

WHAT IS CLAIMED IS:

1. A method for communicating between a vehicle and a remote application server, said method comprising:

receiving at a computer system (100, 220) an application message transmitted from a vehicle (205);

determining by the computer system (100, 220) whether the application message should be forwarded to a remote application server (210) that provides a remote software application (225) associated with the application message; and

redirecting the application message to a local software application (315) executed by the computer system (100, 220) when the application message should not be forwarded.

2. A method in accordance with Claim 1, wherein the local software application (315) stores data included in the application message, said method further comprising, after said redirecting the application message:

establishing an uplink connection with the remote application server (210); and

synchronizing the stored data with the remote software application (225) provided by the remote application server.

3. A method in accordance with any of Claim 1 or 2, further comprising forwarding the application message to the remote application server (210) when it is determined that the application message should be forwarded to the remote application server (210).

4. A method in accordance with Claim 3, wherein receiving an application message comprises receiving an application message transmitted from the vehicle (205) using a first communication standard, and forwarding the application message comprises forwarding the application message using a second communication standard.

5. A method in accordance with Claim 3, wherein the application message is a first application message of a plurality of application messages, said method further comprising:

assigning a priority to the first application message; and

forwarding the first application message before forwarding a second application message of the plurality of application messages, based at least in part on the priority assigned to the first application message and a priority assigned to the second application message.

6. A method in accordance with Claim 1, wherein determining whether the application message should be forwarded to the remote application server (210) comprises determining whether a local software application (315) corresponding to the remote software application (225) is executed by the computer system (100, 220).

7. A method in accordance with any of Claims 1 to 6, wherein determining whether the application message should be forwarded to the remote application server comprises determining whether an uplink connection can be established between the computer system (100, 220) and the remote application server (210).

8. A gateway device for use in communicating between a vehicle and a remote application server, said device comprising:

a vehicle communications unit (110, 240) configured to receive an application message from a computer system (100, 220) onboard a vehicle (205), wherein the application message is associated with a destination corresponding to a remote application server (210) that provides a remote software application (225);

a processor unit (104) coupled to said vehicle communications unit (110, 240) and programmed to:

execute a local software application (315) corresponding to the remote software application;

determine whether the application message should be forwarded to the remote application server (210); and

redirect the application message to the local software application (315) when the application message should not be forwarded to the remote application server (225),

wherein the local software application (315) interacts with the computer system (100, 220) in a manner that is indistinguishable from the manner in which the remote software application (225) interacts with the computer system.

9. A gateway device in accordance with Claim 8, further comprising a wide area network (WAN) communications unit (110, 245) configured to forward the application message to the remote application server (210) when the application message should be forwarded to the remote application server (210).

10. A gateway device in accordance with Claim 9, wherein the application message is a first application message of a plurality of application messages, and said WAN communications unit (110, 245) is further configured to forward each application message of the plurality of application messages to the remote application server (210) corresponding to the application message when an uplink connection can be established with the corresponding remote application server (210).

11. A gateway device in accordance with Claim 10, wherein said processor unit (104) is further programmed to:

assign a priority to each application message of the plurality of application messages based on a destination associated with the application message; and

forward the application messages assigned a first priority before forwarding the application messages assigned a second priority that is less than the first priority.

12. A gateway device in accordance with any of Claims 8-11, wherein said vehicle communications unit (110, 240) is configured to receive the application message at least in part by receiving vehicle sensor data.

13. A gateway device in accordance with any of Claims 8-12, further comprising:

a storage device, wherein the local software application (315) updates data in said storage device in response to the redirected application message; and

a wide area network (WAN) communications unit (110, 245) configured to:

establish an uplink connection with the remote application server (210) after the local software application (315) updates the data; and

transmit the updated data to the remote application server (210).

14. A gateway device in accordance with any of Claims 8-13, wherein the local software application (315) is a first local software application (315) that corresponds to a first remote software application (225), and said processor unit (104) is further programmed to:

execute the first local software application (315) in a first virtual machine (325);

execute a second local software application (315) corresponding to a second remote software application (225) in a second virtual machine (325);

determine whether application messages should be forwarded to a second remote application server (210) that provides the second remote software application (225); and

redirect, to the second local software application (315), application messages associated with a destination corresponding to the second remote application server (210) when application messages should not be forwarded to the second remote application server (210).

15. A gateway device in accordance with any of Claims 8-14, wherein:

the application message is a first application message received from a first computer system (100, 220) onboard a first vehicle (205);

said vehicle communications unit (110, 240) is further configured to receive a second application message from a second computer system (100, 220) onboard a second vehicle (205), the second application message associated with the destination corresponding to the remote application server (210); and

said processor unit (104) is further programmed to redirect the second application message to the local software application (315) when the second application message should not be forwarded to the remote application server (210).

16. One or more computer readable media having computer-executable components, said components comprising:

a local software application component (320) that when executed by at least one processor unit (104) causes the at least one processor unit to execute a local software application (315);

a vehicle communication interface component (305) that when executed by at least one processor unit (104) causes the at least one processor unit to receive an application message transmitted by a computer system (110, 220) onboard a vehicle (205); and

a routing component (330) that when executed by at least one processor unit (104) causes the at least one processor unit to:

determine whether the application message should be forwarded to a remote application server (210) that provides a remote software application (225) associated with the application message; and

redirect the application message to the local software application (315) when the application message should not be forwarded to the remote application server (210).

17. One or more computer readable media in accordance with Claim 16, wherein the application message is a first application message, the local software application (315) creates a second application message based on the first application message, and said components further comprise a wide area network (WAN) interface component (310) that when executed by at least one processor unit (104) causes the at least one processor unit (104) to forward the second application message to the remote application server (210).

18. One or more computer readable media in accordance with Claim 16, wherein the application message is a first application message that corresponds to a first remote software application (225), and said routing component (330) causes the at least one processor unit (104) to forward a second application message to a second remote application server (210) that provides a second remote software application (225) associated with the second application message.

19. One or more computer readable media in accordance with Claim 18, wherein the second application message is received after the first application message, and said computer-executable components further comprise a traffic shaping component that when executed by at least one processor unit causes the at least one processor unit to:

associate a first priority with the first remote software application;

associate a second priority greater than the first priority with the second remote software application; and

forward the second application message before forwarding the first application message based on the first priority and the second priority.

20. One or more computer readable media in accordance with Claim 16, wherein said routing component further causes the at least one processor unit to redirect the application message to the local software application at least in part by:

receiving from the computer system onboard the vehicle a request for a network address corresponding to a name associated with the remote application server; and

in response to receiving the request, transmitting a network address corresponding to the local software application to the computer system.

CLAIMS:

1. A method for communicating between a vehicle and a remote application server, said method comprising:

5 receiving at a gateway device computer system (235) an application message transmitted from a vehicle computer system (220);

determining by the gateway device computer system (235) whether the application message should be forwarded to a remote application server (210) that provides a remote software application (225) associated with the application message; and

10 redirecting the application message to a local software application (315) executed by the gateway device computer system (100, 220) when the application message should not be forwarded, wherein the local software application corresponds to the remote software application, and wherein the local software application (315) interacts with the vehicle computer system (100, 220)
15 in a manner that is indistinguishable from the manner in which the remote software application (225) interacts with the vehicle computer system (220).

2. A method in accordance with Claim 1, wherein the local software application (315) stores data included in the application message, said method
20 further comprising, after said redirecting the application message:

establishing an uplink connection with the remote application server (210);
and

synchronizing the stored data with the remote software application (225) provided by the remote application server.

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3. A method in accordance with any of Claim 1 or 2, further comprising forwarding the application message to the remote application server (210) when it is determined that the application message should be forwarded to the remote application server (210).

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4. A method in accordance with Claim 3, wherein receiving an application message comprises receiving an application message transmitted from the vehicle (205) using a first communication standard, and forwarding the application message comprises forwarding the application message using a
5 second communication standard.

5. A method in accordance with Claim 3, wherein the application message is a first application message of a plurality of application messages, said method further comprising:

10 assigning a priority to the first application message; and
forwarding the first application message before forwarding a second application message of the plurality of application messages based at least in part on the priority assigned to the first application message and a priority assigned to the second application message.

15 6. A method in accordance with Claim 1, wherein determining whether the application message should be forwarded to the remote application server (210) comprises determining whether a local software application (315) corresponding to the remote software application (225) is executed by the gateway device
20 computer system (235).

7. A method in accordance with any of Claims 1 to 6, wherein determining whether the application message should be forwarded to the remote application server comprises determining whether an uplink connection can be established
25 between the computer system (100, 220) and the remote application server (210).

8. A gateway device for use in communicating between a vehicle and a remote application server, said device comprising:

a vehicle communications unit (110, 240) configured to receive an application message from a computer system (100, 220) onboard a vehicle (205), wherein the application message is associated with a destination corresponding to a remote application server (210) that provides a remote software application (225);

a processor unit (104) coupled to said vehicle communications unit (110, 240) and programmed to:

execute a local software application (315) corresponding to the remote software application;

determine whether the application message should be forwarded to the remote application server (210); and

redirect the application message to the local software application (315) when the application message should not be forwarded to the remote application server (225),

wherein the local software application (315) interacts with the computer system (100, 220) onboard the vehicle in a manner that is indistinguishable from the manner in which the remote software application (225) interacts with the computer system onboard the vehicle.

9. A gateway device in accordance with Claim 8, further comprising a wide area network (WAN) communications unit (110, 245) configured to forward the application message to the remote application server (210) when the application message should be forwarded to the remote application server (210).

10. A gateway device in accordance with Claim 9, wherein the application message is a first application message of a plurality of application messages, and said WAN communications unit (110, 245) is further configured to forward each application message of the plurality of application messages to the remote application server (210) corresponding to the application message when an uplink connection can be established with the corresponding remote application server (210).

11. A gateway device in accordance with Claim 10, wherein said processor unit (104) is further programmed to:

assign a priority to each application message of the plurality of application messages based on a destination associated with the application message; and

5 forward the application messages assigned a first priority before forwarding the application messages assigned a second priority that is less than the first priority.

12. A gateway device in accordance with any of Claims 8-11, wherein said
10 vehicle communications unit (110, 240) is configured to receive the application message at least in part by receiving vehicle sensor data.

13. A gateway device in accordance with any of Claims 8-12, further comprising:

15 a storage device, wherein the local software application (315) updates data in said storage device in response to the redirected application message; and

a wide area network (WAN) communications unit (110, 245) configured to:
establish an uplink connection with the remote application server (210)
20 after the local software application (315) updates the data; and
transmit the updated data to the remote application server (210).

14. A gateway device in accordance with any of Claims 8-13, wherein the local software application (315) is a first local software application (315) that
25 corresponds to a first remote software application (225) , and said processor unit (104) is further programmed to:

execute the first local software application (315) in a first virtual machine (325);

30 execute a second local software application (315) corresponding to a second remote software application (225) in a second virtual machine (325);

determine whether application messages should be forwarded to a second remote application server (210) that provides the second remote software application (225); and

redirect, to the second local software application (315), application
5 messages associated with a destination corresponding to the second remote application server (210) when application messages should not be forwarded to the second remote application server (210).

15. A gateway device in accordance with any of Claims 8-14, wherein:

10 the application message is a first application message received from a first computer system (100, 220) onboard a first vehicle (205);

said vehicle communications unit (110, 240) is further configured to receive a second application message from a second computer system (100, 220) onboard a second vehicle (205), the second application message
15 associated with the destination corresponding to the remote application server (210); and

said processor unit (104) is further programmed to redirect the second application message to the local software application (315) when the second application message should not be forwarded to the remote application server
20 (210).

16. One or more computer readable media having computer-executable components, said components comprising:

a local software application component (320) that when executed by at
25 least one processor unit (104) causes the at least one processor unit to execute a local software application (315);

a vehicle communication interface component (305) that when executed by at least one processor unit (104) causes the at least one processor unit to receive an application message transmitted by a computer system (110, 220)
30 onboard a vehicle (205); and

a routing component (330) that when executed by at least one processor unit (104) causes the at least one processor unit to:

determine whether the application message should be forwarded to a remote application server (210) that provides a remote software application (225) associated with the application message; and

redirect the application message to the local software application (315)

5 when the application message should not be forwarded to the remote application server (210) wherein the local software application corresponds to the remote software application and wherein the local software application (315) interacts with the computer system (100, 220) onboard the vehicle (205) in a manner that is indistinguishable from the manner in which the remote software application
10 (225) interacts with the computer system (220) onboard the vehicle (205).

17. One or more computer readable media in accordance with Claim 16, wherein the application message is a first application message, the local software application (315) creates a second application message based on the first
15 application message, and said components further comprise a wide area network (WAN) interface component (310) that when executed by at least one processor unit (104) causes the at least one processor unit (104) to forward the second application message to the remote application server (210).

20 18. One or more computer readable media in accordance with Claim 16, wherein the application message is a first application message that corresponds to a first remote software application (225), and said routing component (330) causes the at least one processor unit (104) to forward a second application message to a second remote application server (210) that provides a second
25 remote software application (225) associated with the second application message.

19. One or more computer readable media in accordance with Claim 18, wherein the second application message is received after the first application
30 message, and said computer-executable components further comprise a traffic shaping component that when executed by at least one processor unit causes the at least one processor unit to:

associate a first priority with the first remote software application;
associate a second priority greater than the first priority with the second
remote software application; and
forward the second application message before forwarding the first
5 application message based on the first priority and the second priority.

20. One or more computer readable media in accordance with Claim 16,
wherein said routing component further causes the at least one processor unit to
redirect the application message to the local software application at least in part
10 by:

receiving from the computer system onboard the vehicle a request for a
network address corresponding to a name associated with the remote application
server; and
in response to receiving the request, transmitting a network address
15 corresponding to the local software application to the computer system.