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TCP flags match field Extension
Version 0.1

December 23, 2014

OpenFlow

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1 Introduction

This document describes an ONF extension for OpenFlow version 1.3.X that matches the TCP flags field.

2 How it works

A new OXM match field is defined. This field map to the TCP flags header field present in the TCP header. It can only be used to either match on this field and can not be rewriten.

3 TCP flags Experimenter ID

The Experimenter ID of this extension is:

`ONF_EXPERIMENTER_ID` $= 0x4F4E4600$

4 TCP flags match field

This extension defines the following experimenter oxm type:

```
/* OXM types */
enum onf_oxm_exp_type {
  ONFOXM_ET_TCP_FLAGS = 42,    /* TCP flags. */
};
```

The OXM field have the size, prerequisites and masking capability specified in the following table.

Field	Bits	Mask	Pre-requisite	Description
ONFOXM_ET_TCP_FLAGS	12	Yes	IP_PROTO=6	TCP flags from the TCP header.

Table 1: Example match fields details.

The `ONFOXM_ET_TCP_FLAGS` oxm type uses the following action structure :

```
/* Structure for OXM field output match. */
struct onf_oxm_tcp_flags {
  uint32_t      oxm_header;      /* oxm_class = OFPXMC_EXPERIMENTER,
                                    oxm_field = ONFOXM_ET_TCP_FLAGS. */
  uint32_t      experimenter;    /* ONF_EXPERIMENTER_ID. */
  uint16_t      tcp_flags;       /* TCP Flags. */
};
OFP_ASSERT(sizeof(struct onf_oxm_tcp_flags) == 10);
```

The `oxm_header` field must be set with class `OFPXMC_EXPERIMENTER`, field type `ONFOXM_ET_TCP_FLAGS` and the proper OXM length and mask bit.

The `experimenter` field is the Experimenter ID (see 3).

The `tcp_flags` field matches the flag bits in a TCP header. Considering bit 0 the least significant bit, it specifically contains:

- Bits 0–5: The original TCP flags defined in RFC 793.

- Bits 6–8: Additional TCP flags defined by RFCs 3168 and 3540.

- Bits 9–11: Reserved bits not yet standardized by RFCs.

- Bits 12–15: Not part of the OXM field, forced to zero. (The TCP header uses the corresponding bits for other purposes, so they will never be standardized as flags.)