# ATIC (5gangip) Road Map
# IETF 101 Side Meeting

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# Privacy Enabled Mapping System

- From where we came here:
  - Mobile systems since 2G (GPRS) have successfully used tunneling mainly GTP-U based
  - Without being proven inept it will continue in 5G
  - In view of new services (IoT) and trends (convergence) Identifier Locator systems offer a nice alternative revolutionary solution
  - That requires efficient Identifier-Locator maps for routing inside 5G architecture
  - That requires the privacy of end nodes (UEs) to be preserved

# Location Privacy

- UE has an unique Identifier (64-bit or longer)
- UE has an address based on its location
- UE is moving around and if its identifier is exposed then its location can be tracked
- UE is moving around and its address is changing so 5G architecture nodes should be able to route its packets optimally
- 5G architecture nodes, e.g. gNBs, UPFs need identifier locator maps to route the packet to the destination

gNB: NG-RAN node, UPF: User Plane Function as defined and specified by 3GPP

# Mapping System

- Is it a NoSQL non-relational datastore?
- Is it a DNS like distributed database?
- Key-value databases with very efficient writes in order to support handovers at 5G speeds
- Read/Write operations are called Publish/Subscribe or Pub/Sub
- Efficient Pub/Sub in modern No-Sql databases
- Or all these are implementation issues that we should not deal much?
- Maybe blockchain technology could help?

# Blockchains?

- The latest buzzword after cryptocurrencies captured the public imagination
-  Can a blockchain based mapping system be built?
- The answer seems to be yes, see this IETF 97 presentation on blockchain based mapping system for LISP
- [https://datatracker.ietf.org/meeting/97/materials/slides-97-lisp-blockchain-based-mapping-system/](https://datatracker.ietf.org/meeting/97/materials/slides-97-lisp-blockchain-based-mapping-system/)
- So blockchain could be an implementation technology

# Tradeoffs

- With Id-Loc systems, UE is in charge of its mobility, 5G architectural nodes do not deal with mobility – End node mobility

- Tradeoff: proxied mobility, 5G architectural elements deal with mobility

- In this case we need to consider proxy nodes and how they will act in view of Id-Loc system usage

# How to Define the Privacy?

- Is it address privacy, e.g. Tom Herbert's draft where quickly changing the UE address is considered as improving the privacy

- Is it related to the access to the mapping system? Consider not enabling public access and considering only access by authorized UEs or end systems?

- Other definitions (see draft-ietf-lisp-eid-anonymity-01 or the draft on multiple Identifiers per entity) …

- Consider all of them?

# Use Cases

- What are the use cases?
- How to deal with each?

# Control Plane

- Most Id-Loc systems address only the data plane, ILA is a good example

- Some have control plane defined, ILNP is an example

- None have control plane defined for the mapping system that we want to define and build

# Road Map Proposal for ATIC BOF

- Aim is to go for a BOF on end-to-end privacy enabled mapping system
- Documents planned:
- Problem statement: Define the problem to be solved, relate it to 5G architecture, address the importance of privacy
- Github will be used. We already created a new project called bsarikaya/atic
- Get a Github account, clone this project.
- Requirements: start with GTP tunneling long in use in 3GPP, derive the requirements for a mapping system for ID-Loc languages with end-to-end privacy
- Architecture: describe how the mapping system will be used by UE and by 5G architectural nodes

# Thank you.