Cloud Service Types, Deployment, and Ownership Model

Essential Characteristics

- On-demand Self-service
  - User can provision computing resources without human intervention
    - Server time, storage, software resources
- Broadband Network Access
  - Resources can be accessed through public network
    - Workstations, Laptops, Tablets, Mobile Phones

Essential Characteristics

- Resource Pooling
  - Services are pooled to serve multiple consumers using multi-tenant model
  - Physical and virtual resources allocation are dynamic based upon demand
- Rapid Elasticity
  - Resources can be elastically provisioned and related to enable scaling
  - Consumer gets virtually unlimited resources
- Measured Services
  - Automatically optimize and control resources
  - Resource utilization can be monitored, reported and controlled

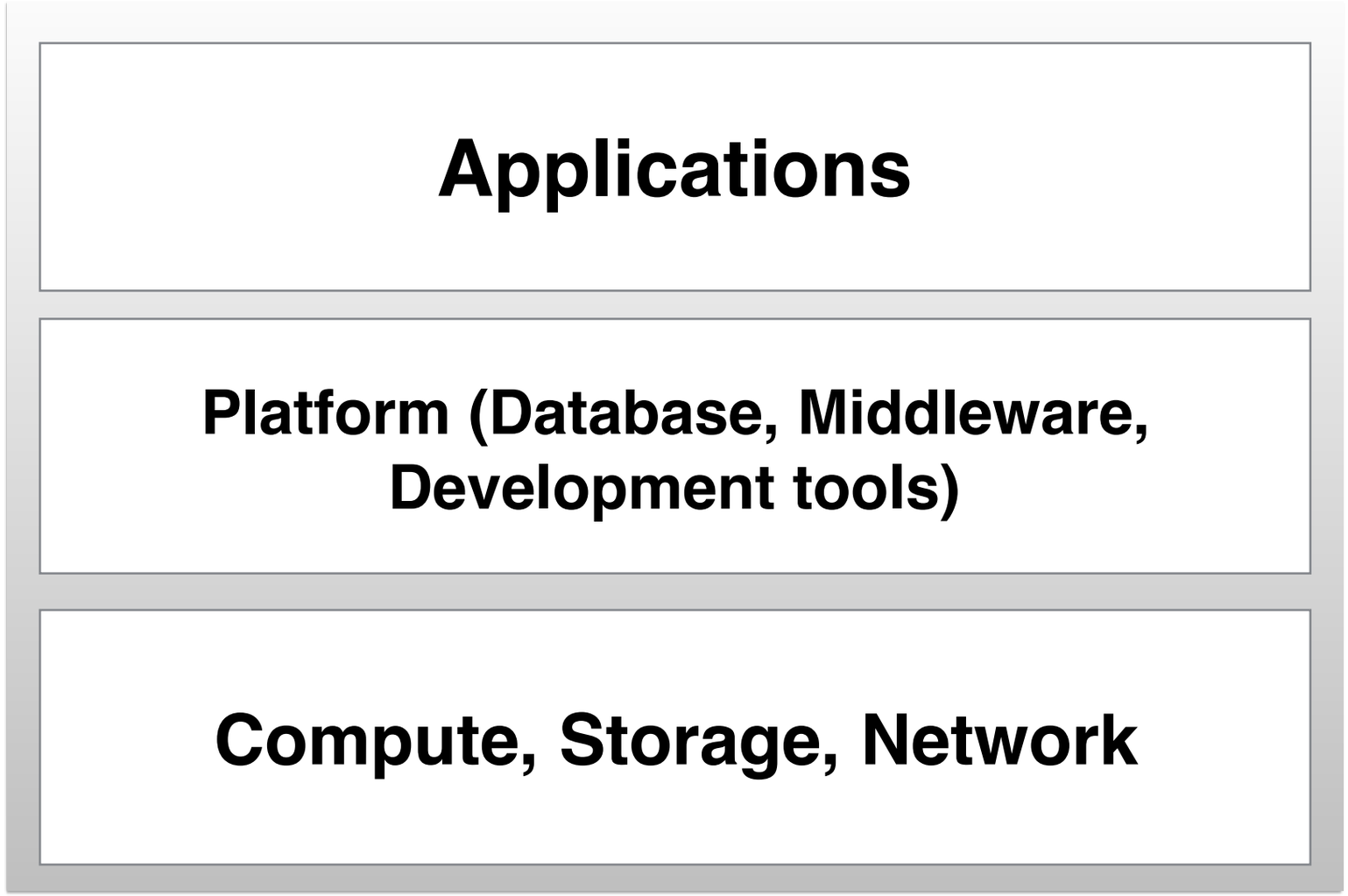
What does all this mean

- Get resources when you want (rapidly)
- Grow or shrink resources on demand
- Keep tabs on your cost
- Easily accessible
- Retail Store during Christmas
  - Scale resources with demand and return after the season
  - No need to setup permanent resources

How are Cloud Services Provided?

Resources

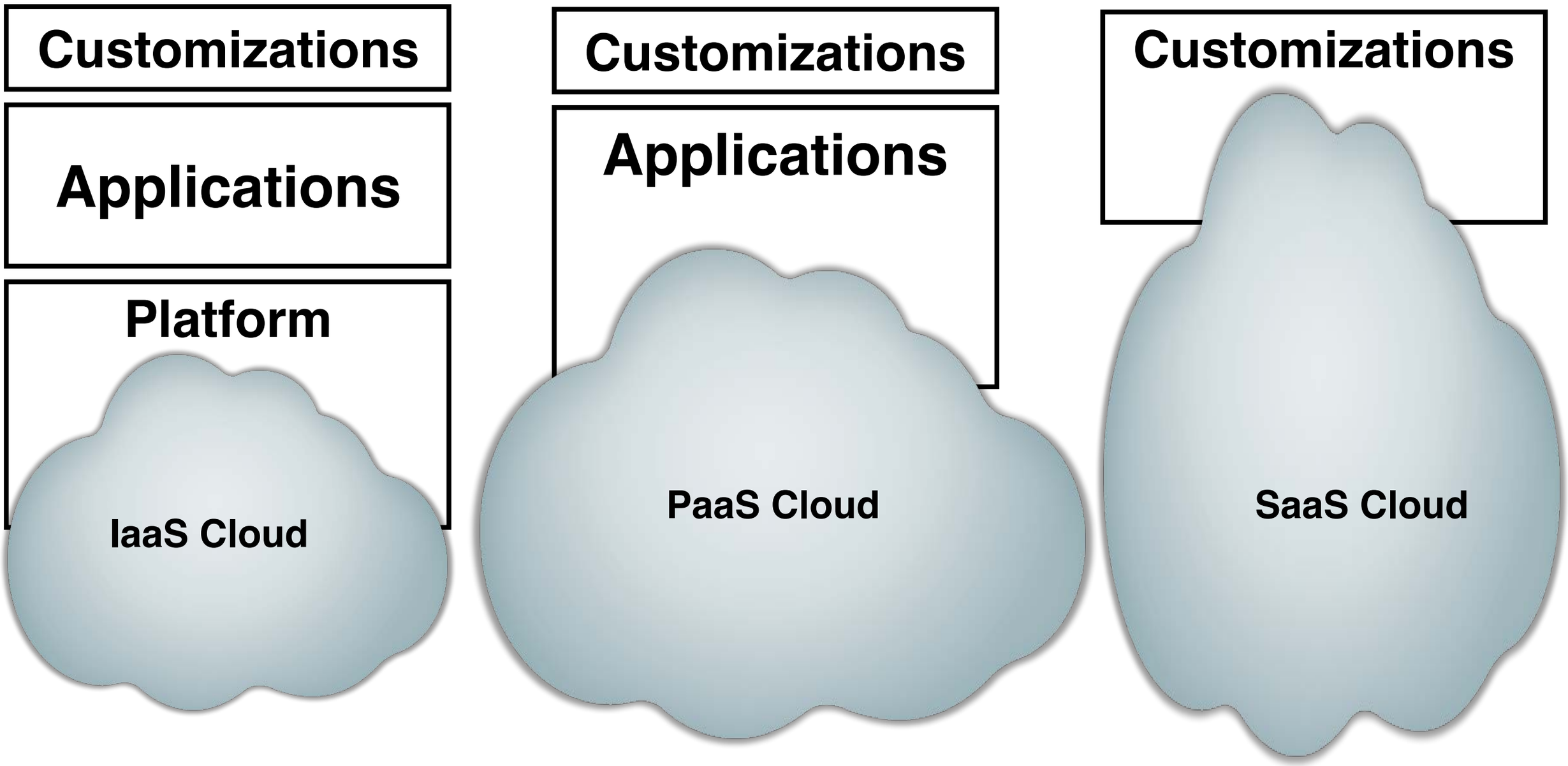
- Resources in 3 buckets



Service Models

- Cloud services are provided to users in many forms
- NIST defines at least 3 forms:

Service Models



Infrastructure as a Service (IaaS)

- Provides users functionality to provision computing and storage resources
- Resources available as Virtual images
- Cloud users have capability to manage these virtual resources
- Cloud Provider is responsible for managing underlying technology
    - Hardware, operating system, network.
- Resources are charged as “pay-per-use” basis
    - Subscription economy
- User get full visibility and control of resource usage

Platform as a Service (PaaS)

- Builds on top of the Infrastructure as a service
- Provides users:
  - Development tools, Software Libraries, Databases,
  - Middleware
- Enable users to quickly develop and deploy applications
- Cloud provider manages:
  - Hardware, OS, Network, Storage, Middleware

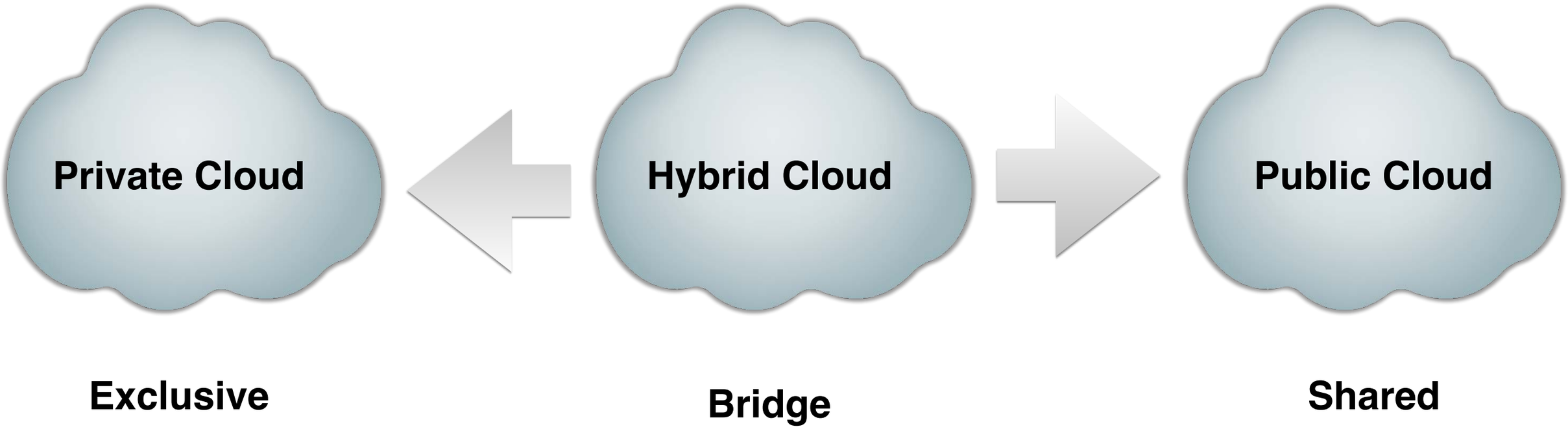
Software as a Service (SaaS)

- Builds on top of the Platform as a service
- Provides a complete software application for use
- Application is accessed from anywhere over the internet
- Cloud provider manages everything including the:
  - Application, and Data
  - User is completely unaware of details of underlying architecture

How is Cloud Deployed?

Deployment

- Private, Public, & Hybrid



Private Cloud

- Cloud infrastructure is dedicated for a single organization.
- Infrastructure can be setup on-premise or off-premise
- Internal or external cloud management
- Provides complete control

Public Cloud

- Cloud services are shared
- Cloud services are provided by 3rd party
- Operational Expense
  - Little to no upfront investment.

Hybrid Cloud

- Combines services of private and public clouds
- Take advantage of public cloud while controlling mission-critical applications
- Cloud bursting — overdraft for peak loads
- Development/Test & Production resource distributions