Onboard Personnel Multimedia Device
(OPMD)

HMAS Ballarat personnel utilising the PWA system while deployed on Operation Manitou,
Source: *'Deployed Ballarat crew able to video chat with home'*, Navy Daily

The Problem

It is possible that the recent rollout of the Royal Australian Navy's (RAN) Personal Wi-Fi-Access (PWA) system on a series of HMA Ships has introduced several security vulnerabilities for the assets and personnel onboard. Although it is likely that the team responsible for the rollout considered the risk before introducing the PWA and may have a contingency plan in place, any system that connects to the internet has inherent vulnerabilities which cannot be disappeared.

The system's capabilities, including its capacity to host up to 180 concurrent users, allows personnel to access social media, emails, stream music and videos and download files to their devices while at sea and on operation. In its current configuration, it is possible that the PWA introduces the risk of adversaries gaining access to the ship's live positioning data and, if sufficiently compromised, collecting intelligence on the activities of those who use the network, crippling the ship's operational security.
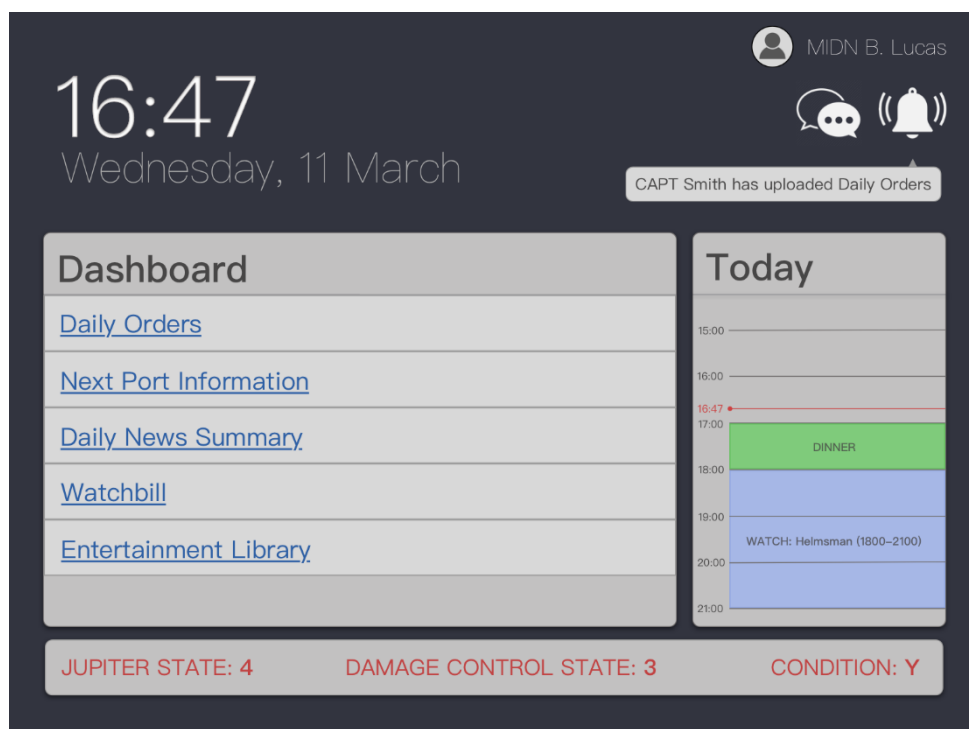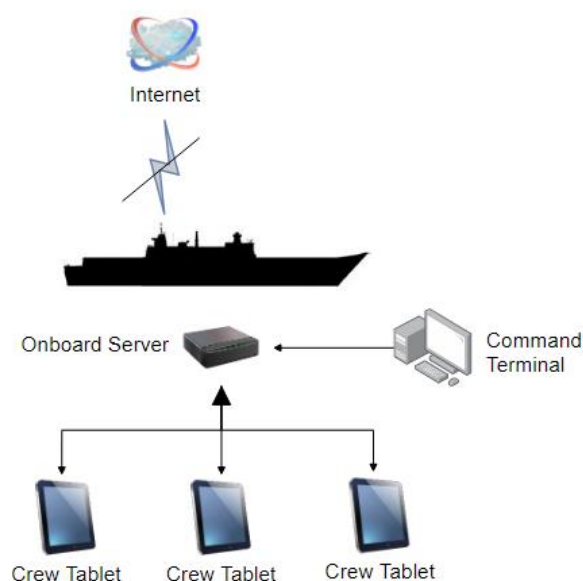
The Solution

The PWA cannot be removed entirely because a lack of personal connectivity poses a retention problem for the RAN. Therefore, I propose modifications be made to the PWA to enhance its resilience against cyber threats and ensure that it does not compromise the RAN's mission to fight and win at sea.

Proposed OPMD system architecture

I propose the RAN trial an 'Onboard Personnel Multimedia Device' (OPMD), utilising the infrastructure currently in place with the PWA, which would present fewer vulnerabilities. Much like inflight entertainment systems used by commercial airlines, the OPMD would provide personnel with access to a list of internally stored movies, tv shows, music and books for entertainment.

To facilitate external communication, personnel can queue messages for release. When command sees fit, the ship can choose to send and receive queued messages, minimising the risk of compromising positioning data.
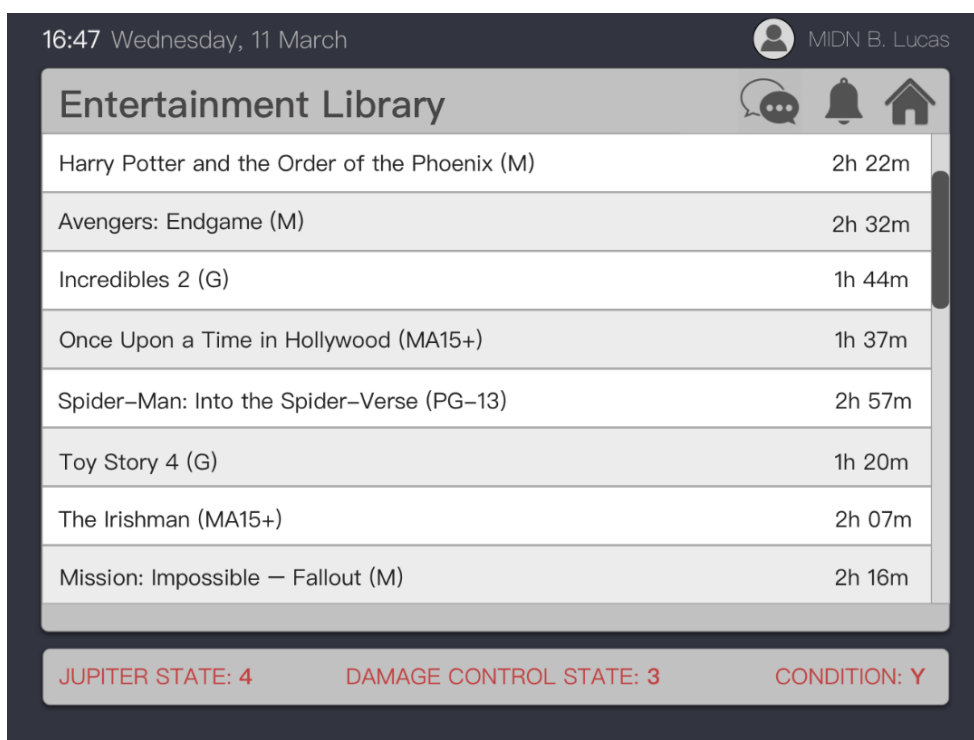
OPMD 'home' screen

Onboard Entertainment

Data files of recent movies and TV shows can be uploaded via data transfer prior to the ship's departure. News summaries can also be downloaded from ABC News at sea whenever upload/download links are established.
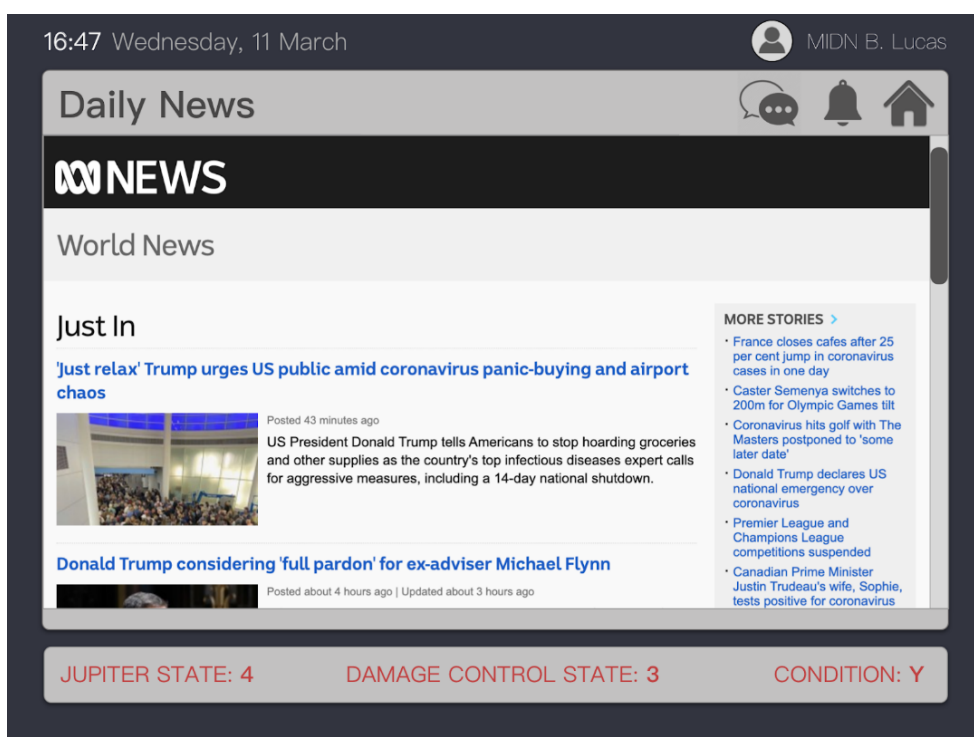

OPMD entertainment library selection (above) and daily news update (below)

Personnel Analytics and Welfare Monitoring

The OPMD has scope to include features such as a sleep calculator which would allow personnel to voluntarily log and track their sleep, helping combat fatigue and providing command with an accurate picture of the health of ship's company. In addition, fitness trackers, including workout suggestions and progression logs, can be implemented to improve its accuracy.
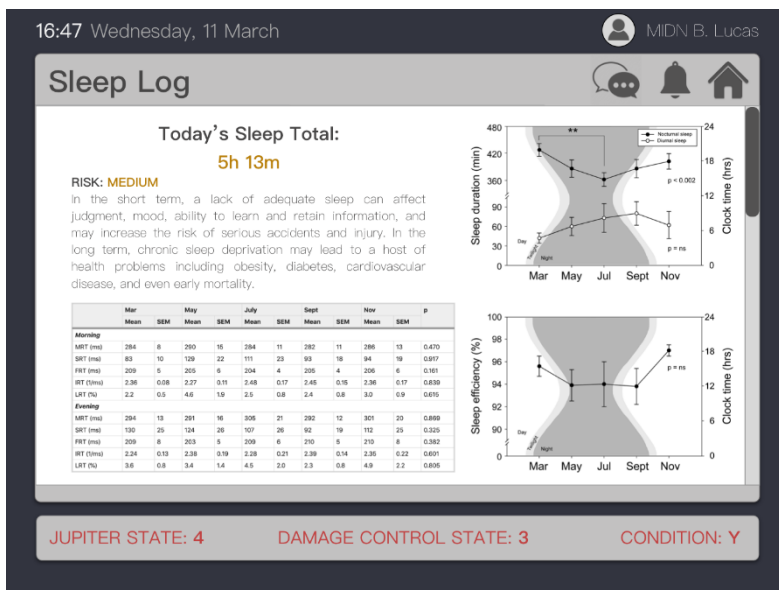
Concept proposal of an integrated sleep tracker

Possible Additional Features

1. Inter-bunk text chat facilitating text commucation across the ship

2. Scheduling system allowing personel to book medical appointments and mess timings

3. Electronic dissemination of daily orders

Proposed Implementation

The OPMD could be implemented in two possible configurations;

1. A retractable screen mounted overhead in bunks utilising wired connections to a central computing system.

This configuration could utilise pre-existing technologies such as Thales' 'Avant In-flight Entertainment System' used by most commercial airlines.

Avant In-flight Entertainment System

- Android operating system.

- 1080p Full High Definition (FHD) video capacitive multi-touch screens ranging from 10" to 32"

2. A portable version utilising a connection to the existing PWA infrastructure, however instead of broadcasting Wi-Fi the system would broadcast an intranet connection only enabling users to access internally stored information.

DT311 Portable Tablet

- Integrated hardware-software encryption capabilities.

- Rear and front cameras offer software privacy control, while a mechanical privacy shutter can be applied to the rear camera.