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# **Praktikum Rechnernetze**

Protokoll zu Versuch 9 (Netzmanagement und  
Netzanalyse) von Gruppe 1

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## 1 Einführung

### 1.1 Mitwirken

Diese Materialien basieren auf Professor Kiefers “Praktikum Rechnernetze”-Vorlesung der HdM Stuttgart.

**Sie haben einen Fehler gefunden oder haben einen Verbesserungsvorschlag?** Bitte eröffnen Sie ein Issue auf GitHub ([github.com/pojntfx/uni-netpractice-notes](https://github.com/pojntfx/uni-netpractice-notes)):



**Abbildung 1:** QR-Code zum Quelltext auf GitHub

Wenn Ihnen die Materialien gefallen, würden wir uns über einen GitHub-Stern sehr freuen.

### 1.2 Lizenz

Dieses Dokument und der enthaltene Quelltext ist freie Kultur bzw. freie Software.



**Abbildung 2:** Badge der AGPL-3.0-Lizenz

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SPDX-License-Identifier: AGPL-3.0

## 2 SNMP

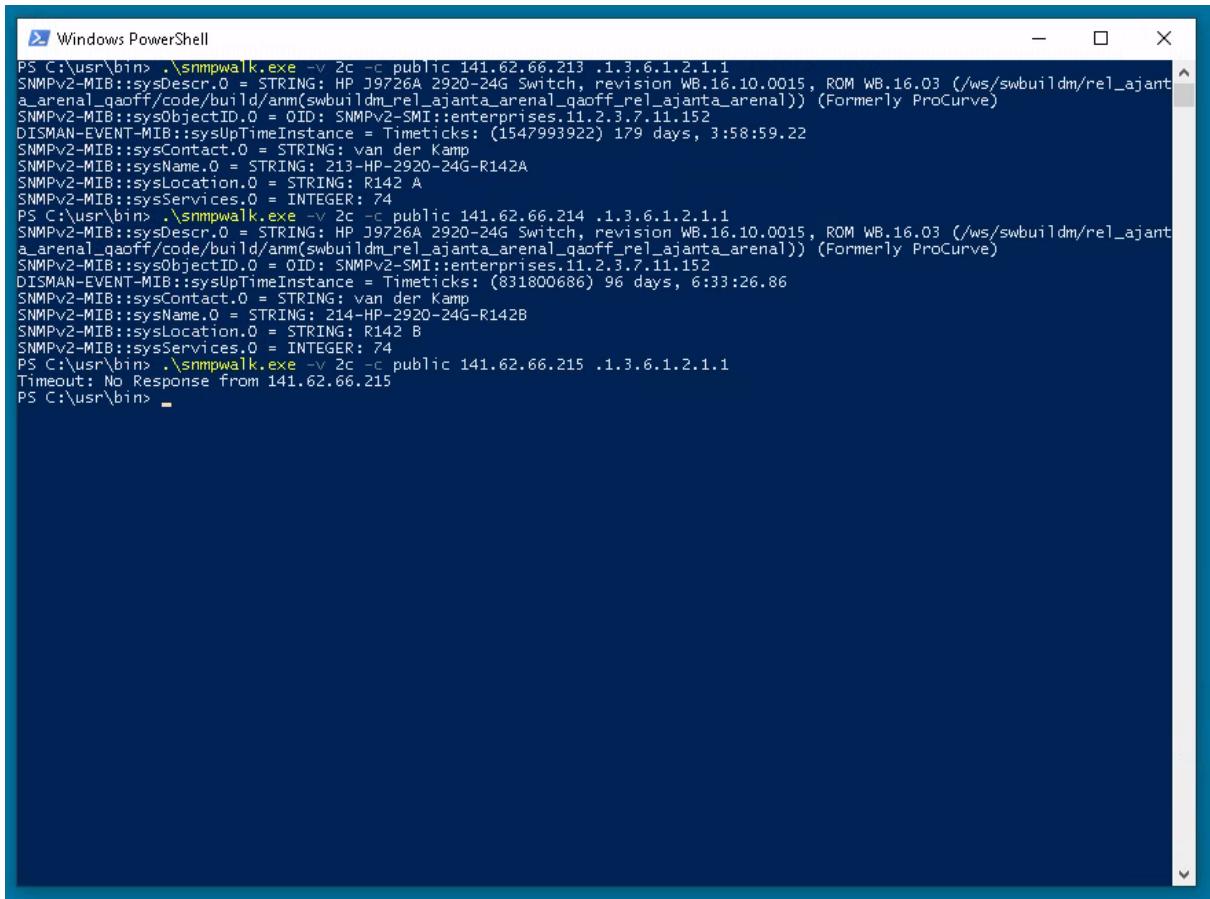
**Erkennen Sie, wer der Verwalter des Gerätes 141.62.66.213, 141.62.66.214 und 141.62.66.215 ist (sysContact)? Starten Sie eine Anfrage an einen Switch, die die Systeminfos abruft.**

Um die nötigen Informationen zu erhalten, verwendeten wir den folgenden Befehl für die angegebenen IP-Adressen:

```
1 ./snmpwalk.exe -v 2c -c public 141.62.66.213 .1.3.6.1.2.1.1
```

141.62.66.215 war, wie auf dem Screenshot zu sehen ist, zum Zeitpunkt der Versuchsdurchführung nicht erreichbar.

Der Screenshot zeigt, dass der `sysContact` und dementsprechend der Verwalter der Geräte für 141.62.66.213 und 141.62.66.214 den String-Wert "van der Kamp" hat.



```
PS C:\usr\bin> ./snmpwalk.exe -v 2c -c public 141.62.66.213 .1.3.6.1.2.1.1
SNMPv2-MIB::sysDescr.0 = STRING: HP J9726A 2920-24G Switch, revision WB.16.10.0015, ROM WB.16.03 (/ws/swbuildm/rel_ajant
a_arenal_qaoff/code/build/ann(swbuildm_rel_ajanta_arenal_qaoff_rel_ajanta_arenal)) (Formerly ProCurve)
SNMPv2-MIB::sysObjectID.0 = OID: SNMPv2-SMI::enterprises.11.2.3.7.11.152
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (1547993922) 179 days, 3:58:59.22
SNMPv2-MIB::sysContact.0 = STRING: van der Kamp
SNMPv2-MIB::sysName.0 = STRING: 213-HP-2920-24G-R142A
SNMPv2-MIB::sysLocation.0 = STRING: R142 A
SNMPv2-MIB::sysServices.0 = INTEGER: 74
PS C:\usr\bin> ./snmpwalk.exe -v 2c -c public 141.62.66.214 .1.3.6.1.2.1.1
SNMPv2-MIB::sysDescr.0 = STRING: HP J9726A 2920-24G Switch, revision WB.16.10.0015, ROM WB.16.03 (/ws/swbuildm/rel_ajant
a_arenal_qaoff/code/build/ann(swbuildm_rel_ajanta_arenal_qaoff_rel_ajanta_arenal)) (Formerly ProCurve)
SNMPv2-MIB::sysObjectID.0 = OID: SNMPv2-SMI::enterprises.11.2.3.7.11.152
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (831800686) 96 days, 6:33:26.86
SNMPv2-MIB::sysContact.0 = STRING: van der Kamp
SNMPv2-MIB::sysName.0 = STRING: 214-HP-2920-24G-R142B
SNMPv2-MIB::sysLocation.0 = STRING: R142 B
SNMPv2-MIB::sysServices.0 = INTEGER: 74
PS C:\usr\bin> ./snmpwalk.exe -v 2c -c public 141.62.66.215 .1.3.6.1.2.1.1
Timeout: No Response from 141.62.66.215
PS C:\usr\bin>
```

**Abbildung 3:** Ergebnis der Abfrage (van der Kamp)

**Nutzen Sie den Befehl snmpwalk, um zu ergründen auf welchem Switchport (141.62.66.213, 141.62.66.214 oder 141.62.66.215) wie viel los war. Um welche Einheit handelt es sich? Auf welchem Switchport war bisher offensichtlich kein PC angesteckt?**

Verwendet wurde `ifInOctets` bzw. `ifOutOctets`, was die Anzahl an empfangenen bzw. gesendeten Oktets (Bytes) beschreibt; auf den Ports, an welchen kein Traffic stattfindet, ist offensichtlich kein PC eingesteckt.

141.62.66.215 war zum Zeitpunkt der Versuchsdurchführung nicht erreichbar.

```

Windows PowerShell
PS C:\usr\bin> \snmpwalk -v 2c -c public 141.62.66.213 ifInOctets
IF-MIB::ifInOctets.0 = Counter32: 3460115186
IF-MIB::ifInOctets.1 = Counter32: 4456516186
IF-MIB::ifInOctets.2 = Counter32: 700818917
IF-MIB::ifInOctets.3 = Counter32: 2244722091
IF-MIB::ifInOctets.4 = Counter32: 1024491922
IF-MIB::ifInOctets.5 = Counter32: 1024491995
IF-MIB::ifInOctets.6 = Counter32: 4575301
IF-MIB::ifInOctets.7 = Counter32: 0
IF-MIB::ifInOctets.8 = Counter32: 29161630
IF-MIB::ifInOctets.9 = Counter32: 0
IF-MIB::ifInOctets.10 = Counter32: 0
IF-MIB::ifInOctets.11 = Counter32: 0
IF-MIB::ifInOctets.12 = Counter32: 0
IF-MIB::ifInOctets.13 = Counter32: 0
IF-MIB::ifInOctets.14 = Counter32: 0
IF-MIB::ifInOctets.15 = Counter32: 0
IF-MIB::ifInOctets.16 = Counter32: 0
IF-MIB::ifInOctets.17 = Counter32: 0
IF-MIB::ifInOctets.18 = Counter32: 0
IF-MIB::ifInOctets.19 = Counter32: 0
IF-MIB::ifInOctets.20 = Counter32: 0
IF-MIB::ifInOctets.21 = Counter32: 0
IF-MIB::ifInOctets.22 = Counter32: 0
IF-MIB::ifInOctets.23 = Counter32: 0
IF-MIB::ifInOctets.24 = Counter32: 0
IF-MIB::ifInOctets.25 = Counter32: 3056888288
IF-MIB::ifInOctets.26 = Counter32: 1980291627
IF-MIB::ifInOctets.30 = Counter32: 0
IF-MIB::ifInOctets.426 = Counter32: 52535347
IF-MIB::ifInOctets.426 = Counter32: 0
IF-MIB::ifInOctets.427 = Counter32: 0
IF-MIB::ifInOctets.428 = Counter32: 0
IF-MIB::ifInOctets.429 = Counter32: 0
IF-MIB::ifInOctets.430 = Counter32: 0
IF-MIB::ifInOctets.431 = Counter32: 0
IF-MIB::ifInOctets.432 = Counter32: 0
IF-MIB::ifInOctets.433 = Counter32: 0
IF-MIB::ifInOctets.438 = Counter32: 0
IF-MIB::ifInOctets.439 = Counter32: 0
PS C:\usr\bin> \snmpwalk -v 2c -c public 141.62.66.213 ifOutOctets
IF-MIB::ifOutOctets.1 = Counter32: 3392524663
IF-MIB::ifOutOctets.2 = Counter32: 112409577
IF-MIB::ifOutOctets.3 = Counter32: 427935005
IF-MIB::ifOutOctets.4 = Counter32: 427935922
IF-MIB::ifOutOctets.5 = Counter32: 3738593326
IF-MIB::ifOutOctets.6 = Counter32: 2739175677
IF-MIB::ifOutOctets.7 = Counter32: 29605743
IF-MIB::ifOutOctets.8 = Counter32: 0
IF-MIB::ifOutOctets.9 = Counter32: 71494016
IF-MIB::ifOutOctets.10 = Counter32: 0
IF-MIB::ifOutOctets.11 = Counter32: 0
IF-MIB::ifOutOctets.12 = Counter32: 0
IF-MIB::ifOutOctets.13 = Counter32: 0
IF-MIB::ifOutOctets.14 = Counter32: 0
IF-MIB::ifOutOctets.15 = Counter32: 0
IF-MIB::ifOutOctets.16 = Counter32: 0
IF-MIB::ifOutOctets.17 = Counter32: 0
IF-MIB::ifOutOctets.18 = Counter32: 0
IF-MIB::ifOutOctets.19 = Counter32: 0
IF-MIB::ifOutOctets.20 = Counter32: 0
IF-MIB::ifOutOctets.21 = Counter32: 0
IF-MIB::ifOutOctets.22 = Counter32: 0
IF-MIB::ifOutOctets.23 = Counter32: 0
IF-MIB::ifOutOctets.24 = Counter32: 0
IF-MIB::ifOutOctets.25 = Counter32: 47542184
IF-MIB::ifOutOctets.30 = Counter32: 4024842686
IF-MIB::ifOutOctets.33 = Counter32: 0
IF-MIB::ifOutOctets.425 = Counter32: 52526116
IF-MIB::ifOutOctets.426 = Counter32: 0
IF-MIB::ifOutOctets.427 = Counter32: 0
IF-MIB::ifOutOctets.428 = Counter32: 0
IF-MIB::ifOutOctets.429 = Counter32: 0
IF-MIB::ifOutOctets.430 = Counter32: 0
IF-MIB::ifOutOctets.431 = Counter32: 0
IF-MIB::ifOutOctets.432 = Counter32: 0
IF-MIB::ifOutOctets.433 = Counter32: 166458240
IF-MIB::ifOutOctets.438 = Counter32: 0
PS C:\usr\bin>

```

**Abbildung 4:** Ergebnis der Abfrage auf 141.62.66.213

```
PS C:\>snmpwalk -v 2c -c public 141.62.66.214 ifInOctets
IF-MIB::ifInOctets.1 = Counter32: 19204783
IF-MIB::ifInOctets.2 = Counter32: 2939211595
IF-MIB::ifInOctets.3 = Counter32: 0
IF-MIB::ifInOctets.4 = Counter32: 1173218484
IF-MIB::ifInOctets.5 = Counter32: 0
IF-MIB::ifInOctets.6 = Counter32: 805346398
IF-MIB::ifInOctets.7 = Counter32: 0
IF-MIB::ifInOctets.8 = Counter32: 761122113
IF-MIB::ifInOctets.9 = Counter32: 4668446
IF-MIB::ifInOctets.10 = Counter32: 145922648
IF-MIB::ifInOctets.11 = Counter32: 20218
IF-MIB::ifInOctets.12 = Counter32: 3203873898
IF-MIB::ifInOctets.13 = Counter32: 0
IF-MIB::ifInOctets.14 = Counter32: 0
IF-MIB::ifInOctets.15 = Counter32: 0
IF-MIB::ifInOctets.16 = Counter32: 0
IF-MIB::ifInOctets.17 = Counter32: 10968960
IF-MIB::ifInOctets.18 = Counter32: 0
IF-MIB::ifInOctets.19 = Counter32: 3087867
IF-MIB::ifInOctets.20 = Counter32: 0
IF-MIB::ifInOctets.21 = Counter32: 0
IF-MIB::ifInOctets.22 = Counter32: 0
IF-MIB::ifInOctets.23 = Counter32: 0
IF-MIB::ifInOctets.24 = Counter32: 0
IF-MIB::ifInOctets.25 = Counter32: 2357467405
IF-MIB::ifInOctets.26 = Counter32: 429311930
IF-MIB::ifInOctets.30 = Counter32: 0
IF-MIB::ifInOctets.31 = Counter32: 28191195
IF-MIB::ifInOctets.4426 = Counter32: 0
IF-MIB::ifInOctets.4427 = Counter32: 0
IF-MIB::ifInOctets.4428 = Counter32: 0
IF-MIB::ifInOctets.4429 = Counter32: 0
IF-MIB::ifInOctets.4430 = Counter32: 0
IF-MIB::ifInOctets.4431 = Counter32: 0
IF-MIB::ifInOctets.4432 = Counter32: 0
IF-MIB::ifInOctets.4433 = Counter32: 0
IF-MIB::ifInOctets.4434 = Counter32: 0
PS C:\>snmpwalk -v 2c -c public 141.62.66.214 ifOutOctets
IF-MIB::ifOutOctets.1 = Counter32: 125161715
IF-MIB::ifOutOctets.2 = Counter32: 988279594
IF-MIB::ifOutOctets.3 = Counter32: 0
IF-MIB::ifOutOctets.4 = Counter32: 1200705986
IF-MIB::ifOutOctets.5 = Counter32: 0
IF-MIB::ifOutOctets.6 = Counter32: 950556673
IF-MIB::ifOutOctets.7 = Counter32: 0
IF-MIB::ifOutOctets.8 = Counter32: 3129404361
IF-MIB::ifOutOctets.9 = Counter32: 5952445
IF-MIB::ifOutOctets.10 = Counter32: 2876235434
IF-MIB::ifOutOctets.11 = Counter32: 337557
IF-MIB::ifOutOctets.12 = Counter32: 843873624
IF-MIB::ifOutOctets.13 = Counter32: 0
IF-MIB::ifOutOctets.14 = Counter32: 0
IF-MIB::ifOutOctets.15 = Counter32: 0
IF-MIB::ifOutOctets.16 = Counter32: 0
IF-MIB::ifOutOctets.17 = Counter32: 279308169
IF-MIB::ifOutOctets.18 = Counter32: 0
IF-MIB::ifOutOctets.19 = Counter32: 672646993
IF-MIB::ifOutOctets.20 = Counter32: 0
IF-MIB::ifOutOctets.21 = Counter32: 0
IF-MIB::ifOutOctets.22 = Counter32: 0
IF-MIB::ifOutOctets.23 = Counter32: 0
IF-MIB::ifOutOctets.24 = Counter32: 0
IF-MIB::ifOutOctets.25 = Counter32: 1796700246
IF-MIB::ifOutOctets.30 = Counter32: 89450489630489
IF-MIB::ifOutOctets.39 = Counter32: 0
IF-MIB::ifOutOctets.4425 = Counter32: 28190856
IF-MIB::ifOutOctets.4426 = Counter32: 0
IF-MIB::ifOutOctets.4427 = Counter32: 0
IF-MIB::ifOutOctets.4428 = Counter32: 0
IF-MIB::ifOutOctets.4429 = Counter32: 0
IF-MIB::ifOutOctets.4430 = Counter32: 0
IF-MIB::ifOutOctets.4431 = Counter32: 0
IF-MIB::ifOutOctets.4432 = Counter32: 0
IF-MIB::ifOutOctets.4433 = Counter32: 89450100
IF-MIB::ifOutOctets.4438 = Counter32: 0
PS C:\>
```

**Abbildung 5:** Ergebnis der Abfrage auf 141.62.66.214

**Welche „Geschwindigkeiten“ (10, 100, 1000 Mbit/s) haben die Interfaces derzeit jeweils und warum? Was ist das besondere bei Port 25 auf Switch 141.62.66.215? (Hinweis: ifSpeed vs. ifHighSpeed)**

```

Windows PowerShell
PS C:\>snmpwalk.exe -v 2c -c public 141.62.66.213 ifSpeed
IF-MIB::ifSpeed.1 = Gauge32: 1000000000
IF-MIB::ifSpeed.2 = Gauge32: 1000000000
IF-MIB::ifSpeed.3 = Gauge32: 1000000000
IF-MIB::ifSpeed.4 = Gauge32: 1000000000
IF-MIB::ifSpeed.5 = Gauge32: 1000000000
IF-MIB::ifSpeed.6 = Gauge32: 1000000000
IF-MIB::ifSpeed.7 = Gauge32: 1000000000
IF-MIB::ifSpeed.8 = Gauge32: 1000000000
IF-MIB::ifSpeed.9 = Gauge32: 1000000000
IF-MIB::ifSpeed.10 = Gauge32: 1000000000
IF-MIB::ifSpeed.11 = Gauge32: 1000000000
IF-MIB::ifSpeed.12 = Gauge32: 1000000000
IF-MIB::ifSpeed.13 = Gauge32: 1000000000
IF-MIB::ifSpeed.14 = Gauge32: 1000000000
IF-MIB::ifSpeed.15 = Gauge32: 1000000000
IF-MIB::ifSpeed.16 = Gauge32: 1000000000
IF-MIB::ifSpeed.17 = Gauge32: 1000000000
IF-MIB::ifSpeed.18 = Gauge32: 1000000000
IF-MIB::ifSpeed.19 = Gauge32: 1000000000
IF-MIB::ifSpeed.20 = Gauge32: 1000000000
IF-MIB::ifSpeed.21 = Gauge32: 1000000000
IF-MIB::ifSpeed.22 = Gauge32: 1000000000
IF-MIB::ifSpeed.23 = Gauge32: 1000000000
IF-MIB::ifSpeed.24 = Gauge32: 1000000000
IF-MIB::ifSpeed.25 = Gauge32: 4294967295
IF-MIB::ifSpeed.26 = Gauge32: 1000000000
IF-MIB::ifSpeed.300 = Gauge32: 0
IF-MIB::ifSpeed.4426 = Gauge32: 0
IF-MIB::ifSpeed.4427 = Gauge32: 0
IF-MIB::ifSpeed.4428 = Gauge32: 0
IF-MIB::ifSpeed.4429 = Gauge32: 0
IF-MIB::ifSpeed.4430 = Gauge32: 0
IF-MIB::ifSpeed.4431 = Gauge32: 0
IF-MIB::ifSpeed.4432 = Gauge32: 0
IF-MIB::ifSpeed.4433 = Gauge32: 1000000000
IF-MIB::ifSpeed.4438 = Gauge32: 0
PS C:\>snmpwalk.exe -v 2c -c public 141.62.66.213 ifHighSpeed
IF-MIB::ifHighSpeed.1 = Gauge32: 1000
IF-MIB::ifHighSpeed.2 = Gauge32: 1000
IF-MIB::ifHighSpeed.3 = Gauge32: 1000
IF-MIB::ifHighSpeed.4 = Gauge32: 1000
IF-MIB::ifHighSpeed.5 = Gauge32: 1000
IF-MIB::ifHighSpeed.6 = Gauge32: 1000
IF-MIB::ifHighSpeed.7 = Gauge32: 1000
IF-MIB::ifHighSpeed.8 = Gauge32: 1000
IF-MIB::ifHighSpeed.9 = Gauge32: 1000
IF-MIB::ifHighSpeed.10 = Gauge32: 1000
IF-MIB::ifHighSpeed.11 = Gauge32: 1000
IF-MIB::ifHighSpeed.12 = Gauge32: 1000
IF-MIB::ifHighSpeed.13 = Gauge32: 1000
IF-MIB::ifHighSpeed.14 = Gauge32: 1000
IF-MIB::ifHighSpeed.15 = Gauge32: 1000
IF-MIB::ifHighSpeed.16 = Gauge32: 1000
IF-MIB::ifHighSpeed.17 = Gauge32: 1000
IF-MIB::ifHighSpeed.18 = Gauge32: 1000
IF-MIB::ifHighSpeed.19 = Gauge32: 1000
IF-MIB::ifHighSpeed.20 = Gauge32: 1000
IF-MIB::ifHighSpeed.21 = Gauge32: 1000
IF-MIB::ifHighSpeed.22 = Gauge32: 1000
IF-MIB::ifHighSpeed.23 = Gauge32: 1000
IF-MIB::ifHighSpeed.24 = Gauge32: 1000
IF-MIB::ifHighSpeed.25 = Gauge32: 1000
IF-MIB::ifHighSpeed.300 = Gauge32: 0
IF-MIB::ifHighSpeed.4425 = Gauge32: 0
IF-MIB::ifHighSpeed.4426 = Gauge32: 0
IF-MIB::ifHighSpeed.4427 = Gauge32: 0
IF-MIB::ifHighSpeed.4428 = Gauge32: 0
IF-MIB::ifHighSpeed.4429 = Gauge32: 0
IF-MIB::ifHighSpeed.4430 = Gauge32: 0
IF-MIB::ifHighSpeed.4431 = Gauge32: 0
IF-MIB::ifHighSpeed.4432 = Gauge32: 0
IF-MIB::ifHighSpeed.4433 = Gauge32: 100
IF-MIB::ifHighSpeed.4438 = Gauge32: 0
PS C:\>

```

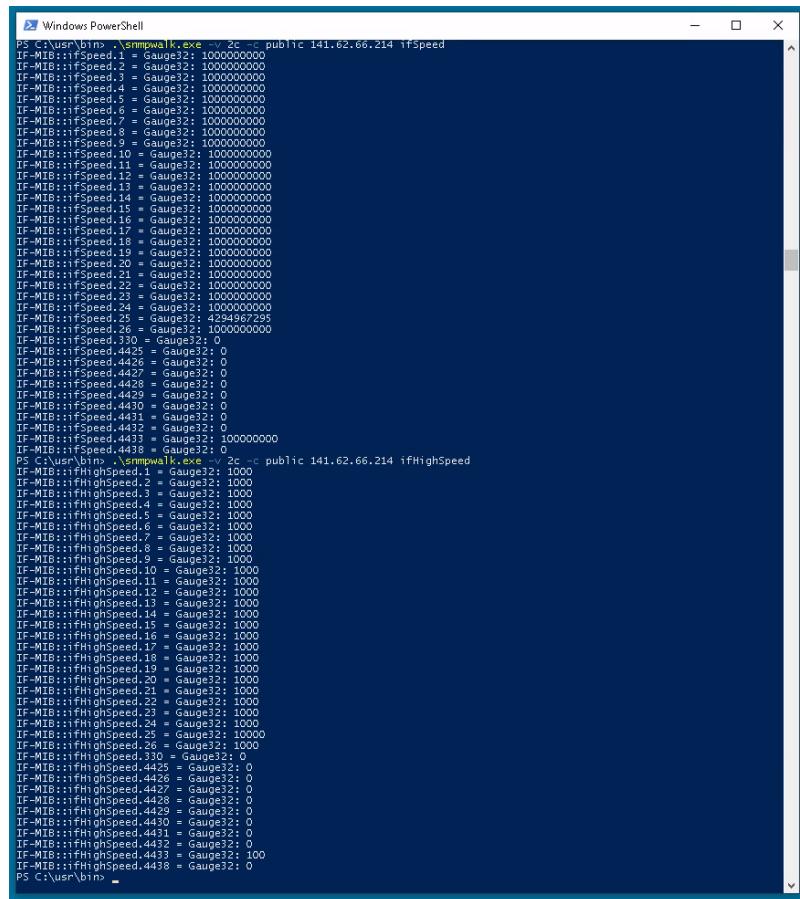
**Abbildung 6:** Ergebnis der Abfrage auf 141.62.66.213

- Port 2 auf 141.62.66.215: 10 Mbit/s
- Port 24 auf 141.62.66.215: 100 Mbit/s
- Port 25 auf 141.62.66.213, 141.62.66.214: 10 Gigabit/s
- Restliche Ports: 1 Gigabit/s

**Welche Geräte sind auf welchen Ports (141.62.66.213 oder .214, .215) angeschlossen (Hinweis: ifAlias)?**

141.62.66.215 war zum Zeitpunkt der Versuchsdurchführung nicht erreichbar.

Mit `./snmpwalk.exe -v 2c -c public 141.62.66.213 ifAlias` können wir die angeschlossenenen Geräte an den jeweiligen Ports finden.



The screenshot shows a Windows PowerShell window with the title bar "Windows PowerShell". The command entered is PS C:\user\bin> \snmpwalk.exe -v 2c -c public 141.62.66.214 ifSpeed. The output of the command is displayed in the window, listing various interface speeds in bytes per second (Bps) for the specified IP address. The output includes entries for IF-MIB::ifSpeed.1 through IF-MIB::ifSpeed.25, IF-MIB::ifHighSpeed.1 through IF-MIB::ifHighSpeed.24, and IF-MIB::ifHighSpeed.370. Most interfaces show a speed of 1000000000 (1 Gbps), except for one entry which shows 4294967295.

```
PS C:\user\bin> \snmpwalk.exe -v 2c -c public 141.62.66.214 ifSpeed
IF-MIB::ifSpeed.1 = Gauge32: 1000000000
IF-MIB::ifSpeed.2 = Gauge32: 1000000000
IF-MIB::ifSpeed.3 = Gauge32: 1000000000
IF-MIB::ifSpeed.4 = Gauge32: 1000000000
IF-MIB::ifSpeed.5 = Gauge32: 1000000000
IF-MIB::ifSpeed.6 = Gauge32: 1000000000
IF-MIB::ifSpeed.7 = Gauge32: 1000000000
IF-MIB::ifSpeed.8 = Gauge32: 1000000000
IF-MIB::ifSpeed.9 = Gauge32: 1000000000
IF-MIB::ifSpeed.10 = Gauge32: 1000000000
IF-MIB::ifSpeed.11 = Gauge32: 1000000000
IF-MIB::ifSpeed.12 = Gauge32: 1000000000
IF-MIB::ifSpeed.13 = Gauge32: 1000000000
IF-MIB::ifSpeed.14 = Gauge32: 1000000000
IF-MIB::ifSpeed.15 = Gauge32: 1000000000
IF-MIB::ifSpeed.16 = Gauge32: 1000000000
IF-MIB::ifSpeed.17 = Gauge32: 1000000000
IF-MIB::ifSpeed.18 = Gauge32: 1000000000
IF-MIB::ifSpeed.19 = Gauge32: 1000000000
IF-MIB::ifSpeed.20 = Gauge32: 1000000000
IF-MIB::ifSpeed.21 = Gauge32: 1000000000
IF-MIB::ifSpeed.22 = Gauge32: 1000000000
IF-MIB::ifSpeed.23 = Gauge32: 1000000000
IF-MIB::ifSpeed.24 = Gauge32: 1000000000
IF-MIB::ifSpeed.25 = Gauge32: 4294967295
IF-MIB::ifSpeed.26 = Gauge32: 1000000000
IF-MIB::ifSpeed.4425 = Gauge32: 0
IF-MIB::ifSpeed.4426 = Gauge32: 0
IF-MIB::ifSpeed.4427 = Gauge32: 0
IF-MIB::ifSpeed.4428 = Gauge32: 0
IF-MIB::ifSpeed.4429 = Gauge32: 0
IF-MIB::ifSpeed.4430 = Gauge32: 0
IF-MIB::ifSpeed.4431 = Gauge32: 0
IF-MIB::ifSpeed.4432 = Gauge32: 0
IF-MIB::ifSpeed.4433 = Gauge32: 100000000
IF-MIB::ifSpeed.4434 = Gauge32: 0
IF-MIB::ifSpeed.4435 = Gauge32: 0
IF-MIB::ifHighSpeed.1 = Gauge32: 1000
IF-MIB::ifHighSpeed.2 = Gauge32: 1000
IF-MIB::ifHighSpeed.3 = Gauge32: 1000
IF-MIB::ifHighSpeed.4 = Gauge32: 1000
IF-MIB::ifHighSpeed.5 = Gauge32: 1000
IF-MIB::ifHighSpeed.6 = Gauge32: 1000
IF-MIB::ifHighSpeed.7 = Gauge32: 1000
IF-MIB::ifHighSpeed.8 = Gauge32: 1000
IF-MIB::ifHighSpeed.9 = Gauge32: 1000
IF-MIB::ifHighSpeed.10 = Gauge32: 1000
IF-MIB::ifHighSpeed.11 = Gauge32: 1000
IF-MIB::ifHighSpeed.12 = Gauge32: 1000
IF-MIB::ifHighSpeed.13 = Gauge32: 1000
IF-MIB::ifHighSpeed.14 = Gauge32: 1000
IF-MIB::ifHighSpeed.15 = Gauge32: 1000
IF-MIB::ifHighSpeed.16 = Gauge32: 1000
IF-MIB::ifHighSpeed.17 = Gauge32: 1000
IF-MIB::ifHighSpeed.18 = Gauge32: 1000
IF-MIB::ifHighSpeed.19 = Gauge32: 1000
IF-MIB::ifHighSpeed.20 = Gauge32: 1000
IF-MIB::ifHighSpeed.21 = Gauge32: 1000
IF-MIB::ifHighSpeed.22 = Gauge32: 1000
IF-MIB::ifHighSpeed.23 = Gauge32: 1000
IF-MIB::ifHighSpeed.24 = Gauge32: 1000
IF-MIB::ifHighSpeed.25 = Gauge32: 100000
IF-MIB::ifHighSpeed.370 = Gauge32: 0
IF-MIB::ifHighSpeed.4425 = Gauge32: 0
IF-MIB::ifHighSpeed.4426 = Gauge32: 0
IF-MIB::ifHighSpeed.4427 = Gauge32: 0
IF-MIB::ifHighSpeed.4428 = Gauge32: 0
IF-MIB::ifHighSpeed.4429 = Gauge32: 0
IF-MIB::ifHighSpeed.4430 = Gauge32: 0
IF-MIB::ifHighSpeed.4431 = Gauge32: 100
IF-MIB::ifHighSpeed.4438 = Gauge32: 0
PS C:\user\bin>
```

**Abbildung 7:** Ergebnis der Abfrage auf 141.62.66.214

```

Dienst neu starten
Windows PowerShell
PS C:\usr\bin> ./snmpwalk.exe -v 2c -c public 141.62.66.215 ifSpeed
IF-MIB::ifSpeed.0 = Gauge32: 1000000000
IF-MIB::ifSpeed.2 = Gauge32: 1000000000
IF-MIB::ifSpeed.3 = Gauge32: 1000000000
IF-MIB::ifSpeed.4 = Gauge32: 1000000000
IF-MIB::ifSpeed.5 = Gauge32: 1000000000
IF-MIB::ifSpeed.6 = Gauge32: 1000000000
IF-MIB::ifSpeed.7 = Gauge32: 1000000000
IF-MIB::ifSpeed.8 = Gauge32: 1000000000
IF-MIB::ifSpeed.9 = Gauge32: 1000000000
IF-MIB::ifSpeed.10 = Gauge32: 1000000000
IF-MIB::ifSpeed.11 = Gauge32: 1000000000
IF-MIB::ifSpeed.12 = Gauge32: 1000000000
IF-MIB::ifSpeed.13 = Gauge32: 1000000000
IF-MIB::ifSpeed.14 = Gauge32: 1000000000
IF-MIB::ifSpeed.15 = Gauge32: 1000000000
IF-MIB::ifSpeed.16 = Gauge32: 1000000000
IF-MIB::ifSpeed.17 = Gauge32: 1000000000
IF-MIB::ifSpeed.18 = Gauge32: 1000000000
IF-MIB::ifSpeed.19 = Gauge32: 1000000000
IF-MIB::ifSpeed.20 = Gauge32: 1000000000
IF-MIB::ifSpeed.21 = Gauge32: 1000000000
IF-MIB::ifSpeed.22 = Gauge32: 1000000000
IF-MIB::ifSpeed.23 = Gauge32: 1000000000
IF-MIB::ifSpeed.24 = Gauge32: 1000000000
IF-MIB::ifSpeed.25 = Gauge32: 1000000000
IF-MIB::ifSpeed.26 = Gauge32: 1000000000
IF-MIB::ifSpeed.33a = Gauge32: 0
IF-MIB::ifSpeed.4425 = Gauge32: 0
IF-MIB::ifSpeed.4426 = Gauge32: 0
IF-MIB::ifSpeed.4427 = Gauge32: 0
IF-MIB::ifSpeed.4428 = Gauge32: 0
IF-MIB::ifSpeed.4429 = Gauge32: 0
IF-MIB::ifSpeed.4430 = Gauge32: 0
IF-MIB::ifSpeed.4431 = Gauge32: 0
IF-MIB::ifSpeed.4432 = Gauge32: 0
IF-MIB::ifSpeed.4433 = Gauge32: 1000000000
IF-MIB::ifSpeed.4438 = Gauge32: 1000000000
PS C:\usr\bnn>

```

**Abbildung 8:** Ergebnis der `ifspeed` Abfrage auf 141.62.66.215

141.62.66.213 hat ein Gerät namens [PC-1](#) in Port 20 angeschlossen und [Server-15](#) in Port 21.

An 141.62.66.214 sind an Port 20 ein [HP-Officejet](#) angeschlossen und an Port 21 eine [Fritzbox 7590](#).

**Gibt es Unterschiede beispielsweise zwischen PCs die angeschaltet sind und solchen, die zwar angeschlossen, aber ausgeschaltet sind (Hinweis: Erkennbar an der Port-Geschwindigkeit) ?**

Anfangs waren alle Geräte bei uns angeschlossen und deren Ports als 1 Gigabit-Port dargestellt; Alias 25 aber wird als 10 Gigabit-Port dargestellt. Alias 4433 wird als 100 Mbit-Port dargestellt.

Nachdem der Rechner [rn04](#) ausgeschaltet wurde, findet sich für den Switch mit der IP 141.62.66.214 an Port 5 die Geschwindigkeit 10 Mbit:

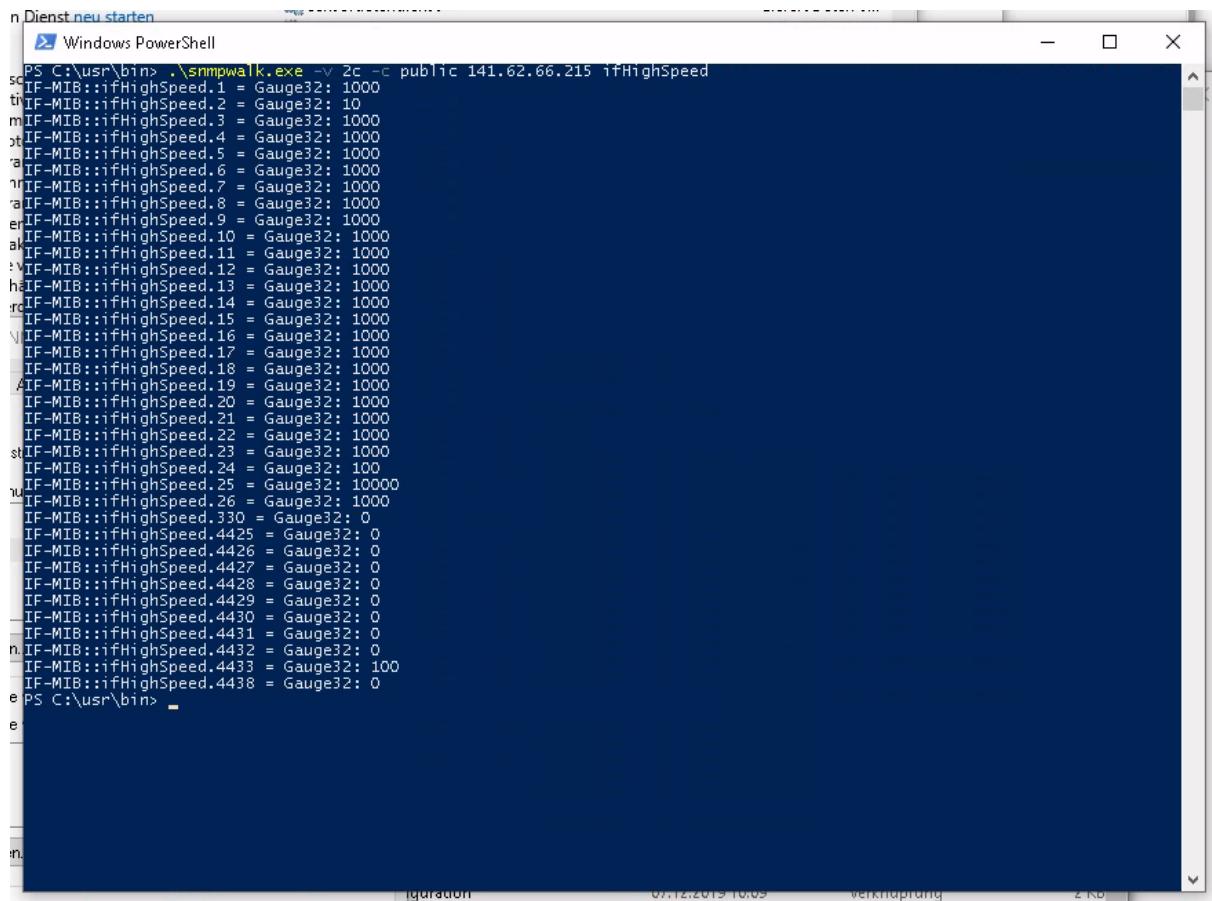
Zu sehen ist also, dass für ausgeschaltete PCs die Port-Geschwindigkeit auf 10 Mbit sinkt.

**Wie sieht ein entsprechender snmpwalk bei Ihrem Switch aus (objectID: .1.3.6.1.2.1.1)?**

Wir verwenden den Befehl `./snmpwalk.exe -v 2c -c public 141.62.66.71 .1.3.6.1.2.1.1:`

Man kann auf dem Screenshot erkennen, dass `sysContact`, `sysName` und `sysLocation` noch nicht konfiguriert sind, beziehungsweise Standardwerte haben.

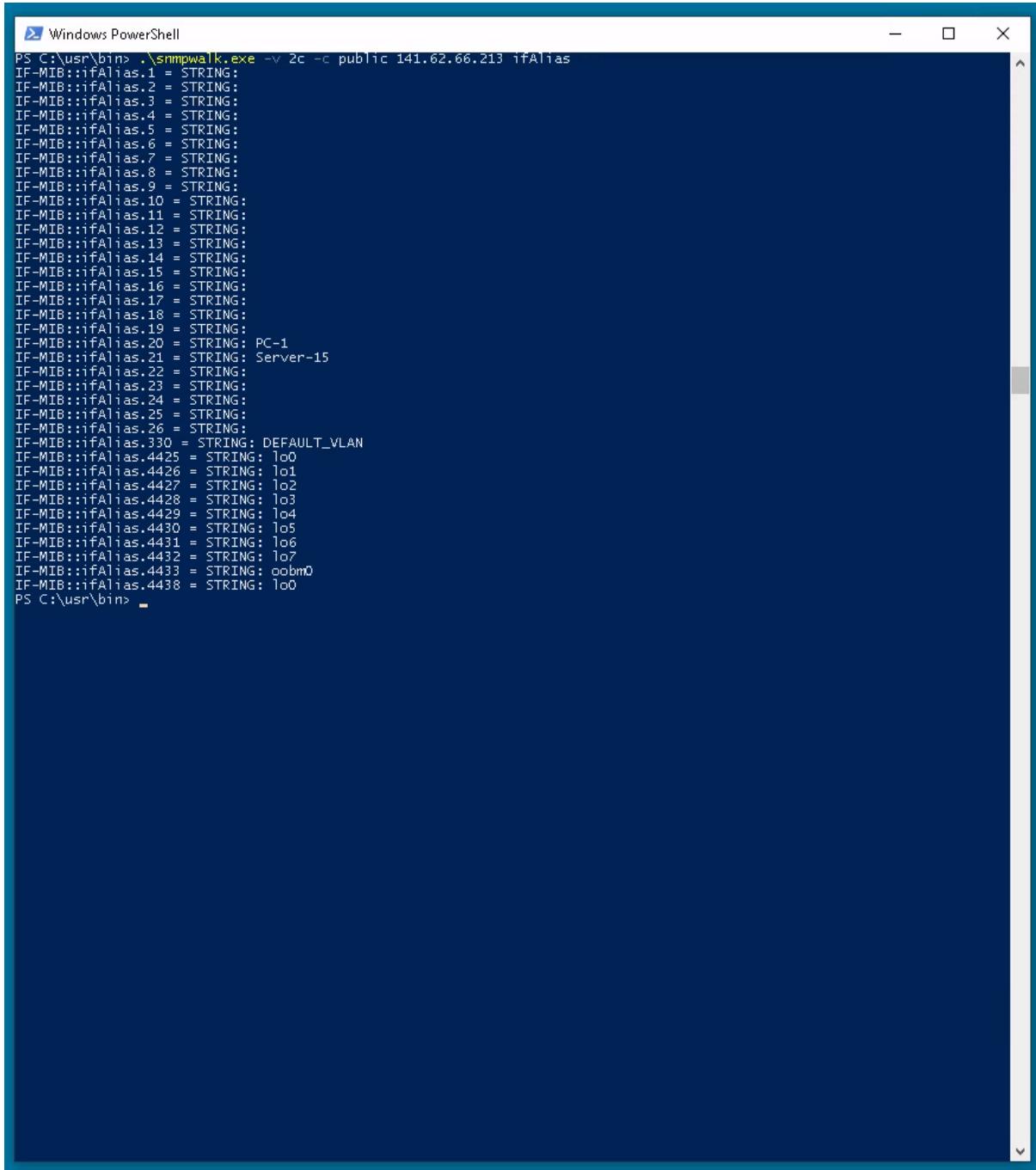
**Setzen Sie mit `snmpset` einen Ansprechpartner auf Ihrem Switch. Überprüfen sie Ihre Einstellung!**



The screenshot shows a Windows PowerShell window titled "Dienst neu starten". The command executed is `PS C:\usr\bin> .\snmpwalk.exe -v 2c -c public 141.62.66.215 ifHighSpeed`. The output lists numerous entries under the IF-MIB::ifHighSpeed object identifier, each consisting of a OID and a value (Gauge32). Most values are 1000, except for a few which are 0 or 100.

```
PS C:\usr\bin> .\snmpwalk.exe -v 2c -c public 141.62.66.215 ifHighSpeed
s:IF-MIB::ifHighSpeed.1 = Gauge32: 1000
t:IF-MIB::ifHighSpeed.2 = Gauge32: 100
m:IF-MIB::ifHighSpeed.3 = Gauge32: 1000
o:IF-MIB::ifHighSpeed.4 = Gauge32: 1000
`IF-MIB::ifHighSpeed.5 = Gauge32: 1000
`IF-MIB::ifHighSpeed.6 = Gauge32: 1000
n:IF-MIB::ifHighSpeed.7 = Gauge32: 1000
`IF-MIB::ifHighSpeed.8 = Gauge32: 1000
`IF-MIB::ifHighSpeed.9 = Gauge32: 1000
e:IF-MIB::ifHighSpeed.10 = Gauge32: 1000
a:IF-MIB::ifHighSpeed.11 = Gauge32: 1000
`IF-MIB::ifHighSpeed.12 = Gauge32: 1000
h:IF-MIB::ifHighSpeed.13 = Gauge32: 1000
r:IF-MIB::ifHighSpeed.14 = Gauge32: 1000
`IF-MIB::ifHighSpeed.15 = Gauge32: 1000
`IF-MIB::ifHighSpeed.16 = Gauge32: 1000
`IF-MIB::ifHighSpeed.17 = Gauge32: 1000
`IF-MIB::ifHighSpeed.18 = Gauge32: 1000
`IF-MIB::ifHighSpeed.19 = Gauge32: 1000
`IF-MIB::ifHighSpeed.20 = Gauge32: 1000
`IF-MIB::ifHighSpeed.21 = Gauge32: 1000
`IF-MIB::ifHighSpeed.22 = Gauge32: 1000
s:IF-MIB::ifHighSpeed.23 = Gauge32: 1000
`IF-MIB::ifHighSpeed.24 = Gauge32: 100
`IF-MIB::ifHighSpeed.25 = Gauge32: 10000
`IF-MIB::ifHighSpeed.26 = Gauge32: 1000
`IF-MIB::ifHighSpeed.330 = Gauge32: 0
`IF-MIB::ifHighSpeed.4425 = Gauge32: 0
`IF-MIB::ifHighSpeed.4426 = Gauge32: 0
`IF-MIB::ifHighSpeed.4427 = Gauge32: 0
`IF-MIB::ifHighSpeed.4428 = Gauge32: 0
`IF-MIB::ifHighSpeed.4429 = Gauge32: 0
`IF-MIB::ifHighSpeed.4430 = Gauge32: 0
`IF-MIB::ifHighSpeed.4431 = Gauge32: 0
`IF-MIB::ifHighSpeed.4432 = Gauge32: 0
`IF-MIB::ifHighSpeed.4433 = Gauge32: 100
`IF-MIB::ifHighSpeed.4438 = Gauge32: 0
e:PS C:\usr\bin>
```

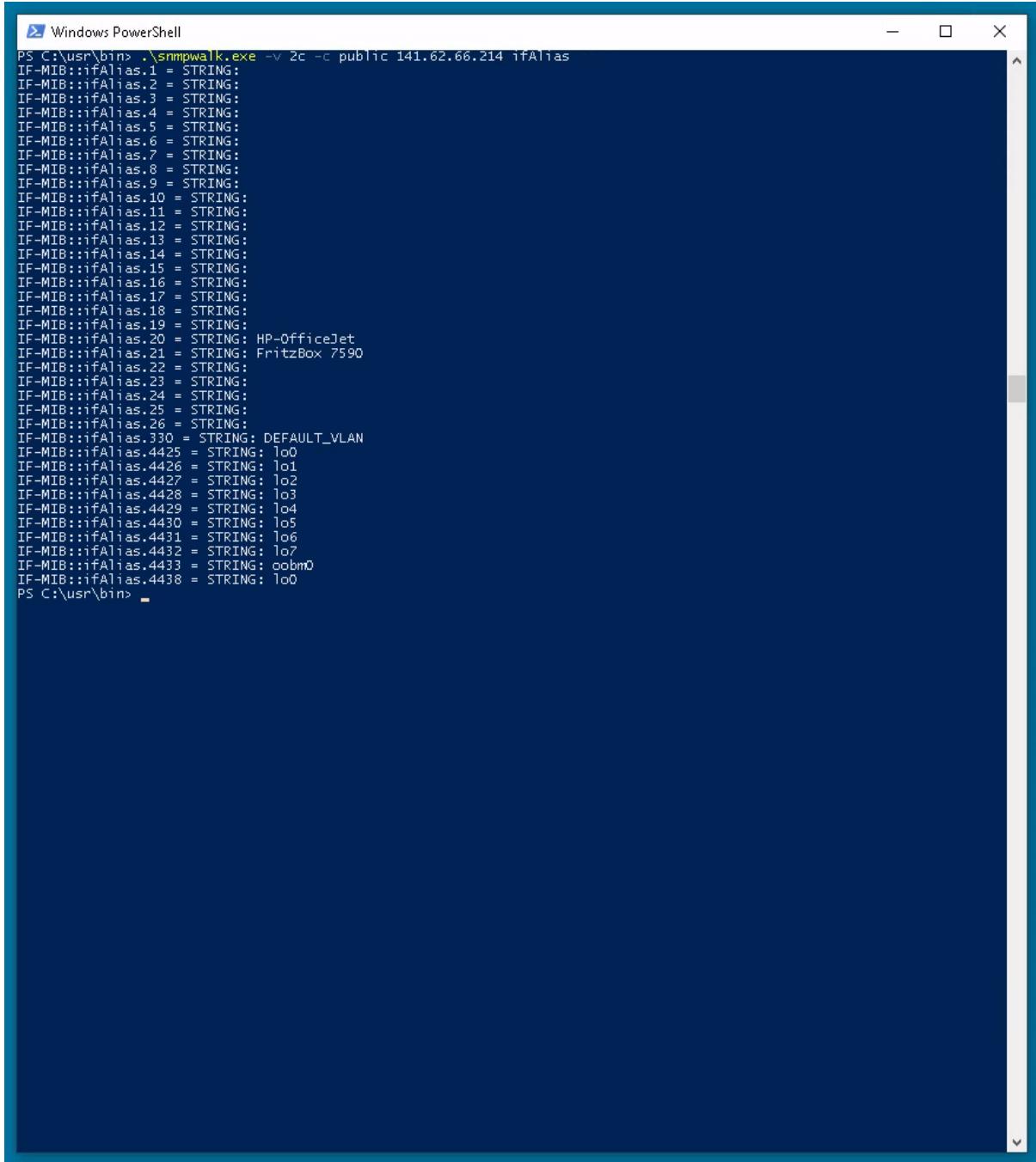
**Abbildung 9:** Ergebnis der `ifHighSpeed` Abfrage auf `141.62.66.215`



The screenshot shows a Windows PowerShell window with the title "Windows PowerShell". The command entered was `PS C:\usr\bin> .\snmpwalk.exe -v 2c -c public 141.62.66.213 ifAlias`. The output lists numerous entries for `IF-MIB::ifAlias`, each consisting of a number from 1 to 4438 followed by a colon and a string value. The strings represent various interface aliases, such as "PC-1", "Server-15", and "lo0" through "lo6". The last entry shown is "qobm0". The PowerShell prompt at the bottom is `PS C:\usr\bin>`.

```
PS C:\usr\bin> .\snmpwalk.exe -v 2c -c public 141.62.66.213 ifAlias
IF-MIB::ifAlias.1 = STRING:
IF-MIB::ifAlias.2 = STRING:
IF-MIB::ifAlias.3 = STRING:
IF-MIB::ifAlias.4 = STRING:
IF-MIB::ifAlias.5 = STRING:
IF-MIB::ifAlias.6 = STRING:
IF-MIB::ifAlias.7 = STRING:
IF-MIB::ifAlias.8 = STRING:
IF-MIB::ifAlias.9 = STRING:
IF-MIB::ifAlias.10 = STRING:
IF-MIB::ifAlias.11 = STRING:
IF-MIB::ifAlias.12 = STRING:
IF-MIB::ifAlias.13 = STRING:
IF-MIB::ifAlias.14 = STRING:
IF-MIB::ifAlias.15 = STRING:
IF-MIB::ifAlias.16 = STRING:
IF-MIB::ifAlias.17 = STRING:
IF-MIB::ifAlias.18 = STRING:
IF-MIB::ifAlias.19 = STRING:
IF-MIB::ifAlias.20 = STRING: PC-1
IF-MIB::ifAlias.21 = STRING: Server-15
IF-MIB::ifAlias.22 = STRING:
IF-MIB::ifAlias.23 = STRING:
IF-MIB::ifAlias.24 = STRING:
IF-MIB::ifAlias.25 = STRING:
IF-MIB::ifAlias.26 = STRING:
IF-MIB::ifAlias.330 = STRING: DEFAULT_VLAN
IF-MIB::ifAlias.4425 = STRING: lo0
IF-MIB::ifAlias.4426 = STRING: lo1
IF-MIB::ifAlias.4427 = STRING: lo2
IF-MIB::ifAlias.4428 = STRING: lo3
IF-MIB::ifAlias.4429 = STRING: lo4
IF-MIB::ifAlias.4430 = STRING: lo5
IF-MIB::ifAlias.4431 = STRING: lo6
IF-MIB::ifAlias.4432 = STRING: lo7
IF-MIB::ifAlias.4433 = STRING: qobm0
IF-MIB::ifAlias.4438 = STRING: lo0
PS C:\usr\bin>
```

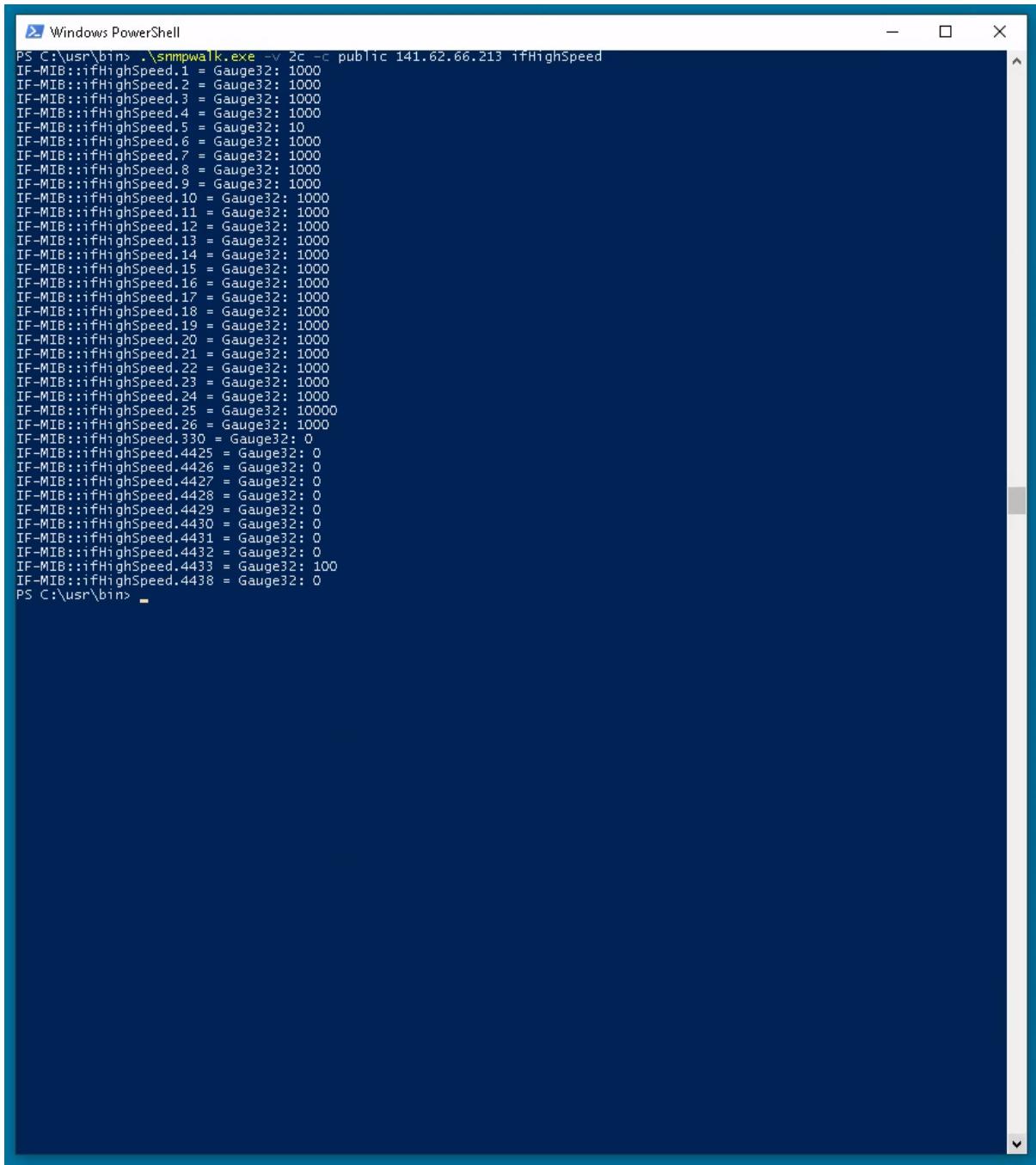
**Abbildung 10:** Ergebnis der Abfrage auf 141.62.66.213



The screenshot shows a Windows PowerShell window titled "Windows PowerShell". The command entered is "PS C:\usr\bin> .\snmpwalk.exe -v 2c -c public 141.62.66.214 ifAlias". The output displays a list of MIB objects and their string values:

```
PS C:\usr\bin> .\snmpwalk.exe -v 2c -c public 141.62.66.214 ifAlias
IF-MIB::ifAlias.1 = STRING:
IF-MIB::ifAlias.2 = STRING:
IF-MIB::ifAlias.3 = STRING:
IF-MIB::ifAlias.4 = STRING:
IF-MIB::ifAlias.5 = STRING:
IF-MIB::ifAlias.6 = STRING:
IF-MIB::ifAlias.7 = STRING:
IF-MIB::ifAlias.8 = STRING:
IF-MIB::ifAlias.9 = STRING:
IF-MIB::ifAlias.10 = STRING:
IF-MIB::ifAlias.11 = STRING:
IF-MIB::ifAlias.12 = STRING:
IF-MIB::ifAlias.13 = STRING:
IF-MIB::ifAlias.14 = STRING:
IF-MIB::ifAlias.15 = STRING:
IF-MIB::ifAlias.16 = STRING:
IF-MIB::ifAlias.17 = STRING:
IF-MIB::ifAlias.18 = STRING:
IF-MIB::ifAlias.19 = STRING:
IF-MIB::ifAlias.20 = STRING: HP-OfficeJet
IF-MIB::ifAlias.21 = STRING: FritzBox 7590
IF-MIB::ifAlias.22 = STRING:
IF-MIB::ifAlias.23 = STRING:
IF-MIB::ifAlias.24 = STRING:
IF-MIB::ifAlias.25 = STRING:
IF-MIB::ifAlias.26 = STRING:
IF-MIB::ifAlias.330 = STRING: DEFAULT_VLAN
IF-MIB::ifAlias.4425 = STRING: lo0
IF-MIB::ifAlias.4426 = STRING: lo1
IF-MIB::ifAlias.4427 = STRING: lo2
IF-MIB::ifAlias.4428 = STRING: lo3
IF-MIB::ifAlias.4429 = STRING: lo4
IF-MIB::ifAlias.4430 = STRING: lo5
IF-MIB::ifAlias.4431 = STRING: lo6
IF-MIB::ifAlias.4432 = STRING: lo7
IF-MIB::ifAlias.4433 = STRING: oobm0
IF-MIB::ifAlias.4438 = STRING: lo0
PS C:\usr\bin>
```

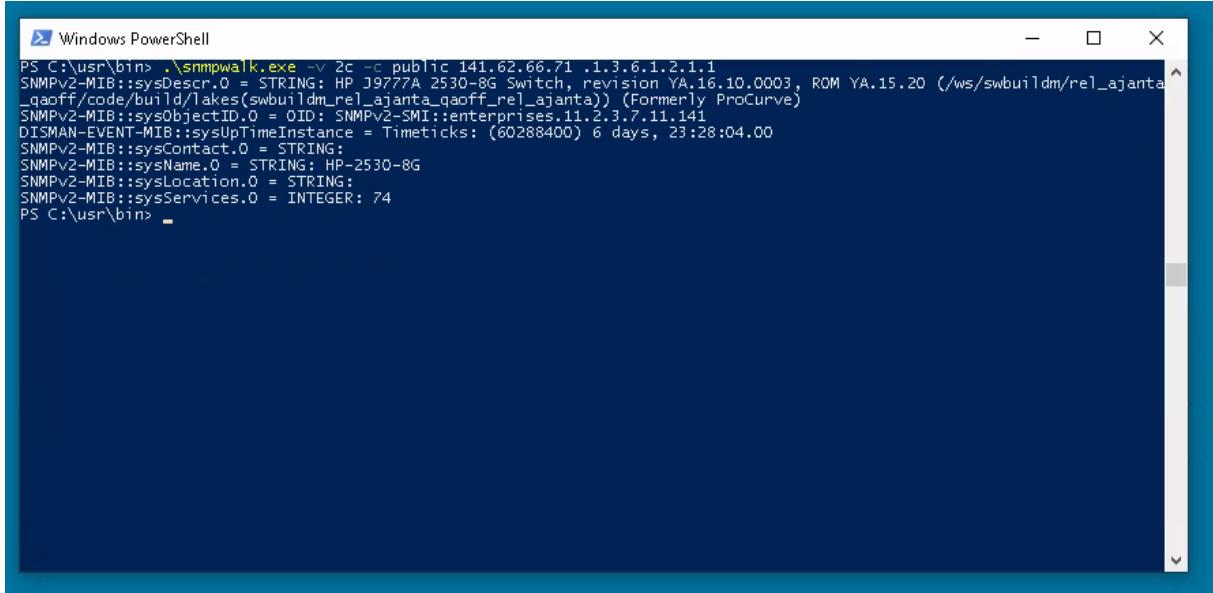
**Abbildung 11:** Ergebnis der Abfrage auf 141.62.66.214



The screenshot shows a Windows PowerShell window titled "Windows PowerShell". The command executed is ".\snmpwalk.exe -v 2c -c public 141.62.66.213 ifHighSpeed". The output displays numerous entries under the MIB object IF-MIB::ifHighSpeed, each consisting of a OID and its corresponding value (Gauge32). Most values are 1000, except for one entry which is 10. The output ends with "PS C:\usr\bin> -".

```
PS C:\usr\bin> .\snmpwalk.exe -v 2c -c public 141.62.66.213 ifHighSpeed
IF-MIB::ifHighSpeed.1 = Gauge32: 1000
IF-MIB::ifHighSpeed.2 = Gauge32: 1000
IF-MIB::ifHighSpeed.3 = Gauge32: 1000
IF-MIB::ifHighSpeed.4 = Gauge32: 1000
IF-MIB::ifHighSpeed.5 = Gauge32: 10
IF-MIB::ifHighSpeed.6 = Gauge32: 1000
IF-MIB::ifHighSpeed.7 = Gauge32: 1000
IF-MIB::ifHighSpeed.8 = Gauge32: 1000
IF-MIB::ifHighSpeed.9 = Gauge32: 1000
IF-MIB::ifHighSpeed.10 = Gauge32: 1000
IF-MIB::ifHighSpeed.11 = Gauge32: 1000
IF-MIB::ifHighSpeed.12 = Gauge32: 1000
IF-MIB::ifHighSpeed.13 = Gauge32: 1000
IF-MIB::ifHighSpeed.14 = Gauge32: 1000
IF-MIB::ifHighSpeed.15 = Gauge32: 1000
IF-MIB::ifHighSpeed.16 = Gauge32: 1000
IF-MIB::ifHighSpeed.17 = Gauge32: 1000
IF-MIB::ifHighSpeed.18 = Gauge32: 1000
IF-MIB::ifHighSpeed.19 = Gauge32: 1000
IF-MIB::ifHighSpeed.20 = Gauge32: 1000
IF-MIB::ifHighSpeed.21 = Gauge32: 1000
IF-MIB::ifHighSpeed.22 = Gauge32: 1000
IF-MIB::ifHighSpeed.23 = Gauge32: 1000
IF-MIB::ifHighSpeed.24 = Gauge32: 1000
IF-MIB::ifHighSpeed.25 = Gauge32: 10000
IF-MIB::ifHighSpeed.26 = Gauge32: 1000
IF-MIB::ifHighSpeed.330 = Gauge32: 0
IF-MIB::ifHighSpeed.4425 = Gauge32: 0
IF-MIB::ifHighSpeed.4426 = Gauge32: 0
IF-MIB::ifHighSpeed.4427 = Gauge32: 0
IF-MIB::ifHighSpeed.4428 = Gauge32: 0
IF-MIB::ifHighSpeed.4429 = Gauge32: 0
IF-MIB::ifHighSpeed.4430 = Gauge32: 0
IF-MIB::ifHighSpeed.4431 = Gauge32: 0
IF-MIB::ifHighSpeed.4432 = Gauge32: 0
IF-MIB::ifHighSpeed.4433 = Gauge32: 100
IF-MIB::ifHighSpeed.4438 = Gauge32: 0
PS C:\usr\bin> -
```

**Abbildung 12:** Ergebnis der Abfrage auf 141.62.66.214



```
Windows PowerShell
PS C:\usr\bin> ./snmpwalk.exe -v 2c -c public 141.62.66.71 .1.3.6.1.2.1.1
SNMPv2-MIB::sysDescr.0 = STRING: HP J9777A 2530-8G Switch, revision YA.16.10.0003, ROM YA.15.20 (/ws/swbuildm/rel_ajanta_qaoft/code/build/lakes(swbuildm_rel_ajanta_qaoft_rel_ajanta)) (Formerly ProCurve)
SNMPv2-MIB::sysObjectID.0 = OID: SNMPv2-SMI::enterprises.11.2.3.7.11.141
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (60288400) 6 days, 23:28:04.00
SNMPv2-MIB::sysContact.0 = STRING:
SNMPv2-MIB::sysName.0 = STRING: HP-2530-8G
SNMPv2-MIB::sysLocation.0 = STRING:
SNMPv2-MIB::sysServices.0 = INTEGER: 74
PS C:\usr\bin>
```

**Abbildung 13:** Ergebnis der Abfrage auf 141.62.66.71

Zuerst muss SNMP-Schreibzugriff aktiviert werden:

Im nachfolgenden wird nun der Switch mit der IP 141.62.66.81 verwendet.

Zunächst geben wir uns den alten `sysContact` mit `./snmpwalk.exe -v 2c -c public 141.62.66.81 syscontact` aus. Wir sehen, dieser hat aktuell den Wert `TestSwitch`.

Nun setzen wir den Wert des `syscontacts` mit dem Befehl `./snmpset.exe -v 2c -c public 141.62.66.81 1.3.6.1.2.1.1.4.0 s "uwu"` auf den Wert `uwu`. Danach geben wir uns den geänderten `sysContact` erneut aus:

**Verändern Sie mittels snmpset die Namen einzelner Switchports.**

Zuerst zeigen wir uns mit `./snmpwalk.exe -v 2c -c public 141.62.66.81 IF-MIB::ifAlias` die bisherigen Informationen und daher auch die Namen der Switchports an.

Im folgenden ändern wir den Namen des ersten Ports mit dem Befehl `./snmpset.exe -v 2c -c public 141.62.66.81 IF-MIB::ifAlias.1 s "uwu_port"` auf den Wert `uwu_port`.

Beim erneuten Anzeigen der Switchport-Informationen können wir den geänderten Namen sehen:

**Setzen Sie mit snmpset einen beliebigen Switchport auf disable (Vorsicht: „Schneiden Sie sich nicht den Ast auf dem Sie sitzen ab!“)**

Mit `./snmpset.exe -v 2c -c public 141.62.66.81 IF-MIB::ifAdminStatus.7 i 2` deaktivieren wir einen der Switchports. Der Wert 2 kann zum Deaktivieren verwendet werden.

```
HP-2530-8G                               8-Jan-1990  2:30:32 ^

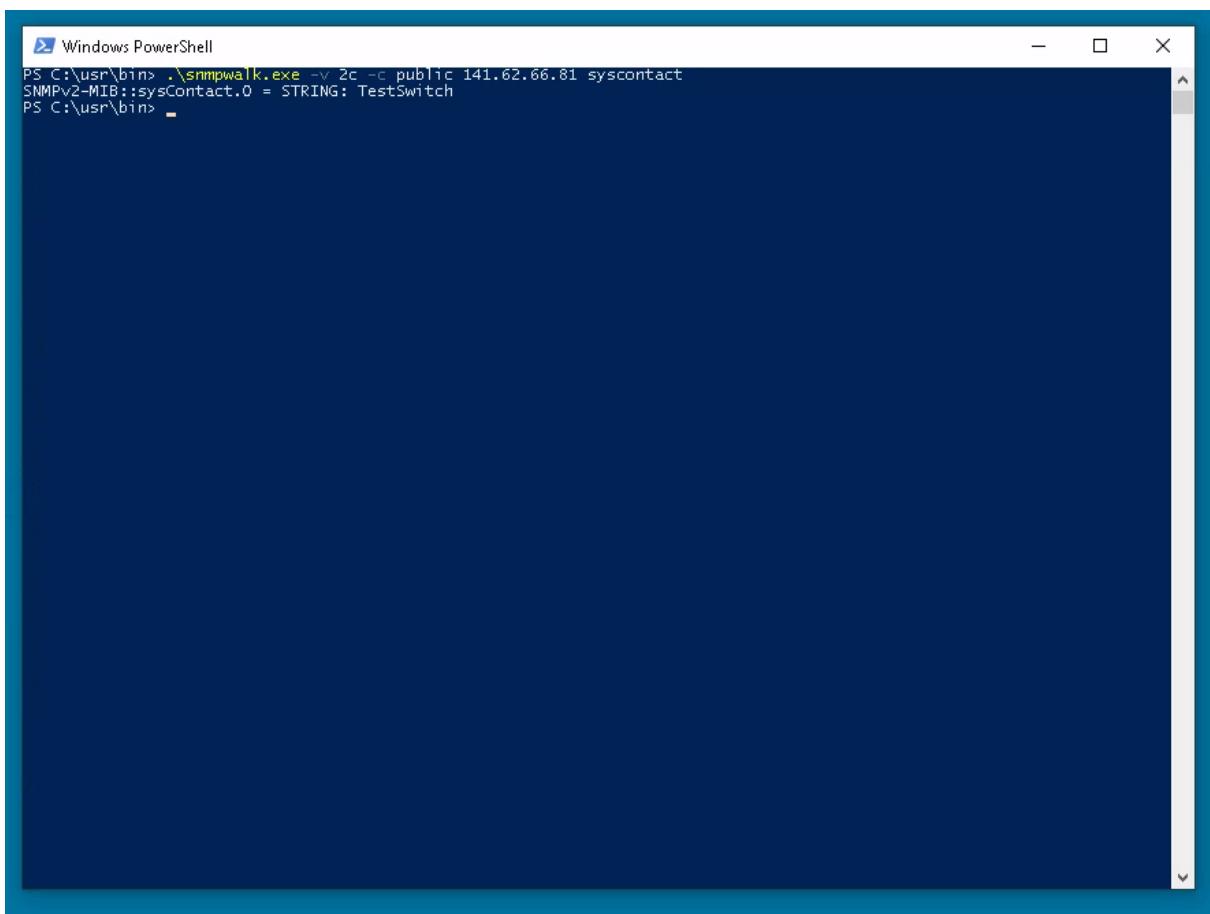
===== CONSOLE - MANAGER MODE =====
Switch Configuration - SNMP Communities

Community Name      MIB View Write Access
-----
public              Manager   Unrestricted

Actions-> Back Add Edit Delete Help
Return to previous screen.

Use up/down arrow keys to change record selection, left/right arrow keys to
change action selection, and <Enter> to execute action.
```

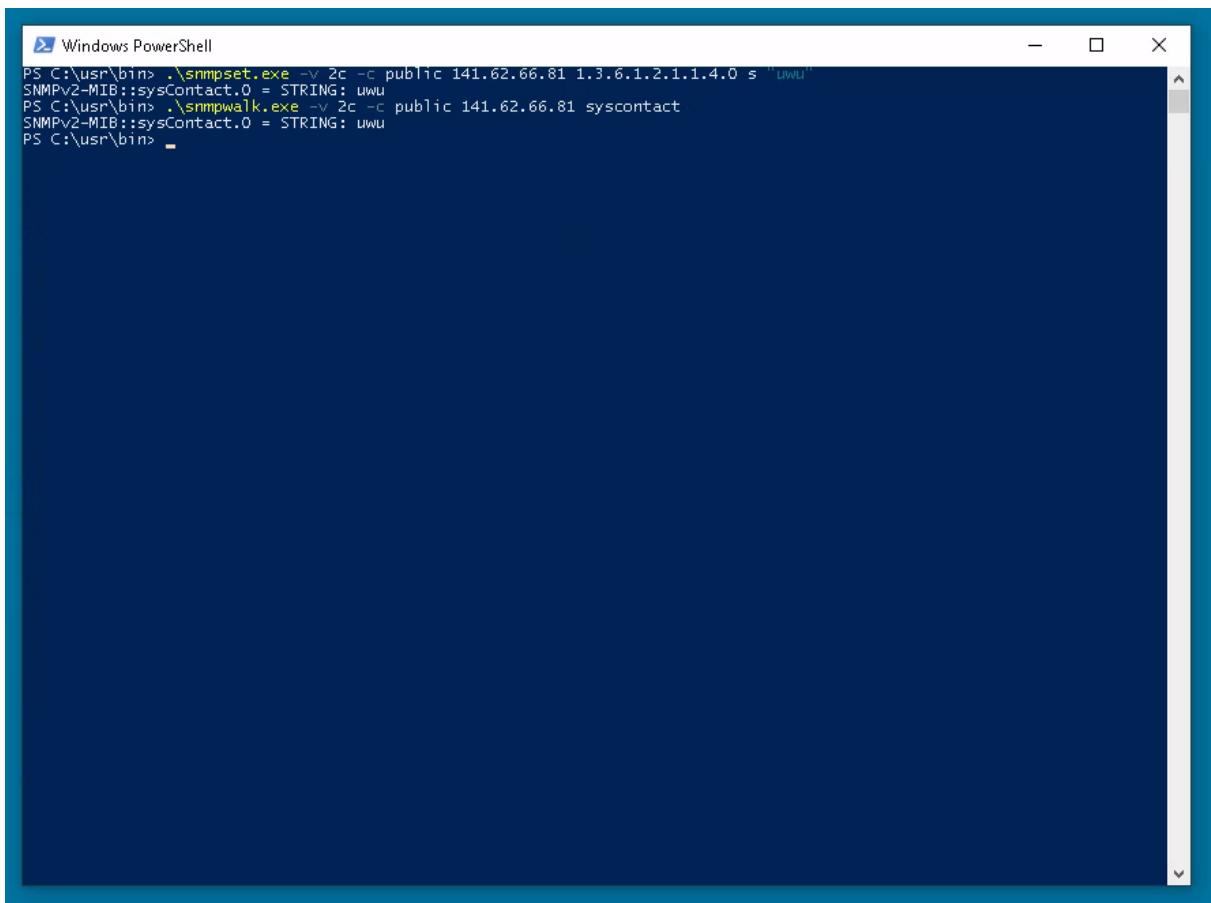
**Abbildung 14:** Aktivieren von SNMP-Schreibzugriff



The screenshot shows a Windows PowerShell window titled "Windows PowerShell". The command entered is ".\snmpwalk.exe -v 2c -c public 141.62.66.81 syscontact". The output shows one result: "SNMPv2-MIB::sysContact.0 = STRING: TestSwitch". The window has a dark blue background and standard Windows-style borders.

```
PS C:\usr\bin> .\snmpwalk.exe -v 2c -c public 141.62.66.81 syscontact
SNMPv2-MIB::sysContact.0 = STRING: TestSwitch
PS C:\usr\bin>
```

**Abbildung 15:** Ergebnis der Abfrage auf 141.62.66.81



The screenshot shows a Windows PowerShell window titled "Windows PowerShell". The command entered is ".\snmpset.exe -v 2c -c public 141.62.66.81 1.3.6.1.2.1.1.4.0 s \"luwu\"". The output shows the variable "SNMPv2-MIB::sysContact.0 = STRING: luwu". The next command entered is ".\snmpwalk.exe -v 2c -c public 141.62.66.81 syscontact". The output shows the variable "SNMPv2-MIB::sysContact.0 = STRING: luwu". The final command shown is "PS C:\usr\bin> -".

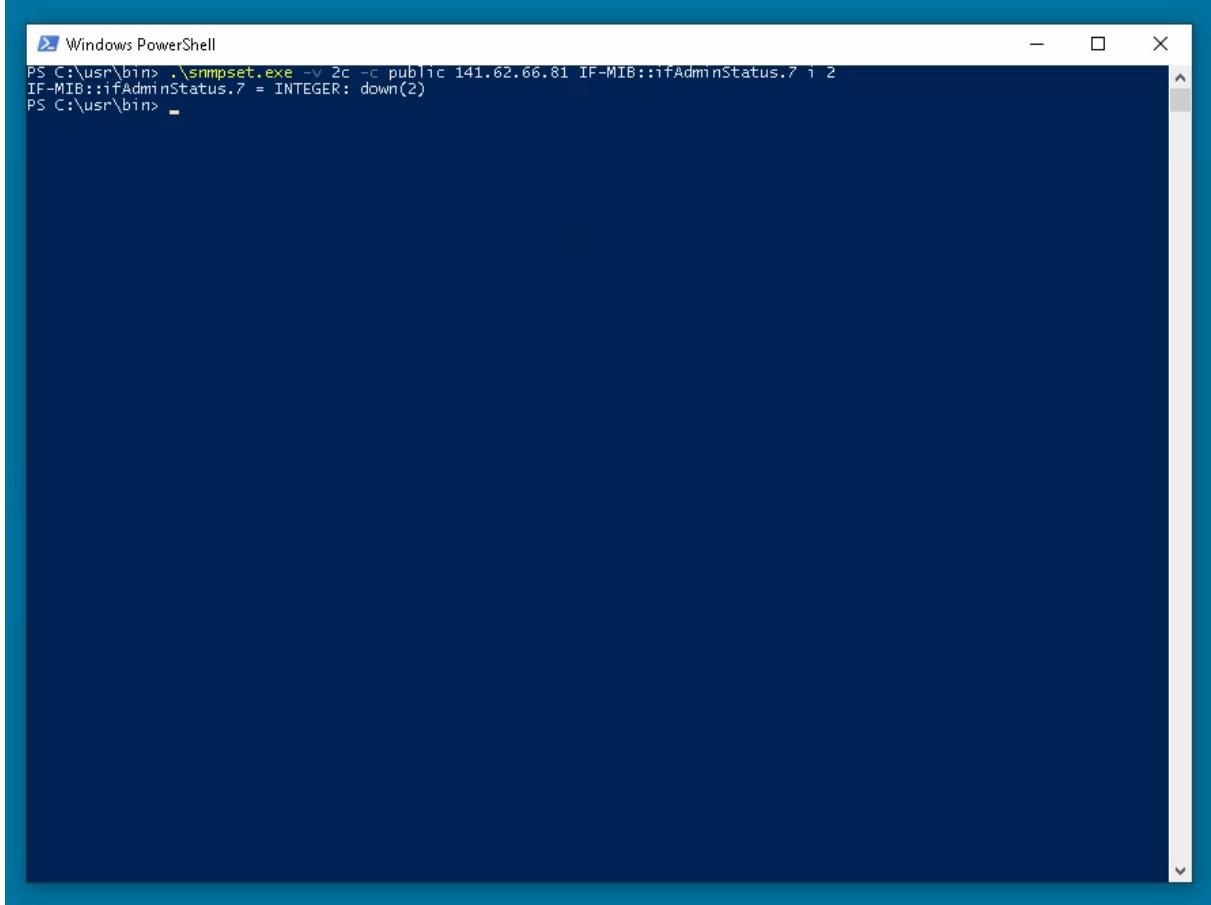
**Abbildung 16:** Setzen und erneutes Abfragen von syscontact auf 141.62.66.81

```
Windows PowerShell
PS C:\usr\bin> .\snmpwalk.exe -v 2c -c public 141.62.66.81 IF-MIB::ifAlias
IF-MIB::ifAlias.1 = STRING:
IF-MIB::ifAlias.2 = STRING:
IF-MIB::ifAlias.3 = STRING:
IF-MIB::ifAlias.4 = STRING:
IF-MIB::ifAlias.5 = STRING:
IF-MIB::ifAlias.6 = STRING:
IF-MIB::ifAlias.7 = STRING:
IF-MIB::ifAlias.8 = STRING:
IF-MIB::ifAlias.9 = STRING:
IF-MIB::ifAlias.10 = STRING:
IF-MIB::ifAlias.102 = STRING: DEFAULT_VLAN
IF-MIB::ifAlias.4324 = STRING: lo0
IF-MIB::ifAlias.4325 = STRING: lo1
IF-MIB::ifAlias.4326 = STRING: lo2
IF-MIB::ifAlias.4327 = STRING: lo3
IF-MIB::ifAlias.4328 = STRING: lo4
IF-MIB::ifAlias.4329 = STRING: lo5
IF-MIB::ifAlias.4330 = STRING: lo6
IF-MIB::ifAlias.4331 = STRING: lo7
PS C:\usr\bin> .\snmpset.exe -v 2c -c public 141.62.66.81 IF-MIB::ifAlias.1 s "www_port"
IF-MIB::ifAlias.1 = STRING: www_port
PS C:\usr\bin> .\snmpwalk.exe -v 2c -c public 141.62.66.81 IF-MIB::ifAlias
IF-MIB::ifAlias.1 = STRING: www_port
IF-MIB::ifAlias.2 = STRING:
IF-MIB::ifAlias.3 = STRING:
IF-MIB::ifAlias.4 = STRING:
IF-MIB::ifAlias.5 = STRING:
IF-MIB::ifAlias.6 = STRING:
IF-MIB::ifAlias.7 = STRING:
IF-MIB::ifAlias.8 = STRING:
IF-MIB::ifAlias.9 = STRING:
IF-MIB::ifAlias.10 = STRING:
IF-MIB::ifAlias.102 = STRING: DEFAULT_VLAN
IF-MIB::ifAlias.4324 = STRING: lo0
IF-MIB::ifAlias.4325 = STRING: lo1
IF-MIB::ifAlias.4326 = STRING: lo2
IF-MIB::ifAlias.4327 = STRING: lo3
IF-MIB::ifAlias.4328 = STRING: lo4
IF-MIB::ifAlias.4329 = STRING: lo5
IF-MIB::ifAlias.4330 = STRING: lo6
IF-MIB::ifAlias.4331 = STRING: lo7
PS C:\usr\bin>
```

**Abbildung 17:** Abfragen und Setzen des Namens des Switch-Ports 1 auf 141.62.66.81

Der Wert 1 aktiviert den Switchport wieder.

Wie wir im Screenshot sehen können, hat sich der Status des Ports auf **down (2)** geändert:



The screenshot shows a Windows PowerShell window titled "Windows PowerShell". The command entered is:

```
PS C:\usr\bin> .\snmpset.exe -v 2c -c public 141.62.66.81 IF-MIB::ifAdminStatus.7 i 2
IF-MIB::ifAdminStatus.7 = INTEGER: down(2)
PS C:\usr\bin>
```

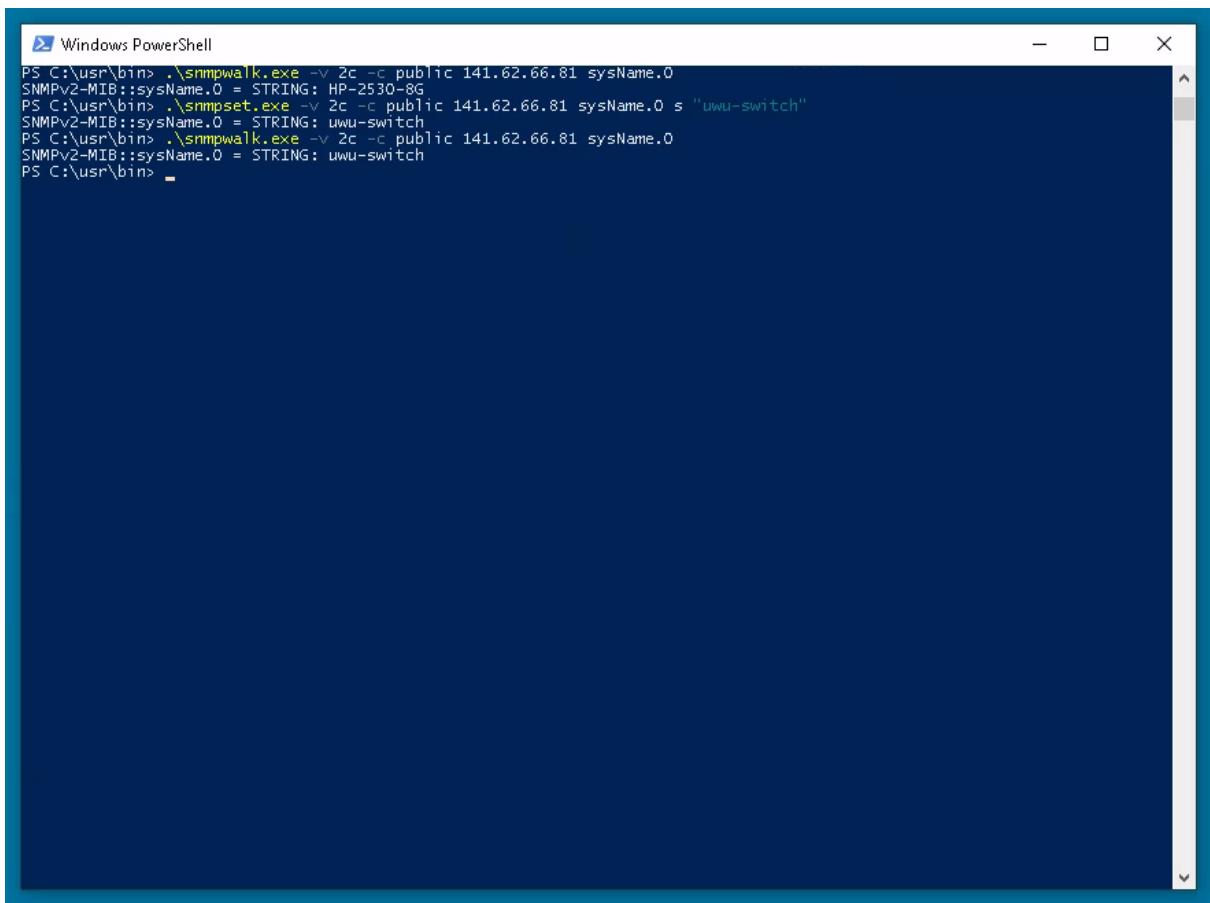
**Abbildung 18:** Deaktivieren eines Switchports auf 141.62.66.81

### Wie ändert man den System-Namen des Switches?

Zuerst geben wir uns den bisherigen Switch-Namen mit `./snmpwalk.exe -v 2c -c public 141.62.66.81 sysName.0` aus. Der bisherige System-Name ist **HP-2530-8G**.

Wir ändern den Switch-Namen mit `./snmpset.exe -v 2c -c public 141.62.66.81 sysName.0 s "uwu-switch"` auf den Wert **uwu-switch**.

Mit `./snmpwalk.exe -v 2c -c public 141.62.66.81 sysName.0` geben wir uns den geänderten System-Namen erneut aus:



The screenshot shows a Windows PowerShell window titled "Windows PowerShell". The command entered is:

```
PS C:\usr\bin> .\snmpwalk.exe -v 2c -c public 141.62.66.81 sysName.0
SNMPv2-MIB::sysName.0 = STRING: HP-2530-8G
PS C:\usr\bin> .\snmpset.exe -v 2c -c public 141.62.66.81 sysName.0 s "uwu-switch"
SNMPv2-MIB::sysName.0 = STRING: uwu-switch
PS C:\usr\bin> .\snmpwalk.exe -v 2c -c public 141.62.66.81 sysName.0
SNMPv2-MIB::sysName.0 = STRING: uwu-switch
PS C:\usr\bin> -
```

**Abbildung 19:** Abfragen und Setzen des Namens des Switch-Namens 1 auf 141.62.66.81

### 3 Prometheus und Grafana

#### Fragen Sie mit Prometheus den sysName ihres Switches ab

Mit `sysName{instance="141.62.66.81"}` können wir den System-Namen unseres Switches abfragen:

The screenshot shows the Prometheus web interface. At the top, there are tabs for Prometheus, Alerts, Graph, Status, and Help. Below the tabs, a search bar contains the query `sysName(instance="141.62.66.81")`. To the right of the search bar, it says "Load time: 8ms", "Resolution: 14s", and "Total time series: 1". Below the search bar are two buttons: "Execute" (which is highlighted in blue) and "- insert metric at cursor -". Underneath these buttons are two tabs: "Graph" (which is highlighted in blue) and "Console". The main area displays a table with one row. The table has two columns: "Element" and "Value". The "Element" column contains the metric name `sysName(display="Switch-81",instance="141.62.66.81",job="snmp",sysName="uwu-switch")`. The "Value" column contains the value "1". At the bottom right of the table is a link "Remove Graph". At the very bottom left is a button "Add Graph".

**Abbildung 20:** Ergebnis der `sysname`-Abfrage für 141.62.66.81‘

Der Name unseres Switches ist, wie vorhin festgelegt, **uwu–switch**.

#### Wie lange läuft Ihr Switch bereits?

Mit `sysUpTime{instance="141.62.66.81"}` können wir herausfinden, wie lange unser Switch bisher läuft:

The screenshot shows the Prometheus web interface. At the top, there are tabs for Prometheus, Alerts, Graph, Status, and Help. Below the tabs, a search bar contains the query `sysUpTime(instance="141.62.66.81")`. To the right of the search bar, it says "Load time: 6ms", "Resolution: 14s", and "Total time series: 1". Below the search bar are two buttons: "Execute" (which is highlighted in blue) and "- insert metric at cursor -". Underneath these buttons are two tabs: "Graph" (which is highlighted in blue) and "Console". The main area displays a table with one row. The table has two columns: "Element" and "Value". The "Element" column contains the metric name `sysUpTime(display="Switch-81",instance="141.62.66.81",job="snmp")`. The "Value" column contains the value "8587799". At the bottom right of the table is a link "Remove Graph". At the very bottom left is a button "Add Graph".

**Abbildung 21:** Ergebnis der `uptime`-Abfrage für 141.62.66.81‘

Unser Switch läuft seit 8587799. Unter diesem [Link](#) konnten wir herausfinden, dass dieser Wert in Hundertstel-Sekunden angegeben ist. Das lässt darauf schließen, dass dieser Switch seit 85877 Sekunden läuft, was ungefähr einem Tag entspricht.

#### Sind alle Switchports „UP“?

Mit `ifAdminStatus{instance="141.62.66.82"}` können wir uns Informationen über unsere Switchports anzeigen lassen. Die Value 1 deutet auf einen aktivierten Switchport hin. Der Wert 2 deutet auf deaktivierte Switchports hin.

Auf unserem Screenshot haben 7 Ports die Value 2, was darauf deutet, dass diese Ports deaktiviert sind und damit nicht alle Switchports “up” sind.

Element	Value
ifAdminStatus(display="Switch-82",ifIndex="1",instance="141.62.66.82",job="snmp")	1
ifAdminStatus(display="Switch-82",ifIndex="10",instance="141.62.66.82",job="snmp")	1
ifAdminStatus(display="Switch-82",ifIndex="102",instance="141.62.66.82",job="snmp")	1
ifAdminStatus(display="Switch-82",ifIndex="2",instance="141.62.66.82",job="snmp")	1
ifAdminStatus(display="Switch-82",ifIndex="3",instance="141.62.66.82",job="snmp")	1
ifAdminStatus(display="Switch-82",ifIndex="4",instance="141.62.66.82",job="snmp")	1
ifAdminStatus(display="Switch-82",ifIndex="4324",instance="141.62.66.82",job="snmp")	1
ifAdminStatus(display="Switch-82",ifIndex="4325",instance="141.62.66.82",job="snmp")	2
ifAdminStatus(display="Switch-82",ifIndex="4326",instance="141.62.66.82",job="snmp")	2
ifAdminStatus(display="Switch-82",ifIndex="4327",instance="141.62.66.82",job="snmp")	2
ifAdminStatus(display="Switch-82",ifIndex="4328",instance="141.62.66.82",job="snmp")	2
ifAdminStatus(display="Switch-82",ifIndex="4329",instance="141.62.66.82",job="snmp")	2
ifAdminStatus(display="Switch-82",ifIndex="4330",instance="141.62.66.82",job="snmp")	2
ifAdminStatus(display="Switch-82",ifIndex="4331",instance="141.62.66.82",job="snmp")	2
ifAdminStatus(display="Switch-82",ifIndex="5",instance="141.62.66.82",job="snmp")	1
ifAdminStatus(display="Switch-82",ifIndex="6",instance="141.62.66.82",job="snmp")	1
ifAdminStatus(display="Switch-82",ifIndex="7",instance="141.62.66.82",job="snmp")	1
ifAdminStatus(display="Switch-82",ifIndex="8",instance="141.62.66.82",job="snmp")	1
ifAdminStatus(display="Switch-82",ifIndex="9",instance="141.62.66.82",job="snmp")	1

**Abbildung 22:** Ergebnis der Switchport-Status-Abfrage für 141.62.66.81<sup>1</sup>

### Mit welchem Speed laufen ihre Switchports

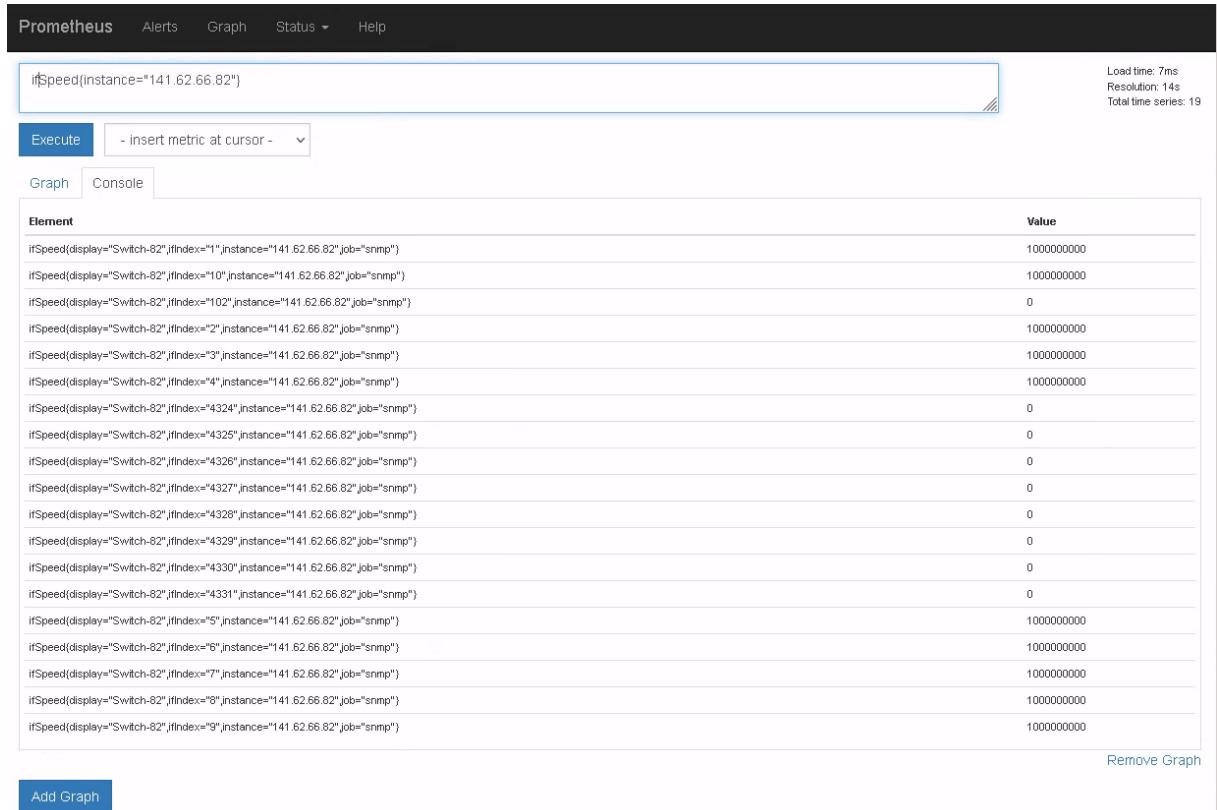
Mit `ifSpeed{instance="141.62.66.82"}` kann die Bandbreite der Switchports angezeigt werden. Laut der [Dokumentation](#) wird die Bandbreite in Bits pro Sekunde angegeben.

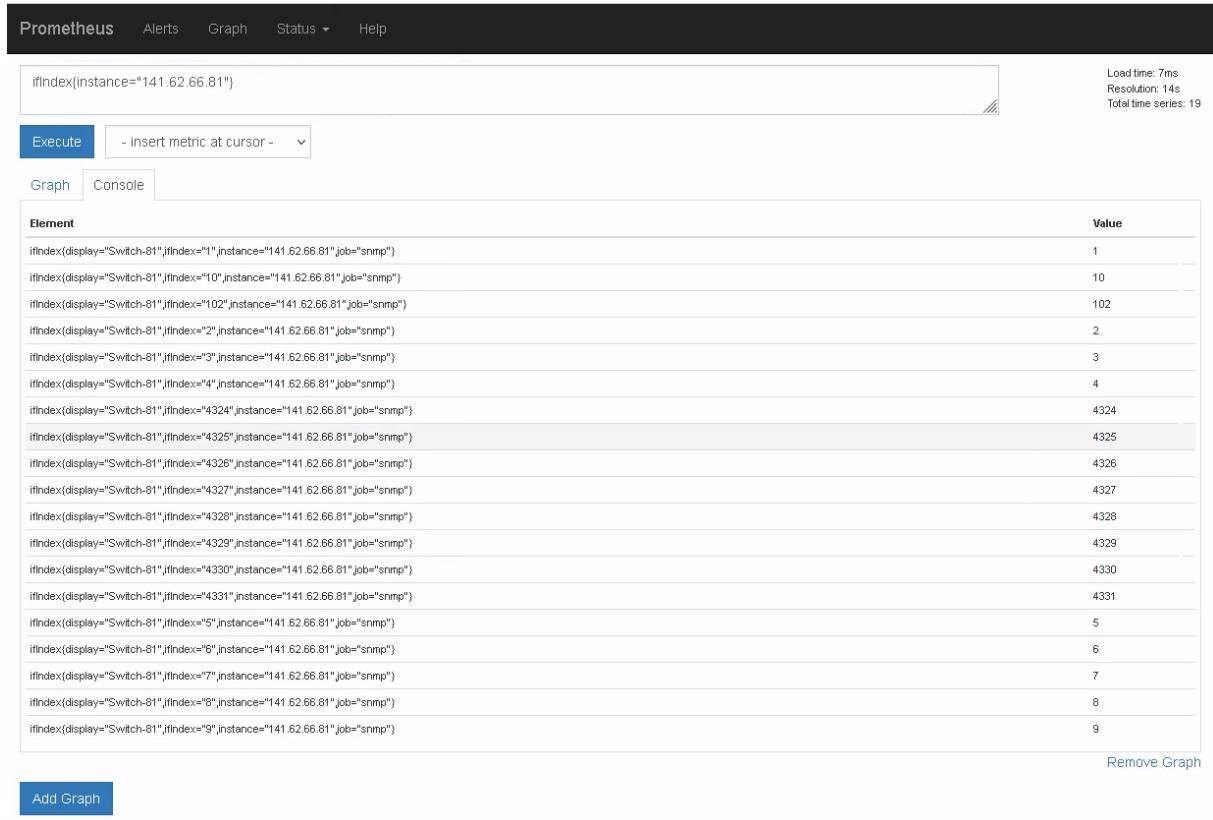
Die meisten Switchports laufen auf 1.000.000.000 Bits pro Sekunde, was 1 Gigabit pro Sekunde entspricht.

### Über wie viele Ethernet-Interfaces verfügt ihr Switch?

Mit `ifIndex{instance="141.62.66.81"}` können die Ethernet-Interfaces aufgelistet werden. Auf dem Screenshot sind 19 Ethernet-Interfaces zu sehen.

**Legen Sie sich zunächst ein eigenes Dashboard (entsprechend ihrem Switch-Namen) an, damit**

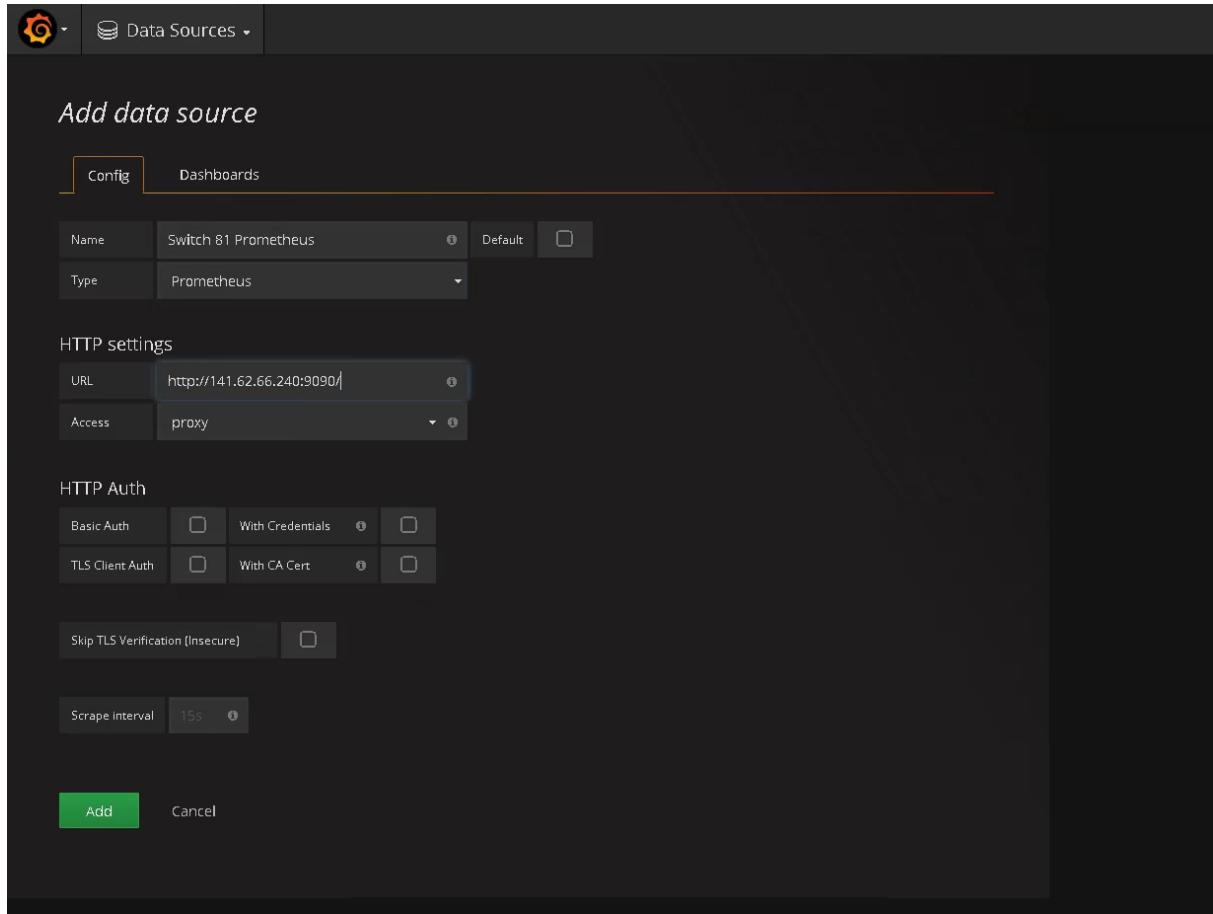
**Abbildung 23:** Ergebnis der `iSpeed`-Abfrage für 141.62.66.81‘



**Abbildung 24:** Ergebnis der `ifindex`-Abfrage für 141.62.66.81

**Sie niemandem in die Quere kommen.**

Zunächst erstellen wir eine neue Data Source mit der folgenden Konfiguration:



**Abbildung 25:** Erstellen der Datenquelle für Prometheus

**Stellen Sie Ingress und Egress eines Switchports mit einem sinnvollen Graphen dar**

Mit Prometheus kann der Graph mit Hilfe der Query `irate(ifInOctets{instance="141.62.66.81", ifIndex="1"}[1m])` angezeigt werden.

Mit Graphana kann der Graph mit der gleichen Query angezeigt werden:

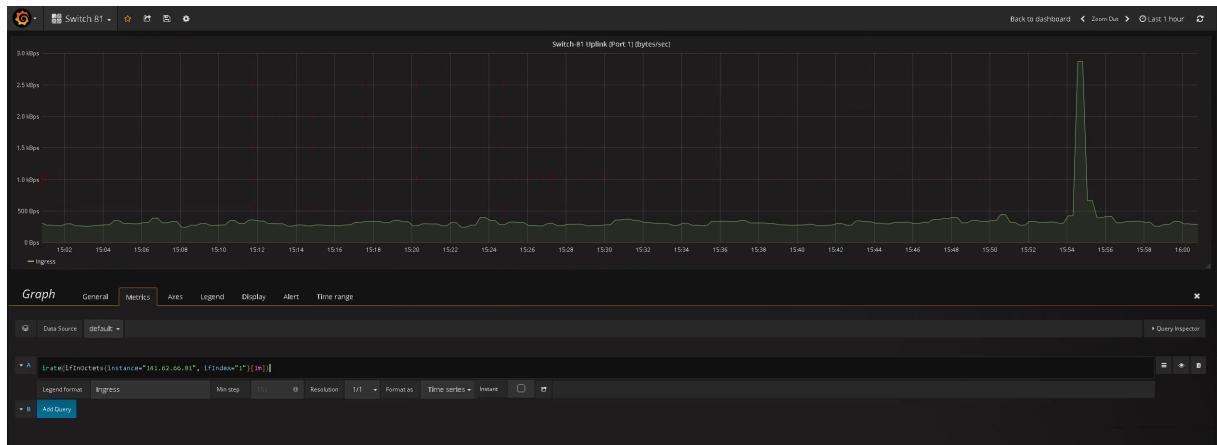
## 4 Munin

**Wie platziert man sämtliche Nodes/Switche in der Web-Ansicht unter einer neuen Gruppe „Labor“ ? (Hinweis: Die gewählt Gruppenbezeichnung ist jedem Node voranzustellen.) Sprechen**

**Abbildung 26:** Query in Prometheus

```
(rate(ifInOctets{instance="141.62.66.81", ifIndex="1"}[1m]))
```

**Abbildung 27:** Graph in Grafana



**Abbildung 28:** Eingestellte Metrics in Grafana

**Sie sich innerhalb der Gruppe beim Editieren der /etc/munin/munin.conf ab, Sie arbeiten an EI-NER Datei!**

```

1 $ ssh-copy-id root@141.62.66.91
2 $ ssh root@141.62.66.91
3 # 83 ist im Versuch nicht erreichbar gewesen
4 for node in 81 82 84 85; do
5 munin-node-configure --shell --snmp 141.62.66.${node} --snmpcommunity
   public | bash
6 tee /etc/munin/munin-conf.d/141.62.66.${node}.conf <<EOT
7 [Labor;141.62.66.${node}]
8   address 127.0.0.1
9   use_node_name no
10 EOT
11 done
12 # systemctl restart munin-node
13 # munin-check

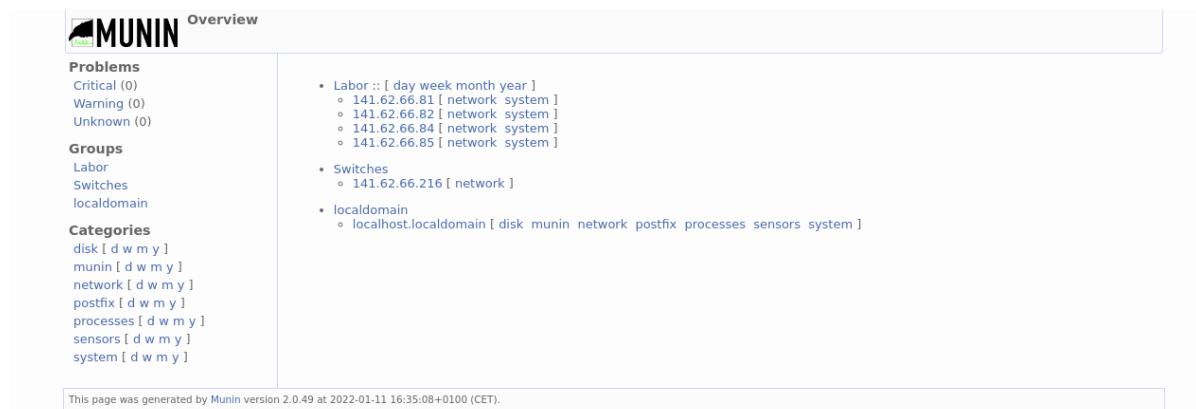
```

**Vergleichen Sie die beiden Tools Prometheus/grafana und munin. Welche Vor und Nachteile sehen sie jeweils?**

Bei Prometheus/grafana ist die UI etwas ansprechender und konfigurierbar. Das älter aussehende Munin ist nur in der CLI konfigurierbar. Es gibt dort bereits einige Grafen zu Themen wie Traffic und Errors. In grafana hätte man diese selbst konfigurieren müssen.

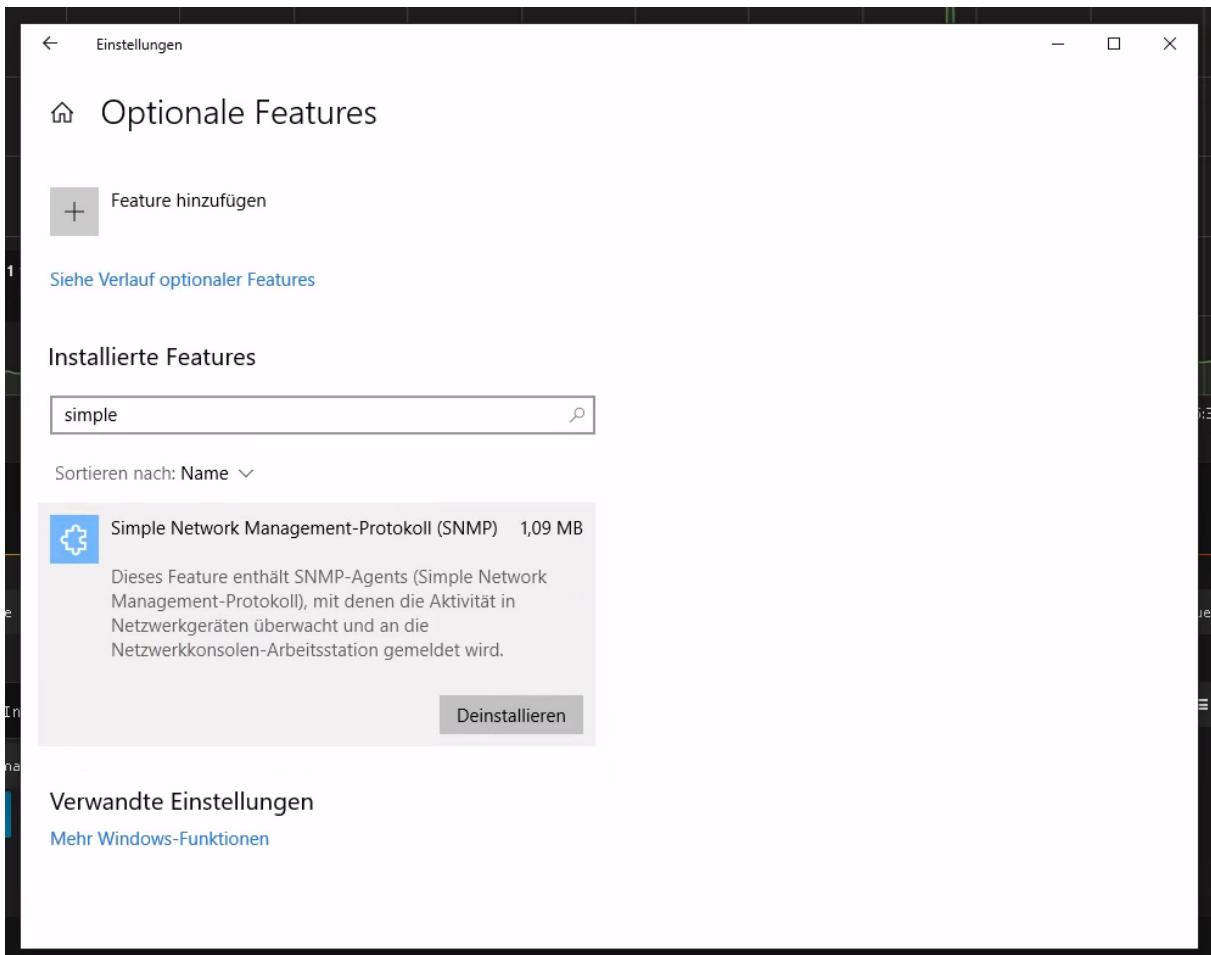
## 5 LibreNMS

**Richten Sie ihren Windows-Client für den SNMP-Dienst her und fügen ihn als Device in LibreNMS hinzu. Konfigurieren Sie sinnvolle Einträge für „sysContact“ und „Location“. Wie interpretieren**

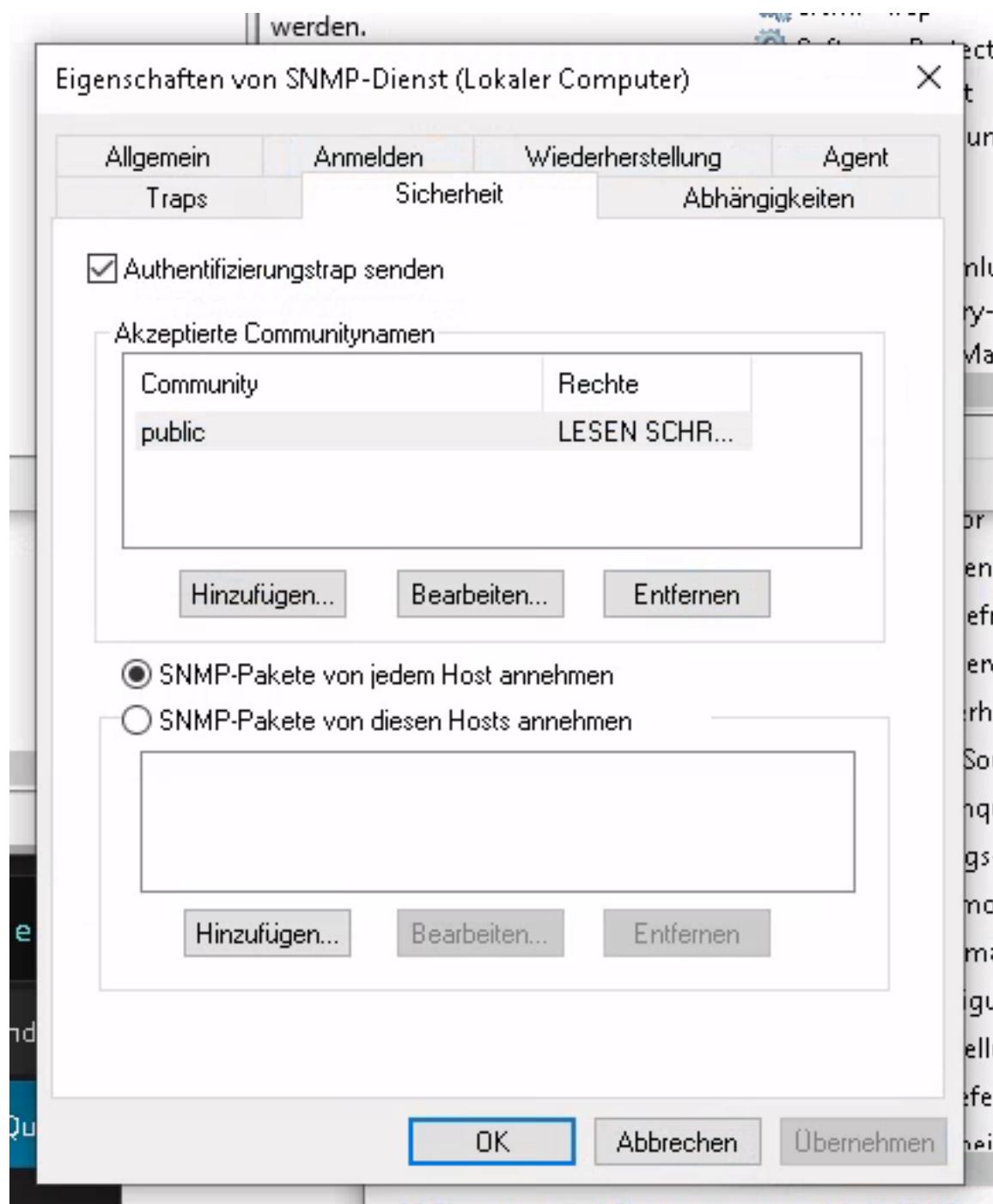


**Abbildung 29:** Output der Web-GUI (Switch 216 in der Gruppe “Switches” war zuvor schon konfiguriert)

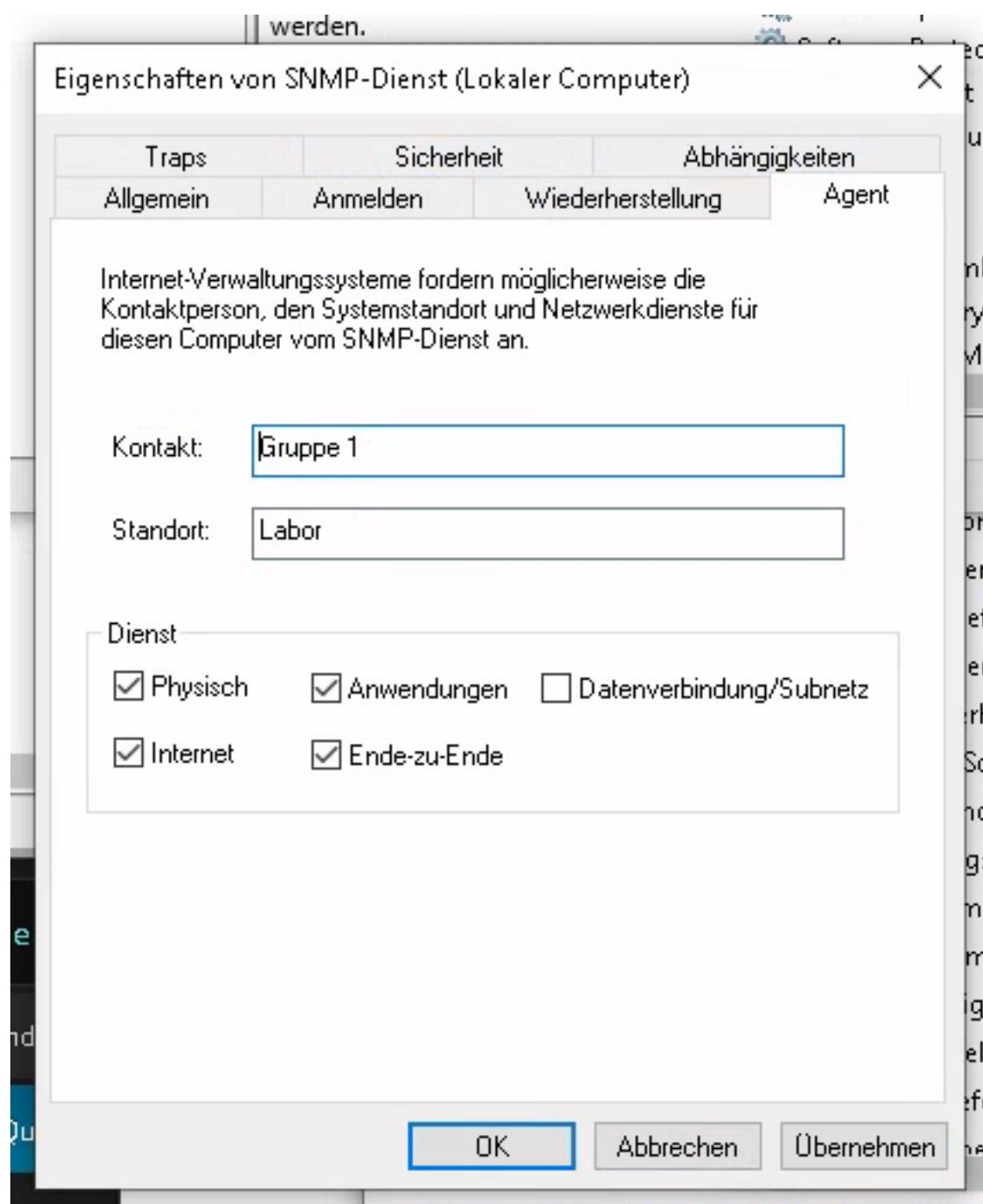
**Sie die Anzahl und die Bezeichnungen der Ethernet-Ports für Ihre Windows-Maschine?**



**Abbildung 30:** Aktivierung von SNMP auf Windows



**Abbildung 31:** Aktivierung von Remotezugriff bei SNMP auf Windows



**Abbildung 32:** Setzen der SNMP-Einstellungen auf Windows

```

1 $ snmpwalk -v 2c -c public 141.62.66.1
2 SNMPv2-MIB::sysDescr.0 = STRING: Hardware: Intel64 Family 6 Model 158
   Stepping 9 AT/AT COMPATIBLE - Software: Windows Version 6.3 (Build
   19043 Multiprocessor Free)
3 SNMPv2-MIB::sysObjectID.0 = OID: SNMPv2-SMI::enterprises.311.1.1.3.1.1
4 DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (103835) 0:17:18.35
5 SNMPv2-MIB::sysContact.0 = STRING: Gruppe 1
6 SNMPv2-MIB::sysName.0 = STRING: rn01
7 SNMPv2-MIB::sysLocation.0 = STRING: Labor
8 SNMPv2-MIB::sysServices.0 = INTEGER: 77

```

- **loopback\_5**: Ein Pseudo-Interface, über welches sich das System selbst kontaktieren kann (auf Linux: `lo`)
- **tunnel\_\***: Windows-Äquivalent eines TAP- oder TUN-Device, mittels welchem z.B. VPNs realisiert werden können (auf Linux: `tapX/tunX`); da mehrere solcher Adapter vorhanden sind, sind wohl mehrere Tunnel vorhanden
- **ethernet\_\***: Ethernet-Adapter (auf Linux: `enpXsX`); da mehrere solcher Adapter vorhanden sind, sind wohl mehrere Netzwerkkarten verbaut
- **ppp\_\***: Ein Point-to-Point-Protokoll-Adapter (auf Linux: `pppX`)

### **Welche Erkenntnisse ziehen Sie aus den Angaben zu STP und Neighbours bzgl. Ihres HP 2530-Switch, nachdem Sie ihn hinzugefügt haben?**

```

1 $ snmpwalk -v 2c -c public 141.62.66.81
2 SNMPv2-MIB::sysDescr.0 = STRING: HP J9777A 2530-8G Switch, revision YA
   .16.06.0006, ROM YA.15.20 (/ws/swbuildm/rel_washington_qaoff/code/
   build/lakes(swbuildm_rel_washington_qaoff_rel_washington)) (Formerly
   ProCurve)
3 SNMPv2-MIB::sysObjectID.0 = OID: SNMPv2-SMI::enterprises
   .11.2.3.7.11.141
4 DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (9263269) 1 day,
   1:43:52.69
5 SNMPv2-MIB::sysContact.0 = STRING: uwu
6 SNMPv2-MIB::sysName.0 = STRING: uwu-switch
7 SNMPv2-MIB::sysLocation.0 = STRING:
8 SNMPv2-MIB::sysServices.0 = INTEGER: 74

```

Zu STP kann erkannt werden:

- Ob der Switch die Root-Bridge ist
- MAC-Adresse der Bridge
- Verwendete Protokollspezifikation
- Priorität
- Zeit, seitdem sich zuletzt die Topologie geändert hat
- MAC-Adresse des Roots

## Add Device

Devices will be checked for Ping/SNMP reachability before being probed.

Hostname or IP	141.62.66.1		
SNMP	ON	<input type="checkbox"/>	
SNMP Version	v2c	port	udp
Port Association Mode	ifIndex		

## SNMPv1/2c Configuration

Community	public		
Force add (No ICMP or SNMP checks performed)	OFF	<input type="checkbox"/>	

Add Device

**Abbildung 33:** Hinzufügen des Windows-Hosts in LibreNMS

```
[pojntfx@felicias-xps13 ~]$ snmpwalk -v 2c -c public 141.62.66.1 ifAlias
IF-MIB::ifAlias.1 = STRING: Loopback Pseudo-Interface 1
IF-MIB::ifAlias.2 = STRING: LAN-Verbindung_4
IF-MIB::ifAlias.3 = STRING: 6to4 Adapter
IF-MIB::ifAlias.4 = STRING: LAN-Verbindung_1
IF-MIB::ifAlias.5 = STRING: Microsoft IP-HTTPS Platform Interface
IF-MIB::ifAlias.7 = STRING: VirtualBox Host-Only Network #3
IF-MIB::ifAlias.8 = STRING: LAN-Verbindung_3
IF-MIB::ifAlias.9 = STRING: LAN-Verbindung_2
IF-MIB::ifAlias.10 = STRING: LAN-Verbindung_9
IF-MIB::ifAlias.11 = STRING: Teredo Tunneling Pseudo-Interface
IF-MIB::ifAlias.12 = STRING: Ethernet
IF-MIB::ifAlias.13 = STRING: LAN-Verbindung_6
IF-MIB::ifAlias.14 = STRING: LAN-Verbindung_7
IF-MIB::ifAlias.15 = STRING: LAN-Verbindung_8
IF-MIB::ifAlias.16 = STRING: VirtualBox Host-Only Network #3-WFP Native MAC Layer LightWeight
IF-MIB::ifAlias.17 = STRING: VirtualBox Host-Only Network #3-Npcap Packet Driver (NPCAP)-0000
IF-MIB::ifAlias.18 = STRING: VirtualBox Host-Only Network #3-QoS Packet Scheduler-0000
IF-MIB::ifAlias.19 = STRING: VirtualBox Host-Only Network #3-WFP 802.3 MAC Layer LightWeight
IF-MIB::ifAlias.20 = STRING: Ethernet-WFP Native MAC Layer LightWeight Filter-0000
IF-MIB::ifAlias.21 = STRING: Ethernet-Npcap Packet Driver (NPCAP)-0000
IF-MIB::ifAlias.22 = STRING: Ethernet-VirtualBox NDIS Light-Weight Filter-0000
IF-MIB::ifAlias.23 = STRING: Ethernet-QoS Packet Scheduler-0000
IF-MIB::ifAlias.24 = STRING: Ethernet-WFP 802.3 MAC Layer LightWeight Filter-0000
IF-MIB::ifAlias.25 = STRING: LAN-Verbindung_7-WFP Native MAC Layer LightWeight Filter-0000
IF-MIB::ifAlias.26 = STRING: LAN-Verbindung_7-Npcap Packet Driver (NPCAP)-0000
IF-MIB::ifAlias.27 = STRING: LAN-Verbindung_7-QoS Packet Scheduler-0000
IF-MIB::ifAlias.28 = STRING: LAN-Verbindung_8-WFP Native MAC Layer LightWeight Filter-0000
IF-MIB::ifAlias.29 = STRING: LAN-Verbindung_8-Npcap Packet Driver (NPCAP)-0000
IF-MIB::ifAlias.30 = STRING: LAN-Verbindung_8-QoS Packet Scheduler-0000
IF-MIB::ifAlias.31 = STRING: LAN-Verbindung_9-WFP Native MAC Layer LightWeight Filter-0000
IF-MIB::ifAlias.32 = STRING: LAN-Verbindung_9-Npcap Packet Driver (NPCAP)-0000
IF-MIB::ifAlias.33 = STRING: LAN-Verbindung_9-QoS Packet Scheduler-0000
[pojntfx@felicias-xps13 ~]$
```

**Abbildung 34:** Abfrage der Netzwerkinterfaces des Windows-Host über `snmpwalk`

Port	Port Group	Traffic	Speed	Media	Mac Address
↳ <b>loopback_5</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Loopback	MAC 00:0C:29:00:00:00
↳ <b>kernel_32779</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Fastethernet	MAC 00:0C:29:00:00:01
↳ <b>kernel_32771</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Fastethernet	MAC 00:0C:29:00:00:02
↳ <b>kernel_32769</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Fastethernet	MAC 00:0C:29:00:00:03
↳ <b>kernel_32768</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Fastethernet	MAC 00:0C:29:00:00:04
↳ <b>ethernet_32773</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	MAC 00:0C:29:00:00:05
↳ <b>ethernet_32789</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	AC 9E:02:00:00:00:00
↳ <b>ppp_32786</b> Link monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	PPP	MAC 00:0C:29:00:00:06
↳ <b>ethernet_32770</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	MAC 00:0C:29:00:00:07
↳ <b>ethernet_32771</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	MAC 00:0C:29:00:00:08
↳ <b>ethernet_9</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	AC 9E:02:00:00:00:09
↳ <b>ethernet_10</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	AC 9E:02:00:00:00:0A
↳ <b>ethernet_16</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	AC 9E:02:00:00:00:0B
↳ <b>ethernet_17</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	AC 9E:02:00:00:00:0C
↳ <b>ethernet_18</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	AC 9E:02:00:00:00:0D
↳ <b>ethernet_20</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	AC 9E:02:00:00:00:0E
↳ <b>ethernet_21</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	AC 9E:02:00:00:00:0F
↳ <b>ethernet_23</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	AC 9E:02:00:00:00:10
↳ <b>ethernet_24</b> Link monitoring: 1 Last monitoring: 1	Offload	↑↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps ↑ 1 Gbps ↓ 1 Gbps	1 Gbps	Ethernet	AC 9E:02:00:00:00:11

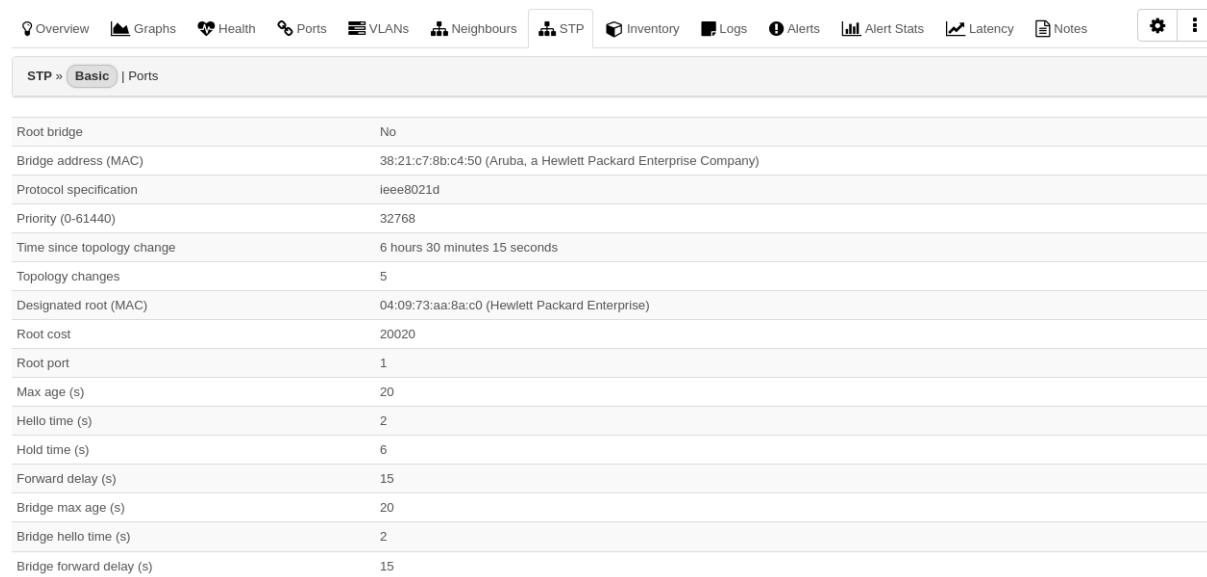
**Abbildung 35:** Abfrage der Netzwerkinterfaces des Windows-Host über LibreNMS

Add Device

Devices will be checked for Ping/SNMP reachability before being probed.

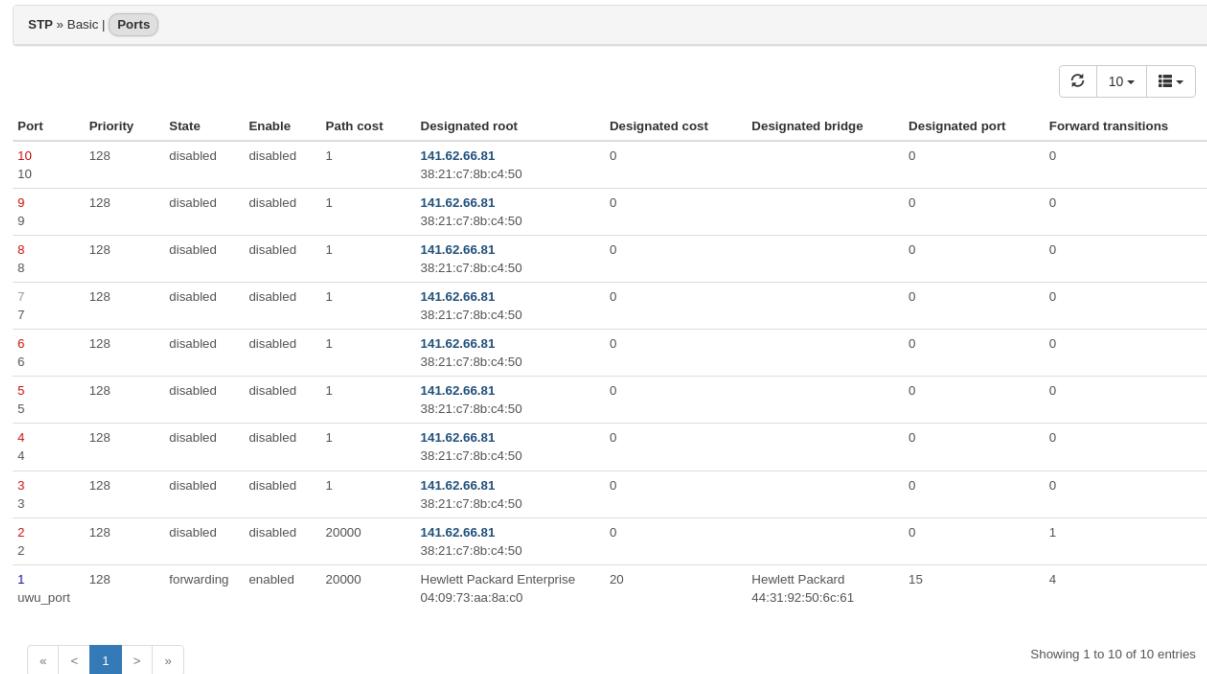
Hostname or IP	141.62.66.81
SNMP	ON
SNMP Version	v2c
Port Association Mode	ifIndex
SNMPv1/2c Configuration	
Community	public
Force add (No ICMP or SNMP checks performed)	OFF
<input type="button" value="Add Device"/>	

**Abbildung 36:** Hinzufügen des Switch in LibreNMS**Abbildung 37:** Graph zu Neighbours in LibreNMS



The screenshot shows the LibreNMS interface for the STP module. The top navigation bar includes links for Overview, Graphs, Health, Ports, VLANs, Neighbours, STP, Inventory, Logs, Alerts, Alert Stats, Latency, Notes, and settings. The main content area is titled 'STP' and has tabs for 'Basic' and 'Ports'. The 'Basic' tab is selected, displaying various configuration parameters:

Root bridge	No
Bridge address (MAC)	38:21:c7:8b:c4:50 (Aruba, a Hewlett Packard Enterprise Company)
Protocol specification	ieee8021d
Priority (0-61440)	32768
Time since topology change	6 hours 30 minutes 15 seconds
Topology changes	5
Designated root (MAC)	04:09:73:aa:8a:c0 (Hewlett Packard Enterprise)
Root cost	20020
Root port	1
Max age (s)	20
Hello time (s)	2
Hold time (s)	6
Forward delay (s)	15
Bridge max age (s)	20
Bridge hello time (s)	2
Bridge forward delay (s)	15

**Abbildung 38:** STP-Basics LibreNMS


The screenshot shows the LibreNMS interface for the STP module, specifically the 'Ports' tab. The top navigation bar includes links for Overview, Graphs, Health, Ports, VLANs, Neighbours, STP, Inventory, Logs, Alerts, Alert Stats, Latency, Notes, and settings. The main content area is titled 'STP' and has tabs for 'Basic' and 'Ports'. The 'Ports' tab is selected, displaying a table of port configurations:

Port	Priority	State	Enable	Path cost	Designated root	Designated cost	Designated bridge	Designated port	Forward transitions
10	128	disabled	disabled	1	<b>141.62.66.81</b> 38:21:c7:8b:c4:50	0		0	0
9	128	disabled	disabled	1	<b>141.62.66.81</b> 38:21:c7:8b:c4:50	0		0	0
8	128	disabled	disabled	1	<b>141.62.66.81</b> 38:21:c7:8b:c4:50	0		0	0
7	128	disabled	disabled	1	<b>141.62.66.81</b> 38:21:c7:8b:c4:50	0		0	0
6	128	disabled	disabled	1	<b>141.62.66.81</b> 38:21:c7:8b:c4:50	0		0	0
5	128	disabled	disabled	1	<b>141.62.66.81</b> 38:21:c7:8b:c4:50	0		0	0
4	128	disabled	disabled	1	<b>141.62.66.81</b> 38:21:c7:8b:c4:50	0		0	0
3	128	disabled	disabled	1	<b>141.62.66.81</b> 38:21:c7:8b:c4:50	0		0	0
2	128	disabled	disabled	20000	<b>141.62.66.81</b> 38:21:c7:8b:c4:50	0		0	1
1	128	forwarding	enabled	20000	Hewlett Packard Enterprise 04:09:73:aa:8a:c0	20	Hewlett Packard 44:31:92:50:6c:61	15	4
uwu_port									

Pagination controls at the bottom left show pages 1 to 10. A note at the bottom right says 'Showing 1 to 10 of 10 entries'.

**Abbildung 39:** Ports zu STP LibreNMS

- Performance- und Latenzdaten wie Hello Time etc.

Bzgl. der Neighbors kann aus dem Graph entnommen werden, dass die Node 151.62.66.1 im selben Netz ist.

**Fügen Sie den Switch 141.62.66.215 zu LibreNMS hinzu. Kontrollieren Sie den Port 25 (A1) auf Switch 141.62.66.215. Wie ist die Angabe des „Speed“ im Vergleich zur Feststellung aus Aufgabe 1 c?**

```

1 $ snmpwalk -v 2c -c public 141.62.66.215
2 SNMPv2-MIB::sysDescr.0 = STRING: HP J9726A 2920-24G Switch, revision WB
   .16.10.0015, ROM WB.16.03 (/ws/swbuildm/rel_ajanta_arenal_qaoff/code
   /build/anm(swbuildm_rel_ajanta_arenal_qaoff_rel_ajanta_arenal)) (
   Formerly ProCurve)
3 SNMPv2-MIB::sysObjectID.0 = OID: SNMPv2-SMI::enterprises
   .11.2.3.7.11.152
4 DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (1790824277) 207 days,
   6:30:42.77
5 SNMPv2-MIB::sysContact.0 = STRING: van der Kamp
6 SNMPv2-MIB::sysName.0 = STRING: 215-HP-2920-24G-R141
7 SNMPv2-MIB::sysLocation.0 = STRING: R141
8 SNMPv2-MIB::sysServices.0 = INTEGER: 74

```

Der Port 25 (Port A1) ist ein 10-Gigabit-Port.

**Fügen Sie Device 141.62.66.241 hinzu. Wozu dient das Device?**

```

1 $ snmpwalk -v 2c -c public 141.62.66.241
2 SNMPv2-MIB::sysDescr.0 = STRING: ws_brs
3 SNMPv2-MIB::sysObjectID.0 = OID: SNMPv2-SMI::enterprises.40595
4 DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (189474772) 21 days,
   22:19:07.72
5 SNMPv2-MIB::sysContact.0 = STRING: RNLab Admin
6 SNMPv2-MIB::sysName.0 = STRING: BrennenstuhlPDU
7 SNMPv2-MIB::sysLocation.0 = STRING: R142A
8 SNMPv2-MIB::sysServices.0 = INTEGER: 72
9 IF-MIB::ifNumber.0 = INTEGER: 1
10 IF-MIB::ifIndex.1 = INTEGER: 1
11 IF-MIB::ifDescr.1 = STRING: ti
12 IF-MIB::ifType.1 = INTEGER: ethernetCsmacd(6)
13 IF-MIB::ifMtu.1 = INTEGER: 1500
14 IF-MIB::ifSpeed.1 = Gauge32: 1000000
15 IF-MIB::ifPhysAddress.1 = STRING: 20:4c:6d:0:32:b
16 IF-MIB::ifAdminStatus.1 = INTEGER: up(1)
17 IF-MIB::ifOperStatus.1 = INTEGER: up(1)
18 IF-MIB::ifLastChange.1 = Timeticks: (0) 0:00:00.00
19 IF-MIB::ifInOctets.1 = Counter32: 0
20 IF-MIB::ifInUcastPkts.1 = Counter32: 0
21 IF-MIB::ifInNUcastPkts.1 = Counter32: 0
22 IF-MIB::ifInDiscards.1 = Counter32: 0
23 IF-MIB::ifInErrors.1 = Counter32: 0
24 IF-MIB::ifInUnknownProtos.1 = Counter32: 24726828
25 IF-MIB::ifOutOctets.1 = Counter32: 0
26 IF-MIB::ifOutUcastPkts.1 = Counter32: 0
27 IF-MIB::ifOutNUcastPkts.1 = Counter32: 0
28 IF-MIB::ifOutDiscards.1 = Counter32: 0

```

## Add Device

Devices will be checked for Ping/SNMP reachability before being probed.

Hostname or IP	141.62.66.215		
SNMP	ON		
SNMP Version	v2c	port	udp
Port Association Mode	ifIndex		
SNMPv1/2c Configuration			
Community	public		
Force add (No ICMP or SNMP checks performed)	OFF		
<input type="button" value="Add Device"/>			

**Abbildung 40:** Hinzufügen des Switch in LibreNMS

A1	Default	10 Gbps	Ethernet	ec00:00:98:29:67	✓ DEFAULT_Vlan
A1	Default	10 Gbps	Ethernet	ec00:00:98:29:67	✓ DEFAULT_Vlan

**Abbildung 41:** Speed an Port A1

```
29 IF-MIB::ifOutErrors.1 = Counter32: 0
30 IF-MIB::ifOutQLen.1 = Gauge32: 0
31 IF-MIB::ifSpecific.1 = OID: SNMPv2-SMI::zeroDotZero
```

## Add Device

Devices will be checked for Ping/SNMP reachability before being probed.

Hostname or IP

SNMP

SNMP Version  Port  UDP

Port Association Mode

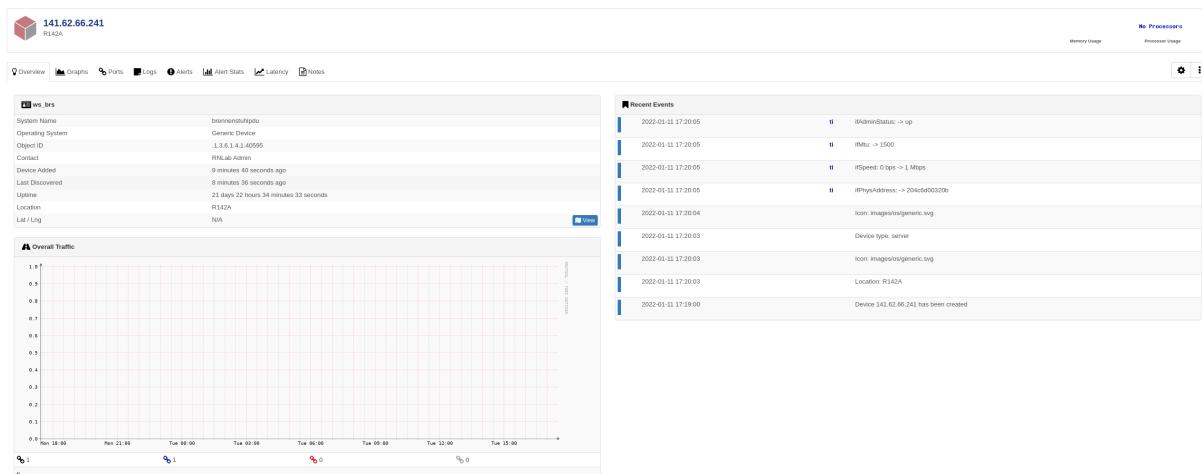
SNMPv1/2c Configuration

Community

Force add (No ICMP or SNMP checks performed)

**Abbildung 42:** Hinzufügen des Geräts in LibreNMS

Aus dem Systennamen [brennenstuhlpdu](#) lässt sich schließen, dass es sich um eine Steckdosenleiste des Herstellers Brennenstuhl handelt.



**Abbildung 43:** Device info in LibreNMS