**Layer 4 vs. Layer 7 Load Balancer – Summary**

**Introduction**

Load balancers distribute incoming network traffic across multiple servers to ensure high availability, scalability, and reliability. They operate at different layers of the OSI model, primarily at Layer 4 (Transport) and Layer 7 (Application). This document provides a concise comparison of Layer 4 and Layer 7 load balancers.

**Comparison Table**

| **Feature** | **Layer 4 Load Balancer** | **Layer 7 Load Balancer** |
| --- | --- | --- |
| **OSI Layer** | Transport (Layer 4) | Application (Layer 7) |
| **Routing Based On** | IP address & port | HTTP headers, URL, cookies, content |
| **Performance** | Faster, minimal processing | Slower, more processing overhead |
| **Use Case** | TCP/UDP traffic (e.g., database servers, VoIP) | HTTP/HTTPS traffic (e.g., web applications, API gateways) |
| **Flexibility** | Limited control over traffic | Advanced traffic management (e.g., content-based routing, authentication) |
| **Security Features** | Basic DDoS protection | WAF integration, request filtering, SSL termination |
| **Examples** | AWS Network Load Balancer (NLB), Azure Load Balancer | AWS Application Load Balancer (ALB), Azure Application Gateway |

**Conclusion**

Choosing between a Layer 4 and Layer 7 load balancer depends on application requirements. Layer 4 is suitable for high-speed, protocol-agnostic traffic routing, while Layer 7 provides more granular traffic control, ideal for web applications requiring advanced routing and security features.