# Shield Reply become Oracle Partners to harness the best technology for supporting the defence of our Nation



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## Purpose

The purpose of this article is to explain how Shield Reply, a leading company in AI and digital solutions, uses Oracle technologies to provide cutting-edge, cloud-based, software applications to our nation's defence, intelligence, and security organisations. The article will highlight how Shield Reply leverages Oracle Cloud Infrastructure, Autonomous Database, AI and Spatial capabilities with APEX to rapidly deliver scalable, secure, and intelligent solutions that help protect our national interests. The article also highlights several success stories that Shield Reply have had in their partnership with Oracle and their clients in the defence, intelligence, and security sectors.

# Context

Our world faces security threats at a scale scarcely seen before in history. The rapid technological advancement and increase in global interconnectedness that society has enjoyed in recent decades has given us countless benefits but, it has also raised potential drawbacks. Innovations in areas such as artificial intelligence (AI), big data, robotics, and quantum technology have fundamentally transformed the way countries and organisations are able to operate and compete. The landscape of defence is shifting from mass, physicality, and kinetic effect, to increasingly leveraging the power of information by embedding the power of the rapid digital technological revolution. AI is streamlining and increasing the efficacy of decision making by allowing demanding time critical decisions and complex predictions to be informed by a corpus of data and historic information at such a volume, variety and velocity unachievable by a human alone.

State and non-state actors, organisations and people can now pose threats to our national security by easily leveraging these modern technologies that empower them to an extent never seen before. AI is enabling the creation of more sophisticated autonomous weapons systems such as drones, which reduce, or even eliminate the need for a human operator. The advent of quantum computing and mass proliferation of digital technologies could open the floodgates to cyber-attacks targeting the vital infrastructure on which we rely on for our national safety and security. Additionally, malevolent actors can now rapidly sow discord and distrust within our societies by spreading mis/disinformation, often enabled by AI, and seen on an almost daily basis, which defence and security agencies must be equipped to combat.

At present, adversaries on the world stage are seeking to destabilise the global order that has afforded us an unprecedented level of peace for decades. This is particularly alarming when we consider the proliferation of nuclear weapons, long-range precision strike weapons, or weapons aimed at degrading the space-based infrastructure on which modern life increasingly depends. In September of 2020, the Ministry of Defence, (MOD) launched its 'Integrated Operating Concept'[1] (IOC), a new strategic vision for defence that recognises the world has entered an 'era of global competition' and 'technological change [is] transforming the character of warfare.' For this reason, Shield Reply believes that it is vital for our collective national security that we harness cutting edge technologies to help overcome the complex defence challenges confronting us.

To outpace the challenge that faces us all, Shield Reply have partnered with Oracle to work closely with our defence customers to provide innovative, adaptive, cutting-edge solutions. For 45+ years[2], Oracle, a renowned global leader in cloud computing and database management, has played a pivotal role in driving innovations within the global defence sector, and in this article, we explore how their latest technologies are enhancing defence capabilities in partnership with Shield Reply.

# Why Shield Reply is an Oracle Partner



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Founded in 1977, Oracle has grown from being a database pioneer to a comprehensive technology provider, offering solutions that align well within a defence context. As warfare has shifted to include digital battlefields, Oracle has expanded into cloud computing, AI, and machine learning (ML) technologies to address key security concerns for the defence industry. Recognising this investment, Shield Reply have partnered with Oracle to harness these digital solutions, that are vital to our collective national security to overcome the pressing issues of defence today.

We believe that Oracle's secure infrastructure and advanced capabilities are ideal for managing the massive increase in complex military sensor data and providing real-time insights to decision makers. Wireless Sensor Networks (WSNs) 'have received enormous attention in recent years,'[3] and 'have brought revolution to the field of technology'. When deployed on military platforms they play a key role in military operations. However, the increased amount of data drives an increased need to rapidly evolve how data is stored, accessed, processed, and analysed to provide timely, accurate and timely information to provide real-time decision advantage to military leaders. In a contested, congested, cluttered, constrained, connected and even unconnected environment, using Oracle's Roving Edge Devices (RED) supported by Shield's platform and software solutions, makes this crucial data processable at the Edge even when critical communication links are disrupted.

Systems like RED underscore Oracle's commitment to security and innovation, which we believe make them an ideal partner for addressing modern defence challenges. They provide solutions that protect against cyber threats, combat misinformation, enhance decision-making, and assist in countering threats. By combining our subject matter defence and technology expertise as a small to medium sized enterprise, with Oracle's Global reach and technology, our partnership is uniquely positioned to support defence agencies rapidly and constantly adapt to new, and ever-changing security realities. Together, we aim to keep defence capabilities at the cutting edge, defending against current, and future, threats to national security.

# Oracle's Contributions to Defence Innovations



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## Oracle Cloud Infrastructure: Hyperscale Capabilities

Oracle Cloud Infrastructure (OCI) provides a secure, high-performance environment for running complex applications, with scalability and resilience that make it ideal for managing the demanding workloads of defence operations. This is why Shield Reply have built and deployed multiple projects using OCI and will continue to maximise its capability in the future. Important key features that we will briefly mention here are:

- **Scalability and Performance:** Oracle's cloud solutions scale to meet the needs of large defence projects, ensuring resources are available when and wherever needed. This makes OCI a great solution for Shield, our projects often involve managing large data sets that are computationally expensive and need hosting on increasingly scalable platforms.

- **Security:** With built-in security features, OCI protects sensitive data from unauthorised access and cyber threats. This is, of course, of immense importance to us as we must assure our clients that, when storing data, the highest standards of security are met. Through OCI we provide authentication, authorisation, granular role-based access control and audit capabilities.

- **Compliance**: Oracle Cloud meets stringent regulatory requirements, ensuring compliance with defence industry standards and regulations, allowing us to operate securely and confidently within the complex regulatory landscape.

- **Global Reach**: With a global network of data centres, OCI provides dependable, low-latency access to applications and data anywhere in the world. This is crucial for defence actors, ensuring secure and seamless operations across multiple, and often otherwise isolated, regions.

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## Roving Edge Devices (REDs): Deployable Cloud Capabilities

One of the key challenges defence forces have faced in the shift to digital operations is increased reliance on technology that is vulnerable to cyber-attacks, jamming, and other forms of electronic warfare that can disrupt or compromise critical systems and infrastructure. As a mitigation to this issue Roving Edge Devices, or REDs, are of particular interest to us. REDs are 'hardware platform[s] providing cloud-integrated services that enable OCI cloud compute and storage at the edge of networks and in disconnected locations.' [5] The features that make them ideal for defence utilisation are:

- **Edge Computing Capability:** REDs bring powerful computing resources closer to where data is generated, enabling faster processing, and reducing latency, crucial for real-time applications in remote or tactical environments.

- **Rapid Deployment:** These devices can be quickly deployed in the field, providing immediate access to cloud services and computing power in situations where time is critical.

- **Rugged and Portable:** These devices are designed to be durable and portable, making them ideal for use in harsh or remote environments where traditional data centres are impractical.

- **Scalable and Modular Design:** REDs can be configured and scaled according to mission requirements, allowing Shield Reply to tailor the computing power and storage capacity to the specific needs of each operation, ensuring efficient resource utilisation in diverse operational scenarios.

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## Oracle's AI and ML: Empowering Advanced Defence Capabilities

The shift to digital demands not only robust data management, but also intelligent, predictive capabilities to stay ahead of evolving threats and harness the enormous amount of data now being gathered from sensors. Oracle's AI and ML technologies are at the forefront of solving this problem for defence. Currently, these advanced tools address the complex challenges outlined in our introduction, and Shield Reply are integrating them into ongoing projects to equip defence agencies with the operational edge they need to stay competitive. The following elements are the key features that ensure the best use of resources and assets:

- **Predictive Analytics:** From historic data, Oracle's AI technology can provide predictive analytics for the defence industry. Enabling us to create software that predicts potential threats before they occur. The healthcare industry is also implementing this, 'Through predictive diagnostics, they can better care for patients, optimize clinicians' time, and provide greater insights at the point of care.' [4]

- **Resource Optimisation:** ML can help models optimise resource allocation, ensuring defence agencies respond efficiently to emerging threats. This is of great interest to us because our work often involves the need to develop accurate and reliable systems able to rapidly analyse volumes of data for operation in high pressure environments. Resource Optimisation allows us to stay agile in complex situations.

- **Enhanced Cybersecurity**: ML models can help identify and respond to cyber threats, recognising patterns of malicious activity and improving cyber resilience. With the smooth integration of this tech into Oracle applications, we can assure our client's software is secure against cyber-attacks.

- **Countering Disinformation**: AI tools can help identify and combat the spread of misinformation. This can be done through the creation of tools that can recognise malicious patterns of behaviour and spot false information, addressing one of the key challenges in modern information warfare.

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## Oracle APEX: Rapidly developed Low-Code Applications

Oracle APEX (Application Express) is a crucial component in our success and provides a robust, low-code development platform that enhances security and operational efficiency. APEX allows for the rapid deployment of apps, enabling us to meet the evolving needs of clients and stay agile in high pressure situations. It is also interoperable with other Oracle services, allowing for the easy integration of AI technology, into the Oracle cloud as well. APEX provides a compelling solution for the demanding needs of the defence industry, so we have chosen to adopt it as our primary tool for building applications. We are currently working with APEX for multiple projects, specifically for the ingestion and visualisation of data. We are also incorporating Geospatial Information Systems (GIS), in combination with APEX, within our platform, which enables us to have detailed spatial analysis and mapping, both vital for situational awareness. We are using these advanced technologies to modernise old systems for our clients to allow them to operate reliably in the digital age. The following are the key features of APEX:

- **Rapid Application Development**: We use Oracle APEX to swiftly develop and deploy scalable, secure applications tailored to defence needs like logistics management and mission planning. This rapid capability is essential for adapting to evolving threats, it allows us to deliver at pace, ready to create capable systems with limited notice.

- **Security and Compliance**: APEX includes robust security features that protect sensitive defence data, ensuring compliance with stringent industry standards, crucial for maintaining operational integrity.

- **Rapid Prototyping and Iteration:** The low-code nature of Oracle APEX allows for quick prototyping and iterative development, which is essential for testing new concepts and strategies before full deployment. This also allows us to quickly create demonstrations of applications or capabilities to show clients and respond to their evolving needs.

- **User-Centric Design:** APEX enables the development of user-friendly interfaces, ensuring that defence personnel can interact with complex systems efficiently, reducing training time

and increasing operational effectiveness. This makes it a compelling solution for our needs, as the ability to easily interact with complex systems can often be mission critical. APEX is currently aiding us in the development of an ongoing project that requires data visualisation, so having a user-friendly design makes it particularly compelling to us.

# Conclusion

The evolving digital landscape has fundamentally transformed the nature of modern warfare, presenting new and complex challenges for defence agencies. However, by partnering with leading technology companies such as Oracle, we have positioned Shield Reply to help our defence, intelligence and security customers constantly stay ahead of these continuously emerging threats.

Through Oracle's innovative technologies - from secure cloud infrastructure and edge computing capabilities to advanced AI and machine learning tools - we are arming our defence clients with the capabilities they need to make swift, informed decisions, enhance cyber resilience, and counter emerging threats and misinformation campaigns. Currently, we have multiple ongoing projects working on integrating technologies like AI, APEX and OCI and we work closely with Oracle to consistently provide the optimal solutions for our clients.

With our expertise in incorporating GIS within our platform to enable detailed spatial analysis and mapping, critical for mission planning and battlefield awareness, through to providing robust document libraries systems to enable defence agencies to maintain comprehensive and secure knowledge bases, we are uniquely positioned to build solutions that tackle some of the most pressing issues the defence industry faces today.

As the world becomes increasingly interconnected, and the digital domain expands across the battlespace, it is vital that defence agencies continue to embrace innovative solutions to safeguard our national security. That is why we at Shield Reply, in partnership with Oracle, provide our defence clients with the tools and expertise to defend against current and future threats, and are committed to being at the forefront of this technological revolution.

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