The Duplicity Game:
or why you can trust KERI

Samuel M. Smith Ph.D.
sam@prosapien.com
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version 2.25
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https://github.com/SmithSamuelM/Papers/blob/master/presentations/KERI2_Overview_IIW_2020_A.pdf
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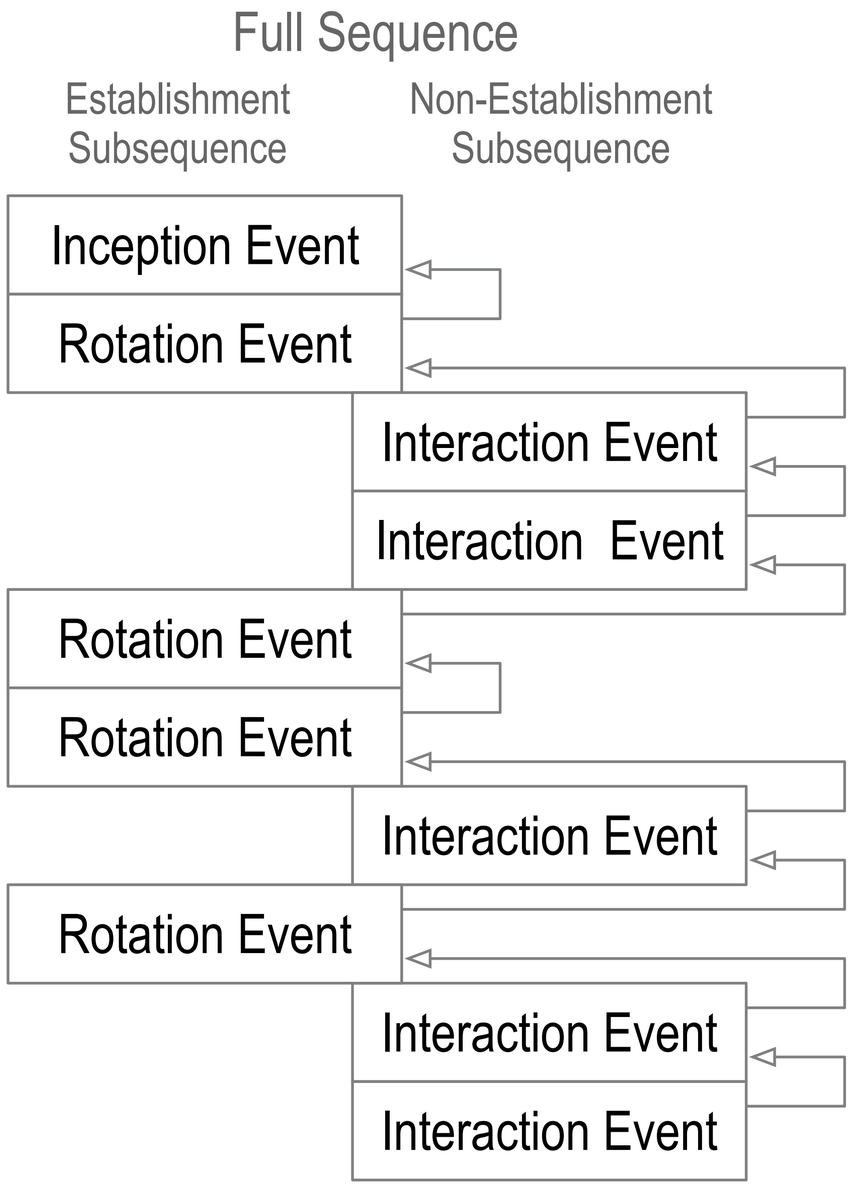
https://github.com/decentralized-identity/keri
https://github.com/decentralized-identity/keri/blob/master/implementation.md
https://hackmd.io/orhyiJkLT721v4PCPkvQiA?both

Inconsistency and Duplicity



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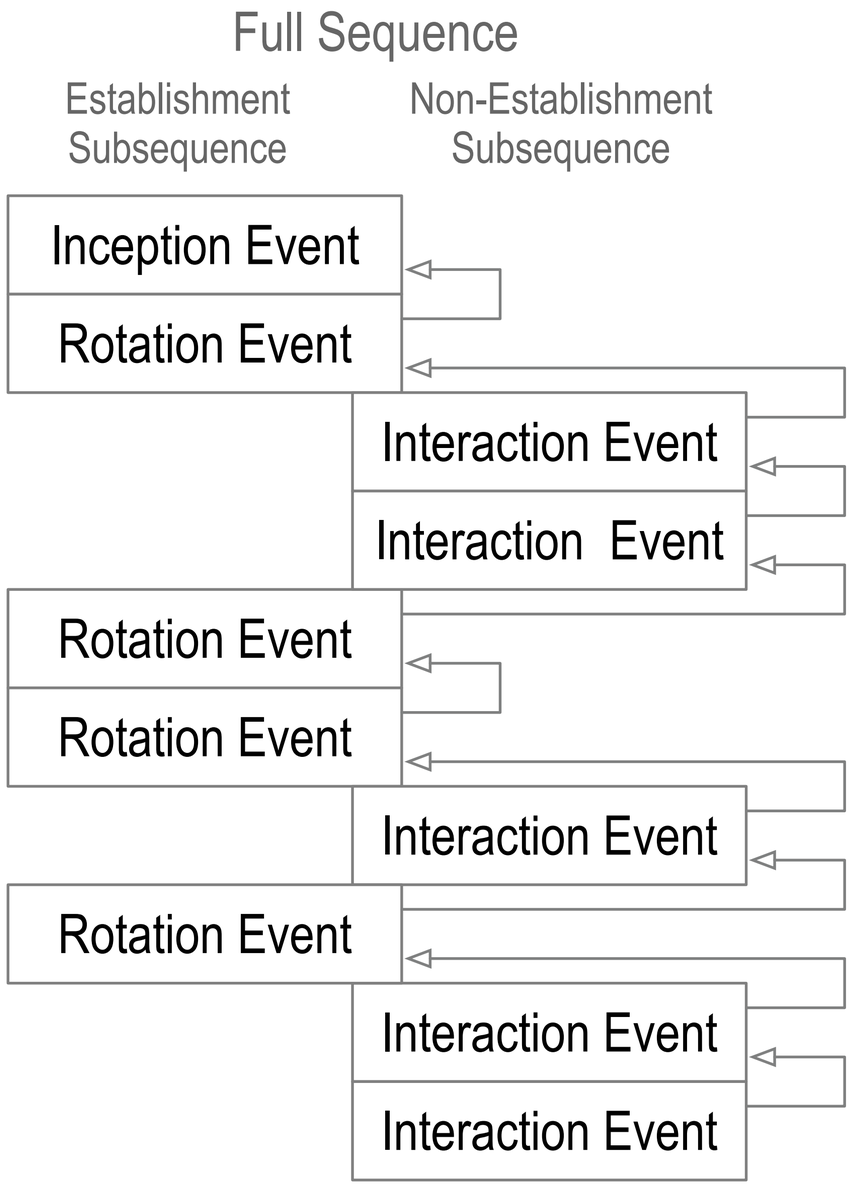

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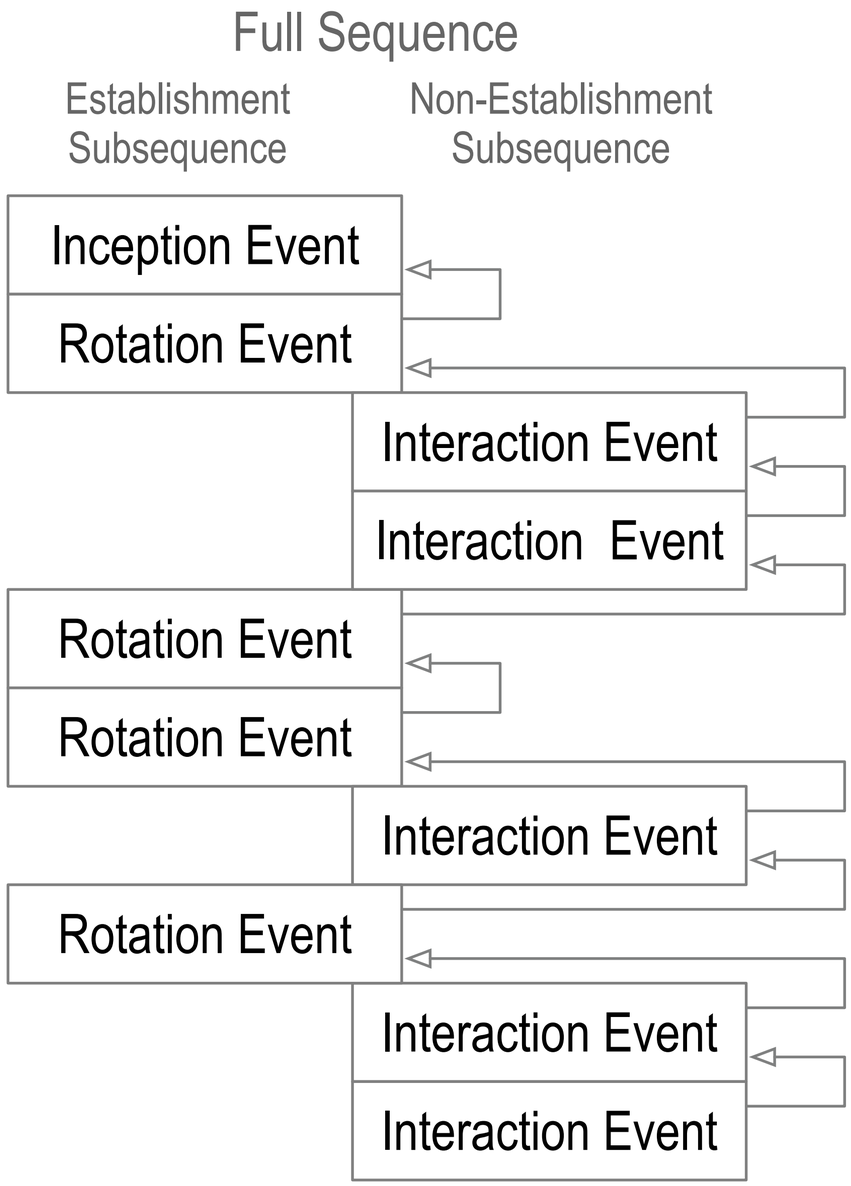

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inconsistency: lacking agreement, as two or more things in relation to each other

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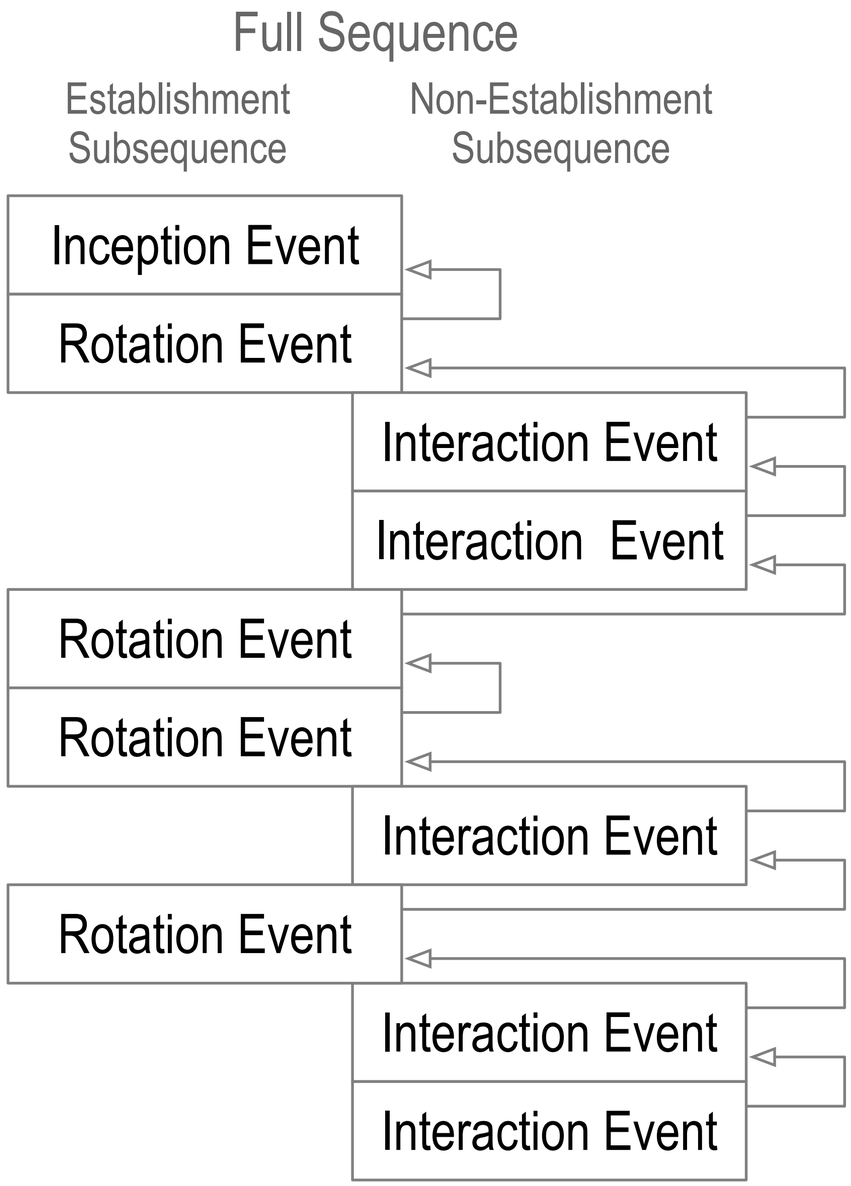

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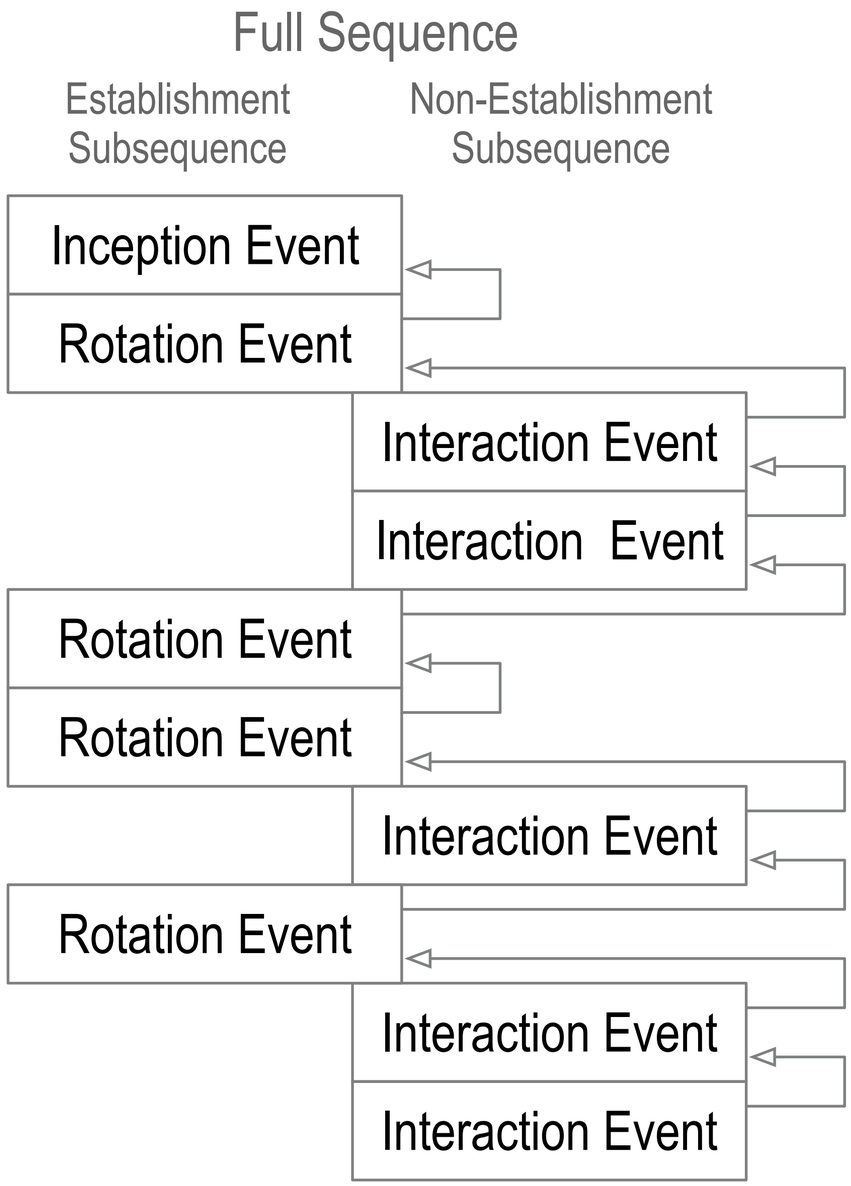

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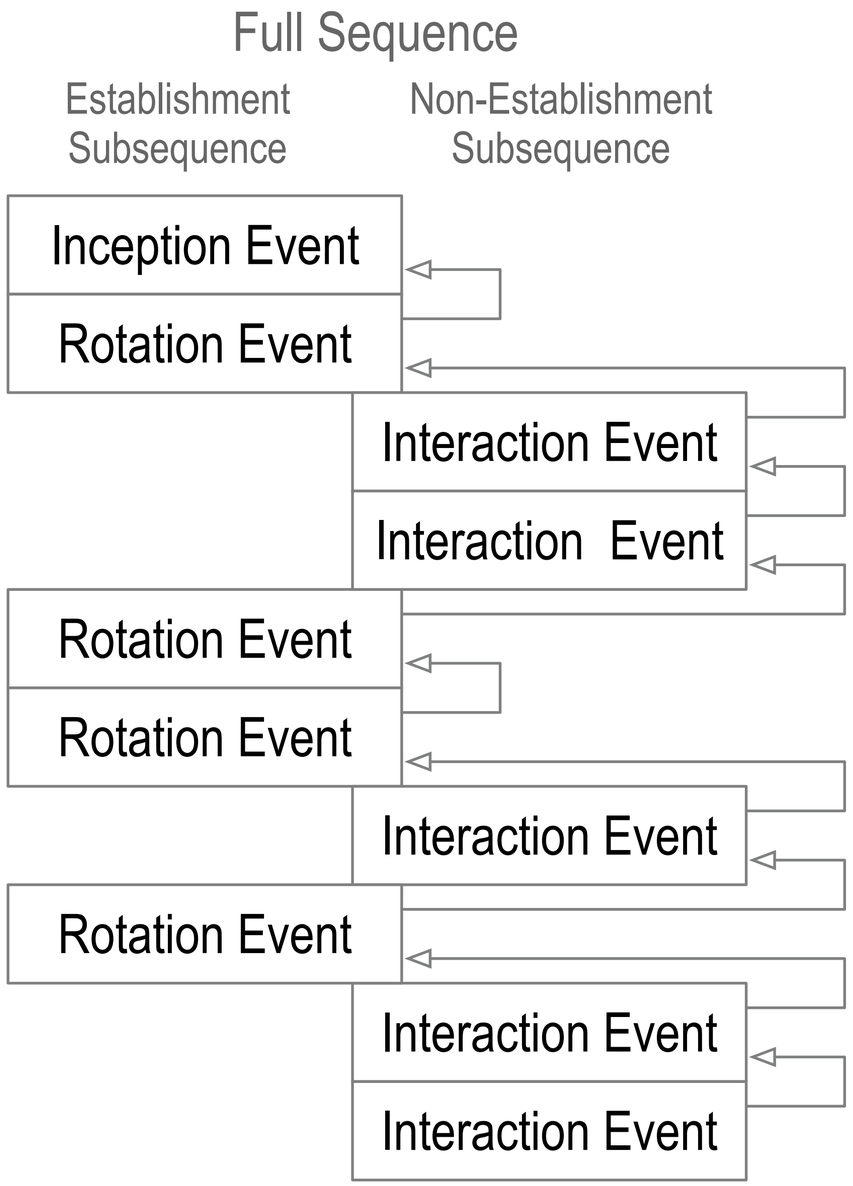

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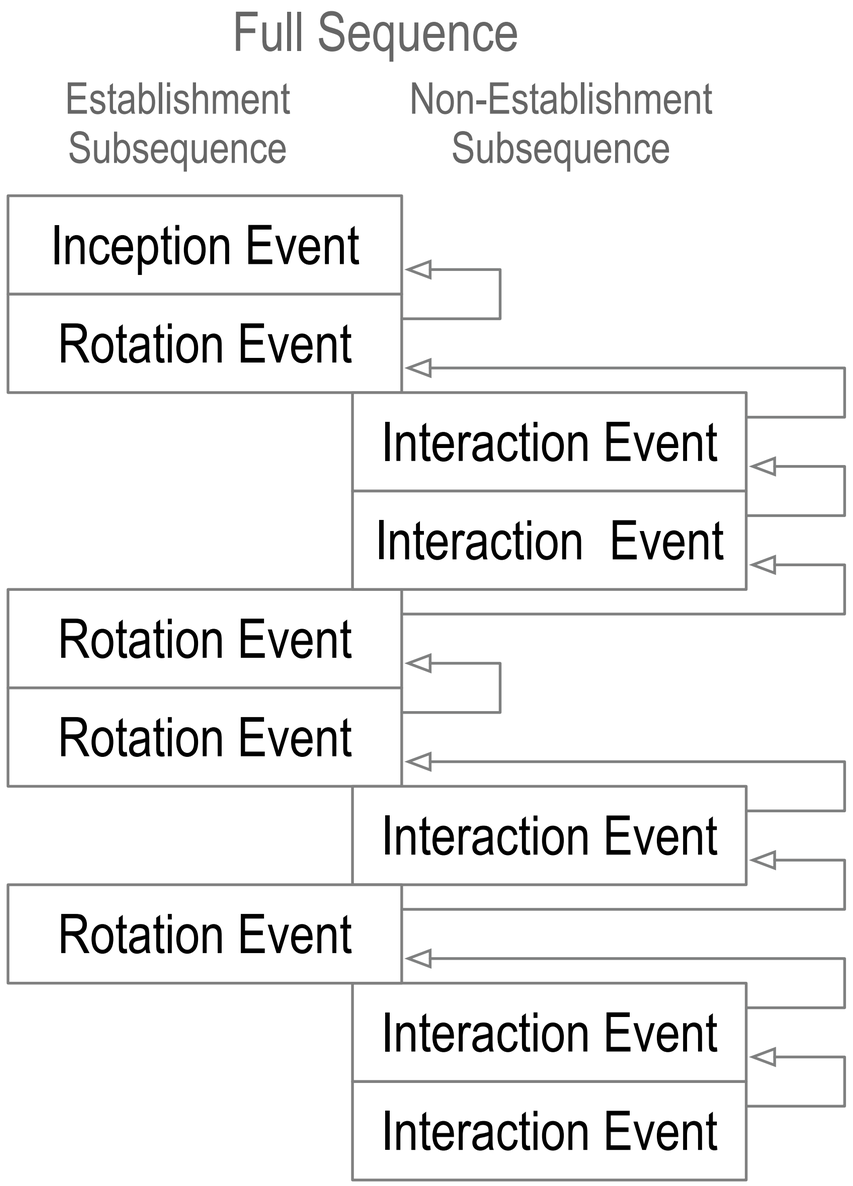

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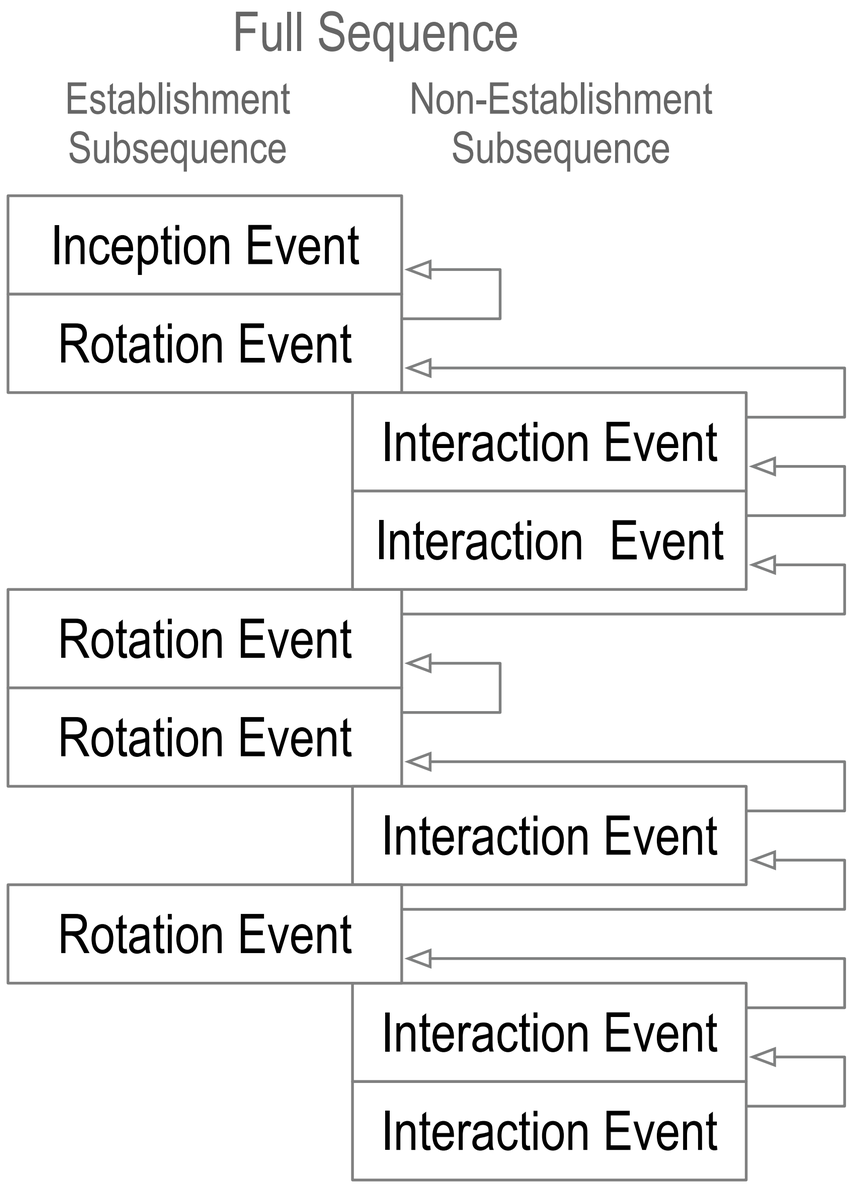

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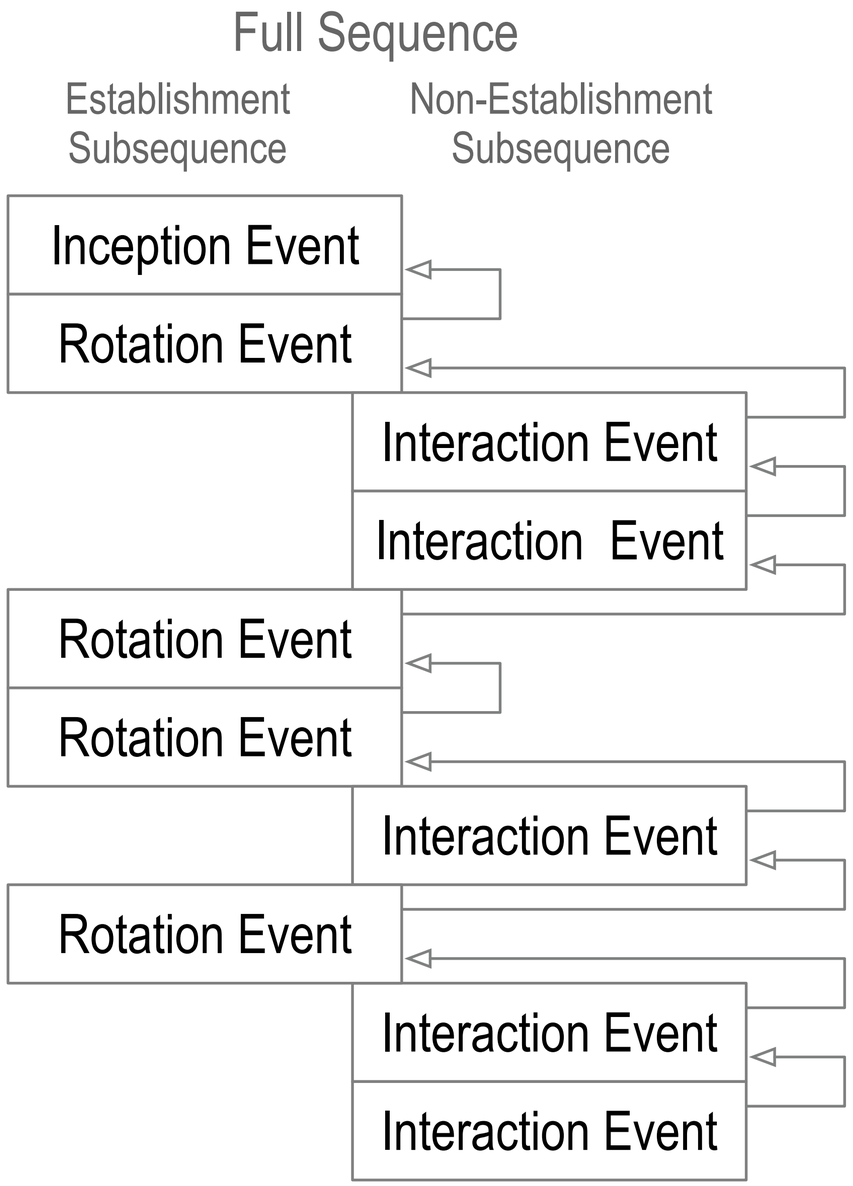

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Duplicity detection protects against external inconsistency.

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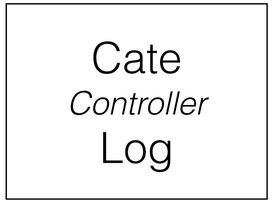

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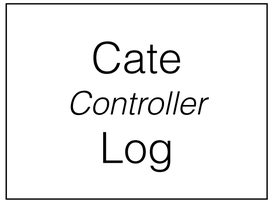

private (one-to-one) interactions

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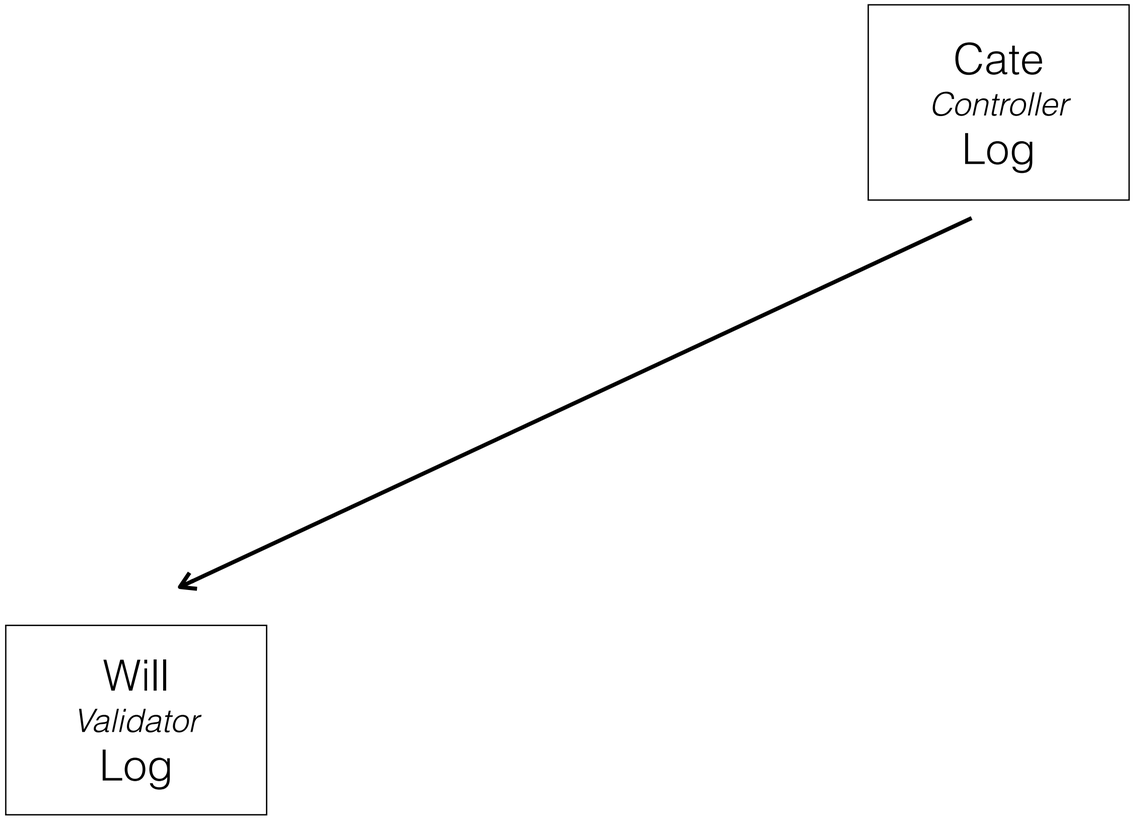

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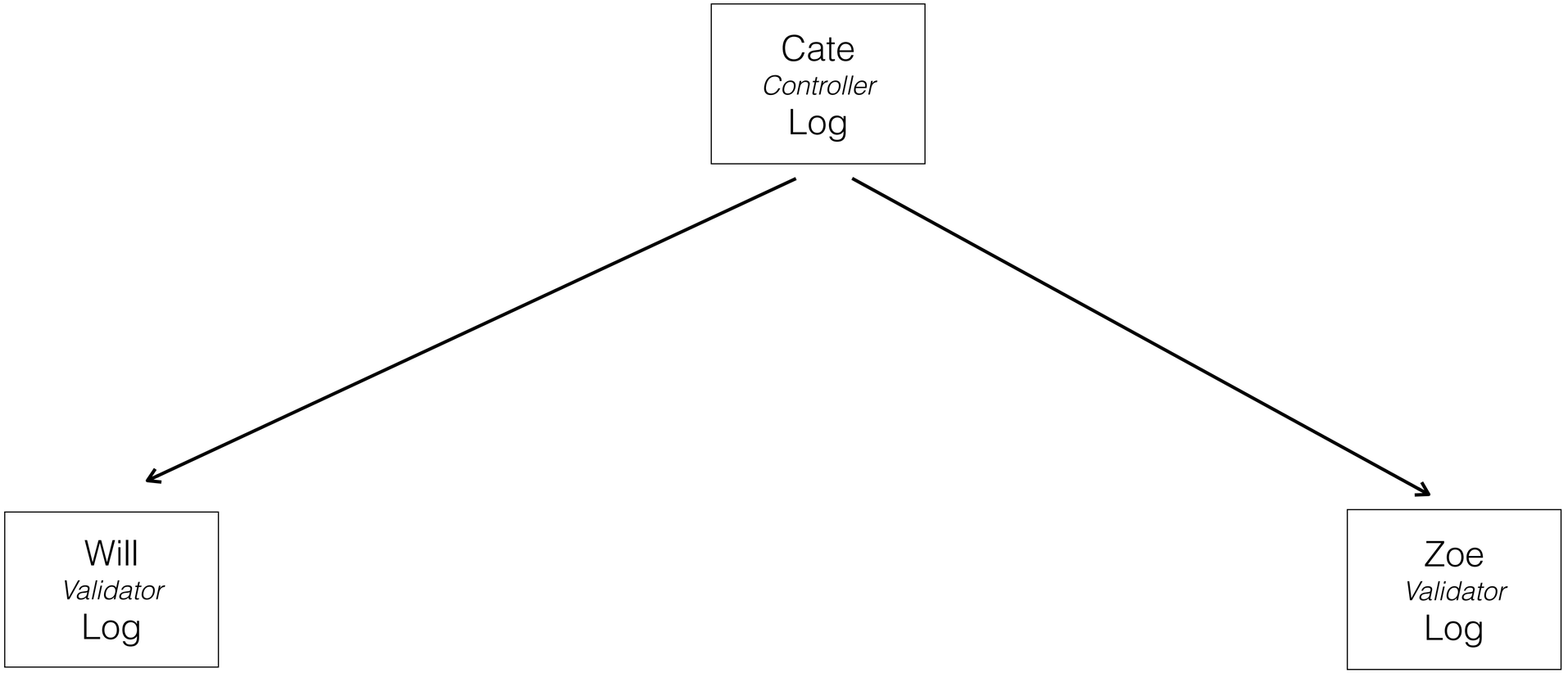

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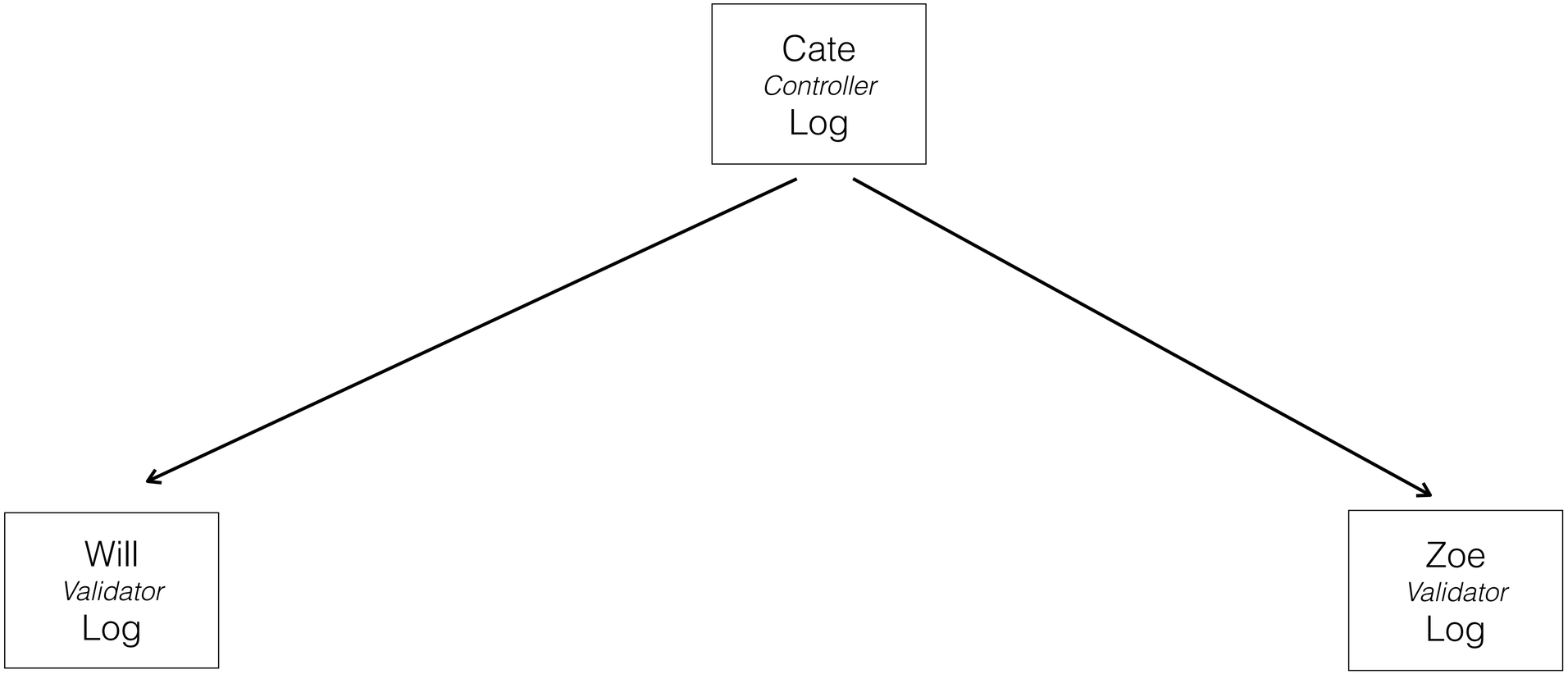

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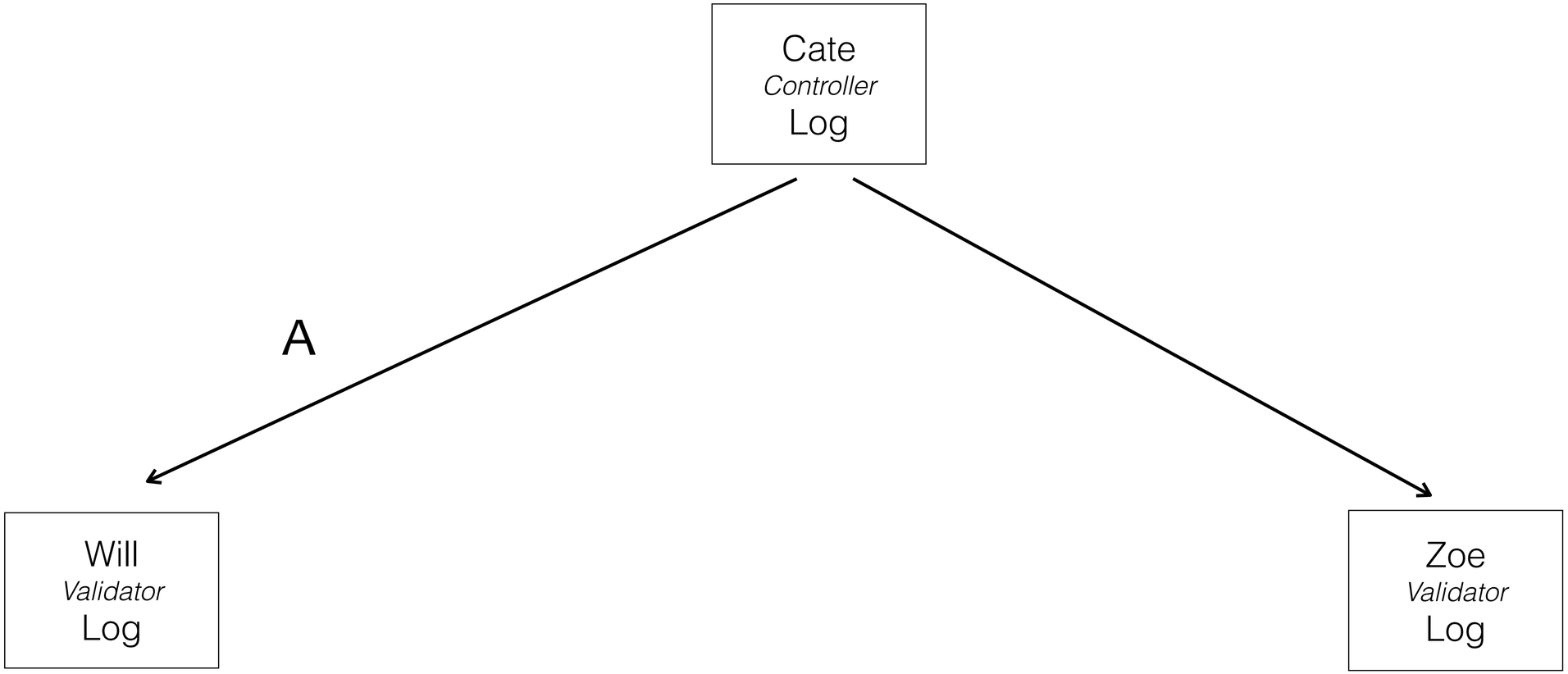

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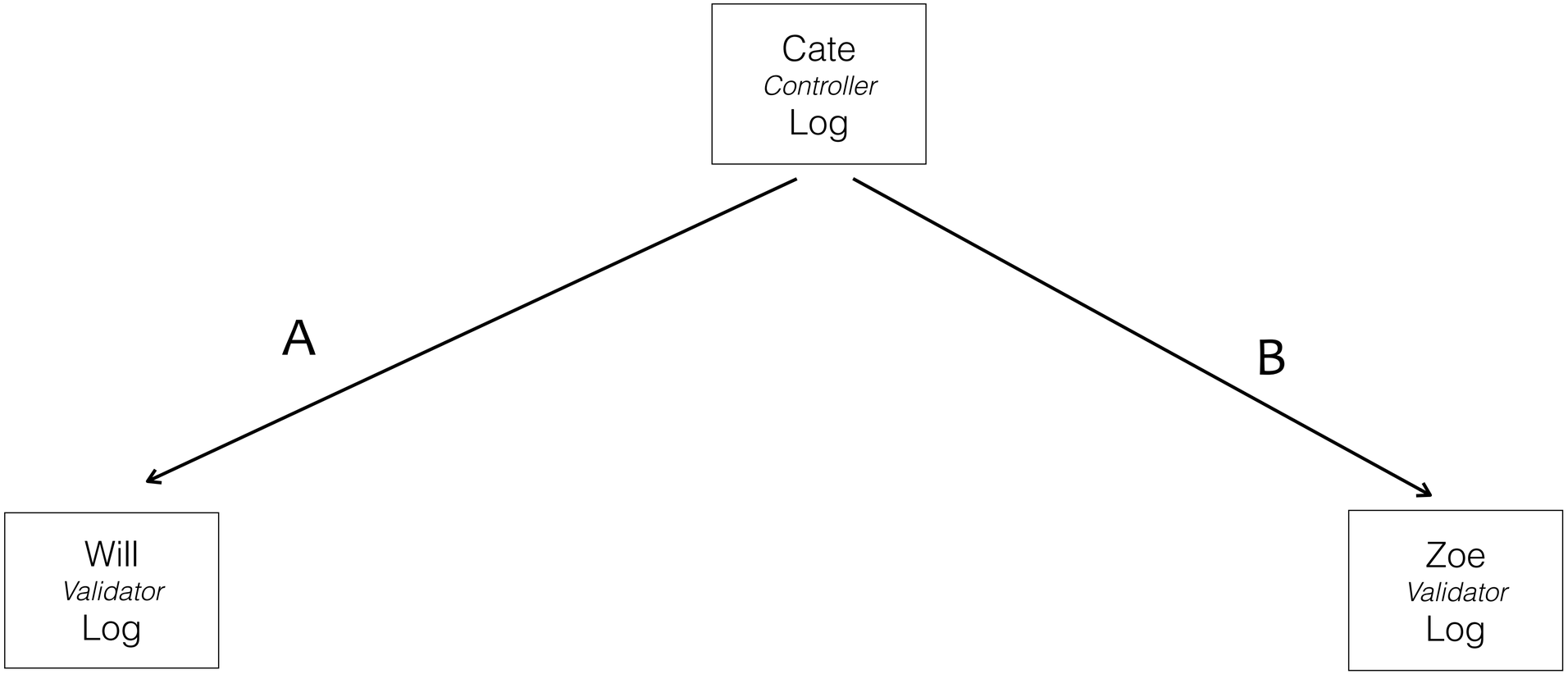

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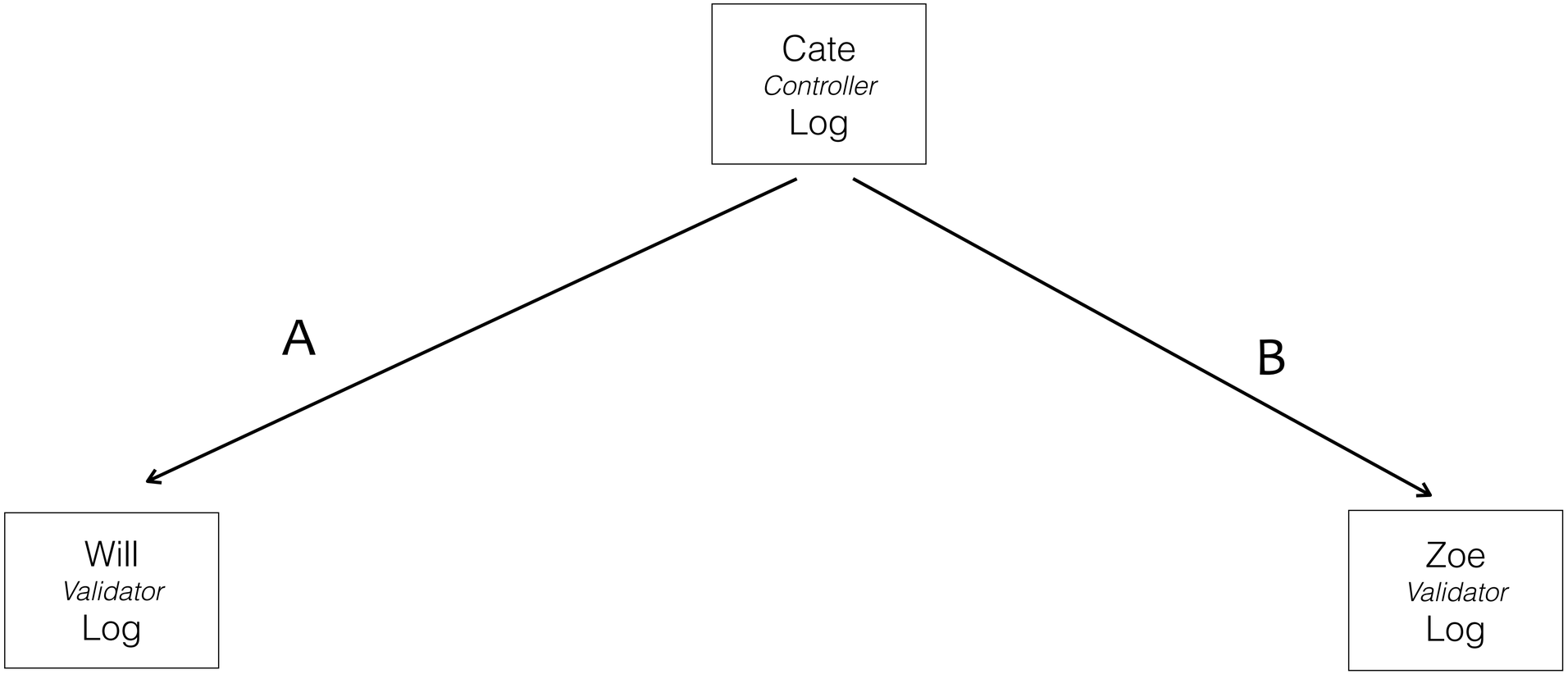

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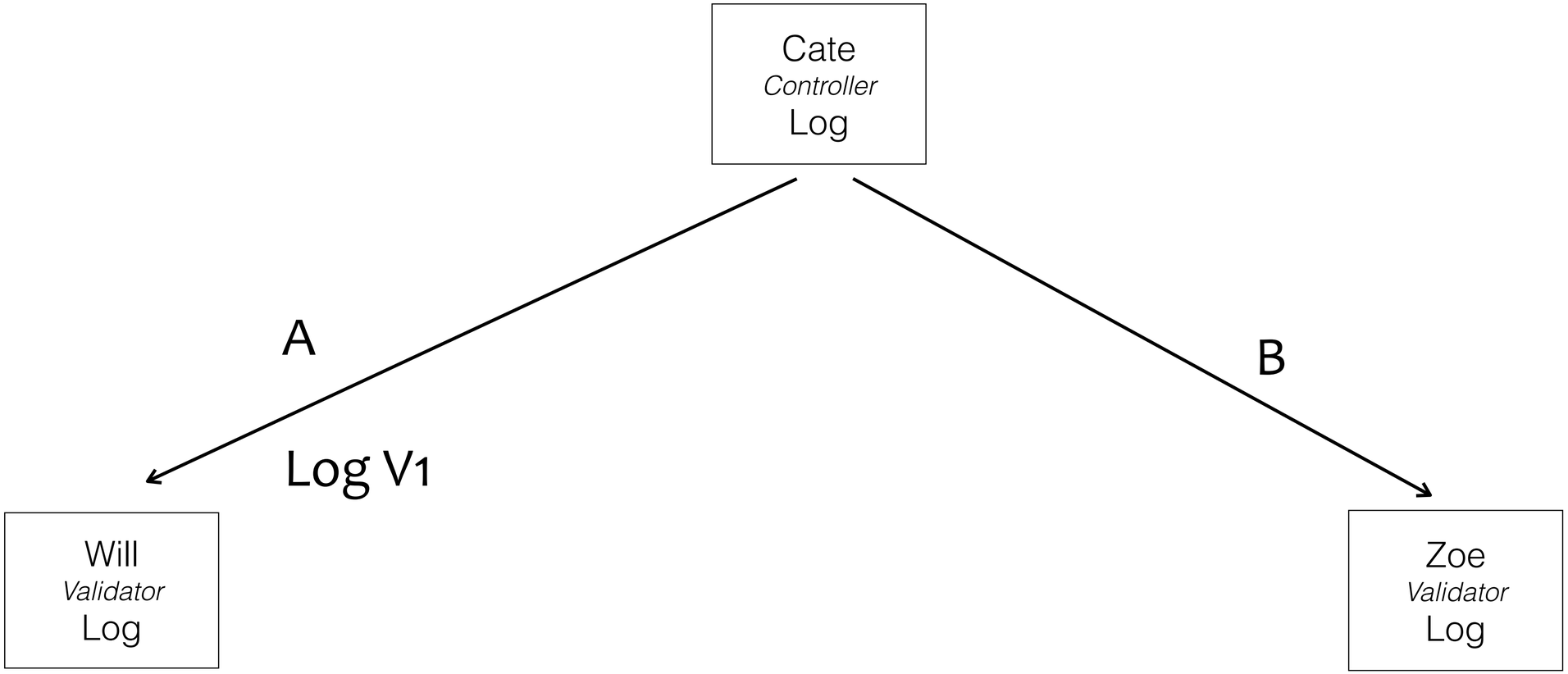

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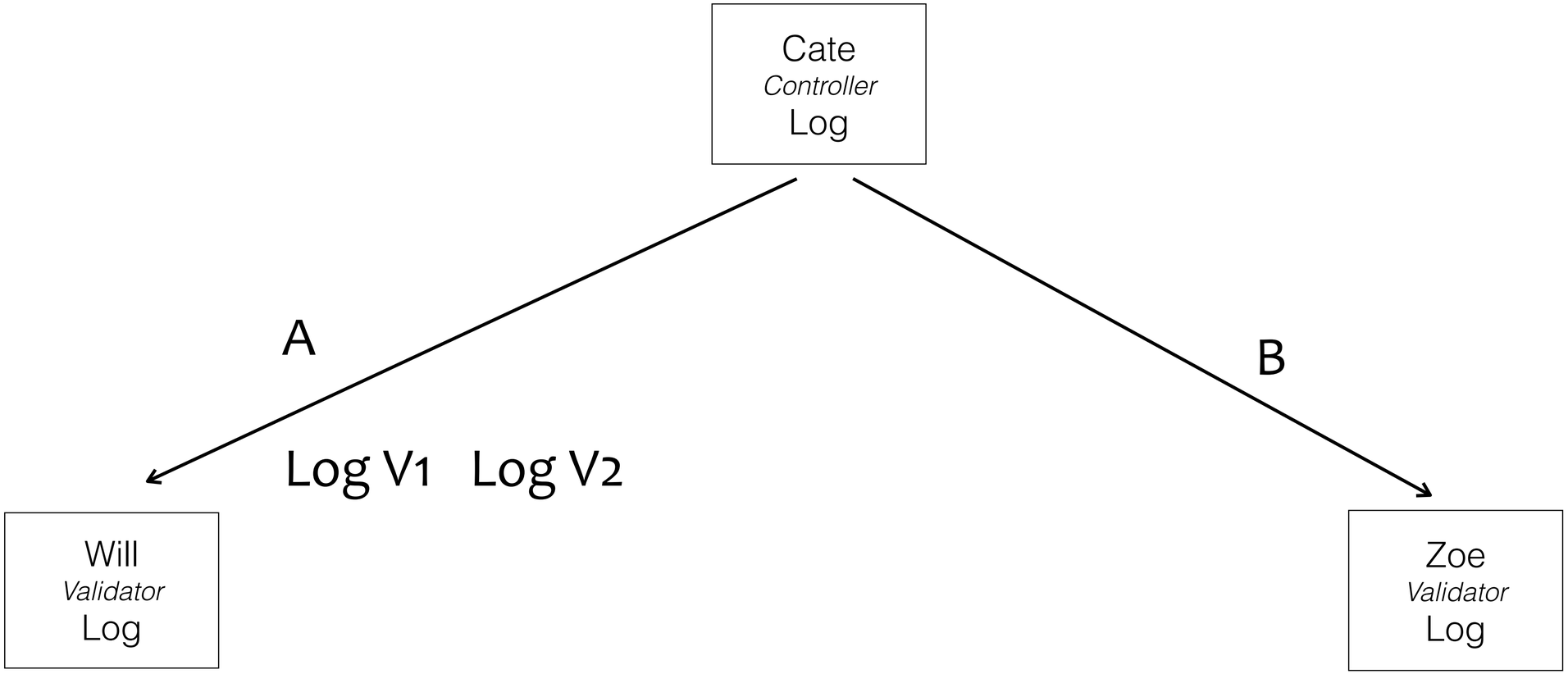

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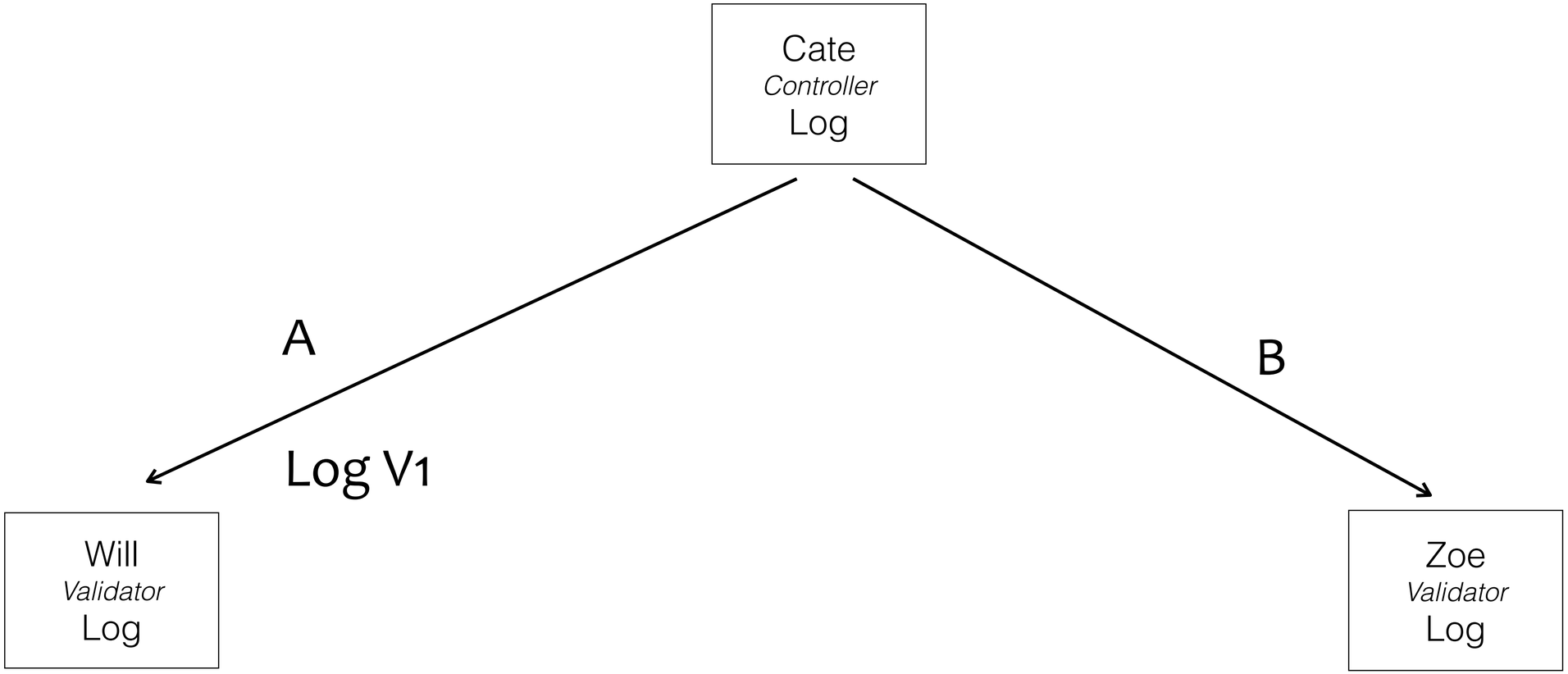

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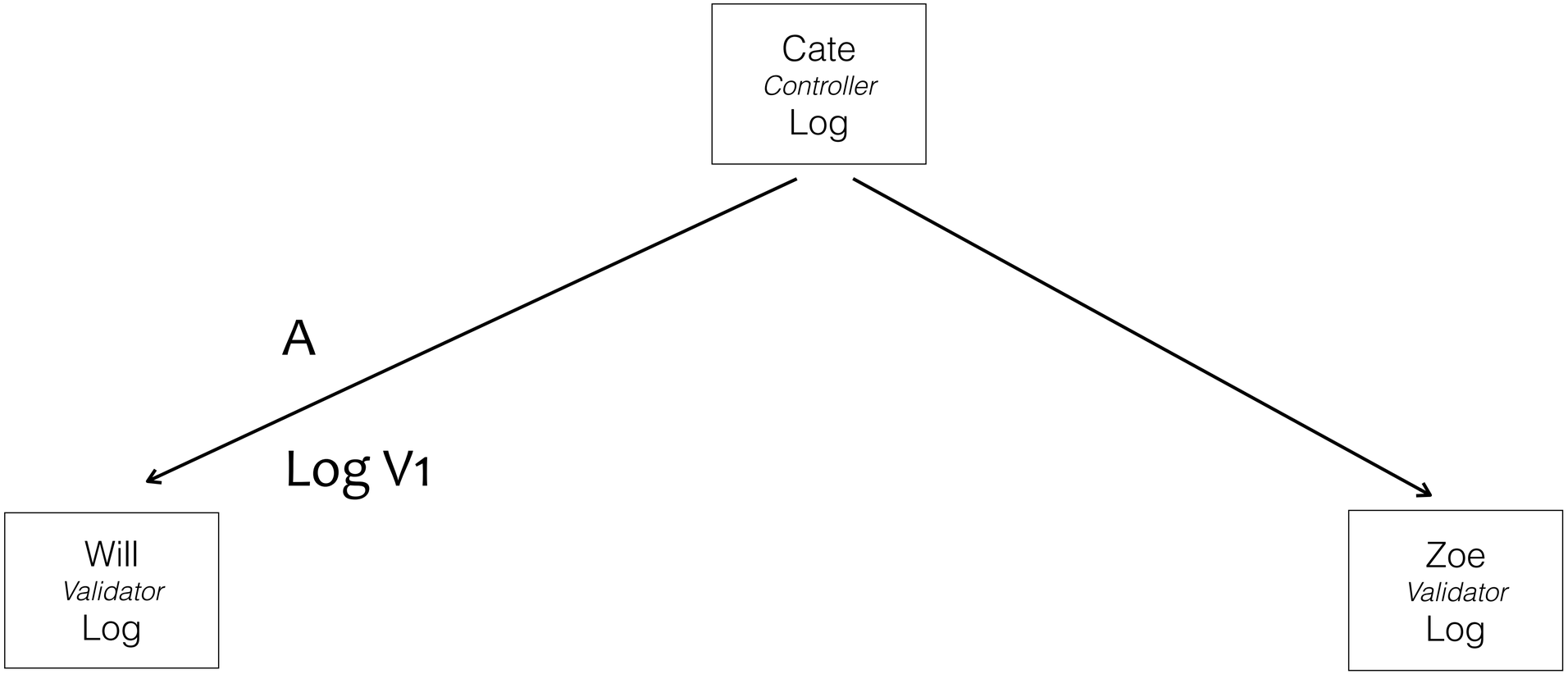

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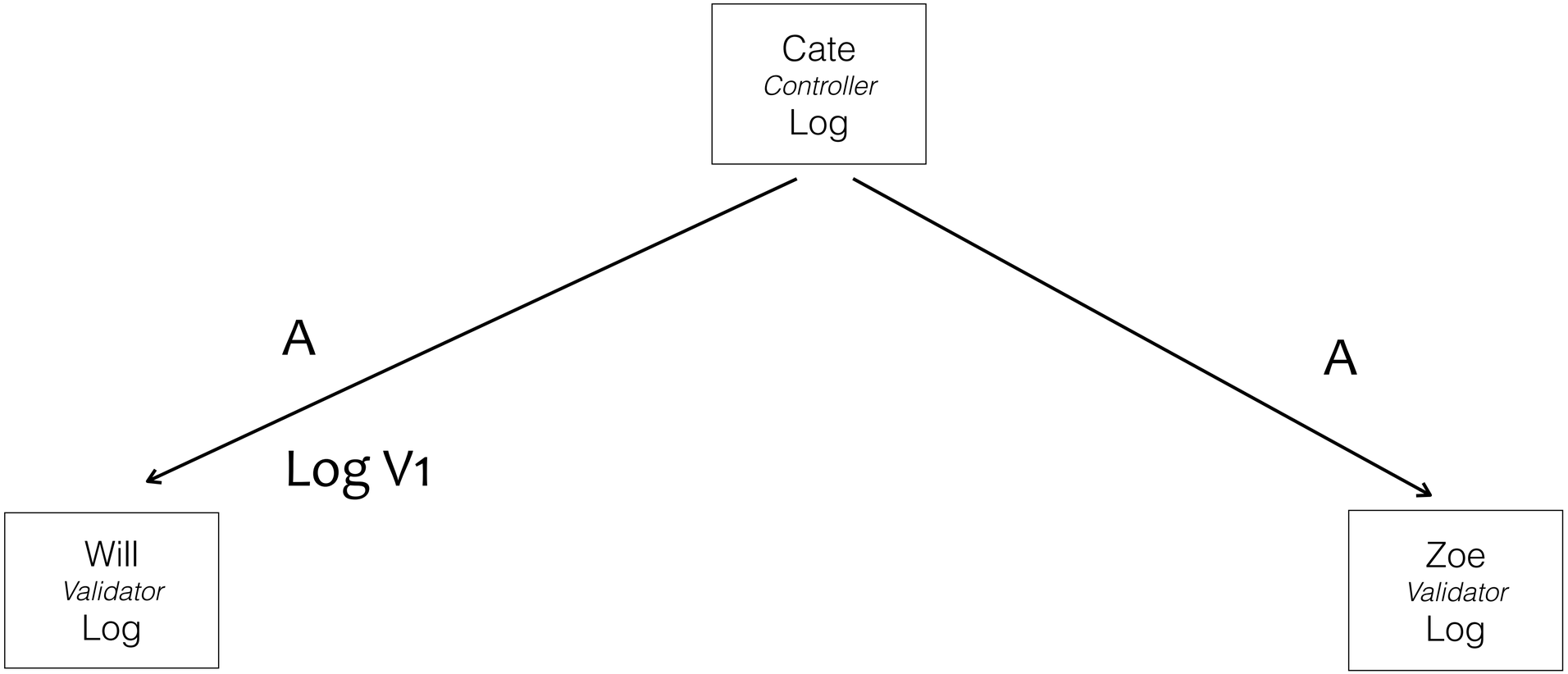

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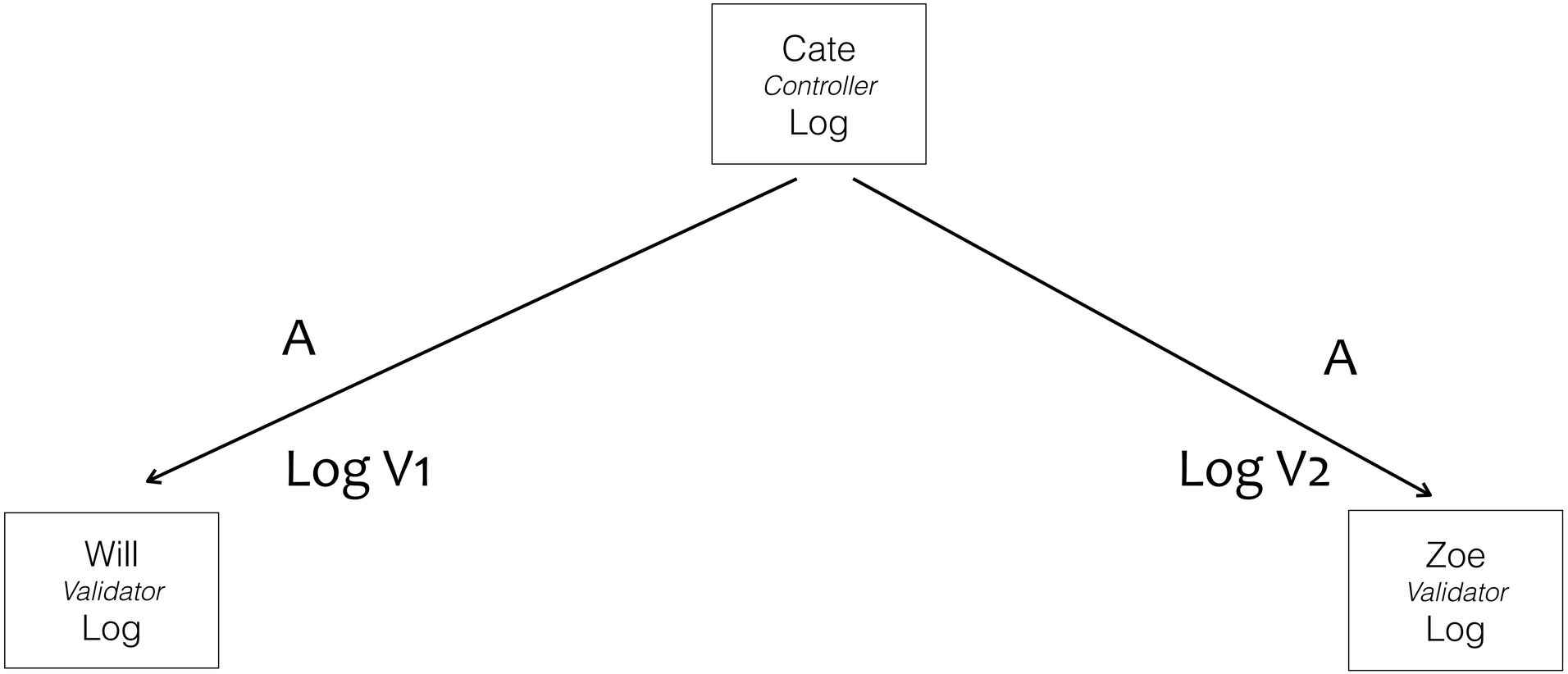

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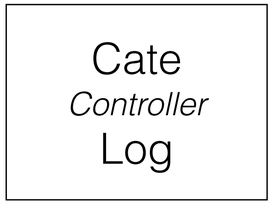

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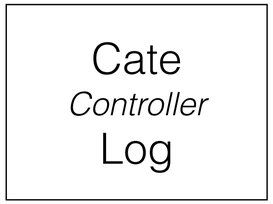

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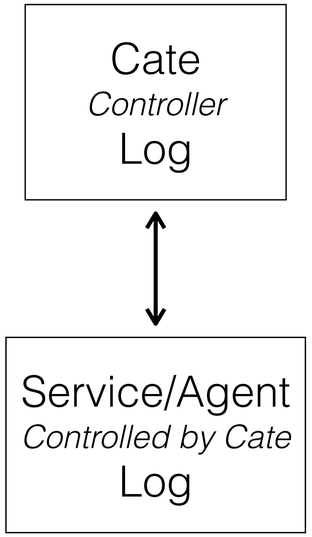

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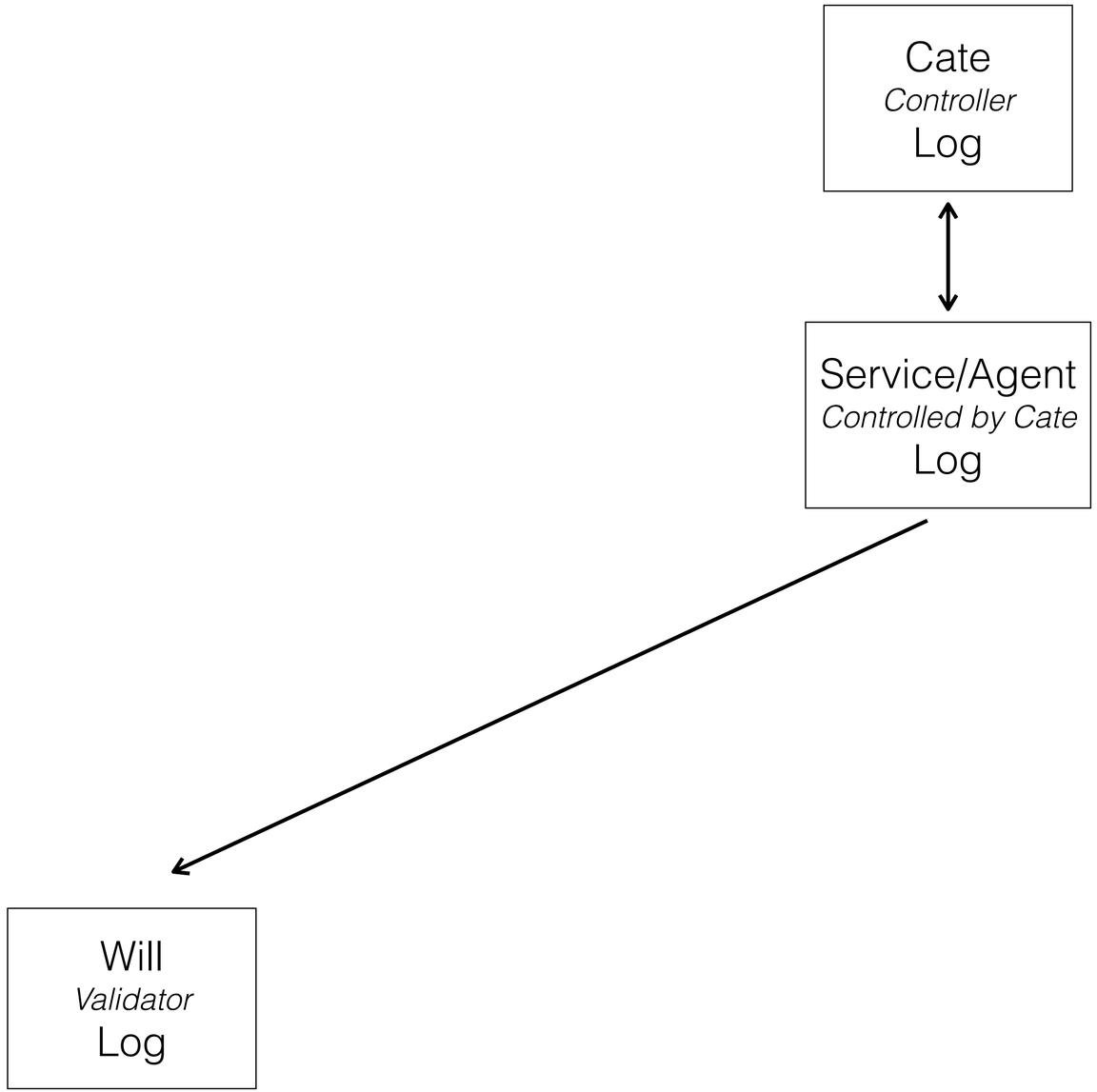

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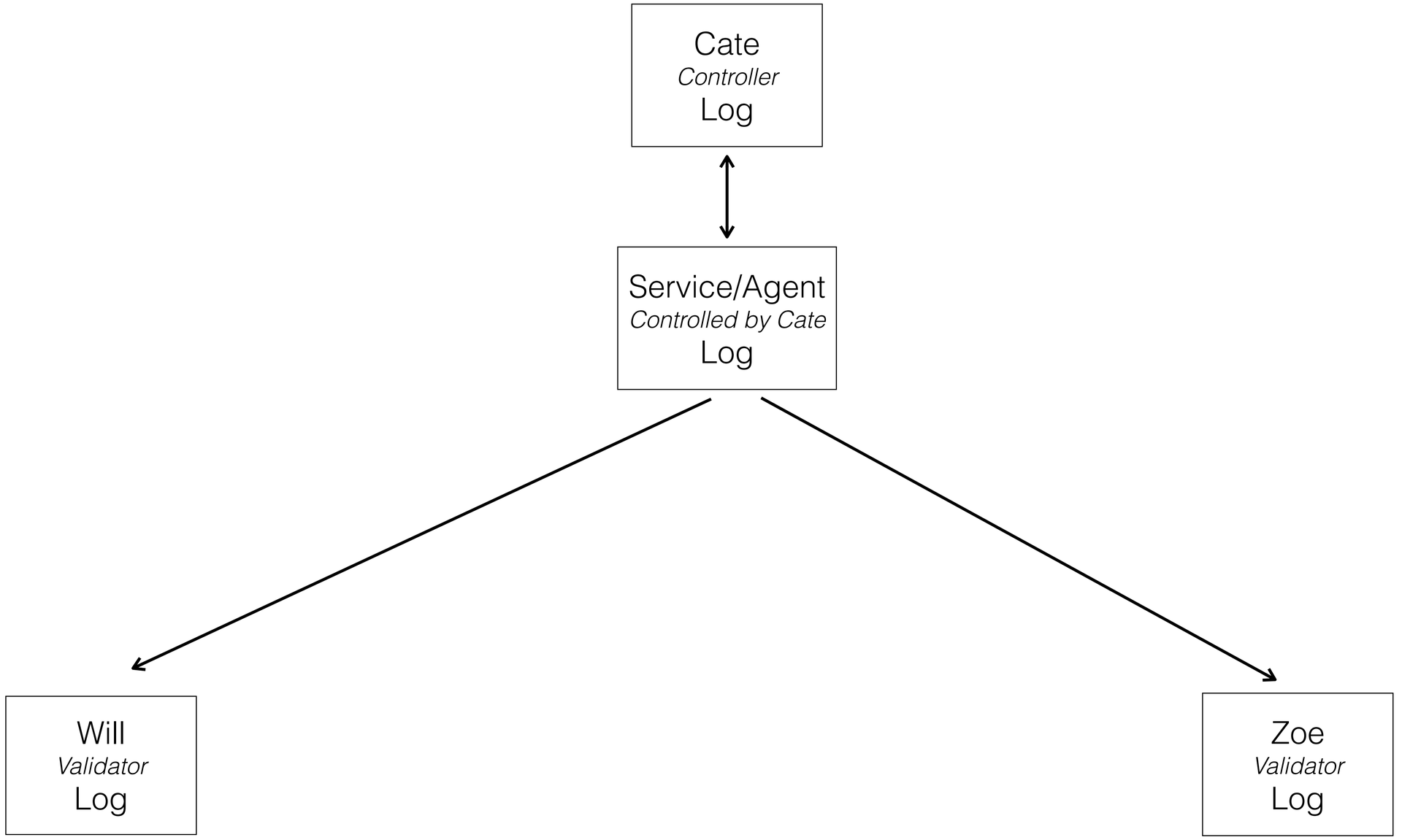

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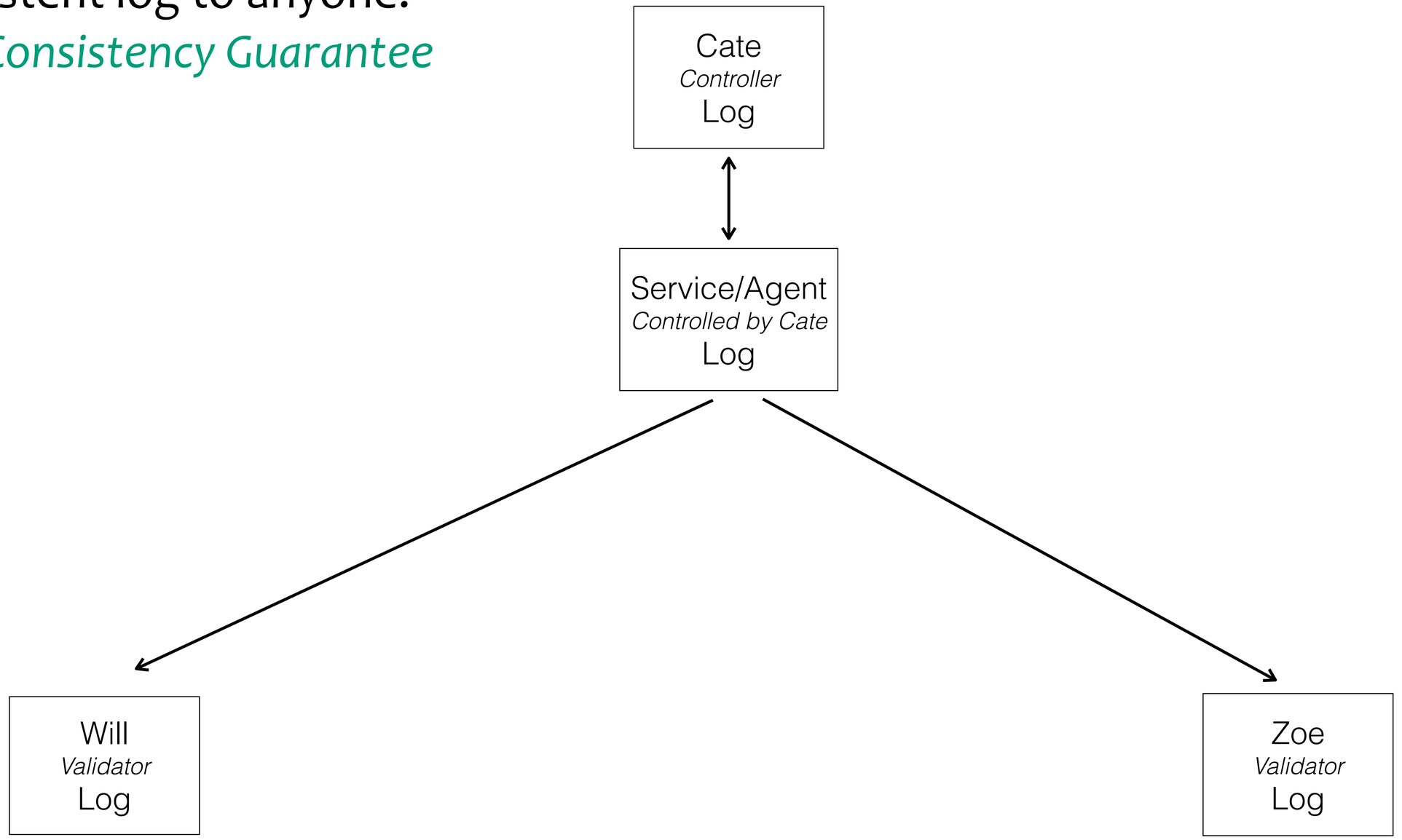

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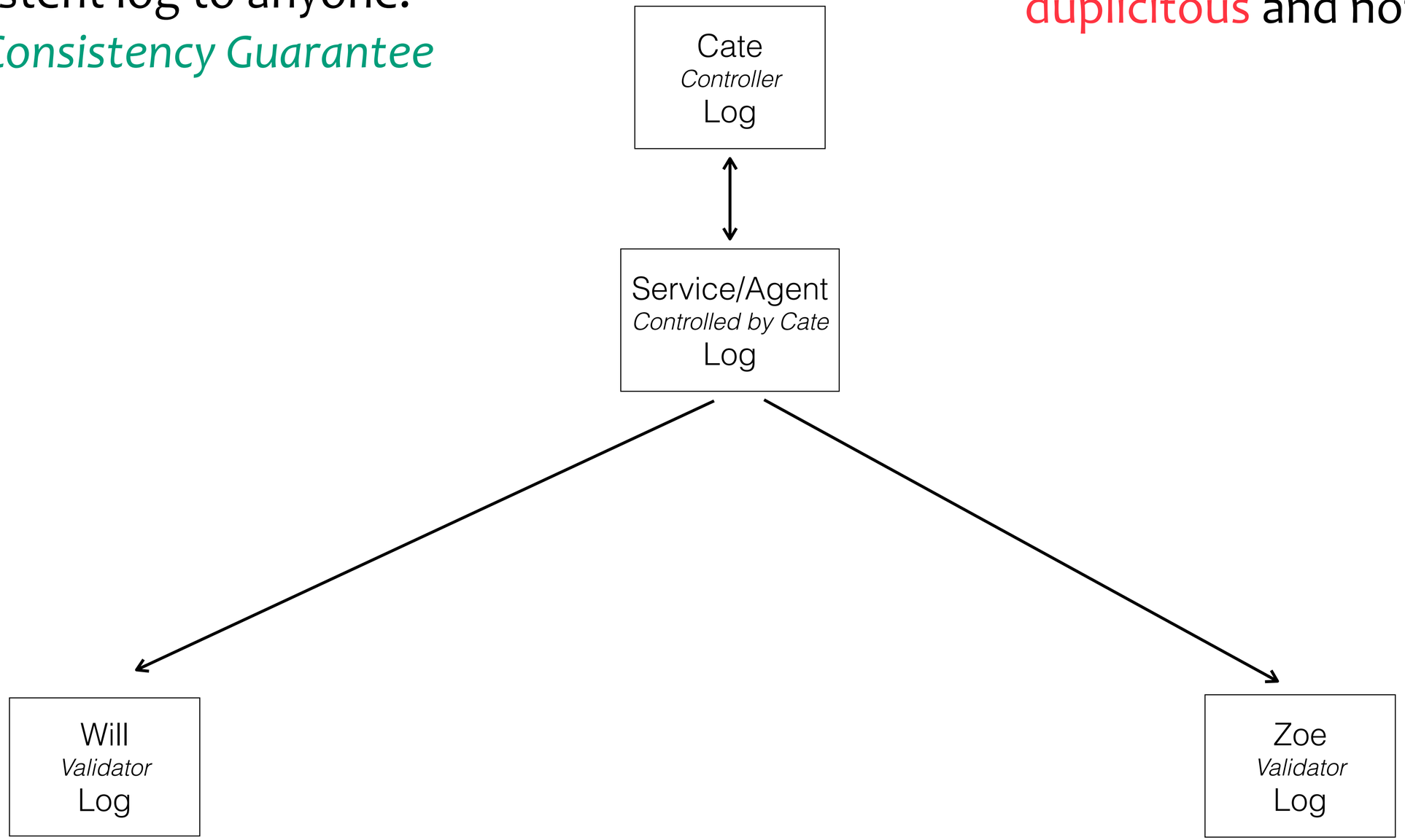

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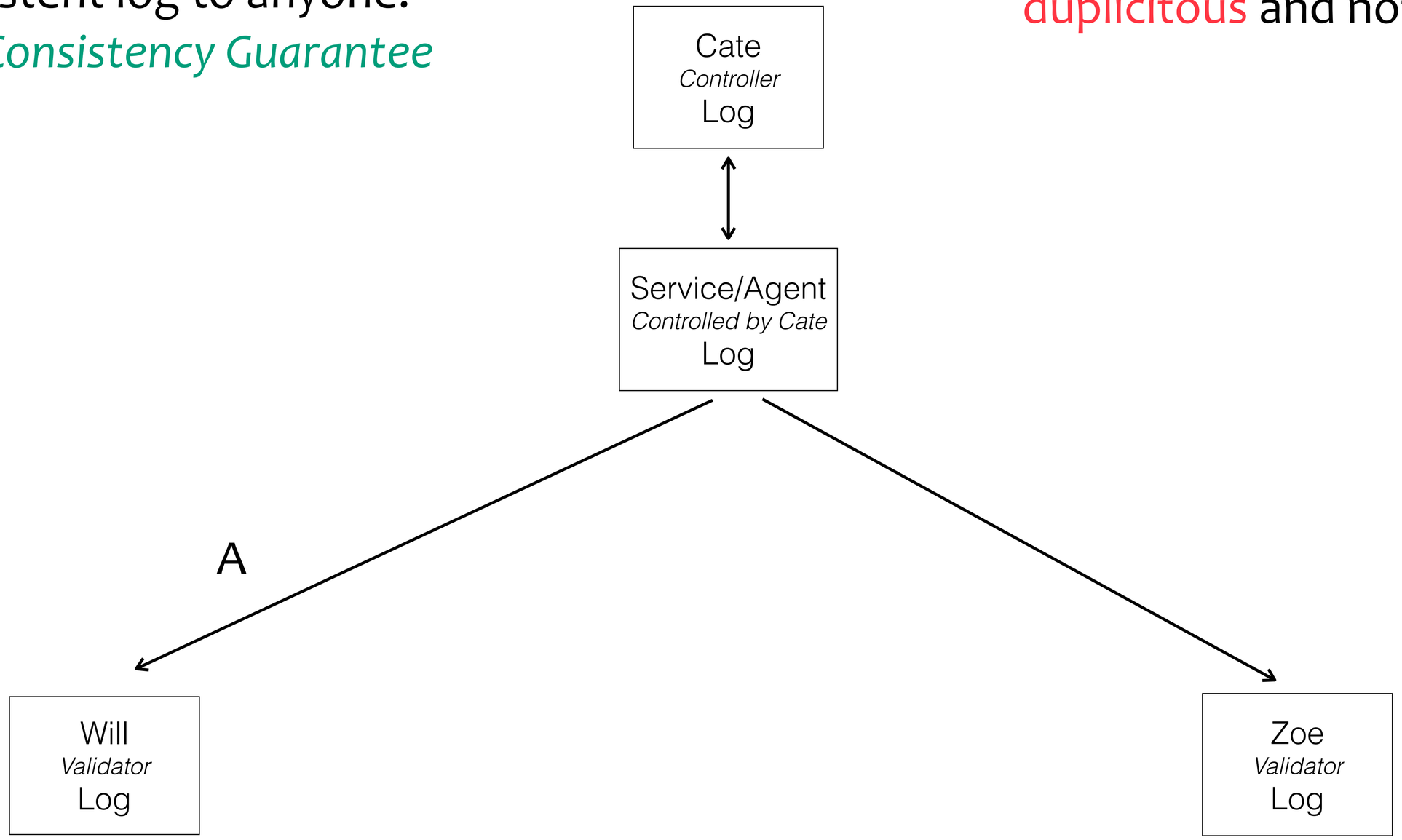

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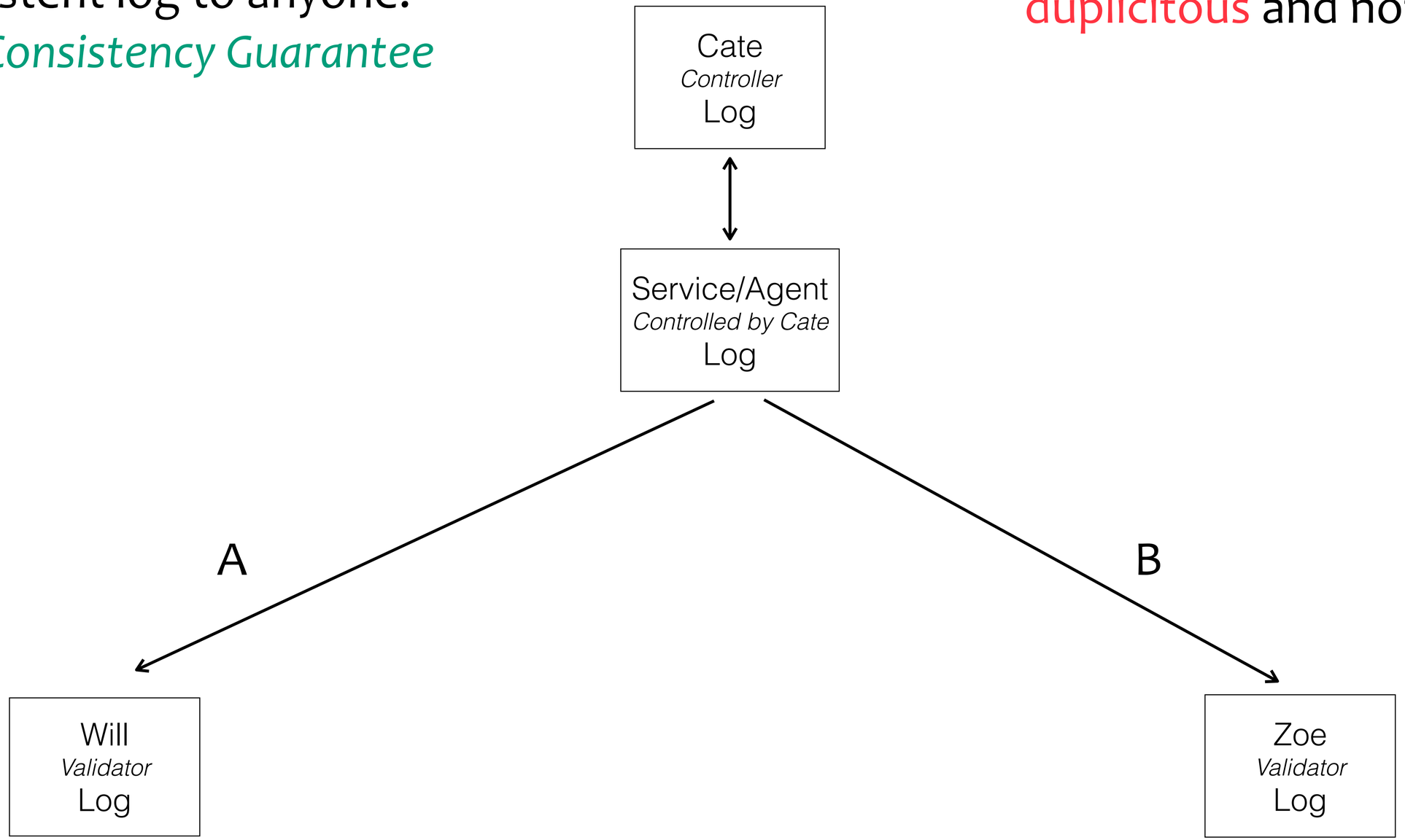

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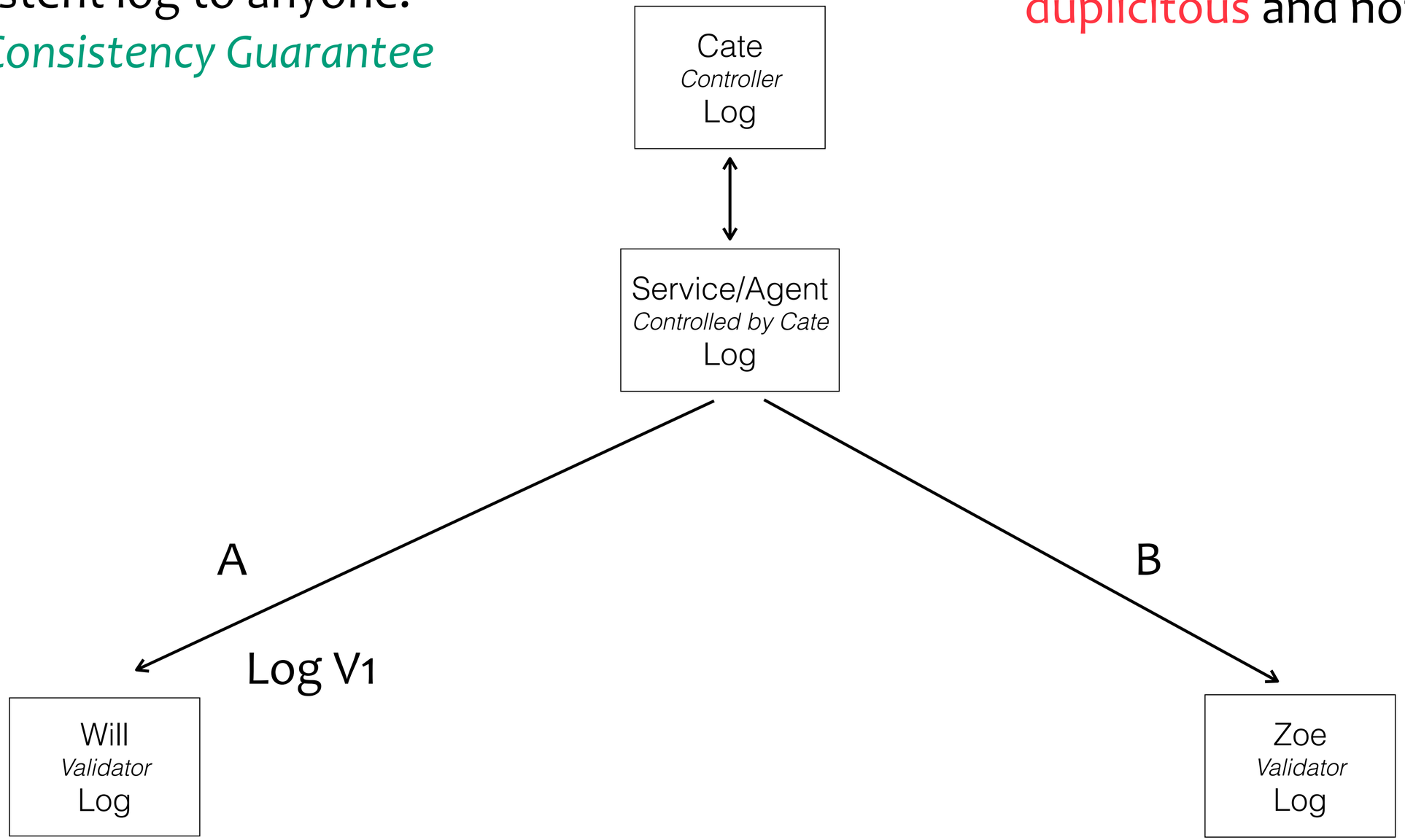

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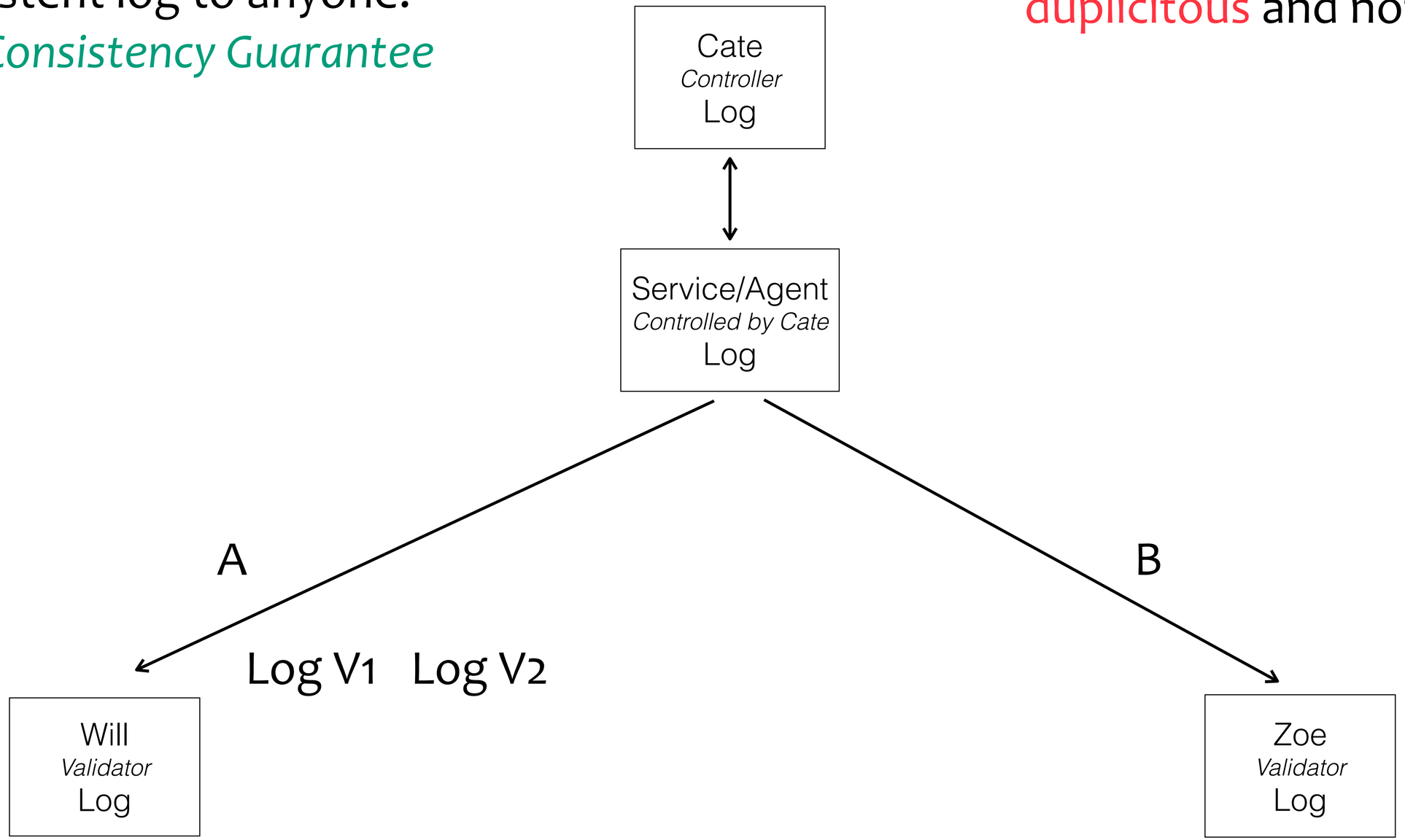

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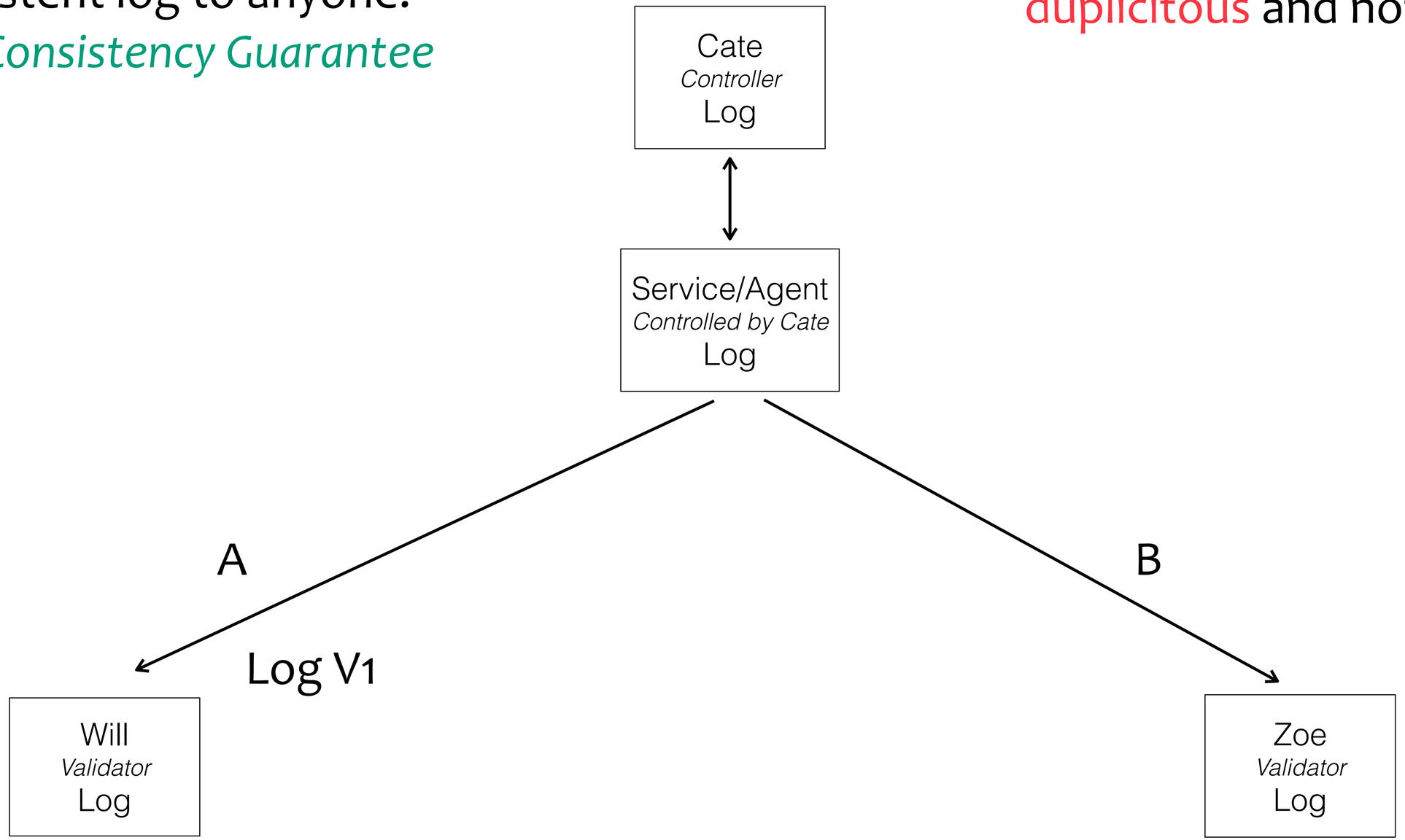

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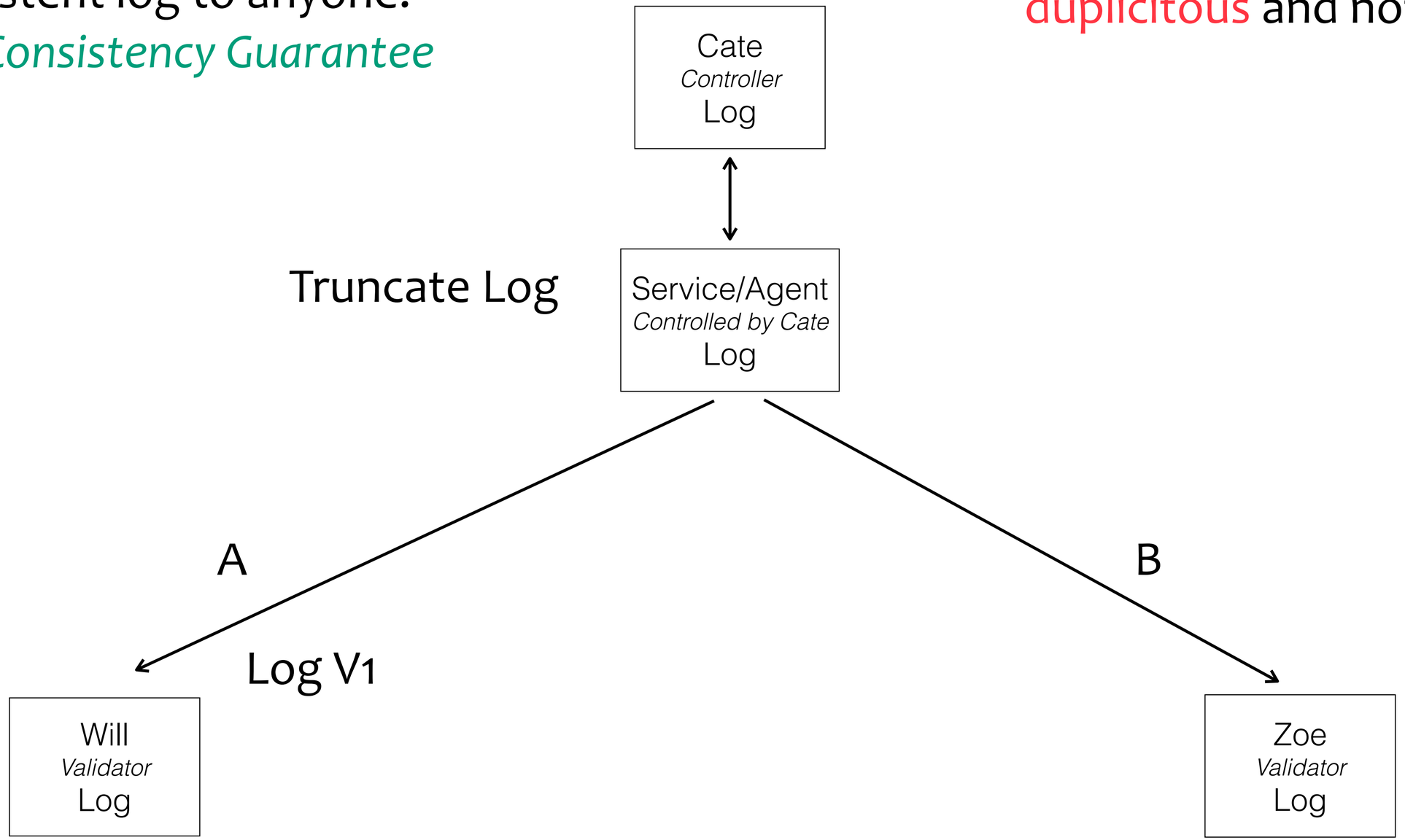

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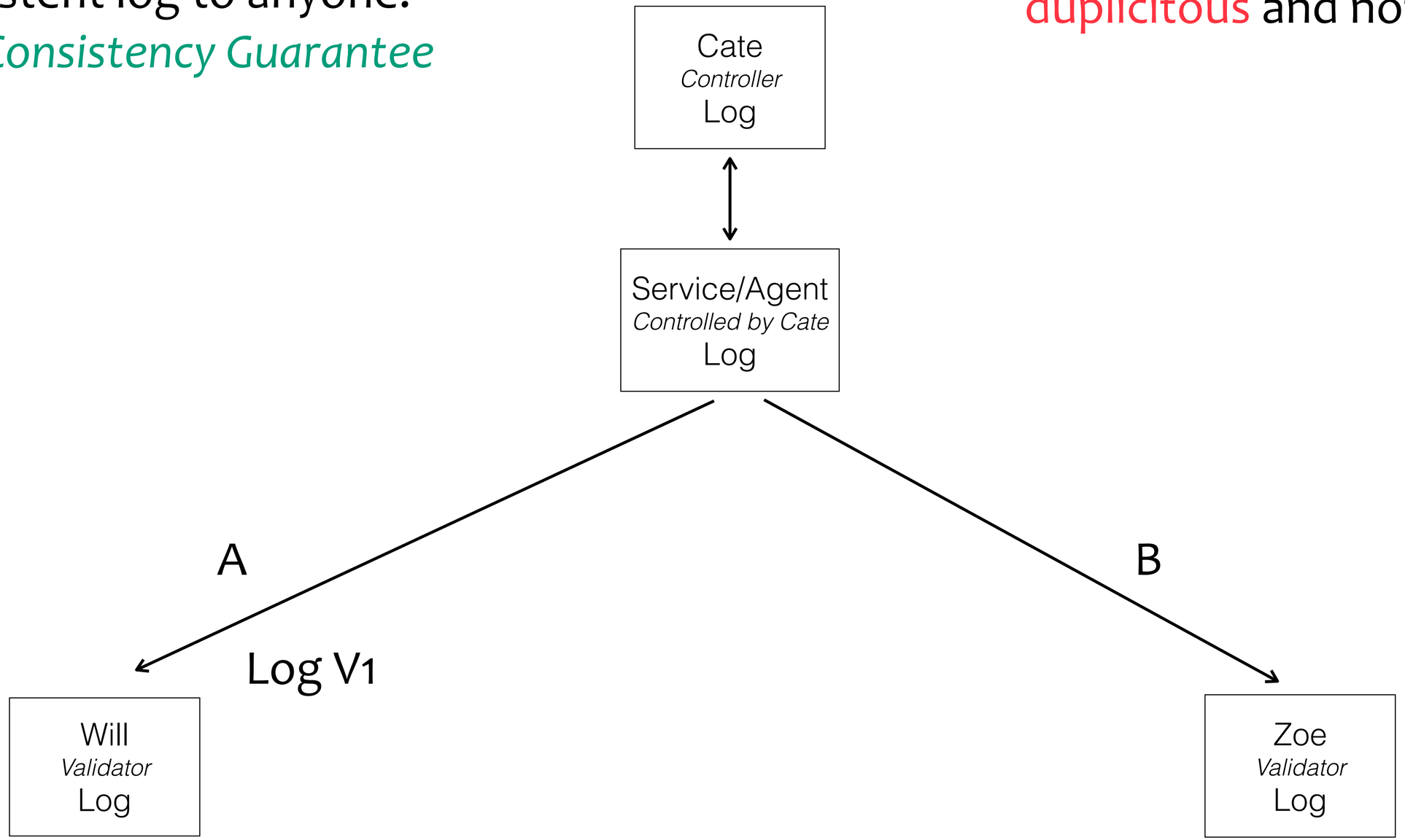

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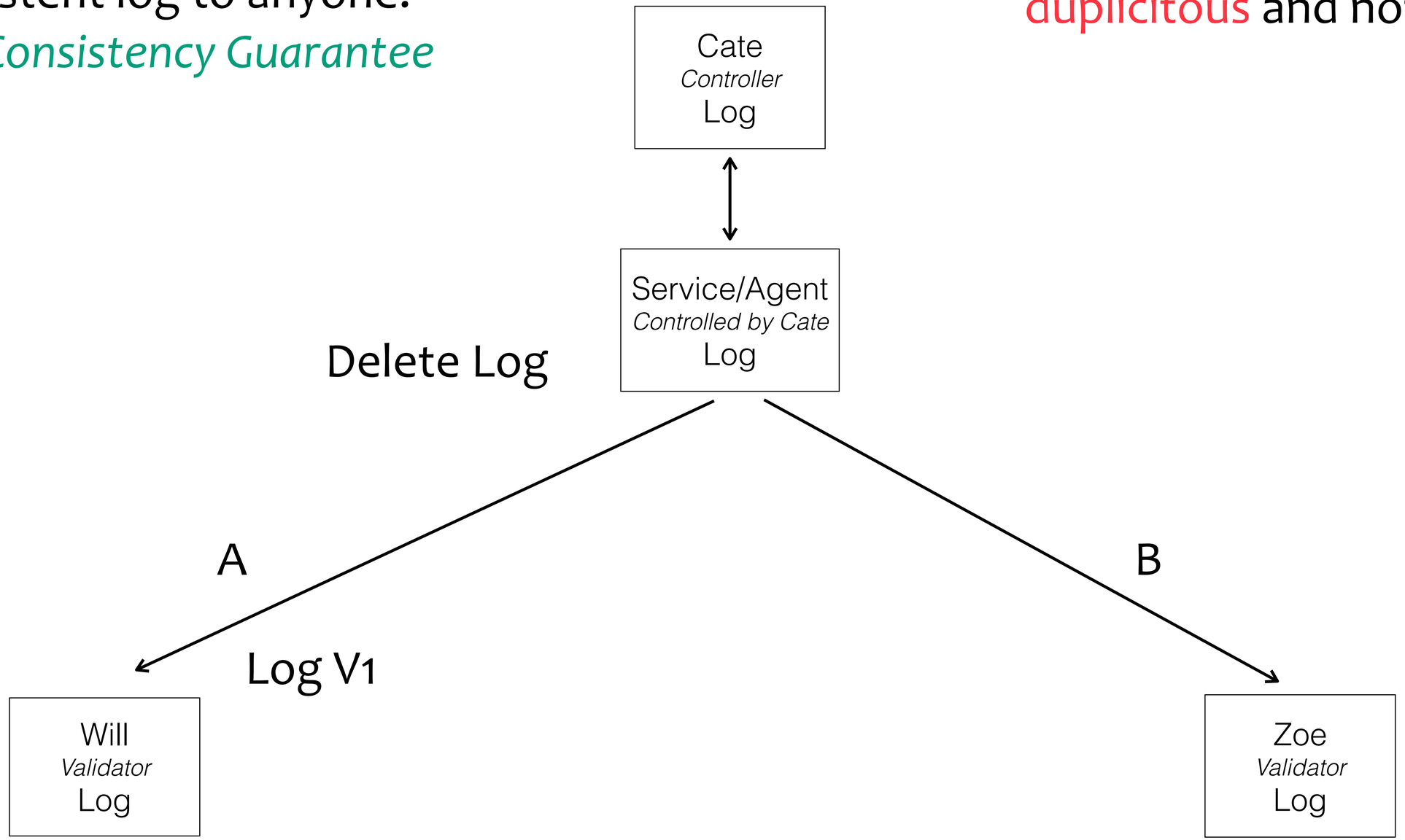

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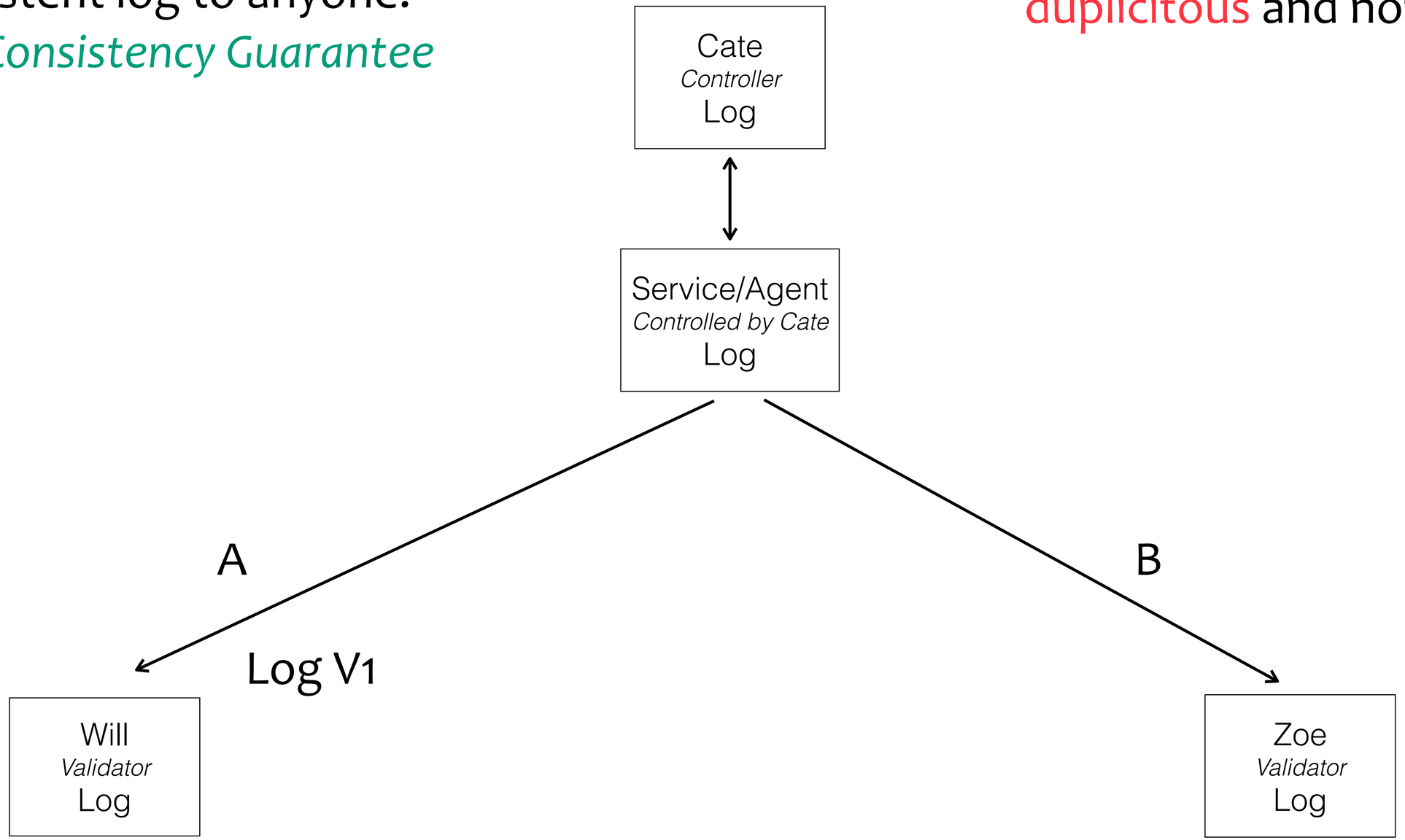

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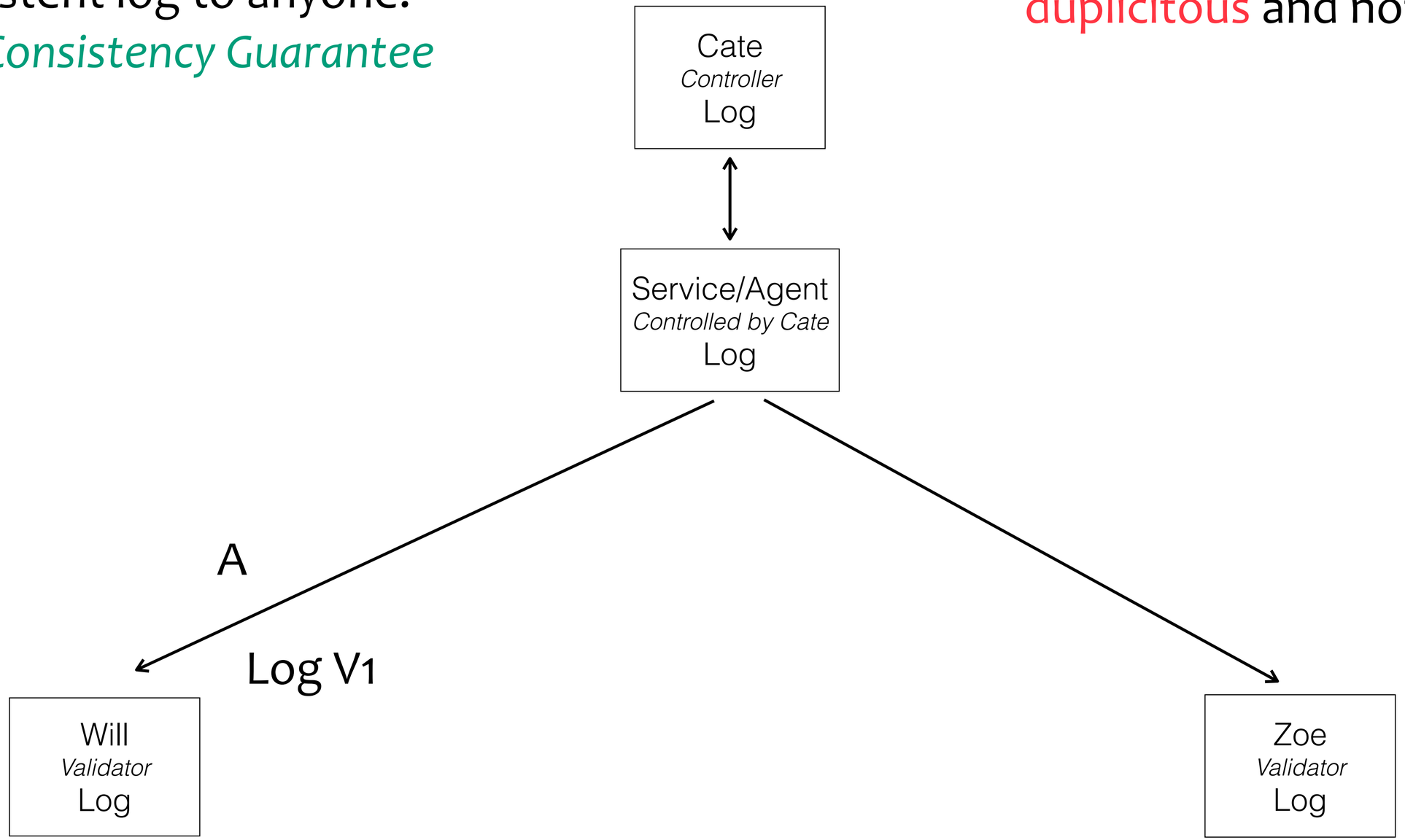

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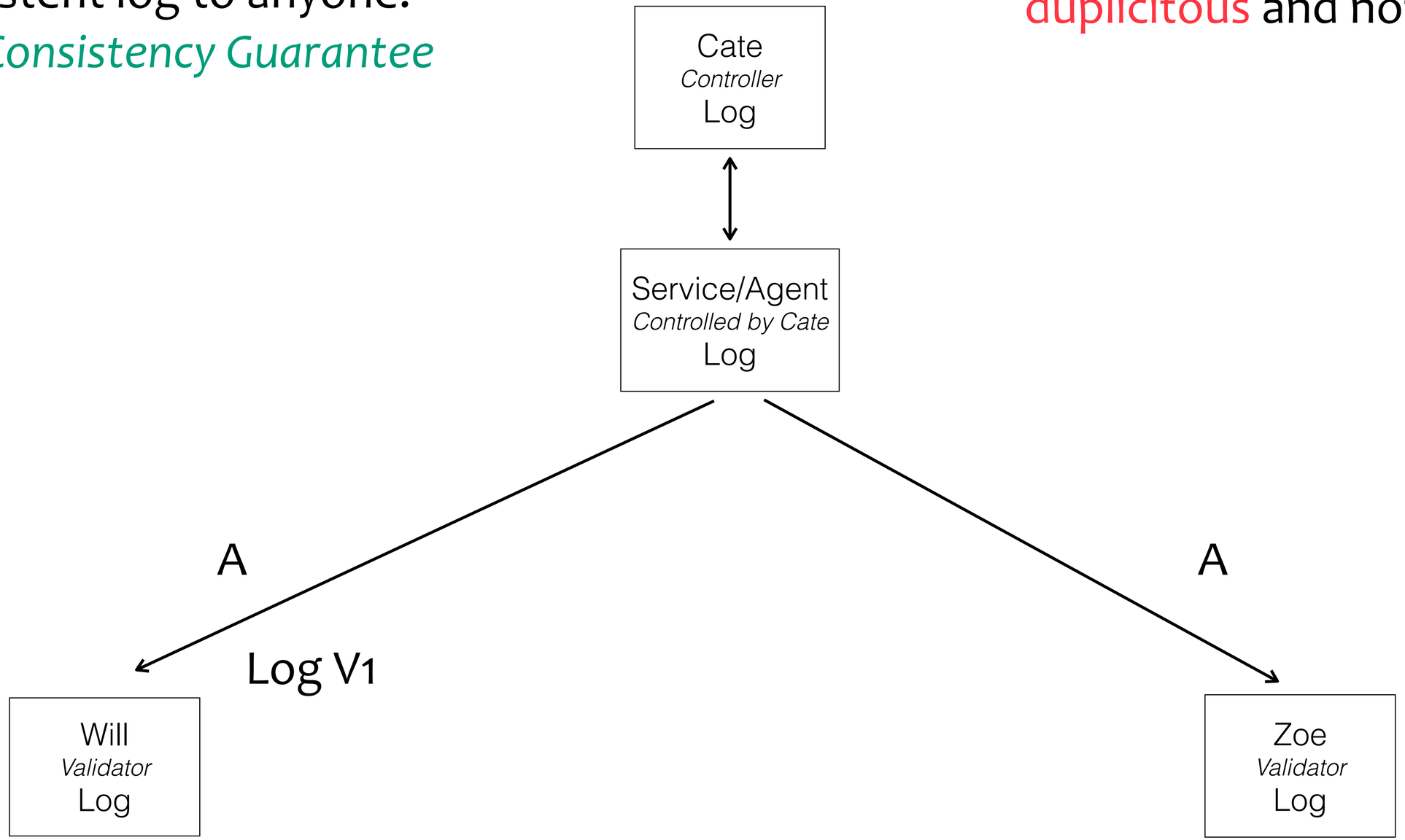

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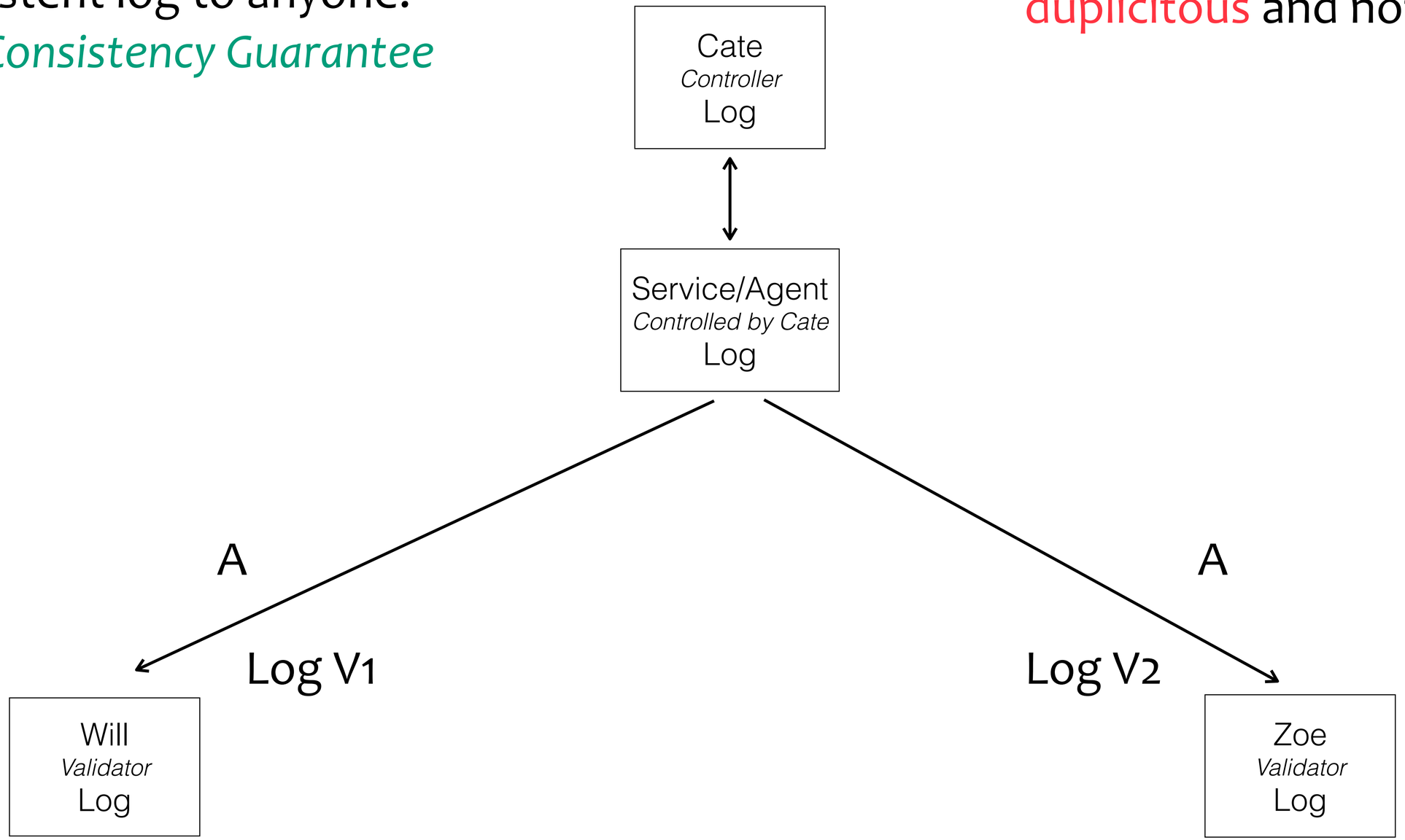

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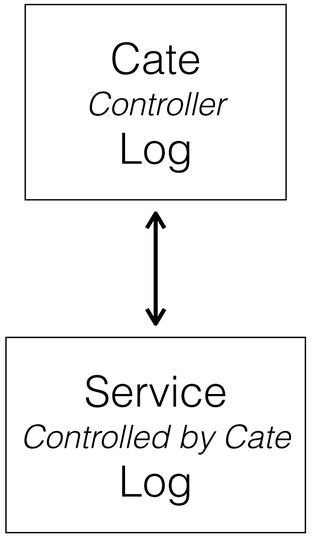

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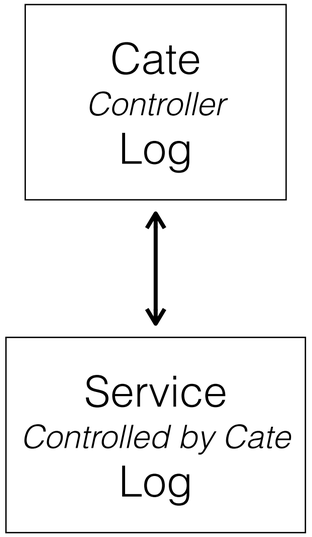

global consistent, highly available, and public (one-to-any) interactions

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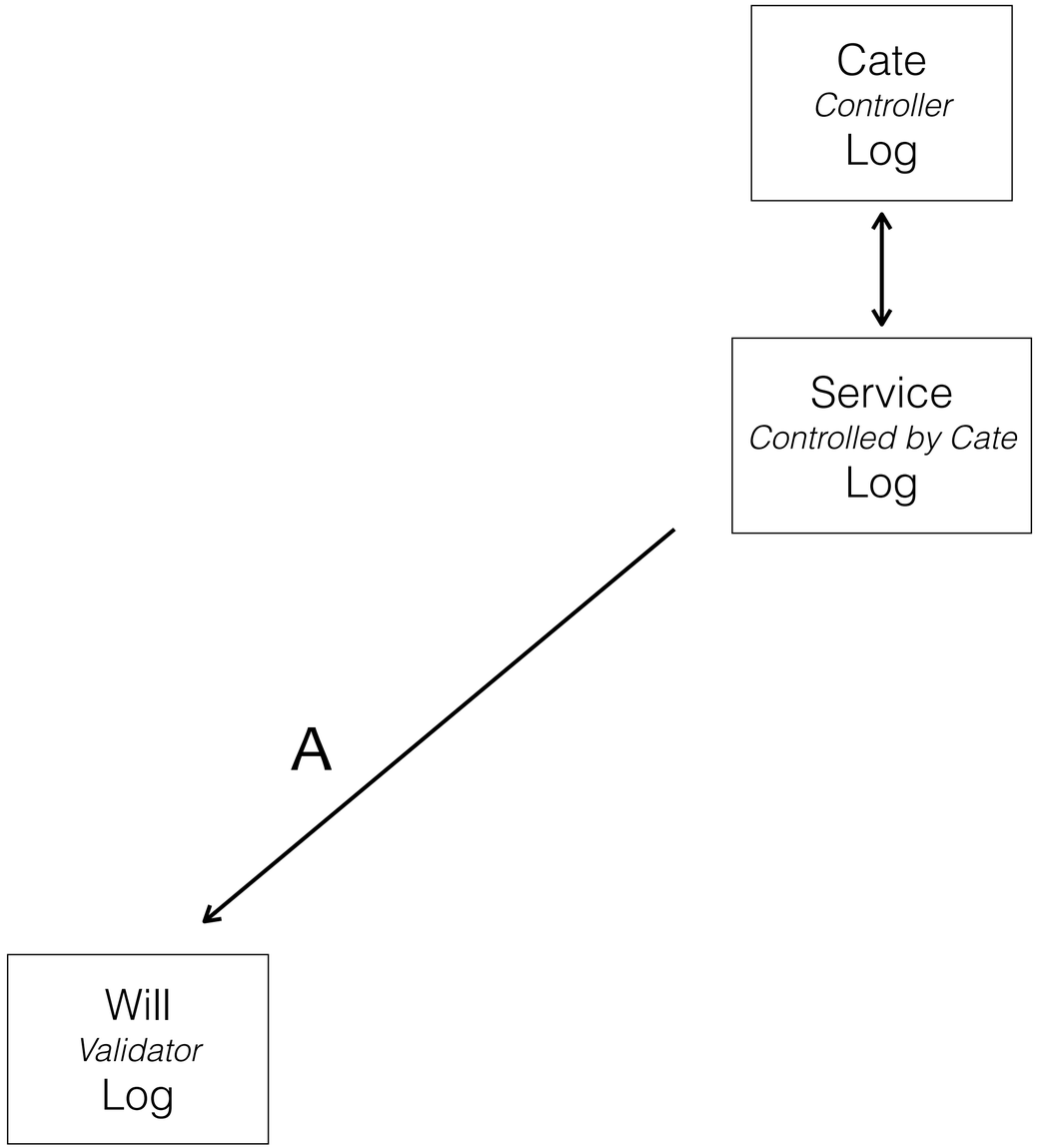

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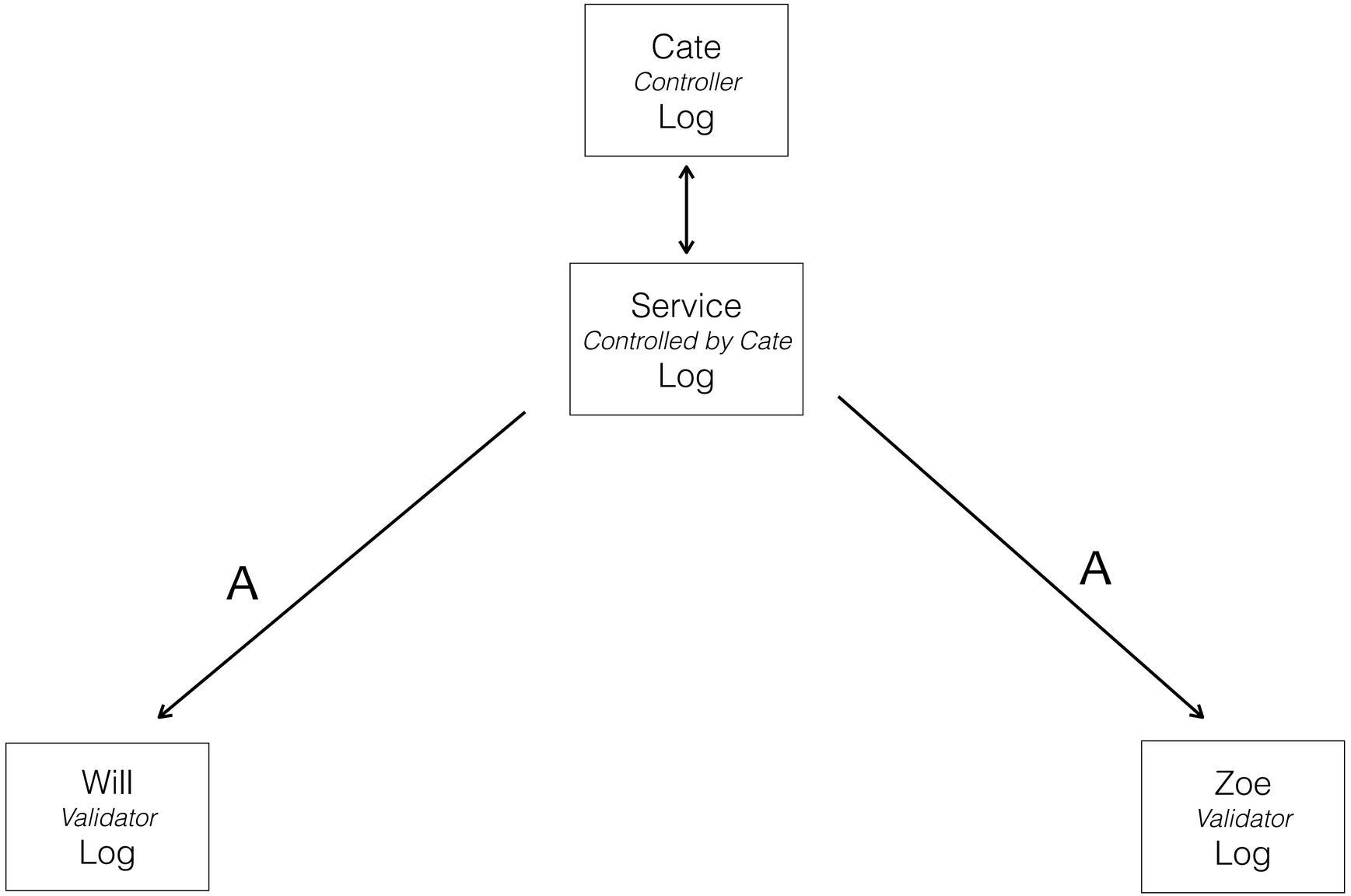

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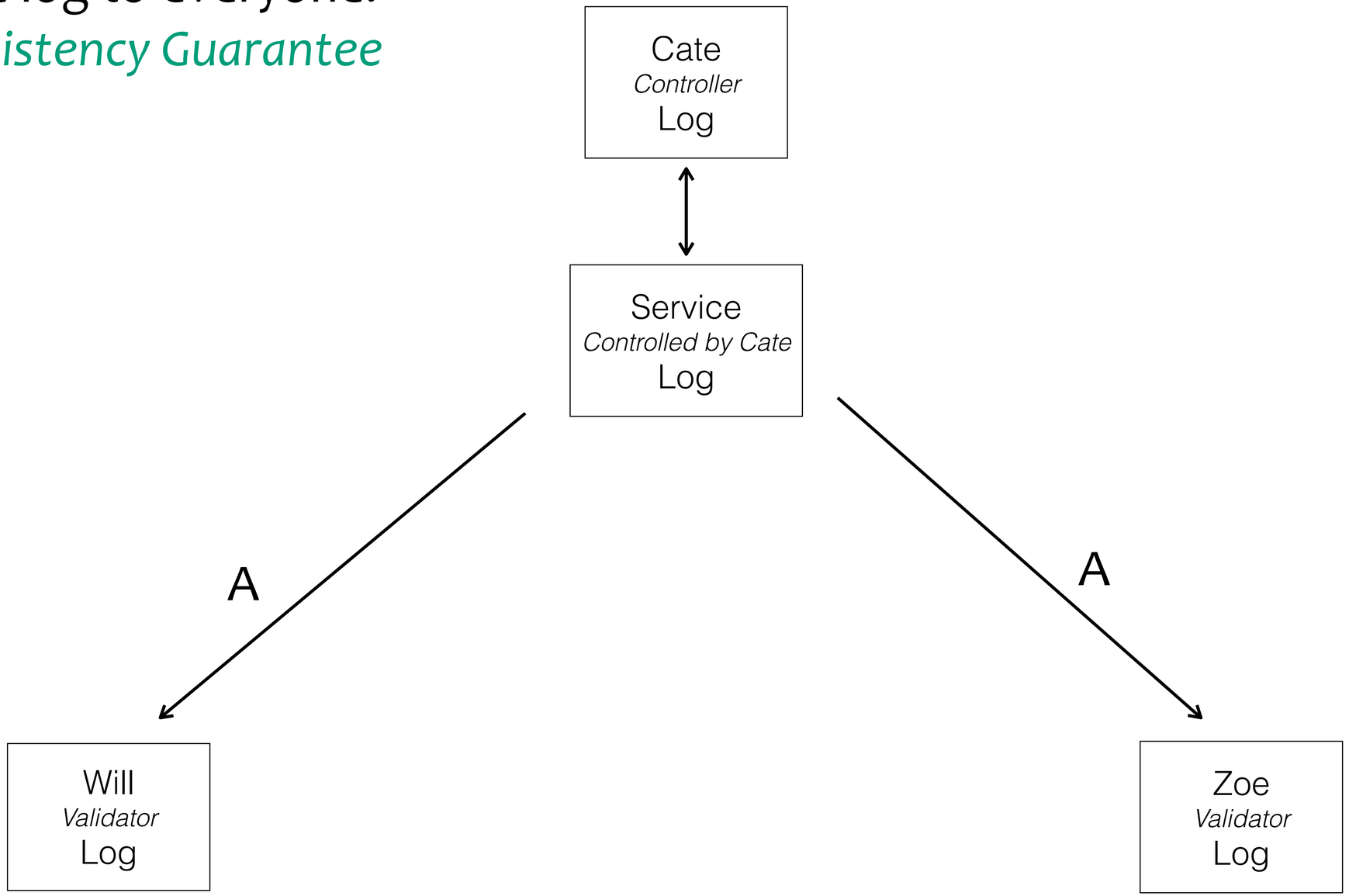

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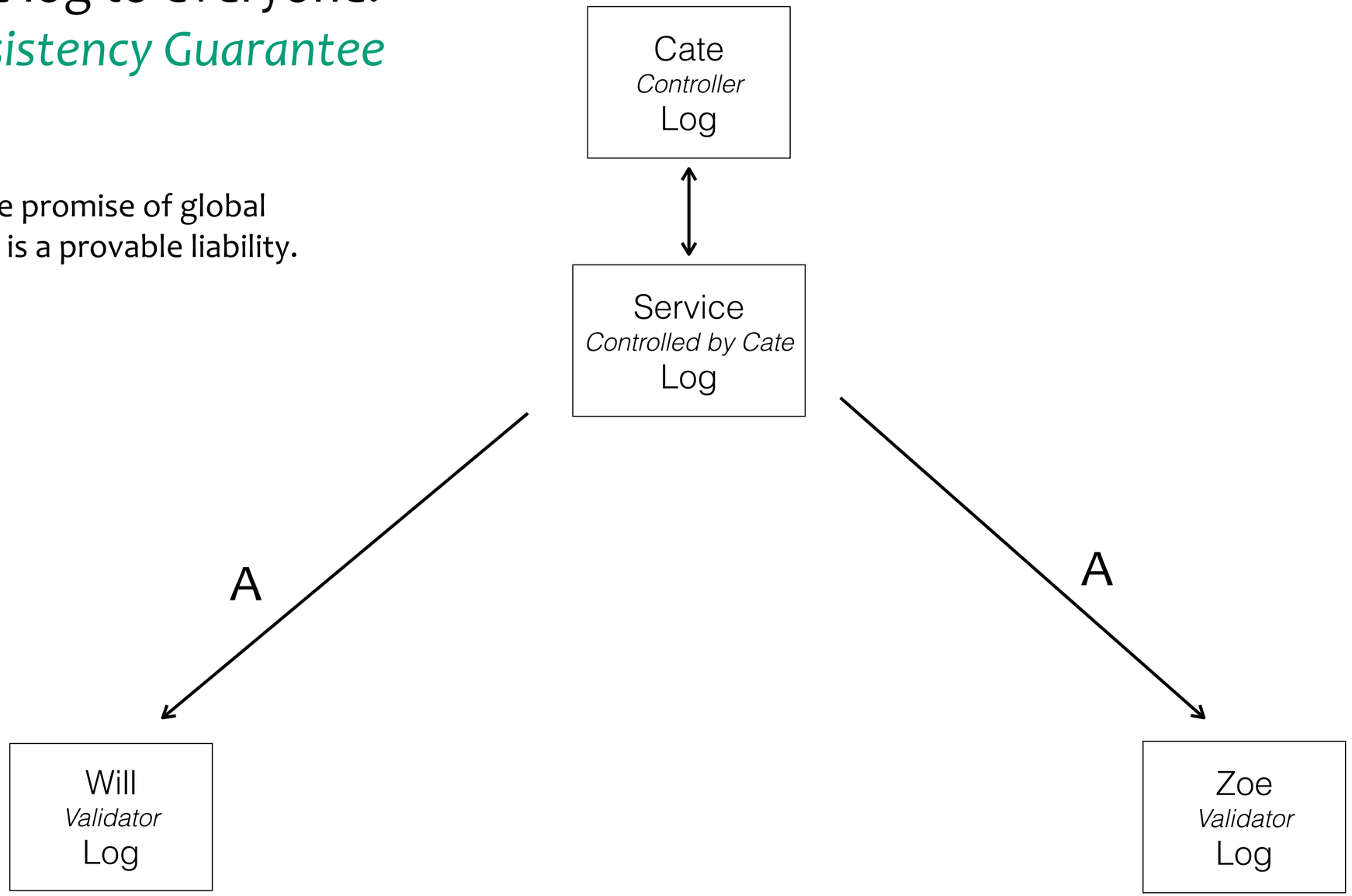

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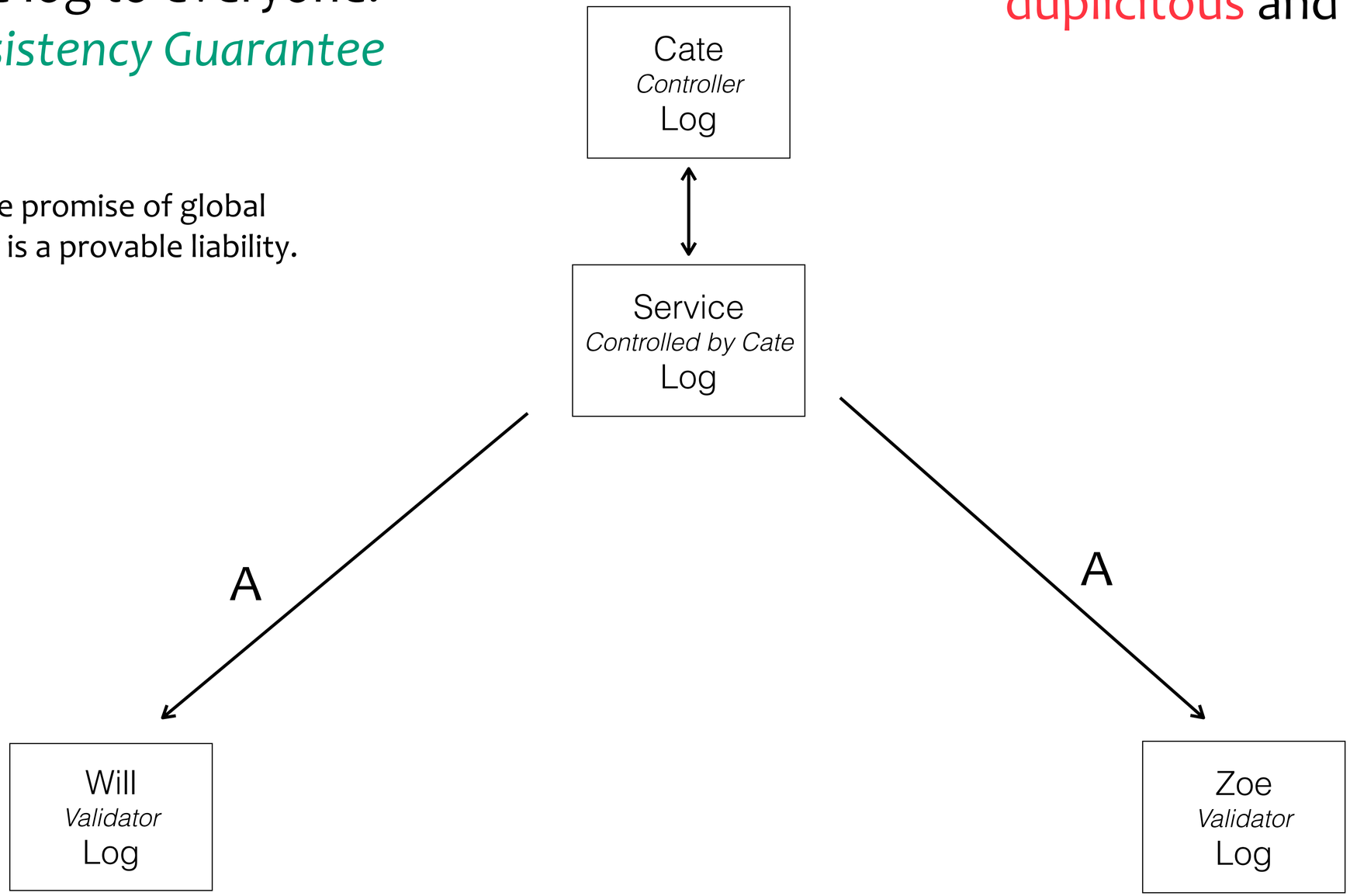

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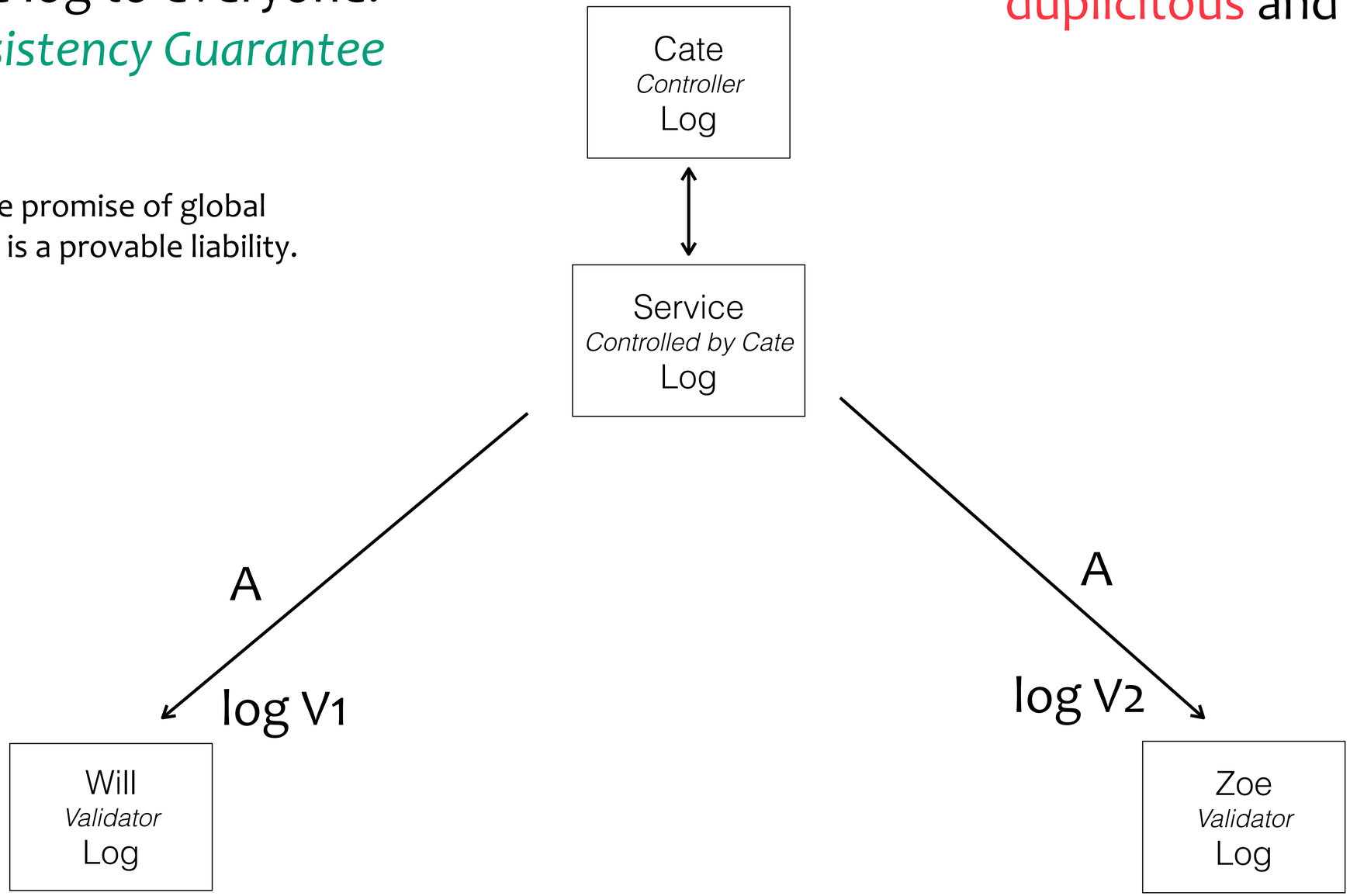

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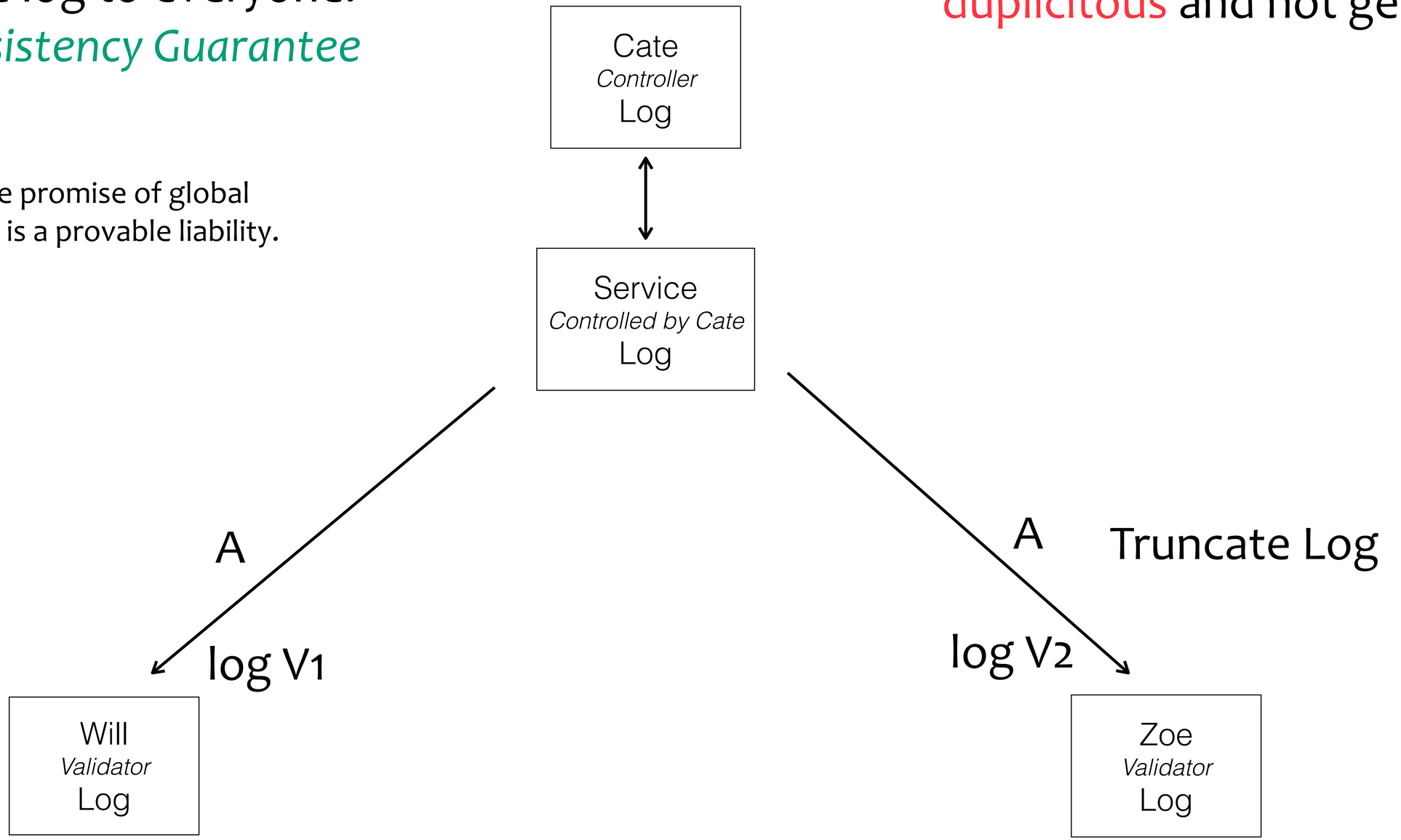

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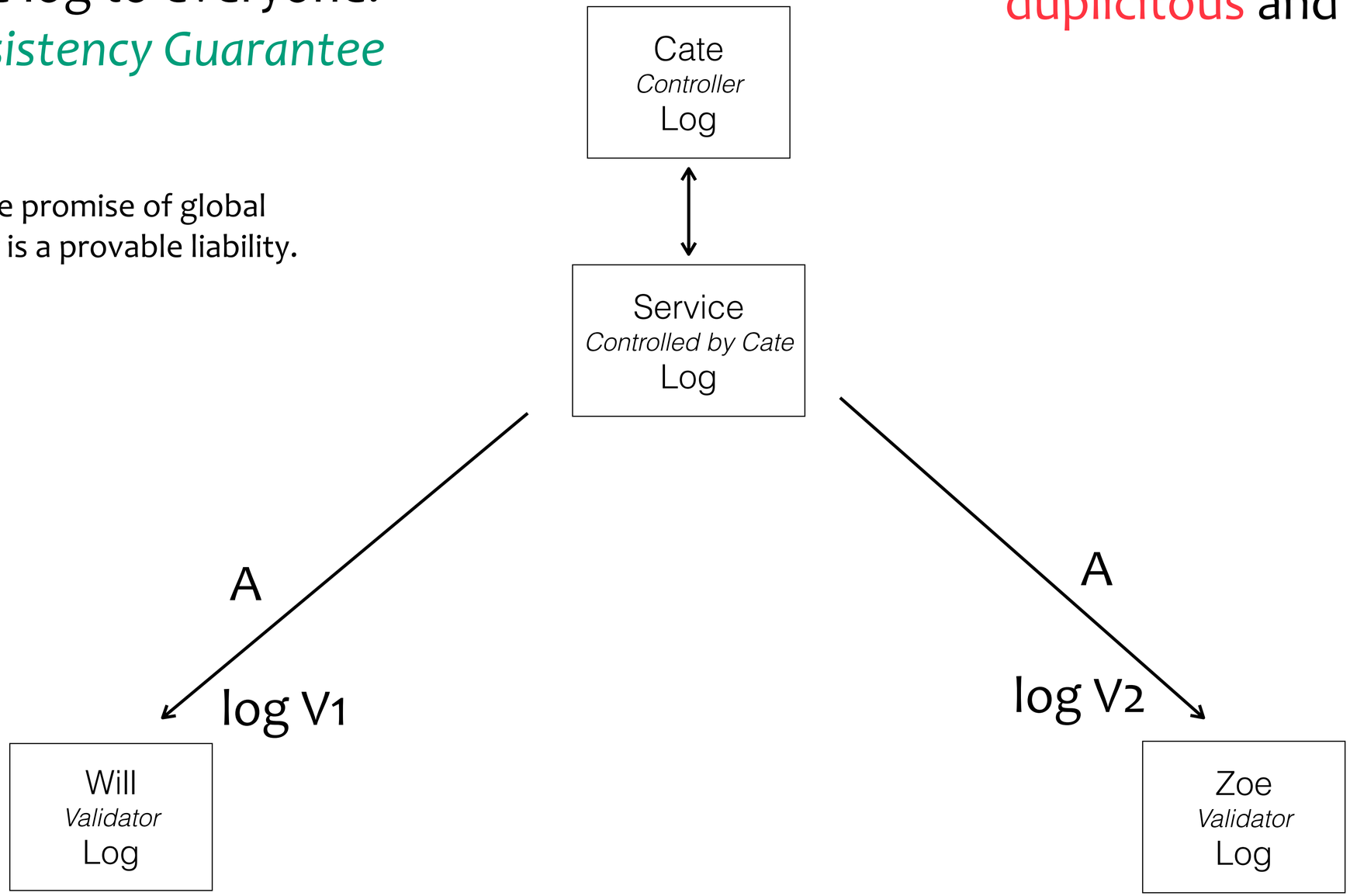

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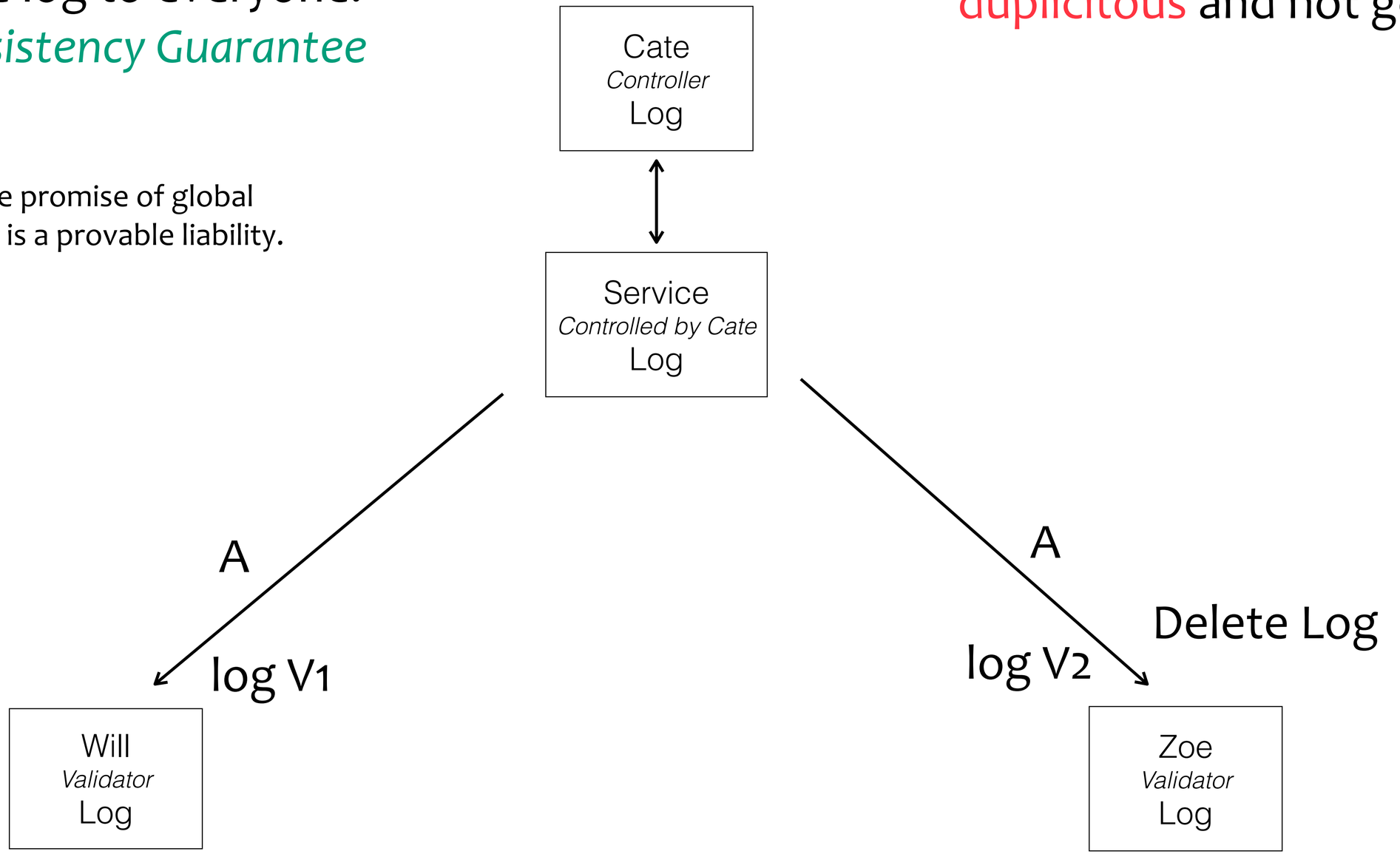

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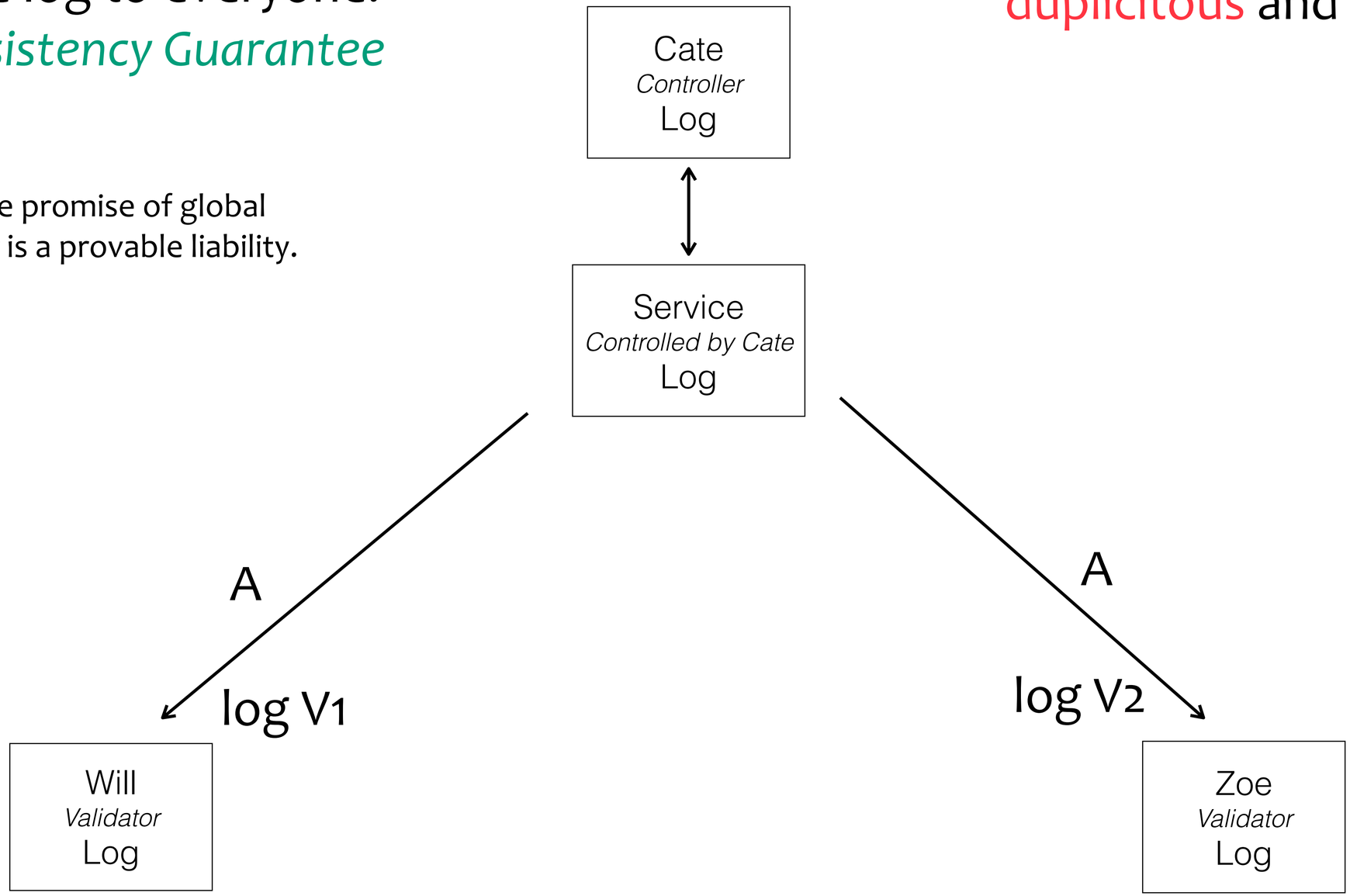

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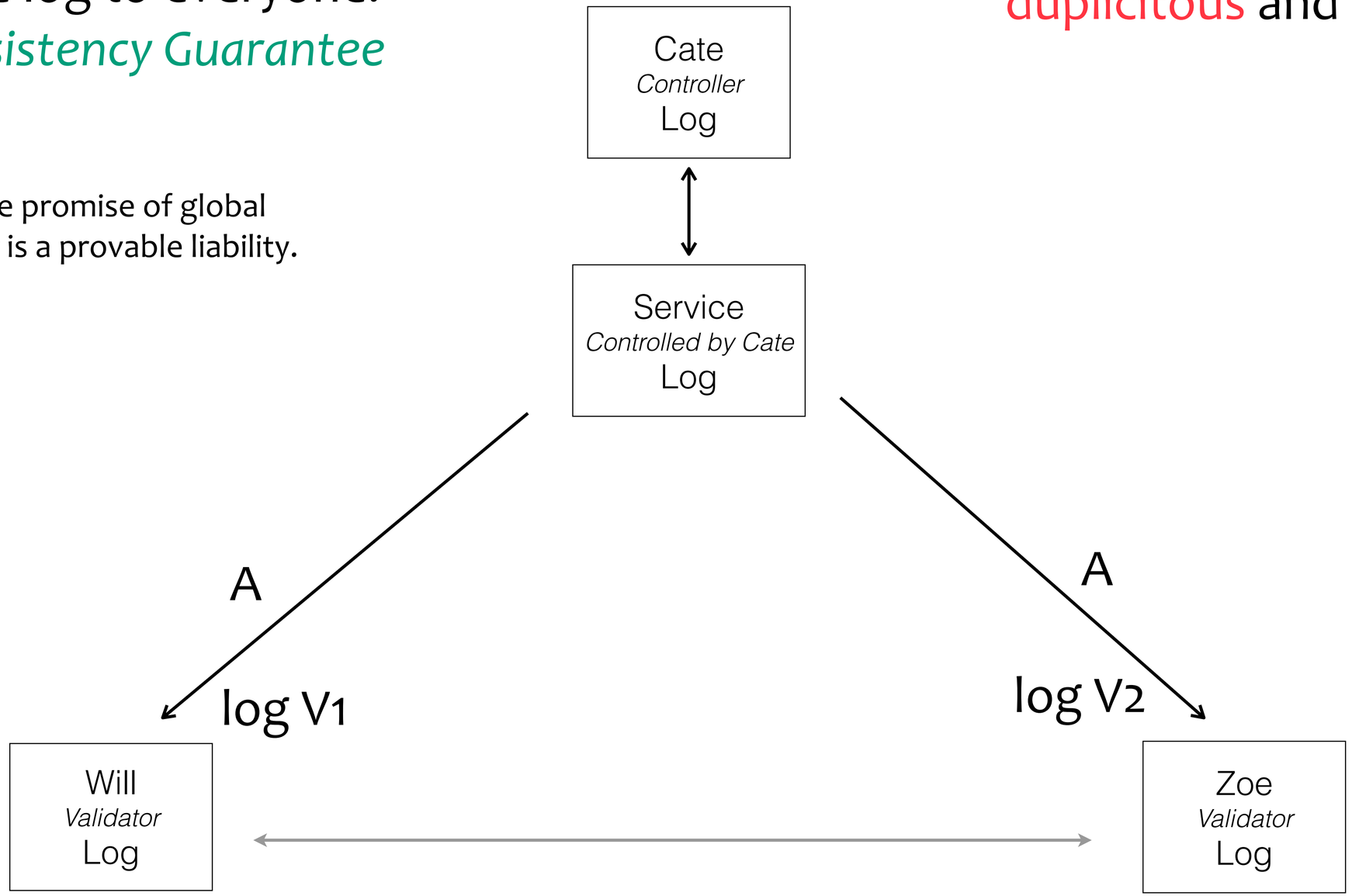

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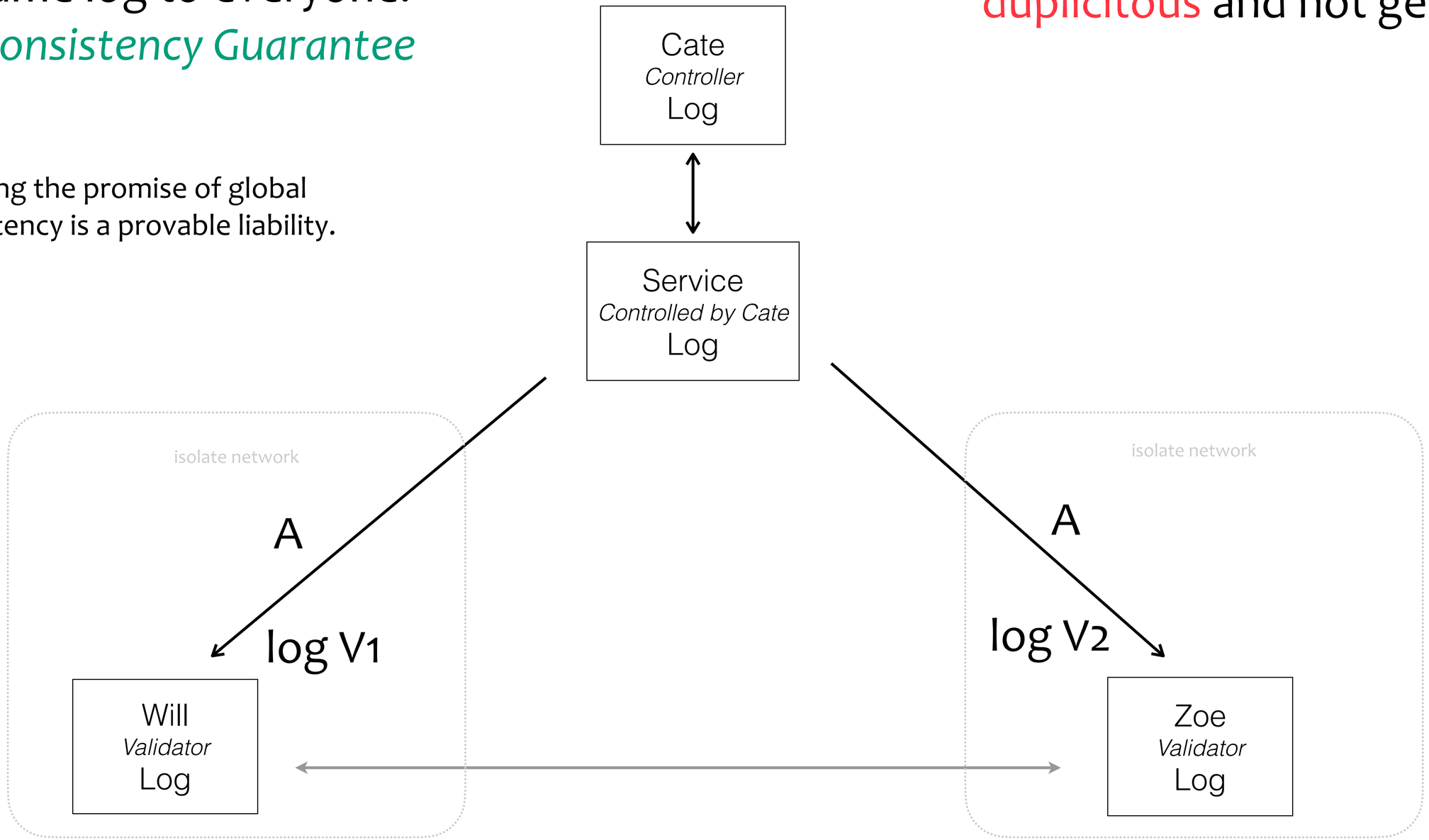

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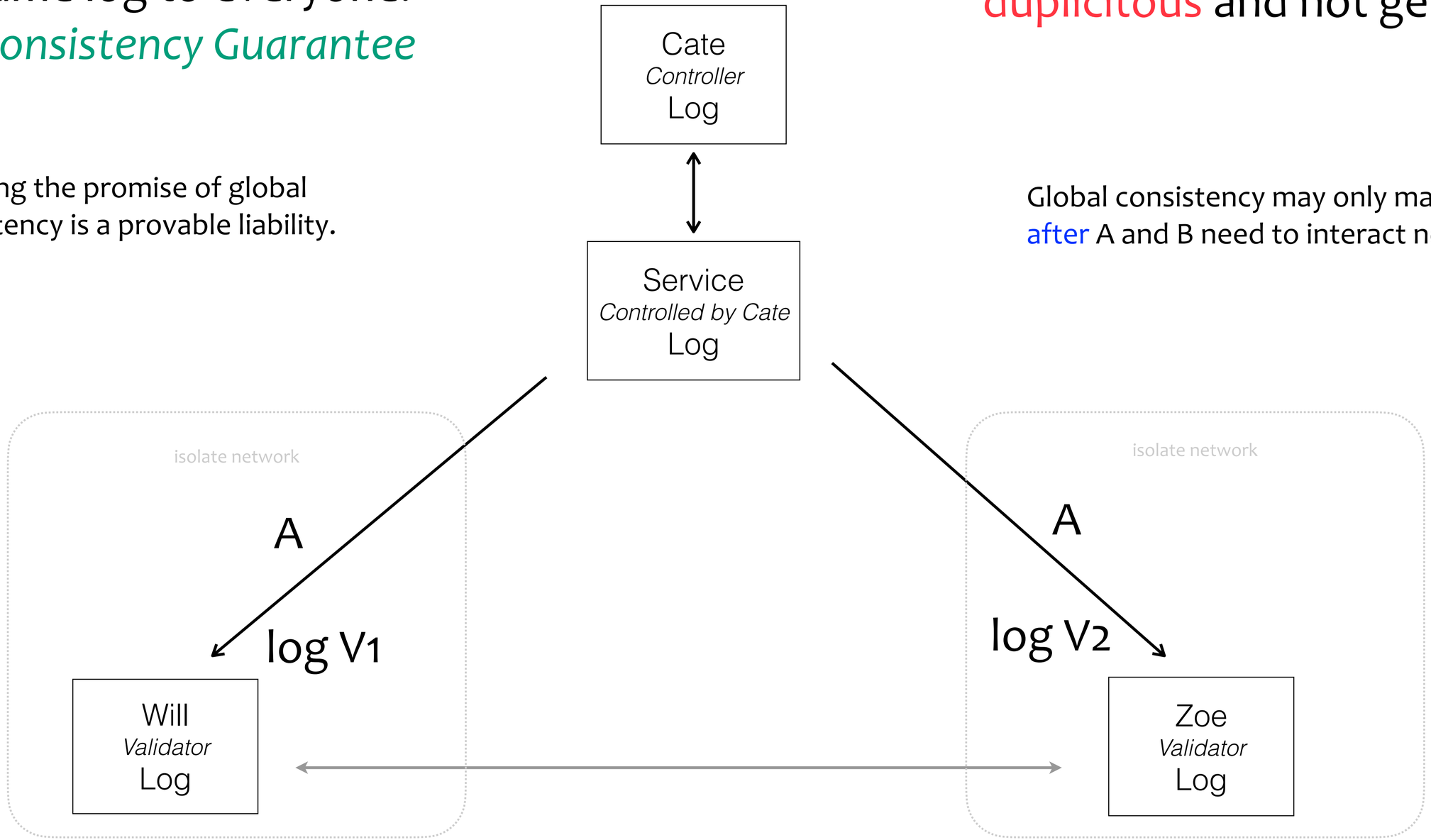

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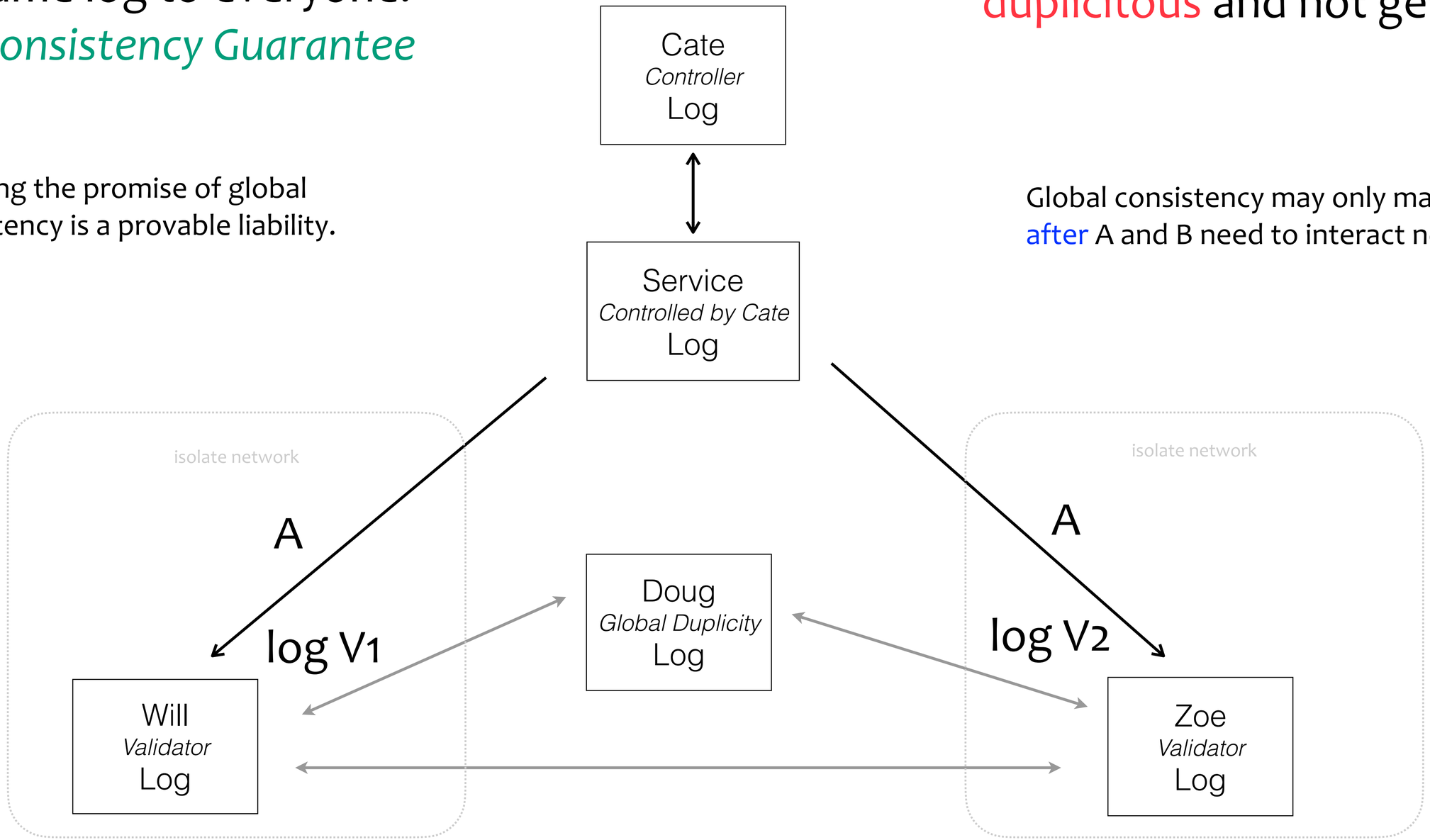

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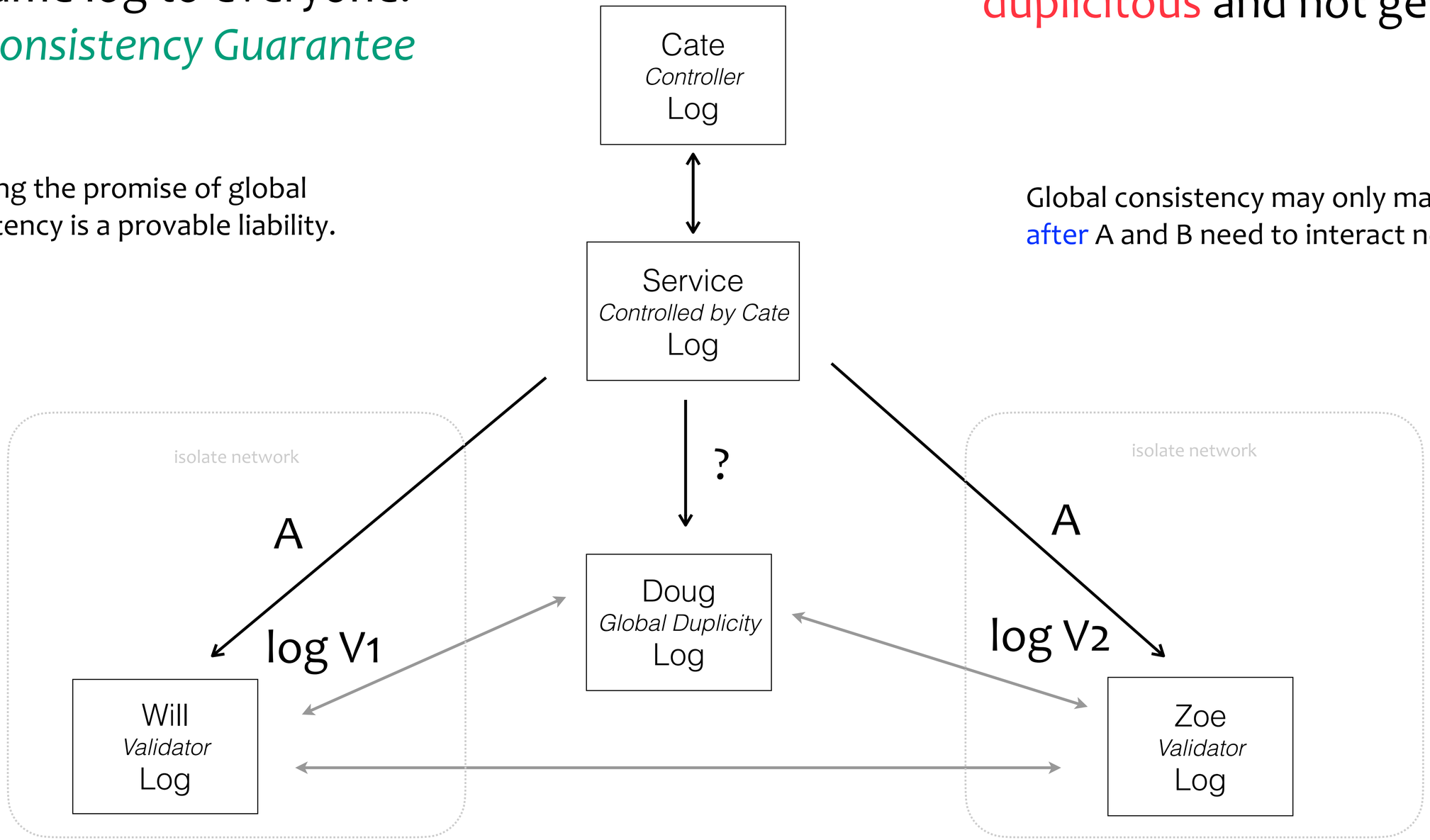

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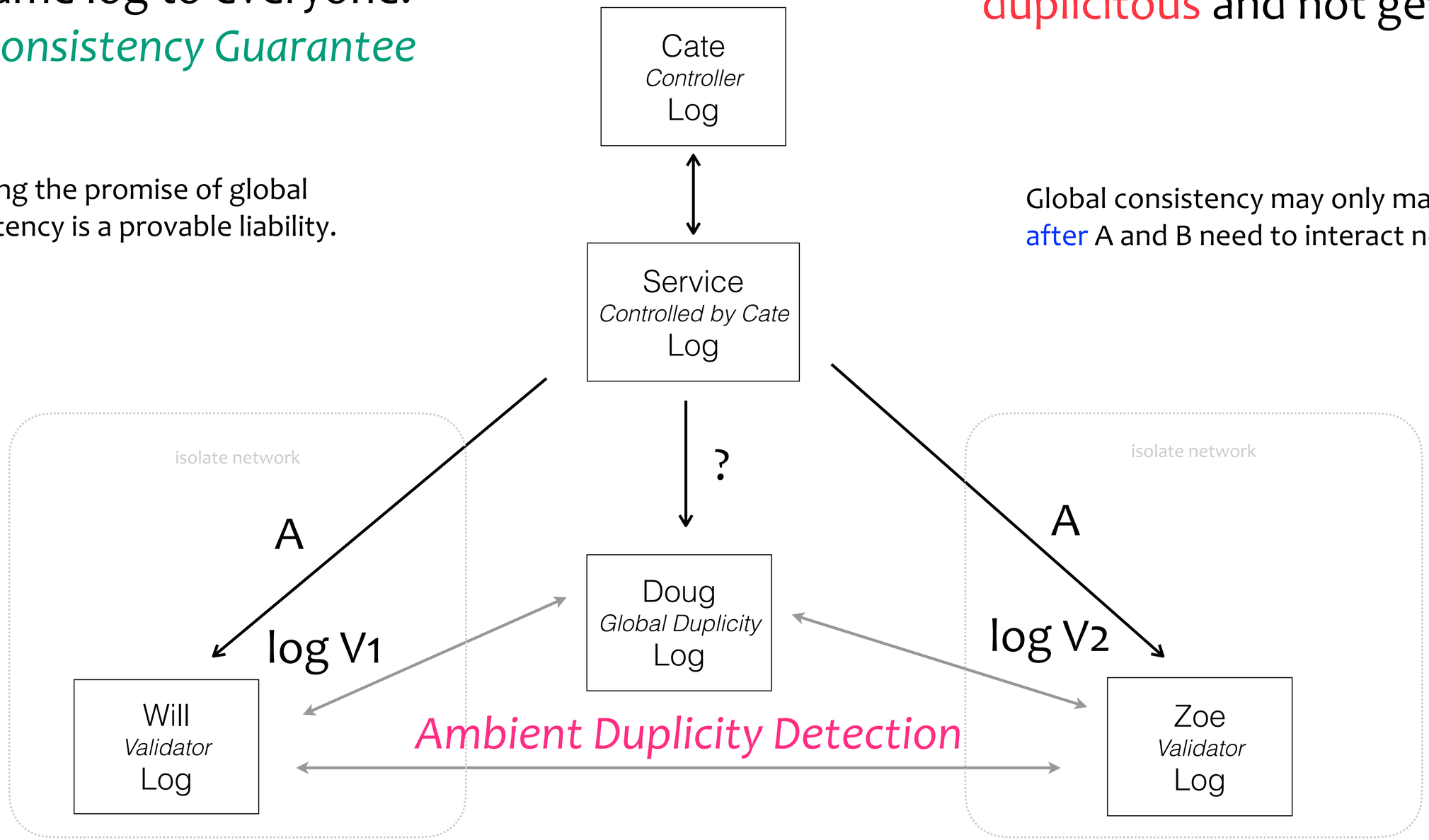

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KERI = self-cert root-of-trust + certificate transparency + KA^{2}CE + recoverable + post-quantum.

BACKGROUND

Certificate Transparency Problem

“The solution the computer world has relied on for many years is to introduce into the system trusted third parties (CAs) that vouch for the binding between the domain name and the private key. The problem is that we've managed to bless several hundred of these supposedly trusted parties, any of which can vouch for any domain name. Every now and then, one of them gets it wrong, sometimes spectacularly.”

Pinning inadequate
Notaries inadequate
DNSSec inadequate
All require trust in 3rd party compute infrastructure that is inherently vulnerable

Certificate Transparency: (related EFF SSL Observatory)
Public end-verifiable append-only event log with consistency and inclusion proofs
End-verifiable duplicity detection = Ambient verifiability of duplicity
Event log is third party infrastructure but zero trust because it is verifiable.
Sparse Merkle Trees for revocation of certificates

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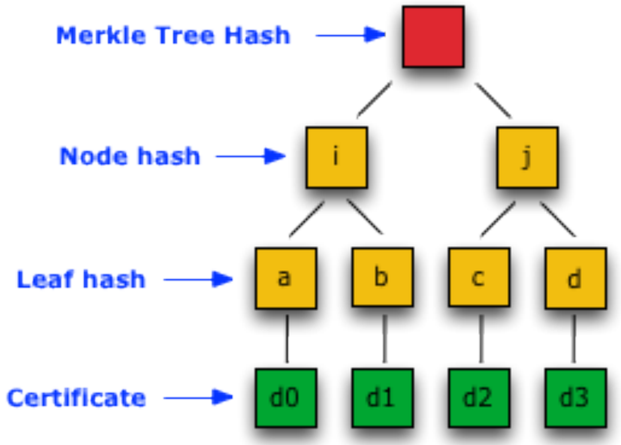

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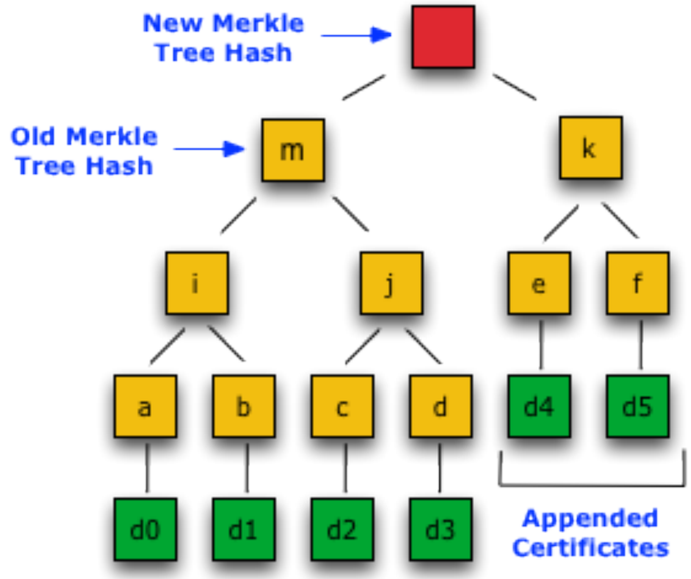

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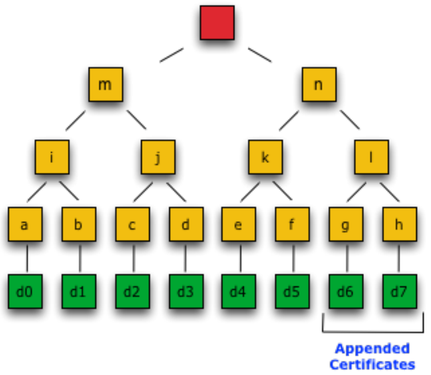

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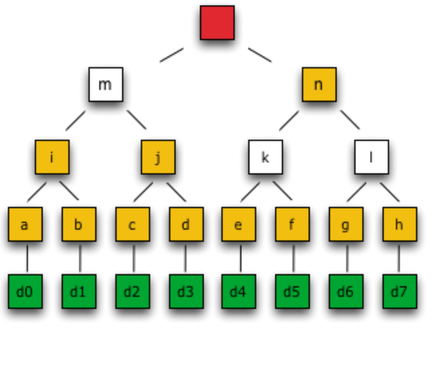

Figure 4