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"The OAM Acronym Soup"
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Abstract

At first glance the acronym "OAM" seems to be well known and well understood. Looking at it a bit more closely reveals a set of recurring problems that are revisited time and again. This document has one primary and a secondary goal. The primary goal is to find an understanding of OAM that is feasible for the MPLS Transport Profile (MPLS-TP) effort. The secondary goal is to make this understanding applicable in a wider scope

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1. Introduction

The state of this work is very much "work in progress" and the discussion is ongoing. The reason to publish the draft at this stage is that some of the relevant MPLS-TP drafts are getting close to working group last call and some of the directives in this document is needed for consistency within that group of draft.

The acronym OAM is frequently used in the data- and telecommunication industry. One would assume that something that is so widely used is very clearly defined. However a closer look reveals some points that needs to be clarified.

The examples used below comes mainly from the first set of MPLS-TP IDs. In the IDs there were a number of examples of how the acronym could be a number of ways to expand and understand the acronym e.g.:

- o OAM = Operations, Administration, Maintenance
- o OAM = Operations, Administration, Management
- o OAM = Operations and Maintenance
- o OAM = Operations and Management
- o O&M = Operations and Maintenance
- o O&M = Operations and Management

The examples above were taken from drafts that later has been corrected and aligned with what is proposed in this document.

Sometimes there is a fourth letter added to the acronym:

- o OAM and P = Operations, Administration, Maintenance and Provisioning

If such an important piece of our technology is so poorly defined, or if there are dialects of the technology with different understandings of such a key concept, this will eventually cause problems.

Trying to understand the use of an acronym that is as "content-rich" as OAM reveals two levels of complexity. First, each letter in the acronym represent a integrated piece of functionality; secondly the acronym as such represent something that is more than just the sum of the pieces

There is also the issue of how each piece of the acronym is defined.

In this document we will analyse how each piece of the acronym is defined and provide possible interpretations of the acronym. Finally we will suggest the use of the OAM acronym for the MPLS-TP effort based on the greement reached based on the JWT report [[I-D.bryant-mp1s-tp-jwt-report](#)].

Our immediate target is to document the use of the OAM acronym such that it is useful for MPLS-TP. However, we hope to shed some light on the issue in a broader scope.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

2. OAM and O, A and M

2.1. OAM as a functional unit

Operations, Administration, and Maintenance (OAM): A group of network management functions that provide network fault indication, performance information, and data and diagnosis functions. Examples are ATM OAM [ITU-T I-610] and IEEE Std. 802.3 Clause 57 OAM

Alternatively (Huub :))

Operations, Administration, and Maintenance (OAM): A group of network management functions that provide network fault indication, fault localisation performance information, and data and diagnosis functions.

ITU-T M.3010 recommendation defines:

operations systems function: A function block that processes information related to the telecommunications management for the purpose of monitoring/coordinating and/or controlling telecommunication functions including management functions (i.e. the TMN itself).

The Metro Ethernet Forum refers to OAM as to: OAM refers to the tools and utilities to install, monitor and troubleshoot a network, helping carriers run their networks more efficiently.

Note: the paragraphs above are so far just placeholders.

2.2. The acronym broken up

2.2.1. O in OAM

The O in the OAM acronym invariably stands for "Operations".

However there is some ambivalences in the definition and scope of "Operation"

Note: Examples to be provided.

2.2.2. A in OAM

The A in the OAM acronym mostly stands for "Adminstration", though in a few cases it seems like "Accounting" have crept in. For the purpose of this document we will assume that "Adminstration" is the correct expansion of "A".

Note: Examples to be provided.

Administration is used to support maintenance functions, e.g. by collecting failure and performance information, continuous or on-demand.

2.2.3. M in OAM

In the list above the M in the OAM acronym stands for "Maintenance" or "Management".

Since Maintenance and Management are defined as two different activities it does not seem to be a good idea to use them interchangeably.

Note: Examples to be provided.

The recommendation M.20 from ITU-T defines maintenance:

Maintenance involves the whole of operations required for setting up and maintaining, within prescribed limits, any element entering into the setting-up of a connection (see Recommendation M.60). In order to properly plan and program the maintenance operations required to establish and maintain a network.

It should have as a major aim to minimize both the occurrence and the impact of failures and to ensure that in case of a failure the correct actions are taken. The ITU-T document also clearly defines a maintenance philosophy.

3. Use of the OAM acronym MPLS-TP effort

In [Section 4](#) we list the acronyms as they will be used in the MPLS-TP effort, this section gives some background.

If we need as an abbreviation for "Management" we will use "Mgt". We do not define Management in this draft, but note that an important part of the Management functionality relates to tools to report the state of the network.

We propose that the OAM acronym is reserved to be used for "Operations, Administration and Maintenance", i.e. excluding provisioning.

OAM tools and protocols and the "Management space" are complementary in nature. Management focuses on FCAPS functionality and on manager (or NOC) to device (or network) interaction.

From an architecture point of view OAM protocols and tools tend to be "horizontal" i.e. network element to network element while the management protocols tend to be "vertical"

Where each part of the acronym and provisioning is defined as follows:

- o Operations - Operation activities is undertaken to keep the network (and the services that the network provides) up and running. It includes monitoring the network and find problems. Ideally these problems should be found before users are affected."
- o Administration - Administration activities involves keeping track of resources in the network and how they are used. It includes all the book keeping that is necessary to keep track of networking resources and the network under control.
- o Maintenance - Maintenance activities are focused on facilitating repairs and upgrades - for example, when equipment must be replaced, when a router needs a patch for an operating system image, when a new switch is added to a network. Maintenance also involves corrective and preventive measures to make the managed network run more efficient, e.g. adjusting device configuration and parameters.
- o Even though we don't include "Provisioning" in the OAM acronym we note that:

Provisioning - Provisioning activities involves configuring resources in the network to support the offered services. This

might include setting up the network so that a new customer can receive an Internet access service.

- o We also note that sometimes it is necessary to talk about the combination of functions and tools supplied by OAM and Management, we prefer that this is spelled out as "OAM and Management". In cases where an acronym is needed O&M should be used.

4. Acronyms for the MPLS-TP effort

OAM - Operations, Administration and Maintenance

O&M - Operations, Administration, Maintenance and Management

"Mgt" - Management

5. IANA considerations

There are no requests for IANA allocation of code points in this document.

6. Security considerations

This document only changes the name of one field in the MPLS Shim Header and thus does not introduce any new security considerations.

[7.](#) Acknowledgments

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8. References

8.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.

8.2. Informative references

[I-D.bryant-mpis-tp-jwt-report]
Bryant, S. and L. Andersson, "JWT Report on MPLS Architectural Considerations for a Transport Profile", [draft-bryant-mpis-tp-jwt-report-00](#) (work in progress), July 2008.

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