

What is claimed is:

1. A system comprising:

a first computer system (221) in a first local service provider network (202-1), wherein the first computer system is configured to:

(i) receive (602) a source address of a first stream of data packets, and

(ii) assign (603) a first Internet Protocol (IP) address to the first stream of data packets, wherein the first IP address is selected from a first non-empty pool of IP addresses that are allocated only to fulfilling a predefined service, between a first computer network (111-1) and a second computer network (111-2), the predefined service comprising a deterministic routing of the first stream of data packets through a predefined plurality of networking devices (305, 306, 307) within a backbone network (311), such that the first stream of data packets are processed by a program executing on at least one networking device (301) before being provided to an end user at the second computer network (111-2),

wherein the first computer system is configured to assign the first IP address based on

a) the source address belonging to the first computer network (111-1) that is subscribed to the predefined service and

b) a destination address of the first stream of data packets belonging to the second computer network (111-2) that is also subscribed to the predefined service, and

wherein the first local service provider network provides the first computer network with connectivity to the Internet,

wherein the predefined plurality of networking devices (305, 306, 307) are configured to route the first stream of data packets within the backbone network, when received from the first local service provider network, to a second local service provider network (202-2) based on the first IP address being assigned to the first stream and in accordance with the predefined service, wherein the second local service provider network provides the second computer network with connectivity to the Internet,

wherein the at least one networking device (301)

is external to the first local service provider network (202-1) and the second local service provider network (202-2), and

is a non-participant of the predefined service.

2. The system of claim 1 wherein the first and second computer networks (111-1, 111-2) are of the same business enterprise that is subscribed to the predefined service.

3. The system of claim 1 or 2 further comprising a second computer system (222) in the second local service provider network (202-2), wherein the second computer system is configured to:

(i) receive (611) the first IP address as part of a stream of data packets incoming to the second provider network; and

(ii) assign (612) a second IP address to the incoming stream of data packets, wherein the second IP address is selected from a second non-empty pool of IP addresses that are allocated only to fulfilling the predefined service, wherein the second computer system is configured to assign the second IP address based on determining the first IP address as being allocated only to the predefined service.

4. The system of claim 3 wherein the first computer system (221) is further configured to:

(i) allocate (501) a first set of IP addresses only to the predefined service; and

(ii) announce (502) the first set of IP addresses in accordance with the Border Gateway Protocol (BGP) such that the first set of IP addresses is propagated via at least one of the plurality of networking devices (305, 306, 307) to the second local service provider network (202-2); and

wherein the second computer system (222) is further configured to add (506) the first set of IP addresses, when received, to the second pool of IP addresses.

5. The system of claim 3 or 4 wherein the second computer system (222) is further configured to:

(i) allocate (511) a second set of IP addresses only to the predefined service; and

(ii) announce (512) the second set of IP addresses in accordance with the Border Gateway Protocol (BGP) such that the second set of IP addresses is propagated via at least one of the plurality of networking devices (305, 306, 307) to the first local service provider network (202-1); and

wherein the first computer system (221) is further configured to add (518) the second set of IP addresses, when received, to the first pool of IP addresses.

6. The system of claim 5 wherein the first computer system (221) is configured to allocate the first set of IP addresses and the second computer system (222) is configured to allocate the second set of IP addresses independently of each other.

7. The system of any of claims 1-6 wherein at least one networking device (301) that is unaware of the predefined service is situated between the first local service provider network (202-1) and the plurality of networking devices (305, 306, 307), and

wherein the first local service provider network is configured to route (604) the first stream of data packets to a destination address that is based on an IP address of at least one of the plurality of networking devices.

8. A method comprising:

receiving (602), by a first computer system (221) in a first local service provider network (202-1), a source address of a first stream of data packets; and

assigning (603), by the first computer system, a first Internet Protocol (IP) address to the first stream of data packets, wherein the first IP address is selected from a first non-empty pool of IP addresses that are allocated only to fulfilling a predefined service between a first computer network (111-1) and a second computer network (111-2), the predefined service comprising a deterministic routing of the first stream of data packets through a predefined plurality of networking devices (305, 306, 307) within a backbone network (311), such that the first stream of data packets are processed by a program executing on at least one networking device (301) before being provided to an end user at the second computer network (111-2), wherein the at least one networking device (301) is external to the first local service provider network (202-1) and the second local service provider network (202-2), and is a non-participant of the predefined service,

wherein the assigning of the first IP address is based on

a) the source address belonging to the first computer network (111-1) that is subscribed to the predefined service and

b) a destination address of the first stream of data packets belonging to the second computer network (111-2) that is also subscribed to the predefined service, and

wherein the first local service provider network provides the first computer network with connectivity to the Internet;

routing the first stream of data packets, by the predefined plurality of networking devices (305, 306, 307) within the backbone network when received from the first local service provider network, to a second local service provider network (202-2) based on the first IP address being assigned to the first stream and in accordance with the predefined service, wherein the second local service provider network provides the second computer network with connectivity to the Internet.

9. The method of claim 8 wherein the first and second computer networks (111-1, 111-2) are of the same business enterprise that is subscribed to the predefined service.

10. The method of claim 8 or 9 further comprising:

receiving (611), by a second computer system (222) in the second local service provider network (202-2), the first IP address as part of a stream of data packets incoming to the second provider network; and

assigning (612), by the second computer system, a second IP address to the incoming stream of data packets, wherein the second IP address is selected from a second non-empty pool of IP addresses that are allocated only to fulfilling the predefined service, wherein the assigning of the second IP address is based on the second computer system determining the first IP address as being allocated only to the predefined service.

11. The method of claim 10 further comprising:

allocating (501), by the first computer system (221), a first set of IP addresses only to the predefined service;

announcing (502), by the first computer system, the first set of IP addresses in accordance with the Border Gateway Protocol (BGP) such that the first set of IP addresses is propagated via at least one of the plurality of networking devices (305, 306, 307) to the second local service provider network (202-2); and

adding (506), by the second computer system (222), the first set of IP addresses when received to the second pool of IP addresses.

12. The method of claim 10 or 11 further comprising:

allocating (511), by the second computer system (222), a second set of IP addresses only to the predefined service;

announcing (512), by the second computer system, the second set of IP addresses in accordance with the Border Gateway Protocol (BGP) such that the second set of IP addresses is propagated via at least one of the plurality of networking devices (305, 306, 307) to the first local service provider network (202-1); and

adding (518), by the first computer system (221), the second set of IP addresses when received to the first pool of IP addresses.

13. The method of claim 12 wherein the first computer system (221) allocates the first set of IP addresses and the second computer system (222) allocates the second set of IP addresses independently of each other.

14. The method of any of claims 8-13 wherein at least one networking device (301) that is unaware of the predefined service is situated between the first local service provider network (202-1) and the plurality of networking devices (305, 306, 307); and further comprising routing (604), by the first local service provider network, the first

stream of data packets to a destination address that is based on an IP address of at least one of the plurality of networking devices.

15. A system comprising:

a first computer system (221) in a first local service provider network (202-1), wherein the first computer system is configured to:

(i) allocate (501) a first set of IP addresses only to fulfilling a predefined service, wherein the predefined service is between a first computer network (111-1) and a second computer network (111-2), the predefined service comprising a deterministic routing of a first stream of data packets through a predefined plurality of networking devices (305, 306, 307) within a backbone service provider network (311), such that the first stream of data packets are processed by a program executing on at least one networking device (301) before being provided to an end user at the second computer network (111-2), wherein the at least one networking device (301) is external to the first local service provider network (202-1) and the second local service provider network (202-2), and is a non-participant of the predefined service,

(ii) announce (502) the first set of IP addresses in accordance with a Border Gateway Protocol (BGP) such that the first set of IP addresses is propagated to a second local service provider network (202-2) via the backbone service provider network (311),

(iii) receive (602) a source address of the first stream of data packets, and

(iv) assign (603) a first Internet Protocol (IP) address to the first stream of data packets, wherein the first IP address is selected from a first non-empty pool of IP addresses that are allocated only to fulfilling the predefined service and that comprises the first set, wherein the first computer system is configured to assign the first IP address based on a) the source address belonging to the first computer network (111-1) that is subscribed to the predefined service and b) a destination address of the first stream of data packets belonging to a second computer network (111-2) that is also subscribed to the predefined service; and

the second computer system (222) in the second local service provider network (202-2), wherein the second computer system is configured to:

(i) allocate (511) a second set of IP addresses only to fulfilling the predefined service,

(ii) announce (512) the second set of IP addresses in accordance with the Border Gateway Protocol (BGP) such that the second set of IP addresses is propagated to the first local service provider network via the backbone service provider network;

wherein the first local service provider network is configured to route the first stream of data packets to the second local service provider network (202-2) via the

backbone service provider network based on the first IP address being assigned to the first stream and in accordance with the predefined service.

16. The system of claim 15 further comprising a plurality of networking devices (305, 306, 307) that constitute the backbone service provider network (311) and that are configured to route the first stream of data packets within the backbone network, when received from the first local service provider network (202-1), to the second local service provider network (202-2) based on the first IP address being assigned to the first stream and in accordance with the predefined service.

17. The system of claim 15 or 16 wherein the second computer system (222) is further configured to add (506) the first set of IP addresses, when received, to a second non-empty pool of IP addresses that also comprises the second set of IP addresses.

18. A method comprising:

allocating (501), by a first computer system (221) in a first local service provider network (202-1), a first set of IP addresses only to fulfilling a predefined service between a first computer network (111-1) and a second computer network (111-2), the predefined service comprising a deterministic routing of a first stream of data packets through a predefined plurality of networking devices (305, 306, 307) within a backbone service provider network (311), such that the first stream of data packets are processed by a program executing on at least one networking device (301) before being provided to an end user at the second computer network (111-2), wherein the first local service provider network provides the first computer network with connectivity to the Internet;

announcing (502), by the first computer system, the first set of IP addresses in accordance with a Border Gateway Protocol (BGP) such that the first set of IP addresses is propagated to a second local service provider network (202-2) via the backbone service provider network (311);

receiving (602), by the first computer system, a source address of a first stream of data packets;

assigning (603), by the first computer system, a first Internet Protocol (IP) address to the first stream of data packets, wherein the first IP address is selected from a first non-empty pool of IP addresses that are allocated only to fulfilling the predefined service, wherein the first computer system is configured to assign the first IP address based on

a) the source address belonging to the first computer network (111-1) that is subscribed to the predefined service and

b) a destination address of the first stream of data packets belonging to the second computer network (111-2) that is also subscribed to the predefined service;

allocating (511), by a second computer system (222) in the second local service provider network (202-2), a second set of IP addresses only to fulfilling the predefined service, wherein the first computer system allocates the first set of IP addresses and the second computer system allocates the second set of IP addresses independently of each other;

announcing (512), by the second computer system, the second set of IP addresses in accordance with the Border Gateway Protocol (BGP) such that the second set of IP addresses is propagated to the first local service provider network via the backbone service provider network; and

routing (604), by the first local service provider network, the first stream of data packets to the second local service provider network via the backbone service provider network, based on the first IP address being assigned to the first stream and in accordance with the predefined service.

19. The method of claim 18 further comprising a plurality of networking devices (305, 306, 307) that constitute the backbone service provider network (311) and that are configured to route the first stream of data packets, when received from the first local service provider network (202-1), to the second local service provider network (202-2) based on the first IP address being assigned to the first stream and in accordance with the predefined service.

20. The method of claim 18 or 19 wherein the second computer system (222) is further configured to add (506) the first set of IP addresses, when received, to a second non-empty pool of IP addresses that also comprises the second set of IP addresses.