OpenBSD vmm at bsd.network and conference tutorials

Peter Hessler
phessler@openbsd.org

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OpenBSD has a native hypervisor
... development started in 2015
... enabled by default in 6.1 (released in Apr 2017)
bsd.network is a social network connected to the activitypub fediverse owned by me and a friend of mine opened for registrations 2 Jan 2018 1249 users, 405 monthly active, 122,849 statuses, 4243 connections around 30 statuses per hour. has, and enforces, a code of conduct
vmm was chosen because I'm an OpenBSD developer and wanted to dogfood our hypervisor.

... was already using it for my bgp tutorial.

first public production service of vmm(4) in the world.

... to the best of our knowledge.
1 physical server
12x xeon e5 cores, 64G ram, two ssd disks
3 vmm guests
has always been OpenBSD-on-OpenBSD
bsd.network - each guest

- 1 vcpu
- 8G ram
- two nics, one external, one internal
- external interface has public v4 and public v6
- ... all services are dual stack
- external interfaces are bridged together
- ... and to the egress interface
internal interface has private v4 and private v6
... all services are still dual stack
... originally was v6-only, but go is stupid
internal interfaces are bridged together
... and heavily firewalled from the outside world
bsd.network - mastodon

- ruby web app
- ... with a nodejs service
- uses sidekiq as a queue runner
very cpu heavy
fork heavy
ruby isn’t too terrible
but nodejs is a trashfire
... npm makes me consider never using electricity again
- originally ran all services on a single vmm guest
- was alright until around 400 user accounts
- grew to 3 VMs
- ... web front end
- ... databases
- ... queue runners and media server (mostly developers artwork)
since June 2017 I teach a tutorial on BGP
... intended for non-experts
(happening on Thursday, wink wink)
just talking isn’t very interesting
... I wanted labs
connecting networks together is the entire point
simple home labs are insufficient
connect all of the students together
... real tests they can see
... free experimentation with (minimal) consequences
1 Thinkpad t430s
... already owned it
... 16G of ram
... very silly things with disks
each student gets two VM guests
1 vcpu, 192M ram, small disk
side-left and side-right
... interfaces are bridged together
side-right is also connected to a shared LAN
each guest runs openbsd
... acts as a BGP router
pre-configured in simple ways
... students are expected to grow the configuration through the class
side-right is connected to everyone
... started with only connected to a router I control
they add connections to other students throughout the lab sessions
1 vcpu, 512M ram, slightly larger disk

first router they connect to
5 teaching VMs
... one central router
... two teacher routers
... two attacker routers
2x VMs per student
max of 30 people per class
up to 65 guests
at the time, largest single system deployment of vmm(4)
ttyd
web accessible terminals
... connects to each guest and re-attaches to a tmux session
each student does the lab work from a web page
... contains two terminals they can type into
... reminders of their Internet Numbers for doing BGP things
students only need a web browser on the correct wifi