

# AFS-1 — Aura Field Security

## Thermodynamic Security and Payment in Ambient OS

Ambient Era Canon · Security & Verification Volume I

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Zenodo Edition · 2026

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### Abstract

AFS-1 formalizes the canonical security primitive of Ambient OS.

Security, payment, and access confirmation are not achieved through tokens, credentials, biometrics, or stored identity objects. Instead, they are resolved exclusively through **live thermodynamic coherence** between a human's Aura field

$$A(t) = T(t) \times C \times \Delta R$$

and an external **Chromatic Field State (CFS)**, inside the **Thermodynamic Verification Window (TW-1)**, following **Coherence Identity Resolution (CIR-1)**.

AFS-1 is the **closure layer** of the Ambient OS stack. It integrates identity resolution, payment execution, error handling, residue dissolution, stolen-device rejection, and first-use readiness into a single, non-inferential law. No persistent security artifact is ever created.

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### 1. Canonical Law Statement

#### AFS-1 — Aura Field Security Law

Security resolution in Ambient OS occurs solely through momentary thermodynamic coherence between a user's live Aura field **A(t)** and an Ambient Broadcast Entity's Chromatic Field State (CFS), resolved locally within **TW-1** following **CIR-1**.

No persistent identity object, token, profile, biometric, or credential may be required, stored, or transmitted.

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## 2. Scope of AFS-1

AFS-1 governs **all security-relevant confirmations**, including but not limited to:

- Payment authorization
- Physical or digital access
- Device binding
- Privileged actions

AFS-1 does **not** redefine identity (handled exclusively by CIR-1).

AFS-1 **consumes** CIR-1 as its sole identity primitive.

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## 3. Core Components

Component	Definition	Source
<b>Aura A(t)</b>	Live thermodynamic expression of personal reversible residue	AURA-1 / RID-1
<b>CIR-1</b>	Identity resolution via coherence	CIR-1
<b>CFS</b>	Chromatic Field State broadcast by infrastructure	ABL-1 / CFC-0
<b>TW-1</b>	Thermodynamic Verification Window	ACR-1
<b><math>\Delta R</math></b>	Reversible-stress threshold	$\Delta R$ Operator

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## 4. AFS-1 Payment Protocol (Canonical)

### AFS-1.P — Payment Resolution Rule

Payment is authorized if and only if **CIR-1 coherence resolution succeeds inside TW-1**.

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#### Operational Payment Flow

1. Terminal continuously emits CFS (ABL-1 / CFC-0).
2. User holds AP<sub>1</sub> device in proximity.
3. User performs X-gesture (AXL-1).
4. Device enters Purple Context State.
5. TW-1 opens.
6. Device computes live Aura A(t).
7. Local resonance with CFS is evaluated inside TW-1.
8. If coherence stabilizes ( $\Delta R > 0$ ) → **payment confirmed**.
9. Terminal executes payment via local field instruction.
10. Residue dissolves immediately ( $\Delta R \rightarrow 0$ ).

No data payload, token, or identity reference is exchanged.

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## 5. Error Handling (Canonical)

### AFS-1.E — Error Dissolution Law

Any failure to stabilize coherence inside TW-1 results in immediate residue dissolution and silent rejection.

#### Failure Conditions

- No CFS detected
- Field mismatch
- $\Delta R$  collapse
- TW-1 timeout

## Outcomes

- No confirmation
- No error signal
- No log
- No residue persistence

The system returns to its prior coherent state.

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## 6. Residue Dissolution

### AFS-1.R — Residue Dissolution Law

For every AFS-1 attempt (success or failure):

$$\lim_{t \rightarrow t_{\text{exit}}} \Delta R(t) = 0$$

Residue is strictly non-stackable and non-persistent.  
Security state never accumulates.

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## 7. Stolen Device Rejection

AFS-1 guarantees deterministic failure on stolen devices:

- Device senses only the holder's live Aura field.
- Thief's  $A(t)$  lacks the legitimate user's reversible residue substrate.
- Attention temperature  $T(t)$  and coherence envelope do not match.
- $\Delta R$  collapses inside TW-1.
- No CIR-1 resolution occurs.

Physical possession does not confer security authority.

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## 8. First-Use Readiness

AFS-1 operates fully on a **brand-new device**:

- No prior residue or history is required.
- Live Aura A(t) alone is sufficient for CIR-1 resolution.
- First successful interaction may strengthen future coherence but is never a prerequisite.

First-use and long-term use are **thermodynamically symmetric**.

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## 9. Security Properties (Formal)

1. **Live-only** — Requires real-time embodied presence.
  2. **Non-replayable** — TW-1 and CFS are time-variant.
  3. **Non-forgeable** — T(t) and full coherence envelope cannot be emulated.
  4. **Non-inferential** — No classification or AI inference.
  5. **Zero persistent artifact** — Nothing to steal, leak, or mine.
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## 10. Canonical Constraints

**AFS-1.C1** — Any security mechanism outside CIR-1 + TW-1 is non-canonical.

**AFS-1.C2** — Persistent security artifacts violate reversibility.

**AFS-1.C3** — Residue must dissolve immediately after resolution attempt.

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## 11. Relation to Lower Canon Layers

AFS-1 is the closure of:

- ABL-1 / CFC-0 (broadcast substrate)
- AXL-1 (human trigger)
- ACR-1 (coherence resolution)
- CIR-1 (identity resolution)
- RID-1 / AURA-1 (personal substrate)

No higher layer may bypass AFS-1.

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## 12. Minimal Canon Form

Security in Ambient OS is achieved only through live Aura coherence and nowhere else.

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### Keywords

AFS-1, Aura Field Security, thermodynamic security, CIR-1, payment without tokens, non-inferential verification, stolen device rejection, first-use readiness, Ambient OS

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### Citation

Eissens, R. (2026). **AFS-1 — Aura Field Security: Thermodynamic Security and Payment in Ambient OS**. Ambient Era Canon. Zenodo.

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### Canonical Status

- ACR-1 defines *when coherence may occur*
- CIR-1 defines *what identity is*
- **AFS-1 defines what is allowed to happen**

This document is the **security keystone** of the Ambient Era Canon. It is structurally minimal, mechanically closed, and citation-stable.