



# AXINOM ON-BOARD CLOUD

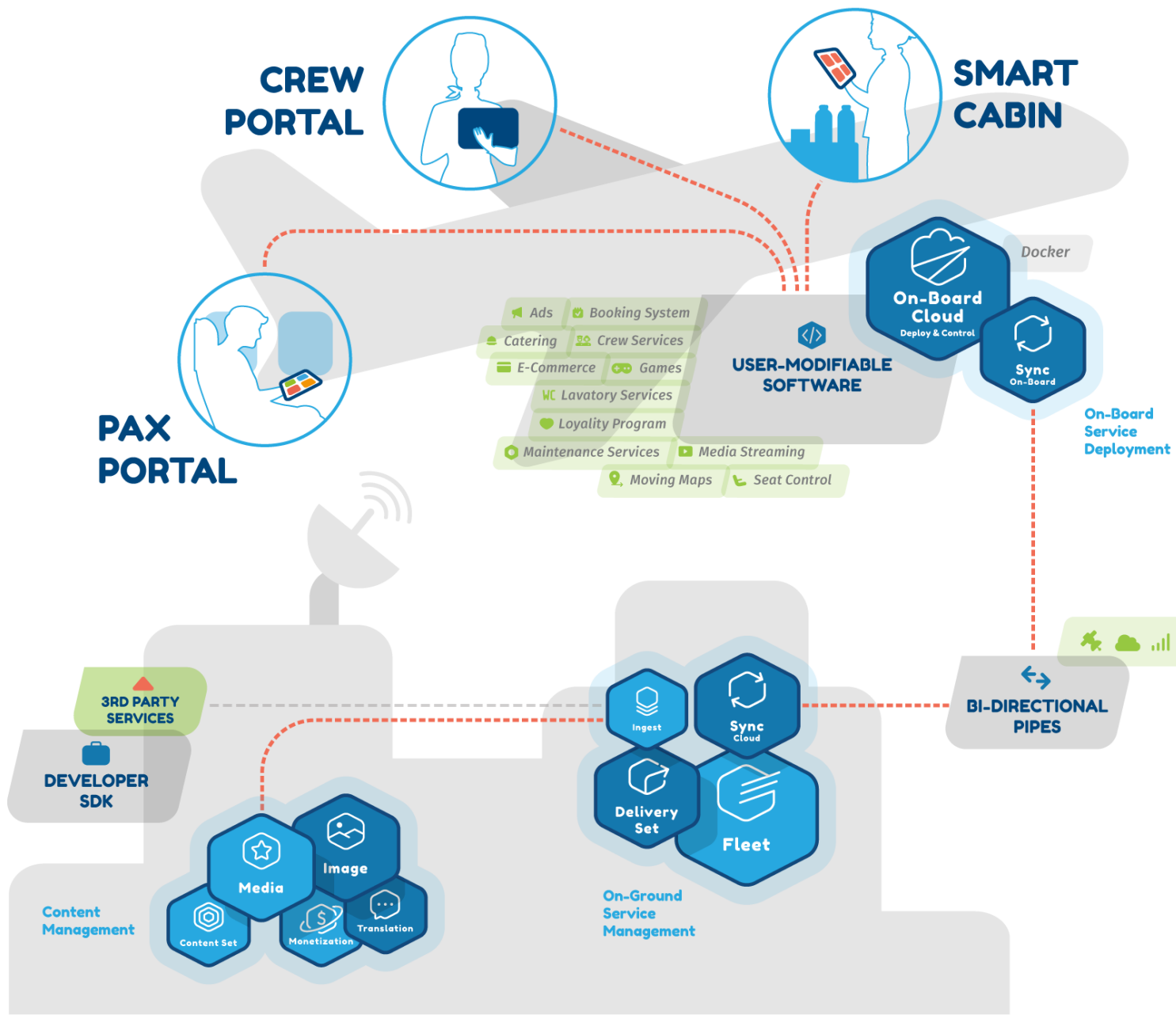
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# STANDARDIZING ON-BOARD SERVICES



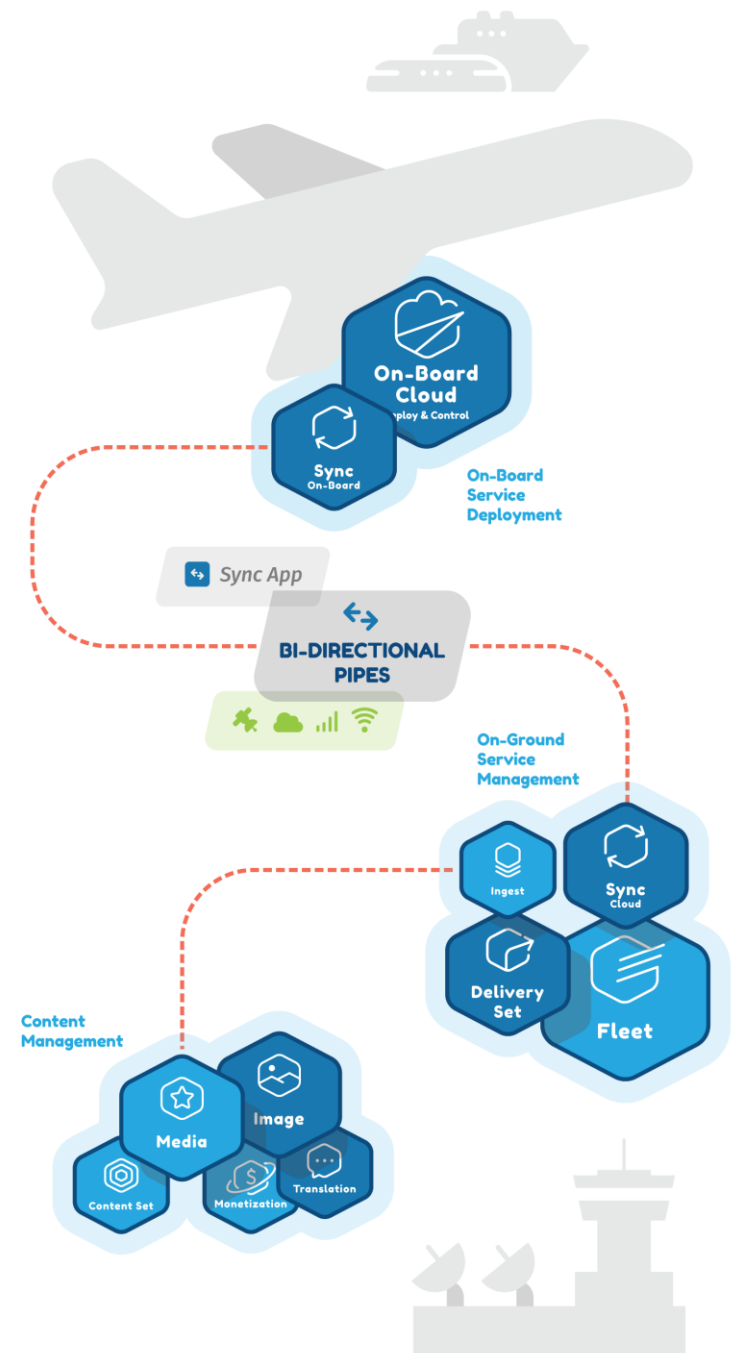
# DISCOVER AXINOM ON-BOARD CLOUD

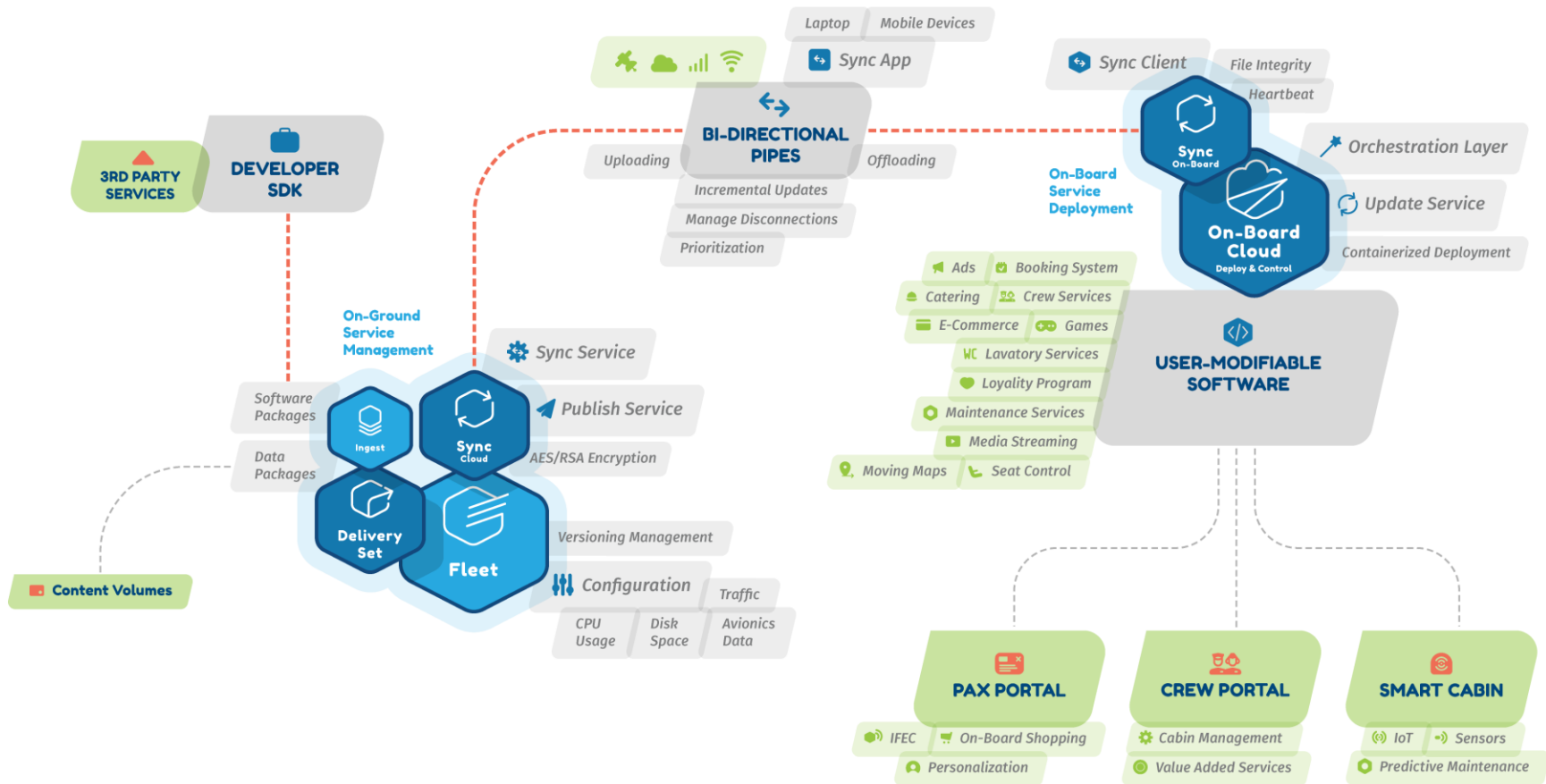
With **Axinom On-Board Cloud**, the transportation industry can not only innovate technologically but also deliver immense business value. The solution reduces the complexities in management, delivery, and deployment of data, content, and services on a transport vessel. **Utilizing standardized architectures, it simplifies and unites the various digital passenger, cabin, and crew systems and ancillary services.**

The solution consists of all components required to centrally manage own or third-party digital services. It prepares the services to be delivered to the vessel, and takes care of containerized deployment, with integration of and access from passenger, crew, or cabin portals.

As the UMS (User-Modifiable Software) services are encapsulated in containers and isolated from the system, the hassle of testing and certification is considerably reduced.

Axinom On-Board Cloud provides a granular control over the service orchestration, deployment, and resources.





# SOLUTION COMPONENTS

Axinom On-Board Cloud consists of on-ground and on-board components and leverages Axinom Sync to facilitate communication between the two.



## Axinom On-Board Cloud

The on-ground components of **On-Board Cloud – Fleet and Delivery Set** manage services and content for further delivery to the on-board components. Published services are synchronized to the on-board part using **Axinom Sync**.

The on-board components, **On-Board Cloud Deploy and Control** consist of certified system services and modifiable managed services (UMS)\* that can be deployed without any need of certifications.

The services are accessible from passenger, crew devices, or IoT, over BLE, WIFI, cable, or other interfaces provided by the on-board hardware.

\*System services are the required services for operations, whereas managed UMS services are the 3rd party services like entertainment, e-commerce, IoT applications for smart cabin services, predictive maintenance, and much more.

## Axinom Sync

**Axinom Sync** is a robust solution that manages all aspects of data synchronization, including uploading and offloading of data. It utilizes different pipes (LAN, Wi-Fi, 3G, LTE, satellite networks) with capability to manage interruptions, prioritize important data, and control data transfer costs.

It allows secure and robust bidirectional content synchronization using standardized communication protocols and mediums.

**Axinom Sync** consists of **Cloud Storage and On-board Storage** to transfer and synchronize data and services across **On-Board Cloud** components.



# HIGHLIGHTS OF AXINOM ON-BOARD CLOUD

# HIGHLIGHTS



## ZERO CERTIFICATIONS

The containerization of services isolates them from the system, critical data, and operation services. Access to system data is restricted and can be controlled. This isolation and strict control translates to zero certification needs for UMS (User-Modifiable Software) services, with faster time-to-market and reduced initial, operational costs.



## STANDARDIZED INFRASTRUCTURE

Using standardized architecture and technologies, **Axinom On-Board Cloud** simplifies the most complicated digital challenges in the transport industry. **The system brings most digital on-board cabin and crew services onto a single platform to be managed and deployed.** It also reduces the fragmentation of operating and maintaining multiple hardware servers for numerous services.



## GRANULAR RESOURCE CONTROL

**Axinom On-Board Cloud** also provides granular control over resource allocation and interaction of services with system components. **The administrator of the system gets full control over the resources, communication channels, runtime, and data access of each service.** Moreover, services can be removed or killed as needed.



## ISOLATED EXECUTION ENVIRONMENT

The container orchestration layer of **Axinom On-Board Cloud** allows docker implementation to create containers that consist of only the service to be used. The containerized managed services can still get read-only access to system information or data as decided, using the provided API. **The isolated execution adds multiple layers of security for complete control over data and access.**

# HIGHLIGHTS



## STANDARD OS & H/W INTERFACE

Axinom On-Board Cloud components are connected to the on-board hardware and operating system using a standard interface layer. **The platform can utilize any hardware, data type, or operating system,** making it truly agile and flexible.



## CENTRALIZED MANAGEMENT

On-ground management system of Axinom On-Board Cloud, called **Manage Services** allows **ingestion of user-modifiable software services from multiple sources**, assigning them to a fleet or single vessel, management of updates, choosing monetization models, and more. The management system also allows management and analysis of backchannel data through integration with BI systems.



## INTER-SERVICE COMMUNICATION

On-board services can communicate with each other through the **Axinom On-Board Cloud** gateway. This facilitates monitoring and authorization for inter-service communication. The data gateway also acts as a firewall between critical data and the managed on-board services.



## INNOVATIVE USE-CASES

With **Axinom On-Board Cloud**, operators can explore countless use-cases to build smart services. For example, gathering and reporting of sensor data for IoT, predictive maintenance, sending the status of seats, lavatory status, acquiring passenger data from the booking systems, and pushing it to the crew portal. **With available integrations and data, unique passenger and crew experiences, business models can be created.**



# HIGHLIGHTS



## INCREMENTAL UPDATES

To reduce the amount of data and time that is needed for the transfers, the Axinom Sync on-board component compares the content sets and updates only **the differences**. Also, for roll-backs and as contingencies, it keeps track of content versions. This also reduces the associated costs while using limited and expensive data channels.



## DATA REDUNDANCY & RECOVERY

Axinom Sync extends the safety of the data from accidental corruption or loss through redundancy, using the system capability to maintain multiple identical copies and versions of the data in separate places, or on different servers.



## ROBUST AND SECURE TRANSFER

Axinom Sync uses a combined encryption approach to encrypt data, optimized explicitly for delivering cryptographic data as a stream. The system ensures highest security when delivering and synchronizing data. Both data and services can be encrypted on-the-fly reliably to ensure secure data transfer both ways.



## INTERRUPTION MANAGEMENT

Axinom Sync also allows handling of disconnections or interruptions during synchronization. Using Axinom Sync, the successfully synchronized part of the content can be used on-board, while continuing updates as soon as connectivity is available.

# HIGHLIGHTS



## BIDIRECTIONAL DATA FLOW

The whole system architecture supports bidirectional content delivery. The backchannel can handle any kind of data that is generated on the on-board or home server by **Axinom On-Board Cloud** managed services, like system health data, log files, payment data, etc. Subscribers like payment gateways, analytics tools, shops, can subscribe to backchannel data to gather information they need to process.



## CHOICE OF PIPELINE

Axinom Sync supports standard communication protocols and mediums for synchronization:

- Cellular 3G/4G
- Wireless Access
- Satellite
- Physical storage devices like USB and SSD
- Personal devices like crew phones, laptops and tablets

# APPLICATIONS

A photograph of an airplane wing flying over a sea of clouds at sunset or sunrise. The wing is in the foreground, and the sun is low on the horizon, creating a warm, golden glow. A blue banner with the word 'APPLICATIONS' is overlaid on the left side of the image.

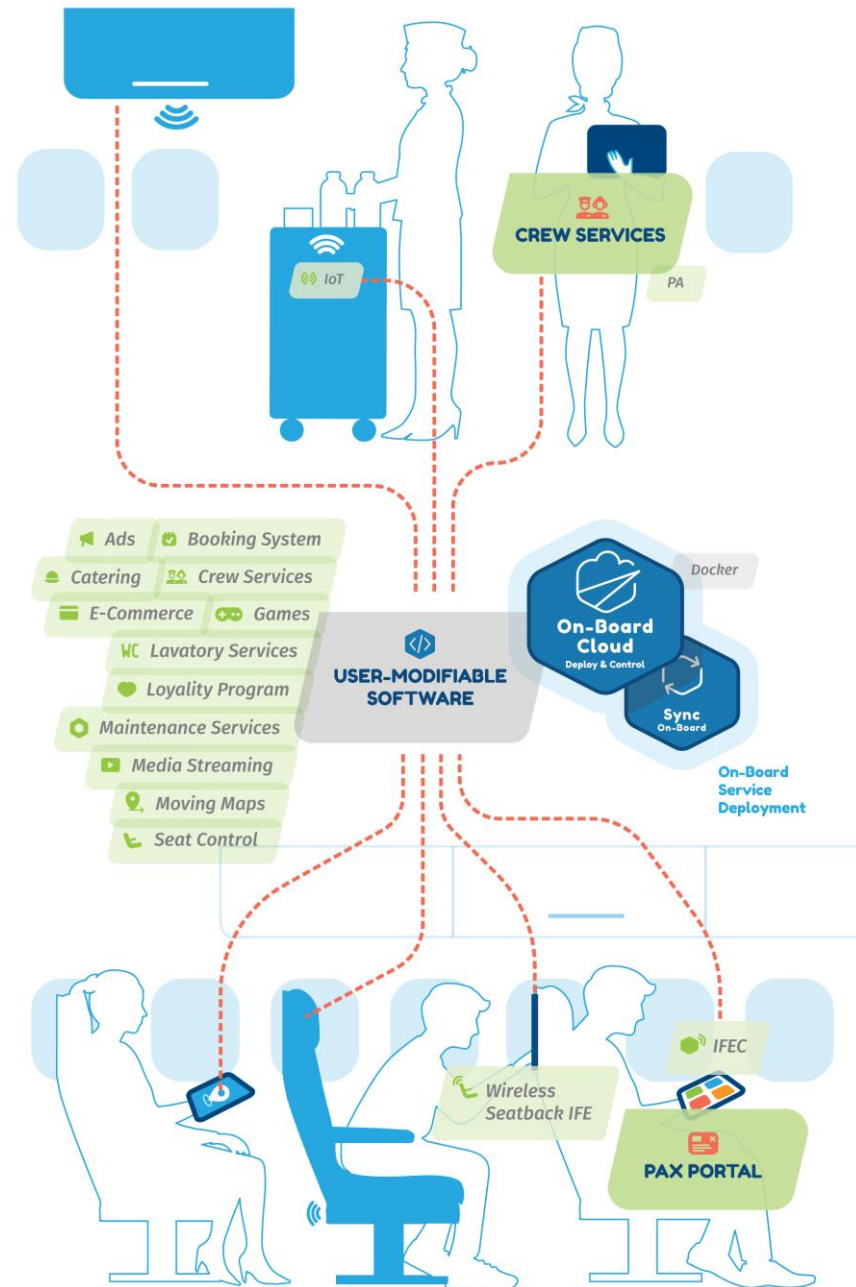
# LIMITED ONLY BY IMAGINATION

Axinom On-Board Cloud opens the tightly regulated digital services space in the transportation industry to digital service providers, innovative use-cases, and novel applications.

Transport service providers, integrators, and vessel builders, manufacturers can benefit from **Axinom On-Board Cloud** to enhance and enrich passenger and crew experience, streamline operations and earn ancillary revenues.

Examples of the types of services that can be built and implemented are:

- Smart cabin services like connected trolleys, lavatories
- Connected cabins for seat or cabin planning , mapping, and up-selling
- Entertainment including integrated Wireless Seatback Entertainment, Wireless Entertainment, and VoD services
- Destination services like hotel and cab booking, itinerary planning
- E-commerce with integration of on-board, port or station duty-free
- Luggage and cargo status, with environment or container sensors data
- Predictive maintenance for cabin hardware
- On-board integrated IoT system applications, and much more



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