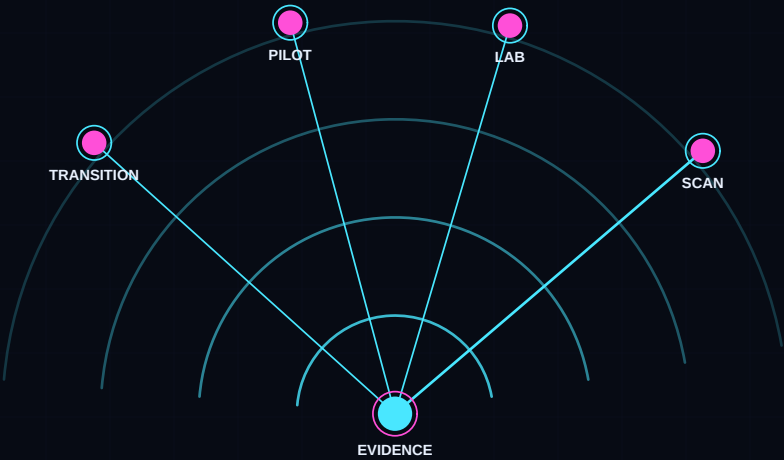
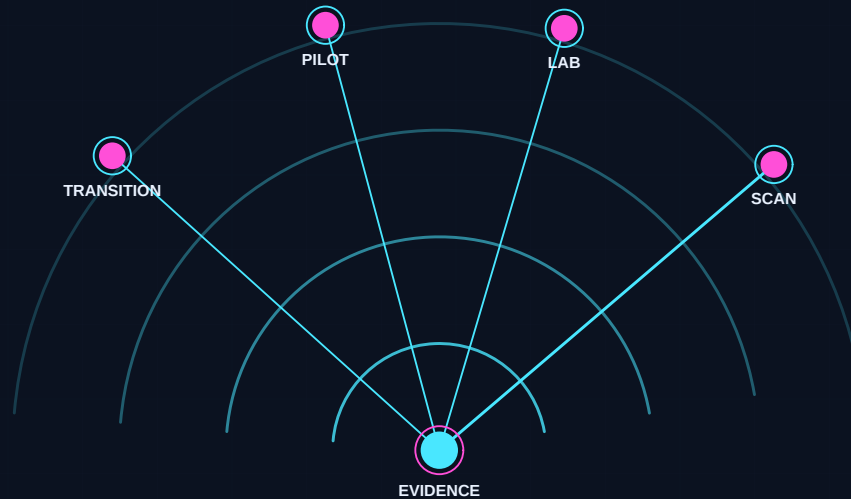


Emerging and Advanced Technology Standards Portfolio



Architecture & Assurance Map

A compact reasoning model for implementation, assessment, and evidence review.



OPERATING POSITION

Technology evidence becomes authority only after readiness gates.

EVIDENCE PATH

signal -> lab evidence -> pilot evidence -> transition decision -> lifecycle review

READINESS SIGNALS

maturity, interoperability, safety, reversibility, supplier exit

PERMANENT PUBLICATION IDENTITY

Emerging and Advanced Technology Standards Portfolio			DOCUMENT ID MYTHOS-EMT-PORT-0001 VERSION 1.0.0-candidate STATUS Portfolio Edition PUBLISHER Mythos Systems PUBLICATION DATE 2026-07-24 SCHEDULED REVIEW 2027-01-24 CLASSIFICATION Public
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 emerging and advanced technology 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-EMT-PORT-0001 / EMERGING TECHNOLOGY

Portfolio Position

Permanent standards portfolio for emerging and advanced technology.

OPERATING POSITION

This portfolio consolidates 7 permanent standards for emerging and advanced technology.

- Use it to establish a shared control vocabulary, implementation sequence, evidence profile, and adoption roadmap.
- Individual standards remain independently identifiable and citable.

MYTHOS-EMT-PORT-0001 / EMERGING TECHNOLOGY

Portfolio Register

OPERATING POSITION

MYTHOS-EMT-0001 - Emerging Technology Horizon Scanning, Experimentation, and Transition Standard

- MYTHOS-EMT-0002 - Advanced Cryptography, Privacy-Enhancing Technology, and Crypto-Agility Standard
- MYTHOS-EMT-0003 - Integrated Photonics and Optical Compute Systems Standard
- MYTHOS-EMT-0004 - Neuromorphic Computing and Event-Driven Intelligence Standard
- MYTHOS-EMT-0005 - Decentralized Physical Infrastructure Network Research and Assurance Standard
- MYTHOS-EMT-0006 - 5G-Advanced and 6G Research Evaluation Standard
- MYTHOS-EMT-0007 - Advanced Semiconductor, Chiplet, and Heterogeneous Integration Standard

MYTHOS-EMT-PORT-0001 / EMERGING TECHNOLOGY

Control Architecture

OPERATING POSITION

Reasoning proposes; policy authorizes; deterministic systems execute; evidence records.

- State, identity, sources, and learning remain governed throughout the lifecycle.
- High-consequence use requires stronger isolation, approval, reproducibility, and recovery.

MYTHOS-EMT-PORT-0001 / EMERGING TECHNOLOGY

Assurance Model

OPERATING POSITION

Six assurance views: governance, architecture, security, operations, privacy/rights, and human/societal impact.

- Three implementation profiles: Foundational, Advanced, and High Assurance.
- Atomic criteria receive pass, partial, fail, not-applicable, or controlled-exception disposition.

MYTHOS-EMT-PORT-0001 / EMERGING TECHNOLOGY

Adoption Sequence

OPERATING POSITION

Establish ownership and inventory.

- Classify consequence and select profile.
- Create enforceable identity, policy, execution, and data boundaries.
- Evaluate representative workloads and adversarial cases.
- Release gradually with rollback and evidence.
- Operate, reassess, and retire with preserved records.

MYTHOS-EMT-PORT-0001 / 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-l/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.



ENGINEERING STANDARDS LIBRARY / EMERGING AND ADVANCED TECHNOLOGY

Emerging Technology Horizon Scanning, Experimentation, and Transition Standard

Portfolio sensing, research classification, experimentation, evidence, adoption gates, transition control, and retirement for emerging technologies.

PERMANENT DOCUMENT ID

MYTHOS-EMT-0001

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

Emerging Technology Horizon Scanning, Experimentation, and Transition Standard			DOCUMENT ID MYTHOS-EMT-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

Emerging and Advanced Technology

A trustworthy emerging-technology discovery, experimentation, and transition 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

Executive mandate	6
Scope and applicability	7
Definitions and taxonomy	8
Architecture and trust model	9
Governance and accountability	10
Normative control system	11
Evidence and assessment	16
Assurance views and metrics	17
Failure modes and adversarial scenarios	19
Implementation profiles and lifecycle	20
Adoption roadmap and conformance	22
Source authority and revision control	24

Navigation doctrine

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

MYTHOS-EMT-0001 / EMERGING TECHNOLOGY

0. Executive Mandate

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

MANDATE

Organizations evaluating emerging-technology discovery, experimentation, and transition **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 emerging-technology discovery, experimentation, and transition.
- 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-0001 / 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 emerging-technology discovery, experimentation, and transition.
- 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-0001 / 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.

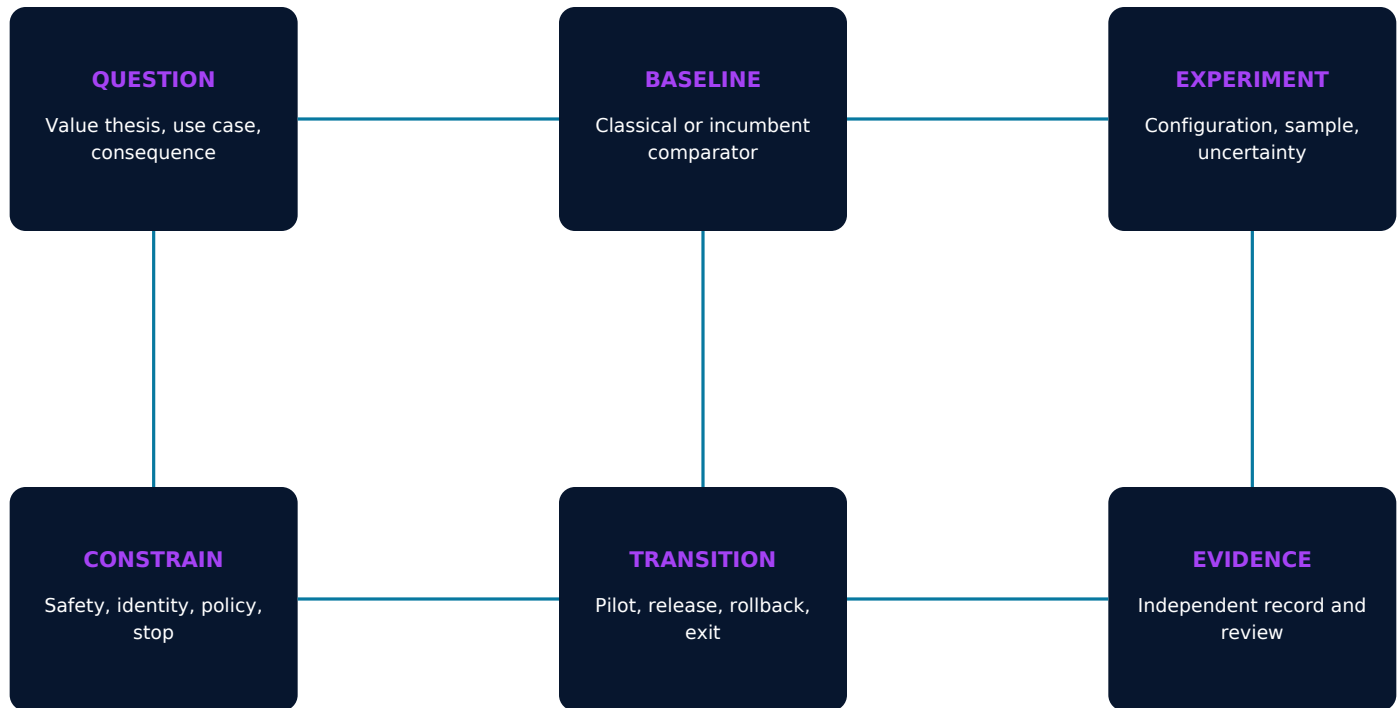
REASSESSMENT TRIGGER

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

MYTHOS-EMT-0001 / 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.

MYTHOS-EMT-0001 / EMERGING 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-EMT-0001 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-EMT-0001-C01 Technology Thesis and Strategic Relevance

The organization **MUST** define, implement, verify, and maintain technology thesis and strategic relevance for the declared emerging-technology discovery, experimentation, and transition 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-0001-C02 Source Authority and Research Currency

The organization **MUST** define, implement, verify, and maintain source authority and research currency for the declared emerging-technology discovery, experimentation, and transition 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-0001-C03 Readiness-Level and Evidence-State Classification

The organization **MUST** define, implement, verify, and maintain readiness-level and evidence-state classification for the declared emerging-technology discovery, experimentation, and transition 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-0001-C04 Intended Use, Consequence, and Prohibited Use

The organization **MUST** define, implement, verify, and maintain intended use, consequence, and prohibited use for the declared emerging-technology discovery, experimentation, and transition 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-0001 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-EMT-0001-C05

Named Sponsor, Technical Owner, and Risk Owner

The organization MUST define, implement, verify, and maintain named sponsor, technical owner, and risk owner for the declared emerging-technology discovery, experimentation, and transition 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-0001-C06

Research Environment and Production Separation

The organization MUST define, implement, verify, and maintain research environment and production separation for the declared emerging-technology discovery, experimentation, and transition 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-0001-C07

Reference Baseline and Competing Alternative

The organization MUST define, implement, verify, and maintain reference baseline and competing alternative for the declared emerging-technology discovery, experimentation, and transition 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-0001-C08

Reproducible Experiment Design and Configuration

The organization MUST define, implement, verify, and maintain reproducible experiment design and configuration for the declared emerging-technology discovery, experimentation, and transition 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-0001 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-EMT-0001-C09

Measurement Uncertainty and Statistical Validity

The organization MUST define, implement, verify, and maintain measurement uncertainty and statistical validity for the declared emerging-technology discovery, experimentation, and transition 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-0001-C10

Security, Privacy, Safety, and Rights Review

The organization MUST define, implement, verify, and maintain security, privacy, safety, and rights review for the declared emerging-technology discovery, experimentation, and transition 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-0001-C11

Supplier, Intellectual Property, and Export Constraints

The organization MUST define, implement, verify, and maintain supplier, intellectual property, and export constraints for the declared emerging-technology discovery, experimentation, and transition 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-0001-C12

Interoperability, Standards, and Ecosystem Maturity

The organization MUST define, implement, verify, and maintain interoperability, standards, and ecosystem maturity for the declared emerging-technology discovery, experimentation, and transition 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-0001 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-EMT-0001-C13**Operational Skills, Support, and Lifecycle Burden**

The organization **MUST** define, implement, verify, and maintain operational skills, support, and lifecycle burden for the declared emerging-technology discovery, experimentation, and transition 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-0001-C14**Cost, Energy, Capacity, and Sustainability Model**

The organization **MUST** define, implement, verify, and maintain cost, energy, capacity, and sustainability model for the declared emerging-technology discovery, experimentation, and transition 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-0001-C15**Pilot Scope, Kill Switch, and Stop Conditions**

The organization **MUST** define, implement, verify, and maintain pilot scope, kill switch, and stop conditions for the declared emerging-technology discovery, experimentation, and transition 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-0001 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-EMT-0001-C16**Transition Architecture and Backout Plan**

The organization **MUST** define, implement, verify, and maintain transition architecture and backout plan for the declared emerging-technology discovery, experimentation, and transition 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-0001-C17**Adoption Gate, Decision Record, and Residual Risk**

The organization **MUST** define, implement, verify, and maintain adoption gate, decision record, and residual risk for the declared emerging-technology discovery, experimentation, and transition 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-0001-C18**Reassessment, Sunset, and Evidence Preservation**

The organization **MUST** define, implement, verify, and maintain reassessment, sunset, and evidence preservation for the declared emerging-technology discovery, experimentation, and transition 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-0001 / 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-0001 / 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-0001 / 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-0001 / 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-0001 / EMERGING TECHNOLOGY

9. Implementation Profiles

Risk-proportional implementation without weakening mandatory boundaries

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

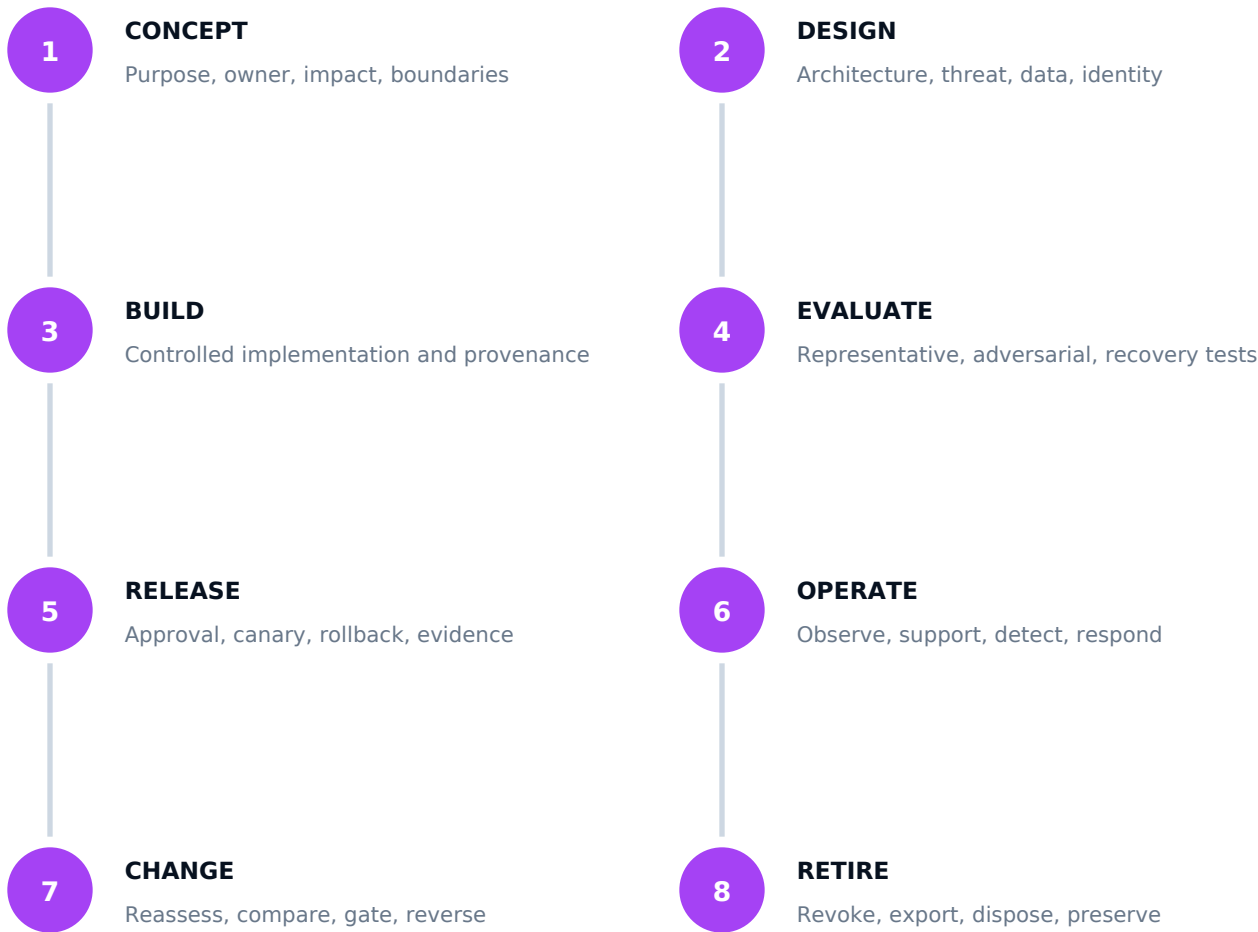
Profile selection rule

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-0001 / 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-0001 / 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-0001 / 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-0001 / 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-0001 / 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-0001
MYTHOS SYSTEMS / ENGINEERING STANDARDS LIBRARY



ENGINEERING STANDARDS LIBRARY / EMERGING AND ADVANCED TECHNOLOGY

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

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 advanced cryptography and privacy-enhancing technology 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

Executive mandate	6
Scope and applicability	7
Definitions and taxonomy	8
Architecture and trust model	9
Governance and accountability	10
Normative control system	11
Evidence and assessment	16
Assurance views and metrics	17
Failure modes and adversarial scenarios	19
Implementation profiles and lifecycle	20
Adoption roadmap and conformance	22
Source authority and revision control	24

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.

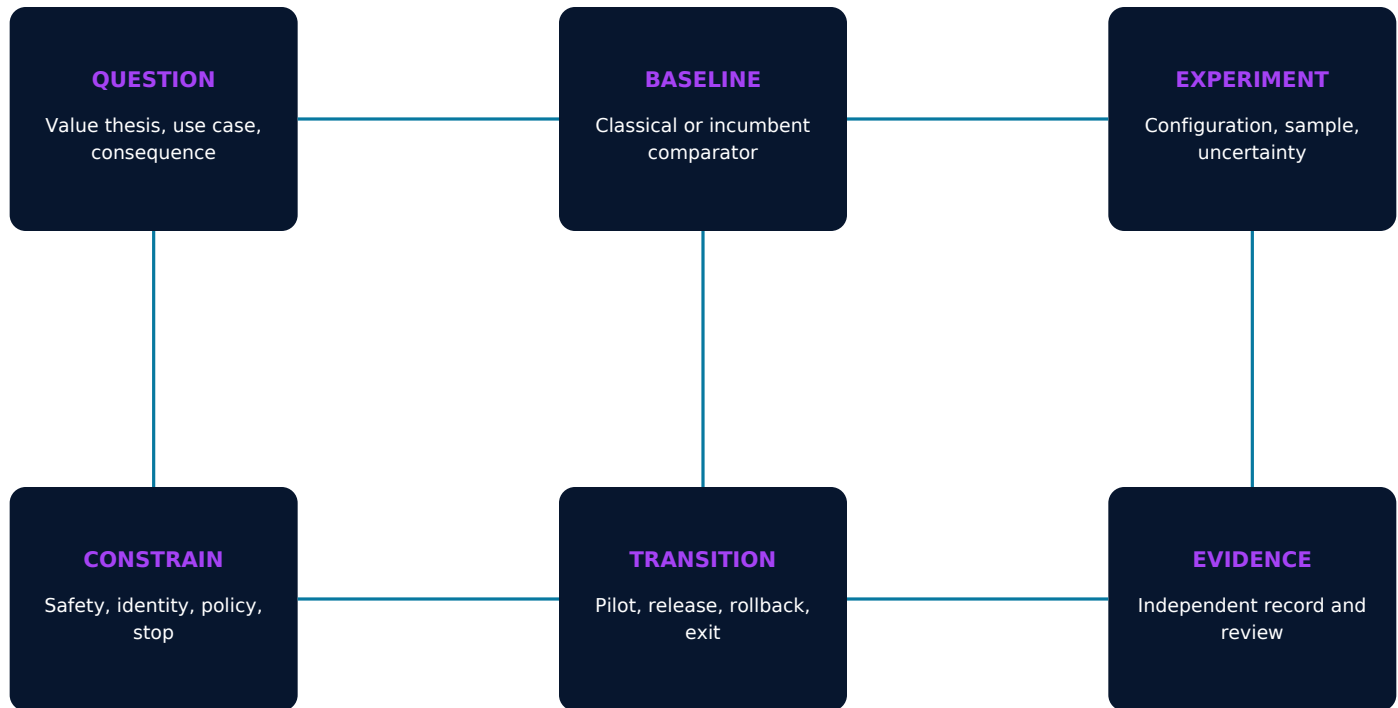
REASSESSMENT TRIGGER

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.

MYTHOS-EMT-0002 / EMERGING 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-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	ADVANCED	HIGH ASSURANCE
TYPICAL SCOPE Low consequence, limited autonomy, non-sensitive data, reversible outputs.	TYPICAL SCOPE Business-critical workflow, sensitive data, multiple tools or providers, moderate autonomy.	TYPICAL SCOPE Safety, security, regulated, financial, identity, or broadly consequential use.
MINIMUM DEPTH Named owner; inventory; basic evaluation; access control; logging; rollback; annual review.	MINIMUM DEPTH Formal threat model; representative evaluation; approval gates; isolated execution; tested recovery; quarterly review.	MINIMUM DEPTH Independent challenge; strongest identity; deterministic enforcement; comprehensive evidence; canary release; continuous monitoring.

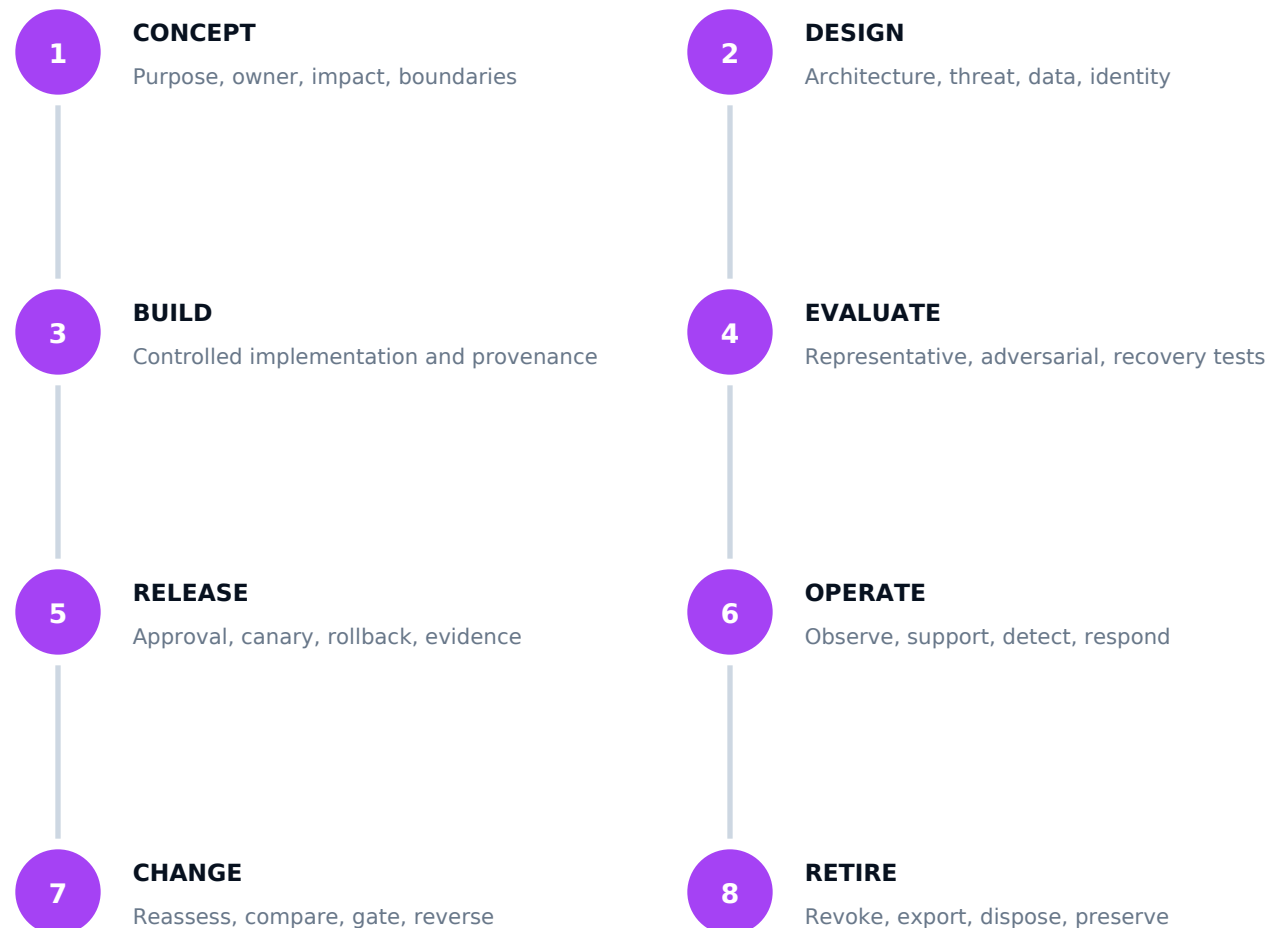
Profile selection rule

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 / EMERGING AND ADVANCED TECHNOLOGY

Integrated Photonics and Optical Compute Systems Standard

Photonic design, packaging, optical I/O, calibration, control electronics, reliability, manufacturing, safety, performance, and lifecycle evidence.

PERMANENT DOCUMENT ID

MYTHOS-EMT-0003

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

Integrated Photonics and Optical Compute Systems Standard			DOCUMENT ID MYTHOS-EMT-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

Emerging and Advanced Technology

A trustworthy integrated photonics and optical compute 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

Contents

Executive mandate	6
Scope and applicability	7
Definitions and taxonomy	8
Architecture and trust model	9
Governance and accountability	10
Normative control system	11
Evidence and assessment	16
Assurance views and metrics	17
Failure modes and adversarial scenarios	19
Implementation profiles and lifecycle	20
Adoption roadmap and conformance	22
Source authority and revision control	24

Navigation doctrine

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

MYTHOS-EMT-0003 / EMERGING TECHNOLOGY

0. Executive Mandate

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

MANDATE

Organizations evaluating integrated photonics and optical compute **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 integrated photonics and optical compute.
- 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-0003 / 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 integrated photonics and optical compute.
- 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-0003 / 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.

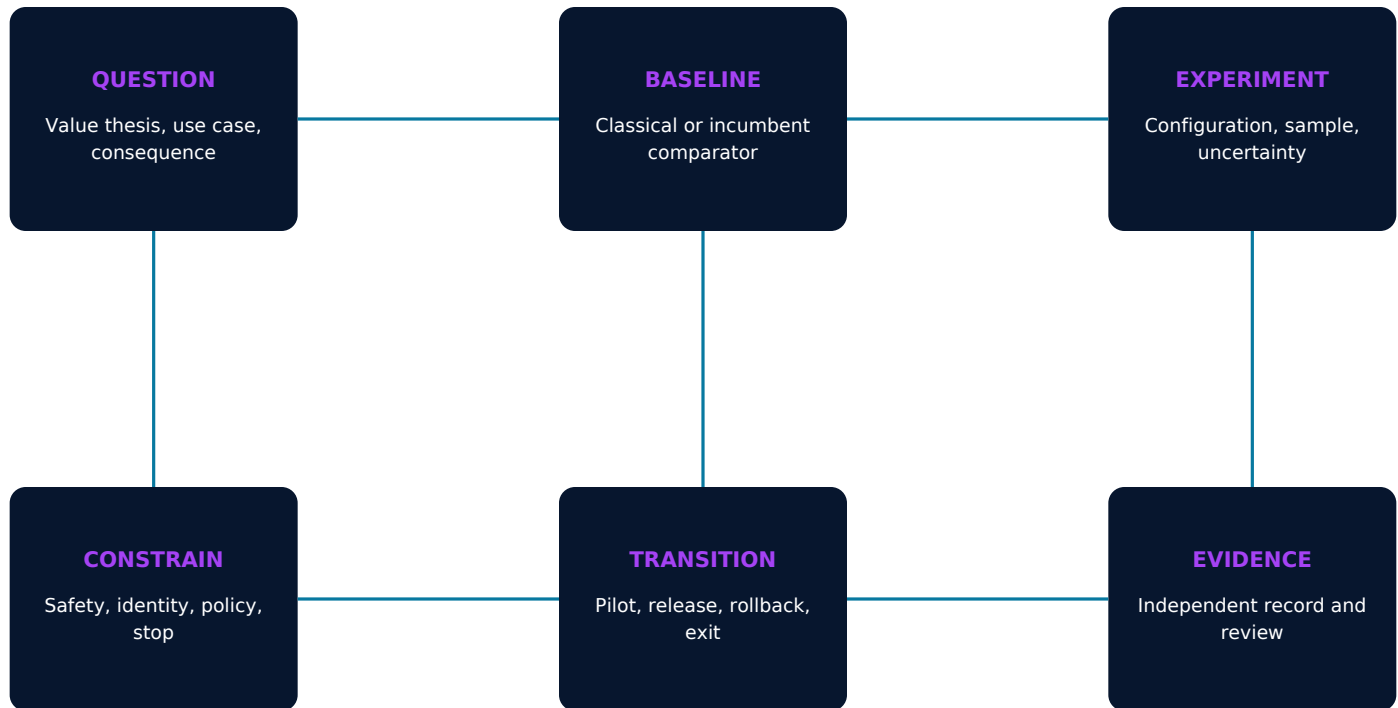
REASSESSMENT TRIGGER

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

MYTHOS-EMT-0003 / 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.

MYTHOS-EMT-0003 / EMERGING 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-EMT-0003 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-EMT-0003-C01 Photonic Use Case and System Boundary

The organization **MUST** define, implement, verify, and maintain photonic use case and system boundary for the declared integrated photonics and optical compute 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-0003-C02 Optical Architecture, Wavelength Plan, and Link Budget

The organization **MUST** define, implement, verify, and maintain optical architecture, wavelength plan, and link budget for the declared integrated photonics and optical compute 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-0003-C03 Material Platform and Process Design Kit Authority

The organization **MUST** define, implement, verify, and maintain material platform and process design kit authority for the declared integrated photonics and optical compute 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-0003-C04 Electronic-Photonic Co-Design and Control Loop

The organization **MUST** define, implement, verify, and maintain electronic-photonic co-design and control loop for the declared integrated photonics and optical compute 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-0003 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-EMT-0003-C05**Laser Source, Coupling, and Optical Power Governance**

The organization MUST define, implement, verify, and maintain laser source, coupling, and optical power governance for the declared integrated photonics and optical compute 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-0003-C06**Packaging, Alignment, Fiber Attach, and Connector Control**

The organization MUST define, implement, verify, and maintain packaging, alignment, fiber attach, and connector control for the declared integrated photonics and optical compute 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-0003-C07**Thermal Drift, Calibration, and Compensation**

The organization MUST define, implement, verify, and maintain thermal drift, calibration, and compensation for the declared integrated photonics and optical compute 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-0003-C08**Signal Integrity, Crosstalk, Noise, and Error Budget**

The organization MUST define, implement, verify, and maintain signal integrity, crosstalk, noise, and error budget for the declared integrated photonics and optical compute 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-0003 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-EMT-0003-C09

Optical I-O, Switching, and Compute Interface Contract

The organization MUST define, implement, verify, and maintain optical i-o, switching, and compute interface contract for the declared integrated photonics and optical compute 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-0003-C10

Manufacturing Variability and Yield Characterization

The organization MUST define, implement, verify, and maintain manufacturing variability and yield characterization for the declared integrated photonics and optical compute 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-0003-C11

Device Aging, Radiation, Environmental, and Reliability Testing

The organization MUST define, implement, verify, and maintain device aging, radiation, environmental, and reliability testing for the declared integrated photonics and optical compute 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-0003-C12

Eye, Skin, and Laser Safety Classification

The organization MUST define, implement, verify, and maintain eye, skin, and laser safety classification for the declared integrated photonics and optical compute 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-0003 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-EMT-0003-C13**Firmware, Driver, Telemetry, and Control Security**

The organization **MUST** define, implement, verify, and maintain firmware, driver, telemetry, and control security for the declared integrated photonics and optical compute 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-0003-C14**Benchmark Baseline and Application-Level Performance**

The organization **MUST** define, implement, verify, and maintain benchmark baseline and application-level performance for the declared integrated photonics and optical compute 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-0003-C15**Energy, Cooling, Density, and Sustainability Evidence**

The organization **MUST** define, implement, verify, and maintain energy, cooling, density, and sustainability evidence for the declared integrated photonics and optical compute 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-0003 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-EMT-0003-C16**Supplier, Foundry, Packaging, and Test Dependencies**

The organization **MUST** define, implement, verify, and maintain supplier, foundry, packaging, and test dependencies for the declared integrated photonics and optical compute 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-0003-C17**Repairability, Field Diagnostics, and Replacement**

The organization **MUST** define, implement, verify, and maintain repairability, field diagnostics, and replacement for the declared integrated photonics and optical compute 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-0003-C18**Qualification, Transition Gate, and Lifecycle Record**

The organization **MUST** define, implement, verify, and maintain qualification, transition gate, and lifecycle record for the declared integrated photonics and optical compute 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-0003 / 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-0003 / 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-0003 / 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-0003 / 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-0003 / EMERGING TECHNOLOGY

9. Implementation Profiles

Risk-proportional implementation without weakening mandatory boundaries

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

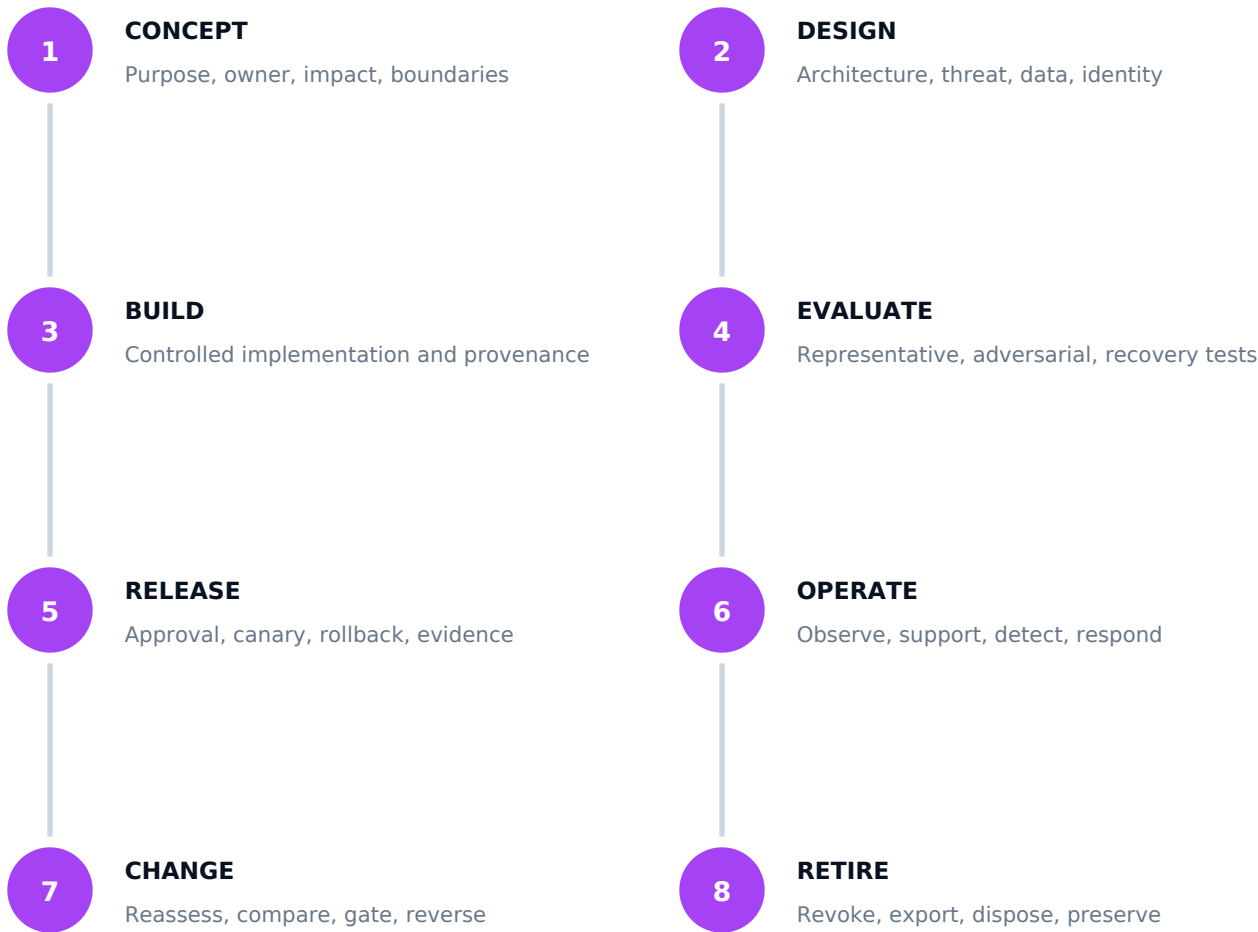
Profile selection rule

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-0003 / 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-0003 / 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-0003 / 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-0003 / 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-0003 / 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.



ENGINEERING STANDARDS LIBRARY / EMERGING AND ADVANCED TECHNOLOGY

Neuromorphic Computing and Event-Driven Intelligence Standard

Brain-inspired architectures, event coding, spiking models, hardware mapping, learning, benchmarks, energy, drift, tooling, and deployment assurance.

PERMANENT DOCUMENT ID

MYTHOS-EMT-0004

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

Neuromorphic Computing and Event-Driven Intelligence Standard			DOCUMENT ID MYTHOS-EMT-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

Emerging and Advanced Technology

A trustworthy neuromorphic computing and event-driven intelligence 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

Contents

Executive mandate	6
Scope and applicability	7
Definitions and taxonomy	8
Architecture and trust model	9
Governance and accountability	10
Normative control system	11
Evidence and assessment	16
Assurance views and metrics	17
Failure modes and adversarial scenarios	19
Implementation profiles and lifecycle	20
Adoption roadmap and conformance	22
Source authority and revision control	24

Navigation doctrine

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

MYTHOS-EMT-0004 / EMERGING TECHNOLOGY

0. Executive Mandate

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

MANDATE

Organizations evaluating neuromorphic computing and event-driven intelligence **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 neuromorphic computing and event-driven intelligence.
- 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-0004 / 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 neuromorphic computing and event-driven intelligence.
- 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-0004 / 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.

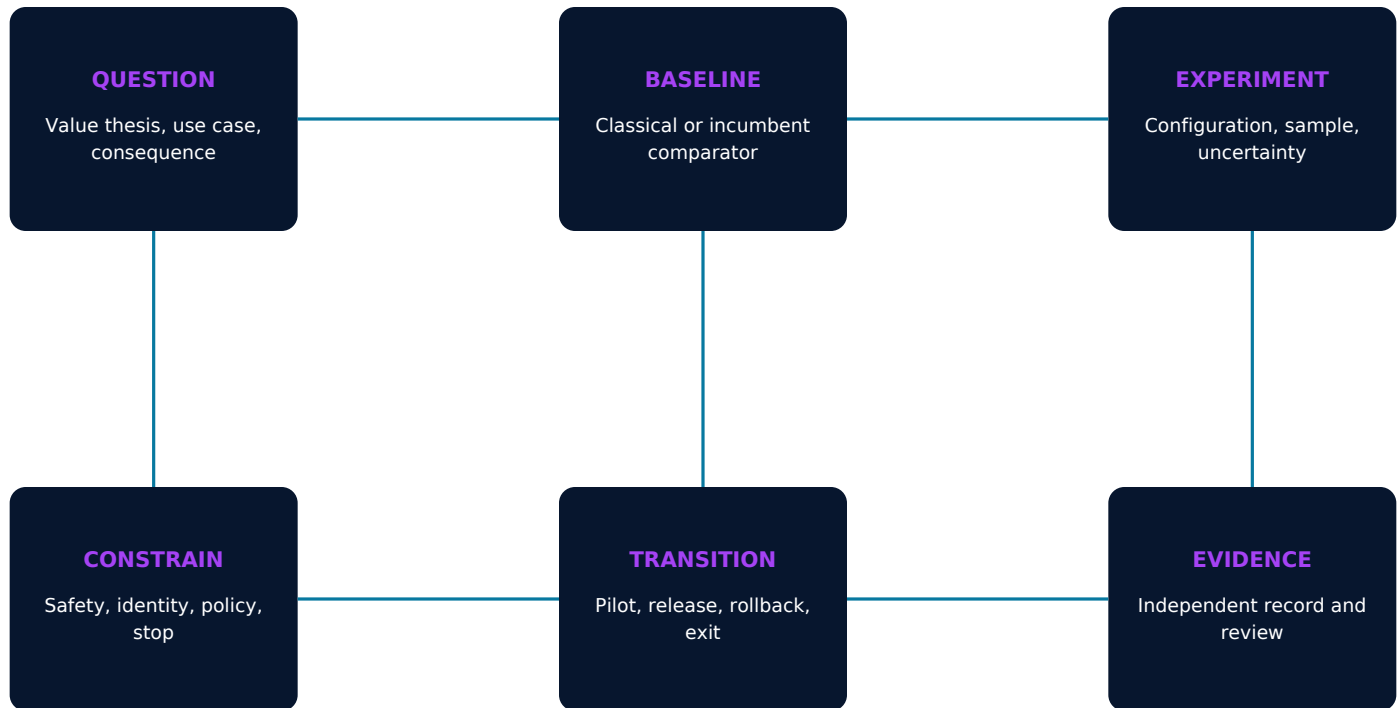
REASSESSMENT TRIGGER

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

MYTHOS-EMT-0004 / 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.

MYTHOS-EMT-0004 / EMERGING 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-EMT-0004 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-EMT-0004-C01 Neuromorphic Workload and Value Hypothesis

The organization **MUST** define, implement, verify, and maintain neuromorphic workload and value hypothesis for the declared neuromorphic computing and event-driven intelligence 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-0004-C02 Architecture and Computational Model Classification

The organization **MUST** define, implement, verify, and maintain architecture and computational model classification for the declared neuromorphic computing and event-driven intelligence 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-0004-C03 Event Encoding, Time Semantics, and Sensor Interface

The organization **MUST** define, implement, verify, and maintain event encoding, time semantics, and sensor interface for the declared neuromorphic computing and event-driven intelligence 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-0004-C04 Network Topology, Neuron, Synapse, and State Definition

The organization **MUST** define, implement, verify, and maintain network topology, neuron, synapse, and state definition for the declared neuromorphic computing and event-driven intelligence 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-0004 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-EMT-0004-C05

Training, Conversion, Calibration, and Mapping Pipeline

The organization MUST define, implement, verify, and maintain training, conversion, calibration, and mapping pipeline for the declared neuromorphic computing and event-driven intelligence 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-0004-C06

On-Chip Learning and Plasticity Governance

The organization MUST define, implement, verify, and maintain on-chip learning and plasticity governance for the declared neuromorphic computing and event-driven intelligence 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-0004-C07

Determinism, Stochasticity, and Repeatability

The organization MUST define, implement, verify, and maintain determinism, stochasticity, and repeatability for the declared neuromorphic computing and event-driven intelligence 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-0004-C08

Hardware Resource, Routing, and Placement Constraints

The organization MUST define, implement, verify, and maintain hardware resource, routing, and placement constraints for the declared neuromorphic computing and event-driven intelligence 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-0004 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-EMT-0004-C09

Dataset, Event Stream, and Ground-Truth Authority

The organization **MUST** define, implement, verify, and maintain dataset, event stream, and ground-truth authority for the declared neuromorphic computing and event-driven intelligence 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-0004-C10

Accuracy, Latency, Energy, and Sparsity Benchmarking

The organization **MUST** define, implement, verify, and maintain accuracy, latency, energy, and sparsity benchmarking for the declared neuromorphic computing and event-driven intelligence 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-0004-C11

Drift, Catastrophic Forgetting, and Continual Adaptation

The organization **MUST** define, implement, verify, and maintain drift, catastrophic forgetting, and continual adaptation for the declared neuromorphic computing and event-driven intelligence 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-0004-C12

Fault, Noise, Process Variation, and Degradation Testing

The organization **MUST** define, implement, verify, and maintain fault, noise, process variation, and degradation testing for the declared neuromorphic computing and event-driven intelligence 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-0004 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-EMT-0004-C13 Safety, Bias, Explainability, and Human Oversight

The organization **MUST** define, implement, verify, and maintain safety, bias, explainability, and human oversight for the declared neuromorphic computing and event-driven intelligence 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-0004-C14 Compiler, Runtime, Driver, and Toolchain Provenance

The organization **MUST** define, implement, verify, and maintain compiler, runtime, driver, and toolchain provenance for the declared neuromorphic computing and event-driven intelligence 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-0004-C15 Hybrid Neuromorphic-Classical Orchestration

The organization **MUST** define, implement, verify, and maintain hybrid neuromorphic-classical orchestration for the declared neuromorphic computing and event-driven intelligence 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-0004 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-EMT-0004-C16**Security, Side Channel, and Model Extraction Risk**

The organization **MUST** define, implement, verify, and maintain security, side channel, and model extraction risk for the declared neuromorphic computing and event-driven intelligence 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-0004-C17**Portability, Vendor Exit, and Reproducibility**

The organization **MUST** define, implement, verify, and maintain portability, vendor exit, and reproducibility for the declared neuromorphic computing and event-driven intelligence 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-0004-C18**Pilot Gate, Operational Evidence, and Reassessment**

The organization **MUST** define, implement, verify, and maintain pilot gate, operational evidence, and reassessment for the declared neuromorphic computing and event-driven intelligence 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-0004 / 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-0004 / 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-0004 / 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-0004 / 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-0004 / 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.
---	---	---

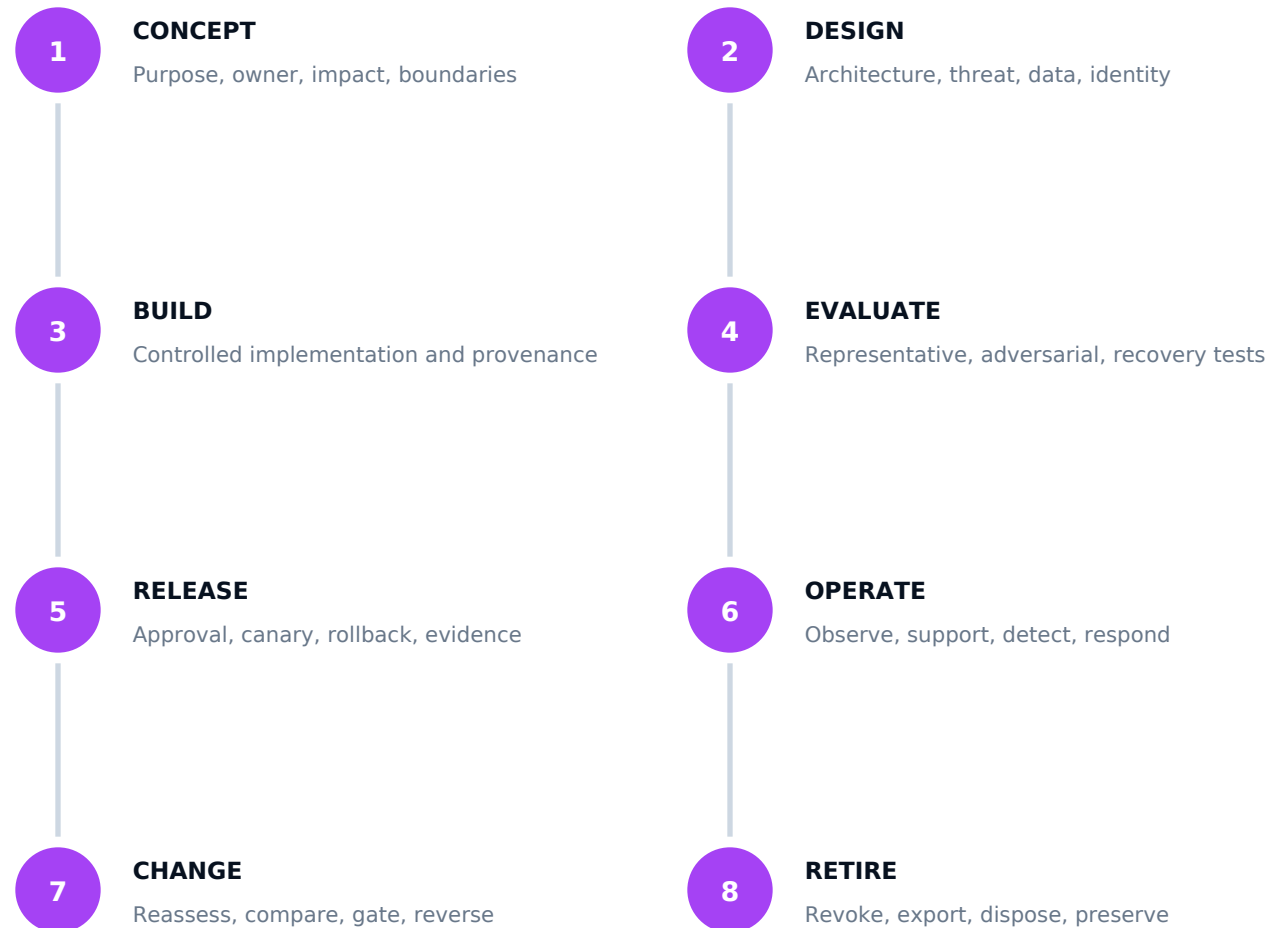
Profile selection rule

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-0004 / 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-0004 / 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-0004 / 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-0004 / 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-0004 / 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-0004

MYTHOS SYSTEMS / ENGINEERING STANDARDS LIBRARY



ENGINEERING STANDARDS LIBRARY / EMERGING AND ADVANCED TECHNOLOGY

Decentralized Physical Infrastructure Network Research and Assurance Standard

Physical-node identity, proof of service, measurement, incentives, governance, economics, privacy, Sybil resistance, resilience, and exit for DePIN systems.

PERMANENT DOCUMENT ID

MYTHOS-EMT-0005

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

Decentralized Physical Infrastructure Network Research and Assurance Standard			DOCUMENT ID MYTHOS-EMT-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

Emerging and Advanced Technology

A trustworthy decentralized physical infrastructure networks 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

Executive mandate	6
Scope and applicability	7
Definitions and taxonomy	8
Architecture and trust model	9
Governance and accountability	10
Normative control system	11
Evidence and assessment	16
Assurance views and metrics	17
Failure modes and adversarial scenarios	19
Implementation profiles and lifecycle	20
Adoption roadmap and conformance	22
Source authority and revision control	24

Navigation doctrine

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

MYTHOS-EMT-0005 / EMERGING TECHNOLOGY

0. Executive Mandate

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

MANDATE

Organizations evaluating decentralized physical infrastructure networks **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 decentralized physical infrastructure networks.
- 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-0005 / 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 decentralized physical infrastructure networks.
- 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-0005 / 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.

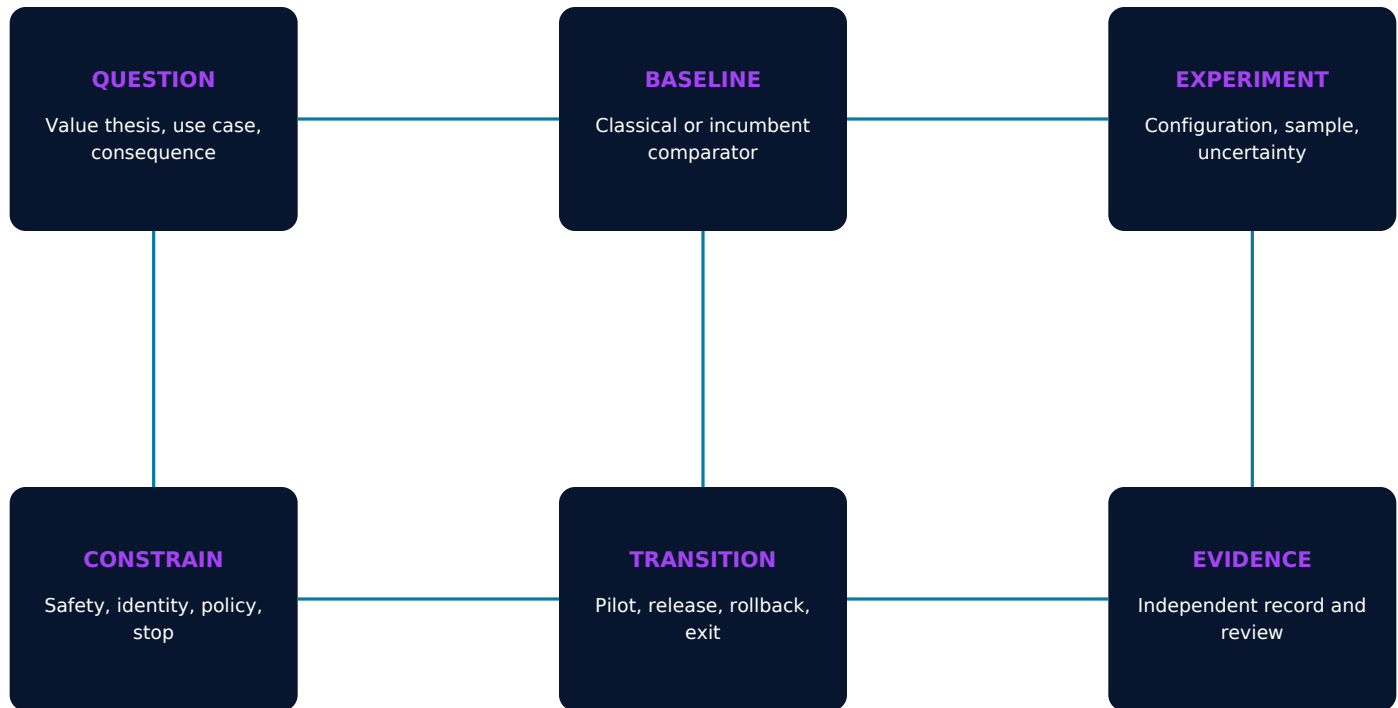
REASSESSMENT TRIGGER

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

MYTHOS-EMT-0005 / 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.

MYTHOS-EMT-0005 / EMERGING 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-EMT-0005 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-EMT-0005-C01

Physical Service, Geography, and Stakeholder Boundary

The organization **MUST** define, implement, verify, and maintain physical service, geography, and stakeholder boundary for the declared decentralized physical infrastructure networks 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-0005-C02

Node Identity, Ownership, and Hardware Attestation

The organization **MUST** define, implement, verify, and maintain node identity, ownership, and hardware attestation for the declared decentralized physical infrastructure networks 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-0005-C03

Enrollment, Commissioning, and Eligibility

The organization **MUST** define, implement, verify, and maintain enrollment, commissioning, and eligibility for the declared decentralized physical infrastructure networks 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-0005-C04

Proof-of-Service and Measurement Method

The organization **MUST** define, implement, verify, and maintain proof-of-service and measurement method for the declared decentralized physical infrastructure networks 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-0005 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-EMT-0005-C05

Oracle, Telemetry, and External Data Authority

The organization MUST define, implement, verify, and maintain oracle, telemetry, and external data authority for the declared decentralized physical infrastructure networks 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-0005-C06

Sybil, Collusion, Fraud, and Replay Resistance

The organization MUST define, implement, verify, and maintain sybil, collusion, fraud, and replay resistance for the declared decentralized physical infrastructure networks 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-0005-C07

Consensus, Settlement, and Finality Assumptions

The organization MUST define, implement, verify, and maintain consensus, settlement, and finality assumptions for the declared decentralized physical infrastructure networks 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-0005-C08

Incentive, Token, Fee, and Subsidy Model

The organization MUST define, implement, verify, and maintain incentive, token, fee, and subsidy model for the declared decentralized physical infrastructure networks 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-0005 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-EMT-0005-C09

Economic Stress, Manipulation, and Sustainability Testing

The organization **MUST** define, implement, verify, and maintain economic stress, manipulation, and sustainability testing for the declared decentralized physical infrastructure networks 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-0005-C10

Quality of Service and Customer Outcome Verification

The organization **MUST** define, implement, verify, and maintain quality of service and customer outcome verification for the declared decentralized physical infrastructure networks 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-0005-C11

Privacy, Location, Metadata, and Regulatory Exposure

The organization **MUST** define, implement, verify, and maintain privacy, location, metadata, and regulatory exposure for the declared decentralized physical infrastructure networks 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-0005-C12

Physical Safety, Tamper, Theft, and Maintenance

The organization **MUST** define, implement, verify, and maintain physical safety, tamper, theft, and maintenance for the declared decentralized physical infrastructure networks 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-0005 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-EMT-0005-C13**Protocol Governance, Upgrade, and Emergency Authority**

The organization **MUST** define, implement, verify, and maintain protocol governance, upgrade, and emergency authority for the declared decentralized physical infrastructure networks 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-0005-C14**Smart Contract, Wallet, Key, and Bridge Security**

The organization **MUST** define, implement, verify, and maintain smart contract, wallet, key, and bridge security for the declared decentralized physical infrastructure networks 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-0005-C15**Network Partition, Regional Failure, and Recovery**

The organization **MUST** define, implement, verify, and maintain network partition, regional failure, and recovery for the declared decentralized physical infrastructure networks 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-0005 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-EMT-0005-C16**Supplier, Host, Carrier, and Cloud Dependencies**

The organization **MUST** define, implement, verify, and maintain supplier, host, carrier, and cloud dependencies for the declared decentralized physical infrastructure networks 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-0005-C17**Interoperability, Portability, and Exit Rights**

The organization **MUST** define, implement, verify, and maintain interoperability, portability, and exit rights for the declared decentralized physical infrastructure networks 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-0005-C18**Research Classification, Adoption Gate, and Evidence**

The organization **MUST** define, implement, verify, and maintain research classification, adoption gate, and evidence for the declared decentralized physical infrastructure networks 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-0005 / 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-0005 / 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-0005 / 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-0005 / 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-0005 / EMERGING TECHNOLOGY

9. Implementation Profiles

Risk-proportional implementation without weakening mandatory boundaries

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

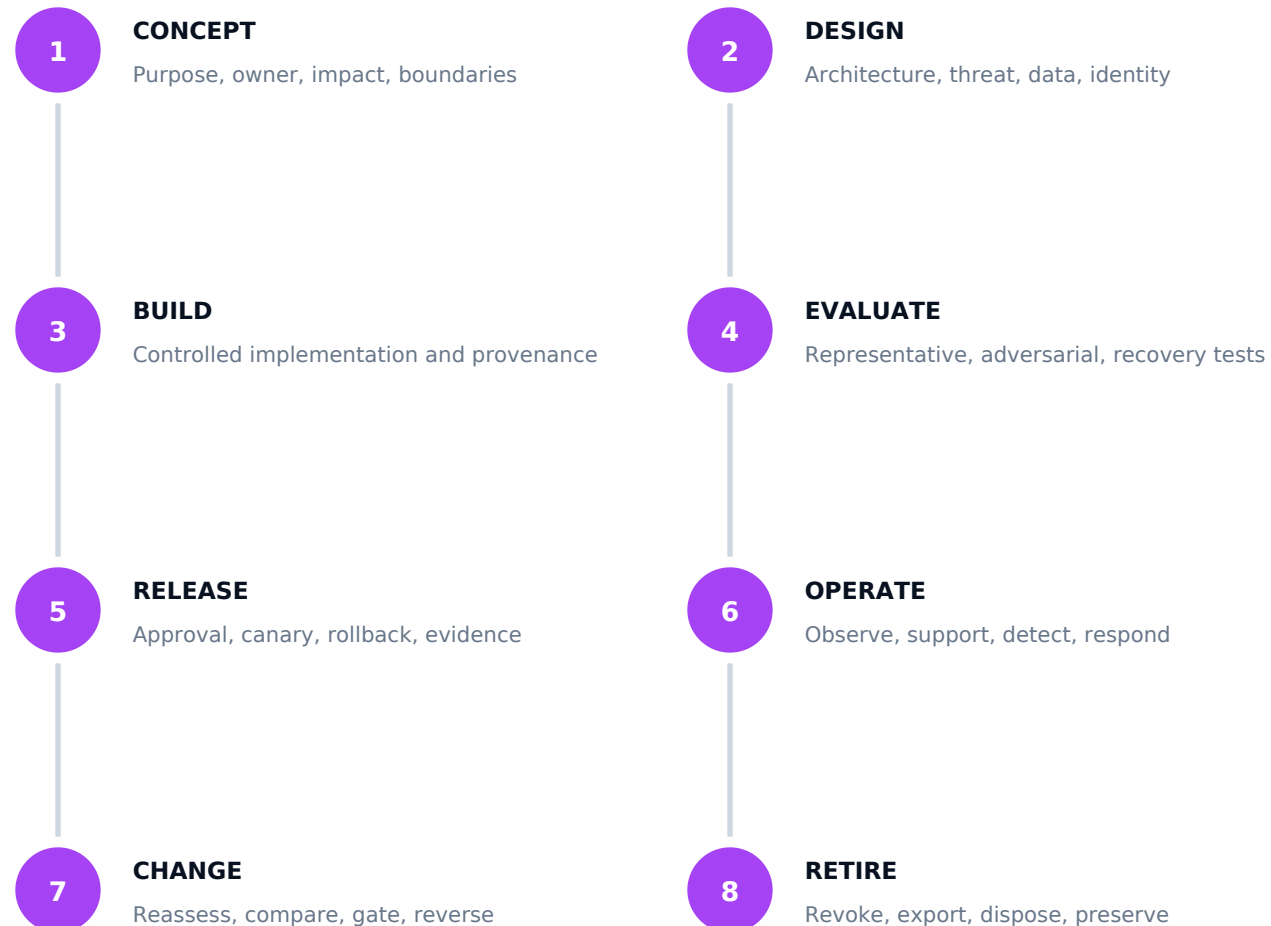
Profile selection rule

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-0005 / 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-0005 / 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.

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-0005 / 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-0005 / 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.
- SUPERSESION** 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-0005

MYTHOS SYSTEMS / ENGINEERING STANDARDS LIBRARY



ENGINEERING STANDARDS LIBRARY / EMERGING AND ADVANCED TECHNOLOGY

5G-Advanced and 6G Research Evaluation Standard

Release-aware research for 5G-Advanced and IMT-2030, including radio, core, sensing, AI-native control, security, spectrum, sustainability, and evidence.

PERMANENT DOCUMENT ID

MYTHOS-EMT-0006

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

5G-Advanced and 6G Research Evaluation Standard			DOCUMENT ID MYTHOS-EMT-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

Emerging and Advanced Technology

A trustworthy 5G-Advanced and 6G research 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

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

Executive mandate	6
Scope and applicability	7
Definitions and taxonomy	8
Architecture and trust model	9
Governance and accountability	10
Normative control system	11
Evidence and assessment	16
Assurance views and metrics	17
Failure modes and adversarial scenarios	19
Implementation profiles and lifecycle	20
Adoption roadmap and conformance	22
Source authority and revision control	24

Navigation doctrine

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

MYTHOS-EMT-0006 / EMERGING TECHNOLOGY

0. Executive Mandate

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

MANDATE

Organizations evaluating 5G-Advanced and 6G research 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 5G-Advanced and 6G research 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-EMT-0006 / 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 5G-Advanced and 6G research 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-EMT-0006 / 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.

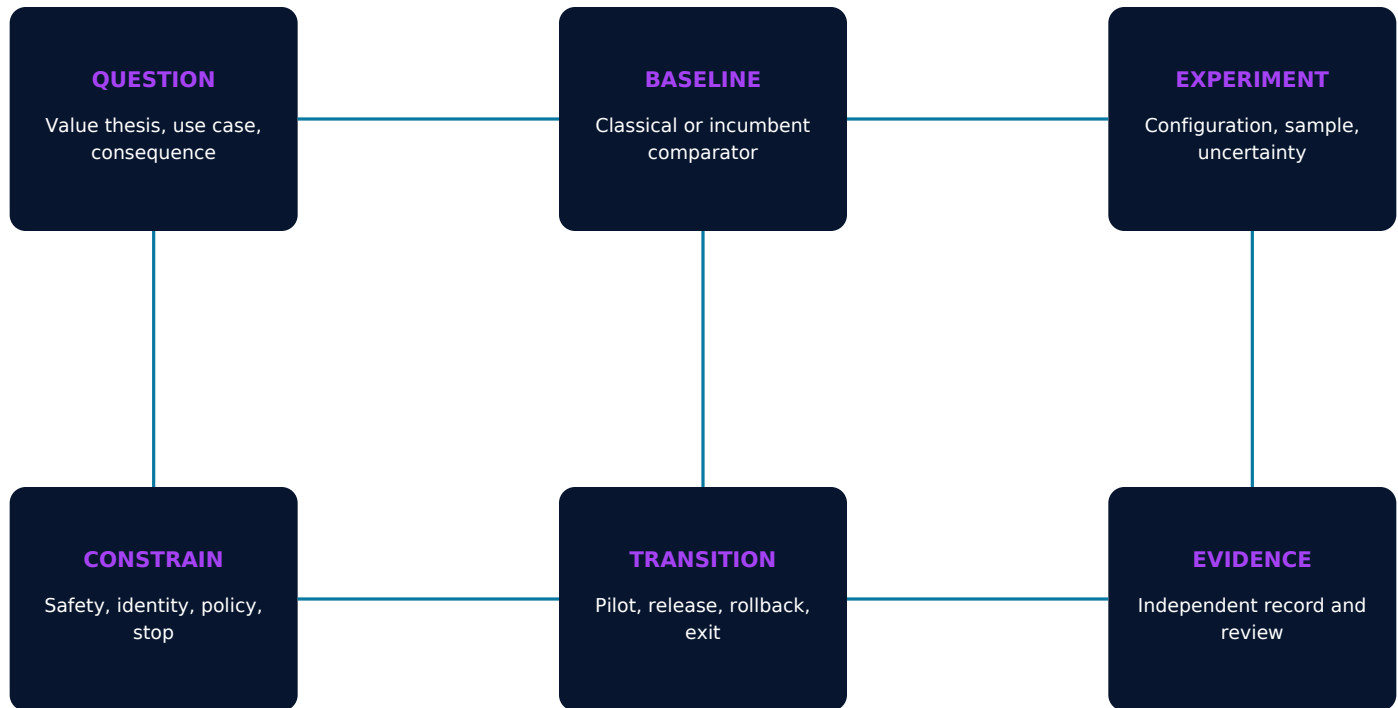
REASSESSMENT TRIGGER

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

MYTHOS-EMT-0006 / 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.

MYTHOS-EMT-0006 / EMERGING 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-EMT-0006 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-EMT-0006-C01

Standards Release, Study Item, and Feature Status

The organization **MUST** define, implement, verify, and maintain standards release, study item, and feature status for the declared 5G-Advanced and 6G research 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. 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-0006-C02

Use Case, Capability, and Service-Level Hypothesis

The organization **MUST** define, implement, verify, and maintain use case, capability, and service-level hypothesis for the declared 5G-Advanced and 6G research 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. 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-0006-C03

Spectrum, Band, Licensing, and Regulatory Boundary

The organization **MUST** define, implement, verify, and maintain spectrum, band, licensing, and regulatory boundary for the declared 5G-Advanced and 6G research 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. 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-0006-C04

Radio, Transport, Core, Edge, and Cloud Architecture

The organization **MUST** define, implement, verify, and maintain radio, transport, core, edge, and cloud architecture for the declared 5G-Advanced and 6G research 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. 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-0006 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-EMT-0006-C05**AI-Native Control, Data, and Model Governance**

The organization **MUST** define, implement, verify, and maintain ai-native control, data, and model governance for the declared 5G-Advanced and 6G research 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. 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-0006-C06**Integrated Sensing and Communication Boundary**

The organization **MUST** define, implement, verify, and maintain integrated sensing and communication boundary for the declared 5G-Advanced and 6G research 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. 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-0006-C07**Non-Terrestrial and Multi-Layer Network Integration**

The organization **MUST** define, implement, verify, and maintain non-terrestrial and multi-layer network integration for the declared 5G-Advanced and 6G research 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. 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-0006-C08**Identity, Authentication, Privacy, and Trust Model**

The organization **MUST** define, implement, verify, and maintain identity, authentication, privacy, and trust model for the declared 5G-Advanced and 6G research 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. 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-0006 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-EMT-0006-C09

Slice, QoS, Isolation, and Resource Semantics

The organization MUST define, implement, verify, and maintain slice, qos, isolation, and resource semantics for the declared 5G-Advanced and 6G research 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. 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-0006-C10

Timing, Positioning, Synchronization, and Resilience

The organization MUST define, implement, verify, and maintain timing, positioning, synchronization, and resilience for the declared 5G-Advanced and 6G research 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. 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-0006-C11

RF Exposure, Coexistence, Interference, and Safety

The organization MUST define, implement, verify, and maintain rf exposure, coexistence, interference, and safety for the declared 5G-Advanced and 6G research 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. 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-0006-C12

Digital Twin, Simulation, Channel, and Traffic Model

The organization MUST define, implement, verify, and maintain digital twin, simulation, channel, and traffic model for the declared 5G-Advanced and 6G research 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. 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-0006 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-EMT-0006-C13**Prototype, Testbed, and Vendor Interoperability**

The organization **MUST** define, implement, verify, and maintain prototype, testbed, and vendor interoperability for the declared 5G-Advanced and 6G research 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. 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-0006-C14**Performance, Coverage, Capacity, and Energy Measurement**

The organization **MUST** define, implement, verify, and maintain performance, coverage, capacity, and energy measurement for the declared 5G-Advanced and 6G research 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. 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-0006-C15**Security, Jamming, Spoofing, and Signaling Abuse**

The organization **MUST** define, implement, verify, and maintain security, jamming, spoofing, and signaling abuse for the declared 5G-Advanced and 6G research 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. 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-0006 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-EMT-0006-C16**Migration from 5G and 5G-Advanced**

The organization MUST define, implement, verify, and maintain migration from 5g and 5g-advanced for the declared 5G-Advanced and 6G research 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. 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-0006-C17**Commercial, Ecosystem, and Lifecycle Readiness**

The organization MUST define, implement, verify, and maintain commercial, ecosystem, and lifecycle readiness for the declared 5G-Advanced and 6G research 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. 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-0006-C18**Research Claim, Adoption Gate, and Reassessment**

The organization MUST define, implement, verify, and maintain research claim, adoption gate, and reassessment for the declared 5G-Advanced and 6G research 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. 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-0006 / 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-0006 / 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-0006 / 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-0006 / 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-0006 / EMERGING TECHNOLOGY

9. Implementation Profiles

Risk-proportional implementation without weakening mandatory boundaries

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

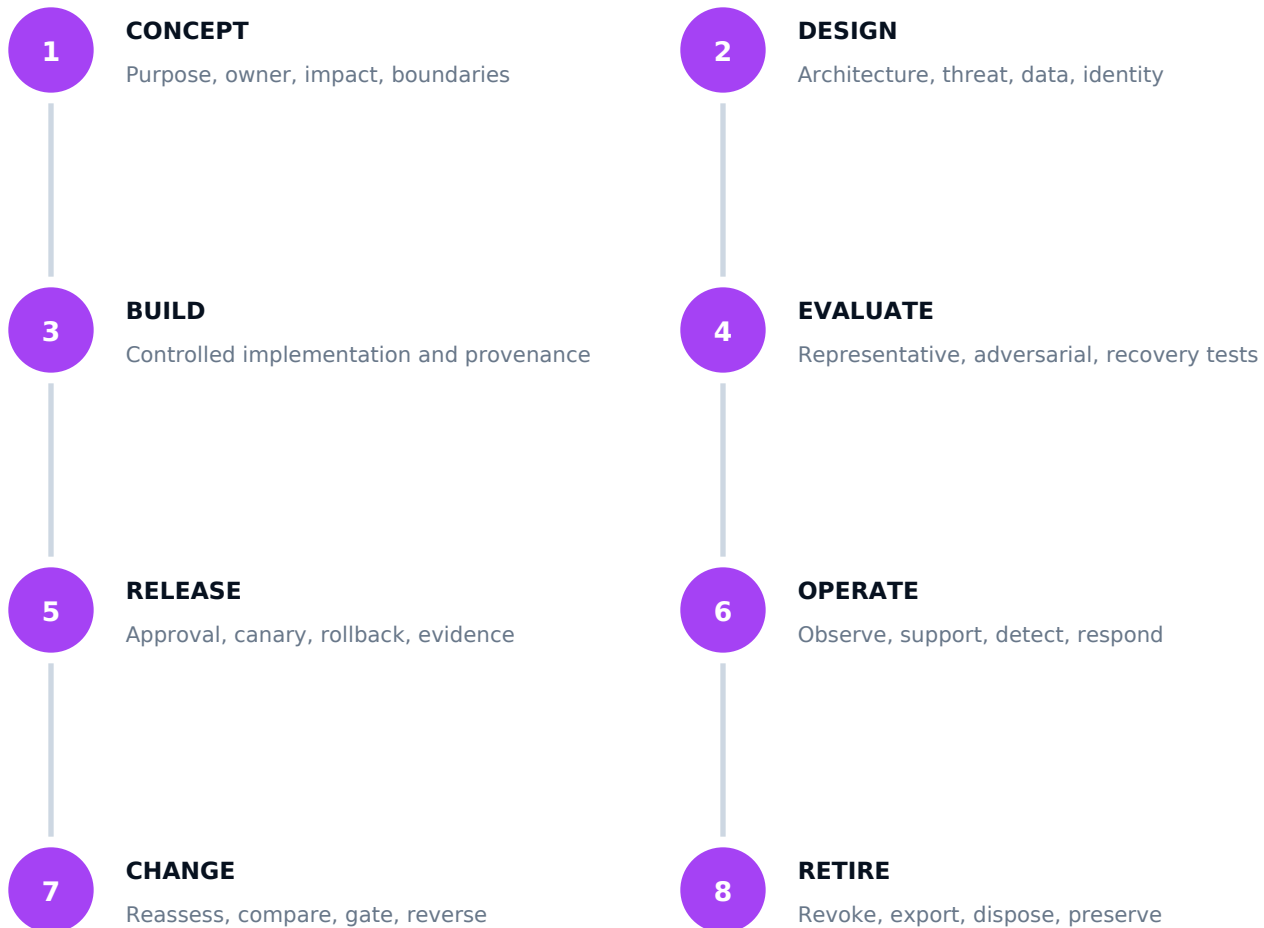
Profile selection rule

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-0006 / 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-0006 / 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-0006 / 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-0006 / 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-0006 / 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-0006
MYTHOS SYSTEMS / ENGINEERING STANDARDS LIBRARY



ENGINEERING STANDARDS LIBRARY / EMERGING AND ADVANCED TECHNOLOGY

Advanced Semiconductor, Chiplet, and Heterogeneous Integration Standard

Chiplets, advanced packaging, interconnect, memory, thermals, power, firmware, supply chain, qualification, reliability, and lifecycle assurance.

PERMANENT DOCUMENT ID

MYTHOS-EMT-0007

PUBLICATION

Candidate Standard
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

Advanced Semiconductor, Chiplet, and Heterogeneous Integration Standard			DOCUMENT ID MYTHOS-EMT-0007 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

Emerging and Advanced Technology

A trustworthy advanced semiconductor and heterogeneous integration 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

Executive mandate	6
Scope and applicability	7
Definitions and taxonomy	8
Architecture and trust model	9
Governance and accountability	10
Normative control system	11
Evidence and assessment	16
Assurance views and metrics	17
Failure modes and adversarial scenarios	19
Implementation profiles and lifecycle	20
Adoption roadmap and conformance	22
Source authority and revision control	24

Navigation doctrine

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

MYTHOS-EMT-0007 / EMERGING TECHNOLOGY

0. Executive Mandate

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

MANDATE

Organizations evaluating advanced semiconductor and heterogeneous integration **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 semiconductor and heterogeneous integration.
- 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-0007 / 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 semiconductor and heterogeneous integration.
- 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-0007 / 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.

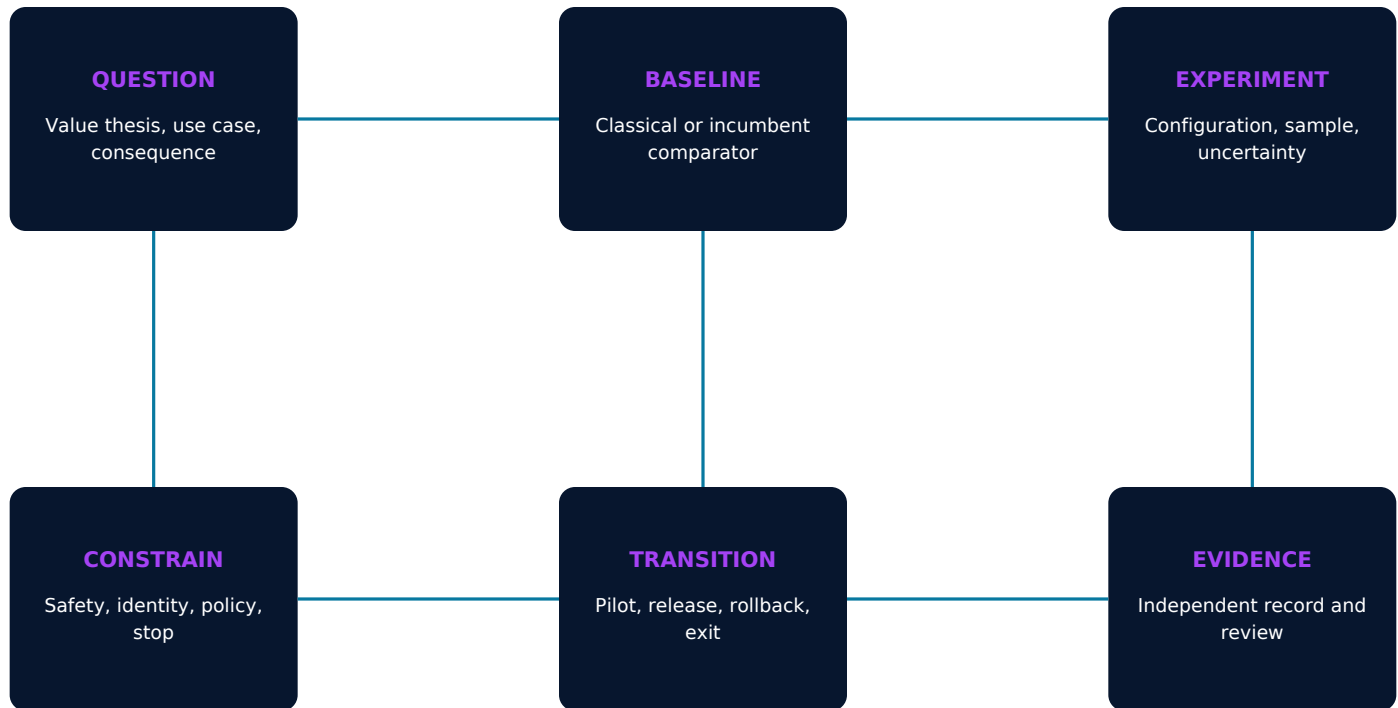
REASSESSMENT TRIGGER

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

MYTHOS-EMT-0007 / 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.

MYTHOS-EMT-0007 / EMERGING 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-EMT-0007 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 01-04 of 18

MYTHOS-EMT-0007-C01

System Architecture and Partitioning Rationale

The organization **MUST** define, implement, verify, and maintain system architecture and partitioning rationale for the declared advanced semiconductor and heterogeneous integration 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-0007-C02

Chiplet, Die, Package, and Substrate Inventory

The organization **MUST** define, implement, verify, and maintain chiplet, die, package, and substrate inventory for the declared advanced semiconductor and heterogeneous integration 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-0007-C03

Interface, Protocol, and Interoperability Contract

The organization **MUST** define, implement, verify, and maintain interface, protocol, and interoperability contract for the declared advanced semiconductor and heterogeneous integration 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-0007-C04

Process Node, Foundry, and Manufacturing Authority

The organization **MUST** define, implement, verify, and maintain process node, foundry, and manufacturing authority for the declared advanced semiconductor and heterogeneous integration 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-0007 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 05-08 of 18

MYTHOS-EMT-0007-C05

Package Design, Signal, Power, and Thermal Integrity

The organization MUST define, implement, verify, and maintain package design, signal, power, and thermal integrity for the declared advanced semiconductor and heterogeneous integration 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-0007-C06

High-Bandwidth Memory and Coherent Memory Boundary

The organization MUST define, implement, verify, and maintain high-bandwidth memory and coherent memory boundary for the declared advanced semiconductor and heterogeneous integration 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-0007-C07

Die-to-Die Security, Identity, and Isolation

The organization MUST define, implement, verify, and maintain die-to-die security, identity, and isolation for the declared advanced semiconductor and heterogeneous integration 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-0007-C08

Firmware, Microcode, and Initialization Trust

The organization MUST define, implement, verify, and maintain firmware, microcode, and initialization trust for the declared advanced semiconductor and heterogeneous integration 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-0007 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 09-12 of 18

MYTHOS-EMT-0007-C09 Test Access, Debug, Scan, and Lifecycle Security

The organization MUST define, implement, verify, and maintain test access, debug, scan, and lifecycle security for the declared advanced semiconductor and heterogeneous integration 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-0007-C10 Supply Chain, Provenance, Counterfeit, and Tamper Control

The organization MUST define, implement, verify, and maintain supply chain, provenance, counterfeit, and tamper control for the declared advanced semiconductor and heterogeneous integration 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-0007-C11 Known-Good-Die and Assembly Yield Evidence

The organization MUST define, implement, verify, and maintain known-good-die and assembly yield evidence for the declared advanced semiconductor and heterogeneous integration 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-0007-C12 Performance, Latency, Bandwidth, and Energy Benchmark

The organization MUST define, implement, verify, and maintain performance, latency, bandwidth, and energy benchmark for the declared advanced semiconductor and heterogeneous integration 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-0007 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 13-15 of 18

MYTHOS-EMT-0007-C13**Reliability, Aging, Electromigration, and Fault Testing**

The organization **MUST** define, implement, verify, and maintain reliability, aging, electromigration, and fault testing for the declared advanced semiconductor and heterogeneous integration 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-0007-C14**Cooling, Power Delivery, Facility, and Sustainability**

The organization **MUST** define, implement, verify, and maintain cooling, power delivery, facility, and sustainability for the declared advanced semiconductor and heterogeneous integration 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-0007-C15**Repair, Rework, Spare, and Field Replacement Strategy**

The organization **MUST** define, implement, verify, and maintain repair, rework, spare, and field replacement strategy for the declared advanced semiconductor and heterogeneous integration 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-0007 / EMERGING TECHNOLOGY

5. Normative Control System

Atomic criteria 16-18 of 18

MYTHOS-EMT-0007-C16**Export, Licensing, Intellectual Property, and Supplier Risk**

The organization MUST define, implement, verify, and maintain export, licensing, intellectual property, and supplier risk for the declared advanced semiconductor and heterogeneous integration 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-0007-C17**Qualification, Change Notification, and Revalidation**

The organization MUST define, implement, verify, and maintain qualification, change notification, and revalidation for the declared advanced semiconductor and heterogeneous integration 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-0007-C18**End-of-Life, Sanitization, and Evidence Preservation**

The organization MUST define, implement, verify, and maintain end-of-life, sanitization, and evidence preservation for the declared advanced semiconductor and heterogeneous integration 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-0007 / 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-0007 / 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-0007 / 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-0007 / 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-0007 / 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.
---	---	---

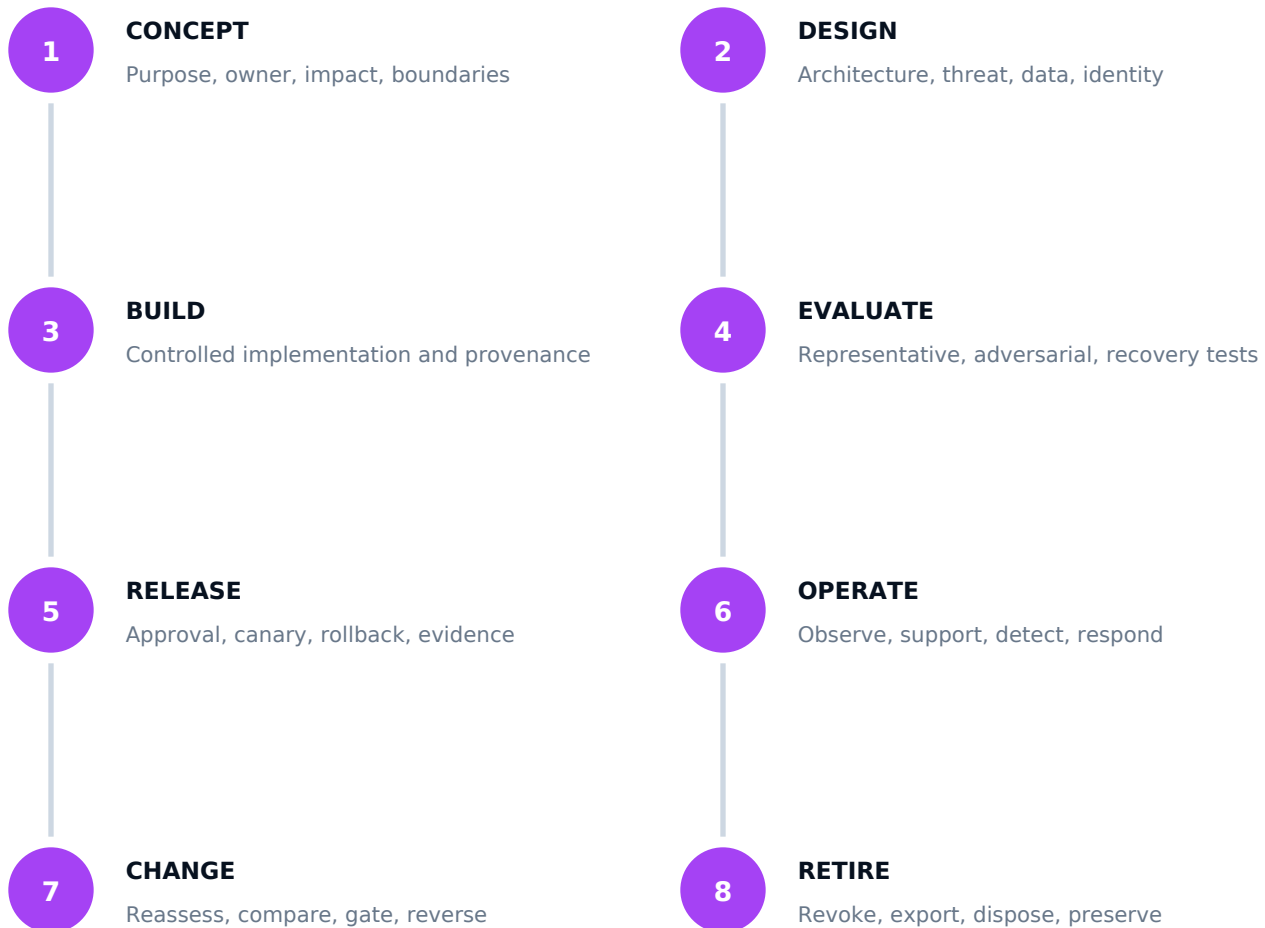
Profile selection rule

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-0007 / 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-0007 / 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-0007 / 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-0007 / 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-0007 / 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-0007
MYTHOS SYSTEMS / ENGINEERING STANDARDS LIBRARY