# Chameleon: Keeping data safe for the naïve and thrifty

Ansley Post and Peter Druschel

MPI-SWS

NOTE: Slides contain notes which include additional information for readers of the slides

# Application Scenario

- Home Users / Small Businesses

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What is RAID?

Is my data safe?

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- Home Users / Small Businesses

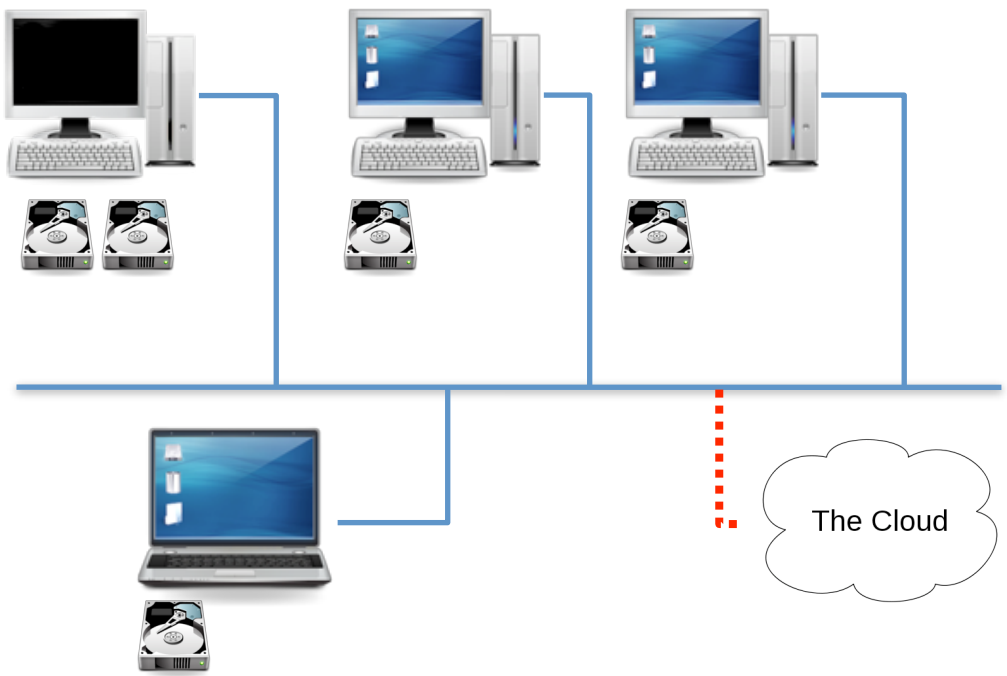
What is RAID?

Is my data safe?

Am I capable of managing this?

How much is this going to cost?

# Example



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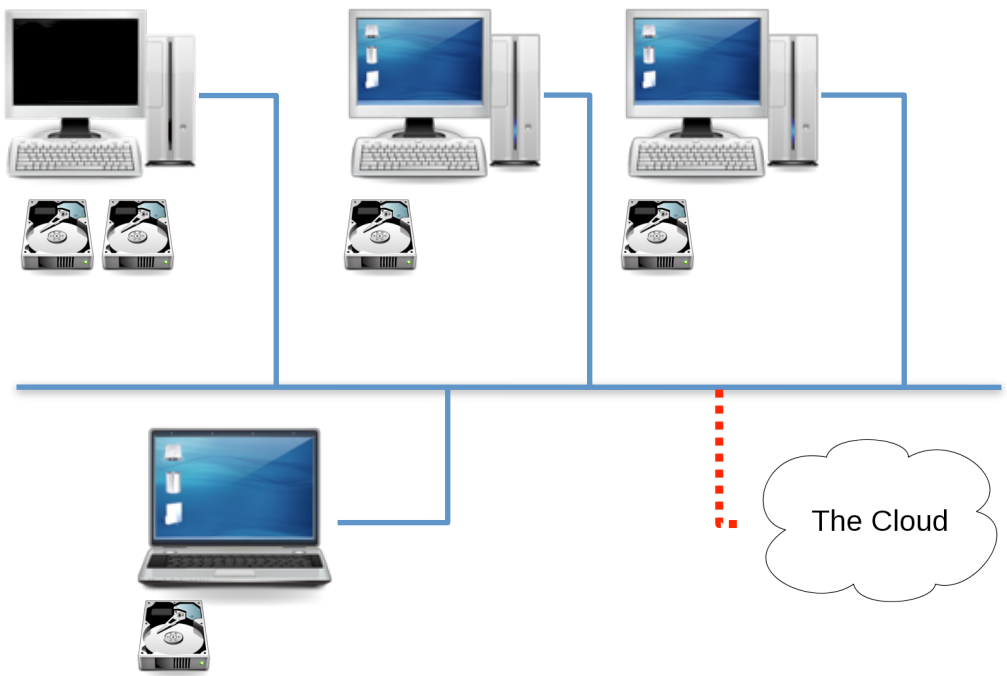


Many possible ways to replicate, place and encode data

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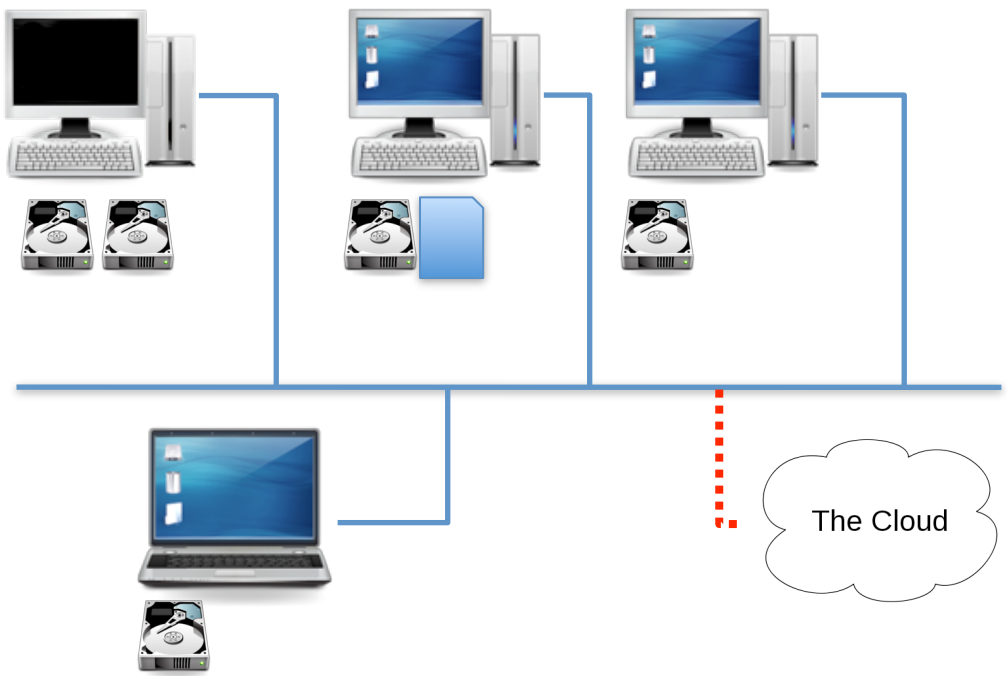


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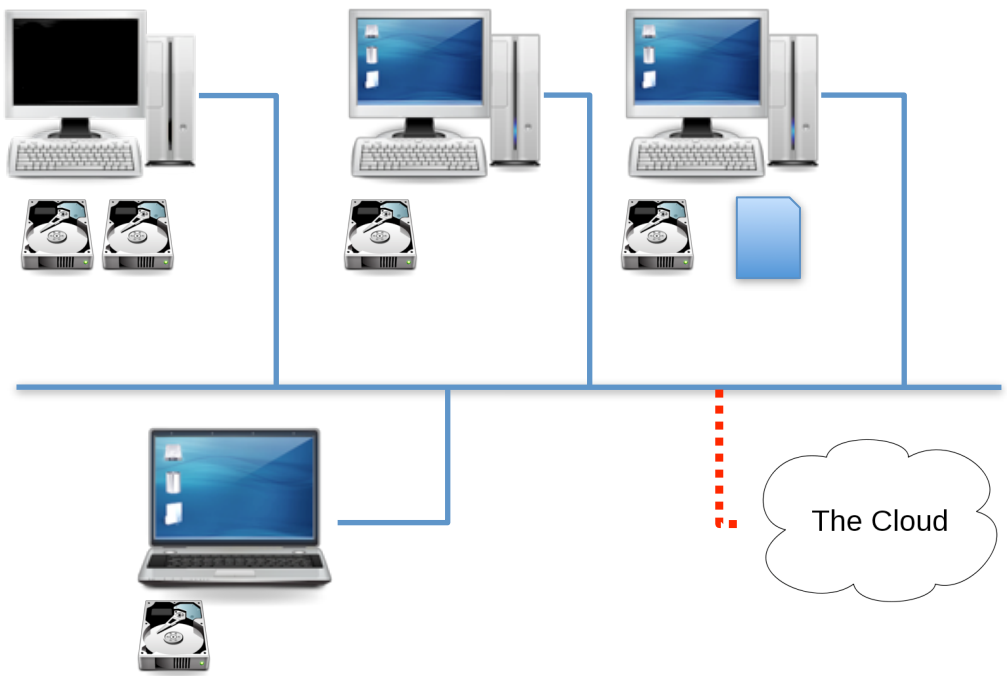


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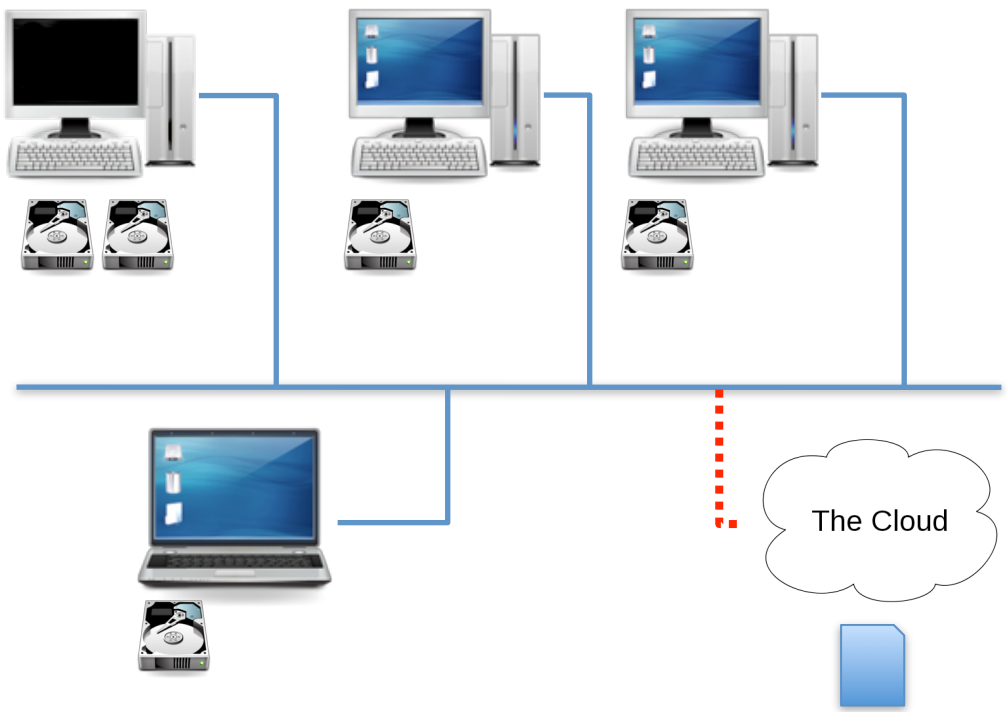


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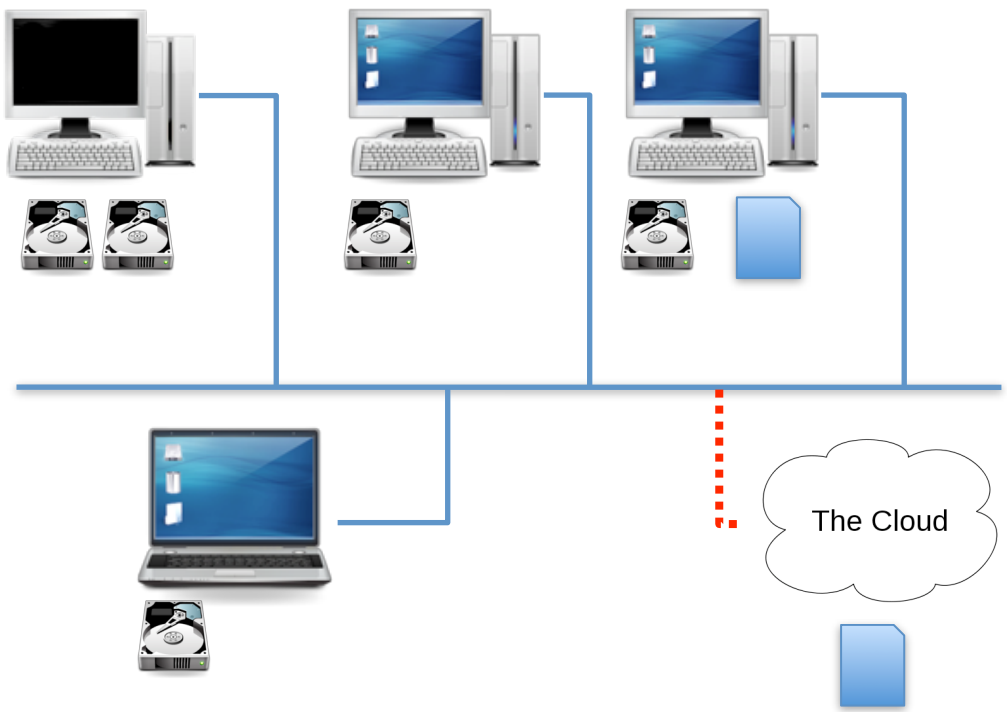


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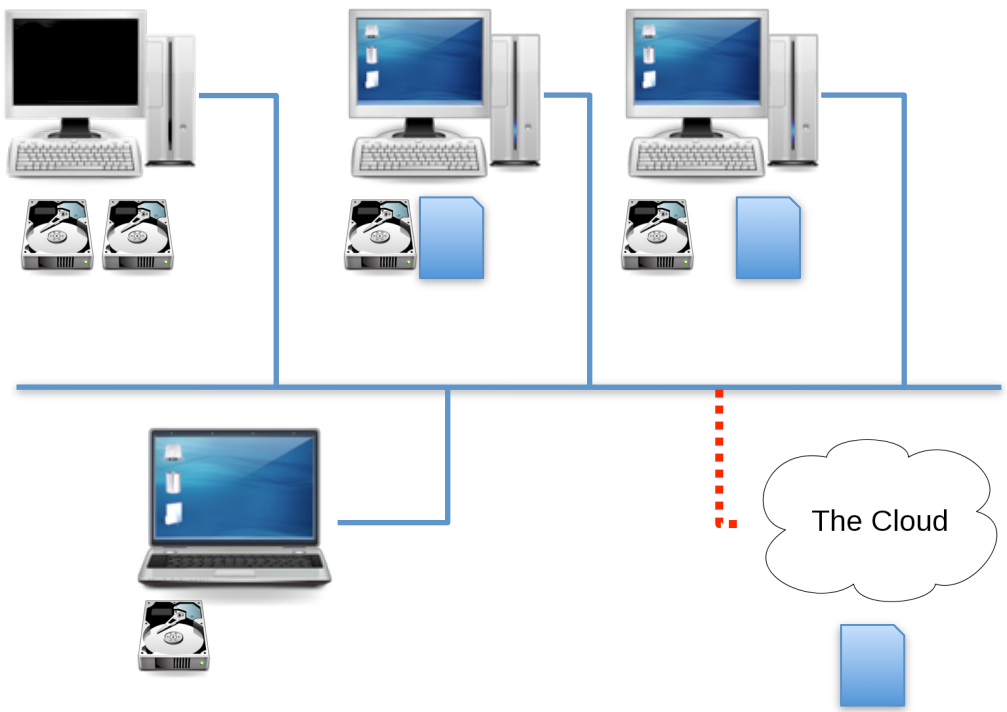


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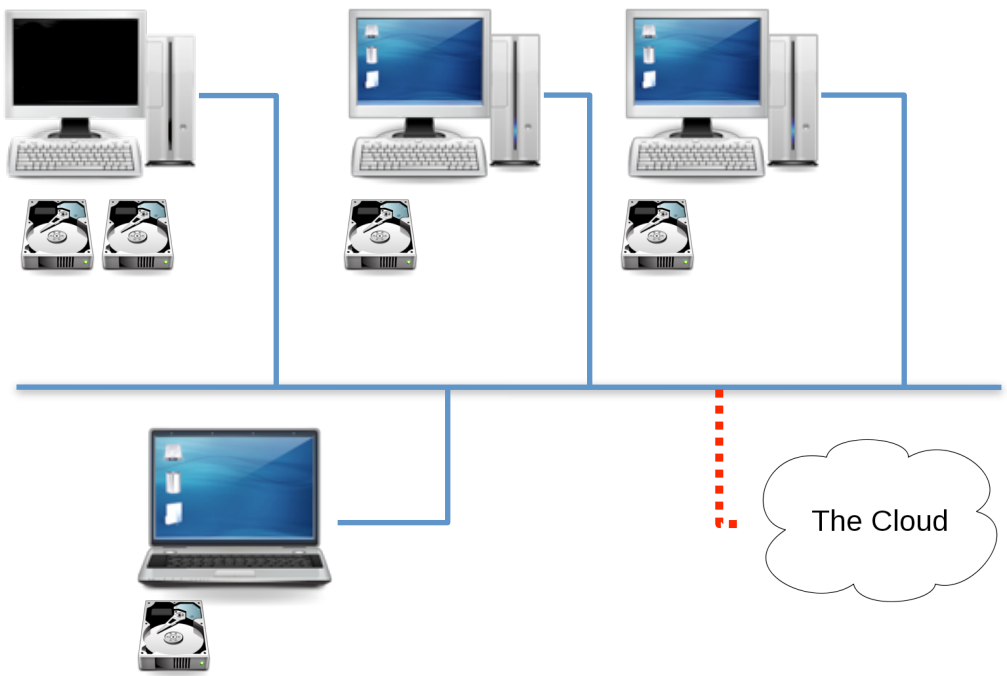


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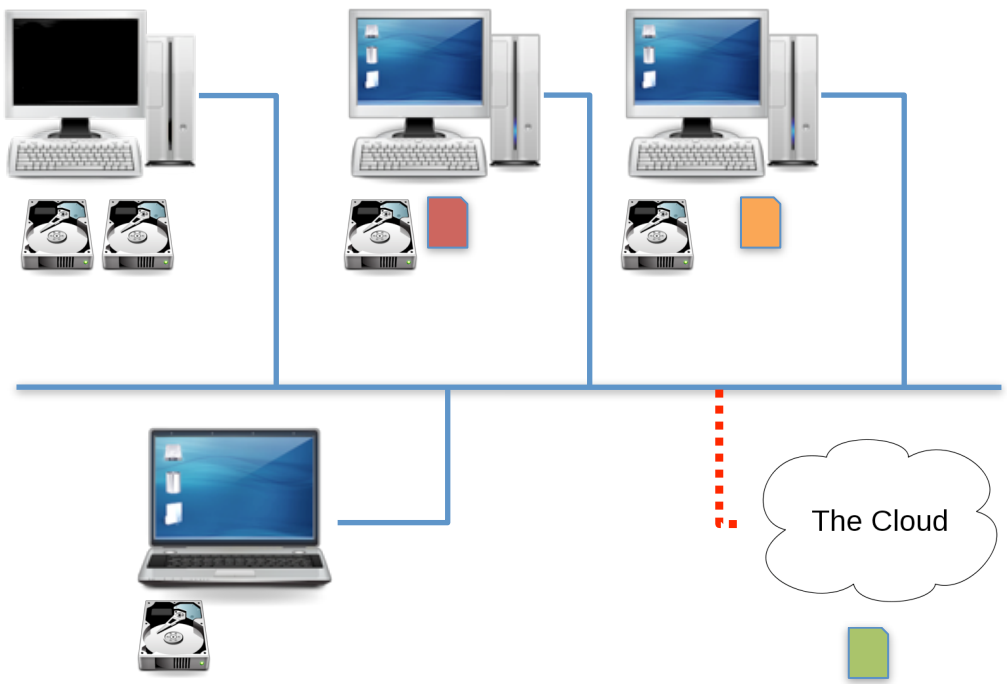


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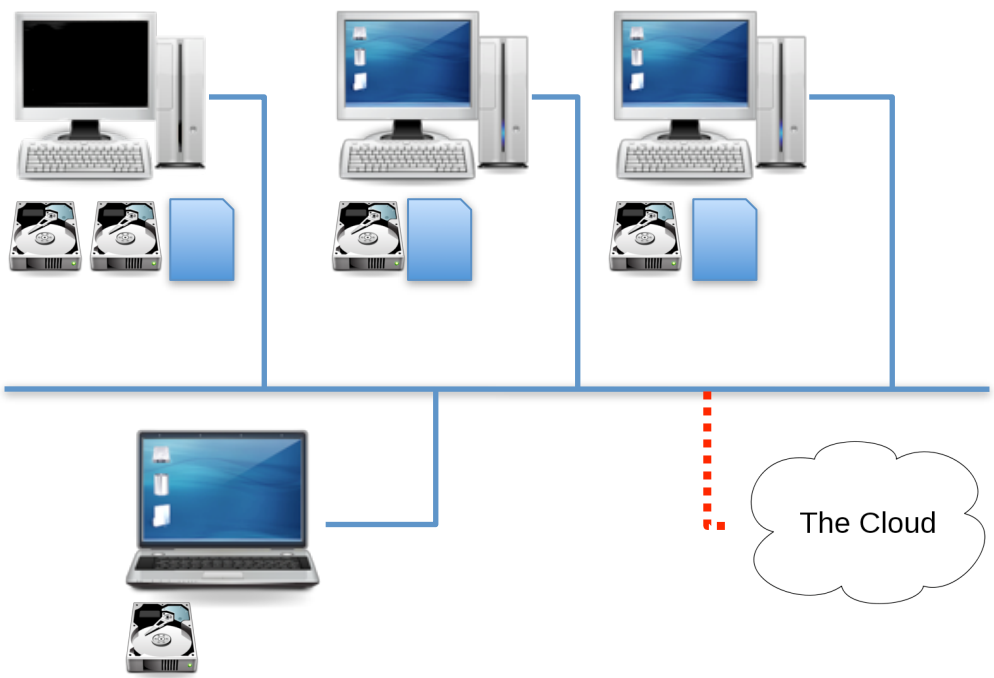
# Offline storage

- Ideally, data is stored on at least one offline device
  - Enables recovery from catastrophic failure

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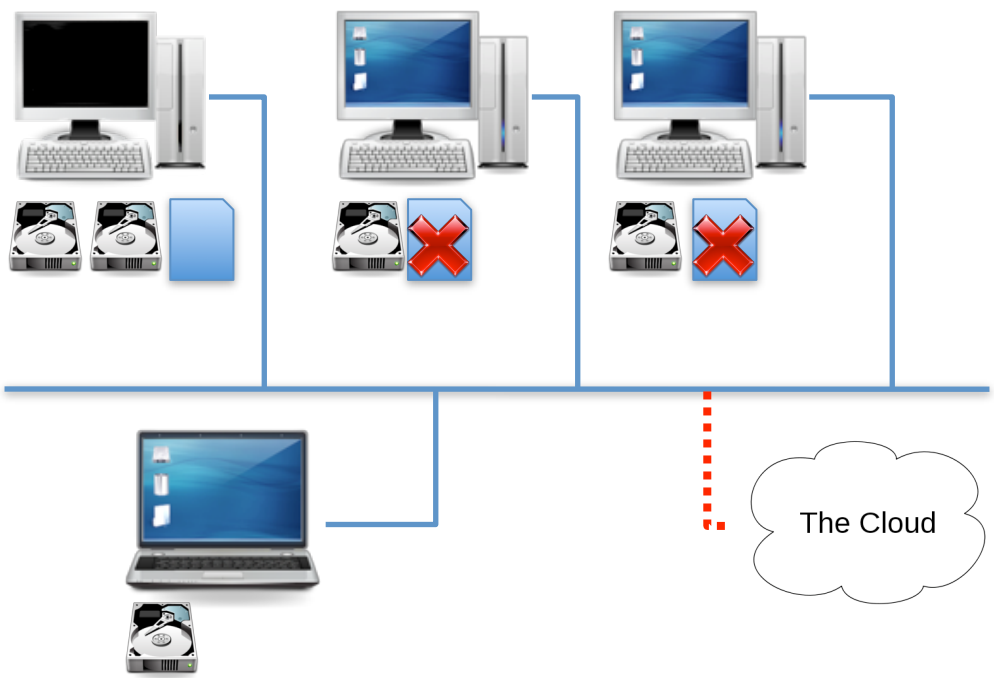


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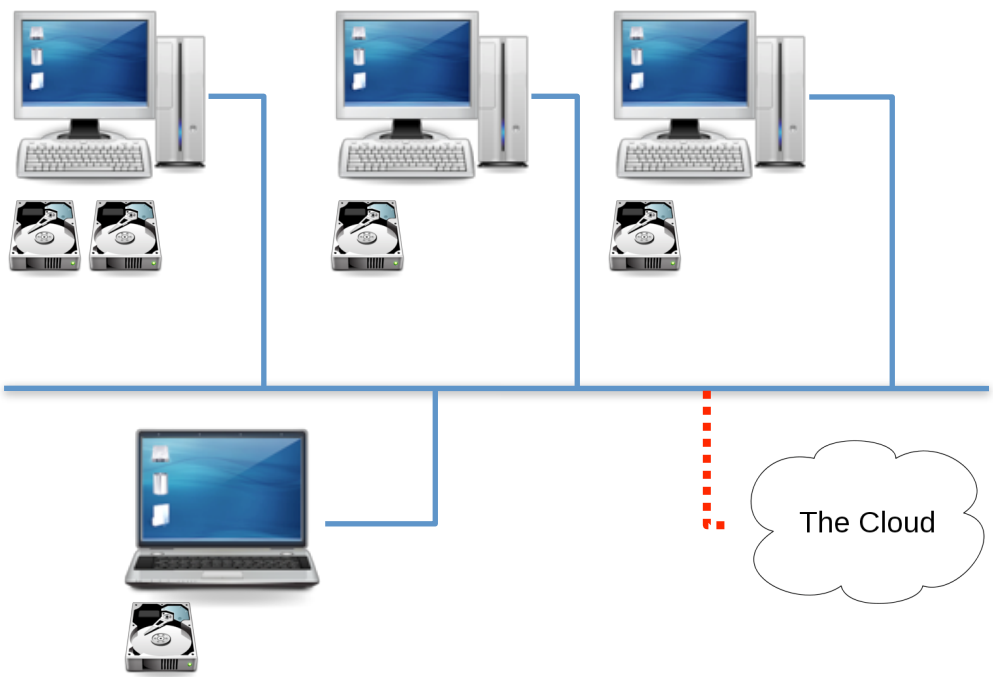
# Anti-availability protocol

- Writes are only allowed if a certain number of devices are offline
  - Enforced by a small trusted kernel

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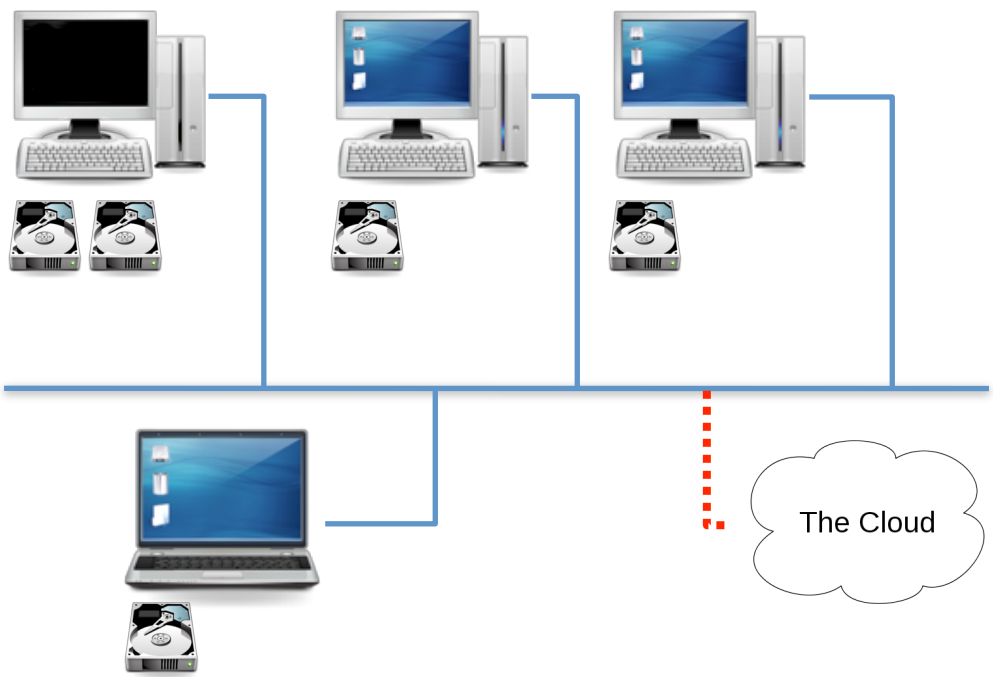


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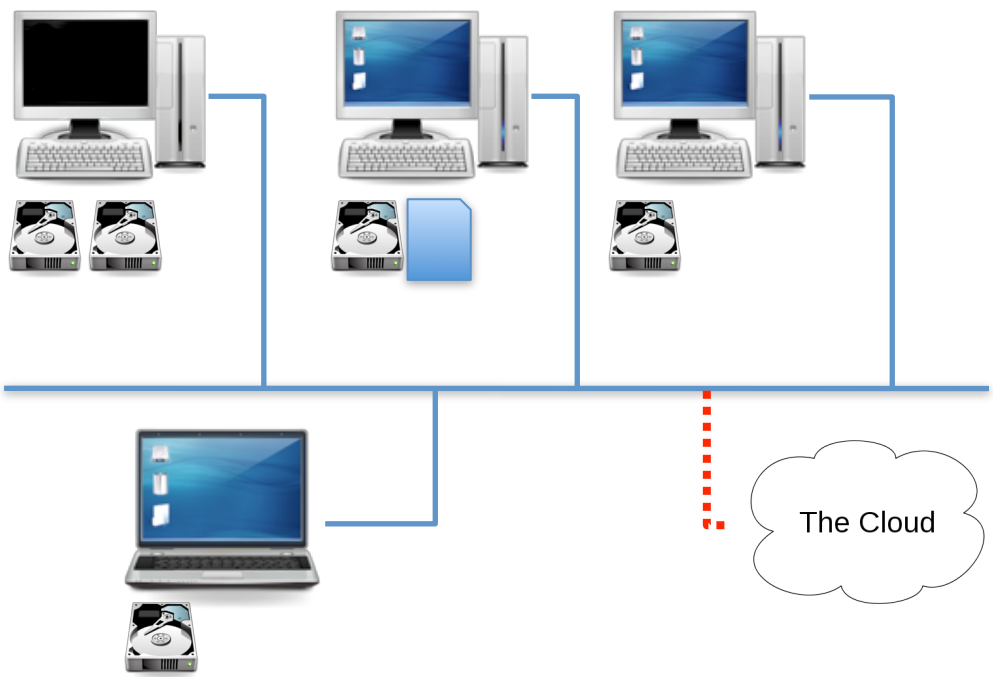


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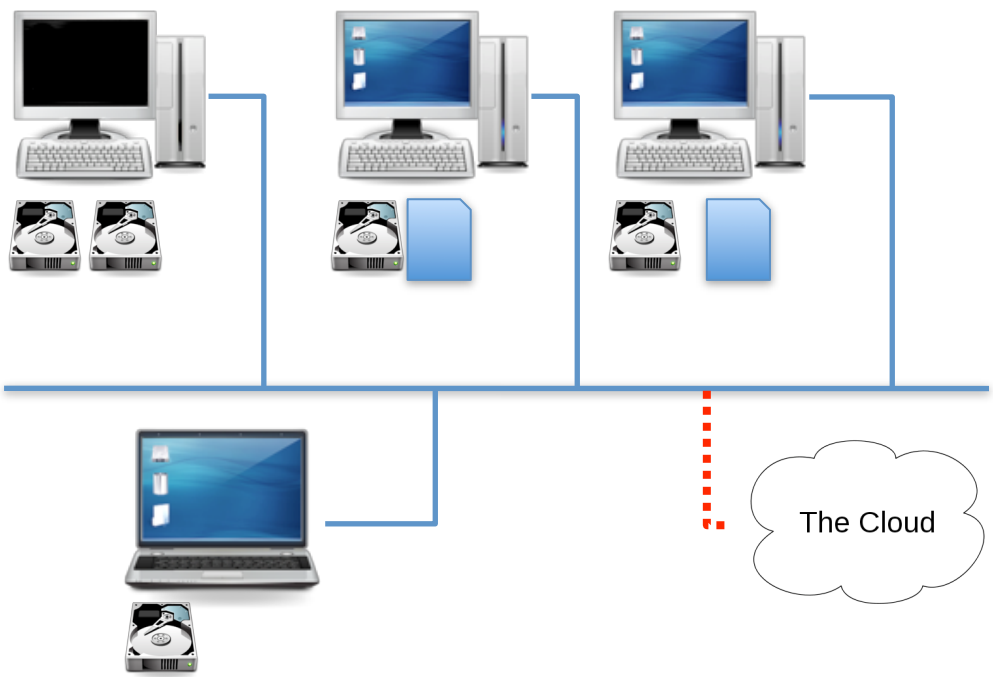


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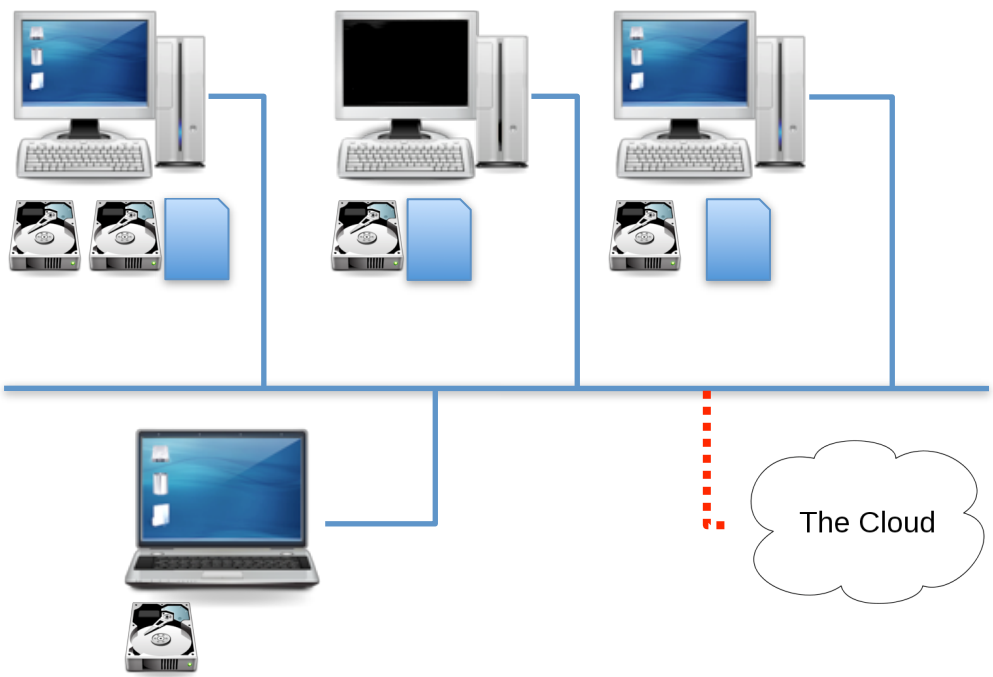


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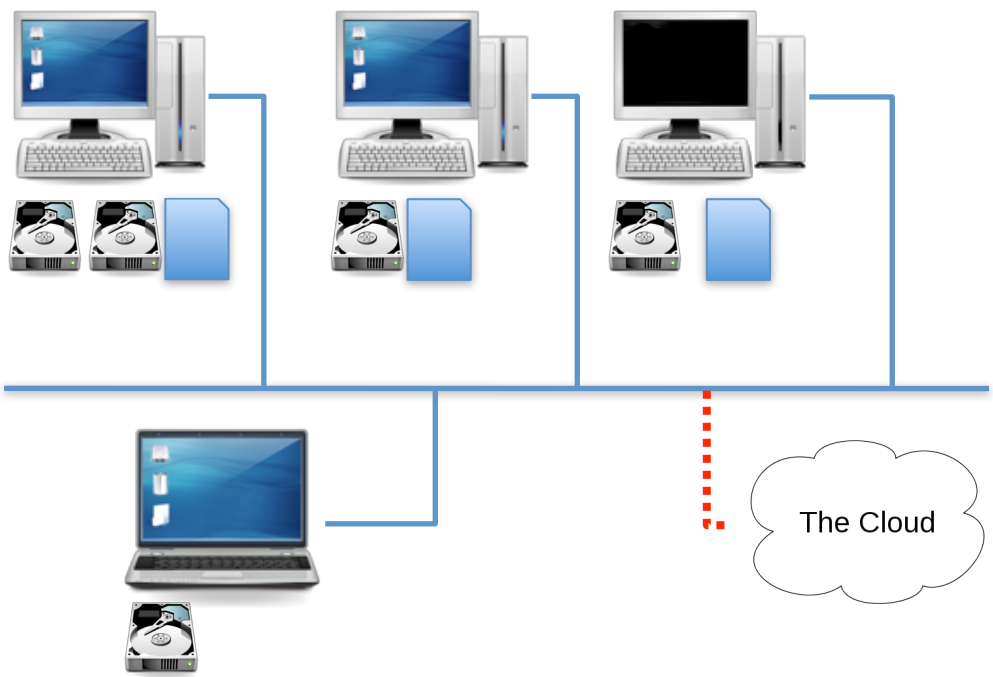


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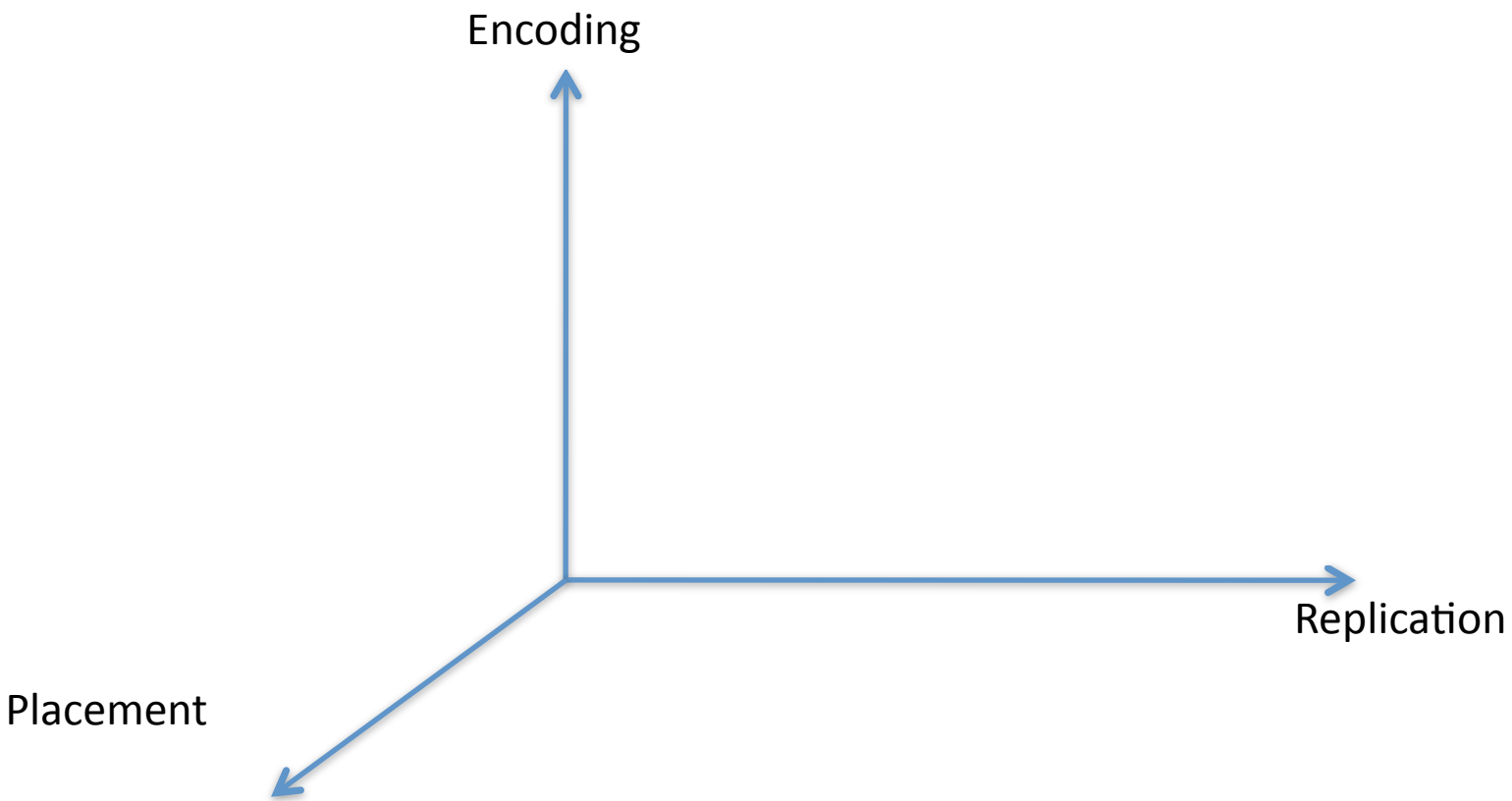
# Adaptive data storage

- Use linear programming to select and adapt storage configuration




NOTE: Huge number of possible tradeoffs. Well defined objective allows automatic selection of best configuration.

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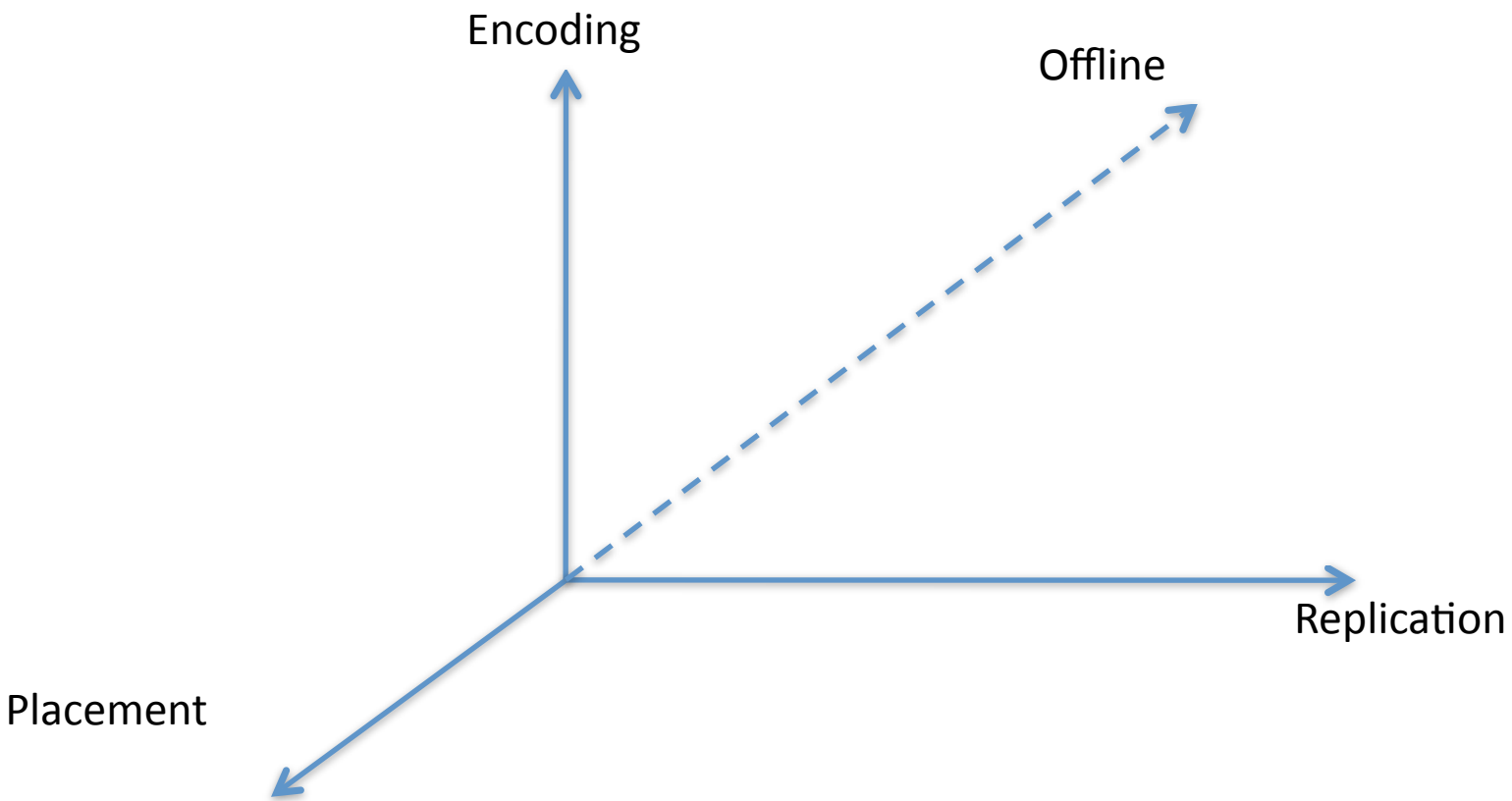


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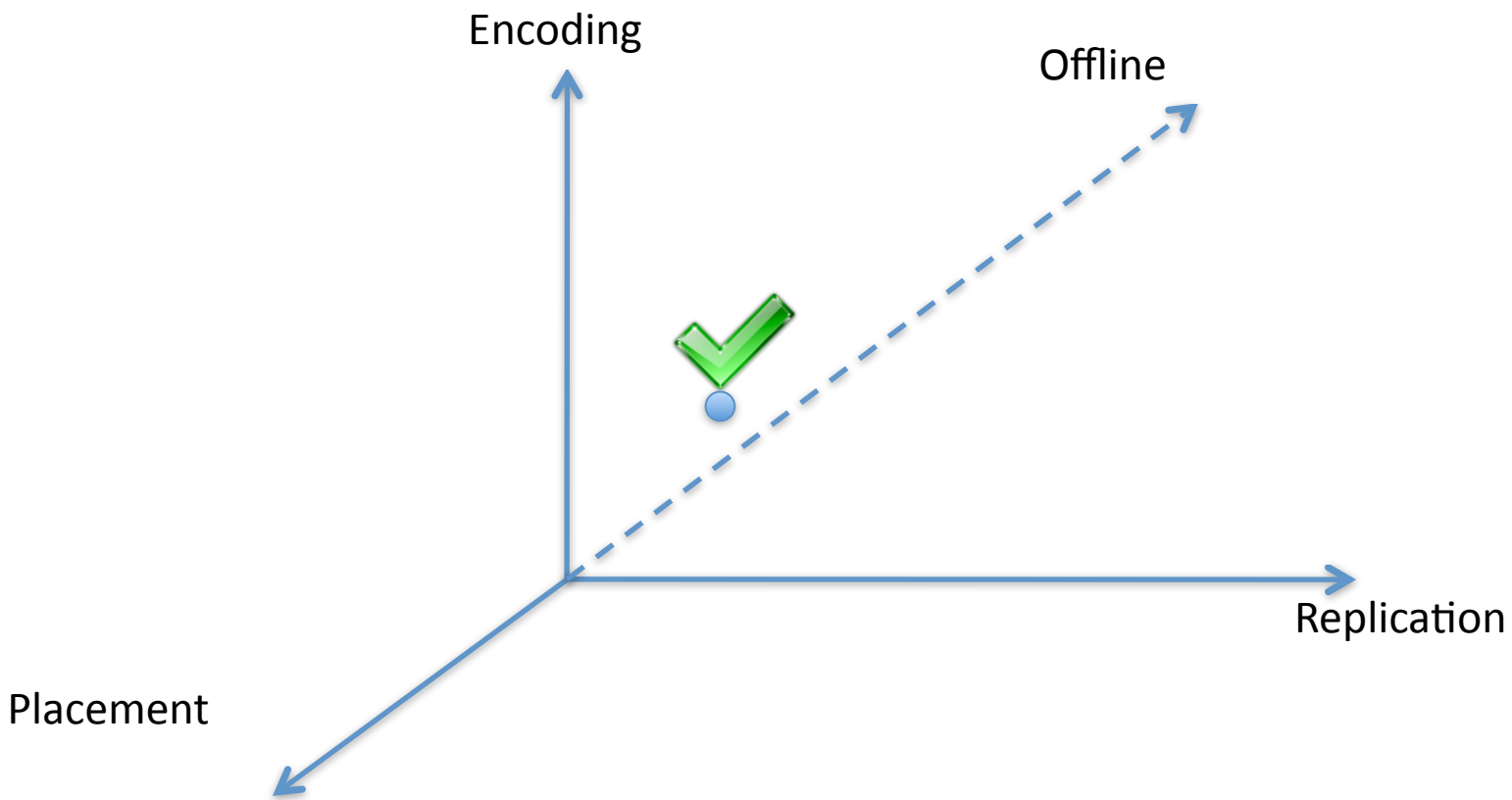


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# Conclusion

- Currently finalizing design
- Prototype, named *Chameleon*, is under development

Contact: abpost@mpi-sws.org for more information