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Export of Network Resource Partition (NRP) Information in IP Flow

Information Export (IPFIX)

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Abstract

This document introduces new IP Flow Information Export (IPFIX)

Information Element to report the Network Resource Partition (NRP)

over which an observed flow is forwarded.

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Table of Contents

1. Introduction . . . . . . . . . . . . . . . . . . . . . . . . 2

2. Terminology . . . . . . . . . . . . . . . . . . . . . . . . . 2

3. New IPFIX Information Element . . . . . . . . . . . . . . . . 3

4. Usecases . . . . . . . . . . . . . . . . . . . . . . . . . . 3

5. IANA Considerations . . . . . . . . . . . . . . . . . . . . . 3

6. Security Considerations . . . . . . . . . . . . . . . . . . . 4

7. References . . . . . . . . . . . . . . . . . . . . . . . . . 4

7.1. Normative References . . . . . . . . . . . . . . . . . . 4

7.2. Informative References . . . . . . . . . . . . . . . . . 4

Author's Address . . . . . . . . . . . . . . . . . . . . . . . . 5

1. Introduction

The definition of the IETF Network Slice, a framework, and the general principles

of network slicing in the IETF context are discussed in

[I-D.ietf-teas-ietf-network-slices]. As described in

[I-D.ietf-teas-ietf-network-slices], an IETF Network Slice Service enables

connectivity between a set of Service Demarcation Points (SDPs) with

specific Service Level Objectives (SLOs) and Service Level

Expectations (SLEs) over a common underlay network. To meet the

connectivity and performance requirements, network slice services

map be mapped to Network Resource Partitions (NRPs). An NRP is

a collection of resources (bufferage, queuing, scheduling, etc.) in

the underlay network.

As introduced in [I-D.ietf-teas-ns-ip-mpls], an NRP can be

idenified using a unique NRP-ID in control plane and management

plane. A NRP-ID may also be encapsulated in data packets to

guide the NRP-specific packet forwarding.

This document defines new IPFIX Information Elements within the

"IPFIX Information Elements" [RFC7012] to report the

NRP that is associated with a Flow.

2. 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 BCP

14 [RFC2119][RFC8174] when, and only when, they appear in all

capitals, as shown here.

This document uses the IPFIX-specific terminology (Information

Element, Template, Collector, Data Record, Flow Record, Exporting

Process, Collecting Process, etc.) defined in Section 2 of [RFC7011].

As in [RFC7011], these IPFIX-specific terms have the first letter of

a word capitalized.

3. New IPFIX Information Element

This section defines the following new IPFIX IE:

\* Name: NRPIdentifier

\* ElementID: TBD1

\* Description: The NRP ID as defined in [I-D.ietf-teas-ns-ip-mpls].

\* Abstract Data Type: unsigned32

\* Data Type Semantics: identifier

4. Use Cases

A typical use case scenario is to monitoring the network slice traffic

that is forwarded based on NRP specific resource-aware segments

[I-D.ietf-spring-resource-aware-segments] that operate over SR-MPLS

or SRv6 data planes. By looking at the SID itself, it is not always

clear as to which NRP it belongs.

Another use case is the monitoring of the network slice traffic whose

NRP-ID is encapsulated in data packet to determine the Network

Resource Partition Per Hop Behavior.

By using NRPIdentifier (TBD1), and some counters, it is

possible to answer the following questions (amongst others):

\* How many packets are forwarded or dropped?

\* If dropped, for which reasons?

\* Which NRP is the traffic related with?

5. IANA Considerations

This document requests IANA to add a new IE to the "IPFIX Information

Elements" registry [RFC7012] available at [IANA-IPFIX].

-----------------------------------------------------

| ElementID| Name | Reference |

|---------------------------------------------------|

| TBD1 | NRP-ID | This document |

|---------------------------------------------------|

6. Security Considerations

There exists no significant extra security considerations regarding

the allocation of these new IPFIX IEs compared to [RFC7012].

7. References

7.1. Normative References

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[IANA-IPFIX]

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