

PROJECT TITAN RISK SIGNAL CATALOG

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Owner: Risk Operations & Data Engineering

Audience: Risk Analysts, Data Engineers, ML Engineers, Compliance

1.0 PURPOSE

This catalog defines every risk signal monitored by the Titan Engine. It is the authoritative source for signal logic, data requirements, and ownership. No signal may be processed unless defined herein.

2.0 SIGNAL CATEGORIES

2.1 Identity & Authentication (IDN)

Signals related to user verification and session legitimacy.

IDN-001 to IDN-045

2.2 Transaction Behavior (TXN)

Signals related to payment and transfer patterns.

TXN-101 to TXN-155

2.3 Device & Network (DEV)

Signals from device fingerprinting and network analysis.

DEV-201 to DEV-235

2.4 Behavioral Biometrics (BIO)

Signals from user interaction patterns.

BIO-301 to BIO-325

2.5 Historical Profile (HIS)

Signals comparing current activity to user history.

HIS-401 to HIS-445

3.0 SIGNAL DEFINITIONS

IDN-045: Login Country Mismatch

Description: Flags logins from countries not seen in user's history.

Formula: $\text{current_login_country} \text{ NOT IN } \text{user_country_history_90d}$

Data Source: Geo-IP Service (MaxMind)

Refresh: Real-time

Owner: Fraud Ops Team

Threshold: Any mismatch = TRUE

TXN-155: High-Velocity Transfer Attempt

Description: Multiple transfer requests in short period.

Formula: $\text{COUNT}(\text{transfer_requests_1h}) > \text{velocity_threshold}$

Data Source: Transaction Service API

Refresh: 1-minute rolling window

Owner: Risk Analytics

Threshold: Velocity threshold = 5 (configurable)

DEV-235: Emulator Detection

Description: Detects mobile app running in emulator.

Formula: $\text{device_is_emulator} = \text{TRUE}$

Data Source: Mobile SDK (v4.2+)

Refresh: Per session

Owner: Security Engineering

Threshold: TRUE = High risk

BIO-310: Typing Rhythm Anomaly

Description: Deviation from user's typical typing pattern.

Formula: $\text{typing_speed_std_dev} > 2.5 \text{ AND } \text{keystroke_latency_change} > 40\%$

Data Source: Behavioral Analytics Service

Refresh: Per authentication event

Owner: ML Engineering

Threshold: Score > 0.85 (0-1 scale)

HIS-445: Amount-to-History Ratio

Description: Transaction amount vs. 90-day average.

Formula: $\text{current_amount} / \text{avg_amount_90d} > \text{ratio_threshold}$

Data Source: Transaction Database
Refresh: Real-time (with 90d lookback)
Owner: Risk Analytics
Threshold: Ratio threshold = 3.0

4.0 DATA QUALITY REQUIREMENTS

4.1 Freshness SLAs

Signal Category	Maximum Latency	Allowed Downtime
Identity (IDN)	100ms	5 min/month
Transaction (TXN)	50ms	2 min/month
Device (DEV)	200ms	10 min/month
Biometrics (BIO)	150ms	15 min/month
History (HIS)	300ms	30 min/month

4.2 Completeness Requirements

All signals must maintain >99% data completeness. Signals dropping below 95% are automatically disabled and alerted.

5.0 SIGNAL MANAGEMENT

5.1 Adding New Signals

Proposal: Submit signal definition template

Review: Data Engineering + Risk Ops approval

Testing: 30-day shadow mode in staging

Documentation: Update this catalog

Activation: Compliance sign-off required

5.2 Deprecating Signals

Notice: 30-day notice to all consumers

Phase-out: Gradual weight reduction in model

Archive: Signal logic retained in Appendix C

Removal: Complete after 90-day notice period

6.0 APPENDICES

Appendix A: Signal Version History

v2.1 (Nov 2023): Added BIO-301 to BIO-325

v2.0 (Aug 2023): Major restructuring by category

v1.5 (May 2023): Initial production release

Appendix B: Data Source Specifications

Detailed API contracts and schema definitions for each data source.

Appendix C: Deprecated Signals

Archive of retired signal logic for audit purposes.

APPROVAL SIGNATURES

Head of Risk Operations: _____ Date: _____

Director of Data Engineering: _____ Date: _____

Chief Compliance Officer: _____ Date: _____