Final Metrics Summary - Image_visual test

Generated: 2025-12-13 00:18:40

1. Quantum Key Distribution (BB84) Summary

Metric	AES-GCM	ChaCha20	AES-SIV
Key A Length	128	120	128
Key B Length	124	114	126
Key B (1s count)	64	56	77
Key B (0s count)	60	58	49
A/B Match %	100.0	100.0	100.0
Error Rate	0.0	0.0	0.0
Shannon Entropy	1.0	0.9968	0.97
Key Confirmation	Passed	Passed	Passed

2. Encryption Performance Summary

Metric	AES-GCM	ChaCha20	AES-SIV
Timestamp	2025-12-09 22:22:23.836743	2025-12-09 22:22:52.536598	2025-12-12 17:40:05.649563
Encryption Time (s)	3.1586	2.9796	2.6553
Original File Size (bytes)	1610187	1610187	1610187
Encrypted File Size (bytes)	2872362	2872363	2872346
SHA-256 Hash	e4940d7955008eb3f174...	f09e1ba703c0955e0fd7...	cc027556bbf3535fd3b8...
Post-Quantum Signature	Enabled	Enabled	Enabled

Interpretation:

+ ChaCha20 was 5.7% faster than AES-GCM in encryption
+ AES-SIV was 15.9% faster than AES-GCM in encryption
+ Both produced similar encrypted file sizes
+ Post-quantum Dilithium5 signatures protect against quantum attacks

3. Decryption Performance Summary

Metric	AES-GCM	ChaCha20	AES-SIV
Timestamp	2025-12-09 22:23:24.674163	2025-12-09 22:23:52.680101	2025-12-12 17:41:39.857850
Decryption Time (s)	0.1621	0.1498	0.1483
AEAD Authentication	Passed	Passed	Passed
Decrypted File Size (bytes)	1610187	1610187	1610187
SHA-256 Hash	48a0a8e2b222d8881c56...	48a0a8e2b222d8881c56...	48a0a8e2b222d8881c56...

Interpretation:

+ VERIFICATION PASSED: Both ciphers decrypted to identical files

+ ChaCha20 was -8.2% faster than AES-GCM in decryption
+ AES-SIV was 8.5% faster than AES-GCM in decryption
+ AEAD authentication prevents tampering and ensures data integrity
+ Both ciphers provide equivalent 256-bit security strength