CHAINGENTIC / AIERC

Fraud-resistance technical sheet

The two-council calculation

Calculated result: approximately 1 in 27.5 billion.

This is the modeled probability that a malicious transaction is incorrectly approved by two required, independent five-of-seven councils under the assumptions below. It is not a measured rate of fraud on the network.

1. Assumptions

- Each evaluator has a 5% probability of incorrectly approving the same malicious transaction.
- Evaluator errors within each seven-seat council are independent.
- At least five approvals are needed for each council to approve.
- Two separate councils must approve the transaction, and their errors are independent of one another.

2. One council

Let X be the number of erroneous approvals. With p = 0.05:

```
P(X ≥ 5) = Σ[k=5..7] C(7,k) p^k (1−p)^(7−k)
= 21 × 0.05^5 × 0.95^2
  + 7 × 0.05^6 × 0.95
  + 0.05^7
= 0.00000602734375
```

That is approximately one erroneous approval in 165,911 such trials.

3. Two required, independent councils

```
P(both approve incorrectly) = P(X ≥ 5)^2
= 0.00000000003632887268066406 25
1 / P ≈ 27,526,315,193
Rounded: 1 in 27.5 billion
```

4. What this number does not establish

Different model families do not automatically have independent errors. Shared evidence, a common exploit, correlated reasoning and shared infrastructure can invalidate that assumption. A real error rate must be measured with appropriate adversarial testing.

The result applies to the specified escalated two-council case, not every transaction. It does not cover every cause of loss, implementation faults, compromised infrastructure or fraud outside the checks. The ordinary two-of-two path is not multiplied into this example as an extra independent filter.

5. How to interpret it

The calculation illustrates the potential benefit of requiring independent assessments to agree. Its assumptions describe what must be tested; the result is not a guarantee that fraud cannot occur.

Calculation reference: project fraud-math model. Recomputed for this technical sheet using p = 0.05 and a five-of-seven threshold.