Webhosting on IPv6-only Virtual Machines

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Webhosting for small to medium sized websites

Model	Separation	Security	File access	Shell	Webserver	Database	php
old	nameVirtual Host	suexec	ftp (chroot)	no	shared	shared	shared

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old	nameVirtual Host	suexec	ftp (chroot)	no	shared	shared	shared
new	jail	jail	ftp, scp	root	own	own	own

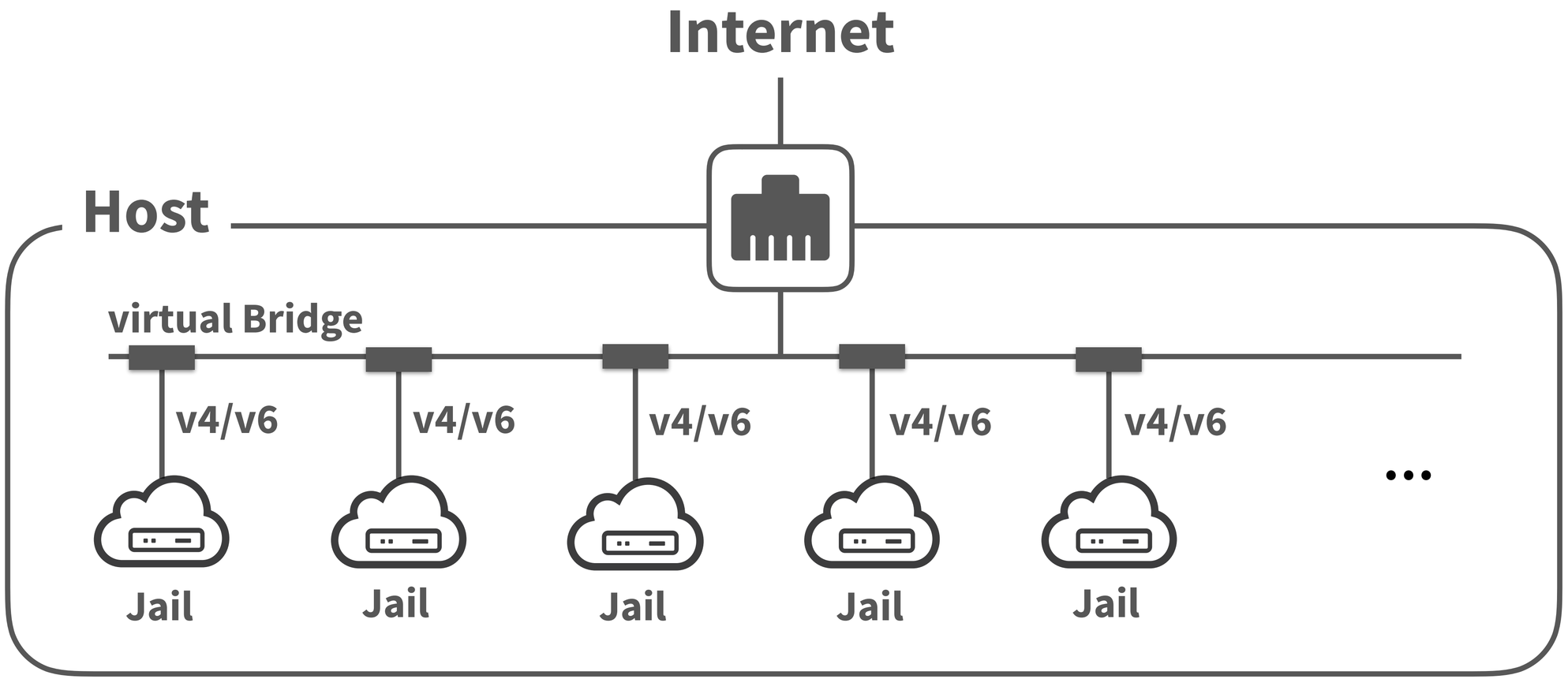
FreeBSD jails

- Jails are lightweight virtual machines
- Extension of chroot model: partition not only file system but also process table, network- and IPC-stack etc.

We use jails combined with ZFS datasets

- System environment on r/o mount from host
- Application environment on r/o mount from blueprint
- Configuration defaults copied from blueprint to r/w dataset
- r/w dataset for application data and software

Jail hosting – version 1



SSL

“dehydrated” script running in each jail to aquire SSL certificates from “Let's Encrypt”

IP Address requirement

old model: one address shared by all websites on one physical machine

new model: one address per website

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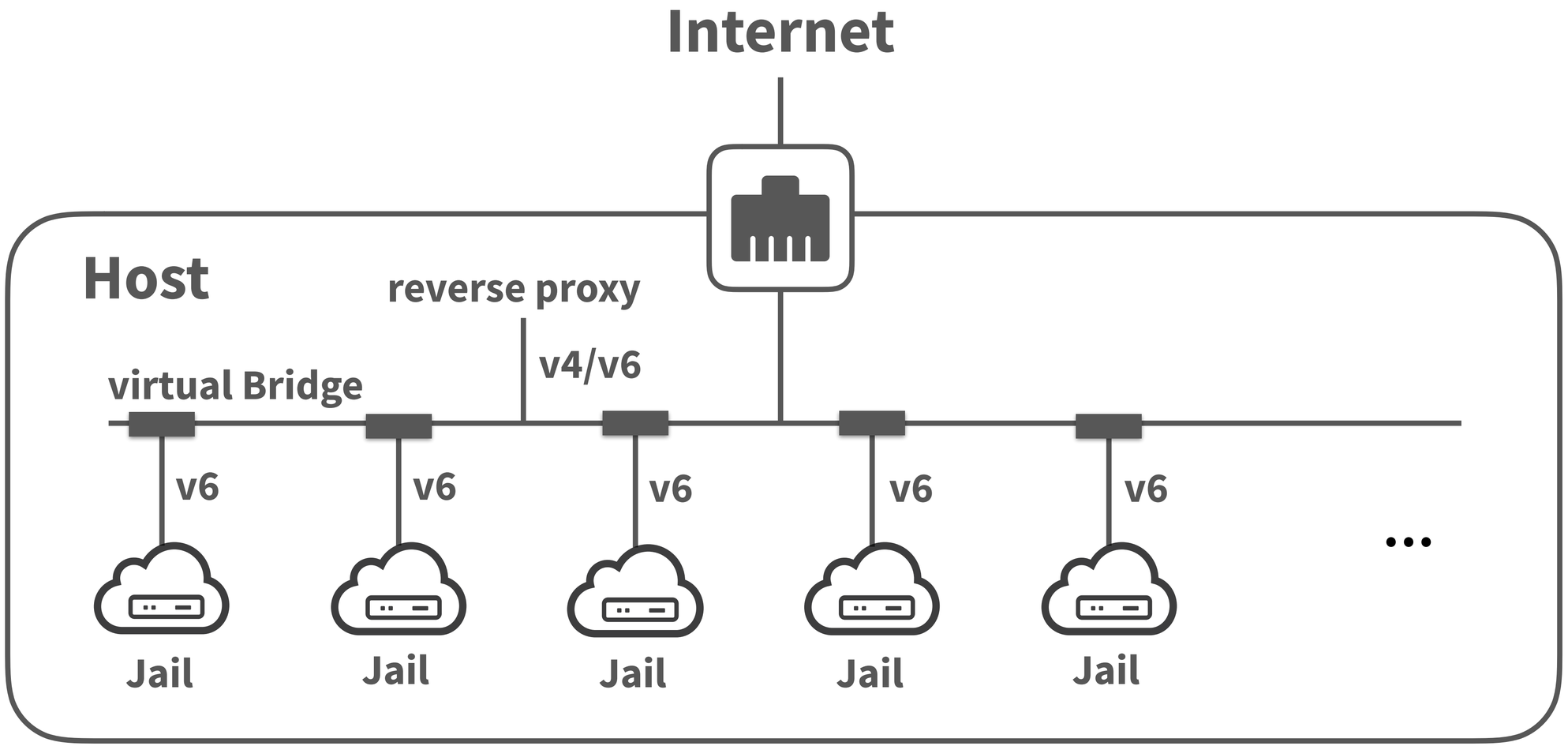
AS16188 address space

IPv4: 1 x /20, 1 x (final) /22
-> 5120 addresses

IPv6: 1 x /32
-> 79228162514264337593543950336 addresses

Jail hosting – version 2



First implementation for “nextcloud” hosting

- Application pre-installed
- Customer interacts per https only

SSL

- “dehydrated” script running on host only
- host has r/w access of jail dataset to provision certificate and key
- v4 SSL termination on host, proxy to v6 http on jail

At time of implementation, “Let's encrypt” would send challenges on IPv4 if signing request was by IPv4.

Problem

- Applications sends mail to users
- Some users don't have IPv6 on mailserver

Solution

- Use host system as outgoing mail relay

Problem

- “nextcloud” plugin repository is IPv4 only

Solution (kind of)

- disable plugin installation by customer

Problem

- Let’s encrypt now sends challenge on IPv6

Tried

- run “dehydrated” in jail

-> failed: “dehydrated” does not work on IPv6-only

Solution

- reverse proxy on jail for challenges, going to host IPv6

Problem

- Some webdav clients fail because of SSL termination on host

Solution (probably)

- proxy to https on jail instead of http

Outlook

For "generic" webhosting we expect more challenges:

- customers with IPv4-only need ssh access
- code repositories (e.g. GitHub, RubyGems, ...) are IPv4-only
- ...

Questions?

Thank you

Further questions: hosting@punkt.de

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