SDN FS2022 - Zusammenfassung

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
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1 Introduction and Concepts

Traditional Networking Architecture is divided into planes, depending on the layer

2 OpenFlow

Managed by the Open Networking Foundation Standard Southbound Protocol used between the SDN controller and the switch - *management only!*

`res`/`openflow-basic.png`

OpenFlow operates as TCP Protocol (6644 / 6653) and can be secured by TLS using certificates.
Components of an OpenFlow Switch

- Flow Table(s)

- Group Table

- OpenFlow channel(s) to external controller

2.1 Controller

OpenFlow messages - for OF Channel setup between switch and controller
Controller manages *Flow Entries* in every switches flow tables (add, update, delete).

	Control Plane		Data Plane	
Spanning Tree, Overlays (VLANs)	Forward *Ethernet Frames*			
Layer 3	Routing Protocols, Overlays (MPLS)	Forward *IP Packets*		

HELLO	Sent by the switch, reply by the controller
FEATURE_REQUEST	Sent by controller, as supported OF capabilities
FEATURE_REPLY	Sent by switch to advertise

2.2   Flow Tables

Flow entry consists of

- Match fields

- Counter

- Instructions

Replaces traditional MAC/CAM table that stores hosts' hardware addresses. A flow entry is selected by IP packet matching fields, first matching entry is used ordered by priority.

- 39 fields possible to match on in OpenFlow 1.3, BUT must be supported by the hardware used

- usually in routing: most specific match

Instructions can be actions or modify pipeline processing. Possible actions are

- Forward on port

- Drop

- Flood

- Send to controller

If no match in any flow table is found: TABLE_MISS rule configuration: send to controller or drop.