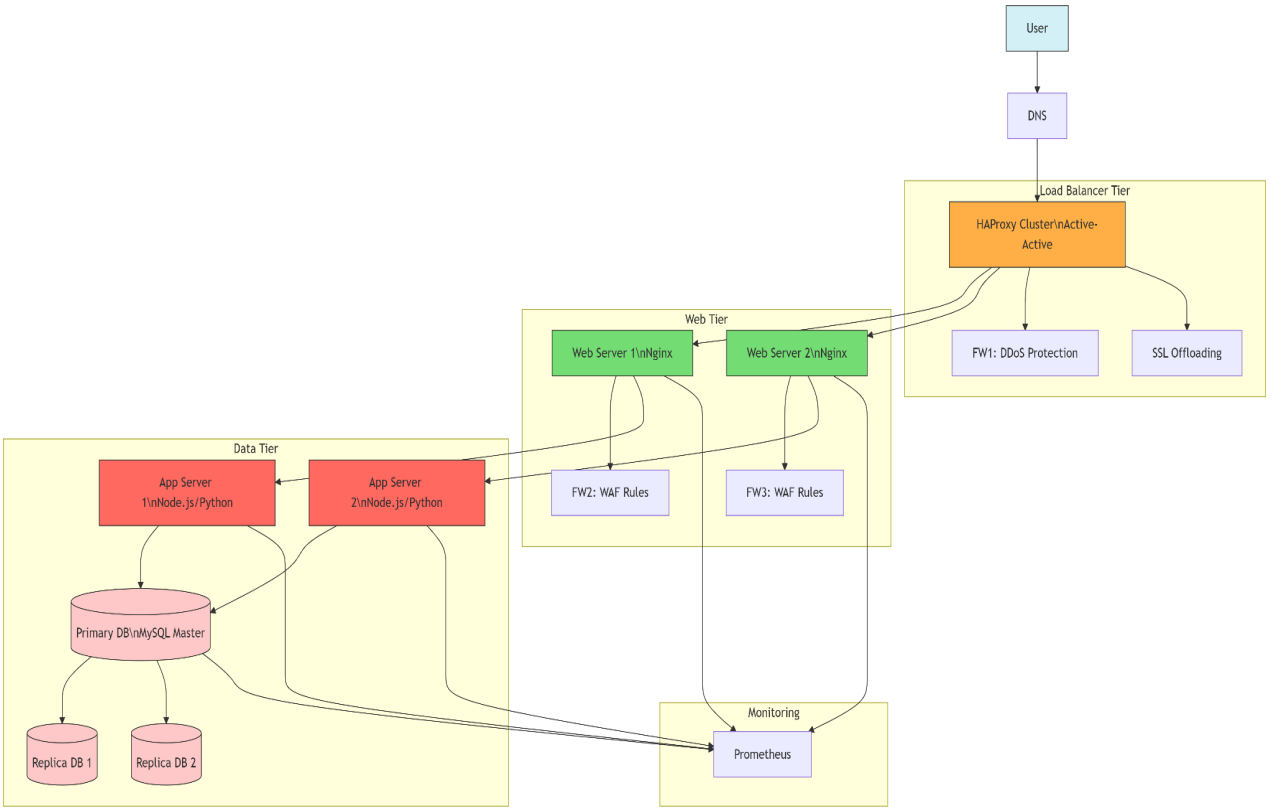
Diagram (ASCII Representation)



Key Additions & Justifications:

1. HAProxy Cluster (Active-Active):
    - Added second load balancer for redundancy
    - Uses keepalived for floating VIP
    - Why? Eliminates LB as SPOF
2. Dedicated Servers per Layer:
    - Web Tier: Nginx only (static content + reverse proxy)
    - App Tier: Pure application servers (no web server processes)
    - Data Tier: Isolated database servers
    - Why? Better resource allocation and scaling
3. Database Replicas (2x):
    - 1 master + 2 read replicas
    - Why? Distribute read queries and enable fast failover
4. Component Separation Benefits:
    - Independent scaling (e.g., add more app servers without touching DBs)
    - Security isolation (DBs not exposed to web traffic)

    - Simplified debugging (clear separation of concerns)

Traffic Flow:

1. User → DNS → HAProxy Cluster
2. HAProxy → Web Server (Nginx)
3. Nginx → App Server (via proxy_pass)
4. App Server → Primary DB (writes) or Replica (reads)

Advanced Features:

- Web Tier: Nginx handles SSL termination (end-to-end encryption)
- App Tier: Stateless servers + auto-scaling group
- Data Tier: Semi-sync replication for data consistency

Monitoring Setup:

- Each component exposes metrics (Nginx stub_status, DB exporters)
- Prometheus scrapes all nodes every 15s
- Grafana dashboards track:
    - Web: Requests/sec, 5xx errors
    - App: CPU/RAM per process
    - DB: Replication lag, slow queries