



ENGINEERING STANDARDS LIBRARY / EMERGING AND ADVANCED TECHNOLOGY

Quantum and Advanced Cryptography Standards Portfolio

Thematic portfolio edition for coordinated emerging-technology evaluation.

PERMANENT DOCUMENT ID

MYTHOS-EMERGING-QUANTUMCRYPTO-PORT-001

PUBLICATION

Portfolio Edition
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

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0 ATOMIC CRITERIA	6 ASSURANCE VIEWS	4 IMPLEMENTATION PROFILES	1 PERMANENT IDENTITY

Publication doctrine. This publication establishes durable requirements for its defined scope. Interpretation must preserve the permanent document identity, required evidence, controlled exceptions, source currency, and formal revision history.

EMERGING TECHNOLOGY AND ASSURANCE TOPOLOGY

Emerging and Advanced Technology

A trustworthy quantum and advanced cryptography standards portfolio program is a governed path from research claim through baseline, experiment, safety and security challenge, transition decision, bounded operation, and preserved evidence.

CLASSIFY

Separate established practice, candidate standard, reproduced result, vendor claim, implementation hypothesis, and open research.

EXPERIMENT

Declare baseline, configuration, uncertainty, scenario coverage, stop conditions, and independent reproduction before conclusions.

CONSTRAIN

Identity, policy, safety envelopes, physical boundaries, cryptographic authority, and human intervention limit consequence.

TRANSITION

Adoption, pilot, production, rollback, supplier exit, lifecycle, and retirement decisions remain evidence-bearing and reversible.

EVIDENCE - BOUND TRANSITION FLOW



No novelty claim becomes an operational claim without reproduced evidence and an explicit authority decision

INTERPRETATION AND ASSURANCE

How to apply this publication

Normative intent

Requirements define outcomes and constraints. Implementations may vary, but evidence must demonstrate equivalent control.

Evidence over assertion

Vendor documentation and design intent are not equivalent to reproduced behavior. Record evidence grade and uncertainty.

Risk-proportional depth

Higher consequence, autonomy, sensitivity, and irreversibility require stronger isolation, review, verification, and recovery.

Controlled exception

Exceptions require an owner, rationale, compensating control, residual-risk acceptance, expiration, and reevaluation trigger.

Normalized assessment scale



A numeric score must never hide a failed mandatory gate, missing evidence, untested workload, or unacceptable residual risk.

MYTHOS-EMERGING-QUANTUMCRYPTO-PORT-0001 / EMERGING TECHNOLOGY

Portfolio Position

Thematic portfolio edition for coordinated emerging-technology evaluation.

OPERATING POSITION

This thematic portfolio consolidates 7 permanent standards across emerging technology, quantum, and robotics.

- Individual standards remain the authoritative citable publications.

MYTHOS-EMERGING-QUANTUMCRYPTO-PORT-0001 / EMERGING TECHNOLOGY

Permanent Publication Register

OPERATING POSITION

MYTHOS-EMT-0002 - Advanced Cryptography, Privacy-Enhancing Technology, and Crypto-Agility Standard

- MYTHOS-QTC-0001 - Quantum Computing System and Workload Evaluation Standard
- MYTHOS-QTC-0002 - Post-Quantum Cryptography Migration and Algorithm Portfolio Standard
- MYTHOS-QTC-0003 - Quantum Networking, Entanglement Distribution, and QKD Standard
- MYTHOS-QTC-0004 - Quantum Sensing, Timing, and Metrology Standard
- MYTHOS-QTC-0005 - Hybrid Quantum-Classical Orchestration and Reproducibility Standard
- MYTHOS-QTC-0006 - Fault-Tolerant Quantum Computing and Error-Correction Readiness Standard

Cross-Domain Invariants

OPERATING POSITION

Bound every claim by evidence state and exact configuration.

- Use an incumbent or classical comparator.
- Keep research authority isolated from production and physical control.
- Require safety, security, reproducibility, rollback, and supplier-exit gates.

MYTHOS-EMERGING-QUANTUMCRYPTO-PORT-0001 / EMERGING TECHNOLOGY

Publication Controls and Decision Record

Permanent identity, evidence, exceptions, and revision discipline

- Document identity remains stable across revision and packaging.
- Evidence grades and uncertainty accompany consequential claims.
- Exceptions are time-bounded and independently visible.
- Source currency is reviewed at assessment and scheduled publication review.
- Release artifacts are hashed and listed in the public manifest.

MYTHOS-EMERGING-QUANTUMCRYPTO-PORT-0001

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11. Source Authority and Reference Register

Primary sources informing interpretation; verify current status at assessment time

NIST CSF 2.0 Cybersecurity Framework 2.0 https://doi.org/10.6028/NIST.CSWP.29 Enterprise governance and cybersecurity outcome framework.	NIST Integrated Photonics Integrated Photonics Program and Metrology https://www.nist.gov/programs-projects/integrated-photonics Primary research and measurement work for heterogeneous integrated photonic devices.
NIST SP 800-53 Rev. 5 Security and Privacy Controls for Information Systems and Organizations https://doi.org/10.6028/NIST.SP.800-53r5 Broad organizational control baseline for technology systems and services.	ITU-R M.2160 Framework and Overall Objectives for IMT-2030 https://www.itu.int/rec/R-REC-M.2160-0-202311-I/en In-force framework for IMT-2030 objectives, use cases, and capabilities.
NIST PQC Project Post-Quantum Cryptography Standardization and Migration https://csrc.nist.gov/projects/post-quantum-cryptography Final PQC standards, continuing algorithm work, migration direction, and official project status.	ETSI ISG PDL Permissioned Distributed Ledger Specifications https://www.etsi.org/committee/pdl Primary technical work for governed distributed-ledger systems and decentralized trust.
IEEE P3706 Guide for Brain-Inspired Computing Technologies https://standards.ieee.org/ieee/3706/12098/ Published guide describing brain-inspired computing technology options and terminology.	3GPP Release 20 5G-Advanced Studies and 6G Study Roadmap https://www.3gpp.org/specifications-technologies/releases/release-20 Official release program separating continued 5G-Advanced work from initial 6G studies.

Source currency rule: authorities, specifications, laws, provider services, hardware, protocols, standards status, and research evidence MUST be checked at assessment time. This publication records a 2026-07-24 source snapshot.



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Advanced Cryptography, Privacy-Enhancing Technology, and Crypto-Agility Standard

Cryptographic inventory, algorithm agility, threshold systems, zero knowledge, multiparty computation, homomorphic encryption, privacy, migration, and evidence.

PERMANENT DOCUMENT ID

MYTHOS-EMT-0002

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

Advanced Cryptography, Privacy-Enhancing Technology, and Crypto-Agility Standard			DOCUMENT ID MYTHOS-EMT-0002 VERSION 1.0.0-candidate STATUS Candidate Standard PUBLISHER Mythos Systems PUBLICATION DATE 2026-07-24 SCHEDULED REVIEW 2027-01-24 CLASSIFICATION Public
18 ATOMIC CRITERIA	6 ASSURANCE VIEWS	4 IMPLEMENTATION PROFILES	1 PERMANENT IDENTITY

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Normalized assessment scale

0	1	2	3	4	5
ABSENT	AD HOC	PARTIAL	OPERATIONAL	ADVANCED	LEADING

A numeric score must never hide a failed mandatory gate, missing evidence, untested workload, or unacceptable residual risk.

INTERACTIVE NAVIGATION

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Navigation doctrine

Bookmarks and internal links are conveniences. Permanent document identity, criterion identifiers, evidence references, and revision history remain authoritative.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

0. Executive Mandate

Research value, transition discipline, and non-negotiable evidence boundaries

MANDATE

Organizations evaluating advanced cryptography and privacy-enhancing technology **MUST** separate research from operational authority, establish a reproducible baseline, constrain safety and security consequence, disclose uncertainty, and require a documented transition or rejection decision.

Required outcomes

- Establish a durable, product-neutral evidence system for advanced cryptography and privacy-enhancing technology.
- Prevent novelty, investment, vendor prestige, roadmap language, or laboratory success from substituting for operational proof.
- Require representative performance, adversarial, failure, recovery, safety, privacy, and lifecycle evidence.
- Keep pilots bounded by identity, authority, environment, duration, budget, stop conditions, and rollback.
- Preserve rejected alternatives, limitations, residual risk, source currency, and reassessment triggers.

Decision boundary: conformance supports a bounded engineering assurance position. It does not prove scientific consensus, regulatory approval, universal safety, quantum advantage, cryptographic perfection, autonomous competence, or commercial viability.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

1. Scope and Applicability

Research, pilot, transition, operational, and retirement boundaries

IN SCOPE

- Research, architecture, acquisition, experiment, pilot, transition, operation, and retirement of advanced cryptography and privacy-enhancing technology.
- Hardware, software, models, data, protocols, facilities, people, suppliers, providers, physical processes, and evidence.
- Laboratory, simulation, testbed, shadow, pilot, canary, production, and field deployment states.
- Claims, benchmarks, uncertainty, safety, security, privacy, economics, interoperability, support, and exit.

OUT OF SCOPE

- Scientific truth inferred from a single benchmark, simulation, provider, hardware generation, or laboratory configuration.
- Safety, regulatory, export, spectrum, airspace, clinical, cryptographic, or standards approval not granted by the responsible authority.
- Roadmap forecasts, token price, patent counts, press releases, or investment treated as engineering evidence.
- Hidden production use of research components outside the declared transition and assurance boundary.

Applicability triggers

- The capability is novel, rapidly changing, weakly standardized, difficult to reproduce, or dependent on immature suppliers.
- A claim concerns safety, security, privacy, physical action, critical infrastructure, cryptographic trust, or consequential autonomy.
- The system requires specialized facilities, scarce hardware, spectrum, foundry, cryogenic, optical, robotics, or field-test dependencies.
- Failure or lock-in may create long-lived data, capital, infrastructure, workforce, or regulatory consequences.
- A research component is proposed for pilot, customer, production, public, or externally relied-upon use.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

2. Definitions and Taxonomy

Controlled language for architecture, governance, and assessment

AUTHORITY

The right to approve, deny, constrain, or execute an action. Model output is not authority.

EVIDENCE

A reproducible source, trace, measurement, test, record, signed artifact, or documented observation supporting a claim.

ASSURANCE VIEW

A defined perspective such as governance, architecture, security, operations, privacy, or human oversight.

ATOMIC CRITERION

A uniquely identified requirement that can be assessed, evidenced, excepted, and revised independently.

IMPLEMENTATION PROFILE

A risk-proportional set of required depth, evidence, and gates for a class of use.

CONTROLLED EXCEPTION

A time-bounded deviation with owner, rationale, compensating control, residual risk, expiration, and review trigger.

DETERMINISTIC MECHANISM

A component whose inputs, policy, state transition, and side effects can be constrained and verified.

SOURCE AUTHORITY

The documented basis for treating a source as reliable for a defined claim, context, jurisdiction, and time.

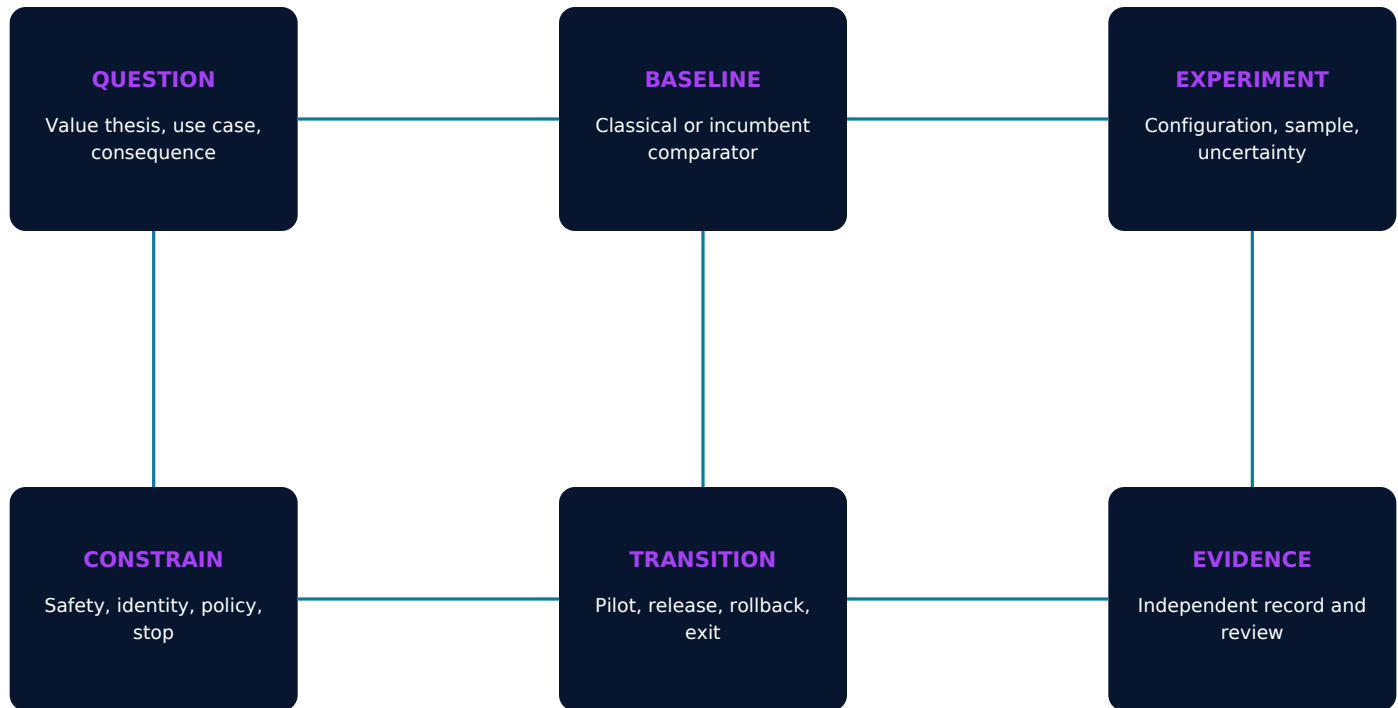
REASSESSMENT TRIGGER

A change, incident, drift signal, dependency revision, or time boundary requiring renewed evaluation.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

3. Architecture and Trust Model

Separation of research, authority, physical systems, runtime, and evidence



Mandatory trust boundaries

- Research systems **MUST NOT** inherit production identity, secrets, authority, data, networks, or physical control by convenience.
- Claims **MUST** retain the exact hardware, software, model, protocol, calibration, environment, workload, and observation boundary.
- Safety, cryptographic, physical, spectrum, autonomy, and human-intervention constraints **MUST** remain independently enforceable.
- Transition **MUST** have a named decision authority, acceptance criteria, monitored pilot, rollback, supplier exit, and retirement path.
- Evidence **MUST** remain reviewable when a vendor, cloud, token network, laboratory, model, robot, or quantum backend is unavailable.

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4. Governance and Accountability

Decision rights, separation of duties, and lifecycle ownership

ACCOUNTABLE OWNER

Accepts scope, risk tolerance, funding, and residual risk.

SYSTEM OWNER

Maintains architecture, inventory, operating boundaries, and change control.

SECURITY / PRIVACY

Defines threat, identity, data, isolation, monitoring, and incident requirements.

EVALUATION AUTHORITY

Designs representative tests, gates releases, and preserves reproducibility.

OPERATIONS

Maintains availability, rollback, recovery, evidence, and incident handling.

HUMAN OVERSIGHT

Reviews consequential decisions, exceptions, disputed outcomes, and harm signals.

DECISION PRINCIPLE

No single actor should be able to define the objective, grant authority, execute the consequential action, suppress evidence, and approve the result. Separation must be technical where consequence requires it.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-EMT-0002-C01 Cryptographic Service and Dependency Inventory

The organization **MUST** define, implement, verify, and maintain cryptographic service and dependency inventory for the declared advanced cryptography and privacy-enhancing technology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims **MUST** remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE technology thesis; source-currency review; sponsor, technical owner, and risk decision

MYTHOS-EMT-0002-C02 Security Objective and Adversary Model

The organization **MUST** define, implement, verify, and maintain security objective and adversary model for the declared advanced cryptography and privacy-enhancing technology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims **MUST** remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE research-state classification; baseline; competing alternative; prohibited-claim register

MYTHOS-EMT-0002-C03 Algorithm, Parameter, and Security-Level Policy

The organization **MUST** define, implement, verify, and maintain algorithm, parameter, and security-level policy for the declared advanced cryptography and privacy-enhancing technology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims **MUST** remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE experiment plan; versions; configuration; sample; uncertainty; reproducibility bundle

MYTHOS-EMT-0002-C04 Cryptographic Agility and Negotiation Boundaries

The organization **MUST** define, implement, verify, and maintain cryptographic agility and negotiation boundaries for the declared advanced cryptography and privacy-enhancing technology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims **MUST** remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE security, privacy, safety, rights, export, spectrum, and supplier assessment

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-EMT-0002-C05

Key Generation, Custody, Rotation, and Destruction

The organization MUST define, implement, verify, and maintain key generation, custody, rotation, and destruction for the declared advanced cryptography and privacy-enhancing technology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims MUST remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE benchmark results with incumbent comparator, resource accounting, and limitations

MYTHOS-EMT-0002-C06

Threshold Cryptography and Quorum Governance

The organization MUST define, implement, verify, and maintain threshold cryptography and quorum governance for the declared advanced cryptography and privacy-enhancing technology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims MUST remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE pilot boundary; identities; kill switch; stop conditions; rollback and exit exercise

MYTHOS-EMT-0002-C07

Multiparty Computation Participant and Collusion Model

The organization MUST define, implement, verify, and maintain multiparty computation participant and collusion model for the declared advanced cryptography and privacy-enhancing technology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims MUST remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE interoperability, standards, skills, support, lifecycle, and ecosystem evidence

MYTHOS-EMT-0002-C08

Zero-Knowledge Statement, Circuit, and Setup Governance

The organization MUST define, implement, verify, and maintain zero-knowledge statement, circuit, and setup governance for the declared advanced cryptography and privacy-enhancing technology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims MUST remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE adoption or rejection record; residual risk; reassessment and sunset trigger

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-EMT-0002-C09 Homomorphic Encryption Parameter and Noise-Budget Control

The organization MUST define, implement, verify, and maintain homomorphic encryption parameter and noise-budget control for the declared advanced cryptography and privacy-enhancing technology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims MUST remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE technology thesis; source-currency review; sponsor, technical owner, and risk decision

MYTHOS-EMT-0002-C10 Privacy Budget, Leakage, and Metadata Analysis

The organization MUST define, implement, verify, and maintain privacy budget, leakage, and metadata analysis for the declared advanced cryptography and privacy-enhancing technology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims MUST remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE research-state classification; baseline; competing alternative; prohibited-claim register

MYTHOS-EMT-0002-C11 Randomness, Entropy, Nonce, and Domain Separation

The organization MUST define, implement, verify, and maintain randomness, entropy, nonce, and domain separation for the declared advanced cryptography and privacy-enhancing technology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims MUST remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE experiment plan; versions; configuration; sample; uncertainty; reproducibility bundle

MYTHOS-EMT-0002-C12 Protocol Composition and Cross-Layer Analysis

The organization MUST define, implement, verify, and maintain protocol composition and cross-layer analysis for the declared advanced cryptography and privacy-enhancing technology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims MUST remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE security, privacy, safety, rights, export, spectrum, and supplier assessment

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-EMT-0002-C13**Side-Channel, Fault, and Implementation Resistance**

The organization **MUST** define, implement, verify, and maintain side-channel, fault, and implementation resistance for the declared advanced cryptography and privacy-enhancing technology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims **MUST** remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE benchmark results with incumbent comparator, resource accounting, and limitations

MYTHOS-EMT-0002-C14**Library, Hardware, and Provider Validation**

The organization **MUST** define, implement, verify, and maintain library, hardware, and provider validation for the declared advanced cryptography and privacy-enhancing technology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims **MUST** remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE pilot boundary; identities; kill switch; stop conditions; rollback and exit exercise

MYTHOS-EMT-0002-C15**Interoperability, Versioning, and Downgrade Resistance**

The organization **MUST** define, implement, verify, and maintain interoperability, versioning, and downgrade resistance for the declared advanced cryptography and privacy-enhancing technology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims **MUST** remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE interoperability, standards, skills, support, lifecycle, and ecosystem evidence

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-EMT-0002-C16 Migration, Hybrid Operation, and Rollback

The organization **MUST** define, implement, verify, and maintain migration, hybrid operation, and rollback for the declared advanced cryptography and privacy-enhancing technology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims **MUST** remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE adoption or rejection record; residual risk; reassessment and sunset trigger

MYTHOS-EMT-0002-C17 Performance, Cost, and Operational Evidence

The organization **MUST** define, implement, verify, and maintain performance, cost, and operational evidence for the declared advanced cryptography and privacy-enhancing technology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims **MUST** remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE technology thesis; source-currency review; sponsor, technical owner, and risk decision

MYTHOS-EMT-0002-C18 Cryptographic Incident, Revocation, and Reassessment

The organization **MUST** define, implement, verify, and maintain cryptographic incident, revocation, and reassessment for the declared advanced cryptography and privacy-enhancing technology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Research claims **MUST** remain separate from pilot and production claims, with a baseline, stop conditions, rollback, supplier exit, and recorded adoption or rejection decision.

MINIMUM EVIDENCE research-state classification; baseline; competing alternative; prohibited-claim register

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

6. Evidence and Assessment

Reproduce, compare, challenge, observe, recover, and trace

EXAMINE

Research papers, standards, designs, bills of material, protocols, source, models, data, calibration, configurations, contracts, and claims.

REPRODUCE

Repeat the experiment or assessment with captured versions, seeds, parameters, environment, uncertainty, and acceptance criteria.

COMPARE

Use an honest incumbent, classical, manual, or alternative baseline with equivalent outcome, data, scale, and resource accounting.

CHALLENGE

Apply adversarial input, environmental variation, dependency loss, fault injection, safety cases, security tests, and boundary conditions.

OBSERVE

Measure field or production-like quality, latency, energy, drift, physical behavior, interventions, failures, maintenance, and user impact.

TRACE

Link claim, authority, experiment, configuration, evidence, decision, pilot, change, incident, rollback, and reassessment.

Evidence grades

A

Independently reproduced, current, representative, uncertainty-bounded, integrity-protected, and operationally relevant.

B

Reproduced by the implementing organization with strong provenance, comparator, challenge, and declared limitations.

C

Partial, laboratory-only, simulation-heavy, inherited, or indirect evidence with material uncertainty and dependencies.

D

Roadmap, assertion, demonstration, benchmark excerpt, patent, token metric, press release, or vendor statement without...

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

7. Assurance Views

Six perspectives required for a complete assurance claim

GOVERNANCE

Ownership, purpose, risk tolerance, policy, exception, and decision rights.

ARCHITECTURE

Boundaries, dependencies, failure modes, state, data flow, and portability.

SECURITY

Identity, authorization, isolation, secrets, abuse resistance, and incident response.

OPERATIONS

Reliability, performance, cost, observability, change, recovery, and support.

PRIVACY / RIGHTS

Purpose limitation, minimization, consent, access, correction, deletion, and egress.

HUMAN / SOCIETAL

Usability, accessibility, disclosure, contestability, impact, and human control.

Conformance requires a defensible position across every applicable view. A strong aggregate score cannot compensate for an unowned system, a failed mandatory gate, untested recovery, or evidence below the accepted grade.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

7.2 Evaluation Metrics and Decision Gates

Measures expose utility, uncertainty, safety, physical limits, transition cost, and lifecycle burden

UTILITY

Task outcome, comparator delta, coverage, quality, accuracy, mission success, and stakeholder value.

UNCERTAINTY

Confidence, calibration, variance, sample coverage, reproducibility, sensitivity, and unresolved assumptions.

PERFORMANCE

Latency, throughput, fidelity, range, precision, bandwidth, scale, density, and availability.

SAFETY / SECURITY

Hazard exposure, unsafe action, exploitability, spoofing, physical consequence, intervention, and containment.

RESOURCE

Energy, power, cooling, spectrum, shots, qubits, memory, materials, facility, operator, and maintenance demand.

MATURITY

Standards state, supply chain, interoperability, tooling, skills, support, qualification, and lifecycle readiness.

ECONOMICS

Acquisition, operation, provider, token, facility, migration, insurance, support, and opportunity cost.

TRANSITION

Pilot escape, rollback time, incumbent fallback, portability, lock-in, retirement, and evidence completeness.

Decision gate: thresholds **MUST** be declared before assessment, include an incumbent baseline and uncertainty statement, and identify any safety, security, cryptographic, physical, reproducibility, or rollback failure that blocks transition.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

8. Failure Modes and Adversarial Scenarios

Challenge assumptions before the system is trusted with consequential work

TECHNOLOGY THEATER

A demonstration or vendor roadmap is treated as proof of production utility or readiness.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

RESEARCH-TO-PRODUCTION ESCAPE

Experimental components enter consequential environments without transition controls.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

UNSUPPORTED SECURITY CLAIM

Novel cryptographic, decentralized, photonic, or network claims are adopted without reproducible evidence.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

ECOSYSTEM COLLAPSE

A supplier, foundry, protocol, token economy, or standards path fails before replacement is viable.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

MEASUREMENT ILLUSION

Benchmark, simulation, or laboratory conditions hide scale, environment, energy, or reliability limits.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

IRREVERSIBLE LOCK-IN

Data, skills, hardware, interfaces, capital, or operations cannot migrate when the technology stalls.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

Adversarial testing MUST protect people and production systems. Use isolated environments, synthetic or minimized data, bounded authority, kill switches, explicit legal and ethical review, and documented stop conditions.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

9. Implementation Profiles

Risk-proportional implementation without weakening mandatory boundaries

FOUNDATIONAL TYPICAL SCOPE Low consequence, limited autonomy, non-sensitive data, reversible outputs. MINIMUM DEPTH Named owner; inventory; basic evaluation; access control; logging; rollback; annual review.	ADVANCED TYPICAL SCOPE Business-critical workflow, sensitive data, multiple tools or providers, moderate autonomy. MINIMUM DEPTH Formal threat model; representative evaluation; approval gates; isolated execution; tested recovery; quarterly review.	HIGH ASSURANCE TYPICAL SCOPE Safety, security, regulated, financial, identity, or broadly consequential use. MINIMUM DEPTH Independent challenge; strongest identity; deterministic enforcement; comprehensive evidence; canary release; continuous monitoring.
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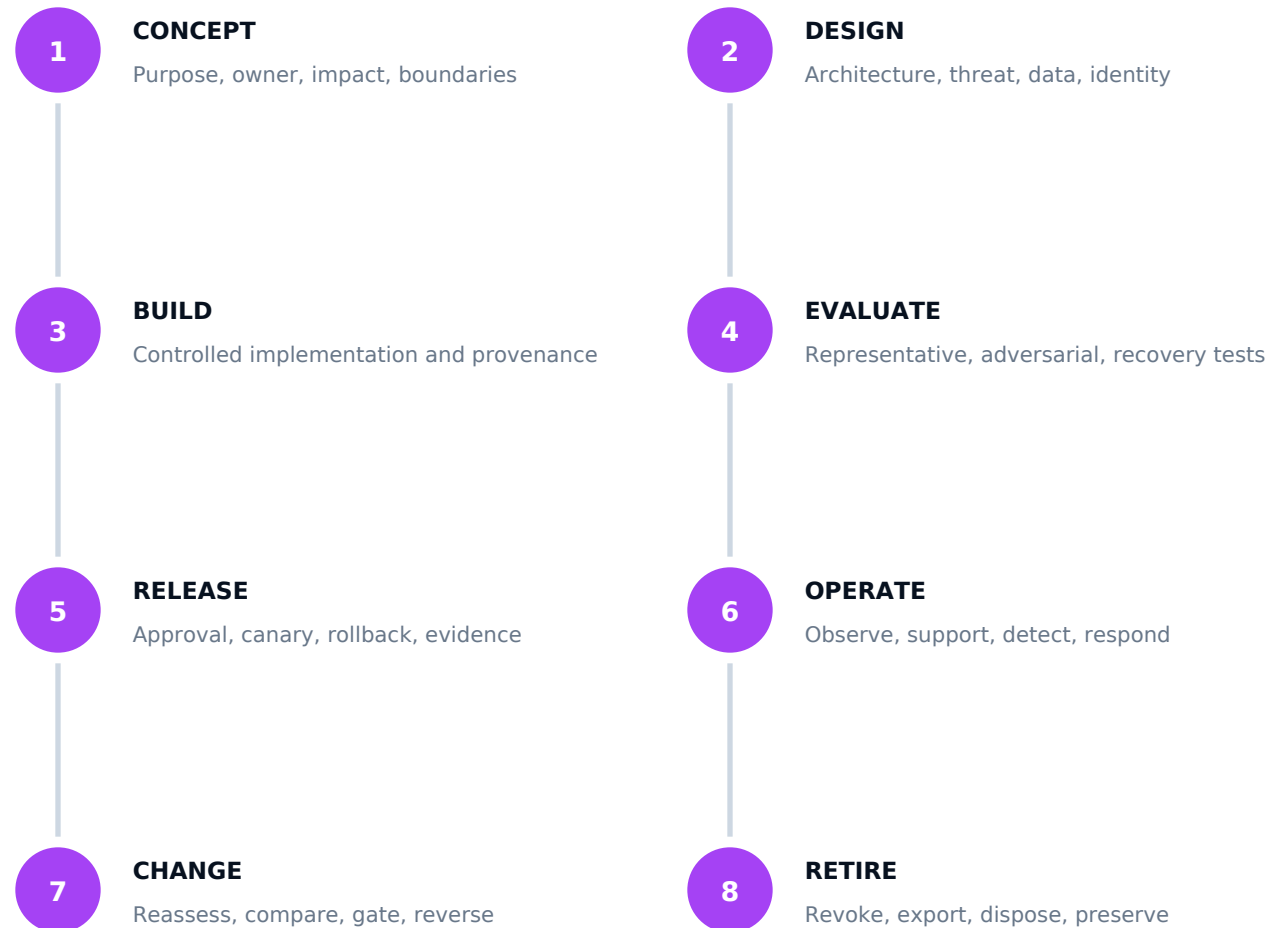
Profile selection rule

Choose the highest profile triggered by consequence, autonomy, sensitivity, scale, irreversibility, external dependency, or inability to rapidly detect and recover. Tailoring may strengthen controls; it may not erase a mandatory gate without a controlled exception.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

9.2 Operational Lifecycle

Evidence-bearing operation from concept through retirement



LIFECYCLE INVARIANT

Every stage **MUST** leave sufficient evidence for the next authority to understand what was intended, what changed, what was tested, what failed, what was accepted, what remains uncertain, and how to recover or exit.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

10. Adoption Roadmap

A sequenced path from uncontrolled capability to evidence-bearing operation

0-30 DAYS**Establish ownership and truth**

Inventory systems and dependencies; classify risk; freeze unsupported claims; identify immediate privilege, data, and evidence gaps.

31-90 DAYS**Create enforceable boundaries**

Define policy; isolate execution; implement identity and approval gates; establish representative evaluation and baseline telemetry.

3-6 MONTHS**Prove recovery and operating control**

Exercise failure, rollback, revocation, incident, provider exit, and state-recovery scenarios; mature evidence packaging.

6-12 MONTHS**Scale assurance**

Automate control checks; expand workload coverage; independent challenge; portfolio metrics; controlled exception expiry; continuous reassessment.

Adoption is complete only when operating evidence demonstrates the selected profile in the actual deployment context. Documentation alone is not conformance.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

10.2 Conformance and Exception Statement

What an assurance claim must contain

SYSTEM / SERVICE Named, versioned capability and deployment boundary.	PROFILE Foundational, Advanced, or High Assurance with trigger rationale.
SCOPE Workloads, users, data, tools, regions, providers, and exclusions.	CRITERIA Pass, partial, fail, not applicable, and exception status for every criterion.
EVIDENCE Artifact references, evidence grade, date, environment, and reproducibility.	LIMITATIONS Known failure modes, unsupported workloads, uncertainty, and residual risk.
EXCEPTIONS Owner, rationale, compensating control, expiration, and approval.	VALIDITY Assessment date, change boundary, review date, and reassessment triggers.

Prohibited claim: “compliant” without the named scope, profile, evidence date, limitations, exceptions, and authority accepting residual risk.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

11. Source Authority and Reference Register

Primary sources informing interpretation; verify current status at assessment time

NIST CSF 2.0

Cybersecurity Framework 2.0

<https://doi.org/10.6028/NIST.CSWP.29>

Enterprise governance and cybersecurity outcome framework.

NIST Integrated Photonics

Integrated Photonics Program and Metrology

<https://www.nist.gov/programs-projects/integrated-photonics>

Primary research and measurement work for heterogeneous integrated photonic devices.

NIST SP 800-53 Rev. 5

Security and Privacy Controls for Information Systems and Organizations

<https://doi.org/10.6028/NIST.SP.800-53r5>

Broad organizational control baseline for technology systems and services.

ITU-R M.2160

Framework and Overall Objectives for IMT-2030

<https://www.itu.int/rec/R-REC-M.2160-0-202311-I/en>

In-force framework for IMT-2030 objectives, use cases, and capabilities.

NIST PQC Project

Post-Quantum Cryptography Standardization and Migration

<https://csrc.nist.gov/projects/post-quantum-cryptography>

Final PQC standards, continuing algorithm work, migration direction, and official project status.

ETSI ISG PDL

Permissioned Distributed Ledger Specifications

<https://www.etsi.org/committee/pdl>

Primary technical work for governed distributed-ledger systems and decentralized trust.

IEEE P3706

Guide for Brain-Inspired Computing Technologies

<https://standards.ieee.org/ieee/3706/12098/>

Published guide describing brain-inspired computing technology options and terminology.

3GPP Release 20

5G-Advanced Studies and 6G Study Roadmap

<https://www.3gpp.org/specifications-technologies/releases/release-20>

Official release program separating continued 5G-Advanced work from initial 6G studies.

Source currency rule: authorities, specifications, laws, provider services, hardware, protocols, standards status, and research evidence MUST be checked at assessment time. This publication records a 2026-07-24 source snapshot.

MYTHOS-EMT-0002 / EMERGING TECHNOLOGY

11.2 Revision History and Decision Register

Permanent identity, controlled change, and publication integrity

VERSION	DATE	STATE	SUMMARY
1.0.0-candidate	2026-07-24	Candidate	Permanent-publication edition; source refresh; expanded criteria, evidence, assurance, and lifecycle guidance.
Next review	2027-01-24	Scheduled	Review source currency, threat evolution, operating evidence, adoption feedback, and proposed revisions.

Publication decisions

- PERMANENT IDENTITY** The document ID remains stable across revisions; batch or production sequence metadata is not public identity.
- CHANGE CONTROL** Normative changes require rationale, impact analysis, affected-criterion mapping, and approval.
- SUPERSESSION** A superseded edition remains traceable; current routes and catalogs identify the active edition.
- CORRECTION** Material errors require a recorded correction, affected-evidence analysis, and notification appropriate to impact.
- ARCHIVAL INTEGRITY** Published artifacts receive hashes, metadata, and a release manifest sufficient for independent verification.

END OF PERMANENT PUBLICATION / MYTHOS-EMT-0002

MYTHOS SYSTEMS / ENGINEERING STANDARDS LIBRARY



ENGINEERING STANDARDS LIBRARY / QUANTUM TECHNOLOGY AND COMPUTING

Quantum Computing System and Workload Evaluation Standard

Quantum hardware, workload suitability, algorithm selection, calibration, error, benchmarking, cloud access, reproducibility, and adoption evidence.

PERMANENT DOCUMENT ID

MYTHOS-QTC-0001

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

Quantum Computing System and Workload Evaluation Standard			DOCUMENT ID MYTHOS-QTC-0001 VERSION 1.0.0-candidate STATUS Candidate Standard PUBLISHER Mythos Systems PUBLICATION DATE 2026-07-24 SCHEDULED REVIEW 2027-01-24 CLASSIFICATION Public
18 ATOMIC CRITERIA	6 ASSURANCE VIEWS	4 IMPLEMENTATION PROFILES	1 PERMANENT IDENTITY

Publication doctrine. This publication establishes durable requirements for its defined scope. Interpretation must preserve the permanent document identity, required evidence, controlled exceptions, source currency, and formal revision history.

EMERGING TECHNOLOGY AND ASSURANCE TOPOLOGY

Quantum Technology and Computing

A trustworthy quantum computing system and workload evaluation program is a governed path from research claim through baseline, experiment, safety and security challenge, transition decision, bounded operation, and preserved evidence.

CLASSIFY

Separate established practice, candidate standard, reproduced result, vendor claim, implementation hypothesis, and open research.

EXPERIMENT

Declare baseline, configuration, uncertainty, scenario coverage, stop conditions, and independent reproduction before conclusions.

CONSTRAIN

Identity, policy, safety envelopes, physical boundaries, cryptographic authority, and human intervention limit consequence.

TRANSITION

Adoption, pilot, production, rollback, supplier exit, lifecycle, and retirement decisions remain evidence-bearing and reversible.

EVIDENCE - BOUND TRANSITION FLOW



No novelty claim becomes an operational claim without reproduced evidence and an explicit authority decision

INTERPRETATION AND ASSURANCE

How to apply this publication

Normative intent

Requirements define outcomes and constraints. Implementations may vary, but evidence must demonstrate equivalent control.

Evidence over assertion

Vendor documentation and design intent are not equivalent to reproduced behavior. Record evidence grade and uncertainty.

Risk-proportional depth

Higher consequence, autonomy, sensitivity, and irreversibility require stronger isolation, review, verification, and recovery.

Controlled exception

Exceptions require an owner, rationale, compensating control, residual-risk acceptance, expiration, and reevaluation trigger.

Normalized assessment scale



A numeric score must never hide a failed mandatory gate, missing evidence, untested workload, or unacceptable residual risk.

INTERACTIVE NAVIGATION

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Navigation doctrine

Bookmarks and internal links are conveniences. Permanent document identity, criterion identifiers, evidence references, and revision history remain authoritative.

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

0. Executive Mandate

Research value, transition discipline, and non-negotiable evidence boundaries

MANDATE

Organizations evaluating quantum computing system and workload evaluation **MUST** separate research from operational authority, establish a reproducible baseline, constrain safety and security consequence, disclose uncertainty, and require a documented transition or rejection decision.

Required outcomes

- Establish a durable, product-neutral evidence system for quantum computing system and workload evaluation.
- Prevent novelty, investment, vendor prestige, roadmap language, or laboratory success from substituting for operational proof.
- Require representative performance, adversarial, failure, recovery, safety, privacy, and lifecycle evidence.
- Keep pilots bounded by identity, authority, environment, duration, budget, stop conditions, and rollback.
- Preserve rejected alternatives, limitations, residual risk, source currency, and reassessment triggers.

Decision boundary: conformance supports a bounded engineering assurance position. It does not prove scientific consensus, regulatory approval, universal safety, quantum advantage, cryptographic perfection, autonomous competence, or commercial viability.

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

1. Scope and Applicability

Research, pilot, transition, operational, and retirement boundaries

IN SCOPE

- Research, architecture, acquisition, experiment, pilot, transition, operation, and retirement of quantum computing system and workload evaluation.
- Hardware, software, models, data, protocols, facilities, people, suppliers, providers, physical processes, and evidence.
- Laboratory, simulation, testbed, shadow, pilot, canary, production, and field deployment states.
- Claims, benchmarks, uncertainty, safety, security, privacy, economics, interoperability, support, and exit.

OUT OF SCOPE

- Scientific truth inferred from a single benchmark, simulation, provider, hardware generation, or laboratory configuration.
- Safety, regulatory, export, spectrum, airspace, clinical, cryptographic, or standards approval not granted by the responsible authority.
- Roadmap forecasts, token price, patent counts, press releases, or investment treated as engineering evidence.
- Hidden production use of research components outside the declared transition and assurance boundary.

Applicability triggers

- The capability is novel, rapidly changing, weakly standardized, difficult to reproduce, or dependent on immature suppliers.
- A claim concerns safety, security, privacy, physical action, critical infrastructure, cryptographic trust, or consequential autonomy.
- The system requires specialized facilities, scarce hardware, spectrum, foundry, cryogenic, optical, robotics, or field-test dependencies.
- Failure or lock-in may create long-lived data, capital, infrastructure, workforce, or regulatory consequences.
- A research component is proposed for pilot, customer, production, public, or externally relied-upon use.

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

2. Definitions and Taxonomy

Controlled language for architecture, governance, and assessment

AUTHORITY

The right to approve, deny, constrain, or execute an action. Model output is not authority.

EVIDENCE

A reproducible source, trace, measurement, test, record, signed artifact, or documented observation supporting a claim.

ASSURANCE VIEW

A defined perspective such as governance, architecture, security, operations, privacy, or human oversight.

ATOMIC CRITERION

A uniquely identified requirement that can be assessed, evidenced, excepted, and revised independently.

IMPLEMENTATION PROFILE

A risk-proportional set of required depth, evidence, and gates for a class of use.

CONTROLLED EXCEPTION

A time-bounded deviation with owner, rationale, compensating control, residual risk, expiration, and review trigger.

DETERMINISTIC MECHANISM

A component whose inputs, policy, state transition, and side effects can be constrained and verified.

SOURCE AUTHORITY

The documented basis for treating a source as reliable for a defined claim, context, jurisdiction, and time.

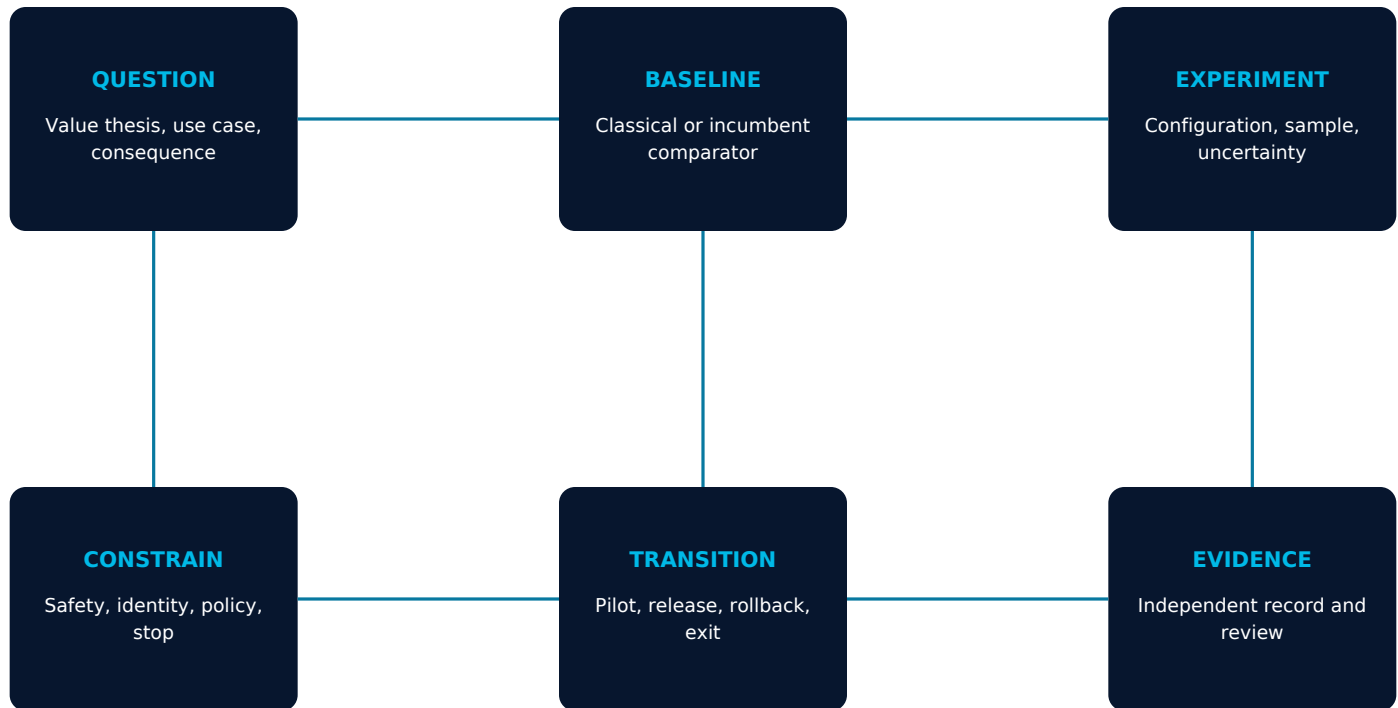
REASSESSMENT TRIGGER

A change, incident, drift signal, dependency revision, or time boundary requiring renewed evaluation.

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

3. Architecture and Trust Model

Separation of research, authority, physical systems, runtime, and evidence



Mandatory trust boundaries

- Research systems **MUST NOT** inherit production identity, secrets, authority, data, networks, or physical control by convenience.
- Claims **MUST** retain the exact hardware, software, model, protocol, calibration, environment, workload, and observation boundary.
- Safety, cryptographic, physical, spectrum, autonomy, and human-intervention constraints **MUST** remain independently enforceable.
- Transition **MUST** have a named decision authority, acceptance criteria, monitored pilot, rollback, supplier exit, and retirement path.
- Evidence **MUST** remain reviewable when a vendor, cloud, token network, laboratory, model, robot, or quantum backend is unavailable.

4. Governance and Accountability

Decision rights, separation of duties, and lifecycle ownership

ACCOUNTABLE OWNER

Accepts scope, risk tolerance, funding, and residual risk.

SYSTEM OWNER

Maintains architecture, inventory, operating boundaries, and change control.

SECURITY / PRIVACY

Defines threat, identity, data, isolation, monitoring, and incident requirements.

EVALUATION AUTHORITY

Designs representative tests, gates releases, and preserves reproducibility.

OPERATIONS

Maintains availability, rollback, recovery, evidence, and incident handling.

HUMAN OVERSIGHT

Reviews consequential decisions, exceptions, disputed outcomes, and harm signals.

DECISION PRINCIPLE

No single actor should be able to define the objective, grant authority, execute the consequential action, suppress evidence, and approve the result. Separation must be technical where consequence requires it.

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-QTC-0001-C01**Quantum Use Case and Classical Baseline**

The organization **MUST** define, implement, verify, and maintain quantum use case and classical baseline for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0001-C02**Computational Model and Hardware Modality**

The organization **MUST** define, implement, verify, and maintain computational model and hardware modality for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0001-C03**Problem Encoding and Resource Estimation**

The organization **MUST** define, implement, verify, and maintain problem encoding and resource estimation for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE captured circuit, parameters, seeds, shots, mapping, calibration snapshot, and result data

MYTHOS-QTC-0001-C04**Algorithm Selection and Complexity Claim**

The organization **MUST** define, implement, verify, and maintain algorithm selection and complexity claim for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cross-backend, simulator, independent reproduction, and statistical comparison evidence

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-QTC-0001-C05**Qubit Topology, Connectivity, and Native Gate Set**

The organization **MUST** define, implement, verify, and maintain qubit topology, connectivity, and native gate set for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cryptographic inventory, hybrid profile, interoperability tests, downgrade tests, and revocation plan

MYTHOS-QTC-0001-C06**Calibration, Fidelity, Coherence, and Drift**

The organization **MUST** define, implement, verify, and maintain calibration, fidelity, coherence, and drift for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE quantum-channel, timing, authentication, trusted-node, detector, or key-lifecycle evidence

MYTHOS-QTC-0001-C07**Compilation, Transpilation, Mapping, and Optimization**

The organization **MUST** define, implement, verify, and maintain compilation, transpilation, mapping, and optimization for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE facility, energy, cooling, queue, cost, availability, support, and exit evidence

MYTHOS-QTC-0001-C08**Noise Model, Error Characterization, and Uncertainty**

The organization **MUST** define, implement, verify, and maintain noise model, error characterization, and uncertainty for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE bounded claim, limitation register, promotion gate, fallback, and long-term evidence package

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-QTC-0001-C09

Error Mitigation, Suppression, and Validation

The organization MUST define, implement, verify, and maintain error mitigation, suppression, and validation for the declared quantum computing system and workload evaluation boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0001-C10

Shot Count, Sampling, Randomness, and Confidence

The organization MUST define, implement, verify, and maintain shot count, sampling, randomness, and confidence for the declared quantum computing system and workload evaluation boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0001-C11

Classical Preprocessing, Postprocessing, and Hybrid Cost

The organization MUST define, implement, verify, and maintain classical preprocessing, postprocessing, and hybrid cost for the declared quantum computing system and workload evaluation boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE captured circuit, parameters, seeds, shots, mapping, calibration snapshot, and result data

MYTHOS-QTC-0001-C12

Provider Queue, Access, Region, and Data Boundary

The organization MUST define, implement, verify, and maintain provider queue, access, region, and data boundary for the declared quantum computing system and workload evaluation boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE cross-backend, simulator, independent reproduction, and statistical comparison evidence

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-QTC-0001-C13**Experiment Configuration and Reproducibility Package**

The organization **MUST** define, implement, verify, and maintain experiment configuration and reproducibility package for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cryptographic inventory, hybrid profile, interoperability tests, downgrade tests, and revocation plan

MYTHOS-QTC-0001-C14**Benchmark Integrity and Advantage-Claim Control**

The organization **MUST** define, implement, verify, and maintain benchmark integrity and advantage-claim control for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE quantum-channel, timing, authentication, trusted-node, detector, or key-lifecycle evidence

MYTHOS-QTC-0001-C15**Security, Multi-Tenancy, and Result Confidentiality**

The organization **MUST** define, implement, verify, and maintain security, multi-tenancy, and result confidentiality for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE facility, energy, cooling, queue, cost, availability, support, and exit evidence

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-QTC-0001-C16**Cost, Energy, Throughput, and Operational Burden**

The organization **MUST** define, implement, verify, and maintain cost, energy, throughput, and operational burden for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE bounded claim, limitation register, promotion gate, fallback, and long-term evidence package

MYTHOS-QTC-0001-C17**Adoption Gate and Classical Fallback**

The organization **MUST** define, implement, verify, and maintain adoption gate and classical fallback for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0001-C18**Reassessment, Portability, and Evidence Retention**

The organization **MUST** define, implement, verify, and maintain reassessment, portability, and evidence retention for the declared quantum computing system and workload evaluation boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

6. Evidence and Assessment

Reproduce, compare, challenge, observe, recover, and trace

EXAMINE

Research papers, standards, designs, bills of material, protocols, source, models, data, calibration, configurations, contracts, and claims.

REPRODUCE

Repeat the experiment or assessment with captured versions, seeds, parameters, environment, uncertainty, and acceptance criteria.

COMPARE

Use an honest incumbent, classical, manual, or alternative baseline with equivalent outcome, data, scale, and resource accounting.

CHALLENGE

Apply adversarial input, environmental variation, dependency loss, fault injection, safety cases, security tests, and boundary conditions.

OBSERVE

Measure field or production-like quality, latency, energy, drift, physical behavior, interventions, failures, maintenance, and user impact.

TRACE

Link claim, authority, experiment, configuration, evidence, decision, pilot, change, incident, rollback, and reassessment.

Evidence grades

A

Independently reproduced, current, representative, uncertainty-bounded, integrity-protected, and operationally relevant.

B

Reproduced by the implementing organization with strong provenance, comparator, challenge, and declared limitations.

C

Partial, laboratory-only, simulation-heavy, inherited, or indirect evidence with material uncertainty and dependencies.

D

Roadmap, assertion, demonstration, benchmark excerpt, patent, token metric, press release, or vendor statement without...

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

7. Assurance Views

Six perspectives required for a complete assurance claim

GOVERNANCE

Ownership, purpose, risk tolerance, policy, exception, and decision rights.

ARCHITECTURE

Boundaries, dependencies, failure modes, state, data flow, and portability.

SECURITY

Identity, authorization, isolation, secrets, abuse resistance, and incident response.

OPERATIONS

Reliability, performance, cost, observability, change, recovery, and support.

PRIVACY / RIGHTS

Purpose limitation, minimization, consent, access, correction, deletion, and egress.

HUMAN / SOCIETAL

Usability, accessibility, disclosure, contestability, impact, and human control.

Conformance requires a defensible position across every applicable view. A strong aggregate score cannot compensate for an unowned system, a failed mandatory gate, untested recovery, or evidence below the accepted grade.

7.2 Evaluation Metrics and Decision Gates

Measures expose utility, uncertainty, safety, physical limits, transition cost, and lifecycle burden

UTILITY

Task outcome, comparator delta, coverage, quality, accuracy, mission success, and stakeholder value.

UNCERTAINTY

Confidence, calibration, variance, sample coverage, reproducibility, sensitivity, and unresolved assumptions.

PERFORMANCE

Latency, throughput, fidelity, range, precision, bandwidth, scale, density, and availability.

SAFETY / SECURITY

Hazard exposure, unsafe action, exploitability, spoofing, physical consequence, intervention, and containment.

RESOURCE

Energy, power, cooling, spectrum, shots, qubits, memory, materials, facility, operator, and maintenance demand.

MATURITY

Standards state, supply chain, interoperability, tooling, skills, support, qualification, and lifecycle readiness.

ECONOMICS

Acquisition, operation, provider, token, facility, migration, insurance, support, and opportunity cost.

TRANSITION

Pilot escape, rollback time, incumbent fallback, portability, lock-in, retirement, and evidence completeness.

Decision gate: thresholds **MUST** be declared before assessment, include an incumbent baseline and uncertainty statement, and identify any safety, security, cryptographic, physical, reproducibility, or rollback failure that blocks transition.

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

8. Failure Modes and Adversarial Scenarios

Challenge assumptions before the system is trusted with consequential work

QUANTUM ADVANTAGE OVERCLAIM

A narrow or non-comparable experiment is presented as useful superiority over classical methods.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

CALIBRATION INVALIDATION

Backend drift or missing calibration state makes results irreproducible or misleading.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

CRYPTOGRAPHIC TRANSITION FAILURE

Legacy algorithms, protocol gaps, or downgrade paths survive after PQC migration claims.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

QUANTUM CHANNEL COMPROMISE

Trusted nodes, detectors, timing, classical authentication, or devices violate the stated security model.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

RESOURCE-ESTIMATION COLLAPSE

Logical qubit, error correction, runtime, facility, or cost assumptions invalidate the roadmap.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

PROVIDER AND EVIDENCE LOSS

Remote hardware, queue behavior, configuration, or experiment records cannot be independently reproduced.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

Adversarial testing MUST protect people and production systems. Use isolated environments, synthetic or minimized data, bounded authority, kill switches, explicit legal and ethical review, and documented stop conditions.

9. Implementation Profiles

Risk-proportional implementation without weakening mandatory boundaries

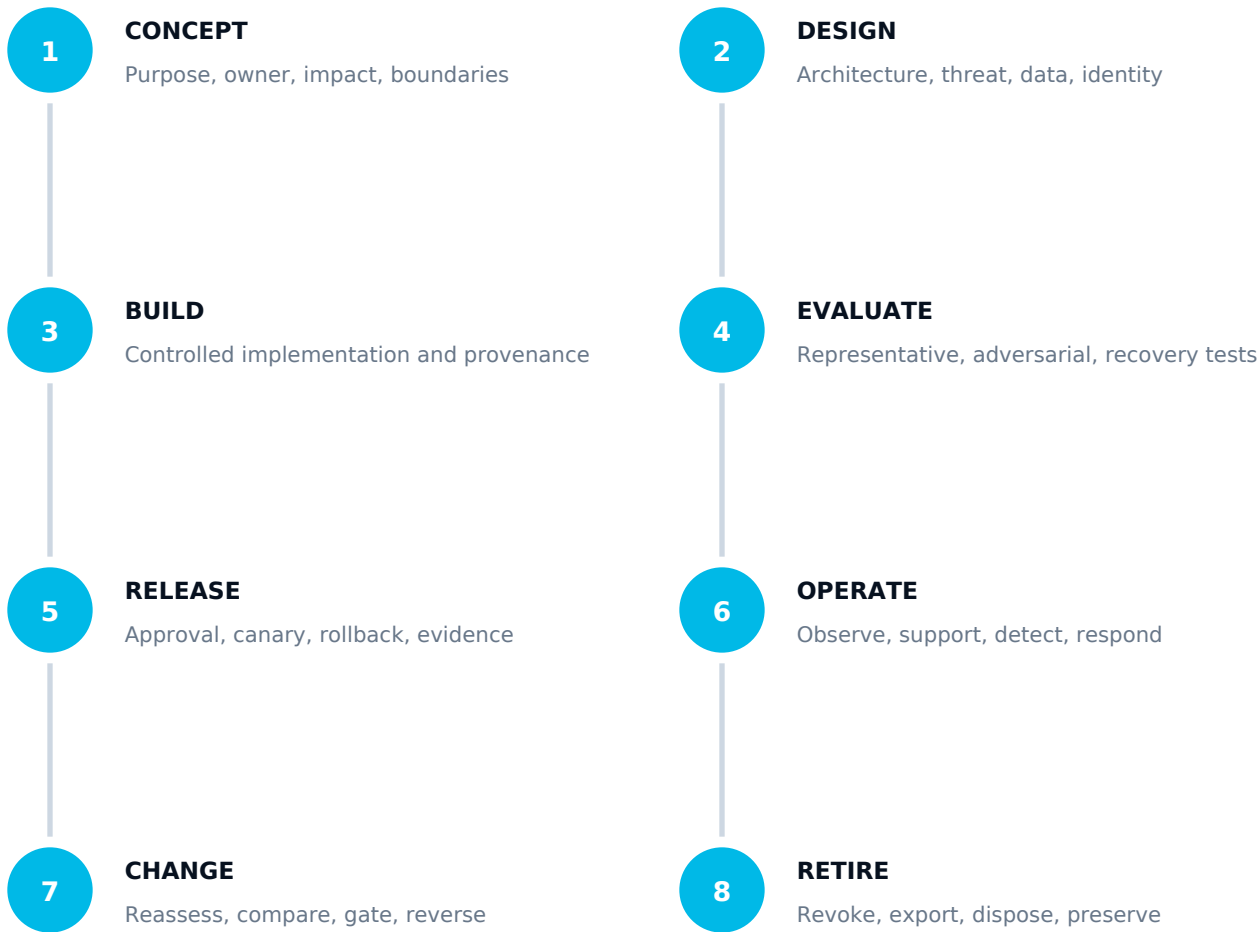
FOUNDATIONAL TYPICAL SCOPE Low consequence, limited autonomy, non-sensitive data, reversible outputs. MINIMUM DEPTH Named owner; inventory; basic evaluation; access control; logging; rollback; annual review.	ADVANCED TYPICAL SCOPE Business-critical workflow, sensitive data, multiple tools or providers, moderate autonomy. MINIMUM DEPTH Formal threat model; representative evaluation; approval gates; isolated execution; tested recovery; quarterly review.	HIGH ASSURANCE TYPICAL SCOPE Safety, security, regulated, financial, identity, or broadly consequential use. MINIMUM DEPTH Independent challenge; strongest identity; deterministic enforcement; comprehensive evidence; canary release; continuous monitoring.
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Profile selection rule

Choose the highest profile triggered by consequence, autonomy, sensitivity, scale, irreversibility, external dependency, or inability to rapidly detect and recover. Tailoring may strengthen controls; it may not erase a mandatory gate without a controlled exception.

9.2 Operational Lifecycle

Evidence-bearing operation from concept through retirement



LIFECYCLE INVARIANT

Every stage **MUST** leave sufficient evidence for the next authority to understand what was intended, what changed, what was tested, what failed, what was accepted, what remains uncertain, and how to recover or exit.

MYTHOS-QTC-0001 / QUANTUM TECHNOLOGY

10. Adoption Roadmap

A sequenced path from uncontrolled capability to evidence-bearing operation

0-30 DAYS**Establish ownership and truth**

Inventory systems and dependencies; classify risk; freeze unsupported claims; identify immediate privilege, data, and evidence gaps.

31-90 DAYS**Create enforceable boundaries**

Define policy; isolate execution; implement identity and approval gates; establish representative evaluation and baseline telemetry.

3-6 MONTHS**Prove recovery and operating control**

Exercise failure, rollback, revocation, incident, provider exit, and state-recovery scenarios; mature evidence packaging.

6-12 MONTHS**Scale assurance**

Automate control checks; expand workload coverage; independent challenge; portfolio metrics; controlled exception expiry; continuous reassessment.

Adoption is complete only when operating evidence demonstrates the selected profile in the actual deployment context. Documentation alone is not conformance.

10.2 Conformance and Exception Statement

What an assurance claim must contain

SYSTEM / SERVICE Named, versioned capability and deployment boundary.	PROFILE Foundational, Advanced, or High Assurance with trigger rationale.
SCOPE Workloads, users, data, tools, regions, providers, and exclusions.	CRITERIA Pass, partial, fail, not applicable, and exception status for every criterion.
EVIDENCE Artifact references, evidence grade, date, environment, and reproducibility.	LIMITATIONS Known failure modes, unsupported workloads, uncertainty, and residual risk.
EXCEPTIONS Owner, rationale, compensating control, expiration, and approval.	VALIDITY Assessment date, change boundary, review date, and reassessment triggers.

Prohibited claim: “compliant” without the named scope, profile, evidence date, limitations, exceptions, and authority accepting residual risk.

11. Source Authority and Reference Register

Primary sources informing interpretation; verify current status at assessment time

NIST CSF 2.0

Cybersecurity Framework 2.0

<https://doi.org/10.6028/NIST.CSWP.29>

Enterprise governance and cybersecurity outcome framework.

NIST PQC Standards

Post-Quantum Cryptography Project

<https://csrc.nist.gov/projects/post-quantum-cryptography>

FIPS 203, 204, and 205, HQC selection, and continuing migration guidance.

NIST SP 800-53 Rev. 5

Security and Privacy Controls for Information Systems and Organizations

<https://doi.org/10.6028/NIST.SP.800-53r5>

Broad organizational control baseline for technology systems and services.

ETSI QKD

Quantum Key Distribution Industry Specification Group

<https://www.etsi.org/committee/qkd>

QKD component, interface, security, deployment, and interoperability specifications.

NIST Quantum Science

Quantum Science Programs and Testbeds

<https://www.nist.gov/quantum-science>

Official NIST research across quantum computing, communications, networking, sensing, and metrology.

ISO/IEC 4879:2024

Quantum Computing - Terminology and Vocabulary

<https://www.iso.org/standard/80432.html>

International terminology foundation for quantum computing concepts.

NIST Quantum Networks

Quantum Networks at NIST

<https://www.nist.gov/pml/productsservices/quantum-networks-nist>

Quantum-network concepts, components, applications, and metropolitan research testbeds.

Source currency rule: authorities, specifications, laws, provider services, hardware, protocols, standards status, and research evidence MUST be checked at assessment time. This publication records a 2026-07-24 source snapshot.

11.2 Revision History and Decision Register

Permanent identity, controlled change, and publication integrity

VERSION	DATE	STATE	SUMMARY
1.0.0-candidate	2026-07-24	Candidate	Permanent-publication edition; source refresh; expanded criteria, evidence, assurance, and lifecycle guidance.
Next review	2027-01-24	Scheduled	Review source currency, threat evolution, operating evidence, adoption feedback, and proposed revisions.

Publication decisions

- PERMANENT IDENTITY** The document ID remains stable across revisions; batch or production sequence metadata is not public identity.
- CHANGE CONTROL** Normative changes require rationale, impact analysis, affected-criterion mapping, and approval.
- SUPERSESSION** A superseded edition remains traceable; current routes and catalogs identify the active edition.
- CORRECTION** Material errors require a recorded correction, affected-evidence analysis, and notification appropriate to impact.
- ARCHIVAL INTEGRITY** Published artifacts receive hashes, metadata, and a release manifest sufficient for independent verification.



ENGINEERING STANDARDS LIBRARY / QUANTUM TECHNOLOGY AND COMPUTING

Post-Quantum Cryptography Migration and Algorithm Portfolio Standard

PQC discovery, data-lifetime analysis, algorithm portfolios, hybrid deployment, protocol migration, testing, interoperability, and cryptographic transition evidence.

PERMANENT DOCUMENT ID

MYTHOS-QTC-0002

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

Post-Quantum Cryptography Migration and Algorithm Portfolio Standard			DOCUMENT ID MYTHOS-QTC-0002 VERSION 1.0.0-candidate STATUS Candidate Standard PUBLISHER Mythos Systems PUBLICATION DATE 2026-07-24 SCHEDULED REVIEW 2027-01-24 CLASSIFICATION Public
18 ATOMIC CRITERIA	6 ASSURANCE VIEWS	4 IMPLEMENTATION PROFILES	1 PERMANENT IDENTITY

Publication doctrine. This publication establishes durable requirements for its defined scope. Interpretation must preserve the permanent document identity, required evidence, controlled exceptions, source currency, and formal revision history.

EMERGING TECHNOLOGY AND ASSURANCE TOPOLOGY

Quantum Technology and Computing

A trustworthy post-quantum cryptography migration program is a governed path from research claim through baseline, experiment, safety and security challenge, transition decision, bounded operation, and preserved evidence.

CLASSIFY

Separate established practice, candidate standard, reproduced result, vendor claim, implementation hypothesis, and open research.

EXPERIMENT

Declare baseline, configuration, uncertainty, scenario coverage, stop conditions, and independent reproduction before conclusions.

CONSTRAIN

Identity, policy, safety envelopes, physical boundaries, cryptographic authority, and human intervention limit consequence.

TRANSITION

Adoption, pilot, production, rollback, supplier exit, lifecycle, and retirement decisions remain evidence-bearing and reversible.

EVIDENCE - BOUND TRANSITION FLOW



No novelty claim becomes an operational claim without reproduced evidence and an explicit authority decision

INTERPRETATION AND ASSURANCE

How to apply this publication

Normative intent

Requirements define outcomes and constraints. Implementations may vary, but evidence must demonstrate equivalent control.

Evidence over assertion

Vendor documentation and design intent are not equivalent to reproduced behavior. Record evidence grade and uncertainty.

Risk-proportional depth

Higher consequence, autonomy, sensitivity, and irreversibility require stronger isolation, review, verification, and recovery.

Controlled exception

Exceptions require an owner, rationale, compensating control, residual-risk acceptance, expiration, and reevaluation trigger.

Normalized assessment scale

0	1	2	3	4	5
ABSENT	AD HOC	PARTIAL	OPERATIONAL	ADVANCED	LEADING

A numeric score must never hide a failed mandatory gate, missing evidence, untested workload, or unacceptable residual risk.

INTERACTIVE NAVIGATION

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Navigation doctrine

Bookmarks and internal links are conveniences. Permanent document identity, criterion identifiers, evidence references, and revision history remain authoritative.

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

0. Executive Mandate

Research value, transition discipline, and non-negotiable evidence boundaries

MANDATE

Organizations evaluating post-quantum cryptography migration **MUST** separate research from operational authority, establish a reproducible baseline, constrain safety and security consequence, disclose uncertainty, and require a documented transition or rejection decision.

Required outcomes

- Establish a durable, product-neutral evidence system for post-quantum cryptography migration.
- Prevent novelty, investment, vendor prestige, roadmap language, or laboratory success from substituting for operational proof.
- Require representative performance, adversarial, failure, recovery, safety, privacy, and lifecycle evidence.
- Keep pilots bounded by identity, authority, environment, duration, budget, stop conditions, and rollback.
- Preserve rejected alternatives, limitations, residual risk, source currency, and reassessment triggers.

Decision boundary: conformance supports a bounded engineering assurance position. It does not prove scientific consensus, regulatory approval, universal safety, quantum advantage, cryptographic perfection, autonomous competence, or commercial viability.

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

1. Scope and Applicability

Research, pilot, transition, operational, and retirement boundaries

IN SCOPE

- Research, architecture, acquisition, experiment, pilot, transition, operation, and retirement of post-quantum cryptography migration.
- Hardware, software, models, data, protocols, facilities, people, suppliers, providers, physical processes, and evidence.
- Laboratory, simulation, testbed, shadow, pilot, canary, production, and field deployment states.
- Claims, benchmarks, uncertainty, safety, security, privacy, economics, interoperability, support, and exit.

OUT OF SCOPE

- Scientific truth inferred from a single benchmark, simulation, provider, hardware generation, or laboratory configuration.
- Safety, regulatory, export, spectrum, airspace, clinical, cryptographic, or standards approval not granted by the responsible authority.
- Roadmap forecasts, token price, patent counts, press releases, or investment treated as engineering evidence.
- Hidden production use of research components outside the declared transition and assurance boundary.

Applicability triggers

- The capability is novel, rapidly changing, weakly standardized, difficult to reproduce, or dependent on immature suppliers.
- A claim concerns safety, security, privacy, physical action, critical infrastructure, cryptographic trust, or consequential autonomy.
- The system requires specialized facilities, scarce hardware, spectrum, foundry, cryogenic, optical, robotics, or field-test dependencies.
- Failure or lock-in may create long-lived data, capital, infrastructure, workforce, or regulatory consequences.
- A research component is proposed for pilot, customer, production, public, or externally relied-upon use.

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

2. Definitions and Taxonomy

Controlled language for architecture, governance, and assessment

AUTHORITY

The right to approve, deny, constrain, or execute an action. Model output is not authority.

EVIDENCE

A reproducible source, trace, measurement, test, record, signed artifact, or documented observation supporting a claim.

ASSURANCE VIEW

A defined perspective such as governance, architecture, security, operations, privacy, or human oversight.

ATOMIC CRITERION

A uniquely identified requirement that can be assessed, evidenced, excepted, and revised independently.

IMPLEMENTATION PROFILE

A risk-proportional set of required depth, evidence, and gates for a class of use.

CONTROLLED EXCEPTION

A time-bounded deviation with owner, rationale, compensating control, residual risk, expiration, and review trigger.

DETERMINISTIC MECHANISM

A component whose inputs, policy, state transition, and side effects can be constrained and verified.

SOURCE AUTHORITY

The documented basis for treating a source as reliable for a defined claim, context, jurisdiction, and time.

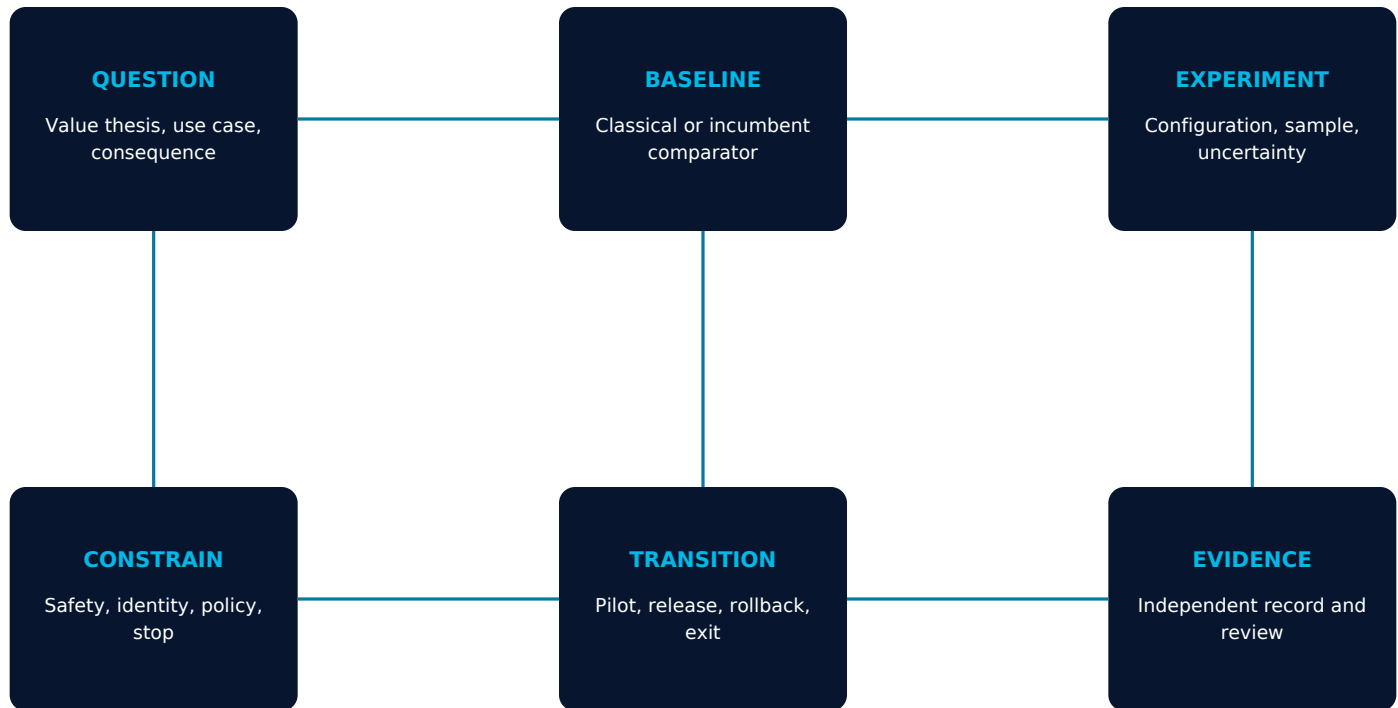
REASSESSMENT TRIGGER

A change, incident, drift signal, dependency revision, or time boundary requiring renewed evaluation.

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

3. Architecture and Trust Model

Separation of research, authority, physical systems, runtime, and evidence



Mandatory trust boundaries

- Research systems **MUST NOT** inherit production identity, secrets, authority, data, networks, or physical control by convenience.
- Claims **MUST** retain the exact hardware, software, model, protocol, calibration, environment, workload, and observation boundary.
- Safety, cryptographic, physical, spectrum, autonomy, and human-intervention constraints **MUST** remain independently enforceable.
- Transition **MUST** have a named decision authority, acceptance criteria, monitored pilot, rollback, supplier exit, and retirement path.
- Evidence **MUST** remain reviewable when a vendor, cloud, token network, laboratory, model, robot, or quantum backend is unavailable.

4. Governance and Accountability

Decision rights, separation of duties, and lifecycle ownership

ACCOUNTABLE OWNER

Accepts scope, risk tolerance, funding, and residual risk.

SYSTEM OWNER

Maintains architecture, inventory, operating boundaries, and change control.

SECURITY / PRIVACY

Defines threat, identity, data, isolation, monitoring, and incident requirements.

EVALUATION AUTHORITY

Designs representative tests, gates releases, and preserves reproducibility.

OPERATIONS

Maintains availability, rollback, recovery, evidence, and incident handling.

HUMAN OVERSIGHT

Reviews consequential decisions, exceptions, disputed outcomes, and harm signals.

DECISION PRINCIPLE

No single actor should be able to define the objective, grant authority, execute the consequential action, suppress evidence, and approve the result. Separation must be technical where consequence requires it.

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-QTC-0002-C01

Cryptographic Discovery and Dependency Graph

The organization **MUST** define, implement, verify, and maintain cryptographic discovery and dependency graph for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0002-C02

Protected-Data Lifetime and Quantum Risk Horizon

The organization **MUST** define, implement, verify, and maintain protected-data lifetime and quantum risk horizon for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0002-C03

Algorithm Portfolio and Approved Parameter Sets

The organization **MUST** define, implement, verify, and maintain algorithm portfolio and approved parameter sets for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE captured circuit, parameters, seeds, shots, mapping, calibration snapshot, and result data

MYTHOS-QTC-0002-C04

ML-KEM Deployment and Encapsulation Policy

The organization **MUST** define, implement, verify, and maintain ml-kem deployment and encapsulation policy for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cross-backend, simulator, independent reproduction, and statistical comparison evidence

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-QTC-0002-C05**ML-DSA, SLH-DSA, and Signature Policy**

The organization **MUST** define, implement, verify, and maintain ml-dsa, slh-dsa, and signature policy for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cryptographic inventory, hybrid profile, interoperability tests, downgrade tests, and revocation plan

MYTHOS-QTC-0002-C06**Backup KEM and Algorithm-Diversity Strategy**

The organization **MUST** define, implement, verify, and maintain backup kem and algorithm-diversity strategy for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE quantum-channel, timing, authentication, trusted-node, detector, or key-lifecycle evidence

MYTHOS-QTC-0002-C07**Hybrid Classical-PQC Composition**

The organization **MUST** define, implement, verify, and maintain hybrid classical-pqc composition for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE facility, energy, cooling, queue, cost, availability, support, and exit evidence

MYTHOS-QTC-0002-C08**Certificate, PKI, Code-Signing, and Trust-Store Migration**

The organization **MUST** define, implement, verify, and maintain certificate, pki, code-signing, and trust-store migration for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE bounded claim, limitation register, promotion gate, fallback, and long-term evidence package

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-QTC-0002-C09

Protocol, Library, Hardware, and Vendor Compatibility

The organization MUST define, implement, verify, and maintain protocol, library, hardware, and vendor compatibility for the declared post-quantum cryptography migration boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0002-C10

Key, Ciphertext, Signature, and Bandwidth Sizing

The organization MUST define, implement, verify, and maintain key, ciphertext, signature, and bandwidth sizing for the declared post-quantum cryptography migration boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0002-C11

Randomness, Side Channel, and Implementation Validation

The organization MUST define, implement, verify, and maintain randomness, side channel, and implementation validation for the declared post-quantum cryptography migration boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE captured circuit, parameters, seeds, shots, mapping, calibration snapshot, and result data

MYTHOS-QTC-0002-C12

Downgrade, Negotiation, and Algorithm-Confusion Resistance

The organization MUST define, implement, verify, and maintain downgrade, negotiation, and algorithm-confusion resistance for the declared post-quantum cryptography migration boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE cross-backend, simulator, independent reproduction, and statistical comparison evidence

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-QTC-0002-C13**Inventory Coverage and Migration Wave Planning**

The organization **MUST** define, implement, verify, and maintain inventory coverage and migration wave planning for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cryptographic inventory, hybrid profile, interoperability tests, downgrade tests, and revocation plan

MYTHOS-QTC-0002-C14**Interoperability Lab and Negative Testing**

The organization **MUST** define, implement, verify, and maintain interoperability lab and negative testing for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE quantum-channel, timing, authentication, trusted-node, detector, or key-lifecycle evidence

MYTHOS-QTC-0002-C15**Performance, Capacity, and Availability Evidence**

The organization **MUST** define, implement, verify, and maintain performance, capacity, and availability evidence for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE facility, energy, cooling, queue, cost, availability, support, and exit evidence

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-QTC-0002-C16**Emergency Revocation and Algorithm Withdrawal**

The organization **MUST** define, implement, verify, and maintain emergency revocation and algorithm withdrawal for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE bounded claim, limitation register, promotion gate, fallback, and long-term evidence package

MYTHOS-QTC-0002-C17**Legacy Decommissioning and Long-Lived Data Protection**

The organization **MUST** define, implement, verify, and maintain legacy decommissioning and long-lived data protection for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0002-C18**Migration Evidence, Exceptions, and Reassessment**

The organization **MUST** define, implement, verify, and maintain migration evidence, exceptions, and reassessment for the declared post-quantum cryptography migration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

6. Evidence and Assessment

Reproduce, compare, challenge, observe, recover, and trace

EXAMINE

Research papers, standards, designs, bills of material, protocols, source, models, data, calibration, configurations, contracts, and claims.

REPRODUCE

Repeat the experiment or assessment with captured versions, seeds, parameters, environment, uncertainty, and acceptance criteria.

COMPARE

Use an honest incumbent, classical, manual, or alternative baseline with equivalent outcome, data, scale, and resource accounting.

CHALLENGE

Apply adversarial input, environmental variation, dependency loss, fault injection, safety cases, security tests, and boundary conditions.

OBSERVE

Measure field or production-like quality, latency, energy, drift, physical behavior, interventions, failures, maintenance, and user impact.

TRACE

Link claim, authority, experiment, configuration, evidence, decision, pilot, change, incident, rollback, and reassessment.

Evidence grades

A

Independently reproduced, current, representative, uncertainty-bounded, integrity-protected, and operationally relevant.

B

Reproduced by the implementing organization with strong provenance, comparator, challenge, and declared limitations.

C

Partial, laboratory-only, simulation-heavy, inherited, or indirect evidence with material uncertainty and dependencies.

D

Roadmap, assertion, demonstration, benchmark excerpt, patent, token metric, press release, or vendor statement without...

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

7. Assurance Views

Six perspectives required for a complete assurance claim

GOVERNANCE

Ownership, purpose, risk tolerance, policy, exception, and decision rights.

ARCHITECTURE

Boundaries, dependencies, failure modes, state, data flow, and portability.

SECURITY

Identity, authorization, isolation, secrets, abuse resistance, and incident response.

OPERATIONS

Reliability, performance, cost, observability, change, recovery, and support.

PRIVACY / RIGHTS

Purpose limitation, minimization, consent, access, correction, deletion, and egress.

HUMAN / SOCIETAL

Usability, accessibility, disclosure, contestability, impact, and human control.

Conformance requires a defensible position across every applicable view. A strong aggregate score cannot compensate for an unowned system, a failed mandatory gate, untested recovery, or evidence below the accepted grade.

7.2 Evaluation Metrics and Decision Gates

Measures expose utility, uncertainty, safety, physical limits, transition cost, and lifecycle burden

UTILITY

Task outcome, comparator delta, coverage, quality, accuracy, mission success, and stakeholder value.

UNCERTAINTY

Confidence, calibration, variance, sample coverage, reproducibility, sensitivity, and unresolved assumptions.

PERFORMANCE

Latency, throughput, fidelity, range, precision, bandwidth, scale, density, and availability.

SAFETY / SECURITY

Hazard exposure, unsafe action, exploitability, spoofing, physical consequence, intervention, and containment.

RESOURCE

Energy, power, cooling, spectrum, shots, qubits, memory, materials, facility, operator, and maintenance demand.

MATURITY

Standards state, supply chain, interoperability, tooling, skills, support, qualification, and lifecycle readiness.

ECONOMICS

Acquisition, operation, provider, token, facility, migration, insurance, support, and opportunity cost.

TRANSITION

Pilot escape, rollback time, incumbent fallback, portability, lock-in, retirement, and evidence completeness.

Decision gate: thresholds **MUST** be declared before assessment, include an incumbent baseline and uncertainty statement, and identify any safety, security, cryptographic, physical, reproducibility, or rollback failure that blocks transition.

8. Failure Modes and Adversarial Scenarios

Challenge assumptions before the system is trusted with consequential work

QUANTUM ADVANTAGE OVERCLAIM

A narrow or non-comparable experiment is presented as useful superiority over classical methods.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

CALIBRATION INVALIDATION

Backend drift or missing calibration state makes results irreproducible or misleading.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

CRYPTOGRAPHIC TRANSITION FAILURE

Legacy algorithms, protocol gaps, or downgrade paths survive after PQC migration claims.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

QUANTUM CHANNEL COMPROMISE

Trusted nodes, detectors, timing, classical authentication, or devices violate the stated security model.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

RESOURCE-ESTIMATION COLLAPSE

Logical qubit, error correction, runtime, facility, or cost assumptions invalidate the roadmap.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

PROVIDER AND EVIDENCE LOSS

Remote hardware, queue behavior, configuration, or experiment records cannot be independently reproduced.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

Adversarial testing MUST protect people and production systems. Use isolated environments, synthetic or minimized data, bounded authority, kill switches, explicit legal and ethical review, and documented stop conditions.

9. Implementation Profiles

Risk-proportional implementation without weakening mandatory boundaries

FOUNDATIONAL TYPICAL SCOPE Low consequence, limited autonomy, non-sensitive data, reversible outputs. MINIMUM DEPTH Named owner; inventory; basic evaluation; access control; logging; rollback; annual review.	ADVANCED TYPICAL SCOPE Business-critical workflow, sensitive data, multiple tools or providers, moderate autonomy. MINIMUM DEPTH Formal threat model; representative evaluation; approval gates; isolated execution; tested recovery; quarterly review.	HIGH ASSURANCE TYPICAL SCOPE Safety, security, regulated, financial, identity, or broadly consequential use. MINIMUM DEPTH Independent challenge; strongest identity; deterministic enforcement; comprehensive evidence; canary release; continuous monitoring.
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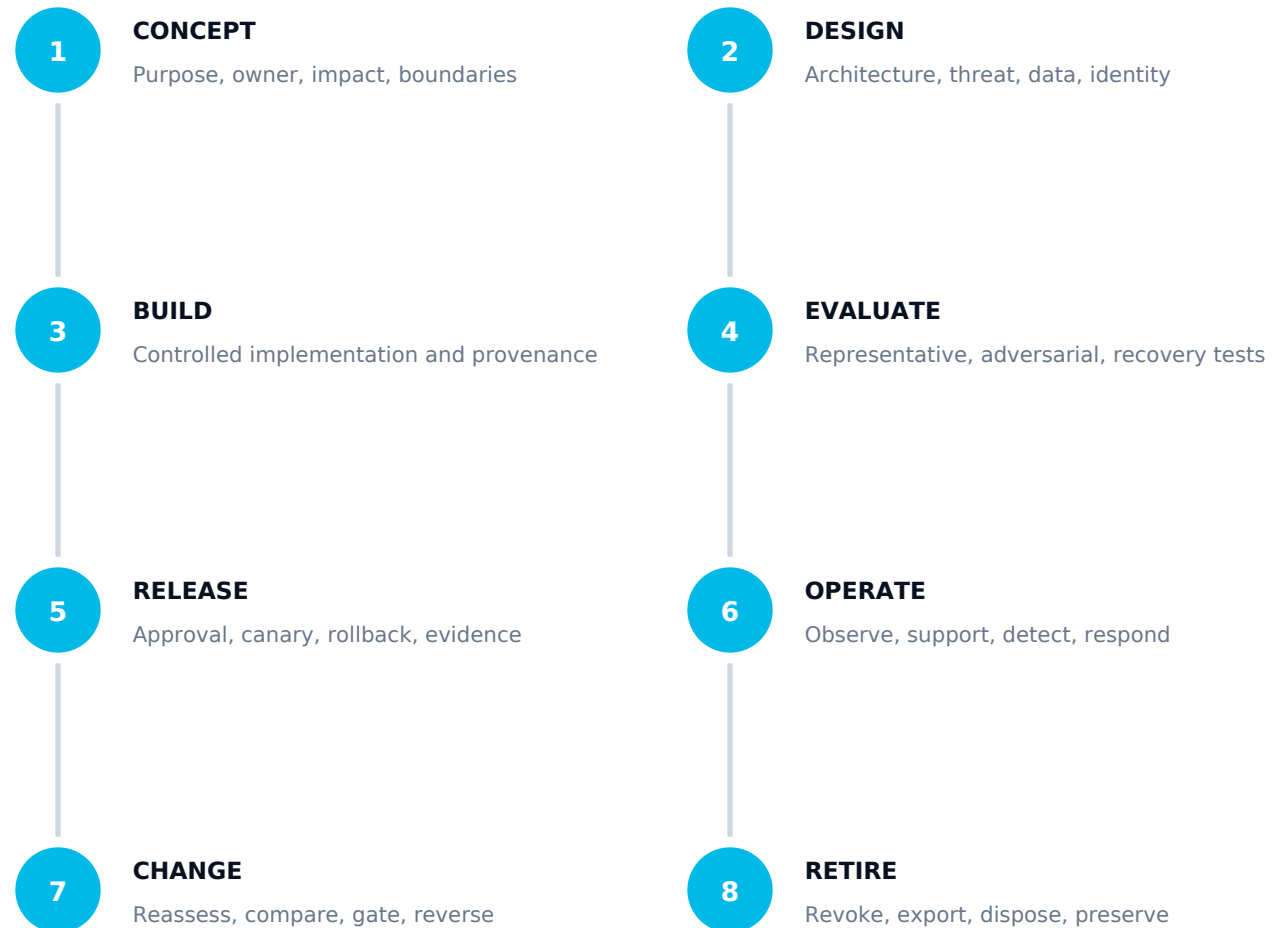
Profile selection rule

Choose the highest profile triggered by consequence, autonomy, sensitivity, scale, irreversibility, external dependency, or inability to rapidly detect and recover. Tailoring may strengthen controls; it may not erase a mandatory gate without a controlled exception.

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

9.2 Operational Lifecycle

Evidence-bearing operation from concept through retirement



LIFECYCLE INVARIANT

Every stage **MUST** leave sufficient evidence for the next authority to understand what was intended, what changed, what was tested, what failed, what was accepted, what remains uncertain, and how to recover or exit.

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

10. Adoption Roadmap

A sequenced path from uncontrolled capability to evidence-bearing operation

0-30 DAYS**Establish ownership and truth**

Inventory systems and dependencies; classify risk; freeze unsupported claims; identify immediate privilege, data, and evidence gaps.

31-90 DAYS**Create enforceable boundaries**

Define policy; isolate execution; implement identity and approval gates; establish representative evaluation and baseline telemetry.

3-6 MONTHS**Prove recovery and operating control**

Exercise failure, rollback, revocation, incident, provider exit, and state-recovery scenarios; mature evidence packaging.

6-12 MONTHS**Scale assurance**

Automate control checks; expand workload coverage; independent challenge; portfolio metrics; controlled exception expiry; continuous reassessment.

Adoption is complete only when operating evidence demonstrates the selected profile in the actual deployment context. Documentation alone is not conformance.

10.2 Conformance and Exception Statement

What an assurance claim must contain

SYSTEM / SERVICE Named, versioned capability and deployment boundary.	PROFILE Foundational, Advanced, or High Assurance with trigger rationale.
SCOPE Workloads, users, data, tools, regions, providers, and exclusions.	CRITERIA Pass, partial, fail, not applicable, and exception status for every criterion.
EVIDENCE Artifact references, evidence grade, date, environment, and reproducibility.	LIMITATIONS Known failure modes, unsupported workloads, uncertainty, and residual risk.
EXCEPTIONS Owner, rationale, compensating control, expiration, and approval.	VALIDITY Assessment date, change boundary, review date, and reassessment triggers.

Prohibited claim: “compliant” without the named scope, profile, evidence date, limitations, exceptions, and authority accepting residual risk.

MYTHOS-QTC-0002 / QUANTUM TECHNOLOGY

11. Source Authority and Reference Register

Primary sources informing interpretation; verify current status at assessment time

NIST CSF 2.0

Cybersecurity Framework 2.0

<https://doi.org/10.6028/NIST.CSWP.29>

Enterprise governance and cybersecurity outcome framework.

NIST PQC Standards

Post-Quantum Cryptography Project

<https://csrc.nist.gov/projects/post-quantum-cryptography>

FIPS 203, 204, and 205, HQC selection, and continuing migration guidance.

NIST SP 800-53 Rev. 5

Security and Privacy Controls for Information Systems and Organizations

<https://doi.org/10.6028/NIST.SP.800-53r5>

Broad organizational control baseline for technology systems and services.

ETSI QKD

Quantum Key Distribution Industry Specification Group

<https://www.etsi.org/committee/qkd>

QKD component, interface, security, deployment, and interoperability specifications.

NIST Quantum Science

Quantum Science Programs and Testbeds

<https://www.nist.gov/quantum-science>

Official NIST research across quantum computing, communications, networking, sensing, and metrology.

ISO/IEC 4879:2024

Quantum Computing - Terminology and Vocabulary

<https://www.iso.org/standard/80432.html>

International terminology foundation for quantum computing concepts.

NIST Quantum Networks

Quantum Networks at NIST

<https://www.nist.gov/pml/productsservices/quantum-networks-nist>

Quantum-network concepts, components, applications, and metropolitan research testbeds.

Source currency rule: authorities, specifications, laws, provider services, hardware, protocols, standards status, and research evidence MUST be checked at assessment time. This publication records a 2026-07-24 source snapshot.

11.2 Revision History and Decision Register

Permanent identity, controlled change, and publication integrity

VERSION	DATE	STATE	SUMMARY
1.0.0-candidate	2026-07-24	Candidate	Permanent-publication edition; source refresh; expanded criteria, evidence, assurance, and lifecycle guidance.
Next review	2027-01-24	Scheduled	Review source currency, threat evolution, operating evidence, adoption feedback, and proposed revisions.

Publication decisions

- PERMANENT IDENTITY** The document ID remains stable across revisions; batch or production sequence metadata is not public identity.
- CHANGE CONTROL** Normative changes require rationale, impact analysis, affected-criterion mapping, and approval.
- SUPERSESSON** A superseded edition remains traceable; current routes and catalogs identify the active edition.
- CORRECTION** Material errors require a recorded correction, affected-evidence analysis, and notification appropriate to impact.
- ARCHIVAL INTEGRITY** Published artifacts receive hashes, metadata, and a release manifest sufficient for independent verification.

END OF PERMANENT PUBLICATION / MYTHOS-QTC-0002
MYTHOS SYSTEMS / ENGINEERING STANDARDS LIBRARY



ENGINEERING STANDARDS LIBRARY / QUANTUM TECHNOLOGY AND COMPUTING

Quantum Networking, Entanglement Distribution, and QKD Standard

Quantum nodes, channels, repeaters, memories, timing, control planes, QKD, key integration, coexistence, security, and metropolitan testbed evidence.

PERMANENT DOCUMENT ID

MYTHOS-QTC-0003

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

Quantum Networking, Entanglement Distribution, and QKD Standard			DOCUMENT ID MYTHOS-QTC-0003 VERSION 1.0.0-candidate STATUS Candidate Standard PUBLISHER Mythos Systems PUBLICATION DATE 2026-07-24 SCHEDULED REVIEW 2027-01-24 CLASSIFICATION Public
18 ATOMIC CRITERIA	6 ASSURANCE VIEWS	4 IMPLEMENTATION PROFILES	1 PERMANENT IDENTITY

Publication doctrine. This publication establishes durable requirements for its defined scope. Interpretation must preserve the permanent document identity, required evidence, controlled exceptions, source currency, and formal revision history.

EMERGING TECHNOLOGY AND ASSURANCE TOPOLOGY

Quantum Technology and Computing

A trustworthy quantum networking and entanglement distribution program is a governed path from research claim through baseline, experiment, safety and security challenge, transition decision, bounded operation, and preserved evidence.

CLASSIFY

Separate established practice, candidate standard, reproduced result, vendor claim, implementation hypothesis, and open research.

EXPERIMENT

Declare baseline, configuration, uncertainty, scenario coverage, stop conditions, and independent reproduction before conclusions.

CONSTRAIN

Identity, policy, safety envelopes, physical boundaries, cryptographic authority, and human intervention limit consequence.

TRANSITION

Adoption, pilot, production, rollback, supplier exit, lifecycle, and retirement decisions remain evidence-bearing and reversible.

EVIDENCE-BOUND TRANSITION FLOW



No novelty claim becomes an operational claim without reproduced evidence and an explicit authority decision

INTERPRETATION AND ASSURANCE

How to apply this publication

Normative intent

Requirements define outcomes and constraints. Implementations may vary, but evidence must demonstrate equivalent control.

Evidence over assertion

Vendor documentation and design intent are not equivalent to reproduced behavior. Record evidence grade and uncertainty.

Risk-proportional depth

Higher consequence, autonomy, sensitivity, and irreversibility require stronger isolation, review, verification, and recovery.

Controlled exception

Exceptions require an owner, rationale, compensating control, residual-risk acceptance, expiration, and reevaluation trigger.

Normalized assessment scale

0	1	2	3	4	5
ABSENT	AD HOC	PARTIAL	OPERATIONAL	ADVANCED	LEADING

A numeric score must never hide a failed mandatory gate, missing evidence, untested workload, or unacceptable residual risk.

INTERACTIVE NAVIGATION

Contents

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Navigation doctrine

Bookmarks and internal links are conveniences. Permanent document identity, criterion identifiers, evidence references, and revision history remain authoritative.

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

0. Executive Mandate

Research value, transition discipline, and non-negotiable evidence boundaries

MANDATE

Organizations evaluating quantum networking and entanglement distribution **MUST** separate research from operational authority, establish a reproducible baseline, constrain safety and security consequence, disclose uncertainty, and require a documented transition or rejection decision.

Required outcomes

- Establish a durable, product-neutral evidence system for quantum networking and entanglement distribution.
- Prevent novelty, investment, vendor prestige, roadmap language, or laboratory success from substituting for operational proof.
- Require representative performance, adversarial, failure, recovery, safety, privacy, and lifecycle evidence.
- Keep pilots bounded by identity, authority, environment, duration, budget, stop conditions, and rollback.
- Preserve rejected alternatives, limitations, residual risk, source currency, and reassessment triggers.

Decision boundary: conformance supports a bounded engineering assurance position. It does not prove scientific consensus, regulatory approval, universal safety, quantum advantage, cryptographic perfection, autonomous competence, or commercial viability.

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

1. Scope and Applicability

Research, pilot, transition, operational, and retirement boundaries

IN SCOPE

- Research, architecture, acquisition, experiment, pilot, transition, operation, and retirement of quantum networking and entanglement distribution.
- Hardware, software, models, data, protocols, facilities, people, suppliers, providers, physical processes, and evidence.
- Laboratory, simulation, testbed, shadow, pilot, canary, production, and field deployment states.
- Claims, benchmarks, uncertainty, safety, security, privacy, economics, interoperability, support, and exit.

OUT OF SCOPE

- Scientific truth inferred from a single benchmark, simulation, provider, hardware generation, or laboratory configuration.
- Safety, regulatory, export, spectrum, airspace, clinical, cryptographic, or standards approval not granted by the responsible authority.
- Roadmap forecasts, token price, patent counts, press releases, or investment treated as engineering evidence.
- Hidden production use of research components outside the declared transition and assurance boundary.

Applicability triggers

- The capability is novel, rapidly changing, weakly standardized, difficult to reproduce, or dependent on immature suppliers.
- A claim concerns safety, security, privacy, physical action, critical infrastructure, cryptographic trust, or consequential autonomy.
- The system requires specialized facilities, scarce hardware, spectrum, foundry, cryogenic, optical, robotics, or field-test dependencies.
- Failure or lock-in may create long-lived data, capital, infrastructure, workforce, or regulatory consequences.
- A research component is proposed for pilot, customer, production, public, or externally relied-upon use.

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

2. Definitions and Taxonomy

Controlled language for architecture, governance, and assessment

AUTHORITY

The right to approve, deny, constrain, or execute an action. Model output is not authority.

EVIDENCE

A reproducible source, trace, measurement, test, record, signed artifact, or documented observation supporting a claim.

ASSURANCE VIEW

A defined perspective such as governance, architecture, security, operations, privacy, or human oversight.

ATOMIC CRITERION

A uniquely identified requirement that can be assessed, evidenced, excepted, and revised independently.

IMPLEMENTATION PROFILE

A risk-proportional set of required depth, evidence, and gates for a class of use.

CONTROLLED EXCEPTION

A time-bounded deviation with owner, rationale, compensating control, residual risk, expiration, and review trigger.

DETERMINISTIC MECHANISM

A component whose inputs, policy, state transition, and side effects can be constrained and verified.

SOURCE AUTHORITY

The documented basis for treating a source as reliable for a defined claim, context, jurisdiction, and time.

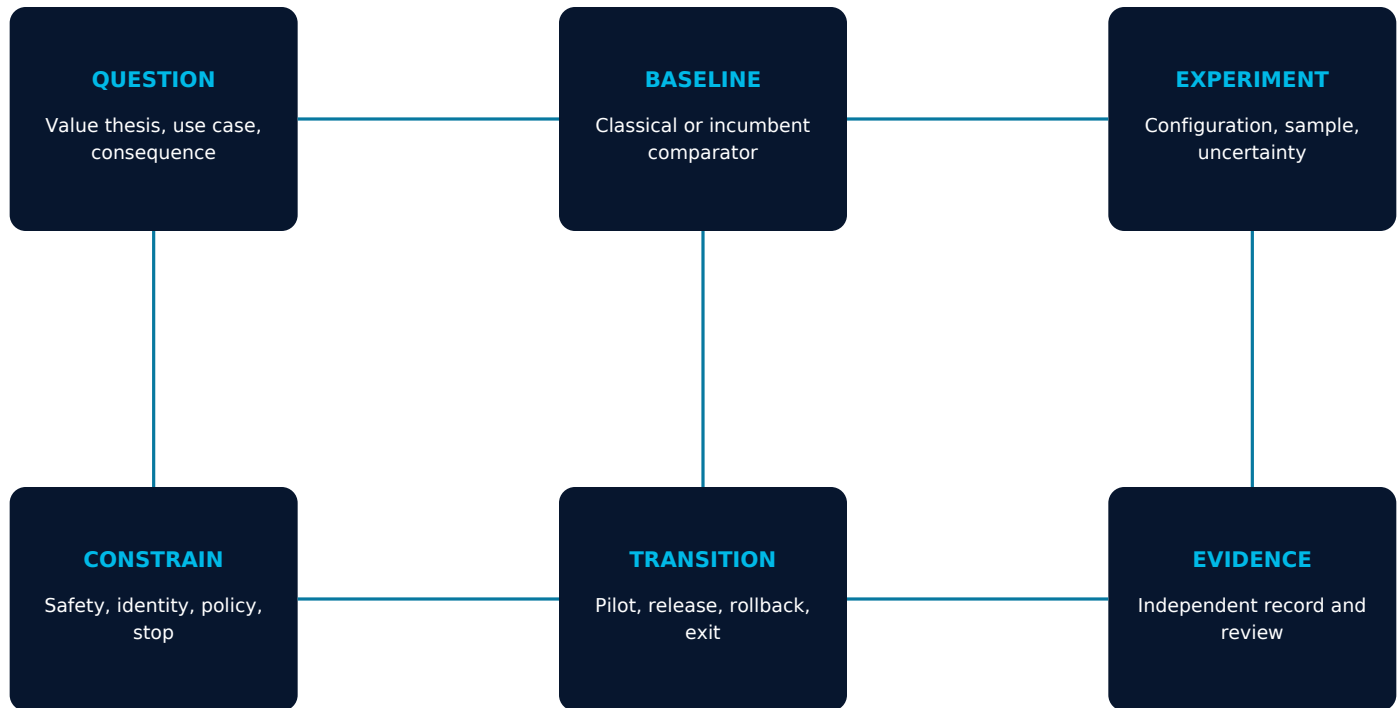
REASSESSMENT TRIGGER

A change, incident, drift signal, dependency revision, or time boundary requiring renewed evaluation.

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

3. Architecture and Trust Model

Separation of research, authority, physical systems, runtime, and evidence



Mandatory trust boundaries

- Research systems **MUST NOT** inherit production identity, secrets, authority, data, networks, or physical control by convenience.
- Claims **MUST** retain the exact hardware, software, model, protocol, calibration, environment, workload, and observation boundary.
- Safety, cryptographic, physical, spectrum, autonomy, and human-intervention constraints **MUST** remain independently enforceable.
- Transition **MUST** have a named decision authority, acceptance criteria, monitored pilot, rollback, supplier exit, and retirement path.
- Evidence **MUST** remain reviewable when a vendor, cloud, token network, laboratory, model, robot, or quantum backend is unavailable.

4. Governance and Accountability

Decision rights, separation of duties, and lifecycle ownership

ACCOUNTABLE OWNER

Accepts scope, risk tolerance, funding, and residual risk.

SYSTEM OWNER

Maintains architecture, inventory, operating boundaries, and change control.

SECURITY / PRIVACY

Defines threat, identity, data, isolation, monitoring, and incident requirements.

EVALUATION AUTHORITY

Designs representative tests, gates releases, and preserves reproducibility.

OPERATIONS

Maintains availability, rollback, recovery, evidence, and incident handling.

HUMAN OVERSIGHT

Reviews consequential decisions, exceptions, disputed outcomes, and harm signals.

DECISION PRINCIPLE

No single actor should be able to define the objective, grant authority, execute the consequential action, suppress evidence, and approve the result. Separation must be technical where consequence requires it.

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-QTC-0003-C01

Quantum Network Use Case and Trust Boundary

The organization MUST define, implement, verify, and maintain quantum network use case and trust boundary for the declared quantum networking and entanglement distribution boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0003-C02

Node, Source, Detector, Memory, and Repeater Inventory

The organization MUST define, implement, verify, and maintain node, source, detector, memory, and repeater inventory for the declared quantum networking and entanglement distribution boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0003-C03

Quantum Channel and Classical Control Channel Separation

The organization MUST define, implement, verify, and maintain quantum channel and classical control channel separation for the declared quantum networking and entanglement distribution boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE captured circuit, parameters, seeds, shots, mapping, calibration snapshot, and result data

MYTHOS-QTC-0003-C04

Entanglement Generation, Distribution, and Verification

The organization MUST define, implement, verify, and maintain entanglement generation, distribution, and verification for the declared quantum networking and entanglement distribution boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE cross-backend, simulator, independent reproduction, and statistical comparison evidence

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-QTC-0003-C05**Loss, Fidelity, Decoherence, and Link Budget**

The organization MUST define, implement, verify, and maintain loss, fidelity, decoherence, and link budget for the declared quantum networking and entanglement distribution boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE cryptographic inventory, hybrid profile, interoperability tests, downgrade tests, and revocation plan

MYTHOS-QTC-0003-C06**Timing, Synchronization, Stabilization, and Calibration**

The organization MUST define, implement, verify, and maintain timing, synchronization, stabilization, and calibration for the declared quantum networking and entanglement distribution boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE quantum-channel, timing, authentication, trusted-node, detector, or key-lifecycle evidence

MYTHOS-QTC-0003-C07**Routing, Scheduling, Resource Reservation, and Control**

The organization MUST define, implement, verify, and maintain routing, scheduling, resource reservation, and control for the declared quantum networking and entanglement distribution boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE facility, energy, cooling, queue, cost, availability, support, and exit evidence

MYTHOS-QTC-0003-C08**Quantum Key Distribution Protocol and Assumptions**

The organization MUST define, implement, verify, and maintain quantum key distribution protocol and assumptions for the declared quantum networking and entanglement distribution boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE bounded claim, limitation register, promotion gate, fallback, and long-term evidence package

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-QTC-0003-C09**Authentication and Classical Cryptographic Dependency**

The organization **MUST** define, implement, verify, and maintain authentication and classical cryptographic dependency for the declared quantum networking and entanglement distribution boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0003-C10**Key Management, Consumption, Buffering, and Expiration**

The organization **MUST** define, implement, verify, and maintain key management, consumption, buffering, and expiration for the declared quantum networking and entanglement distribution boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0003-C11**Trusted-Node, Measurement-Device, and Side-Channel Risk**

The organization **MUST** define, implement, verify, and maintain trusted-node, measurement-device, and side-channel risk for the declared quantum networking and entanglement distribution boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE captured circuit, parameters, seeds, shots, mapping, calibration snapshot, and result data

MYTHOS-QTC-0003-C12**Denial, Jamming, Injection, and Device Manipulation**

The organization **MUST** define, implement, verify, and maintain denial, jamming, injection, and device manipulation for the declared quantum networking and entanglement distribution boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cross-backend, simulator, independent reproduction, and statistical comparison evidence

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-QTC-0003-C13**Fiber, Free-Space, Satellite, and Coexistence Constraints**

The organization **MUST** define, implement, verify, and maintain fiber, free-space, satellite, and coexistence constraints for the declared quantum networking and entanglement distribution boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cryptographic inventory, hybrid profile, interoperability tests, downgrade tests, and revocation plan

MYTHOS-QTC-0003-C14**Interoperability, Interface, and Metropolitan Testbed**

The organization **MUST** define, implement, verify, and maintain interoperability, interface, and metropolitan testbed for the declared quantum networking and entanglement distribution boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE quantum-channel, timing, authentication, trusted-node, detector, or key-lifecycle evidence

MYTHOS-QTC-0003-C15**Availability, Recovery, and Classical Fallback**

The organization **MUST** define, implement, verify, and maintain availability, recovery, and classical fallback for the declared quantum networking and entanglement distribution boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE facility, energy, cooling, queue, cost, availability, support, and exit evidence

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-QTC-0003-C16**Performance, Distance, Rate, and Uncertainty Evidence**

The organization **MUST** define, implement, verify, and maintain performance, distance, rate, and uncertainty evidence for the declared quantum networking and entanglement distribution boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE bounded claim, limitation register, promotion gate, fallback, and long-term evidence package

MYTHOS-QTC-0003-C17**Research Claim, Security Proof, and Limitation Record**

The organization **MUST** define, implement, verify, and maintain research claim, security proof, and limitation record for the declared quantum networking and entanglement distribution boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0003-C18**Transition Gate, Lifecycle, and Evidence Preservation**

The organization **MUST** define, implement, verify, and maintain transition gate, lifecycle, and evidence preservation for the declared quantum networking and entanglement distribution boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

6. Evidence and Assessment

Reproduce, compare, challenge, observe, recover, and trace

EXAMINE

Research papers, standards, designs, bills of material, protocols, source, models, data, calibration, configurations, contracts, and claims.

REPRODUCE

Repeat the experiment or assessment with captured versions, seeds, parameters, environment, uncertainty, and acceptance criteria.

COMPARE

Use an honest incumbent, classical, manual, or alternative baseline with equivalent outcome, data, scale, and resource accounting.

CHALLENGE

Apply adversarial input, environmental variation, dependency loss, fault injection, safety cases, security tests, and boundary conditions.

OBSERVE

Measure field or production-like quality, latency, energy, drift, physical behavior, interventions, failures, maintenance, and user impact.

TRACE

Link claim, authority, experiment, configuration, evidence, decision, pilot, change, incident, rollback, and reassessment.

Evidence grades

A

Independently reproduced, current, representative, uncertainty-bounded, integrity-protected, and operationally relevant.

B

Reproduced by the implementing organization with strong provenance, comparator, challenge, and declared limitations.

C

Partial, laboratory-only, simulation-heavy, inherited, or indirect evidence with material uncertainty and dependencies.

D

Roadmap, assertion, demonstration, benchmark excerpt, patent, token metric, press release, or vendor statement without...

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

7. Assurance Views

Six perspectives required for a complete assurance claim

GOVERNANCE

Ownership, purpose, risk tolerance, policy, exception, and decision rights.

ARCHITECTURE

Boundaries, dependencies, failure modes, state, data flow, and portability.

SECURITY

Identity, authorization, isolation, secrets, abuse resistance, and incident response.

OPERATIONS

Reliability, performance, cost, observability, change, recovery, and support.

PRIVACY / RIGHTS

Purpose limitation, minimization, consent, access, correction, deletion, and egress.

HUMAN / SOCIETAL

Usability, accessibility, disclosure, contestability, impact, and human control.

Conformance requires a defensible position across every applicable view. A strong aggregate score cannot compensate for an unowned system, a failed mandatory gate, untested recovery, or evidence below the accepted grade.

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

7.2 Evaluation Metrics and Decision Gates

Measures expose utility, uncertainty, safety, physical limits, transition cost, and lifecycle burden

UTILITY

Task outcome, comparator delta, coverage, quality, accuracy, mission success, and stakeholder value.

UNCERTAINTY

Confidence, calibration, variance, sample coverage, reproducibility, sensitivity, and unresolved assumptions.

PERFORMANCE

Latency, throughput, fidelity, range, precision, bandwidth, scale, density, and availability.

SAFETY / SECURITY

Hazard exposure, unsafe action, exploitability, spoofing, physical consequence, intervention, and containment.

RESOURCE

Energy, power, cooling, spectrum, shots, qubits, memory, materials, facility, operator, and maintenance demand.

MATURITY

Standards state, supply chain, interoperability, tooling, skills, support, qualification, and lifecycle readiness.

ECONOMICS

Acquisition, operation, provider, token, facility, migration, insurance, support, and opportunity cost.

TRANSITION

Pilot escape, rollback time, incumbent fallback, portability, lock-in, retirement, and evidence completeness.

Decision gate: thresholds **MUST** be declared before assessment, include an incumbent baseline and uncertainty statement, and identify any safety, security, cryptographic, physical, reproducibility, or rollback failure that blocks transition.

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

8. Failure Modes and Adversarial Scenarios

Challenge assumptions before the system is trusted with consequential work

QUANTUM ADVANTAGE OVERCLAIM

A narrow or non-comparable experiment is presented as useful superiority over classical methods.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

CALIBRATION INVALIDATION

Backend drift or missing calibration state makes results irreproducible or misleading.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

CRYPTOGRAPHIC TRANSITION FAILURE

Legacy algorithms, protocol gaps, or downgrade paths survive after PQC migration claims.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

QUANTUM CHANNEL COMPROMISE

Trusted nodes, detectors, timing, classical authentication, or devices violate the stated security model.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

RESOURCE-ESTIMATION COLLAPSE

Logical qubit, error correction, runtime, facility, or cost assumptions invalidate the roadmap.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

PROVIDER AND EVIDENCE LOSS

Remote hardware, queue behavior, configuration, or experiment records cannot be independently reproduced.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

Adversarial testing MUST protect people and production systems. Use isolated environments, synthetic or minimized data, bounded authority, kill switches, explicit legal and ethical review, and documented stop conditions.

9. Implementation Profiles

Risk-proportional implementation without weakening mandatory boundaries

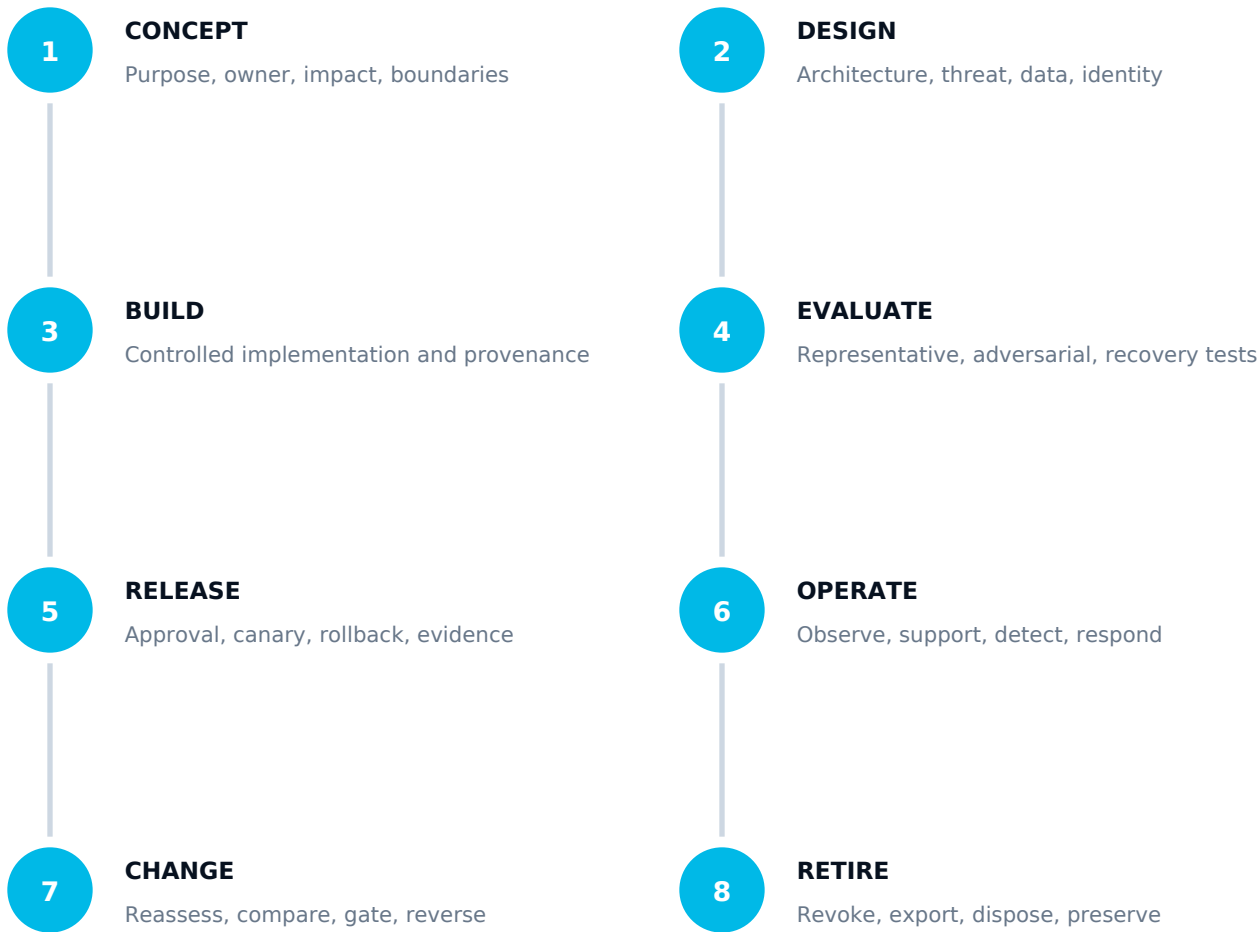
FOUNDATIONAL TYPICAL SCOPE Low consequence, limited autonomy, non-sensitive data, reversible outputs. MINIMUM DEPTH Named owner; inventory; basic evaluation; access control; logging; rollback; annual review.	ADVANCED TYPICAL SCOPE Business-critical workflow, sensitive data, multiple tools or providers, moderate autonomy. MINIMUM DEPTH Formal threat model; representative evaluation; approval gates; isolated execution; tested recovery; quarterly review.	HIGH ASSURANCE TYPICAL SCOPE Safety, security, regulated, financial, identity, or broadly consequential use. MINIMUM DEPTH Independent challenge; strongest identity; deterministic enforcement; comprehensive evidence; canary release; continuous monitoring.
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Profile selection rule

Choose the highest profile triggered by consequence, autonomy, sensitivity, scale, irreversibility, external dependency, or inability to rapidly detect and recover. Tailoring may strengthen controls; it may not erase a mandatory gate without a controlled exception.

9.2 Operational Lifecycle

Evidence-bearing operation from concept through retirement



LIFECYCLE INVARIANT

Every stage **MUST** leave sufficient evidence for the next authority to understand what was intended, what changed, what was tested, what failed, what was accepted, what remains uncertain, and how to recover or exit.

MYTHOS-QTC-0003 / QUANTUM TECHNOLOGY

10. Adoption Roadmap

A sequenced path from uncontrolled capability to evidence-bearing operation

0-30 DAYS**Establish ownership and truth**

Inventory systems and dependencies; classify risk; freeze unsupported claims; identify immediate privilege, data, and evidence gaps.

31-90 DAYS**Create enforceable boundaries**

Define policy; isolate execution; implement identity and approval gates; establish representative evaluation and baseline telemetry.

3-6 MONTHS**Prove recovery and operating control**

Exercise failure, rollback, revocation, incident, provider exit, and state-recovery scenarios; mature evidence packaging.

6-12 MONTHS**Scale assurance**

Automate control checks; expand workload coverage; independent challenge; portfolio metrics; controlled exception expiry; continuous reassessment.

Adoption is complete only when operating evidence demonstrates the selected profile in the actual deployment context. Documentation alone is not conformance.

10.2 Conformance and Exception Statement

What an assurance claim must contain

SYSTEM / SERVICE Named, versioned capability and deployment boundary.	PROFILE Foundational, Advanced, or High Assurance with trigger rationale.
SCOPE Workloads, users, data, tools, regions, providers, and exclusions.	CRITERIA Pass, partial, fail, not applicable, and exception status for every criterion.
EVIDENCE Artifact references, evidence grade, date, environment, and reproducibility.	LIMITATIONS Known failure modes, unsupported workloads, uncertainty, and residual risk.
EXCEPTIONS Owner, rationale, compensating control, expiration, and approval.	VALIDITY Assessment date, change boundary, review date, and reassessment triggers.

Prohibited claim: “compliant” without the named scope, profile, evidence date, limitations, exceptions, and authority accepting residual risk.

11. Source Authority and Reference Register

Primary sources informing interpretation; verify current status at assessment time

NIST CSF 2.0

Cybersecurity Framework 2.0

<https://doi.org/10.6028/NIST.CSWP.29>

Enterprise governance and cybersecurity outcome framework.

NIST PQC Standards

Post-Quantum Cryptography Project

<https://csrc.nist.gov/projects/post-quantum-cryptography>

FIPS 203, 204, and 205, HQC selection, and continuing migration guidance.

NIST SP 800-53 Rev. 5

Security and Privacy Controls for Information Systems and Organizations

<https://doi.org/10.6028/NIST.SP.800-53r5>

Broad organizational control baseline for technology systems and services.

ETSI QKD

Quantum Key Distribution Industry Specification Group

<https://www.etsi.org/committee/qkd>

QKD component, interface, security, deployment, and interoperability specifications.

NIST Quantum Science

Quantum Science Programs and Testbeds

<https://www.nist.gov/quantum-science>

Official NIST research across quantum computing, communications, networking, sensing, and metrology.

ISO/IEC 4879:2024

Quantum Computing - Terminology and Vocabulary

<https://www.iso.org/standard/80432.html>

International terminology foundation for quantum computing concepts.

NIST Quantum Networks

Quantum Networks at NIST

<https://www.nist.gov/pml/productsservices/quantum-networks-nist>

Quantum-network concepts, components, applications, and metropolitan research testbeds.

Source currency rule: authorities, specifications, laws, provider services, hardware, protocols, standards status, and research evidence MUST be checked at assessment time. This publication records a 2026-07-24 source snapshot.

11.2 Revision History and Decision Register

Permanent identity, controlled change, and publication integrity

VERSION	DATE	STATE	SUMMARY
1.0.0-candidate	2026-07-24	Candidate	Permanent-publication edition; source refresh; expanded criteria, evidence, assurance, and lifecycle guidance.
Next review	2027-01-24	Scheduled	Review source currency, threat evolution, operating evidence, adoption feedback, and proposed revisions.

Publication decisions

- PERMANENT IDENTITY** The document ID remains stable across revisions; batch or production sequence metadata is not public identity.
- CHANGE CONTROL** Normative changes require rationale, impact analysis, affected-criterion mapping, and approval.
- SUPERSESSION** A superseded edition remains traceable; current routes and catalogs identify the active edition.
- CORRECTION** Material errors require a recorded correction, affected-evidence analysis, and notification appropriate to impact.
- ARCHIVAL INTEGRITY** Published artifacts receive hashes, metadata, and a release manifest sufficient for independent verification.

END OF PERMANENT PUBLICATION / MYTHOS-QTC-0003
MYTHOS SYSTEMS / ENGINEERING STANDARDS LIBRARY



ENGINEERING STANDARDS LIBRARY / QUANTUM TECHNOLOGY AND COMPUTING

Quantum Sensing, Timing, and Metrology Standard

Quantum sensors, calibration, traceability, environmental control, signal processing, uncertainty, security, field deployment, safety, and lifecycle evidence.

PERMANENT DOCUMENT ID

MYTHOS-QTC-0004

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

Quantum Sensing, Timing, and Metrology Standard			DOCUMENT ID MYTHOS-QTC-0004 VERSION 1.0.0-candidate STATUS Candidate Standard PUBLISHER Mythos Systems PUBLICATION DATE 2026-07-24 SCHEDULED REVIEW 2027-01-24 CLASSIFICATION Public
18 ATOMIC CRITERIA	6 ASSURANCE VIEWS	4 IMPLEMENTATION PROFILES	1 PERMANENT IDENTITY

Publication doctrine. This publication establishes durable requirements for its defined scope. Interpretation must preserve the permanent document identity, required evidence, controlled exceptions, source currency, and formal revision history.

EMERGING TECHNOLOGY AND ASSURANCE TOPOLOGY

Quantum Technology and Computing

A trustworthy quantum sensing, timing, and metrology program is a governed path from research claim through baseline, experiment, safety and security challenge, transition decision, bounded operation, and preserved evidence.

CLASSIFY

Separate established practice, candidate standard, reproduced result, vendor claim, implementation hypothesis, and open research.

EXPERIMENT

Declare baseline, configuration, uncertainty, scenario coverage, stop conditions, and independent reproduction before conclusions.

CONSTRAIN

Identity, policy, safety envelopes, physical boundaries, cryptographic authority, and human intervention limit consequence.

TRANSITION

Adoption, pilot, production, rollback, supplier exit, lifecycle, and retirement decisions remain evidence-bearing and reversible.

EVIDENCE-BOUND TRANSITION FLOW



No novelty claim becomes an operational claim without reproduced evidence and an explicit authority decision

INTERPRETATION AND ASSURANCE

How to apply this publication

Normative intent

Requirements define outcomes and constraints. Implementations may vary, but evidence must demonstrate equivalent control.

Evidence over assertion

Vendor documentation and design intent are not equivalent to reproduced behavior. Record evidence grade and uncertainty.

Risk-proportional depth

Higher consequence, autonomy, sensitivity, and irreversibility require stronger isolation, review, verification, and recovery.

Controlled exception

Exceptions require an owner, rationale, compensating control, residual-risk acceptance, expiration, and reevaluation trigger.

Normalized assessment scale



A numeric score must never hide a failed mandatory gate, missing evidence, untested workload, or unacceptable residual risk.

INTERACTIVE NAVIGATION

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Navigation doctrine

Bookmarks and internal links are conveniences. Permanent document identity, criterion identifiers, evidence references, and revision history remain authoritative.

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

0. Executive Mandate

Research value, transition discipline, and non-negotiable evidence boundaries

MANDATE

Organizations evaluating quantum sensing, timing, and metrology **MUST** separate research from operational authority, establish a reproducible baseline, constrain safety and security consequence, disclose uncertainty, and require a documented transition or rejection decision.

Required outcomes

- Establish a durable, product-neutral evidence system for quantum sensing, timing, and metrology.
- Prevent novelty, investment, vendor prestige, roadmap language, or laboratory success from substituting for operational proof.
- Require representative performance, adversarial, failure, recovery, safety, privacy, and lifecycle evidence.
- Keep pilots bounded by identity, authority, environment, duration, budget, stop conditions, and rollback.
- Preserve rejected alternatives, limitations, residual risk, source currency, and reassessment triggers.

Decision boundary: conformance supports a bounded engineering assurance position. It does not prove scientific consensus, regulatory approval, universal safety, quantum advantage, cryptographic perfection, autonomous competence, or commercial viability.

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

1. Scope and Applicability

Research, pilot, transition, operational, and retirement boundaries

IN SCOPE

- Research, architecture, acquisition, experiment, pilot, transition, operation, and retirement of quantum sensing, timing, and metrology.
- Hardware, software, models, data, protocols, facilities, people, suppliers, providers, physical processes, and evidence.
- Laboratory, simulation, testbed, shadow, pilot, canary, production, and field deployment states.
- Claims, benchmarks, uncertainty, safety, security, privacy, economics, interoperability, support, and exit.

OUT OF SCOPE

- Scientific truth inferred from a single benchmark, simulation, provider, hardware generation, or laboratory configuration.
- Safety, regulatory, export, spectrum, airspace, clinical, cryptographic, or standards approval not granted by the responsible authority.
- Roadmap forecasts, token price, patent counts, press releases, or investment treated as engineering evidence.
- Hidden production use of research components outside the declared transition and assurance boundary.

Applicability triggers

- The capability is novel, rapidly changing, weakly standardized, difficult to reproduce, or dependent on immature suppliers.
- A claim concerns safety, security, privacy, physical action, critical infrastructure, cryptographic trust, or consequential autonomy.
- The system requires specialized facilities, scarce hardware, spectrum, foundry, cryogenic, optical, robotics, or field-test dependencies.
- Failure or lock-in may create long-lived data, capital, infrastructure, workforce, or regulatory consequences.
- A research component is proposed for pilot, customer, production, public, or externally relied-upon use.

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

2. Definitions and Taxonomy

Controlled language for architecture, governance, and assessment

AUTHORITY

The right to approve, deny, constrain, or execute an action. Model output is not authority.

EVIDENCE

A reproducible source, trace, measurement, test, record, signed artifact, or documented observation supporting a claim.

ASSURANCE VIEW

A defined perspective such as governance, architecture, security, operations, privacy, or human oversight.

ATOMIC CRITERION

A uniquely identified requirement that can be assessed, evidenced, excepted, and revised independently.

IMPLEMENTATION PROFILE

A risk-proportional set of required depth, evidence, and gates for a class of use.

CONTROLLED EXCEPTION

A time-bounded deviation with owner, rationale, compensating control, residual risk, expiration, and review trigger.

DETERMINISTIC MECHANISM

A component whose inputs, policy, state transition, and side effects can be constrained and verified.

SOURCE AUTHORITY

The documented basis for treating a source as reliable for a defined claim, context, jurisdiction, and time.

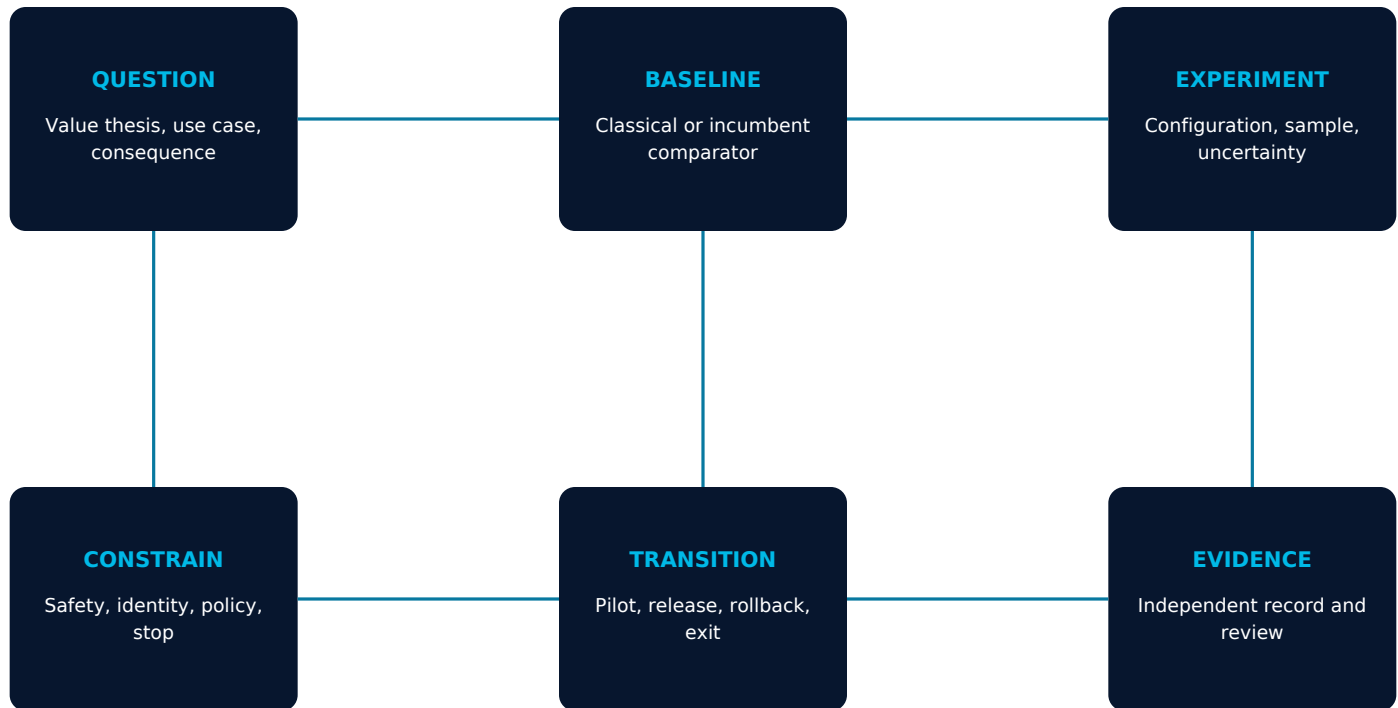
REASSESSMENT TRIGGER

A change, incident, drift signal, dependency revision, or time boundary requiring renewed evaluation.

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

3. Architecture and Trust Model

Separation of research, authority, physical systems, runtime, and evidence



Mandatory trust boundaries

- Research systems **MUST NOT** inherit production identity, secrets, authority, data, networks, or physical control by convenience.
- Claims **MUST** retain the exact hardware, software, model, protocol, calibration, environment, workload, and observation boundary.
- Safety, cryptographic, physical, spectrum, autonomy, and human-intervention constraints **MUST** remain independently enforceable.
- Transition **MUST** have a named decision authority, acceptance criteria, monitored pilot, rollback, supplier exit, and retirement path.
- Evidence **MUST** remain reviewable when a vendor, cloud, token network, laboratory, model, robot, or quantum backend is unavailable.

4. Governance and Accountability

Decision rights, separation of duties, and lifecycle ownership

ACCOUNTABLE OWNER

Accepts scope, risk tolerance, funding, and residual risk.

SYSTEM OWNER

Maintains architecture, inventory, operating boundaries, and change control.

SECURITY / PRIVACY

Defines threat, identity, data, isolation, monitoring, and incident requirements.

EVALUATION AUTHORITY

Designs representative tests, gates releases, and preserves reproducibility.

OPERATIONS

Maintains availability, rollback, recovery, evidence, and incident handling.

HUMAN OVERSIGHT

Reviews consequential decisions, exceptions, disputed outcomes, and harm signals.

DECISION PRINCIPLE

No single actor should be able to define the objective, grant authority, execute the consequential action, suppress evidence, and approve the result. Separation must be technical where consequence requires it.

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-QTC-0004-C01**Measurement Mission and Required Quantity**

The organization MUST define, implement, verify, and maintain measurement mission and required quantity for the declared quantum sensing, timing, and metrology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0004-C02**Sensor Modality and Quantum Resource**

The organization MUST define, implement, verify, and maintain sensor modality and quantum resource for the declared quantum sensing, timing, and metrology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0004-C03**Reference Standard and Metrological Traceability**

The organization MUST define, implement, verify, and maintain reference standard and metrological traceability for the declared quantum sensing, timing, and metrology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE captured circuit, parameters, seeds, shots, mapping, calibration snapshot, and result data

MYTHOS-QTC-0004-C04**Calibration Interval, Procedure, and Authority**

The organization MUST define, implement, verify, and maintain calibration interval, procedure, and authority for the declared quantum sensing, timing, and metrology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE cross-backend, simulator, independent reproduction, and statistical comparison evidence

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-QTC-0004-C05**Environmental Isolation and Compensation**

The organization **MUST** define, implement, verify, and maintain environmental isolation and compensation for the declared quantum sensing, timing, and metrology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cryptographic inventory, hybrid profile, interoperability tests, downgrade tests, and revocation plan

MYTHOS-QTC-0004-C06**Signal Acquisition, Filtering, and Estimation**

The organization **MUST** define, implement, verify, and maintain signal acquisition, filtering, and estimation for the declared quantum sensing, timing, and metrology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE quantum-channel, timing, authentication, trusted-node, detector, or key-lifecycle evidence

MYTHOS-QTC-0004-C07**Uncertainty Budget and Confidence Statement**

The organization **MUST** define, implement, verify, and maintain uncertainty budget and confidence statement for the declared quantum sensing, timing, and metrology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE facility, energy, cooling, queue, cost, availability, support, and exit evidence

MYTHOS-QTC-0004-C08**Dynamic Range, Resolution, Sensitivity, and Bias**

The organization **MUST** define, implement, verify, and maintain dynamic range, resolution, sensitivity, and bias for the declared quantum sensing, timing, and metrology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE bounded claim, limitation register, promotion gate, fallback, and long-term evidence package

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-QTC-0004-C09**Timing, Frequency, Position, and Synchronization**

The organization MUST define, implement, verify, and maintain timing, frequency, position, and synchronization for the declared quantum sensing, timing, and metrology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0004-C10**Sensor Fusion and Classical Comparator**

The organization MUST define, implement, verify, and maintain sensor fusion and classical comparator for the declared quantum sensing, timing, and metrology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0004-C11**Spoofing, Manipulation, and Adversarial Signal Risk**

The organization MUST define, implement, verify, and maintain spoofing, manipulation, and adversarial signal risk for the declared quantum sensing, timing, and metrology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE captured circuit, parameters, seeds, shots, mapping, calibration snapshot, and result data

MYTHOS-QTC-0004-C12**Data Integrity, Provenance, and Chain of Custody**

The organization MUST define, implement, verify, and maintain data integrity, provenance, and chain of custody for the declared quantum sensing, timing, and metrology boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE cross-backend, simulator, independent reproduction, and statistical comparison evidence

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-QTC-0004-C13**Field Deployment, Packaging, Power, and Reliability**

The organization **MUST** define, implement, verify, and maintain field deployment, packaging, power, and reliability for the declared quantum sensing, timing, and metrology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cryptographic inventory, hybrid profile, interoperability tests, downgrade tests, and revocation plan

MYTHOS-QTC-0004-C14**Human, Environmental, RF, Laser, and Operational Safety**

The organization **MUST** define, implement, verify, and maintain human, environmental, rf, laser, and operational safety for the declared quantum sensing, timing, and metrology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE quantum-channel, timing, authentication, trusted-node, detector, or key-lifecycle evidence

MYTHOS-QTC-0004-C15**Maintenance, Drift, Recalibration, and Diagnostics**

The organization **MUST** define, implement, verify, and maintain maintenance, drift, recalibration, and diagnostics for the declared quantum sensing, timing, and metrology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE facility, energy, cooling, queue, cost, availability, support, and exit evidence

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-QTC-0004-C16**Performance Claim and Reproducibility Package**

The organization **MUST** define, implement, verify, and maintain performance claim and reproducibility package for the declared quantum sensing, timing, and metrology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE bounded claim, limitation register, promotion gate, fallback, and long-term evidence package

MYTHOS-QTC-0004-C17**Operational Decision Boundary and Fallback**

The organization **MUST** define, implement, verify, and maintain operational decision boundary and fallback for the declared quantum sensing, timing, and metrology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0004-C18**Lifecycle, Export, and Evidence Preservation**

The organization **MUST** define, implement, verify, and maintain lifecycle, export, and evidence preservation for the declared quantum sensing, timing, and metrology boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

6. Evidence and Assessment

Reproduce, compare, challenge, observe, recover, and trace

EXAMINE

Research papers, standards, designs, bills of material, protocols, source, models, data, calibration, configurations, contracts, and claims.

REPRODUCE

Repeat the experiment or assessment with captured versions, seeds, parameters, environment, uncertainty, and acceptance criteria.

COMPARE

Use an honest incumbent, classical, manual, or alternative baseline with equivalent outcome, data, scale, and resource accounting.

CHALLENGE

Apply adversarial input, environmental variation, dependency loss, fault injection, safety cases, security tests, and boundary conditions.

OBSERVE

Measure field or production-like quality, latency, energy, drift, physical behavior, interventions, failures, maintenance, and user impact.

TRACE

Link claim, authority, experiment, configuration, evidence, decision, pilot, change, incident, rollback, and reassessment.

Evidence grades

A

Independently reproduced, current, representative, uncertainty-bounded, integrity-protected, and operationally relevant.

B

Reproduced by the implementing organization with strong provenance, comparator, challenge, and declared limitations.

C

Partial, laboratory-only, simulation-heavy, inherited, or indirect evidence with material uncertainty and dependencies.

D

Roadmap, assertion, demonstration, benchmark excerpt, patent, token metric, press release, or vendor statement without...

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

7. Assurance Views

Six perspectives required for a complete assurance claim

GOVERNANCE

Ownership, purpose, risk tolerance, policy, exception, and decision rights.

ARCHITECTURE

Boundaries, dependencies, failure modes, state, data flow, and portability.

SECURITY

Identity, authorization, isolation, secrets, abuse resistance, and incident response.

OPERATIONS

Reliability, performance, cost, observability, change, recovery, and support.

PRIVACY / RIGHTS

Purpose limitation, minimization, consent, access, correction, deletion, and egress.

HUMAN / SOCIETAL

Usability, accessibility, disclosure, contestability, impact, and human control.

Conformance requires a defensible position across every applicable view. A strong aggregate score cannot compensate for an unowned system, a failed mandatory gate, untested recovery, or evidence below the accepted grade.

7.2 Evaluation Metrics and Decision Gates

Measures expose utility, uncertainty, safety, physical limits, transition cost, and lifecycle burden

UTILITY

Task outcome, comparator delta, coverage, quality, accuracy, mission success, and stakeholder value.

UNCERTAINTY

Confidence, calibration, variance, sample coverage, reproducibility, sensitivity, and unresolved assumptions.

PERFORMANCE

Latency, throughput, fidelity, range, precision, bandwidth, scale, density, and availability.

SAFETY / SECURITY

Hazard exposure, unsafe action, exploitability, spoofing, physical consequence, intervention, and containment.

RESOURCE

Energy, power, cooling, spectrum, shots, qubits, memory, materials, facility, operator, and maintenance demand.

MATURITY

Standards state, supply chain, interoperability, tooling, skills, support, qualification, and lifecycle readiness.

ECONOMICS

Acquisition, operation, provider, token, facility, migration, insurance, support, and opportunity cost.

TRANSITION

Pilot escape, rollback time, incumbent fallback, portability, lock-in, retirement, and evidence completeness.

Decision gate: thresholds **MUST** be declared before assessment, include an incumbent baseline and uncertainty statement, and identify any safety, security, cryptographic, physical, reproducibility, or rollback failure that blocks transition.

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

8. Failure Modes and Adversarial Scenarios

Challenge assumptions before the system is trusted with consequential work

QUANTUM ADVANTAGE OVERCLAIM

A narrow or non-comparable experiment is presented as useful superiority over classical methods.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

CALIBRATION INVALIDATION

Backend drift or missing calibration state makes results irreproducible or misleading.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

CRYPTOGRAPHIC TRANSITION FAILURE

Legacy algorithms, protocol gaps, or downgrade paths survive after PQC migration claims.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

QUANTUM CHANNEL COMPROMISE

Trusted nodes, detectors, timing, classical authentication, or devices violate the stated security model.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

RESOURCE-ESTIMATION COLLAPSE

Logical qubit, error correction, runtime, facility, or cost assumptions invalidate the roadmap.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

PROVIDER AND EVIDENCE LOSS

Remote hardware, queue behavior, configuration, or experiment records cannot be independently reproduced.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

Adversarial testing MUST protect people and production systems. Use isolated environments, synthetic or minimized data, bounded authority, kill switches, explicit legal and ethical review, and documented stop conditions.

9. Implementation Profiles

Risk-proportional implementation without weakening mandatory boundaries

FOUNDATIONAL TYPICAL SCOPE Low consequence, limited autonomy, non-sensitive data, reversible outputs. MINIMUM DEPTH Named owner; inventory; basic evaluation; access control; logging; rollback; annual review.	ADVANCED TYPICAL SCOPE Business-critical workflow, sensitive data, multiple tools or providers, moderate autonomy. MINIMUM DEPTH Formal threat model; representative evaluation; approval gates; isolated execution; tested recovery; quarterly review.	HIGH ASSURANCE TYPICAL SCOPE Safety, security, regulated, financial, identity, or broadly consequential use. MINIMUM DEPTH Independent challenge; strongest identity; deterministic enforcement; comprehensive evidence; canary release; continuous monitoring.
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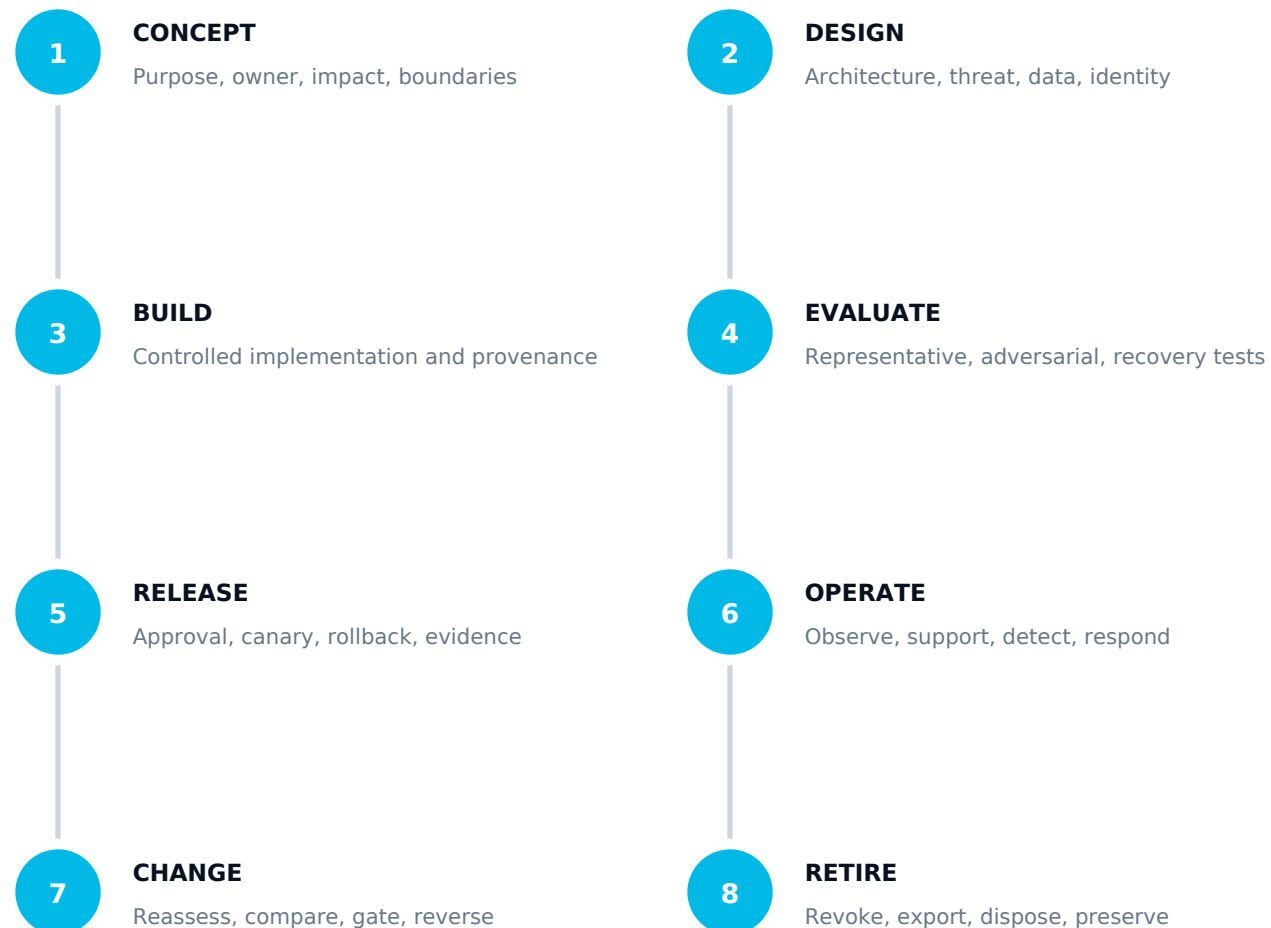
Profile selection rule

Choose the highest profile triggered by consequence, autonomy, sensitivity, scale, irreversibility, external dependency, or inability to rapidly detect and recover. Tailoring may strengthen controls; it may not erase a mandatory gate without a controlled exception.

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

9.2 Operational Lifecycle

Evidence-bearing operation from concept through retirement



LIFECYCLE INVARIANT

Every stage **MUST** leave sufficient evidence for the next authority to understand what was intended, what changed, what was tested, what failed, what was accepted, what remains uncertain, and how to recover or exit.

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

10. Adoption Roadmap

A sequenced path from uncontrolled capability to evidence-bearing operation

0-30 DAYS**Establish ownership and truth**

Inventory systems and dependencies; classify risk; freeze unsupported claims; identify immediate privilege, data, and evidence gaps.

31-90 DAYS**Create enforceable boundaries**

Define policy; isolate execution; implement identity and approval gates; establish representative evaluation and baseline telemetry.

3-6 MONTHS**Prove recovery and operating control**

Exercise failure, rollback, revocation, incident, provider exit, and state-recovery scenarios; mature evidence packaging.

6-12 MONTHS**Scale assurance**

Automate control checks; expand workload coverage; independent challenge; portfolio metrics; controlled exception expiry; continuous reassessment.

Adoption is complete only when operating evidence demonstrates the selected profile in the actual deployment context. Documentation alone is not conformance.

10.2 Conformance and Exception Statement

What an assurance claim must contain

SYSTEM / SERVICE Named, versioned capability and deployment boundary.	PROFILE Foundational, Advanced, or High Assurance with trigger rationale.
SCOPE Workloads, users, data, tools, regions, providers, and exclusions.	CRITERIA Pass, partial, fail, not applicable, and exception status for every criterion.
EVIDENCE Artifact references, evidence grade, date, environment, and reproducibility.	LIMITATIONS Known failure modes, unsupported workloads, uncertainty, and residual risk.
EXCEPTIONS Owner, rationale, compensating control, expiration, and approval.	VALIDITY Assessment date, change boundary, review date, and reassessment triggers.

Prohibited claim: “compliant” without the named scope, profile, evidence date, limitations, exceptions, and authority accepting residual risk.

MYTHOS-QTC-0004 / QUANTUM TECHNOLOGY

11. Source Authority and Reference Register

Primary sources informing interpretation; verify current status at assessment time

NIST CSF 2.0

Cybersecurity Framework 2.0

<https://doi.org/10.6028/NIST.CSWP.29>

Enterprise governance and cybersecurity outcome framework.

NIST PQC Standards

Post-Quantum Cryptography Project

<https://csrc.nist.gov/projects/post-quantum-cryptography>

FIPS 203, 204, and 205, HQC selection, and continuing migration guidance.

NIST SP 800-53 Rev. 5

Security and Privacy Controls for Information Systems and Organizations

<https://doi.org/10.6028/NIST.SP.800-53r5>

Broad organizational control baseline for technology systems and services.

ETSI QKD

Quantum Key Distribution Industry Specification Group

<https://www.etsi.org/committee/qkd>

QKD component, interface, security, deployment, and interoperability specifications.

NIST Quantum Science

Quantum Science Programs and Testbeds

<https://www.nist.gov/quantum-science>

Official NIST research across quantum computing, communications, networking, sensing, and metrology.

ISO/IEC 4879:2024

Quantum Computing - Terminology and Vocabulary

<https://www.iso.org/standard/80432.html>

International terminology foundation for quantum computing concepts.

NIST Quantum Networks

Quantum Networks at NIST

<https://www.nist.gov/pml/productsservices/quantum-networks-nist>

Quantum-network concepts, components, applications, and metropolitan research testbeds.

Source currency rule: authorities, specifications, laws, provider services, hardware, protocols, standards status, and research evidence MUST be checked at assessment time. This publication records a 2026-07-24 source snapshot.

11.2 Revision History and Decision Register

Permanent identity, controlled change, and publication integrity

VERSION	DATE	STATE	SUMMARY
1.0.0-candidate	2026-07-24	Candidate	Permanent-publication edition; source refresh; expanded criteria, evidence, assurance, and lifecycle guidance.
Next review	2027-01-24	Scheduled	Review source currency, threat evolution, operating evidence, adoption feedback, and proposed revisions.

Publication decisions

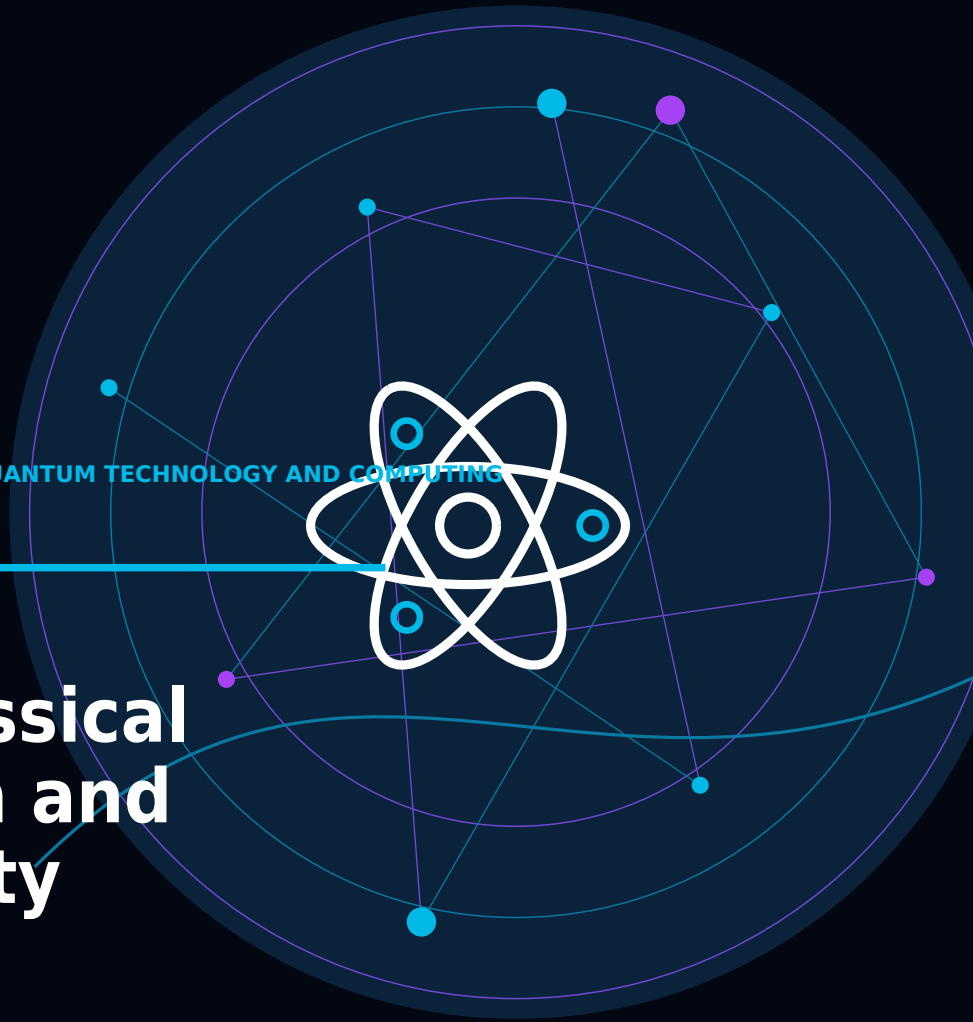
- PERMANENT IDENTITY** The document ID remains stable across revisions; batch or production sequence metadata is not public identity.
- CHANGE CONTROL** Normative changes require rationale, impact analysis, affected-criterion mapping, and approval.
- SUPERSESSION** A superseded edition remains traceable; current routes and catalogs identify the active edition.
- CORRECTION** Material errors require a recorded correction, affected-evidence analysis, and notification appropriate to impact.
- ARCHIVAL INTEGRITY** Published artifacts receive hashes, metadata, and a release manifest sufficient for independent verification.

END OF PERMANENT PUBLICATION / MYTHOS-QTC-0004
MYTHOS SYSTEMS / ENGINEERING STANDARDS LIBRARY



ENGINEERING STANDARDS LIBRARY / QUANTUM TECHNOLOGY AND COMPUTING

Hybrid Quantum-Classical Orchestration and Reproducibility Standard



Workflow graphs, provider abstraction, classical and quantum resource coordination, compilation, provenance, checkpoints, error handling, and reproducible execution.

PERMANENT DOCUMENT ID

MYTHOS-QTC-0005

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

Hybrid Quantum-Classical Orchestration and Reproducibility Standard			DOCUMENT ID MYTHOS-QTC-0005 VERSION 1.0.0-candidate STATUS Candidate Standard PUBLISHER Mythos Systems PUBLICATION DATE 2026-07-24 SCHEDULED REVIEW 2027-01-24 CLASSIFICATION Public
18 ATOMIC CRITERIA	6 ASSURANCE VIEWS	4 IMPLEMENTATION PROFILES	1 PERMANENT IDENTITY

Publication doctrine. This publication establishes durable requirements for its defined scope. Interpretation must preserve the permanent document identity, required evidence, controlled exceptions, source currency, and formal revision history.

EMERGING TECHNOLOGY AND ASSURANCE TOPOLOGY

Quantum Technology and Computing

A trustworthy hybrid quantum-classical orchestration program is a governed path from research claim through baseline, experiment, safety and security challenge, transition decision, bounded operation, and preserved evidence.

CLASSIFY

Separate established practice, candidate standard, reproduced result, vendor claim, implementation hypothesis, and open research.

EXPERIMENT

Declare baseline, configuration, uncertainty, scenario coverage, stop conditions, and independent reproduction before conclusions.

CONSTRAIN

Identity, policy, safety envelopes, physical boundaries, cryptographic authority, and human intervention limit consequence.

TRANSITION

Adoption, pilot, production, rollback, supplier exit, lifecycle, and retirement decisions remain evidence-bearing and reversible.

EVIDENCE - BOUND TRANSITION FLOW



No novelty claim becomes an operational claim without reproduced evidence and an explicit authority decision

INTERPRETATION AND ASSURANCE

How to apply this publication

Normative intent

Requirements define outcomes and constraints. Implementations may vary, but evidence must demonstrate equivalent control.

Evidence over assertion

Vendor documentation and design intent are not equivalent to reproduced behavior. Record evidence grade and uncertainty.

Risk-proportional depth

Higher consequence, autonomy, sensitivity, and irreversibility require stronger isolation, review, verification, and recovery.

Controlled exception

Exceptions require an owner, rationale, compensating control, residual-risk acceptance, expiration, and reevaluation trigger.

Normalized assessment scale

0	1	2	3	4	5
ABSENT	AD HOC	PARTIAL	OPERATIONAL	ADVANCED	LEADING

A numeric score must never hide a failed mandatory gate, missing evidence, untested workload, or unacceptable residual risk.

INTERACTIVE NAVIGATION

Contents

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Navigation doctrine

Bookmarks and internal links are conveniences. Permanent document identity, criterion identifiers, evidence references, and revision history remain authoritative.

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

0. Executive Mandate

Research value, transition discipline, and non-negotiable evidence boundaries

MANDATE

Organizations evaluating hybrid quantum-classical orchestration **MUST** separate research from operational authority, establish a reproducible baseline, constrain safety and security consequence, disclose uncertainty, and require a documented transition or rejection decision.

Required outcomes

- Establish a durable, product-neutral evidence system for hybrid quantum-classical orchestration.
- Prevent novelty, investment, vendor prestige, roadmap language, or laboratory success from substituting for operational proof.
- Require representative performance, adversarial, failure, recovery, safety, privacy, and lifecycle evidence.
- Keep pilots bounded by identity, authority, environment, duration, budget, stop conditions, and rollback.
- Preserve rejected alternatives, limitations, residual risk, source currency, and reassessment triggers.

Decision boundary: conformance supports a bounded engineering assurance position. It does not prove scientific consensus, regulatory approval, universal safety, quantum advantage, cryptographic perfection, autonomous competence, or commercial viability.

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

1. Scope and Applicability

Research, pilot, transition, operational, and retirement boundaries

IN SCOPE

- Research, architecture, acquisition, experiment, pilot, transition, operation, and retirement of hybrid quantum-classical orchestration.
- Hardware, software, models, data, protocols, facilities, people, suppliers, providers, physical processes, and evidence.
- Laboratory, simulation, testbed, shadow, pilot, canary, production, and field deployment states.
- Claims, benchmarks, uncertainty, safety, security, privacy, economics, interoperability, support, and exit.

OUT OF SCOPE

- Scientific truth inferred from a single benchmark, simulation, provider, hardware generation, or laboratory configuration.
- Safety, regulatory, export, spectrum, airspace, clinical, cryptographic, or standards approval not granted by the responsible authority.
- Roadmap forecasts, token price, patent counts, press releases, or investment treated as engineering evidence.
- Hidden production use of research components outside the declared transition and assurance boundary.

Applicability triggers

- The capability is novel, rapidly changing, weakly standardized, difficult to reproduce, or dependent on immature suppliers.
- A claim concerns safety, security, privacy, physical action, critical infrastructure, cryptographic trust, or consequential autonomy.
- The system requires specialized facilities, scarce hardware, spectrum, foundry, cryogenic, optical, robotics, or field-test dependencies.
- Failure or lock-in may create long-lived data, capital, infrastructure, workforce, or regulatory consequences.
- A research component is proposed for pilot, customer, production, public, or externally relied-upon use.

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

2. Definitions and Taxonomy

Controlled language for architecture, governance, and assessment

AUTHORITY

The right to approve, deny, constrain, or execute an action. Model output is not authority.

EVIDENCE

A reproducible source, trace, measurement, test, record, signed artifact, or documented observation supporting a claim.

ASSURANCE VIEW

A defined perspective such as governance, architecture, security, operations, privacy, or human oversight.

ATOMIC CRITERION

A uniquely identified requirement that can be assessed, evidenced, excepted, and revised independently.

IMPLEMENTATION PROFILE

A risk-proportional set of required depth, evidence, and gates for a class of use.

CONTROLLED EXCEPTION

A time-bounded deviation with owner, rationale, compensating control, residual risk, expiration, and review trigger.

DETERMINISTIC MECHANISM

A component whose inputs, policy, state transition, and side effects can be constrained and verified.

SOURCE AUTHORITY

The documented basis for treating a source as reliable for a defined claim, context, jurisdiction, and time.

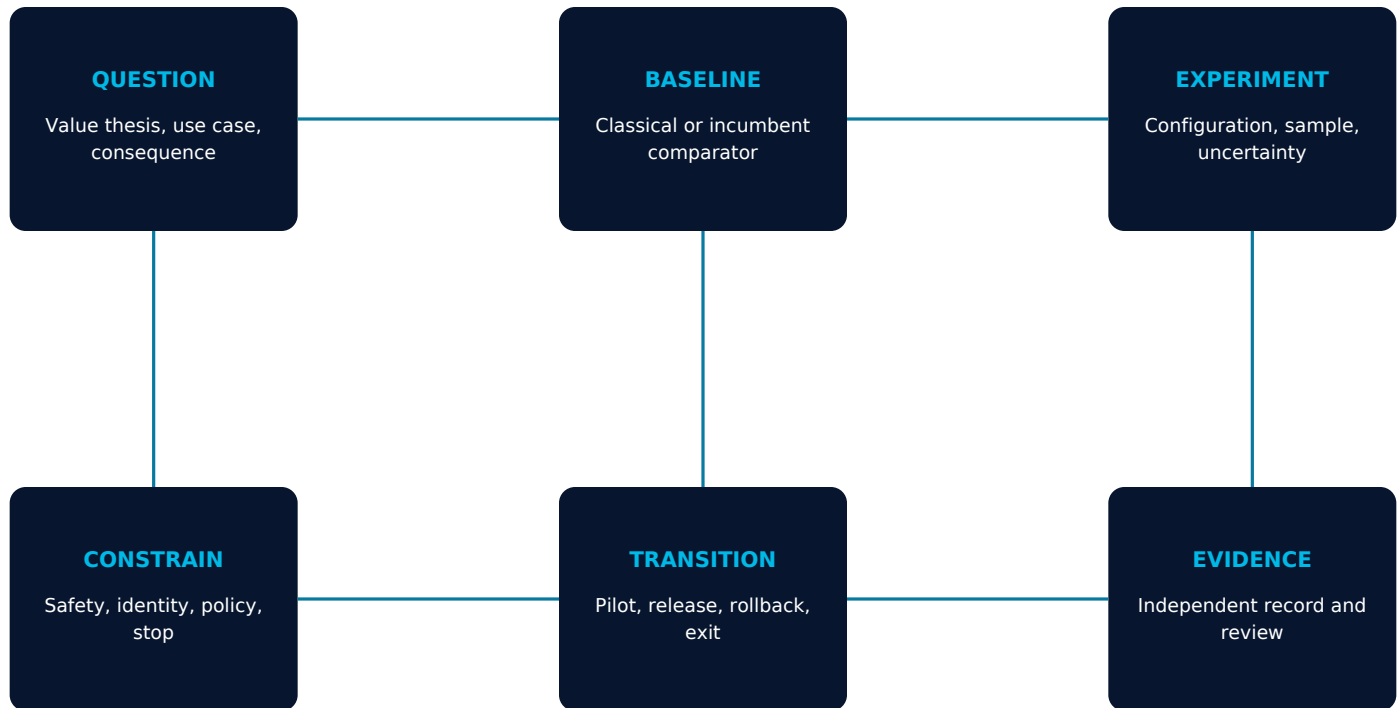
REASSESSMENT TRIGGER

A change, incident, drift signal, dependency revision, or time boundary requiring renewed evaluation.

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

3. Architecture and Trust Model

Separation of research, authority, physical systems, runtime, and evidence



Mandatory trust boundaries

- Research systems **MUST NOT** inherit production identity, secrets, authority, data, networks, or physical control by convenience.
- Claims **MUST** retain the exact hardware, software, model, protocol, calibration, environment, workload, and observation boundary.
- Safety, cryptographic, physical, spectrum, autonomy, and human-intervention constraints **MUST** remain independently enforceable.
- Transition **MUST** have a named decision authority, acceptance criteria, monitored pilot, rollback, supplier exit, and retirement path.
- Evidence **MUST** remain reviewable when a vendor, cloud, token network, laboratory, model, robot, or quantum backend is unavailable.

4. Governance and Accountability

Decision rights, separation of duties, and lifecycle ownership

ACCOUNTABLE OWNER

Accepts scope, risk tolerance, funding, and residual risk.

SYSTEM OWNER

Maintains architecture, inventory, operating boundaries, and change control.

SECURITY / PRIVACY

Defines threat, identity, data, isolation, monitoring, and incident requirements.

EVALUATION AUTHORITY

Designs representative tests, gates releases, and preserves reproducibility.

OPERATIONS

Maintains availability, rollback, recovery, evidence, and incident handling.

HUMAN OVERSIGHT

Reviews consequential decisions, exceptions, disputed outcomes, and harm signals.

DECISION PRINCIPLE

No single actor should be able to define the objective, grant authority, execute the consequential action, suppress evidence, and approve the result. Separation must be technical where consequence requires it.

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-QTC-0005-C01

Hybrid Workflow and Dependency Graph

The organization MUST define, implement, verify, and maintain hybrid workflow and dependency graph for the declared hybrid quantum-classical orchestration boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0005-C02

Classical and Quantum Responsibility Boundary

The organization MUST define, implement, verify, and maintain classical and quantum responsibility boundary for the declared hybrid quantum-classical orchestration boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0005-C03

Provider, Backend, Simulator, and Hardware Selection

The organization MUST define, implement, verify, and maintain provider, backend, simulator, and hardware selection for the declared hybrid quantum-classical orchestration boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE captured circuit, parameters, seeds, shots, mapping, calibration snapshot, and result data

MYTHOS-QTC-0005-C04

Job Identity, Authorization, and Tenant Isolation

The organization MUST define, implement, verify, and maintain job identity, authorization, and tenant isolation for the declared hybrid quantum-classical orchestration boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE cross-backend, simulator, independent reproduction, and statistical comparison evidence

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-QTC-0005-C05

Input, Parameter, Seed, and Data Provenance

The organization MUST define, implement, verify, and maintain input, parameter, seed, and data provenance for the declared hybrid quantum-classical orchestration boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE cryptographic inventory, hybrid profile, interoperability tests, downgrade tests, and revocation plan

MYTHOS-QTC-0005-C06

Compiler, Transpiler, Runtime, and Version Pinning

The organization MUST define, implement, verify, and maintain compiler, transpiler, runtime, and version pinning for the declared hybrid quantum-classical orchestration boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE quantum-channel, timing, authentication, trusted-node, detector, or key-lifecycle evidence

MYTHOS-QTC-0005-C07

Queue, Reservation, Timeout, and Cancellation Policy

The organization MUST define, implement, verify, and maintain queue, reservation, timeout, and cancellation policy for the declared hybrid quantum-classical orchestration boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE facility, energy, cooling, queue, cost, availability, support, and exit evidence

MYTHOS-QTC-0005-C08

Checkpoint, Retry, Replay, and Side-Effect Safety

The organization MUST define, implement, verify, and maintain checkpoint, retry, replay, and side-effect safety for the declared hybrid quantum-classical orchestration boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE bounded claim, limitation register, promotion gate, fallback, and long-term evidence package

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-QTC-0005-C09**Calibration Snapshot and Backend-State Capture**

The organization **MUST** define, implement, verify, and maintain calibration snapshot and backend-state capture for the declared hybrid quantum-classical orchestration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0005-C10**Result Validation and Cross-Backend Comparison**

The organization **MUST** define, implement, verify, and maintain result validation and cross-backend comparison for the declared hybrid quantum-classical orchestration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0005-C11**Cost, Shot, Runtime, and Budget Enforcement**

The organization **MUST** define, implement, verify, and maintain cost, shot, runtime, and budget enforcement for the declared hybrid quantum-classical orchestration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE captured circuit, parameters, seeds, shots, mapping, calibration snapshot, and result data

MYTHOS-QTC-0005-C12**Sensitive Data, Intellectual Property, and Egress**

The organization **MUST** define, implement, verify, and maintain sensitive data, intellectual property, and egress for the declared hybrid quantum-classical orchestration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cross-backend, simulator, independent reproduction, and statistical comparison evidence

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-QTC-0005-C13**Observability, Trace Correlation, and Evidence**

The organization **MUST** define, implement, verify, and maintain observability, trace correlation, and evidence for the declared hybrid quantum-classical orchestration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cryptographic inventory, hybrid profile, interoperability tests, downgrade tests, and revocation plan

MYTHOS-QTC-0005-C14**Failure Classification and Classical Fallback**

The organization **MUST** define, implement, verify, and maintain failure classification and classical fallback for the declared hybrid quantum-classical orchestration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE quantum-channel, timing, authentication, trusted-node, detector, or key-lifecycle evidence

MYTHOS-QTC-0005-C15**Portability, API, Intermediate Representation, and Exit**

The organization **MUST** define, implement, verify, and maintain portability, api, intermediate representation, and exit for the declared hybrid quantum-classical orchestration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE facility, energy, cooling, queue, cost, availability, support, and exit evidence

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-QTC-0005-C16**Reproducibility Bundle and Independent Reproduction**

The organization **MUST** define, implement, verify, and maintain reproducibility bundle and independent reproduction for the declared hybrid quantum-classical orchestration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE bounded claim, limitation register, promotion gate, fallback, and long-term evidence package

MYTHOS-QTC-0005-C17**Promotion Gate and Scientific Review**

The organization **MUST** define, implement, verify, and maintain promotion gate and scientific review for the declared hybrid quantum-classical orchestration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0005-C18**Retention, Retirement, and Long-Term Interpretability**

The organization **MUST** define, implement, verify, and maintain retention, retirement, and long-term interpretability for the declared hybrid quantum-classical orchestration boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

6. Evidence and Assessment

Reproduce, compare, challenge, observe, recover, and trace

EXAMINE

Research papers, standards, designs, bills of material, protocols, source, models, data, calibration, configurations, contracts, and claims.

REPRODUCE

Repeat the experiment or assessment with captured versions, seeds, parameters, environment, uncertainty, and acceptance criteria.

COMPARE

Use an honest incumbent, classical, manual, or alternative baseline with equivalent outcome, data, scale, and resource accounting.

CHALLENGE

Apply adversarial input, environmental variation, dependency loss, fault injection, safety cases, security tests, and boundary conditions.

OBSERVE

Measure field or production-like quality, latency, energy, drift, physical behavior, interventions, failures, maintenance, and user impact.

TRACE

Link claim, authority, experiment, configuration, evidence, decision, pilot, change, incident, rollback, and reassessment.

Evidence grades

A

Independently reproduced, current, representative, uncertainty-bounded, integrity-protected, and operationally relevant.

B

Reproduced by the implementing organization with strong provenance, comparator, challenge, and declared limitations.

C

Partial, laboratory-only, simulation-heavy, inherited, or indirect evidence with material uncertainty and dependencies.

D

Roadmap, assertion, demonstration, benchmark excerpt, patent, token metric, press release, or vendor statement without...

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

7. Assurance Views

Six perspectives required for a complete assurance claim

GOVERNANCE

Ownership, purpose, risk tolerance, policy, exception, and decision rights.

ARCHITECTURE

Boundaries, dependencies, failure modes, state, data flow, and portability.

SECURITY

Identity, authorization, isolation, secrets, abuse resistance, and incident response.

OPERATIONS

Reliability, performance, cost, observability, change, recovery, and support.

PRIVACY / RIGHTS

Purpose limitation, minimization, consent, access, correction, deletion, and egress.

HUMAN / SOCIETAL

Usability, accessibility, disclosure, contestability, impact, and human control.

Conformance requires a defensible position across every applicable view. A strong aggregate score cannot compensate for an unowned system, a failed mandatory gate, untested recovery, or evidence below the accepted grade.

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

7.2 Evaluation Metrics and Decision Gates

Measures expose utility, uncertainty, safety, physical limits, transition cost, and lifecycle burden

UTILITY

Task outcome, comparator delta, coverage, quality, accuracy, mission success, and stakeholder value.

UNCERTAINTY

Confidence, calibration, variance, sample coverage, reproducibility, sensitivity, and unresolved assumptions.

PERFORMANCE

Latency, throughput, fidelity, range, precision, bandwidth, scale, density, and availability.

SAFETY / SECURITY

Hazard exposure, unsafe action, exploitability, spoofing, physical consequence, intervention, and containment.

RESOURCE

Energy, power, cooling, spectrum, shots, qubits, memory, materials, facility, operator, and maintenance demand.

MATURITY

Standards state, supply chain, interoperability, tooling, skills, support, qualification, and lifecycle readiness.

ECONOMICS

Acquisition, operation, provider, token, facility, migration, insurance, support, and opportunity cost.

TRANSITION

Pilot escape, rollback time, incumbent fallback, portability, lock-in, retirement, and evidence completeness.

Decision gate: thresholds **MUST** be declared before assessment, include an incumbent baseline and uncertainty statement, and identify any safety, security, cryptographic, physical, reproducibility, or rollback failure that blocks transition.

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

8. Failure Modes and Adversarial Scenarios

Challenge assumptions before the system is trusted with consequential work

QUANTUM ADVANTAGE OVERCLAIM

A narrow or non-comparable experiment is presented as useful superiority over classical methods.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

CALIBRATION INVALIDATION

Backend drift or missing calibration state makes results irreproducible or misleading.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

CRYPTOGRAPHIC TRANSITION FAILURE

Legacy algorithms, protocol gaps, or downgrade paths survive after PQC migration claims.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

QUANTUM CHANNEL COMPROMISE

Trusted nodes, detectors, timing, classical authentication, or devices violate the stated security model.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

RESOURCE-ESTIMATION COLLAPSE

Logical qubit, error correction, runtime, facility, or cost assumptions invalidate the roadmap.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

PROVIDER AND EVIDENCE LOSS

Remote hardware, queue behavior, configuration, or experiment records cannot be independently reproduced.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

Adversarial testing MUST protect people and production systems. Use isolated environments, synthetic or minimized data, bounded authority, kill switches, explicit legal and ethical review, and documented stop conditions.

9. Implementation Profiles

Risk-proportional implementation without weakening mandatory boundaries

FOUNDATIONAL TYPICAL SCOPE Low consequence, limited autonomy, non-sensitive data, reversible outputs. MINIMUM DEPTH Named owner; inventory; basic evaluation; access control; logging; rollback; annual review.	ADVANCED TYPICAL SCOPE Business-critical workflow, sensitive data, multiple tools or providers, moderate autonomy. MINIMUM DEPTH Formal threat model; representative evaluation; approval gates; isolated execution; tested recovery; quarterly review.	HIGH ASSURANCE TYPICAL SCOPE Safety, security, regulated, financial, identity, or broadly consequential use. MINIMUM DEPTH Independent challenge; strongest identity; deterministic enforcement; comprehensive evidence; canary release; continuous monitoring.
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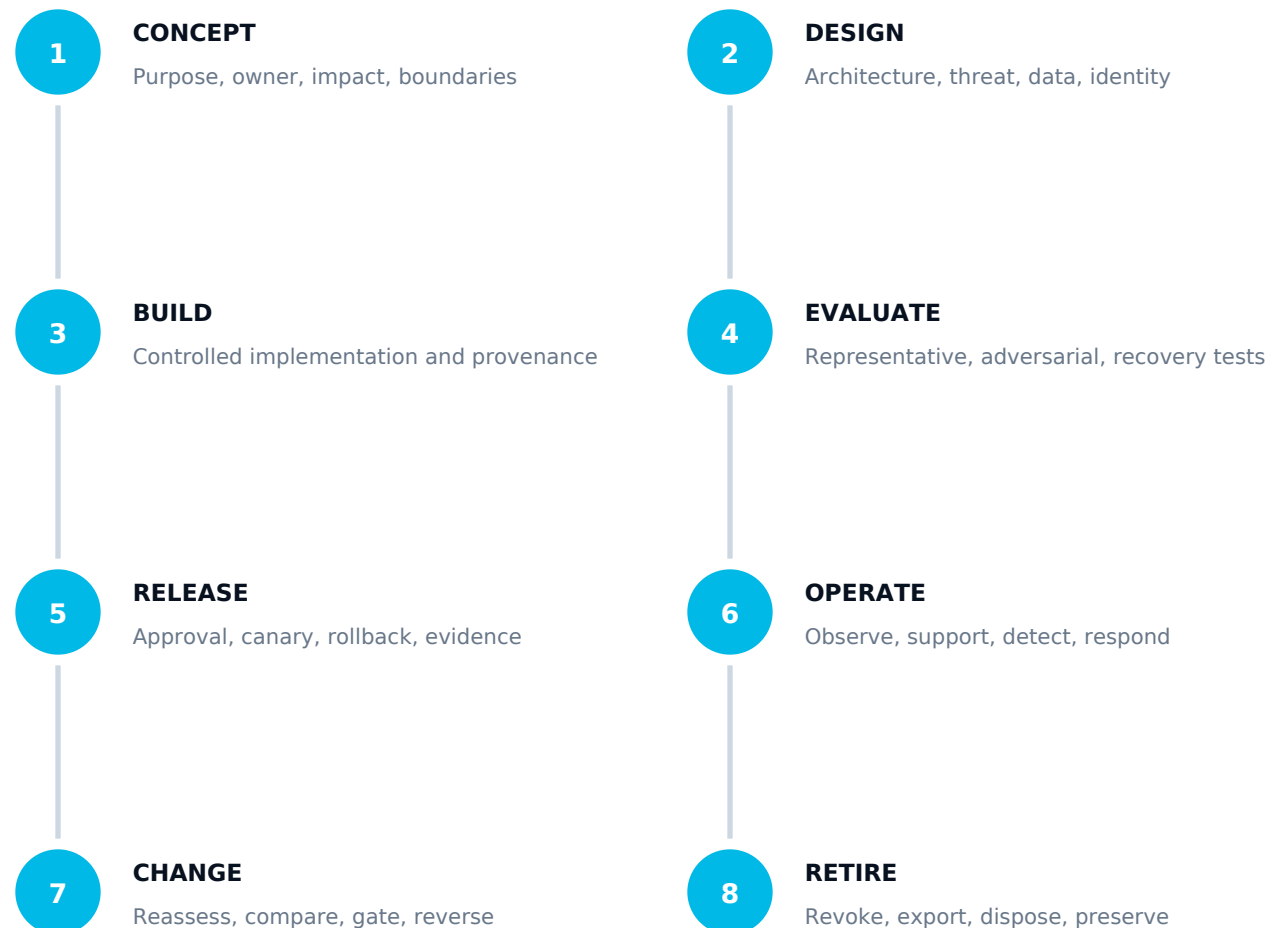
Profile selection rule

Choose the highest profile triggered by consequence, autonomy, sensitivity, scale, irreversibility, external dependency, or inability to rapidly detect and recover. Tailoring may strengthen controls; it may not erase a mandatory gate without a controlled exception.

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

9.2 Operational Lifecycle

Evidence-bearing operation from concept through retirement



LIFECYCLE INVARIANT

Every stage **MUST** leave sufficient evidence for the next authority to understand what was intended, what changed, what was tested, what failed, what was accepted, what remains uncertain, and how to recover or exit.

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

10. Adoption Roadmap

A sequenced path from uncontrolled capability to evidence-bearing operation

0-30 DAYS**Establish ownership and truth**

Inventory systems and dependencies; classify risk; freeze unsupported claims; identify immediate privilege, data, and evidence gaps.

31-90 DAYS**Create enforceable boundaries**

Define policy; isolate execution; implement identity and approval gates; establish representative evaluation and baseline telemetry.

3-6 MONTHS**Prove recovery and operating control**

Exercise failure, rollback, revocation, incident, provider exit, and state-recovery scenarios; mature evidence packaging.

6-12 MONTHS**Scale assurance**

Automate control checks; expand workload coverage; independent challenge; portfolio metrics; controlled exception expiry; continuous reassessment.

Adoption is complete only when operating evidence demonstrates the selected profile in the actual deployment context. Documentation alone is not conformance.

10.2 Conformance and Exception Statement

What an assurance claim must contain

SYSTEM / SERVICE Named, versioned capability and deployment boundary.	PROFILE Foundational, Advanced, or High Assurance with trigger rationale.
SCOPE Workloads, users, data, tools, regions, providers, and exclusions.	CRITERIA Pass, partial, fail, not applicable, and exception status for every criterion.
EVIDENCE Artifact references, evidence grade, date, environment, and reproducibility.	LIMITATIONS Known failure modes, unsupported workloads, uncertainty, and residual risk.
EXCEPTIONS Owner, rationale, compensating control, expiration, and approval.	VALIDITY Assessment date, change boundary, review date, and reassessment triggers.

Prohibited claim: “compliant” without the named scope, profile, evidence date, limitations, exceptions, and authority accepting residual risk.

MYTHOS-QTC-0005 / QUANTUM TECHNOLOGY

11. Source Authority and Reference Register

Primary sources informing interpretation; verify current status at assessment time

NIST CSF 2.0

Cybersecurity Framework 2.0

<https://doi.org/10.6028/NIST.CSWP.29>

Enterprise governance and cybersecurity outcome framework.

NIST PQC Standards

Post-Quantum Cryptography Project

<https://csrc.nist.gov/projects/post-quantum-cryptography>

FIPS 203, 204, and 205, HQC selection, and continuing migration guidance.

NIST SP 800-53 Rev. 5

Security and Privacy Controls for Information Systems and Organizations

<https://doi.org/10.6028/NIST.SP.800-53r5>

Broad organizational control baseline for technology systems and services.

ETSI QKD

Quantum Key Distribution Industry Specification Group

<https://www.etsi.org/committee/qkd>

QKD component, interface, security, deployment, and interoperability specifications.

NIST Quantum Science

Quantum Science Programs and Testbeds

<https://www.nist.gov/quantum-science>

Official NIST research across quantum computing, communications, networking, sensing, and metrology.

ISO/IEC 4879:2024

Quantum Computing - Terminology and Vocabulary

<https://www.iso.org/standard/80432.html>

International terminology foundation for quantum computing concepts.

NIST Quantum Networks

Quantum Networks at NIST

<https://www.nist.gov/pml/productsservices/quantum-networks-nist>

Quantum-network concepts, components, applications, and metropolitan research testbeds.

Source currency rule: authorities, specifications, laws, provider services, hardware, protocols, standards status, and research evidence MUST be checked at assessment time. This publication records a 2026-07-24 source snapshot.

11.2 Revision History and Decision Register

Permanent identity, controlled change, and publication integrity

VERSION	DATE	STATE	SUMMARY
1.0.0-candidate	2026-07-24	Candidate	Permanent-publication edition; source refresh; expanded criteria, evidence, assurance, and lifecycle guidance.
Next review	2027-01-24	Scheduled	Review source currency, threat evolution, operating evidence, adoption feedback, and proposed revisions.

Publication decisions

- PERMANENT IDENTITY** The document ID remains stable across revisions; batch or production sequence metadata is not public identity.
- CHANGE CONTROL** Normative changes require rationale, impact analysis, affected-criterion mapping, and approval.
- SUPERSESSON** A superseded edition remains traceable; current routes and catalogs identify the active edition.
- CORRECTION** Material errors require a recorded correction, affected-evidence analysis, and notification appropriate to impact.
- ARCHIVAL INTEGRITY** Published artifacts receive hashes, metadata, and a release manifest sufficient for independent verification.



ENGINEERING STANDARDS LIBRARY / QUANTUM TECHNOLOGY AND COMPUTING

Fault-Tolerant Quantum Computing and Error-Correction Readiness Standard

Logical qubits, codes, thresholds, decoders, resource estimation, control electronics, verification, roadmap claims, and fault-tolerant adoption gates.

PERMANENT DOCUMENT ID

MYTHOS-QTC-0006

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

Fault-Tolerant Quantum Computing and Error-Correction Readiness Standard			DOCUMENT ID MYTHOS-QTC-0006 VERSION 1.0.0-candidate STATUS Candidate Standard PUBLISHER Mythos Systems PUBLICATION DATE 2026-07-24 SCHEDULED REVIEW 2027-01-24 CLASSIFICATION Public
18 ATOMIC CRITERIA	6 ASSURANCE VIEWS	4 IMPLEMENTATION PROFILES	1 PERMANENT IDENTITY

Publication doctrine. This publication establishes durable requirements for its defined scope. Interpretation must preserve the permanent document identity, required evidence, controlled exceptions, source currency, and formal revision history.

EMERGING TECHNOLOGY AND ASSURANCE TOPOLOGY

Quantum Technology and Computing

A trustworthy fault-tolerant quantum computing readiness program is a governed path from research claim through baseline, experiment, safety and security challenge, transition decision, bounded operation, and preserved evidence.

CLASSIFY

Separate established practice, candidate standard, reproduced result, vendor claim, implementation hypothesis, and open research.

EXPERIMENT

Declare baseline, configuration, uncertainty, scenario coverage, stop conditions, and independent reproduction before conclusions.

CONSTRAIN

Identity, policy, safety envelopes, physical boundaries, cryptographic authority, and human intervention limit consequence.

TRANSITION

Adoption, pilot, production, rollback, supplier exit, lifecycle, and retirement decisions remain evidence-bearing and reversible.

EVIDENCE-BOUND TRANSITION FLOW



No novelty claim becomes an operational claim without reproduced evidence and an explicit authority decision

INTERPRETATION AND ASSURANCE

How to apply this publication

Normative intent

Requirements define outcomes and constraints. Implementations may vary, but evidence must demonstrate equivalent control.

Evidence over assertion

Vendor documentation and design intent are not equivalent to reproduced behavior. Record evidence grade and uncertainty.

Risk-proportional depth

Higher consequence, autonomy, sensitivity, and irreversibility require stronger isolation, review, verification, and recovery.

Controlled exception

Exceptions require an owner, rationale, compensating control, residual-risk acceptance, expiration, and reevaluation trigger.

Normalized assessment scale

0	1	2	3	4	5
ABSENT	AD HOC	PARTIAL	OPERATIONAL	ADVANCED	LEADING

A numeric score must never hide a failed mandatory gate, missing evidence, untested workload, or unacceptable residual risk.

INTERACTIVE NAVIGATION

Contents

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Navigation doctrine

Bookmarks and internal links are conveniences. Permanent document identity, criterion identifiers, evidence references, and revision history remain authoritative.

MYTHOS-QTC-0006 / QUANTUM TECHNOLOGY

0. Executive Mandate

Research value, transition discipline, and non-negotiable evidence boundaries

MANDATE

Organizations evaluating fault-tolerant quantum computing readiness **MUST** separate research from operational authority, establish a reproducible baseline, constrain safety and security consequence, disclose uncertainty, and require a documented transition or rejection decision.

Required outcomes

- Establish a durable, product-neutral evidence system for fault-tolerant quantum computing readiness.
- Prevent novelty, investment, vendor prestige, roadmap language, or laboratory success from substituting for operational proof.
- Require representative performance, adversarial, failure, recovery, safety, privacy, and lifecycle evidence.
- Keep pilots bounded by identity, authority, environment, duration, budget, stop conditions, and rollback.
- Preserve rejected alternatives, limitations, residual risk, source currency, and reassessment triggers.

Decision boundary: conformance supports a bounded engineering assurance position. It does not prove scientific consensus, regulatory approval, universal safety, quantum advantage, cryptographic perfection, autonomous competence, or commercial viability.

MYTHOS-QTC-0006 / QUANTUM TECHNOLOGY

1. Scope and Applicability

Research, pilot, transition, operational, and retirement boundaries

IN SCOPE

- Research, architecture, acquisition, experiment, pilot, transition, operation, and retirement of fault-tolerant quantum computing readiness.
- Hardware, software, models, data, protocols, facilities, people, suppliers, providers, physical processes, and evidence.
- Laboratory, simulation, testbed, shadow, pilot, canary, production, and field deployment states.
- Claims, benchmarks, uncertainty, safety, security, privacy, economics, interoperability, support, and exit.

OUT OF SCOPE

- Scientific truth inferred from a single benchmark, simulation, provider, hardware generation, or laboratory configuration.
- Safety, regulatory, export, spectrum, airspace, clinical, cryptographic, or standards approval not granted by the responsible authority.
- Roadmap forecasts, token price, patent counts, press releases, or investment treated as engineering evidence.
- Hidden production use of research components outside the declared transition and assurance boundary.

Applicability triggers

- The capability is novel, rapidly changing, weakly standardized, difficult to reproduce, or dependent on immature suppliers.
- A claim concerns safety, security, privacy, physical action, critical infrastructure, cryptographic trust, or consequential autonomy.
- The system requires specialized facilities, scarce hardware, spectrum, foundry, cryogenic, optical, robotics, or field-test dependencies.
- Failure or lock-in may create long-lived data, capital, infrastructure, workforce, or regulatory consequences.
- A research component is proposed for pilot, customer, production, public, or externally relied-upon use.

MYTHOS-QTC-0006 / QUANTUM TECHNOLOGY

2. Definitions and Taxonomy

Controlled language for architecture, governance, and assessment

AUTHORITY

The right to approve, deny, constrain, or execute an action. Model output is not authority.

EVIDENCE

A reproducible source, trace, measurement, test, record, signed artifact, or documented observation supporting a claim.

ASSURANCE VIEW

A defined perspective such as governance, architecture, security, operations, privacy, or human oversight.

ATOMIC CRITERION

A uniquely identified requirement that can be assessed, evidenced, excepted, and revised independently.

IMPLEMENTATION PROFILE

A risk-proportional set of required depth, evidence, and gates for a class of use.

CONTROLLED EXCEPTION

A time-bounded deviation with owner, rationale, compensating control, residual risk, expiration, and review trigger.

DETERMINISTIC MECHANISM

A component whose inputs, policy, state transition, and side effects can be constrained and verified.

SOURCE AUTHORITY

The documented basis for treating a source as reliable for a defined claim, context, jurisdiction, and time.

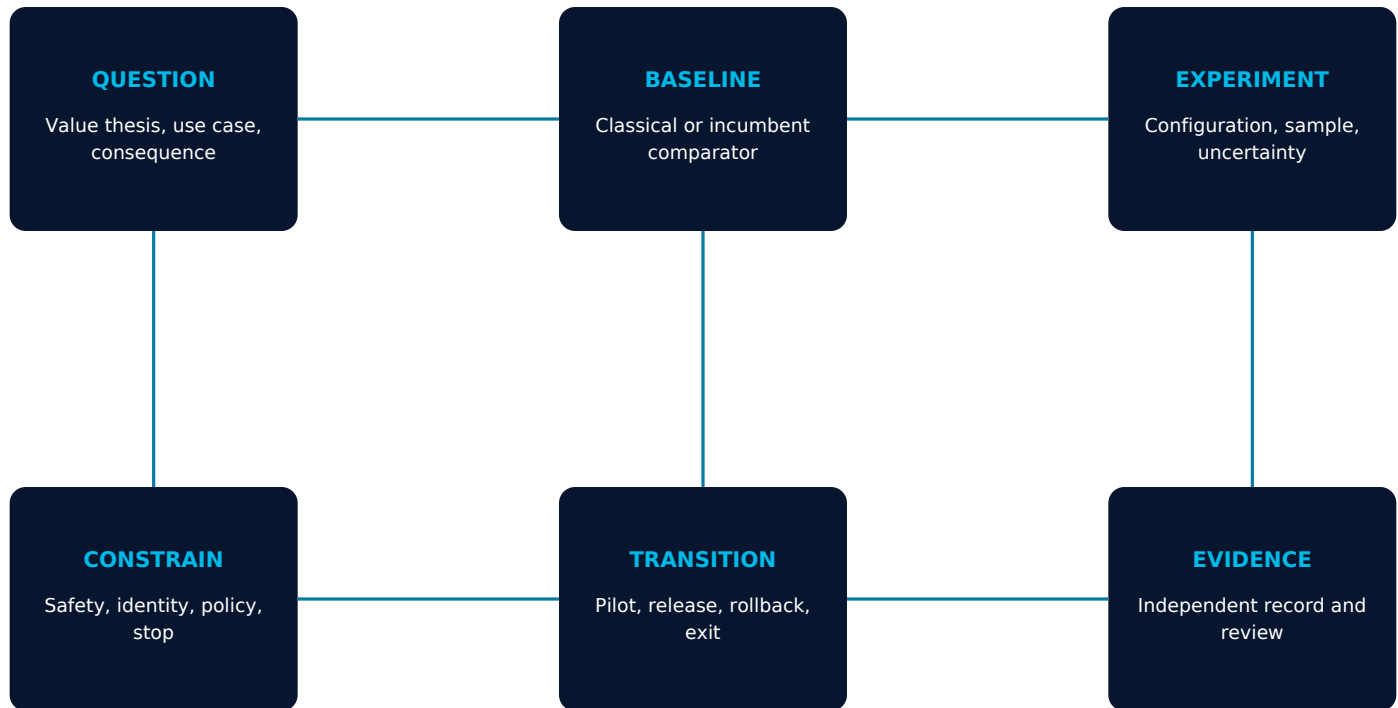
REASSESSMENT TRIGGER

A change, incident, drift signal, dependency revision, or time boundary requiring renewed evaluation.

MYTHOS-QTC-0006 / QUANTUM TECHNOLOGY

3. Architecture and Trust Model

Separation of research, authority, physical systems, runtime, and evidence



Mandatory trust boundaries

- Research systems **MUST NOT** inherit production identity, secrets, authority, data, networks, or physical control by convenience.
- Claims **MUST** retain the exact hardware, software, model, protocol, calibration, environment, workload, and observation boundary.
- Safety, cryptographic, physical, spectrum, autonomy, and human-intervention constraints **MUST** remain independently enforceable.
- Transition **MUST** have a named decision authority, acceptance criteria, monitored pilot, rollback, supplier exit, and retirement path.
- Evidence **MUST** remain reviewable when a vendor, cloud, token network, laboratory, model, robot, or quantum backend is unavailable.

MYTHOS-QTC-0006 / QUANTUM TECHNOLOGY

4. Governance and Accountability

Decision rights, separation of duties, and lifecycle ownership

ACCOUNTABLE OWNER

Accepts scope, risk tolerance, funding, and residual risk.

SYSTEM OWNER

Maintains architecture, inventory, operating boundaries, and change control.

SECURITY / PRIVACY

Defines threat, identity, data, isolation, monitoring, and incident requirements.

EVALUATION AUTHORITY

Designs representative tests, gates releases, and preserves reproducibility.

OPERATIONS

Maintains availability, rollback, recovery, evidence, and incident handling.

HUMAN OVERSIGHT

Reviews consequential decisions, exceptions, disputed outcomes, and harm signals.

DECISION PRINCIPLE

No single actor should be able to define the objective, grant authority, execute the consequential action, suppress evidence, and approve the result. Separation must be technical where consequence requires it.

MYTHOS-QTC-0006 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-QTC-0006-C01

Fault-Tolerance Objective and Readiness Claim

The organization **MUST** define, implement, verify, and maintain fault-tolerance objective and readiness claim for the declared fault-tolerant quantum computing readiness boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0006-C02

Physical Error Model and Correlation Assumptions

The organization **MUST** define, implement, verify, and maintain physical error model and correlation assumptions for the declared fault-tolerant quantum computing readiness boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0006-C03

Code Family, Distance, and Logical-Qubit Definition

The organization **MUST** define, implement, verify, and maintain code family, distance, and logical-qubit definition for the declared fault-tolerant quantum computing readiness boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE captured circuit, parameters, seeds, shots, mapping, calibration snapshot, and result data

MYTHOS-QTC-0006-C04

Syndrome Extraction and Measurement Architecture

The organization **MUST** define, implement, verify, and maintain syndrome extraction and measurement architecture for the declared fault-tolerant quantum computing readiness boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cross-backend, simulator, independent reproduction, and statistical comparison evidence

MYTHOS-QTC-0006 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-QTC-0006-C05

Decoder, Latency, Throughput, and Failure Modes

The organization MUST define, implement, verify, and maintain decoder, latency, throughput, and failure modes for the declared fault-tolerant quantum computing readiness boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE cryptographic inventory, hybrid profile, interoperability tests, downgrade tests, and revocation plan

MYTHOS-QTC-0006-C06

Threshold Evidence and Scaling Method

The organization MUST define, implement, verify, and maintain threshold evidence and scaling method for the declared fault-tolerant quantum computing readiness boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE quantum-channel, timing, authentication, trusted-node, detector, or key-lifecycle evidence

MYTHOS-QTC-0006-C07

Logical Gate, Magic State, and Resource Accounting

The organization MUST define, implement, verify, and maintain logical gate, magic state, and resource accounting for the declared fault-tolerant quantum computing readiness boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE facility, energy, cooling, queue, cost, availability, support, and exit evidence

MYTHOS-QTC-0006-C08

Leakage, Crosstalk, Loss, and Non-Pauli Error

The organization MUST define, implement, verify, and maintain leakage, crosstalk, loss, and non-pauli error for the declared fault-tolerant quantum computing readiness boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE bounded claim, limitation register, promotion gate, fallback, and long-term evidence package

MYTHOS-QTC-0006 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-QTC-0006-C09

Control Electronics, Cryogenic, Optical, and Timing Boundary

The organization MUST define, implement, verify, and maintain control electronics, cryogenic, optical, and timing boundary for the declared fault-tolerant quantum computing readiness boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0006-C10

Verification, Simulation, and Experimental Cross-Check

The organization MUST define, implement, verify, and maintain verification, simulation, and experimental cross-check for the declared fault-tolerant quantum computing readiness boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0006-C11

Workload-Level Logical Resource Estimate

The organization MUST define, implement, verify, and maintain workload-level logical resource estimate for the declared fault-tolerant quantum computing readiness boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE captured circuit, parameters, seeds, shots, mapping, calibration snapshot, and result data

MYTHOS-QTC-0006-C12

Yield, Calibration, Maintenance, and Availability

The organization MUST define, implement, verify, and maintain yield, calibration, maintenance, and availability for the declared fault-tolerant quantum computing readiness boundary. The record MUST identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts MUST remain explicit.

MINIMUM EVIDENCE cross-backend, simulator, independent reproduction, and statistical comparison evidence

MYTHOS-QTC-0006 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-QTC-0006-C13**Facility, Energy, Cooling, and Operational Scale**

The organization **MUST** define, implement, verify, and maintain facility, energy, cooling, and operational scale for the declared fault-tolerant quantum computing readiness boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE cryptographic inventory, hybrid profile, interoperability tests, downgrade tests, and revocation plan

MYTHOS-QTC-0006-C14**Security, Provider, and Intellectual-Property Boundary**

The organization **MUST** define, implement, verify, and maintain security, provider, and intellectual-property boundary for the declared fault-tolerant quantum computing readiness boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE quantum-channel, timing, authentication, trusted-node, detector, or key-lifecycle evidence

MYTHOS-QTC-0006-C15**Roadmap Dependency and Uncertainty Disclosure**

The organization **MUST** define, implement, verify, and maintain roadmap dependency and uncertainty disclosure for the declared fault-tolerant quantum computing readiness boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE facility, energy, cooling, queue, cost, availability, support, and exit evidence

MYTHOS-QTC-0006 / QUANTUM TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-QTC-0006-C16**Classical Alternative and Break-Even Analysis**

The organization **MUST** define, implement, verify, and maintain classical alternative and break-even analysis for the declared fault-tolerant quantum computing readiness boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE bounded claim, limitation register, promotion gate, fallback, and long-term evidence package

MYTHOS-QTC-0006-C17**Transition Gate and Independent Challenge**

The organization **MUST** define, implement, verify, and maintain transition gate and independent challenge for the declared fault-tolerant quantum computing readiness boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE algorithm, hardware, backend, qubit, calibration, compiler, runtime, and provider inventory

MYTHOS-QTC-0006-C18**Reassessment and Long-Horizon Evidence Preservation**

The organization **MUST** define, implement, verify, and maintain reassessment and long-horizon evidence preservation for the declared fault-tolerant quantum computing readiness boundary. The record **MUST** identify accountable ownership, evidence state, exact configuration, assumptions, affected people and systems, failure and recovery behavior, uncertainty, transition authority, and reassessment triggers. Quantum and classical resources, calibration or algorithm state, comparator, statistical confidence, provider dependency, and reproducibility artifacts **MUST** remain explicit.

MINIMUM EVIDENCE classical baseline; resource estimate; noise and uncertainty model; acceptance thresholds

MYTHOS-QTC-0006 / QUANTUM TECHNOLOGY

6. Evidence and Assessment

Reproduce, compare, challenge, observe, recover, and trace

EXAMINE

Research papers, standards, designs, bills of material, protocols, source, models, data, calibration, configurations, contracts, and claims.

REPRODUCE

Repeat the experiment or assessment with captured versions, seeds, parameters, environment, uncertainty, and acceptance criteria.

COMPARE

Use an honest incumbent, classical, manual, or alternative baseline with equivalent outcome, data, scale, and resource accounting.

CHALLENGE

Apply adversarial input, environmental variation, dependency loss, fault injection, safety cases, security tests, and boundary conditions.

OBSERVE

Measure field or production-like quality, latency, energy, drift, physical behavior, interventions, failures, maintenance, and user impact.

TRACE

Link claim, authority, experiment, configuration, evidence, decision, pilot, change, incident, rollback, and reassessment.

Evidence grades

A

Independently reproduced, current, representative, uncertainty-bounded, integrity-protected, and operationally relevant.

B

Reproduced by the implementing organization with strong provenance, comparator, challenge, and declared limitations.

C

Partial, laboratory-only, simulation-heavy, inherited, or indirect evidence with material uncertainty and dependencies.

D

Roadmap, assertion, demonstration, benchmark excerpt, patent, token metric, press release, or vendor statement without...

MYTHOS-QTC-0006 / QUANTUM TECHNOLOGY

7. Assurance Views

Six perspectives required for a complete assurance claim

GOVERNANCE

Ownership, purpose, risk tolerance, policy, exception, and decision rights.

ARCHITECTURE

Boundaries, dependencies, failure modes, state, data flow, and portability.

SECURITY

Identity, authorization, isolation, secrets, abuse resistance, and incident response.

OPERATIONS

Reliability, performance, cost, observability, change, recovery, and support.

PRIVACY / RIGHTS

Purpose limitation, minimization, consent, access, correction, deletion, and egress.

HUMAN / SOCIETAL

Usability, accessibility, disclosure, contestability, impact, and human control.

Conformance requires a defensible position across every applicable view. A strong aggregate score cannot compensate for an unowned system, a failed mandatory gate, untested recovery, or evidence below the accepted grade.

7.2 Evaluation Metrics and Decision Gates

Measures expose utility, uncertainty, safety, physical limits, transition cost, and lifecycle burden

UTILITY

Task outcome, comparator delta, coverage, quality, accuracy, mission success, and stakeholder value.

UNCERTAINTY

Confidence, calibration, variance, sample coverage, reproducibility, sensitivity, and unresolved assumptions.

PERFORMANCE

Latency, throughput, fidelity, range, precision, bandwidth, scale, density, and availability.

SAFETY / SECURITY

Hazard exposure, unsafe action, exploitability, spoofing, physical consequence, intervention, and containment.

RESOURCE

Energy, power, cooling, spectrum, shots, qubits, memory, materials, facility, operator, and maintenance demand.

MATURITY

Standards state, supply chain, interoperability, tooling, skills, support, qualification, and lifecycle readiness.

ECONOMICS

Acquisition, operation, provider, token, facility, migration, insurance, support, and opportunity cost.

TRANSITION

Pilot escape, rollback time, incumbent fallback, portability, lock-in, retirement, and evidence completeness.

Decision gate: thresholds **MUST** be declared before assessment, include an incumbent baseline and uncertainty statement, and identify any safety, security, cryptographic, physical, reproducibility, or rollback failure that blocks transition.

8. Failure Modes and Adversarial Scenarios

Challenge assumptions before the system is trusted with consequential work

QUANTUM ADVANTAGE OVERCLAIM

A narrow or non-comparable experiment is presented as useful superiority over classical methods.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

CALIBRATION INVALIDATION

Backend drift or missing calibration state makes results irreproducible or misleading.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

CRYPTOGRAPHIC TRANSITION FAILURE

Legacy algorithms, protocol gaps, or downgrade paths survive after PQC migration claims.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

QUANTUM CHANNEL COMPROMISE

Trusted nodes, detectors, timing, classical authentication, or devices violate the stated security model.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

RESOURCE-ESTIMATION COLLAPSE

Logical qubit, error correction, runtime, facility, or cost assumptions invalidate the roadmap.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

PROVIDER AND EVIDENCE LOSS

Remote hardware, queue behavior, configuration, or experiment records cannot be independently reproduced.

REQUIRED: PREVENT | DETECT | CONTAIN | RECOVER | EVIDENCE

Adversarial testing MUST protect people and production systems. Use isolated environments, synthetic or minimized data, bounded authority, kill switches, explicit legal and ethical review, and documented stop conditions.

9. Implementation Profiles

Risk-proportional implementation without weakening mandatory boundaries

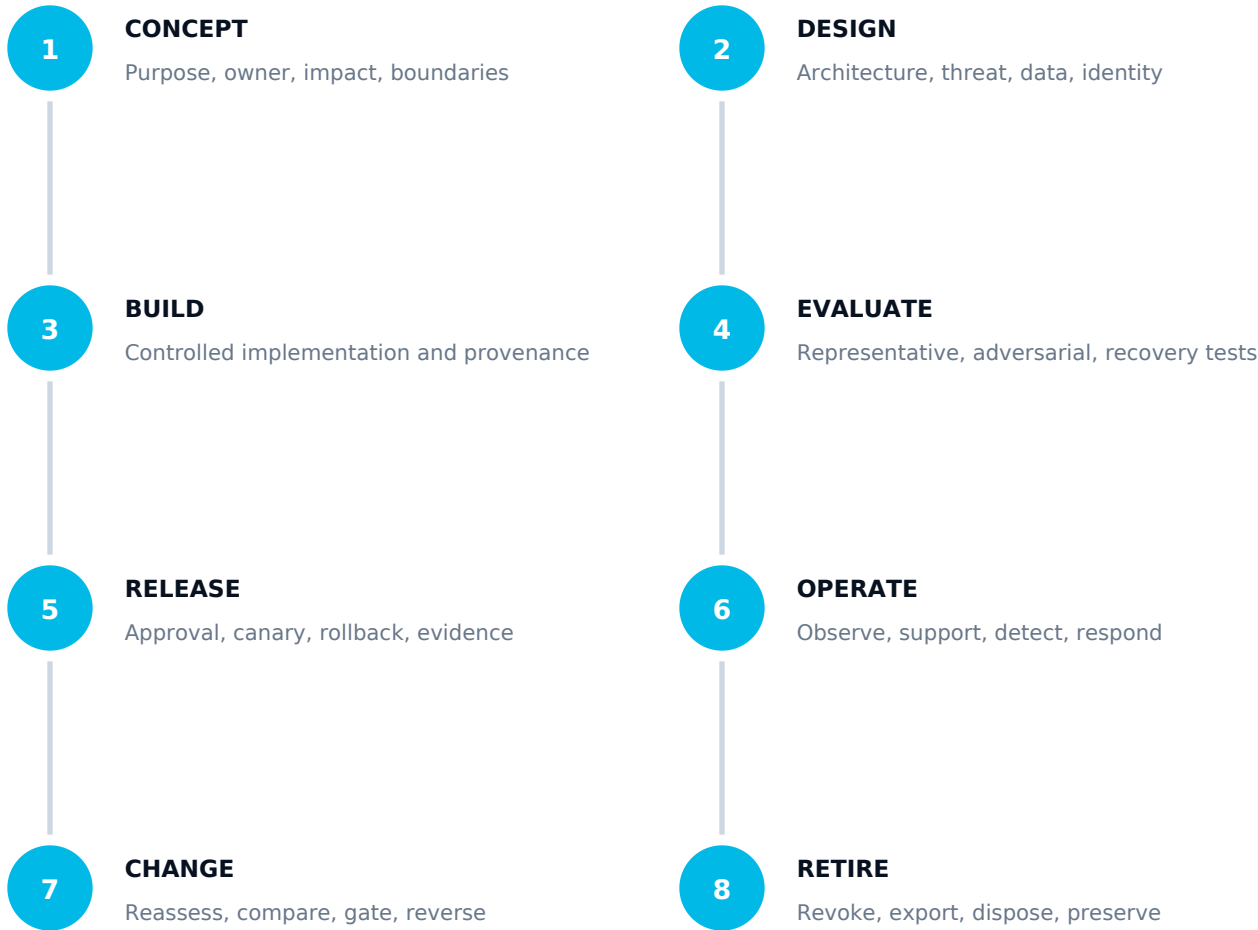
FOUNDATIONAL TYPICAL SCOPE Low consequence, limited autonomy, non-sensitive data, reversible outputs. MINIMUM DEPTH Named owner; inventory; basic evaluation; access control; logging; rollback; annual review.	ADVANCED TYPICAL SCOPE Business-critical workflow, sensitive data, multiple tools or providers, moderate autonomy. MINIMUM DEPTH Formal threat model; representative evaluation; approval gates; isolated execution; tested recovery; quarterly review.	HIGH ASSURANCE TYPICAL SCOPE Safety, security, regulated, financial, identity, or broadly consequential use. MINIMUM DEPTH Independent challenge; strongest identity; deterministic enforcement; comprehensive evidence; canary release; continuous monitoring.
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Profile selection rule

Choose the highest profile triggered by consequence, autonomy, sensitivity, scale, irreversibility, external dependency, or inability to rapidly detect and recover. Tailoring may strengthen controls; it may not erase a mandatory gate without a controlled exception.

9.2 Operational Lifecycle

Evidence-bearing operation from concept through retirement



LIFECYCLE INVARIANT

Every stage **MUST** leave sufficient evidence for the next authority to understand what was intended, what changed, what was tested, what failed, what was accepted, what remains uncertain, and how to recover or exit.

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10. Adoption Roadmap

A sequenced path from uncontrolled capability to evidence-bearing operation

0-30 DAYS**Establish ownership and truth**

Inventory systems and dependencies; classify risk; freeze unsupported claims; identify immediate privilege, data, and evidence gaps.

31-90 DAYS**Create enforceable boundaries**

Define policy; isolate execution; implement identity and approval gates; establish representative evaluation and baseline telemetry.

3-6 MONTHS**Prove recovery and operating control**

Exercise failure, rollback, revocation, incident, provider exit, and state-recovery scenarios; mature evidence packaging.

6-12 MONTHS**Scale assurance**

Automate control checks; expand workload coverage; independent challenge; portfolio metrics; controlled exception expiry; continuous reassessment.

Adoption is complete only when operating evidence demonstrates the selected profile in the actual deployment context. Documentation alone is not conformance.

10.2 Conformance and Exception Statement

What an assurance claim must contain

SYSTEM / SERVICE Named, versioned capability and deployment boundary.	PROFILE Foundational, Advanced, or High Assurance with trigger rationale.
SCOPE Workloads, users, data, tools, regions, providers, and exclusions.	CRITERIA Pass, partial, fail, not applicable, and exception status for every criterion.
EVIDENCE Artifact references, evidence grade, date, environment, and reproducibility.	LIMITATIONS Known failure modes, unsupported workloads, uncertainty, and residual risk.
EXCEPTIONS Owner, rationale, compensating control, expiration, and approval.	VALIDITY Assessment date, change boundary, review date, and reassessment triggers.

Prohibited claim: “compliant” without the named scope, profile, evidence date, limitations, exceptions, and authority accepting residual risk.

11. Source Authority and Reference Register

Primary sources informing interpretation; verify current status at assessment time

NIST CSF 2.0

Cybersecurity Framework 2.0

<https://doi.org/10.6028/NIST.CSWP.29>

Enterprise governance and cybersecurity outcome framework.

NIST PQC Standards

Post-Quantum Cryptography Project

<https://csrc.nist.gov/projects/post-quantum-cryptography>

FIPS 203, 204, and 205, HQC selection, and continuing migration guidance.

NIST SP 800-53 Rev. 5

Security and Privacy Controls for Information Systems and Organizations

<https://doi.org/10.6028/NIST.SP.800-53r5>

Broad organizational control baseline for technology systems and services.

ETSI QKD

Quantum Key Distribution Industry Specification Group

<https://www.etsi.org/committee/qkd>

QKD component, interface, security, deployment, and interoperability specifications.

NIST Quantum Science

Quantum Science Programs and Testbeds

<https://www.nist.gov/quantum-science>

Official NIST research across quantum computing, communications, networking, sensing, and metrology.

ISO/IEC 4879:2024

Quantum Computing - Terminology and Vocabulary

<https://www.iso.org/standard/80432.html>

International terminology foundation for quantum computing concepts.

NIST Quantum Networks

Quantum Networks at NIST

<https://www.nist.gov/pml/productsservices/quantum-networks-nist>

Quantum-network concepts, components, applications, and metropolitan research testbeds.

Source currency rule: authorities, specifications, laws, provider services, hardware, protocols, standards status, and research evidence MUST be checked at assessment time. This publication records a 2026-07-24 source snapshot.

11.2 Revision History and Decision Register

Permanent identity, controlled change, and publication integrity

VERSION	DATE	STATE	SUMMARY
1.0.0-candidate	2026-07-24	Candidate	Permanent-publication edition; source refresh; expanded criteria, evidence, assurance, and lifecycle guidance.
Next review	2027-01-24	Scheduled	Review source currency, threat evolution, operating evidence, adoption feedback, and proposed revisions.

Publication decisions

- PERMANENT IDENTITY** The document ID remains stable across revisions; batch or production sequence metadata is not public identity.
- CHANGE CONTROL** Normative changes require rationale, impact analysis, affected-criterion mapping, and approval.
- SUPERSESSION** A superseded edition remains traceable; current routes and catalogs identify the active edition.
- CORRECTION** Material errors require a recorded correction, affected-evidence analysis, and notification appropriate to impact.
- ARCHIVAL INTEGRITY** Published artifacts receive hashes, metadata, and a release manifest sufficient for independent verification.

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