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IT, INTERNET AND CYBERSECURITY ONBOARD

Chief Scientist Workshop 2025

IN THIS PRESENTATION

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What IT facilities can you expect onboard?

What is the internet connection like?

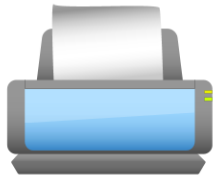
What do you need to do before coming onboard?

How to reduce cybersecurity risks?

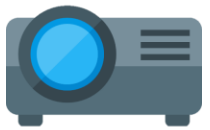
This is an overview… more details will come in pre-cruise documentation!

IT ONBOARD: CORE FACILITIES

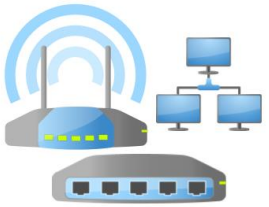
- There are a handful of general-purpose PCs in work areas.
- The scientific party are expected to bring and use their own devices. These will be able to connect to the ship's WiFi or Wired connections.



- There are networked A4 printer/scanners available in the main work areas.
- There is also an A0 plotter and at least one A3 printer.



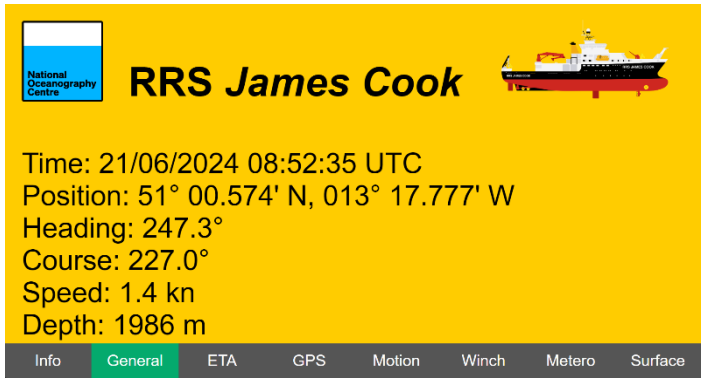
- The conference room on each ship has a projector for presentations.
- Each ship's Main Lab is fitted with large displays which can be used to give presentations too.



- Most areas and cabins, have wireless (WiFi) signal.
- Most areas, including cabins, have wired network outlets. Make sure you bring any adapters you need to connect to standard RJ45 Ethernet sockets.
- The onboard Marine IT Technician can help you get connected up when you arrive.

IT ONBOARD: SCIENTIFIC COMPUTER FACILITIES

- There are scientific display systems showing graphs or sensor readings throughout the main work areas.
- In the Main Lab on each ship there are videowalls for seeing and controlling many systems at once.



- The ship is fitted with virtual machine host servers. We can host your virtual machine images for use onboard.

- Up to 2TB network allocated storage, with redundancy and near-real-time backup to multiple external hard-disks.
- Read-only science data area and Public shared folder available over the network so you can access the science data in real-time and share files.
- Most cruises generate less than 2TB of underway data and this will be handled to the PI on a USB disk at the end of the expedition. (ROV and seismics datasets are handled separately and are generally much larger).

IT ONBOARD: SCIENTIFIC SYSTEMS

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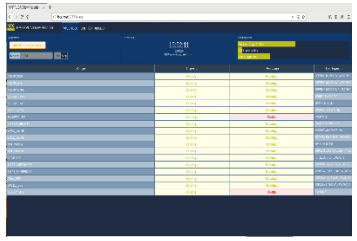

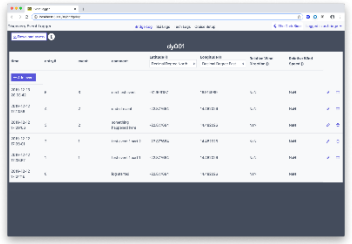

- The ship is fitted with underway data recording systems ‘RVDAS’ and ‘TECHSAS’.
- The data from these is accessible as NetCDF, ASCII or direct SQL query.
- Data can also be viewed and downloaded through a Grafana web portal.
- The ship is fitted with a web-based Event Logging system.
- Through the ship’s display system:
  - ADCPs can be controlled with UHDAS or VMDAS.
  - The Kongsberg echosounder suite can be controlled using Kongsberg SIS and their other proprietary softwares.
  - The USBL underwater positioning system can be controlled and monitored using Sonardyne Ranger2.
  - Situational awareness can be established using the Olex GIS or QGIS suites.

IT ONBOARD: CONNECTING TO THE NETWORK

- To use the onboard IT every user will have to agree to abide by the IT Acceptable Use Policy and consent to data being collected about their use of the IT systems.
- You will also need a compatible device. In 2025, you need a device running one of **Windows 10+, Ubuntu 23+, CentOS/RHEL 8 +, MacOS Ventura+, iOS 15+** to access the network. Some devices running Android may not be able to access the network.
- You will then get ship credentials like firstname.lastname@discovery.ad.noc.ac.uk and a password, which you should change when you get onboard.
- These credentials will allow you to connect to the **Discovery** or **James Cook** WiFi hotspots or use the wired network outlets in labs and cabins.
- These credentials, used on Windows and Mac workstations, will also enable you to mount the science data folders on your device and access science intranet sites.
- Other devices will need additional support from the onboard Marine IT Technician.

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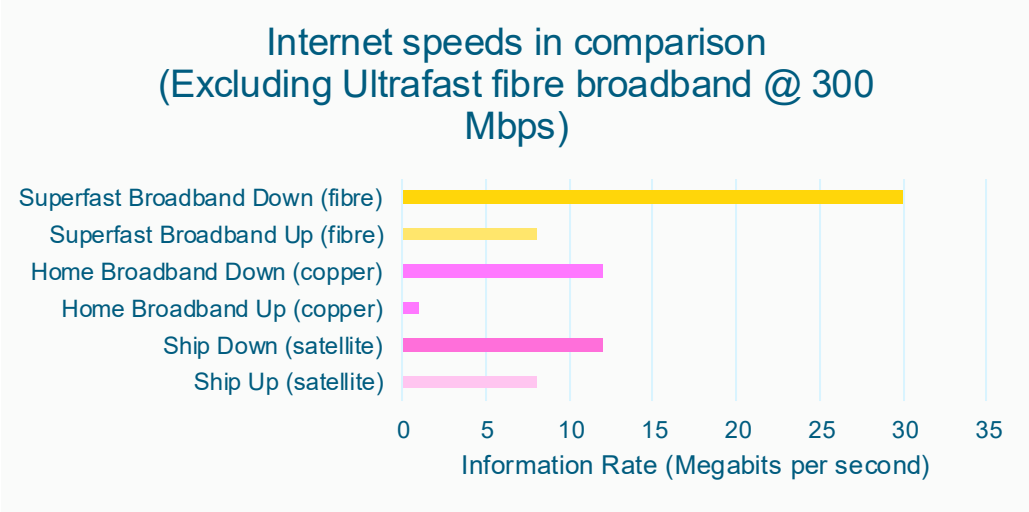
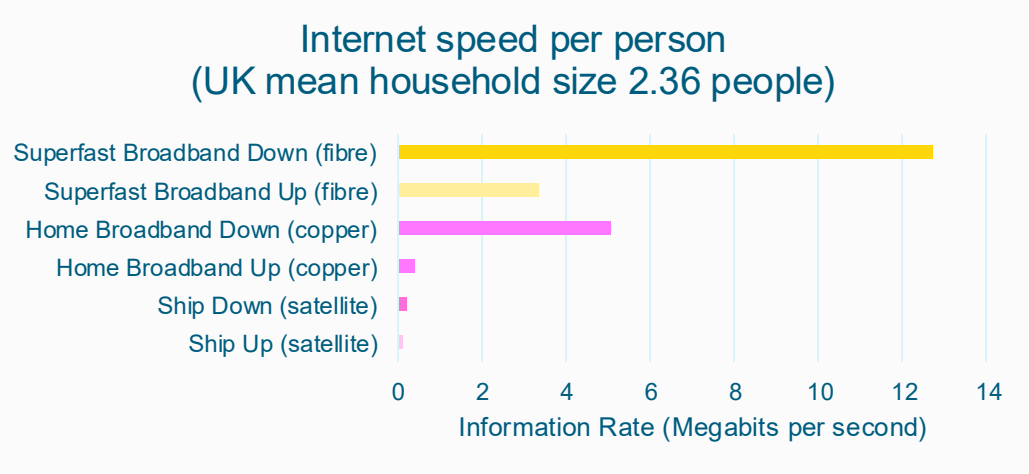
INTERNET PROVISION

INTERNET PROVISION

- The internet onboard is provided via:
  - One C/Ku-band VSAT antenna providing 2-8 Mb/s (mean 5 Mb/s) globally between 70° N/S latitude.
  - Two OneWeb Low Earth Orbit antenna providing 12-75 Mb/s globally, capped at 2.4 TB per month (giving an effective speed of 7.2 Mb/s)
- Backup service provided via Iridium Certus and Starlink.
- The average information rate is managed at around 12 Mb/s, shared between 50 people, to keep us within our data limits.
- There are restrictions in place on video streaming, internet TV, filesharing, and downloads to manage the speed of the link.





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CYBERSECURITY

CYBERSECURITY: WHY IS IT IMPORTANT?

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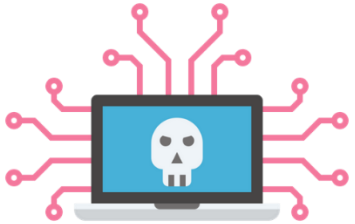

- A cyber incident (arising from an innocent or a malicious cause) can cause any of:
  - Minor inconvenience.
  - Personal accounts (e.g. bank) being compromised.
  - Blackmail.
  - Loss of valuable research data.
  - Data being stolen.
  - Major disruption to data gathering activities.
  - Damage to critical ship systems, like propulsion or navigation.
  - Threat to health, safety and lives.
- The NOC, as a ship operator, is required to manage the risks arising from cyber incidents onboard, just like how we manage H&S.
- The key principles are: maintaining **integrity**, **availability** and **confidentiality** of data and systems.

CYBERSECURITY: HOW CAN INCIDENTS HAPPEN?

- Targeted attack:
  - Phishing emails, extortion, blackmail, scam text messages.
  - WiFi interception in public places like airports or hotels.
  - Compromising a device that is later plugged into a network or a PC.
  - Remote hack over the network by a Nation State, terrorist or other hacker.
  - Dodgy attachment containing a virus or ransomware.
  - Insider attack: someone onboard causing the incident.

- Collateral damage:
  - Infected USB stick unwittingly plugged into onboard PC.
  - Spread of a virus, worm or ransomware onboard after accidental download.

- Accidental (most common!):
  - Power loss, hardware failure, equipment damaged in rough weather, lack of spares, software corruption, operating system corruption.

CYBERSECURITY: 10 STEPS TO BETTER PRACTICE

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1. Use strong passwords (the longer the better).
2. Use antivirus/anti-malware.
3. Keep software/operating system up-to-date.
4. Email and messaging vigilance – know the signs of phishing and fraud.
5. Only download apps and software from trusted sources.
6. Lock when unattended.
7. Report concerns.
8. If you can’t use network file sharing, use your own USB stick and scan it regularly.
9. Use a restricted user account on your device for day-to-day operations (not an admin account).
10. Be careful when using a public wifi: Use a VPN when connecting to a public wifi hotspot.

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BEFORE YOU GET ONBOARD

BEFORE YOU SAIL

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1. You'll have the opportunity to ask questions about IT at the Cruise Planning Meeting.
2. You'll be sent a guide about a month before to help your science party get their IT sorted. You'll also get a copy of the Onboard IT Policy.
3. Onboard, there'll be an IT Briefing to show the science party how to connect up and access data. They'll also receive their own usernames and passwords after they've signed their agreement to the Onboard IT Policy.
4. A Scientific Systems Technician will sail with you to assist in all scientific systems matters, including IT.
5. A member of the Ship Scientific Systems or Marine IT teams will be on standby ashore to assist with more complex IT problems remotely.

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