Why I prefer thick jails over thin jails

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Disclaimer

- Don’t do what I’m doing just because I’m doing it
- It’s right for me - now
- Needs change over time
- Use this talk as catalyst for thoughts about your systems
Terminology

- host - a FreeBSD install
- jail - a VM on a host
What are jails?

- FreeBSD 4.x (2000)
- Poul-Henning Kamp
- simple explanation: simple chroot
- security by isolating stuff
- jails can’t see into host/other jails
- good for trying new stuff/isolating stuff
thick jails

- traditional jail
- complete OS installed
- manage it, more or less, like a host
- not a clone of another system
- zfs copy - OK
- zfs clone - no
thin jails

- a jail which is not thick
- ezjail - basejail - the base OS is supplied via a nullfs mount
- created via `zfs clone`
- jails designed to run exactly one application
jail managers

• There are a few, but I have used only two
ezjail

• first released 2005-10-14
• I used ezjail since at least 2008
• thin jail
• basejail shared by all jails
• update basejail: all your jails are now updated
• but not quite....
iocage

- Added to FreeBSD ports tree in 2014
- I’ve used it since at least 2015
- thick jails
- can use clones… sort of thin
- originally written as a shell script
- now in Python
Why did I convert?

- outdated jails (my fault) - no mergemaster
- upgrade the basejail, upgrade ALL the jails
- can easily mix jail versions (e.g. 11.3 and 12.0)
- disk space
Why should you convert?

- clones are good for short-lived jails
- Don’t upgrade clones to next release - space penalty
- can run `freebsd-update` from inside jail (not recommended if using a jail manager)
- disk space
The script

- converted from ezjail to iocage in mid-2019
- https://github.com/dlangille/thin_to_thick
- replaces basejail with jail (proper)
- “This tool is designed to allow you to copy an existing thin jail into a thick jail, ignoring the bits provided by the basejail.”
- specific to ezjail-base jails, but easily modified
**Typical ezjail basejail**

```bash
$ ls -l /usr/jails/newjail
total 203
basejail
bin    -> /basejail/bin
boot   -> /basejail/boot
lib    -> /basejail/lib
libexec -> /basejail/libexec
rescue -> /basejail/rescue
sbin   -> /basejail/sbin
sys    -> usr/src/sys
```
The steps

• iocage create --thickjail -r 12.0-RELEASE -n myjail

• set config for new iocage jail: hostname, IP address, etc

• zfs snapshot -r system/iocage/jails/myjail@clean

• ezjail-admin stop myjail

• thin_to_thick.sh /usr/jails/newjail \ 
  /usr/jails/myjail/ \ 
  /iocage/jails/myjail/root

• iocage start myjail
Post conversion

- ezjail-admin config -r norun myjail
- iocage set boot=on myjail
Thick is for you!

- You pick and choose when some jails are upgraded
- You want to run jails which are on different versions
- Friends don’t let friends clone jails
Thin is for you!

- Saves space!
- Easy one-step upgrade of all jails
- `rc.d`? Who needs that!
- I’ll mergemaster them later!
Template jails

- all my jails have a common sub-set of packages
- e.g. sudo, anvil, bash, joe, xtail
- the same /etc/resolv.conf
- the same pkg.conf files
- but I do not use template jails
- Ansible scripts will install what I need, post jail-setup
monitoring tips

- /usr/local/etc/periodic/security/405.pkg-base-audit
  - installed by security/base-audit

- /usr/local/etc/periodic/security/410.pkg-audit
  - installed by ports-mgmt/pkg

- code at https://github.com/dlangille/freebsd-nagios-jail
# for security/405.pkg-base-audit
security_status_baseaudit_enable="YES"
security_status_baseaudit_jails="*"

# for 410.pkg-audit
security_status_pkgaudit_expiry=1

# for many scripts including 405 & 410
pkg_jails='*'

Just say no to jail managers!

- Sometimes the jail manager breaks
- when it does, your jails can go offline
- I first used jails without a jail manager, I can do it again
Always use a jail manager!

- The tasks around managing a jail are tedious and boring
- jail managers will do the `zfs create` (& more) for you!
- You’ll start writing scripts for managing jails
- Let someone else do that!
updating the errant jail

- jail configuration files (inside the jail) are out of date?
- run mergemaster
- but instead of mergemaster....
etcmerge / etcupdate

- run instead of mergemaster
- sysutils/etcmerge
- etcupdate is in base since FreeBSD 10.0
- They both do automatic 3-way merges
How I update my jails

- locage update
- soon to be replaced by freebsd-update
Blame Peter Wemm

- Peter tweeted at me to use plain jails
- I ignored him
- ... for a while
one last thought

• very scary
The dark side: jail.conf

- very tempting
- wonderful use of default values
- some tasks are tedious
- I might write a script
- or two
- and package them
- creating a new jail manager....
Recommended reading

- Michael W Lucas
- FreeBSD Mastery: Jails
jail all the things!

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