AGILE ON THE BEACH

Moving beyond spaghetti infrastructure

Rethinking the infrastructure delivery lifecycle

July, 2024

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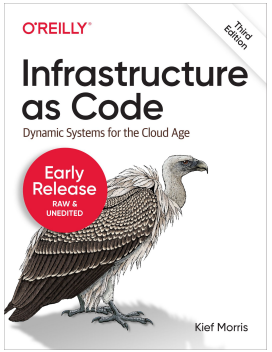
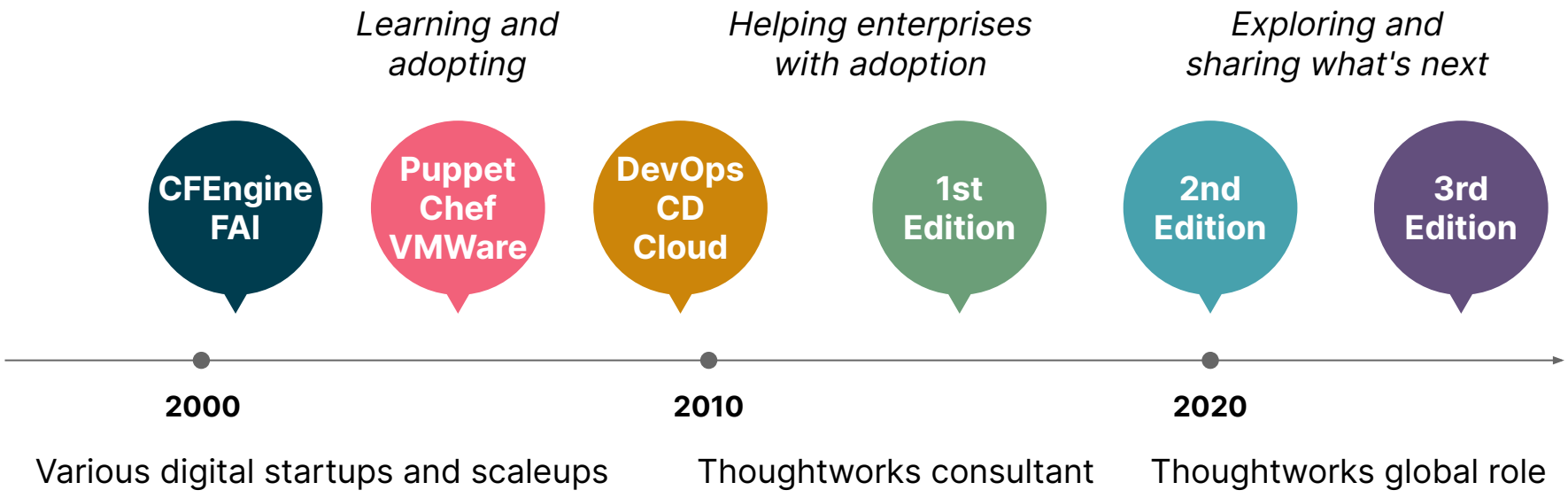
Global Infrastructure Practice Lead

thoughtworks



My journey


Learning and adopting
Helping enterprises with adoption
Exploring and sharing what's next
CFEngine FAI
Puppet Chef VMWare
DevOps CD Cloud
1st Edition
2nd Edition
3rd Edition
2000
2010
2020
Various digital startups and scaleups
Thoughtworks consultant
Thoughtworks global role

Our infrastructure codebases are spaghetti

Problems with infrastructure

- Too much **custom** work
- **Blocker** rather than enabler
- **Costs** not well-aligned
- Lack of **confidence**
- **Legacy** accumulates

Goals

- **Share** more infrastructure code
- **Empower** teams
- Build **governance** in
- Lower the cost of **scaling**
- **Continuously** reduce legacy

How?

Rethink infrastructure code **architecture**

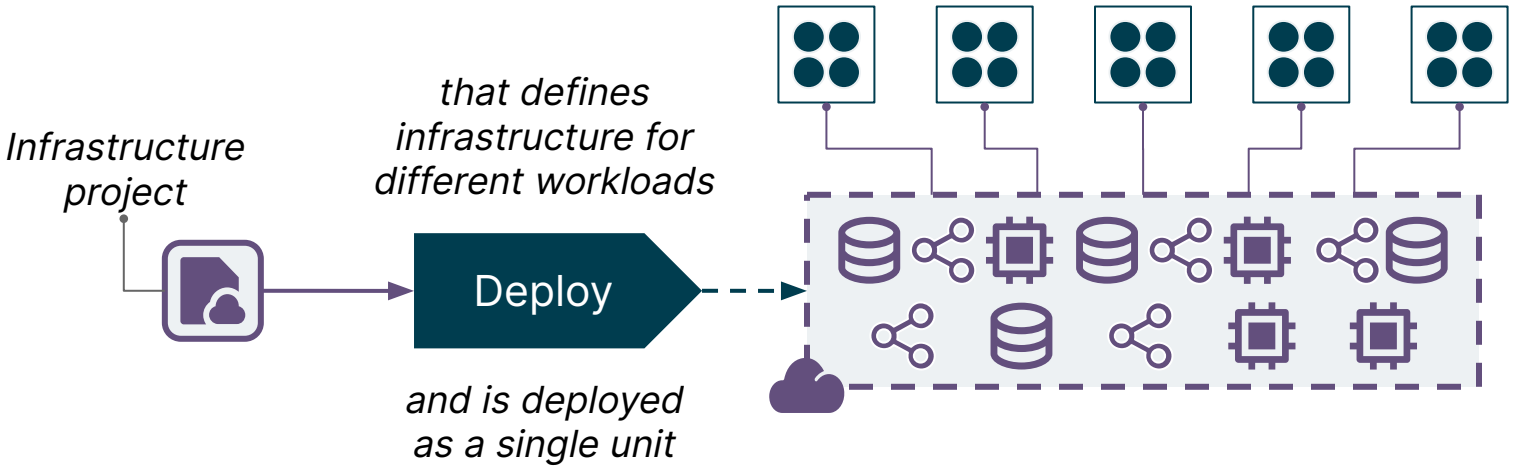
Rethink infrastructure code **delivery**

Rethink infrastructure code **deployment**

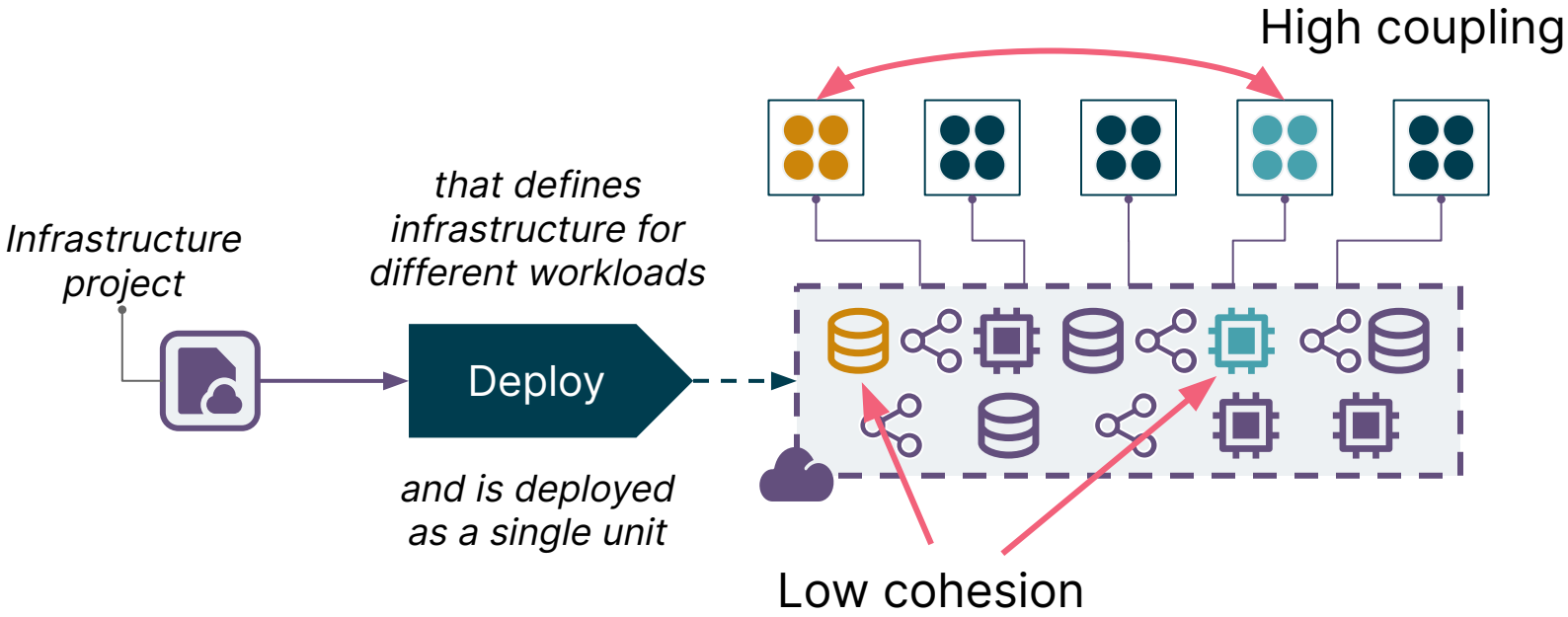
Rethinking infrastructure code architecture

Beyond monolithic infrastructure deployments

What is an infrastructure monolith?



What is an infrastructure monolith?



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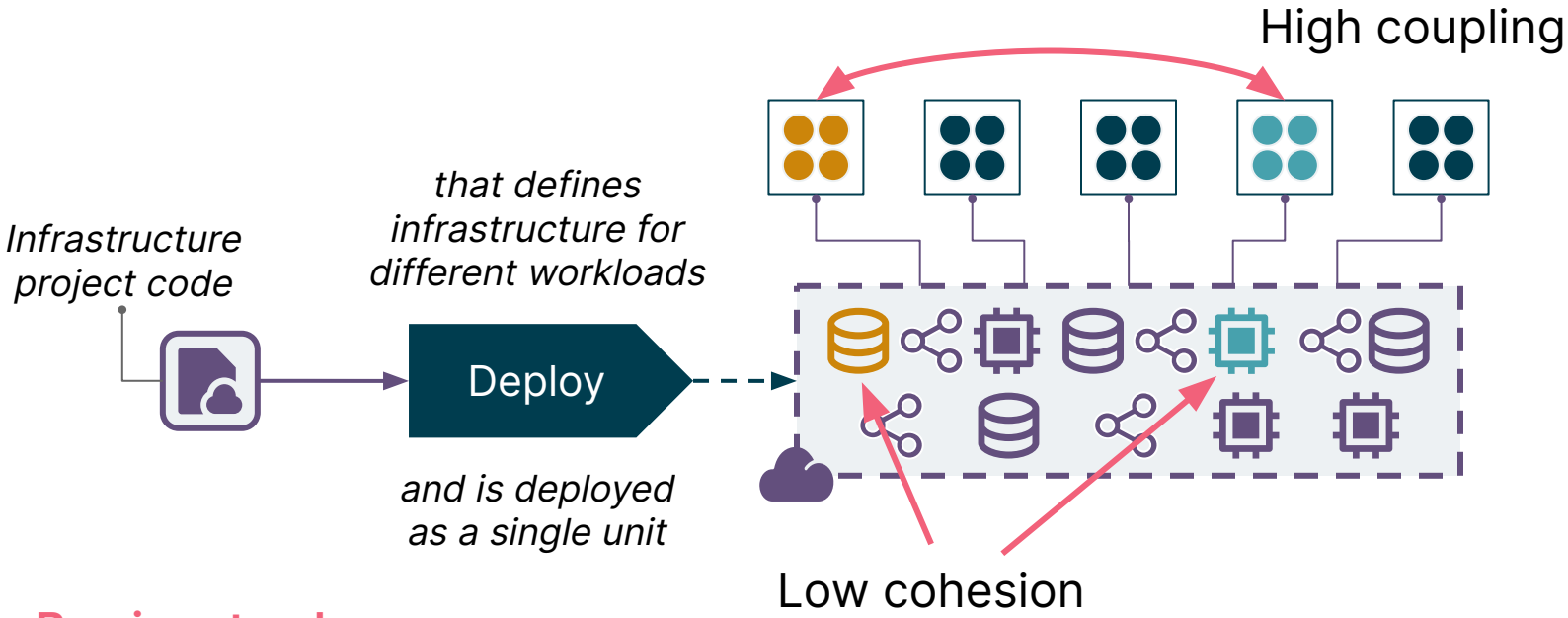
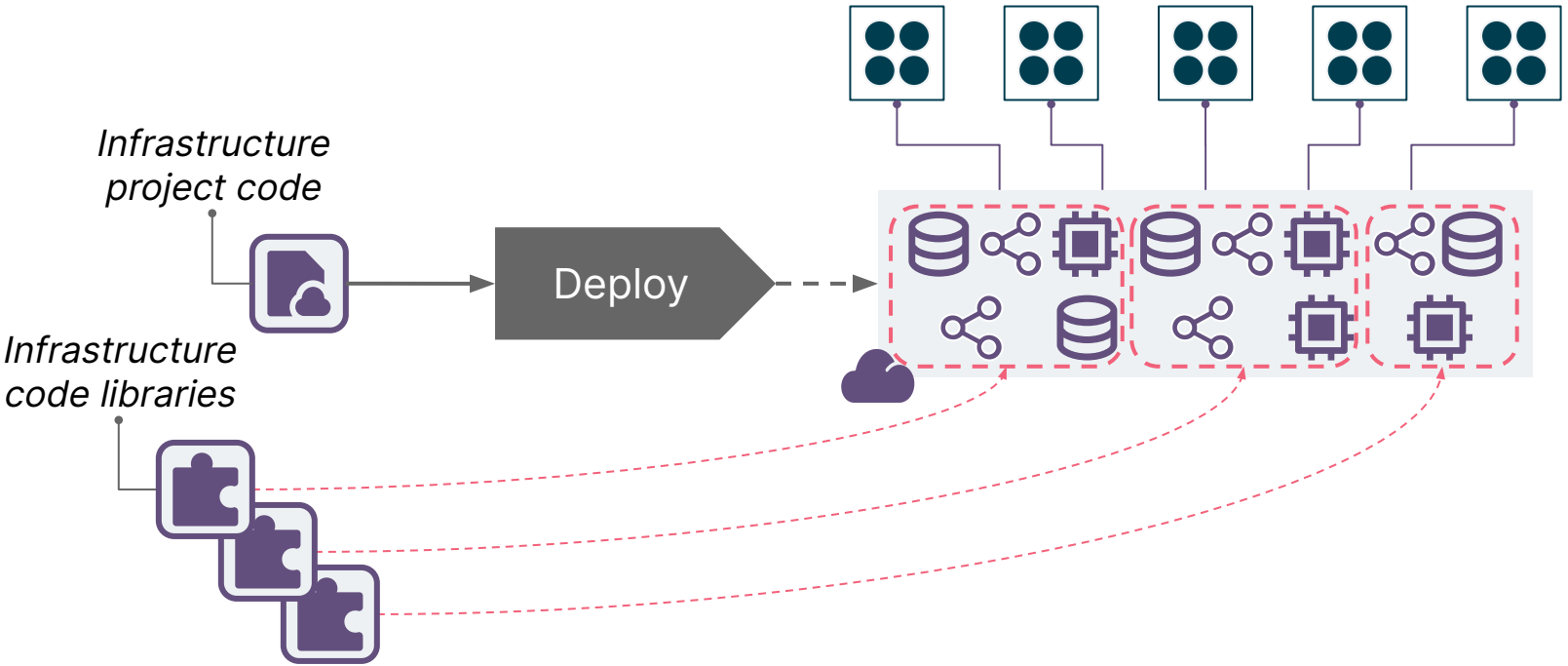


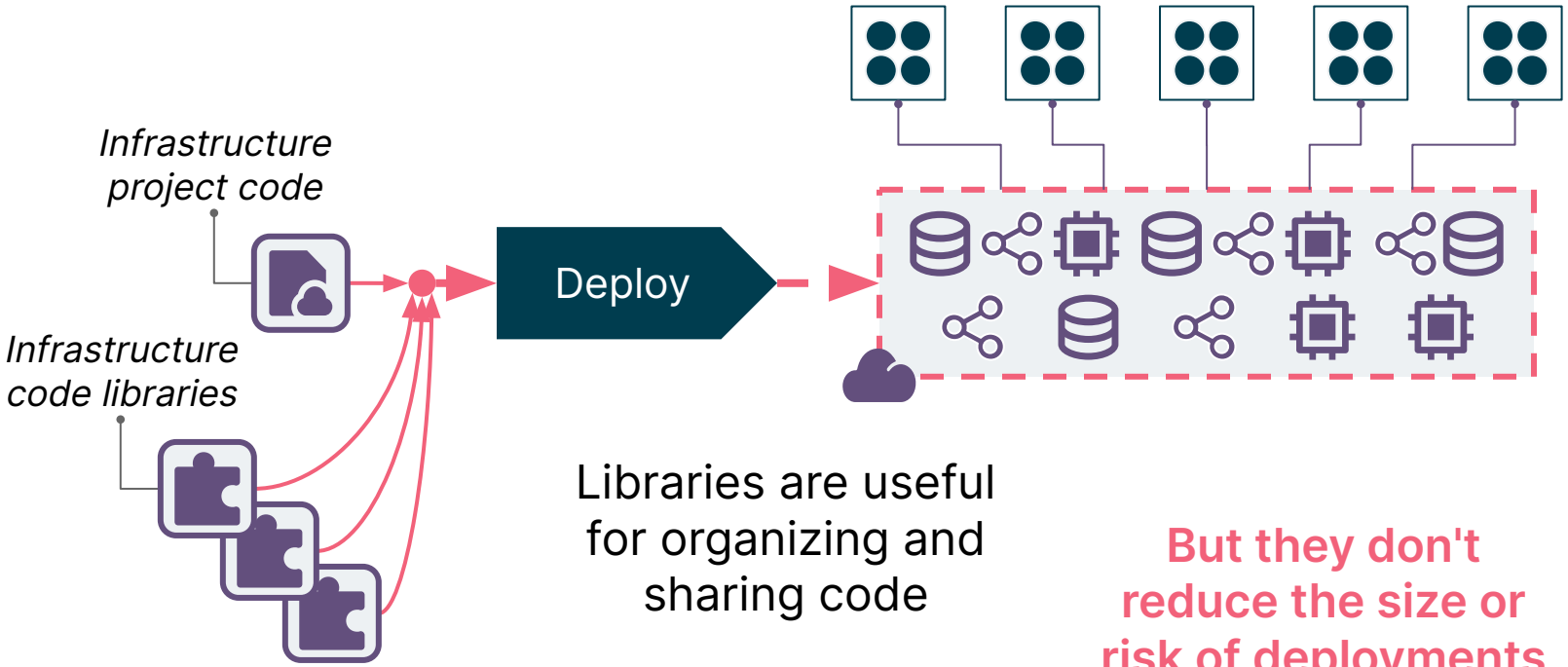
Barriers to change

Barriers to quality

Are code libraries the solution?



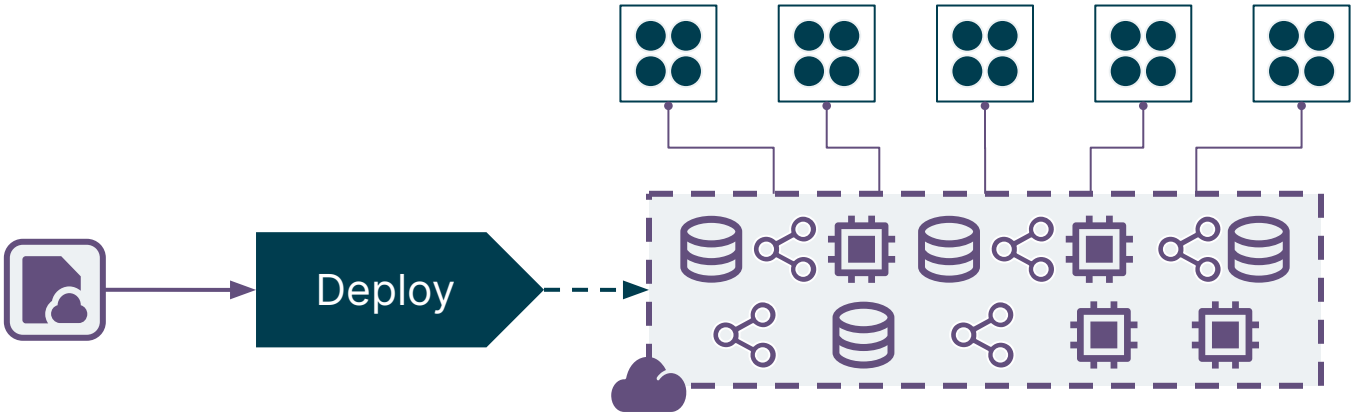
Are code libraries the solution?



Libraries are useful for organizing and sharing code

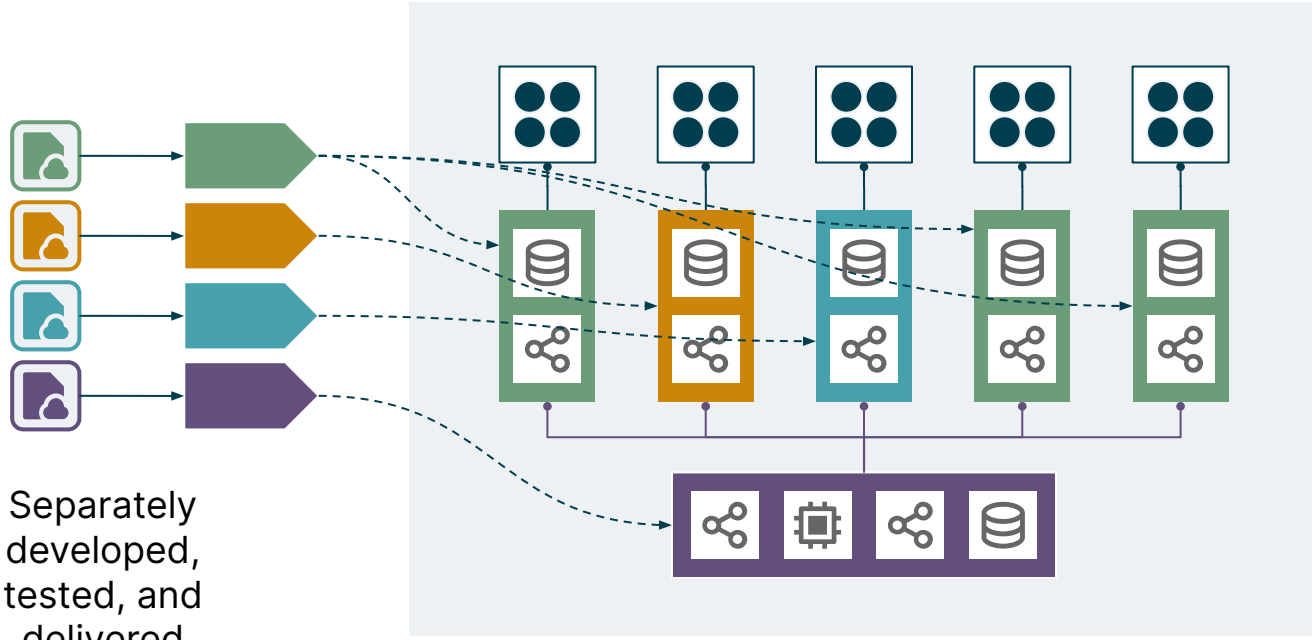
But they don't reduce the size or risk of deployments

From monolith to composable deployments



From monolith to composable deployments

Separately deployable infrastructure components



Separately developed, tested, and delivered

We need more helpful abstractions

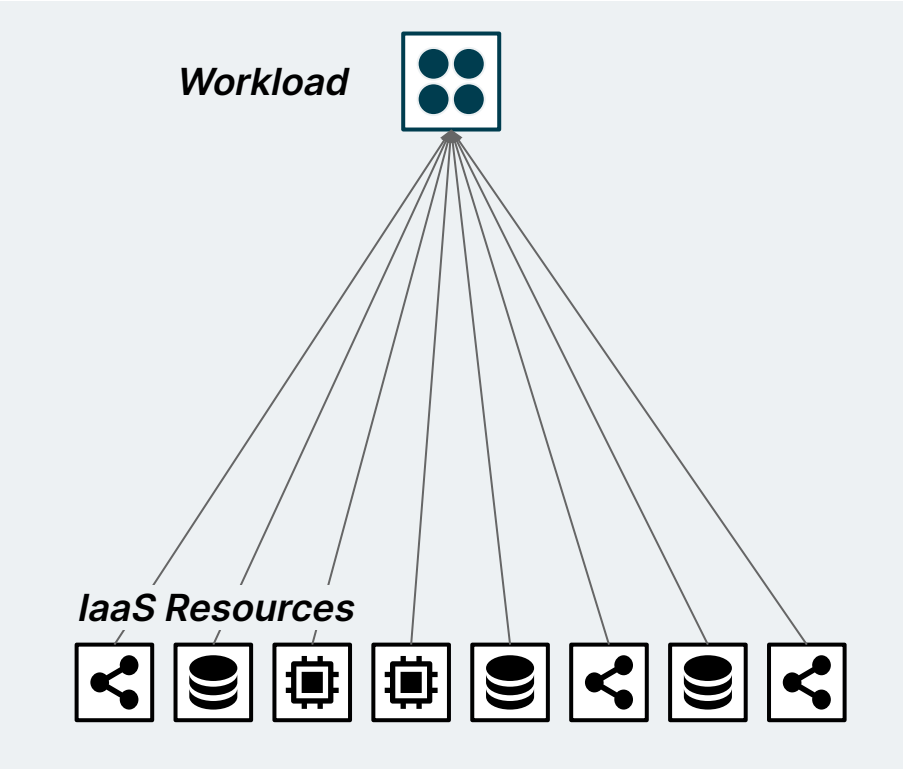
About abstractions

- Abstractions that hide stuff are **unhelpful**
- Abstractions that disempower people are **unhelpful**
- Abstractions that support cognitive focus are **helpful**

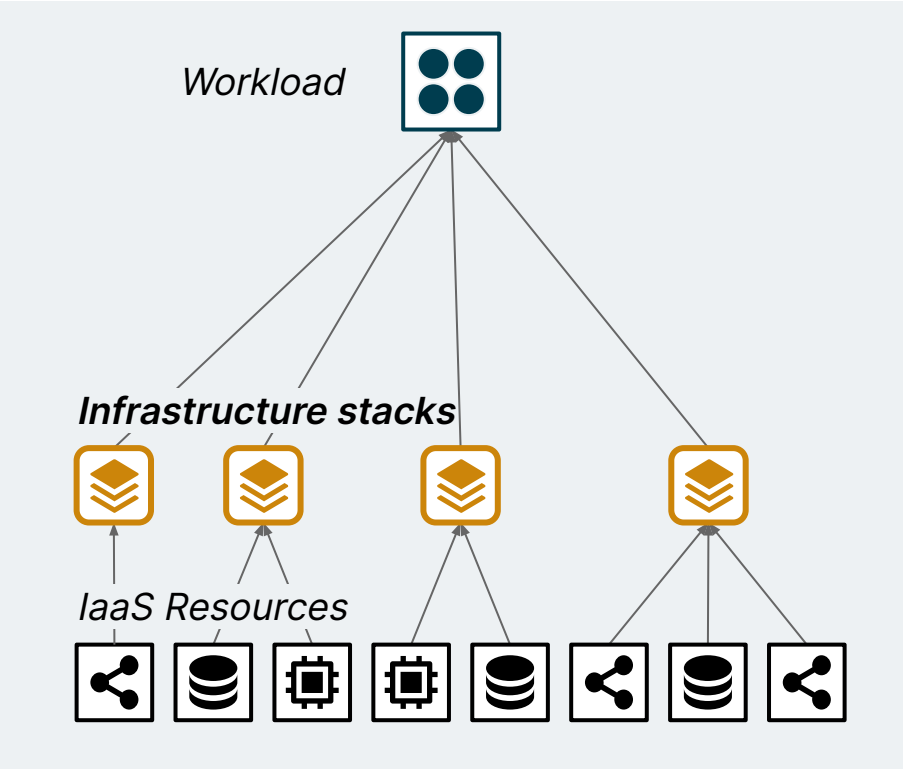
Current infrastructure abstractions are not helpful enough

- Infrastructure code is super low level
- Great for systems administrators, who think at this level
- Not great for application owners, who don't think at this level

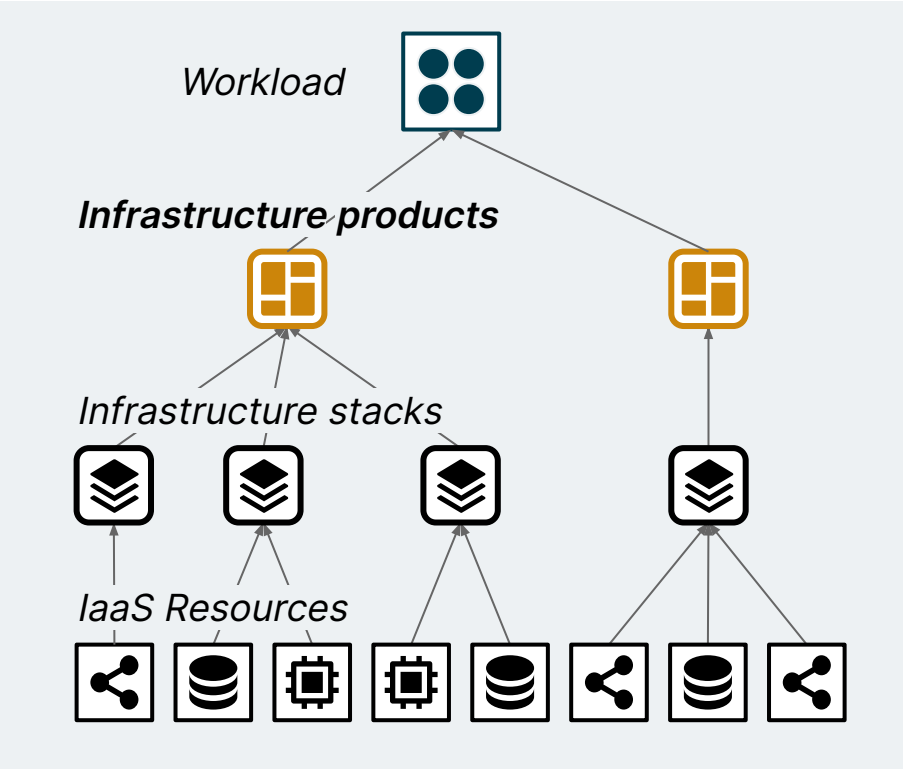
Infrastructure code abstractions



Stacks:
Deployable components



Infrastructure Products: Consumable components

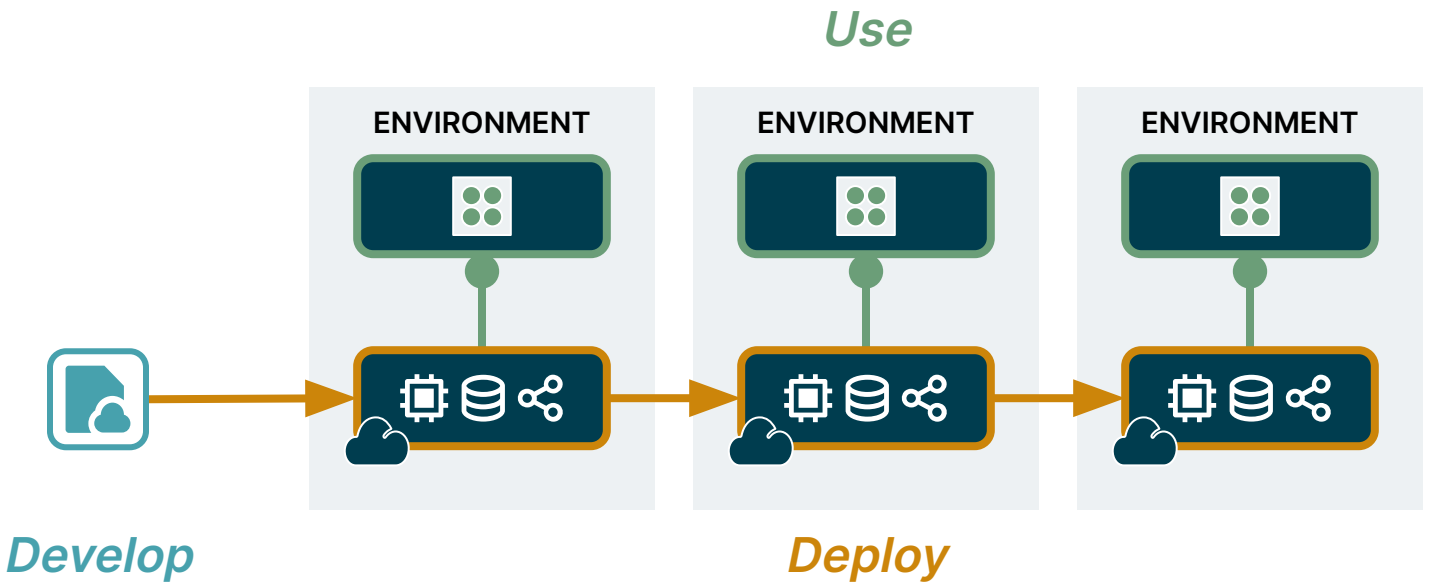


Rethinking infrastructure code delivery

Common issues

- Environments are difficult and expensive to create and change
- Environments are inconsistent and outdated
- Not enough environments available
- Environments are over-provisioned and under-utilized

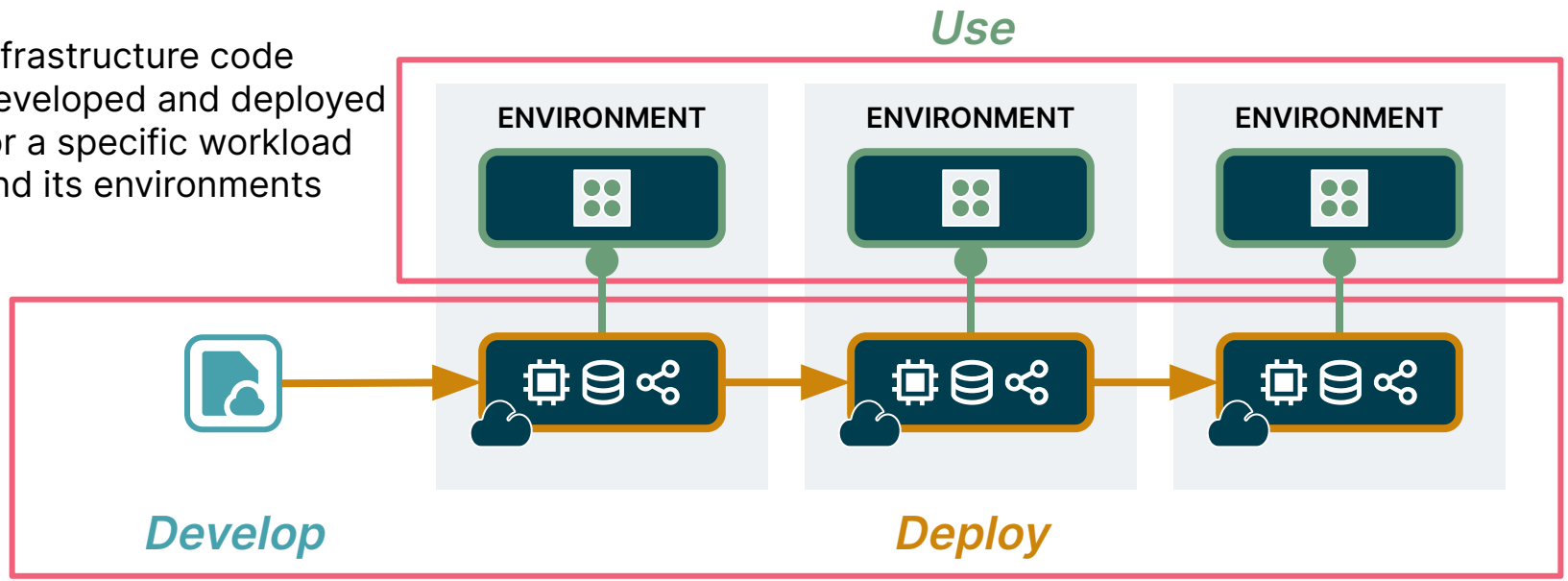
Infrastructure delivery lifecycle



Recoupling the infrastructure delivery lifecycle

Bespoke environments as code

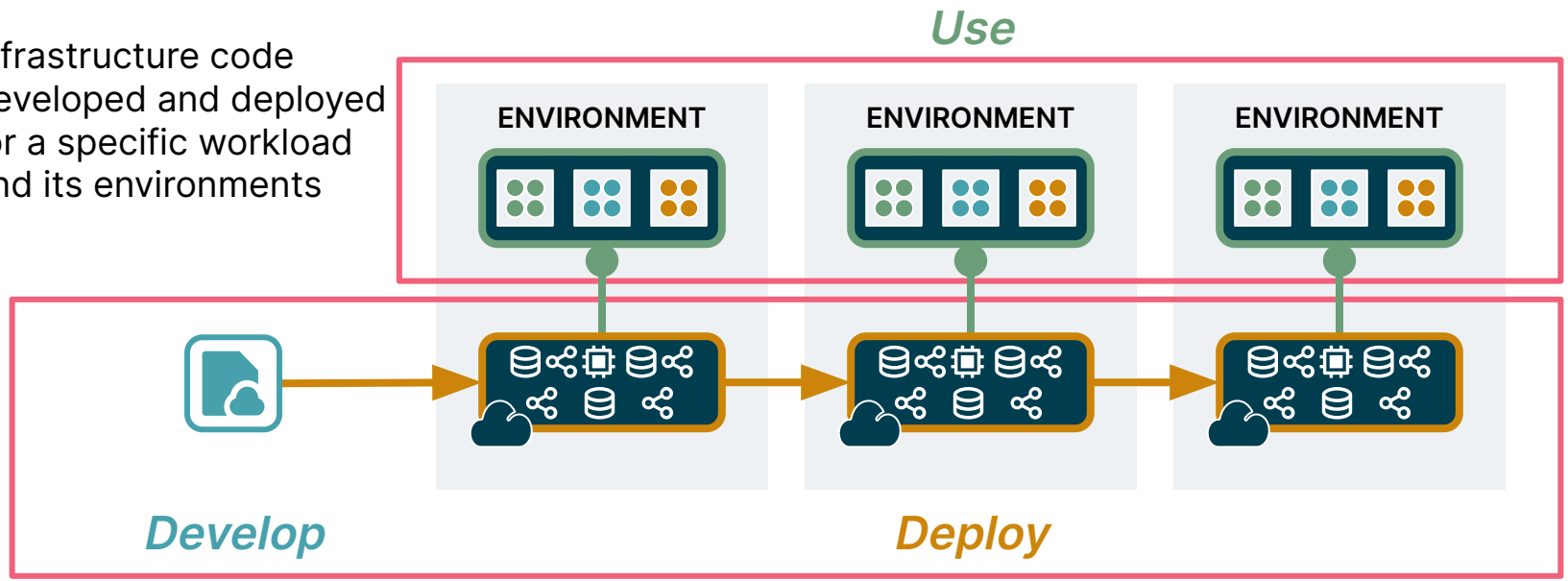
Infrastructure code developed and deployed for a specific workload and its environments



Creates coupling across the infrastructure delivery lifecycle

Bespoke environments

Infrastructure code developed and deployed for a specific workload and its environments



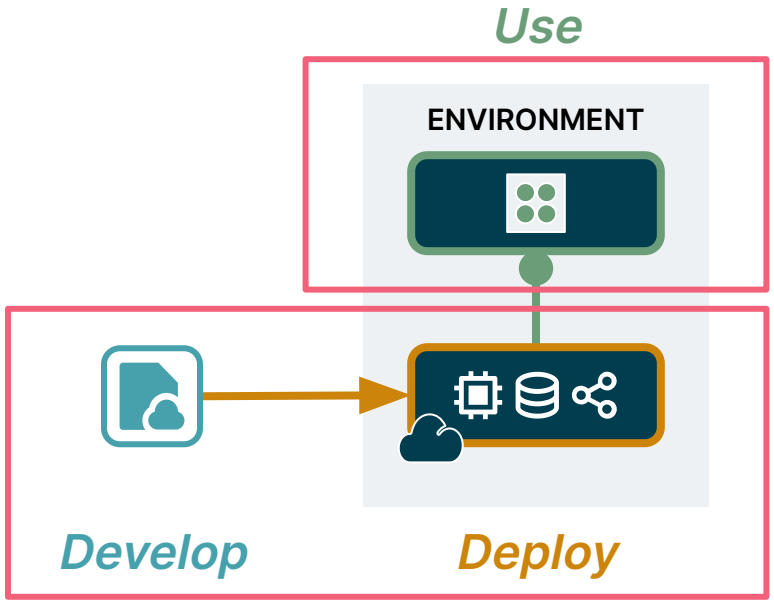
Creates coupling across the infrastructure delivery lifecycle

This creates issues at scale

Silos, bottlenecks

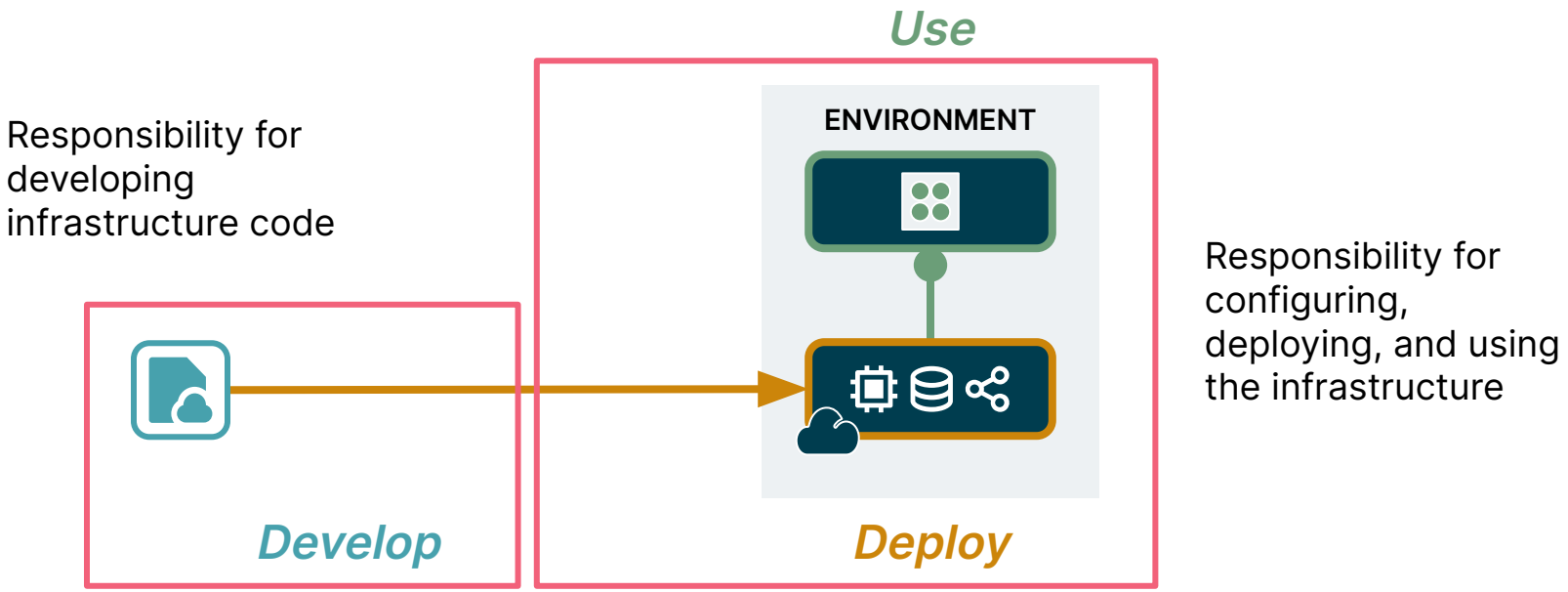
Development and deployment are coupled

Responsibility for developing, configuring, and deploying infrastructure code



Responsibility for making everything work

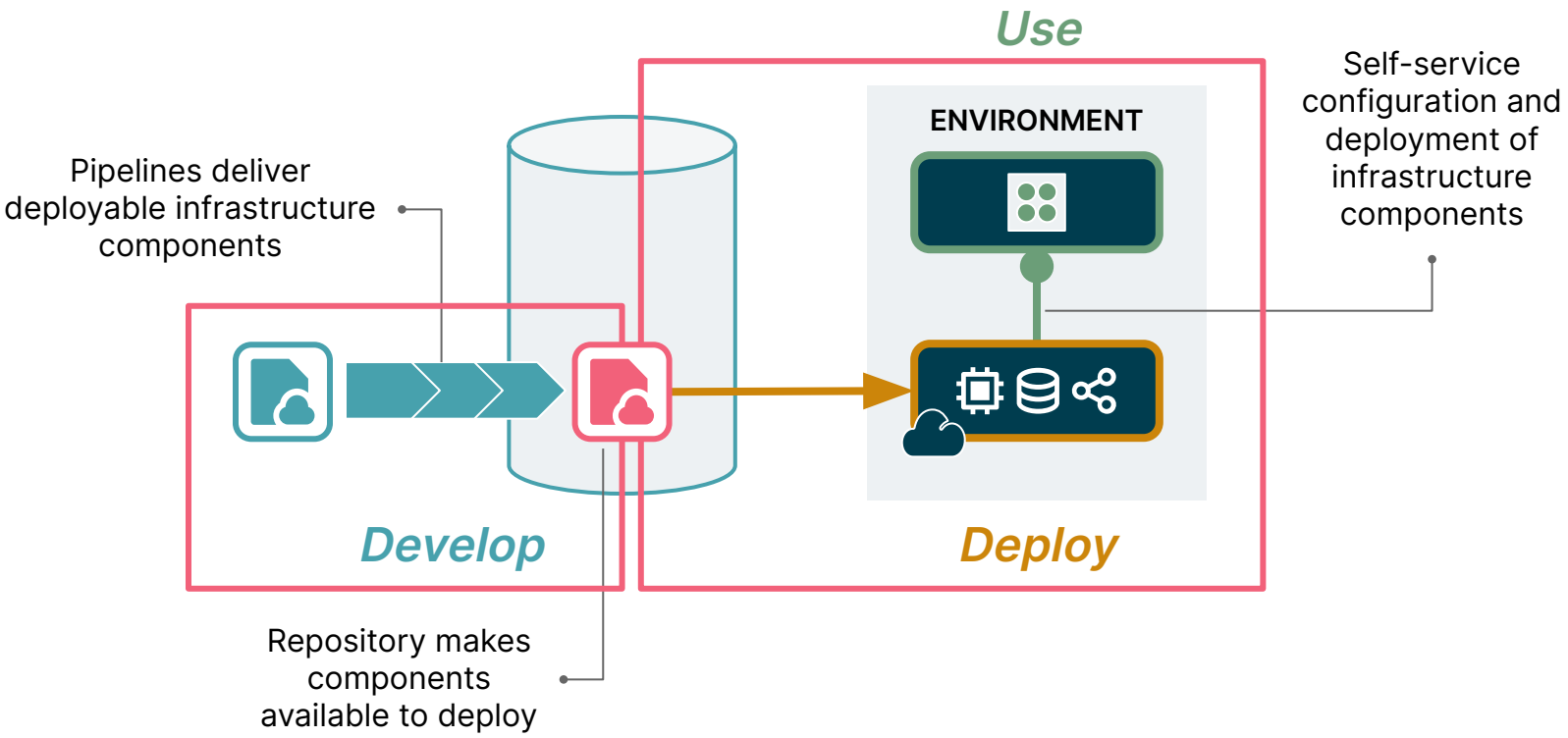
Decoupling development and deployment



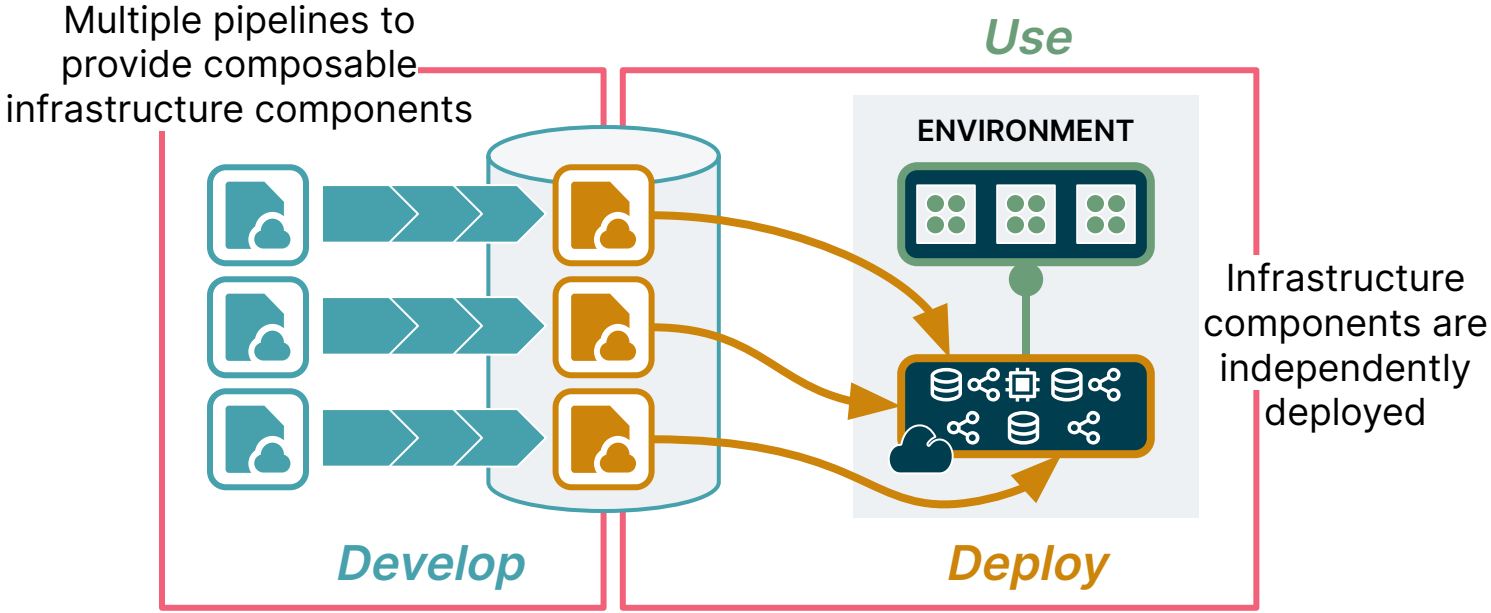
Responsibility for developing infrastructure code

Responsibility for configuring, deploying, and using the infrastructure

Decoupling development and deployment



Decoupling development and deployment

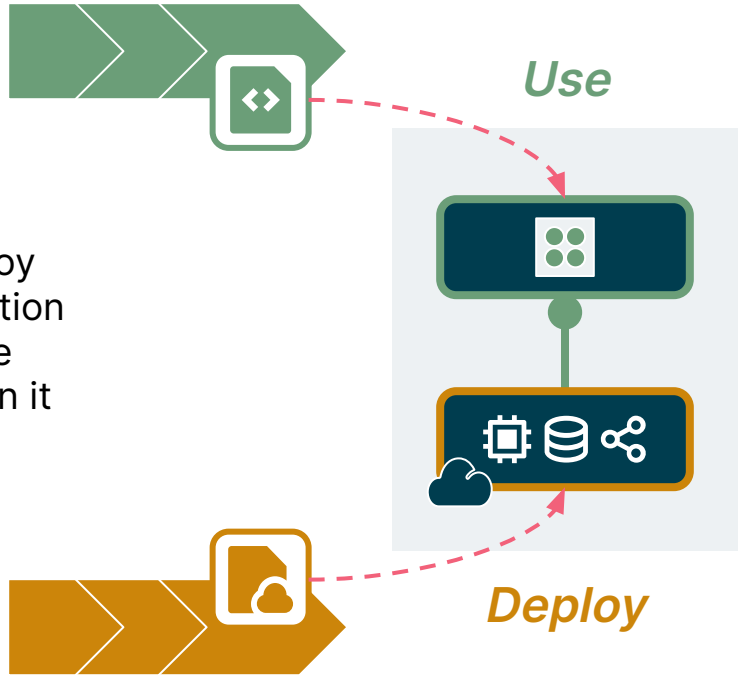


Rethinking infrastructure code deployment

Application-driven infrastructure deployment

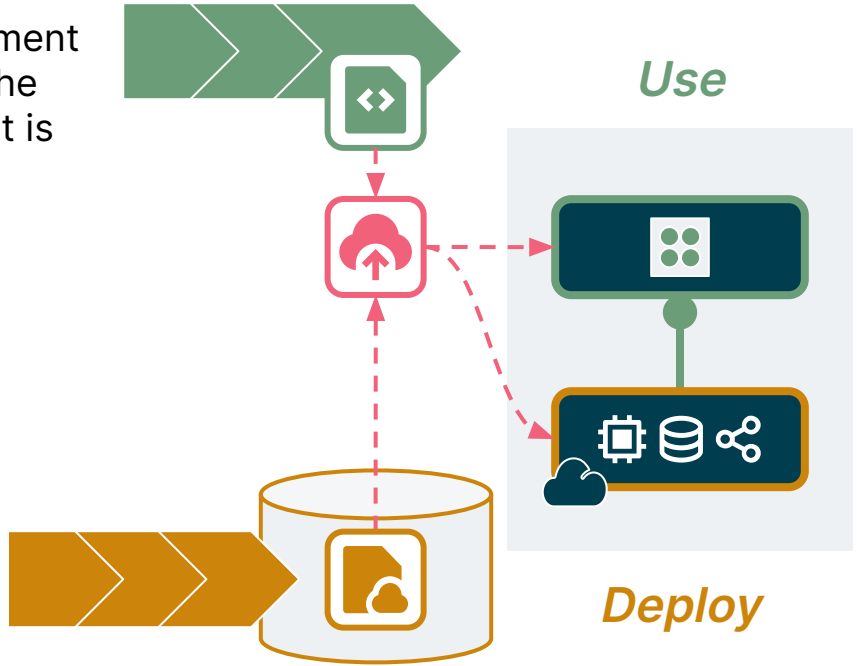
Bottom-up infrastructure deployment

Configure and deploy infrastructure in isolation from deploying the software that runs on it



Application-driven infrastructure deployment

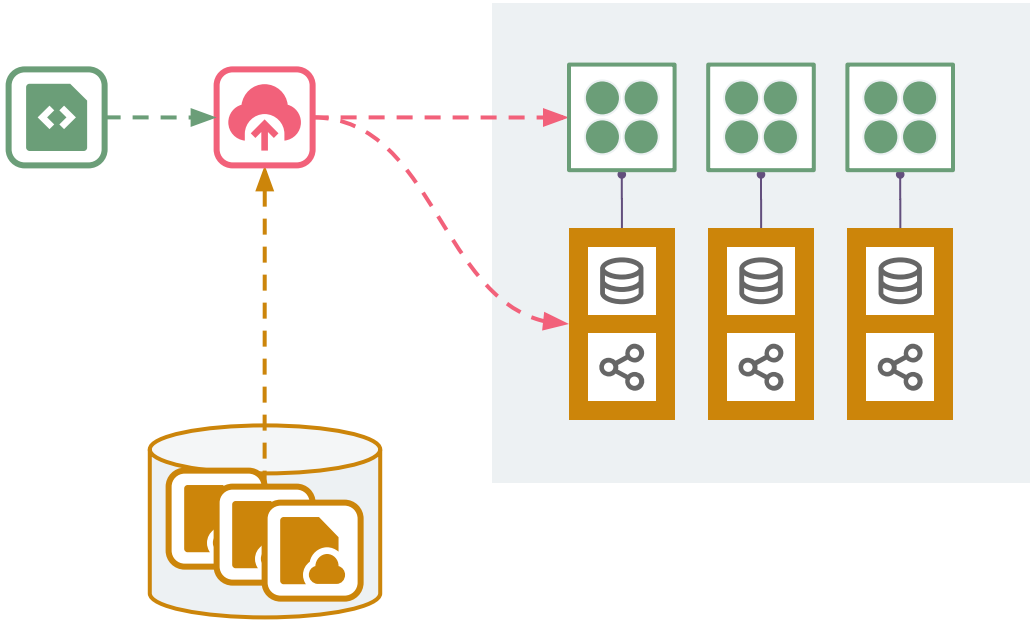
Infrastructure deployment is triggered when the workload that uses it is deployed



Application-driven infrastructure deployment

Infrastructure deployment is triggered when the workload that uses it is deployed

We can use this to deploy different composable infrastructure components for multiple workloads

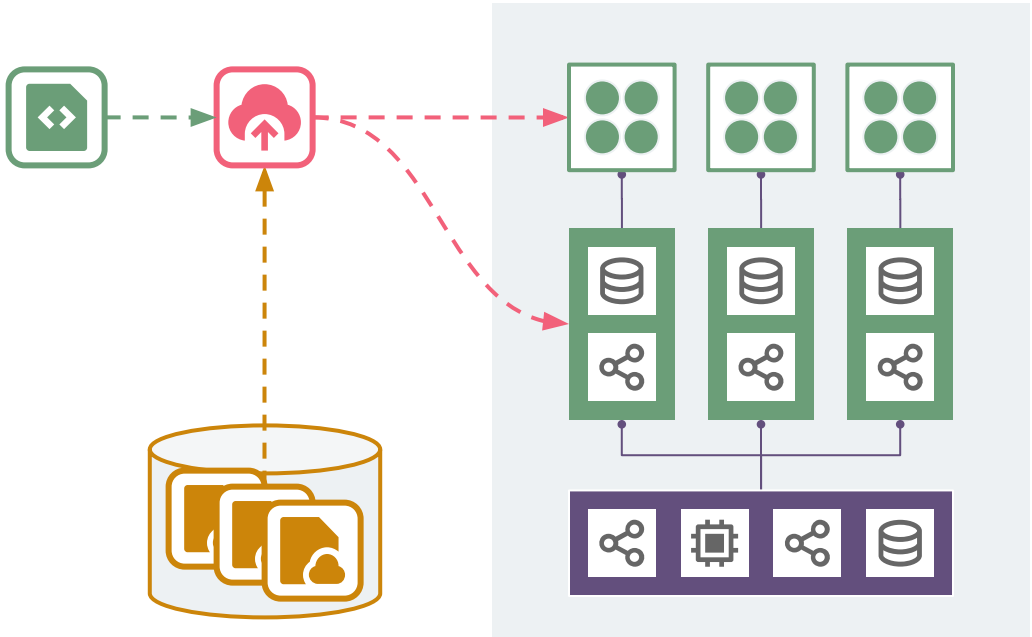


Application-driven infrastructure deployment

Infrastructure deployment is triggered when the workload that uses it is deployed

We can use this to deploy different composable infrastructure components for multiple workloads

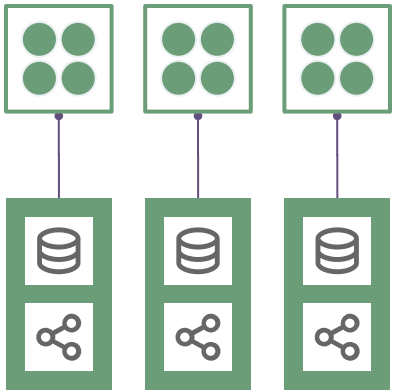
But, how do we handle deploying shared infrastructure?



Composable deployment contexts

Composable deployment contexts

Workload-specific infrastructure

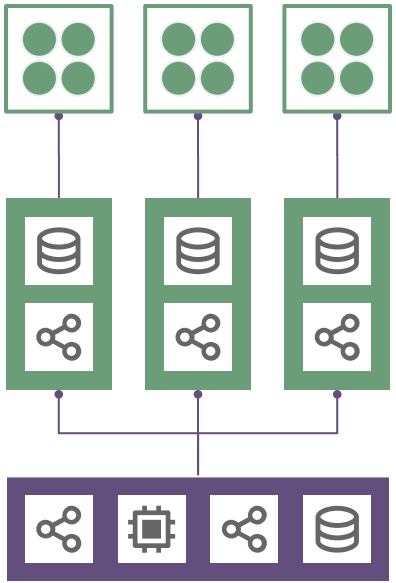


A context can include **multiple deployable** infrastructure components

Composable deployment contexts

Workload-specific infrastructure

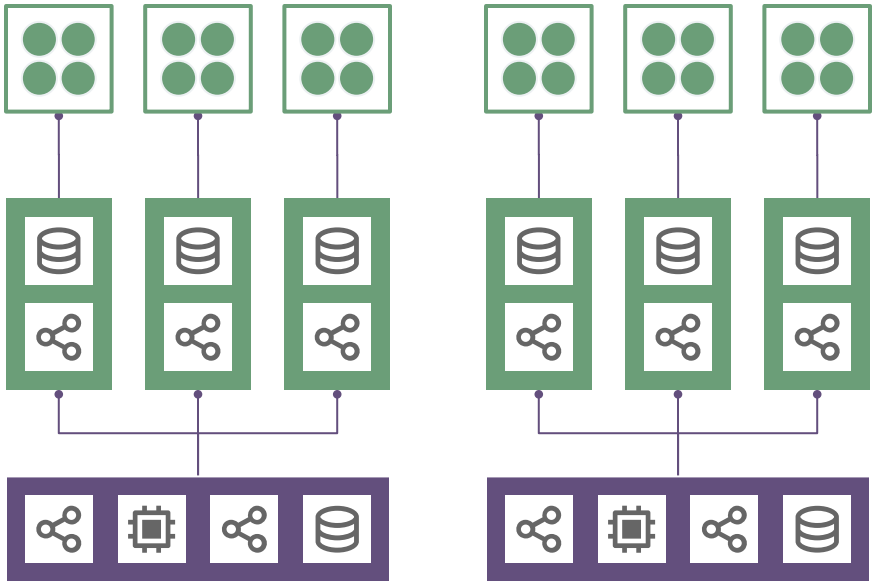
Shared infrastructure



Composable deployment contexts

Workload-specific infrastructure

Shared infrastructure



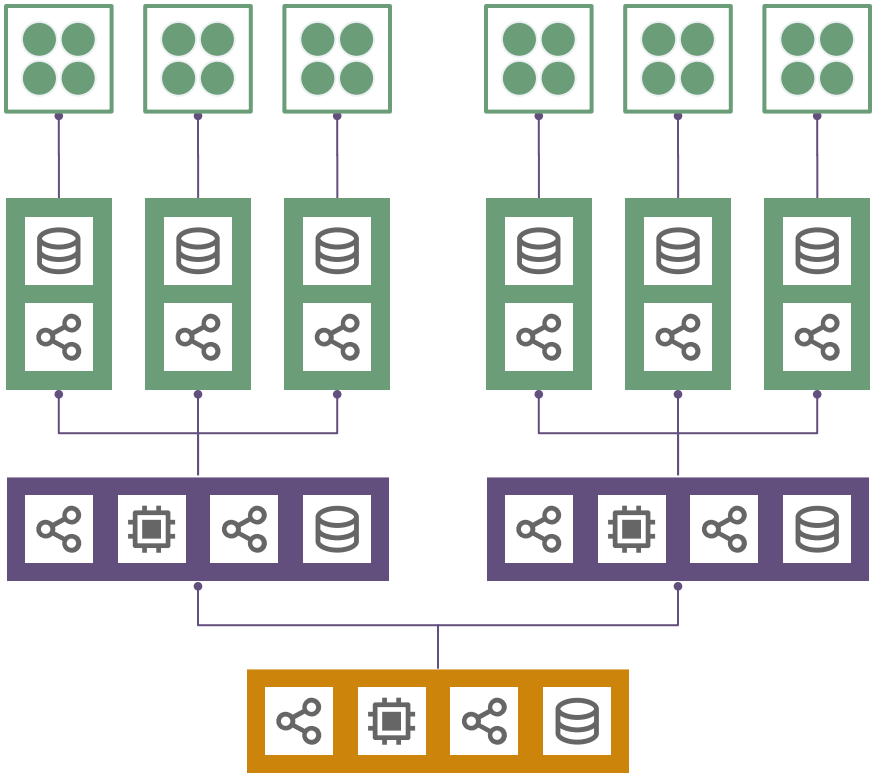
Workload groups

Composable deployment contexts

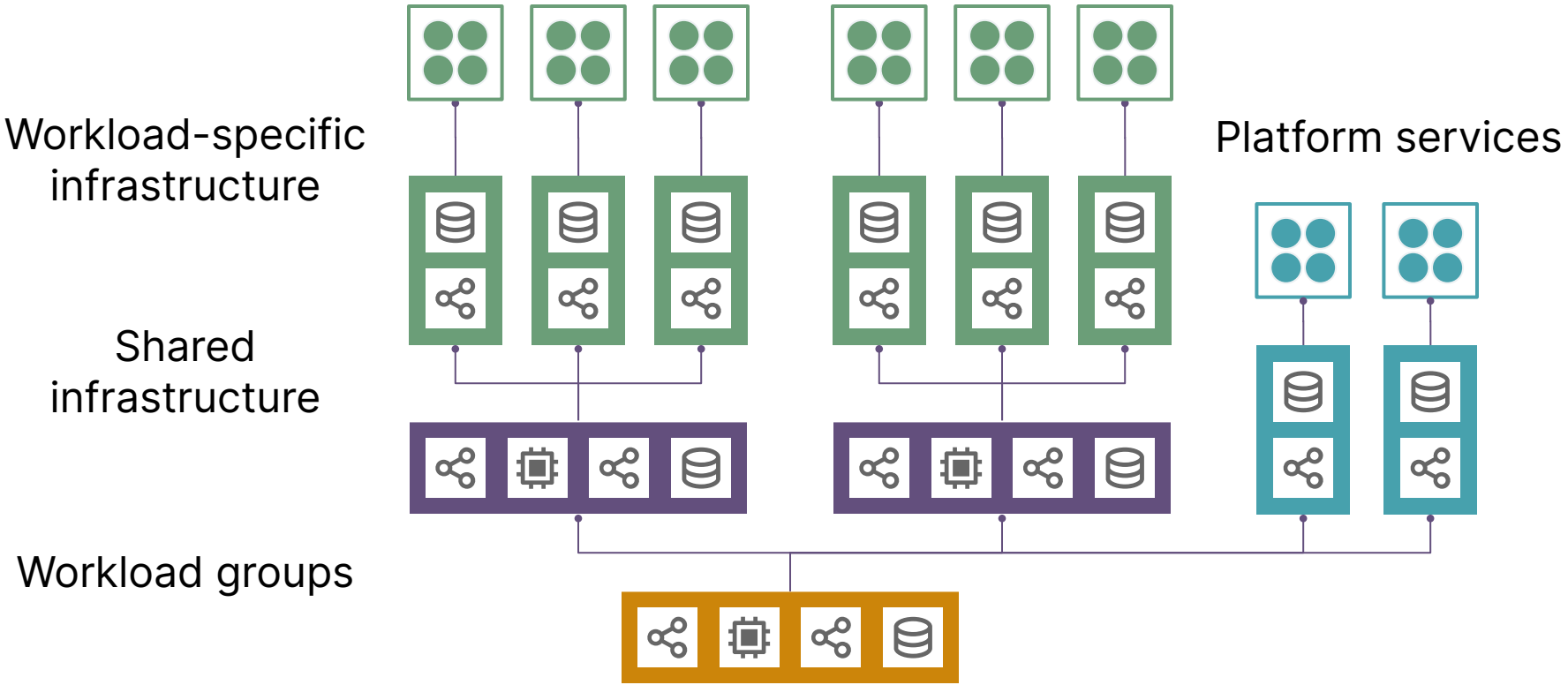
Workload-specific infrastructure

Shared infrastructure

Workload groups



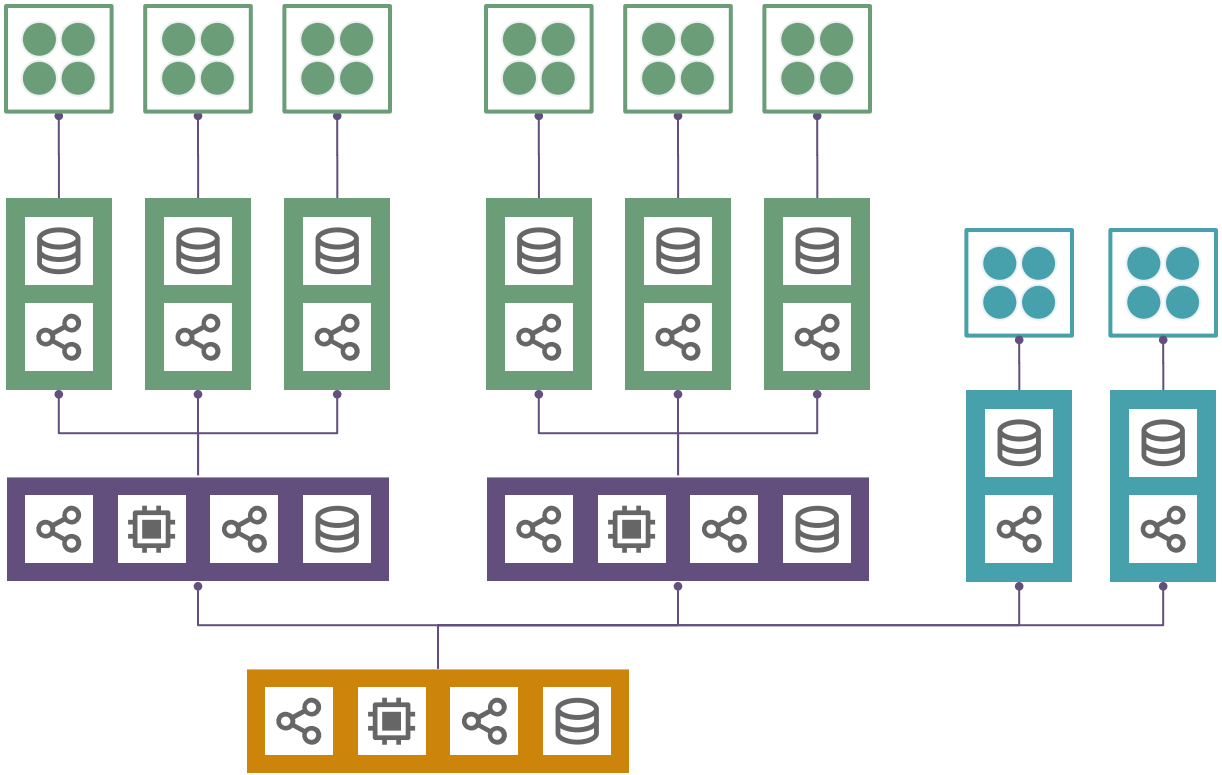
Composable deployment contexts



Composable deployment contexts

Infrastructure should be defined as **close to the workload** as possible

Lower contexts should be **ignorant** of their consumers



Deploying infrastructure by context

Options for deploying infrastructure by context

- Application deployment trigger
- Pipeline stage
- Developer portal
- Platform framework

How can you use these ideas?

Tools and things that may or may not be useful

Codebase and builds

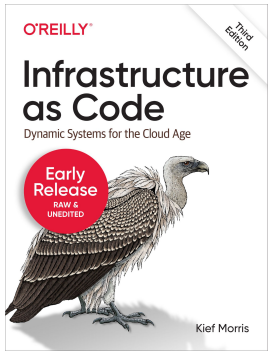
Infrablocks
Terragrunt
Terraspace

Deployment and orchestration

Atlantis
Control Monkey
Crossplane
Digger
env0
Garden
Gruntwork DevOps
HCP Terraform
Harness
Pulumi Cloud
Scalr
Spacelift
Terrakube
Terramate
Terrateam

Infrastructure products and catalogs

Cluster.dev
Gruntwork DevOps
Infrablocks
Resourcely



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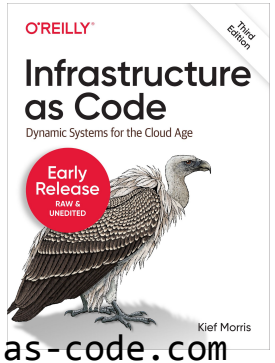

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Thank you!