PQC Dialogue with Government Stakeholders

Meeting Organizers:
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PQC dialogue with government stakeholders

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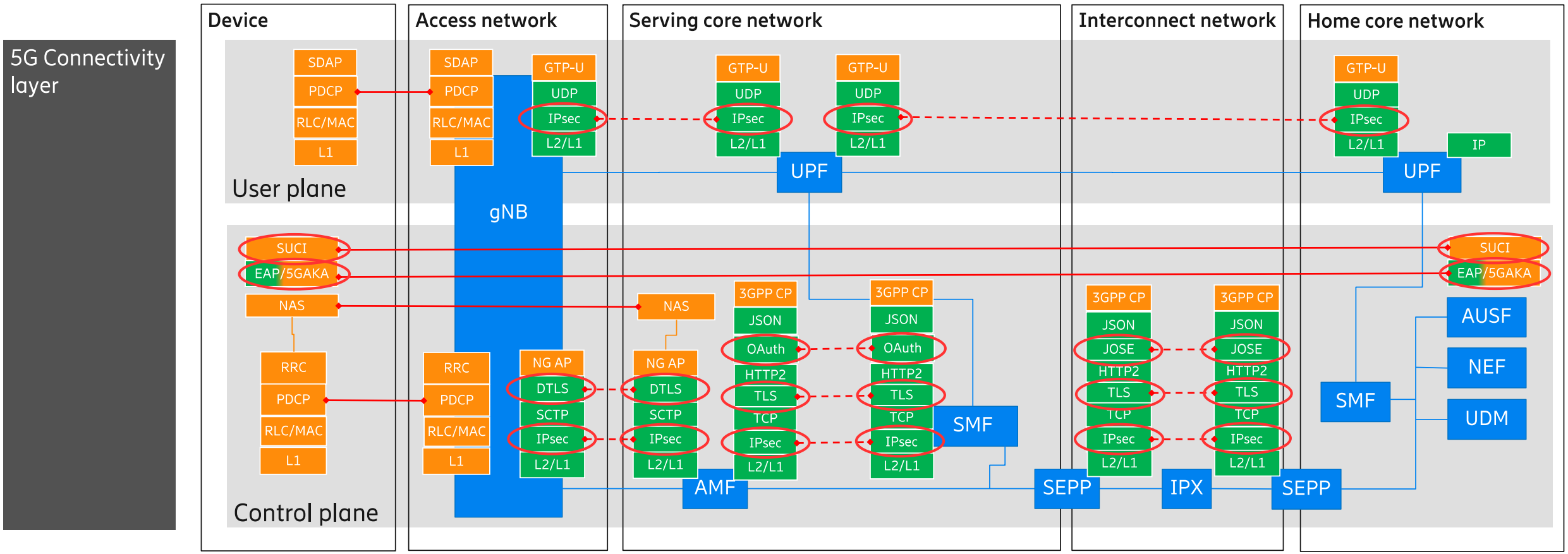
PQC dialogue with government stakeholders

- **Goals:**
  - Information sharing. There has been a lot of discussion and speculation in several groups on what different countries recommend and require.
  - Open dialogue and increased understanding between IETF people and government officials from all over the world.

- **Agenda:**
  - Introduction
  - Overview of PQC activities from governments
  - Dialogue and discussion

IETF protocols are essential for 5G (and 6G)

- 5G relies on IETF protocols like IKEv2, TLS 1.3, DTLS, JOSE, Internet X.509 profile, CMP, CRL, OCSP, EAP-TLS, and EAP-AKA-FS for almost all uses of public-key cryptography. The amount of IETF protocols has increased for each generation.
  - IMSI encryption uses the SECG ECIES standard but augments it with X25519 (RFC 7748).
  - Important with global alignment on algorithms and hybridization.



EU Coordinated Roadmap for the transition to PQC

Alexander Engström, Swedish work group representative, pqc@fra.se

IETF 122, Bangkok

The Commission Recommendation of April 11, 2024

- The Commission Recommendation encourages Member States to develop a comprehensive strategy for the adoption of Post-Quantum Cryptography, to ensure a coordinated and synchronised transition among the different Member States for public administrations and critical infrastructures.
- The strategy should define clear goals, milestones, and timelines resulting in the definition of a joint Post-Quantum Cryptography Implementation Roadmap.

Work group: NIS CG WS PQC

- NIS2 Directive: new rules on cybersecurity of network and information systems.
- NIS Cooperation Group: The Group's overall mission is to achieve a high common level of security for network and information systems in the European Union. It supports and facilitates the strategic cooperation and the exchange of information among EU Member States.
- WS PQC: Work Stream PQC

Publication of roadmap

- Part one in mid-May 2025. Focus on timelines and first steps for member states. No technical recommendations.
- Part two in mid-May 2026. Technical recommendations.

From the roadmap draft

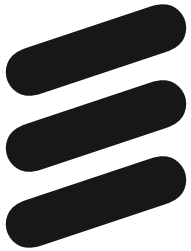
- In general, the transition should be done by the end of 2035.
- The transition for ”Harvest now, decrypt later” should be done by the end of 2030.

NIS CG publications

https://digital-strategy.ec.europa.eu/en/policies/nis-cooperation-group

Potential discussion topics

- **Recommended PQC algorithms (KEMs and signatures)**
  - ML-KEM, ML-DSA, SLH-DSA, FN-DSA, Classic McEliece, FrodoKEM, BIKE/HQC, XMSS/LMS, …
  - Security category 1,2,3,4,5? Does it depend on algorithm and use case?
- **Timelines for PQC migration**
  - When should migration begin? When will it be required?
  - Does it depend on user, use case, protection lifetime, hardware vs software, migration complexity, value of the protected node and data, scheduled hardware replacement, etc.?
- **Hybridization or standalone PQC**
  - Difference between KEMs and Signatures
  - Differences between algorithms (e.g., lattice-based vs. hash-based)
  - Differences between use cases (e.g., confidentiality vs. authentication)
  - Is hybridization a short-term necessity or a long-term strategy?
- **Hybridization of PQC KEMs**
  - Single vs. multiple PQC algorithms? Role of symmetric keys?
  - KEM combiners: general-purpose vs. optimized designs
  - Which traditional curves? X25519/X448, NIST P-curves, Brainpool, …
- **Hybridization of signatures**
  - Role of symmetric keys?
  - Signature combiners, general or optimized?
  - Desired properties: SUF-CMA? Other security properties?
  - Which traditional signatures? EdDSA, ECDSA, RSA?
- **KDF and hash functions**
  - ML-KEM and ML-DSA mandate SHA-3.
  - Time to move away from SHA-2/HMAC/HKDF/MGF?



https://www.ericsson.com/en/security