# Module XX – Lifecycle & Upgrade Governance Capsule

Version: 4.1 | Classification: CTO Mandatory (System Evolution & Version Trust Control)

Scope: Version declarations, upgrade traces, compatibility validation, trust impact

## 0. Purpose & Upgrade Integrity

This module defines the version lifecycle model, upgrade validation process, and downgrade control logic for MaxOneOpen v4.1. It ensures that all structural and runtime changes are declared via capsule lineage, verifiable via ledger trace, and compatible across trust zones and federation anchors. Versioning decisions must be auditable and bound to runtime certification compliance.

## 1. Version Capsule Format & Change Tracking

Each system version must issue a `Lifecycle Capsule (LCC)`:  
`{ version\_id, declared\_by, change\_scope[], compatibility\_tag[], downgrade\_path[], expiration, federation\_hash, hash\_prev\_lcc }`  
- Version ID must be unique and monotonic  
- Change scope = list of impacted modules, capsule types, or federation logic  
- Downgrade path must be predeclared (if any)

## 2. Upgrade Governance Logic

Upgrade procedure:  
- Issue LCC → bind to ledger  
- Confirm via Audit Council (Tier 2+)  
- Trigger new `Certification Capsule (CCC)` based on compatibility check  
- Legacy capsules may be flagged as `expired`, `converted`, or `isolated`  
- Federation zones must issue updated FCC referencing LCC hash

## 3. Compatibility Management & Audit Anchoring

All LCCs must:  
- define backward-compatibility tag (e.g. `v3.4-ok`, `incompatible`, `partial`)  
- log module delta tree  
- provide replay path test status (linked SCC)  
- allow federation anchors to reject or isolate outdated versions

## 4. Downgrade Handling & Rollback Declaration

- Each LCC may include `Reversible = true/false`  
- If true, LCC must contain rollback capsule lineage  
- Systems may freeze ledger for affected modules and fork off restoration chain  
- Certification score is downgraded until upgrade integrity is revalidated

## 5. Federation & Sovereign Co-Upgrade Coordination

- LCCs affecting federation capsules (FCC, FAC, FRC) require dual-zone confirmation  
- Cross-zone capsules must declare compatibility tag and trust-tier unaffected status  
- Non-coordinated upgrades may trigger Fork Divergence Alerts (FDAC)