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# Measuring DNS Integrations into Blockchain Namespaces

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DINR Workshop 2023

22 February 2023

# Agenda

Need for identifiers in blockchain applications

Summary of DNS integrations in blockchain namespaces

Considerations with existing DNS integrations

Measuring DNS integrations

Closing remarks

# Need for Blockchain Identifiers

Easy to Remember

Hard to Remember



# DNS Integrations into Blockchain Applications

- A DNS integration enables a DNS domain name to support new use cases in blockchain applications, e.g., blockchain wallet identifiers
- Two examples of blockchain namespaces that provide DNS integrations



[DNSSEC-based for SLDs](#)  
[\(introduced in 2018\)](#)



[DNSSEC Attestations](#)  
[\(introduced in 2022\)](#)

# Blockchain Namespace and Integration Statistics

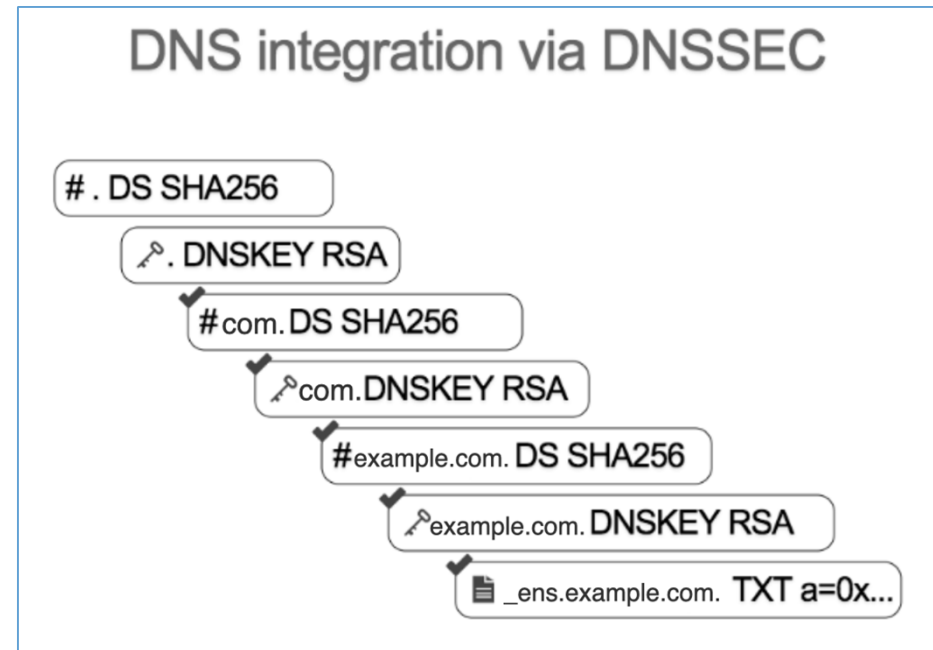
Namespace	Blockchain Identifiers	DNS domain names integrated via. DNSSEC	DNS domain names integrated via. custom solution/s
Ethereum Name Service	2,410,576	863	2,314
Tezos Domains	130,172	5	n/a

Source: <https://etherscan.io>, <https://tzstats.com>

- Blockchain identifiers are registered via a blockchain namespace's protocol
- DNS domain names are integrated via a DNS integration using DNS data
  - DNSSEC-based integration is primary integration method for ENS and Tezos
  - ENS also allows registry operators to provide their own custom DNS integration

# How do DNSSEC-based Integrations Function?

- Registrant updates DNS zone
- Registrant pushes the DNSSEC chain of trust to the blockchain namespace
- Blockchain namespace verifies the DNSSEC chain of trust
- No new DNS tooling required



# Considerations with Existing DNS Integrations



Control

Domain Lifecycle

Alignment

Utility

# Measuring Synchronization in DNS Integrations

- A DNS domain name is synchronized if its state matches in DNS and the blockchain namespace + other users can verify that this is true
- ENS' and Tezos Domains' DNSSEC-based integration links a DNS domain name into a blockchain namespace at a particular point in time
- Important to measure ongoing synchronization in DNS integrations
  - We measured synchronization in ENS

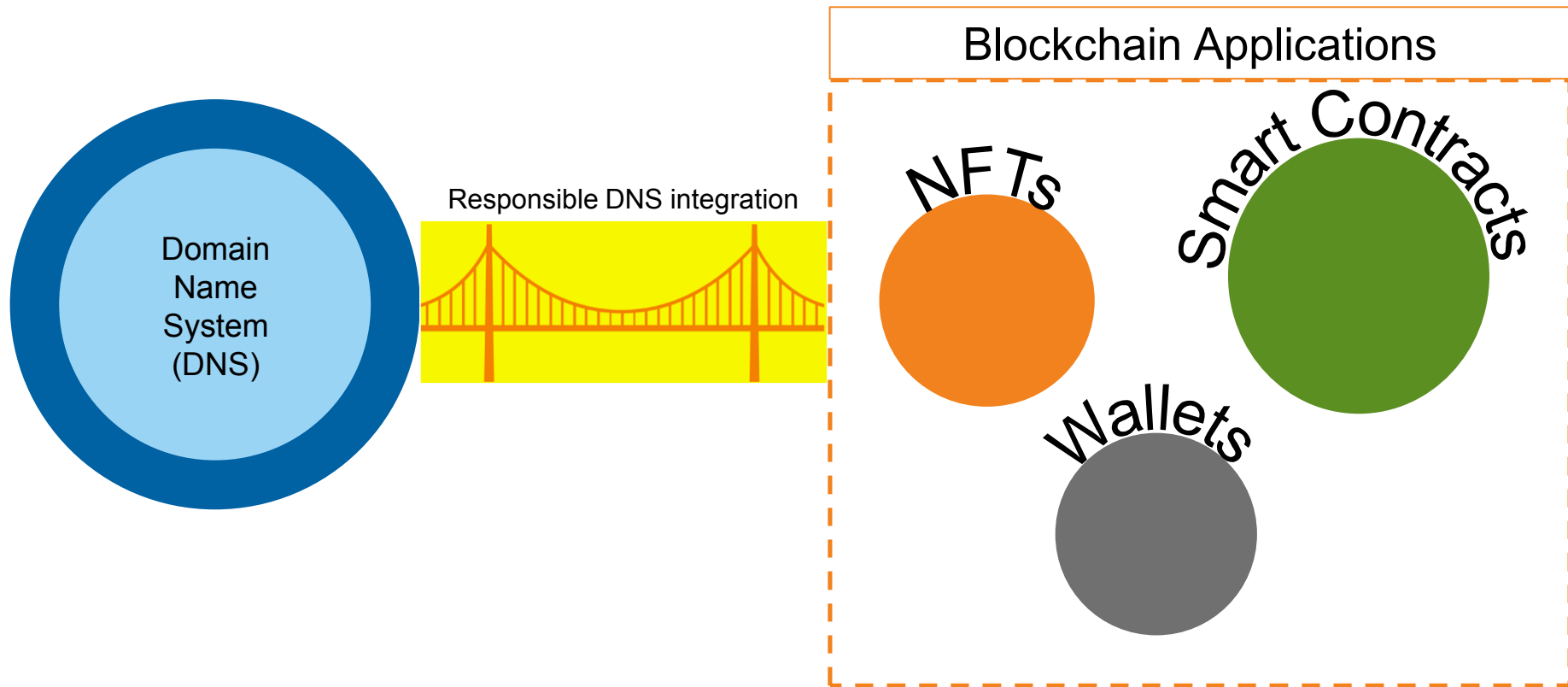


# ENS DNSSEC Integration Analysis

Synchronization Status		Count (Percentage)
<input type="checkbox"/>	ENS <sub>registrant</sub> = DNS <sub>TXT</sub>	663 (76.83%)
<input type="checkbox"/>	SLD DS Missing	75 (8.69%)
<input type="checkbox"/>	SLD NXDOMAIN	53 (6.14%)
<input type="checkbox"/>	SLD SERVFAIL	31 (3.59%)
<input type="checkbox"/>	ENS <sub>registrant</sub> ≠ DNS <sub>TXT</sub>	23 (2.67%)
<input type="checkbox"/>	Results show that synchronization issues are real: <ul style="list-style-type: none"> <li><input type="checkbox"/> <input type="checkbox"/> → Out of sync but <b>can</b> bring back into sync by submitting the latest DNSSEC data</li> <li><input type="checkbox"/> → Out of sync but <b>cannot</b> bring back into sync because does not generate DNSSEC data</li> </ul>	11 (1.27%)
<input type="checkbox"/>	Cloudflare Black Lie	7 (0.81%)

Source: <https://etherscan.io>

# Responsible DNS Integrations



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