secure file storage for the 20th century

Lane Lawley

Can we store files in multiple servers

even if any of them can fail at any time?

What if every data center contains sensitive information we want to protect?

The government could take any of our data centers!

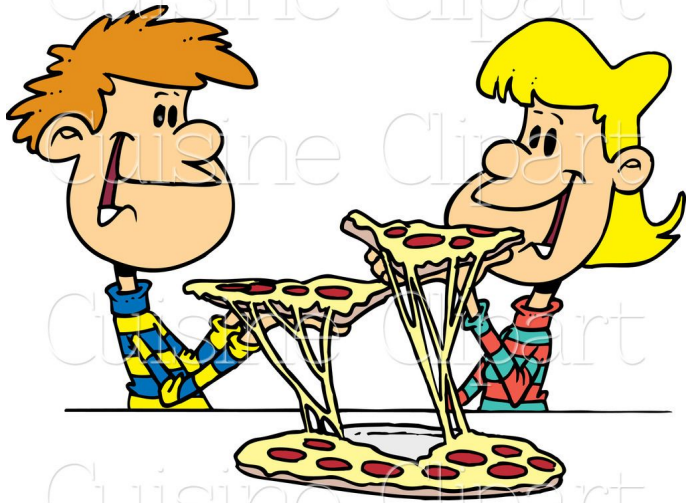
It might sound hard to believe, but as early as 2008, some technologists predict that the government could initiate large-scale tracking operations on its OWN citizens!!!

So let's give every country a piece of the file!

They can work together!

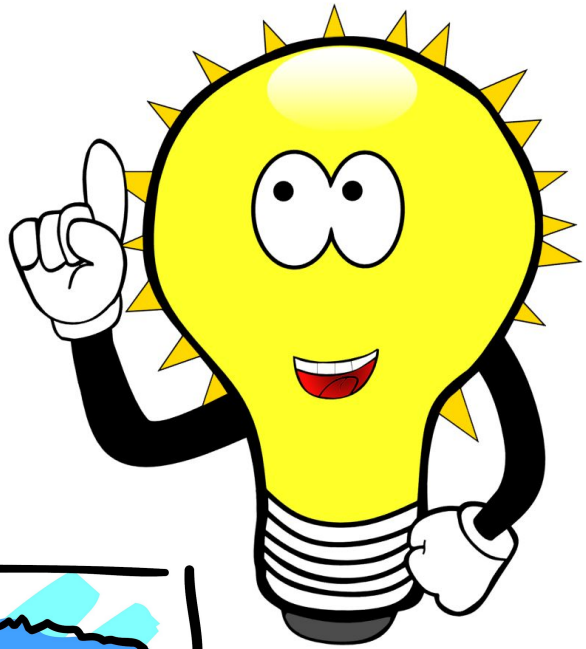
They can put it back together!

…right?



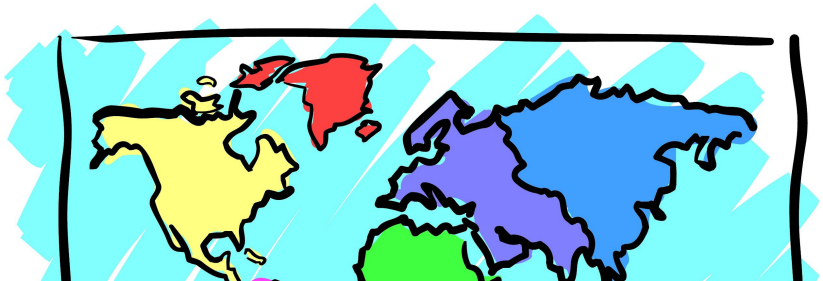
Better idea

We divide the KEYS into pieces (keys are small!)

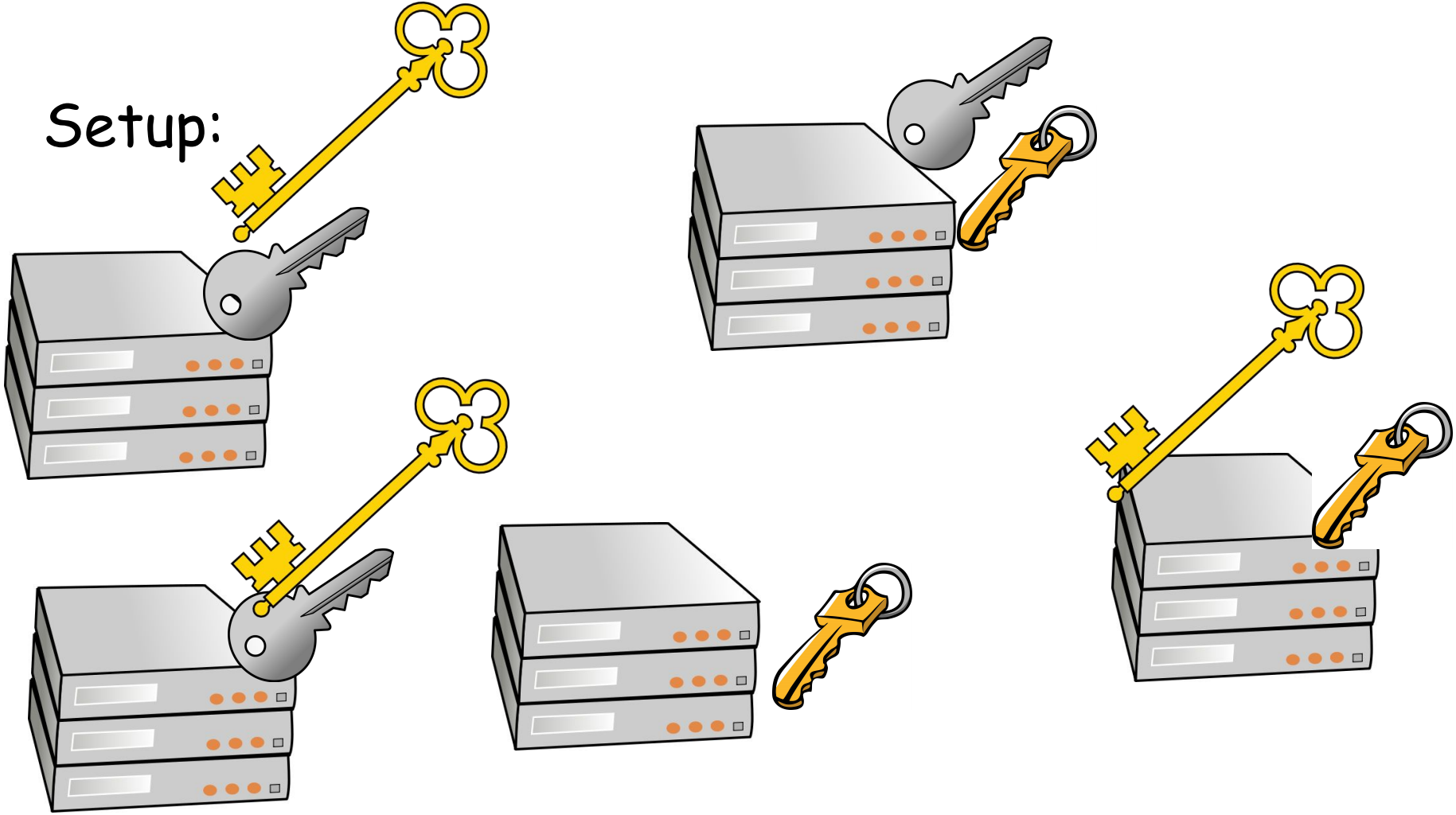


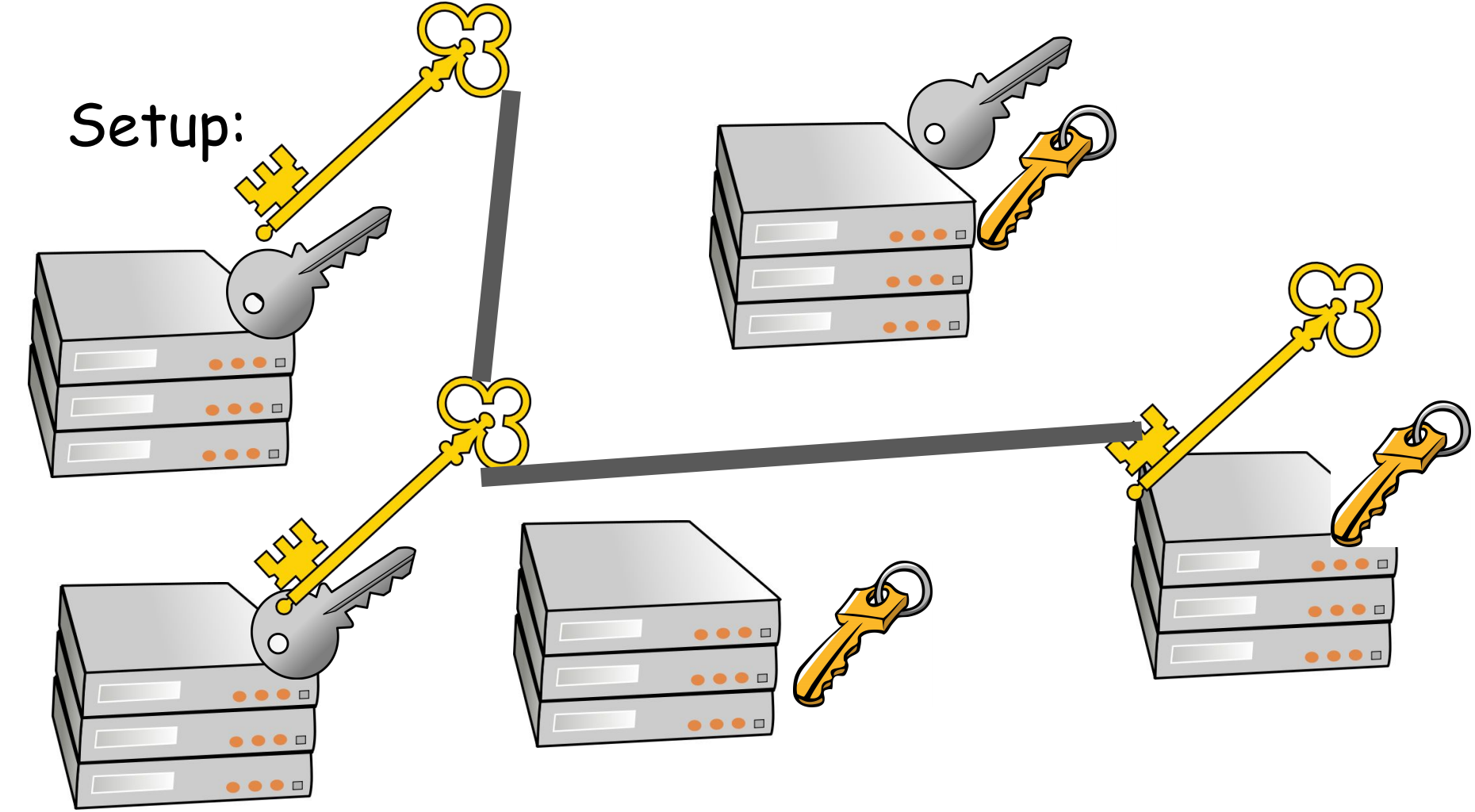
Then we give the keys to WAY MORE countries

Even if they don't have the files



Setup:

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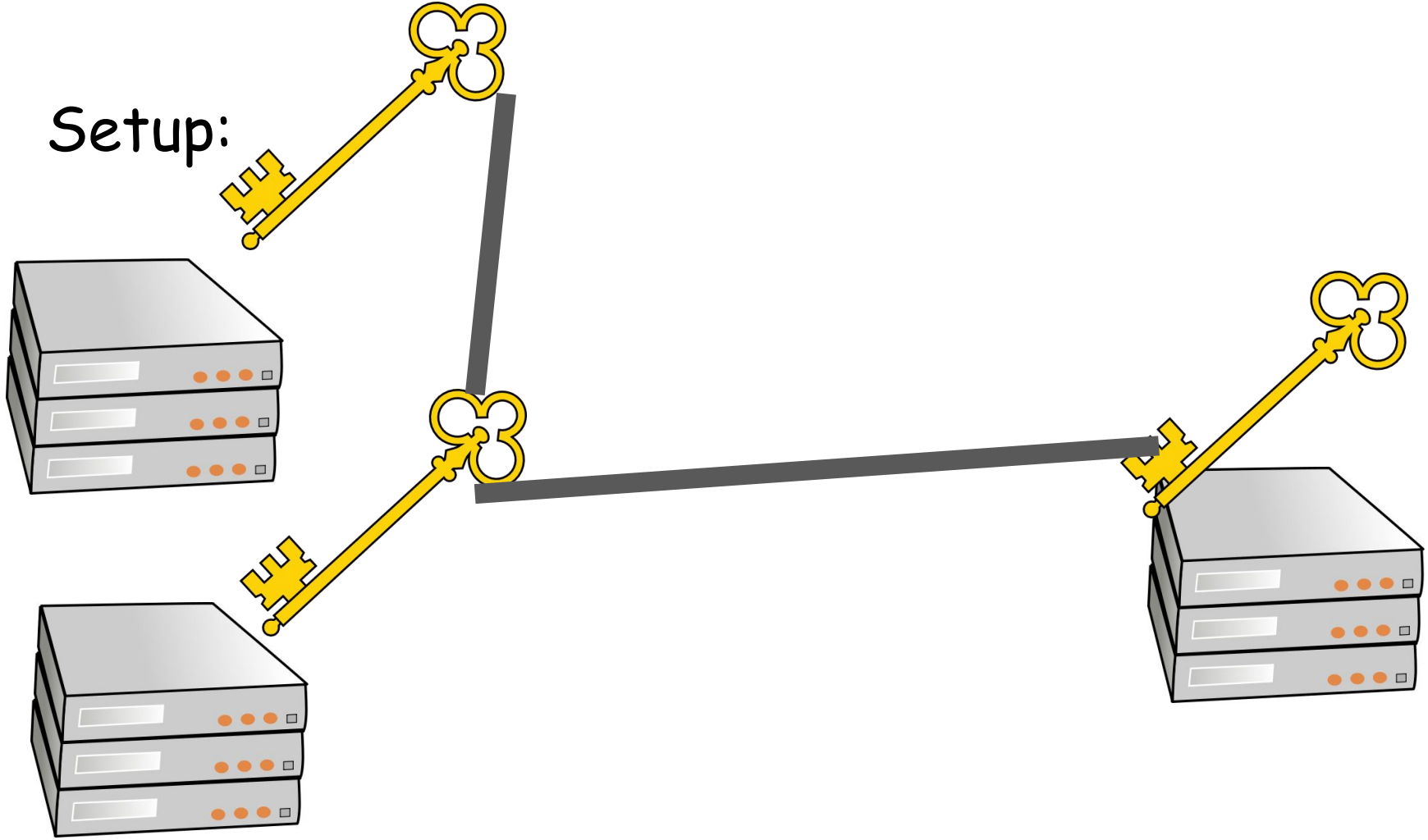

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- Client decrypts key pieces, assembles key, decrypts file

Ke s

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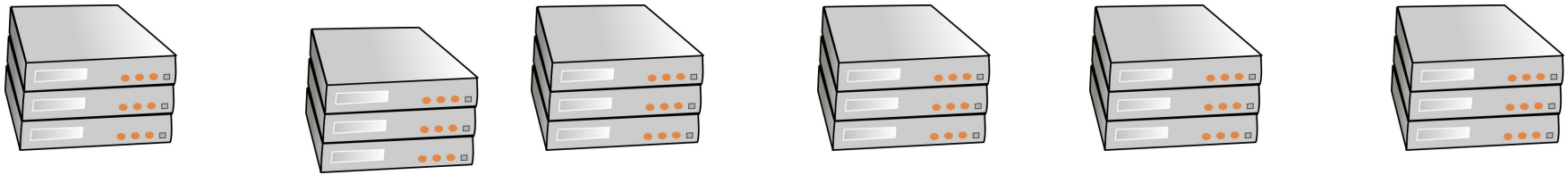
- ks for key
- Replicas encrypt their key pieces
- Client decrypts key pieces, assemb

Consistency



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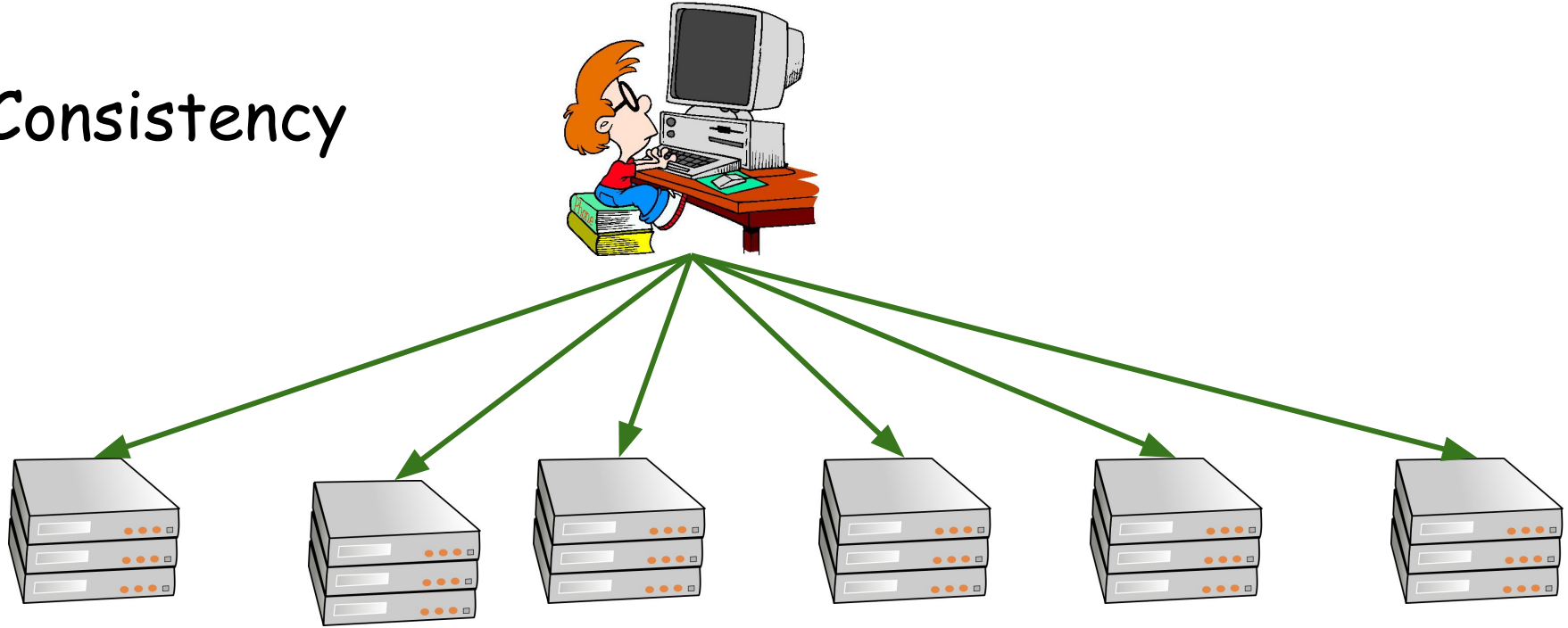

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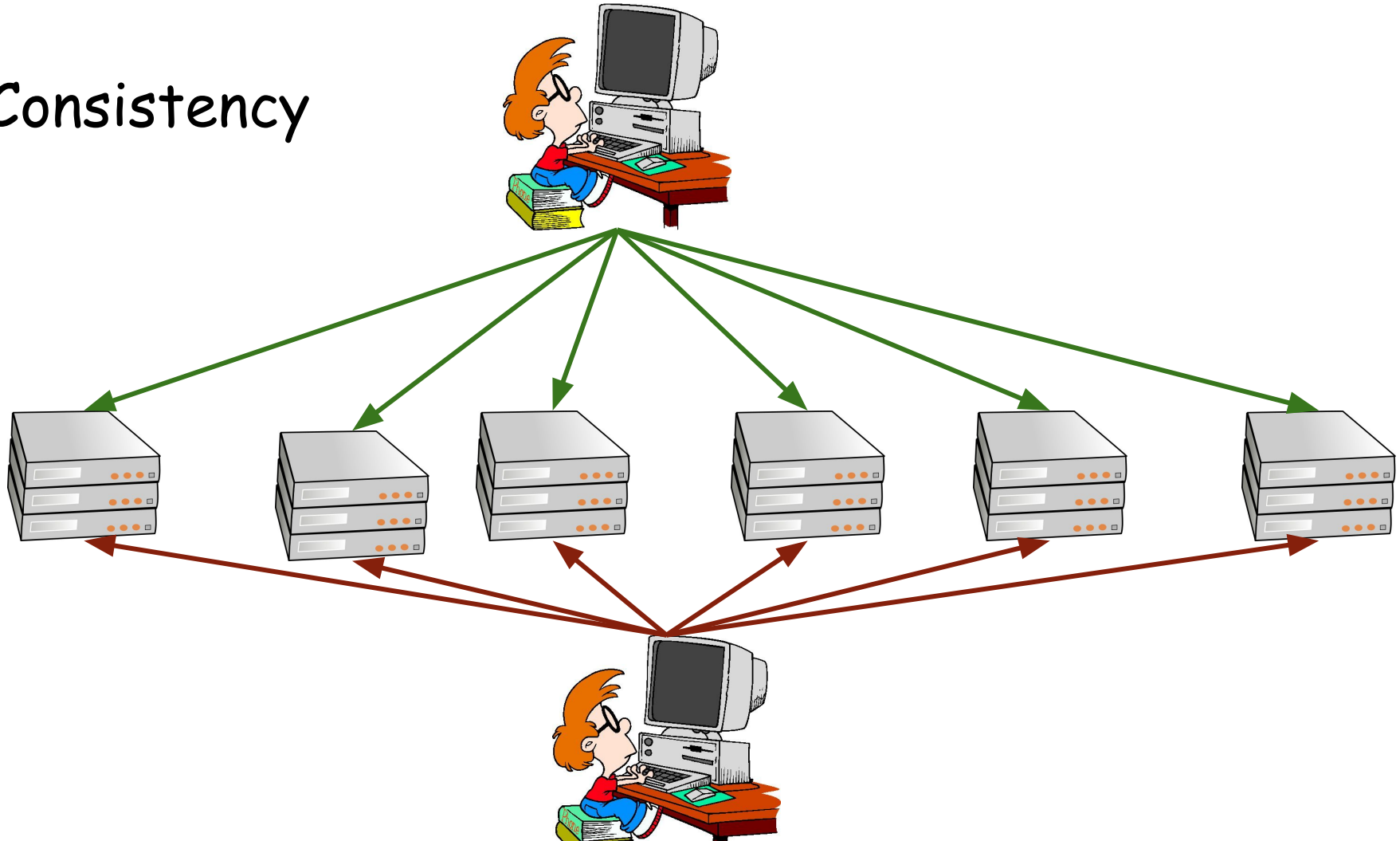

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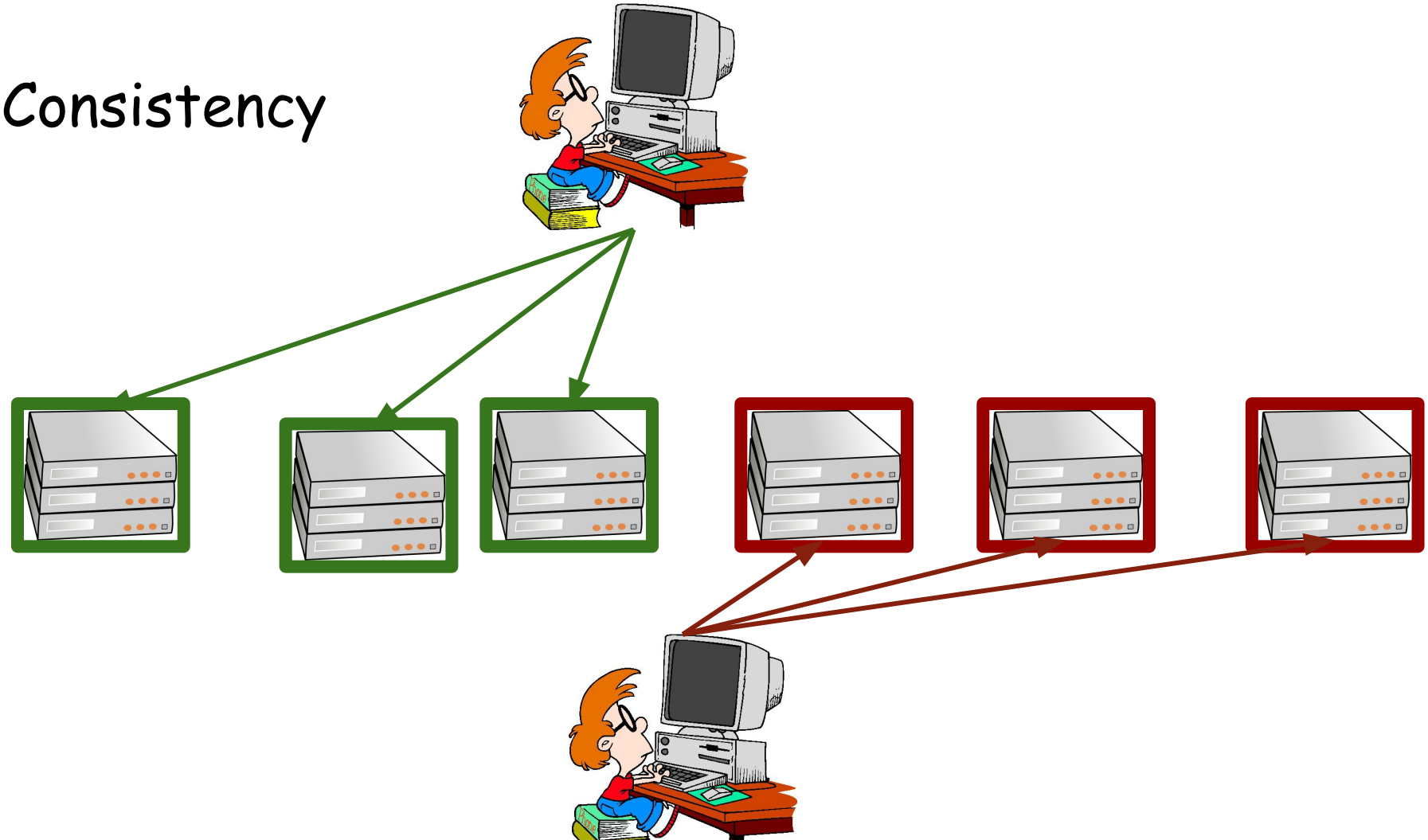

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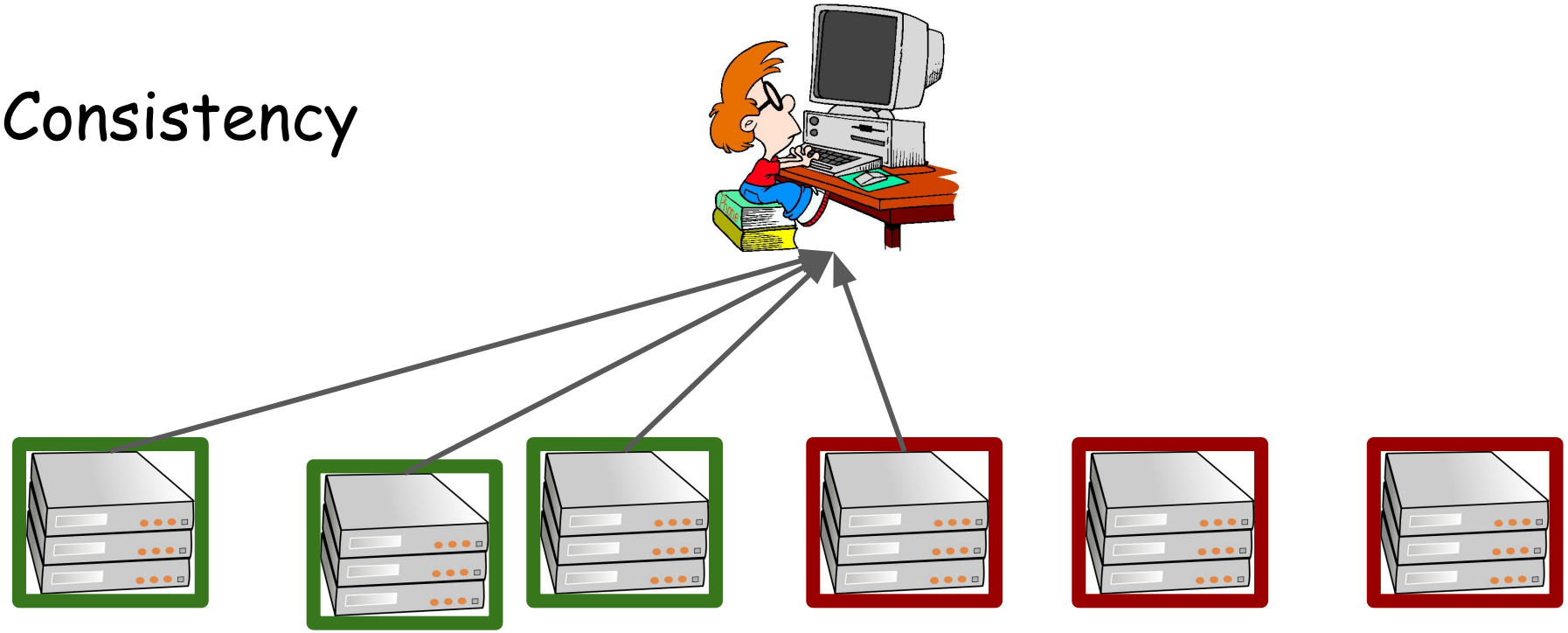
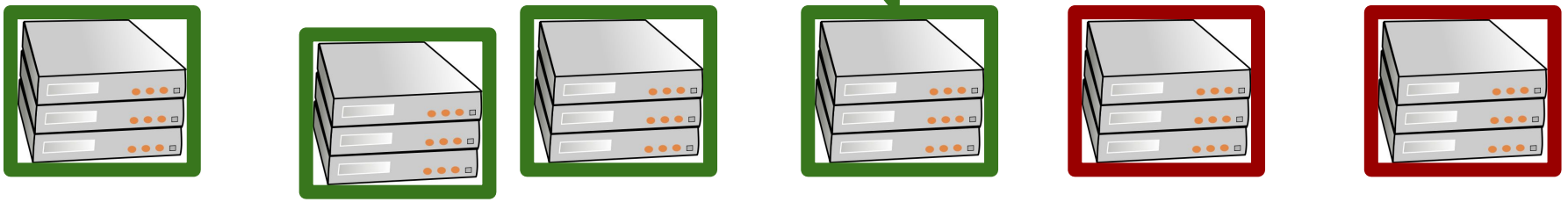


Read Repairs




QUESTIONS?