

boot your baremetals

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for CoreOS Fest, May 2017

Slides

<https://tinyurl.com/yb6duqre>

The Cloud

- Handles unpredictable growth (scaling)
- Outsources operations and expertise
- Distributes initial costs over time
- Gives us lots of value-added services

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Baremetal (re)boot

The cloud can be...

- slow
- expensive
- constraining

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Baremetal booting

- DHCP
- TFTP
- PXE
- iPXE
- OS images
- OS configuration

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Providers

- dnsmasq
 - DHCP server
 - proxyDHCP server
 - TFTP server
- matchbox
 - iPXE server
 - Configuration templating engine
 - HTTP server
 - Static assets server

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DHCP and proxyDHCP

- Network configuration
- Boot file reference

TFTP and PXE

- PXE
 - TFTP only
- iPXE
 - TFTP bootstrap
 - HTTP service

Configuration: Heart of matchbox

- Wonderful world of the world wide web
 - HTTP
 - TLS
 - Common programming
- Ignition
 - YAML rendering
 - Variable expansion
- Validation
 - TLS
 - Hash signatures

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The Tree

- /var/lib/matchbox
- Primary sections
 - assets/
 - groups/
 - ignition/
 - profiles/
- Others (ignoring for now)
 - cloud/
 - generic/

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Groups (alone)

- Selector (who)
- Metadata (what)
- Profile (where)

```
{
  id: node1,
  name: etcd Node 1,
  profile: etcd3,
  selector: {
    mac: 84:39:be:64:4a:65
  },
  metadata: {
    domain_name: node1.demo.cycore.io,
    etcd_name: node1,
    etcd_initial_cluster: node1=http://node1.demo.
0,node3=http://node3.demo.cycore.io:2380,
    ssh_authorized_keys: [
      ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIC9Nf3sC
      ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIGMt0VwS
    ]
  }
}
```

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Profiles

- Boot Options
- Ignition Template

```
{  
  id: etcd3,  
  name: etcd3,  
  boot: {  
    kernel: /assets/coreos/1353.7.0/coreos_production_pxe.vmlinu  
    initrd: [/assets/coreos/1353.7.0/coreos_production_pxe_image  
    args: [  
      coreos.config.url=http://provision.demo.cycore.io:8080/igr  
      initrd=coreos_production_pxe_image.cpio.gz,  
      coreos.first_boot=yes,  
      console=tty0,  
      console=ttyS0,  
      coreos.autologin  
    ]  
  },  
  ignition_id: etcd3.yaml  
}
```

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Assets

- Free-form
- Static files
- Automatic hash generation

```
demo@matchbox /v/l/m/assets> ls -R
```

```
..:
```

```
coreos/
```

```
./coreos:
```

```
1298.7.0/ 1353.7.0/
```

```
./coreos/1298.7.0:
```

```
CoreOS_Image_Signing_Key.asc
```

```
coreos_production_image.bin.bz2
```

```
coreos_production_image.bin.bz2.sig
```

```
coreos_production_pxe.vmlinuz
```

```
coreos_production_pxe.vml
```

```
coreos_production_pxe_image
```

```
coreos_production_pxe_image
```

```
./coreos/1353.7.0:
```

```
CoreOS_Image_Signing_Key.asc
```

```
coreos_production_image.bin.bz2
```

```
coreos_production_image.bin.bz2.sig
```

```
coreos_production_pxe.vmlinuz
```

```
coreos_production_pxe.vml
```

```
coreos_production_pxe_image
```

```
coreos_production_pxe_image
```

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Ignition

- Human-compatible YAML
- Variable substitution
- Golang templating syntax
 - Conditionals
 - Iterators
 - Nested structures

```
--
systemd:
  units:
    - name: etcd-member.service
      enable: true
      dropins:
        - name: 40-etcd-cluster.conf
          contents: |
            [Service]
            Environment="ETCD_IMAGE_TAG=v3.1.6"
            Environment="ETCD_NAME={{.etcd_name}}"
            Environment="ETCD_ADVERTISE_CLIENT_URLS=http://{{
            Environment="ETCD_INITIAL_ADVERTISE_PEER_URLS=htt
            Environment="ETCD_LISTEN_CLIENT_URLS=http://0.0.0
            Environment="ETCD_LISTEN_PEER_URLS=http://0.0.0.0
            Environment="ETCD_INITIAL_CLUSTER={{.etcd_initial
            Environment="ETCD_STRICT_RECONFIG_CHECK=true"
        - name: locksmithd.service
          dropins:
            - name: 40-etcd-lock.conf
              contents: |
                [Service]
                Environment="REBOOT_STRATEGY=etcd-lock"

    {{ if index . "ssh_authorized_keys" }}

```

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Live Demo

(and Exploration)!

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Resources

Demo files:

<https://github.com/CyCoreSystems/coreos-fest-2017>

matchbox, its examples, and dnsmasq packaging and examples:

<https://github.com/coreos/matchbox>

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