

**CASESTUDY**



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Transformative Partnership:  
**MASL revolutionised  
Defense Research with  
Innovative Storage  
Solutions**





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## THE CLIENT

The esteemed client, the Defense Research and Development Organization (DRDO), stands as a pioneering force in India's defense sector. Renowned for its commitment to technological innovation, DRDO sought a strategic collaboration with Millennium Automation Systems Limited (MASL) to address critical challenges in managing software activities for defense research. This partnership aimed to enhance storage solutions, ensuring scalability, unified management, and optimal performance for cutting-edge defense research initiatives.



# THE CHALLENGE



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## **Limited Storage Scalability:**

- The client encountered constraints in storage scalability as the existing infrastructure struggled to adapt to the escalating demands of software activities for defense research. The challenge lay in the inadequacy of the storage capacity to seamlessly accommodate the burgeoning volume of data generated by sophisticated defense research initiatives.

## **Data Management Complexity:**

- Managing diverse software-related data proved to be a complex endeavor for the client. The absence of a unified approach in data management led to intricacies in organizing, accessing, and retrieving crucial information. This complexity hindered the overall efficiency of defense research operations.

## **Performance Optimization Issues:**

- The client grappled with performance optimization issues, experiencing inconsistencies in the execution of critical defense research software activities. Suboptimal I/O traffic posed a hurdle, impacting the smooth functioning of the infrastructure. The imperative need for solutions that could enhance performance and streamline I/O processes became evident in the face of these challenges.





## THE SEARCH

In pursuit of innovative and effective solutions, the Defense Research and Development Organization (DRDO) initiated a meticulous search for a strategic partner capable of addressing the intricate challenges faced in managing software activities for defense research.

The quest was for a collaborator with proven expertise in scalable, unified, and performance-optimized storage solutions. This search led to the strategic alliance with Millennium Automation Systems Limited (MASL), recognized for its excellence in defense infrastructure solutions.





## SCOPE OF WORK

### **High-End Server Deployment:**

- Meticulous deployment of cutting-edge servers to form the backbone of the enhanced infrastructure.

### **Software-Defined Storage Integration:**

- Implementation of advanced software-defined storage capabilities to address the specific needs of defense research software activities.

### **Virtualization Software Utilization:**

- Utilization of state-of-the-art virtualization software to optimize resource utilization and streamline operational efficiency.





## **Associated Infrastructure Enhancement:**

- Comprehensive enhancement of the associated infrastructure to create a cohesive and robust ecosystem for defense research initiatives.

## **Scalability Measures:**

- Implementation of measures to ensure seamless scalability, allowing the infrastructure to adapt to the dynamic demands of defense research data.

## **Unified Management System:**

- Introduction of a unified management system for streamlined control and efficient handling of diverse software-related data.

## **Performance Optimization Strategies:**

- Integration of performance optimization strategies to address inconsistencies in executing critical defense research software activities.

## **Tailored Solutions for Defense Research:**

- Customization of solutions to specifically meet the intricate and evolving requirements of defense research initiatives. This comprehensive scope of work aimed at not only addressing existing challenges but also future-proofing the infrastructure for the evolving landscape of defense research activities.





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## **THE SOLUTION**

### **Enterprise-Class Storage Services:**

- Deployment of software-based storage services supporting both hybrid and all-flash configurations.
- Implementation of Erasure Code support with single and double parity protection.
- Dynamic adjustment of RAID protection levels through policies to enhance storage utilization.

### **Software-Defined Storage Capability:**

- Integration of in-built software-defined storage within and outside the hypervisor kernel.
- Implementation of common management across storage tiers with dynamic SLA automation via policy-driven control.





## Scalability and Flexibility:

- Seamless increase in storage capacity by adding another hard drive in the physical node.
- Introduction of a single unified management console for the entire environment, simplifying manageability.



## Performance Optimization:

- Acceleration of read/write I/O traffic through built-in caching on server-side flash devices.
- Implementation of distributed RAID and cache mirroring for intelligent placement of VM objects.







## **Data Protection and Availability:**

- Implementation of efficient VM-centric snapshots and clones, supporting more than 24 snapshots/clones per VM.
- Introduction of fault domains for tolerating rack failures, in addition to disk, network, and host failures.

## **Replication and Data Integrity:**

- VM-based replication for asynchronous replication across sites.
- End-to-end software checksum for automatic detection and resolution of silent disk errors.

## **Support for Physical Workloads:**

- Capability to expand to new, non-virtualized/physical workloads with iSCSI access.

## **Performance and Snapshot Capabilities:**

- Establishment of an all-flash architecture ensuring consistent and predictable performance.
- Provision of point-in-time snapshots for reverting to an older state when required.

These strategic solutions were meticulously designed to address each challenge faced by the client, ensuring optimal functionality and efficiency in managing software activities for defense research.





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## THE OUTCOME



### **Enhanced Unified Management:**

- Streamlined and unified management, providing a cohesive approach to handling diverse software-related data.

### **Seamless Scalability:**

- Successful implementation of measures allowing the infrastructure to seamlessly adapt to the dynamic demands of defense research data.

### **Robust Data Protection:**

- Robust mechanisms, including fault domains and efficient snapshots, guaranteeing data integrity and availability.

### **Optimized Performance:**

- Consistent and predictable performance achieved through an all-flash architecture and optimized read/write I/O traffic.





## **Improved Accessibility:**

- Enhanced accessibility to critical defense research data, empowering researchers with efficient and quick retrieval capabilities.

## **Simplified Data Management:**

- Simplification of data management processes, addressing complexities and ensuring efficient organization and retrieval.

## **Unified Software Activities:**

- Unification of software-related activities, fostering a cohesive and synchronized approach to defense research initiatives.

## **Cutting-edge Storage Infrastructure:**

- Deployment of a cutting-edge storage infrastructure, meeting the critical requirements of defense research with advanced technology.

This transformative outcome solidifies MAL's commitment to excellence, providing the Defense Research and Development Organization with a storage solution that not only addresses challenges but also sets new benchmarks for efficiency and performance in defense research activities.





**This case study stands as a testament to MASL's success, showcasing an innovative storage solution that not only addresses defense challenges but also sets a new standard for technological excellence in the sector.**





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