Data Availability in L2s

What makes a DA layer secure?

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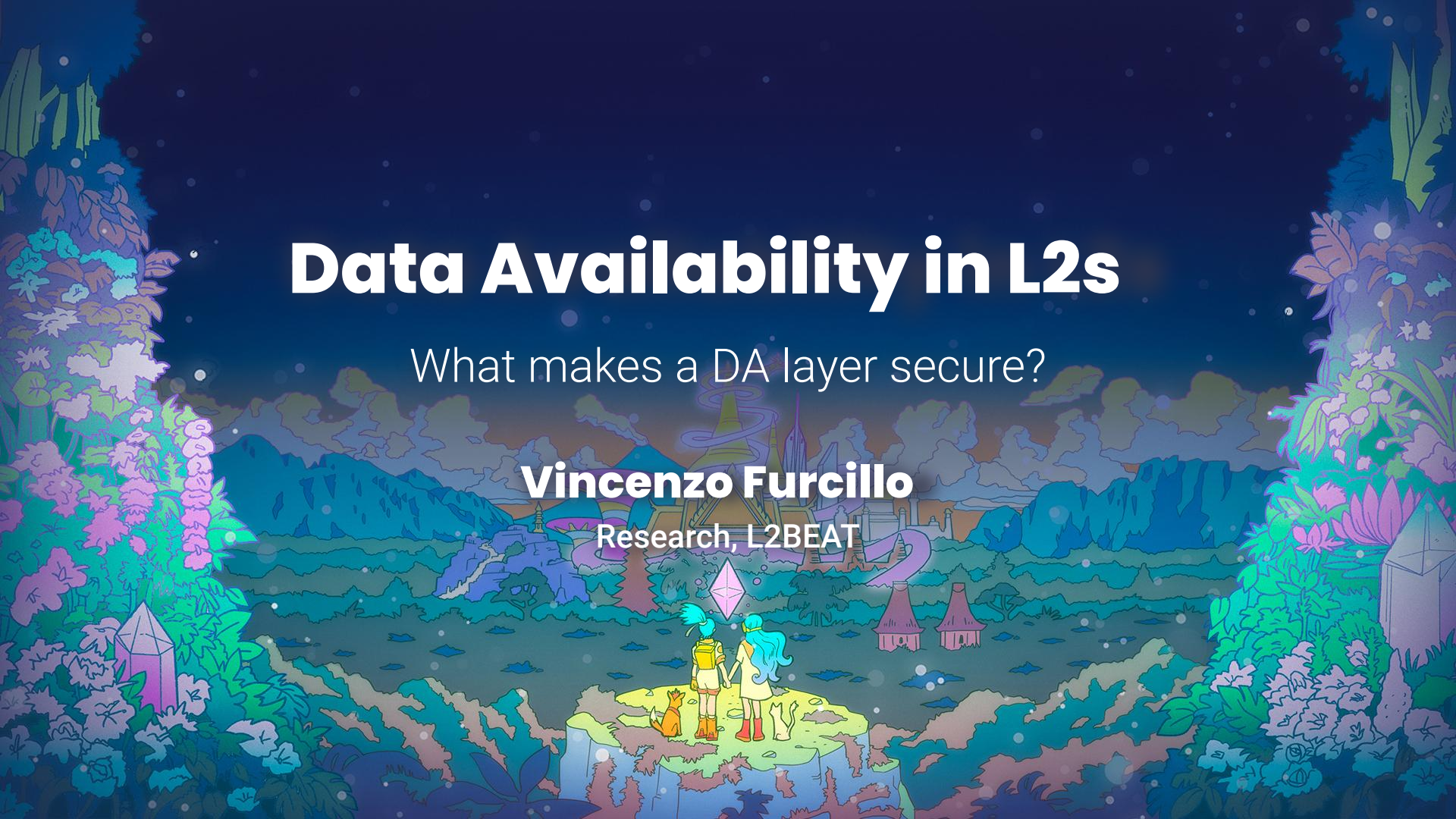

Data Availability is crucial for L2 security

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What makes a DA Layer secure?

Economic Security is not a meme

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Liveness
Data can enter the ledger

Reorgs Safety
Data won't disappear

#	DA LAYER	ECONOMIC SECURITY	SLASHABLE STAKE
1	**Celestia** Public blockchain	Staked assets	$2.45B
2	**Meeda** Public blockchain	No slashing	$0.00
3	**NEAR DA** Public blockchain	Staked assets	$2.12B
4	**EigenDA** DA Service	No slashing	$0.00
5	**Avail** Public blockchain	Staked assets	$95.19M

Slashing for non-attributable faults is very hard

Most slashing mechanisms stand untested or are still under development

Protecting against a Data Withholding Attack

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How can users detect data is unavailable, without downloading the full data?

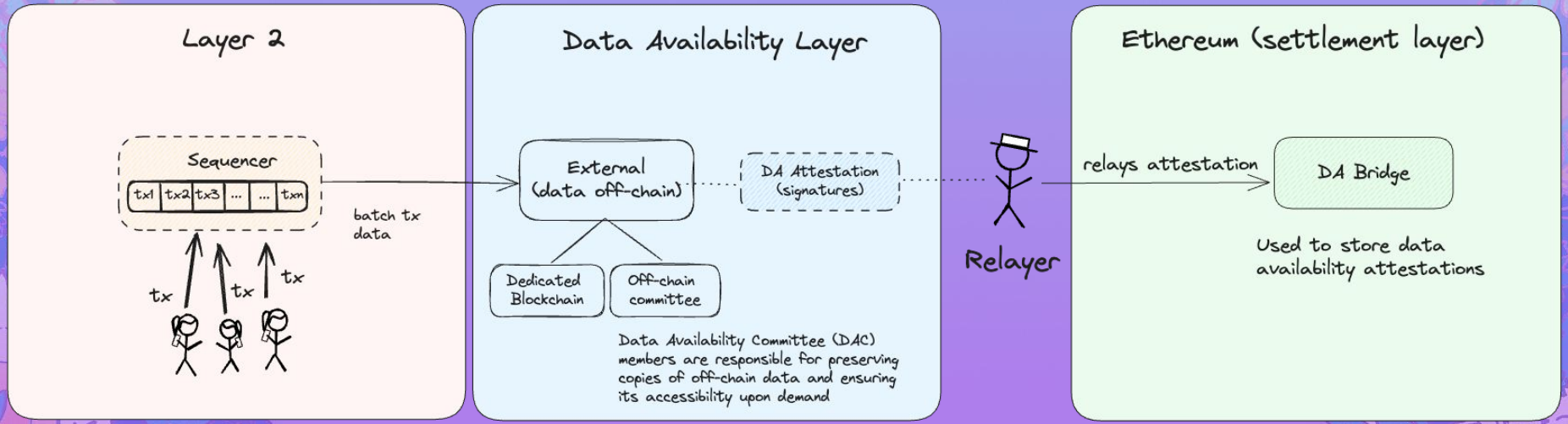
#	DA LAYER	FRAUD DETECTION
1	**Celestia** Public blockchain	DAS
2	**Meeda** Public blockchain	None
3	**NEAR DA** Public blockchain	None
4	**EigenDA** DA Service	None
5	**Avail** Public blockchain	DAS

Data Availability Sampling (DAS)

Assumption on a minimum number of light nodes – very hard to verify

Can light nodes collectively reconstruct a full block from samples?

The Importance of a DA bridge



Without the bridge, Ethereum has no proof of data availability

No Alt-DA L2 integrates with a DA bridge!

#	DA LAYER	BRIDGE	BRIDGE RISKS	VALUE SECURED	USED BY
1	**Celestia** Public blockchain	No bridge	!	$814.14M	+ 5 more
		Blobstream	||| $0.00	No L2 😔
2	**Meeda** Public blockchain	No bridge	!	$322.42M	
3	**NEAR DA** Public blockchain	No bridge	!	$59.54M	
4	**EigenDA** DA Service	No bridge	!	$1.69K	
		ServiceManager	||| $0.00	No L2 😔
5	**Avail** Public blockchain	No bridge	!	$0.00	No L2 😔
		Vector	||| $0.00	No L2 😔

What makes a DA Bridge secure?

DA Bridge Security

Committee Security - Who provides attestations to the bridge?

Relayer Failure - Who can relay the DA attestations?

Bridge Upgradability - Are the attestations immutable?

#	DA LAYER	BRIDGE	COMMITTEE SECURITY	UPGRADEABILITY	RELAYER FAILURE
1	**Celestia** Public blockchain	No bridge	N/A	N/A	N/A
		Blobstream	Validator set	No delay	No mechanism
2	**Meeda** Public blockchain	No bridge	N/A	N/A	N/A
3	**NEAR DA** Public blockchain	No bridge	N/A	N/A	N/A
4	**EigenDA** DA Service	No bridge	N/A	N/A	N/A
		ServiceManager	Permissioned	No delay	No mechanism
5	**Avail** Public blockchain	No bridge	N/A	N/A	N/A
		Vector	Validator set	No delay	No mechanism

What about DACs?

#	DA LAYER	DA RISKS	BRIDGE RISKS	TVS	MEMBERS	FALLBACK	CHALLENGE MECHANISM
1	**Mantle DA** Data Availability Committee			$1.89B	9/10 Anonymous	None	None
2	**FraxtalDA** No DAC		!	$195.11M	N/A	None	None
3	**Re.al DAC** Data Availability Committee			$142.70M	1/2 Anonymous	Ethereum Blobs	None
4	**Gravity DAC** Data Availability Committee			$135.52M	1/1 Anonymous	Ethereum Blobs	None
5	**Immutable X DAC** Data Availability Committee			$94.14M	5/7 Public	None	None
6	**ApeX DAC** Data Availability Committee			$81.20M	3/5 Anonymous	None	None
7	**Arbitrum Nova DAC** Data Availability Committee			$45.05M	5/6 Public	None	None
8	**X Layer DAC** Data Availability Committee			$33.27M	2/2 Anonymous	None	None
9	**Reya DAC**			$27.26M	1/2	Ethereum	None

Data Availability Risk Framework

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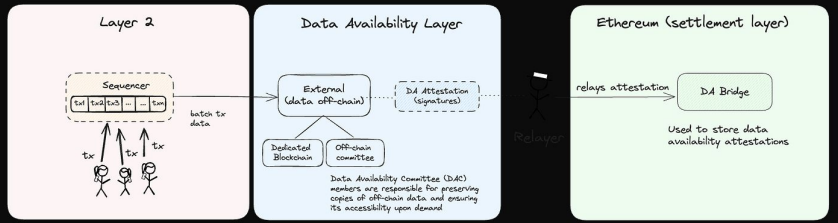
The Data Availability Risk Framework

Methodology & Framework

Vincenzo 2 29d

Building upon the original framework outlined in our previous post [1], the L2BEAT research team has updated the risk categories and their respective scoring methodology, incorporating community feedback.

To provide a clearer analysis, we have divided the risks into two main categories: **DA Layer Security** and **DA Bridge Security**. This separation allows for a more focused evaluation of the specific risks and security considerations inherent to each component.



DA Layer Security

1. Economic Security

Economic security measures the level of trust in the majority consensus of the DA layer,

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Thank you!

Any questions?

Stay in touch  Vincenzo
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