Unchecked prerequisites
# in Floodlight

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OpenFlow

- **OpenFlow** is a **standard protocol** that allows SDN controller to control network switches.
- Using OpenFlow, each switch can receive flow rules from the controller and **determine how it handles network traffic** by storing the **flow rules** in its own **flow table**.
- By default, there are **some prerequisites** for **match fields** according to **OpenFlow specification**.
- **The flow rule is the most important factor in controlling the entire network in SDN.**

Attacker and malicious application

- In SDN, the remote **attacker** can deploy a **malicious application** or install **malformed rules**.
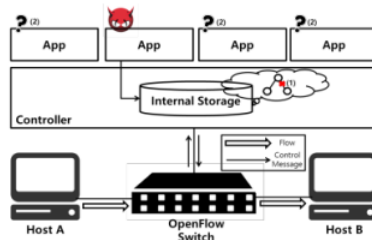
OpenFlow 1.3 Prerequisites

Field	Bits	Bytes	Mask	Pre-requisites	Description
OXM_OF_ETH_DST	48	6	Yes	None	Ethernet destination MAC address.
OXM_OF_ETH_SRC	48	6	Yes	None	Ethernet source MAC address.
OXM_OF_ETH_TYPE	16	2	No	None	Ethernet type of the OpenFlow packet payload, after VLAN tags.
OXM_OF_VLAN_VID	12+1	2	Yes	None	VLAN-ID from 802.1Q header. The CFI bit indicates the presence of a valid VLAN-ID, see below.
OXM_OF_VLAN_PCP	3	1	No	VLAN_VID!=NONE	VLAN-PCP from 802.1Q header.
OXM_OF_IP_DSCP	6	1	No	ETH_TYPE==0x0800 or ETH_TYPE==0x86dd	Diff Serv Code Point (DSCP). Part of the IPv4 ToS field or the IPv6 Traffic Class field.
OXM_OF_IP_ECN	2	1	No	ETH_TYPE==0x0800 or ETH_TYPE==0x86dd	ECN bits of the IP header. Part of the IPv4 ToS field or the IPv6 Traffic Class field.
OXM_OF_IP_PROTO	8	1	No	ETH_TYPE==0x0800 or ETH_TYPE==0x86dd	IPv4 or IPv6 protocol number.
OXM_OF_IPV4_SRC	32	4	Yes	ETH_TYPE==0x0800	IPv4 source address. Can use subnet mask or arbitrary bitmask
OXM_OF_IPV4_DST	32	4	Yes	ETH_TYPE==0x0800	IPv4 destination address. Can use subnet mask or arbitrary bitmask
OXM_OF_TCP_SRC	16	2	No	IP_PROTO==6	TCP source port
OXM_OF_TCP_DST	16	2	No	IP_PROTO==6	TCP destination port
OXM_OF_UDP_SRC	16	2	No	IP_PROTO==17	UDP source port
OXM_OF_UDP_DST	16	2	No	IP_PROTO==17	UDP destination port
OXM_OF_SCTP_SRC	16	2	No	IP_PROTO==132	SCTP source port
OXM_OF_SCTP_DST	16	2	No	IP_PROTO==132	SCTP destination port
OXM_OF_ICMPV4_TYPE	8	1	No	IP_PROTO==1	ICMP type
OXM_OF_ICMPV4_CODE	8	1	No	IP_PROTO==1	ICMP code
OXM_OF_ARP_OP	16	2	No	ETH_TYPE==0x0806	ARP opcode

Table 12: Header match fields details.

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checkFlow() function in
StaticFlowEntryPusherResource.java