



VERISIGN®

# Responsible Integration into Blockchain Namespaces: Considerations for DNS TLD Operators

Swapneel Sheth, Verisign

ROW12

June 20, 2023

# Agenda

Global DNS diversification via integrations

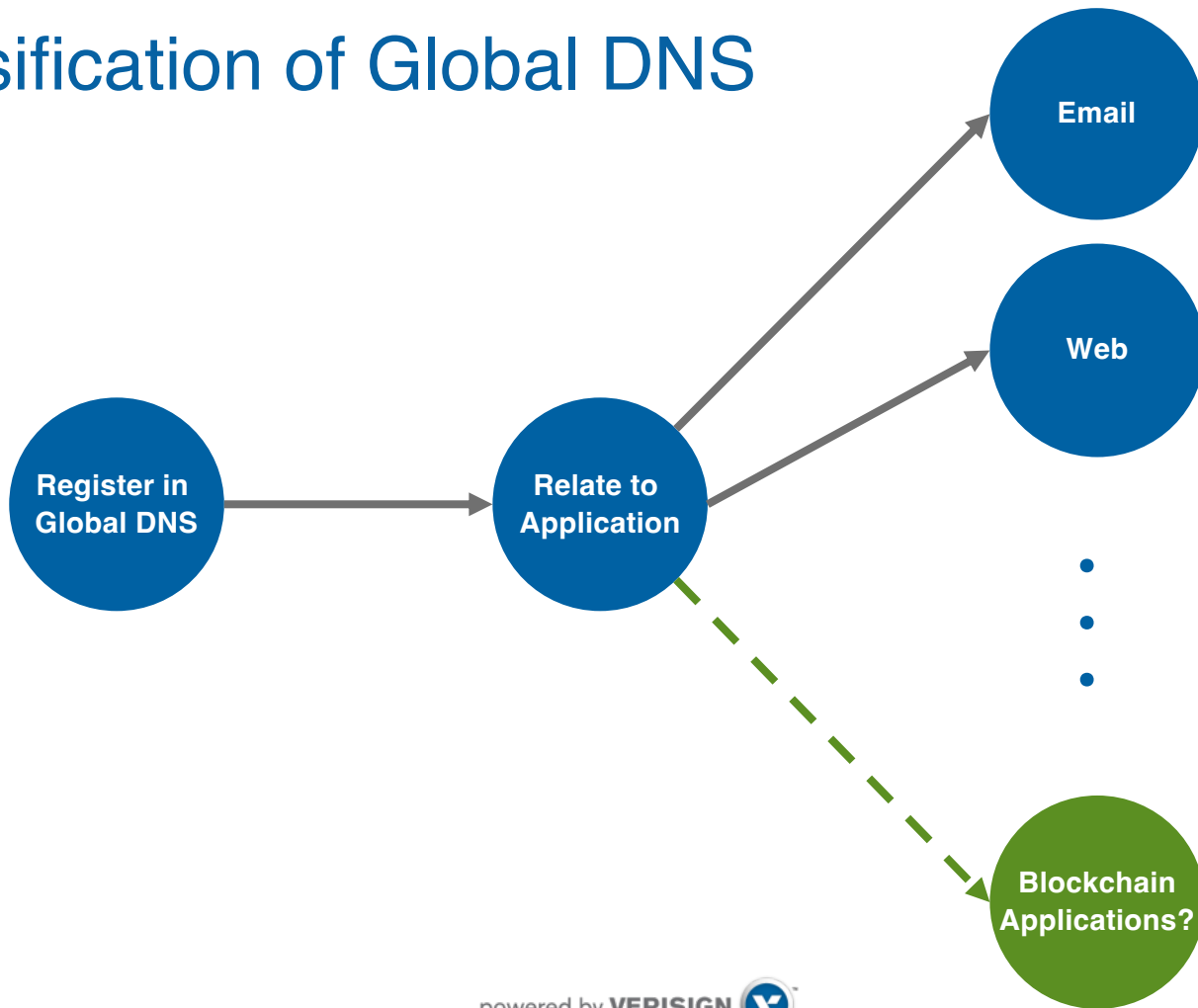
Blockchain applications - a new use case

Alignment with the global DNS

Challenges of managing namespace integrations

Responsible integration

# Diversification of Global DNS



# Need for Blockchain Identifiers

Easy to Remember

Hard to Remember

example.com



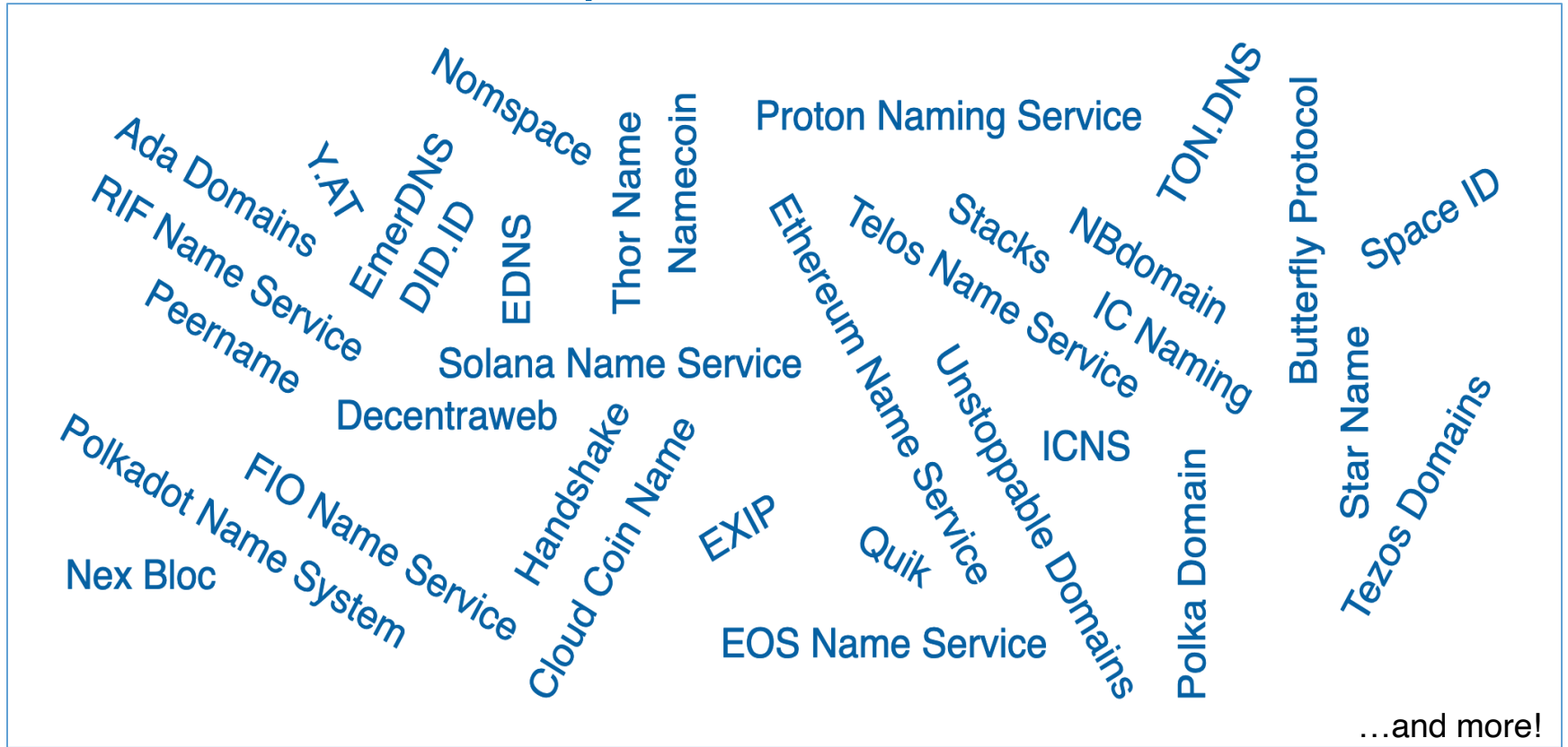
93.184.216.34

example.eth



0x51aba267a6e8e1e76b44183a  
73e881d73a102f26

# Blockchain Namespaces



...and more!

# Why So Many Namespaces?

- Universal need to improve user experience
- Interoperability between blockchains
- DNS support lacking for blockchain use cases

• Four examples mentioned in [ICANN OCTO-034](#) have different emphases



policy to not add new TLDs to their namespace unless anchored to the DNS namespace



traditional alt-root approach offering extensions such as .crypto, .wallet and .nft



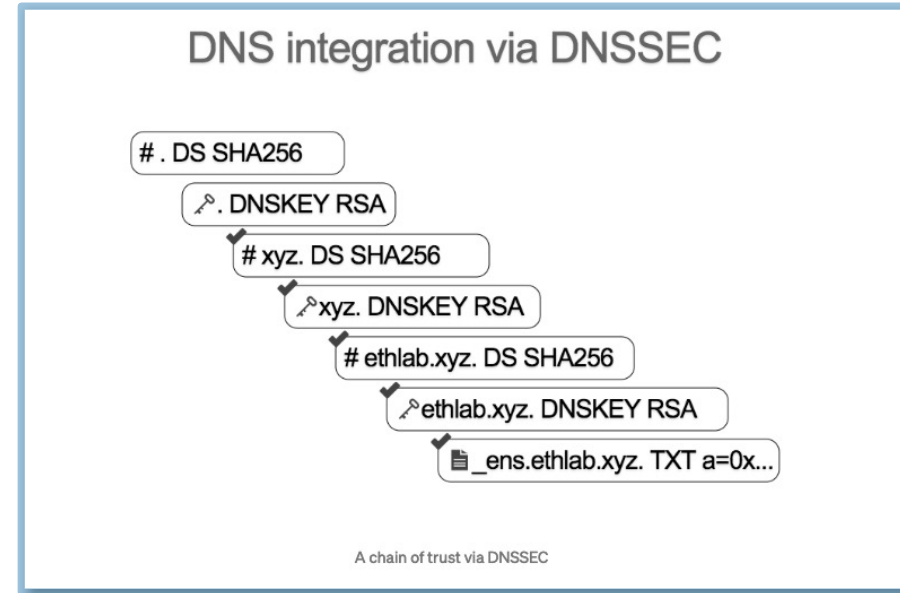
"goal is to maintain our own root zone file"



early experimental fork of Bitcoin

# DNS Integration Approaches

- [DNSSEC-based \(introduced by ENS in 2018\)](#)
- [nic.tld \(proposed by ENS in 2019\)](#)
  - Verisign [notified ENS about issues](#) with this approach

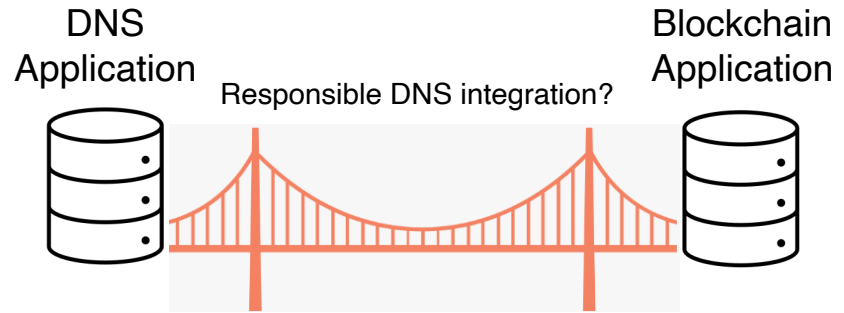


Source: <https://bit.ly/3M99bek>

- Attestation-based (introduced by Tezos Domains in 2022)

# Concerns with Current Approaches

- Synchronization between global DNS and blockchain namespace
- Interoperability
- Cost of blockchain transactions
- Blockchain and DNS have different policy emphases
- Commitment to a particular integration is unclear












# 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	2,226,717	1,098	2,778
Tezos Domains	145,221	6	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

# ENS DNSSEC Integration Analysis

Synchronization Status		Count (Percentage)
	ENS <sub>owner</sub> = DNS <sub>TXT</sub>	802 (73.0%)
	SLD DS Missing	111 (10.1%)
	SLD NXDOMAIN	83 (7.5%)
	SLD SERVFAIL	39 (3.5%)
	ENS <sub>owner</sub> ≠ DNS <sub>TXT</sub>	31 (2.8%)
	TXT NXDOMAIN	19 (1.7%)
	NSEC or NSEC3 Covers TXT	13 (1.2%)

Source: <https://etherscan.io>

Results show that synchronization issues are real:

-  → Out of sync but **can** bring back into sync by submitting the latest DNSSEC data
-  → Out of sync but **cannot** bring back into sync because does not generate DNSSEC data

# Analogy with Web PKI: Key Questions



How can a **certification authority** ensure that **only the registrant** of a global DNS domain name **can claim a certificate** that includes the domain name?

How can a **blockchain namespace** ensure that **only the registrant** of a global DNS domain name **can claim a blockchain identifier** that matches the domain name?

# Importance of Alignment with Global DNS

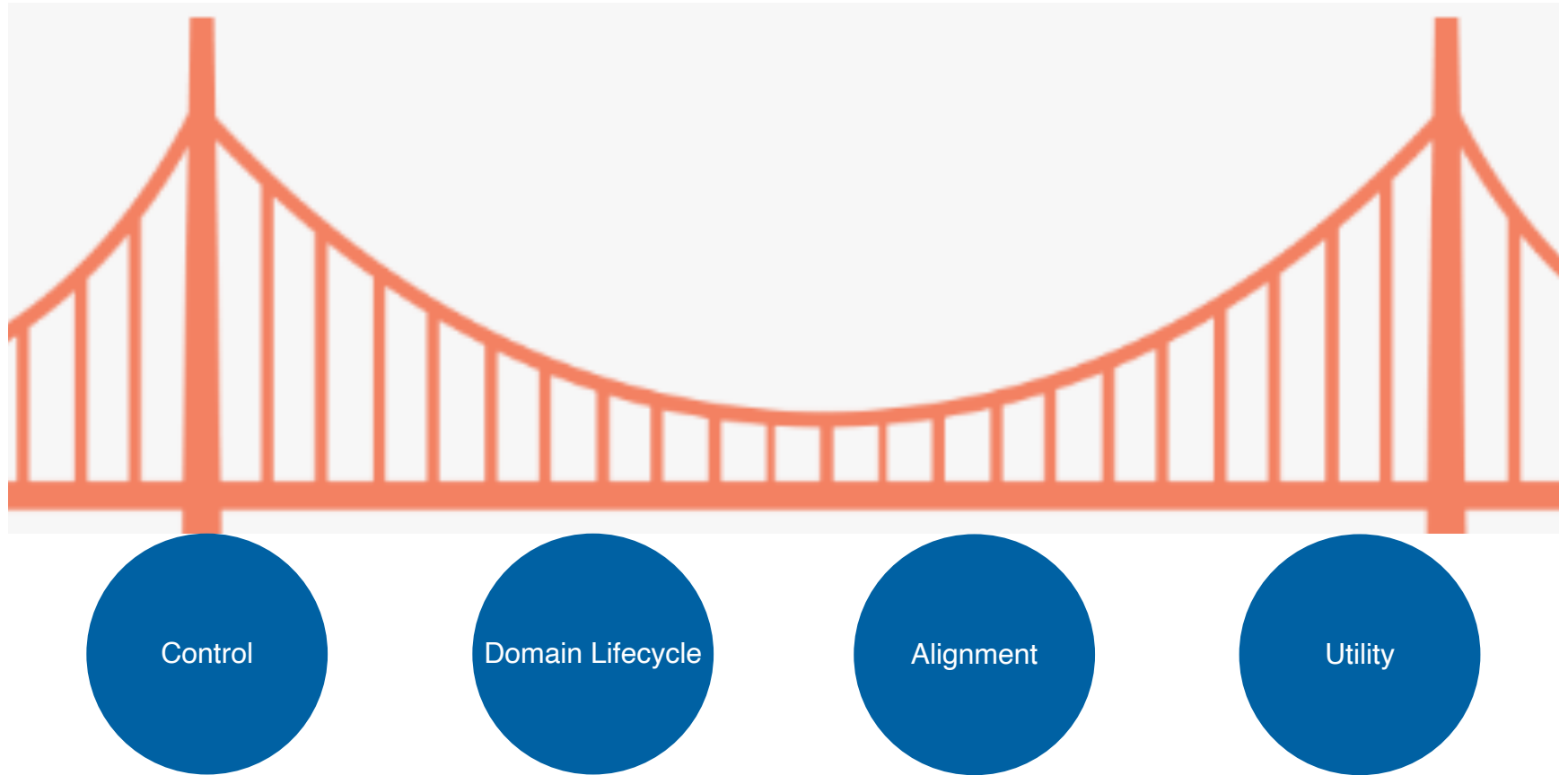
- *A Unique, Authoritative Root for the DNS*  
(ICANN ICP-3, 2001)

“Responsible experimentation is essential to the vitality of the Internet.”

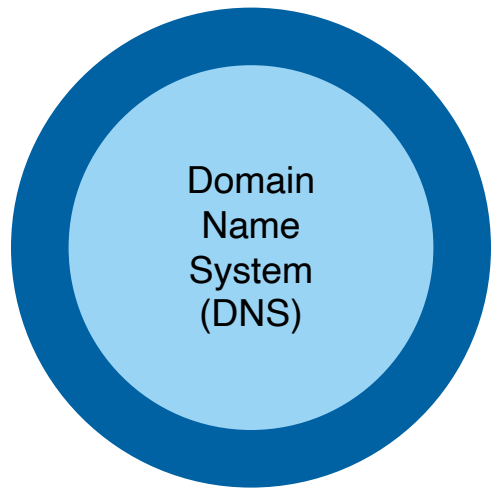
- *Challenges with Alternative Name Systems*  
(ICANN OCTO-034, 2022)

“The lack of name space coordination, ..., will result in unworkable name collisions.”

# Considerations with Existing DNS Integrations



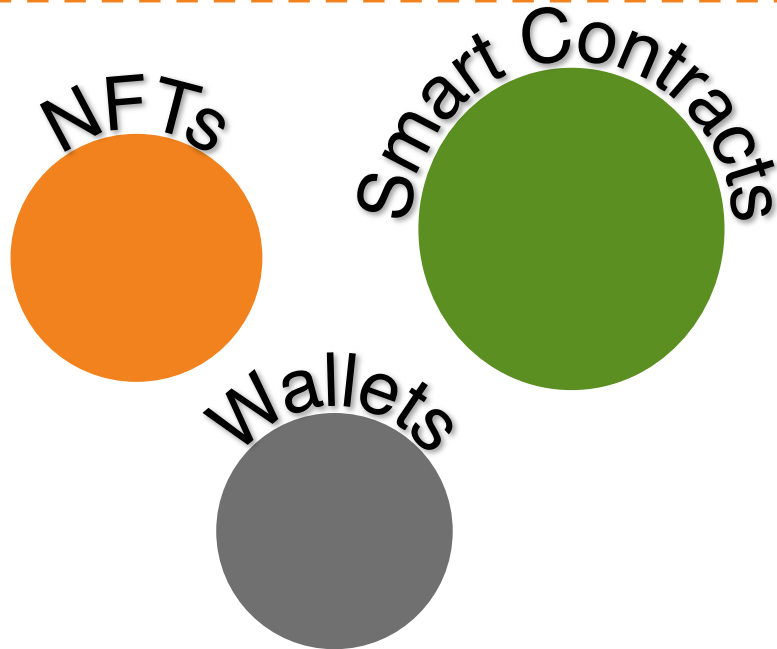
# Standardizing Responsible DNS Integration?



Responsible DNS integration



## Blockchain Applications



powered by



**VERISIGN<sup>®</sup>**