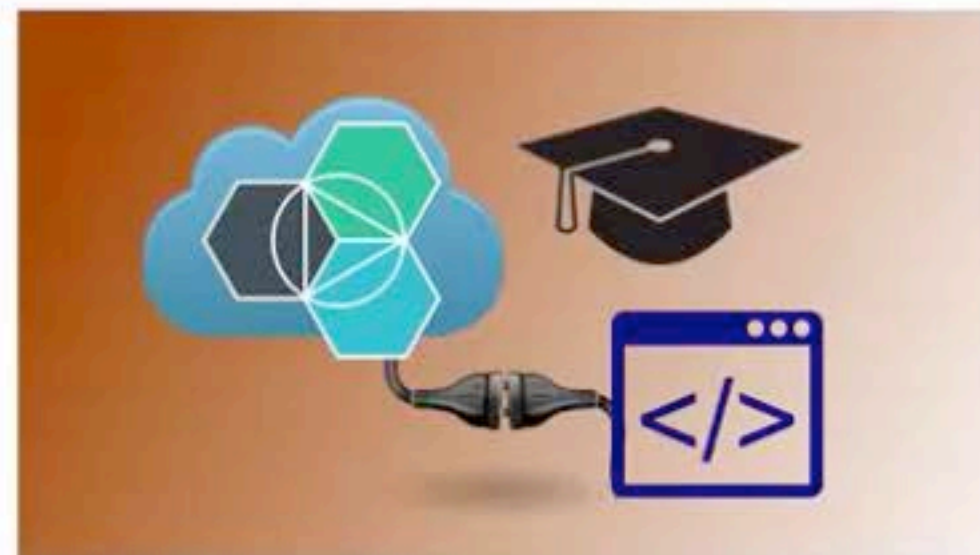# Cloud Foundry – Architecture
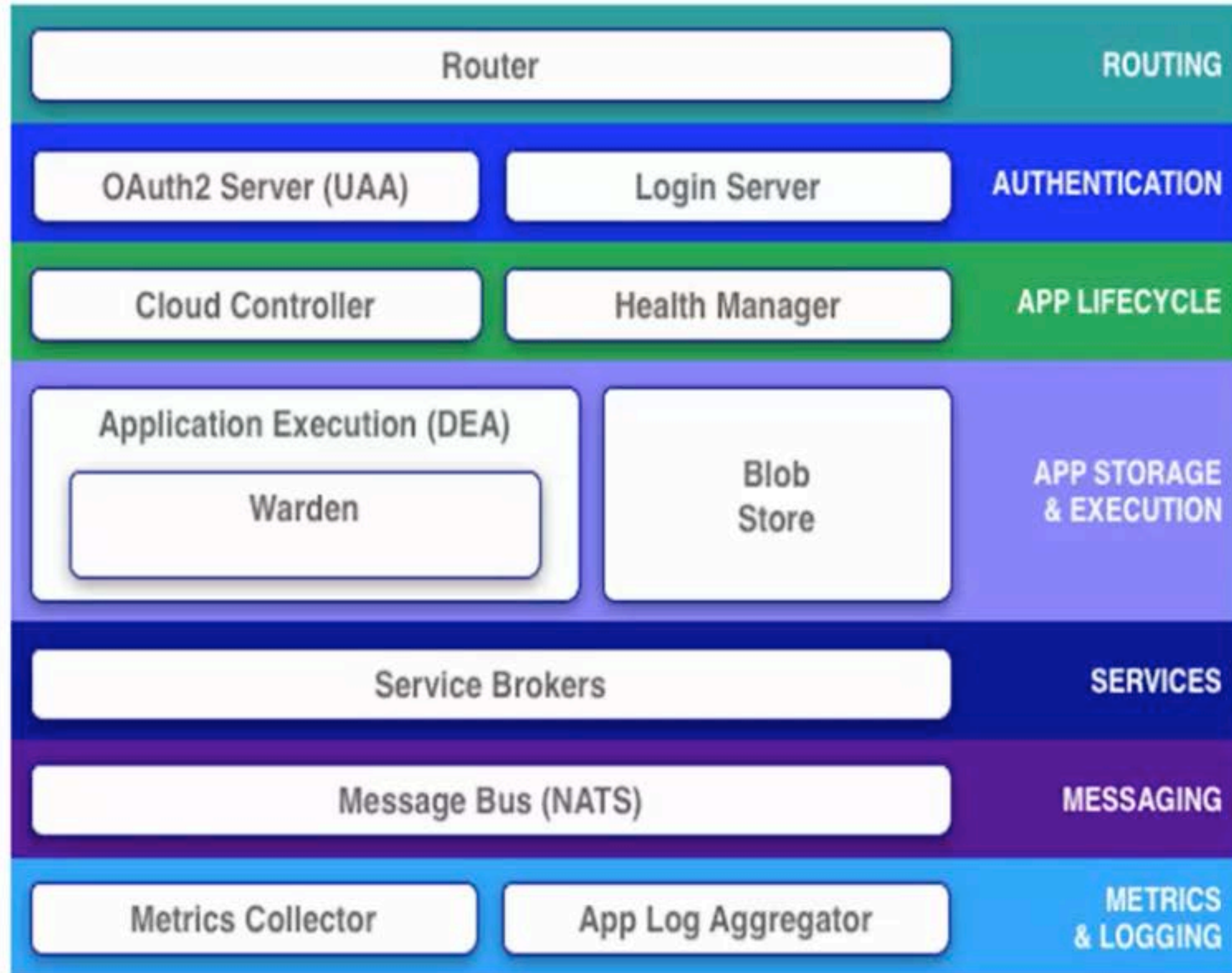

Learning Objectives:

1. Components of Cloud Foundry Architecture

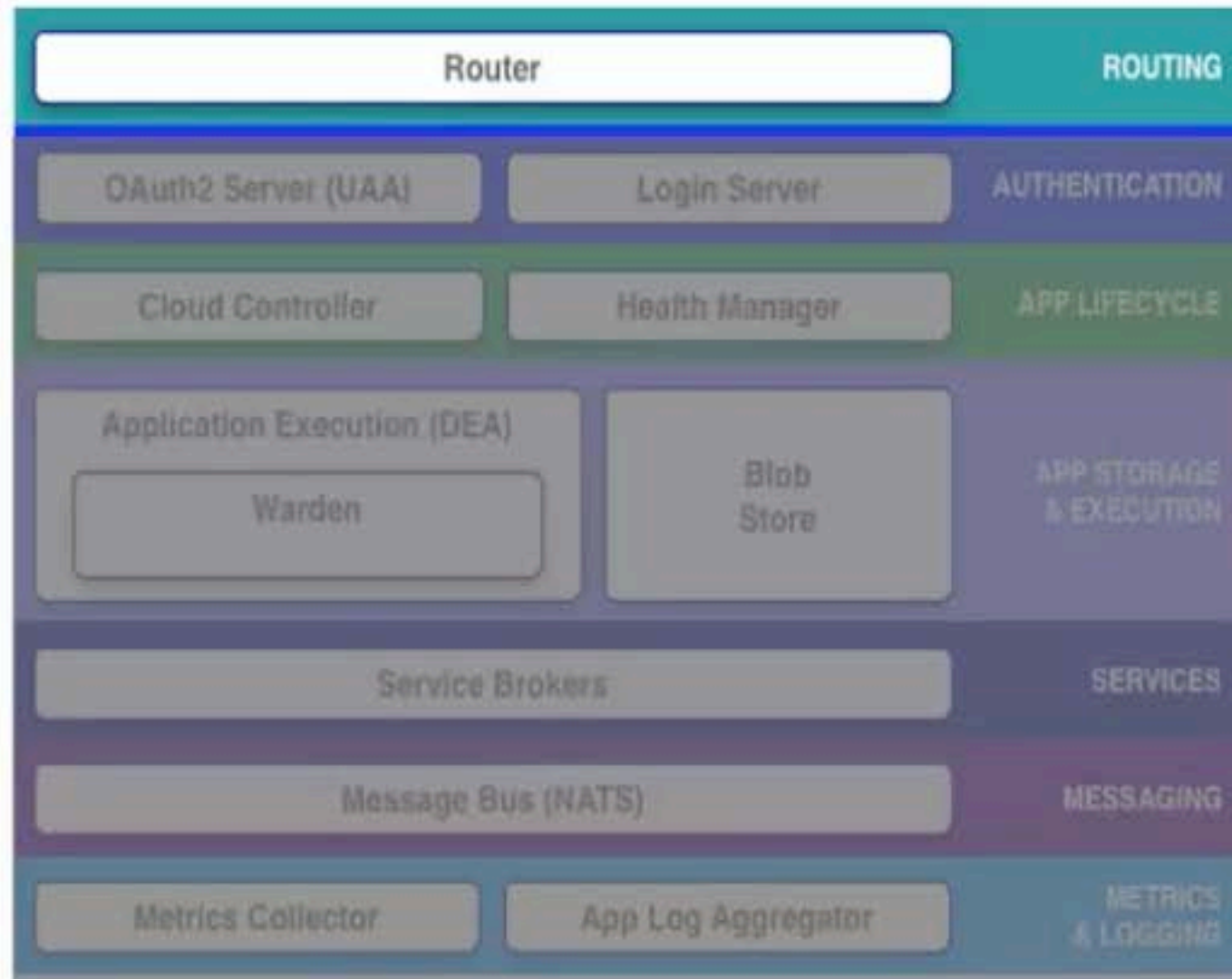2. How all components come together to provide the PaaS

Building blocks

- An **automation engine** for application deployment and lifecycle management

- Self service application **execution engine**

- A scriptable command line interface (**CLI**) & Integration with Tools

- **Buildpack** mechanism

- A **Cloud provider interface**

- A **Service provider interface**

Astronaut's view

|		
Router		**ROUTING**
OAuth2 Server (UAA)	Login Server	**AUTHENTICATION**
Cloud Controller	Health Manager	**APP LIFECYCLE**
Application Execution (DEA) Warden	Blob Store	**APP STORAGE & EXECUTION**
Service Brokers		**SERVICES**
Message Bus (NATS)		**MESSAGING**
Metrics Collector	App Log Aggregator	**METRICS & LOGGING**

Router

- All calls to applications on CF end up on Router

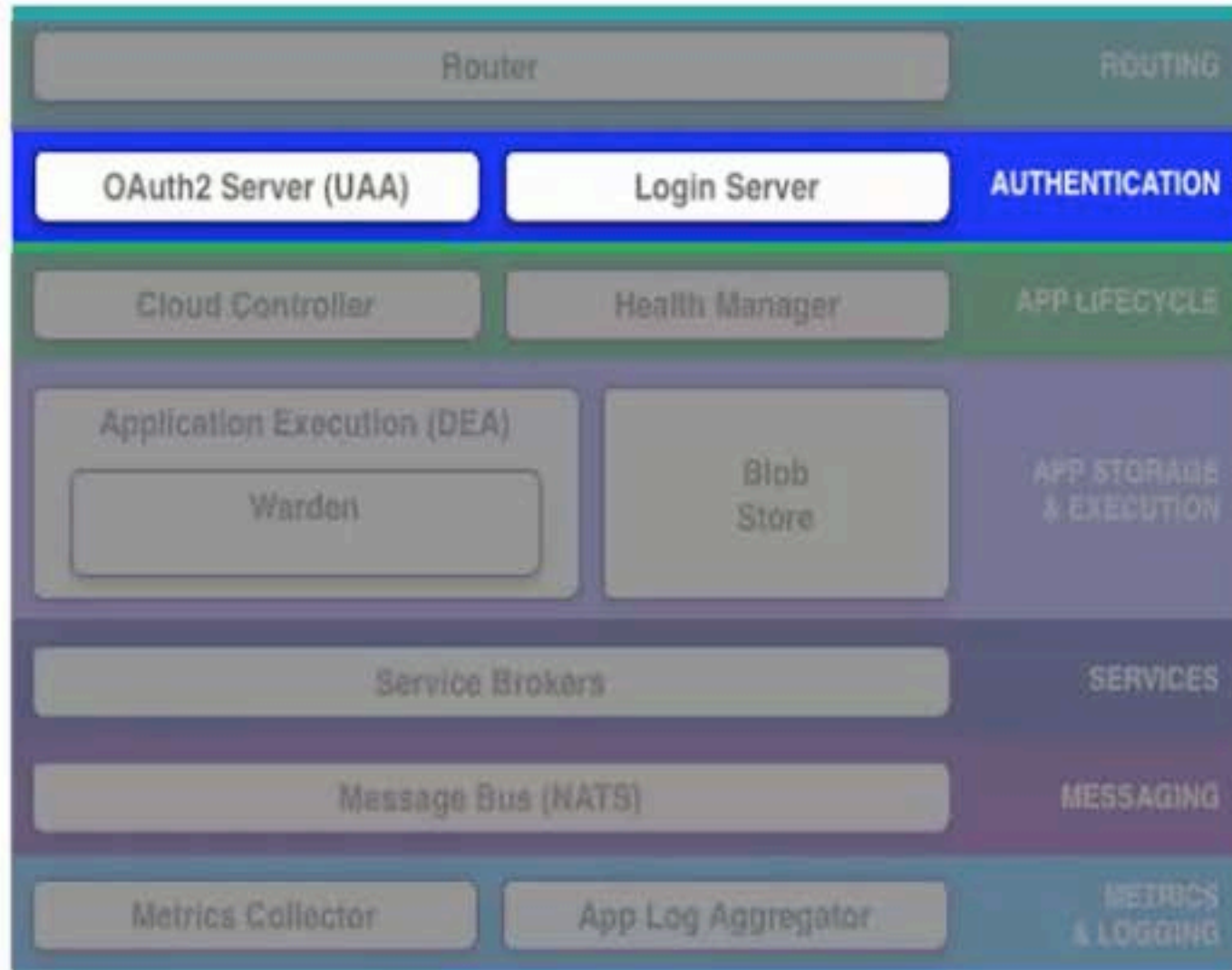- Routes to the appropriate application and controller
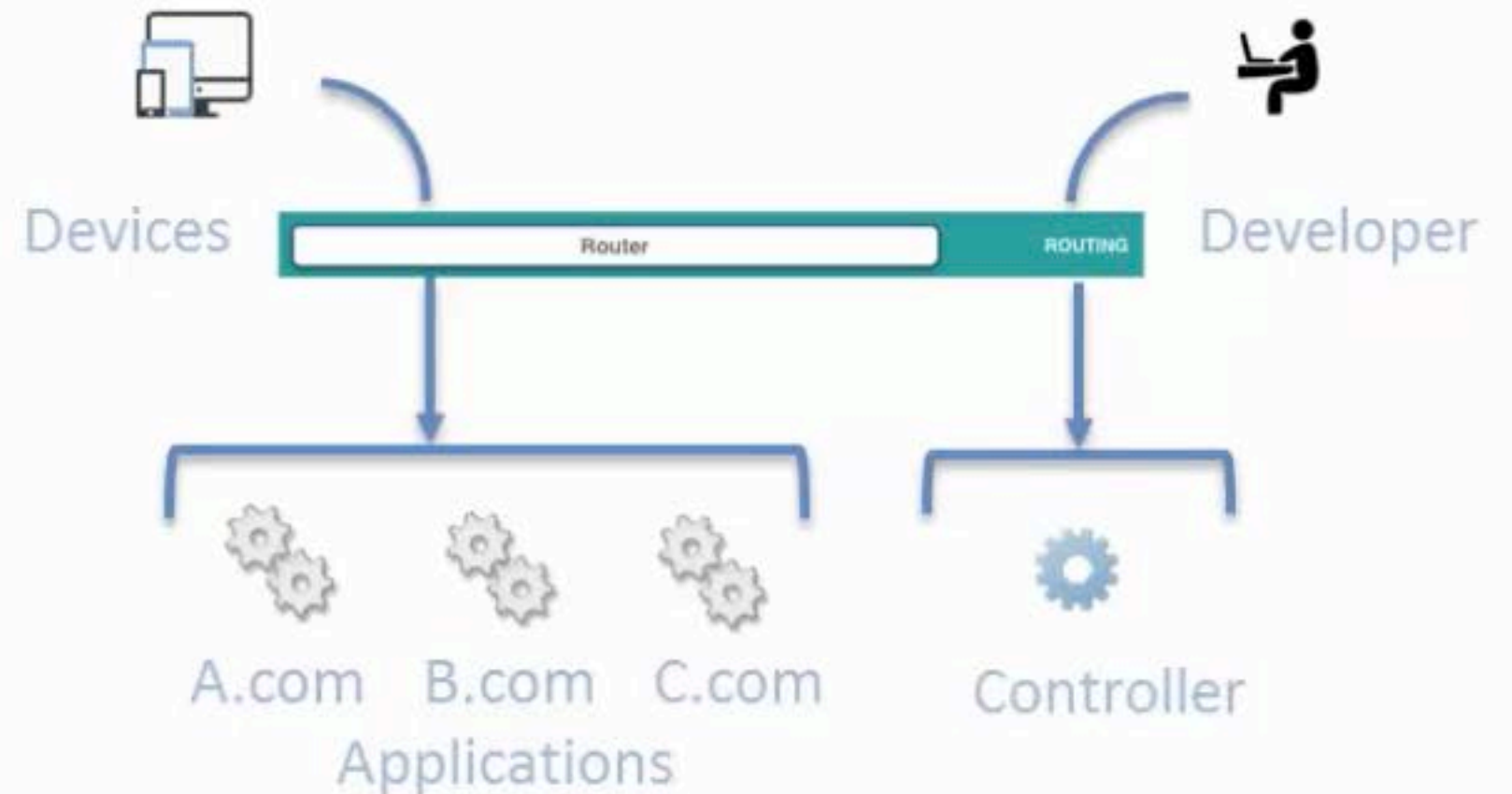
App Storage & Execution
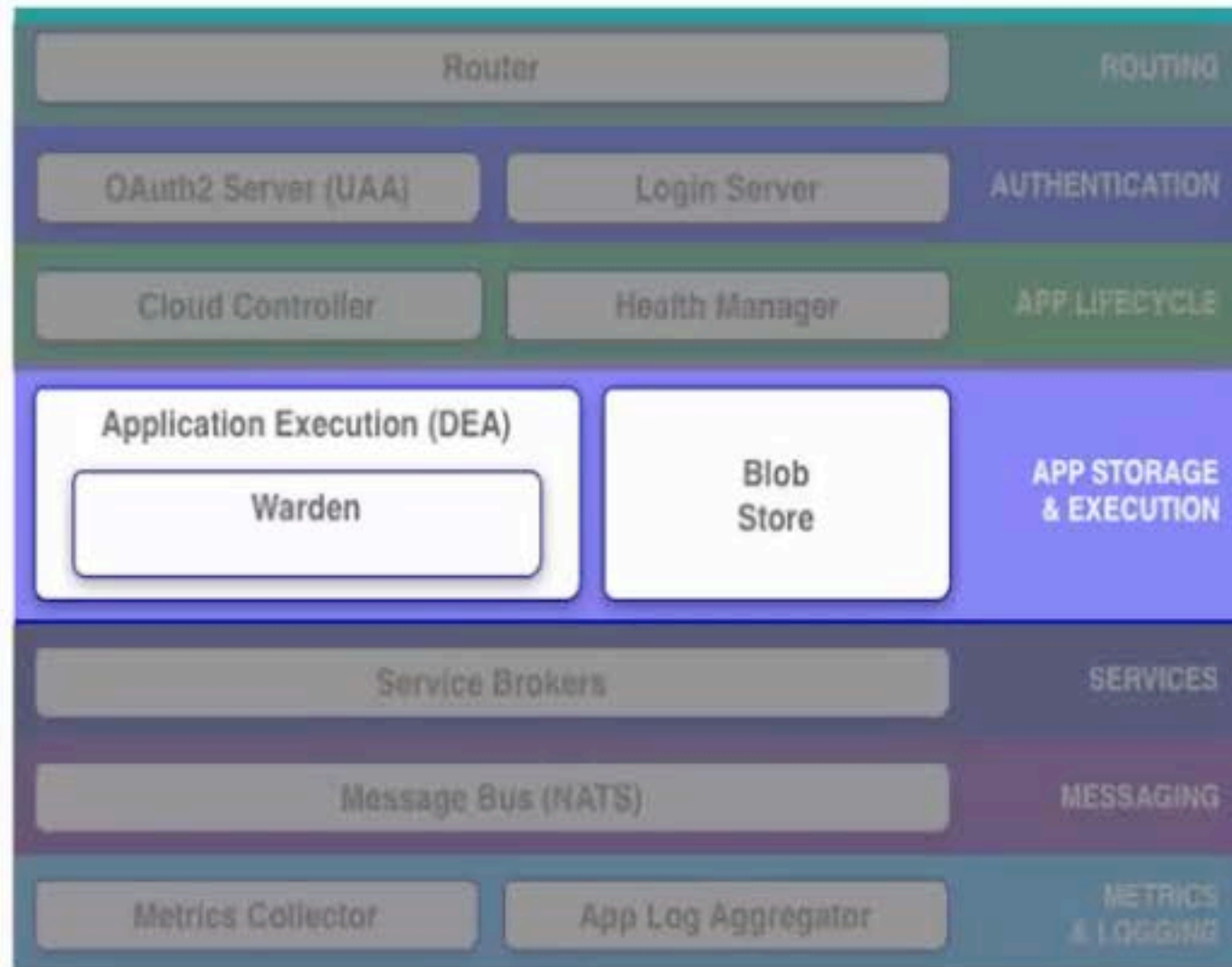
- Droplet Execution Agent (**DEA**) manages application instances, tracks instances & broadcast state

- Applications sit in **warden** containers
  1. Provides isolated environment
  2. Limit CPU, memory, disk & network usage

- Blob Stores hold – Application code, Buildpacks, Droplets

Diagram labels:

- Router — ROUTING
- OAuth2 Server (UAA) — Login Server — AUTHENTICATION
- Cloud Controller — Health Manager — APP LIFECYCLE
- Application Execution (DEA) / Warden — Blob Store — APP STORAGE & EXECUTION
- Service Brokers — SERVICES
- Message Bus (NATS) — MESSAGING
- Metrics Collector — App Log Aggregator — METRICS & LOGGING

Authentication | Identity Management

- User Account & Authentication (UAA) is the identity management service

  - OAuth2 provider

  - Authenticate with login server

  - Single Sign On (SSO) for users

  - Endpoints for managing user accounts & other functions

Cloud Controller & Health Manager
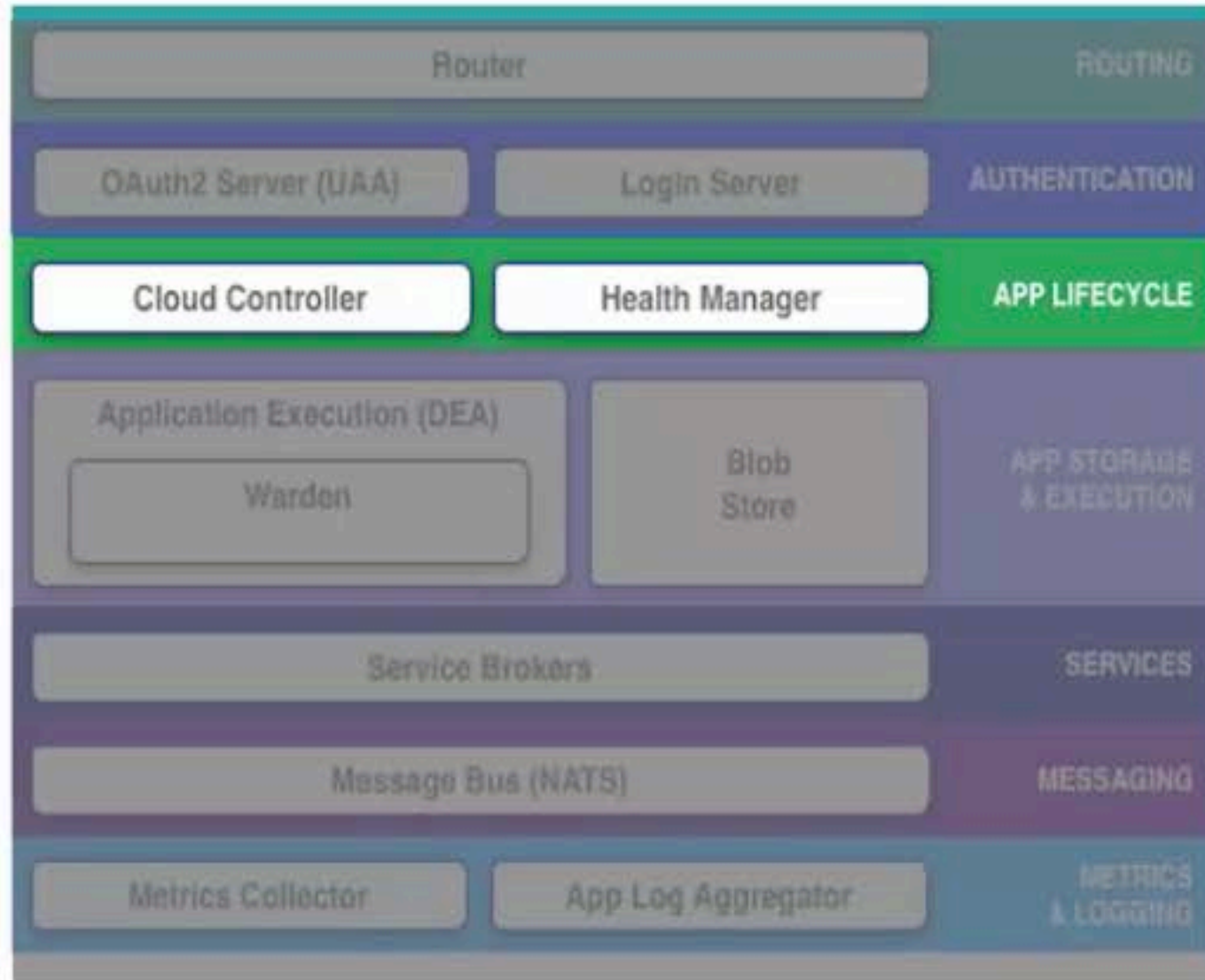
- **Cloud Controller provides command and control system**
  - Exposes the CF API
  - Maintains records of domain objects
  - Directs DEA to stage/run apps
- **Health Manager**
  - Monitors the health of apps
  - App state reconciliation
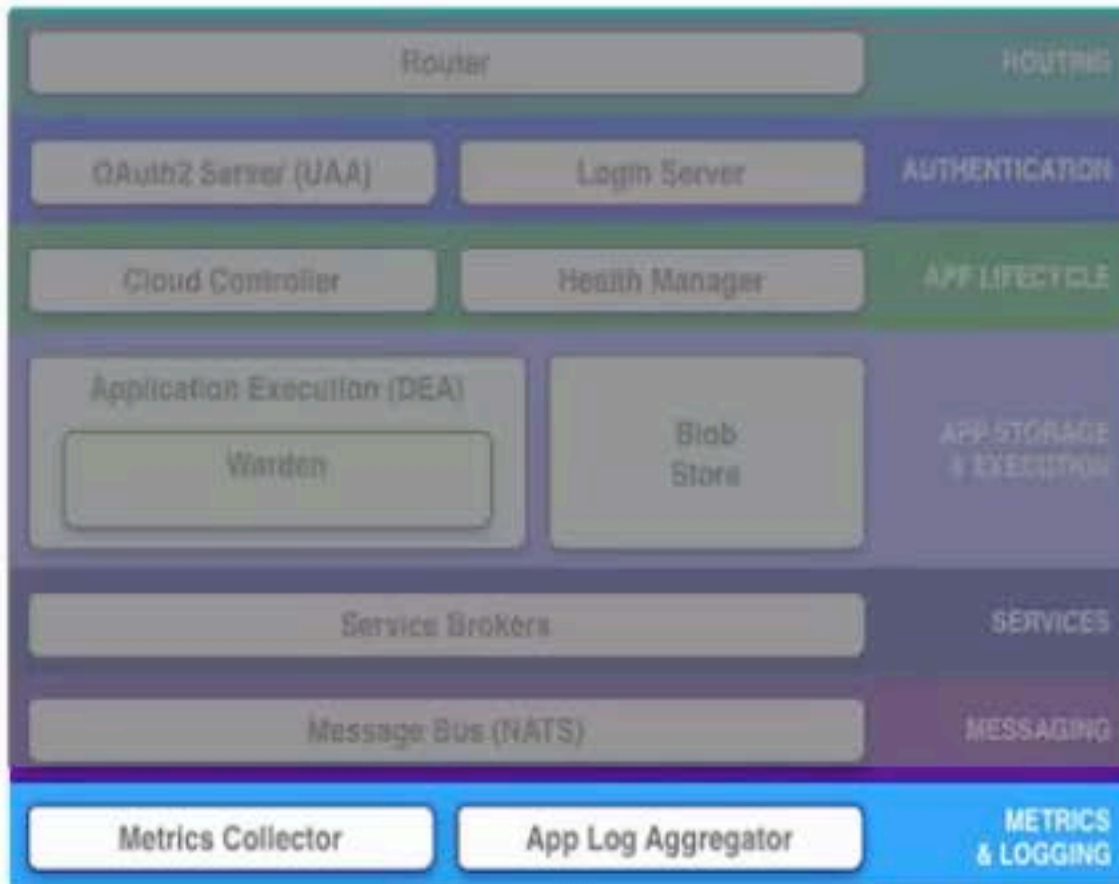 - Directs CC to address issues found

Service Brokers

Service#1

Service#2

- Manages the services
  - Advertises service catalog
  - Service provisioning

    | Create | Bind | Unbind | Delete |

  - Broker API for service providers

Message Bus (NATS)
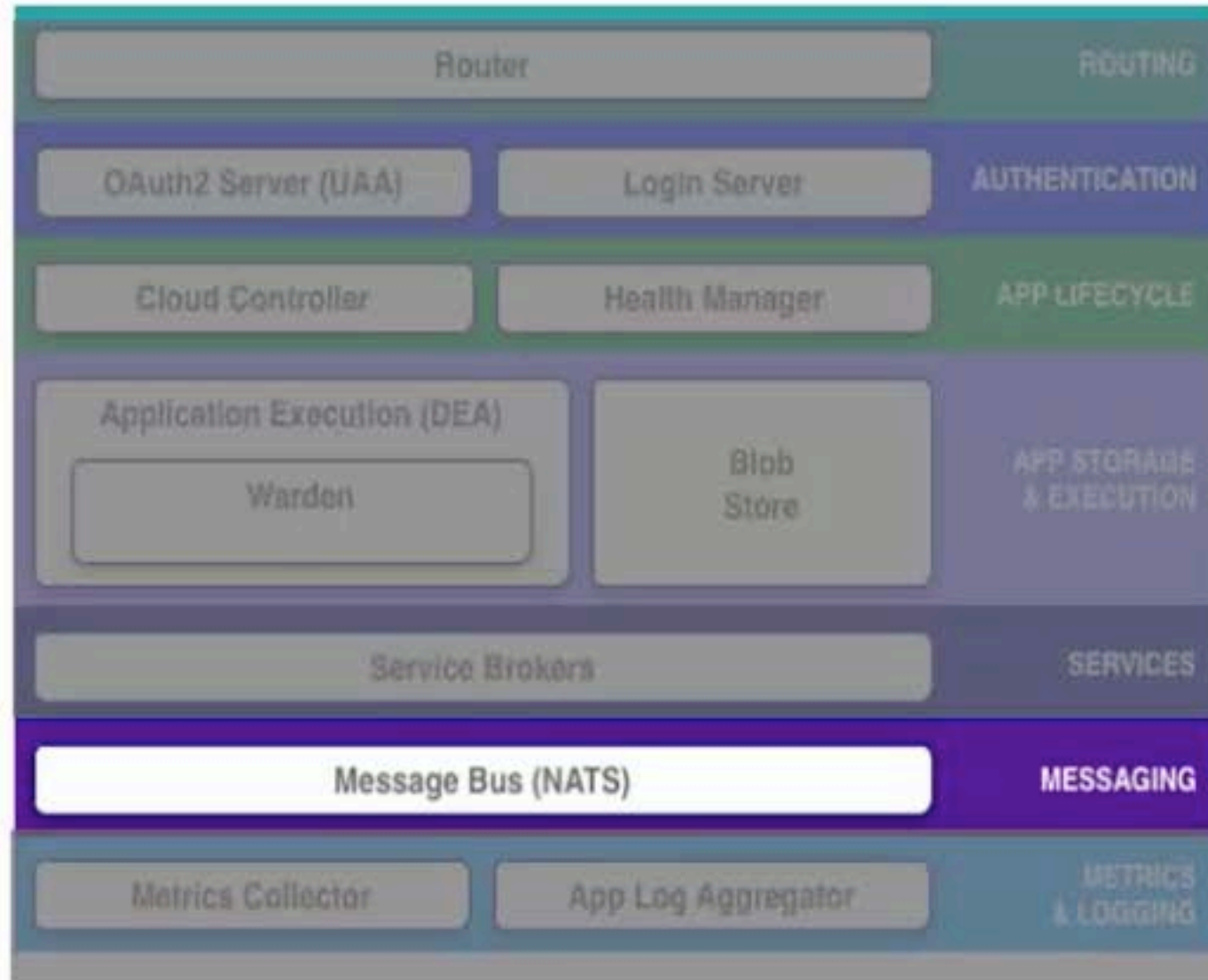
- High performance messaging
  - Internal to Cloud Foundry
  - Publish/Subscribe, Queues
  - Non persistent messages

Metrics & Logging

- Gather metrics from components
  - E.g., number of router.requests
  - E.g., cc.requests.completed
  - Enables CF health management

- Application Log aggregator
  - Streams app logs to developers
  - By default to terminal

```
2014-02-13T11:44:52.11-0800 [API]    OUT Updated app with guid e1ca6390-cf78-
```

Summary