CLAIMS:

1. A method for automatically filtering network messages in an aviation network for an aircraft based on a current system context, the method comprising: receiving (401), by a processor (501) of a computer system (500), a network message (415) transmitted via one or more network packets within the aviation network, wherein the network message is transmitted from a source avionic device to a destination avionic device; establishing (403), by the processor, a current system context (419) based on monitoring one or more avionic devices in the aviation network, wherein the system context indicates an aggregate status (417) of the one or more avionic devices; analyzing (405), by the processor, an acceptability of the network message by: identifying (409) a plurality of attributes (425) corresponding to the network message, wherein the plurality of attributes correspond to header and data fields (427) of the one or more network packets corresponding to the network message; and determining (411) the acceptability of the network message within the system context based on one or more filter rules (429), wherein the one or more filter rules specify what attributes are allowed within a particular system context, wherein the one or more filter rules (429) are automatically generated (433) during a testing phase of the aviation network by: capturing (451) one or more test network packets corresponding to a test functional network flow transmitted within the aviation network; parsing (453) the one or more test network packets in order to extract one or more test network messages corresponding to the test functional network flow; examining (455) a test network message of the one or more test network messages in order to identify a plurality of test attributes (456), wherein the plurality of test attributes correspond to header and data fields of the one or more test network packets corresponding to the test network message; classifying (457) the plurality of test attributes of the test network message; automatically generating (459) one or more tables (461) corresponding to the one or more test network messages, wherein the one or more tables include the one or more filter rules, wherein the one or more tables are chained (463) based on one or more test attributes of the test network messages; and validating (465) the one or more filter rules; and forwarding (407), by the processor, the network message to the destination avionic device if the network message is determined to be acceptable within the system context.

2. The method of claim 1, wherein the current system context (419) includes a combination of one or more of the following: a date, a time, a location of the source avionic device, a location of the destination avionic device, a device state (421) of the plurality of avionic devices, and a flight phase (423) of the aircraft.

3. The method of claim 2, wherein the device state (421) of the plurality of avionic devices includes an operational mode, a maintenance mode, or a data load mode.

4. The method of claim 2, wherein the flight phase (423) of the aircraft includes one of the following operational states: power on, pre-flight, engine start, in-gate, taxi-out, takeoff, initial climb, climb, enroute cruise, descent, approach land, rollout, taxi-in, go around, and engine shutdown.

5. The method of claim 1, wherein the plurality of attributes (425) corresponding to the network message (415) include one or more of the following: a destination address, a source address, a flight phase of the network message, a device state of the network message, a function, a sub-function, a data flow, and a protocol.

6. The method of claim 1, wherein the one or more filter rules (429) include one or more deep packet filtering rules (431), wherein the one or more deep packet filtering rules prevent unauthorized data flows on the aviation network by examining one or more payloads of the one or more network packets.

7. A system for automatically filtering network messages in an aviation network for an aircraft, the system comprising: one or more processors (501); memory (503); and one or more programs stored in the memory, the one or more programs including instructions for: receiving (401), by the one or more processors, a network message (415) transmitted via one or more network packets within the aviation network, wherein the network message is transmitted from a source avionic device to a destination avionic device; establishing (403), by the one or more processors, a current system context (419) based on monitoring one or more avionic devices in the aviation network, wherein the system context indicates an aggregate status (417) of the one or more avionic devices; analyzing (405), by the one or more processors, an acceptability of the network message by: identifying (409) a plurality of attributes (425) corresponding to the network message, wherein the plurality of attributes correspond to header and data fields (427) of the one

or more network packets corresponding to the network message; and determining (411) the acceptability of the network message within the system context based on one or more filter rules (429), wherein the one or more filter rules specify what attributes are allowed within a particular system context, wherein the one or more filter rules (429) are automatically generated (433) during a testing phase of the aviation network by: capturing (451) one or more test network packets corresponding to a test functional network flow transmitted within the aviation network; parsing (453) the one or more test network packets in order to extract one or more test network messages corresponding to the test functional network flow; examining (455) a test network message of the one or more test network messages in order to identify a plurality of test attributes (456), wherein the plurality of test attributes correspond to header and data fields of the one or more test network packets corresponding to the test network message; classifying (457) the plurality of test attributes of the test network message; automatically generating (459) one or more tables (461) corresponding to the one or more test network messages, wherein the one or more tables include the one or more filter rules, wherein the one or more tables are chained (463) based on one or more test attributes of the test network messages; and validating (465) the one or more filter rules; and forwarding (407), by the one or more processors, the network message to the destination avionic device if the network message is determined to be acceptable within the system context.

8. The system of claim 7, wherein the system context (419) includes a combination of one or more of the following: a date, a time, a location of the source avionic device, a location of the destination avionic device, a device state (421) of the plurality of avionic devices, and a flight phase (423) of the aircraft.

9. The system of claim 8, wherein the device state (421) of the plurality of avionic devices includes an operational mode, a maintenance mode, or a data load mode.

10. The system of claim 8, wherein the flight phase (423) of the aircraft includes one of the following operational states: power on, pre-flight, engine start, in-gate, taxi-out, takeoff, initial climb, climb, enroute cruise, descent, approach land, rollout, taxi-in, go around, and engine shutdown.

11. The system of claim 7, wherein the plurality of attributes (425) corresponding to the network message (415) include one or more of the following: a destination address, a source address, a flight phase of the network message, a device state of the network message, a function, a sub-function, a data flow, and a protocol.

12. The system of claim 7, wherein the one or more filter rules (429) include one or more deep packet filtering rules (431), wherein the one or more deep packet filtering rules prevent unauthorized data flows on the aviation network by examining one or more payloads of the one or more network packets.

13. A non-transitory computer readable medium comprising one or more programs configured for execution by a computer system, the one or more programs including instructions for: receiving (401), by a processor (501) of a computer system (500), a network message (415) transmitted via one or more network packets within an aviation network for an aircraft, wherein the network message is transmitted from a source avionic device to a destination avionic device; establishing (403), by the processor, a current system context (419) based on monitoring one or more avionic devices in the aviation network, wherein the system context indicates an aggregate status (417) of the one or more avionic devices; analyzing (405), by the processor, an acceptability of the network message by: identifying (409) a plurality of attributes (425) corresponding to the network message, wherein the plurality of attributes correspond to header and data fields (427) of the one or more network packets corresponding to the network message; and determining (411) the acceptability of the network message within the system context based on one or more filter rules (429), wherein the one or more filter rules specify what attributes (425) are allowed within a particular system context, wherein the one or more filter rules (429) are automatically generated (433) during a testing phase of the aviation network by: capturing (451) one or more test network packets corresponding to a test functional network flow transmitted within the aviation network; parsing (453) the one or more test network packets in order to extract one or more test network messages corresponding to the test functional network flow; examining (455) a test network message of the one or more test network messages in order to identify a plurality of test attributes (456), wherein the plurality of test attributes correspond to header and data fields of the one or more test network packets corresponding to the test network message; classifying (457) the plurality of test attributes of the test network message;

automatically generating (459) one or more tables (461) corresponding to the one or more test network messages, wherein the one or more tables include the one or more filter rules, wherein the one or more tables are chained (463) based on one or more test attributes of the test network messages; and validating (465) the one or more filter rules; and forwarding (407), by the processor, the network message to the destination avionic device if the network message is determined to be acceptable within the system context.

14. The non-transitory computer readable medium of claim 13, wherein the current system context (419) includes a combination of one or more of the following: a date, a time, a location of the source avionic device, a location of the destination avionic device, a device state (421) of the plurality of devices, and a flight phase (423) of the aircraft.

15. The non-transitory computer readable medium of claim 14, wherein the device state (421) of the plurality of avionic devices includes an operational mode, a maintenance mode, or a data load mode.

16. The non-transitory computer readable medium of claim 14, wherein the flight phase (423) of the aircraft includes one of the following operational states: power on, pre-flight, engine start, in-gate, taxi-out, takeoff, initial climb, climb, enroute cruise, descent, approach land, rollout, taxi-in, go around, and engine shutdown.

17. The non-transitory computer readable medium of claim 13, wherein the plurality of attributes (425) corresponding to the network message (415) include one or more of the following: a destination address, a source address, a flight phase of the network message, a device state of the network message, a function, a sub-function, a data flow, and a protocol.

18. The non-transitory computer readable medium of claim 13, wherein the one or more filter rules (429) include one or more deep packet filtering rules (431), wherein the one or more deep packet filtering rules prevent unauthorized data flows on the networked aviation system by examining the payloads of the one or more network packets.