**Lucent - Recovery and Road-to-Production Project Plan**

*All sprints are two weeks unless stated. Tasks are written to be* ***SMART*** *- Specific, Measurable, Achievable, Relevant, Time-bound.*

**Sprint 0 – Project Kick-off and Architectural Decision (1 week)**

| **Goal** | **Metric** | **Owner** |
| --- | --- | --- |
| Select and document the near-term deployment style (modular monolith vs multi-service) | Approved architecture decision record (ADR - 001) committed to main | Lead developer & CTO |

**Deliverables**

1. **Architecture Decision Record ADR - 001**
   * Contains context, decision, consequences, and rationale.
2. **High-level component diagram** (draw.io, committed as PNG + source).
3. **Initial work-item backlog** in GitHub Projects with EPICs for each sprint below.

**Acceptance criteria**

* ADR - 001 merged to main, reviewed and signed off by CTO by Friday 17 May 2025.
* Diagram reflects chosen architecture and matches ADR.
* At least 20 work items seeded in backlog and tagged with the sprint they belong to.

**Sprint 1 – Repository Hygiene and Documentation**

| **Goal** | **Metric** | **Owner** |
| --- | --- | --- |
| Provide clear onboarding docs and remove legacy clutter | Passing CI, < 30 sec git status diff on new clone | Docs lead |

**Work items**

1. **Create top-level README.md**
   * Must include: purpose, prerequisites, setup, run, test, contribute, license.
   * *Done* when merged and peer-reviewed.
2. **Add .editorconfig & stylecop.json**
   * Enforce tabs vs spaces, max line length, naming rules.
   * CI fails on violations.
3. **Prune skeleton projects** (Playground, unused console apps).
   * Remove from solution and filesystem.
   * Confirm build passes locally and in CI.
4. **Introduce CODEOWNERS and CONTRIBUTING.md**
   * At least one reviewer required for PR merge.
5. **Initial CHANGELOG (keep-a-changelog format)**
   * Back-fill v0.1.0 and v0.1.1 from commit history.

**Acceptance criteria**

* CI green on every PR.
* Cloning repository and running dotnet build + dotnet test completes in < 3 minutes on a clean machine.
* New developer can follow README and run unit tests within 15 minutes (measured by pairing session).

**Sprint 2 – CI / Static Analysis and Branch Protection**

| **Goal** | **Metric** | **Owner** |
| --- | --- | --- |
| Raise baseline code quality and automate checks | SonarCloud quality gate “Green”, coverage ≥ 40 % | DevOps engineer |

**Work items**

1. **Enhance GitHub Actions pipeline**
   * Separate jobs: *build*, *test (with coverage)*, *analyze*, *publish artefacts*.
   * Upload coverage report to SonarCloud.
2. **Integrate SonarCloud or dotnet-analyzer**
   * Rules: critical and blocker issues must equal 0.
   * Treat warnings as errors in build.
3. **Enable branch protection** on main
   * Require PR review + passing pipeline.
   * Disallow force pushes.
4. **Dependabot security alerts**
   * Activate for NuGet and GitHub Actions.
   * Create template security update workflow.
5. **Automated release notes**
   * GitHub Action generates CHANGELOG entry and draft GitHub Release when tag pushed.

**Acceptance criteria**

* Pipeline passes end-to-end in < 7 minutes.
* SonarCloud shows ≥ 40 % coverage, ≤ 5 minor issues, 0 major.
* PR cannot be merged without review or failing checks (demonstrated in demo).

**Sprint 3 – Architecture Consolidation and State Persistence**

| **Goal** | **Metric** | **Owner** |
| --- | --- | --- |
| Remove distributed-monolith risk, introduce durable state | Tenants and schedules persist over restart, 100 % automated tests green | Backend lead |

**Work items**

1. **Persist tenant and schedule data**
   * Choose EF Core with SQLite (dev) and Postgres (prod).
   * Migrate RunRegistry and schedule JSON to DB tables.
2. **Refactor service boundaries per ADR - 001**
   * If modular monolith chosen, merge Scheduler and Runner into single process.
   * If multi-service chosen, establish REST or gRPC contract for schedule retrieval.
3. **Data-access unit tests**
   * ≥ 20 tests covering CRUD operations with in-memory provider.
   * Ensure optimistic concurrency test passes.
4. **Migration scripts**
   * Add dotnet ef migrations add InitialCreate committed to repo.
   * Automatic migration at start-up behind --migrate flag.

**Acceptance criteria**

* Restart application and verify tenant schedule remains.
* PR with architecture refactor merged with no broken builds.
* All existing CLI tools (Onboard) work with new persistence layer.

**Sprint 4 – Security Hardening and API Authentication**

| **Goal** | **Metric** | **Owner** |
| --- | --- | --- |
| Protect API endpoints and secrets | All endpoints secured, OWASP top-10 scan passes 0 critical | Security champion |

**Work items**

1. **Add JWT bearer authentication**
   * Validate using identity provider or self-hosted signing key.
   * Swagger updated with Authorise button.
2. **Introduce Azure Key Vault (or HashiCorp Vault) integration**
   * Secrets loaded at runtime, not environment variables.
   * Onboard, API, Runner all use the vault provider.
3. **Write security integration tests**
   * Unauthenticated request returns 401.
   * Expired token returns 401.
   * Valid token accesses endpoint.
4. **Run OWASP ZAP scan in CI**
   * Fail build on high or critical findings.
5. **Security documentation**
   * Update README security section.
   * Add threat model diagram in docs folder.

**Acceptance criteria**

* ZAP report attached to pipeline and shows 0 high severity.
* Manual test: calling /api/health with no token returns 401.
* Secrets removed from local appsettings.\*.json.

**Sprint 5 – Test Coverage Acceleration**

| **Goal** | **Metric** | **Owner** |
| --- | --- | --- |
| Reach ≥ 70 % line coverage, automated end-to-end test | Coverage report 70 %, e2e pipeline runs in < 10 min | QA lead |

**Work items**

1. **Identify coverage gaps with report** and create tasks.
2. **Write unit tests** for Scheduler triggers, ReportPeriod logic, and Auth token refresh edge cases.
3. **Write end-to-end test**
   * Uses WebApplicationFactory to spin up API, schedule job, verify Runner completes task.
4. **Introduce coverage gate in CI**
   * Fail build if coverage dips below threshold.
5. **Add mutation testing (Stryker-dotnet)** for core domain library.

**Acceptance criteria**

* SonarCloud shows ≥ 70 % coverage, mutation score indicator ≥ 60 %.
* Full pipeline including e2e runs in < 15 minutes.
* No flaky tests (three consecutive runs stable).

**Sprint 6 – Performance, Scalability, and Observability**

| **Goal** | **Metric** | **Owner** |
| --- | --- | --- |
| Demonstrate app scales horizontally and is observable | Load test 50 concurrent tenants with < 1 s 95-th percentile | Performance engineer |

**Work items**

1. **Switch Quartz to clustered DB job store**
   * Share schedule across nodes.
2. **Containerise services**
   * Dockerfiles for API, Runner, Onboard.
   * Docker Compose for local dev.
3. **Add Prometheus metrics and structured logging**
   * Expose /metrics endpoint.
   * Logs in JSON with correlation id.
4. **Load test with k6**
   * Simulate onboarding 50 tenants, scheduling jobs, running jobs.
5. **Auto-scaling documentation**
   * Guide for Kubernetes HPA based on CPU and queue length.

**Acceptance criteria**

* k6 report committed in perf/reports, showing < 1 sec P95 latency and zero errors.
* Two Docker containers of Runner share the job store without duplicate runs (verified via logs).
* Grafana dashboard screenshot included in PR.

**Delivery Timeline Snapshot**

| **Sprint** | **Start** | **End** | **Major Milestone** |
| --- | --- | --- | --- |
| 0 | 13 May 2025 | 17 May 2025 | ADR - 001 approved |
| 1 | 20 May 2025 | 31 May 2025 | Repository clean, docs live |
| 2 | 3 Jun 2025 | 14 Jun 2025 | Quality gate enforced |
| 3 | 17 Jun 2025 | 28 Jun 2025 | Durable state implemented |
| 4 | 1 Jul 2025 | 12 Jul 2025 | API secured, vault live |
| 5 | 15 Jul 2025 | 26 Jul 2025 | 70 % coverage & e2e |
| 6 | 29 Jul 2025 | 9 Aug 2025 | Load-tested & observable |

**Ongoing Governance**

* **Weekly sprint review** each Friday at 15:00 BST.
* **Definition of Done**: code reviewed, tests written, CI green, documentation updated.
* **Risk register** updated every sprint by Scrum Master.
* **Blockers escalated** within 24 hours to CTO.

Following this plan aligns the team with rigorous standards, provides measurable outputs every two weeks, and leads Lucent towards a production-ready, investor-reassuring state by early August 2025.