Report on DigitalOcean

What is Digital Ocean

DigitalOcean is a cloud infrastructure provider that provides cloud computing services to business entities. It is used to scale by deploying DigitalOcean applications that run parallel across multiple cloud servers without compromising performance.

In January 2018, it acquired the title of the third-largest Cloud hosting company globally in web-facing computers.

Key Features of DigitalOcean: -

1. Droplets: DigitalOcean's virtual private servers, called Droplets, allow users to deploy and scale applications on the cloud easily. Users can choose from various pre-configured Droplet sizes or customize their own based on their requirements.

2. Kubernetes: DigitalOcean offers managed Kubernetes service, allowing users to deploy, manage, and scale containerized applications using Kubernetes, an open-source container orchestration platform.

3. App Platform: DigitalOcean's App Platform provides a platform-as-a-service (PaaS) solution that allows developers to build, deploy, and scale web applications quickly without worrying about infrastructure management.

4. Block Storage: Users can attach scalable and high-performance block storage volumes to their Droplets to expand storage capacity.

5. Object Storage (Spaces): DigitalOcean offers Spaces, an object storage service similar to Amazon S3, for storing and serving large amounts of unstructured data like images, videos, and backups.

6. Databases: DigitalOcean provides managed database services for popular databases like PostgreSQL, MySQL, and Redis, simplifying the management and scaling of databases.

7. Load Balancers: Users can set up load balancers to distribute incoming traffic across multiple Droplets for improved application performance and high availability.

8. Networking: DigitalOcean offers various networking features like floating IPs, private networking, and Virtual Private Clouds (VPCs) for secure and scalable networking configurations.

9. Monitoring and Alerts: DigitalOcean provides monitoring tools and alerts to help users track the performance of their Droplets and respond to issues proactively.

10. API and Command-Line Interface (CLI): DigitalOcean offers a comprehensive API and CLI, enabling users to automate and manage their infrastructure programmatically.

DigitalOcean vs AWS

DigitalOcean and Amazon Web Services (AWS) are both popular cloud service providers, but they cater to different types of users and have different strengths. Here are some key differences between DigitalOcean and AWS:

1. Target Audience:

   - DigitalOcean: DigitalOcean primarily targets developers, startups, and small to medium-sized businesses. It emphasizes simplicity and ease of use, making it a popular choice for those who may be new to cloud infrastructure or want a more straightforward experience.

   - AWS: Amazon Web Services is a comprehensive cloud services platform that caters to a broad range of customers, from startups to large enterprises. AWS offers a vast array of services, making it suitable for businesses with complex requirements and workloads.

2. Service Offerings:

   - DigitalOcean: DigitalOcean provides a focused set of cloud services, including virtual private servers (Droplets), managed databases, Kubernetes, object storage (Spaces), and a Platform-as-a-Service (App Platform).

   - AWS: AWS offers an extensive portfolio of services, covering computing, storage, databases, machine learning, analytics, networking, security, and more. Some of the well-known AWS services include Amazon EC2 (Elastic Compute Cloud), Amazon S3 (Simple Storage Service), Amazon RDS (Relational Database Service), and AWS Lambda.

3. Complexity:

   - DigitalOcean: DigitalOcean is known for its simplicity and user-friendly interface. It's relatively easy to set up and manage cloud resources, making it appealing to developers and smaller teams.

   - AWS: AWS is a powerful platform with a vast number of services and configuration options. As a result, it can be more complex to use, especially for those new to cloud computing. It offers extensive documentation and tools for managing and scaling resources effectively, but it may require a steeper learning curve.

4. Scalability:

   - DigitalOcean: While DigitalOcean provides scalability options and the ability to resize Droplets, it may not be as robust as AWS when it comes to handling extremely large-scale and complex workloads.

   - AWS: AWS is designed to handle massive workloads and offers various auto-scaling and load balancing features, making it suitable for enterprises and high-traffic applications.

5. Pricing:

   - DigitalOcean: DigitalOcean is known for its transparent and straightforward pricing model. It typically offers predictable flat-rate pricing for its services, which can be helpful for budget planning.

- AWS: AWS provides a pay-as-you-go pricing model, which means you pay for the resources you use. While this can be cost-effective for many use cases, it also requires careful monitoring to avoid unexpected costs.

In summary, DigitalOcean is an excellent choice for developers and smaller businesses looking for simplicity and ease of use. AWS, on the other hand, is a comprehensive platform suitable for businesses of all sizes, offering a vast range of services to meet diverse needs. The choice between DigitalOcean and AWS depends on the specific requirements, technical expertise, and scale of the project or business.

What is a Droplet

Droplet refers to a virtual private server (VPS) that you can deploy in the cloud. It is essentially a scalable and flexible compute instance that runs on a remote server hosted by DigitalOcean.

Creating a Droplet

1. Choose OS (Ubuntu, FreeBSD, Fedora, Debian, CentOS)
2. Choose a plan (Standard, General Purpose, CPU-Optimized, Memory-Optimized)
3. Choose Datacentre region (India – Bangalore)
   - If your site is not restricted to local customers, then go for New York or San Francisco as the network is much superior
4. Additional options(optional) – Ipv6, User data, Monitoring
5. Authentication – SSH Key(Recommended as more secure) or Root Password
   - To create an SSH key(Windows)

     Open command prompt

     i.   git-bash
     ii. cd ~/.ssh/
     iii. ssh-keygen   (generates public key and private key)
   - Paste the public key inside SSH key Content
   - Name the server and check it
6. Select number of droplets and choose a hostname
7. Add tags to organize and group droplets.
8. Select a project(You can create your own projects and they are free)
9. Enable Backups(optional - $1.00 per month and per droplet)
10. Select create droplet
11. Copy the IPv4 address

Setting up SSH

1. ssh -i ./dokey root@IPv4_address
2. apt-get install nginx

Pricing in Digital Ocean (Droplets)

Basic Droplets
      Regular
- 512 MiB(mebibyte 2^{20} bytes) Memory 10 GiB SSD - $4
- 1 GiB(gibibyte 2^{30} bytes) Memory 25 GiB SSD - $6
- 2 GiB Memory 25 GiB SSD - $12
- 2 GiB Memory 50 GiB SSD - $18
- 4 GiB Memory 60 GiB SSD - $24
- 8 GiB Memory 160 GiB SSD - $48

      We have Premium Intel and Premium AMD (higher transfer speeds) with higher prices also

CPU-Optimized Droplets
General Purpose Droplets
Memory Optimized droplets

Pricing Link - https://www.digitalocean.com/pricing/droplets

Virtual Private Cloud (VPC)

A VPC or Virtual Private Cloud is a feature of DigitalOcean that allows you to create a private network interface for your cloud resources. A VPC network provides more security and isolation for your resources because it is inaccessible from the public internet and other VPC networks. You can use VPC networks to control how your resources communicate with each other and with external sources.

Some benefits of using VPC networks are:

- You can create multiple VPC networks in different regions and customize their IP address ranges and names.
- You can add new or existing resources to a VPC network, such as Droplets, Kubernetes clusters, load balancers, databases, etc.
- You can configure firewalls to allow or deny traffic to and from your VPC network based on source, destination, protocol, and port.
- You can transfer data within a VPC network for free, without counting against your bandwidth usage.

To get started with VPC networks, you can follow these steps:

- Create a VPC network in the region of your choice using the DigitalOcean dashboard, CLI, or API. You can also use the default VPC network that is automatically created for each region.
- Add resources to your VPC network by selecting it during the resource creation process or by migrating existing resources using snapshots.
- Configure firewalls to manage the traffic to and from your VPC network. You can also use tags to apply firewalls to groups of resources.

DigitalOcean Spaces ($5 per month 250 GB storage)

Spaces is designed to store and serve large amounts of unstructured data, such as images, videos, backups, and other media files.

1. Object Storage: Spaces provides scalable and durable object storage, similar to other cloud providers' object storage services like Amazon S3 or Google Cloud Storage.

2. Simple API: Spaces offers a straightforward API that allows developers to interact with and manage their stored objects programmatically.

3. Content Delivery: Spaces allows you to deliver content to end-users with low latency by integrating with a Content Delivery Network (CDN). This helps improve the performance and load times for users accessing your stored objects from various locations worldwide.

4. Security: Spaces offers various security features, such as access control policies, to control who can access your stored objects. It also provides the option to enable or disable public access to objects as needed.

5. Data Redundancy: DigitalOcean ensures data durability and redundancy by replicating objects across multiple data centers within a region.

6. Pricing: Spaces follows a transparent pricing model, with costs based on the amount of storage used and data transfer. The pay-as-you-go pricing allows you to pay only for the resources you consume.

7. Integration with Other DigitalOcean Services: Spaces can be integrated with other DigitalOcean services, such as Droplets (virtual machines) and Kubernetes clusters, allowing you to store and serve media files for your applications seamlessly.

Spaces is an Object Storage while Volumes is a Block Storage

Creating a space

1. Choose a datacenter region
2. Enable CDN(optional – allows users to fetch data faster instead of user going all around the world to access the datacenter)
3. Enable File Listing(optional – makes url for the objects and the contents)
4. Choose a subdomain name for the space
5. Select project and create a storage

Uploading files in spaces

- File can be any size
- We can upload the file as private or public.
- When in private the content in the link will be unavailable to view but with a special signature, we can view the content for a limited duration.

Live feed videos in DigitalOcean

Storing live feed videos in DigitalOcean or any cloud infrastructure provider depends on several factors and considerations. Storing live feed videos in DigitalOcean or any cloud infrastructure provider depends on several factors and considerations. However, whether it's a good choice for storing live feed videos depends on the specific requirements of your use case. Here are some factors to consider:

1. Performance and Scalability: DigitalOcean Spaces is designed for storing and serving static content efficiently. If your live feed generates a significant amount of video data and requires real-time streaming or high throughput, you should carefully evaluate DigitalOcean's performance and scalability capabilities.

2. Bandwidth and Data Transfer Costs: Streaming live videos can consume a considerable amount of bandwidth, and some cloud providers may charge for data transfer. It's essential to review DigitalOcean's pricing and understand the potential costs associated with serving live video content.

3. Latency and Geographic Distribution: If your application requires low-latency access to live video feeds from different regions, you might need to consider using a content delivery network (CDN) or a cloud provider with a broader global network.

4. Data Redundancy and Durability: Ensure that your live video data is redundantly stored to prevent data loss. DigitalOcean provides data replication within their data centers, but you might want to assess your requirements for disaster recovery and data durability.

5. Data Security and Access Control: Depending on the sensitivity of the live video content, you should implement proper access control and security measures to protect user privacy and prevent unauthorized access.

6. Content Management and Archiving: Consider how long you need to retain live video recordings and whether you need features like content lifecycle management and archival.

7. Compliance and Legal Considerations: If your application handles user-generated video content, you might need to comply with data protection and privacy regulations. Ensure that your chosen cloud provider meets the necessary compliance standards.

8. Streaming Technology and Protocols: Evaluate the streaming technology and protocols you plan to use for the live videos. Some cloud providers might offer specialized services for streaming and transcoding.

In general, for applications that require high-performance, low-latency, and large-scale live video streaming, specialized video hosting and streaming platforms might be more suitable. However, for smaller-scale applications or projects with specific requirements, DigitalOcean Spaces can be a viable option for storing and serving live feed videos.