

# Securaa High-Level Design (High Level Design)

## 1. Overview

Securaa is a modular cybersecurity platform designed for scalable, secure, and automated deployment across cloud and on-premise environments. The system is composed of multiple services, packaged for both Docker-based development and production-grade RPM/DEB installations.

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## 2. Architecture

### 2.1. Core Components

- **Core Services:** Main backend logic, APIs, and business rules (Go-based, in `securaa/` and `executedb/`).
- **UI:** React-based frontend, built and served as a static site or via Docker.
- **ML Services:** Machine learning modules for analytics and automation.
- **Arbiter:** Specialized service for orchestration or arbitration tasks.
- **Database:** MongoDB (Dockerized for dev, native for prod).
- **Logging:** Fluentd for log aggregation and forwarding.

### 2.2. Supporting Components

- **Scripts:** Automation for build, deployment, and cloud provisioning ( `scripts/` , `core_scripts/` , `deployment_scripts/` ).
- **Packaging:** RPM/DEB build system for RedHat and Debian-based deployments ( `pkg/` ).
- **Cloud Automation:** AWS EC2 provisioning and remote install via shell scripts.

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## 3. Deployment Topologies

### 3.1. Local Development

- **Docker Compose:** All services (MongoDB, Fluentd, Core, UI, ML) run as containers.
- **Config:** `appliance/docker-compose.yml`, `appliance/local/config.json`.

### 3.2. Production

- **RedHat/CentOS:** RPM packages for core, UI, ML, Arbiter, and dependencies.
- **Debian/Ubuntu:** DEB packages for all components.
- **Cloud:** Automated EC2 launch and install via scripts.

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## 4. Build & Release Flow

1. **Source Checkout:** Git-based, multi-repo support.
2. **Build:** Scripts for Go services, React UI, ML modules.
3. **Package:** Makefiles and spec files for RPM/DEB creation.
4. **Deploy:** Install scripts for each OS, Docker Compose for dev.
5. **Post-Install:** Systemd service enablement, config, and cleanup.

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## 5. Security & Compliance

- **AVX Check:** Ensures hardware compatibility for MongoDB 7.0.
- **SELinux Handling:** Temporarily disabled during install for Docker.
- **SSH/SCP:** Secure remote operations for cloud installs.
- **Environment Variables:** Managed via `.env` files.

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## 6. Extensibility

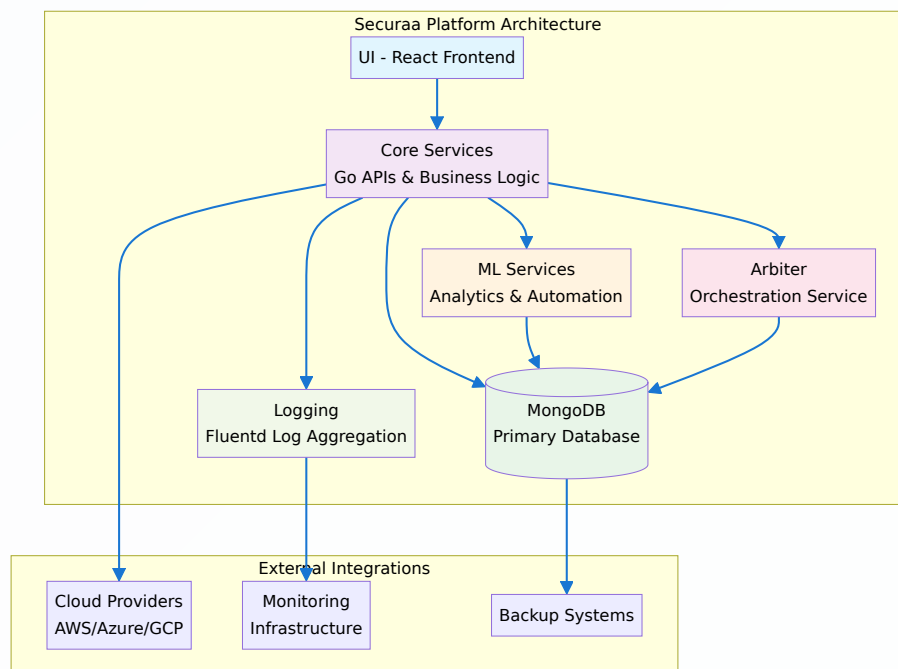
- **Modular Packaging:** Each service can be built, packaged, and deployed independently.
  - **Scripted Automation:** Easy to extend for new services or cloud providers.
  - **Configurable:** All major parameters are externalized in config files.
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## 7. Key Directories

- `appliance/`: Docker Compose, local config, and scripts.
- `core_scripts/`, `deployment_scripts/`, `scripts/`: Automation and deployment logic.
- `pkg/`: Packaging, specs, and control files.
- `securaa/`, `executedb/`: Go source code for core services.

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## 8. System Architecture Diagram



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## 9. References

- See deployment document for detailed install and build steps.
- All scripts and configs are in the root and respective subfolders.

DB[(MongoDB  
Primary Database)] ML[ML Services  
Analytics & Automation] ARB[Arbiter  
Orchestration Service] LOG[Logging  
Fluentd Log Aggregation] end subgraph "External Integrations" CLOUD[Cloud  
Providers

AWS/Azure/GCP] MON[Monitoring

Infrastructure] BACKUP[Backup Systems] end UI --> CORE CORE --> DB CORE --  
> ML CORE --> ARB CORE --> LOG ML --> DB ARB --> DB LOG --> MON CORE --  
> CLOUD DB --> BACKUP style UI fill:#e1f5fe style CORE fill:#f3e5f5 style DB  
fill:#e8f5e8 style ML fill:#fff3e0 style ARB fill:#fce4ec style LOG fill:#f1f8e9

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