Twins

BFT Systems Made Robust

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Diem / Facebook Novi

Research

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Engineering

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Byzantine Fault Tolerance

DiemBFT

A Production BFT System

- 10,000 Git commits
- 200 contributors
- Years of development

Byzantine Adversaries

How to write integration/unit tests?

Twins is not formal verification

It is a pragmatic (black box) approach

Twins

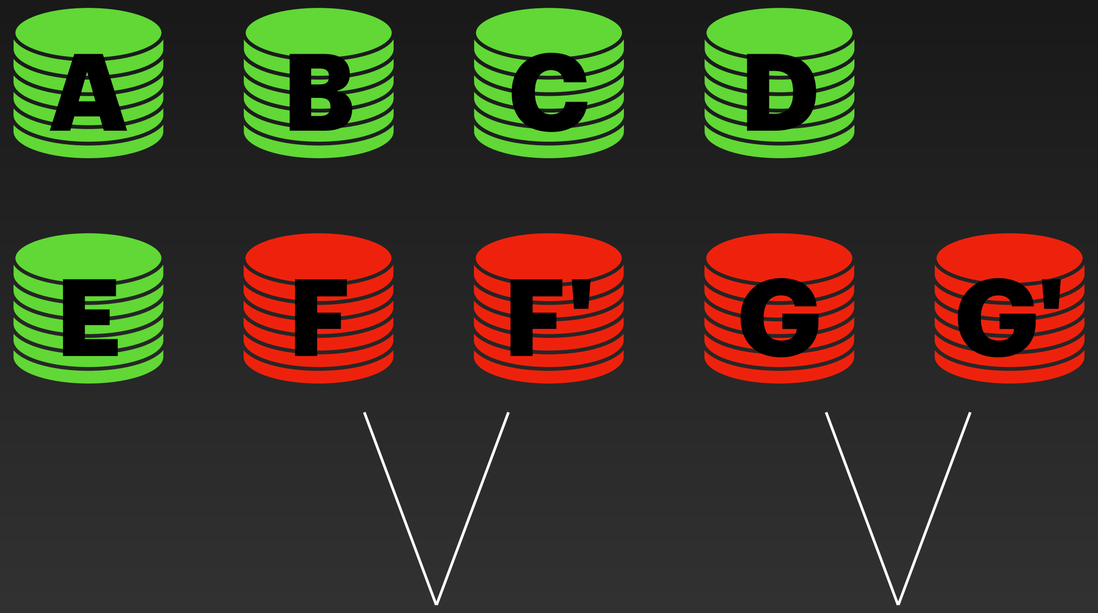
Multiple copies of the same node

Twins

Multiple copies of the same node

Twins

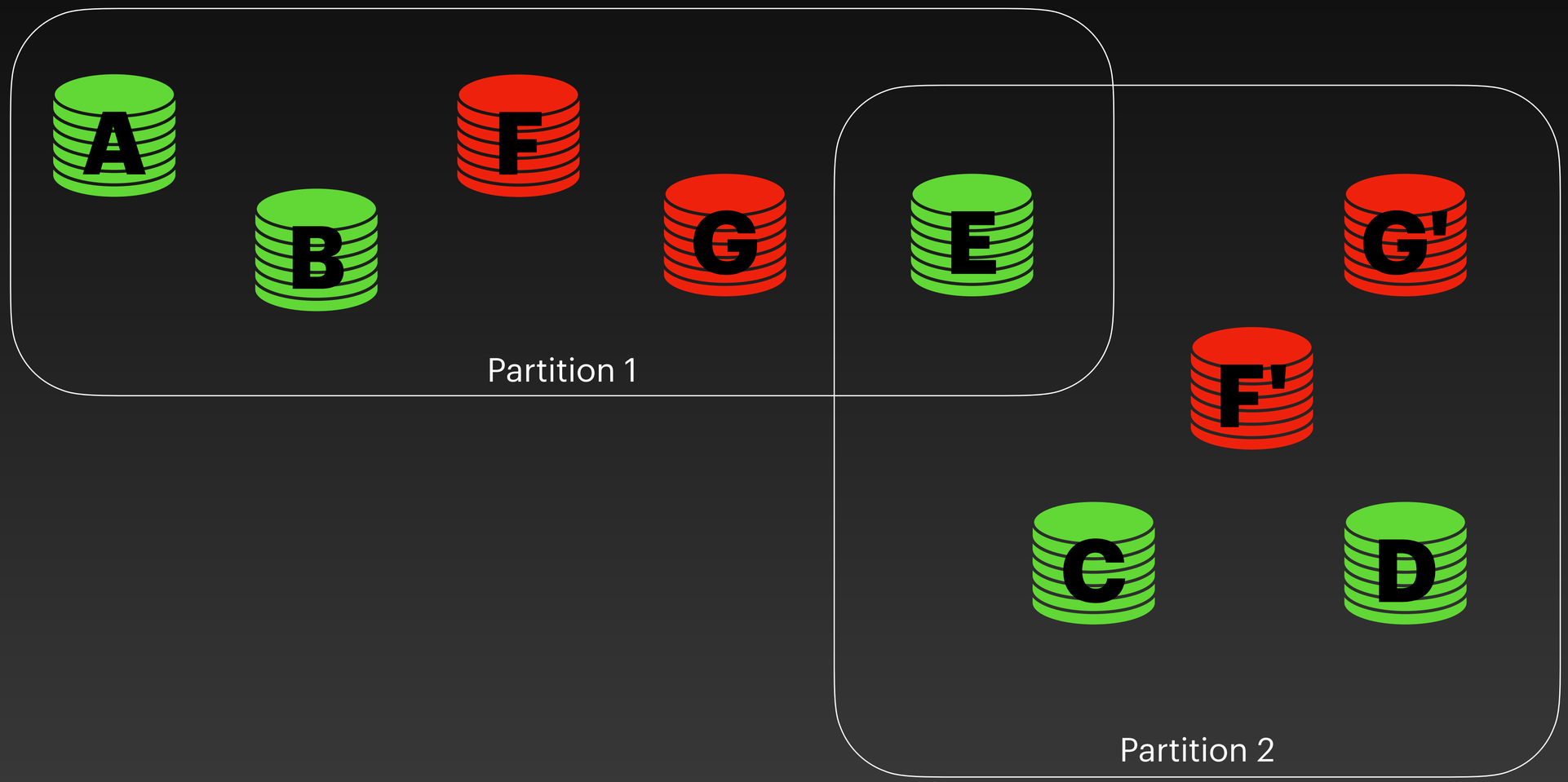
Multiple copies of the same node



Twins have the same cryptographic keys
When leader, they propose a different (random) payload

Twins

Network Partitions (on a round base)



Why does Twins Help?

It captures notable misbehaviors

Equivocations

Eg. Equivocating propsals

Amnesia

Eg. Forgetting that we already voted in this round

Losing internal state

Eg. Loose 'locks' guarding voted values

Conclusion

Twins

- A pragmatic approach to BFT testing, the first of its kind
- Needs a community effort

- **Paper:** https://arxiv.org/abs/2004.10617
- **Code:** https://github.com/diem/diem