

# Forensic Analysis Report

Neuro-Symbolic Crisis Generator • Comprehensive Evaluation

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## Test Configuration

**Model:** GPT-4o

**Temperature:** 0.7

**Mode:** Thesis (Full Validation) vs. Legacy (Skip Validation)

**Max Iterations:** 20 per Scenario

**Execution:** Parallel (2 Scenarios simultaneously)

# Executive Summary

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**Note:** This report uses **Deep Forensic Analysis** data from refinement loops. The numbers below reflect actual errors caught during validation, not surface-level batch comparison.

18

UNIQUE INJECTS ANALYZED

63

ERRORS PREVENTED (FORENSIC)

6

TOTAL SCENARIOS

21.2%

REJECTION RATE

# Statistical Significance Analysis

## Hypothesis Testing

**H0:**  $\mu_{\text{legacy}} = \mu_{\text{thesis}}$  (No difference)

**H1:**  $\mu_{\text{legacy}} > \mu_{\text{thesis}}$  (Thesis reduces hallucinations)

Metric	Value	Interpretation
Mean Difference	0.167	Legacy - Thesis hallucinations
T-Statistic	1.000	Test statistic
P-Value	0.3632	Significance level
Cohen's d	0.408	Effect size: Small
95% CI	[-0.262, 0.595]	Confidence interval
Sample Size	6	Number of scenarios

# Qualitative Error Pattern Analysis



CATEGORY	COUNT	THESIS INTERPRETATION
Asset/ Hallucination	25	LLM invents non-existent assets. System enforces reality.
MITRE/Logic	17	LLM violates cybersecurity rules. System enforces domain knowledge.
Temporal/Time	2	LLM creates temporal paradoxes. System enforces causality.
Status/Physics	1	LLM violates state consistency. System enforces physics.

## Exemplary Interventions

## Hall of Fame: Concrete examples of errors caught by the Critic Agent

### Asset/Hallucination:

*"Asset 'SRV-CORE-003' ist im Systemzustand als 'suspicious' aufgeführt, aber es wird behauptet, dass Daten von diesem Asset exfiltriert wurden, was einen kompromittierten Zustand voraussetzt."*

### MITRE/Logic:

*"MITRE ID T1546.014 (Event Triggered Execution) passt nicht zur beschriebenen Aktivität der Verschlüsselung und der Lösegeldforderung. Diese Technik ist nicht direkt mit der Verschlüsselung von Dateien..."*

### Temporal/Time:

*"Temporale Inkonsistenz: Inject INJ-010 hat Zeitstempel T+00:00:05, aber vorheriger Inject INJ-003 hat T+00:03:00 (später). Zeitstempel müssen chronologisch sein."*

### Status/Physics:

*"Der Zustand von 'SRV-CORE-001' wird als 'compromised' angegeben, aber der Inject beschreibt einen Ausfall, was eine Diskrepanz darstellt."*

# Refinement Efficiency Analysis



**0.00**

AVG REFINES PER SCENARIO

**0**

MAX REFINES NEEDED

**100.0%**

FIRST ATTEMPT SUCCESS RATE

# Cost-Benefit Analysis

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53

AVG LEGACY API CALLS

54

AVG THESIS API CALLS

0.9%

OVERHEAD

1

TOTAL PREVENTED

# Forensic Analysis Details

146

TOTAL EVENTS

18

UNIQUE INJECTS

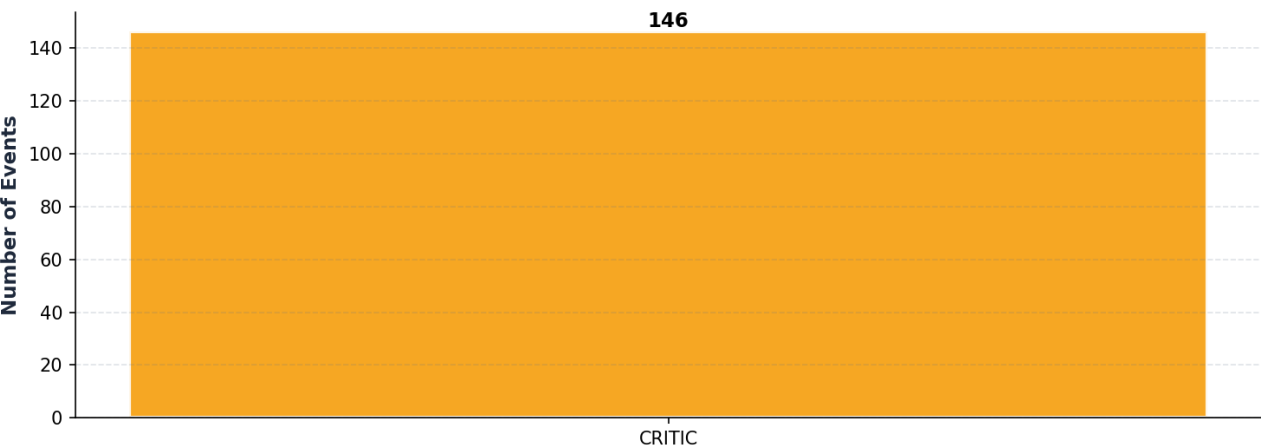
21.2%

REJECTION RATE

1.00

AVG REFINES PER INJECT

Event Type Distribution





# Robustness Analysis

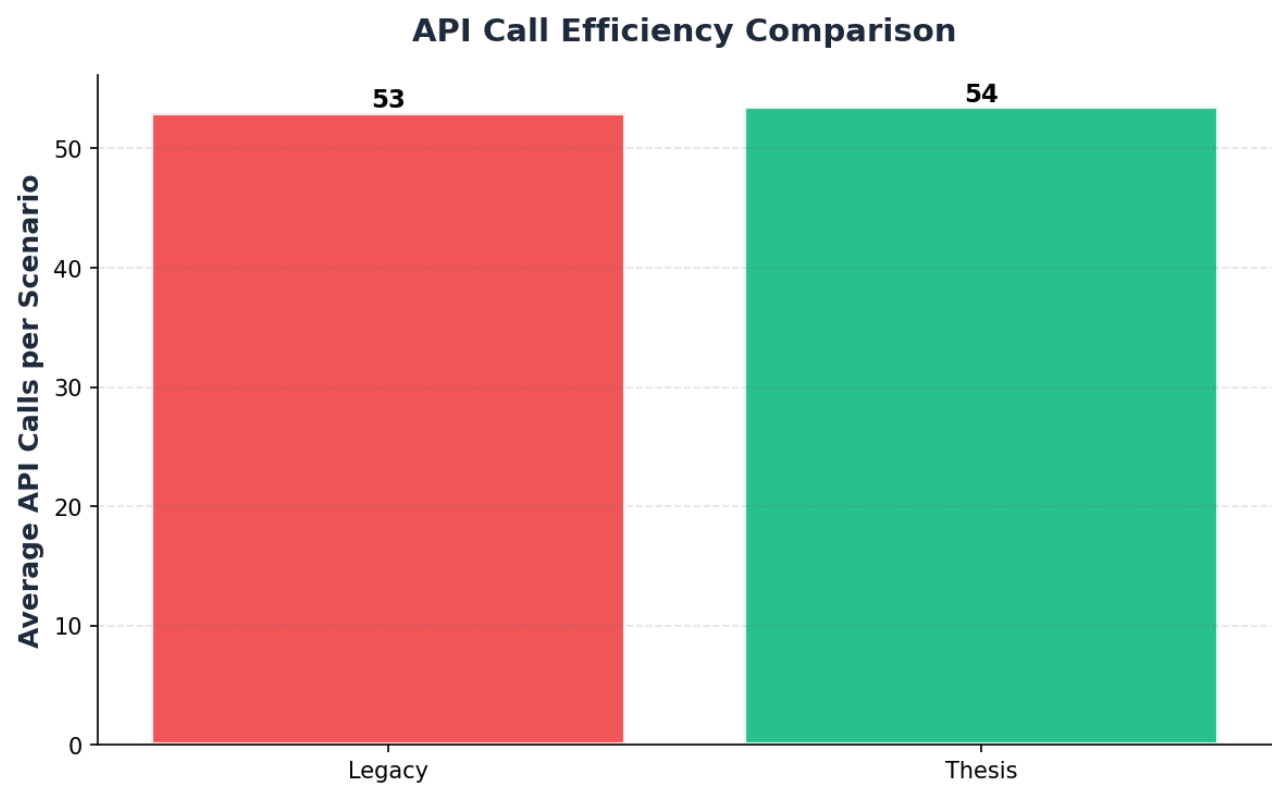
Consistency Check: How robust are the results across different scenarios?



METRIC		VALUE
Average Reduction %		100.0%
Std Deviation		0.0%
Min Reduction		100.0%
Max Reduction		100.0%
Consistency Score		100.0%

# API Call Efficiency

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# Detailed Results by Scenario

Scenario ID	Legacy Hallucinations	Thesis Hallucinations	Hallucinations Prevented	Thesis Refines
SCEN-000	0	0	0	0
SCEN-001	0	0	0	0
SCEN-002	0	0	0	0
SCEN-003	0	0	0	0
SCEN-004	0	0	0	0
SCEN-005	1	0	1	0