STEGANOGRAPHY ALONG WITH VISUAL CRYPTOGRAPHY USING DISTRIBUTED COMPUTING

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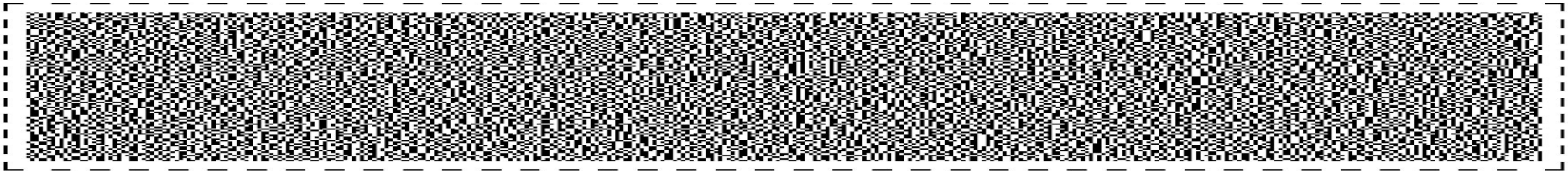
Let's start with the basics

(a)



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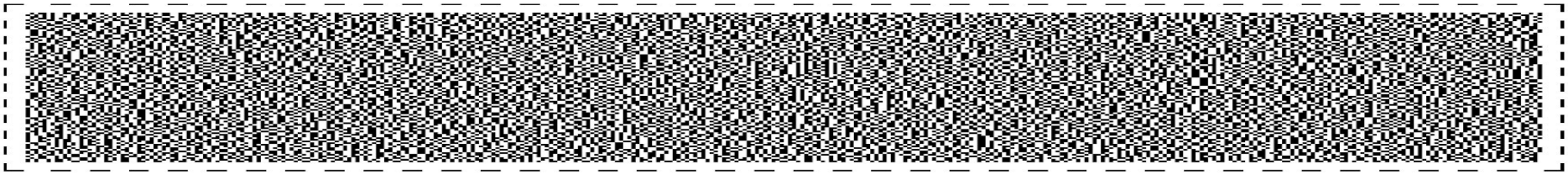


(c)

(d)

Let's dive into the project

Technology Used

- Message Passing Interface (MPI)
- Secure Shell (SSH)
- Network File System (NFS)

What is MPI?

- **M P I = Message Passing Interface**

- MPI is a ***specification*** for the developers and users of message passing libraries. By itself, it is NOT a library - but rather the specification of what such a library should be.

- MPI primarily addresses the ***message-passing parallel programming model:*** data is moved from the address space of one process to that of another process through cooperative operations on each process.

- Simply stated, the goal of the Message Passing Interface is to provide a widely used standard for writing message passing programs. The interface attempts to be:
  - Practical
  - Portable
  - Efficient
  - Flexible

Communication and File Exchange

- ***Secure Shell(SSH)*:** It's a program to log into another computer over a network, to execute commands in a remote machine. We use it to send commands from the leader node to the compute nodes.

- ***Network File System(NFS)*:** This is a distributed file system. We use this technology to exchange the files generated between the processes running on different compute nodes.

Challenges deep-dive

Challenge 1

Real Time Communication between Processes

The computing nodes must be able to share process data and status amongst themselves.

Sol : MPI

Challenge 2

Management of processes in compute nodes

Sending the instructions to start multiple process, collect the results from the multiple processes.

Sol *: SSH*

Challenge 3

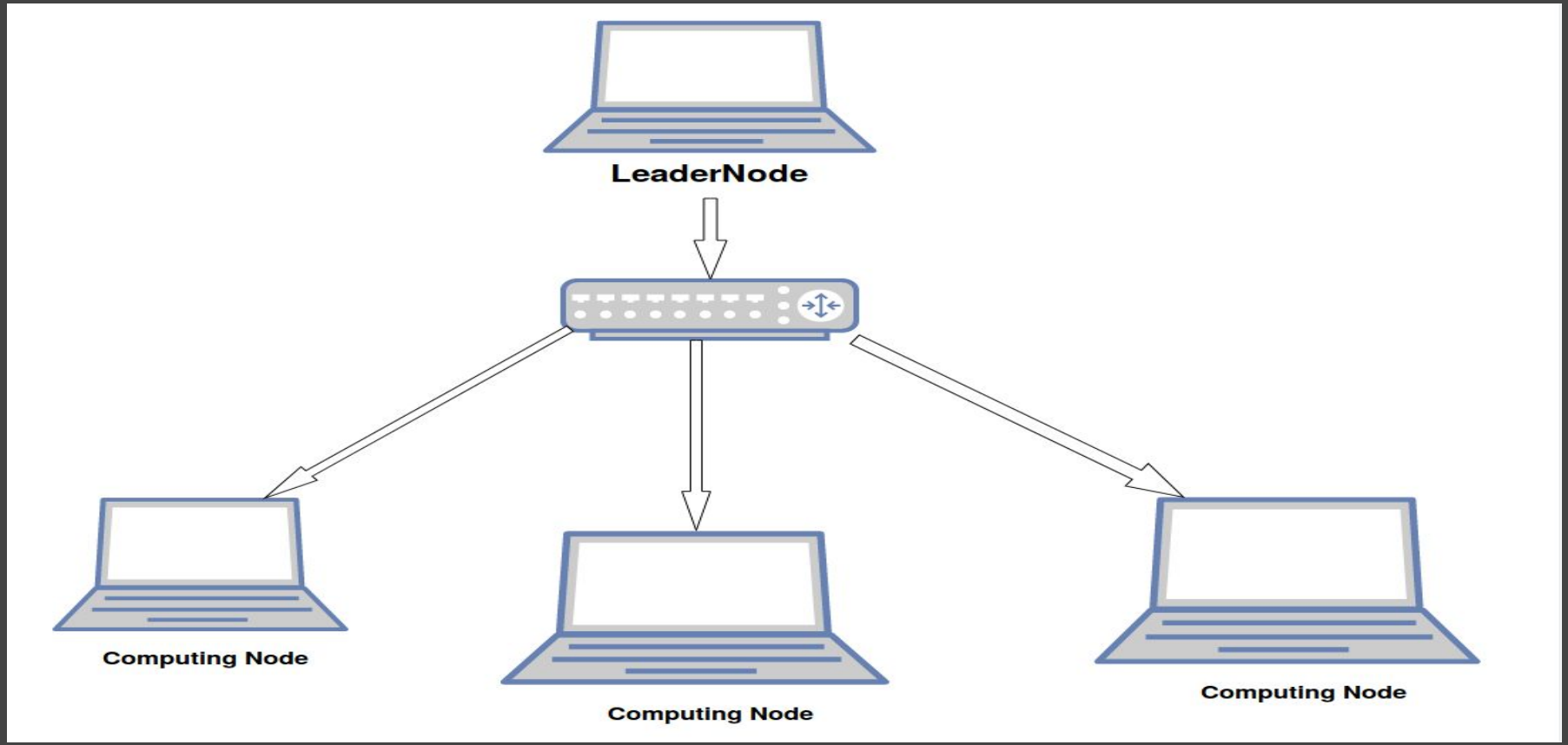
Real Time Sharing of Files between the nodes

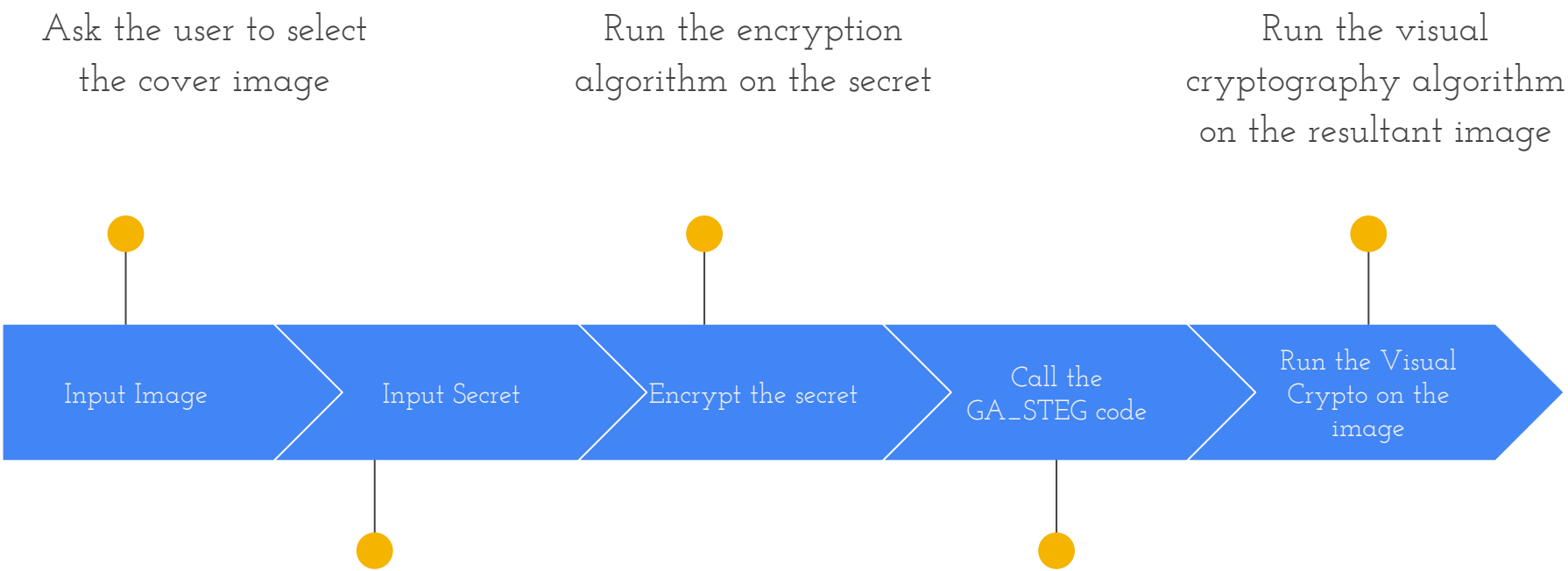
Sharing of files created by multiple processes on different compute nodes real time was a major challenge

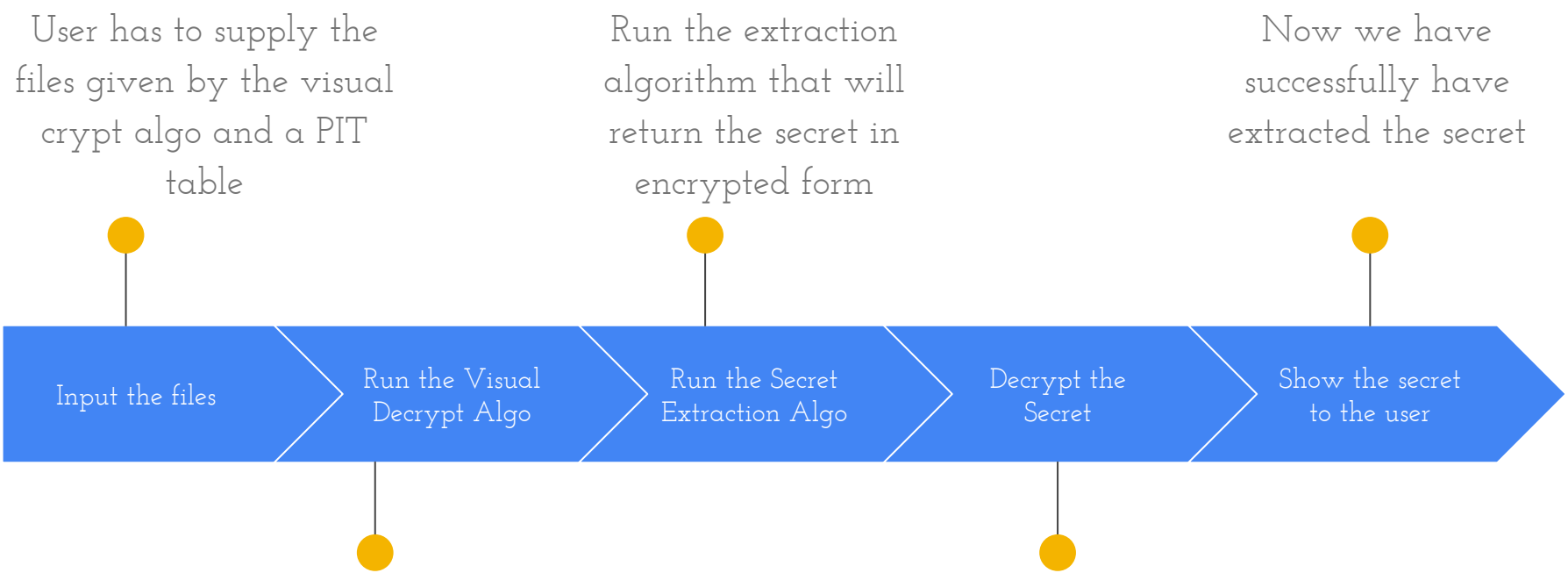
Sol: *NFS-Network File System*

Setting up the cluster of nodes to work seamlessly using these technologies was the biggest challenge

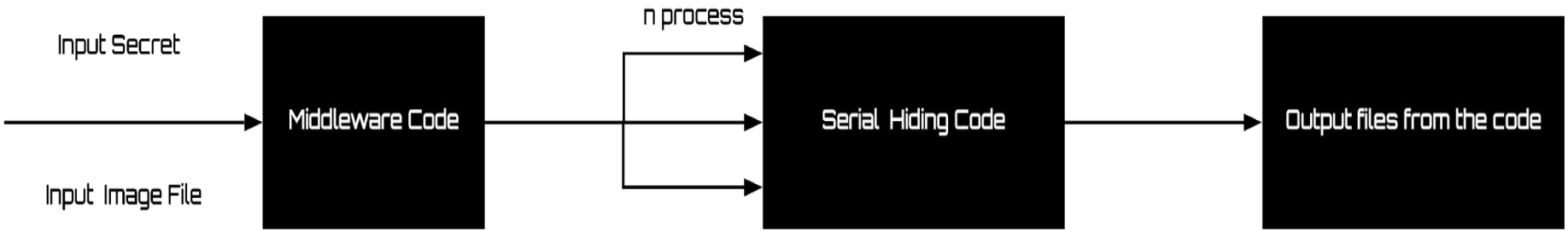
Implementation



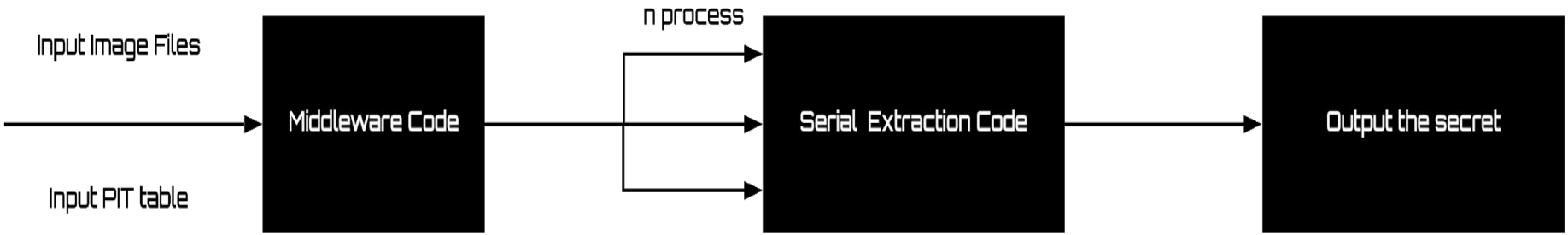

Ask the user to select the cover image
Run the encryption algorithm on the secret
Run the visual cryptography algorithm on the resultant image
Input Image
Input Secret
Encrypt the secret
Call the GA_STEG code
Run the Visual Crypto on the image
Take the secret to hide inside the image from the user
Run the genetic steg algorithm on the image and the encrypted image


User has to supply the files given by the visual crypt algo and a PIT table
Run the extraction algorithm that will return the secret in encrypted form
Now we have successfully have extracted the secret
Input the files
Run the Visual Decrypt Algo
Run the Secret Extraction Algo
Decrypt the Secret
Show the secret to the user
Run the visual decrypt algo along with the decryption password
Run the text decryption algorithm along with the decryption key

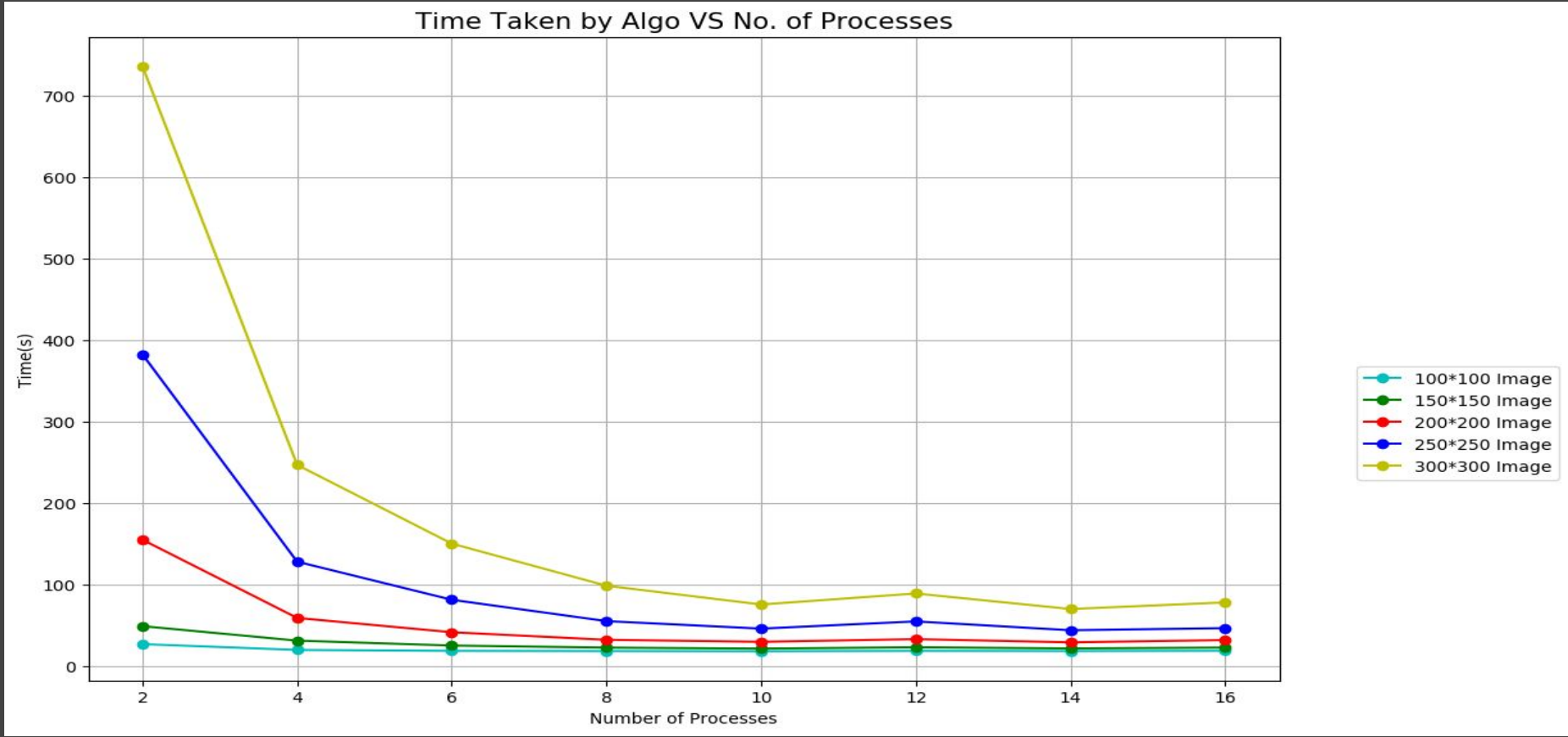
Distributed Secret Hiding



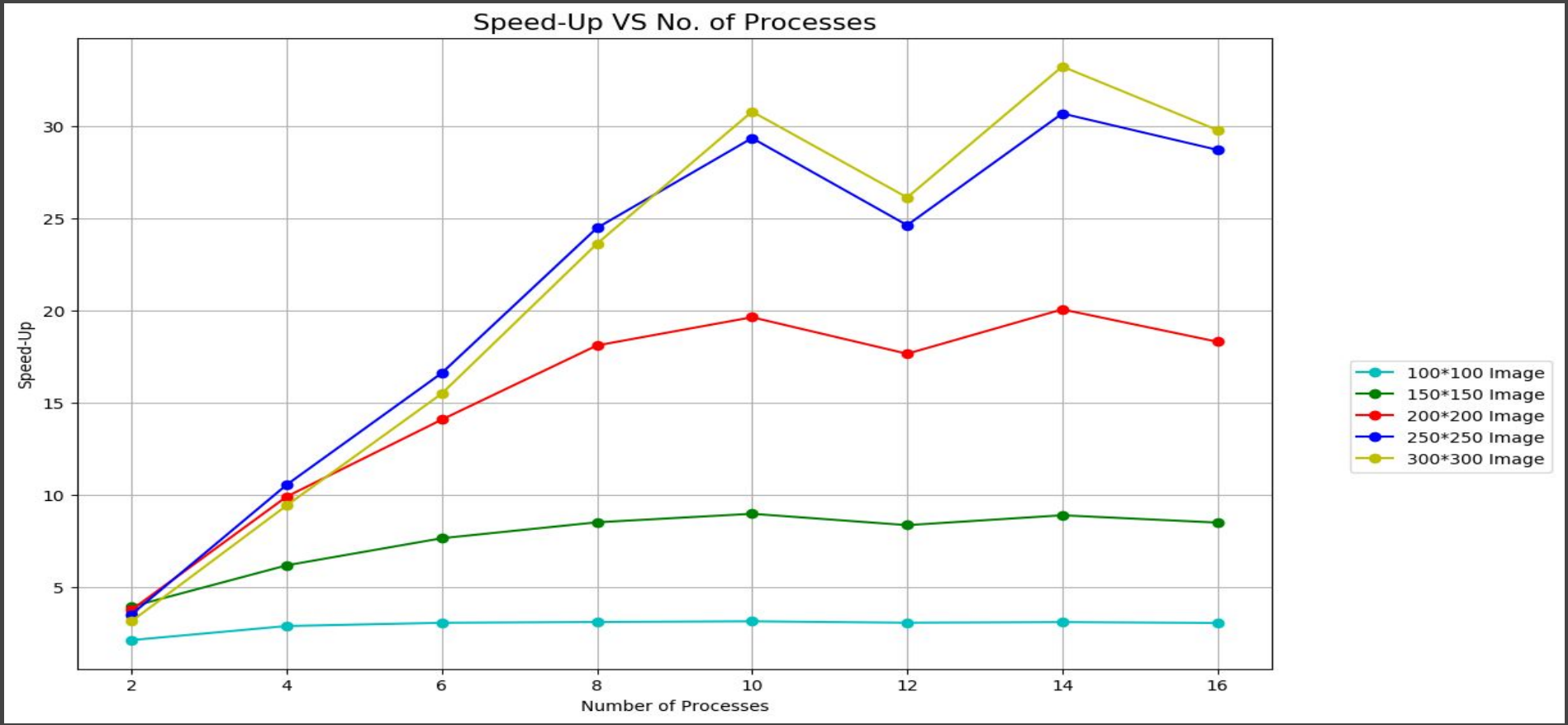
Distributed Secret Extraction



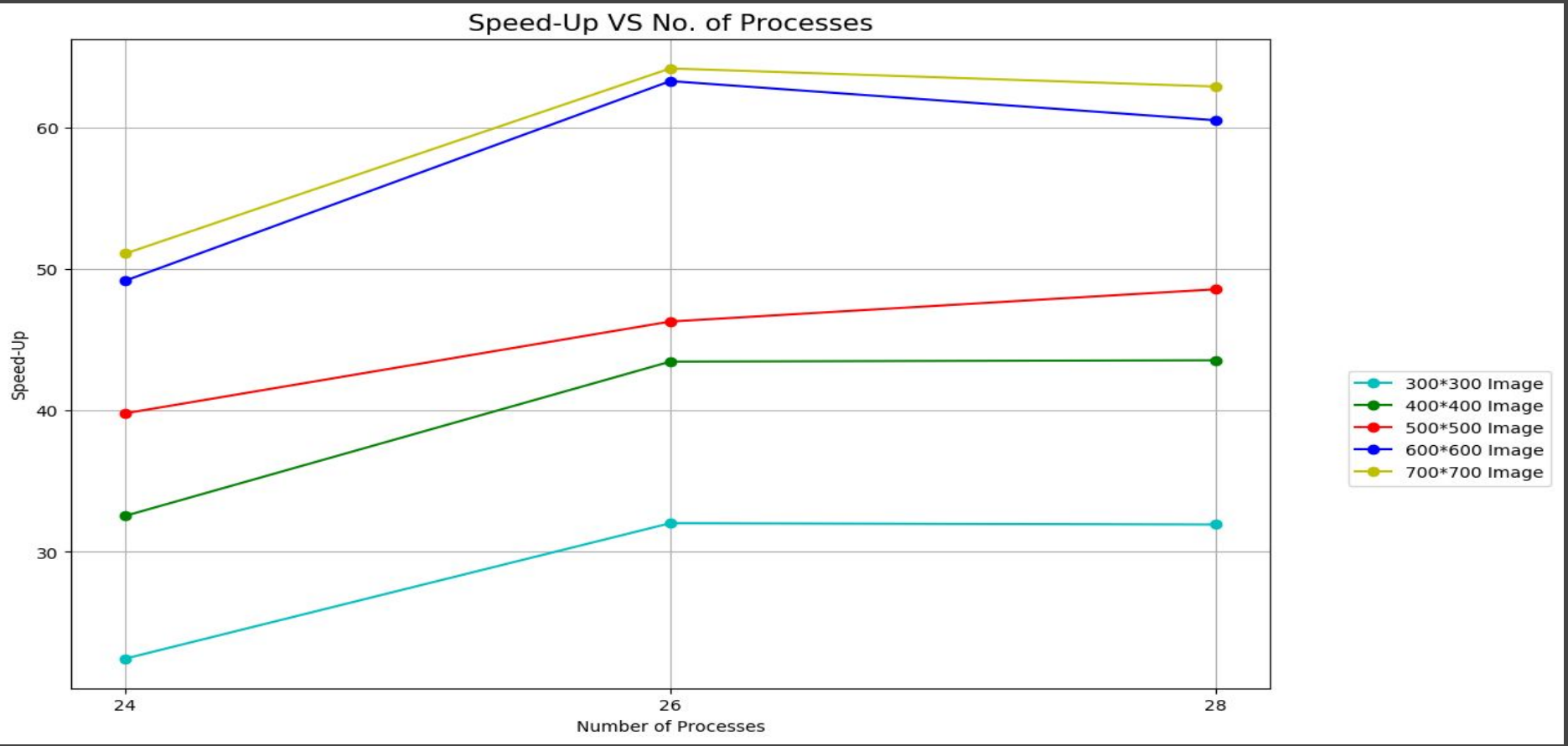
Time Improvisation Analysis on Light-Weight Images



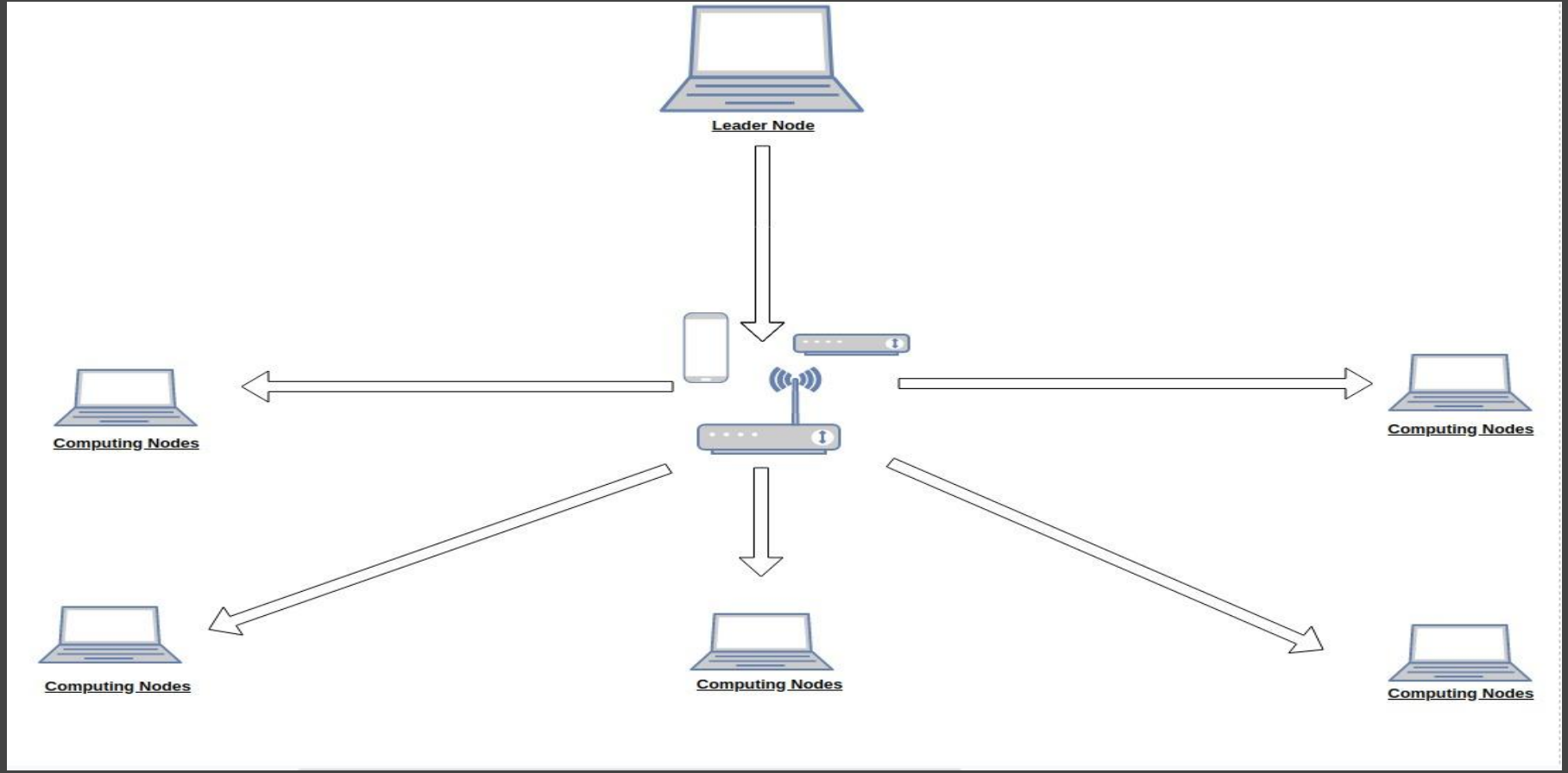
Speed-Up analysis on Light Weight Images



Speed-Up analysis on Heavy-Weight Images



FUTURE IMPROVEMENTS



Thank You