

WHY IS IT SO HARD TO DEPLOY IPV6?

RIPE80, IPv6 Working Group

WILHELM BOEDDINGHAUS

Deploying IPv6 since 2008

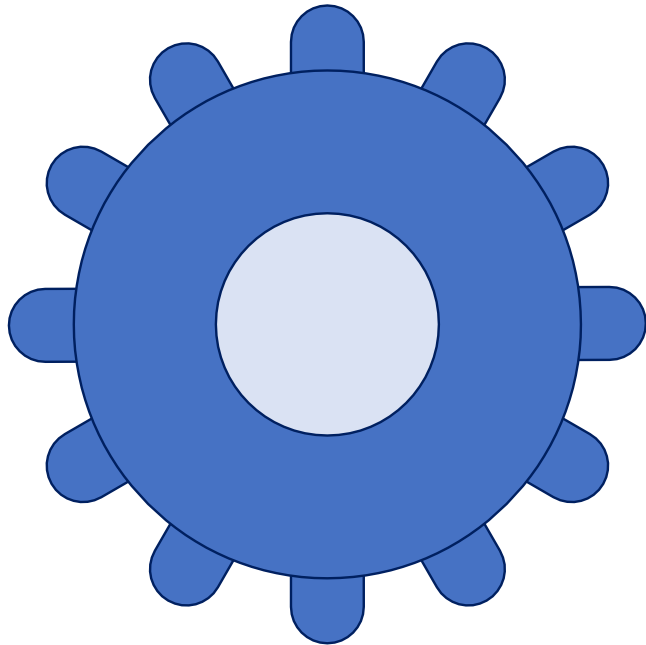
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Member of German IPv6 Council

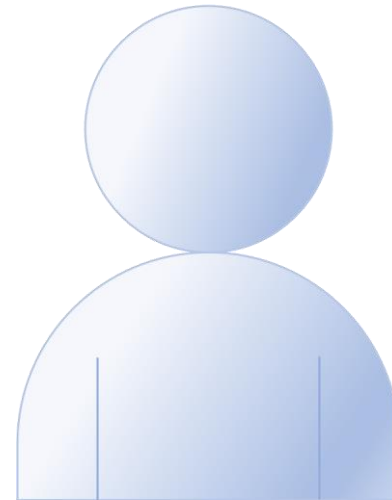
First RIPE Meeting: RIPE56 in Berlin

WHY IS IT SO HARD TO DEPLOY IPV6?

Technology



People



TECHNOLOGY

IPv6 on Routers: ✓

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IPv6 on Routers: ✓

IPv6 on Firewalls: ?

IPV6 ON FIREWALLS

Example: Handling of ICMPv6 Type 3, Time Exceeded

Code 0: Hop Limit = 0

Code 1: Fragment reassembly timeout

\$Firewall_Vendor:

CLI: two separate ICMPv6 codes

GUI: Code 1 = subcodes of Code 0 (which is wrong)

TECHNOLOGY

IPv6 on Routers: ✓

IPv6 on Firewalls: ?

IPv6 and Switches: ?

SWITCHES

Ask your customer: Name the switch-vendors you use in your network.

The usual suspects :

Cisco, Brocade / Extreme, Juniper, Arista, Huawei, HP, etc.

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They don't mention:

Linux Switching (Bridge, OVS, etc.)

VMware

THIS SERVER IS MINE

The server administrators configure the virtual switches

Why?

My box is my responsibility.

No split between hypervisor and network

This is not a technical issue

THIS SERVER IS MINE

Ask for:

IPv6 first hop security

Consistent Spanning Tree design

VLAN Access Lists

Filtering on Ethertype

Monitoring per Port (IPv6, IPv4, Packet size, etc.)

Netflow Data from virtual Routers

PEOPLE

Some want to innovate, some want to keep the Status Quo

Some want to learn, some already know everything

Little kingdoms in an organisation have a king

you are a threat to this little kings

Everything new is dangerous

No, you are not going to implement IPv6 in my network!

THE GOOD GUYS

They try to innovate, they want IPv6 in their organisation

Where to start?

Procurement: RIPE 554, Publication date: 04 Jun 2012

Security: RFC 4890, Filtering ICMPv6, Publication date: May 2007

We have a lot of good documents to start with, but many are old.

IPv6 RFC Finder: <https://www.system.de/ipv6-rfc/>

MANAGEMENT

Project Title: Implement Dualstack

That means:

- No IPv6 only networks (Out of Scope)

- No new network design (Microsegments)

- Double [Logfiles | Firewall Rules | Monitoring]

This means „evolution“, not „revolution“

SUMMARY

When you experience:

Old Documents

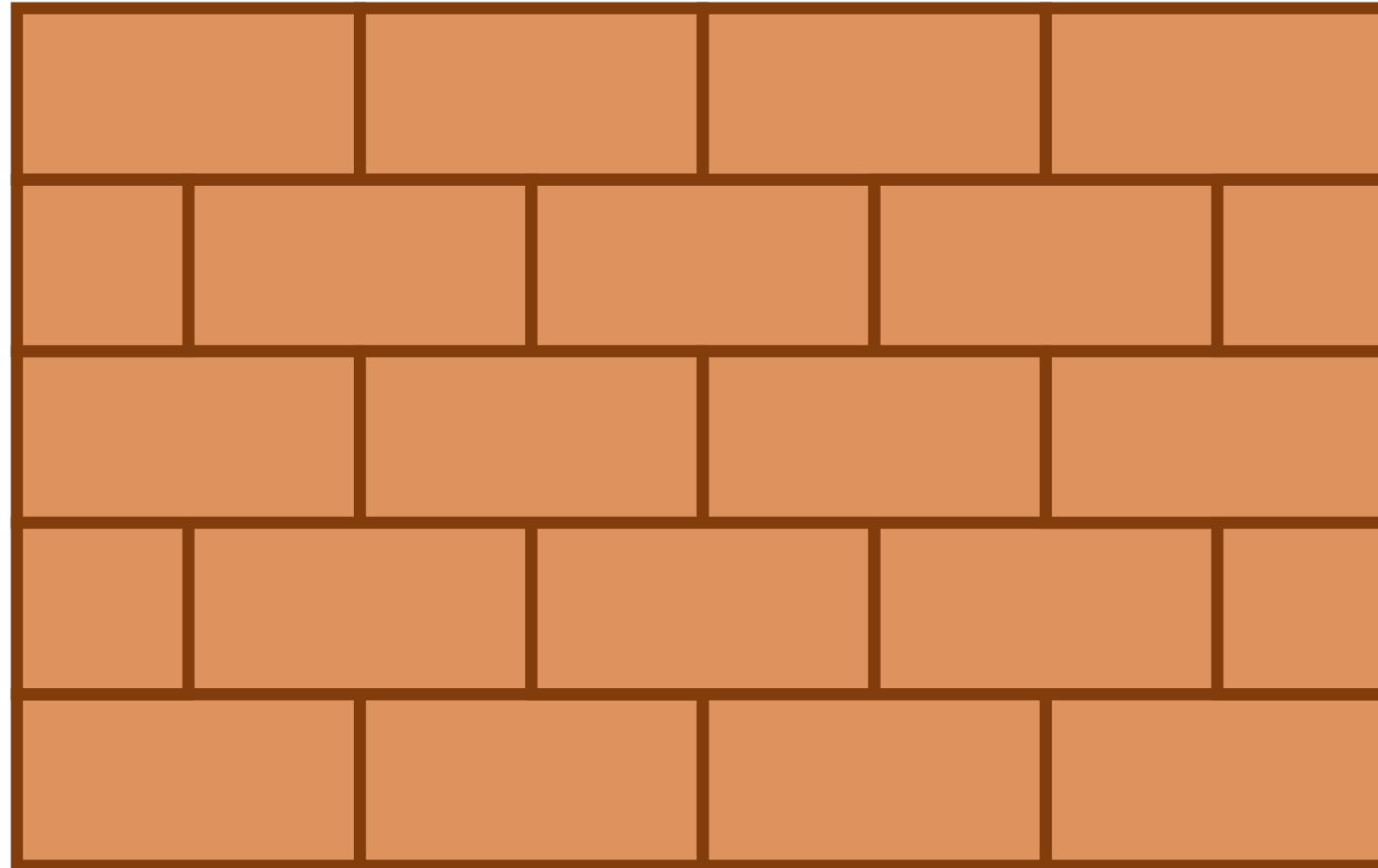
Little Kingdoms

Wrong Project Title

Wrong people doing networking

Vendors not implementing IPv6 correctly

IT IS HARD TO IMPLEMENT IPV6



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