CLAIMS

What is claimed is:

1. A computing system, comprising:

a host device, comprising:

a processor;

a memory coupled with and readable by the processor, wherein the memory is configured to store a user application; and

a network adapter device configured to communicate with a network;

wherein the host device is configured to:

execute the user application, wherein the user application is configured to:

determine a destination address for a set of data, wherein the destination address identifies a server on the network;

determine an address handle for the destination address, wherein the address handle is an index for reading a memory of the network adapter device, wherein the memory of the network adapter device is operable to store a plurality of transport contexts;

provide the set of data and the address handle to the network adapter device;

and wherein the network adapter device is configured to:

identify, using the address handle, a transport context from the plurality of transport contexts maintained in the memory of the network adapter device, wherein a transport service is assigned to the transport context, the transport service providing a protocol for transmitting packets to the server identified by the destination address, and, wherein the transport context maintains a state of packets transmitted to the server identified by the destination address;

generate a packet, wherein the packet includes at least a portion of the set of data, wherein the transport context provides data for generating the packet, and wherein the packet is addressed to the destination address; and

transmit the packet over the network.

2. The computing system of claim 1, wherein the host device is further configured to execute a driver program, and wherein the user application is further configured to, upon being unable to determine the address handle for the destination address:

request the address handle from the driver program, wherein the request includes the destination address;

and wherein the driver program is configured to:

determine the address handle for the destination address using an address map; and

provide the address handle to the user application.

3. The computing system of claim 2, wherein the driver program is further configured to:

determine that the address map does not include the destination address; and

provide the destination address to the network adapter device;

wherein the network adapter device is further configured to:

generate the transport context for a new communication channel, wherein generating the transport context includes assigning the destination address to the transport context;

store, using the address handle, the transport context in the memory of the network adapter device;

provide the address handle to the driver program; and

establish the new communication channel with the server identified by the destination address;

and wherein the driver program is further configured to:

store the destination address in the address map using the address handle.

4. An apparatus, comprising:

a processor; and

a memory coupled with and readable by the processor, wherein the memory is configured to store a plurality of transport contexts;

wherein the apparatus is configured to:

receive a set of data and destination information identifying a destination on a network for the set of data; and

determine, using the destination information, a transport context from the plurality of transport contexts, wherein a transport service is assigned to the transport context, the transport service providing a protocol for transmitting packets between the apparatus and the destination on the network, and wherein the transport context maintains a state of packets transmitted to the destination on the network; and

use the transport service to send the set of data to the destination on the network.

5. The apparatus of claim 4, wherein the apparatus is further configured to:

generate a packet including at least a portion of the set of data; and

transmit the packet over the network, wherein the packet is transmitted according to the protocol provided by the transport service.

6. The apparatus of claim 4, wherein the destination information comprises an address handle, and wherein the apparatus is further configured to:

determine, using the address handle, a network address map object from a plurality of address map objects stored in the memory, wherein the address map object provides a data structure for storing information for transport context in the memory.

7. The apparatus of claim 6, wherein the network address map object includes a pre-generated packet header.

8. The apparatus of claim 6, wherein the apparatus is further configured to:

receive a request for a new address handle, wherein the request includes the destination information;

identify, using the destination information, the network address map object;

generate the new address handle, wherein the new address handle is an index in the memory for storing the network address map object; and

return the new address handle.

9. The apparatus of claim 6, wherein the apparatus is further configured to:

receive a request for a new address handle, wherein the request includes new destination information;

upon determining that the plurality of transport contexts does not include a transport context for the new destination information:

generate a new transport context for a new communication channel;

generate a new network address map object, wherein the network address map object is a data structure for storing information for the new transport context in the memory;

generate the new address handle, wherein the new address handle is an index for storing the new network address map object in the memory; and

return the new address handle.

10. The apparatus of claim 9, wherein the apparatus is further configured to, upon determining that the plurality of transport contexts does not include a transport context for the new destination information, establish a new communication channel with a new destination on the network that is identified by the new destination information.

11. The apparatus of claim 9, wherein generating a new network address map object includes generating a packet header using the new destination information, wherein the packet header is stored as part of the new network address map object.

12. The apparatus of claim 4, wherein the apparatus is further configured to establish a communication channel with a destination on the network that is identified by the destination information.

13. The apparatus of claim 4, wherein the destination information comprises a network address.

14. The apparatus of claim 4, wherein the destination information comprises a flow identifier.

15. The apparatus of claim 4, wherein the destination on the network is on a server on the network.

16. The apparatus of claim 4, wherein the destination on the network is associated with one or more Internet Protocol addresses.

17. The apparatus of claim 4, wherein the destination on the network is associated with Internet Protocol address and a communication endpoint identifier.

18. The apparatus of claim 4, wherein the set of data includes a sequence identifier, the sequence identifier indicating a sequence of the set of data with respect to other sets of data from a same application, and wherein the apparatus is configured to:

generate a packet including at least a portion of the set of data and the sequence identifier;

transmit the packet over the network, wherein the packet is transmitted according to the protocol provided by the transport service; and

monitor status for the packet.

19. The apparatus of claim 4, wherein the apparatus is a network adapter device.

20. The apparatus of claim 4, wherein the apparatus includes a system-on-chip (SoC), a field-programmable gate array (FPGA), or an application-specific integrated circuit (ASIC).

21. The apparatus of claim 4, further comprising an integrated circuit configured to perform operations for the transport service.

22. The apparatus of claim 21, where the operations include sending the set of data to the destination on the network.

23. The apparatus of claim 21, wherein the integrated circuit executes firmware to perform the operations.

24. A method, comprising:

receiving, by a network adapter device, a set of data and destination information identifying a destination on a network for the set of data; and

determining, using the destination information, a transport context from a plurality of transport contexts, wherein a transport service is assigned to the transport context, the transport service providing a protocol for transmitting packets over the network to the destination on the network, and wherein the transport context maintains a state of packets transmitted to the destination on the network; and

using the transport service to send the set of data to the destination on the network.

25. The method of claim 24, further comprising:

generating a packet including at least a portion of the set of data; and

transmitting the packet over the network, wherein the packet is transmitted according to the protocol provided by the transport service.

26. The method of claim 24, wherein the destination information comprises an address handle, and further comprising:

determining, using the address handle, a network address map object from a plurality of address map objects stored in a memory of the network adapter device, and wherein the address map object provides a data structure for storing information for the transport context in the memory.

27. The method of claim 26, further comprising:

receiving, by the network adapter device, a request for a new address handle, wherein the request includes the destination information;

identifying, using the destination information, the network address map object;

generating the new address handle, wherein the new address handle is associated with the network address map object; and

returning the new address handle.

28. The method of claim 26, further comprising:

receiving, by the network adapter device, a request for a new address handle, wherein the request includes new destination information;

upon determining that the plurality of transport contexts does not include a transport context associated with the new destination information:

generating a new transport context, for a new communication channel; and

establishing the new communication channel with a new destination on the network that is associated with the new destination information;

generating a new network address map object, wherein the network address map object is associated with the new transport context;

generating the new address handle, wherein the new address handle is associated with the new network address map object; and

return the new address handle.