

Outline

1. Core technology

(1) ORiON Plus

Overview/Network control/Vessel PCs status monitoring/Ticket system/ORiON DRIVE/ORiON EYE

(2) ORiON L2X

(3) ORiON L3

(4) Cold Standby Firewall

2. Communication Infrastructure

(1) FX

(2) VSAT

(3) Low earth orbit satellite

(4) Certus

(5) World Wide 4G

(6) Local 4G/5G

3. Onboard Equipment

(1) About LAN overview

(2) Business LAN

Overview/NAS/Windows PC/Tablet PC/
ORiON PHONE/SMS Server/CCTV

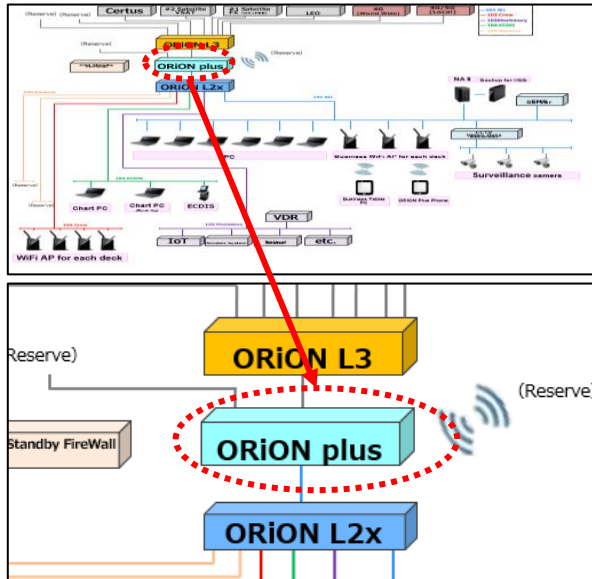
(3) Other LANs

Crew LAN/Machinery LAN/ECDIS LAN/Reserve



ORiON PLUS Overview

It is the central device of the maritime network provided by ORCA.



Main function

Network control

Vessel PC status monitoring

Ticket system

Functions to ensure cyber security

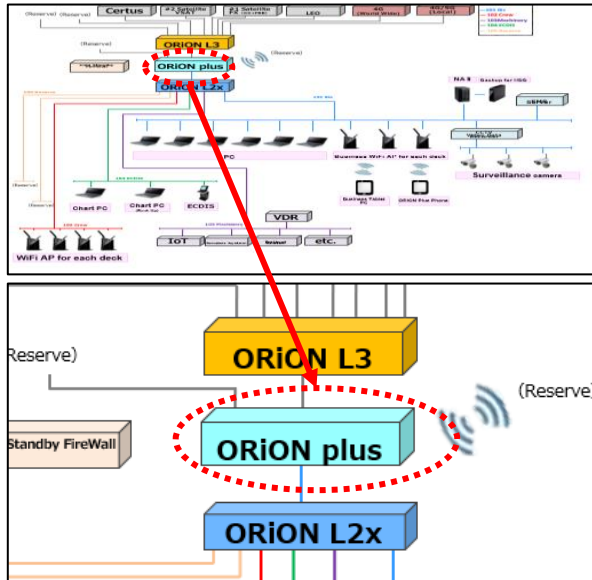
ORiON DRIVE

ORiON EYE



ORION PLUS Vessel PC status monitoring / Ensuring cyber security

Monitor PC status on board.



What can be monitored

- Antivirus update
- Software introduction status
- Status of devices connected to the network

Functions to ensure cyber security

- Equipped with FireWall function

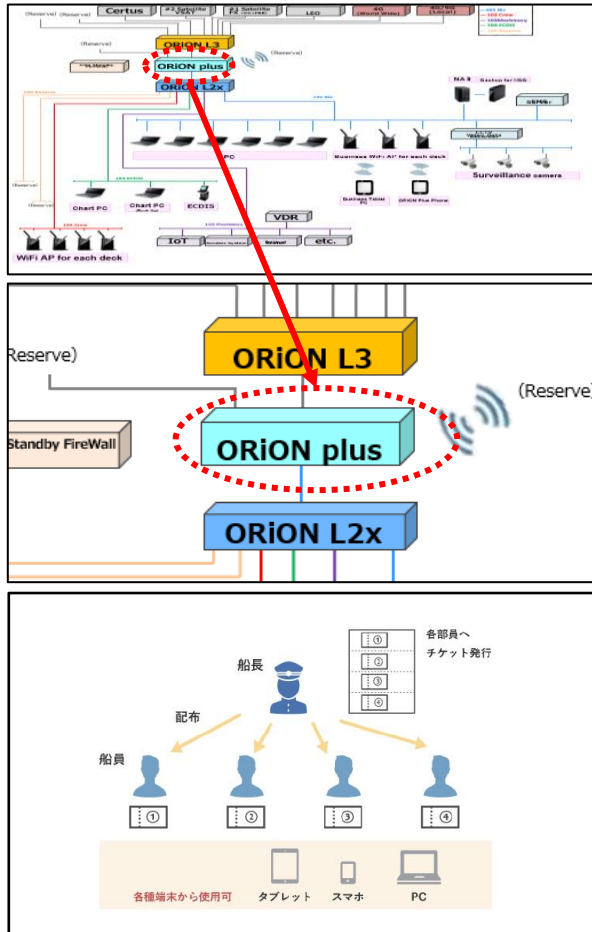


**Network status can be managed remotely,
reducing crews burden**



ORION PLUS Ticket system

This is a ticket distribution function that allows sailors to use upstream communication fairly.



Easy and fair

- Do not rely on IDs and passwords
- Users only need to enter the issuing ticket code
- No cost

User's voice

Problems caused by overuse of the Internet have been resolved

- Unnecessary Internet use during work
- Lack of sleep
- Lack of communication between crew members, etc.



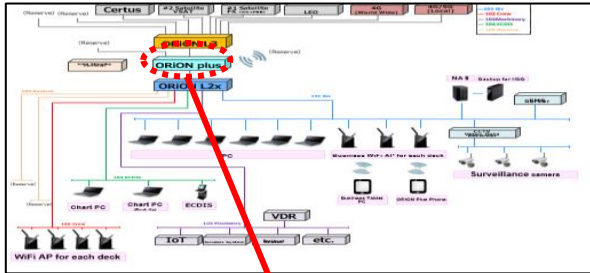
Simple operation that is completed on board is attractive

- Ticket printout & distribution only
- Use size is set in advance



ORION PLUS ORION DRIVE

It is a mechanism for exchanging large files between vessels and shores.



Exchange data little by little

- Supports sizes up to MAX 500MB
- Send and receive in small increments at a limited speed

Minimal impact on business emails and other important communications

Executable files can also be sent

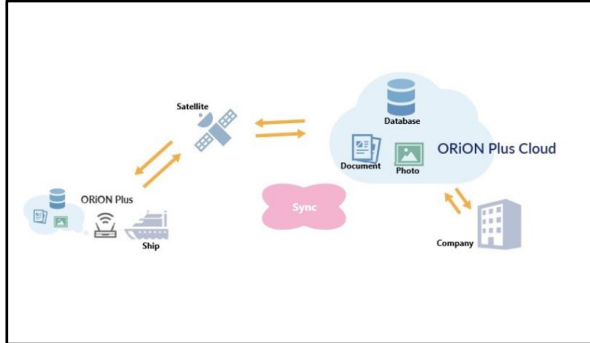
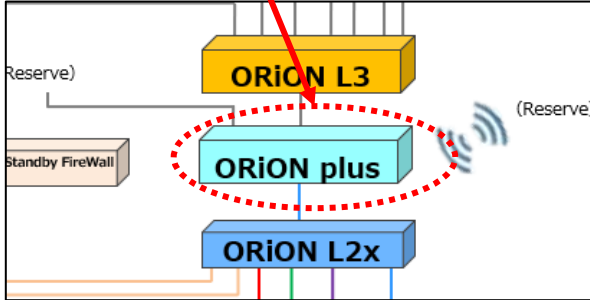
Example

Receive

Videos and photos of the accident

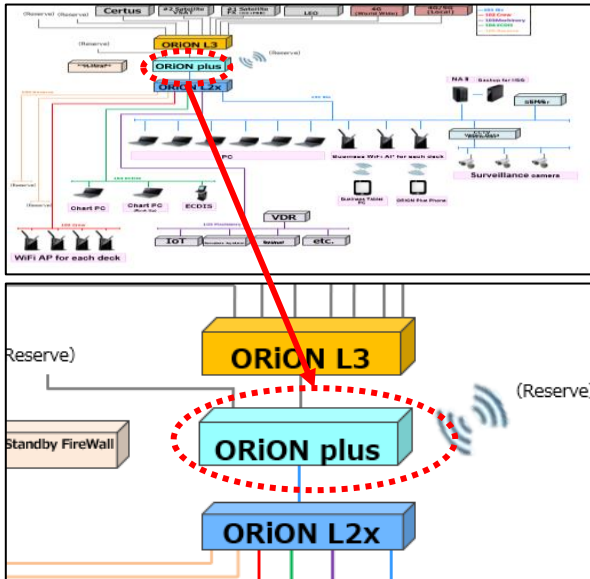
Send in

GA / ECDIS Nautical charts when PC malfunctions / Software installers / Extension files such as exe. that cannot be sent from mail servers



ORION PLUS ORiON EYE

A camera is installed on the vessel, and the status can be monitored from land.



**Bridge installation
(outward)**

Cargo handling
The weather

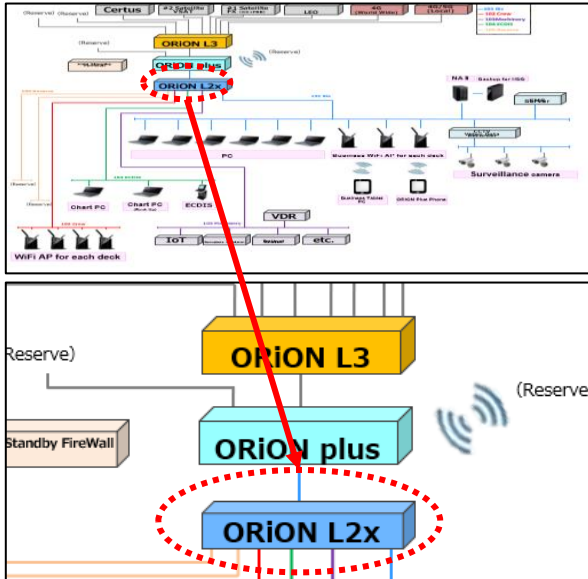
**Bridge installation
(inward facing)**

Observe watch state



ORiON L2x (OL2x)

A network device that maintains and manages the onboard LAN in combination with ORiON Plus.



Virtually separate networks
(Virtual LAN)

Divide LAN space into multiple segments
(Business/ Crew / ECDIS / Other machinery, etc.)

No additional wiring work required

Because it is virtually separated, it can be separated only with existing LAN wiring.

Prioritization

Communication speed and priority of each network can be changed

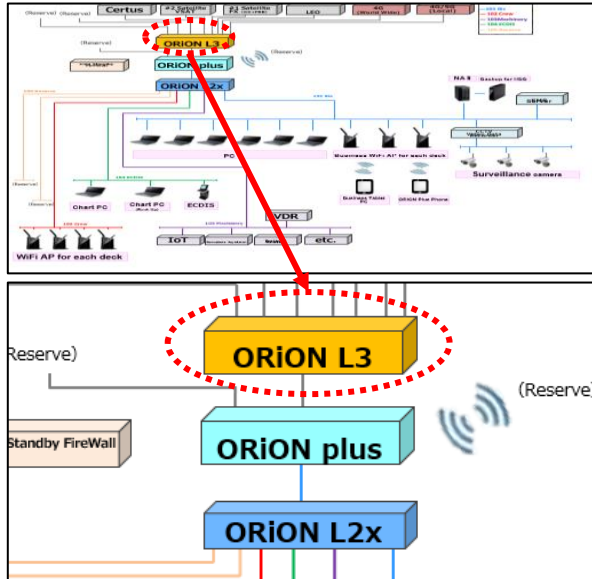
Remote management

LAN space can be adjusted remotely

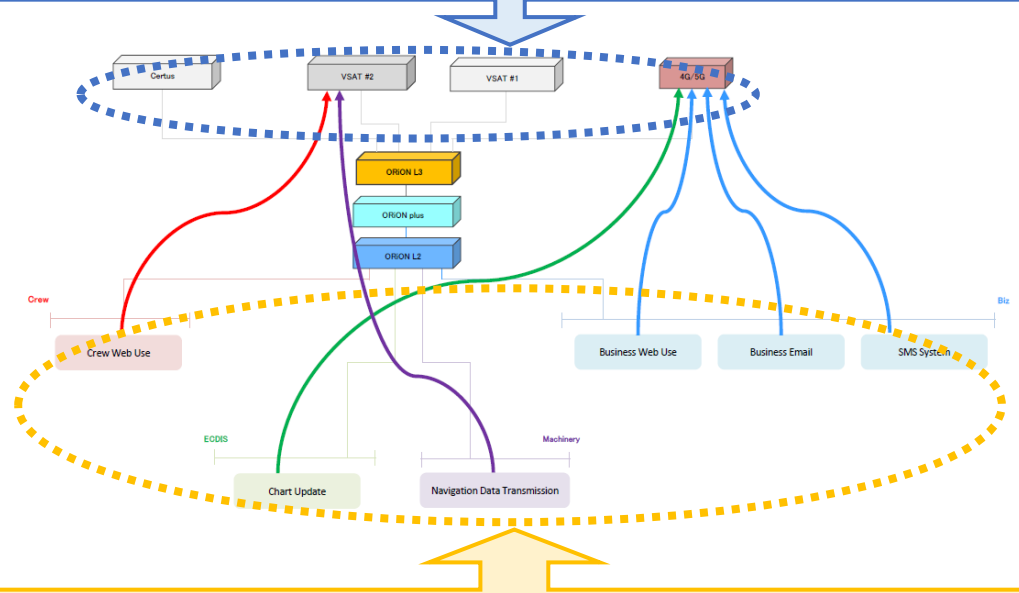


ORION L3 (OL3)

This is ORCA's latest service and the newest system for bundling vessel communication infrastructure.



Up to 8 communication infrastructures

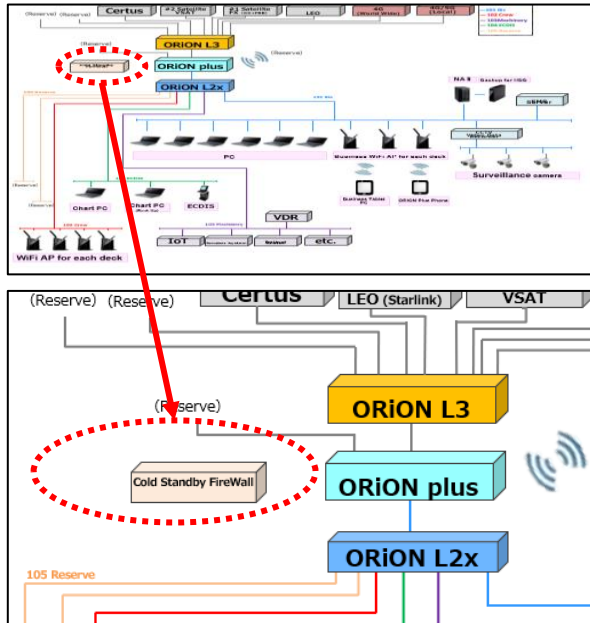


Optimal route for upstream communication infrastructure
Simultaneous distribution to LAN wiring on board.
Crew can use communication without being aware of upstream



Cold Standby Firewall

It is a Cold Standby Firewall machine that changes the connection in the event that ORiON Plus breaks down at sea.



ORiON Plus
= the central function of the vessel network (critical equipment)

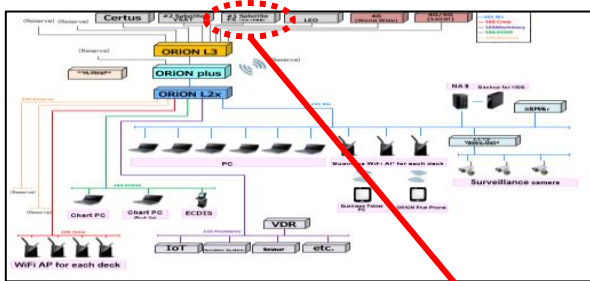
In case of failure

Prepare equipment for Cold Standby
Maintain critical communication functions



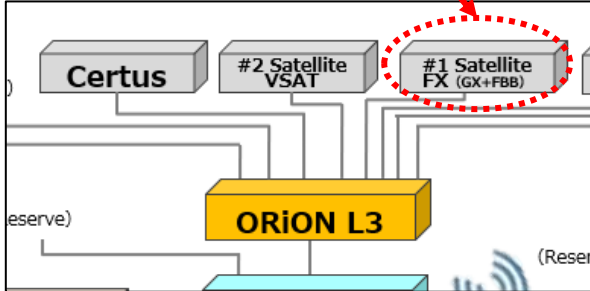
FX (Fleet Express)

Satellite communication provided by Inmarsat.



With GX and FB line composition

Consists of Inmarsat GX line and Inmarsat FB line



Ka band

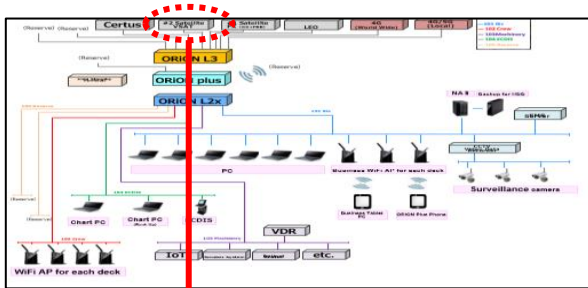
- 27GHz to 40GHz frequency band
- About 188 to 20.2 GHz for downstream communication speed

Example

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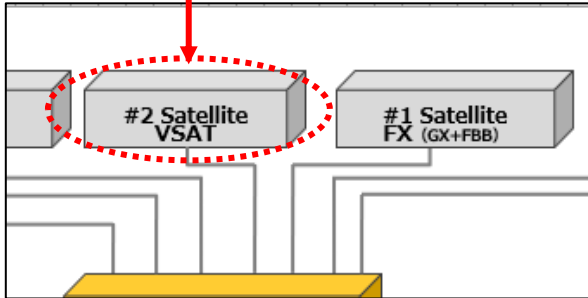
VSAT

Kuband satellite communications.



Multi-satellite roaming

Essentially a global service coverage



numerous distributors

Expand various plan contents

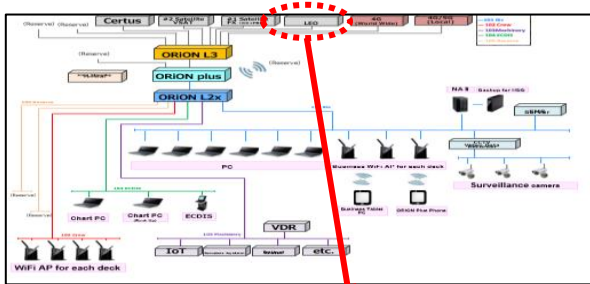
Example

MARLINK
KVHI
SATCOM GLOBAL

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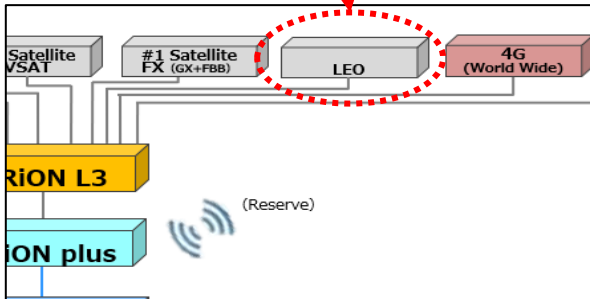
Low Earth Orbit (LEO) - Starlink, etc. -

Satellite communications that pass at altitudes of 2,000 km or less above the Earth's surface.



Fast and small

Said to be as fast as on land



Various businesses such as Starlink

Services such as Starlink are expanding

Example

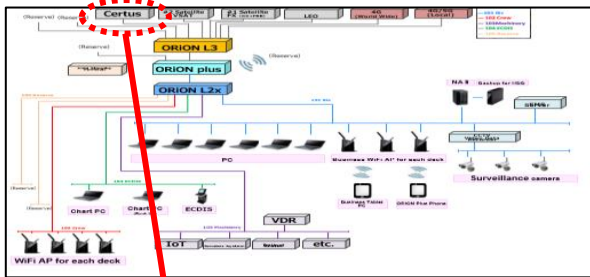


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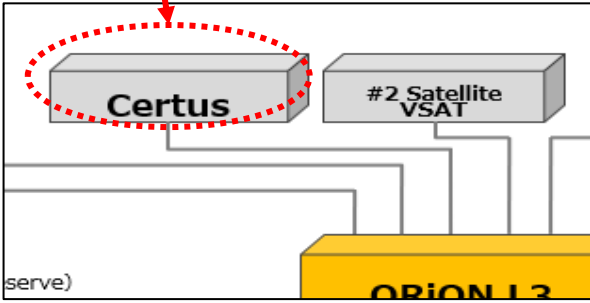
Certus

Satellite communications from Iridium.



Used as a backup line

Primarily used as a backup line due to its relatively easy introduction price

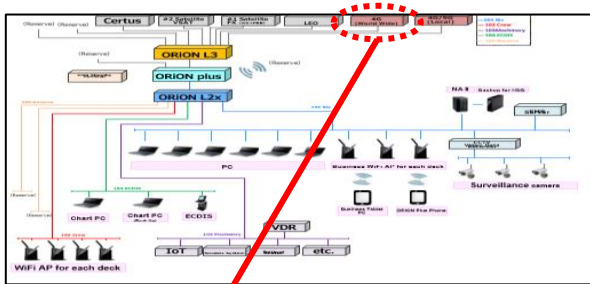


Example

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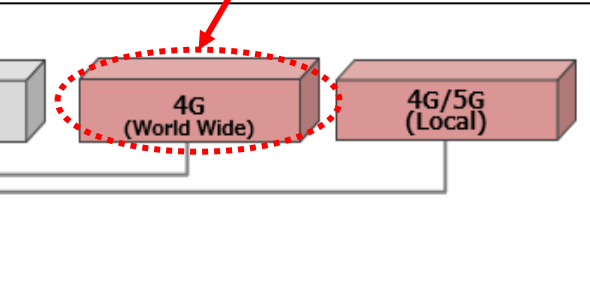
World Wide 4G (WW4G)

This is a roaming service for mobile phone networks in various countries.



Compatible with countries around the world

Available on the coasts of each country



High speed

Achieve smartphone-level speed

Example

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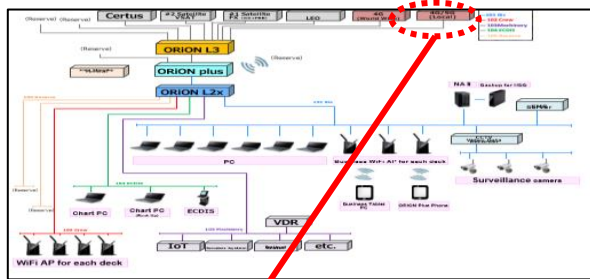
Various usage

Online meetings / sending and receiving large data / remote access to various machinery systems / updating PCs and other equipment, etc.



Local 4G/5G

Domestic mobile phone network communications for each country.



Low cost

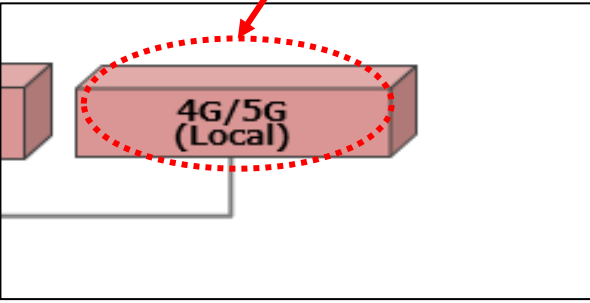
Compared to WW4G, you can get high-capacity communication at a low cost

Convenience

Especially effective when the port of call is fixed

Use as a sub line

Can be combined as a WW4G sub-line



Example

docomo **au**

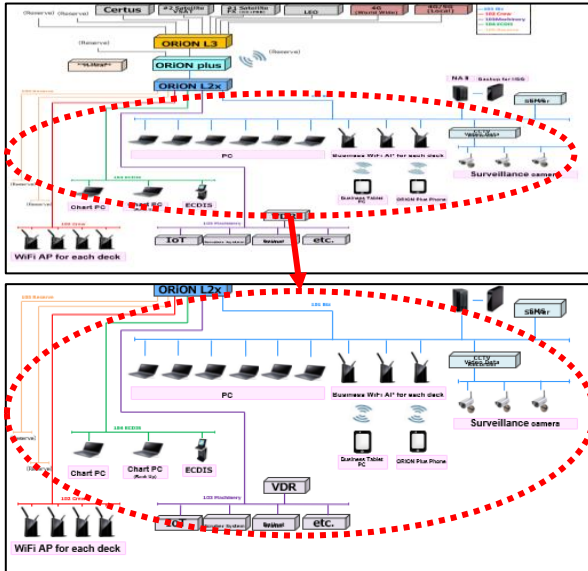
SoftBank

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LAN Space Overview

Can create multiple virtual LAN spaces for downstream communication.



Virtual LAN space = **V**irtual **L**AN = VLAN

Do not interfere
with each other

In principle, LAN spaces are independent of each other and do not interfere with each other.

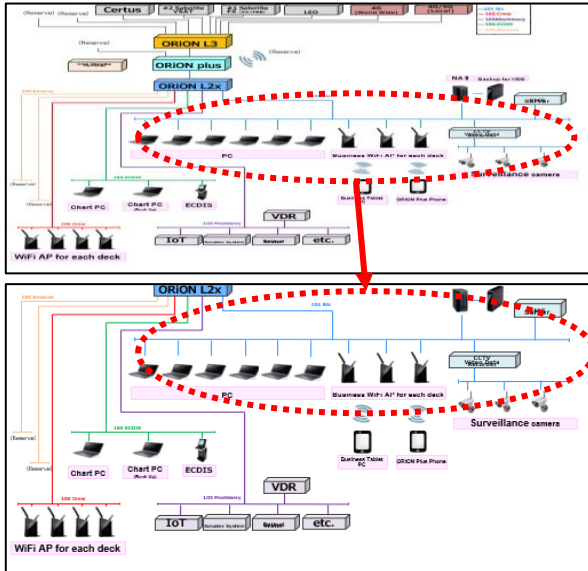
For vessels with different systems, each system can be completed

Ensuring Cyber Security



Business LAN Overview (Business LAN / Biz LAN)

It houses the equipment used by seafarers to carry out their normal duties.



Devices to be connected

Email PC / office PC / NAS / Wi-Fi AP for business LAN, etc.

Most used by crews

in other words

The need to protect safety due to the susceptibility to virus infection

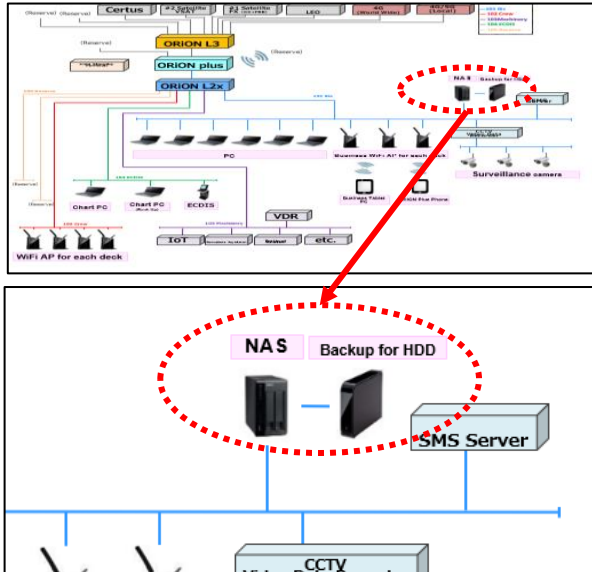
Take a backup

Do not connect personal devices



Business LAN NAS (Business LAN / Biz LAN)

It centrally manages vessel data and has backup functions and fault tolerance.



NAS = Network Attached Storage

Major features

Can be exchanged and installed by Crew hand

Accessible from all business PCs

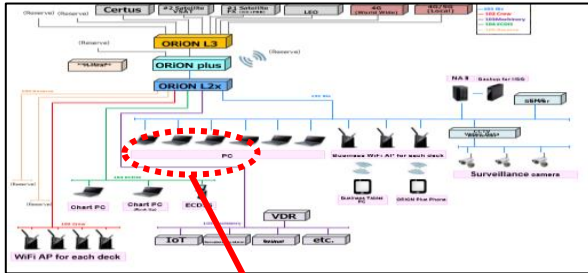
Reduced burden on each PC

Protect data with UPS and backup equipment



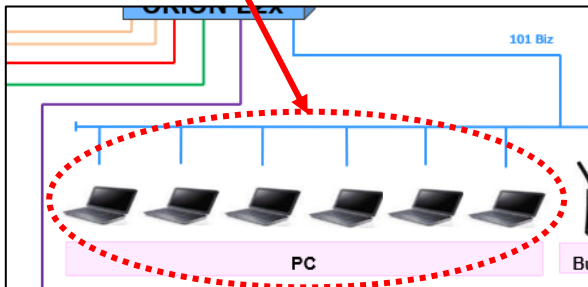
Business LAN Windows PC (Business LAN / Biz LAN)

As of 2023, the mainstream of office PCs will be Windows PCs.



Multiple units installed

The number of units installed per vessel is on the rise



More sophisticated specifications

Higher specifications than before are required

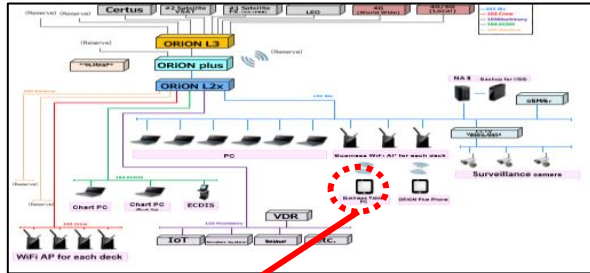


Supports installation of various software/systems even if the specification requirements increase



Business LAN Tablet PC (Business LAN / Biz LAN)

In recent years, there is an increasing trend of operations based on the premise of use.

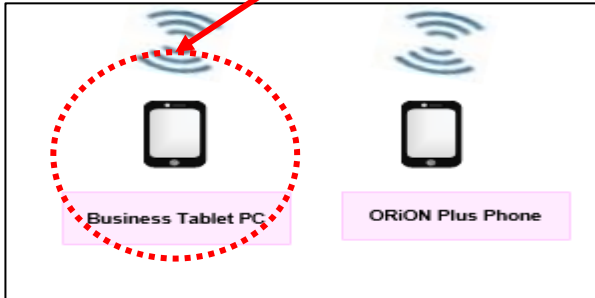


Lightweight
Free to carry

Wireless use with onboard Wi-Fi AP

Various usage

Used for nautical chart software reports / checklist input, etc.



Example

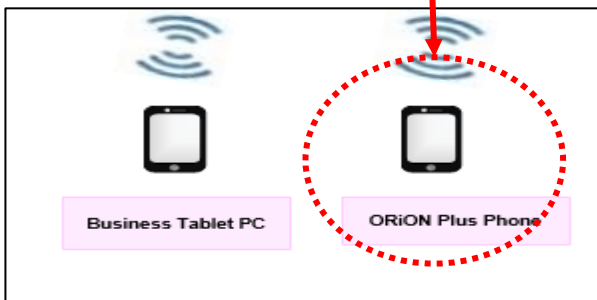
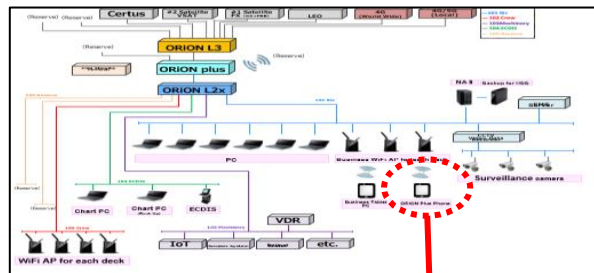
Take photos at the site, attach them to the report and send them

Work can be carried out while communicating via Skype, etc.



Business LAN ORiON PHONE (Business LAN / Biz LAN)

It is a smartphone exclusively for captains provided by ORCA.



Free to carry

Email Enables email communication from anywhere without being in front of a PC

Various usage

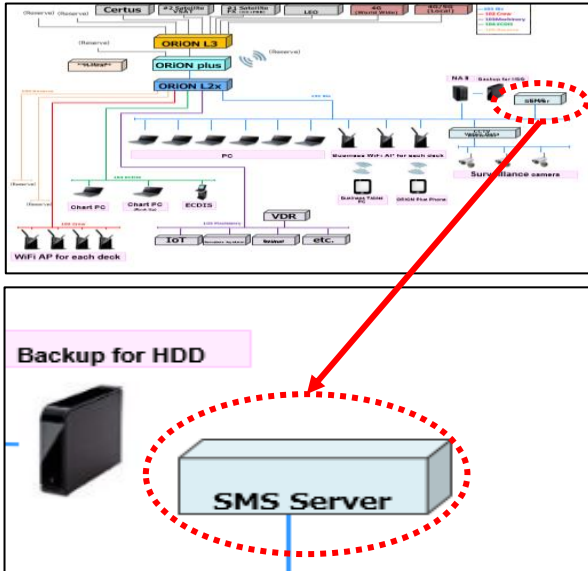
Sending/receiving ORiON Plus Mail / Chat with land (Skype, Messenger, etc.)
*Voice/video calls are also possible depending on the communication situation.

Since you can communicate on a chat basis, it is easy to take pictures and send them. Business efficiency has improved significantly.



Business LAN SMS Server (Business LAN / Biz LAN)

It is a server of the SMS core system used by each company.

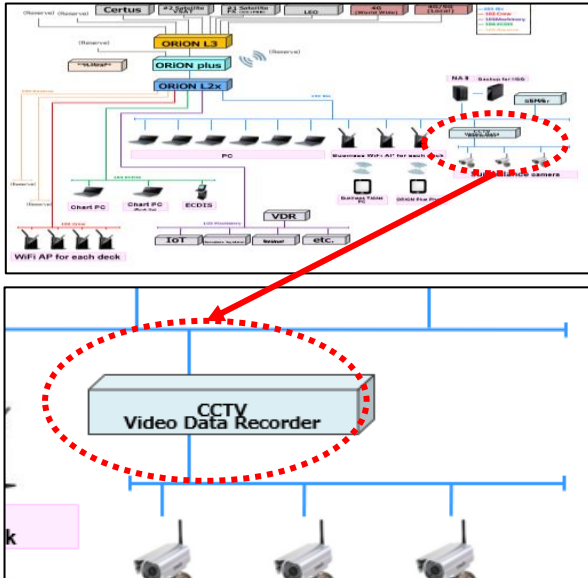


Manage SMS documents and maintenance plans used by each company



Business LAN CCTV (Business LAN / Biz LAN)

It is used to monitor the inside of the bridge and the luggage area.



CCTV = Closed **C**ircuit **T**ele**V**ision

Advancement of
network construction

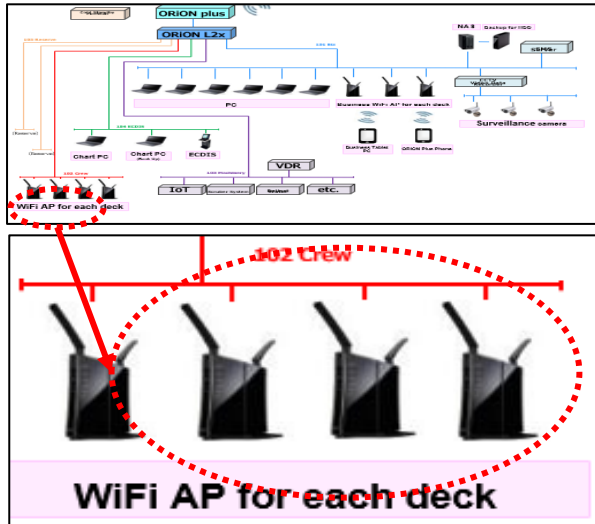
Increasing number of cases of building
surveillance camera systems with
network cameras

Accessible from land with sufficient circuit speed



Other LAN - Crew LAN

**A network for connecting Crew's personal devices.
Selected as one of the internet communications that can be provided for benefits.**



**Does not affect
other networks**

Completely isolated network ensures the security of important equipment

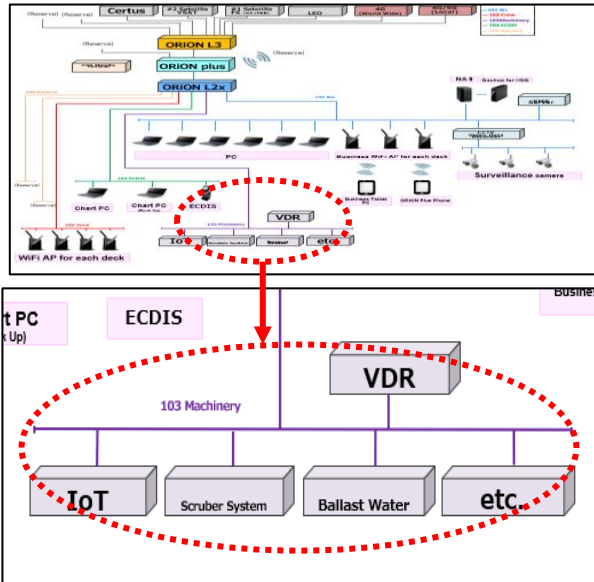
**Equal communication
with Crews**

Use with tickets issued by ORiON Plus



Other LAN - Equipment LAN

A network that connects various OT devices.



Installed systems are increasing

Operation information collection system / scrubber system / ballast water system, etc.

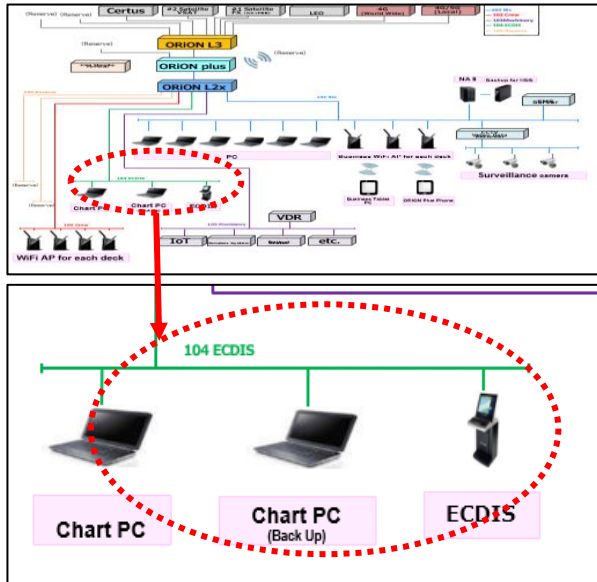
It means

Establishing/maintaining maintenance and confidentiality for each vendor is becoming more important



Other LAN - ECDIS LAN

This is the network to which the equipment for updating ECDIS and the main body of ECDIS belong.



Tend to be independent

Because it is a legal part, it is often separated from BIZ and Crew LAN

Furthermore

For e-books and log books that assume access from all PCs

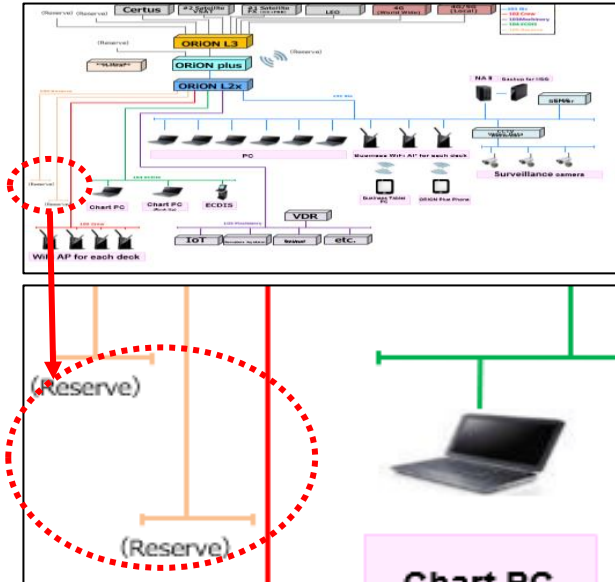
Exceptional access settings are also possible

Can be implemented while ensuring security and LAN separation



OtherLAN - Reserve

LAN space that can be reserved for future use.



Up to 16 VLANs

Up to 16 VLANs can be configured with ORION L2x

Reservable

Reserved for future expansion

