CLAIMS

1. A communication system comprising:

a network interconnecting each of a first plurality of physical components residing on a second plurality of platforms, thereby to define a first plurality of network nodes, wherein plural components from among said first plurality reside on at least one platform P of said second plurality of platforms thereby to provide platform-component level communication of data between the plural components of platform P and other components from among said first plurality; and

at least one processor which comprises a node on the network, which receives data from at least a first component from among the first plurality of components, hosts a third plurality of applications that process the data, thereby to generate at least one processed data result, and provides said processed data result to at least a second component from among the first plurality of components, via said network,

thereby to provide data communication between plural platforms, each including plural physical components, at least at said physical component level,

wherein at least one platform comprises an aircraft and at least one of said physical components comprises a physical portion of an aircraft

wherein the system is configured for generating logical representations of each platform component, and for defining each component as a separate network node which allows grouping, of components on plural platforms, by component-type

and wherein software modules for components can communicate directly through a Distributed Avionics Bus via a data bus within a platform and/or a software router between platforms, with all other objects in the network, creating a distributed network that enables coordinated activities such that, once a given platform is connected to the network, components of the platform can communicate directly with other components or platforms to address operational use cases.

2. A system according to claim 1 or any preceding claim wherein said data comprises information characterizing at least one capability of at least one individual component on platform P which is sent to at least one component on a platform, from among said second plurality of platforms, other than P.

3. A system according to claim 1 or any preceding claim wherein said data comprises information gathered by at least one individual component on platform P which is sent

to at least one component on a platform, from among said second plurality of platforms, other than P.

4. A system according to claim 2 or claim 3 wherein said data is provided via a component interface, which comprises a software driver and a network connectivity interface, and which is in data communication with at least one processor serving said individual component.

5. A system according to claim 4 wherein said interface comprises a radio frequency interface or another physical communication medium (e.g. landline Ethernet, fiber optics, standard avionic bus).

6. A system according to claim 5 wherein said radio frequency interface is implemented in Software-Defined Radio (SDR), legacy radio, or SAT comm.

7. A system according to claim 1 or any preceding claim wherein said network comprises a local area network (aka LAN) and/or wide area network (aka WAN).

8. A system according to claim 1 or any preceding claim wherein said data is received by the processor from each component from among the first plurality of components in a first component-specific format and wherein the processor uses data format, which is predefined by a data dictionary, to share said data with other components, in a format other than said first component-specific format, thereby to create a distributed data cloud.

9. A system according to claim 8 wherein the processor uses the data dictionary to generate, for the said data, a structure, defined by the data dictionary, for sharing with other components via the network, and wherein all structures defined by the data dictionary are understandable by all of said first plurality of components.

10. A system according to claim 1 or any preceding claim wherein each component C of the first plurality of components decides topics to which component C would like to listen, based on at least one of earlier-defined rules or user actions.

11. A system according to claim 10, wherein, given a set of components S from the first plurality of components which are using an individual application from among said third plurality of applications, topics on which data sharing will occur between components in said set S are defined by said individual application.

12. A system according to claim 1 or any preceding claim wherein at least one individual application from among said third plurality of applications comprises a situational awareness application.

13. A system according to claim 1 or any preceding claim wherein all of said third plurality of applications are written using a single common data dictionary.

14. A system according to claim 8 and also comprising data storage operative to accumulate data stored in the distributed data cloud and a server with access to said storage.

15. A system according to claim 14 and wherein said server is operative to perform big data analysis on data stored in said storage.

16. A system according to claim 15 wherein said big data analysis drives predictive maintenance of at least one of said first plurality of components.

17. A system according to claim 14 wherein said server is configured to plan tasks to be performed by a task force including at least one of said first plurality of components and, accordingly, to send task-relevant data stored in central and/or distributed storage, to relevant components in said task force.

18. A system according to claim 1 or any preceding claim wherein at least one of said third plurality of applications comprises a platform-component level application which can be performed by a single component from among said first plurality of components.

19. A system according to claim 18 wherein said platform-component level application can be performed by each of at least two components, on at least two different respective platforms from among the second plurality of platforms.

20. A system according to claim 1 or any preceding claim wherein any component from among said first plurality of components, residing on an individual platform, can create a topic and share the topic with components, from among said first plurality of components, which reside on platforms, from among the second plurality of platforms, other than said individual platform.

21. A system according to claim 1 or any preceding claim wherein any component from among said first plurality of components, residing on an individual platform, can create a topic and share the topic with other components, from among said first plurality of components, which reside on said individual platform.

22. A system according to claim 1 or any preceding claim wherein the platform P comprises a vehicle and the processor is installed aboard the vehicle.

23. A system according to claim 1 or any preceding claim wherein data communication, between said plural platforms, is also provided at platform level.

24. A system according to claim 1 or any preceding claim wherein at least two logical entities such as a process or app are also connected via said network.

25. A system according to claim 1 or any preceding claim wherein data also passes between at least first and second components both residing on a single platform, via an internal network aboard said single platform.

26. A system according to claim 1 wherein logical representations of each platform component are each defined as a separate network node which allows activities to be coordinated between all components thus networked by grouping components on plural platforms by component-type including grouping together all components of a given type in all platforms or in at least some of said platforms.

27. A system according to claim 1 wherein a processor co-located and in data communication with each platform component, may store a plurality of applications on the computer or processor, each of which can be performed by components which the

network is to serve and wherein applications that all components are able to run include pub/sub technology enabling a subscriber to decide which topics it would like to listen to wherein pairs of devices provide each component on each platform with their own independent networking functionality, thus to communicate with other platforms' components, and wherein each of the other platforms' components are also equipped with their own independent networking functionality, and wherein the devices which provide each component on each platform with its own independent networking functionality generate a service level agreement between them such that each such device has protocol generating logic, which, given a certain application, has a given protocol with an additional device, the protocol having been requested by said additional device.

28. A system according to claim 1 wherein said network has routing and/or relay functionality.

29. A system according to claim 1 wherein said network provides basic visibility on physical or logical entities to all nodes interconnected by said network and also provides privileged visibility to only a subset of the nodes interconnected by said network.

30. A system according to claim 1 wherein said network entitles all nodes interconnected by said network to perform a first set of actions on physical or logical entities and also entitles only a subset of the nodes interconnected by said network to perform a second set of actions.

31. A system according to claim 1 wherein said data is secured by authentication logic which authenticates only nodes having an authorized unique identifier.

32. A system according to claim 8 or 9 wherein said data dictionary comprises a Base One International Corp Data Dictionary.

33. A system according to claim 8 or 9 wherein said data dictionary comprises a metadata registry.

34. A system according to claim 33 wherein said metadata registry is ISO/IEC 11179 compliant.

35. A system according to claim 33 wherein said metadata registry comprises an Oracle Enterprise Metadata Manager.

36. A system according to claim 1 wherein at least one component C of the first plurality of components decides on which topics each component in a group of components would like to listen, based on at least one of earlier-defined rules or user actions.

37. A system according to claim 8 and also comprising distributed data storage operative to accumulate data stored in the distributed data cloud and a distributed server with access to said distributed storage.

38. A system according to claim 1 wherein said network has forwarding and relay functionality.

39. A data communication method comprising:

providing a network interconnecting each of a first plurality of physical components residing on a second plurality of platforms, thereby to define a first plurality of network nodes, wherein plural components from among said first plurality reside on at least one platform P of said second plurality of platforms thereby to provide platform-component level communication of data between the plural components of platform P and other components from among said first plurality; and

providing at least one processor which comprises a node on the network, which receives data from at least a first component from among the first plurality of components, hosts a third plurality of applications that process the data, thereby to generate at least one processed data result, and provides said processed data result to at least a second component from among the first plurality of components, via said network,

thereby to provide data communication between plural platforms, each including plural physical components, at least at said physical component level

wherein at least one platform comprises an aircraft and at least one of said physical components comprises a physical portion of an aircraftwherein the system is configured for generating logical representations of each platform component, and for defining each component as a separate network node which allows grouping, of components on plural platforms, by component-type

and wherein software modules for components can communicate directly through a Distributed Avionics Bus via a data bus within a platform and/or a software router between platforms, with all other objects in the network, creating a distributed network that enables coordinated activities such that, once a given platform is connected to the network, components of the platform can communicate directly with other components or platforms to address operational use cases.

40. A computer program product, comprising a non-transitory tangible computer readable medium having computer readable program code embodied therein, said computer readable program code adapted to be executed to implement a data communication method comprising:

providing a network interconnecting each of a first plurality of physical components residing on a second plurality of platforms, thereby to define a first plurality of network nodes, wherein plural components from among said first plurality reside on at least one platform P of said second plurality of platforms thereby to provide platform-component level communication of data between the plural components of platform P and other components from among said first plurality; and

providing at least one processor which comprises a node on the network, which receives data from at least a first component from among the first plurality of components, hosts a third plurality of applications that process the data, thereby to generate at least one processed data result, and provides said processed data result to at least a second component from among the first plurality of components, via said network, thereby to provide data communication between plural platforms, each including plural physical components, at least at said physical component level

wherein at least one platform comprises an aircraft and at least one of said physical components comprises a physical portion of an aircraft

wherein the system is configured for generating logical representations of each platform component, and for defining each component as a separate network node which allows grouping, of components on plural platforms, by component-type

and wherein software modules for components can communicate directly through a Distributed Avionics Bus via a data bus within a platform and/or a software router between platforms, with all other objects in the network, creating a distributed network that enables coordinated activities such that, once a given platform is connected to the network, components of the platform can communicate directly with other components or platforms to address operational use cases.

41. A system according to claim 1 wherein the network includes an avionics bus which provides data connectivity within the platform for both physical and logical entities, the logical entities including a distributed resource manager that manages at least one system resource and make them accessible according to current QoS requirements.

42. A system according to claim 41 wherein the at least one system resource includes at least one of: memory space CPU power.

43. A system according to claim 41 wherein the at least one system resource includes video processing.

44. A system according to claim 41 wherein the at least one system resource includes data events sharing and/or behavioral profiles

45. A system according to claim 6 wherein all or any subset of mixers, filters, amplifiers, modulators/demodulators, detectors, are implemented in software.

46. A system according to claim 41 wherein the QoS requirements impose priority and/or service order on data to be shared over the network.

47. A system according to claim 6 wherein said radio frequency interface supports plural waveforms.

48. A system according to any preceding claim wherein various waveforms are handled by the software router which typically comprises a logical entity which receives data and sends that data over the air using radio.

49. A system according to any preceding claim and wherein said Logical entities include all or any subset of at least two of:

an object which represents a real-world physical component

an object which represents pure information (e.g. threat such as a moving vehicle which may collide with another moving vehicle, engine status, goal)

an object which represents an application; and

aircraft avionics including a set of software tools which operates at least one of the aircraft's physical components.

50. A system according to claim 41 which is configured to transmit data to other aircrafts via the avionics bus which connects all aircraft systems and can exchange data therebetween.

51. A system according to claim 49 wherein said physical component comprise all or any subset of at least two of: wing, tail, engine, fuel system, sensor, radar.

52. A system according to claim 41 wherein said avionics is configured to fuse data from the radar and IFF systems to display a single target to a pilot.

53. A system according to claim 47 wherein the plural waveforms include at least standard waveform and stealth waveform.

54. A system according to any one of the preceding system claims 1 – 38, 41 - 53 wherein plural components communicate with one another and coordinate activities with one another.