



DataRuck

POWERED BY NIGHTHAWK CYBER

Achieving Information Dominance

Sensor and Instrumentation

Data as a Service (Daas)

Mr. Seth Wade

President, Nighthawk Cyber, LLC



Information Dominance

DataRuck is an AI-enabled, Data-as-a-Service (DaaS) solution that revolutionizes human wearable and Internet of Things (IoT) sensor data management, providing analysis and insights to consumers in real time, on demand.

DataRuck drives information dominance by evolving human wearable and IOT instrumentation data management beyond stove piped, application-focused approaches. It transforms data variables into constants through well formed data fabric, creating a foundation for Artificial Intelligence (AI) to generate predictive analytics. Its proprietary design ensures compatibility with customers' target deployment platforms, making adoption seamless. The following paper outlines DataRuck, a Data as a Service (DaaS) solution that propels organizations to excellence.

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IOMT Data Problem

Military organizations acquire enormous amounts of mobile and instrumentation sensor data from various sources, such as physical assets (e.g., weapons, vehicles, ground sensors), service members (e.g., physiological status, movement patterns, performance), and training/mission outcomes.

The challenge surrounding Internet of Military Things (IOMT) data is not just the collection, but the management of the data. While independent sensor data collections may offer useful insights, a consolidated and powerful data ecosystem delivers measurable improvements to war-fighting information dominance. The intelligent convergence of these disparate information streams creates a holistic view of operational and human performance, making vast amounts of data meaningful, accessible, and usable for leadership. The future of highly accurate and predictive models lies in a reliable and structured platform to extract, load, and transform mobile and instrumentation sensor data.

IOMT Data Solution

DataRuck creates an automated, AI enabled platform tailored to manage and analyze human wearable and IOT instrumentation sensor data.

Nighthawk data scientists and software engineers leverage extensive experience deploying software, databases, and analysis tools to a variety of hosting options. These options include, but are not limited to Department of Defense (DoD) cloud service providers, commercial clouds, Federal Risk and Authorization Management Program (FedRAMP) approved cloud service providers, and on-premises hosting. DataRuck developers carefully designed the DataRuck solution to work within customer network and IT constraints.

DataRuck's design ensures that customers' data and analysis needs are compatible with their target deployment platforms. It is intentionally designed to work within existing cArmy or FedRAMP environments to make adoption as seamless as possible. Tools are carefully selected that are approved for use in FedRAMP and Government cloud environments as well as adaptable to other critical infrastructure cyber frameworks such as Healthcare Protected Healthcare Information (PHI) controls.

Additionally, DataRuck may be deployed as customized containers with databases, prepopulated database tables, or storage and data sciences software pre-loaded for use in stand-alone or austere networks for classified processing. The "DataRuck LITE" container and hardware is Trade Agreements Act (TAA) compliant and easily fits within broader system Authority to Operate (ATO). It allows for immediate AI driven processing and analysis of data collected in denied environments that, when appropriate, can be sent back via long haul networks for long term repo and further processing in the DataRuck cloud.



DataRuck incorporates the latest data sciences technology through demonstrated use of tools such as RStudio Workbench, Microsoft's Posit platform, PowerBI, Jupyter Notebooks, and more. DataRuck developers work closely with Nighthawk's customers to gain a deep understanding of intent and expectations, resulting in highly customized analysis solutions that leverage the right tools for the job. DataRuck's engineers and data scientists have the expertise to examine customer data and write custom Python and C# code to perform data mining, analysis, and develop understandable data graphics within DataRuck.

The security focused approach to platform development provides customers with the assurance that their data is protected whether in transit or at rest, and that the products produced by DataRuck's analysis platform will be secure and applicable to a high security environment. Control measures taken include access control, encryption of data, logging and continuous monitoring, and automation of key processes. DataRuck's platform is by default highly secure and capable of processing potentially sensitive customer data. Regardless of the source of the customer's data or the processes needed to obtain key decision-making details, the emphasis is always to provide the customer with a secure and reliable platform for transforming their data into meaningful and usable business intelligence products.

By adherence to National Institute of Standards and Technology (NIST) 800-53 controls during the development process, DataRuck seeks to maintain a constant state of readiness for FedRAMP accreditation. As a Cloud Service Provider seeking to build, develop, and market products to both the federal and commercial sectors, Nighthawk Cyber prioritizes the confidentiality, integrity, and availability of their services and customer data. DataRuck is uniquely positioned as a secure and reliable product that meets federal standards for the protection of sensitive data. This provides a value added benefit to our customers who know their data is being handled in a secure and responsible manner.

DataRuck developers are focused on the automation and AI enablement of mobile and instrumentation data ingestion into an Impact Level 5 (IL5) ready cloud data lake storage. DataRuck's cloud native and IL5 secure architecture allows implementation to be much faster with security and data governance built into the platform. DataRuck's built-in source connectors ingest numerous data sources including databases, Enterprise Resource Planning (ERP) platforms, flat files, third-party cloud services, big data sources, and streaming/IoT device connections. With DataRuck's data sciences and analytics toolset, organizations can now significantly shorten the time to insights. The platform can create predictive AI enabled reporting of mobile and instrumentation data sensor feeds.



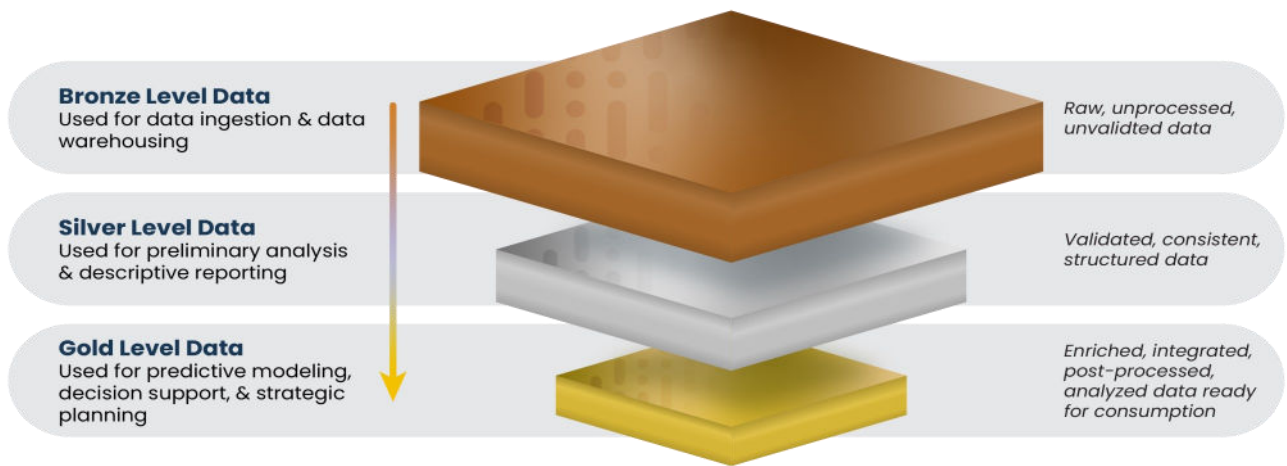
DataRuck drives information dominance and improves leadership decision making through empowering users to access up-to-date information stored on the platform to build the high-performance exports they need, on their own, in real-time.



Sensor Data Management

The DataRuck development team follows established best DEVSECOPS protocols and data science practices to ensure customer data is safely reposed and accurately analyzed. Initial evaluations of customer source data are conducted, and data mining procedures are tailored for that data. When dealing with multiple data sources, Nighthawk data scientists may perform multiple ETL (extract, transform, load) actions to align the data sources to a common data model, correct any transmission errors and to determine the best method to combine data into a common data set.

DataRuck follows a medallion “bronze, silver, gold” approach to logically organize data for management and analysis. This data quality framework categorizes data into three levels based on its maturity and readiness for consumption. This framework helps Nighthawk’s customers ensure that their data is reliable, consistent, and accessible for downstream analysis and decision-making.



Raw data is transferred, captured, or stored in a “Bronze” state. DataRuck can receive data in almost any form, such as JSON, XML, CSV, SQL database dump, API pulls from running code, and sniffing data on the wire (network data stream capture). The incoming sensor data may be malformed, and the initial ingestion process will include writing custom commands using the Data Definition Language (DDL) to push the raw data into a database. Bronze data represents the initial state of data ingestion, often directly from source systems. It is typically unprocessed, unvalidated, and may contain errors or inconsistencies. Bronze data is not suitable for direct analysis or reporting, but it serves as the foundation for further refinement and transformation.

Silver data undergoes a series of data cleansing, validation, and standardization processes to improve its quality. It is typically stored in a structured format and conforms to defined data standards. The Silver data is where Nighthawk customers’ data modeling needs are served. Silver data is considered reliable and consistent, making it suitable for preliminary analysis and reporting.

Gold data represents the highest level of data quality and readiness for consumption. It is derived from silver data through additional enrichment steps, such as data aggregation, integration, and analysis. Gold data is the reference for DataRuck data scientists, working with the customer, to perform predictive modeling, decision support, and strategic planning.

The bronze, silver, gold approach provides a structured and incremental approach to data management and analysis, enabling organizations to gradually improve their data quality and derive more value from their information assets. No matter what level of processing, the same comprehensive and holistic security controls will protect customer data and provide peace of mind for decision makers.



Data as a Service (DaaS)

Data as a Service (DaaS) is a cloud-based delivery model that provides data to consumers on demand.

DaaS providers aggregate data from a variety of sources, including public and private datasets, and make it available to customers through APIs. This allows customers to access and use data without having to invest in their own data infrastructure and management capabilities, and benefit from a security forward approach towards data management. Customers moving through the tiers of the data quality framework are able to realize greater degrees of value from the DataRuck platform.

DaaS offers a number of benefits, including:

- **Cost savings:** DaaS can help customers save money on data storage, processing, and management costs.
- **Scalability:** DaaS is scalable, meaning that customers can easily access more or less data as needed.
- **Agility:** DaaS can help customers improve their business agility by providing them with access to data on demand.
- **Innovation:** DaaS can help customers innovate by providing them with access to new and emerging data sources.

Through DataRuck, Nighthawk offers a complete DaaS solution for use by a wide variety of organizations, including businesses, government agencies, and non-profit organizations. Our approach to data management offers customers the ability to capitalize on business intelligence and analytics applications, which can help organizations make better decisions.

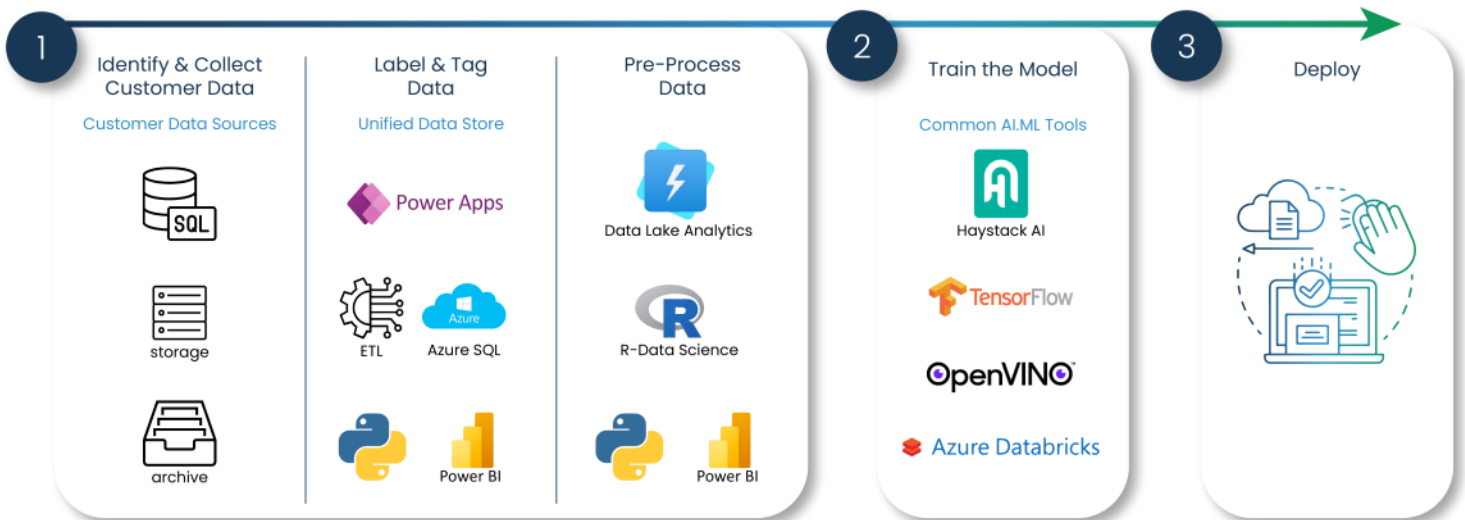


DataRuck Solution Framework

DataRuck creates a scalable and powerful analytics platform, that has the following technical features:

- **Automated ingest** of sensor and instrumentation data at the gold data level
- **Well-formed and clean data environment** from a variety of sources and combinations for analysis of outcomes
- **AI models** tailored and trained for the unique nature of mobile sensor and instrumentation data sets
- **Multi-tiered user reports** that empower non-technical business users to access a centralized data repository to analyze the data any way they want, on their own, in real-time

Below is an operational version view of the DataRuck solution Architecture:





The Customer Environment

Nighthawk Cyber has a unique understanding of the challenges associated with deploying to a military cloud environment and how to address those challenges.

The Nighthawk team leverages decades of experience, including Threat System Management Office, Cybercommand, Airforce Research Labs, and PEO STRI Unified Integration and Transformation Enterprise (UNITE) Infrastructure, to inform their knowledge of unique customer challenges. Military cloud computing is different from commercial cloud service providers in that they require DoD certified cloud access points and offer differing capabilities.

DataRuck developers understand that NIST 800 series and Risk Management Framework (RMF) cyber security process have different regulations in the military cloud environment than the military environments and have worked within both platforms to ensure compliance. DataRuck is built to comply with NIST 800-53 security control standards to ensure full FedRAMP compliance. Diligence is deployed to ensure a solution that may be prototyped on the commercial side is as viable and practical as a solution on the military cloud networks.



Bottom Line

DataRuck is uniquely designed to streamline and aggregate mobile sensor data management.

DataRuck is uniquely designed to streamline and aggregate mobile sensor data management. Through maintaining a central repository of mobile and instrumentation data, the DataRuck platform will empower leaders to make informed, risk reduced, and cost-effective decisions.

DataRuck is tailored for sensor and instrumentation data feeds, and covers all data management aspects - data ingestion, transformation, wrangle, model, store, and real time analysis reporting.

Nighthawk is seeking sponsors and partners to help develop DataRuck beyond its prototype basis into a fully accredited FEDRAMP cloud product and are happy to discuss in depth rough order of magnitude (ROM) costing, development paths, and timelines to provide the value described in this information paper.

Nighthawk's vision is to enable DataRuck users to access the true potential of mobile data by giving them the ability to derive deep actionable insights across vast amounts of disparate data types and achieve information dominance.





Nighthawk is more than just a vendor, we are a trusted partner.

Nighthawk Cyber, LLC is a Service-Disabled Veteran Owned Small Business (SDVOSB) headquartered in Orlando, FL. The Nighthawk team delivers robust solutions supporting a diversified set of cybersecurity, information technology, and data analytics solutions. We rapidly develop and deploy resilient enterprise (IT) and data management offerings comprised of command and control (C2) systems, cloud, and virtualization technologies, ensuring our customers achieve enhanced operations for critical mission areas. Our goal is to leverage our extensive cyber and data focused expertise to meet our clients' critical mission-oriented challenges.

Contract Vehicles

Cyber TRIDENT | TETRAS | RSDP-2 | IWRP Consortium

NAICS Codes

541519, 541330, 541511, 541512, 541513, 541611, 541614, 541618, 541620, 541690, 541715, 541930, 561110, 561210, 561621, 611420, 611430

DUNS

117814705

CAGE Code

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Facilities Clearance (FCL)

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Contact



Seth Wade
President/Chief Growth Officer
Seth.Wade@nighthawkcyber.com
434.329.1746



Nathaniel Wade
Chief Executive Officer
Nathaniel.Wade@nighthawkcyber.com
434.473.1975



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