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## Microservice Essential Components

🔍 Client:

✅ The interface through which users interact with the application (web or mobile).

🔍 DNS (Domain Name System):

✅ Resolves domain names to IP addresses. This allows clients to access services using easy-to-remember domain names instead of numerical IP addresses.

🔍 CDN (Content Delivery Network):

✅ A distributed network of servers that deliver web content to users based on their geographical locations. This helps in improving load times and availability.

🔍 Load Balancer:

✅ Distributes incoming client requests across multiple backend services or microservices to ensure no single service is overwhelmed and to enhance reliability and performance.

🔍 API Gateway:

✅ Acts as a single entry point for all client requests. It routes requests to the appropriate microservices, handles authentication, rate limiting, and can also perform transformations on requests or responses.

🔍 Service Registry:

✅ Keeps track of all active microservices and their instances. It allows services to find and communicate with each other dynamically.

🔍 Microservices:

✅ The core of the architecture, these are independent units that handle specific business functions. They communicate with each other using APIs, often using a lightweight protocol like HTTP or messaging queues.

### Distributed Cache:

✅ Temporarily stores frequently accessed data to reduce latency and improve application response times. This can help minimize the load on databases.

## Monitoring and Logging

### Prometheus:

✅ A monitoring tool that collects metrics from microservices. It can store and query these metrics, making it easier to monitor application performance.

### Grafana:

✅ A visualization tool used for creating dashboards to visualize metrics collected by Prometheus. This enables real-time monitoring and analytics.

### Logs:

✅ Maintaining logs of operations is crucial for debugging and monitoring application health. It helps track the application's behavior in production.

### Logstash:

✅ Part of the ELK stack (Elasticsearch, Logstash, Kibana). It ingests and processes logs from various sources, prepares them for storage and analysis.

### Elasticsearch:

✅ A search engine that allows for storage, search, and analysis of large volumes of data quickly. It's often used to index logs for faster query performance.

### Kibana:

✅ A visualization tool that works with Elasticsearch. It provides an interface for examining data stored in Elasticsearch, allowing users to create visual representations of log data.

## Message Passing

🔍 Distributed Message:

✅ A messaging system (like Kafka or RabbitMQ) that allows microservices to communicate asynchronously. This de-couples the services and improves scalability.

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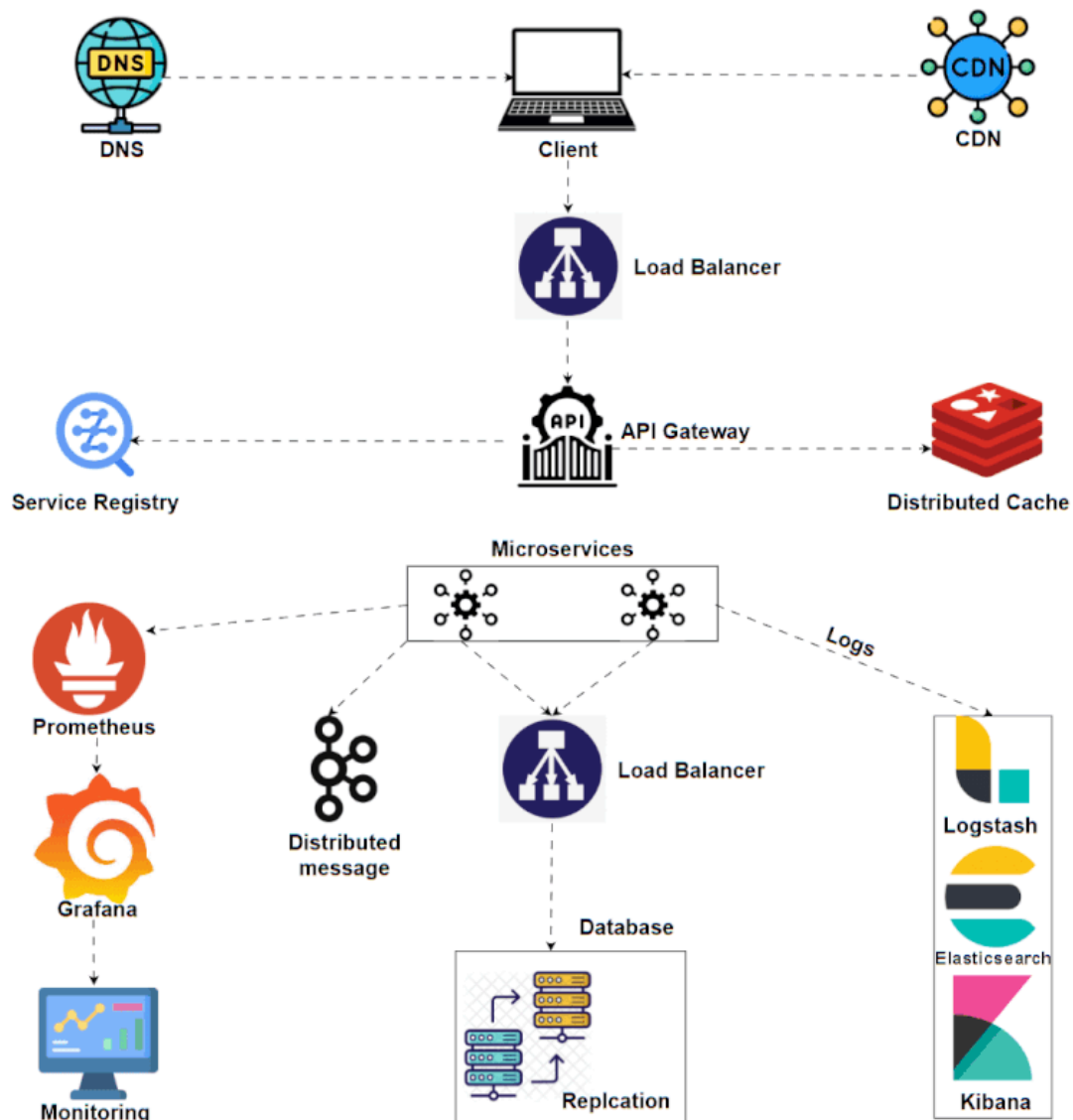
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