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Abstract	<p>The architecture of the integrated modular avionics (IMA) of an aircraft is selected based on the requirements of aircraft systems and the aircraft structure. Aircraft systems using IMA require resources in terms of I/O, memory and calculation power. In addition, systems have secondary requirements like minimum reliability or maintainability. The aim of the IMA design process is to find an architecture, which is compliant to the requirements and is optimal owing to quality measures like cost and weight. Since a huge amount of functions are hosted on IMA in current and future aircrafts, the manual process of defining the architecture is complex, error-prone, and time-consuming. To support this process in speed and maturity, a formal model for IMA architectures is developed, which includes all driving requirements and the resulting architecture. In addition, it enables automated validation, and evaluation of architectures. Moreover, an implementation of modeling, validation and evaluation within the Eclipse development environment is presented.</p>