CLAIMS

1. A computer implemented method for transmitting data packets associated with an application to a data server over a network, the method comprising:

transmitting the data packets to the data server over a network connection, the network connection including a first plurality of devices in the network that the data packets traverse to reach the data server, wherein a network stack initiates the network connection in response to a request by the application;

receiving, at a library integrated with the network stack, a functionality requirement for the network connection; and

in response to receipt of the functionality requirement, instructing the network stack to transmit a control packet that indicates the functionality requirement and instructs a network controller to configure the communications network to provide the functionality requirement by determining a second network connection, the second network connection comprising a second plurality of devices in the network and a service provider that serves the functionality requirement, wherein the data packets traverse the second network connection to reach the data server.

2. The method of claim 1, further comprising:

transmitting the control packet to a forwarding device in the network, wherein the forwarding device adds authentication information to the control packet and receives the transmitted data packets for sending to the data server over the network connection.

3. The method of claim 2, wherein the control packet is transmitted while the data packets are transmitted.

4. The method of claim 2, further comprising:

adding an address of a functionality module to the control packet, wherein the functionality module is connected to the network; and

forwarding the control packet with authentication information to the functionality module, wherein the functionality module instructs the network controller to configure the network, based on the control packet, to determine the second network connection.

5. The method of claim 1, further comprising:

receiving, by a functionality module in a forwarding device, the control packet;

instructing, by the functionality module using the control packet, the network controller to determine the second network connection to provide the functionality requirement.

6. The method of claim 1, wherein the functionality requirement is received through another application being operated by a user.

7. The method of claim 1, wherein the functionality requirement is received from a user before the application begins transmitting the data packets over the network connection.

8. The method of claim 1, wherein the functionality requirement is received through another application being operated by a user while the data packets are being transmitted over the network connection.

9. The method of claim 1, further comprising:

receiving, by the library , a second functionality requirement for the network connection; and

in response to receiving the second functionality requirement, transmitting another control packet, such that the another control packet indicates the functionality requirement and the second functionality requirement for the network connection.

10. The method of claim 1, further comprising:

receiving, by the library and from a second application using the network connection, a second functionality requirement for the network connection; and

transmitting another control packet that indicates the functionality requirement and the second functionality requirement for the network connection and instructs the network to provide both.

11. The method of claim 1, further comprising:

periodically retransmitting the control packet until receipt of a termination request from the application for terminating the network functionality,

wherein when no control packet is transmitted for a time period, the network controller reconfigures the network to no longer provide the functionality requirement.

12. A system for transmitting data packets associated with an application, from a user device configured to run the application using a network stack, over a network connection to a data server, the system comprising:

a library module, implemented on a first computing device, configured to:

receive a functionality requirement for the network connection that the network stack initiated in response to a request by the application wherein the network connection comprises a first plurality of devices in a network that the data packets traverse to reach the data server;

in response to receipt of the functionality requirement, notify the network stack to transmit a control packet that indicates the functionality requirement;

a second computing device connected to the first computing device via the network; and

a functionality module, implemented on the second computing device, configured to, based on the control packet, instruct a network controller to configure the network to provide the functionality requirement by determining a second network connection, the second network connection comprising a second plurality of devices in the network and a service provider that serves the functionality requirement,

wherein the data packets traverse the second network connection to reach the data server.

13. The system of claim 12, wherein the network stack is further configured to transmit the control packet while transmitting the data packets.

14. The system of claim 12 further comprising a forwarding device configured to:

receive the control packet;

receive the data packets transmitted from the application for sending over the network connection; and

add authentication information to the control packet.

15. The system of claim 14, wherein the forwarding device is further configured to:

forward the control packet with authentication information to the functionality module connected to the network; and

add an address of the functionality module to the control packet.

16. The system of claim 15, wherein the forwarding device is located at an edge of the network and is connected to the user device on a local area network.

17. The system of claim 12, further comprising a forwarding device configured to receive the control packet, wherein the forwarding device comprises a second functionality module configured to, based on the control packet, instruct the network controller to configure the network to provide the functionality requirement for the network connection.

18. The system of claim 12, wherein the library module is further configured to:

receive, from a second application using the network connection, another functionality requirement for the network connection;

in response to receiving the second functionality requirement, notify the network stack to transmit another control packet that indicates the functionality requirement and the another functionality requirement for the network connection and

instructs the network controller to reconfigure the network to provide the functionality requirement and the another functionality requirement.

19. The system of claim 12, wherein:

the library module is further configured to:

notify the network stack to periodically retransmit the control packet until receipt of a termination request from the application for terminating the network functionality;

the functionality module further configured to:

when no control packet retransmission is received for a time period, instruct the network controller to reconfigure the network to no longer provide the functionality requirement.

20. The system of claim 12, wherein the network is a private service provider network and the data server is connected to the network through another public network.

21. A program storage device tangibly embodying a program of instructions executable by at least one machine to perform a method for transmitting data packets associated with an application to a data server over a network, the method comprising:

transmitting the data packets to the data server over a network connection, the network connection including a first plurality of devices in the network that the data packets traverse to reach the data server, wherein the network connection is initiated by a network stack in response to a request by the application;

receiving at a library integrated with a network stack a functionality requirement for a network connection; and

in response to receiving the functionality requirement, transmitting a control packet, wherein the control packet indicates the functionality requirement of the application and instructs a network controller to configure the network to provide the functionality requirement by determining a second network connection, the second network connection comprising a second plurality of devices in the network and a service provider that serves the functionality requirement, wherein the data packets traverse the second network connection to reach the data server

22. A computer implemented method for transmitting data packets associated with an application over a network, the method comprising:

transmitting the data packets to a data server via a network connection, wherein the network connection comprises a first plurality of devices in the network

receiving, at a library integrated with a network stack, of a functionality requirement for the network connection that the network stack initiated in response to a request by the application; and

in response to receipt of the functionality requirement, transmitting, from the library, a control packet that indicates the functionality requirement and instructs a functionality module to create a second network connection, the second network connection comprising a second plurality of devices and a service provider that serves the functionality requirement, wherein the data packets traverse the second network connection to reach the data server.