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Wer bin ich?



HP MASE - Network Infrastructure
HP ASE - ProCurve Mobility
HP ASE - ProCurve Network Management

Invented NeDi

Connecting UBS Investment Bank to the internet

Lived in Florida for 2 years

Bachelor (HTL) Communications Technology

NeDi Sponsoren



Integration
Support



Customer
Projects



Workshops



Customizations



Was ist NeDi?

- Netzwerk Management & Überwachung
- Konfigurationen sichern
- IT Inventarisieren
- Computer finden & verfolgen
- Sicherheits-audits & mehr
- VM Management
- Printer Management



NeDi's Focus



Warum & Wo?



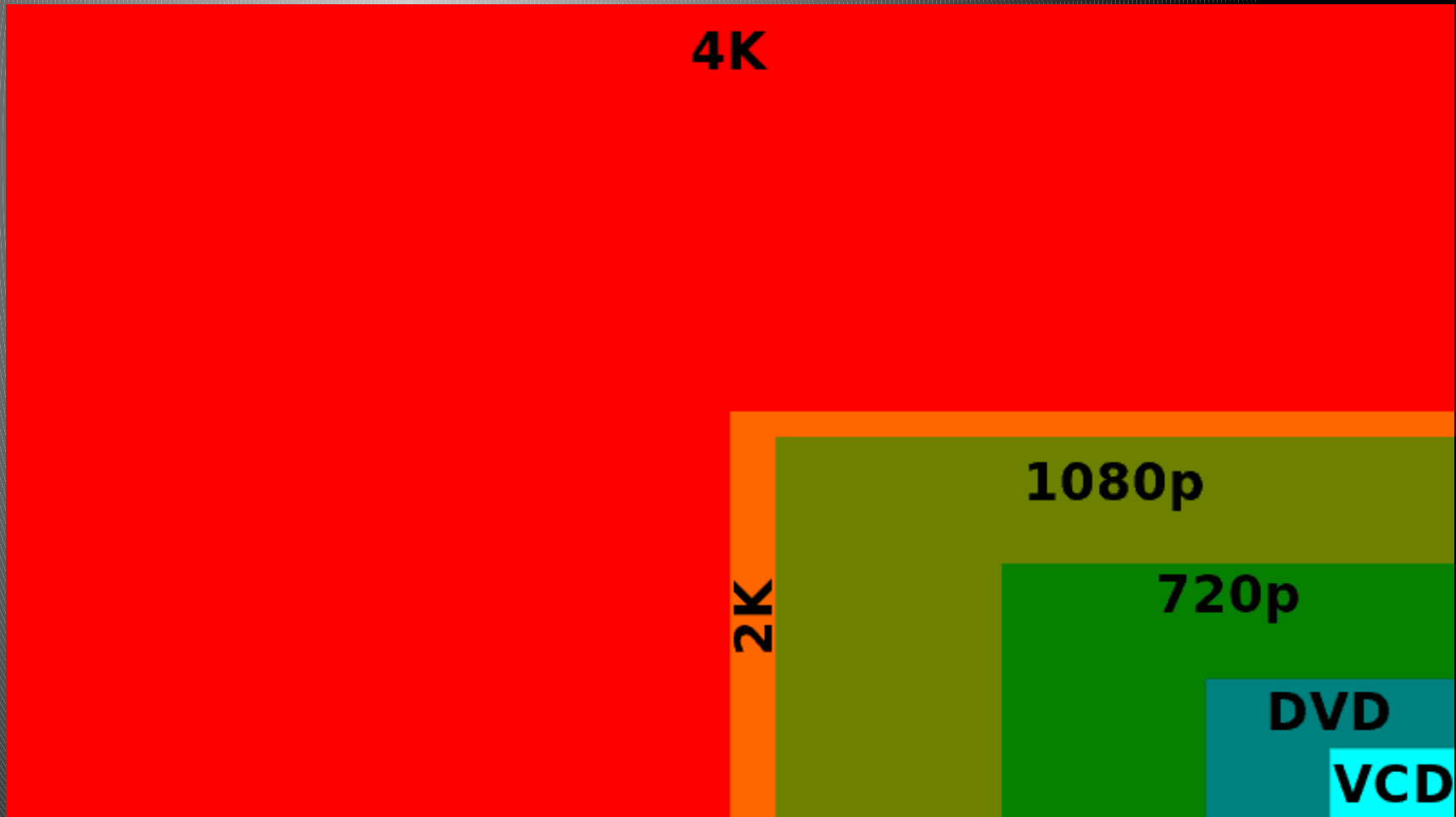
Warum ist es für euch?



Beispiel IPv6



Grössenverhältnisse



Digital video resolutions ([http://commons.wikimedia.org/wiki/File:Digital_video_resolutions_\(VCD_to_4K\).svg](http://commons.wikimedia.org/wiki/File:Digital_video_resolutions_(VCD_to_4K).svg)) by TRauMa

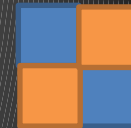
Adressräume

Giga- Faktor ($1024 * 1024 * 1024$)
1073741824

2^{32} -> IPv4
4 Mia

2^{64}
17'179'869'184 Mia

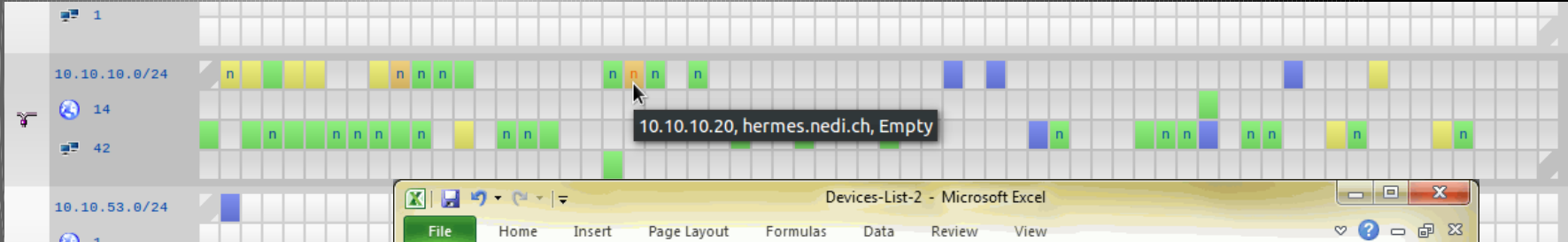
2^{128} -> IPv6
 $3e+29$ Mia



17 Gigapixel !!!

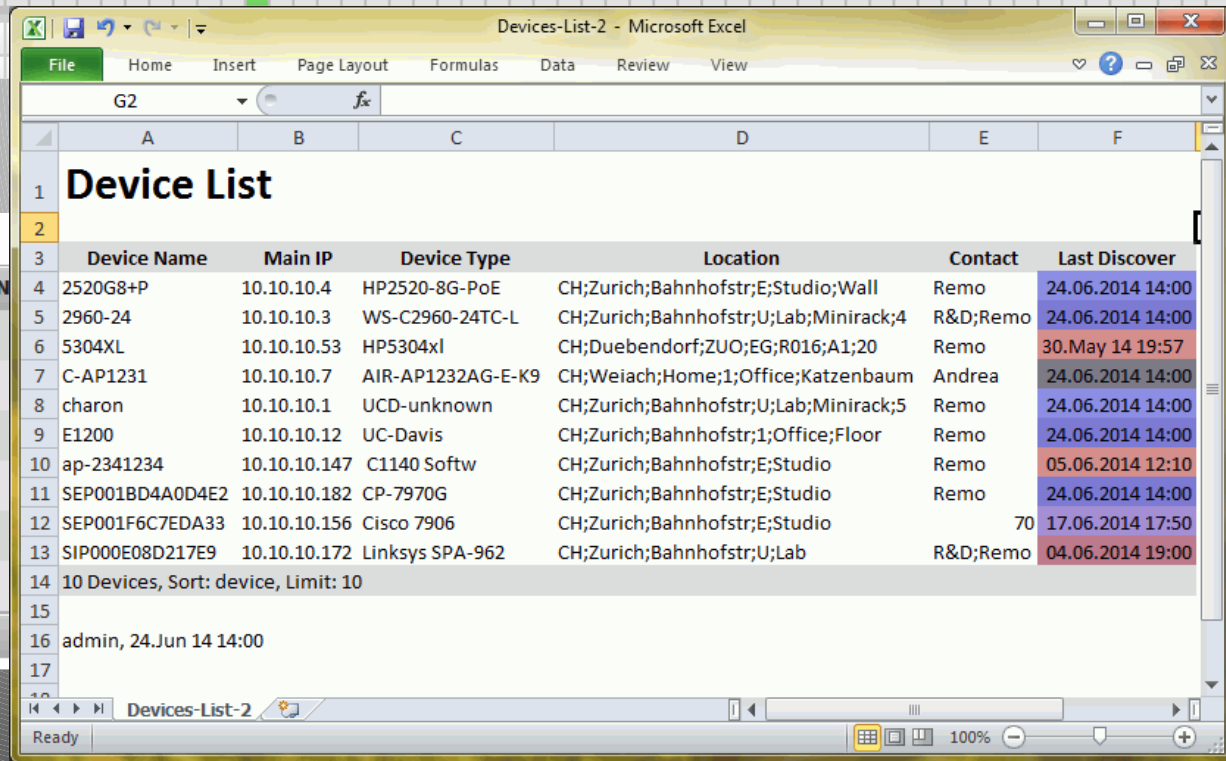
Eine 3 mit sinnlos vielen Nullen !!!

Darum ist es für euch



IP Address	Device Name
10.10.10.254	PE2
192.168.102.1	PE2
192.168.202.1	PE2
192.168.1.10	PE2
192.168.1.18	PE2
192.168.10.97	PE2

6 Network, Sort: ifname, Limit: 100



Devices-List-2 - Microsoft Excel

Device Name	Main IP	Device Type	Location	Contact	Last Discover
2520G8+P	10.10.10.4	HP2520-8G-PoE	CH;Zurich;Bahnhofstr;E;Studio;Wall	Remo	24.06.2014 14:00
2960-24	10.10.10.3	WS-C2960-24TC-L	CH;Zurich;Bahnhofstr;U;Lab;Minirack;4	R&D;Remo	24.06.2014 14:00
5304XL	10.10.10.53	HP5304xl	CH;Duebendorf;ZUO;EG;R016;A1;20	Remo	30.May 14 19:57
C-AP1231	10.10.10.7	AIR-AP1232AG-E-K9	CH;Weiach;Home;1;Office;Katzenbaum	Andrea	24.06.2014 14:00
charon	10.10.10.1	UCD-unknown	CH;Zurich;Bahnhofstr;U;Lab;Minirack;5	Remo	24.06.2014 14:00
E1200	10.10.10.12	UC-Davis	CH;Zurich;Bahnhofstr;1;Office;Floor	Remo	24.06.2014 14:00
ap-2341234	10.10.10.147	C1140 Softw	CH;Zurich;Bahnhofstr;E;Studio	Remo	05.06.2014 12:10
SEP001BD4A0D4E2	10.10.10.182	CP-7970G	CH;Zurich;Bahnhofstr;E;Studio	Remo	24.06.2014 14:00
SEP001F6C7EDA33	10.10.10.156	Cisco 7906	CH;Zurich;Bahnhofstr;E;Studio	70	17.06.2014 17:50
SIP000E08D217E9	10.10.10.172	Linksys SPA-962	CH;Zurich;Bahnhofstr;U;Lab	R&D;Remo	04.06.2014 19:00

10 Devices, Sort: device, Limit: 10

admin, 24.Jun 14 14:00

Schnelle Einsichten



Name	IP Address	First	Last
CISCO	11.11.0.18	26.Jun 14 18:55	26.Jun 14 19:45
CISCO	11.11.13.2	26.Jun 14 18:55	26.Jun 14 19:45
CISCO	11.11.11.1	26.Jun 14 18:35	26.Jun 14 18:50
CISCO	11.11.11.3	26.Jun 14 18:35	26.Jun 14 19:45
CISCO	-	0.0.0.0	26.Jun 14 11:40
ASUS	osiris	10.10.10.133	24.Jun 14 19:10
		192.168.66.65	24.Jun 14 18:15
hp	-	0.0.0.0	24.Jun 14 17:25
hp	Prometheus	10.10.10.157	23.Jun 14 1:05
	cmu	10.10.10.154	21.Jun 14 17:00
hp	zeus	10.10.10.139	20.Jun 14 22:40
AMBIT	Prometheus	10.10.10.138	19.Jun 14 0:15
SAMSUNG	android-31dc8b0e6cd4a7c6	10.10.10.167	5.Jun 14 11:35
intel	acer-ddc3515f70	10.10.10.148	5.Jun 14 11:20
CISCO	iseli_andrea	10.10.10.147	5.Jun 14 6:35
hp	-	0.0.0.0	4.Jun 14 16:50

Tiefe Einsichten



Device List

SNMP Version > 0

Filter

- Device Name
- Image
- Main IP
- Original IP
- Serial#
- Device Type

Show Monitor Delete

200

SNMP Version > '0'

Image	Main IP	Contact	Last Discover	Population	Log	Access Port Free
charon	10.10.10.1	Remo	3.Jun 14 15:10	1		1
E1200	10.10.10.12	Remo	3.Jun 14 15:10	17		1
5304XL	10.10.10.53	Remo	30.May 14 19:57			47
2520G8+P	10.10.10.4	Remo	3.Jun 14 15:10	14		2
2960-24	10.10.10.3	R&D;Remo	3.Jun 14 15:10	17		

5 Devices, Sort: snmpversion, Limit: 200

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Neue Ansichten

Node Status

MAC Address: Show

Node

MAC Address: 00-22-15-17-80-63
00:22:15:17:80:63
0022.1517.8063

Vendor: ASUSTek COMPUTER INC.

Discover: 25.Aug 14 19:00 - 27.Aug 14 14:30

User:

IP Address

1	10.10.10.140	Poseidon.nedi.ch				
2	10.10.10.133	Neptune.nedi.ch				

Metric History

0 = FD, 1 = HD
1 = 10M, 2 = 100M, 3 = 1G, 4 = 10G

Device

Name: 2520G8+P

Type: HP2520-8G-PoE

Contact: Remoo

Location: Zurich,CH Bahnhofstr, Floor E

Port: 9

Vlan: 1 - DEFAULT_VLAN

Statistics Total / Last

100M - HD

25.Aug 14 19:00

IP Change

None

IF Change

None

Eventanalyse

Devices Configuration

List Comparison Limit

Configuration regexp [] Select -> - Type - Select -> 100 10 Show

Time

15.Aug 16:00										
16.Aug 16:00										
17.Aug 16:00										
18.Aug 16:00									297 Total	

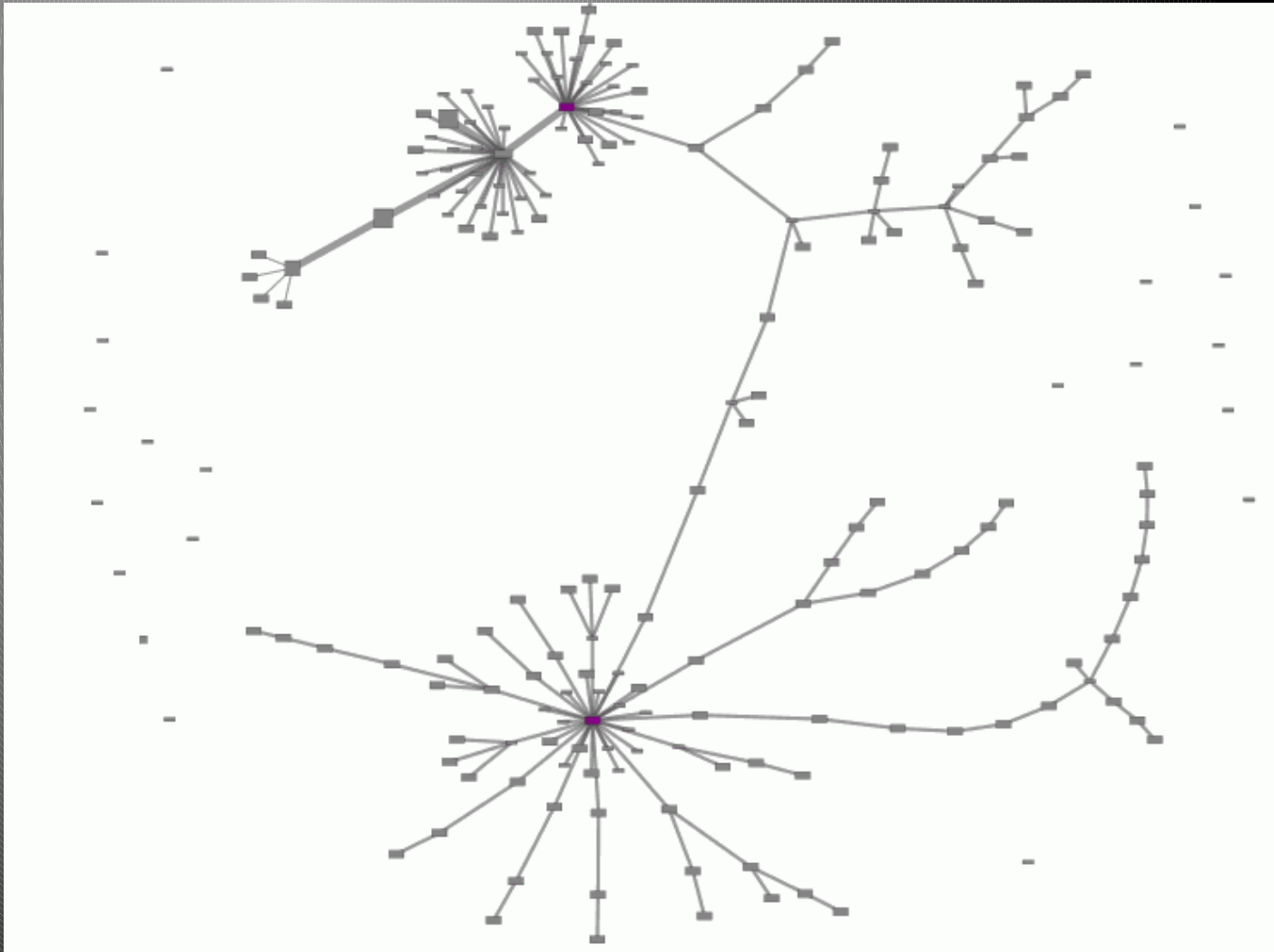
4 Values, 0 Events

Port Inbound Broadcast

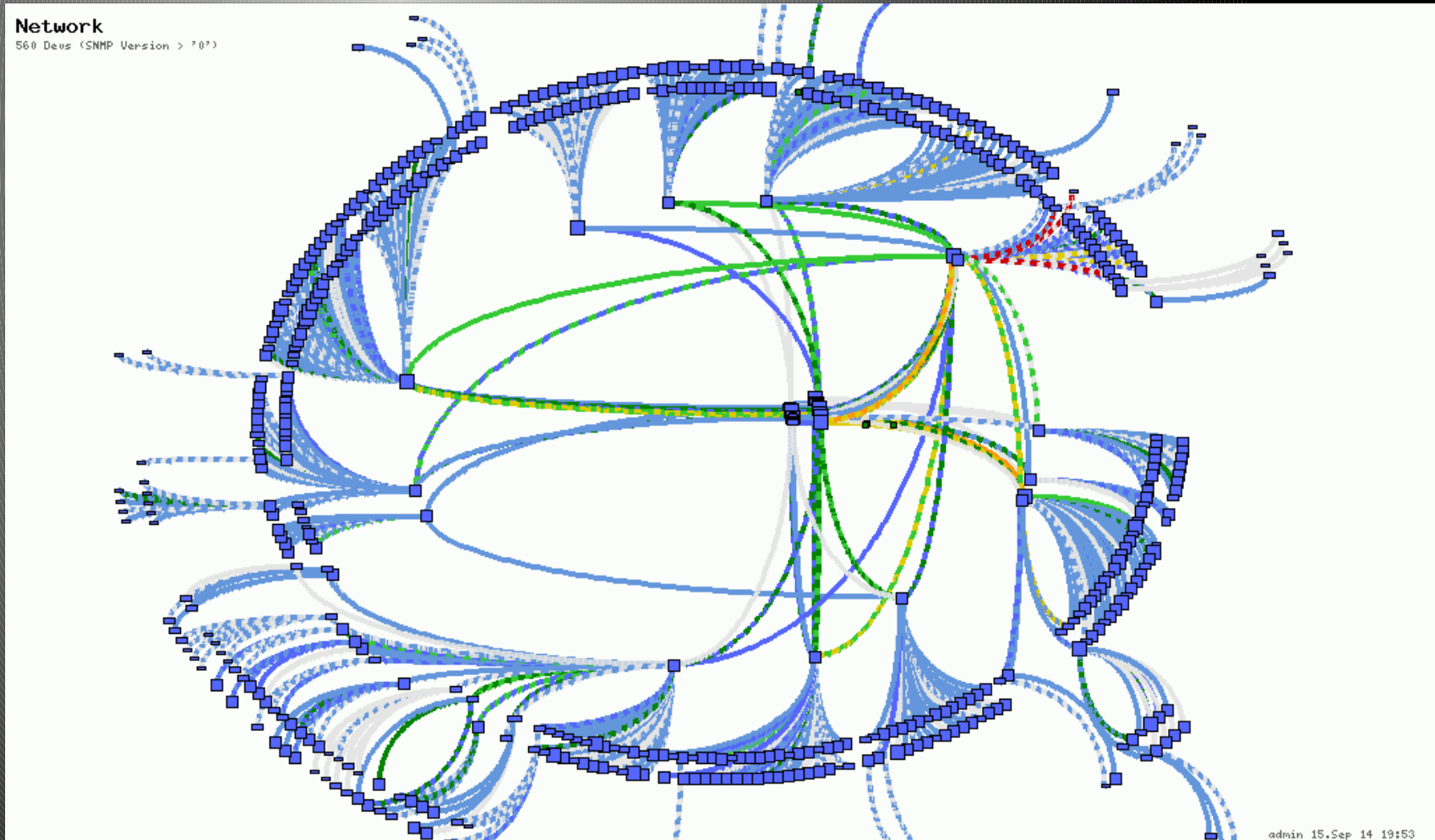
Id	Level	Time	Source	Class	Info
34365		8.Sep 17:08	C3560G-24PoE		New config with 2192 characters added
33115		6.Sep 21:12	2621-E1		New config with 728 characters added
25819		28.Aug 15:03	C831-2		New config with 1225 characters added
25787		28.Aug 14:38	C831-1		New config with 1304 characters added

4 Events

Flexible Einsichten



Schöne Aussichten



Discovery Process

1. Initialization

- Read configuration
- Init seeds

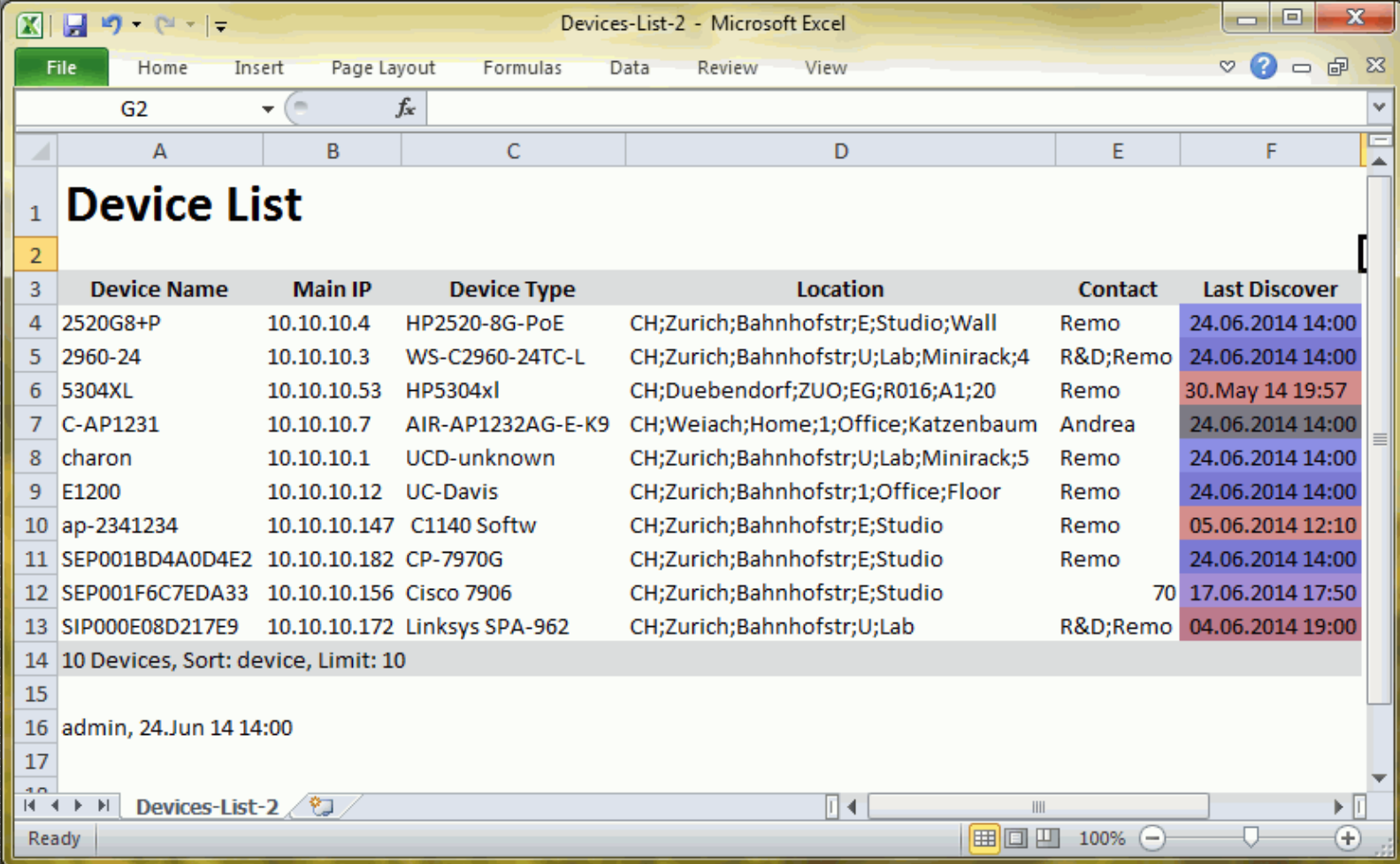
2. Collect Devices

- Get information
- Store in database

3. Finish

- ~~Node calculation~~
- Draw top graphs

Tabellenkalkulation



The screenshot shows a Microsoft Excel spreadsheet titled "Devices-List-2". The spreadsheet contains a table with the following data:

	A	B	C	D	E	F
1	Device List					
2						
3	Device Name	Main IP	Device Type	Location	Contact	Last Discover
4	2520G8+P	10.10.10.4	HP2520-8G-PoE	CH;Zurich;Bahnhofstr;E;Studio;Wall	Remo	24.06.2014 14:00
5	2960-24	10.10.10.3	WS-C2960-24TC-L	CH;Zurich;Bahnhofstr;U;Lab;Minirack;4	R&D;Remo	24.06.2014 14:00
6	5304XL	10.10.10.53	HP5304xl	CH;Duebendorf;ZUO;EG;R016;A1;20	Remo	30.May 14 19:57
7	C-AP1231	10.10.10.7	AIR-AP1232AG-E-K9	CH;Weiach;Home;1;Office;Katzenbaum	Andrea	24.06.2014 14:00
8	charon	10.10.10.1	UCD-unknown	CH;Zurich;Bahnhofstr;U;Lab;Minirack;5	Remo	24.06.2014 14:00
9	E1200	10.10.10.12	UC-Davis	CH;Zurich;Bahnhofstr;1;Office;Floor	Remo	24.06.2014 14:00
10	ap-2341234	10.10.10.147	C1140 Softw	CH;Zurich;Bahnhofstr;E;Studio	Remo	05.06.2014 12:10
11	SEP001BD4A0D4E2	10.10.10.182	CP-7970G	CH;Zurich;Bahnhofstr;E;Studio	Remo	24.06.2014 14:00
12	SEP001F6C7EDA33	10.10.10.156	Cisco 7906	CH;Zurich;Bahnhofstr;E;Studio	70	17.06.2014 17:50
13	SIP000E08D217E9	10.10.10.172	Linksys SPA-962	CH;Zurich;Bahnhofstr;U;Lab	R&D;Remo	04.06.2014 19:00
14	10 Devices, Sort: device, Limit: 10					
15						
16	admin, 24.Jun 14 14:00					
17						

Discovery Callout



```
1dev:~#ne -a charon
```

```
Discovery (%VERSION%) /var/nedi/nedi.pl -a charon
```

```
Started with 1 seeds at Mon Aug 25 17:13:55 2014
```

```
-----  
Device          Status          Todo/Done-Time
```

```
=====
```

10.10.10.1	charon	SvSmlclm i8 j5 a0	0/1-1s
------------	--------	-------------------	--------

```
=====
```

```
END :Took 0 minutes
```

```
n1dev:~#ne -a charon -x echo
```

```
Discovery (%VERSION%) /var/nedi/nedi.pl -a charon -x echo
```

```
Started with 1 seeds at Mon Aug 25 17:12:26 2014
```

```
-----  
Device          Status          Todo/Done-Time
```

```
=====
```

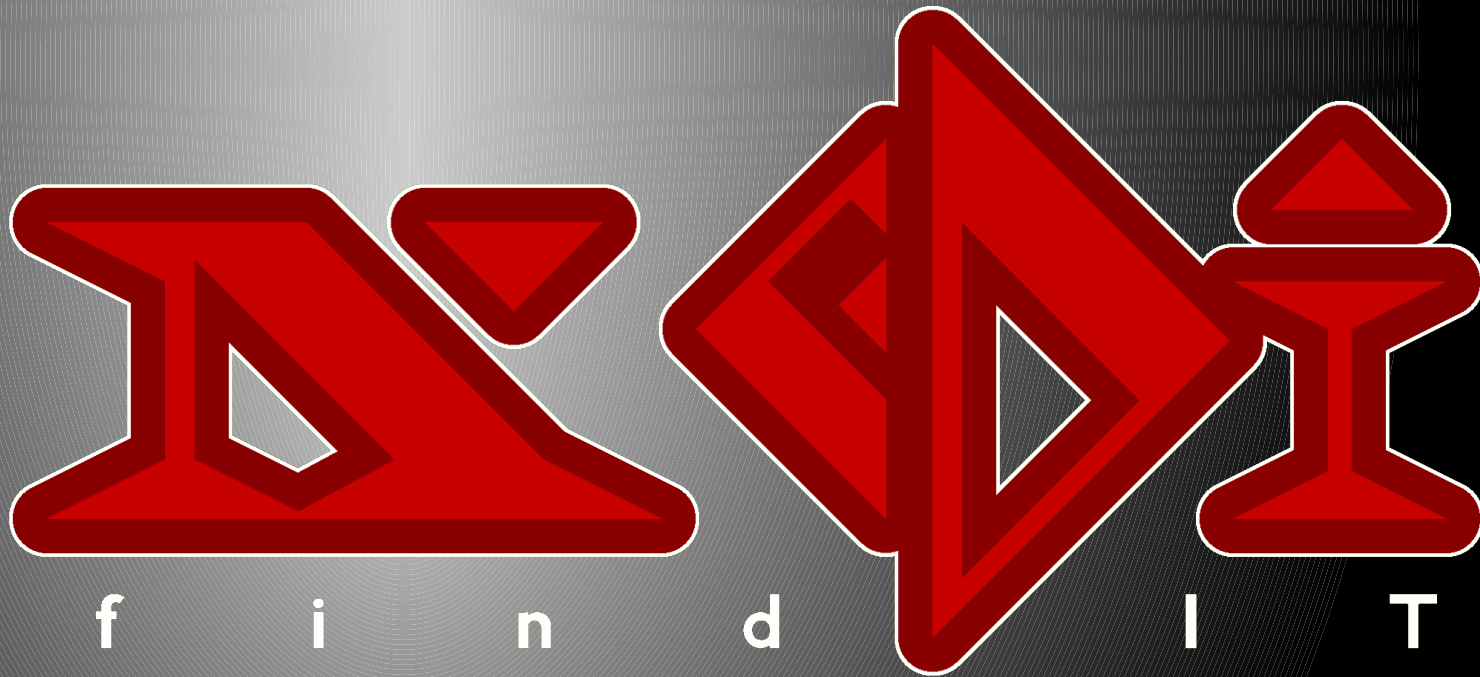
10.10.10.1	charon	SvSmlclm i8 j5 a0	existing charon 10.10.10.1 2 public 1.3.6.1.4.1.2021.250.255 m0n0wall charon.nedi.ch 1.8.1 generic-pc FreeBSD 8.4-RELEASE-p7 i386
------------	--------	-------------------	---

```
0 0/1-1s  
=====
```

```
END :Took 0 minutes
```


Danke!

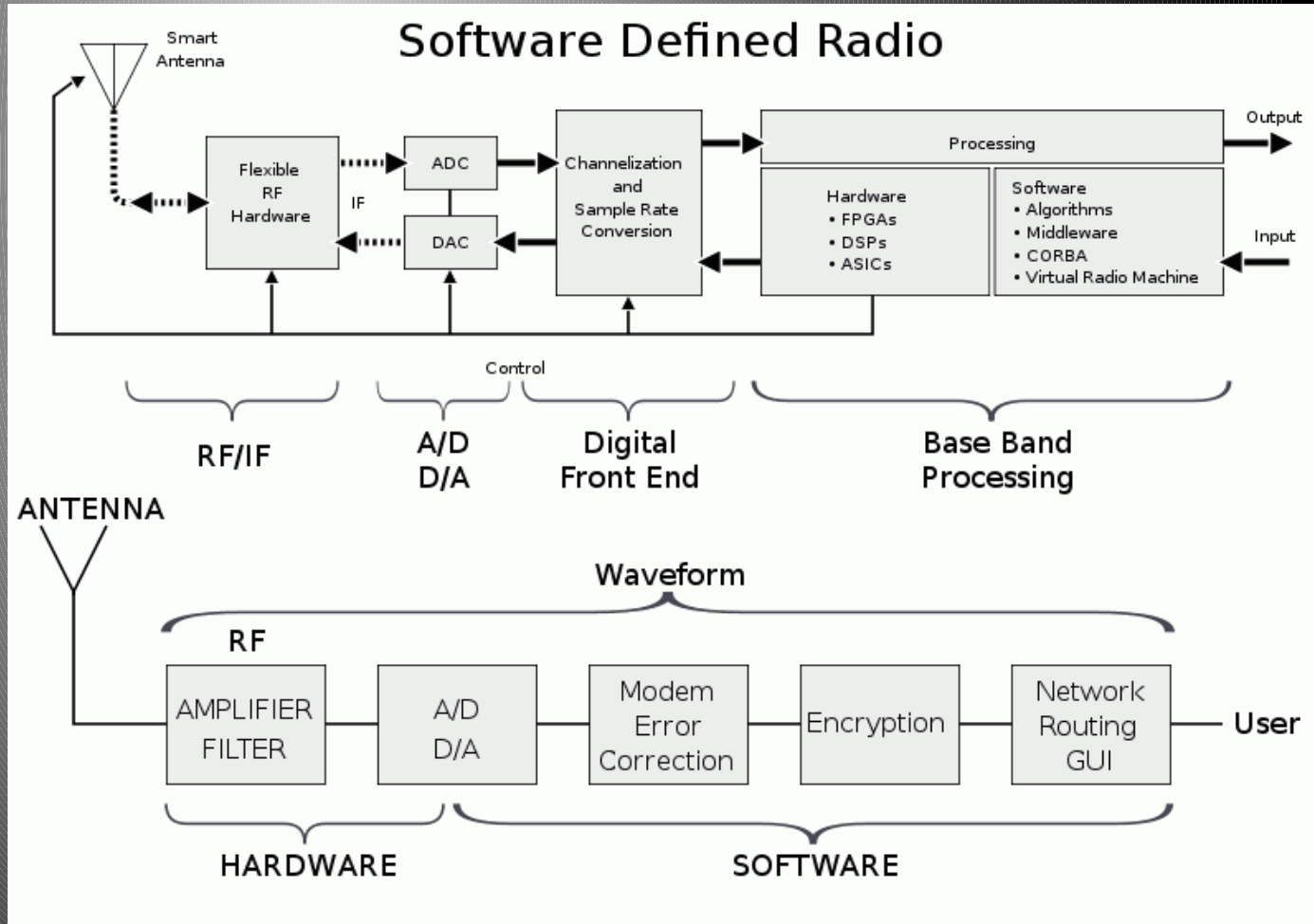
Mehr Info auf:
www.nedi.ch



For NeRDs!



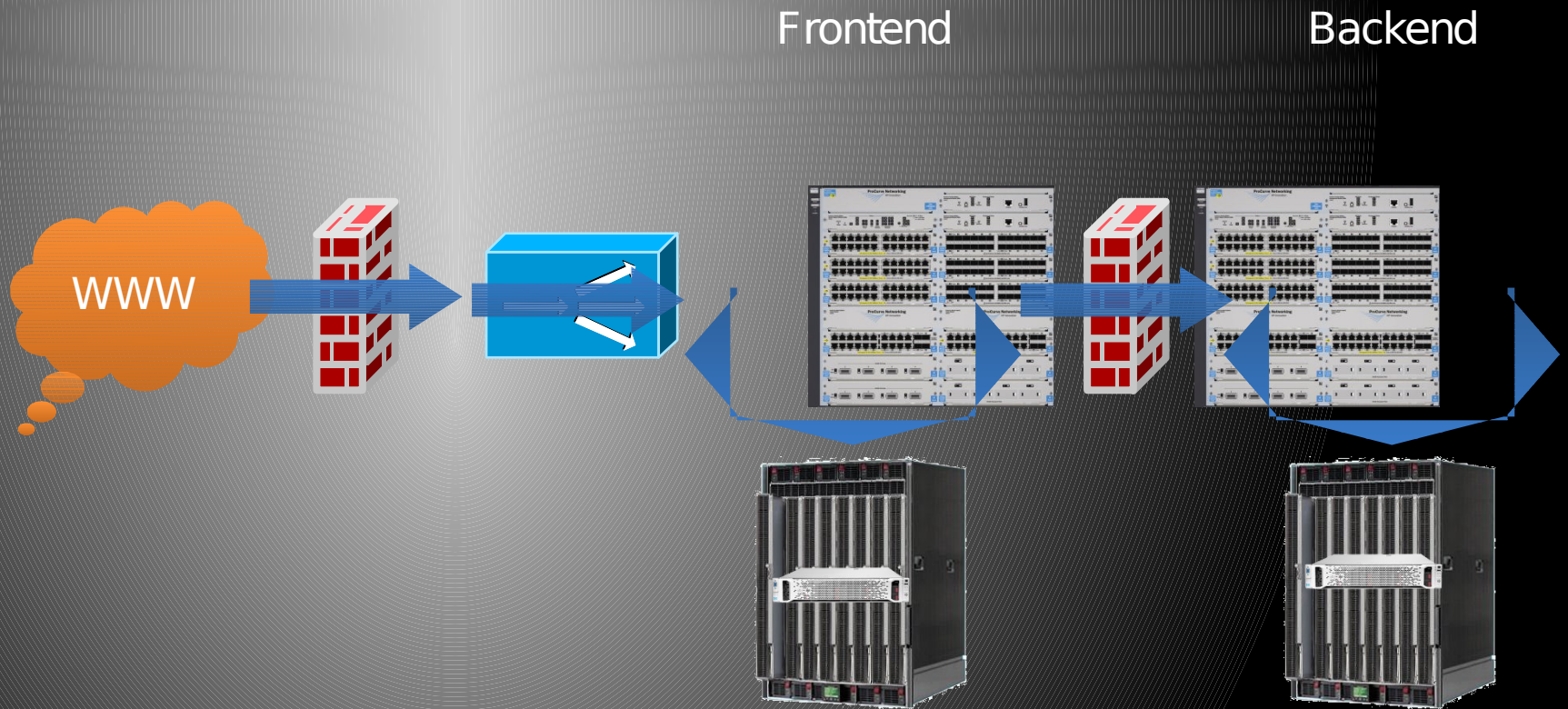
Software Defined Radio



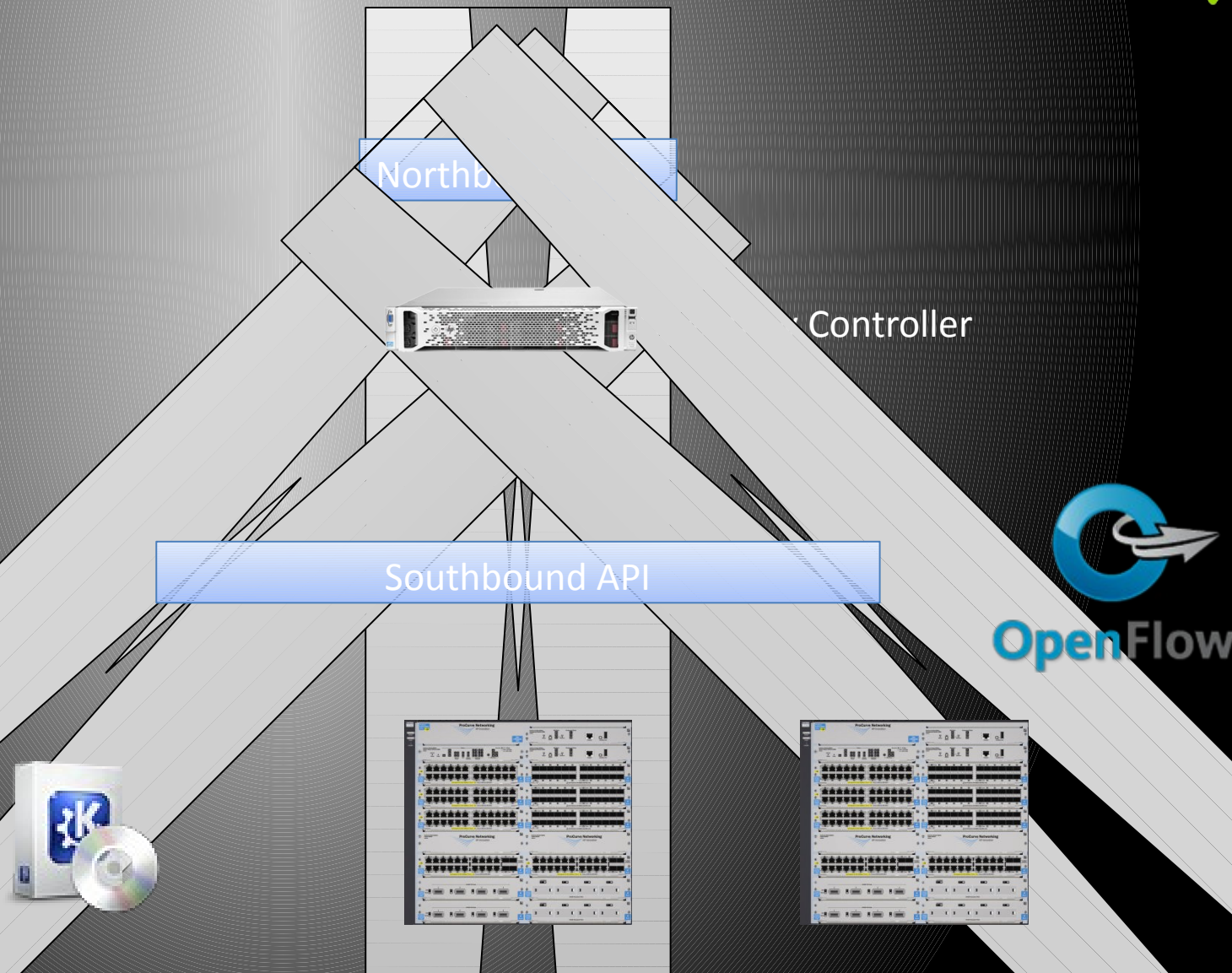
http://commons.wikimedia.org/wiki/File:SDR_et_WF.svg by Topituuk

Orchestrating a DMZ

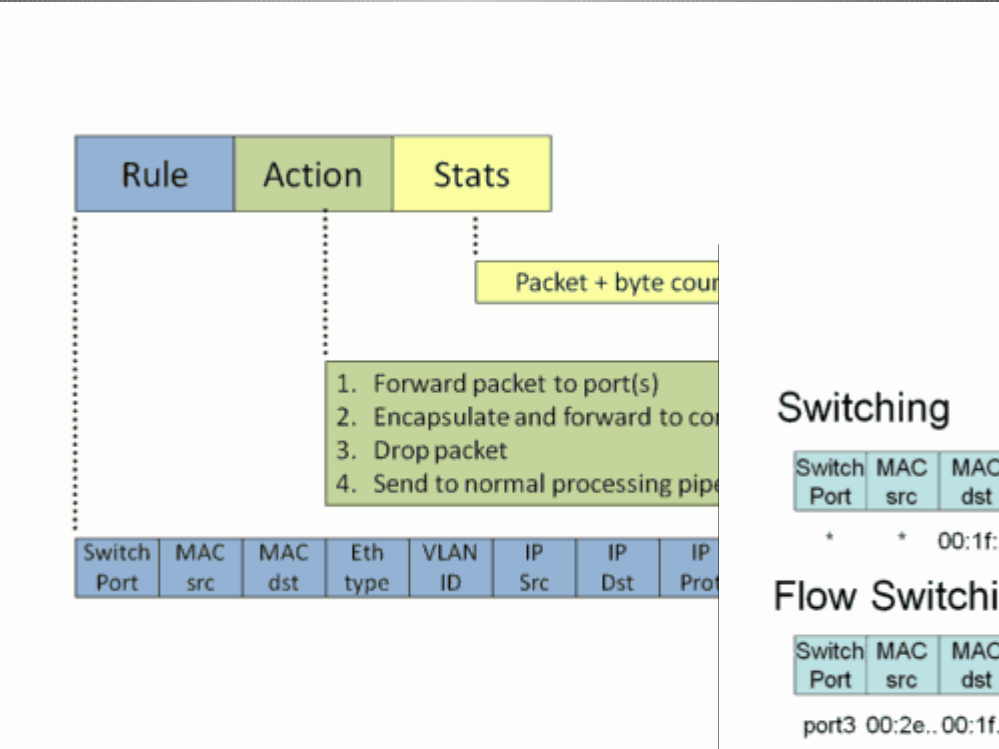
NFV in Action



SDN & Openflow



Openflow Details



<http://yuba.stanford.edu/cs244/wiki/index.php/Overview>

Examples

Switching

Switch Port	MAC src	MAC dst	Eth type	VLAN ID	IP Src	IP Dst	IP Prot	TCP sport	TCP dport	Action
*	*	00:1f:..	*	*	*	*	*	*	*	port6

Flow Switching

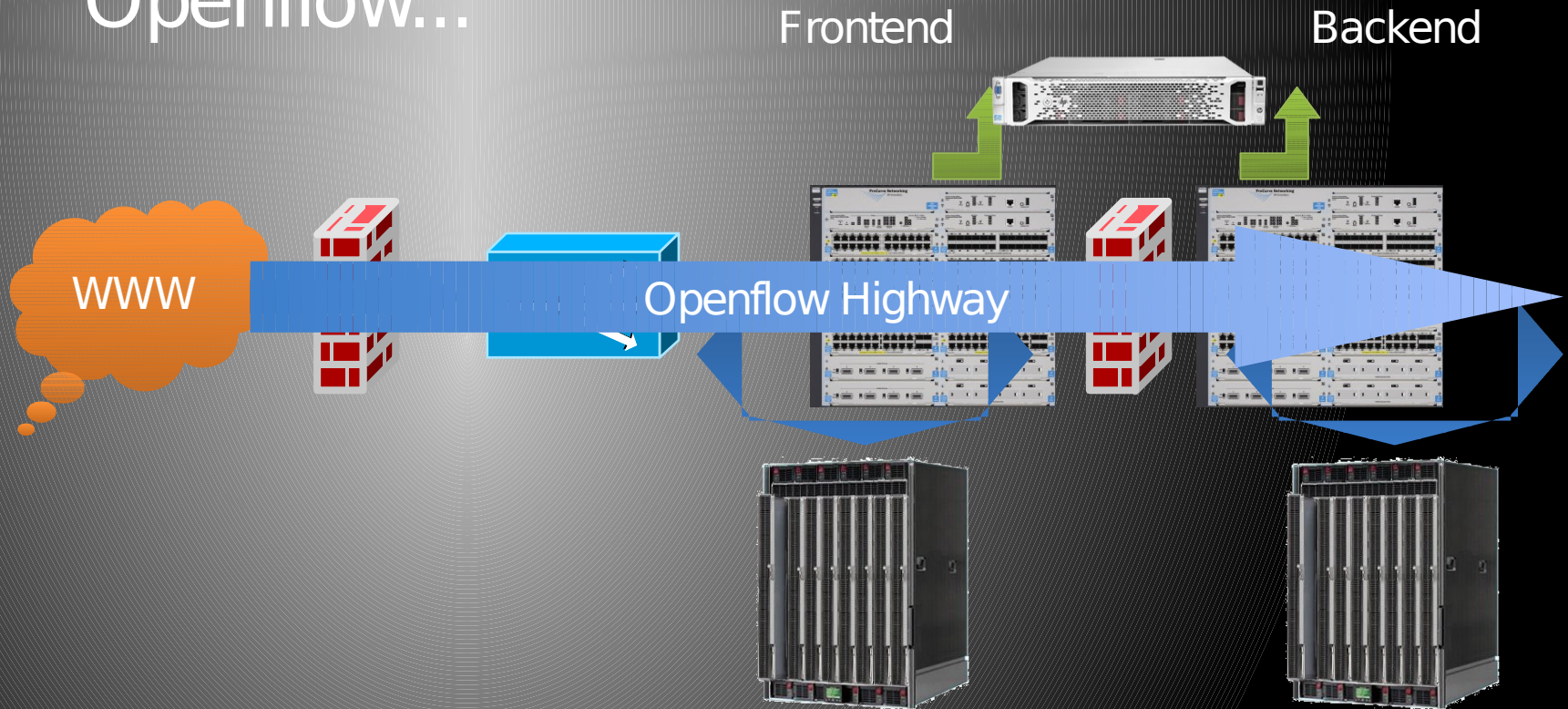
Switch Port	MAC src	MAC dst	Eth type	VLAN ID	IP Src	IP Dst	IP Prot	TCP sport	TCP dport	Action
port3	00:2e..	00:1f..	0800	vlan1	1.2.3.4	5.6.7.8	4	17264	80	port6

Firewall





Switch Port	MAC src	MAC dst	Eth type	VLAN ID	IP Src	IP Dst	IP Prot	TCP sport	TCP dport	Action
*	*	*	*	*	*	*	*	*	22	drop

Orchestrating a DMZ

This time with
Openflow...



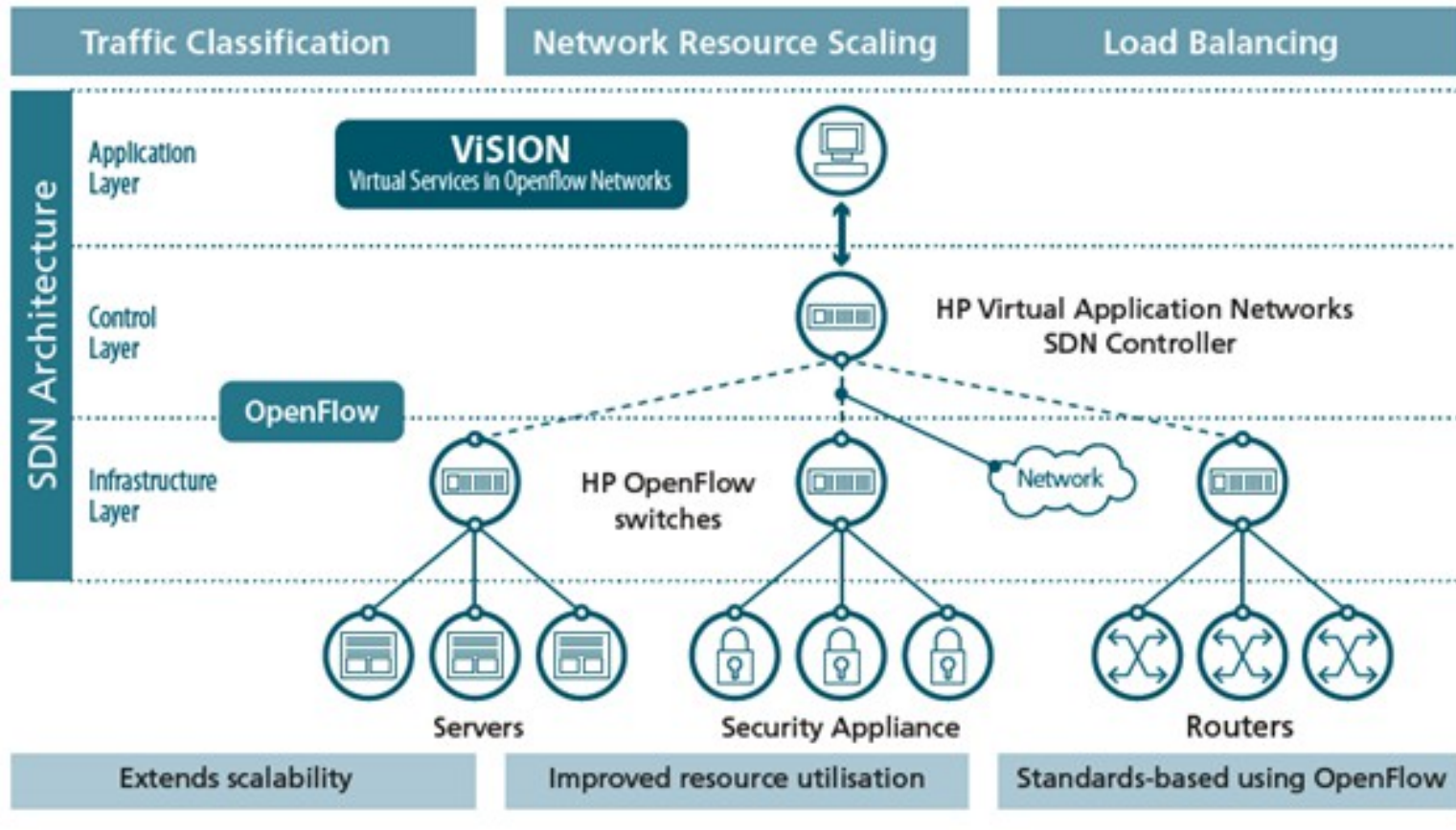
SDN Welt

Hersteller	Produkt	Typ
Cisco 	API	HW, Proprietär
HP 	VAN SDN	OF, Closedsource
Vmware 	NSX	SW, Proprietär
Opendaylight 	Hydrogen	OF, Opensource

Openflow & CERN

ViSION Software Architecture

Virtual Services in OpenFlow networks

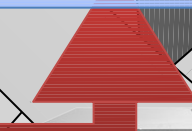


<http://openlab.web.cern.ch/sites/openlab.web.cern.ch/files/Vision%20Software.png.png>

Openflow & NeDi



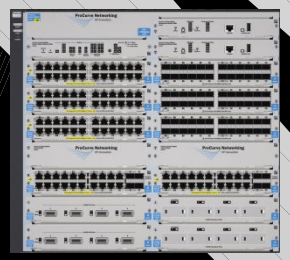
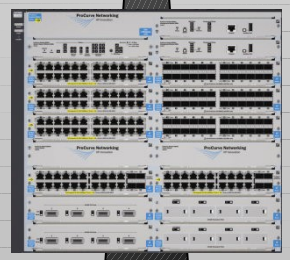
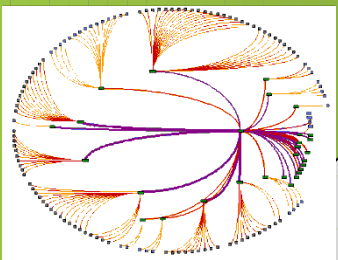
Northbound API



OpenFlow controller

	android-806287aac7d532b2	10.10.10.177	28.May 14 10:15	28.Jun 14 19:40
	android-433863ab34269977	10.10.10.134	28.May 14 10:15	28.Jun 14 19:40
	anubis	10.10.10.158	31.May 14 14:25	22.Jun 14 1:15
	anubis	10.10.10.143	28.May 14 10:15	28.Jun 14 19:40
	beta	10.10.10.179	31.May 14 13:00	20.Jun 14 14:50
	Chromecast	10.10.10.135	28.May 14 10:15	28.Jun 14 19:35
	cmu	10.10.10.154	21.Jun 14 17:00	22.Jun 14 20:45
	ILOG886132X4D	10.10.10.144	2.Jun 14 16:10	2.Jun 14 17:05

Southbound API



Wie geht es weiter?



SDN/NFV

- Clouds wollen das!
- Kann sich auch im «normalen» Netz durchsetzen
- Konkurrenz z.B. Von ALGs in HW

Openflow

- Immer noch im Aufbau
- Vorerst wenige «Apps»
- HW noch limitiert
- Reale Anwendung (z.B. Verfügbarkeit, Skalierung & Latenz)
- Verbreitung reiner SW SDN Lösungen

Danke!

Mehr Info auf:
www.nedi.ch