Information Distribution over GRASP

draft-ietf-anima-grasp-distribution-07

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- Refine the Abstract and Introduction
- Added new smart home use case
- Integrate technical analysis into chapter 4. Re-sort out the analysis of information distribution modes and requirements. Clearly point out the gaps of current GRASP protocol.
- Added Section 6, partly based on previous node behaviors section. Clearly described how to use the newly defined GRASP extensions to meet the functional requirements.
- Refined the text and general format, including reference correction, requirement language text, grammar errors, and many editorial changes
- Removed the open issues records from appendix.
Abstract and Introduction Refined

• Refine the Abstract and Introduction

• Abstract: This document analyzes the Information distribution models in the Autonomic Networks that are based on the ANI. Most of instantaneous modes and their requirements have been met by GRASP already. However, in order to effectively support the asynchronous information distribution modes, which is newly described in this document, several new GRASP extensions are defined. This document also describes the corresponding behaviors on processing these new extensions.

• Introduction: Although most of instantaneous information distribution modes and their requirements have been met by GRASP already, asynchronous information distribution modes need new functions to support. In publishing for retrieval mode, information needs to be stored and re-distribute on-demand; additionally, conflict resolution is also needed when stored information is updated with information from multiple sources.

• Technical analysis integrated into chapter 4 “Analysis of Information Distribution Modes and Requirements ”
A New Use case: Smart Home

• 3.1. Service-Based Architecture (SBA) in 3GPP

Within Service-Based Architecture (SBA) defined by 3GPP [Network Functions should interact with each other with information exchange over the Service-Based Infrastructure. Service information (e.g., events, results, profiles, and statuses etc.) must be stored first, and after that, whenever the information is requested, it can be delivered properly to the requesting NF.

• 3.4. Smart Home

Within the smart home network, multi-device collaboration means that multiple devices work together to complete a service. Distributed shared objects allow automatic synchronization of state or digital content between two or more devices. Many asynchronous information that would be used multiple times shall be stored within the smart home and retrieved later on demand. Devices must be able to distribute the information to the selected receivers.
Gaps of Current GRASP Protocol

• From the timing perspective, Information distribution can be categorized into instantaneous and asynchronous modes

• ASA-level specific requirements of distributing information: Long Communication Intervals, Common Interest Distribution, Distributed Coordination and Collision Update.

4.3. Gaps of current GRASP Protocol

As most of instantaneous information distribution modes and their requirements have been met by GRASP already, asynchronous information distribution modes need new functions to be supported. In publishing for retrieval mode, information needs to be stored and re-distribute on-demand; additionally, conflict resolution is also needed when stored information is updated with information from multiple sources.
In order to avoid unnecessary flooding, a selective flooding on GRASP extension is provided where an information sender wants to send information to multiple receivers at once.

**Sending information needs to contain criteria** to judge on which interfaces the distributed information should and should not be sent. Specifically, the criteria contain:

- *O_MATCH-CONDITION* in Selective-Flooding-option [defined in Section 5.2]: matching condition, a set of matching rules such as addresses of recipients, node features and so on.
- *action* in Selective-Flooding-option: what the node needs to do when the Matching Condition is fulfilled. For example, the action could be forwarding or dropping the distributed message.

Sent information must be included in the message with Selective-Flooding-option distributed from the sender. The receiving node reacts by first checking the carried O_MATCH-CONDITION in the message to decide who should consume the message, which could be either the node itself, some neighbors or both. If the node itself is a recipient, action in Selective-Flooding-option is followed; if a neighbor is a recipient, the message is sent accordingly.
The Event Queue (EQ) module is to help ASAs to publish information to the network and subscribe/unsubscribe to interested information in asynchronous scenarios. Extensions to support information publishing, subscription and unsubscribe on GRASP are described in Section 5. In an ANI, information generated on network nodes is an event labeled with an event ID, which is semantically related to the topic of the information. Key features of EQ module are summarized as follows.

2) Event Prioritization: Events SHOULD have different priorities in ANI. This corresponds to how much important or urgent the event implies. Some of them are more urgent than regular ones. Prioritization allows ASAs to differentiate events (i.e. information) they publish, subscribe or unsubscribe to.
The Text and General Format Refined

- Refined the text and general format, including reference correction, requirement language text, grammar errors, and many editorial changes.
- Re-sorted out the requirement language ‘SHOULD, MUST” through the whole document, particularly, the extension section and node behavior section
- Open Issues Records section removed from Appendix
• Update the draft based on comments and remarks, make the use cases solid and map them to the technical requirements well

• New GRASP extension defined in Section 5 to be implemented

• More reviews & comments are appreciated
THANKS!