The Digital Audio Assets Protocol (DAAP)

A Protocol for Structuring, Preserving, and Distributing Session-Derived Music Assets

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Abstract

The Digital Audio Assets Protocol (DAAP) is a standard-based framework for defining, packaging, and distributing modern musical works as structured digital assets rather than flat audio files. Contemporary music production is inherently systemic, emerging from complex environments composed of digital audio workstations, plugin chains, routing architectures, automation systems, hybrid hardware, and increasingly, AI-assisted tools. However, prevailing distribution formats preserve only the rendered waveform, collapsing the production environment and externalizing attribution, provenance, and structural identity.

DAAP addresses this structural limitation by introducing a containerized asset model that binds audio payloads to a canonical manifest and an integrity layer. The canonical manifest captures the essential structure of the session environment, including track topology, routing summaries, plugin chain identities, contributor roles, rights pointers, and provenance, in a durable, machine-readable form. The integrity layer enables independent verification and authentication of the asset across distribution systems, archives, and future playback environments.

INTRODUCTION

Music production has undergone a profound structural transformation. What was once a linear, tool-bounded process centered around isolated recordings has evolved into a complex, systemic environment composed of interdependent digital and physical components. Today's musical works emerge from digital audio workstations, plugin chains, synthesis engines, routing architectures, automation systems, hybrid hardware, and increasingly, AI-assisted tools. These components do not merely support the creative process, they *define* it. They shape the identity, behavior, and long-term value of the work.

Yet despite this evolution, the industry continues to distribute music as if it were still produced in the era of tape and consoles. The rendered audio file, WAV, AIFF, FLAC, MP3, remains the canonical unit of distribution. These formats were designed to preserve *sound*, not *structure*. They carry the final waveform but discard the production system that created it. They cannot represent session topology, plugin identities, routing relationships, automation logic, contributor roles, or provenance. They cannot express the creative and technical decisions that shape the work. They cannot survive the complexity of modern production.

This mismatch, between systemic production and flat-file distribution, is no longer a minor inconvenience. It is a structural failure with far-reaching consequences. When the production system collapses into a single waveform, attribution becomes optional, provenance becomes fragile, and identity becomes externalized. Metadata becomes a patchwork of optional fields scattered across DAWs, distributors, and platforms, none of which can reliably survive editing, transcoding, or archival migration. The result is a persistent erosion of trust, transparency, and economic clarity.

At the same time, the industry is entering a new era of session-aware, context-preserving digital assets. These assets do not treat the waveform as the whole story. They recognize that the structure of the production environment, the topology of the session, the identities of the tools, the lineage of the work, is essential to understanding, valuing, and preserving the music itself. As these assets move from concept to deployment, the limitations of flat files become more than a technical inconvenience; they become a barrier to innovation, attribution, and long-term industry health.

The Digital Audio Assets Protocol (DAAP) is designed to address this structural gap. DAAP introduces a standards-based, containerized asset model that preserves the essential structure of the production environment in a durable, interoperable form. It binds audio payloads to a canonical manifest and an integrity layer, ensuring that identity, provenance, and production topology remain attached to the work itself, not scattered across external systems or lost in translation.

DAAP is not a DAW format, not a plugin host, and not a DRM system. It does not attempt to recreate the full editing environment or expose proprietary DSP algorithms. Instead, it preserves the approved, distributable representation of the session, the structural information necessary for attribution, provenance, and long-term interpretability, while remaining compatible with existing distribution standards such as DDEX, ISRC, and EBU metadata frameworks.

As the industry confronts the challenges of AI-mediated production, dynamic rendering, and large-scale catalog operations, the need for durable, asset-bound identity becomes urgent. DAAP provides the technical foundation required for transparent attribution, verifiable provenance, and future-proof distribution. It is the missing layer between the studio and the ecosystem, the structural substrate upon which the next generation of music infrastructure will be built.

SECTION 1: THE PROBLEM WITH FLAT-FILE DISTRIBUTION

The modern music industry continues to rely on a distribution model built around a fundamental assumption: that a rendered audio file is the complete and authoritative representation of a musical work. This assumption made sense in an era when recordings were produced through linear workflows and fixed hardware chains. But in today's environment, where music is created

through complex, interdependent digital systems, the flat audio file has become a structural bottleneck.

A WAV or AIFF file is excellent at preserving the *sound* of a finished mix. It is not designed to preserve the *system* that produced it. When a session is rendered to a flat file, the entire production topology collapses into a single waveform. The relationships, decisions, tools, and structures that define the work disappear. This collapse is not a minor technical detail; it is the root cause of attribution loss, metadata fragility, and long-term interpretability failures across the industry.

1.1 The Collapse of Production Topology

A rendered audio file cannot represent:

- the track and stem structure
- routing relationships
- plugin chain identities
- automation and control logic
- tool usage and contribution pathways
- the lineage of decisions that shaped the sound
- the context in which the work was created

These elements are not optional. They are the *production topology*, the structural identity of the work. When topology collapses, attribution collapses with it. The tools and contributors that shaped the music become invisible. The decisions that define the work become irretrievable. The production environment becomes untraceable.

This is why metadata loss is not a metadata problem; it is a topology problem. No number of optional metadata fields can compensate for the structural collapse that occurs when a session is flattened into a waveform.

1.2 Distribution-Stage Degradation

Even when metadata is present in a rendered file, it rarely survives the distribution pipeline intact. During ingestion, transcoding, and repackaging:

- iXML and BWF metadata are often stripped
- platform-specific schemas overwrite or truncate fields
- distributor pipelines normalize or discard nonstandard chunks
- attribution is reconstructed externally rather than preserved internally
- provenance becomes dependent on external databases

This creates a fragile, inconsistent ecosystem where identity is maintained through reconciliation rather than through the asset itself. The result is a persistent erosion of trust and transparency.

1.3 The Structural Consequences

The consequences of flat-file distribution are systemic:

- **Attribution gaps** - contributors and tools disappear from the asset.
- **Economic opacity** - valuation becomes guesswork rather than evidence-based.

- **Catalog instability** - provenance cannot be reliably demonstrated.
- **Archival fragility** - future systems cannot interpret the work's structure.
- **AI indistinguishability** - without provenance, human and machine outputs blur.
- **Platform dependency** - identity becomes externalized and platform-controlled.

These failures are not the result of bad metadata practices. They are the result of a distribution model that cannot carry the structure of modern production.

1.4 Diagram: Flat-File Distribution vs DAAP Distribution

Diagram 1.4a and 1.4b illustrates the structural difference between traditional flat-file distribution and DAAP's session-aware asset model.

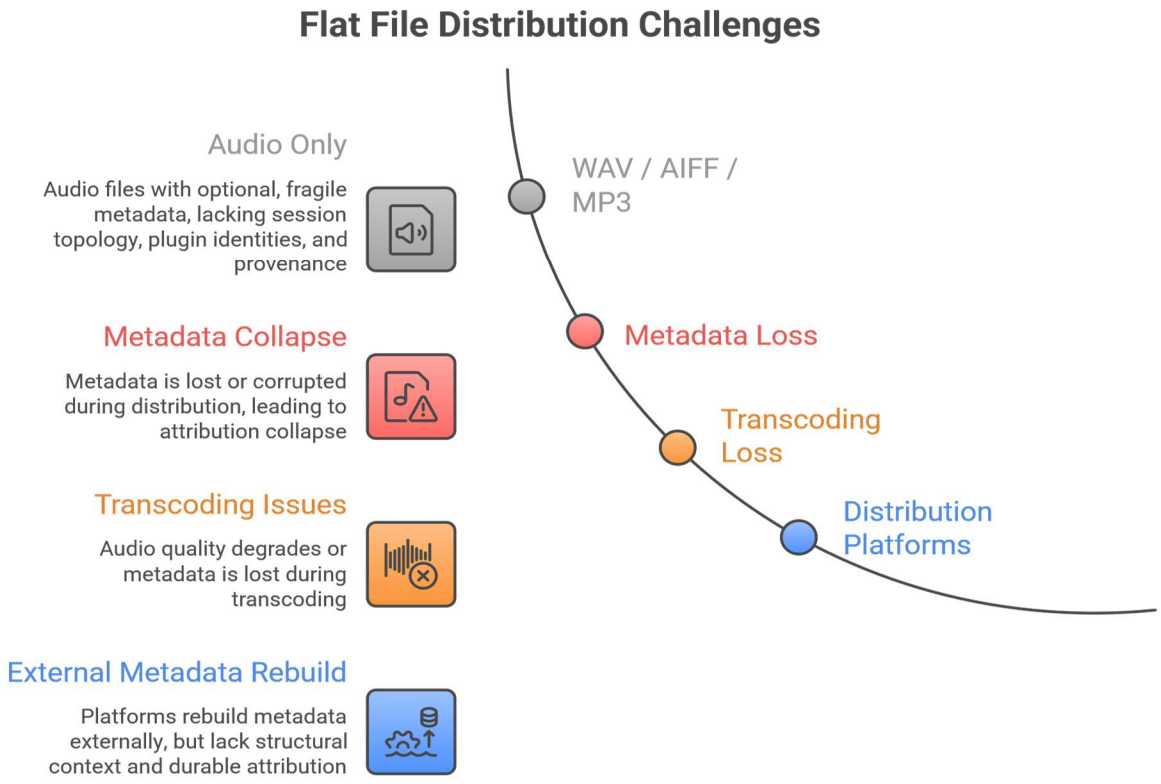


Illustration 1.4a

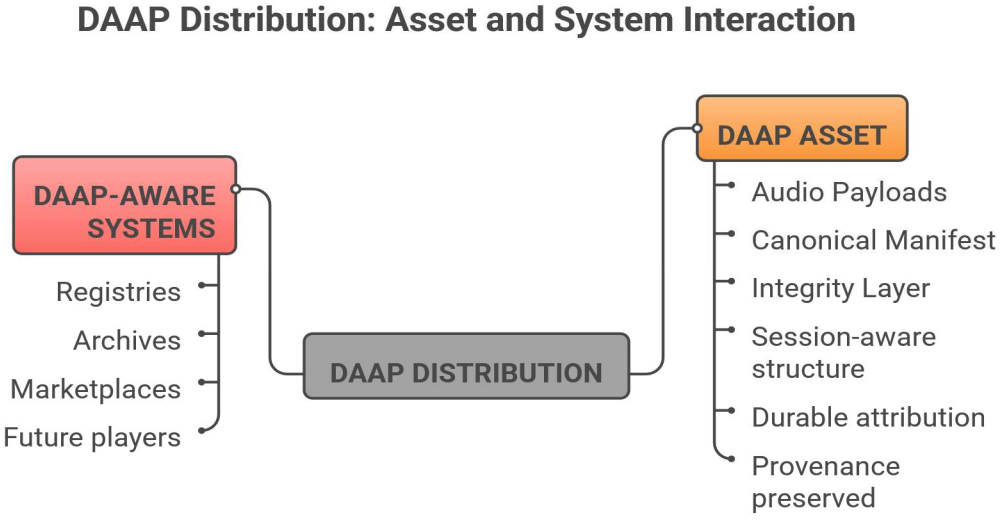


Illustration 1.4b

1.5 Why This Problem Cannot Be Solved by Metadata Alone

Attempts to solve attribution and provenance through metadata alone, whether through BWF, iXML, XMP, or platform-specific schemas LIKE CP2A, fail for three reasons:

1. **Metadata is optional**
   If it is not required, it will not be consistently present.

2. **Metadata is fragile**
   It is routinely stripped, overwritten, or truncated during distribution.

3. **Metadata is externalized**
   It lives in separate systems, not in the asset itself.

DAAP addresses these failures by making identity, structure, and provenance **intrinsic to the asset**, not external to it.

SECTION 2: DAAP PROTOCOL OVERVIEW

The Digital Audio Assets Protocol (DAAP) defines a new foundational unit for music distribution: the session-derived digital asset. Unlike traditional audio files, which preserve only the final waveform, a DAAP asset preserves the structural, contextual, and attributional information that defines how the work was created. DAAP does this through a standards-based container model that binds audio payloads to a canonical manifest and an integrity layer, ensuring

that identity and provenance remain attached to the asset across every stage of its lifecycle.

DAAP is not a DAW format, not a plugin host, and not a replacement for existing distribution standards. It does not attempt to recreate the full editing environment or expose proprietary DSP algorithms. Instead, DAAP captures the approved, distributable representation of the session, the structural information necessary for attribution, provenance, and long-term interpretability, in a durable, interoperable form.

At its core, DAAP defines three interlocking components:

1. **Audio Payloads**
   The distributable audio representations of the work, including the master mix, session-derived stems, and optional preview assets. These payloads are the audible expression of the asset.

2. **Canonical Manifest**
   A machine-readable, schema-versioned document that captures the structural identity of the work: contributor roles, session topology, plugin chain identities, rights pointers, provenance, and versioning. The manifest is the authoritative definition of the asset.

3. **Integrity Layer**
   A set of cryptographic hashes, optional digital signatures, and verification metadata that ensure the asset can be authenticated, validated, and trusted across distribution systems, archives, and future playback environments.

Together, these components form self-describing, self-verifying digital objects that can survive editing, transcoding, ingestion, redistribution, and archival migration without losing its identity or structural meaning.

DAAP is designed to be implementation-agnostic. It does not prescribe how DAWs must operate, how plugins must be built, or how distributors must ingest assets. Instead, it defines the minimum structural guarantees required for a musical work to be considered a DAAP asset. This ensures that the protocol can be adopted incrementally, without disrupting existing workflows or requiring immediate industry-wide changes.

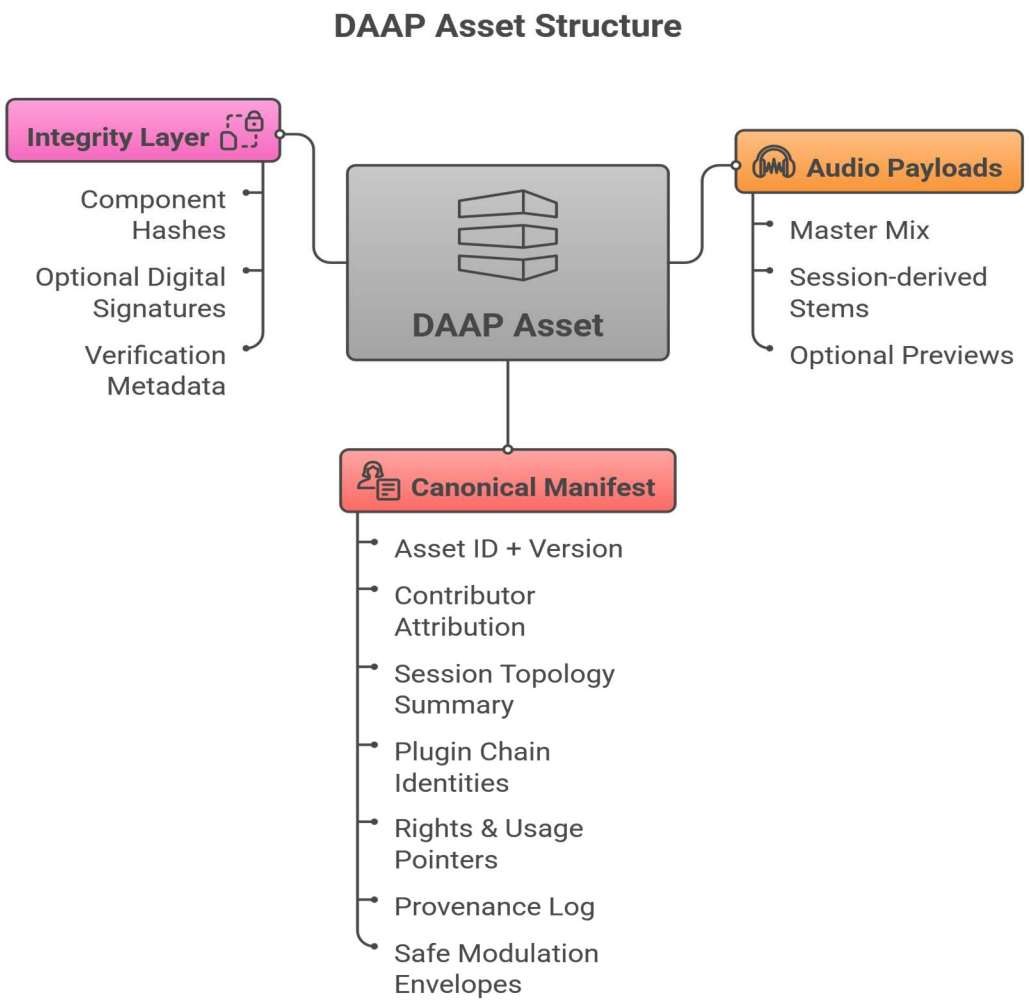
DAAP also establishes clear protocol boundaries. It does not define pricing, licensing, valuation, or economic participation. These are governance-level decisions that belong to the consortium. DAAP provides the technical substrate upon which attribution standards, valuation frameworks, and ethical guidelines can be built, but it does not dictate those frameworks itself.

By defining music as a structured digital asset rather than a flat file, DAAP enables a new generation of tools, registries, archives, and marketplaces to operate with clarity, transparency, and long-term stability. It provides the missing layer of infrastructure required for session-aware distribution, durable attribution, and verifiable provenance.

2.1 DAAP Asset Structure

A DAAP asset is defined as a **self-contained, session-derived digital object** composed of three tightly bound components: audio payloads, a canonical manifest, and an integrity layer. This structure replaces the traditional flat audio file as the unit of distribution, ensuring that the audible output of a work is inseparable from the structural, attributional, and provenance information that defines how the work was created. Each component serves a distinct role, but the asset derives its meaning and durability from their combined operation as a single, verifiable object.

The following diagram illustrates the core components of a DAAP asset:



2.2 Why DAAP Is a Protocol, Not a Product

DAAP is intentionally defined as a protocol rather than a product or platform. This distinction is essential:

- A product is controlled by a single entity.
- Protocol is governed collectively and implemented broadly.

DAAP's role is to define the rules of structure, identity, and verification, not to enforce licensing, dictate business models, or prescribe playback behavior. This separation ensures that DAAP remains neutral, extensible, and compatible with diverse tools and workflows.

2.3 Protocol Guarantees

DAAP provides the following guarantees:

- **Durable attribution** - contributor roles and tool identities remain attached to the asset.
- **Structural preservation** - session topology is captured in canonical form.
- **Provenance continuity** - the lineage of the work is recorded and verifiable.
- **Interoperability** - assets can be mapped into existing standards (DDEX, ISRC, EBU).
- **Long-term interpretability** - future systems can understand the asset without the original DAW or plugins.
- **Integrity and trust** - assets can be authenticated and validated independently.

These guarantees form the foundation for the next generation of music distribution and archival systems.

SECTION 3: DAAP ASSET ARCHITECTURE

The Digital Audio Assets Protocol defines a structured, session-derived digital object that preserves the essential identity, topology, and provenance of a musical work. This object, the DAAP asset, is the foundational unit of distribution in the DAAP ecosystem. It is designed to survive editing, transcoding, ingestion, redistribution, and archival migration without losing the structural meaning of the work.

A DAAP asset is composed of three interlocking components:

1. **Audio Payloads**
2. **Canonical Manifest**
3. **Integrity Layer**

Together, these components form a self-describing self-verifying, session-aware digital asset that can be interpreted by future systems without requiring the original DAW, plugins, or hardware.

3.1 Audio Payloads

The audio payloads are the audible expressions of the work. They include:

- the master mix
- session-derived stems
- optional preview assets
- optional alternate mixes (if authorized)

These payloads are not arbitrary exports. They are **canonicalized representations** of the session, produced through a controlled print-down process that freezes plugin outputs, captures approved parameter states, and ensures that the audio reflects the intended, distributable version of the work.
DAAP does not attempt to recreate the full editing environment. Instead, it preserves the frozen DSP outputs that define the sound of the work at the moment of publication.

3.2 Canonical Manifest

The canonical manifest is the authoritative definition of the asset. It is a machine-readable, schema-versioned document that captures the structural identity of the work. The manifest includes:

- **Contributor Attribution**
  Artists, producers, engineers, mixers, mastering engineers, and other contributors.

- **Session Topology Summary**
  Track structure, stem-mapping, routing relationships, and groupings.

- **Plugin Chain Identities**
  Plugin IDs, versions, vendors, and chain order - not binaries or proprietary DSP.

- **Rights & Usage Pointers**
  ISRC, ISWC, DDEX mappings, license references, and registry identifiers.

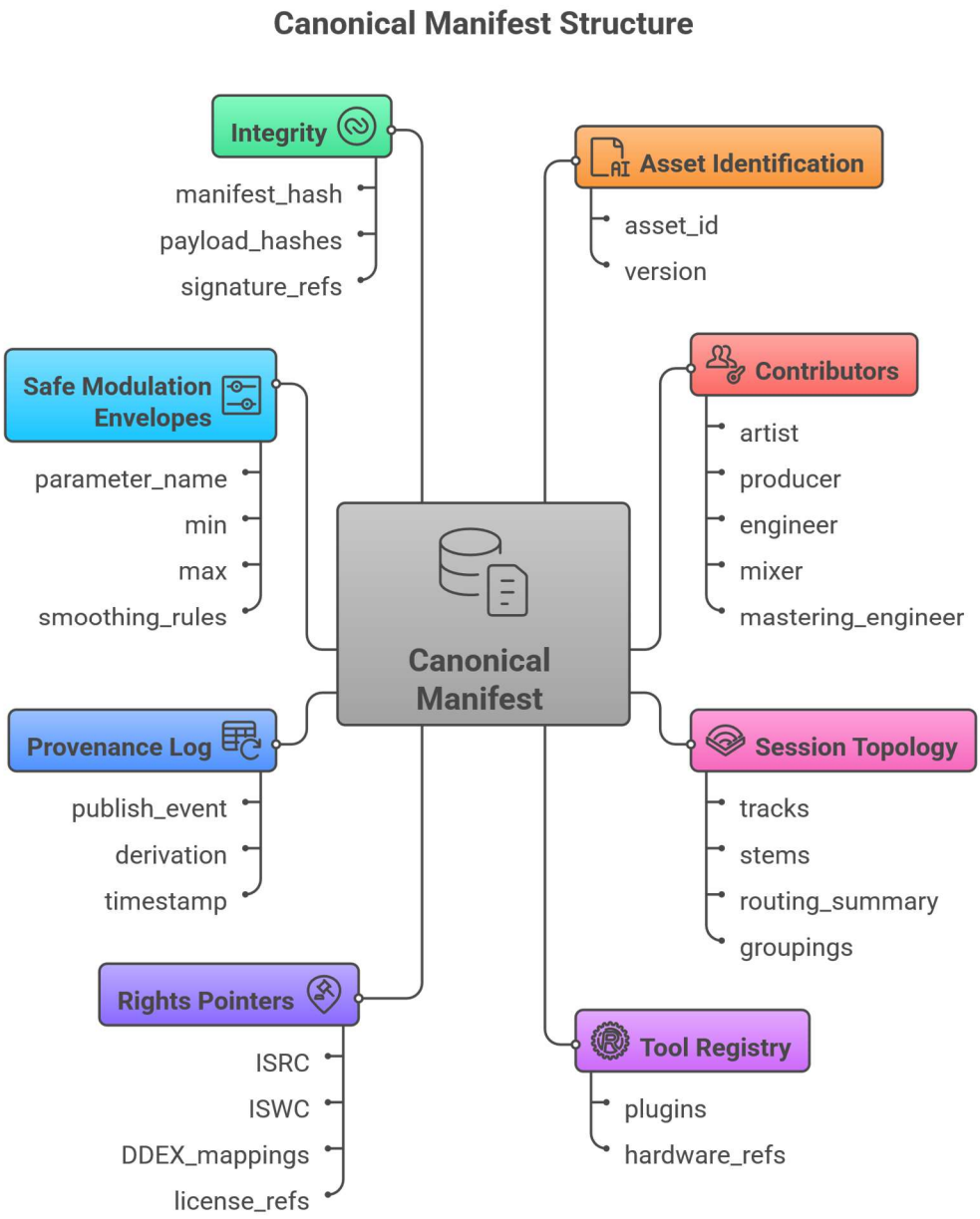
- **Provenance Log**
  Publish events, derivations, timestamps, and lineage.

- **Versioning**
  Asset version, manifest version, and schema version.

- **Optional Dynamic Envelopes**
  Artist-approved modulation ranges for future presentation-layer transformations.

The manifest is not a DAW session file. It is a canonicalized representation of the session environment, the structural information necessary for attribution, provenance, and long-term interpretability.

Diagram: 3.2 Canonical Manifest Schema



3.3 Integrity Layer

The integrity layer ensures that a DAAP asset can be authenticated, validated, and trusted across its entire lifecycle. It includes:

- **Component Hashes**
  Cryptographic hashes for each audio payload and the manifest.

- **Optional Digital Signatures**
  Publisher signatures, contributor signatures, or registry signatures.

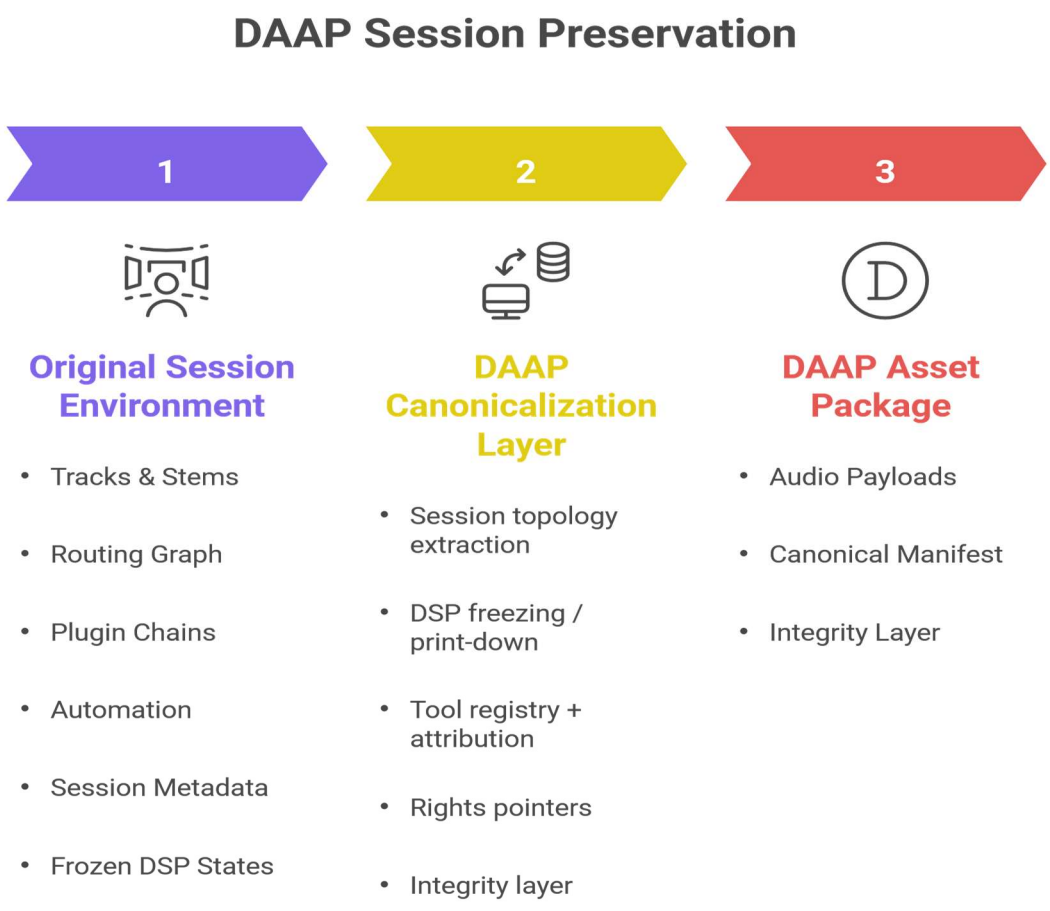
- **Verification Metadata**
  Information required to validate the asset independently.

The integrity layer does not enforce DRM. It provides tamper detection, not access control. Its purpose is to ensure that the asset remains authentic and unaltered, regardless of where it travels.

3.4 How DAAP Preserves the Session Environment

DAAP preserves the session environment not by embedding the DAW project file or plugin binaries, but by capturing the canonicalized structure of the session, the topology, identities, and frozen DSP outputs that define the work.

This allows future DAAP-aware systems to reconstruct the approved, distributable representation of the session, even if the original tools no longer exist.
Diagram: How DAAP Preserves the Session Environment



3.5 DAAP vs DAW Session

To clarify the distinction between creation and distribution, DAAP defines a distributable environment, not an editable one.
Diagram: DAAP vs DAW Session (Canonicalized vs Editable Environment)

DAW Session vs. DAAP Asset

Characteristic	DAW Session	DAAP Asset
Track List	Editable	Session Topology Summary
Plugin Chains	Live, Executable	Plugin Chain Identities
Automation Curves	Editable	Frozen DSP Outputs
Routing Graph	Dynamic, DAW-Specific	Session-Derived Stems + Master
Plugin Binaries + Presets	Included	Contributor Attribution
Hardware Dependencies	Present	Rights Pointers
Proprietary Session Format	Used	Provenance Log
		Integrity Layer

Table 3.5

DAAP does not replace the DAW.
It replaces the **flat file** as the unit of distribution.

Modern music production environments are extraordinarily complex. A DAW session contains editable tracks, live plugin chains, automation curves, routing graphs, hardware dependencies, and proprietary project structures. These elements form the creative environment in which music is made, but they are not suitable for distribution, preservation, or long-term interpretability.

DAAP does not attempt to replicate or replace the DAW. Instead, it defines a distributable representation of the session, one that captures the structural identity of the work without requiring the full editing environment. This distinction is essential: DAAP is not an authoring format; it is a publishing format.

A DAW session is inherently:

- **editable**
- **proprietary**
- **tool-dependent**
- **non-portable**
- **fragile across time**
- **unsuitable for distribution**

A DAAP asset is intentionally:

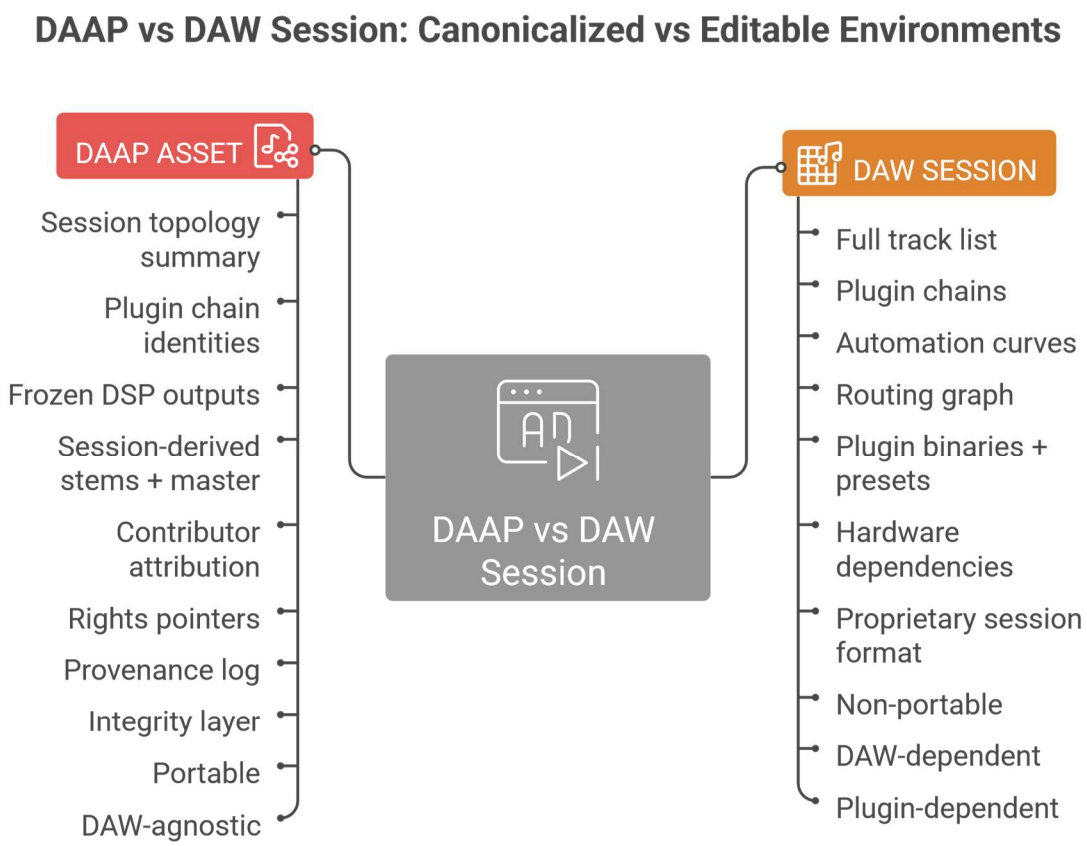
- **canonicalized**
- **portable**
- **DAW-agnostic**
- **plugin-agnostic**
- **durable across time**
- **suitable for distribution and archival**

DAAP preserves the *structure* of the session, not the *mechanics* of the DAW. It captures the topology, identities, and frozen DSP outputs that define the work, while excluding proprietary elements such as plugin binaries, presets, or DAW-specific editing constructs.

This approach ensures that future DAAP-aware systems can reconstruct the approved, distributable representation of the session without requiring the original tools. It also ensures that the asset remains interpretable decades into the future, even if the DAW, plugins, or hardware used to create it no longer exist.

The distinction between the editable environment and the distributable environment is illustrated below.

Illustration 3.5



SECTION 4: WHY DAAP MUST BE A PROTOCOL

DAW project files are not designed for distribution. They contain:

- proprietary data structures
- plugin-specific state
- hardware-dependent configurations
- non-standardized routing graphs
- undo history

- temporary states
- incomplete or experimental edits

These elements are essential for creation but irrelevant, and often harmful, for distribution. They introduce fragility, incompatibility, and long-term risk.

DAAP solves this by defining a canonicalized, distributable representation of the session that:

- preserves the structure
- freezes the DSP outputs
- identify the tools
- captures the attribution
- records the provenance
- ensures integrity

...without requiring the original editing environment.

4.1 Why DAAP Must Preserve the Session Environment

DAAP preserves the session environment because:

- attribution depends on tool usage
- provenance depends on lineage
- valuation depends on contribution modeling
- AI interpretability depends on structural context
- archival stability depends on topology
- Future playback depends on canonicalized structure

A flat file cannot support these requirements.

A DAW session cannot be distributed. DAAP fills the gap.

4.2 DAAP as the Successor to the Flat File

DAAP is not a replacement for the DAW. It is a replacement for the flat file as the unit of distribution.
Where the flat file collapses structure, DAAP preserves it.
Where the flat file externalizes identity, DAAP binds it.
Where the flat file loses provenance, DAAP records it.
Where the flat file cannot survive the future, DAAP is designed for it.
DAAP is the first format built for the reality of modern production, and the future of music information technology.

SECTION 5: INTEROPERABILITY & STANDARDS ALIGNMENT

The Digital Audio Assets Protocol is designed to strengthen, not disrupt, the existing music-industry standards ecosystem. DAAP does not replace DDEX, ISRC, ISWC, EBU metadata frameworks, or platform-specific ingestion schemas. Instead, it provides the structural substrate that these systems have always lacked: a durable, asset-bound representation of the production environment.

Today's metadata and rights systems operate out-of-band relative to the audio file. They rely on external databases, ingestion pipelines, and reconciliation

processes to maintain identity and attribution. This approach works only as long as the audio file remains stable and the metadata remains intact, conditions that are increasingly difficult to guarantee in a world of dynamic rendering, AI-mediated workflows, and large-scale catalog operations.

DAAP addresses this fragility by binding identity, structure, and provenance directly to the asset. It ensures that the information required for attribution, rights management, and long-term interpretability travels *with* the work, not separately from it. This makes DAAP a natural complement to existing standards, providing the missing layer of structural integrity that enables those standards to function more reliably.

5.1 Alignment with DDEX

DDEX standards such as RIN (Recording Information Notification) and ERN (Electronic Release Notification) define how metadata is exchanged between labels, distributors, and platforms. They do not define how that metadata is preserved inside the asset itself.
DAAP fills this gap by:

- capturing contributor roles and tool usage in the canonical manifest
- providing stable identifiers that can be mapped into DDEX fields
- ensuring that attribution survives beyond the ingestion pipeline
- enabling DDEX-compliant systems to validate the asset's provenance

DAAP does not replace DDEX. It strengthens it by ensuring that the metadata DDEX expects is structurally tied to the asset.

5.2 Alignment with ISRC and ISWC

ISRC and ISWC identifiers remain essential for recording and composition identity. DAAP does not alter or replace these identifiers. Instead, it:

- embeds ISRC and ISWC references directly into the manifest
- ensures that these identifiers remain attached to the asset
- provides a structural context that enhances their interpretability
- supports future registry systems that may require asset-bound identity

DAAP ensures that ISRC and ISWC are not just external labels, they become part of the asset's internal identity.

5.3 Alignment with EBU Metadata Standards

EBU Tech 3293 and related metadata frameworks define broadcast-oriented production metadata. DAAP complements these standards by:

- providing a canonicalized session topology
- capturing plugin chain identities and routing summaries
- preserving provenance in a machine-readable form

- enabling broadcasters to interpret the asset without external reconstruction

DAAP does not duplicate EBU metadata. It provides the structural foundation that EBU metadata can reference.

5.4 Alignment with Platform-Specific Ingestion Schemas

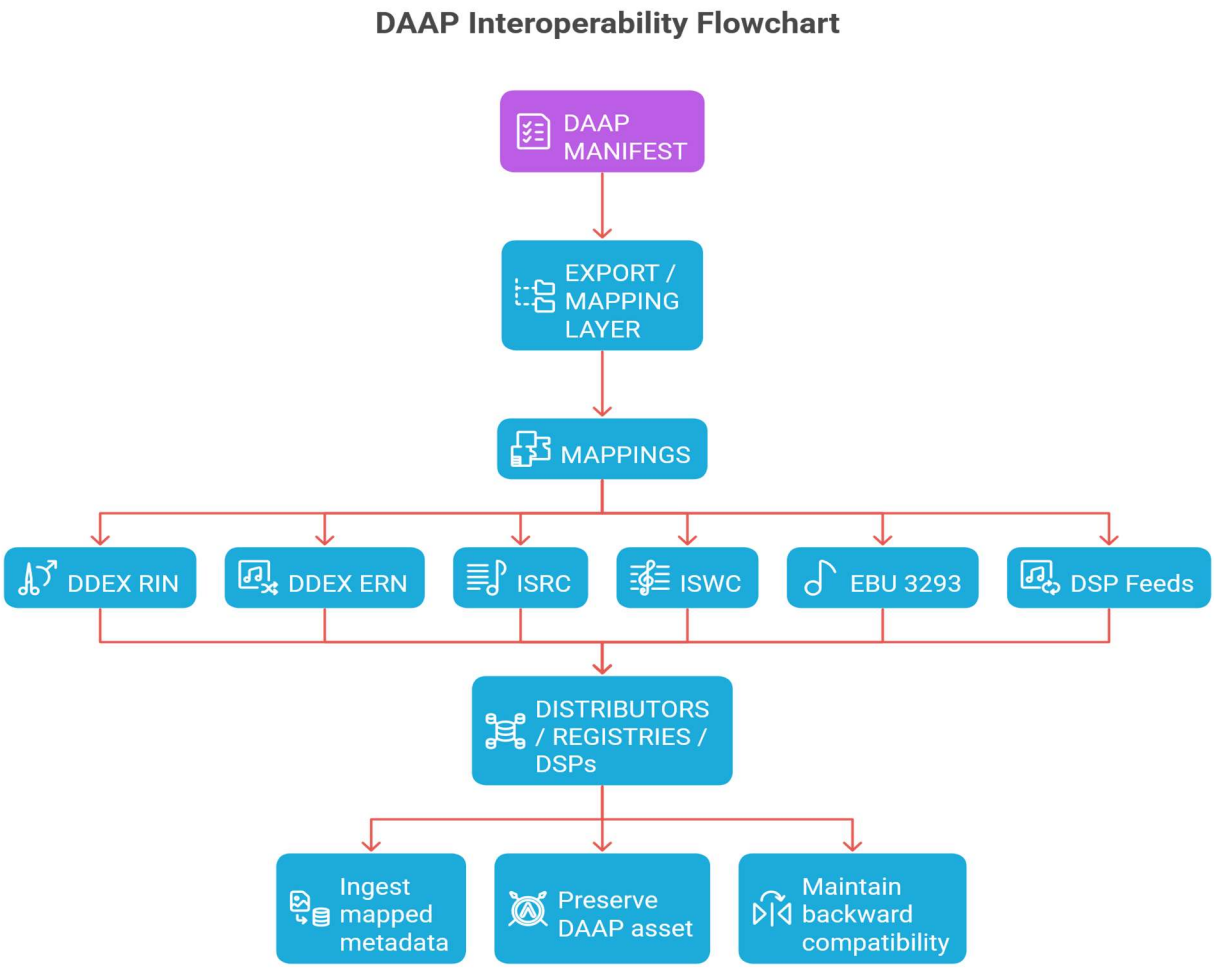
Every major DSP (Spotify, Apple Music, Amazon, YouTube, etc.) uses its own ingestion schema. These schemas are not standardized, and they often overwrite or discard metadata during processing.

DAAP solves this by:

- preserving attribution and structure inside the asset
- enabling ingestion systems to extract canonical metadata
- reducing reliance on fragile external metadata feeds
- ensuring that identity survives transcoding and repackaging

DAAP is not a replacement for ingestion schemas. It is a source of truth that ingestion schemas can rely on.

5.5 Diagram: DAAP Interoperability with DDEX / ISRC / EBU



5.6 DAAP as a Compatibility Layer

DAAP is intentionally designed to be:

- **backward-compatible** with existing metadata systems
- **forward-compatible** with future session-aware assets
- **agnostic** to DAW, plugin, and distributor implementations
- **neutral** with respect to business models and licensing frameworks

DAAP does not require industry to abandon existing standards. It provides a structural foundation that allows those standards to function more reliably and evolve more gracefully.

5.7 Why Interoperability Matters

Interoperability is not a convenience; it is a requirement for long-term industry health. Without it:

- attribution remains inconsistent
- Rights management remains fragile
- provenance remains unverifiable
- archives remain incomplete
- AI systems remain ungrounded
- catalog operations remain error-prone

DAAP ensures that the structural identity of a musical work is preserved across every system it touches, enabling a more transparent, accountable, and durable music ecosystem.

SECTION 6: GOVERNANCE & CONSORTIUM ALIGNMENT

The Digital Audio Assets Protocol is intentionally designed as a neutral, open, and extensible standard. Its long-term viability depends on governance that is transparent, practitioner-driven, and independent of any single company, platform, or commercial interest.

For this reason, DAAP is stewarded by the Digital Audio Assets & Production Attribution Consortium, a multi-stakeholder body composed of educators, engineers, developers, archivists, researchers, and industry professionals.

The consortium does not control the creative process, the economics of music, or the business models of distributors. Instead, it governs the standards layer, the schemas, definitions, versioning rules, and compliance requirements that ensure DAAP remains stable, interoperable, and aligned with the needs of the people who build and use modern production systems.

This separation of concerns is essential. DAAP defines the technical substrate: how assets are structured, how identity is preserved, how provenance is recorded, and how integrity is verified.

The consortium defines the governance substrate: how schemas evolve, how attribution models are standardized, how ethical guidelines are maintained, and how compliance is validated.

Together, they form a layered architecture in which the protocol provides the

technical foundation and the consortium provides the institutional stability required for long-term adoption.

6.1 The Role of the Consortium

The consortium is responsible for:

- **Schema Versioning**
  Maintaining and evolving the canonical manifest schema, ensuring backward compatibility and forward extensibility.
- **Attribution Standards**
  Defining contributor roles, tool categories, and attribution models that reflect real-world production practices.
- **Valuation Frameworks (Non-Prescriptive)**
  Establishing optional, non-binding frameworks that enable evidence-based valuation without dictating economic outcomes.
- **Ethical Guidelines**
  Ensuring that DAAP supports transparency, fairness, and responsible use of production data, especially in AI-mediated workflows.
- **Compliance Testing**
  Providing reference implementations, validation tools, and certification processes to ensure consistent adoption.
- **Education & Outreach**
  Supporting educators, students, and practitioners in understanding and using DAAP effectively.

The consortium does **not** control pricing, licensing, royalties, or business models. These remain the responsibility of rights holders, distributors, and market participants. The consortium's role is to ensure that the information infrastructure underlying those decisions is accurate, durable, and trustworthy.

6.2 The Role of the DAAP Protocol

The DAAP protocol defines:

- the asset structure
- the canonical manifest
- the integrity layer
- validation rules
- interoperability mappings
- technical boundaries

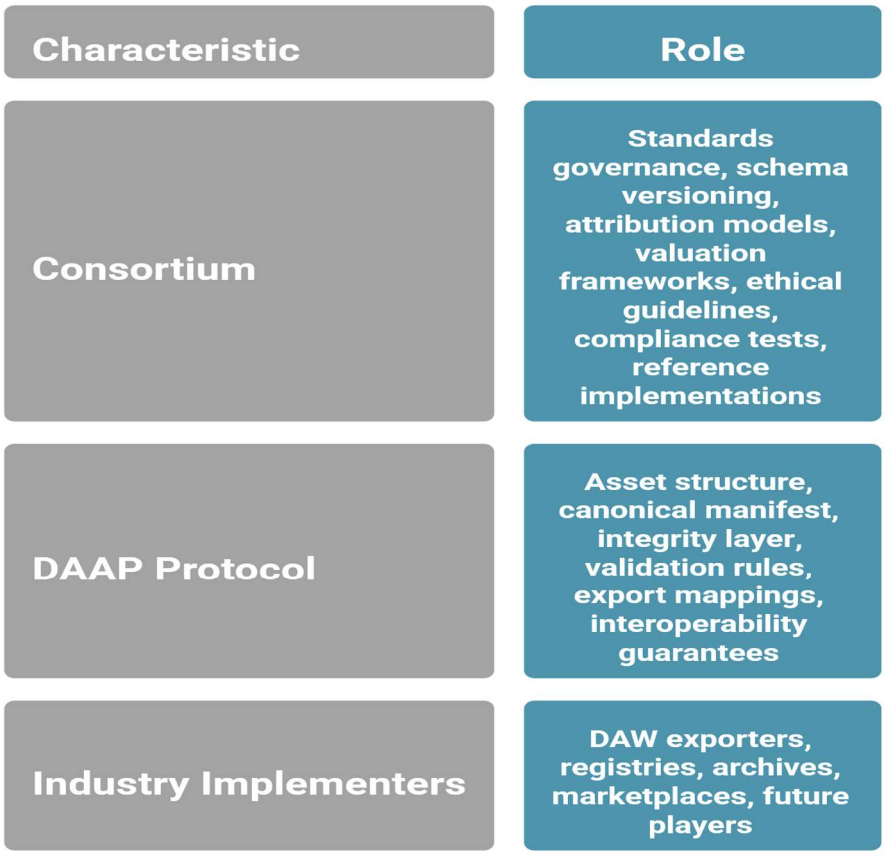
It does **not** define:

- economic participation
- royalty splits
- licensing terms
- playback behavior
- platform policies

This separation ensures that DAAP remains a technical standard, not a political instrument.

6.3 Diagram

DAAP Governance Model



6.4 Why Governance Matters

Without governance, technical standards drift, fragment, or become captured by dominant platforms. DAAP is designed to avoid these outcomes by ensuring that:

- no single company controls the protocol
- no platform can unilaterally redefine attribution
- no vendor can lock the ecosystem into proprietary extensions
- no distributor can dictate the structure of the asset
- no tool can bypass the integrity layer

Governance ensures that DAAP remains:

- **neutral**
- **transparent**
- **practitioner-driven**
- **academically grounded**
- **industry-aligned**
- **future-proof**

This is essential for building trust across the ecosystem.

6.5 The Consortium as a Long-Term Steward

The consortium's role is not to dictate creative practice or economic policy. Its role is to ensure that the information infrastructure of music, attribution, provenance, structure, identity, remains durable, interpretable, and aligned with the needs of creators, educators, technologists, and archivists.

DAAP provides the technical foundation. The consortium provides the institutional foundation.

Together, they enable a healthier, more transparent, and more resilient music digital distribution ecosystem.

SECTION 7: CONCLUSION

The Digital Audio Assets Protocol represents a structural shift in how the music industry defines, preserves, and distributes recorded works. For decades, the industry has relied on flat audio files as the canonical representation of music, formats that faithfully preserve sound but discard the production systems, contributor identities, and contextual information that define how modern music is created. This model was sufficient for an earlier era, but it is fundamentally incompatible with the realities of contemporary production and the demands of future-facing music ecosystems.

DAAP addresses this gap by introducing a session-derived, structurally complete digital asset that binds audio payloads to a canonical manifest and an integrity layer. This asset preserves the topology of the session, the identities of the tools, the roles of contributors, the lineage of the work, and the metadata required for long-term interpretability. It ensures that identity and provenance remain attached to the asset itself, not scattered across external databases or lost during distribution.

DAAP does not attempt to recreate the DAW or expose proprietary DSP algorithms. Instead, it captures the approved, distributable representation of the session, the structural information necessary for attribution, provenance, and future interpretability, in a durable, interoperable form. This approach enables DAAP-aware systems to reconstruct the essential context of the work without requiring the original editing environment, plugins, or hardware.

The protocol is intentionally neutral, open, and extensible. It is designed to complement existing standards such as DDEX, ISRC, ISWC, and EBU metadata frameworks, not replace them. DAAP provides the structural foundation that allows these standards to function more reliably and evolve more gracefully. It strengthens the entire ecosystem by ensuring that the information required for attribution, rights management, and archival preservation is embedded directly within the asset.

The consortium provides the governance necessary to steward this protocol responsibly. By maintaining schema versioning, defining attribution models, establishing ethical guidelines, and

supporting compliance testing, the consortium ensures that DAAP remains aligned with the needs of creators, educators, technologists, archivists, and industry professionals. This governance structure protects the protocol from fragmentation, platform capture, and commercial distortion, ensuring that DAAP remains a stable and trustworthy foundation for decades to come.

As the industry moves toward session-aware, dynamically interpretable assets, and as AI-mediated production becomes increasingly integrated into creative workflows, the need for durable, asset-bound identity becomes urgent. DAAP provides the technical substrate required for transparent attribution, verifiable provenance, and future-proof distribution. It enables a healthier, more accountable, and more resilient music information infrastructure.

DAAP is not merely a new format. It is a new definition of what a musical work *is* in the digital era: not a flattened waveform, but a structured, self-describing, self-verifying digital asset that preserves the creative and technical systems from which it emerged.
DAAP is the foundation.

The consortium is the steward.
Together, they define **the future of music information technology.**

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APPENDIX A

Glossary (DAAP Terms)

Active Manifest - The single DAAP manifest instance designated by deterministic selection rules as the authoritative claims object for an asset. The active manifest is the reference point for verification, attribution, provenance evaluation, and policy enforcement.

Asset (DAAP Asset) - A packaged, signed, and versioned digital object consisting of audio payload bindings, a canonical manifest, and an integrity layer. In DAAP, an asset denotes an object whose identity, structure, and provenance are verifiable independently of any single platform, database, or distributor.

Asset ID (asset_id) - The stable identifier assigned to a DAAP asset across all versions. The Asset ID identifies the asset lineage as a whole rather than a specific serialized file instance.

Asset Version (asset_version) - A monotonic or semantically versioned label identifying a specific manifest state within an asset lineage. Asset versions are linked through explicit parent pointers and derivation events.

Attribution - The structured representation of contributor roles, tool usage, and creative or technical participation in the production of a musical work. In DAAP, attribution is embedded directly in the canonical manifest.

Audio Payloads - The audible components of a DAAP asset, including the master mix, session-derived stems, and optional preview assets. Audio payloads represent frozen DSP outputs corresponding to the approved, distributable version of the work.

Bundle / Container - The physical packaging form that carries the DAAP manifest store and, optionally, the associated payloads. DAAP defines a normative container model as well as an optional external-reference bridge for payload storage.

Canonical Manifest - The authoritative manifest encoded using a DAAP-defined format and canonicalization scheme such that all compliant implementations produce identical byte sequences for hashing and signing. DAAP v1 specifies JSON canonicalization using RFC 8785 (JCS) as the baseline.

Canonicalization - The deterministic process of transforming a manifest into a stable byte representation suitable for cryptographic hashing and signing. DAAP v1 requires RFC 8785 for JSON canonicalization.

Content Binding / Payload Binding - A cryptographic binding between a manifest and payload bytes using hashes and, typically, digital signatures. Payloads are identified by

cryptographic digests rather than filenames alone, with hash baselines defined by FIPS 180-4.

Contributor - Any individual or entity that played a creative, technical, or supervisory role in the production of a musical work, including artists, producers, engineers, mixers, mastering engineers, session musicians, and technical contributors.

DAAP Manifest Store - The authoritative location within a DAAP container that holds the active manifest, associated cryptographic objects such as signatures and timestamp tokens, and optionally historical manifests.

DAAP-Aware System - Any tool, registry, archive, marketplace, or playback environment capable of interpreting the structure, manifest, and integrity layer of a DAAP asset without requiring the original DAW or plugins.

DAW (Digital Audio Workstation) - A software environment used for recording, editing, mixing, and producing audio. DAW sessions contain editable tracks, live plugin chains, automation, routing graphs, and proprietary project structures. DAAP does not replace the DAW.

Derivation Chain - The ordered sequence of asset versions and/or derived assets connected by explicit parent pointers and derivation events. The derivation chain supports auditability and controlled evolution of an asset over time.

Disclosure Tier - A declared policy level, designated T0 through T3, that specifies which manifest fields are present, omitted, committed via hashes, or encrypted in a given manifest view.

DSP Freezing (Print-Down) - The process of rendering plugin outputs, automation, and routing behavior into fixed audio representations. DSP freezing ensures that audio payloads reflect the approved, distributable version of the work.

Hash Commitment - A privacy preserving representation of a value in which only the hash of the value is disclosed. Hash commitments allow verifiers to confirm stability and continuity without revealing plaintext data.

Integrity Layer - The collection of hashes, digital signatures, trust anchors, revocation checks, and timestamp evidence that enables a verifier to confirm that the manifest and payload bindings have not been altered and were authorized by a trusted signer.

Interoperability - The ability of a DAAP asset to integrate with existing metadata and rights systems such as DDEX, ISRC, ISWC, and EBU frameworks by binding identity and structure directly to the asset.

Manifest Hash (manifest_hash)
The cryptographic digest of the canonicalized manifest bytes. The manifest hash serves as the primary signing input, either directly or indirectly, depending on the signature packaging model.

Non-goals - Capabilities that DAAP explicitly does not define, including executable DSP recreation, DAW session interchange, payout or royalty policy, and DRM access enforcement.

Optional Bridge Profile - A DAAP packaging mode that allows payload bytes to be referenced externally while preserving the same verification semantics, including hash bindings and signatures, as fully embedded bundles.

PartyRef - A structured reference to a person or organization within the manifest, such as an artist, label, or vendor, typically expressed using stable internal identifiers and optional external identifiers.

Plugin Chain Identity - A representation of the tools used in the production of a track or stem, including plugin identifiers, versions, vendors, and chain order. DAAP captures plugin identities but does not embed plugin binaries or proprietary DSP.

Provenance - The lineage of a musical work, including its creation, modification, publication, and derivation events. Provenance is recorded in the canonical manifest to ensure long-term interpretability and trust.

Provenance Event (events[]) - A recorded lifecycle event associated with an asset, such as creation, acceptance, distribution, or derivation, optionally bound to trusted time evidence such as RFC 3161 timestamps or equivalent log proofs.

Revocation - The mechanism by which compromised or unauthorized signing credentials are invalidated. DAAP v1 supports revocation via X.509 mechanisms defined in RFC 5280 and RFC 6960 when X.509 trust models are used.

Session Environment - The editable production environment inside a DAW, including tracks, routing, plugin chains, automation, hardware dependencies, and proprietary project structures. DAAP preserves the structure of the session environment in canonicalized form.

Session Topology - The structural layout of a session, including track organization, stem mapping, routing relationships, groupings, and signal flow. DAAP captures a topology summary in the canonical manifest.

Synopsis Graph (Production Graph Synopsis) - A portable, abstract graph representation describing structural relationships among tracks, buses, renders, and payloads at a level sufficient for lineage tracking and intelligibility without exposing DAW-specific edit state.

Tool Registry - A section of the canonical manifest that records the identities of plugins, hardware references, and other tools used in the production of the work.

Validation - The process of verifying that a DAAP asset conforms to protocol requirements and that its integrity layer matches the referenced audio payloads and manifest.

Versioning - The system by which DAAP assets, manifests, and schemas track changes over time, ensuring backward compatibility and forward extensibility.

Waveform Collapse - The loss of structural, attributional, and contextual information that occurs when a DAW session is rendered to a flat audio file. DAAP is designed to prevent waveform collapse by preserving session structure.

Work (Musical Work) - The creative output represented by a DAAP asset, including its audio payloads, structural identity, contributor roles, and provenance.