

# evs | 27

The 27th INTERNATIONAL  
ELECTRIC VEHICLE  
SYMPOSIUM & EXHIBITION

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**19. November 2013**  
**Session 5C: Standardization**

## GLOBAL SERVICE PROVIDER FOR ELECTRIC VEHICLE ROAMING

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### What is roaming?

- the term originates from wireless telecommunications
- ➔ extension of connectivity service in a location that is different from the home location where the service was registered. Roaming enables to
- ➔ access services when travelling outside the geographical coverage area of the home network by means of using a visited network

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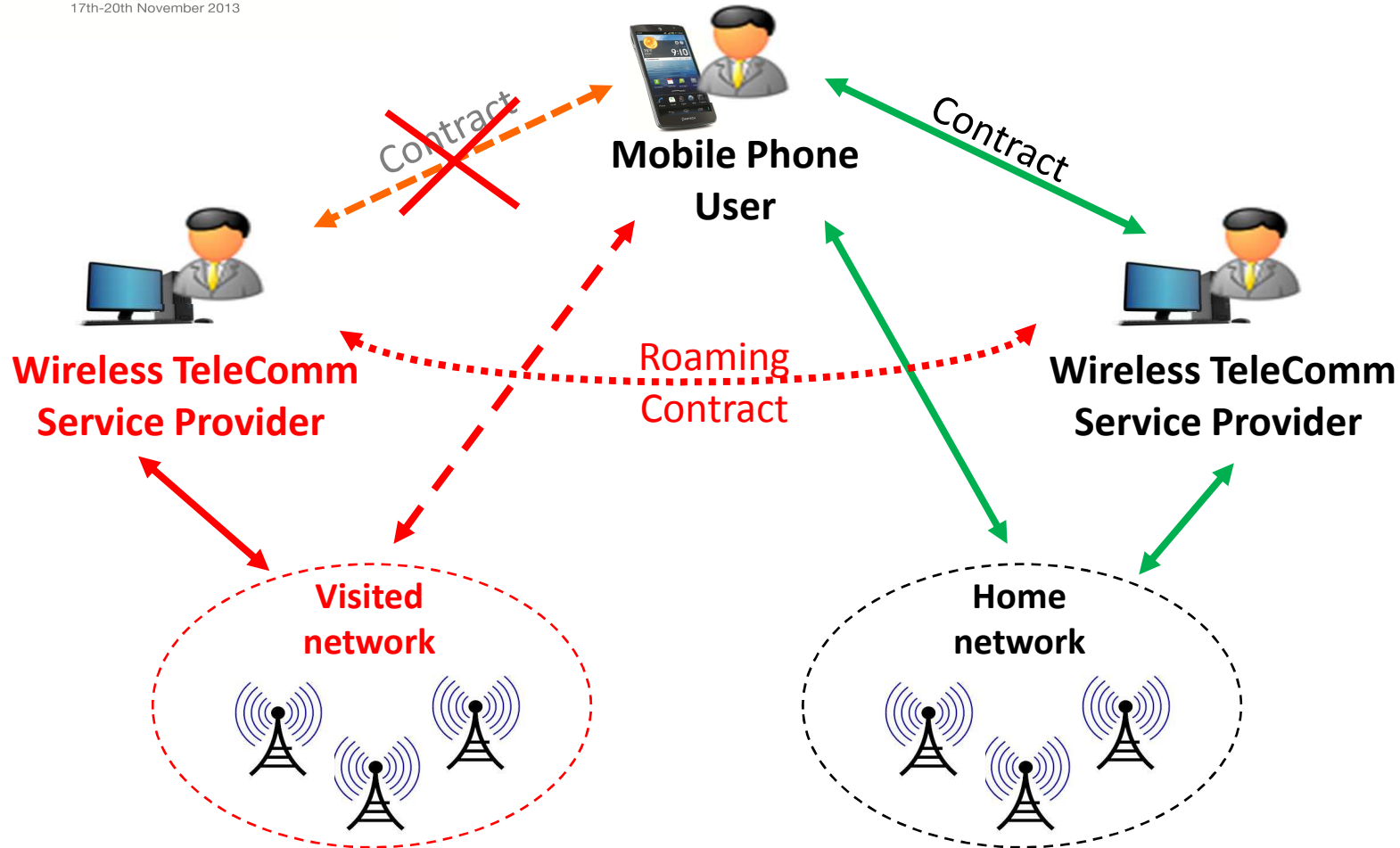


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## Global Service Provider for EV Roaming ROAMING IN TELECOMMUNICATIONS



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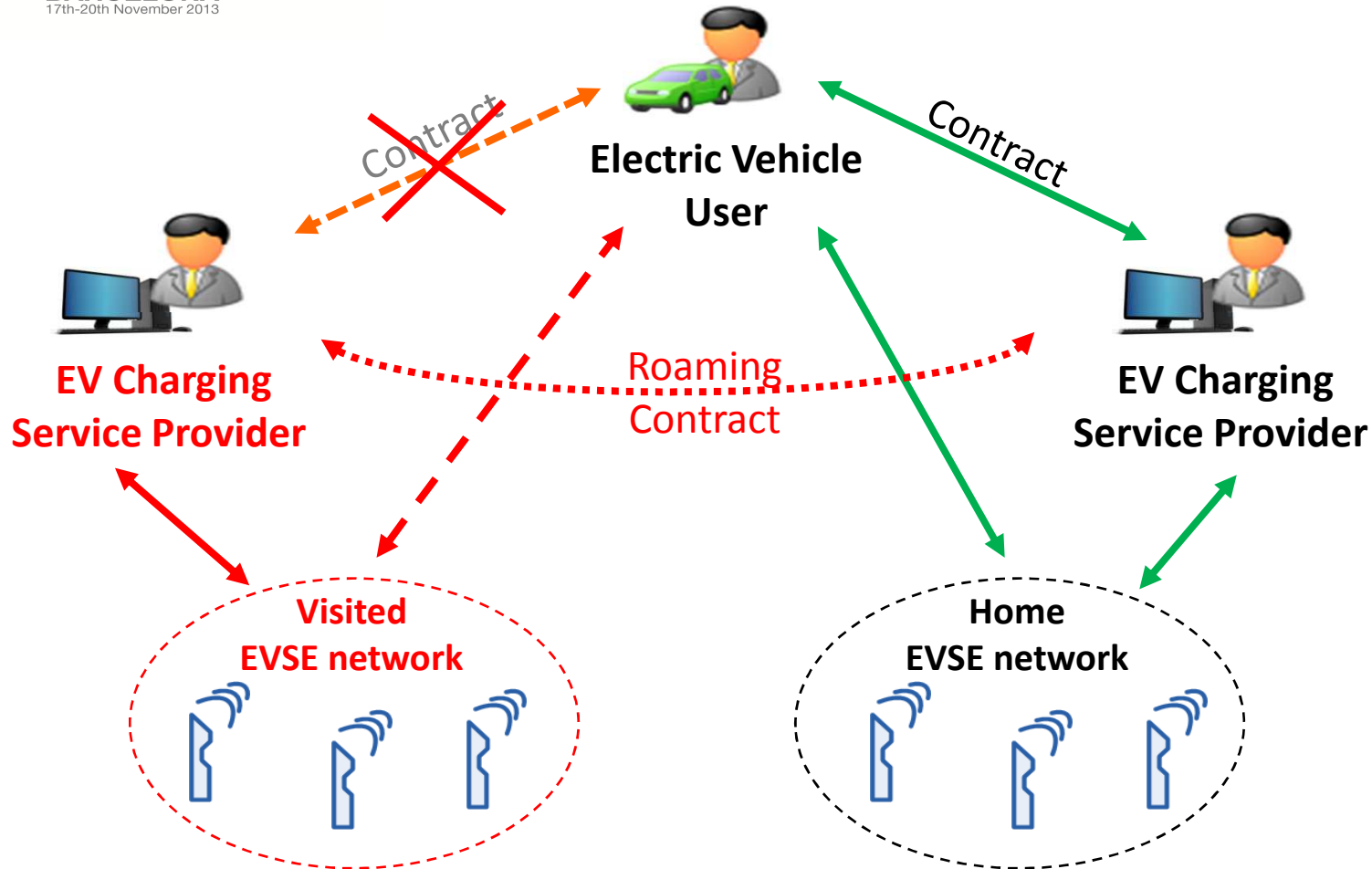


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## Global Service Provider for EV Roaming ROAMING IN ELECTRIC VEHICLE CHARGING



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## Global Service Provider for EV Roaming WHY ROAMING IN ELECTRIC MOBILITY?

- **Sufficient coverage with charging infrastructure operated by a single Charging Service Provider (CSP):**
  - not to be expected in large geographic areas
  - business approach of different CSPs
  - competition shall be enabled
- **Number of EVs and intensity of their use will increase**
- **Range of EVs will increase**

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## Global Service Provider for EV Roaming ACTORS IN ELECTRIC VEHICLE CHARGING

- **EV User:** charges the EV at Electric Vehicle Supply Equipment (EVSE)
- **Charging Service Provider (CSP):** operates the “home” network of Electric Vehicle Supply Equipment (EVSE) and makes contracts with EV Users

**Electric Mobility Service Provider (EMSP):** makes contracts with EV Users and EVSE Operator(s)

**EVSE Operator:** operates the EVSE and makes contracts with EMSPs to enable their EV Users to charge the EVs at its EVSE

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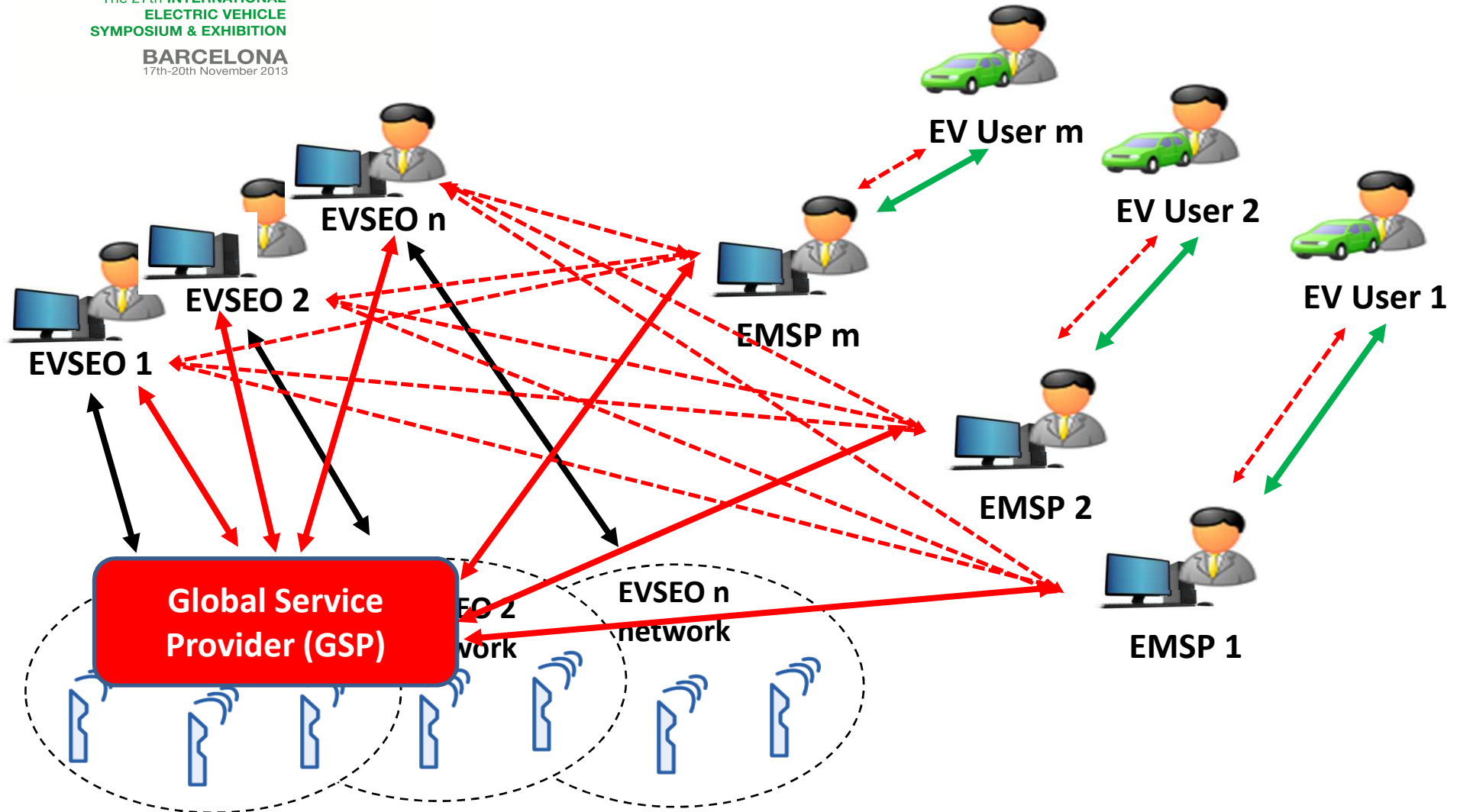


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## Global Service Provider for EV Roaming MULTIPLE EVSEOs AND EMSPs



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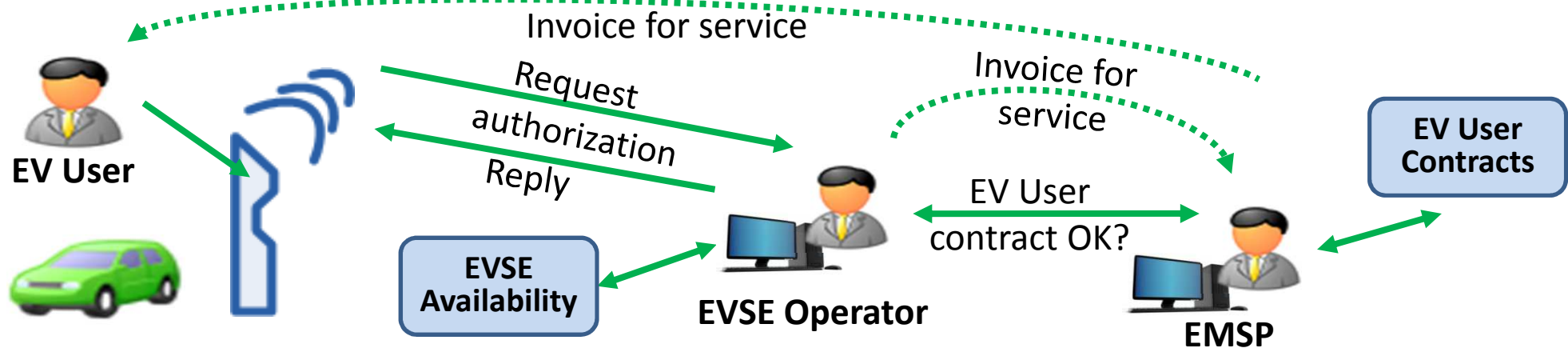


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- EV User's identification at EVSE
- Request for charging authorization: charging allowed?
  - Verification of EVSE availability
  - Verification of EV User's contract (on the "white list"?)
- Reply to EVSE: start / deny charging
- Stop charging → send invoice for service to EMSP



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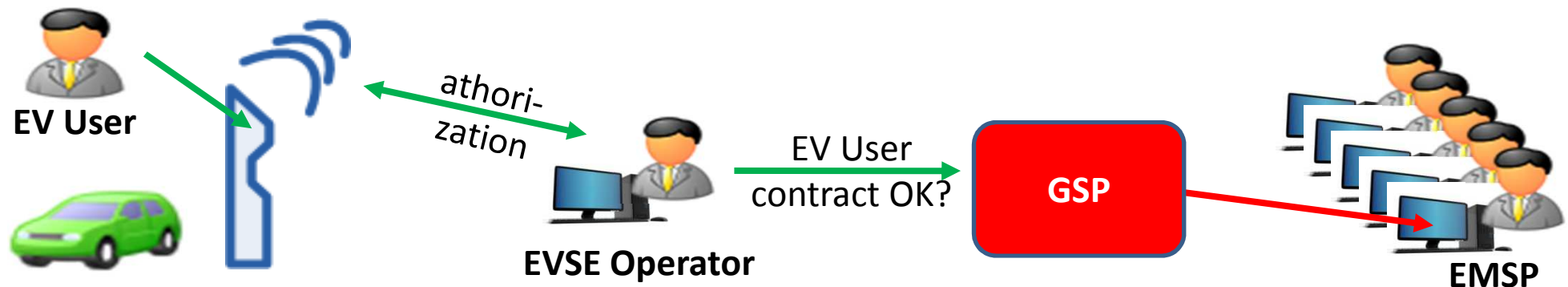


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- **Verification of EV User's contract: who is the EV user?**
  - The EV User and the EVSE Operator do not have a contract ! The EV User has a contract with EMSP
- **Who is the EV User's EMSP?**
  - The EVSEOs and the EMSPs do not have a direct contract ! They exercise the roaming services through the GSP



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- For identification of EV user several methods can be applied:

Method applied	EV User's identifier
RFID, NFC, communication EV-EVSE	EV User's ID determined by the EMSP
SMS, SmartPhone Apps	EV User's phone number
Credit, debit cards	Card's number
Pay-As-You-Go (on the spot payment)	No identification needed

- Only the first method enables the direct extraction of EMSP's identity from the EV User's identifier
- Other methods require introduction of "translation table" at the GSP to connect the EV Users' identifiers with their EMSPs

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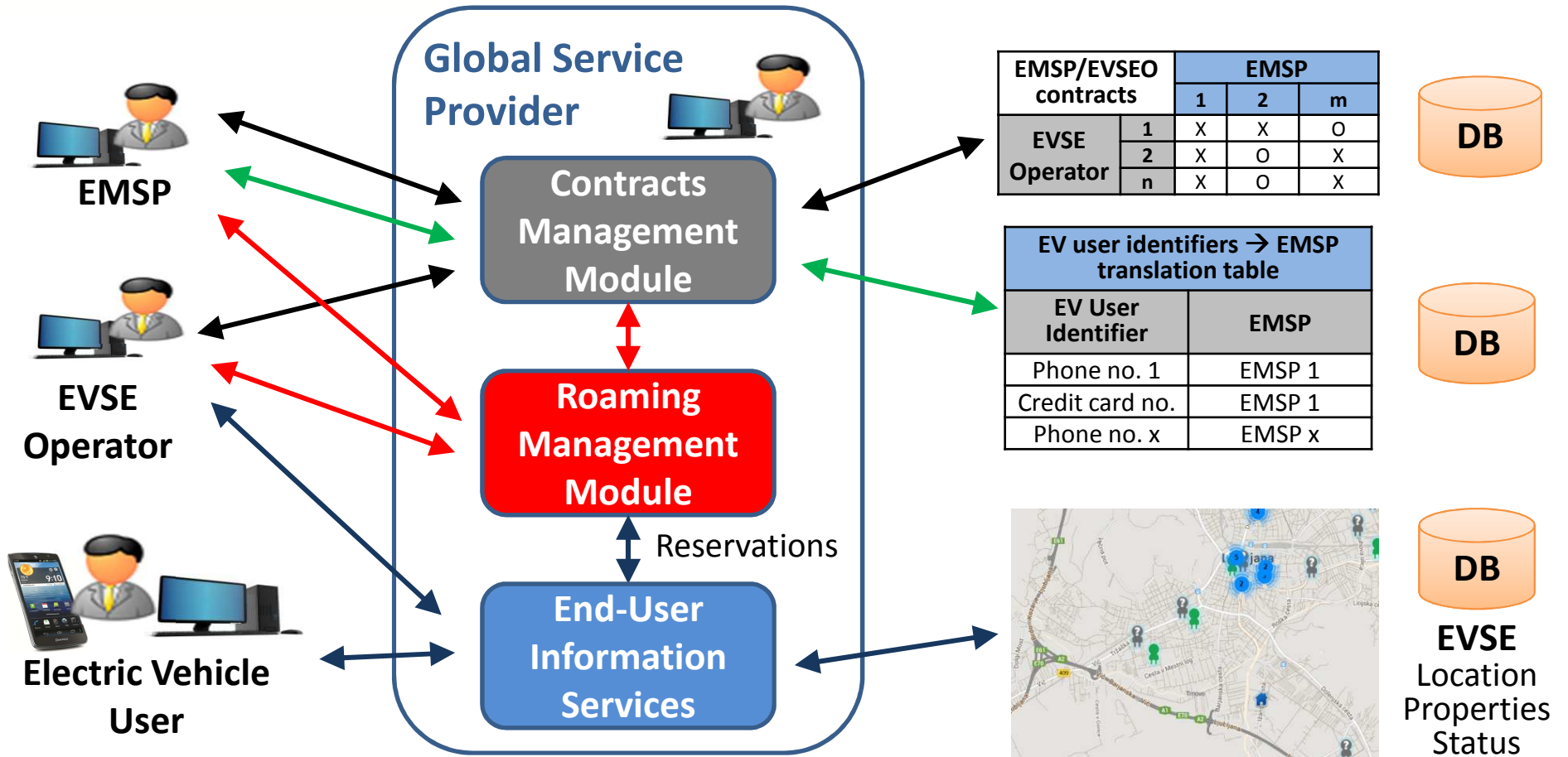
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### SW developed within the ICT4EVEU project



- **Implementation of hierarchical structure of GSP:**
  - A single GSP covers the actors (and EV User's) on a certain geographical area (region)
  - Higher level GSPs (national, international) may be introduced to connect different GSPs and enable roaming in wider area
- **Financial clearing:**
  - In the presented solution the billing procedures between the EVSEOs and EMSPs are executed on a bilateral level (not via the GSP)
  - In the future, the GSP may assume also a function of financial clearing and settlement
  - Upgrade of GSP's legal status needed (permission to execute financial activities)
  - Implementation of rigid security and safety standards in communication

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- **EV User's identifiers:**
  - The use of commonly agreed identification methods and structure of EV User's IDs would facilitate the interoperability between the different GSPs (regional, national, international)
  - The EV User's ID should be "world wide unique"
  - The EV User's ID should contain a unique EMSP code
  - With implementation of such IDs the EV Users – EMSPs translation tables are not needed (and also a storage of large amount of data on EV Users at different GSP levels)

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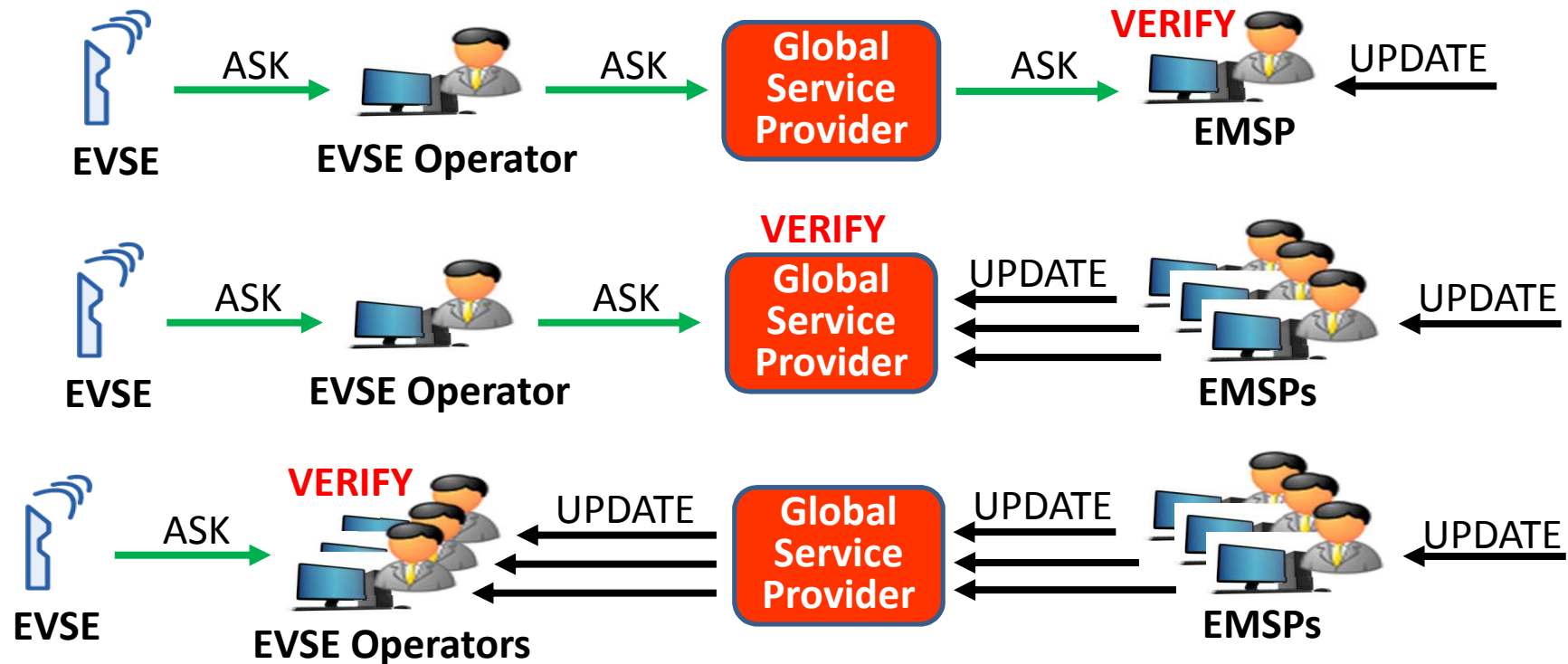


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- Verification of EV User's contract validity: where to store (and verify) the "contract status" data?



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