

10 Network Management

10.1 Device Discovery with CDP (Cisco Discovery Protocol)

CDP an- und ausschalten

```
ROUTER(config)# no cdp run  
ROUTER(config)# cdp run
```

```
SWITCH(config-if)# cdp enable
```

Informationen über CDP

```
ROUTER# show cdp  
ROUTER# show cdp interface
```

Informationen über benachbarte Cisco-Geräte

```
ROUTER# show cdp neighbors  
ROUTER# show cdp neighbors detail
```

- Device ID (Nachbar)
- Local Interface (dieses Gerät)
- Holdtime
- Capability (Nachbar)
- Platform (Nachbar)
- Port ID (Nachbar)

10.2 Device Discovery with LLDP (Link Layer Discovery Protocol)

LLDP an- und ausschalten

```
ROUTER(config)# no lldp run  
ROUTER(config)# lldp run
```

```
SWITCH(config-if)# lldp transmit  
SWITCH(config-if)# lldp receive
```

Informationen über LLDP

```
ROUTER# show lldp
```

Informationen über benachbarte Geräte

```
ROUTER# show lldp neighbors  
ROUTER# show lldp neighbors detail
```

- Device ID (Nachbar)
- Local Interface (dieses Gerät)
- Holdtime
- Capability (Nachbar)
- Port ID (Nachbar)

10.3 NTP (Network Time Protocol)

- Stratum 0: atomic and GPS clocks (non-network high-precision)
- Stratum 1: directly connected to the authoritative time sources
- Stratum 2 and Lower: connected to network connections
- ...
- Stratum 15: max hop count
- Stratum 16: unsynchronized

Configuration

```
ROUTER# show clock detail
```

```
ROUTER(config)# ntp server 209.165.200.225
```

```
ROUTER# show ntp associations
```

```
ROUTER# show ntp status
```

10.4 SNMP (Simple Network Management Protocol)

nur Theorie

10.5 Syslog

Serverport

UDP 514

Router/Switch als Syslog-Client

```
Router(config)# logging host 1.2.3.4 # IP-Adresse des Servers
```

```
Router(config)# logging trap debugging # Alles mit Level ≤ 7 mitloggen
```

```
Router(config)# service timestamps log datetime msec # Zeit mitloggen
```

Severity Level (Schwere des Fehlers)

Level	Name	Erklärung
0	Emergencies	System Unusable
1	Alerts	Immediate Action Needed
2	Critical	Critical Condition
3	Errors	Error Condition
4	Warnings	Warning Condition
5	Notifications	Normal, but Significant Condition
6	Information	Informational Message
7	Debugging	Debugging Message

Message Format

```
*Mär 01, 00:37:41.3737: %SYS-5-CONFIG_I: Configured from console by console
```

Mär 01, 00:37:41.3737	Timestamp
SYS	Sylog reporting facility
5	Severity level
CONFIG_I	Mnemonic
Configured from console by console	Description

10.6 Router and Switch File Maintenance

Befehle zum Dateisystem

```
ROUTER# show file systems
ROUTER# dir
ROUTER# cd nvram:
ROUTER# pwd
```

Backup and Restore Configuration in Textfiles

Backup and Restore Configuration with TFTP

```
ROUTER# copy running-config tftp
ROUTER# copy tftp running-config
```

USB Ports on a Cisco Router

```
ROUTER# dir usbflash0:
ROUTER# copy running-config usbflash0:
ROUTER# copy usbflash0:/... running-config
```

Password Recovery Procedures

1. Enter the ROMMON mode
2. Change the configuration register
3. Copy the startup-config to the running-config
4. Change the password
5. Save the running-config as the new startup-config
6. Reload the device

10.7 IOS Image Management

IOS Image on TFTP-Server

```
ROUTER# show flash0:
ROUTER# copy flash: tftp:
ROUTER# copy copy tftp: flash:
```

The boot system Command

```
ROUTER(config)# boot system flash0:isr4200-universalk9_ias.16.09.04.SPA.bin
ROUTER# copy running-config startup-config
ROUTER# reload
ROUTER# show version
```