# Extreme Containering

## ... and other virtual fun

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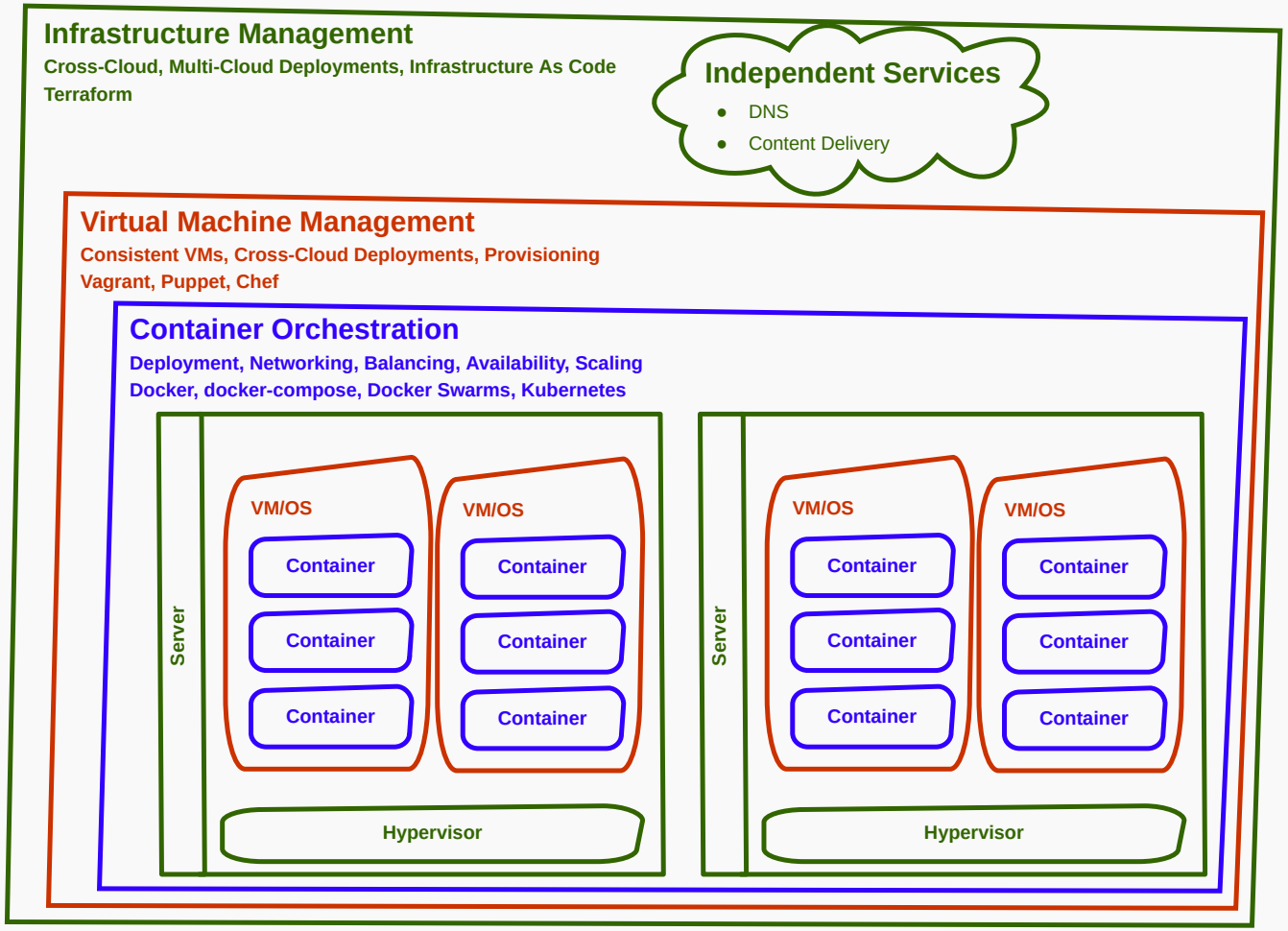
# Agenda

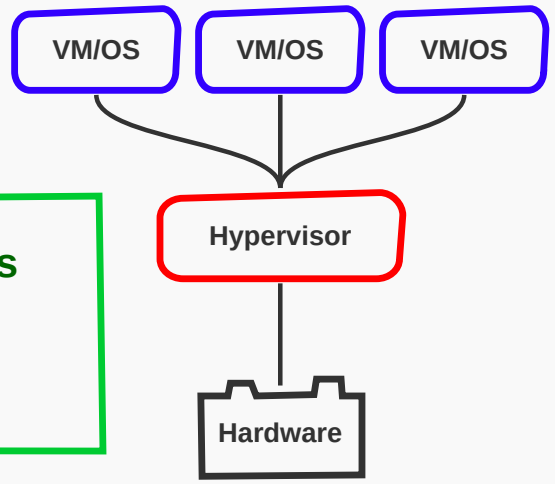
- What's what - Containers, VMs and all that
- Docker
- Chromebook
- Qubes
- WSL
- Beer

# Containers and VMs



# Hypervisors

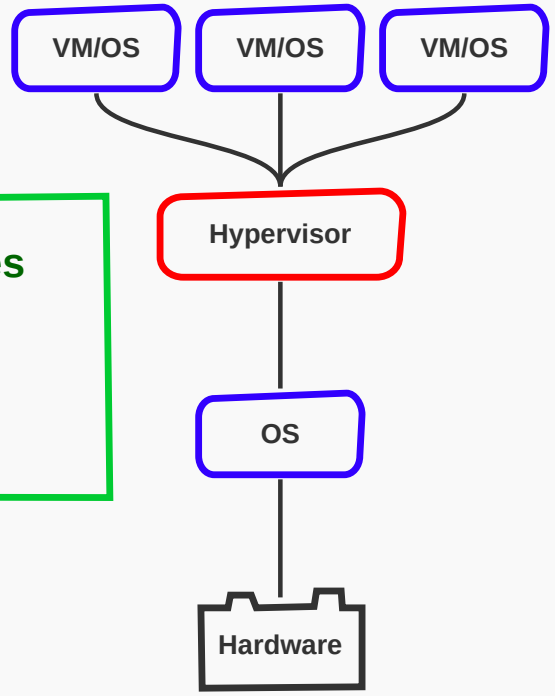
## Type 1 Native Hypervisor




### Type 1 Examples

- Xen
- Hyper-V
- VMWare ESX(i)

## Type 2 Hosted Hypervisor




### Type 2 Examples

- VMWare
- Parallels
- VirtualBox
- QEMU

### A bit complicated

- KVM - can be type 1 or 2
- Hyper-V really is type 1

# Containers (OS-Level Virtualization)

- Origin of the idea: chroot
- Docker
- LXC/LXD
- Many others: Solaris Containers, FreeBSD jail, RKT, etc
- Based on kernel extensions that implement the required separation

# Docker & Co

- Docker: images, containers, volumes, network setups, swarms, etc
- Docker containers are mostly application/process centric, often ephemeral and externally updated
- Docker Hub, Amazon/Azure Container Registry
- docker-compose: container dependencies, scaling
- Kubernetes: advanced orchestration, deployment and scaling
  - Can also use container types other than Docker (CRI-O), including those that use their own hypervisors (Frakti, runV)

# LXC/LXD

- Linux Containers, used to be the basis of Docker functionality
- Two interfaces: `lxc-*` commands (old) and `lxc` command (new, LXD)
- Mostly long-running system containers, multi-purpose
- Sometimes stacked: cloud-hosted virtual system -> LXD container -> Kubernetes -> Inner containers
- Very common -- my phone uses LXC to run Android

# DEMO

## Docker

# Chromebook

- Runs Chrome OS, Linux based operating system
- Chrome (duh)
- Crouton: old-style system to run Linux for devs
- Crostini: new integrated Linux based on VMs and LXC/LXD containers
- Active development efforts underway to improve integration, hardware access, etc

# DEMO

## Chromebook LXC/LXD based Linux

# Qubes OS

- "A reasonably secure operating system"
- Hypervisor: Xen
- Everything is a VM (domain, qube)
- UI/usability integration
- Idea: isolation of technical responsibilities, user activities and data

# DEMO

## Qubes OS

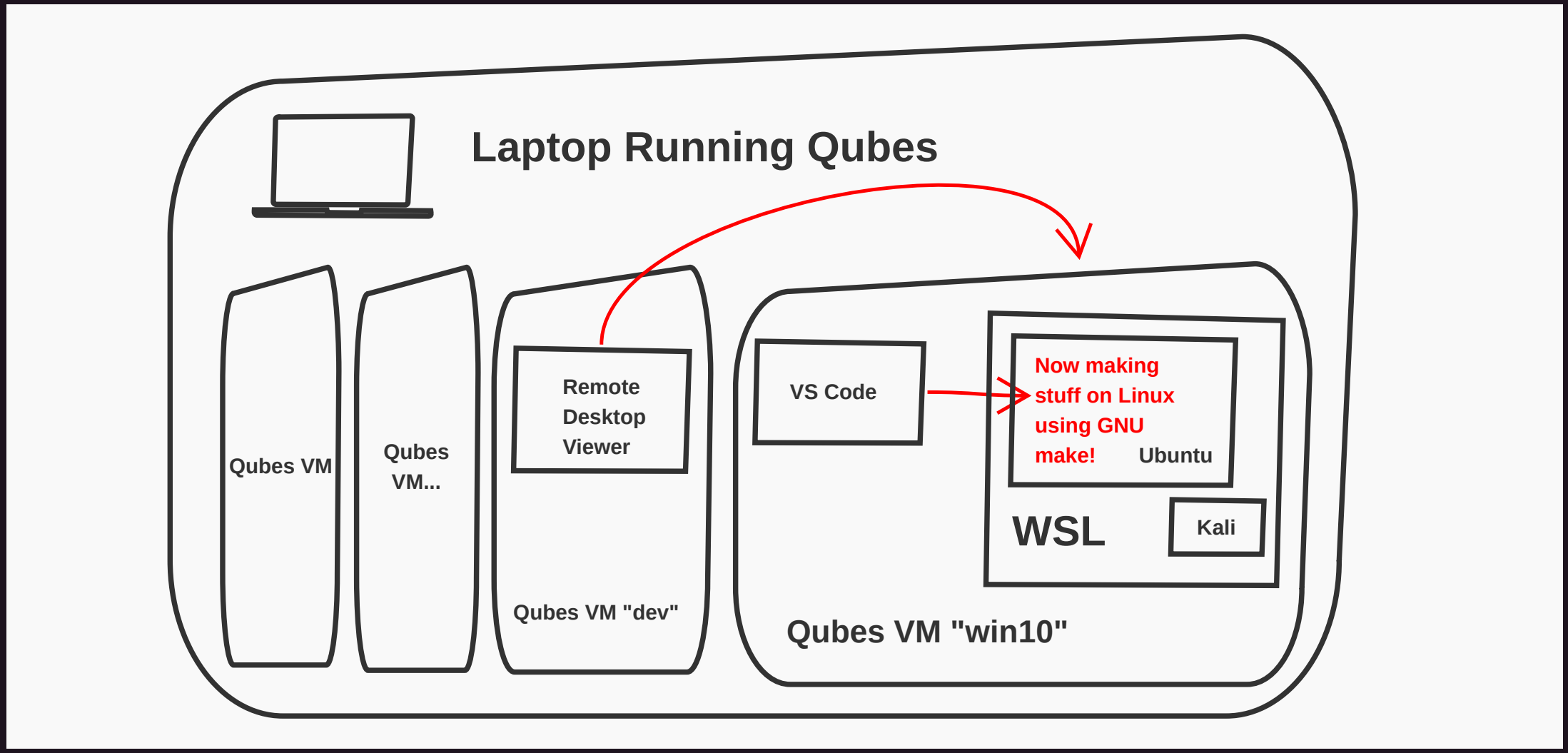
# Windows and WSL

- "Compatibility layer" provided by WSL 1, while WSL 2 uses a "real" (and customized) Linux kernel in a VM
- Runs distros of unmodified Linux binaries, similar to LXC/LXD
  - ... but using their own format, after all it's Microsoft
- Work in progress, similar to Crostini
- Pretty sucky integration compared to Crostini
- Very cool with VS Code though!
  - ... also with Visual Studio 2019, but they seem to target only C++ devs with that.

# DEMO

## WSL

# What just happened?



# Sources

- This presentation:
  - https://oliversturm.github.io/extreme-containering
  - PDF download: https://oliversturm.github.io/extreme-containering/slides.pdf

# Thank You

Please feel free to contact me about the content anytime.

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