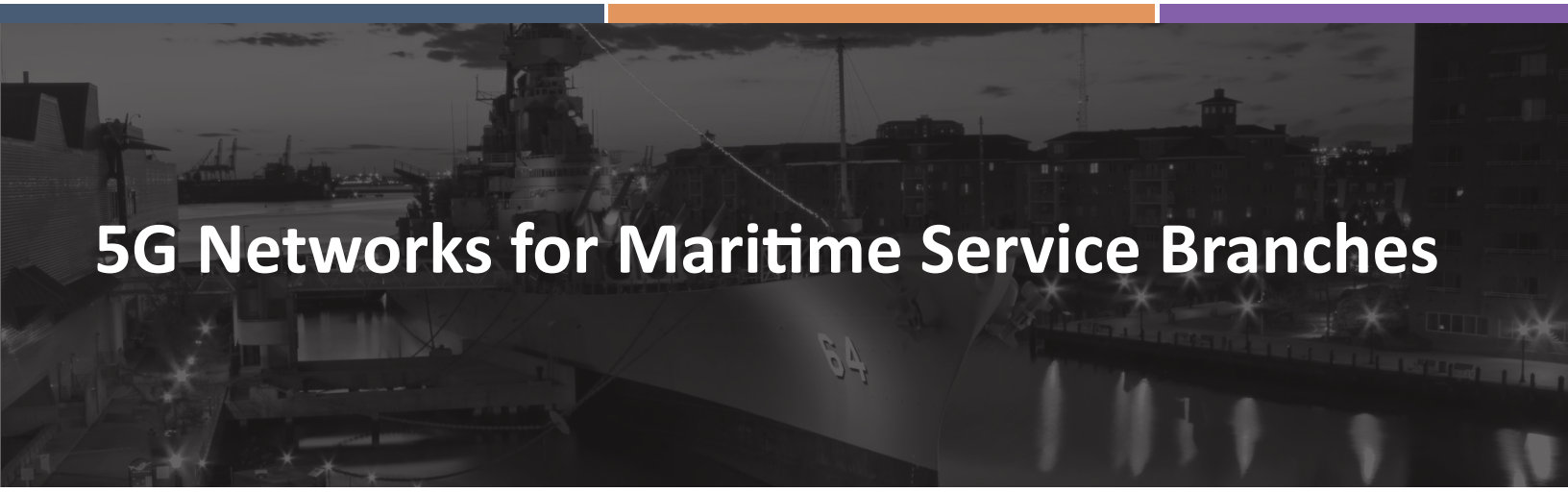

5G Networks for Maritime Service Branches

Naval assets are critical components of a unified military strategy. Maintaining an open sea aids military forces in securing an objective, protecting people and assets or applying dominance. Whether operating independently or as part of a larger battle group, each vessel must be performing optimally at all times. Downtime or performance issues could be catastrophic – not only to the ship but to the success of an entire mission.

Ensuring a vessel is operating at its peak and that any issues are quickly identified and repaired demands the continuous collection and inspection of maintenance information from a myriad of sensors monitoring practically every system and component. From gas turbines to gun turrets, data analysis is forming the foundation of modern maintenance regimes. With so much at stake, the speed at which these records can be moved from onboard systems to the shore-based computing resources and applications examining and acting on the information is increasingly important.

There are several scheduled or unscheduled corrective and ongoing preventative maintenance actions being continually carried out on a fleet. The aim of applying big data analytics to this combination is to identify possible issues and their severity before they are discovered by extensive planned maintenance or though catastrophic failure. This can help lessen the amount of time a ship spends in docks and reduce the chances of having to return to port for impromptu repairs. And with the U.S. GAO reporting that only 12.5% of US Navy craft are returning to sea on schedule, following repairs at Norfolk regional maintenance center, the adoption of new proactive repair processes has never been more opportune.

Though the application of complex machine learning algorithms, maritime service branches can employ artificial intelligence to deliver a predictive maintenance strategy that reduces downtime without escalating the costs typically associated with over-maintaining a vessel. Combining functional benchmarks and historical records with real-time operational and test data, this analysis forms the foundation of a condition-based maintenance approach that strives to pinpoint potential issues and accurately gauge the condition of a system before costly and timely repairs are undertaken.

Two technologies are expected to provide the foundation for this evolution: Public edge compute clouds and 5G new radio. The fifth generation of mobile cellular technology promises to provide ubiquitous high-speed connectivity on-par with fixed-line while dramatically increasing connection density. 5G also provides security and quality of service characteristics unrivaled by wireless alternatives like Wi-Fi 6. When meeting the requirements of Impact Level 5 and 6 information, public edge compute clouds provide the ideal platforms for supporting the data analytics applications required for predictive maintenance and the core network functions supporting the 5G infrastructure.

From aircraft carriers to submarines, 5G connections from ship to shore enable the processing of maintenance data to commence even before the (often-extensive) docking procedures are complete. Along with delivering the infrastructure for fixed Navel maintenance centers, the portability of public clouds enables secure ad-hoc networks and compute capacity to be deployed in battlefield harbors.

Naturally, there are also many opportunities to extend 5G new radio and the public cloud ship-wide in the future, supporting anything from expanding sensor and control applications to communications services for the crew.