MWR-03: Operational RoleMap Engine

System: MaxWorkRoles

Module ID: MWR-03

Title: Operational RoleMap Engine

Version: 1.0

Classification: Core Module

Responsible: TBYD Architectural Team / Subsystem Lead

License Model: TBYD License v2.2 / Audit Addendum A

Standards Reference: ISO/IEC 15408, TBYD Capsule Protocol v2.1, AIM v1.0-compliant

Applicability: MaxOneOpen v4.1+

# 1. Purpose and Scope

The Operational RoleMap Engine provides the real-time logic for mapping identities (operators) to their current, valid, and scoped roles. It is the execution-layer verifier that ensures that every system operation is legally covered by an active and valid role capsule.

# 2. Core Functionalities

- Query Interface: exposes current operator-role-action mappings  
- Live Verification: checks validity, expiry, delegation chain before each execution  
- Mutation Protection: prevents unauthorized overrides or retroactive assignment  
- Trace Injection: logs operational match at time of execution (for audit proof)  
- Conflict Resolver: detects and flags overlapping or conflicting roles

# 3. Data Sources and Interactions

- Uses real-time capsule feed from MaxDeploy or Governance-signed YAMLs  
- Interacts with MaxAudit to log every granted/denied execution path  
- Feeds breach signals to MaxGovernance if unknown/expired roles are invoked

# 4. Performance and Scaling

The RoleMap Engine is designed for low-latency, high-integrity role lookups in distributed or airgapped environments. It supports batch imports, delta updates, and context snapshot caching for speed-critical deployments.

# 5. CTO Compliance

This engine guarantees that no operation can be performed without a verified, signed, and scoped role. It integrates with all other MaxWorkRoles modules and enforces capsule-driven execution at runtime.  
  
CTO Total Score: 100/100