Realization of SCONE in the 5G Scenario

draft-jiang-scone-realization-5gcase-00

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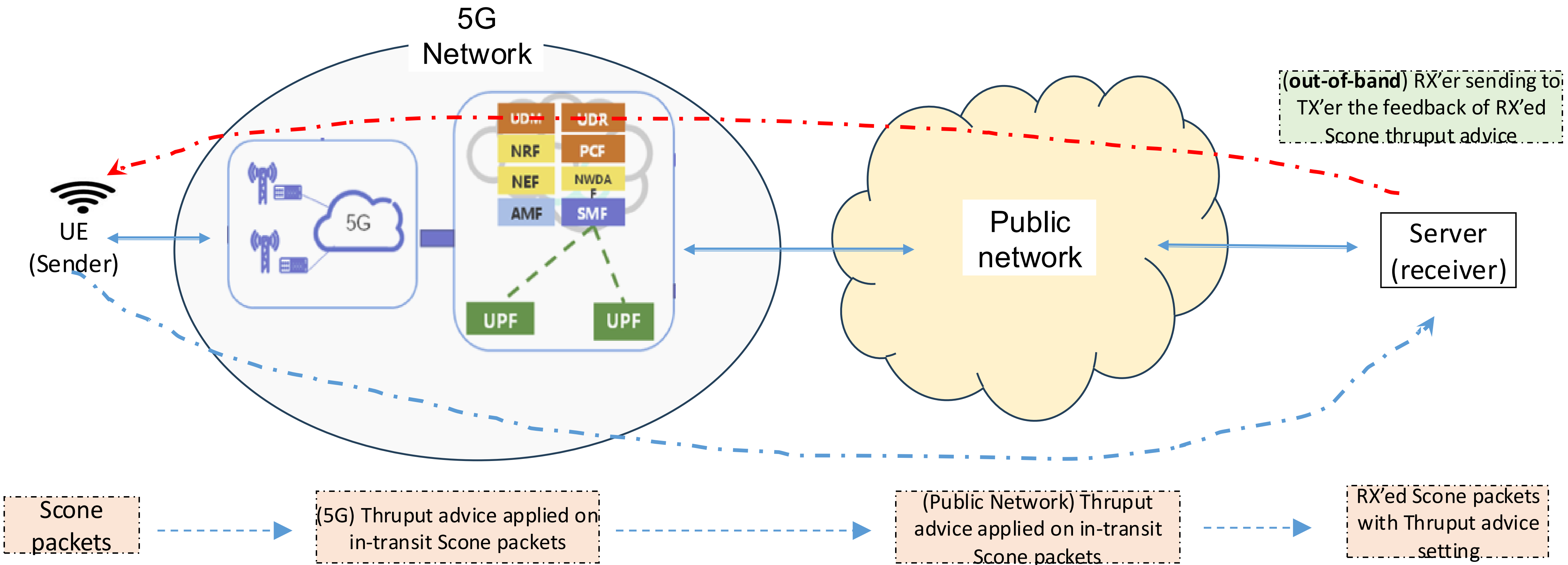
Agenda

- SCONE: End-to-end Architecture: 5GS + Public Network
- SCONE: Realization in 5GS
  - Interaction w/ SCONE: 5G Control Plane/Data Plane
  - Traffic detection, identification and classification: 5G PDU & PDU session
  - Advantages of realization of 5G use case

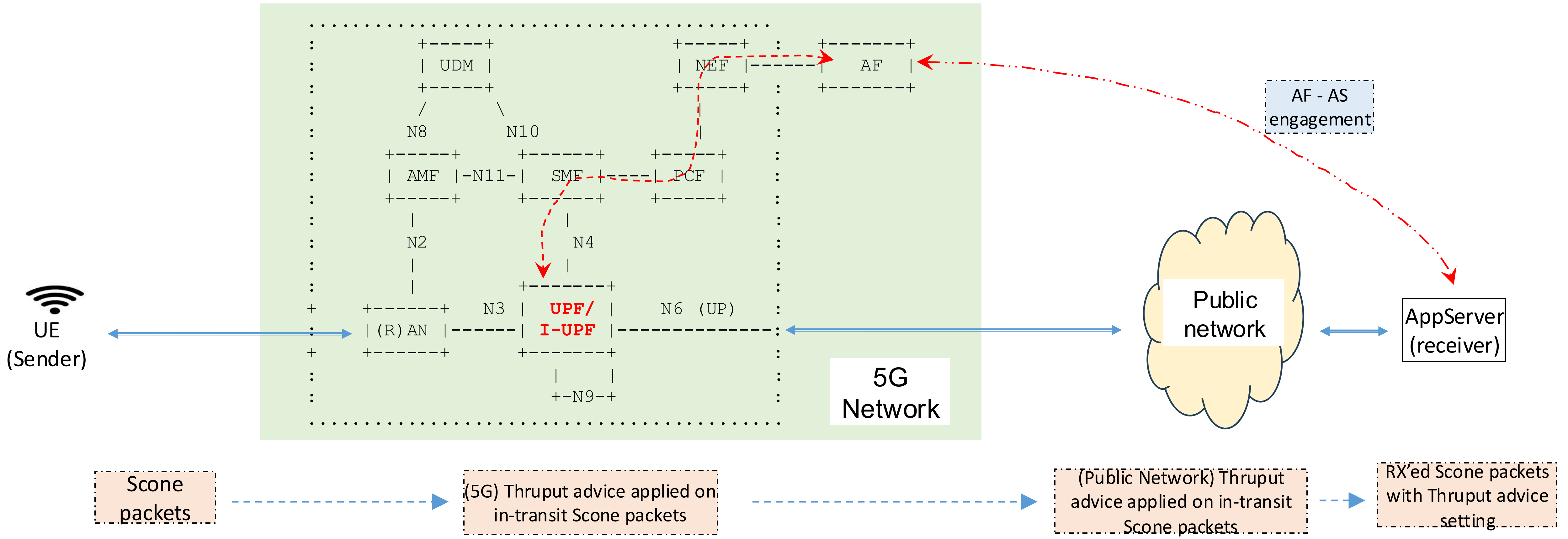
SCONE: End-to-end Architecture: 5GS + Public Network

- **SCONE**: For network elements (NEs) to signal the maximum sustained thruput or so-named 'thruput advice' to (UDP) flow senders (feedback'ed from the RX sides)
  - Detection, classification & setting at NEs w/ the per-flow granularity
  - Pre-provisioned (SCONE) policies on on-path NEs for 'thruput advice'
  - On-path NEs: Possibly the holistic impacts from all SCONE-capable on-path NEs for a flow
- **5G** wireless service (shown in the picture):
  - SCONE on-path NEs: over both 5G network ('wall-gardened') + Public network



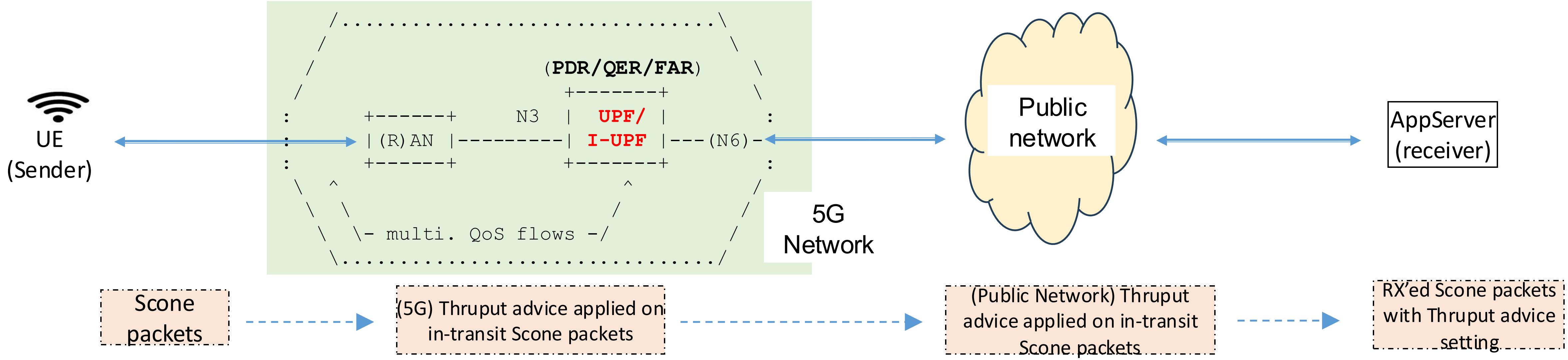
Interaction w/ SCONE: Realization in 5GS (1) – 5G CP/DP

- 5G control plane (CP) and data plane (DP)
- AS (AppServer) & AF engagement to send SCONE policies (or ‘thruput advice’) to NEs in a 5GS
- On-path NEs (i.e., UPFs) detect, classify and mark based on SCONE policies



SCONE Realization in 5GS (2): Traffic detection, identification & classification - PDU & PDU session

- In 5GS, senders (UEs) communicate with AppServers via PDU sessions (both UL and DL directions)
- Per QoS-flow granularity (multi QoS-flows in a PDU session)
- For SCONE: SDF filters w/ (static or dynamic) pre-provisioned policies (SDFs vs. IP/UDP flows)
- SCONE packets processing at UPFs (NEs): w/ **PDR** (packet detection rule), **QER** (QoS enforcement rule) and **FAR** (forward action rule)
    - Traffic detection: identification and classification matching filters configured at UPFs (NEs)
    - ‘Throughput advice' applied: policy to be provisioned and 'advice' to be set in the SCONE packet header at UPFs (NEs).



SCONE: Realization in 5GS (3) - Advantages

- Capabilities of achieving **dynamic provisioning & realization** at NEs (i.e., UPFs)
  - Dynamic provisioning: SCONE traffic filters and policies generated at AS; then transmit via an AF to the 5GS (i.e., *UPF or NE*); the AS-supplied policies can also be provided to end devices. This is a fully dynamic communication process.
  - On-demand 'throughput advice'/value settings: a UPF (or NE) may receive updated PDRs, QERs and FARs, thru which the UPF can apply the new throughput advice and value settings to the detected SCONE packets.
- 5G **high granularity**, particularly best if target at achieving the per-flow SCONE throughput advice.
  - UPFs (NEs) feature the SCONE support via PDU session with multiple QoS-flows
  - Per-flow requirement (i.e., high-granularity): though sort of challenging in the public network
- 5G effective SCONE **feedback mechanism**:
  - While the SCONE draft states an RX'er needs to feedback the rx'ed thruput advice to the corresponding flow TX'er, the same document <u>does not</u> define how that signaling occurs as it is specific to the application in use.
  - 5G AF may engage with AppServer (AS) to feedback the SCONE advice.
- Controllable implementation & '*wall-gardened*' **field deployment**, especially for the initial trial of the SCONE in the greenfield: So, the 5G network is an excellent use-case scenario.
  - 3GPP ever discussed the potential application of SCONE in the XRM Phase-3 SID proposal.

Summary: SCONE Realization in 5GS

- 5GS is a unique use case for the SCONE realization: w/ advantages
- Controlled implementation & wall-gardened field deployment for better ‘greenfield’ trial
- 3GPP discussed the potential application of SCONE in XRM Phase-3 SID proposal (rel-20)

So, do the SCONE WG consider this draft demonstrates an interesting & practical SCONE use case, along with its applications & requirements (as laid out via various advantages)?

Thank you!