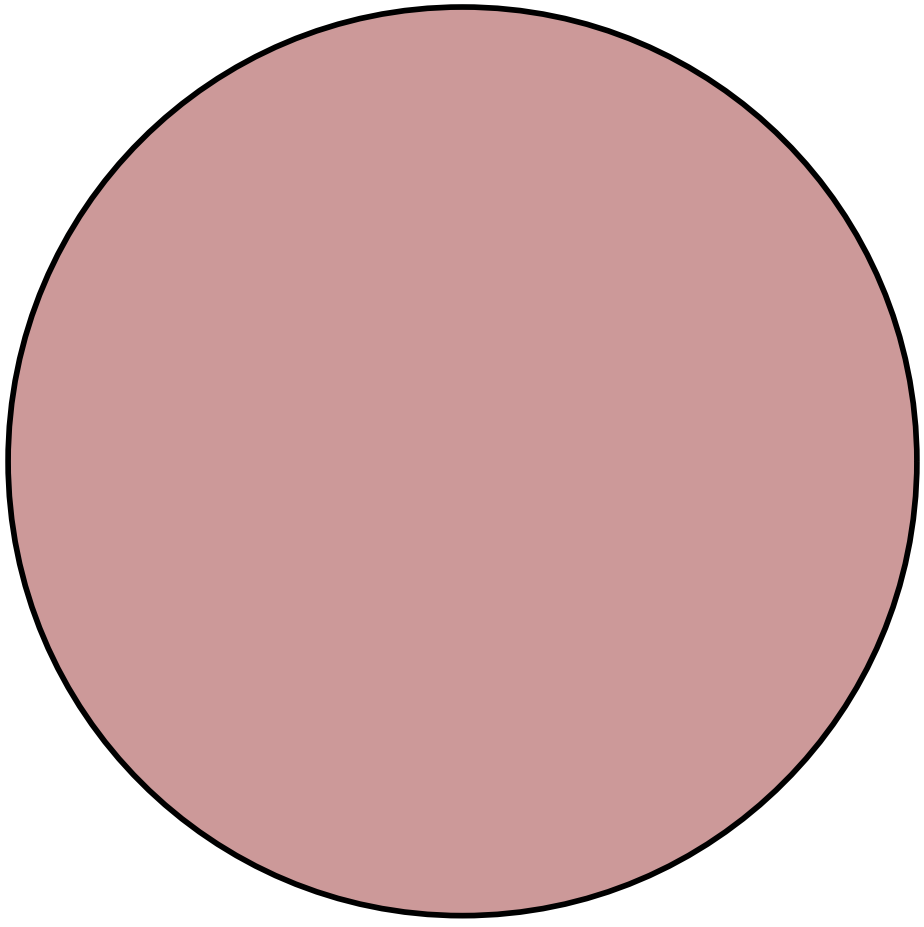
Introduction to Infrastructure as Code

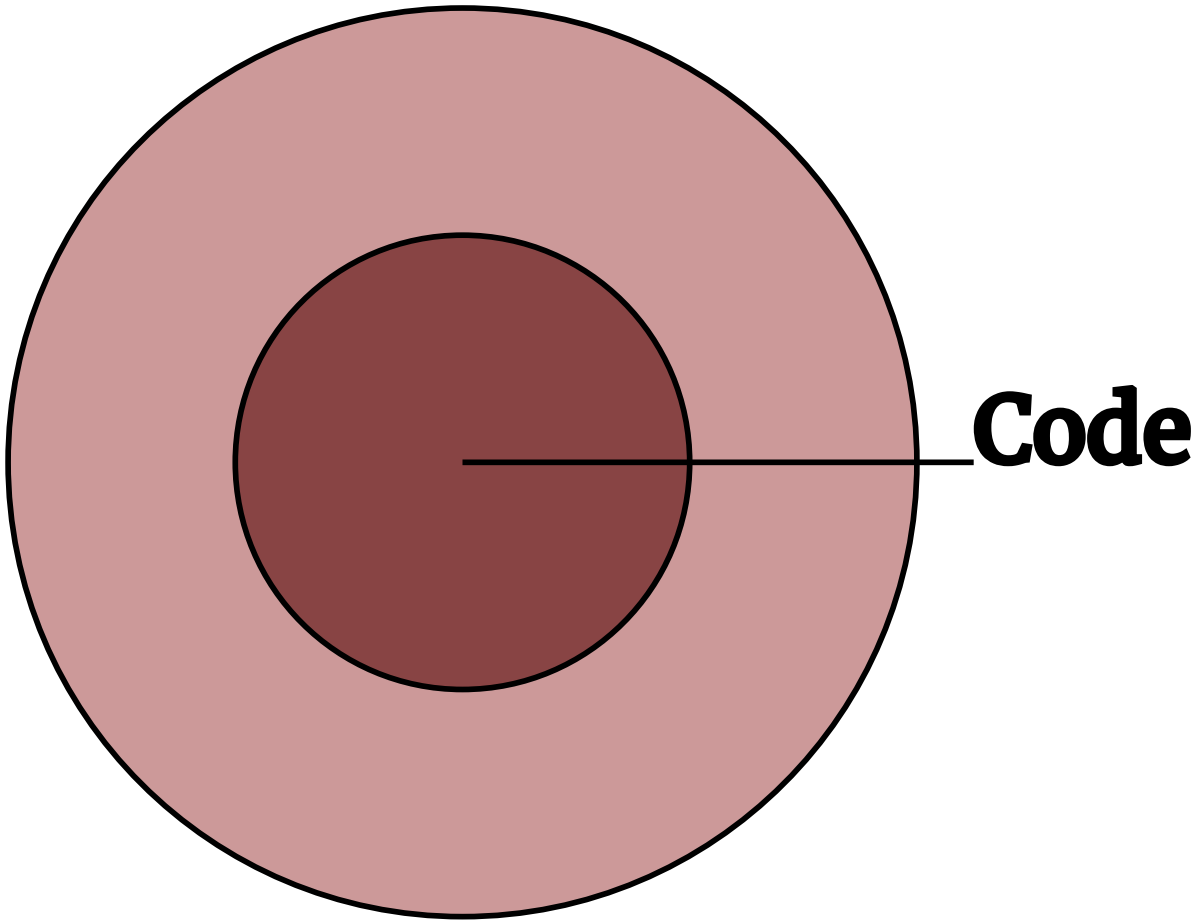
Simon Arneaud

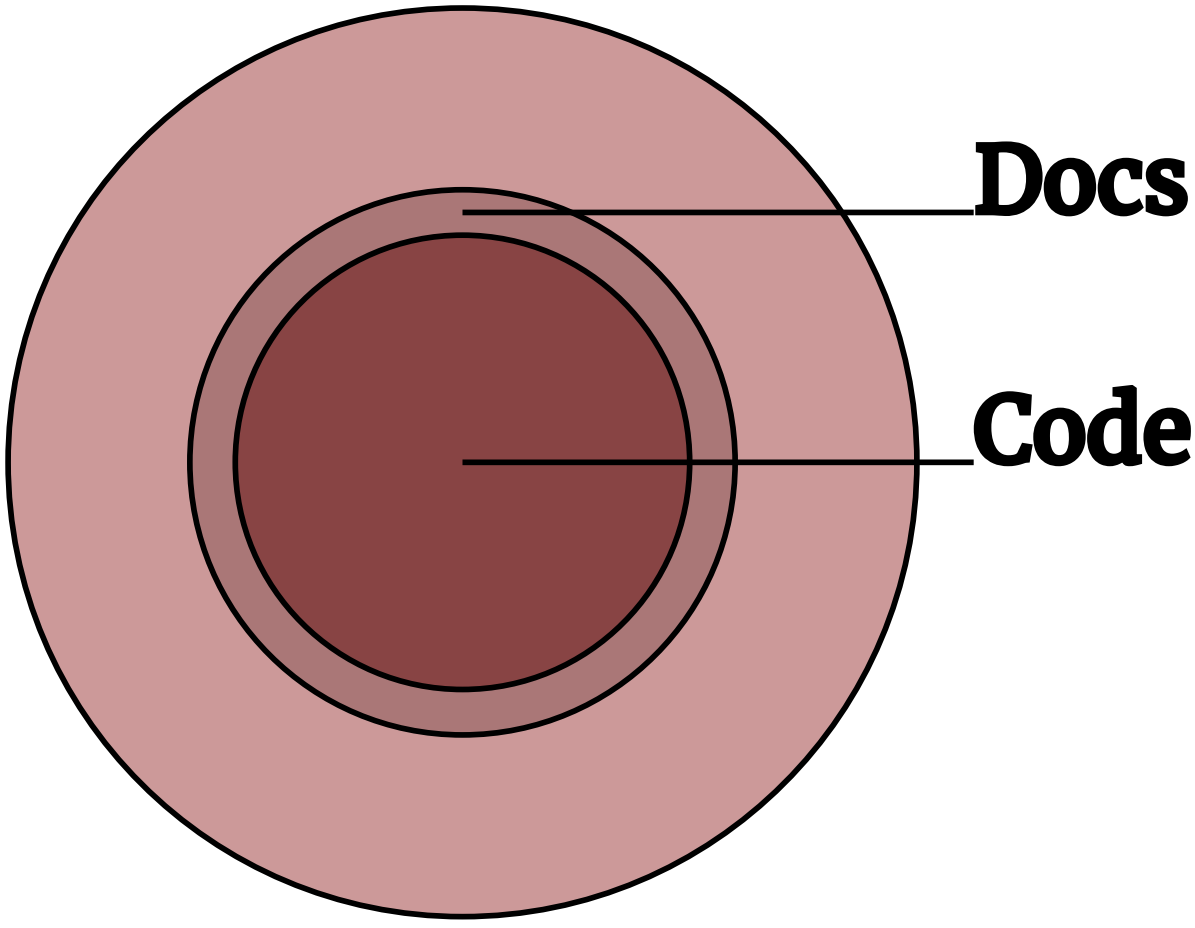
https://theartofmachinery.com/

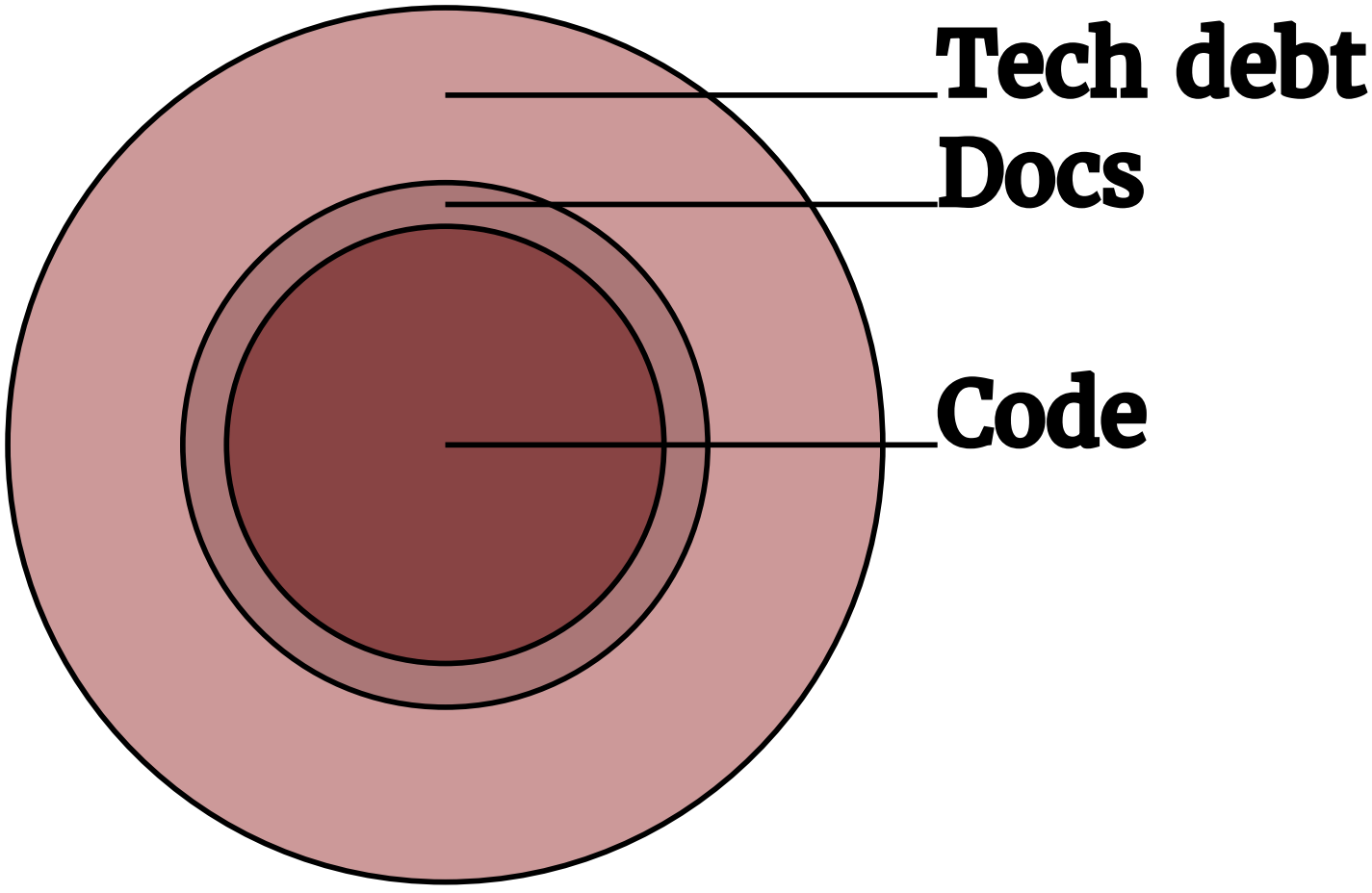
A new dev wants to deploy your app

What's needed to make your app go?




Code


Docs
Code


Tech debt
Docs
Code

If it isn't in source control,
it's tech debt

- Package dependencies
- Machine and OS configuration
- Data storage backends
- DNS and networking

Code in source control is fantastic

How does your existing infrastructure management compare?

Code can be commented and
linked to bug reports

Code can be reproduced exactly

Consistent dev/prod environments means more reliable pushes

Code can be reviewed before committing

(Harder to do that with GUIs)

Code can be restored from backup

Code can have a revision history

Code leaves a trail for compliance auditors

Good news!

There are tools for making things into code

Terraform

https://www.terraform.io/

Especially good for hardware infrastructure

- VMs
- VPC networking
- DNS
- Hosted databases
- Storage buckets

```
resource "aws_instance" "dashboard" {
  ami                         = "${var.my_fav_ami}"
  instance_type               = "t2.micro"
  subnet_id                   = "${aws_subnet.tools.id}"
  associate_public_ip_address = true

  vpc_security_group_ids = [
    "${aws_security_group.tools.id}",
  ]
}

resource "aws_route53_record" "dashboard_sarn_tech_a" {
  zone_id = "${aws_route53_zone.sarn_tech.zone_id}"
  name    = "dashboard.sarn.tech."
  type    = "A"
  ttl     = 86400
  records = ["${aws_instance.dashboard.public_ip}"]
}
```

But Terraform can do even more!

- Kubernetes
- Github, Gitlab
- TLS (SSL certs)
- Vault

https://www.terraform.io/docs/providers/index.html

Terraform isn't so good
at configuring machines

But there are other tools that are good at that:

- Puppet
- Ansible
- SaltStack

Ansible isn't the most scalable,
but it's powerful and easy to use

https://www.ansible.com/

If you

- can SSH into it, and
- have step-by-step installation instructions

You can make a YAML Ansible playbook

```
- name: Install system services
  yum:
    name:
      - cronie
      - ntp

- name: Enable cron service
  systemd:
    name: crond
    state: started
    enabled: true

- name: Create /root/bin directory
  file:
    name: /root/bin
    state: directory
    mode: 0755
```

Ansible has modules for

- Basic file operations
- Templated configuration
- Managing TLS certs/keys
- Configuring cron jobs
- Running commands
- Working with source control repos

And many, many more:

https://docs.ansible.com/ansible/latest/modules/modules_by_category.html

Or build a portable image/container

- Docker (containers)
- Packer (disk images)

Container images need a runtime system.

Disk images are slow to start
but can run directly on a machine.

```
FROM debian:7.11-slim

RUN apt-get update && apt-get -y install git unzip

ADD bosh-cli-* /usr/local/bin/bosh
RUN chmod +x /usr/local/bin/bosh
```

Questions?

Simon Arneaud

https://theartofmachinery.com/

enquiries@taom.systems