Claims

1. A network management entity for providing a customized virtual wireless network, the system comprising:

a service-oriented virtual network auto-creation (SONAC) (302) module executed by a computing device that is connected to a wireless network, the SONAC module configured to receive service requirement data from
the wireless network and create a service customized virtual network (VN) according to the service requirement data, the service requirement data describing one or more service requirements;

wherein the SONAC module comprises an interface to interact with:

a software-defined topology (SDT) (504) component, the SDT component used by the SONAC module to determine a service customized logical topology;

a software-defined resource allocation (SDRA) (506) component that maps the logical topology to physical network resources within the wireless network,; and

a software-defined protocol (SDP) (508) component that determines an end-to-end data transport protocol for communication between a first device and a second device via the wireless network **characterized by** the SONAC module being coupled to a management plane via a management plane application programming interface (M-API), wherein the SONAC entity defines a management plane service topology and wherein the management plane performs at least one of connectivity management, customer service management, infrastructure management, content and forwarding management, and data analysis management.

2. The network management entity of claim 1, wherein the network management entity includes the SDT, the SDRA, and the SDP components.

3. The network management entity of claim 1, wherein the SONAC module is configured to interface with at least one of a service and an application via an application programming interface (API) to initiate or update a service-customized virtual network (SCVN) according to a customer requirement.

4. The network management entity of claim 1, wherein the SONAC module is configured to automatically update the service customized VN via a control plane-user plane (C-U) interface.

5. The network management entity of claim 4, wherein the service customized VN is updated via a virtual service specific serving gateway (v-s-SGW) in a user plane via the C-U interface.

6. A method in a network device for providing a customized virtual wireless network, the method comprising:

receiving, by a service-oriented virtual network auto-creation (302) (SONAC) module executed by a computing device that is connected to a wireless network, service requirement data representing one or more service requirements; and

creating a service customized virtual network (VN) according to the service requirement data, wherein creating the service customized VN comprises determining a service-customized logical topology, mapping the determined logical topology to physical network resources, and determining an end-to-end data transport protocol
for use by entities in the logical topology in accordance with the availability of the physical network resources;

characterized by the SONAC module being coupled to a management plane via a management plane application programming interface (M-API), wherein the SONAC entity defines a management plane service topology and wherein the management plane performs at least one of connectivity management, customer service management, infrastructure management, content and forwarding management, and data analysis management.

7. The method of claim 6, wherein determining the service-customized logical topology comprises communicating with a network functions virtualization (NFV)-enabled network node (NN) management component to request creation of the logical functions.

8. The method of claim 6, further comprising instantiating or terminating a virtual and service-specific serving gateway (SGW) in response to receiving service requirement data for a machine-to-machine (M2M) service.

9. The method of claim 6, further comprising associating a virtual user equipment (UE) specific serving gateway (SGW) in response to receiving service requirement data for a registered UE.

10. The method of claim 6, further comprising creating a virtual user connectivity manager for a user equipment (UE) in response to receiving service requirement data for the UE.

11. A network node, comprising:

a processor(2704); and

a non-transitory computer readable storage medium (2706) storing programming for execution by the processor, the programming including instructions to:

receive, from a service-oriented virtual network auto-creation (SONAC) module, service requirement data representing one or more service requirements; and

create a service customized virtual network (VN) according to the service requirement data, wherein the

instructions to create the service customized VN comprises instructions to: determine a service-customized logical topology, map the determined logical topology to physical network resources, and determine an end-to-end data transport protocol for use by entities in the logical topology in accordance with the availability of the physical network resources;

characterized by the SONAC module being coupled to a management plane via a management plane application programming interface (M-API), wherein the SONAC entity defines a management plane service topology and wherein the management plane performs at least one of connectivity management, customer service management, infrastructure management, content and forwarding management, and data analysis management.