

Distributed ENUM networking for interconnection

Session 4: Numbering, addressing and identification

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ITU-T SG11 activities on VoLTE/ViLTE interconnection

Workshop on Voice and Video Services Interoperability Over Fixed-Mobile Hybrid Environments, Including IMT-Advanced (LTE) (Geneva, 1 December 2015)

Current issues of interconnection of VoLTE-based networks:

- Roaming issues and scenarios
- Roaming charges
- Numbering/addressing
- Emergency services

Operators Challenges:

- different VoLTE interconnection/roaming solutions available
- vendors VoLTE solutions are not always interoperable
- VoLTE roaming procedures are not agreed and therefore may not be implemented

ITU-T SG11 outcomes:

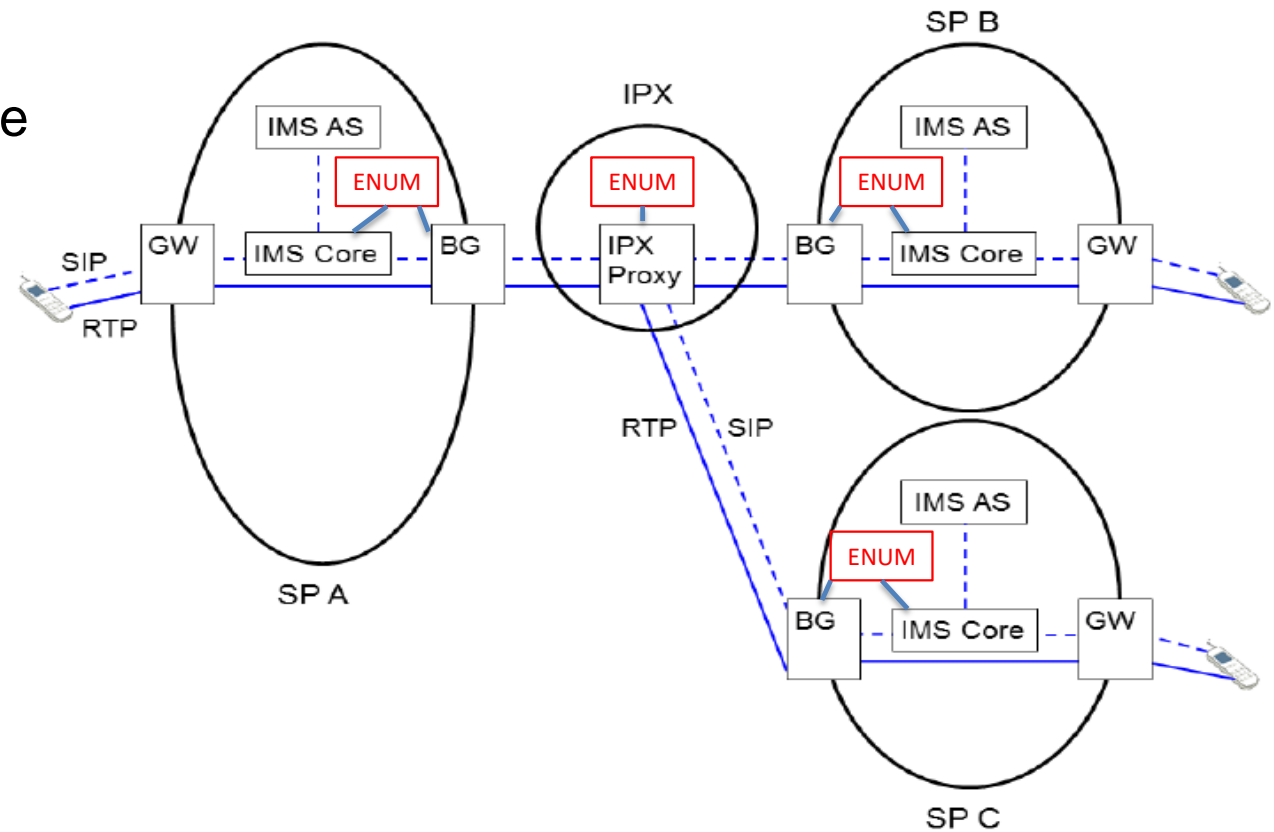
- Recommendation **ITU-T Q.3640**: Framework of interconnection of VoLTE/ViLTE-based networks
- Recommendation **ITU-T Q.3953**: VoLTE/ViLTE interconnection testing for interworking and roaming scenarios
- Supplement 69 to ITU-T Q-series Recommendations: Framework for interconnection between VoLTE-based network and other networks supporting emergency telecommunications service (ETS)

Ongoing activities on VoLTE interconnection:

- New draft Recommendation ITU-T Q.DEN_IMS: Signalling architecture of distributed ENUM networking for IMS
- New draft Recommendation ITU-T Q.Pro_DES: Protocol at interface between two distributed ENUM servers for IMS

The requirements of ENUM (E.164 Number Mapping) in IMS

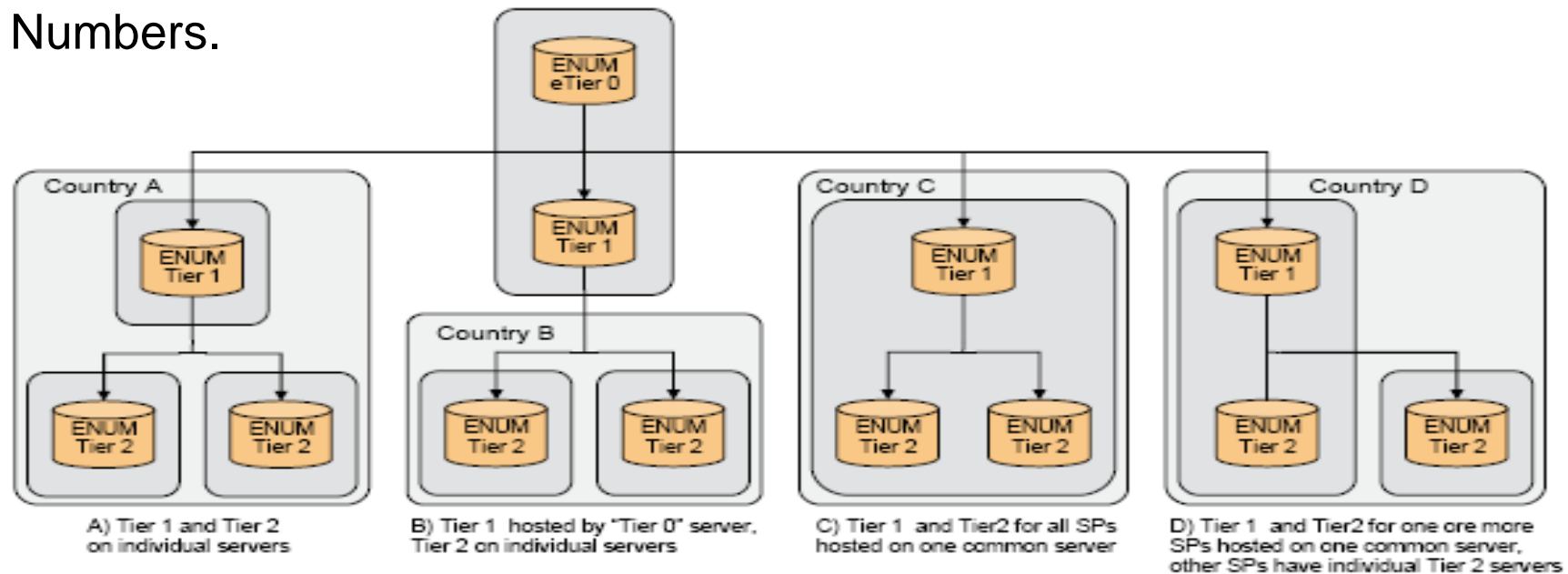
- Mapping the telephone number of the destination into an URI (Uniform Resource Identifier), which is a SIP phone number that clearly identifies the destination network



Note: take IPX Hubbing Model as an example

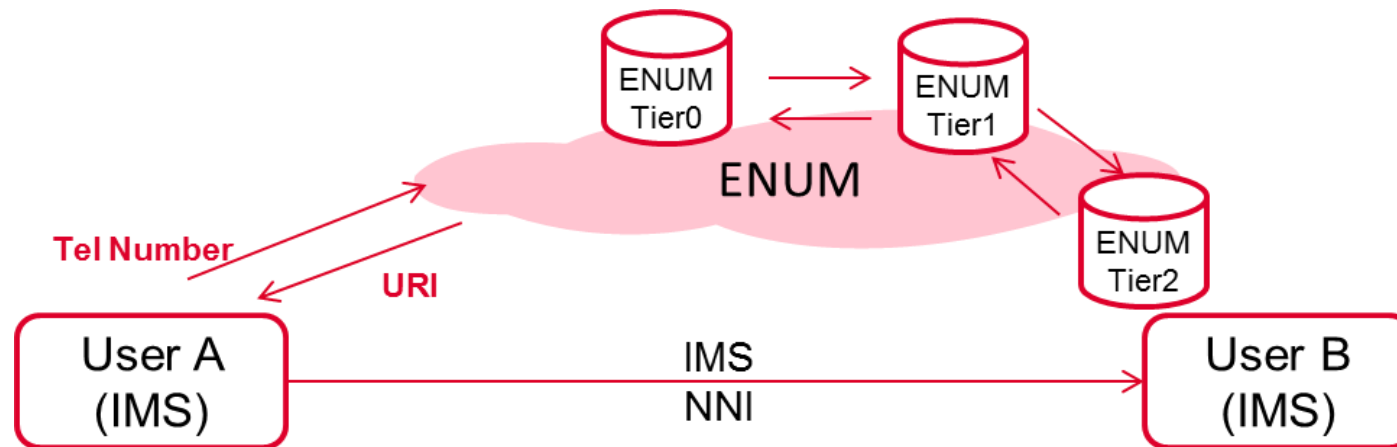
ENUM Hierarchical Model proposed in GSMA

- ❑ **Tier 0 : Global level**, authoritative for the ENUM top level domain. Under this domain are pointers to the Tier 1 authoritative servers.
- ❑ **Tier 1: Country Code level**, authoritative for ITU-T assigned E.164 country codes. Under this domain are pointers to the Tier 2 authoritative servers.
- ❑ **Tier 2:Service Provider level**, authoritative for National Destination Codes and individual Subscriber Numbers.



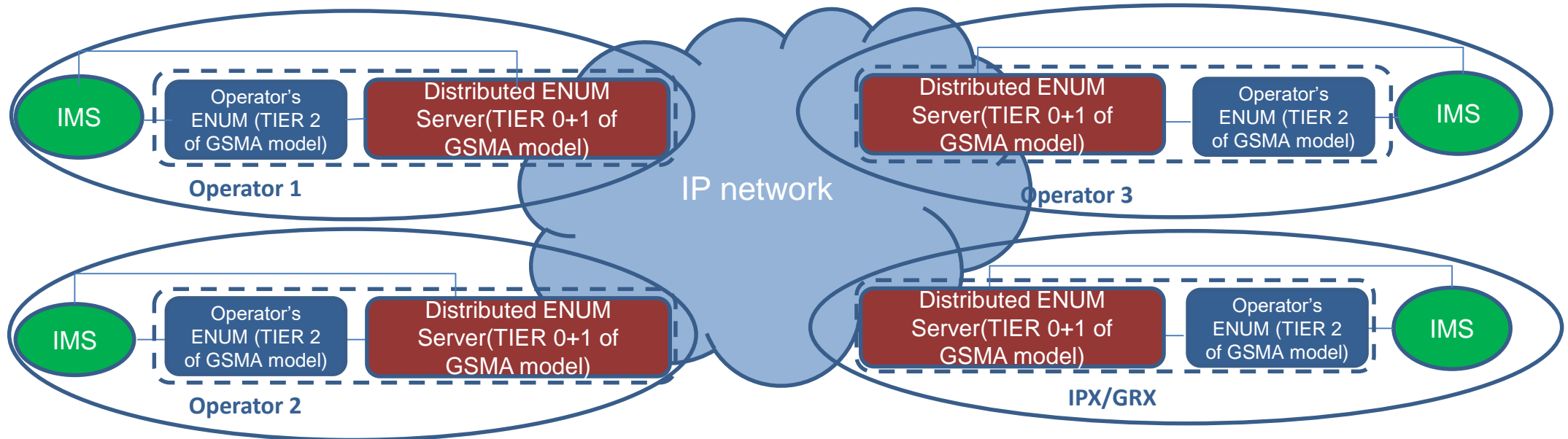
Key issues of ENUM Hierarchical Model for IMS interconnection

- ❑ It's difficult to estimate the processing capacity of a Tier 0&1 ENUM server which needs to be deployed by the third party
- ❑ there is no detailed timeline for deploying Tier 0 and Tier 1 ENUM servers, as it is quite complicated to involve third parties in setting up ENUM servers to provide ENUM query services for operators.
- ❑ **Security issue: Customer Data Exposure remains a real issue.** Opening of ENUM Tier2 (operator level) to external queries is not available, because some IMS operators do not intend to open ENUM servers to external queries for security reasons.



Proposed distributed ENUM model for IMS by ITU-T: ITU-T Q.DEN_IMS

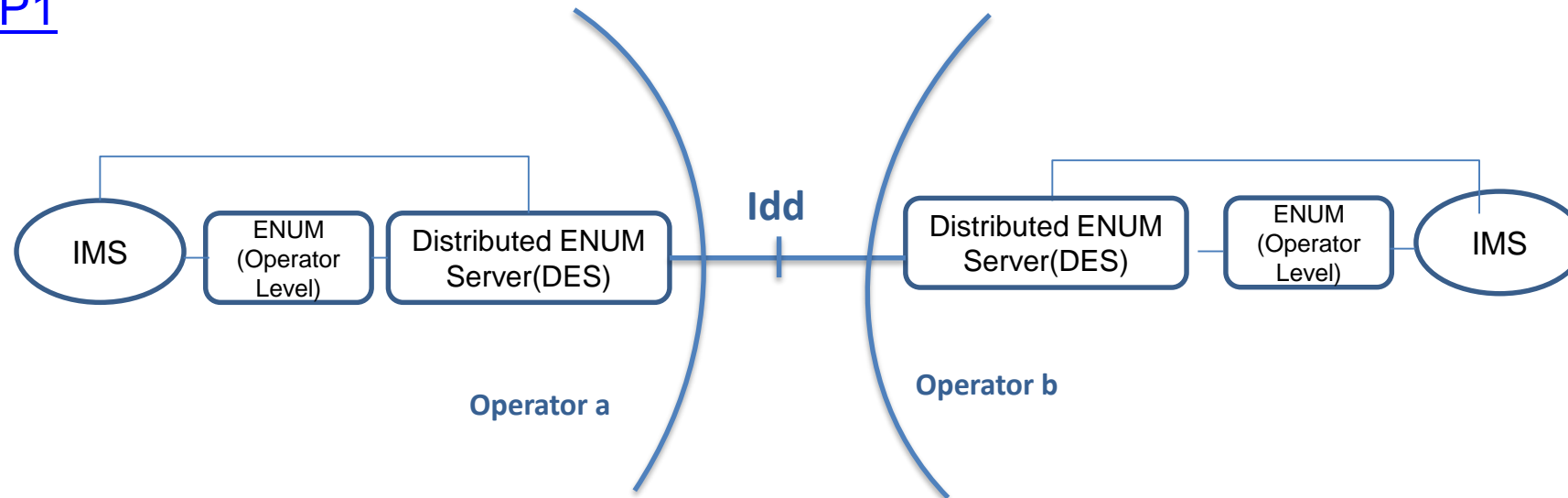
- To solve the issues of ENUM hierarchical model and speed up IMS interconnection deployment
- To introduce an **Distributed ENUM Server**, which will be deployed by operators, to establish a self-management distributed ENUM model in support of IMS interconnection.
- **Determine Q.DEN_IMS in Oct. 2019**, , the latest output can be found in [SG11-TD27/WP1](#)



Proposed protocols using in the distributed ENUM model

□ ITU-T Q.Pro_DES:

- To specify the protocols using at the interface Idd between two Distributed ENUM Servers (DES)
- To specify the messages and parameters in support of the self-management of the distributed ENUM model
- To sent Q.Pro_DES for onsent in July 2019, the latest output can be found in [SG11-TD36/WP1](#)



Strategic direction to be taken by ITU-T

- Keep close cooperation among SG11, SG2 and SG13 on this subject
- Invite all interested stakeholders to join our effort to improve the solution which can speed up the implementation of VoLTE/ViLTE interconnection
- Invite all ITU Members to deploy VoLTE/ViLTE interconnection using distributed ENUM system
- Collaborate with GSMA to promote the deployment of VoLTE/ViLTE interconnection

Questions for SGLA discussion

- Question 1: Are there any additional signalling and protocol requirements in terms of VoLTE/ViLTE interconnection?
- Question 2: Any suggestions on the cooperation with other SGs and SDOs on this subject?
- Question 3: Any comments on the TAP of Q.DEN_IMS?