Transitioning Verisign's TLDs to Elliptic Curve DNSSEC

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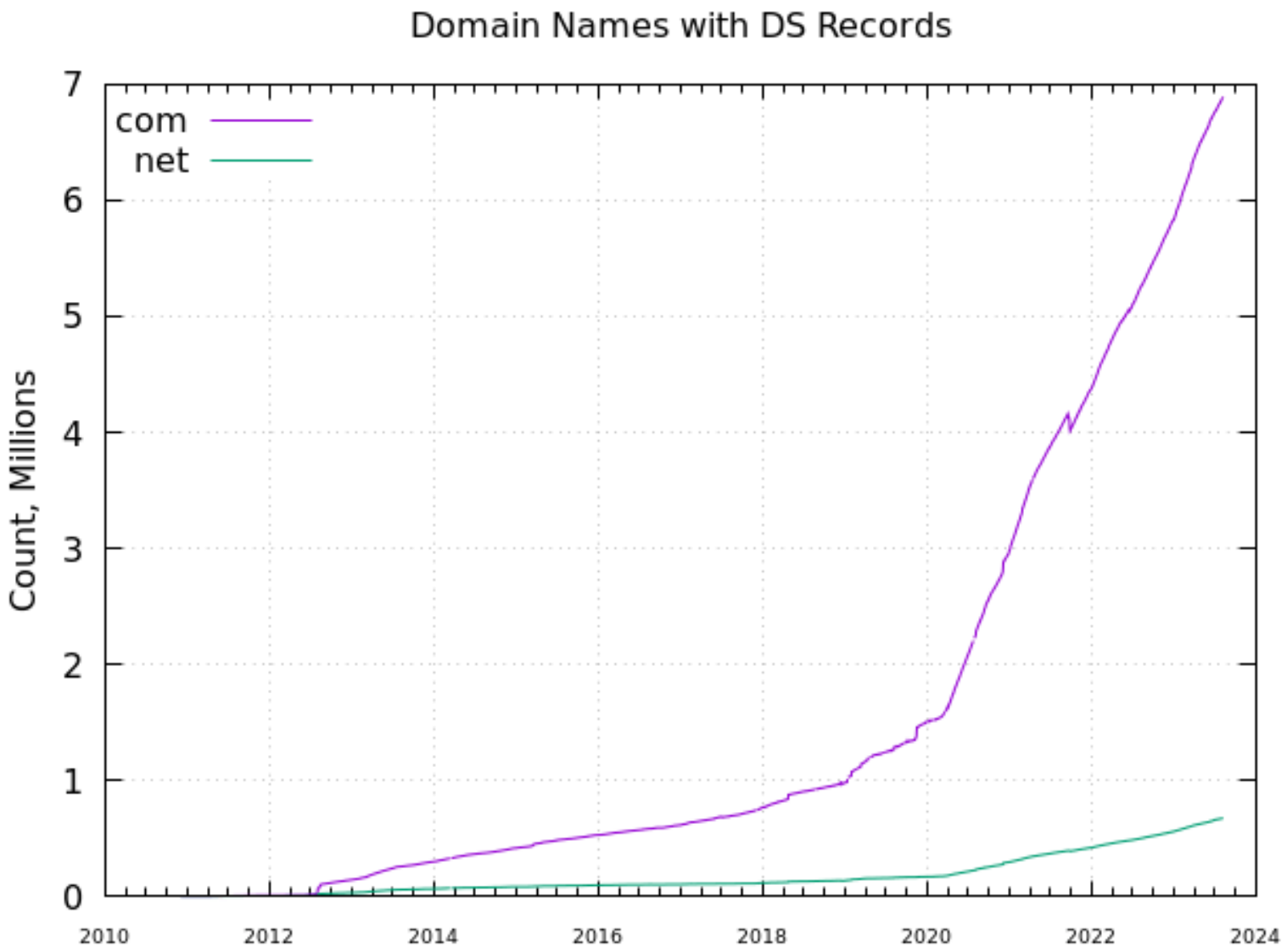
VERISIGN

Growth in COM/NET Signed Domain Names



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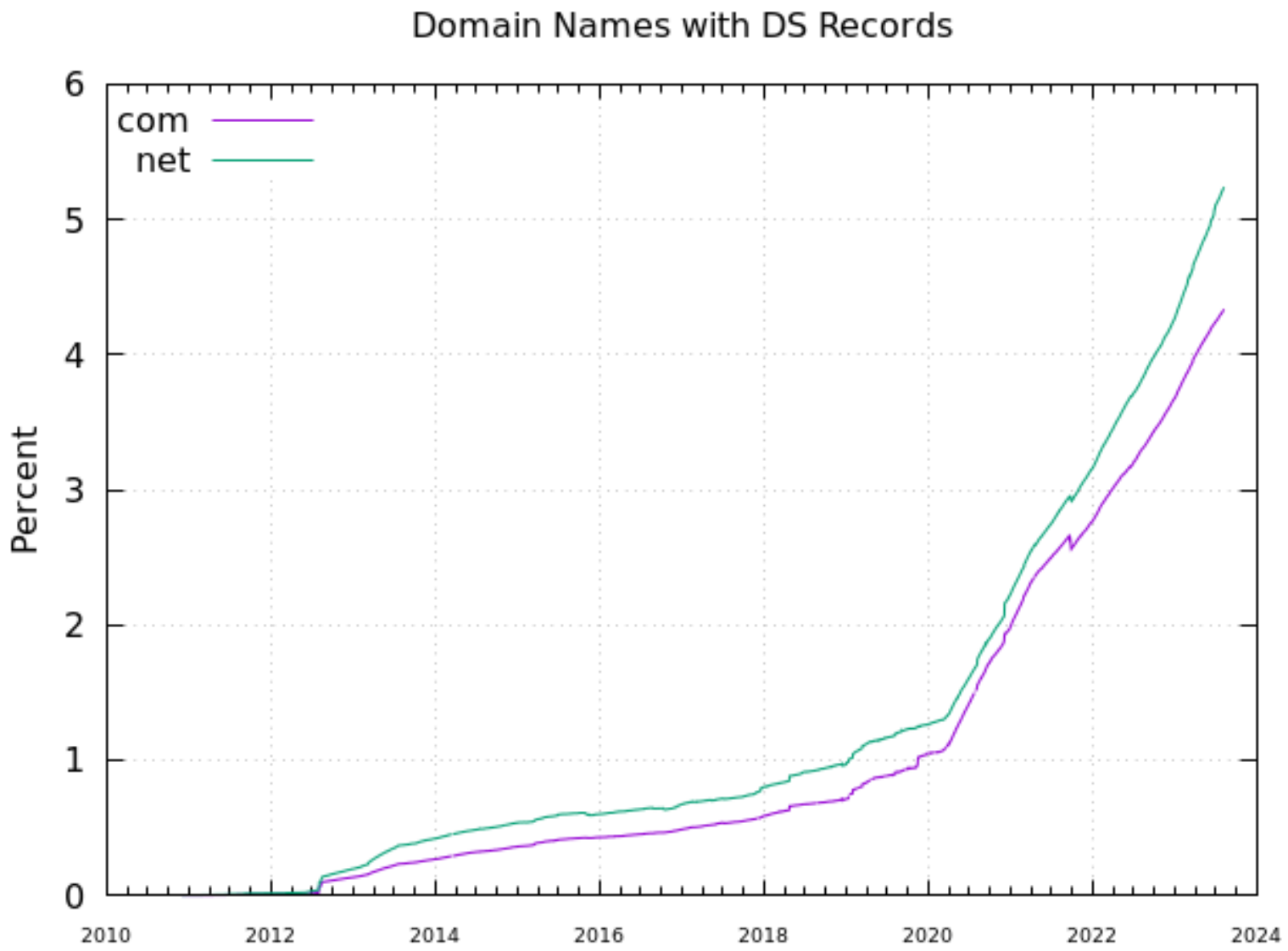

Growth in COM/NET Signed Domain Names

- About 0.1% per year growth* 2012—2020
- About 1.1% per year growth* 2020—present
- We anticipate continued growth in the number of signed second-level domains

*growth based on total domains

Benefits of ECDSA

- Smaller signature sizes
  - 64 bytes for ECDSA vs 160 bytes for 1280-bit RSA
  - Benefits both message size and memory usage
- Improved cryptographic strength
  - ECDSA Curve P-256 is generally considered equivalent to 3072-bit RSA

Changing DNSSEC Algorithms

- Currently RSA/SHA-256 (8):
  - 2048-bit KSK
  - 1280-bit ZSK
- Rolling to ECDSA Curve P-256 with SHA-256 (13) with conservative, double-signature approach:
  1. add algorithm 13 ZSK signatures along side algorithm 8 signatures (25% per day)
  2. add algorithm 13 DNSKEY records
  3. add algorithm 13 DS record; remove algorithm 8 DS record
  4. remove algorithm 8 DNSKEY records
  5. remove algorithm 8 ZSK signatures (25% per day)

Schedule

Zone	Start	Rollover	End
EDU	Sept 6	Sept 12-15	Sept 22
NET	Oct 25	Oct 31-Nov 3	Nov 10
COM	Nov 29	Dec 5-8	Dec 15

- Start: Algorithm 13 signatures first published
- Rollover: Root zone publishes DS record for algorithm 13
- End: Algorithm 8 signatures no longer published

- Note: dates are subject to change
- Schedule for remaining TLDs still to be determined

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