WHAT IS CLAIMED IS:

1. A method comprising:

mapping, by a software defined topology (SDT) module, a service-level topology for a service to a service-specific data plane logical topology for a network having a plurality of physical network nodes, the mapping comprising:

receiving service parameters for the service;

selecting according to the service parameters, the service-level topology, and a physical infrastructure of the plurality of physical network nodes, a node in the plurality of physical network nodes at which to locate a logical network node in the service-specific data plane logical topology, wherein the logical network node comprise a respective software defined entity;

defining connections among the logical network nodes according to the service parameters, the service-level topology, and the physical infrastructure;

defining respective connections for a plurality of user equipments, UEs, to at least one of the logical network nodes according to the service parameters, the service-level topology, and the physical infrastructure; and

defining respective functionalities for the logical network nodes; and

after the mapping, providing the service-specific data plane logical topology to a software defined network, SDN, module for physical resource mapping.

2. The method of Claim 1 wherein the receiving the service parameters includes receiving service requirements from one of at least one of a customer for the service and a provider of the service.

3. The method of Claim 1 wherein the defining connections among the logical network nodes includes defining respective data rates for each logical connection.

4. The method of Claim 1 further comprising providing the respective functionalities to a software defined protocol, SDP, module for configuring the logical network nodes.

5. The method of Claim 1 wherein the logical network nodes comprise at least one service-specific virtual serving gateway, v-s-SGW and the locating comprises defining the at least one v-s-SGW for the service within the service-specific data plane logical topology according to the physical infrastructure, the service-level topology, and the service parameters, wherein the service includes machine-to-machine communication wherein the machine-to-machine communications optionally comprises communication between at least two UEs from the plurality of UEs.

6. The method of Claim 5wherein the logical network nodes comprise at least one service-specific virtual server for the service within the service-specific data plane logical topology according to the physical infrastructure, the service-level topology, a distribution of the UEs, and the service parameters, wherein the UEs comprise customers of the service.

7. The method of Claim 1 wherein the logical network nodes comprise at least one of:

logical content container nodes and the locating includes defining the logical content container nodes for content dissemination into the network according to the service parameters and the service-level topology, wherein the service parameters include quality of service (QoS) requirements, traffic statistics, and content request statistics; and

comprise a first user-specific virtual serving gateway, v-u-SGW, and the locating includes defining the first v-u-SGW for a UE among the plurality of UEs according to the physical infrastructure, the service parameters, and the service-level topology, wherein the service parameters include service quality of experience (QoE) requirements and location and mobility of the UE

8. The method of Claim 7 wherein the locating includes selecting source nodes from the logical content container nodes for content delivery to at least one UE among the plurality of UEs according to a requested content and the at least one UE.

9. The method of Claim 7 wherein the locating further comprises defining a second v-u-SGW for the UE when the UE moves to a new location.

10. The method of Claim 1 further comprising:

identifying service traffic flows from the connections among the logical network nodes that need a rate adjustment;

determining respective adapted rates for the service traffic flows according to respective location and mobility of the plurality of UEs and network congestion; and

determining a link capacity requirement according to the respective adapted rates and a quality of experience (QoE) for the service.

11. The method of Claim 1 further comprising:

activating compression for at least one connection from the connections among the logical network nodes and the respective connections for the plurality of UEs;

identifying service traffic flows over the at least one connection that need compression according to network congestion; and

selecting a compression scheme for the service traffic flows.

12. The method of Claim 1 wherein the respective functionalities include message aggregation.

13. A communication system, comprising:

a non-transitory memory storage comprising instructions including a control plane software defined topology (SDT) module; and

one or more processors in communication with the memory, wherein the one or more processors execute the control plane SDT module for:

mapping a service-level topology for a service to a service-specific data plane logical topology for a network having a plurality of physical network nodes, the mapping comprising:

receive service parameters for the service,

selecting, by the control plane SDT module, according to the service parameters, the service-level topology, and a physical infrastructure of the plurality of physical network nodes, a node in the plurality of physical network nodes at which to locate a logical network node in the service-specific data plane logical topology, wherein the logical network node comprise a respective software defined entity;

define connections among the logical network nodes according to the service parameters, the service-level topology, and the physical infrastructure,

define respective connections for a plurality of user equipments (UEs) to at least one of the logical network nodes according to the service parameters, the service-level topology, and the physical infrastructure, and

define respective functionalities for the logical network nodes; and

after the mapping, providing the service-specific data plane logical topology to a software defined network (SDN) module for physical resource mapping.

14. The communication system of Claim 13 wherein the service parameters include at least one of quality of experience (QoE) requirements, UE capabilities, service traffic characteristics, and network traffic load predictions.

15. The communication system of Claim 13 wherein the control plane SDT module comprises a top-level SDT module configured to control and manage a plurality of lower-level SDT modules.

16. The communication system of Claim 15 wherein the plurality of lower-level SDT modules are allocated according to the physical infrastructure.

17. The communication system of Claim 13 wherein the SDT module is configured to perform at least one of:

receiving the service parameters from a customer for the service

and

providing the functionalities to a software defined protocol (SDP) module for configuring the logical network nodes.