Main Updates of Version 2

• To better clarify the concept of intent, add the content concept section (Section 3.1), and also more use cases (Section 3.3.1 & 3.3.2)
  – 3.1. Concept of Autonomic Network Intent
  – 3.3.1. High-Level Policy Intent
  – 3.3.2. Network-Level Parameter Intent

• Add some sections, which are considered related, but the contents are TBD
  – 3.4. Distribution of Autonomic Network Intent
  – 3.5. Interpretation of Autonomic Network Intent
Intent Definition

• Intent: "An abstract, high level policy used to operate the network" (quoted from [[I-D. behringer-anima-reference-model]])
  – Different from the NMS method, no need to configure every node directly

• The main question: Whether we should consider the use case in [I-D.jiang-anima-prefix-management] as an intent?
  – The use case: It is suggested that the prefix lengths for the CSG, ASG, RSG (different roles in IPRAN) should be assigned as an "intent"
Exploration of the Concept of Intent

• In current version of the Draft, the answer is “Yes”
  – If not?
    • Definition of another concept $\rightarrow$ configuration needed for the autonomic network

• Concept of Intent extended to include “High-level policy” and “Network-Level Parameter”
  – Different kinds of intent $\rightarrow$ different abstraction levels
  – Different parts of intent can belong to different kinds of intent

• Open questions:
  – Are there any configuration parameters of an anima network outside intents?
  – Or can we agree there are different kinds of intents?
  – Need we define "hierarchy" for intents?
High-Level Policy Intent Examples

Use case one
• Autonomic Network of Operator A composed of Autonomic Function Agents such as load balancing (LB_AFA) and energy saving (ES_AFA)
• Operator A wants to limit the proportion of links loaded over a certain threshold → definition of an Intent to activate load balancing if the load is superior to 0.6 on more than 30% of the links
  – Meanwhile, operator A wants different load balancing policies per (technology, administrative, topology) domain
  – E.g., metropolitan network domain and a core network domain
  – For the core network domain → Operator A applies the previously defined intent
  – For the metropolitan network domain → Operator A defines an Intent to minimize the link load variance
Use case two

- "Arranging VM guest distribution"
  - The autonomic network is supposed to be able to monitor the CPU/power utilization on each host machine and control the status of each host machine (e.g. turn on/off)
  - The operator may have intents
    - "there should be enough hosts to keep CPU utilization less than 70%",
    - "there are few enough hosts powered so that electricity isn't wasted"
Network-Level Parameter Intent Examples

Use case three

• When bootstrapping, the new device needs to know some basic parameters about the autonomic domain to complete the process.
• To reduce the complexity of bootstrapping, they are perhaps not need to be encrypted.
• They can be treated as "bootstrapping intent" as a special kind of intent.
Network-Level Parameter Intent

Examples

Use case four

• Assuming we need an autonomic network to run and connect to Internet, an IP prefix is needed for the whole autonomic domain in the data plane
• Devices in the autonomic domain can configure themselves after the human operator has notified the IP prefix for this autonomic network
• Configuring every device's IP address manually not considered a good way in autonomic network
Network-Level Parameter Intent

Examples

Use case five
• Configuring the routing protocol in the autonomic network directly by the operator
  • E.g., ISIS or OSPF
Network-Level Parameter Intent Examples

Use case six
- Prefix management draft [I-D.jiang-anima-prefix-management]
  - Prefix lengths for the CSG, ASG, RSG (different roles in IPRAN) should be assigned as an "intent"
Comparison of the Two Kinds of Intents

- Abstract level → Autonomic network intent is divided to two kinds
  - High-Level Policy Intent
    - Multiple Autonomic Function Agents may be involved in the implementation
    - Interpretation by a policy continuum to low level commands that the device can understand
    - Detailed realization of the translation → out of scope of this draft
  - Network-Level Parameter Intent
    - Network-level parameters configured by the network operator for a specific autonomic function
    - Distributed in the autonomic domain to influence the detail configurations on each autonomic node
    - Mostly for establishing network infrastructure
      - They are likely only needed to be configured once, and rarely changed
    - Coordination with others parameters not needed most of the times
Other Considerations

• ANIMA first focus → interpretable and implementable intent
  – Obviously, “Network-level Parameters” intent simpler to be realized
• Some related topics
  – 3.4. Distribution of Autonomic Network Intent
    • e.g., Who are the sources and recipients of the intent?
  – 3.5. Interpretation of Autonomic Network Intent
    • e.g., How the AFAs receive, understand and react to an intent?
    • e.g., When/on which triggers are intents generated, updated? How the domain(s) are defined and recognized (if I am an AFA, how do I know i am part of domain x, y or z...?).
Autonomic Network Intent and Format
draft-du-anima-an-intent-02

Thank you. Questions?

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