



Lufthansa Technik:

Commercial aircraft needs for a retrofitable wireless sensor network

Christopher Petermann
Innovation & Research Manager



Lufthansa Technik

Lufthansa Group – The business segments

Passenger transportation



The Lufthansa Group airlines rank among the world's leading carriers.

Logistics



Lufthansa Cargo – one of the world's leading cargo carriers in international air traffic.

Lufthansa Technik Maintenance, Repair, Overhaul



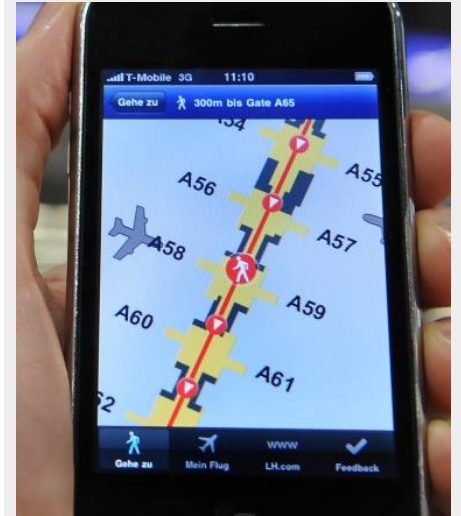
Lufthansa Technik – leading provider of MRO services in the world's airline business.

Catering



LSG Sky Chefs – leading provider of airline catering and integrated in-flight solutions.

Other activities



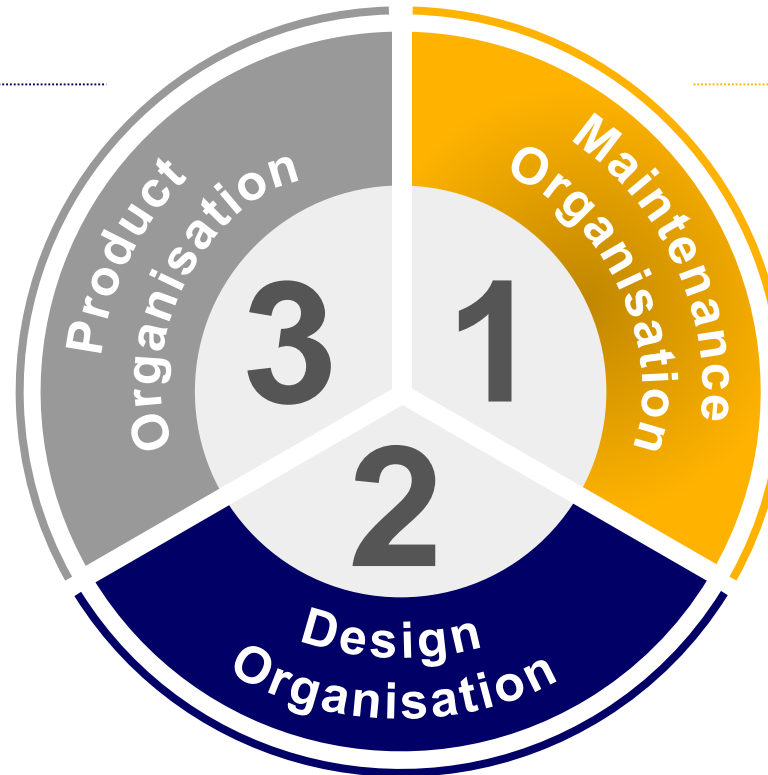
Lufthansa Flight Training
Lufthansa AirPlus
Lufthansa Industry Solutions (and many more)

Triple competence

Approved development of high-level products and procedures

3

Holding **production approvals** allows Lufthansa Technik to manufacture components for the construction of aircraft



1

Lufthansa Technik holds **maintenance organization approvals** by EU authorities and authorities of more than 40 further countries.

2

Holding **Design Organisation Approvals (DOA)** allows Lufthansa Technik e.g. to perform changes or repairs on aeroplanes for which Lufthansa Technik is not type-certificate-holder.

How are we working today?

A photograph of three male technicians in dark blue Lufthansa uniforms working on a large aircraft engine in a hangar. One technician in the foreground is using a flashlight to inspect a part of the engine. Another technician is looking on, and a third is in the background. The scene is brightly lit with industrial lights visible in the background.

ABCD



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A

400-600 flight hours
10h in hangar



B

6-8 month
1-3 days in hangar



C

20-24 month
1-2 weeks in hangar



D

6-10 years
2 month in hangar

From planned far in advance...



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...to live data



...to predictive



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Key Technologies



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Connectivity



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Collecting Data

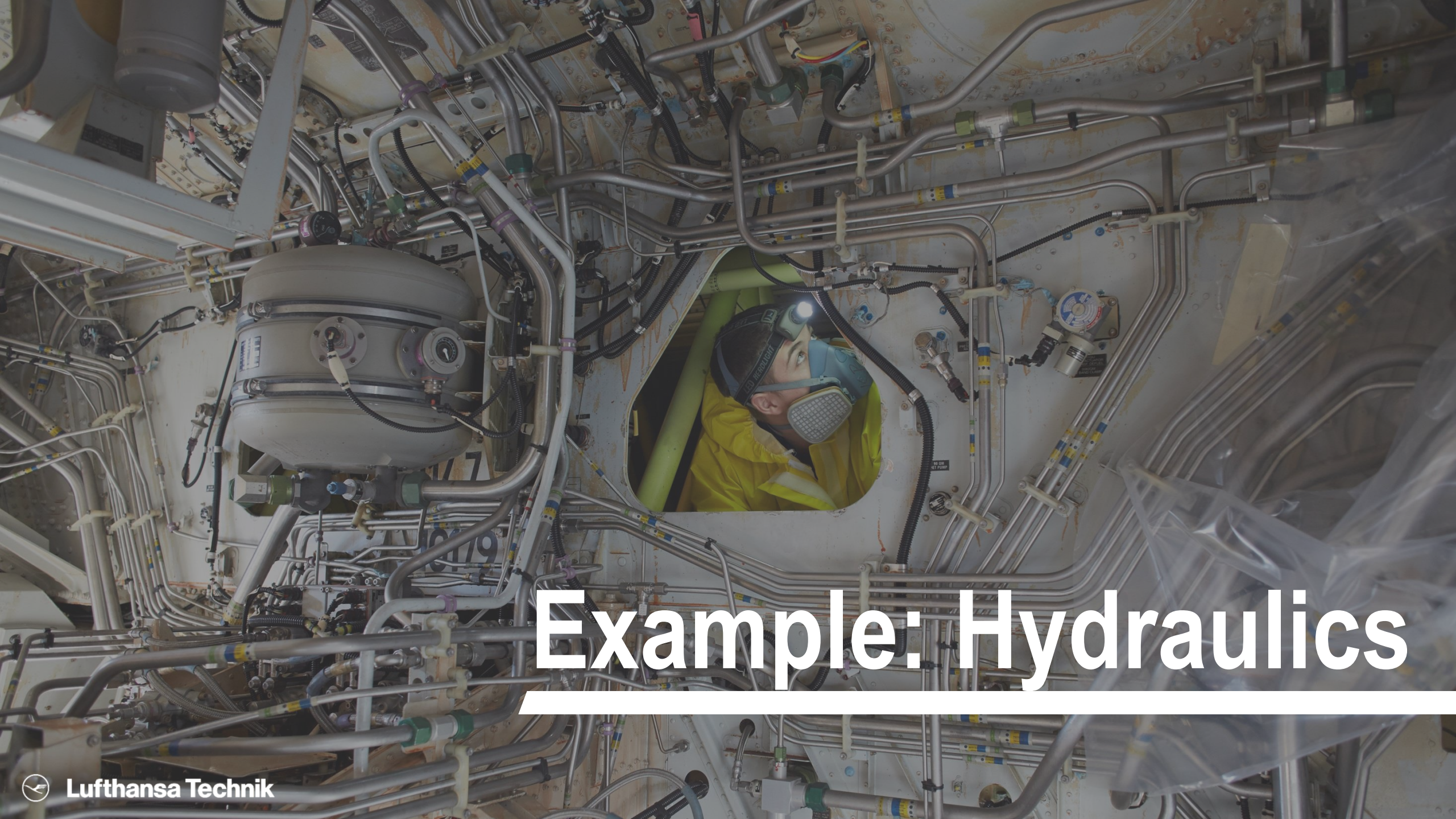


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Missing Data



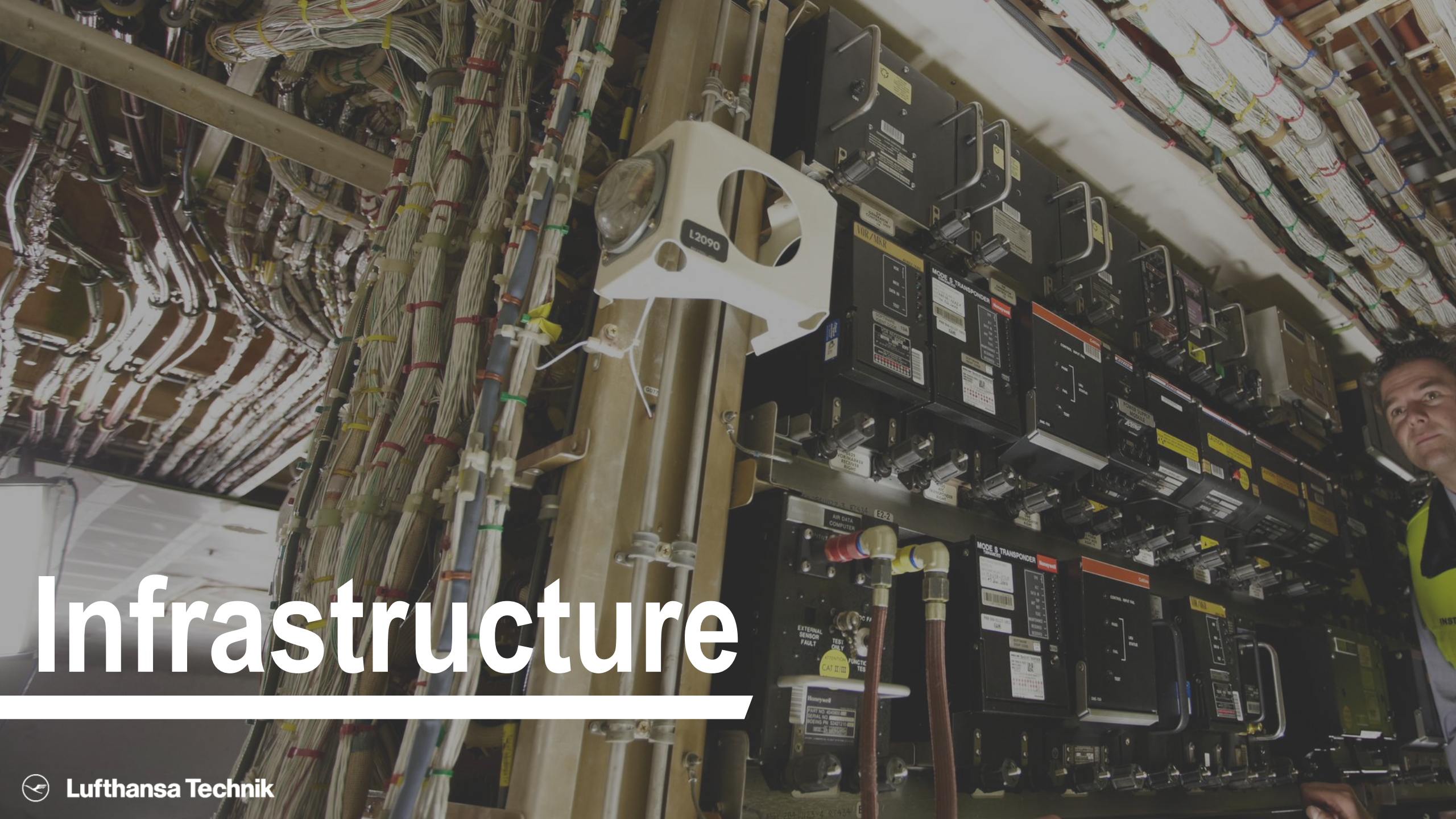


Example: Hydraulics

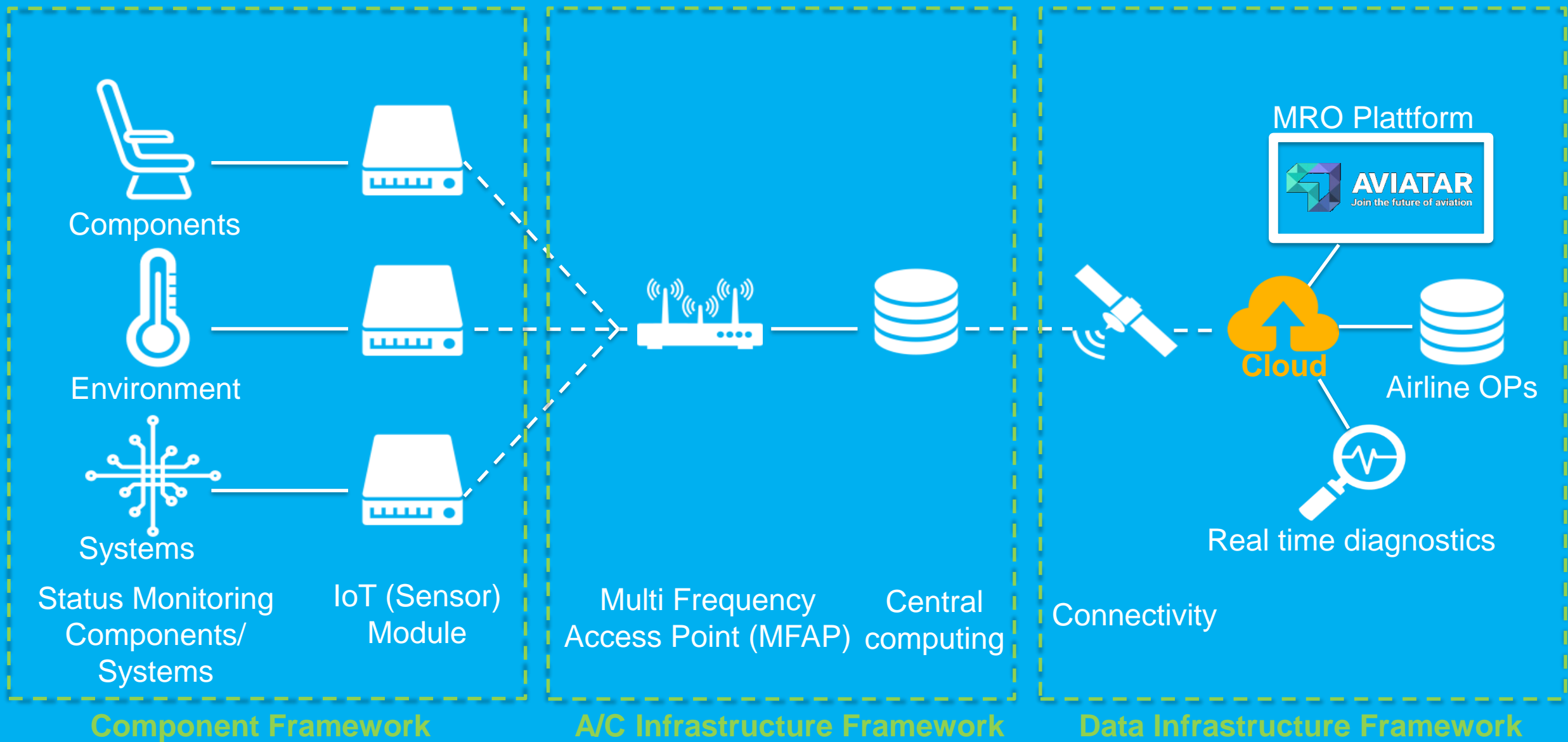
The Black Hole: Cabin



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Infrastructure



Retrofit



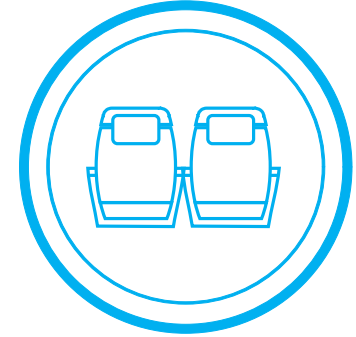
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Wireless Sensor Network

Low cost



Quick integration



Low weight



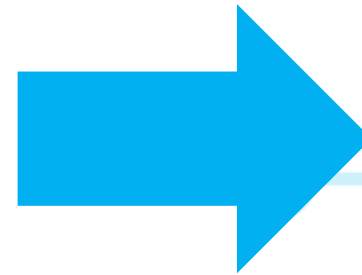
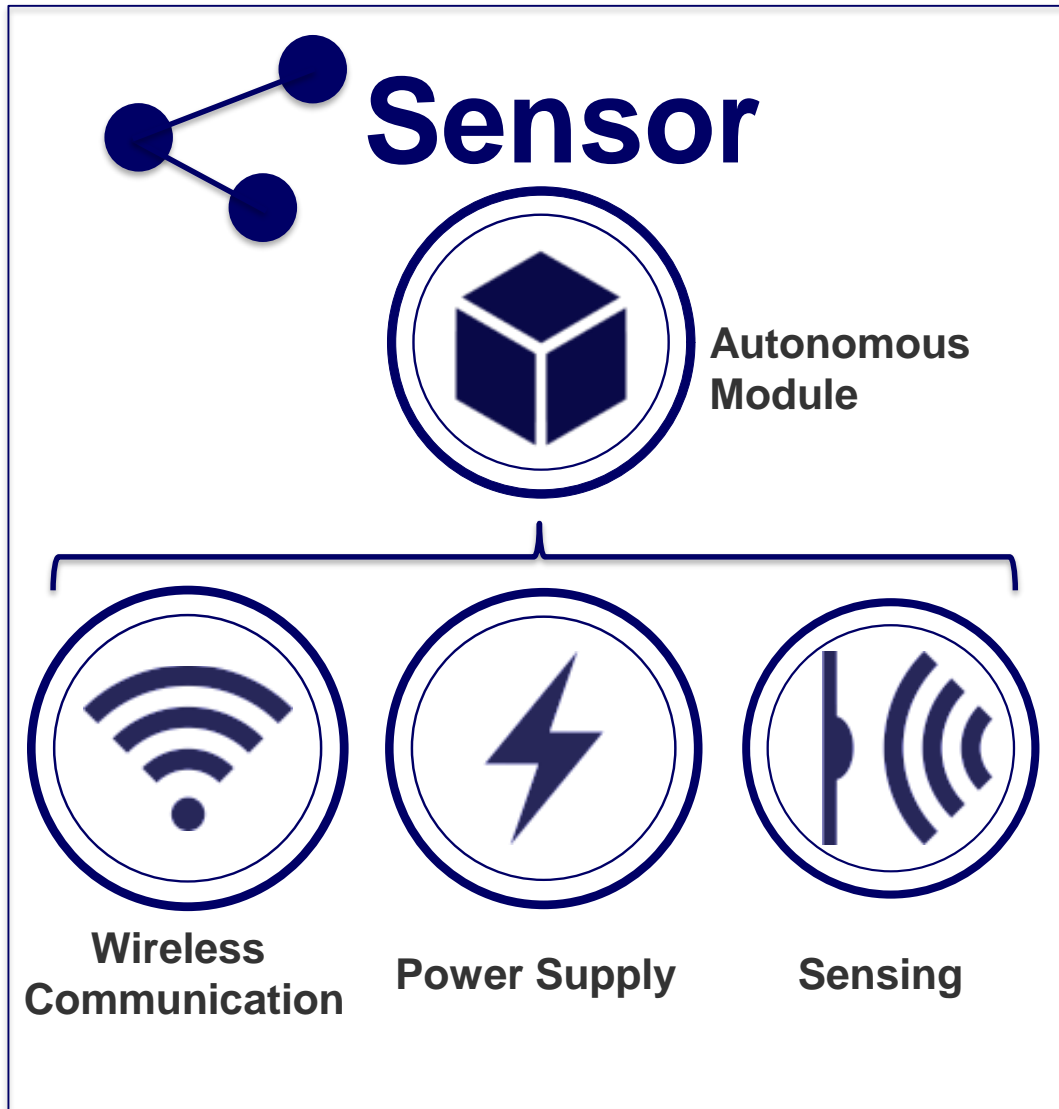
Easy maintenance

A photograph of three men standing in an airport hangar, looking at a tablet. The man on the left is in a blue shirt, the middle one in a suit, and the right one in a yellow safety vest. The background shows the fuselage of an airplane. Overlaid on the image are digital graphics: a globe on the left, a spiral in the center, and a large circular structure on the right, all connected by a network of lines.

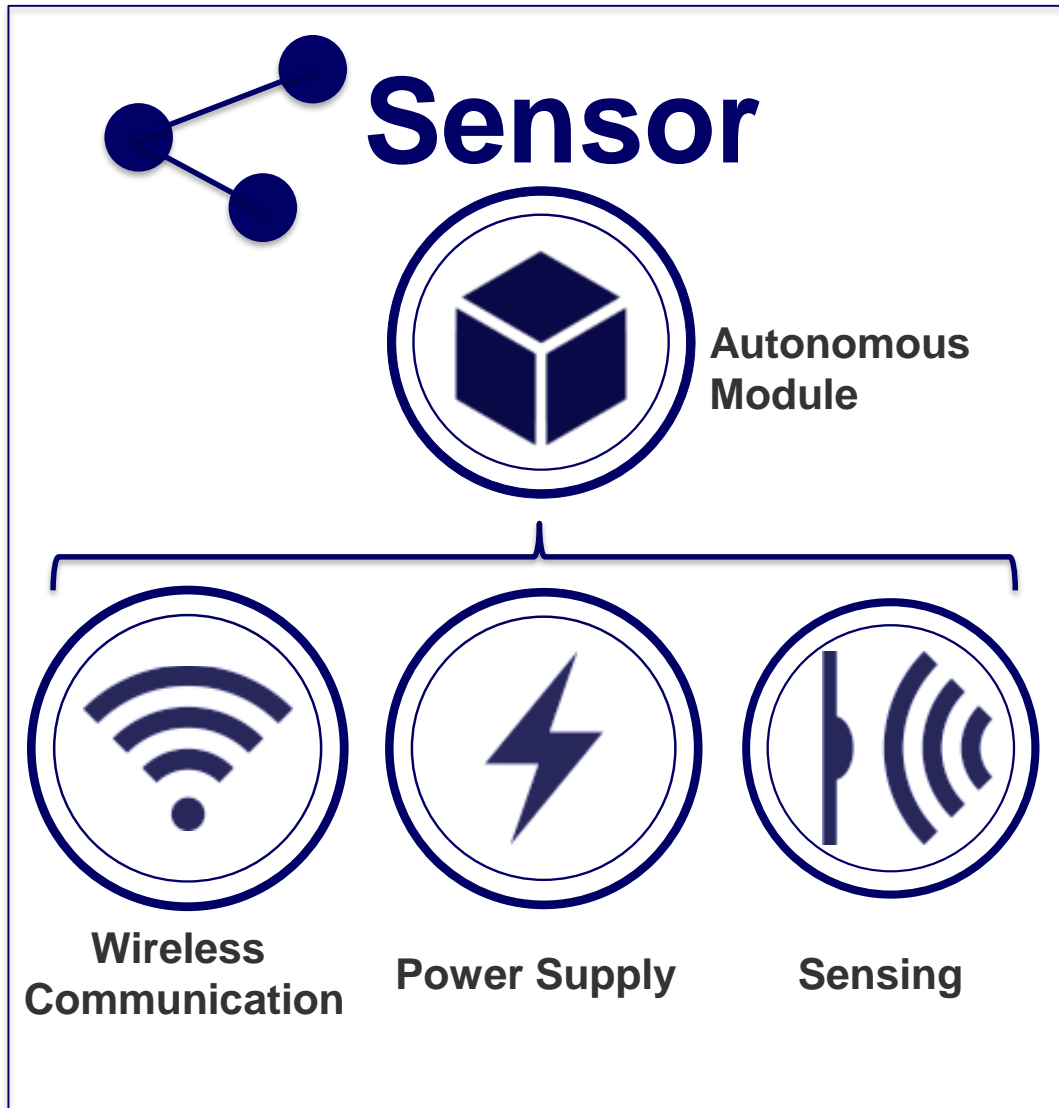
Data is the new Oil



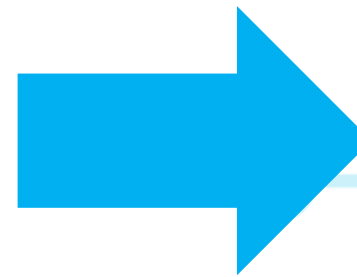
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Active
or
Passive?



In general...



- Low Power Consumption
- Data Transmission
- Non Invasive
- High Quantity of Data
- High Data Rates

Some Use-Cases

A high-angle photograph of an aircraft's main landing gear. Two technicians are standing next to the large tires, inspecting them. The gear is mounted on a white fuselage, and the surrounding structure is painted in a light tan color.

Tire pressure

A photograph showing four technicians working on the interior of an aircraft cabin door. One technician is wearing a yellow vest with the Lufthansa Technik logo. They are surrounded by various tools and equipment, including a red toolbox and a blue toolbox. The door is open, revealing the internal structure and wiring.

Installation
monitoring



All use cases aim at three core benefits...

**Increase
safety**

e.g.
bleed air system

**Decrease
costs**

e.g.
Structure monitoring

**Increase
availability**

e.g.
Tire pressure

