**MesaScore: Interpreting Mango's Practical Scoring Model**

**Overview**

MesaScore is Mango's practical scoring system for evaluating cryptographic sequence performance. It balances deterministic thresholding with precision-driven bonuses to identify sequences that are both robust and well-suited to real-world data.

This document explains how MesaScore works, how to interpret scores, and why this model is central to Mango's adaptive cryptographic philosophy.

**1. The Mesa Metaphor**

A "mesa" is a flat-topped plateau — and that image is a perfect representation of what Mango aims to find: sequences that land on a broad scoring surface of excellence.

**1.1 Bull's-Eye and Concentric Rings**

When Mango's Munge system derives a sequence optimized for a given input type (e.g., Random, Natural, Combined), it finds the "bull's-eye" — the best-known configuration.

Other inputs of the same type may score slightly lower due to differences in structure, entropy, or keying, but scores should remain high and predictable — forming concentric scoring rings around the peak. This scoring stability is a defining feature of MesaScore.

**2. Composition of MesaScore**

MesaScore is made of two layers:

**2.1 Scoring Bands (Integral Score)**

Scores are grouped into practical bands:

* 95–100: Exceptional
* 90–94: Strong
* 85–89: Robust
* 80–84: Acceptable
* <80: Weak or Failing

These are based on hard thresholds from Mango's metric engine. A failed threshold (e.g., entropy or avalanche) can drop a score out of a band.

**2.2 Bonus Resolution (Decimal Score)**

Scores within a band are further adjusted using a precision bonus model:

* Bonus points are awarded for exceeding thresholds.
* The decimal portion of the score reflects closeness to the optimal sequence.

Thus, a score of 90.978 outperforms 90.004 — even though both are in the same band.

**3. Interpreting MesaScores**

**3.1 Absolute Scores**

A single MesaScore reflects how well a sequence performed against a specific input+key combination.

* **High scores (90+)** indicate excellent diffusion, entropy, and correlation resilience.
* **Lower scores (<85)** may still pass reversibility but lack statistical strength.

**3.2 Relative Scores**

Comparisons are more important than absolutes:

* Within the same input type, higher MesaScores indicate better fit.
* If scores degrade sharply on a new input, the profile may need tuning.

**3.3 Stability Expectations**

MesaScore is designed to be stable under slight variations:

* Multiple runs on different samples of the same input type should yield similar scores.
* If not, this may indicate insufficient mesa tolerance or overfitting.

**4. Why MesaScore Matters**

MesaScore provides:

* **Intelligibility**: Developers and researchers can read, compare, and rank sequences easily.
* **Adaptivity**: Profiles can be chosen or refined based on practical outcomes.
* **Transparency**: Every score is backed by a traceable metric evaluation.
* **Resilience**: Scoring tolerates small changes in input or key without collapse.

MesaScore enables Mango to function not just as an encryption engine, but as an adaptive cryptographic system — one where optimal behavior is measurable, repeatable, and explainable.

**5. Summary**

MesaScore is more than a number — it's a model for interpreting robustness in real-world encryption. It helps distinguish great sequences from merely good ones, and provides users with confidence that Mango's adaptivity is working for their specific data needs.

When scoring results form a broad, flat mesa instead of a narrow peak, you’ve found a system worth standing on.