

# Secure Cloud Computing with FlexCloud

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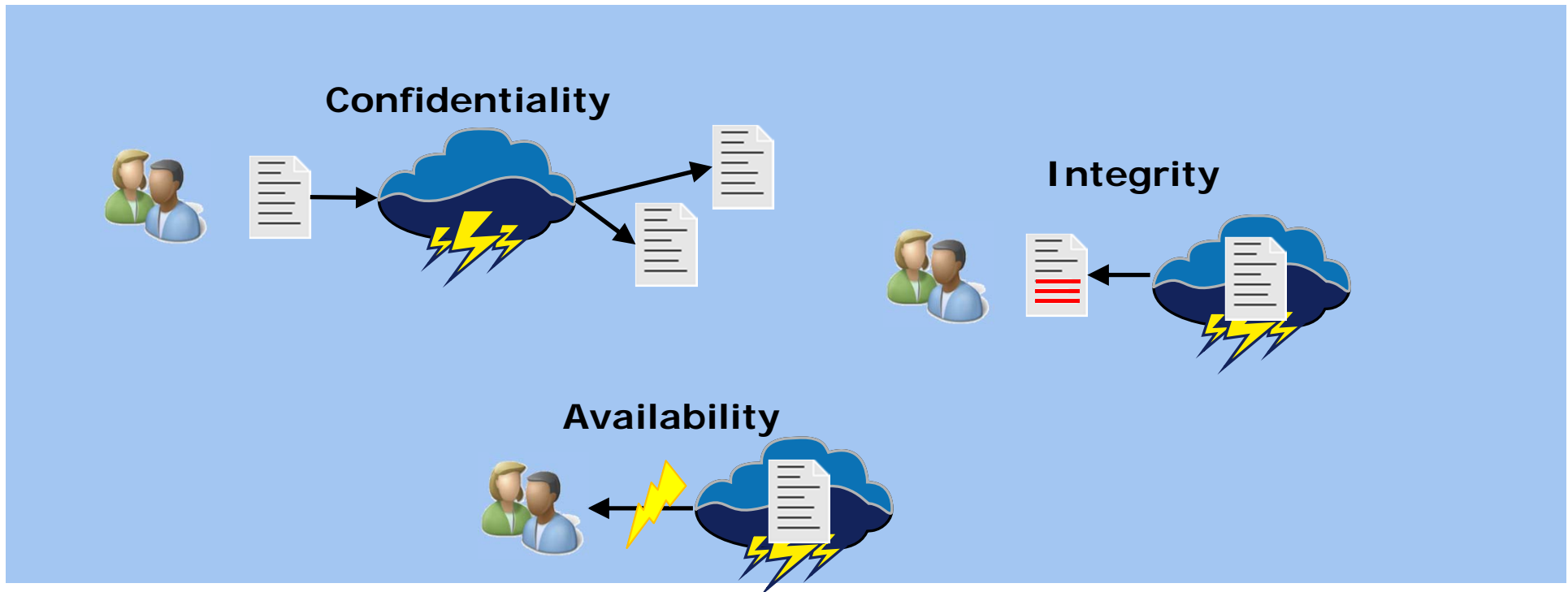
## Cloud Computing ...

- ***Security Problems***
- *$\pi$ -Box: Building your personal secure cloud*
- *Secure Cloud Storage*
- *Prototype & Evaluation*
- *Conclusion & Future Work*

“U.S. government is allowed to access European clouds.” (June, 2011)

“Dropbox accepts arbitrary passwords for 4 hours” (July, 2011)

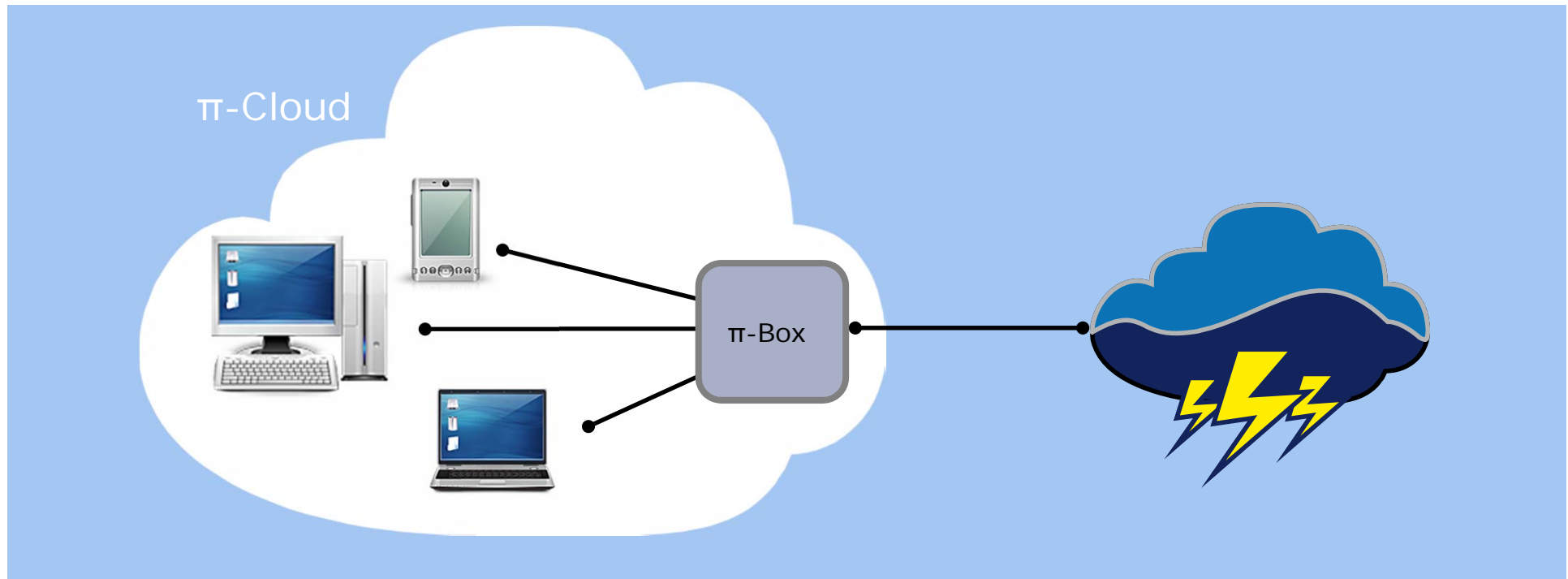
“Thunderbold destroys Amazon EC2.” (August 2011)

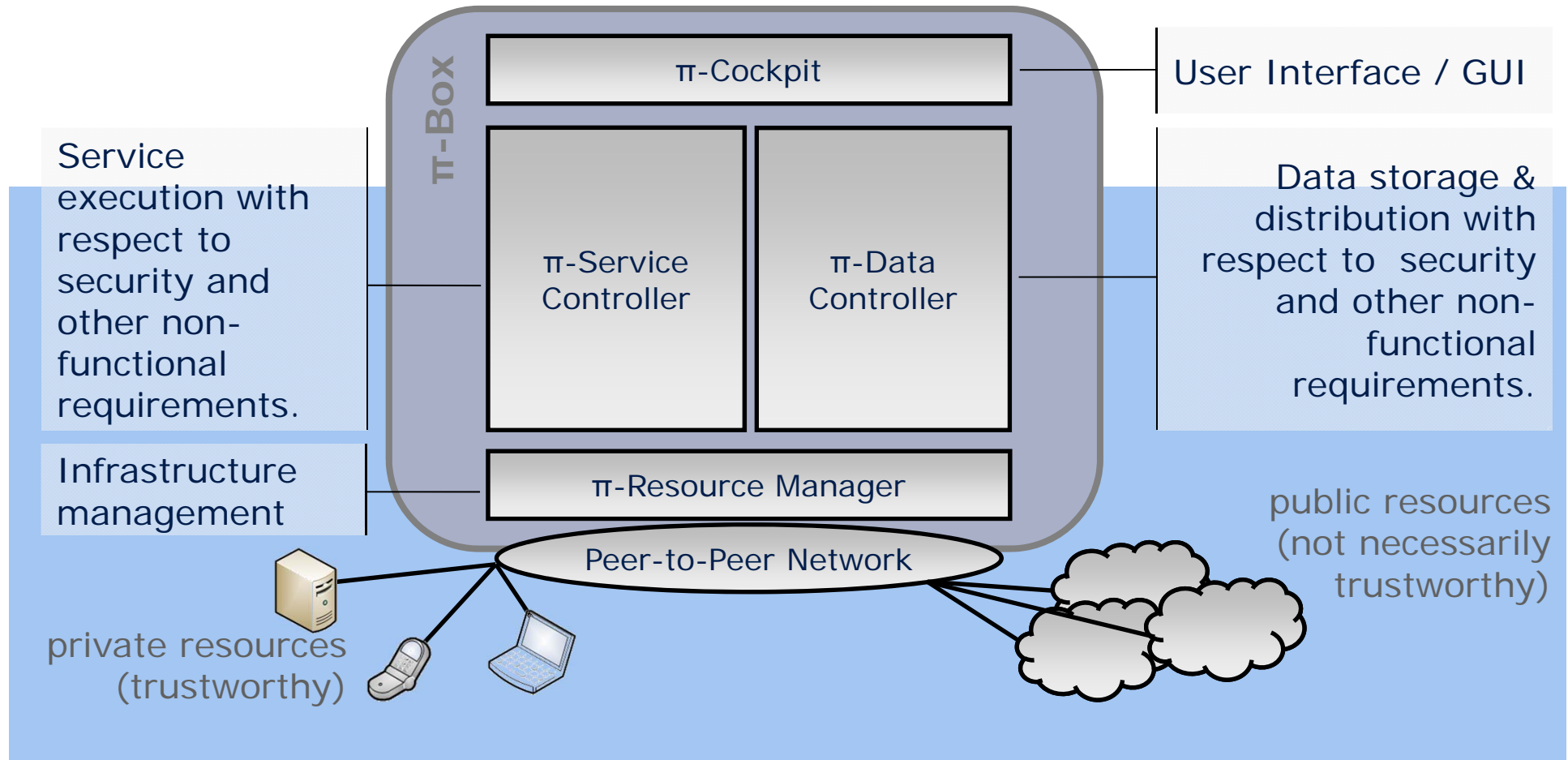


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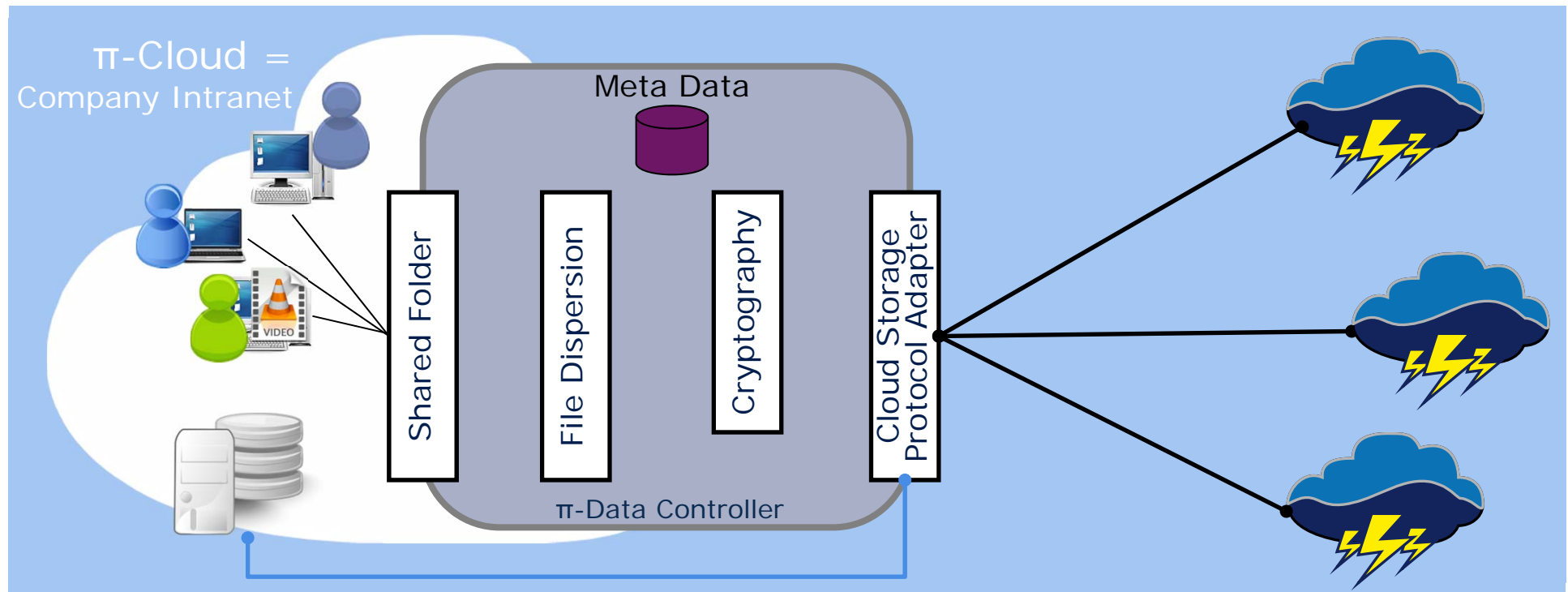
Subsume all end devices within a Personal Secure Cloud ( $\pi$ -Cloud) controlled by the  $\pi$ -Box.





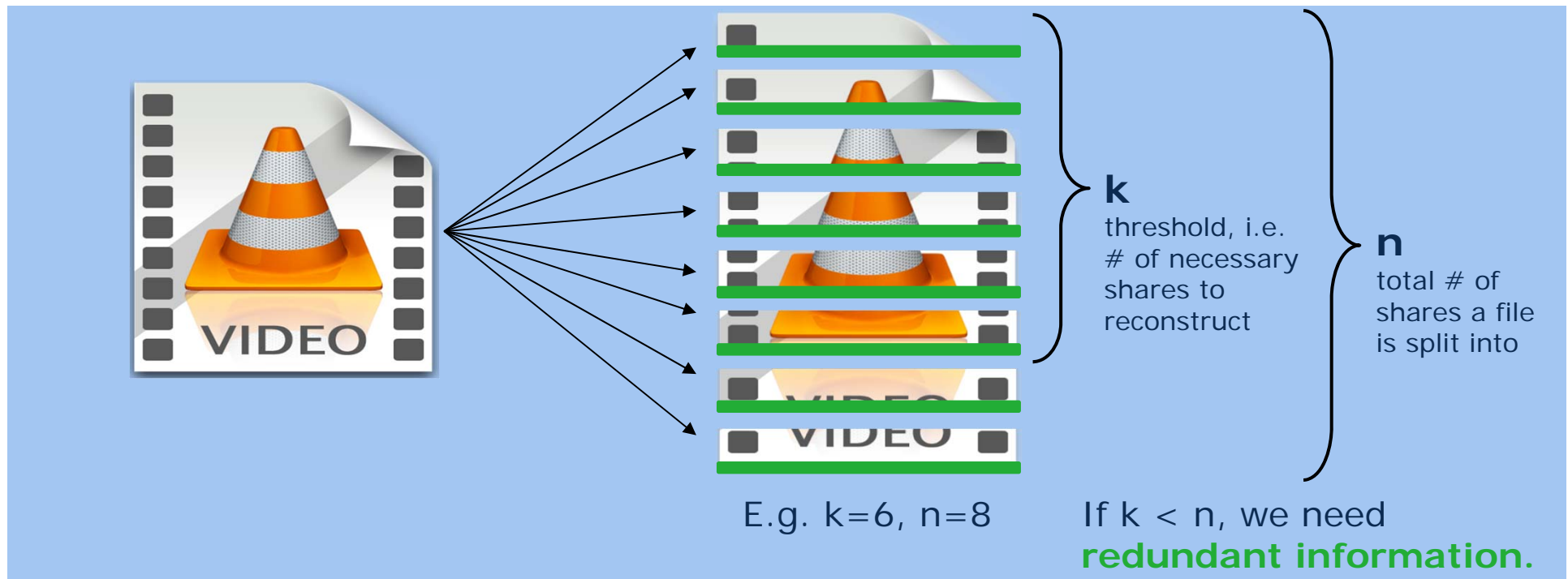
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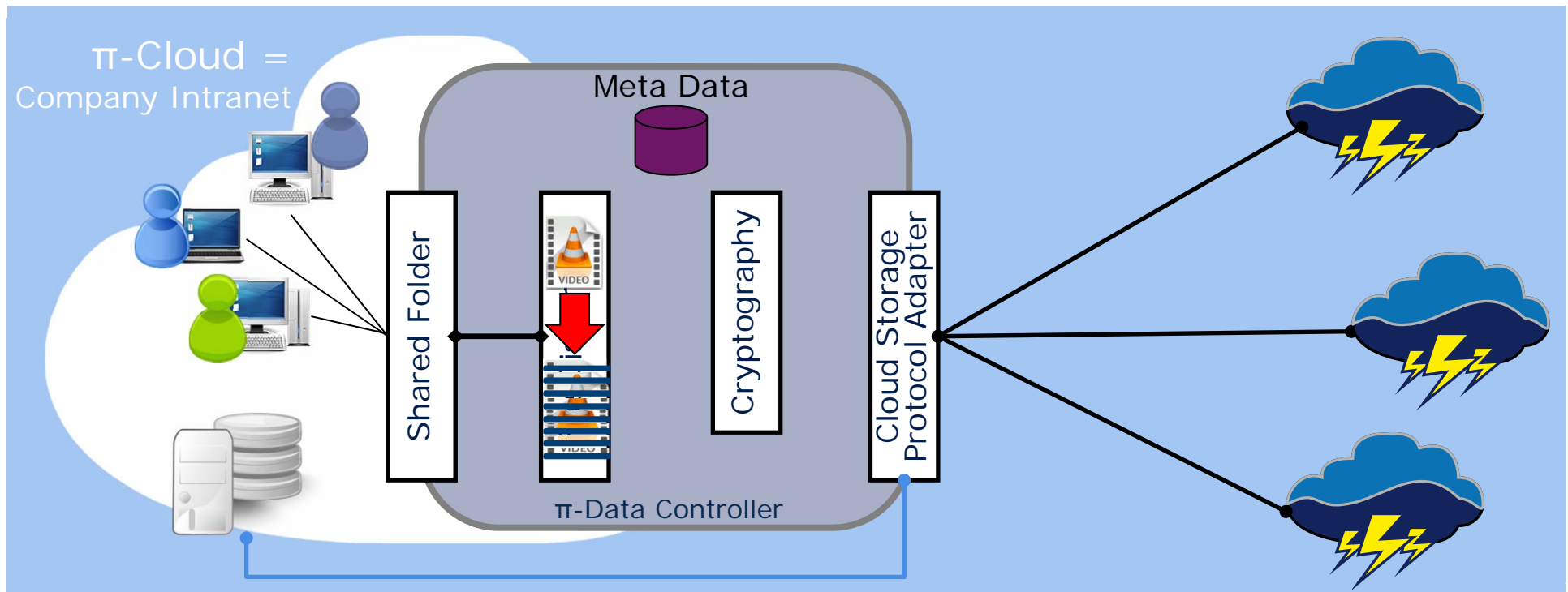
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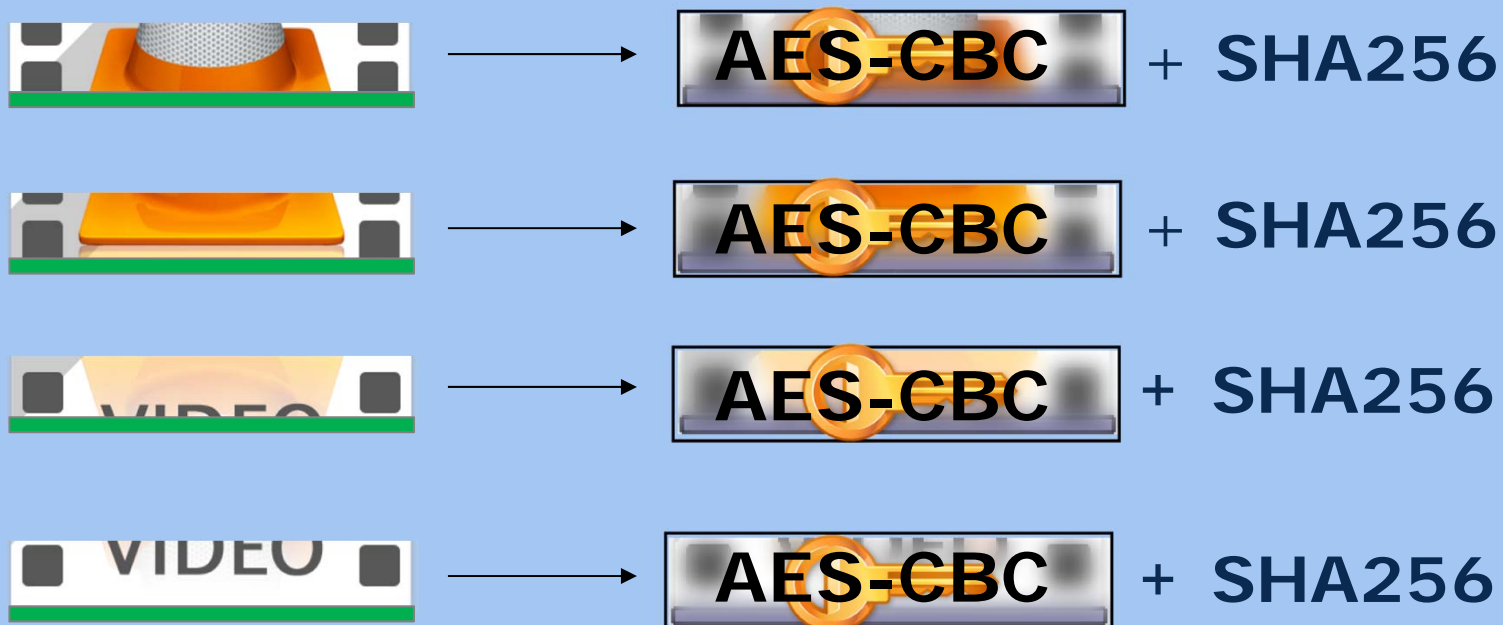


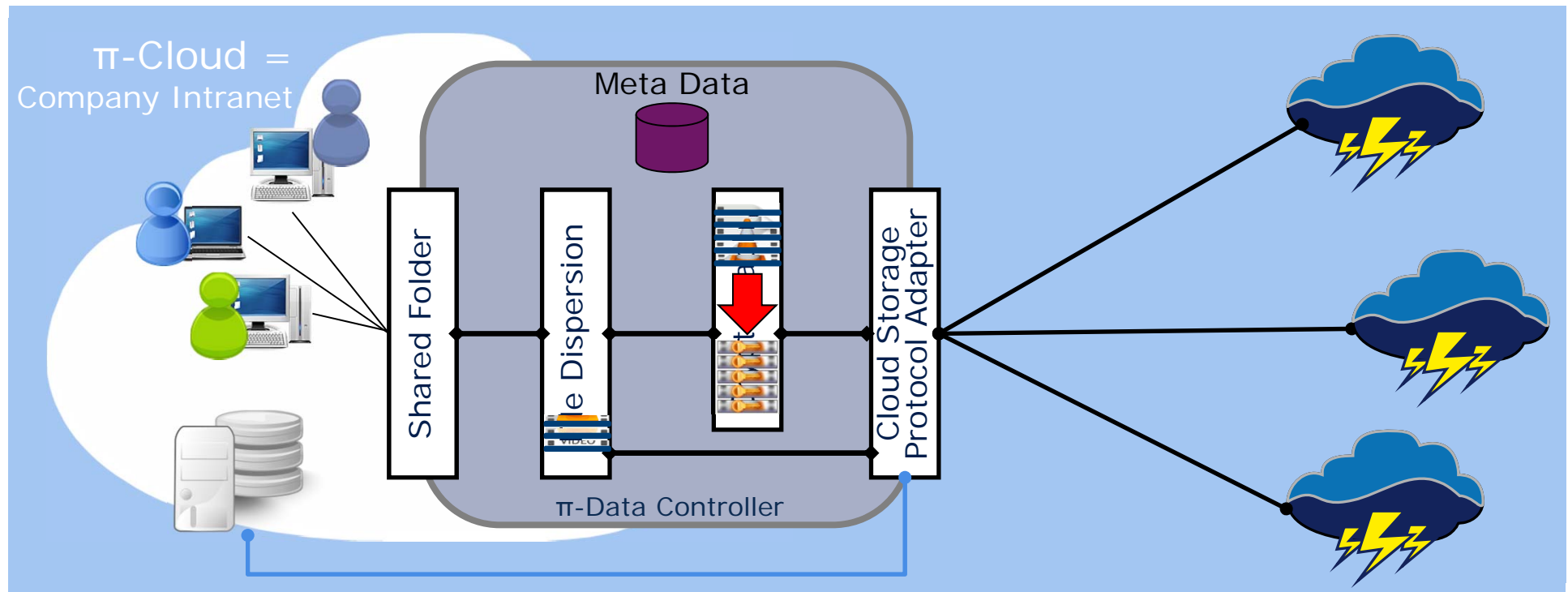
Ensure availability despite of unreliable cloud storage providers ...

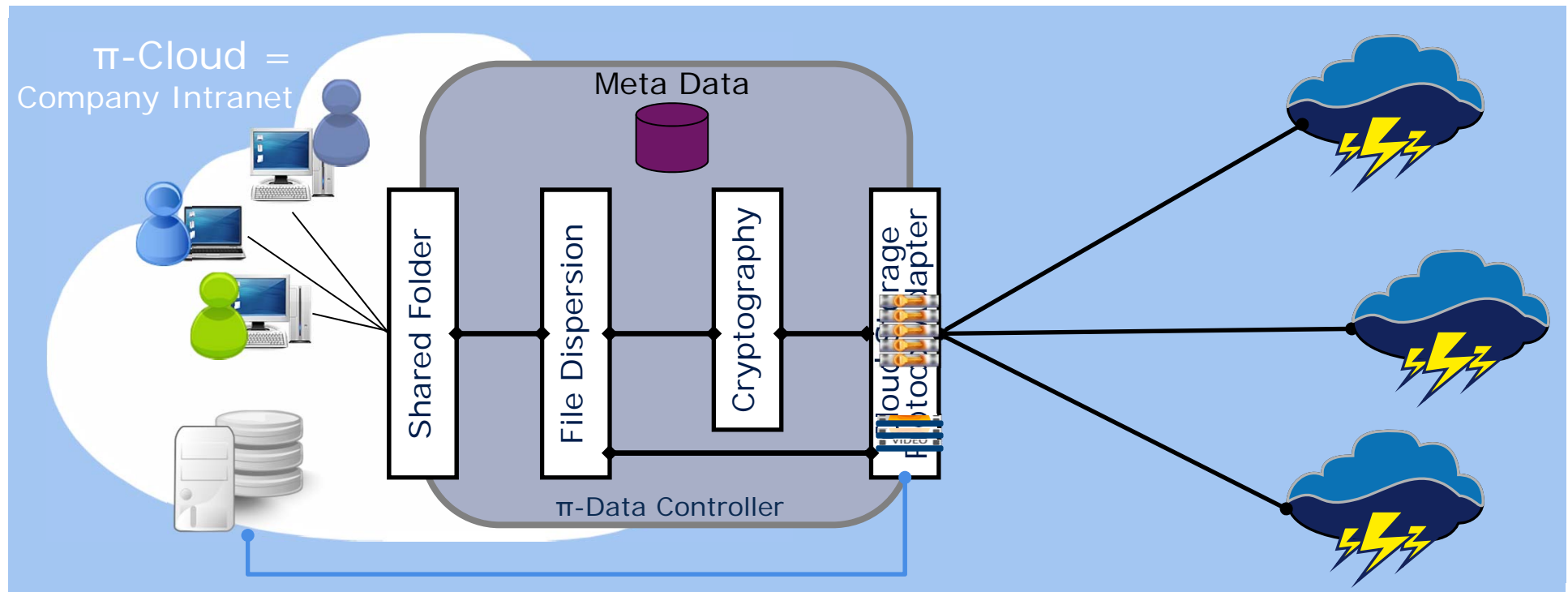




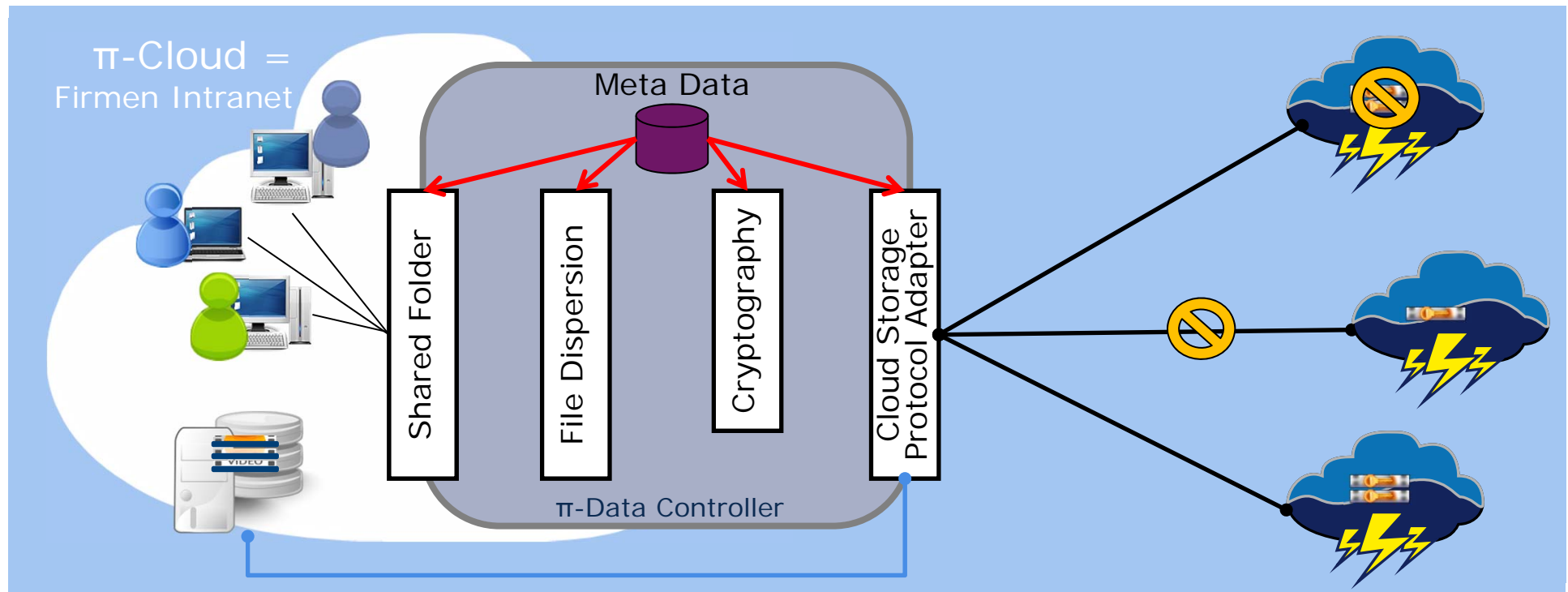
Ensure confidentiality and integrity by encryption and check sum...

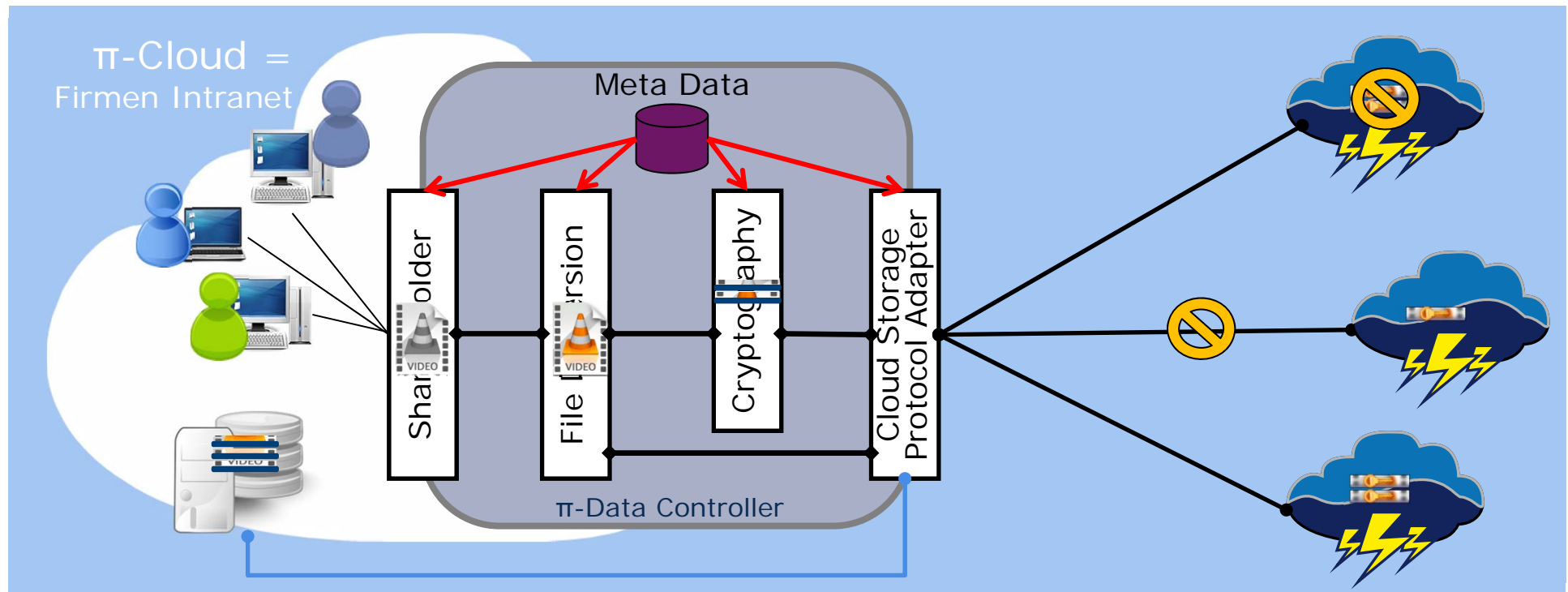






Meta-Data contains all information about dispersion, encryption keys, storage nodes...

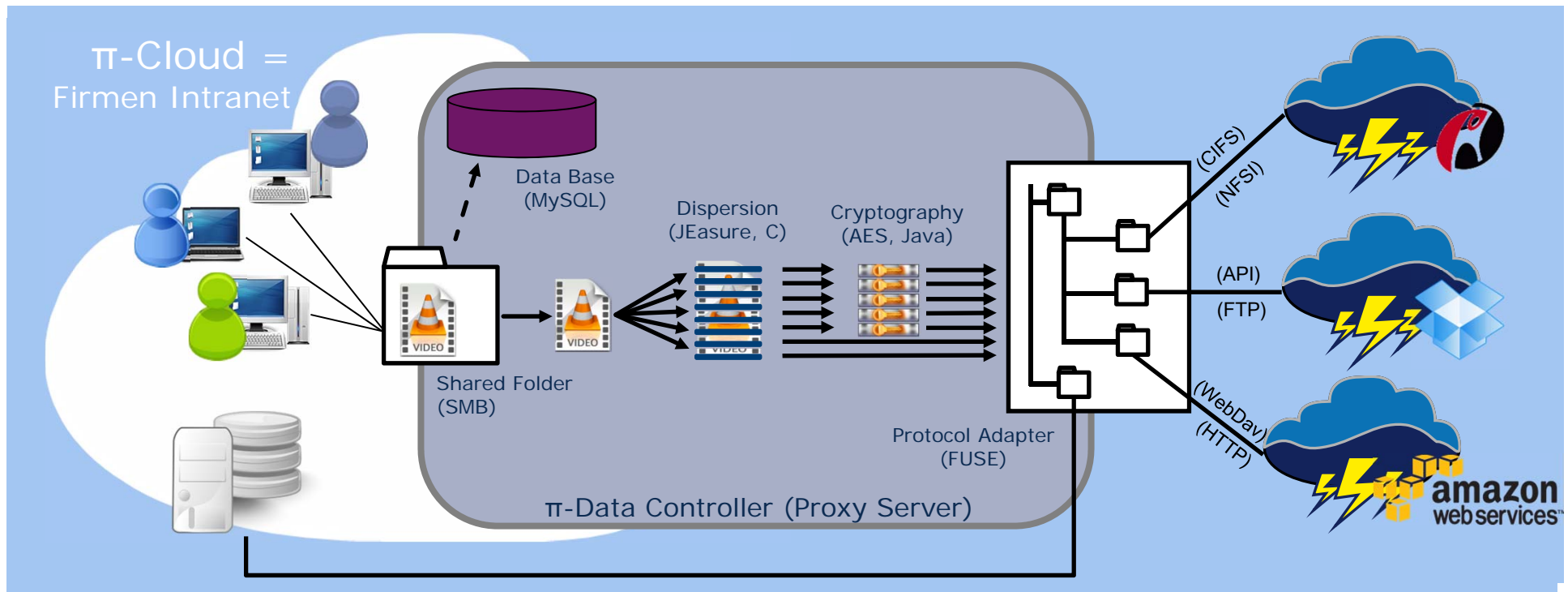




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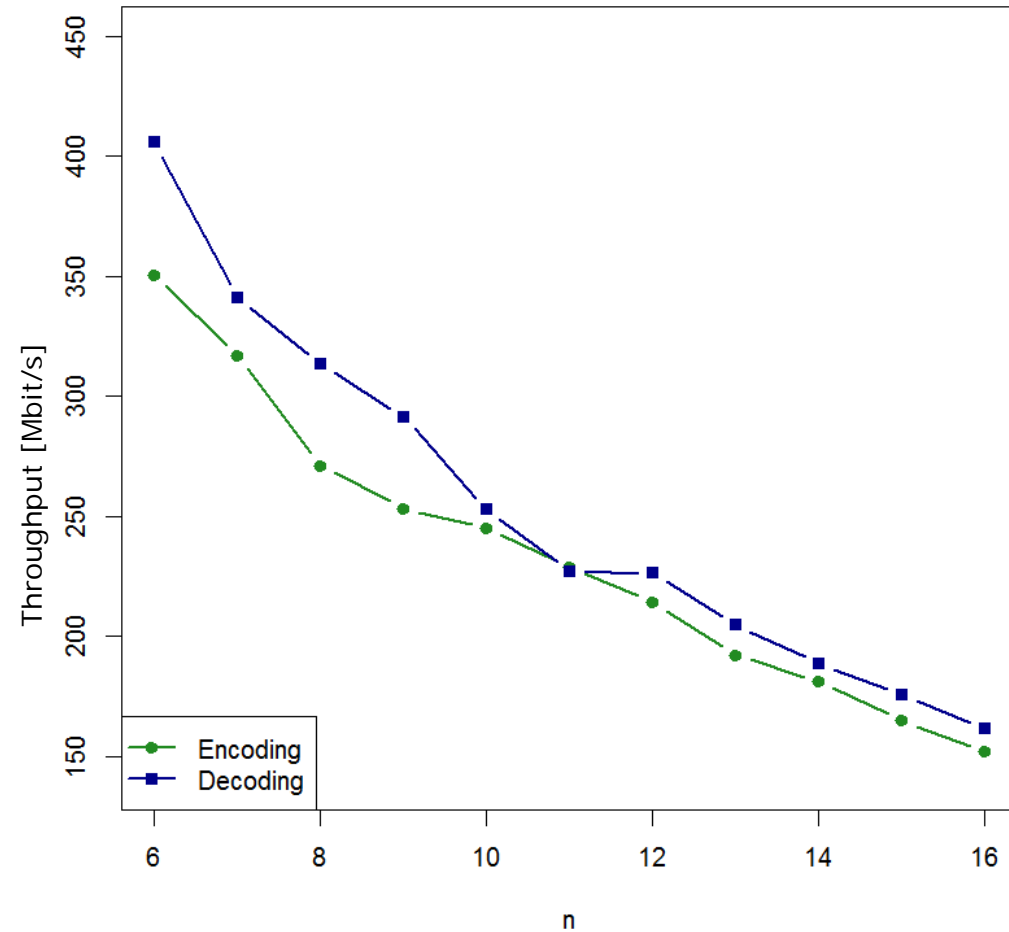




File size:  
24 MB

Machine:  
Single Core Machine  
2 GB memory

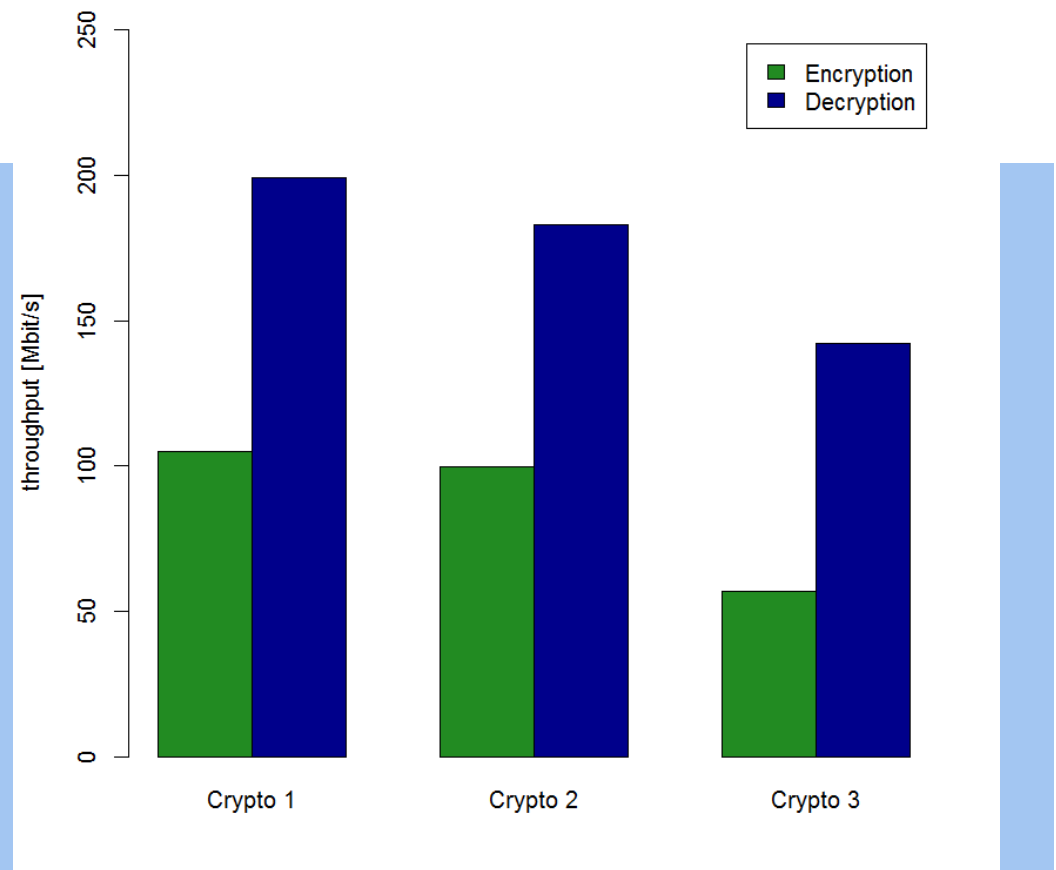
Dispersion parameter:  
 $k = 6$

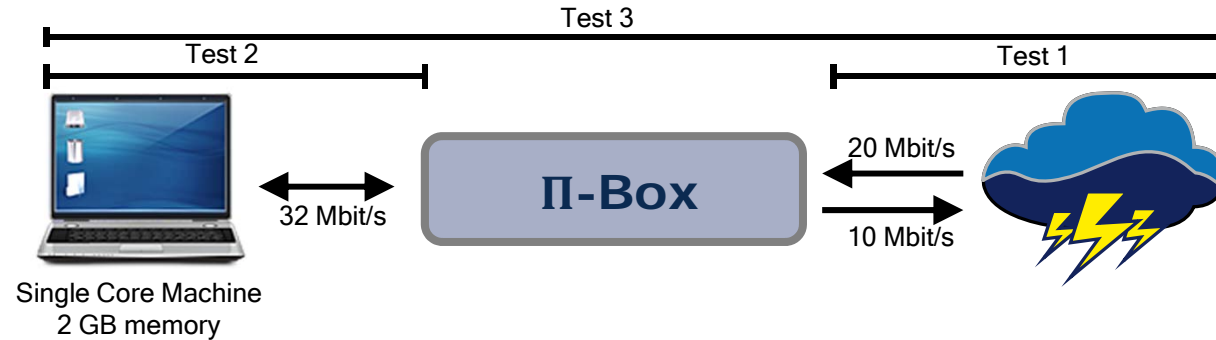


File size:  
24 MB

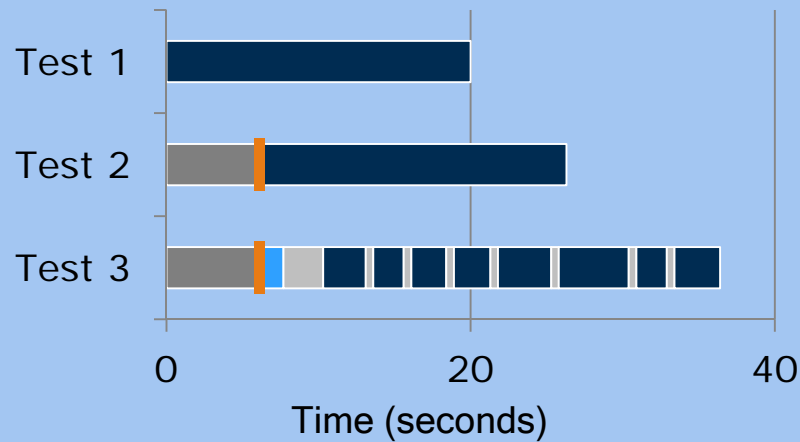
Machine:  
Single Core Machine  
2 GB memory

	Key Size	# of iterations
Crypto 1	128 bit	10
Crypto 2	192 bit	12
Crypto 3	256 bit	14

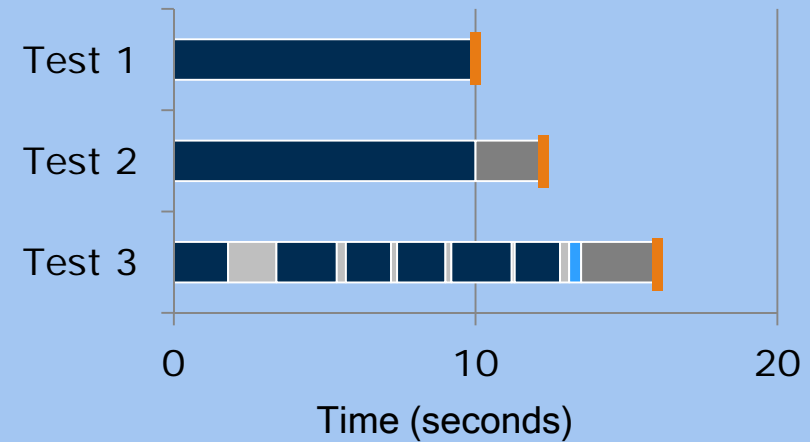




### Upload



### Download



Network Share
  Dispersion
  Cryptography
  Upload/Download
  Upload finished from user perspective

*File size: 24 MB; Dispersion parameters: n=8, k=6;*  
*Cryptography parameters: AES (256 bit, 14 iterations), SHA256;*  
 Machine: Single Core, 2 GB

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The  $\pi$ -Cloud is a solution to externalize IT resources without loosing data control

**Price of Security:**

- Delay due to extra processing
- Additional storage space due redundancy.

**Efficiency:**

$$\frac{\textit{benefit}}{\textit{price}}$$

**Tomorrow's forecast:  
still cloudy but sunny spots**

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<http://flexcloud.eu/>