

Authorization Decision Log

Logius Standard

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Status of This Document

This is a draft that could be altered, removed or replaced by other documents. It is not a recommendation approved by TO.

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§ Conformance

As well as sections marked as non-normative, all authoring guidelines, diagrams, examples, and notes in this specification are non-normative. Everything else in this specification is normative.

The key words *MAY*, *MUST*, *MUST NOT*, *RECOMMENDED*, and *SHOULD* in this document are to be interpreted as described in [BCP 14](#) [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

Abstract

This document defines a method for logging authorization decisions to allow or deny API requests, providing accountability within and across organisations. The standard adopts [[trace-context](#)] for tracing across organisation boundaries and defines an OpenTelemetry-shaped log record based on the [[AuthZEN](#)] information model, supporting [reconstruction](#), analysis and [replay](#) of historical decisions.

§1. Introduction

This standard defines a structure for logging [authorization decisions](#) together with the context that produced them: the tracing context, the request, the response, the active [policies](#), the information sources consulted, and the configuration of the evaluation engine. These categories correspond to the components of the [Guide to Attribute Based Access Control \(ABAC\) Definition and Considerations](#) architecture, also known as the **PxP** architecture.

Additionally, it includes a non-normative outline introducing the concerns, principles and requirements for developing and maintaining such a [log](#) in concordance with legislation.

§1.1 Purpose of this standard

This standard defines a uniform approach for logging [authorization decisions](#), enabling organisations to provide effective accountability for historical decisions.

The standard provides a structured format for all contextual and environmental parameters that affect decisions. A full implementation of the standard allows historical decisions to be [replayed](#) for analysis.

It also defines participation in a distributed [[trace-context](#)] and binds [log records](#) to it, allowing correlation of related logs, such as [[LDV](#)] and [[FSC-Logging](#)], in complex inter-organisational data processing chains.

§1.2 Terminology

The following list defines terminology used throughout this document.

Authorization

Authorization is the process of deciding whether to, fully or partially, allow or deny requests for processing (API requests) and enforcing these decisions.

This is materially different from the noun "authorization" which typically refer to an access token, OAuth scope or other permission grant. These appear as inputs for the decision in the form of attributes of an [authorization decision](#) request.

Authorization decision

A decision produced in the [authorization](#) process, determining whether a particular request is allowed or denied, fully or partially. Authorization decisions are the units recorded in an [Authorization Decision Log](#).

Externalised Authorization Management

Externalised Authorization Management (EAM) is an architectural pattern in which [authorization decisions](#) are made in a different component than the component that enforces the decision.

Log

A list of [log records](#), generated by a service. [Logs](#) are intended for operational monitoring, auditing, and troubleshooting.

Log record

A single unit of information within a [log](#), representing one recorded event. A [log record](#) is immutable.

Trace

A collection of related spans representing an end-to-end transaction across components, as defined in [Trace Context](#).

Span

A single operation within a [trace](#), with a start time and end time, as defined in [Trace Context](#).

Trace context

The propagation format defined by [Trace Context](#) for carrying [trace](#) and [span](#) identifiers across components.

Policy

A set of one or more rules that determine whether a request should be allowed or denied.

Source

A source of one or more pieces of information, such as attributes or [policies](#), which affected an [authorization decision](#) and which come from a single source. A source must be identifiable by a single identifier, for example a version, hash or timestamp.

Reconstruct

The act of reproducing the inputs that affected an [authorization decision](#) — including the request, applicable [policies](#), supporting information and engine configuration — using the data stored in or referenced from the [log record](#).

Replay

The act of re-evaluating an [authorization decision](#) using its [reconstructed](#) inputs in a [PDP](#) to verify the original outcome. Replay requires that the [PDP](#) behaves identically to the original or can be manually configured to do so.

§2. Architecture

The goal of the standard is to enable the [reconstruction](#) of the environment in which historical [authorization decisions](#) were made, allowing those decisions to be analysed and [replayed](#) while preventing unnecessary data duplication.

The inputs for records in the [Authorization Decision Log](#) come from the following standard [EAM](#) or [PxP](#) components as introduced in [Guide to Attribute Based Access Control \(ABAC\) Definition and Considerations](#) and adopt the information model introduced in [[AuthZEN](#)].

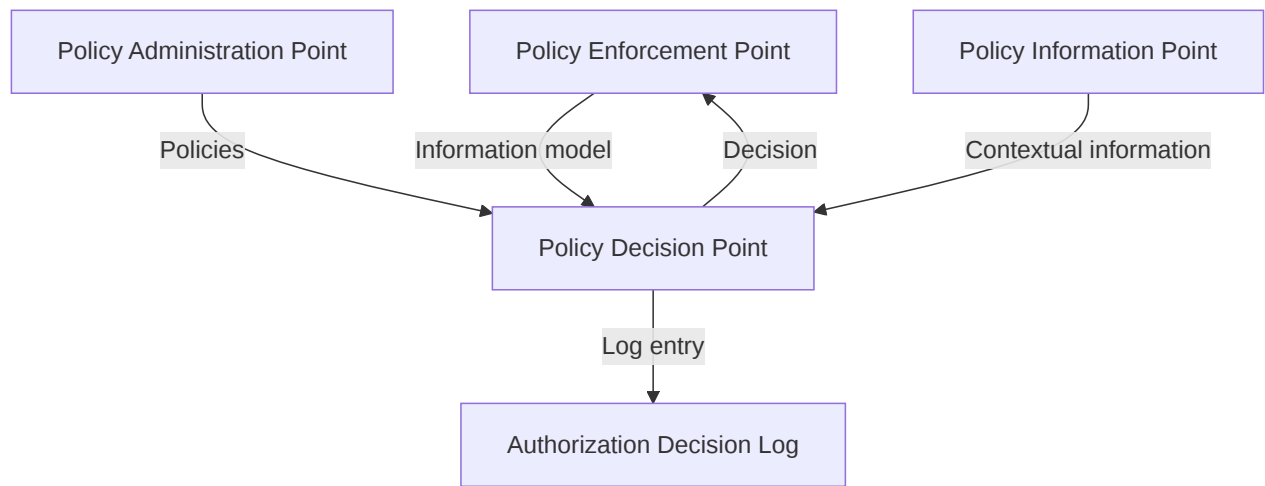


Figure 1 EAM or PxP Architecture

In a federated context, such as introduced by [*FSC-Core*], both the consumer outway and provider inway function as a **PEP** for incoming and outgoing requests. Both the consumer and the provider ask an internal **PDP** to decide on allowing the request. Both of these decisions can be logged using this standard.

When combined with tracing headers per [*trace-context*] (also adopted by [*LDV*]) and the FSC Transaction ID used in [*FSC-Logging*], this enables full traceability across complex multi-organisational processing chains.

See the sequence diagram below for an example of such a flow.

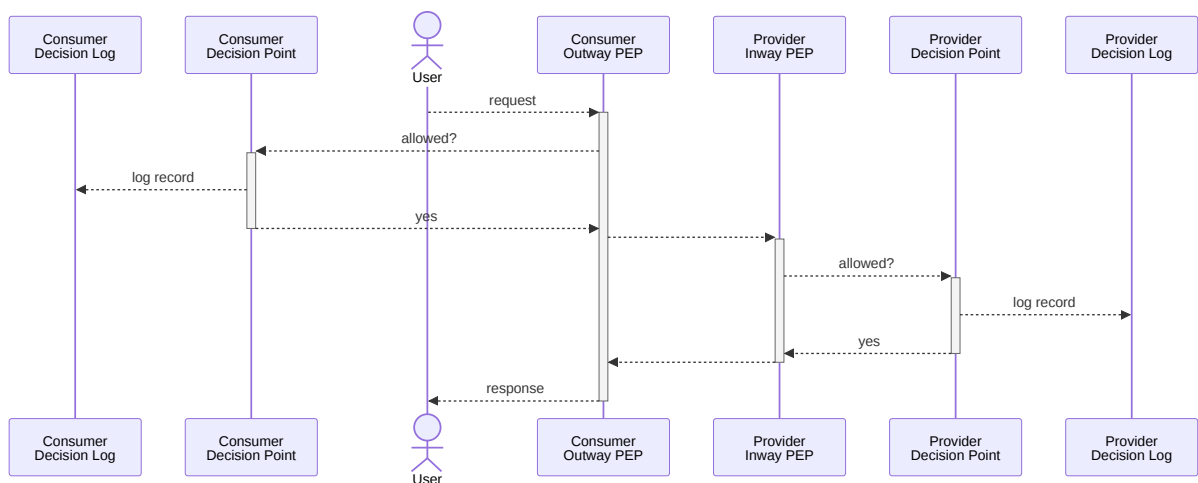


Figure 2 Decision logging in federated context

§2.1 Components

The standard [EAM](#) architecture has the following conceptual components. These can be deployed as stand-alone applications, combined in various configurations, or even implemented within a single monolithic application.

Authorization Decision Log

The Authorization Decision Log contains all information that was used in the [authorization decision](#). Using the [Authorization Decision Log](#) it *SHOULD* be possible to accurately [reconstruct](#) environmental factors that affected historical [authorization decisions](#).

Policy Enforcement Point

A Policy Enforcement Point (PEP) intercepts a user's request, sends it to the [PDP](#) for evaluation, and then enforces the resulting "permit" or "deny" decision. A [PEP](#) can be implemented as an API gateway, as application middleware or as a component within the application itself.

Policy Administration Point

A Policy Administration Point (PAP) is where access [policies](#) are authored, managed, and stored. It is responsible for distributing current policies to the [PDP](#) and archiving previous versions for traceability. This can be a dedicated commercial or open-source tool or a version control system like a Git repository.

Policy Information Point

A Policy Information Point (PIP) enriches access requests with additional attributes needed to make a decision. For example, it might retrieve a user's role or the sensitivity level of a data record from an external [source](#). [PIPs](#) are often integrated directly into the [PDP](#).

Policy Decision Point

A Policy Decision Point (PDP) evaluates incoming requests from the [PEP](#) against the relevant [policies](#) (from the [PAP](#)) and contextual data (from the [PIP](#)) to make a "permit" or "deny" decision. The [PDP](#) is often a separate application or sidecar container.

NOTE: EAM components within a monolithic application

These are architectural roles, not deployment boundaries. A single application can fulfil all four: the authorization interceptor as the [PEP](#), the authorization handler as the [PDP](#), the services it invokes as [PIPs](#), and the application's own Git repository as the [PAP](#).

§2.2 Scope

The specification defines an interface for persisting [log records](#). This is the component that *MUST* be consistent across organisations to ensure interoperability.

Any [authorization decision](#) representable in the [*AuthZEN*] information model is in scope of this standard, regardless of the wire protocol by which the decision is delivered.

The management of a [log](#), however, is left to the discretion of individual implementations. Consequently, the specification does NOT define behaviour or interfaces for:

- deleting or modifying [log records](#)
- managing access to the [log](#)
- ensuring long-term accessibility
- handling archival and retention periods
- ensuring integrity and non-repudiation
- maintaining time synchronisation

See [Information management](#) for an overview of various aspects which *MAY* be required for legal and regulatory compliance.

§2.3 Flows

§ 2.3.1 Evaluating an authorization decision

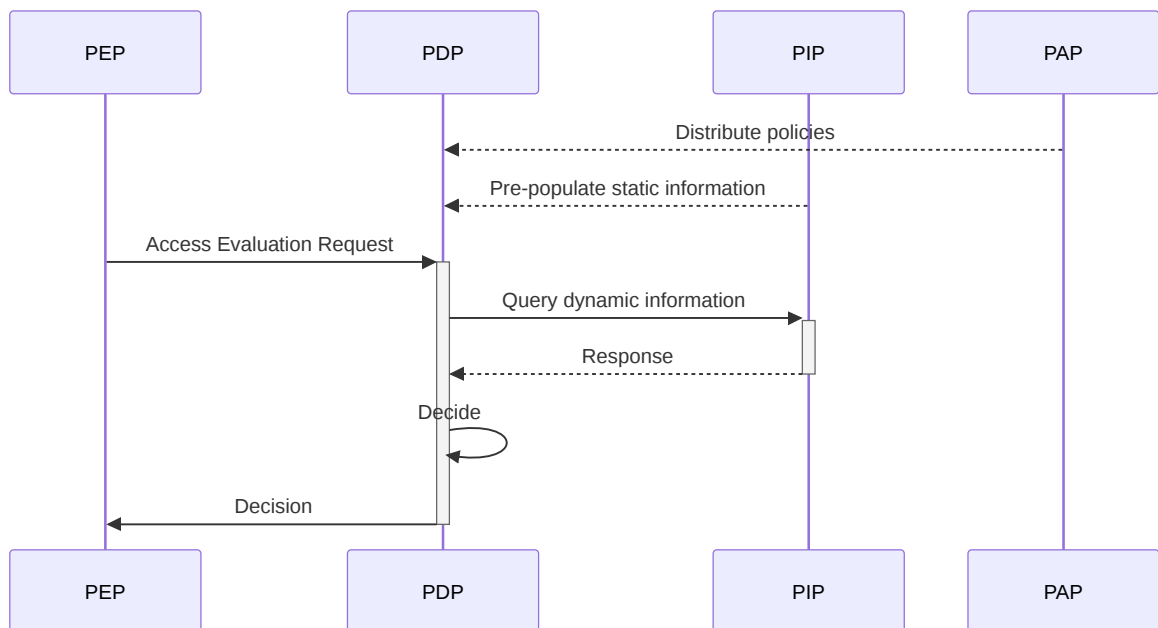


Figure 3 Evaluating an authorization decision

When a [PEP](#) needs an [authorization decision](#) it sends an evaluation request to the [PDP](#). The [PDP](#) evaluates the request against the [policies](#) received from the [PAP](#) and pre-populated information from [PIPs](#), *MAY* query [PIPs](#) for additional dynamic information, and returns the decision.

The [PAP](#) distributes [policies](#) and [PIPs](#) pre-populate static information into the [PDP](#) on their own schedule, independently of any individual [authorization decision](#).

See [Tracing](#) for how this flow maps onto a [trace](#) and its [spans](#).

§ 2.3.2 Writing a log record

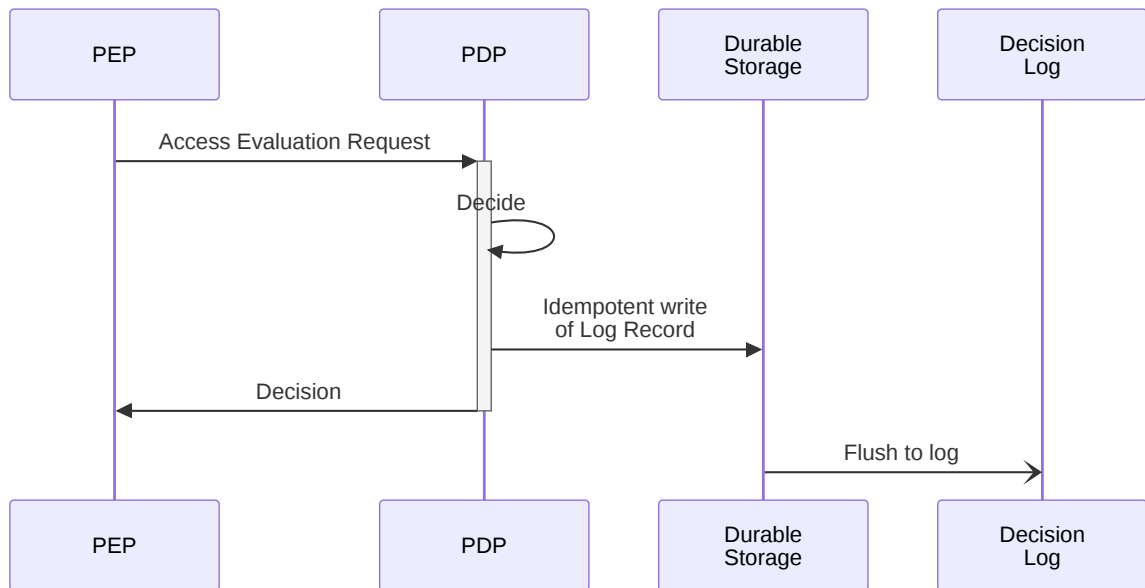


Figure 4 Writing a log record after an authorization decision

To provide accountability for historical [authorization decisions](#) it needs to be possible to [reconstruct](#) the information and environment that affected the decision. The [PDP](#) provides the information required for this to the [Authorization Decision Log](#) in the form of a [log record](#).

The [PDP](#) *SHOULD* ensure that a [log record](#) has been persisted to durable storage before providing the [PEP](#) with the decision. Once the [log record](#) has reached durable storage, an asynchronous flush to the [Authorization Decision Log](#) completes ingestion. The component responsible for this flush is implementation-defined and *MAY* be the [PDP](#), a sidecar (such as the OpenTelemetry Collector or Fluent Bit), or a host-level log collector.

NOTE: Definition of durable storage

"Durable storage" is intentionally not defined by this specification. Organisations *MUST* define a working definition in their logging policy, taking into account their risk appetite and operational constraints. Common interpretations range from a local `fsync`'d write to a replicated commit on a queue with quorum. See [Information management](#) for related considerations.

NOTE: Common pattern: write-ahead log with asynchronous flush

A widely deployed pattern is to write the [log record](#) to a local write-ahead log (durable storage) before the [PDP](#) returns the decision, then asynchronously flush from the write-ahead log to the [Authorization Decision Log](#) with idempotent ingestion. This pattern bounds the synchronous-path latency while preserving the durability guarantee.

§3. Specifications

This section provides the specification for the protocols and interfaces to be used and the expected behaviour of the components.

NOTE: Information model independence

The fields defined in this section form an information model for an authorization-decision [log record](#). The model is independent of any particular telemetry framework; conformant records can be emitted via any transport, provided the record carries the fields specified here. The model is intentionally compatible in shape with [[OpenTelemetry](#)], so that organisations already operating an OpenTelemetry pipeline can carry [log records](#) on existing infrastructure without conversion.

§3.1 Protocols

This standard prescribes the shape of the messages exchanged between the [PDP](#) and the [log](#) (see [3.3 Interface](#)), but not the transport that carries them. Components *MUST* comply with the message interface; the choice of REST, gRPC, messaging, file ingestion, or any other delivery mechanism is left to the implementer.

It is *RECOMMENDED* to use the OpenTelemetry Protocol [[OTLP](#)] for the interaction between the Application and the log.

When using HTTP-based protocols (e.g., HTTP/1.1 [[RFC9112](#)] or HTTP/2 [[RFC9113](#)]), implementations *MUST* use the [Trace Context](#) HTTP header format (traceparent, tracestate) for propagation.

For non-HTTP protocols (e.g., gRPC, messaging systems), implementations *MUST* provide equivalent [trace context](#) propagation semantics, preserving trace_id, span_id, and parent relationships across boundaries. Where the protocol has no formally standardised [[trace-context](#)]

binding, OpenTelemetry context propagation or another widely adopted convention with equivalent semantics is sufficient.

§3.2 Behaviour

§ 3.2.1 Encryption

The [log](#) *MUST* enforce TLS on connections, in accordance with the standard practice established within the organisation.

§ 3.2.2 Tracing

All components participating in the evaluation of [authorization decisions](#) (including [PEPs](#), [PDPs](#), [PAPs](#), and [PIPs](#)) *MUST* propagate [trace context](#) as defined by [Trace Context](#), and *MUST* preserve [trace](#) continuity across component boundaries.

The same rule applies on every request-scoped hop in the evaluation of an [authorization decision](#), whether the sender is a [PEP](#) calling a [PDP](#), a [PDP](#) calling a [PIP](#) or [PAP](#), or any other component:

- On receiving an incoming request, the component *MUST* create a [span](#) as a child of the [span](#) identified by the incoming `traceparent`, or — if no [trace context](#) is present — start a new [trace](#) with a root [span](#).
- Before making an outgoing request, the component *MUST* start a new child [span](#) representing that outgoing operation. The outgoing `traceparent` carries the active `trace_id` and the `span_id` of this new outgoing [span](#) as the `parent-id` from the receiver's perspective, as defined by [Trace Context](#).

NOTE: The W3C Trace Context `parent-id` field

[Trace Context](#) names the field `parent-id` because the field's value, from the next hop's perspective, identifies the parent of any [span](#) the next hop creates; from the sender's perspective it is the sender's own `span_id` for the outgoing [span](#).

This ensures that every [span](#) correctly identifies its immediate parent, and that [authorization decisions](#) are consistently correlated with the broader transaction or request lifecycle in which they occur.

When a [trace context](#) is received from another organisation, the receiving component *MUST* preserve the `trace_id` unchanged in every [log record](#) and outgoing [trace context](#) originating from the resulting [authorization decision](#) flow. A new `trace_id` *MUST NOT* be allocated within an in-progress [authorization decision](#) flow.

Logging of [authorization decisions](#) is independent of the sampled bit in `traceparent`: that bit governs telemetry sampling only, and [log records](#) are accountability records that *MUST* be produced regardless. ADL emitters *MUST NOT* modify the sampled flag.

When propagating, components *MUST* follow the propagation rules in [section 3.5 \(Mutating the `tracestate` Field\)](#) of [\[trace-context\]](#) — in particular, if a component does not modify `traceparent`, it *MUST NOT* modify `tracestate`.

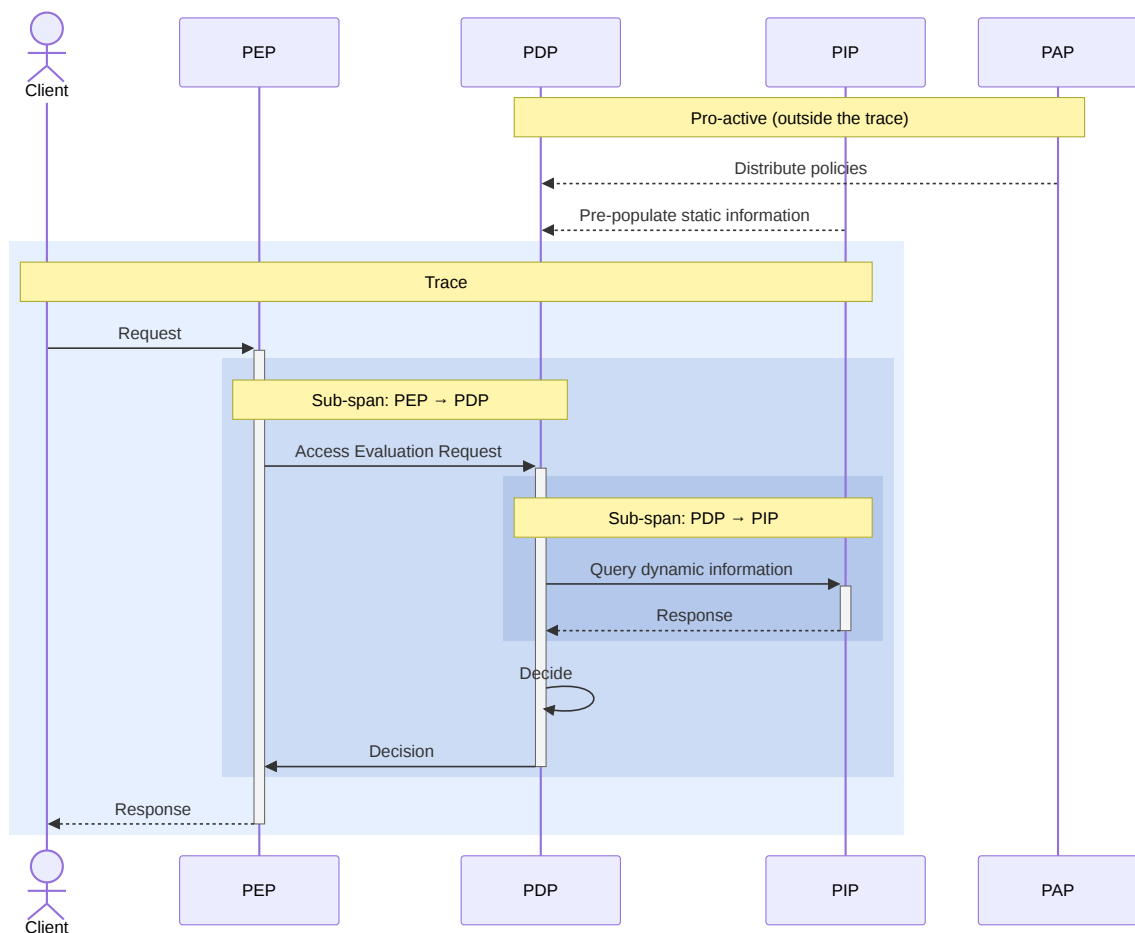


Figure 5 Trace and spans during the evaluation of an authorization decision

NOTE: Pro-active interactions are outside the trace

Pro-active interactions — for example, a [PAP](#) distributing [policies](#) to a [PDP](#), or a [PIP](#) pre-populating data into a [PDP](#) — happen outside the scope of any individual [authorization decision](#) and are not part of its [trace](#). They are independent operations with their own lifecycle and, where applicable, their own [traces](#). The [policies](#) and information delivered through these pro-active interactions are the same content that subsequent [log records](#) reference via [adl.core.policies](#) and [adl.core.information source](#) references when an [authorization decision](#) is evaluated.

§ 3.2.3 Generation

Each [authorization decision](#) evaluated by a [PDP](#) — whether the [PDP](#) completed its evaluation (status of Unset or Ok, with the decision carried in `body.adl.core.response`) or could not complete it (status of Error) — *MUST* produce exactly one [log record](#) persisted to durable storage.

A single API call to the [PDP](#) results in exactly one [log record](#), regardless of whether the call is to the Access Evaluation API (one decision) or the Access Evaluations API (multiple decisions in a single call). Per-sub-decision outcomes are carried in `body.adl.core.response`.

NOTE: Use of Access Evaluations

The [[AuthZEN](#)] Access Evaluations API is well-suited to prospective enumeration (e.g. determining which UI elements to enable for a user) and to compound checks where multiple permissions together correspond to a single user action. In both cases the call has a 1:1 correspondence to that user action and to the resulting [log record](#), and cross-request correlation is preserved.

This standard RECOMMENDS against using Access Evaluations as a batching mechanism for otherwise independent decisions, because the single resulting [log record](#) cannot uniquely correlate to per-decision records in downstream logs (such as [[LDV](#)]). Implementations that nevertheless use it that way are responsible for ensuring that those downstream records can still be joined to the corresponding sub-decision.

NOTE: Cached decisions

Caching [authorization decisions](#) is discouraged. A cached decision references the [policies](#) and information that were current at cache population; [replaying](#) it against the current state may yield a different outcome, and per-cache-use logging — required to preserve accountability — erodes much of the performance benefit caching is intended to provide.

If a cached decision is nevertheless applied to a new request, that application *SHOULD* produce its own [log record](#), carrying the `trace_id` and `parent_span_id` of the new request with a freshly allocated `span_id`. The `trace_id` of the original cache-population request *MUST NOT* be reused. The `attributes.adl.core.policies` and `attributes.adl.core.information` [source](#) references in the new [log record](#) point to the same [sources](#) used by the original decision.

§ 3.2.4 Ingestion

Ingestion of [log records](#) into the [Authorization Decision Log](#) *MUST* be idempotent: re-submitting the same [log record](#) — for example as a result of a queue redelivery in the write-ahead log pattern described in [2. Architecture](#) — *MUST NOT* produce a duplicate persisted record. The idempotency key is implementation-defined; common choices are the pair (`trace_id`, `span_id`) or a content-hash of the [log record](#).

§3.3 Interface

A [log record](#) *MUST* contain the following mandatory fields and *MAY* contain the optional fields:

Field	Type	Mandatory?
trace_id	16 byte	mandatory
span_id	8 byte	mandatory
parent_span_id	8 byte	conditional
event_name	string	mandatory
timestamp	uint64	mandatory
status	enum	mandatory
attributes	object	optional
resource	object	optional

Field	Type	Mandatory?
body	object	optional

§ 3.3.1 `trace_id`

Unique identifier of the [trace](#) that this [authorization decision](#) belongs to.

When serialised in textual form (e.g., JSON), `trace_id` *MUST* be encoded as 32 lowercase hexadecimal characters, matching the form used in the `traceparent` header defined by [[trace-context](#)].

`trace_id` values *MUST* be generated using a cryptographically secure random number generator and *MUST NOT* be derived from user-identifiable input, in line with [section 6 \(Privacy Considerations\)](#) of [[trace-context](#)].

§ 3.3.2 `span_id`

Unique identifier of the [span](#) representing this [authorization decision](#).

When serialised in textual form (e.g., JSON), `span_id` *MUST* be encoded as 16 lowercase hexadecimal characters, matching the form used in the `traceparent` header defined by [[trace-context](#)].

`span_id` values *MUST* be generated using a cryptographically secure random number generator and *MUST NOT* be derived from user-identifiable input, in line with [section 6 \(Privacy Considerations\)](#) of [[trace-context](#)].

§ 3.3.3 `parent_span_id`

Unique identifier of the [span](#) of which this [log record](#)'s [span](#) is a child.

`parent_span_id` *MUST* be set to the `parent-id` of the incoming `traceparent` when one is present. It *MAY* be omitted only when the [authorization decision](#) flow has no upstream caller — that is, when the [log record](#)'s [span](#) is the root of the [trace](#).

§ 3.3.4 event_name

The event_name field identifies the type of [authorization decision](#) the [log record](#) represents. The five conformant values, each corresponding to one of the [\[AuthZEN\]](#) APIs and its information model, are:

AuthZEN API	event_name
Access Evaluation API	adl.access_evaluation
Access Evaluations API	adl.access_evaluations
Subject Search API	adl.search_subject
Action Search API	adl.search_action
Resource Search API	adl.search_resource

The adl. prefix avoids collisions with other events in the same backend and allows [log records](#) to be filtered or indexed by themselves.

NOTE: Decisions not delivered via the AuthZEN API

Implementations that do not deliver decisions through the [\[AuthZEN\]](#) HTTP API select the event_name whose [\[AuthZEN\]](#) information model is most closely aligned with the shape of the decision. This applies to in-application authorization checks, XACML [PDPs](#), and OPA-style direct calls. Decisions whose shape does not correspond to any of the five event_name values are out of scope of this standard.

§ 3.3.5 timestamp

The timestamp field represents the exact point in time when the [authorization decision](#) was made. The timestamp *MUST* be encoded as the number of milliseconds since the Unix epoch (1970-01-01T00:00:00Z), as an unsigned 64-bit integer.

§ 3.3.6 status

The status field describes the outcome of the [PDP](#)'s evaluation attempt. It *MUST* be one of the following values:

- **Unset** — the default value. The [PDP](#) completed its evaluation without internal error. The response itself — in [\[AuthZEN\]](#) format, e.g. a decision boolean for the Evaluation APIs or a results array for the Search APIs — is carried in `body.adl.core.response`.
- **Ok** — optional. Used when an implementation explicitly marks a successfully completed evaluation. Functionally equivalent to **Unset**.
- **Error** — the [PDP](#) could not produce a decision (for example, engine fault, missing attributes, downstream timeout).

A successful evaluation that resulted in denial (for example, `decision: false` from the Access Evaluation API, or an empty `results` array from a Search API) *MUST NOT* be reported as **Error**. The **Error** value is reserved for failures of the [PDP](#) itself to evaluate the request — denial is a valid outcome of evaluation and is therefore **Unset** (or **Ok**).

§ 3.3.7 attributes

The `attributes` object contains [source](#) references and metadata for the [authorization decision](#). It *MAY* be omitted when no [source](#) references or metadata are recorded.

Each `adl.core.*` entry in `attributes` *MUST* be a [source](#) reference: a value sufficient to retrieve the referenced data. Raw payloads *MUST NOT* be inlined in `attributes`; they belong in [body](#). The patterns in [3.5 Sources and referencing](#) illustrate common forms of [source](#) references. The retention obligation that follows from this — keeping the upstream [source](#) available for as long as the [log record](#) references it — is treated in [Data Retention](#).

The following `adl.*` attributes are defined by this specification. The five conditional attributes are present when the corresponding aspect of the [authorization decision](#) is to be made retrievable.

Attribute	Type	Mandatory?
adl.core.request	object	conditional
adl.core.response	object	conditional
adl.core.policies	object	conditional
adl.core.information	object	conditional
adl.core.configuration	object	conditional
adl.fsc.transaction_id	string	conditional

When an `adl.core.*` field is recorded in the [log record](#), the data *MUST* be carried in exactly one of two locations:

- as raw data in [body](#), or

- via a [source](#) reference in `attributes`.

A field *MUST NOT* appear in both `body` and `attributes`. Implementations choose one location per field per record.

Implementations *MAY* include additional attribute keys outside the `adl.*` namespace. Such keys *SHOULD* follow lowercase, dot-separated, namespaced convention (`<vendor>.<area>.<name>`). A consumer that does not recognise an attribute key *MUST* ignore it without error.

§ 3.3.7.1 `adl.core.request`

The `adl.core.request` attribute is a [source](#) reference to the input of the decision when the raw request is not carried in `body`. The reference *SHOULD* resolve to the request in [\[AuthZEN\]](#) format, unless privacy considerations require portions to be omitted.

§ 3.3.7.2 `adl.core.response`

The `adl.core.response` attribute is a [source](#) reference to the output of the decision when the raw response is not carried in `body`. The reference *SHOULD* resolve to the response in [\[AuthZEN\]](#) format, unless privacy considerations require portions to be omitted.

The response *MUST* be retrievable when [status](#) is `Unset` or `Ok` and *MAY* be omitted when [status](#) is `Error`.

NOTE: Search responses and data minimisation

Responses to the Search APIs — in particular `adl.search_subject` and `adl.search_resource` — typically enumerate sets of subjects or resources for which a permission applies. Logging these enumerations in full can itself constitute a privacy exposure beyond the original request. Implementers *SHOULD* pay particular attention to [data minimisation](#) when logging Search API responses.

§ 3.3.7.3 `adl.core.policies`

The `adl.core.policies` attribute references the [policies](#) that the [PDP](#) used to evaluate the request. In a [PxP](#) architecture, this represents the information that would come from the [PAP](#).

A [PDP](#) can have one or more [sources](#) of [policies](#) which can be individually versioned. To accommodate that, `adl.core.policies` is an object in which each key identifies a specific policy [source](#).

All policy [sources](#) that affected the decision *SHOULD* be referenced. Each value *MUST* be a [source](#) reference (see [3.5 Sources and referencing](#)) sufficient to retrieve the [policies](#) from that [source](#).

EXAMPLE 1

A reference value could be:

- A timestamp
- A unique identifier
- A semantic version
- A Git hash

§ 3.3.7.4 *adl.core.information*

The `adl.core.information` attribute references the supporting information used in evaluating the access decision. In a [PxP](#) architecture, this represents the information that would come from [PIPs](#).

It is an object in which each key identifies an information [source](#). All information [sources](#) that affected the decision *SHOULD* be referenced. Each value *MUST* be a [source](#) reference (see [3.5 Sources and referencing](#)) sufficient to retrieve the information.

§ 3.3.7.5 *adl.core.configuration*

The `adl.core.configuration` attribute references the configuration required to [reconstruct](#) the software environment that evaluated the original decision. In a [PxP](#) architecture, this primarily represents the configuration of the [PDP](#), but *MAY* also include configuration of [PIPs](#) and [PAPs](#).

It is an object in which each key identifies a configuration [source](#). All configuration [sources](#) that affected the decision *SHOULD* be referenced. Each value *MUST* be a [source](#) reference (see [3.5 Sources and referencing](#)) sufficient to retrieve the configuration.

A high-confidence [replay](#) claim typically requires capturing all of the following: the engine identifier and version (for example, a container digest), the runtime configuration of the engine, the configuration of every [PIP](#) and [PAP](#) that contributed to the decision, and any external sources (for example time, randomness) on which the decision depended.

EXAMPLE 2

A configuration [source](#) could reference:

- The configuration of the policy engine ([PDP](#))
- The version of the policy language
- The identifier or hostname of the [PDP](#) in case multiple [PDPs](#) are used
- The configuration of [PIPs](#), such as API endpoints
- The Git hash of an IaaS definition, such as a Terraform repository

§ 3.3.7.6 *adl.fsc.transaction_id*

Unique identifier of the FSC transaction this request belongs to. This attribute *MUST* be set when the corresponding request crosses an FSC inway or outway and is therefore expected to be present in [*FSC-Logging*]; it *MUST NOT* be set otherwise.

NOTE

The [Authorization Decision Log](#) and the FSC Log have the same granularity and can thus be combined into a single physical [log](#). This specification ensures that no fields are defined that conflict with those defined in [*FSC-Logging*].

§ 3.3.8 **body**

The body field carries the raw `adl.core.*` payloads. It is an object that *MAY* contain any of the following keys:

- `adl.core.request` - full request in [*AuthZEN*] format
- `adl.core.response` - full response in [*AuthZEN*] format
- `adl.core.policies` - full policies that affected the decision

- `adl.core.information` - full information that affected the decision
- `adl.core.configuration` - full configuration that affected the decision

The shape of `body.adl.core.policies`, `body.adl.core.information` and `body.adl.core.configuration` mirrors the shape of the corresponding [attributes.adl.core.*](#) reference: an object keyed by [source](#) name, with the raw payload as the value in place of the [source](#) reference.

A body *MAY* contain any subset of these keys, and *MAY* be omitted entirely.

§ 3.3.9 resource

The `resource` field identifies the producer of the [log record](#): the system, application, or environment in which the [PDP](#) evaluated the [authorization decision](#). It is an open object of key/value attribute pairs.

The vocabulary of `resource` keys is intentionally not prescribed by this standard. Organisations select keys appropriate to their operational practice — for example a service identifier, an environment label, or a controller identifier — and document the chosen vocabulary in their logging policy.

When [log records](#) are aggregated outside the producing organisation, the producing organisation *MUST* set `resource` such that records can be unambiguously attributed to their producer.

§3.4 Span attributes

The [log record](#) interface defined in [3.3 Interface](#) does not require OpenTelemetry; it may be emitted via any transport. When ADL is implemented on an OpenTelemetry pipeline, however, the same [PDP](#) evaluation is typically also represented by a [span](#). The [span](#) and the [log record](#) describe the same operation and are correlated via the shared `trace_id` and `span_id`. To let observability tooling and the [Authorization Decision Log](#) navigate to each other:

- The [span](#)'s name *SHOULD* equal the [log record](#)'s [event_name](#) (e.g. `adl.access_evaluation`), so [authorization decisions](#) can be identified in tracing tools without joining to the [log record](#).
- Implementations *MAY* additionally mirror selected `adl.core.*` attributes from the [log record](#) onto the [span](#)'s attributes (for example, the [adl.core.policies](#) reference), to enable filtering of decisions in tracing tools.

§3.5 Sources and referencing

A **source reference** is a compact value that identifies a [source](#). A [source reference](#) *MUST* be sufficient to retrieve, on demand, the data from that [source](#) that affected the [authorization decision](#); this lets a [log record](#) omit the raw payload from [body](#) without loss of accountability.

The patterns described below illustrate common reference formats. Implementations are free to use any other format with these properties.

§ 3.5.1 Versioned sources

This section is non-normative.

Some [sources](#) offer the ability to 'time-travel' by providing a version at which to query. In such cases, the data itself may be omitted and the version can be stored instead.

The version identifier can be a simple value, such as a string or number, or a complex object, such as an array or object containing multiple version identifiers.

The following example shows a reference to a specific semantic version of a policy [source](#).

EXAMPLE 3: Policy source reference using semantic versioning

```
{
  "traffic-policy": "gmb-2025-94604@1.1.0"
}
```

In a complex case, such as limiting requests for open data per IP per minute across a large number of servers, the version could also consist of an array of partition offsets in a Kafka stream of HTTP requests.

EXAMPLE 4: Complex versioned information sources using Kafka partition offsets

```
{
  "nginx-requests": [ 8376912, 8368118, 8377785, 8386285, 8383526 ]
}
```


NOTE: Coordinating retention of versioned sources

Organisations relying on Versioned [source](#) references *MUST* coordinate the retention of the upstream [source](#) with the retention of the [log records](#) that reference it, and *MUST* document this coordination in their logging policy. Reference targets that have become unavailable invalidate the accountability claim of the referencing [log record](#).

§ 3.5.2 Temporal sources

This section is non-normative.

In case a [source](#) offers the ability to 'time-travel' by providing a timestamp at which to query, then the data itself may be omitted.

It is *RECOMMENDED* to use the timestamp defined in the `time` field in the context of the request as the base time. In that case the [source](#) *MAY* be omitted fully.

If a different timestamp is used, then it *SHOULD* be included in [[RFC3339](#)] format.

NOTE: Inter-system clock inconsistencies

When system clocks are not aligned properly, a system may be asked to provide data for a timestamp that lies in the future. This can be mitigated by requesting data of a few seconds or minutes ago at the expense of reducing the speed with which changes can be deployed. The risk of inter-system clock inconsistency can be reduced further by synchronising all participating systems to a trusted time source (for example NTP or PTP); see [Information management](#) for related guidance.

NOTE: Usage of REST API Design Rules

In the context of REST APIs developed by the Dutch government the [Temporal extension](#) of the [[ADR](#)] can be used for this purpose.

§ 3.5.3 Logged sources

This section is non-normative.

For [sources](#) that are logged in an external [log](#), a request identifier is needed to look up the corresponding entry in the external [log](#).

It is *RECOMMENDED* to use the `trace_id` and `span_id` carried by [[trace-context](#)] as the request identifier. The referenced request *SHOULD* have the same `trace_id` as the [log record](#), in which case the [source](#) reference can consist of only the value of the `span_id`.

It is *RECOMMENDED* to log requests in the [[WARC](#)] format as it includes all request and response headers that may be used in the [authorization decision](#).

NOTE: Where the logged source lives

The external [log](#) referenced from a Logged [source](#) is typically the producing organisation's own record of the call (for example, the WARC archive of HTTP exchanges originated by [PIPs](#) running alongside the [PDP](#)) and is managed alongside the [Authorization Decision Log](#) itself. When the external [log](#) is hosted by another organisation, the producing organisation *SHOULD* coordinate the retention of the external [log](#) with the retention of the [log records](#) that reference it, and *SHOULD* document this coordination in their logging policy.

The following example shows a [log record](#) for a request to find all subjects capable of approving a holiday request, where the call to the HR API is recorded in an external WARC log:

EXAMPLE 5: Log record of a search request for managers with approval rights

```
{
  "trace_id": "28dbeec32e77635cc19bc3204ec56c41",
  "span_id": "17c59821784ee492",
  "parent_span_id": "c4e1d75a3f9b8240",
  "event_name": "adl.search_subject",
  "timestamp": 1757240136089,
  "status": "Unset",
  "attributes": {
    "adl.core.policies": {
      "git": "e4c15a063048367da367d5588d703b5e4a6b760e"
    },
    "adl.core.information": {
      "managers-api": { "span_id": "45deb36022f53afa" }
    }
  },
  "body": {
    "adl.core.request": {
      "subject": {
        "type": "user"
      },
      "action": {
        "name": "approve"
      },
      "resource": {
        "type": "holiday-request",
        "id": "446epbc8y7",
        "properties": {
          "employee": "bob"
        }
      }
    },
    "adl.core.response": {
      "results": [
        {
          "type": "user",
          "id": "carol"
        },
        {
          "type": "user",
          "id": "dan"
        }
      ]
    }
  }
}
```

```
}  
}  
}
```

The `adl.core.information` reference points to a [span](#) (45deb36022f53afa) within the same [trace](#). That [span](#) represents the HR API call. The HTTP exchange of that call is logged as WARC entries indexed by the same `trace_id` and `span_id`:

EXAMPLE 6: WARC entries for REST API call to HR system

```
WARC/1.1
WARC-Type: request
WARC-Date: 2025-09-07T10:15:31Z
WARC-Record-ID: <urn:uuid:48bafbce-8d2a-45c1-9d7a-1a851c36e1c8>
Content-Type: application/http; msgtype=request
Content-Length: 142

GET /users/bob/managers?fields=can_sign HTTP/1.1
Host: hr.example.com
traceparent: 00-28dbeec32e77635cc19bc3204ec56c41-45deb36022f53afa-01

WARC/1.1
WARC-Type: response
WARC-Date: 2025-09-07T10:15:32Z
WARC-Record-ID: <urn:uuid:4a381180-21a7-4712-8706-5b321c17e3f8>
WARC-Concurrent-To: <urn:uuid:48bafbce-8d2a-45c1-9d7a-1a851c36e1c8>
Content-Type: application/http; msgtype=response
Content-Length: 175

HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 107

{
  "alice": {
    "can_sign": false
  },
  "carol": {
    "can_sign": true
  },
  "dan": {
    "can_sign": true
  }
}
```

§4. Data Verifiability and Level of Detail

This section is non-normative.

The ability to provide accountability depends on the [log](#)'s level of detail. A balance needs to be struck between capturing enough information to accurately [replay](#) historical decisions and practical challenges like data duplication and scalability. The appropriate level of detail depends on the organisation's specific context and legal requirements, as the highest level is not always necessary.

To ensure historical accuracy while minimising data storage, referencing external information (e.g., via a timestamp or version number) is preferred over storing copies. This approach keeps [logs](#) lean but is contingent on the ability of source systems to provide versioned historical data.

For full [replayability](#), the [log](#) also needs to identify the exact version and configuration of the policy engine that evaluated the decision; however, providing reliable versioning for the engine may not always be feasible, depending on the infrastructure.

§4.1 Definition of Levels

We have identified four levels of detail, in order from least to most detail. Each level builds on the information from the previous level.

§ 4.1.1 Level 1: Decision Request/Response

At the most basic level only the decision request and the decision response are logged.

NOTE: Engine boundaries

The decision request and response *MAY* contain all information required for an audit log, as described by [ISO/IEC 27002:2022] and [BIO2]. Where that is the case, and all auditable actions are decided on by the [PDP](#), the [Authorization Decision Log](#) *MAY* be combined with logs of other auditable events and used as an audit log.

At this level of detail [log records](#) contain all keys that are described as mandatory in [3.3 Interface](#).

§ 4.1.1.1 Example

In the following example a manager called Alice attempts to approve a holiday request for a team member called Bob, but the request is denied because she does not have signing authority.

Her browser submits the following request to the API:

EXAMPLE 7: HTTP request for holiday approval

```
POST /users/bob/holiday-requests/446epbc8y7 HTTP/1.1
Host: hr.example.com
Authorization: Bearer <alice-auth-token>
traceparent: 00-28dbeec32e77635cc19bc3204ec56c41-dec5220770f8f4f4-01

{"action": "approve"}
```

The application, acting as the [PEP](#), then submits the following HTTP request to the [PDP](#):

EXAMPLE 8: HTTP request from the PEP to the PDP

```
POST /access/v1/evaluation HTTP/1.1
Host: pdp.example.com
Content-Type: application/json
Authorization: Bearer <pep-auth-token>
traceparent: 00-28dbeec32e77635cc19bc3204ec56c41-893e1b2ac52d712f-01

{
  "subject": {
    "type": "user",
    "id": "alice"
  },
  "action": {
    "name": "approve"
  },
  "resource": {
    "type": "holiday-request",
    "id": "446epbc8y7",
    "properties": {
      "employee": "bob"
    }
  },
  "context": {
    "traceparent": "00-28dbeec32e77635cc19bc3204ec56c41-dec5220770"
  }
}
```

The [PDP](#) then determines that Alice can't sign on behalf of the company and thus cannot approve the holiday request. It returns the following response:

EXAMPLE 9: Response from the PDP to the PEP

```
{
  "decision": false,
  "context": {
    "reason": {
      "48": "No signing authority"
    }
  }
}
```

A [log record](#) as expressed as a JSON object for this scenario:

EXAMPLE 10: Log record of denied holiday approval

```
{
  "trace_id": "28dbeec32e77635cc19bc3204ec56c41",
  "span_id": "5e3c8a4f9b2d1e07",
  "parent_span_id": "893e1b2ac52d712f",
  "event_name": "adl.access_evaluation",
  "timestamp": 1757240058042,
  "status": "Unset",
  "attributes": {},
  "body": {
    "adl.core.request": {
      "subject": {
        "type": "user",
        "id": "alice"
      },
      "action": {
        "name": "approve"
      },
      "resource": {
        "type": "holiday-request",
        "id": "446epbc8y7",
        "properties": {
          "employee": "bob"
        }
      },
      "context": {
        "traceparent": "00-28dbeec32e77635cc19bc3204ec56c41-de
      },
      "adl.core.response": {
        "decision": false,
        "context": {
          "reason": {
            "48": "No signing authority"
          }
        }
      }
    }
  }
}
```

§ 4.1.2 Level 2: Decision and Policies

In addition to the request and response, one can refer to the exact version of the [policies](#) that were used to evaluate the request. This can be achieved by incorporating the [adl.core.policies](#) attribute.

§ 4.1.2.1 Example

We can extend the example of the holiday-approval request by adding a reference to a Git repository in which current HR approval [policies](#) are documented. In the example below the git hash of the version currently deployed together with the [PDP](#) is 6266d07750c44b4c9b05d0801b752c0ef884e4f6.

EXAMPLE 11: Git-versioned policy source

```
{
  "hr": "6266d07750c44b4c9b05d0801b752c0ef884e4f6"
}
```

More complex references can be achieved by using an object as the version identifier. If, for example, the HR application takes part in a federation with predefined policies for different maturity levels. The following example shows how those policies can be referenced using a semantic version combined with a filter for policies relevant to the current maturity level.

EXAMPLE 12: Complex policy source reference

```
{
  "hr": "6266d07750c44b4c9b05d0801b752c0ef884e4f6",
  "federation": {
    "version": "2.7.1",
    "filter": "maturity_level <= 3"
  }
}
```

A [log record](#) as expressed as a JSON object for this scenario:

EXAMPLE 13: Log record of denied holiday approval including policies reference

```
{
  "trace_id": "28dbeec32e77635cc19bc3204ec56c41",
  "span_id": "5e3c8a4f9b2d1e07",
  "parent_span_id": "893e1b2ac52d712f",
  "event_name": "adl.access_evaluation",
  "timestamp": 1757240058042,
  "status": "Unset",
  "attributes": {
    "adl.core.policies": {
      "hr": "6266d07750c44b4c9b05d0801b752c0ef884e4f6",
      "federation": {
        "version": "2.7.1",
        "filter": "maturity_level <= 3"
      }
    }
  },
  "body": {
    "adl.core.request": {
      "subject": {
        "type": "user",
        "id": "alice"
      },
      "action": {
        "name": "approve"
      },
      "resource": {
        "type": "holiday-request",
        "id": "446epbc8y7",
        "properties": {
          "employee": "bob"
        }
      },
      "context": {
        "traceparent": "00-28dbeec32e77635cc19bc3204ec56c41-de
      },
      "adl.core.response": {
        "decision": false,
        "context": {
          "reason": {
            "48": "No signing authority"
          }
        }
      }
    }
  }
}
```

```
}  
}  
}
```

§ 4.1.3 Level 3: All Information Sources

Furthermore, every piece of information used in the evaluation can also be programmatically retrieved, by providing the [adl.core.information](#) attribute. This allows full [replayability](#), assuming the engine ([PDP](#)) behaves identically or can be manually [reconstructed](#) in the correct state, which is generally achievable.

§ 4.1.3.1 Example

In the example of the holiday approval, the ability to sign is accessed through the `can_sign` field of the user. The [Policy Information Point](#) called `can-sign-api` requests this via an API from the HR application using the request below:

EXAMPLE 14: PIP's request to the Managers API

```
GET /users/alice?fields=can_sign HTTP/1.1  
Host: hr.example.com  
traceparent: 00-28dbeec32e77635cc19bc3204ec56c41-836ff5286112f460-01
```

And the API returns the following response:

EXAMPLE 15: Managers API response to the PIP's request

```
{  
  "can_sign": false  
}
```

A [log record](#) as expressed as a JSON object for this scenario:

EXAMPLE 16: Log record of denied holiday approval including policies and information references

```
{
  "trace_id": "28dbeec32e77635cc19bc3204ec56c41",
  "span_id": "5e3c8a4f9b2d1e07",
  "parent_span_id": "893e1b2ac52d712f",
  "event_name": "adl.access_evaluation",
  "timestamp": 1757240058042,
  "status": "Unset",
  "attributes": {
    "adl.core.policies": {
      "hr": "6266d07750c44b4c9b05d0801b752c0ef884e4f6",
      "federation": {
        "version": "2.7.1",
        "filter": "maturity_level <= 3"
      }
    },
    "adl.core.information": {
      "can-sign-api": { "span_id": "836ff5286112f460" }
    }
  },
  "body": {
    "adl.core.request": {
      "subject": {
        "type": "user",
        "id": "alice"
      },
      "action": {
        "name": "approve"
      },
      "resource": {
        "type": "holiday-request",
        "id": "446epbc8y7",
        "properties": {
          "employee": "bob"
        }
      },
      "context": {
        "traceparent": "00-28dbeec32e77635cc19bc3204ec56c41-de
      },
      "adl.core.response": {
        "decision": false,
        "context": {
          "reason": {
```

```
    "48": "No signing authority"
  }
}
}
```

NOTE: Logged source for the PIP call

The `adl.core.information` reference for `can-sign-api` is a Logged [source](#): it points to a [span](#) (836ff5286112f460) within the same [trace](#) that represents the [PIP](#) call to the HR API. The actual API request/response is retrieved from an external [log](#) (for example a WARC archive) keyed by `trace_id` and `span_id`. See [3.5 Sources and referencing](#) for the alternative reference patterns.

§ 4.1.4 Level 4: Full Environment

In addition to all information used in the evaluation, the environment and configuration of the system that evaluates the decision can also be accurately [reconstructed](#) through the use of the [adl.core.configuration](#) attribute. This provides full, guaranteed [replayability](#) and maximum accountability.

NOTE: System boundaries

The configuration of all components that influence the decision should be included. While this may be limited to the configuration of the [PDP](#), it often also requires configuration of the [PIP](#) and sometimes the [PAP](#) as well.

At this level of detail [log records](#) contain the following keys, as defined in [3. Specifications](#):

§ 4.1.4.1 Example

In the example below we extend the holiday approval request example by describing the version of the language used by the [PDP](#) and the configuration of the `can-sign-api` [PIP](#).

EXAMPLE 17: Log record of denied holiday approval including configuration in body

```
{
  "trace_id": "28dbeec32e77635cc19bc3204ec56c41",
  "span_id": "5e3c8a4f9b2d1e07",
  "parent_span_id": "893e1b2ac52d712f",
  "event_name": "adl.access_evaluation",
  "timestamp": 1757240058042,
  "status": "Unset",
  "attributes": {
    "adl.core.policies": {
      "hr": "6266d07750c44b4c9b05d0801b752c0ef884e4f6",
      "federation": {
        "version": "2.7.1",
        "filter": "maturity_level <= 3"
      }
    },
    "adl.core.information": {
      "can-sign-api": { "span_id": "836ff5286112f460" }
    }
  },
  "body": {
    "adl.core.request": {
      "subject": {
        "type": "user",
        "id": "alice"
      },
      "action": {
        "name": "approve"
      },
      "resource": {
        "type": "holiday-request",
        "id": "446epbc8y7",
        "properties": {
          "employee": "bob"
        }
      },
      "context": {
        "traceparent": "00-28dbeec32e77635cc19bc3204ec56c41-de
      }
    },
    "adl.core.response": {
      "decision": false,
      "context": {
        "reason": {
          "48": "No signing authority"
        }
      }
    }
  }
}
```

```

    }
  },
  "adl.core.configuration": {
    "opa": "1.10.0",
    "can-sign-api": "https://hr.example.com/users/{subject.id}"
  }
}

```

NOTE: Configuration as raw data in body

In this example the `configuration` is raw data — a few key/value pairs describing the OPA version and the `can-sign-api` endpoint URL — rather than a pointer to a coherent external configuration source. It therefore belongs in [body](#) alongside request and response.

When configuration *is* available from an external source (e.g., a Git-versioned Iaas definition or a configuration management system), the `attributes.adl.core.configuration` reference pattern (analogous to `adl.core.policies`) *SHOULD* be used instead.

§4.2 Implications of levels

The higher the level of detail, the more useful the [log](#) is for determining the context of an [authorization decision](#). On the other hand, higher levels of detail also introduce challenges around scalability, technical feasibility, and security.

Conversely, the lowest level of detail may not be sufficient to provide effective accountability. This depends on the data processing which is being authorised and legal requirements for it.

For that reason it's important to decide for different use cases which level of detail is required and appropriate. Aiming for the highest level of detail for all authorization decisions is thus not necessary.

§5. Information Management and Compliance

This section is non-normative.

Conformance to this standard does not, by itself, guarantee legal or regulatory compliance. The implementing organisation is solely responsible for ensuring its implementation adheres to all applicable frameworks, such as the General Data Protection Regulation (GDPR / AVG) and relevant security baselines, such as [ISO/IEC 27001:2022], [ISO/IEC 27002:2022], and [BIO2]. Each organisation is responsible for its own [Authorization Decision Log](#). There is no central [log](#), although [logs](#) of several organisations can be aggregated if desired.

The following sections list aspects that should be taken into consideration when creating a compliant and secure logging solution.

§5.1 Legal and Privacy Compliance

Logging [authorization decisions](#) creates a new processing of data, which is subject to privacy regulations when personal data is involved.

§ 5.1.1 Purpose Limitation

When collecting personal data, the specific purposes for logging (e.g., operational auditing, forensic analysis, citizen accountability) should be defined and documented in a formal policy before implementation, in line with the purpose-limitation principle of [AVG] art. 5(1)(b). Data collection should be limited to those defined purposes.

§ 5.1.2 Data Minimisation

A core principle is to avoid storing unnecessary information, especially sensitive data. The goal is to make the [log](#) precise, compact, and manageable. Instead of duplicating large amounts of (personal) data, prefer storing only the data used in the decision or even just a reference that allows the state at the time of the decision to be [reconstructed](#).

A logging policy that manages what is logged based on risk should be in place. When logging sensitive data for high-risk use cases, this should be explicitly documented and approved.

Implementers should consider pseudonymisation and anonymisation for personal data, in line with the data-masking control in section 8.11 of [ISO/IEC 27002:2022]. For example, personal identifiers can be hashed or aliased and location data can be randomised.

When aggregate statistics, such as decisions per type per time period, are sufficient, implementers should consider using aggregation as a method of data minimisation and anonymisation.

§ 5.1.3 Data Retention

A data retention policy is required by [AVG] art. 5(1)(e) and should be defined and enforced. Retention periods should be based on the defined purposes and legal obligations, and may differ for different types of [log records](#).

As a general guideline, operational logs (for debugging, support) should be retained for a short period (months), while forensic/audit logs may be retained for longer periods (years).

For implementations within Dutch public-sector organisations, retention is also subject to the Archiefwet and the applicable Selectielijst — for example, the Selectielijst gemeenten en intergemeentelijke organen for municipal deployments, or the central-government Selectielijst for ministries. Retention periods chosen for [logs](#) should be reconciled with these obligations.

[Logs](#) that have exceeded their defined retention period should be automatically and securely purged in line with the secure-deletion control in section 8.10 of [ISO/IEC 27002:2022].

When `attributes.adl.core.*` carries [source](#) references rather than raw payloads, the upstream [sources](#) *MUST* remain retrievable for the full retention period of the referencing [log records](#); otherwise the accountability claim of the referencing [log record](#) is invalidated.

Coordination of upstream retention is the responsibility of the producing organisation and should be documented in its logging policy. See [3.5 Sources and referencing](#) for the related Versioned, Temporal, and Logged source patterns.

§ 5.1.4 Transparency and Subject Rights

If [logs](#) contain personal data, they should be designed to support data subject access requests under [AVG] art. 15. To enable subject-access queries that span ADL and [LDV], implementations *SHOULD* include the `dpl.core.data_subject_id` attribute defined by [LDV] in `attributes` when the request involves personal data. This anchors the [log record](#) to the data subject in the same convention used by LDV.

The [log](#)'s structure, purpose, and retention are to be documented in the organisation's Register of Processing Activities, as required by [AVG] art. 30.

Implementations whose [log](#) content constitutes large-scale or high-risk processing of personal data are subject to the DPIA requirement under [AVG] art. 35. This standard does not impose a DPIA

requirement; it does require organisations to assess whether one applies. The DPIA-leidraad published by the Autoriteit Persoonsgegevens can serve as the basis for such an assessment. When a DPIA is performed, the choice of detail level, retention period, and access scope of the [Authorization Decision Log](#) should be considered as part of it.

§5.2 Access Control

Access to log data should be restricted based on the principle of least privilege.

It is essential to define clear [policies](#) for authorising access to the [Authorization Decision Log](#) or parts thereof. These decisions to provide or deny access to the [log](#) should also be included in the [Authorization Decision Log](#).

Common and important usage policies include:

- **(Forensic) Audits:** The [log](#) is a critical tool for auditing and forensic analysis after a security incident or data breach. It can help determine what actions were permitted at a specific time and on what basis, even if that permission was technically correct but improper in hindsight.
- **Observability in Trust Frameworks:** The [log](#) offers a structured method for data users to provide insight into their data usage to data providers when required, as may be required in trust frameworks. It thus offers an implementation standard for "Observability services" as defined for data spaces under the EU Data Act.
- **Debugging and Support:** The [log](#) can be a useful tool for determining why the [authorization](#) is not working as expected. It can also contain highly sensitive data, however, so it's essential to carefully define if, and under which conditions, the [Authorization Decision Log](#) can be used for this purpose.

§5.3 Security and Integrity

The [log](#) should be protected against unauthorised access, modification, and deletion. The relevant operational baselines for the Dutch government context are [[ISO/IEC 27002:2022](#)] (mirrored in [[BIO2](#)]).

Key concerns for ensuring security and integrity include:

- **Transport Security:** It's recommended to use mTLS (Mutual Transport Layer Security) for network connections that transport log data to ensure authenticated and encrypted transport.

- **Encryption at Rest:** All log data should be encrypted at rest. It's recommended to manage this using a Key Management System (KMS).
- **Data Integrity:** The [log](#) should be configured as append-only storage (WORM) to prevent undetected modification or deletion, in line with section 5.33 of [ISO/IEC 27002:2022]. Mechanisms such as a cryptographic hash chains and periodic cryptographic sealing can be used to ensure integrity and non-repudiation of [logs](#).
- **Time Synchronisation:** All systems involved in generating and storing [logs](#) should be synchronised to a trusted Network Time Protocol (NTP) source to ensure a reliable and accurate timeline of events, in line with section 8.17 of [ISO/IEC 27002:2022].
- **Ingestion:** The logging endpoint should be implemented as idempotent writes to an asynchronous, buffered service (e.g., using a durable queue) to mitigate latency and availability risks in the event of log-ingest failures. See [3.2.4 Ingestion](#) for the normative idempotency rule.

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§A. Index

§A.1 Terms defined by this specification

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[Authorization Decision Log](#) §2.1

[Externalised Authorization Management](#) §1.2

[Log](#) §1.2

[Log record](#) §1.2

[Policy](#) §1.2

[Policy Administration Point](#) §2.1

[Policy Decision Point](#) §2.1

[Policy Enforcement Point](#) §2.1

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[Reconstruct](#) §1.2

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§A.2 Terms defined by reference

[*AUTHZEN*] defines the following:

Access Evaluation API

Access Evaluations API

Action Search API

Resource Search API

Subject Search API

[*TRACE-CONTEXT*] defines the following:

section 3.5 (Mutating the tracestate Field)

section 6 (Privacy Considerations)

§B. References

§B.1 Normative references

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