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Z. Du  
S. Jiang  
Huawei Technologies Co., Ltd  
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**Autonomic Network Intent and Format**  
**draft-du-anima-an-intent-00**

Abstract

This document describes the concept and consideration of the Autonomic Network Intent, and proposes a uniform format for the Autonomic Network Intent.

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## [1.](#) Introduction

This document describes the concept and consideration of the Autonomic Network Intent, which is used to operate the Autonomic Nodes within Autonomic Networks. The background to Autonomic Network (AN) is described in [[I-D.irtf-nmrg-autonomic-network-definitions](#)] and [[I-D.irtf-nmrg-an-gap-analysis](#)]. A generic discovery and negotiation protocol (GDNP) is proposed by [[I-D.carpenter-anima-gdn-protocol](#)], which would be used in the propagation of the Autonomic Network Intent.

The Autonomic Network Intent should be able to be unscrambled by all Autonomic Nodes, although certain parts of contents may not be relevant to a specific Autonomic Node. The Autonomic Network Intent gives operational guidance for every Autonomic Node.

This document also proposes a generic format for Autonomic Network Intent.

The interface to receive or configure the Autonomic Network Intent is out of scope. The distribution mechanism of the Autonomic Network Intent is introduced in [[I-D.liu-anima-intent-distribution](#)].

Note in draft: This version is preliminary. In particular, many design details may be subject to change until the anima specifications become agreed.

## [2.](#) Requirements Language and Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)] when they appear in ALL CAPS. When these words are not in



ALL CAPS (such as "should" or "Should"), they have their usual English meanings, and are not to be interpreted as [[RFC2119](#)] key words.

**Autonomic Function:** A feature or function which requires no configuration, and can derive all required information either through self-knowledge, discovery or through Intent.

**Autonomic Node:** A node which employs exclusively Autonomic Functions.

**Autonomic Network:** A network containing exclusively Autonomic Nodes. It may contain one or several Autonomic Domains.

**Autonomic Service Agent:** An agent implemented on an Autonomic Node which implements an Autonomic Function.

**Intent:** An abstract, high level policy used to operate the network, quoted from [[I-D.irtf-nmrg-autonomic-network-definitions](#)].

**Autonomic Network Intent:** Intent that is used to intervene the running status of the Autonomic Network.

### **3. Intervention of the Network Running by Autonomic Network Intent**

The Autonomic Network is supposed to work with minimum intervention from human operators. However, it is still needed to receive some form of guidance/information/orders in order to meet specific requirements.

Upon receiving the Autonomic Network Intent, the Autonomic Node should be able to unscramble the meaning of the intent with no ambiguity, and act accordingly.

Using this intent approach, the operator can manage the network as a whole, and does not need to configure specific node(s) in the network like what happens in the traditional NMS system. In other words, the operator communicates with the Autonomic Network using an abstract or high lever intent, and the configurations of the nodes take place automatically. By replacing most of the NMS jobs, intent-based management makes the network management work much easier than before.

On the other sides, the intent-based and NMS-based management may co-exist for a long time, because autonomic behavior will be defined function by function. Similarly, at the beginning of defining the Autonomic Network Intents, the intent-based method cannot be assumed to cover every aspect of network management.



### **3.1. Administrative Intent and Service Intent**

The Autonomic Networks are supposed to self-managed. It includes managing the network infrastructure, and also the network services that are running over the network infrastructure. However, the network services have different features against network administration, as listed below. Hence, it may be better to organize them into separated Administrative Intent and Service Intent.

- o A Service Intent may have a smaller scope than the Administrative Intent because only the nodes related to the service need to know this intent. Although it may only affect a few nodes, the Service Intent may also be propagated domain wide.
- o A Service Intent may have a limited lifetime, while the Administrative Intents are normally permanent although the content of the Administrative Intent may be updated from time to time.
- o There maybe are many Service Intents in the autonomic domain, while only one Administrative Intent for a giving Autonomic Service Agent.

{Editor notes: one possibility is to treat the Service Intent as a normal Intent for a certain Autonomic Service Agent, such as a Autonomic Service Provision Agent.}

## **4. Uniform Format of the Autonomic Network Intent**

{Editor Notes: It is still remaining an open issue for the way that intent may be organized. Should the intent be a single one in a given AN domain with a hierarchical version, or multiple intents, each of which targets different Autonomic Service Agent? For now, the below text takes the later approach.}

This section proposes a uniform intent format. It uses the tag-based format.

`<autonomic_intent>` The root tag for the Autonomic Network Intent.

`<intent_type>` It indicates the intent type, which is associated with a specific Autonomic Service Agent.

`<autonomic_domain>` It indicates the domain of the Autonomic Network. It is also the scope of the Autonomic Network Intent.

`<intent_version>` It indicates the version of the Autonomic Network Intent. This is an important feature for synchronization.



<content> It contains the main information of the intent. It may include objects, policies, goals and configuration data. The detailed contents and formats should be defined under their specific situations by documents that specifies the Autonomic Service Agent. Within the content, there may be sub\_intents.

{Editor Notes: it may be needed for a <specification\_version>, which identifies the different version of intent specification.}

## 5. Security Considerations

Relevant security issues are discussed in [[I-D.carpenter-anima-gdn-protocol](#)]. The Autonomic Network Intent requires strong security environment from the start, because it would be great risk if the Autonomic Network Intent had been maliciously tampered.

## 6. IANA Considerations

This document defines one new format. The IANA is requested to establish a new assigned list for it.

## 7. Acknowledgements

Valuable comments were received from Bing Liu.

This document was produced using the xml2rfc tool [[RFC2629](#)].

## 8. Change log [RFC Editor: Please remove]

[draft-du-anima-an-intent-00](#): original version, 2015-06-xx.

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Authors' Addresses

Zongpeng Du  
Huawei Technologies Co., Ltd  
Q14, Huawei Campus, No.156 Beiqing Road  
Hai-Dian District, Beijing, 100095  
P.R. China

Email: [duzongpeng@huawei.com](mailto:duzongpeng@huawei.com)

Sheng Jiang  
Huawei Technologies Co., Ltd  
Q14, Huawei Campus, No.156 Beiqing Road  
Hai-Dian District, Beijing, 100095  
P.R. China

Email: [jiangsheng@huawei.com](mailto:jiangsheng@huawei.com)

