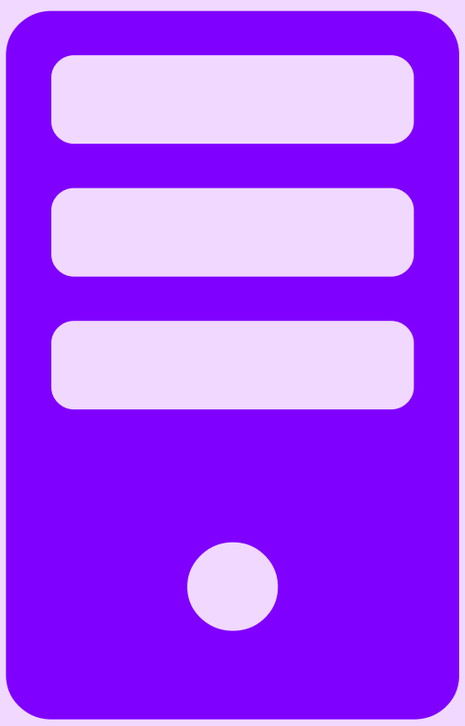
Load Balancing Techniques

Discover 23 Techniques to Optimize Your Network Performance and Boost Your Career



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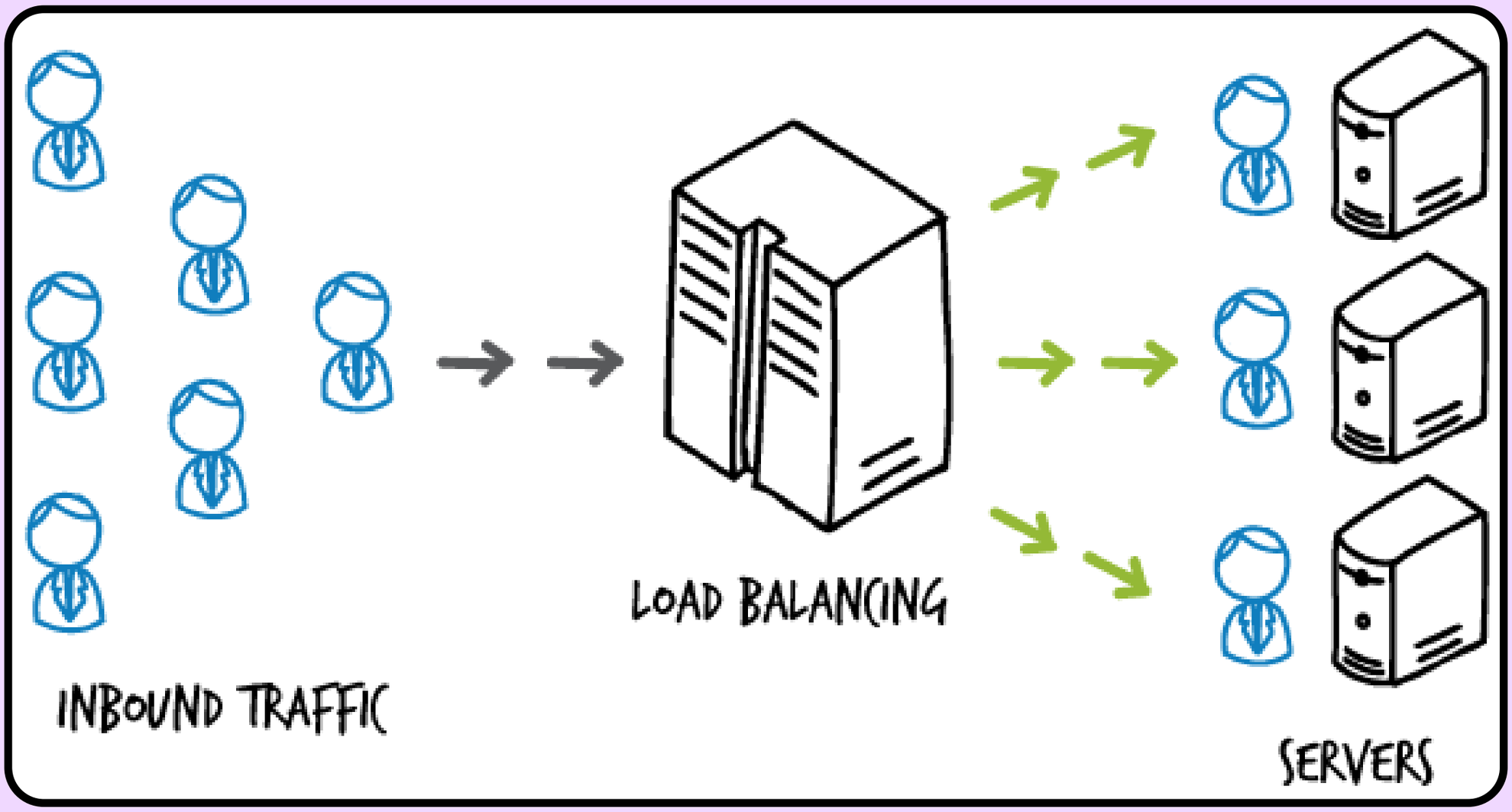
Load Balancing

Load balancing is the process of distributing workloads across multiple servers or resources to ensure that no single resource is overworked or overwhelmed. The goal of load balancing is to improve the overall performance and availability of a network or system.



There are several reasons why one should know about load balancing:

01. Improved Performance

Load balancing can improve the performance of a network or system by distributing the workload across multiple servers or resources.

This can prevent any single resource from becoming overworked, which can lead to slowdowns or even system crashes.

02. Increased Availability

Load balancing can also increase the availability of a network or system by ensuring that if one resource fails, the workload can be automatically redirected to another resource. This can prevent system downtime and ensure that users can continue to access the network or system.

03. Scalability

Load balancing can also make it easier to scale a network or system as more resources are added. This can make it easier to add more servers or resources as the workload increases, without having to manually configure each new resource.

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Load Balancing Techniques

Here are 23 load balancing techniques explained:

01. Round Robin

In this technique, requests are sent to the next available server in a list. This is a simple and effective technique for evenly distributing requests across multiple servers.

02. Least Connections

In this technique, requests are sent to the server with the least number of active connections. This technique can be useful in situations where some servers are more powerful than others and can handle more connections.

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03.IP Hash

In this technique, the IP address of the client is used to determine which server to send the request to. This technique can be useful in situations where the client needs to maintain a persistent connection to the same server.

04. Weighted Round Robin

In this technique, each server is assigned a weight, and requests are sent to the next available server based on their weight. This technique can be useful in situations where some servers are more powerful than others and can handle more connections.

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05.DNS Load Balancing

In this technique, the Domain Name System (DNS) is used to distribute requests across multiple servers. This technique can be useful in situations where the client is not aware of the specific server to connect to.

06. Layer 7 Load Balancing

This technique uses the application layer (layer 7 in the OSI model) to distribute requests based on the content of the request. This can be useful in situations where requests need to be directed to specific servers based on the type of request or the client making the request.

07.Content-Based Routing

This technique uses the content of the request to determine which server should handle the request. This can be useful in situations where requests need to be directed to specific servers based on the type of request or the client making the request.

08. Client IP Hash

This technique uses the IP address of the client to determine which server should handle the request. This can be useful in situations where the client needs to maintain a persistent connection to the same server.

09.Source IP Hash

Same as IP Hash but uses source IP address instead of client IP address.

10.Geolocation-Based Load Balancing

This technique uses the location of the client to determine which server should handle the request. This can be useful in situations where requests need to be directed to specific servers based on the location of the client.

11. Random

Requests are sent to a randomly chosen server.

12. Hybrid Load Balancing

This technique uses a combination of different load balancing techniques to distribute requests. This can be useful in situations where different types of requests need to be handled by different servers.

13.Weighted Least Connections

Similar to Least Connections, but servers are assigned weights.

14. Geographic

Requests are sent to the server that is geographically closest to the client.

15. Session Persistence

Requests from a specific client are always sent to the same server.

16. URL-based

Requests are directed to a specific server based on the requested URL.

17. DNS-based

Requests are directed to a specific server based on the DNS lookup of the client.

18. SSL session-id-based

Requests are directed to a specific server based on the SSL session id.

19. Content-based

Requests are directed to a specific server based on the content of the request.

20. Cache-based

Requests are directed to a server with a cached copy of the requested resource.

21. Scheduling-based

Requests are directed to servers based on a predefined schedule.

22. Predictive-based

Requests are directed to servers based on predicted future load.

23. AI-based

Requests are directed to servers using artificial intelligence algorithms.

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