

APIfication

generate APIs for diverse solutions
to streamline their usage and orchestration

beyond runtime:

Systematic Selection of Solutions

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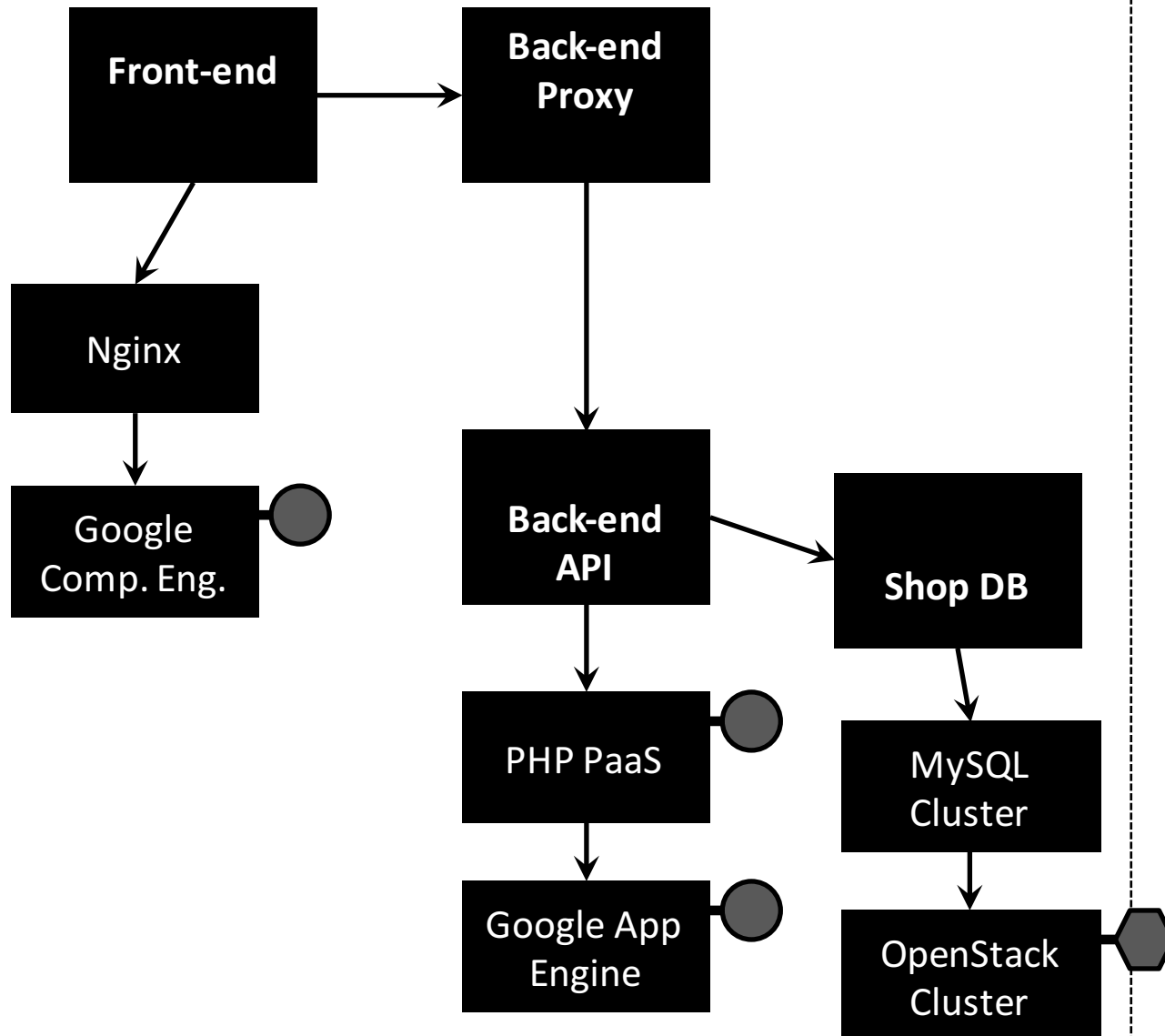
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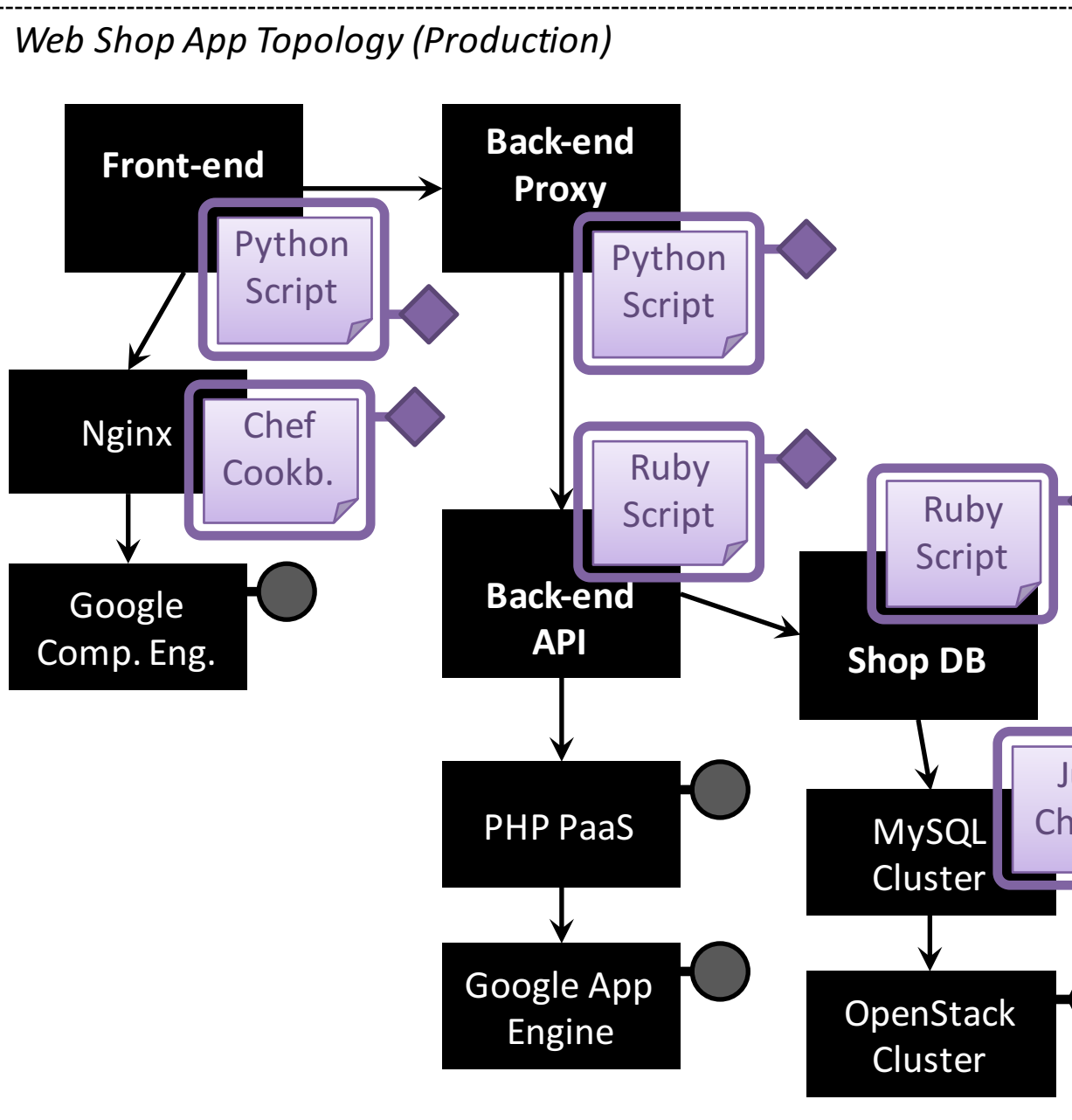


Simplify Orchestration of Deployment Executables

Web Shop App Topology (Production)



Simplify Orchestration of Deployment Executables

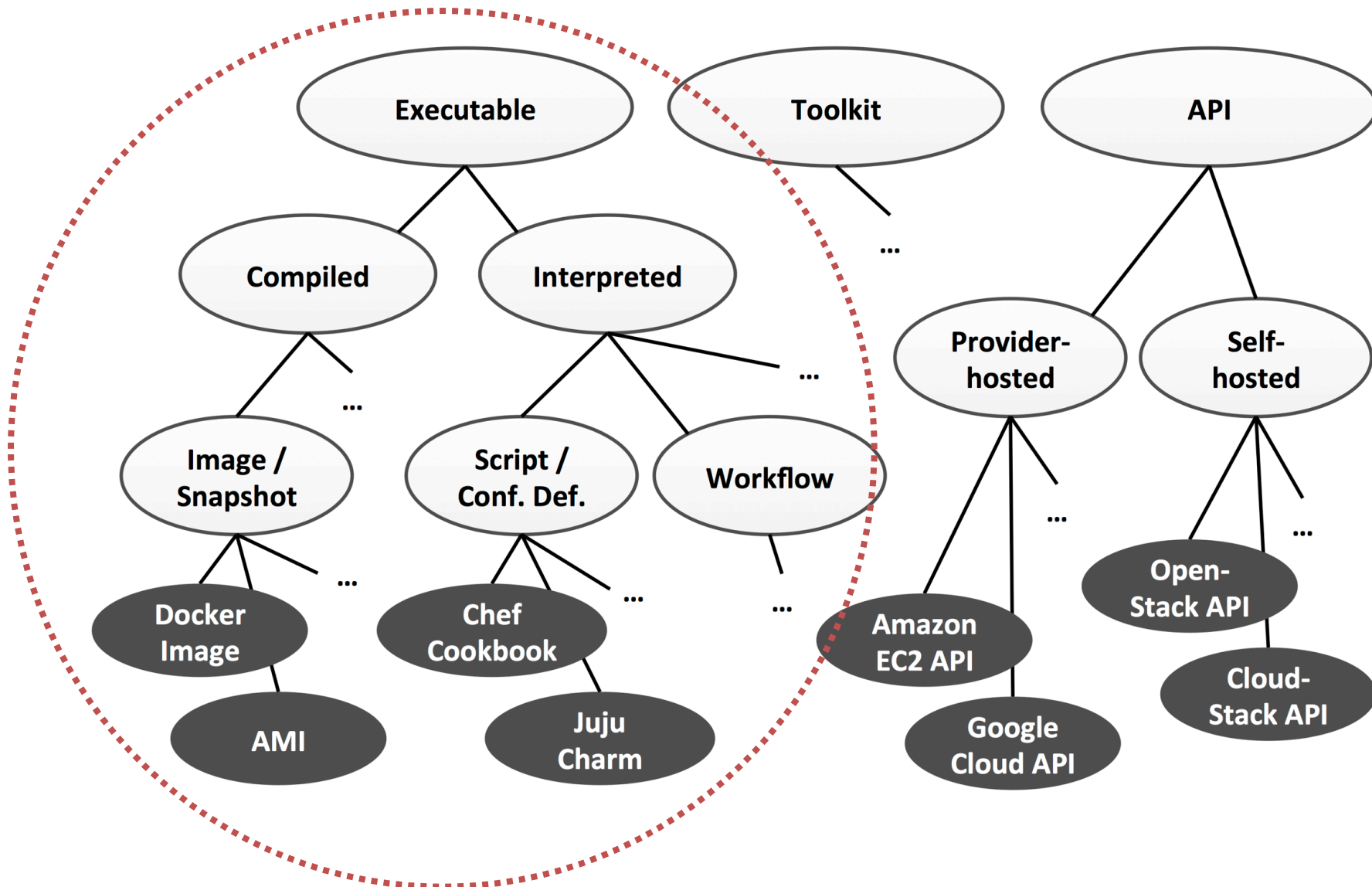


*Plans integrate different kinds of executables and APIs
→ heavily polluted w/ low-level logic such as SSH, SCP, ...*

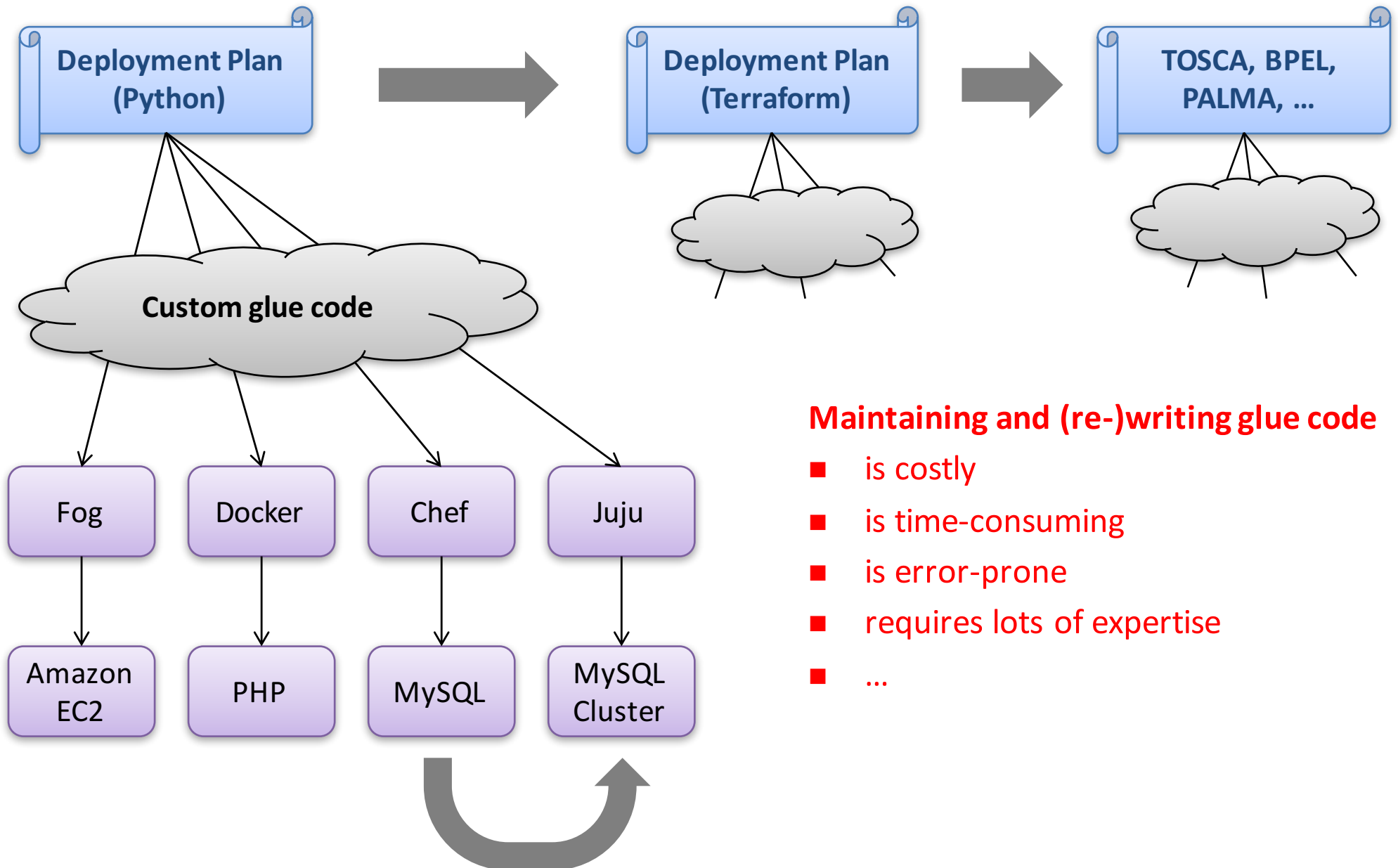


Keep plans clean and focused by orchestrating proper APIs

Deployment Executables



Agile & DevOps: Constant Change and Evolution



Maintaining and (re-)writing glue code

- is costly
- is time-consuming
- is error-prone
- requires lots of expertise
- ...

Agile & DevOps: Constant Change and Evolution



requires
RESTful APIs



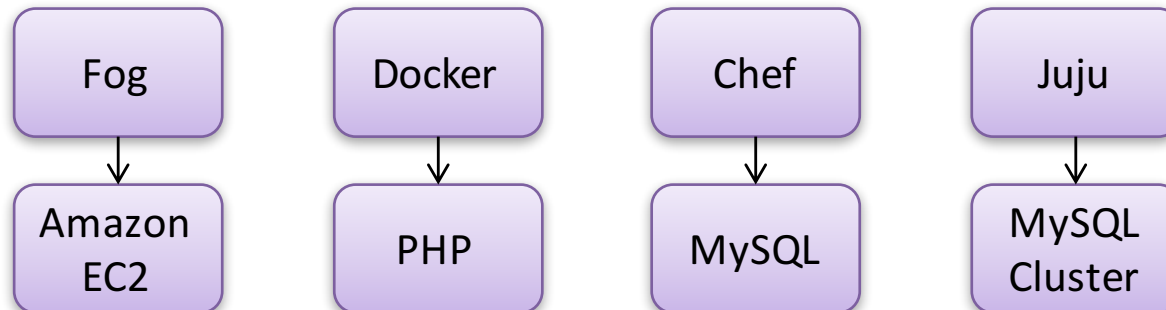
requires
Terraform module APIs



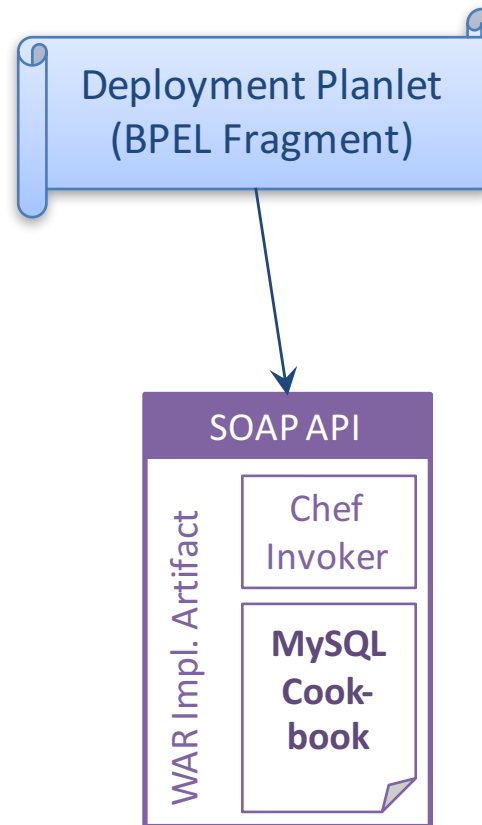
requires
SOAP/WSDL APIs

APIfication (abstraction in both directions)

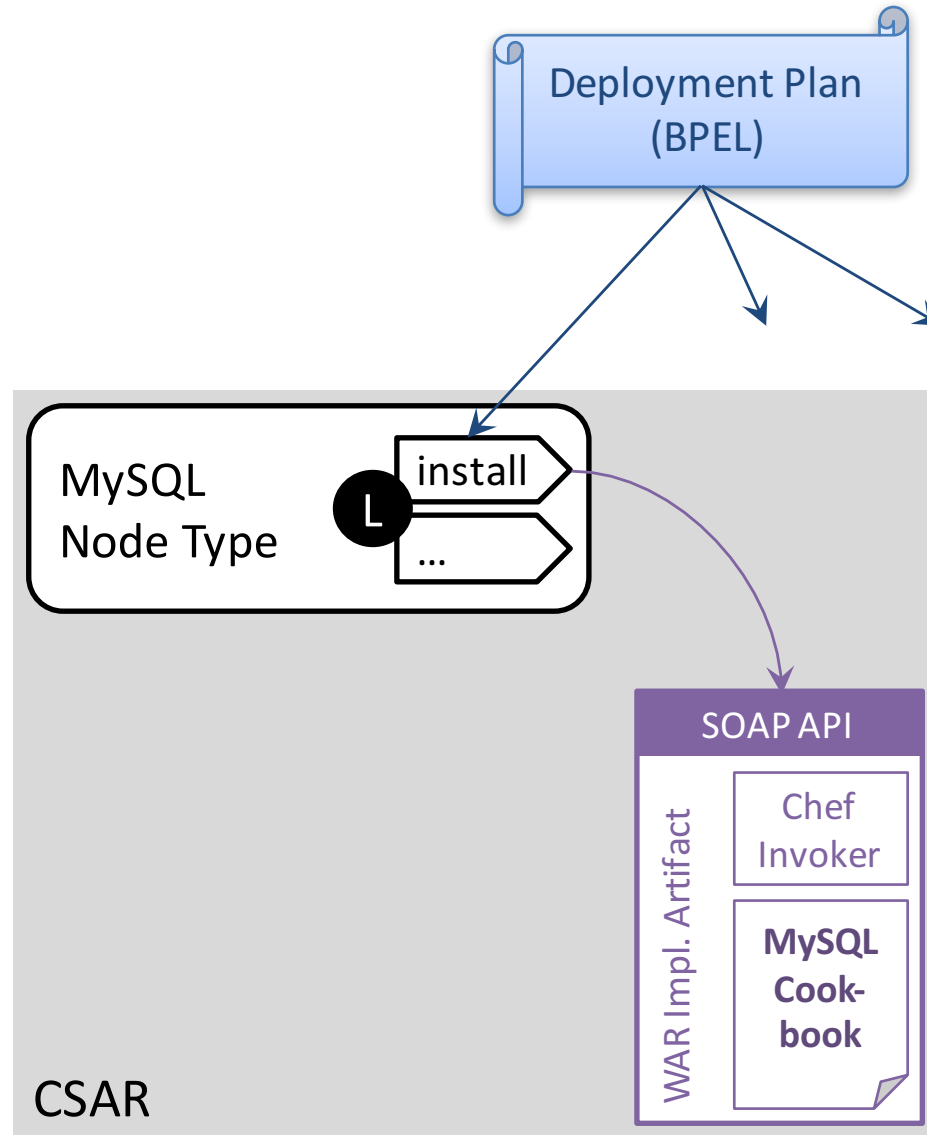
- **Dynamically generate** APIs based on generic (and generated) API spec ... because there is not *the optimal* API for all cases
- Generated APIs are **self-contained** → no (heavy) centralized middleware
- Orchestration technique **completely decoupled** from underlying technologies
- Enables **seamless** change and evolution

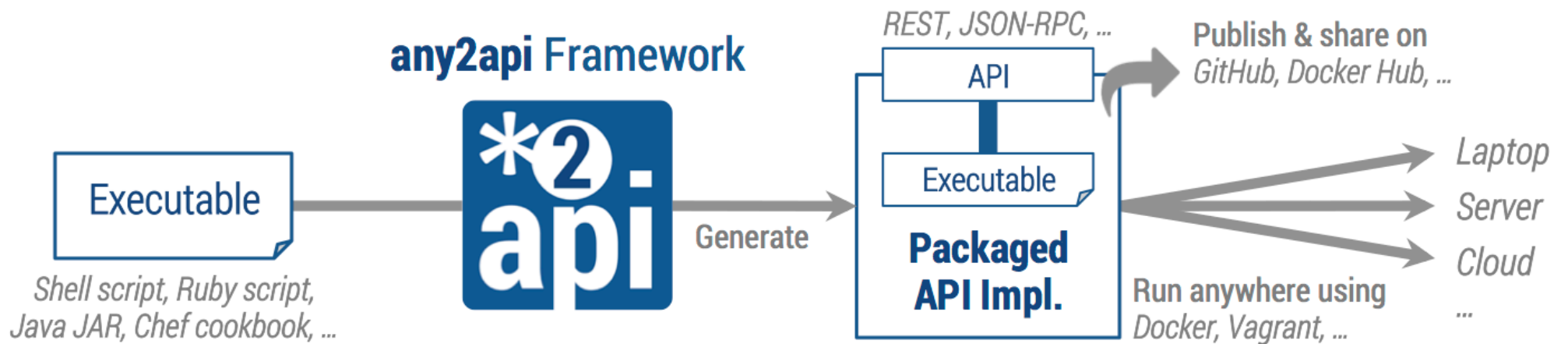


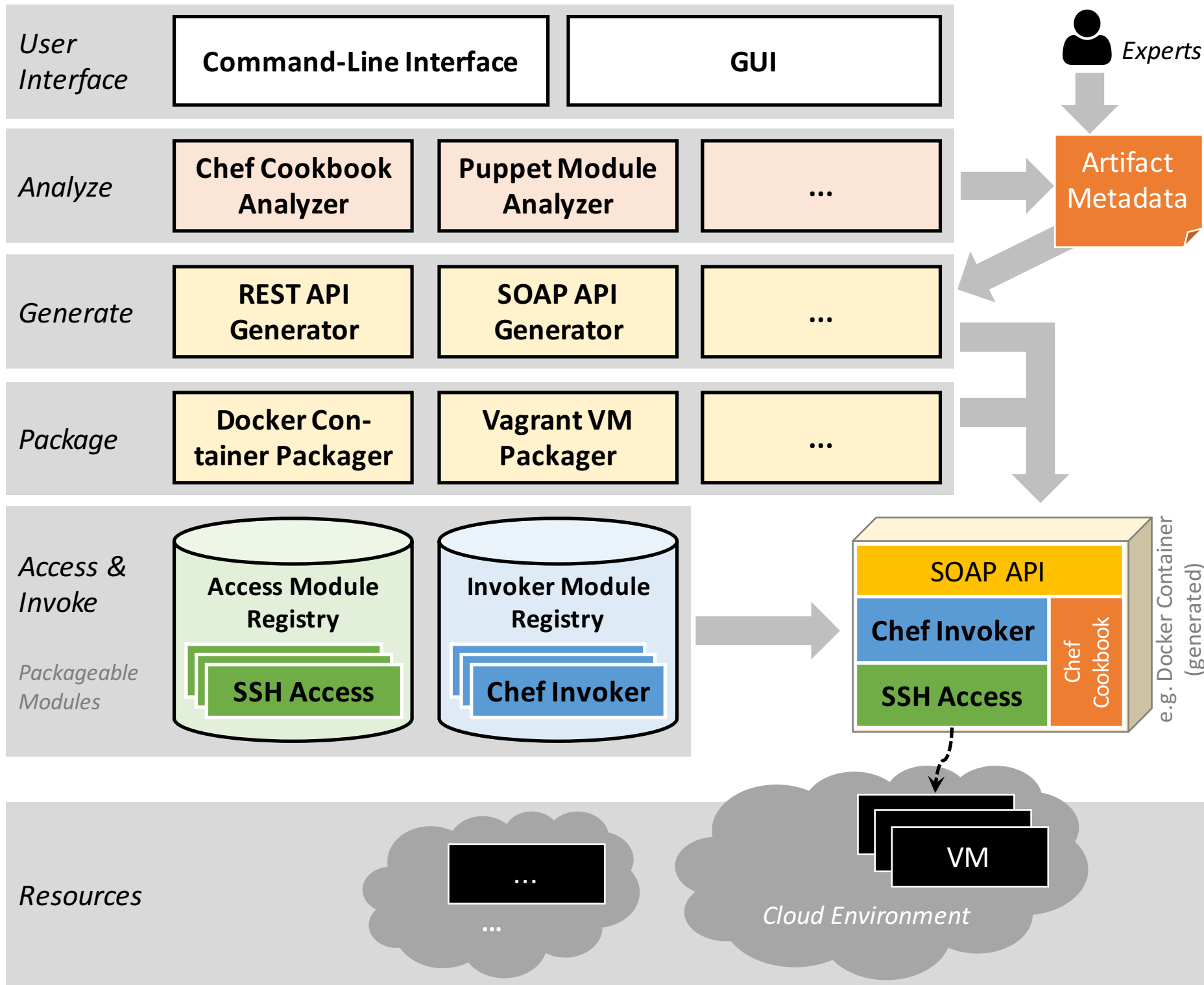
PALMA Example



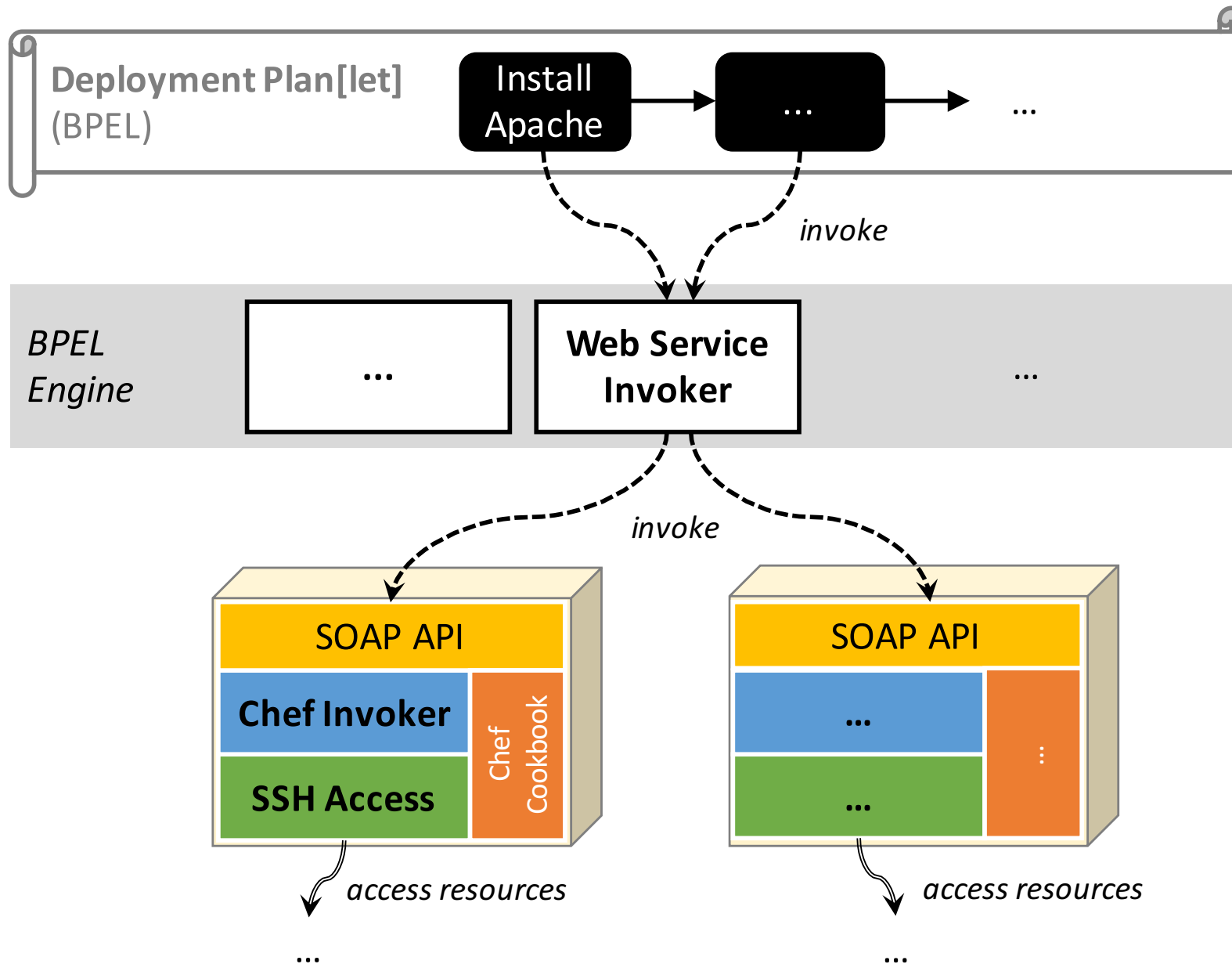
TOSCA Example







any2api – Example



APIfication beyond Deployment Automation

- E-science
- Microservices
 - Implement functionality as “executable”
 - Codebase doesn't contain API code
 - Generate APIs
 - Type of API is not fixed
- Wrap existing API endpoints
- ...

Beyond Runtime Integration:

How to systematically select solutions?

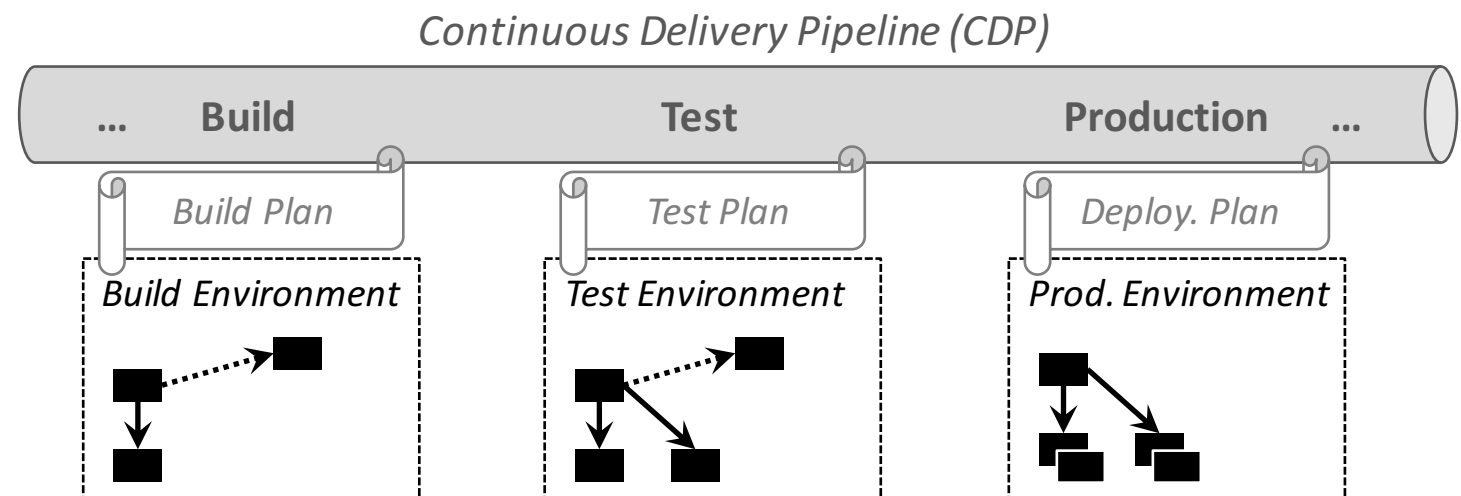
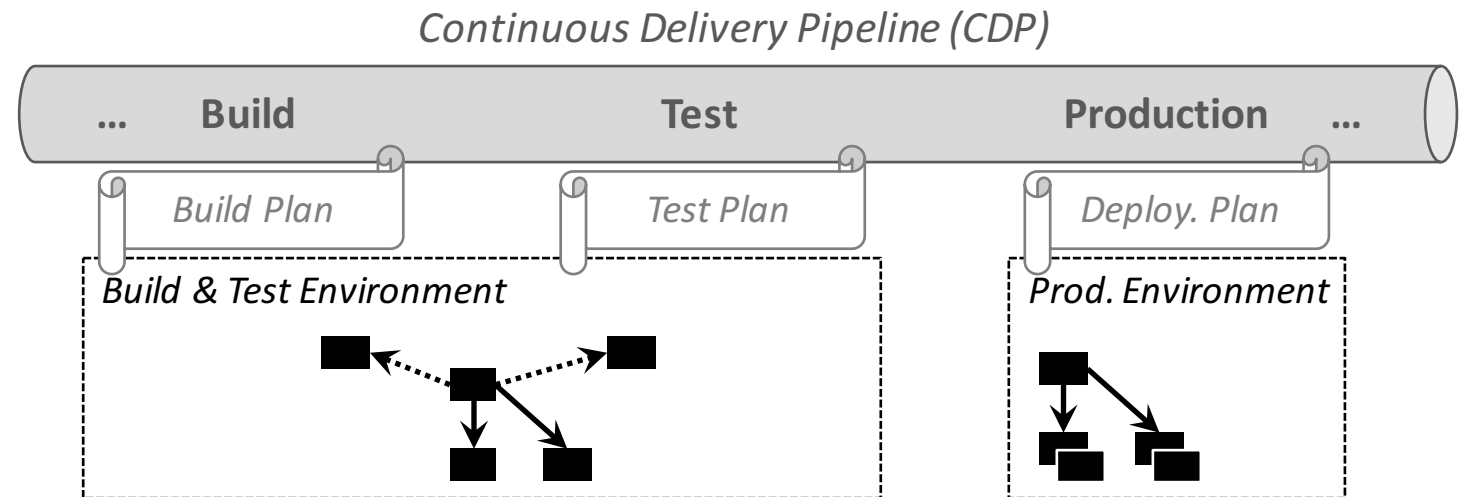
Diverse Application Environments & Topologies

Typically, there's not only a single topology per application.

Different sets of solutions for diverse environments:

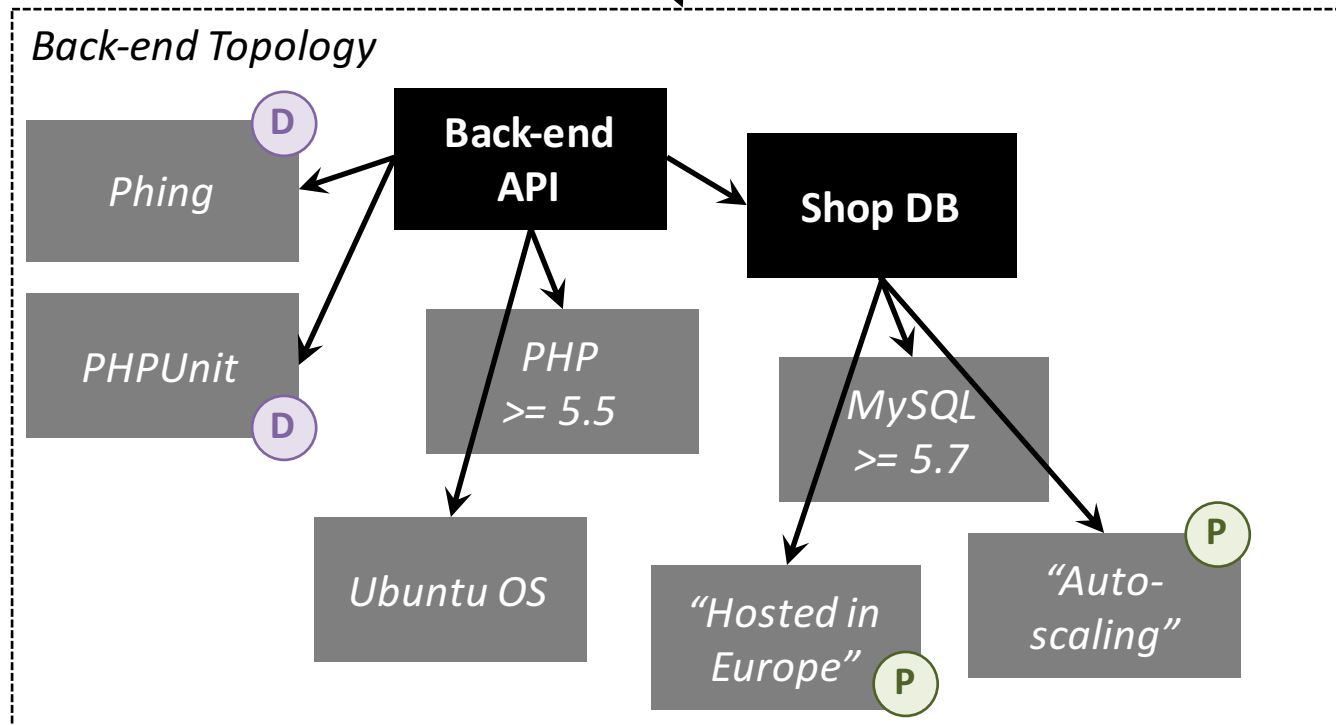
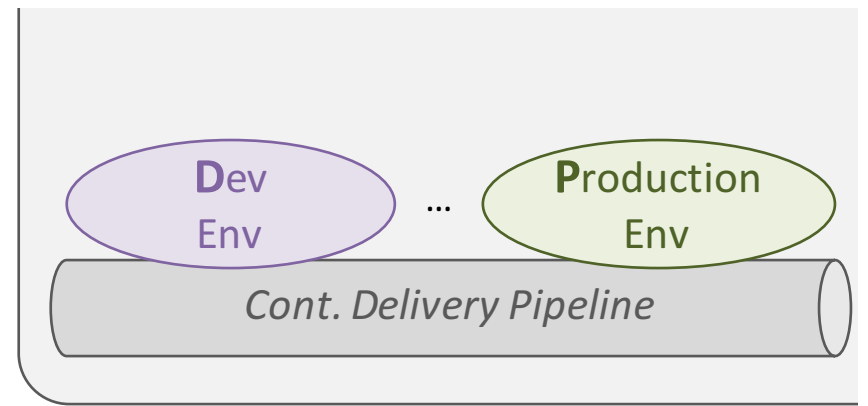
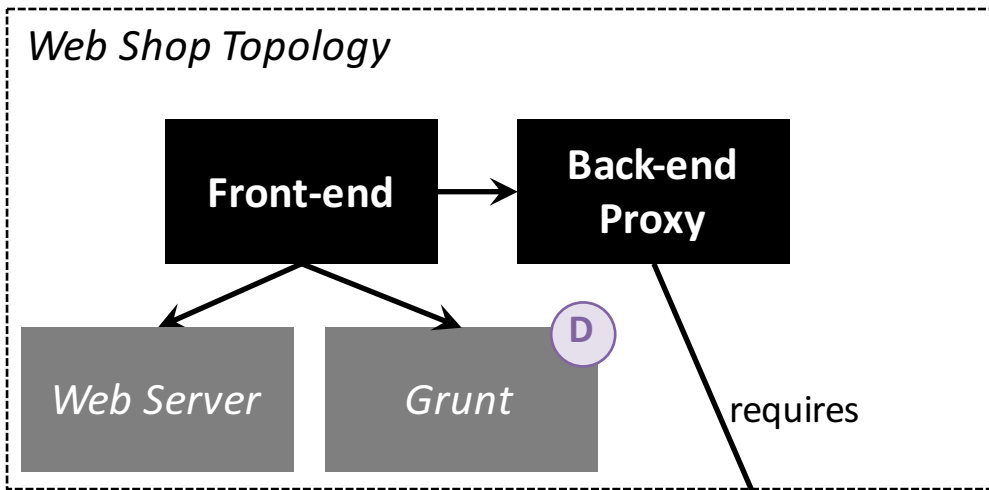
Build, test, production, ...

Application Environments as Key Building Blocks of CDPs



Application Environments

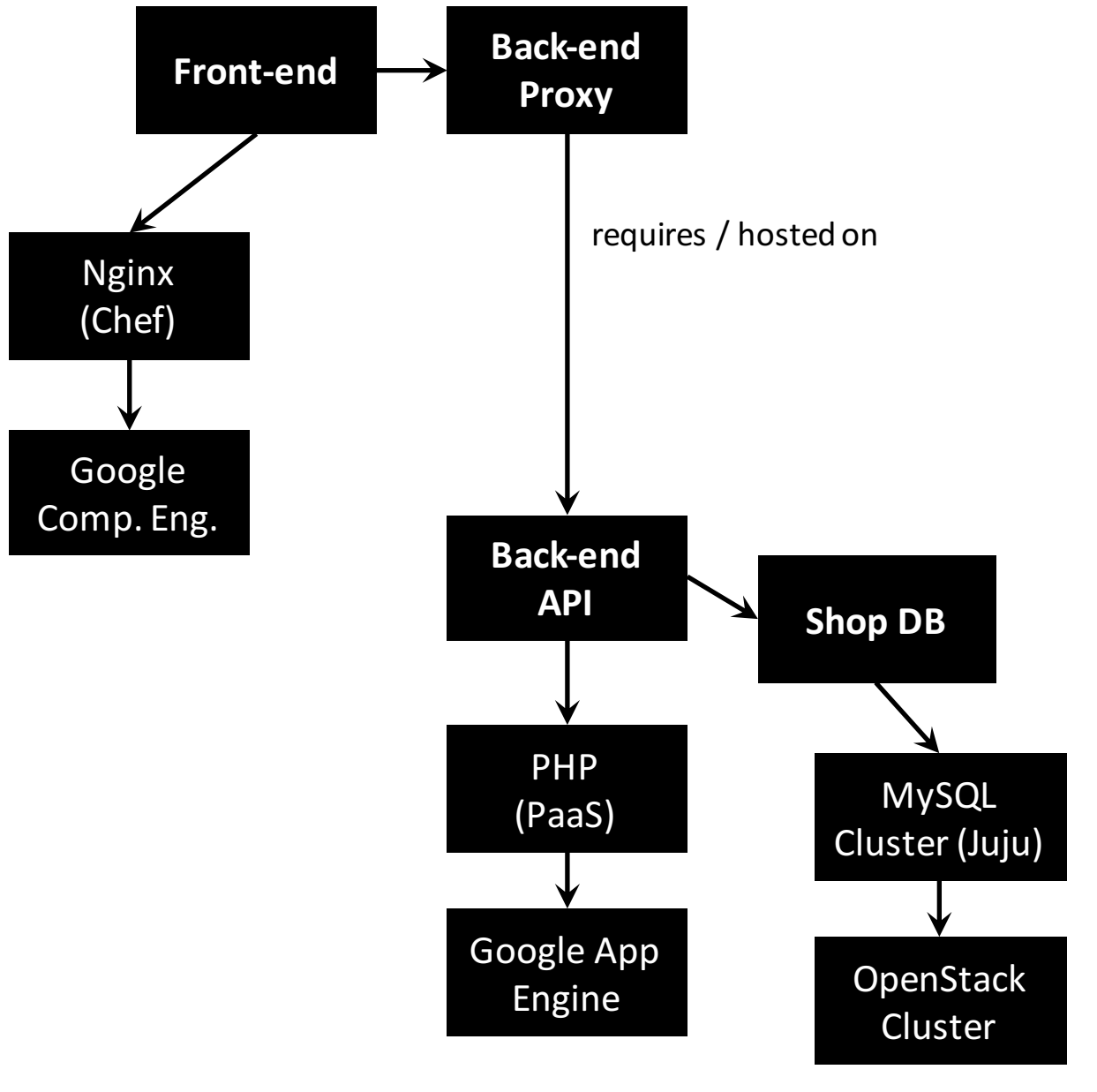
*You need to select and combine diverse solutions
to build application environments.*



■ Application Part (Component/Service)

■ Application Environment Requirement (= AER)

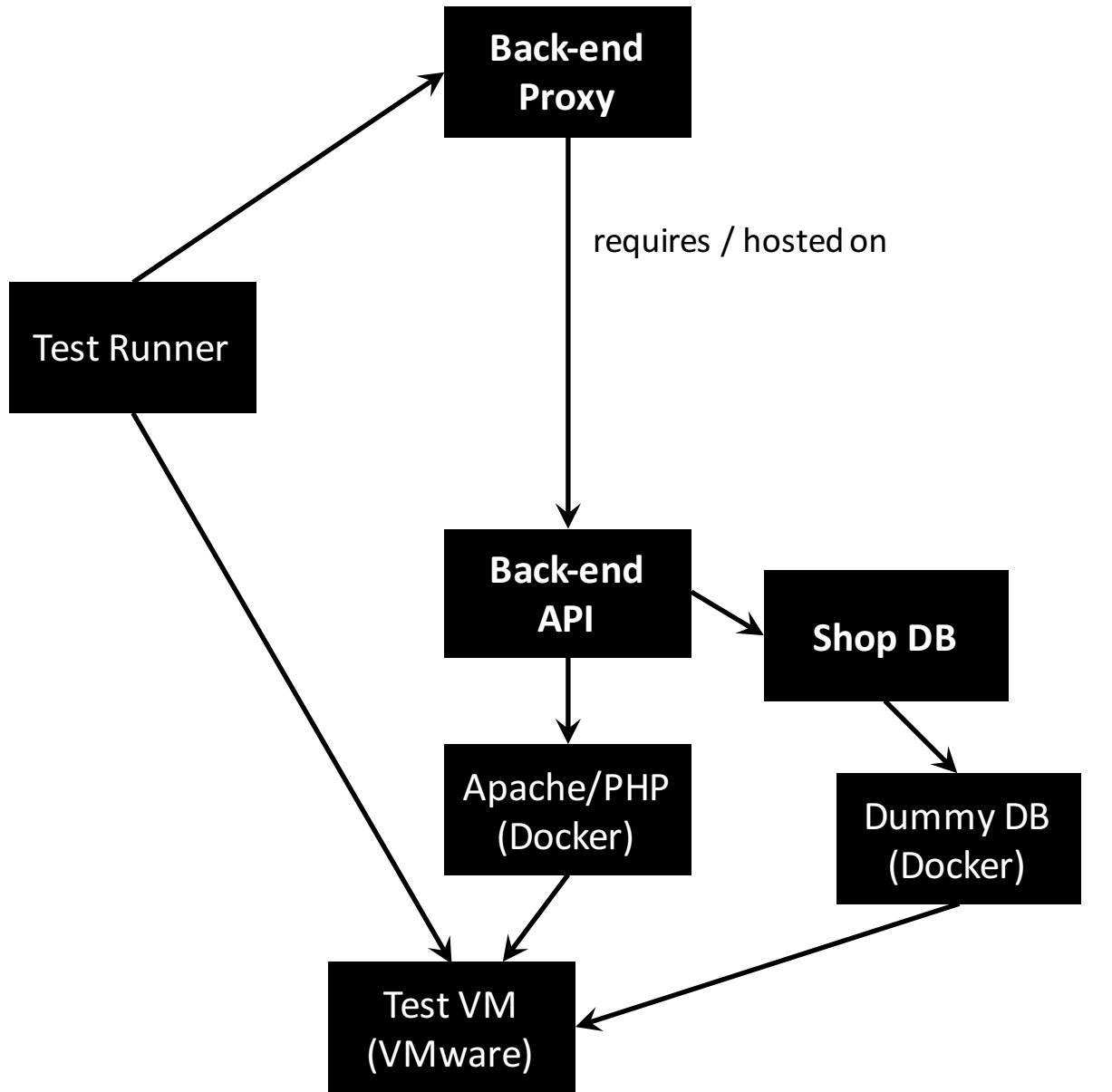
Production Topology



■ Application Part (Component/Service)

■ Application Environment Requirement (= AER)

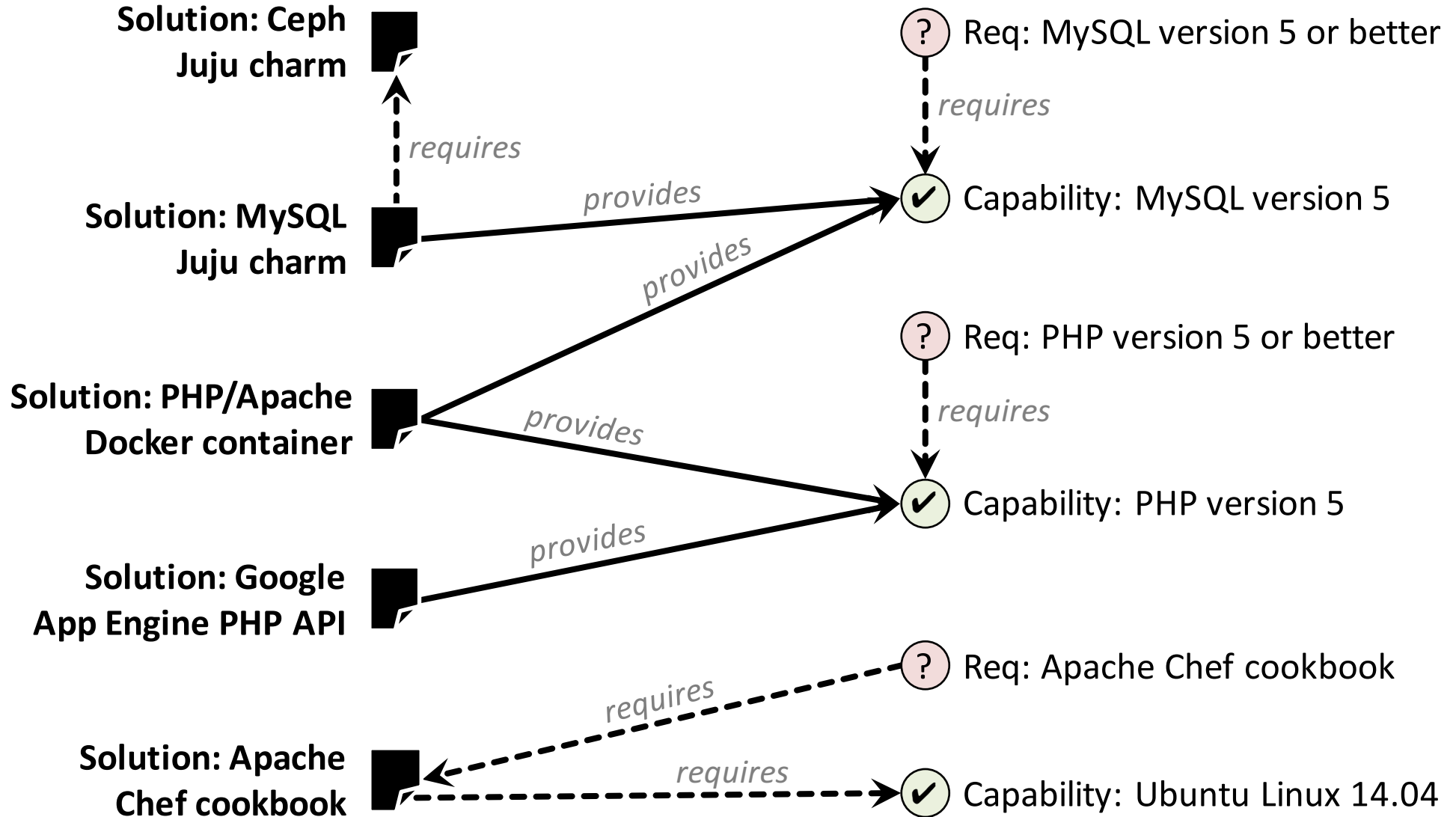
Test Topology



■ Application Part (Component/Service)

■ Application Environment Requirement (= AER)

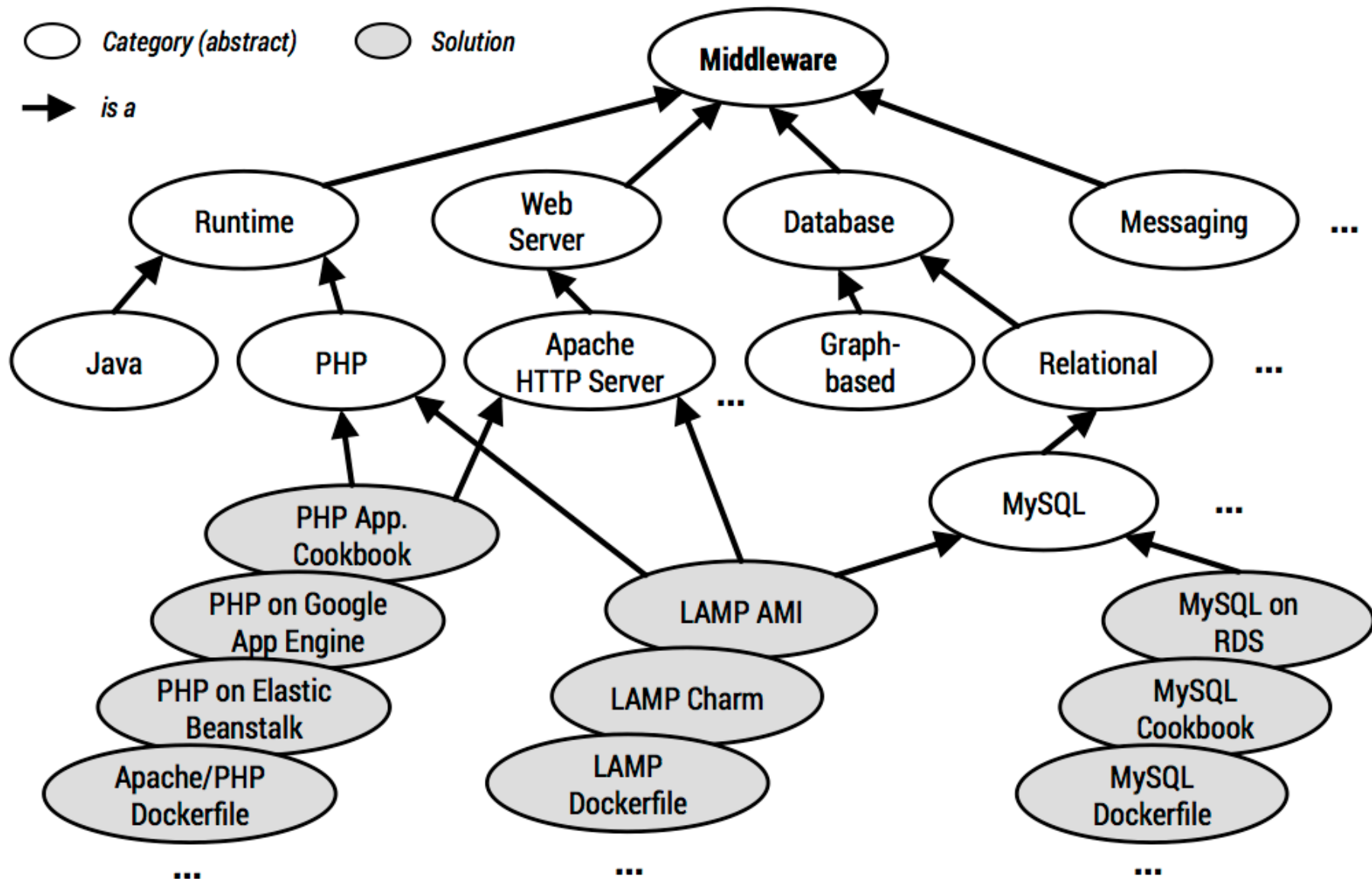
Linked Solutions: Requirements & Capabilities



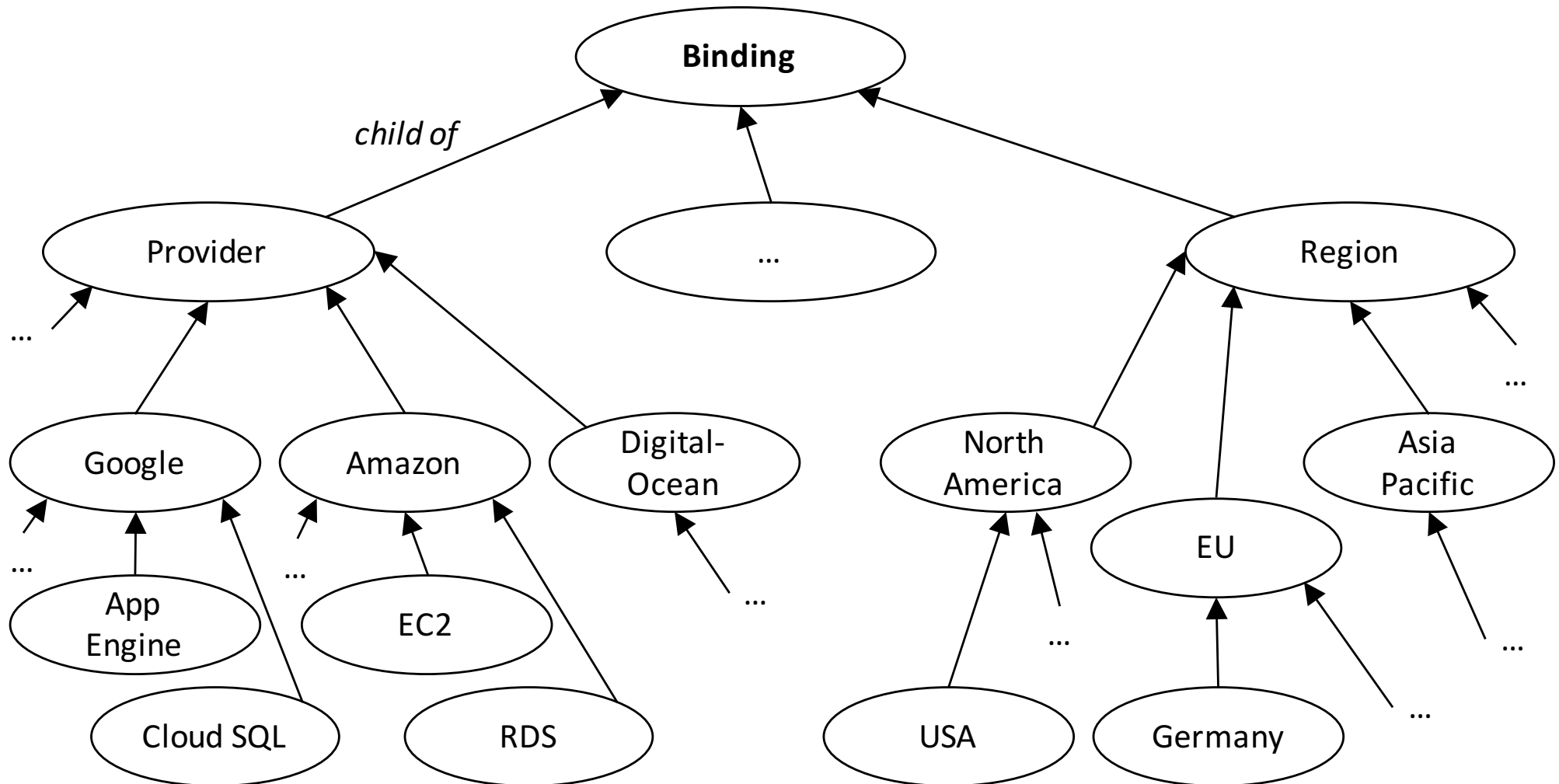
Resolve requirements

- “Optimal” solutions for requirements **depend on constraints of environment ...**
 - On a developer’s machine: *“lightweight” & minimal setup*
 - E.g., whole application stack in a single, compact virtual machine
 - In production: *high availability & elasticity*
 - E.g., scalable cluster of virtual servers (e.g., in the Cloud)

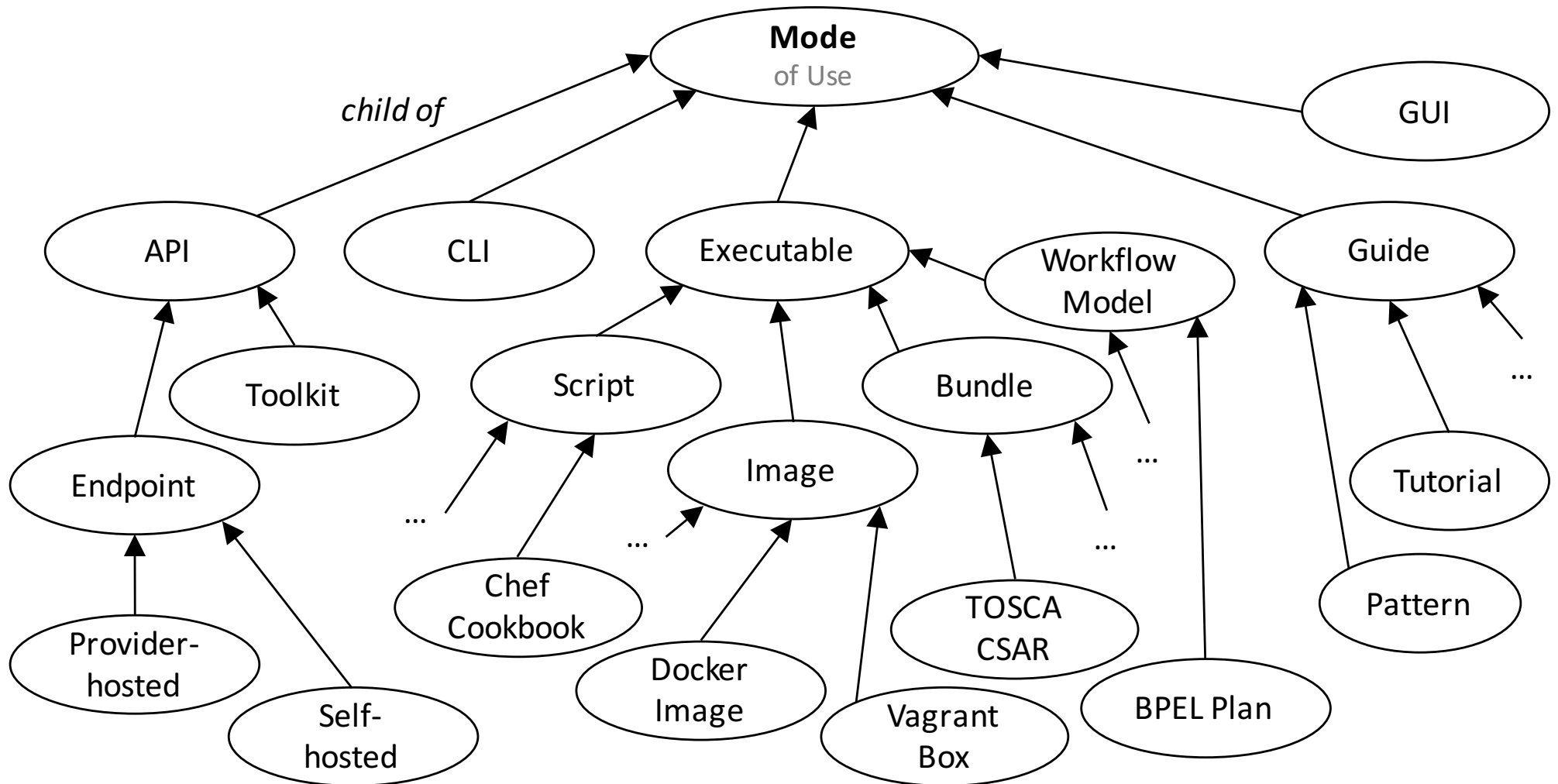
Label Taxonomies (classification of solutions)



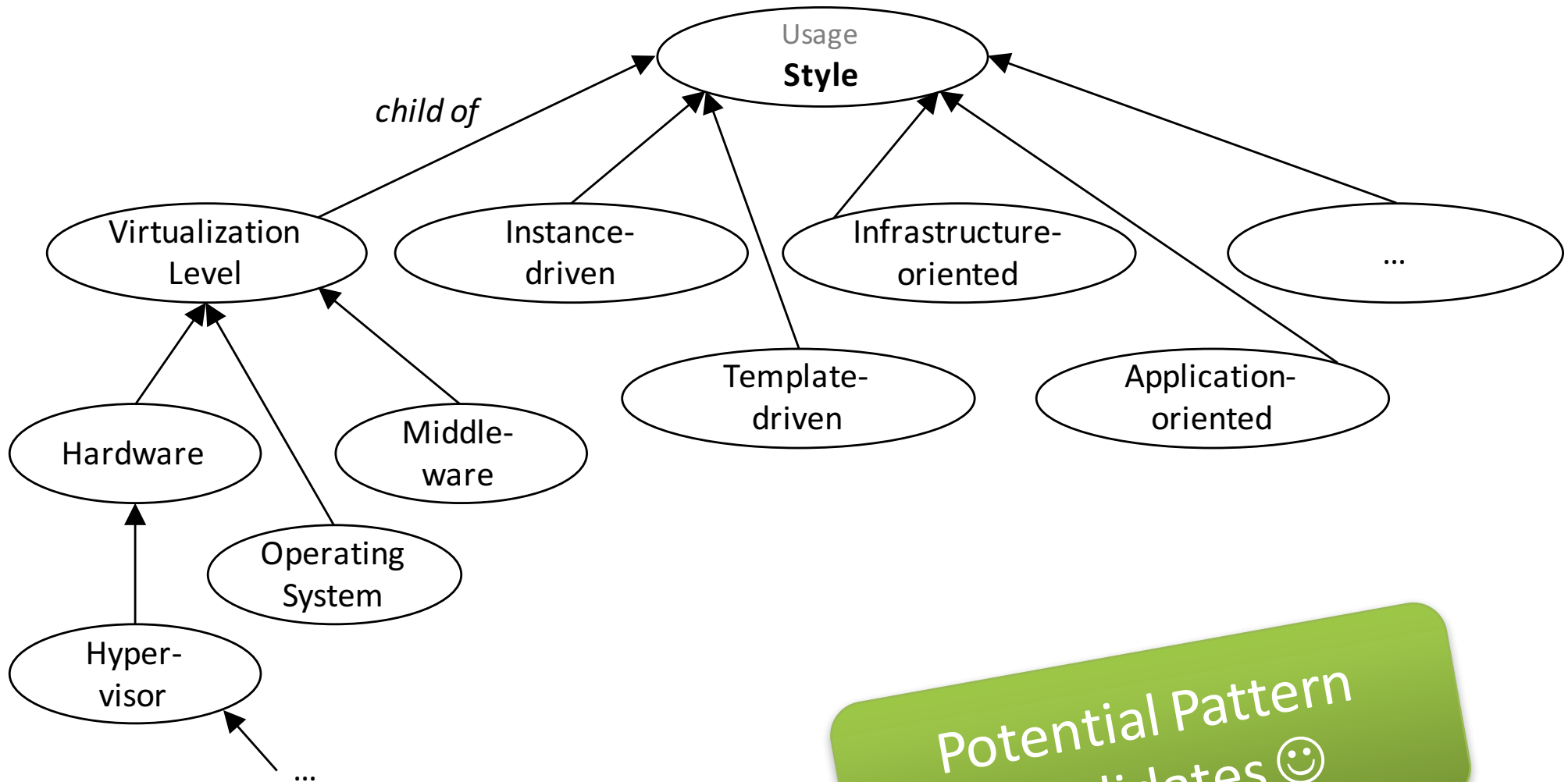
Label Taxonomies (classification of solutions)



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Label Taxonomies (classification of solutions)



Potential Pattern Candidates 😊

Label Taxonomies (classification of solutions)

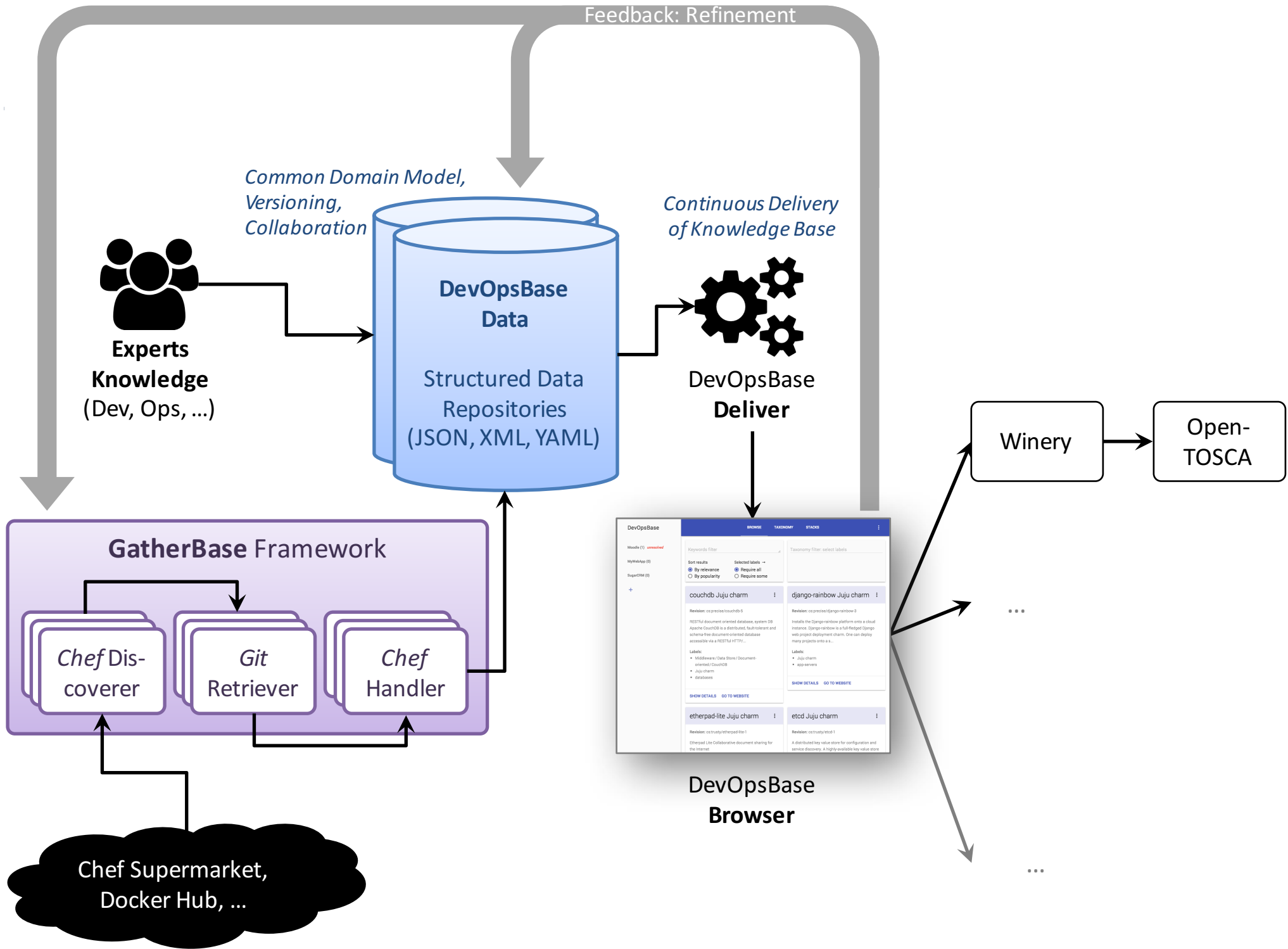
- Type / Middleware / Runtime / Java
- Type / Infrastructure / Operating System / Linux / Ubuntu

- Binding / Provider / Amazon / EC2
- Binding / Region / EU / Germany

- Mode / Executable / Image / Docker Image
- Mode / API / Endpoint

- Style / Virtualization Level / Operating System

- ...



Feedback: Refinement

Common Domain Model, Versioning, Collaboration

Experts Knowledge (Dev, Ops, ...)

DevOpsBase Data
Structured Data Repositories (JSON, XML, YAML)

Continuous Delivery of Knowledge Base

DevOpsBase Deliver

GatherBase Framework

Chef Discoverer

Git Retriever

Chef Handler

DevOpsBase

Browse | Taxonomy | Stacks

Module: **unresolved**

HybridApp (0)

SupportItem (0)

Keywords filter

Sort results: By relevance By popularity

Select labels: Require all Require some

Module	Revision	Description
couchdb Jujju charm	cs:precisecouchdb-6	RESTful document oriented database, system DB
django-rainbow Jujju charm	cs:precisecouchdb-3	Install the Django rainbow platform onto a cloud instance.
etherpad-lite Jujju charm	cs:trustyletetherpad-lite-1	etherpad Lite Collaborative document sharing for the internet.
etcd Jujju charm	cs:trustyletetherpad-1	A distributed key value store for configuration and service discovery.

SHOW DETAILS GO TO WEBSITE

DevOpsBase Browser

Winery

Open-TOSCA

Chef Supermarket, Docker Hub, ...

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