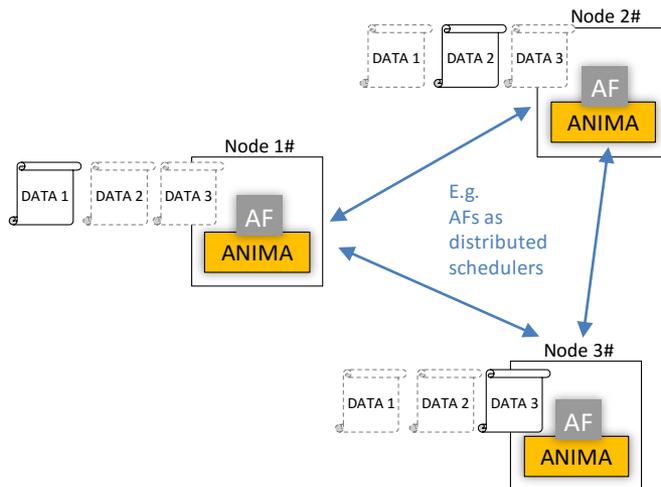
□ Reply takes long time



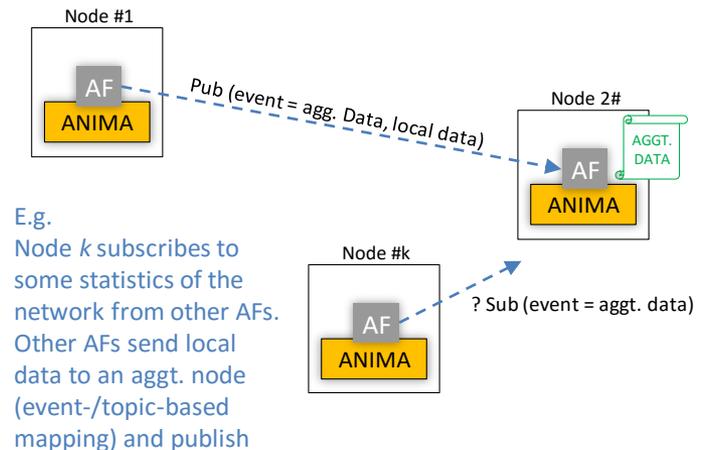
□ Sharing common interests



□ Established a common view among AFs



□ Distributing synthetic/aggregated data



E.g. Node k subscribes to some statistics of the network from other AFs. Other AFs send local data to an aggt. node (event/topic-based mapping) and publish

Node Requirements and GRASP Extension (1/3)

- On Instant Information Distribution
 - Instant P-to-P
 - GRASP M_Synchronization can already do this, no need for extension

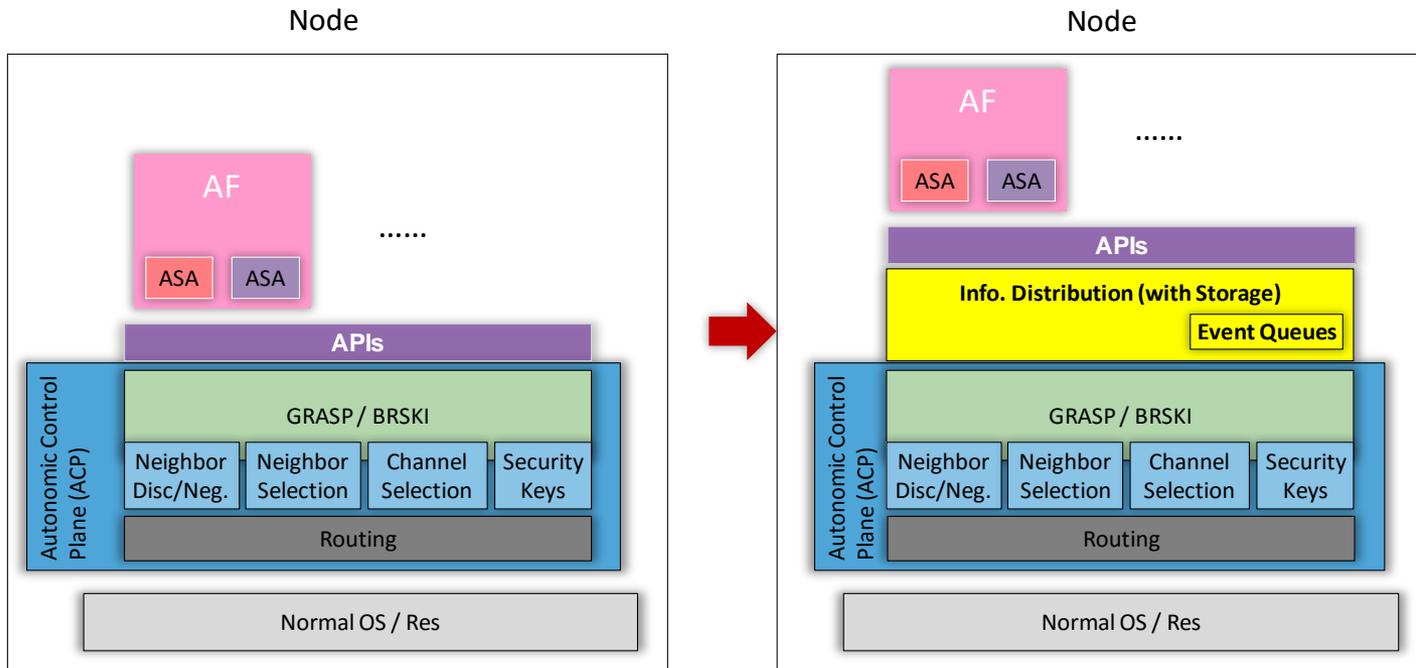
Node Requirements and GRASP Extension (2/3)

- On Asynchronous Information Distribution (1/2)
 - Active P-2-P push
 - *GRASP Extension: a new $M_UnsolicitedSynch$ for actively push*
 - Flooding
 - GRASP M_Flood can already do this
 - Selective Flooding
 - We need a selection mechanism to let the nodes pruning unnecessary flooding neighbors
 - *GRASP Extension: defining a relevant GRASP Objective*

Node Requirements and GRASP Extension (3/3)

- On Asynchronous Information Distribution (2/2)
 - A Distributed Data Layer (other than simply flooding)
 - In principle, a distributed storage system
 - Should be consistent with autonomic principles (e.g. dynamically discovered/updated/corrected)
 - Produced information will be stored somewhere “in the network” (e.g. “Intent”, “Policy”, “certificates”)
 - *GRASP extension: Sub/Pub messaging*
 - Event Queuing
 - Some information needs to be strictly queued. E.g. “Switch-on/off” signaling for light bulbs.
 - *GRASP extension: TBD*
 - API access:
 - ASAs simply access the API for asynchronous communication

Extended ANI with Info. Distribution Module



Comments?
Consider adoption?

Thank you!

IETF101, London