

COMMUNICATION NETWORK, COMMUNICATION NETWORK NODE, USER EQUIPMENT, METHOD

TECHNICAL FIELD

The present disclosure generally pertains to communication networks for providing a distributed ledger, communication networks, a user equipment, and methods for providing mobility as a service.

TECHNICAL BACKGROUND

Generally, it is known to distribute a ledger over multiple nodes such as entities, e.g. electronic devices, servers or the like, which record digital transactions. Distributed ledgers can be based on the known blockchain technology, on which, for example, the known cryptocurrency bitcoin is based, but also the well-known Ethereum project, etc. Generally, a distributed ledger may also be implemented on other technologies than the blockchain technology and examples of distributed ledger projects which are not based on blockchain are BigchainDB and IOTA or the like. For instance, IOTA is a crypto currency which uses linked lists.

Moreover, mobility as a service (MaaS) is known, where a user or passenger uses mobility as a service without owing, for example, a car or the like. Mobility as a service may combine public (e.g. train, bus, etc.) and private (e.g. car sharing, bicycle sharing, etc.) transportation services from associated operators or providers.

Known MaaS solutions typically involve a central and unified gateway through which a trip or journey is planned and booked, wherein a user may pay with a single account.

Although there exist techniques for providing a distributed ledger and mobility as a service, it is generally desirable to provide a communication network node, a user equipment, a communication network and a method for providing mobility as a service.

SUMMARY

According to a first aspect, the disclosure provides a communication network for providing a distributed ledger comprising a plurality of network nodes comprising circuitry configured to: provide a passenger profile of a passenger to a roaming mobility service provider in response to a booking request from a terminal device of a traveler who has a service contract with a home mobility service provider; request the passenger profile of the passenger from the home mobility service provider and receive the passenger profile of the passenger; and provide passenger information based on the passenger profile to a transport operator for allowing the passenger to use a mobility service of the roaming mobility service provider.

According to a second aspect, the disclosure provides a method for controlling a communication network for providing a distributed ledger comprising: providing a passenger profile of a passenger to a roaming mobility service provider in response to a booking request from a terminal device of a traveler who has a service contract with a home mobility service provider; request the passenger profile of the passenger from the home mobility service provider and receive the passenger profile of the passenger; and providing passenger information based on the passenger profile to a transport operator for allowing the passenger to use a mobility service of the roaming mobility service provider.

Disclosed herein is a communication network node comprising circuitry configured to: provide a credential of a passenger based on a decentralized identifier of the passenger, wherein the credential is generated in a decentralized database based on a request to the decentralized database, wherein the request is issued in the communication network node; and transmit the credential to a user equipment for allowing a passenger to use a mobility service of a roaming mobility service provider.

Disclosed herein is a method for controlling a communication network node comprising: providing a credential of a passenger based on a decentralized identifier of the passenger, wherein the credential is generated in a decentralized database based on a request to the decentralized database, wherein the request is issued in the communication network node; and transmitting the credential to a user equipment for allowing a passenger to use a mobility service of a roaming mobility service provider.

Disclosed herein is a user equipment comprising circuitry configured to: receive at least one credential of a plurality of credentials in response to a request of a transport operator to the user equipment, wherein the request of the transport operator is based on a booking request of a roaming mobility service provider for a passenger to the transport operator; and transmit the at least one credential to the transport operator for allowing the passenger to use a mobility service of the transport operator.

Disclosed herein is an electronic network node comprising circuitry configured to: verify at least one credential of a passenger in response to a request of the passenger to use a mobility service of a roaming mobility service provider, wherein the verifying is based on an enquiry of a distributed ledger.

Disclosed herein is a method for controlling an electronic network node comprising: verifying at least one credential of a passenger in response to a request of the passenger to use a mobility service of a roaming mobility service provider, wherein the verifying is based on an enquiry of a distributed ledger.

Disclosed herein is an electronic network node comprising circuitry configured to: select at least one credential of a plurality of credentials in response to a request of a user equipment; and transmit the

at least one credential to the user equipment for allowing the passenger to use a mobility service of the transport operator.

Disclosed herein is a method for controlling an electronic network node comprising: selecting at least one credential of a plurality of credentials in response to a request of a user equipment; and transmitting the at least one credential to the user equipment for allowing the passenger to use a mobility service of the transport operator.

Further aspects and embodiments are set forth in the following description and the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments are explained by way of example with respect to the accompanying drawings, in which:

Fig. 1 depicts a simplified OAuth 2.0 protocol;

Fig. 2 depicts a roaming mobility service method according to the present disclosure;

Fig. 3 depicts a method for a booking of a roaming mobility service according to the present disclosure;

Fig. 4 depicts a method for a booking of a roaming mobility service based on a DID based credential;

Fig. 5 depicts a method for a booking of a mobility service of a roaming mobility service provider;

Fig. 6 depicts a Merkle tree;

Fig. 7 depicts a blockchain and its general data structure;

Fig. 8 illustrates an input and output of a hash function;

Fig. 9 exemplarily illustrates the process PBFT;

Fig. 10 depicts an embodiment of a general purpose computer; and

Fig. 11 depicts an embodiment of a user equipment and of an electronic network node.

DETAILED DESCRIPTION OF EMBODIMENTS

Before a detailed description of the embodiments under reference of Fig. 2 is given, general explanations are made.

In terms of MaaS, a credential for proving a passenger's authorization to use a mobility service, is often provided by a third party.

CLAIMS

1. A communication network for providing a distributed ledger comprising a plurality of network nodes comprising circuitry configured to:
 - provide a passenger profile of a passenger to a roaming mobility service provider in response to a booking request from a terminal device of a traveler who has a service contract with a home mobility service provider;
 - request the passenger profile of the passenger from the home mobility service provider and receive the passenger profile of the passenger; and
 - provide passenger information based on the passenger profile to a transport operator for allowing the passenger to use a mobility service of the roaming mobility service provider.
2. The communication network of claim 1, wherein the distributed ledger is based on a blockchain.
3. The communication network of claim 1, wherein the passenger profile includes personal data.
4. The communication network of claim 3, wherein the passenger information is indicative of the personal data.
5. The communication network of claim 1, wherein the passenger information includes at least one of name, date of birth, gender, and passport information of the passenger.
6. A method for controlling a communication network for providing a distributed ledger comprising:
 - providing a passenger profile of a passenger to a roaming mobility service provider in response to a booking request from a terminal device of a traveler who has a service contract withwith a home mobility service provider;

requesting the passenger profile of the passenger from the home mobility service provider and receiving the passenger profile of the passenger; and

providing passenger information based on the passenger profile to a transport operator for allowing the passenger to use a mobility service of the roaming mobility service provider.