

## 1. TAG

**08:30** Eintreffen der Teilnehmer im Gebäude 4 (Mensa)  
Begrüssung bei Kaffee und Gipfeli

**09:00 - 10:15** **Introduction to INS-HSR**  
**Introduction to Software Defined Networking**

- Market Drivers (Cloud Computing, Virtual Machine Mobility, Smart-phones, etc.)
- Benefits: Network Orchestration, Mobility, Virtualization, Layer-/ Cross-Domain Intelligence, etc.
- Standardization Drivers (IETF, ONF, OpenDaylight, OpenStack, etc.)
- Customer Examples: Google, Amazon, Deutsche Telekom, etc.

## Pause

**10:30 - 11:30** **SDN Architecture**

- Separation of Data and Control Plane, Hybrid Models, Hardware vs. Software
- Network Function Virtualization (NFV)
- Network Automation

**11:30 - 12:00** **Demo: Experience SDN**

- Automated Provisioning with OpenStack

## Mittagessen

**13:00 - 13:45** **Introduction to Application Programming Interfaces**

- Northbound and Southbound Interfaces
- Device APIs (Netconf, Yang)
- Architectural Comparison (Scripting, Object-Oriented Languages)
- Data Representation (XML, CSV, HTTP)
- Communications Models (REST API)

**13:45 - 14:00** **Demo: APIs**

- Examples of APIs

**14:00 - 15:00** **Introduction to Openflow**

- Openflow Architecture
- Protocol and Versions

## Pause

**15:15 - 16:15** **Network Vendors SDN Approaches**

- The legacy vendors: Cisco, HP, Brocade, VMware, Intel, etc.
- The new startups: BigSwitch, Nicira (VMware)
- Technical Implementations and Controller Types
- Open Source Implementations

**16:15 - 17:00** **Lab: Explicit Switching with Openflow**

- Use OpenDaylight Controller to direct traffic through the network

# Agenda SDN Fundamentals

## 2. TAG

09:00 - 09:30

### The New Network Engineer

- How have we been managing our networks in the past?
- What kind of skills will be required in the future?
- How to go on from here?

09:30 - 10:15

### Introduction to Cisco ONE

- Cisco's SDN / DNA Architecture
- Elements of Cisco's SDN Approach: APIs, Controllers, Fabrics, Virtualized Network Functions

## Pause

10:30 - 11:30

### SDN in the WAN

- Benefits
- Architectural Changes
- Use-Cases: Dynamic WAN

11:30 - 12:30

### Lab: iWAN

- Cisco iWAN Solution

## Mittagessen

13:30 - 14:30

### SDN in the Data Center

- Benefits
- Architectural Changes
- Cisco APIC Architecture as an Example
- Use-Case: Automated Provisioning of Cloud Services

14:30 - 14:40

### Lab: Demo Cisco ACI

14:40 - 15:00

### Lab: NSX

- VMWare NSX

## Pause

15:15 - 16:00

### SDN in the Campus / Access

- Benefits
- Architectural Changes
- Use-Case: Network Access Control
- Demo: DNA Center

16:00 - 16:45

### SDN in the Service Provider Network

- The internet of the future (Google Espresso, Facebook OCP, etc.)
- Deploy L3VPNs using UI, CLI and RESTCONF APIs
- Demo: NSO und WAE