Root Zone KSK Rollover Update

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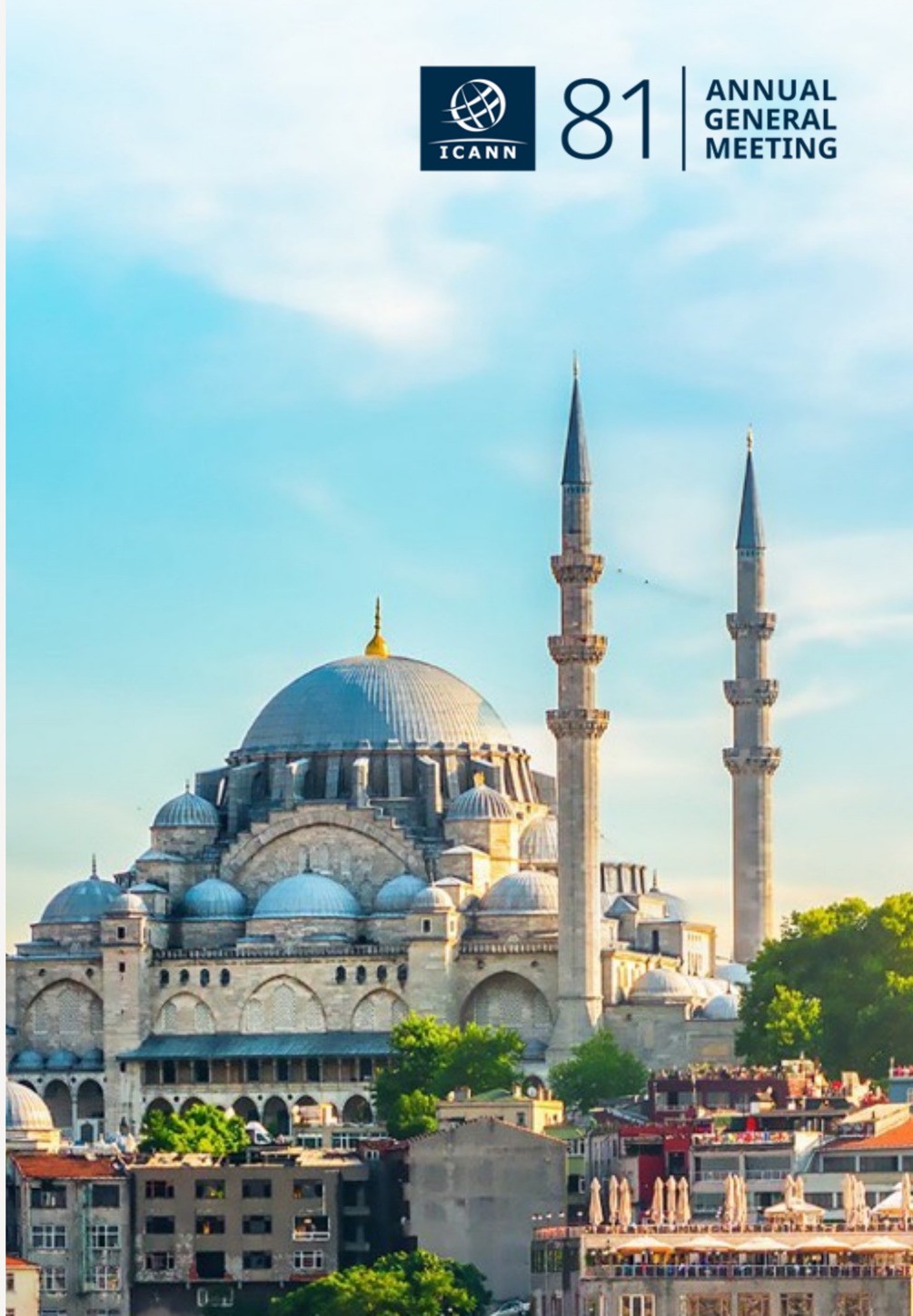


Background

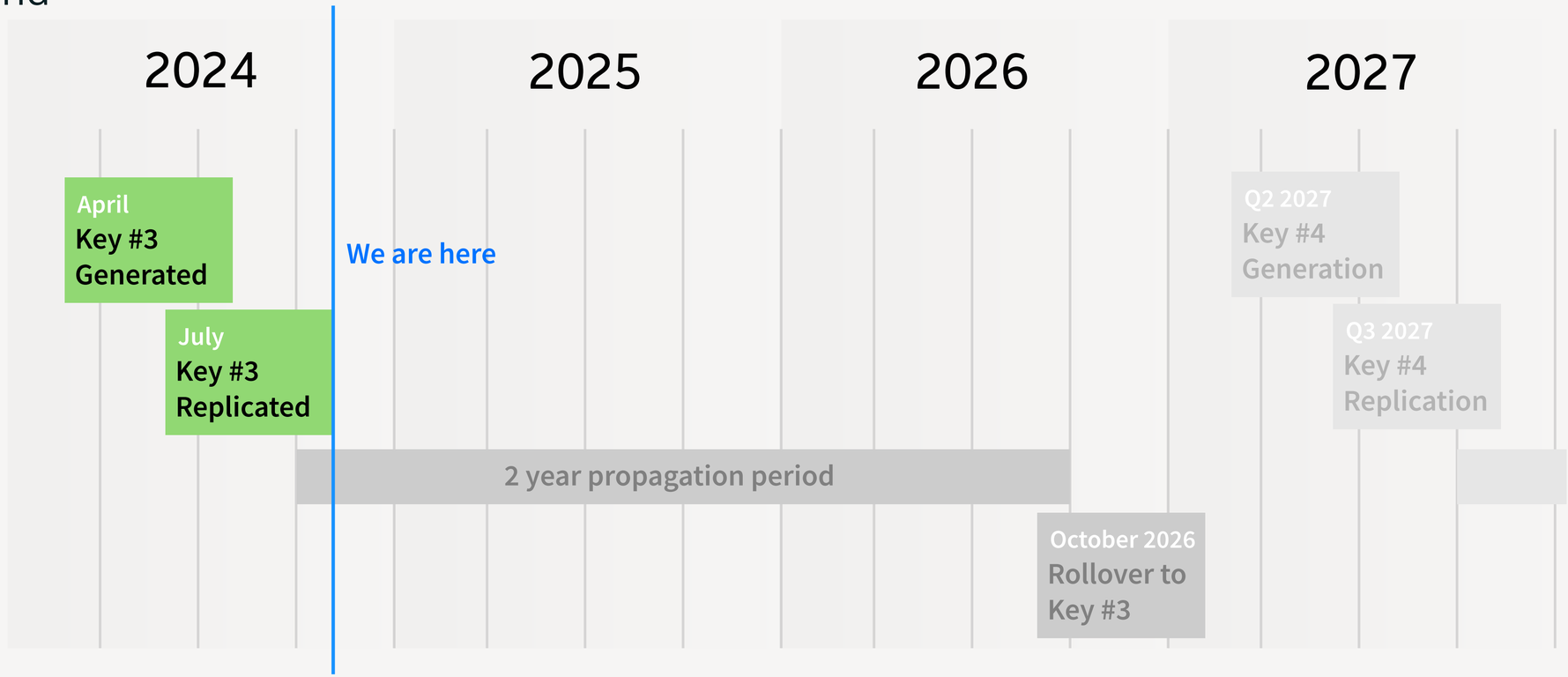
- SSR2 recommended that IANA work with other root zone partners and the global community to develop a consensus plan for future root DNSKEY algorithm rollovers.

- Design Team provided recommendations on the topics of cryptographic function selection and future implementation plans.

- IANA is chartering and initiating the project to build operational capabilities to change the algorithm.
  - Recurring process to evaluate the algorithm
  - Detailed operational plans for the rollover
  - Updates to policies and procedures
  - Software support

Updating the key

- We’ve embarked on the 2nd ever replacement of the key
  - Highly orchestrated event, propagation to all validators through vendor updates etc.
  - Delayed due to (a) COVID, and (b) key hardware vendor change; but now underway
- Implements a 3 year cadence, with new algorithm potential in 2027 and beyond



Now available

- The new trust anchor is now available for propagation (XML file)
  - Most users will adopt it naturally through software updates
  - Will appear in the DNS itself starting 11 January 2025 (RFC 5011)
  - Note — new format per RFC7958bis

Key Status

This table provides additional guidance on how keys have been issues and used. Software implementers should rely on the XML trust anchors file for normative parameters on keys.

INFORMAL NAME	STATUS	DETAILS
KSK-2024	Pre-Publication	Generated 2024-04-26 (attestation) with key tag 38696 and label Kmyv6jo. Expected to be published in DNS on 2025-01-11, and actively signing starting 2026-10-11.
KSK-2017	Active	Generated 2016-10-27 (attestation) with key tag 20326 and label Klajeyz. Signing since 2018-10-11.
KSK-2023	Abandoned	Generated 2023-04-27 (attestation) with key tag 46211 and label Kmrfl3b. Will not be used, superseded by KSK-2024.
KSK-2010	Retired	Generated 2010-06-16 (attestation) with key tag 19036 and label Kjqmt7v. Signing between 2010-07-15 and 2018-10-11.

https://iana.org/dnssec/files

Changing the algorithm

- Recommendation to periodically assess the suitability of the algorithm.
- Assess prior to generation of the successor key
  - Anticipate some form of community consultation

- Expect the subsequent rollover will also change the algorithm
  - Recommendation to perform controlled rollover to ensure preparedness
  - RSA and ECDSA current candidate algorithms
  - Benefit of smaller signatures when changing to ECDSA

Preparing for an algorithm change

- Select the successor key algorithm by 2027.
- Public consultation expected in 2026.
- Consultation will need to be supported with detailed operational plans.

- Conservative approach
  - Pre-publication of signatures
  - Sign with all algorithms

- Changes to process
  - Can’t pre-publish the successor key as with a non-algorithm rollover
  - How long between publication and rollover (revocation)

- Give resolver vendors sufficient time to test their software.

Risks

- Double signing and response message sizes
  - Reduce the size of the ZSK
  - Suspend ZSK rollovers
  - Conservative approach for the root zone rules out alternate rollover methods

- Clients with operational dependency on IANA’s root-anchors.xml

- Size of the root zone will increase during double signing window
  - SSAC advice to limit growth of the root zone

- Interplay between RFC 5011 revocation and rollover code

Call for volunteers

https://iana.org/tcr

Thank you!

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