

STPViz

Visualizing network topologies with the help of the
Spanning Tree Protocol

Überblick

- ▶ **Einleitung & Motivation**
- ▶ **Zeitplanung**
- ▶ **Spanning Tree Protocol (STP)**
- ▶ **STPViz**
- ▶ **Software-Switch**
- ▶ **Tests**
- ▶ **Zusammenfassung & Ausblick**

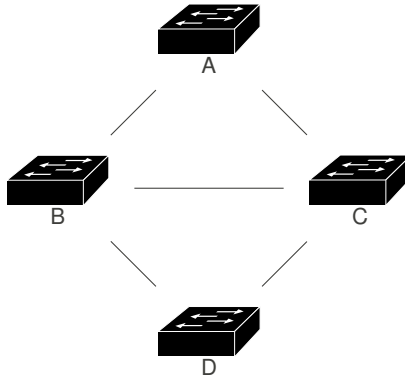


Einleitung & Motivation

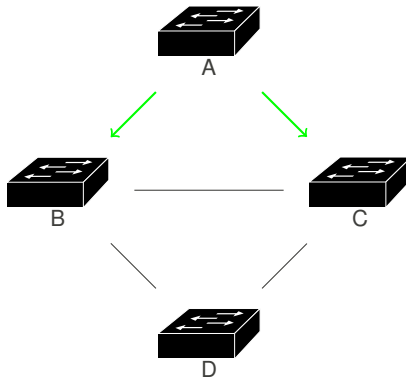
- ▶ Warum STP?
- ▶ Was ist das Problem?
- ▶ Was macht STPViz besser/einfacher?



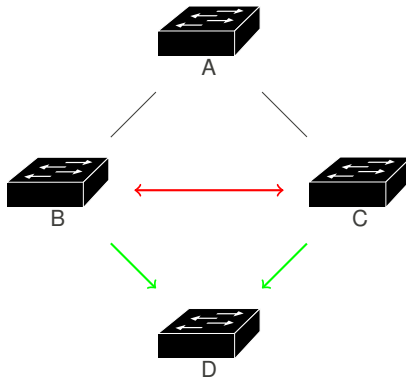
Broadcast Storms



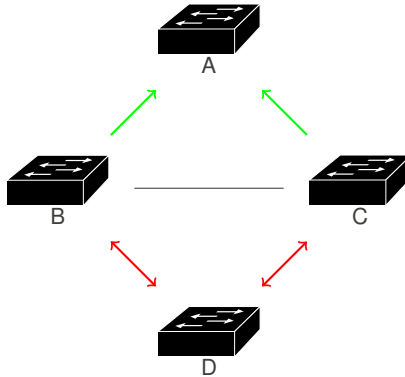
Broadcast Storms



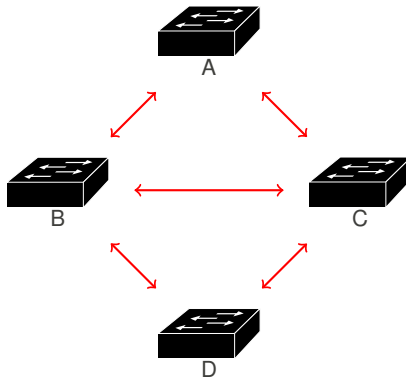
Broadcast Storms



Broadcast Storms



Broadcast Storms



Timeline

- ▶ Geplante Timeline
- ▶ Echte Timeline (mit Problemen)



Spanning Tree Protocol

- ▶ Funktionsweise
- ▶ Pakete



STP Pakete

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Protocol Identifier																Version Id								BPDU Type							
Flags								Root Identifier																							
Root Identifier																															
Root Identifier								Root Path Cost																							
Root Path Cost								Bridge Identifier																							
Bridge Identifier																															
Bridge Identifier								Port Identifier																Message Age							
Message Age								Max Age																Hello Time							
Hello Time								Forward Delay																							



STP Pakete

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Protocol Identifier																Version Id								BPDU Type							
Flags								Root Identifier																							
Root Identifier																															
Root Identifier								Root Path Cost																							
Root Path Cost								Bridge Identifier																							
Bridge Identifier																															
Bridge Identifier								Port Identifier																Message Age							
Message Age								Max Age																Hello Time							
Hello Time								Forward Delay																							



STP Pakete

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Protocol Identifier																Version Id								BPDU Type							
Flags								Root Identifier																							
Root Identifier																															
Root Identifier								Root Path Cost																							
Root Path Cost								Bridge Identifier																							
Bridge Identifier																															
Bridge Identifier								Port Identifier																Message Age							
Message Age								Max Age																Hello Time							
Hello Time								Forward Delay																							

STP Pakete

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Protocol Identifier																Version Id								BPDU Type							
Flags								Root Identifier																							
Root Identifier																															
Root Identifier								Root Path Cost																							
Root Path Cost								Bridge Identifier																							
Bridge Identifier																															
Bridge Identifier								Port Identifier																Message Age							
Message Age								Max Age																Hello Time							
Hello Time								Forward Delay																							

STP Pakete

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Protocol Identifier																Version Id								BPDU Type							
Flags								Root Identifier																							
Root Identifier																															
Root Identifier								Root Path Cost																							
Root Path Cost								Bridge Identifier																							
Bridge Identifier																															
Bridge Identifier								Port Identifier																Message Age							
Message Age								Max Age																Hello Time							
Hello Time								Forward Delay																							



STP Pakete

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Protocol Identifier																Version Id								BPDU Type							
Flags								Root Identifier																							
Root Identifier																															
Root Identifier								Root Path Cost																							
Root Path Cost								Bridge Identifier																							
Bridge Identifier																															
Bridge Identifier								Port Identifier																Message Age							
Message Age								Max Age																Hello Time							
Hello Time								Forward Delay																							



- ▶ Struktur & Funktionsweise
- ▶ Probleme
- ▶ Fehlerkorrektur
- ▶ Darstellung

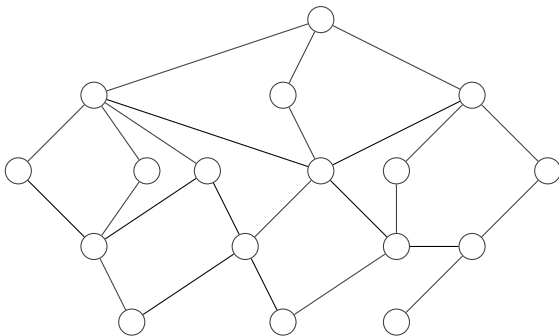


STP Pakete

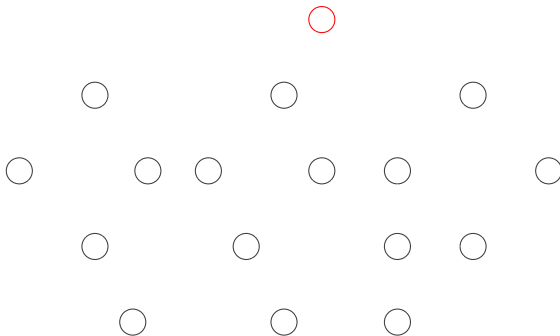
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Protocol Identifier																Version Id								BPDU Type							
Flags								Root Identifier																							
Root Identifier																															
Root Identifier								Root Path Cost																							
Root Path Cost								Bridge Identifier																							
Bridge Identifier																															
Bridge Identifier								Port Identifier																Message Age							
Message Age								Max Age																Hello Time							
Hello Time								Forward Delay																							



Visualisierung



Visualisierung



Visualisierung

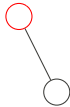


Alexander Schlögl

STPViz

10

Visualisierung

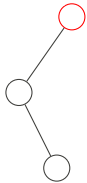


Alexander Schlögl

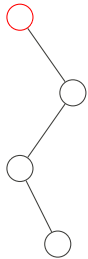
STPViz

10

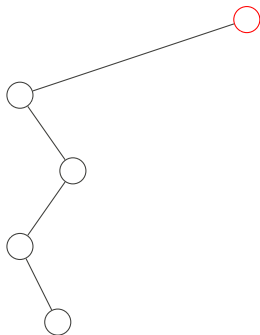
Visualisierung



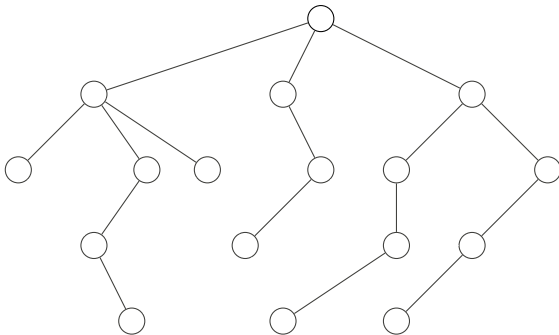
Visualisierung



Visualisierung



Visualisierung



Software-Switch

- ▶ Grund
- ▶ Funktionsweise
- ▶ Grenzen & Beschränkungen



Testing

- ▶ Setup
- ▶ Physisches Setup
- ▶ Tests
- ▶ Resultate



Zusammenfassung und Ausblick

- ▶ STPViz Fähigkeiten
- ▶ STPViz Grenzen
- ▶ Software-Switch
- ▶ Sonstige Dinge (OpenWrt, dd-wrt)



Message

Ich hätte gerne, dass Zuseher folgendes mit nach Hause nehmen:

- ▶ Information aus STP zu extrahieren ist schwer, da es nur lokales Wissen benutzt.
- ▶ Wir haben es trotzdem geschafft (nur halt nicht mit maximaler Informationsdichte).
- ▶ Es gibt nicht viele Use Cases, aber es gibt sie.
- ▶ STPViz ist eine gute Grundlage für weitere Arbeiten.

