A day in the life of an autonomic function

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Motivations

Autonomics can improve network operations
Operators need unified management functions to use autonomies and gain confidence in it.

Common management functions of AF bring
- trust in Autonomic Functions behavior
- capacity to control Autonomic Functions
- conflict avoidance mechanisms
Changes in 01

- Enhanced split between ANIMA next phase items and current items
- Documented requested extensions to GRASP
- Identified items for Reference Model
Controlling ASAs - Their life-cycle

To be kept in mind for future work
ASA life-cycle

3 states + 2 transit ones

Undeployed

Installed

Undeployed

Un-Instantiating

Instantiating

Receives a Mandate

Advertizes its Manifest

Operational

Instantiated

Receives a Set-up cmd

Receives a Set-down cmd

Receives revoke Mandate

Advertizes blank Manifest

Receives a Set-up cmd

Receives a Mandate
Controlling ASAs - Minimal control

Filling holes in current solution
Autonomic Networking Infrastructure

Current ANIMA picture
- GRASP preferably uses ACP
- ASA use GRASP signaling in-between them
- ASA monitor the equipment and modify its state directly using either NetConf, SNMP, call to Basic OS API...

Legend
- Protocol engine

The toolbox
Minimal control of ASA

Control when it runs
(and how it runs)

Know what it does to the network

Decide which equipments are under the ASA control
(Or vice-versa which ASAs control an equipment)
Control when an ASA runs

NEED
- On request Start and Stop the execution of ASA

SOLUTION
- Send a START command
- Send a STOP command
Control when an ASA runs

NEED
- On request Start and Stop the execution of ASA

SOLUTION
- Send a START command
- Send a STOP command

IN ANIMA
- Add to GRASP imperative commands type of message
- Suggested form:

  imperative-message =
  [M_IMPERATIVE, session-id, initiator, objective]
Know what an ASA does to the network

NEED

- Know which network resources are modified by ASA control loop
- Know which network resources are monitored by ASA control loop

SOLUTION

- Disclose an ASA Manifest at ASA bootstrap time
Know what an ASA does to the network

NEED
- Know which network resources are modified by ASA control loop
- Know which network resources are monitored by ASA control loop

SOLUTION
- Disclose an ASA Manifest at ASA bootstrap time

IN ANIMA
- Disclose Manifest with GRASP Discovery messages
- 2 options:
  - Whole manifest disclosed in a single discovery message
  - Each manifest entry disclosed in an independent discovery message

WG/GRASP designers to provide guidance there
Conclusion

Control when it runs

Start/Stop

Know what it does to the network

Manifest

Minimal control of ASA
Conclusion

Can we design a solution that oversees the operators' trust in it?
Autonomic Networking Infrastructure

The toolbox

Simplest option to control ASAs:
- **Same as before**
- **Plus use GRASP signaling between ASAs and AF Control Agents (Coordination, AF Mgt, Info Distribution)**
- **Hence multiple type of GRASP clients**

**Legend**
- **Protocol engine**
- **ANI function (serving ASAs)**

**Diagram**

- **ASA**
- **ASAs**
- **AF Mgt Func**
- **Coordination**
- **Info distrib**
- **GRASP Eng**
- **ACP Engine**
- **Basic OS**

**Diagram Text**

Autonomic Node

ANI

GRASP Eng

ACP Engine

Basic OS