Conclusion

Results of Testing and Related Metrics

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Project Roadmap

IDEA

Compare encryption algorithms.

ENCRYPTION

Identify encryption algorithms.

OBJECTIVES

Create encyption tests.

TESTS

Performs tests for data.

DISCOVERIES

Present findings & comparisons.

CONCLUSION

Determine the best encryption.

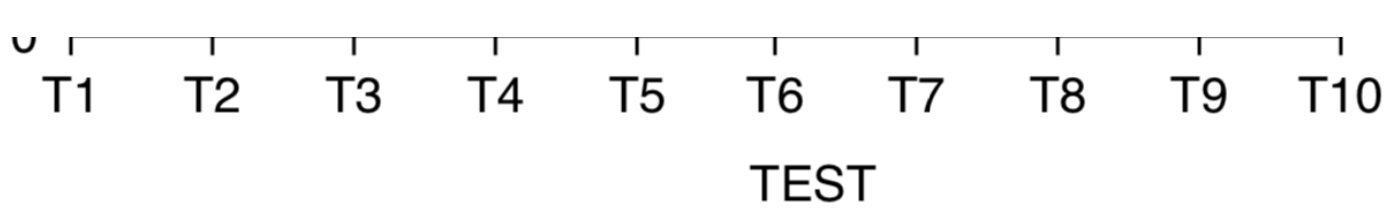
Types of Comparison

Encryption Speed and Encryption Strength.

1. **Encryption Speed**
   - I will perform 50 tests for each encryption algorithm to determine speed efficiency. Each test takes in three files of differing sizes and encrypts the files while recording the start and end time.

2. **Encryption Stength**
   - For these same tests and results I will determin strength of the encrypted algorithm. Without a better metric, I chose to compare the size of the encrypted files created to gauge strength.


Speed
SPEED (NANO-SEC)
1.5
1.2
0.9
0.6
0.3
0
AES
RSA



Speed Test

After calculating the results of over 100 tests I combined similar results, usually over the same size data, to show a simple 10 test chart. As shown, the results are overwhelmingly obvious that AES is on a high order of magnitude faster than RSA Encryption. This is a result of the difference in complexity between the two. RSA has additional instruction sets and byte-chunks that slow down encryption time.

AES Speed: Relatively Fast : Simple implementation does lead to a significant difference in speed.

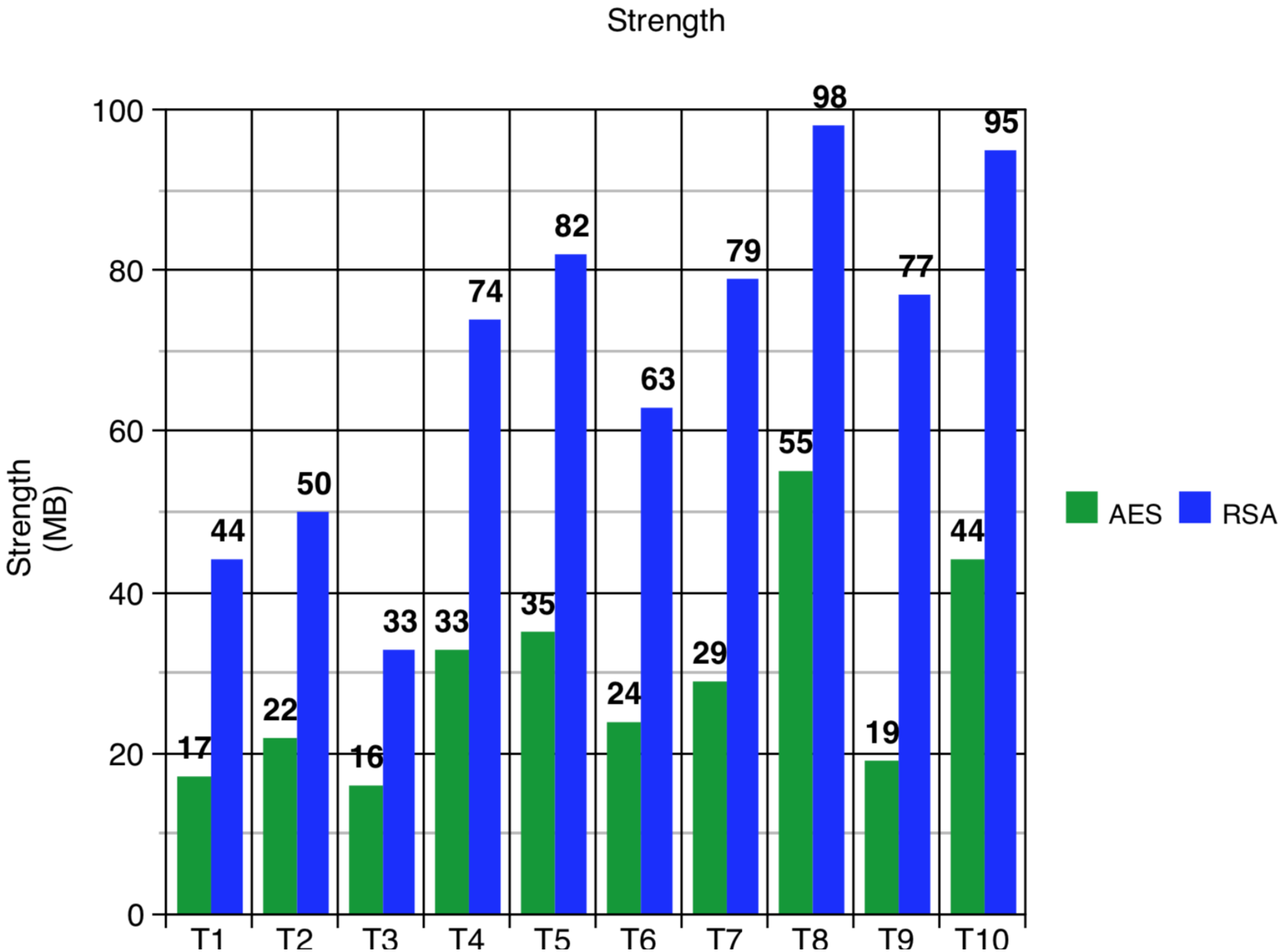
RSA Speed: Relatively Slow : Complex implementation does take time away from processing speed.

Strength Test

Again I combined the results from over 100 tests into 10 since several tests were similar enough in results to condense. The bar chart does show that RSA encryption is hands down more secure based on the file size created after encryption.

AES Encryption Stength: Relatively Weak : Many files sizes created did not exceed 30 MB in encrypted text.

RSA Encryption Stength: Relatively Strong : Many files sizes created did exceeded 50 MB in encrypted text.


Strength
Strength (MB)
100
80
60
40
20
0
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
17
44
22
50
16
33
33
74
35
82
24
63
29
79
55
98
19
77
44
95
AES
RSA

Test

Conclusion

Encryption Speed and Encryption Strength.

1. **Encryption Speed**
   - AES wins the speed test by a landslide. The additional calulations for breaking data into chunks and encrypting chunks and bytes separately leads RSA to a slower implementation.

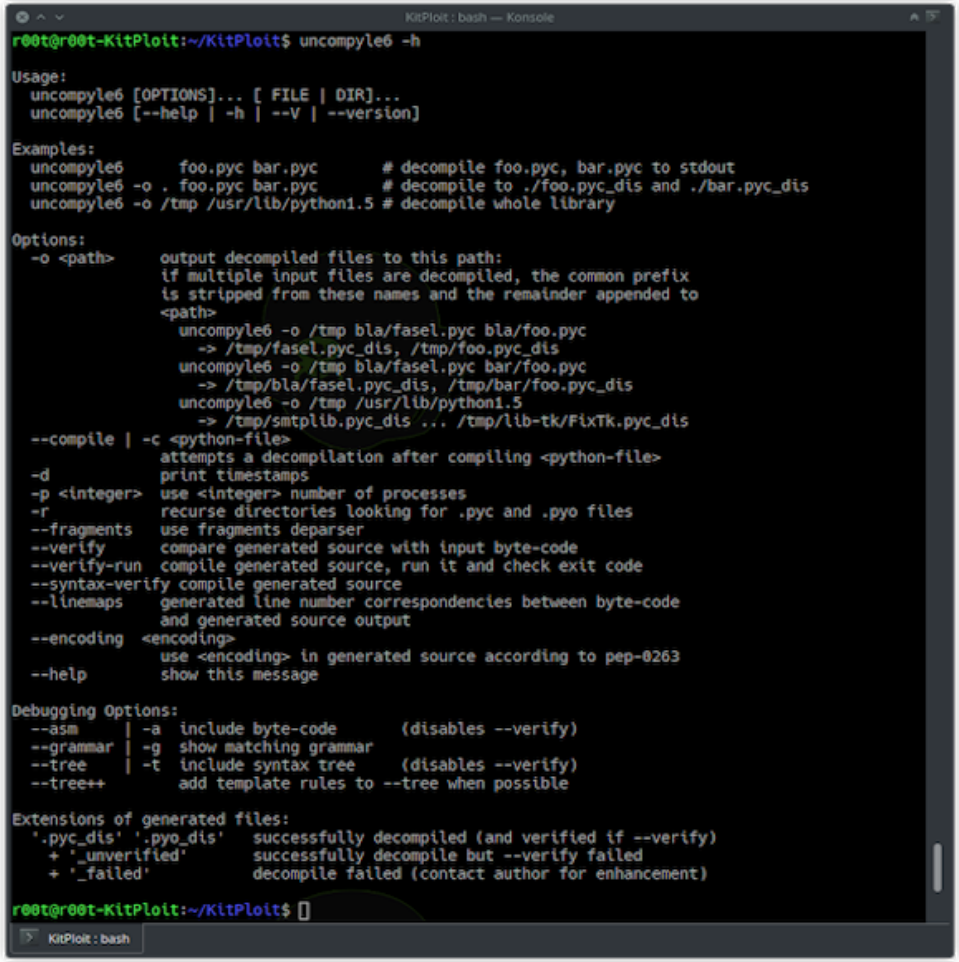
2. **Encryption Stength**
   - RSA holds the title for strength in standard practice and in output file size. Creating files larger than those taken in creates a much more difficult decryption process and thus, stronger encryption.

Metrics

Number of Tests 100	Speed Simulation 
Pass/Fail Tests 	Accuracy 90%
 Compare Results	 Examine Hypothesis
 Record Conclusions	 Publish

Files on Github.

RESEARCH



IMPLEMENTATION

CONCLUSION

Closing Remarks.

There are only two kinds of companies:

1. Those that have been hacked.
2. Those that will be.

~ Robert Mueller

Best,

Brandon Rowe