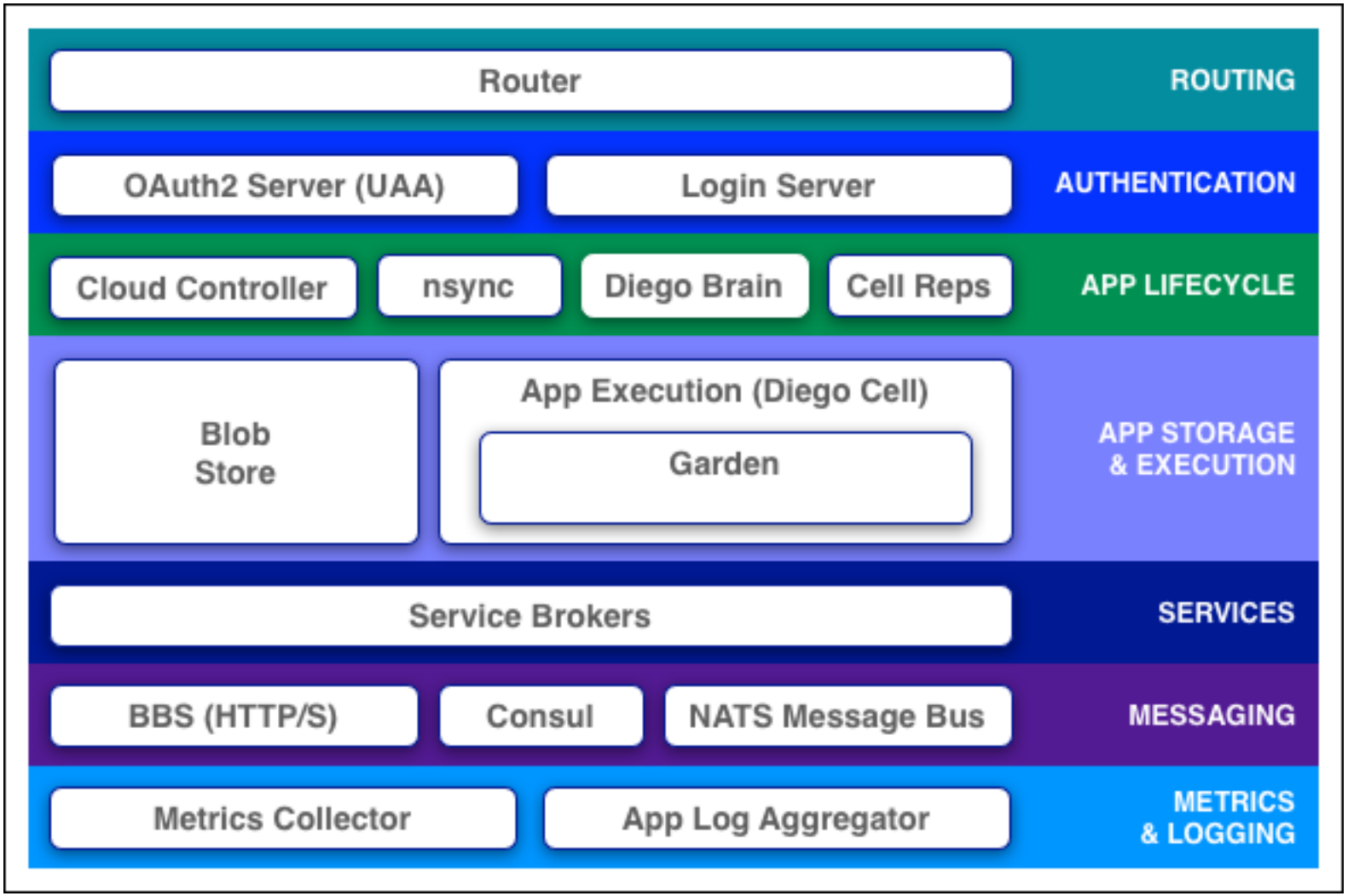
IBM Bluemix PaaS and Cloud Foundry infrastructure

After you complete this section, you should understand:

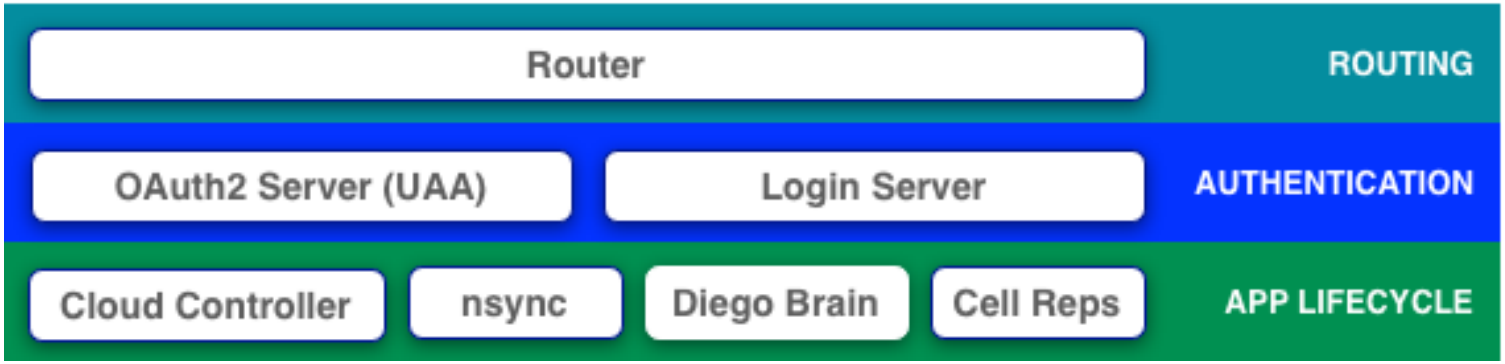
- Key infrastructure components of IBM Bluemix PaaS and Cloud Foundry:
  - Cloud Foundry architecture
  - Application lifecycle
  - Storage and services
  - Messaging and logging

Cloud Foundry architecture



Reference: http://docs.cloudfoundry.org/concepts/architecture/

Key components for routing, authentication, and application lifecycle

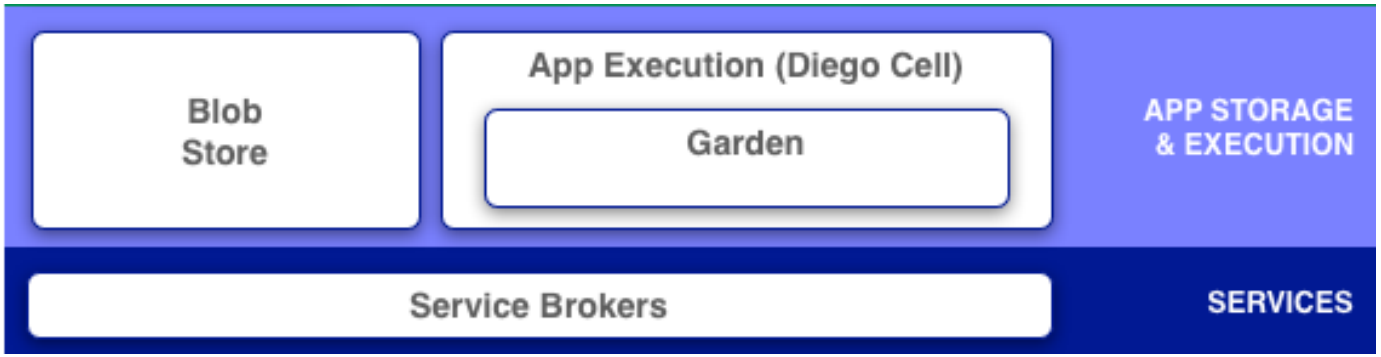


Routing: A ***router*** routes incoming traffic to the appropriate component, usually the Cloud Controller or a running application on a Cell.

Authentication: The ***OAuth2 server*** (the UAA) and ***Login Server*** work together to provide identity management.

App lifecycle: The ***Cloud Controller*** directs the deployment of applications. When a developer pushes an application to Cloud Foundry, the Cloud Controller uses the CC-Bridge to store the application bits and direct the Diego Brain to coordinate Diego Cells to stage and run applications. The Cloud Controller also maintains records of organizations, spaces, services, service instances, user roles, and more. Application availability is coordinated by the ***nsync, BBS,*** and ***Cell Reps*** components. The nsync component stores the desired number of instances (Long Range Processes) in the BBS and the BBS monitors report of actual instances from the Cell Reps.

Key components for application execution, storage, and services



Application execution

- The ***Diego Cell*** hosts application instances, reports application status to the Diego Bulletin Board Service (**BBS**), and provides application logs, errors, and metrics to the Loggregator. Application instances live inside Garden containers.
- Application instances live inside ***Garden*** containers. Containerization ensures that application instances run in isolation, get their share of resources, and are protected from noisy neighbors.

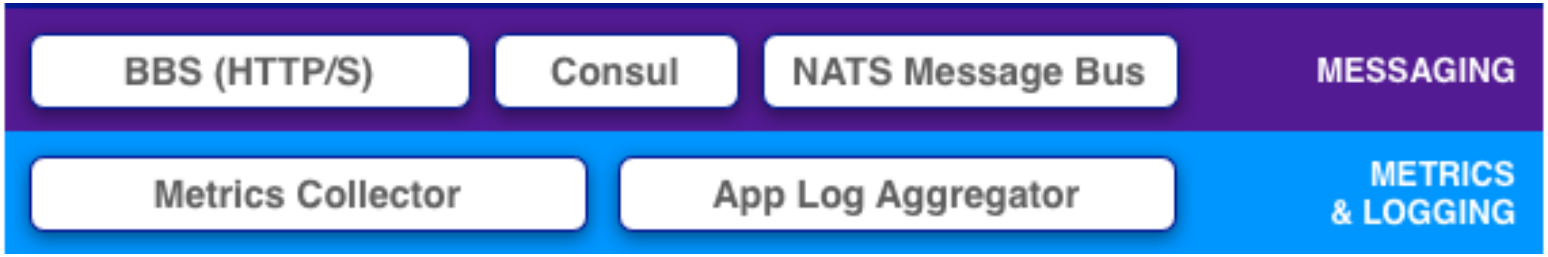
Application storage

- The ***Blob Store*** holds application code, buildpacks, and droplets.

Services

- Applications typically depend on services such as databases or third-party SaaS providers. When you provision and bind a service to an application, the ***service broker*** for that service is responsible for providing the service instance.

Key components for messaging, metrics, and logging



Messaging

- Cloud Foundry uses HTTP/S to communicate between components and stores frequently updated information in the Diego Bulletin Board Service (**BBS**) and long-lived control data in ***Consul***. The ***NATS Message Bus*** is used by the router-emitter to broadcast routing tables to the Router.

Metrics and Logging

- The ***metrics collector*** gathers metrics from the components. Operators can use this information to monitor an instance of Cloud Foundry.
- The ***application log aggregator*** streams application logs to developers.