



ENGINEERING STANDARDS LIBRARY / EMERGING AND ADVANCED TECHNOLOGY

Emerging and Advanced Technology Research and Adoption Annex

Research questions, evidence gaps, adoption hypotheses, field studies, and transition agenda across EMT, QTC, and ROB.

PERMANENT DOCUMENT ID

MYTHOS-EMERGING-RES-ANNEX-0001

PUBLICATION

Candidate Research and Adoption Annex
Version 1.0.0-candidate

ASSURANCE PROFILE

Research / Pilot / Transition
High Assurance

PERMANENT PUBLICATION IDENTITY

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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 research and adoption annex 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.

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Research Position

Research questions, evidence gaps, adoption hypotheses, field studies, and transition agenda across EMT, QTC, and

OPERATING POSITION

This annex distinguishes stable practice, active standardization, reproduced research, provider claims, implementation hypotheses, and open questions.

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Priority Questions

OPERATING POSITION

Which advanced technologies deliver application-level value after equivalent baseline, energy, facility, support, and lifecycle accounting?

- Which quantum, photonic, neuromorphic, DePIN, 6G, and embodied-AI claims can be independently reproduced?
- How can safety, cryptographic trust, physical control, and human intervention remain enforceable during rapid adaptation?

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Field Studies

OPERATING POSITION

Run matched classical, incumbent, and emerging implementations.

- Measure quality, uncertainty, latency, energy, safety, security, maintenance, skills, cost, lock-in, rollback, and exit.

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Adoption Evidence

OPERATING POSITION

Collect time-to-value, experiment reproducibility, pilot escape, incident rate, recovery quality, support burden, ecosystem maturity, and retirement success.

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Research Ethics and Safety

OPERATING POSITION

Do not test on people, public infrastructure, airspace, spectrum, industrial process, cryptographic trust, or autonomous physical systems without explicit authority and bounded stop conditions.

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Publication Controls and Decision Record

Permanent identity, evidence, exceptions, and revision discipline

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

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11. Source Authority and Reference Register

Primary sources informing interpretation; verify current status at assessment time

NIST CSF 2.0

Cybersecurity Framework 2.0

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

Enterprise governance and cybersecurity outcome framework.

NIST Integrated Photonics

Integrated Photonics Program and Metrology

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

Primary research and measurement work for heterogeneous integrated photonic devices.

NIST SP 800-53 Rev. 5

Security and Privacy Controls for Information Systems and Organizations

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

Broad organizational control baseline for technology systems and services.

ITU-R M.2160

Framework and Overall Objectives for IMT-2030

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

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

NIST PQC Project

Post-Quantum Cryptography Standardization and Migration

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

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

ETSI ISG PDL

Permissioned Distributed Ledger Specifications

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

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

IEEE P3706

Guide for Brain-Inspired Computing Technologies

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

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

3GPP Release 20

5G-Advanced Studies and 6G Study Roadmap

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

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

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