SOLUTION BRIEF

Scaling Up the Nation's Armed Forces in a Zero Trust World

A how-to guide on improving the nation's cybersecurity posture by achieving complete observability.

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Improving the Nation's Cybersecurity Posture

Mandated Modernization Sparks Action

Throughout the past several years, the United States Presidential Administration has issued numerous Executive Orders (EO) with the goal of bolstering the United States' security posture in the digital age. To modernize federal government cybersecurity as mandated, one of these EOs requires all federal agencies to develop a plan to implement zero trust architectures and puts the onus on the National Institute of Standards and Technology (NIST) to publish new standards and guidelines to enhance software supply chain security. This includes defining critical software and its required security measures, criteria to evaluate software security, and practices to be strictly followed by all federal agencies.

In proactive alignment and compliance, branches of the **United States Department of Defense (DoD)** have released plans to position themselves advantageously against rapidly paced technological advances in space, cyber, information, and electronic warfare capabilities—resulting in the most expansive modernization program for the department in 40 years. A modernized, unified network, centered around supporting Multi-Domain Operations (MDO), is a critical component for secure global operations and its success relies upon a foundation built on the zero trust framework.

Zero Trust for the DoD

Given it's sizable, complex and multi-tenant organizational structure, designing for and maintaining a large-scale unified network for branches of the DoD is generally constrained. To accomplish successful modernization, the selection and use of the right data and technology allows for effective implementation of a consistent enterprise-wide unified network architecture.

In a modern enterprise, uniformed top-level policies and governance on how data is securely created, transmitted and stored is the driving force behind any modernization approach.

> Architectures that are too restrictive decrease efficiency while architectures that are too unrestrictive introduce risk and vulnerability.

Establishing a baseline of the overall data architecture within an enterprise network, and then using that data to drive the modernized design and integration is paramount.

This methodology allows for organic organizational change to ride inside the vehicle of top-level policy and governance, which is driven by data-centric, dynamic decisions. Enterprise agility, which allows for change to occur rapidly, is critical to the effectiveness of a newly modernized organization. To achieve this, a streamlined method to evaluate and approve changes is required.

Data comes in the form of logs, NetFlow, transactions, packets, conversations, traps and events and from disciplines like security, APM, NPM, ITIM and EUE. The key to being able to realize required changes comes from many things, but ultimately, technology teams need to have a system that can quickly provide analytical verification and validation.

In turn, the IT infrastructure needs to be instrumented in a way that all nodes provide inputs to a common data-decision-driven system.

The RavenVISION Framework

The first steps in a modernization strategy should be to analyze the organization's existing infrastructure to understand its current visibility tools across the ITN and the IEN.

For this purpose, RavenTek has designed the **RavenVISION** framework to help identify visibility gaps as well as weed through duplicate and overlapping technologies. RavenVISION is an integrated service offering that encompasses the Visibility Integration of Security, Infrastructure, Operations and Network data and is designed to focus on the end-state mission objective of a single context observability command center.

To accomplish this mission, RavenTek assesses the current state of the enterprise by working closely with traditionally siloed IT teams to gain a holistic view of the organization's data. RavenVISION is intended to help organizations modernize successfully and resiliently through complete observability, and modern AI/ML automation is a critical component of its framework.

Resolving visibility gaps for complete observability should be accomplished before making major modernization decisions or changes to any enterprise. Observability not only exposes where operations and processes may be vulnerable or weak, but also verifies those that are stable.

The RavenVISION Data Value Chain

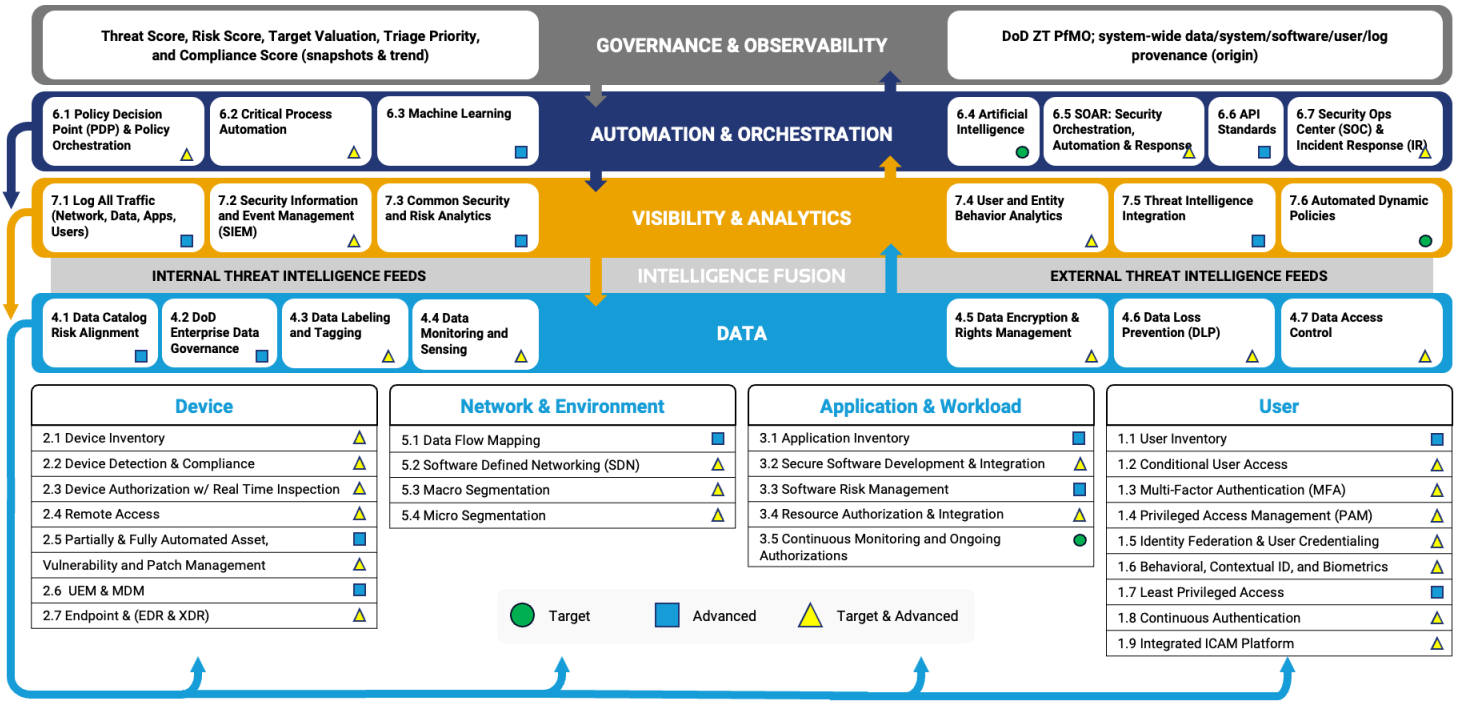
RavenVISION & Riverbed

A key component of the RavenVISION framework is Riverbed's suite of visibility tools, which provide critical data viusalization to make real-time intelligent decisions.

Riverbed's solutions instrument on-prem and cloud-based environments and provide a common portal to visualize the entire enterprise. Utilizing Riverbed's suite of products, as well as the open Rest API's, enterprises gain observable data from layer 1 to layer 8 of the OSI model—a modified version of which the RavenVISION framework, in part, relies upon, where layer 8 represents the true end user in any communication flow.

In recognizing the need for interoperability, RavenTek finds value in Riverbed's ability to integrate with other products to provide for the unique needs of individual enterprises. The top of RavenVISION's Data Intelligence Model demonstrates how all data can be fed to inform a dynamic policy and governance needed in a successful and sustainable zero trust architecture, not just for the network but also the entire enterprise IT environment.

The RavenVISION Data Intelligence Model for the DoD



Complete Observability: The Big Picture

One of the primary tenants of zero trust is to monitor everything, and visibility is paramount in meeting this requirement. Visibility is needed throughout the lifecycle of any such undertaking. It both identifies and validates critical design decisions.

Riverbed's advanced visibility solutions provide comprehensive network intelligence from telemetry collected throughout a complex working environment. Telemetry is collected from all layers of the OSI model to provide a comprehensive unified view into how networks and applications are performing in past, present and future. The telemetry provides data on network performance (NPM), application performance (APM), and end user experience (EUEM). Each operator is provided a unified view of the networks and applications for the missions they are responsible for supporting.

Having such a broad collection of telemetry allows RavenVISION the ability to create an accurate full fidelity model of both the physical and logical network. Traffic flow and routing are also modeled.

Simulations can be run against the model to provide break/fix analysis of any change to the network or application that is being proposed. Using the simulation environment provides for the ability to predict how the network or application will perform in the future without the cost of time and equipment to setup an expensive lab environment.

Riverbed **NetProfiler** provides an excellent starting point for analysis of your network. It can receive flows from your existing infrastructure or dedicated probes can be deployed that leverage existing packet broker networks to provide a more in-depth analysis with packet capture abilities. NetProfiler allows for useful visualizations of flow data to provide insight into the network's current health status.

The **Advanced Security Module** utilizes AI/ML to provide advanced behavioral analysis of your network's traffic to identify potential security vulnerabilities and events that could lead to breaches. It can also give detailed dependency maps that show node-by-node what is talking to what so there's no guessing when securing assets or validating the effects of a change to an environment. This is invaluable when verifying your organization's zero trust efforts are yielding the desired results independent of the tool's visibility.

Riverbed **SteelHeads** provide WAN optimization but also can enrich NetFlow that is forwarded to NetProfiler for higher fidelity flow data than standard NetFlow.

Riverbed **AppResponse** (NPM/APM) provides deep packet inspection and packet capture abilities as well as forwards enriched NetFlow data to NetProfiler.

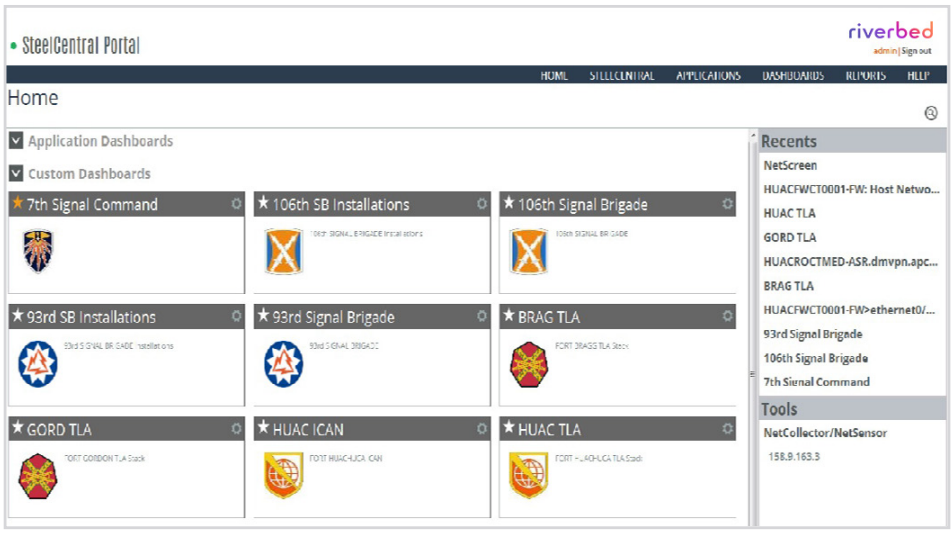
Together, these products offer a rich and robust visualization of the enterprise independent of any other zero trust tools, which allows for an independent way to validate changes and provides for the necessary data to analyze an organization's current environment and plan for the next-gen infrastructure.

Types of Telemetry Collected:

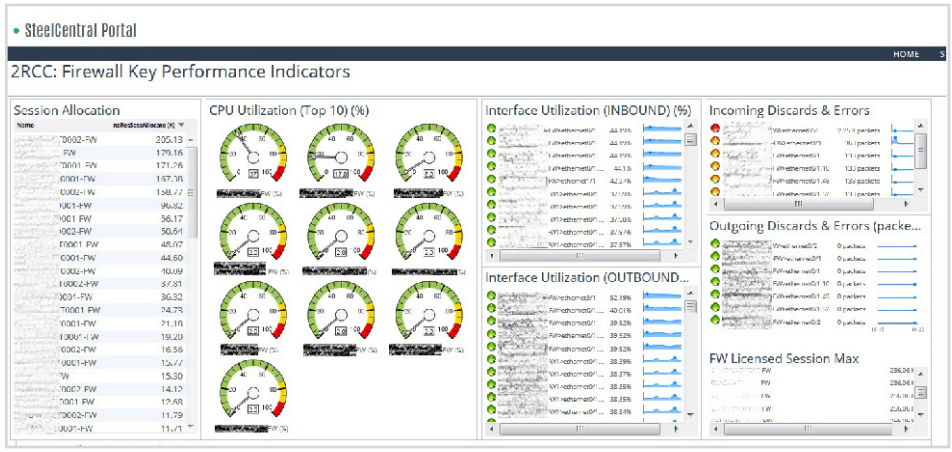
- Flow data from every network device capable of exporting xFlow
- Enhanced flow data from Riverbed packet capture and WAN optimization devices (includes performance data)
- Packet data including deep packet inspection to identify applications
- SNMP data from any device capable of being polled
- WMI data from Windows devices
- Configuration files
- CLI data (i.e., show commands from routers and switches)
- Synthetic transaction data
- Syslog data
- Generic data exported from devices that are incapable of being polled by traditional means
- Application transaction data from application and database servers
- Java and .NET application code performance
- EUEM data from the actual device accessing the application
- End user device information (including hardware data and installed software)

Drilling Down

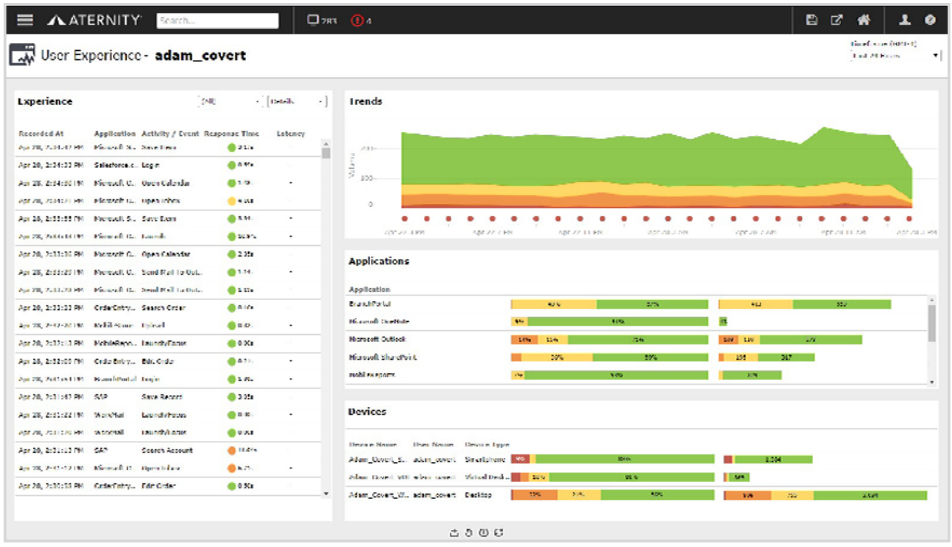
The Riverbed **Aternity** (EUE) solution provides deep details on an organization's end-user systems. It is extremely useful for identifying performance issues that may be the result of changes made during a zero trust lockdown of end systems and has the ability to compare before and after views for visualizing the positive or negative effects of changes.

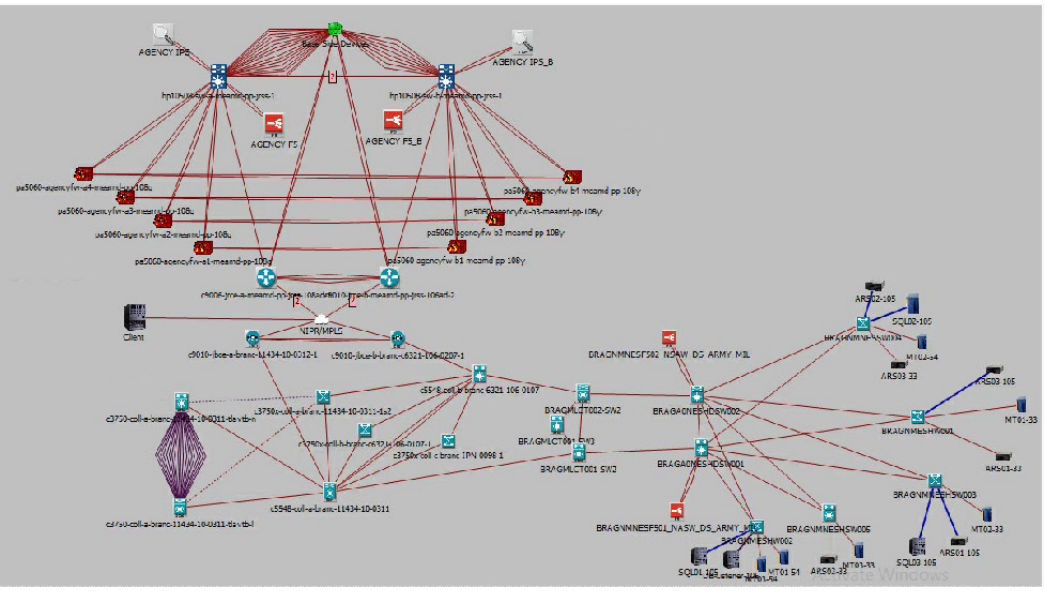


Riverbed's **advanced network intelligence** has a proven track record of providing unified views into NPM, APM and EUEM from the tactical edge to all levels of command and control. Dashboards can be created for each operator based on technical ability, mission and area of responsibility, giving each operator a unique view into the data collected. Drilling down into the underlying tools collecting the data can be accomplished for more extensive troubleshooting.



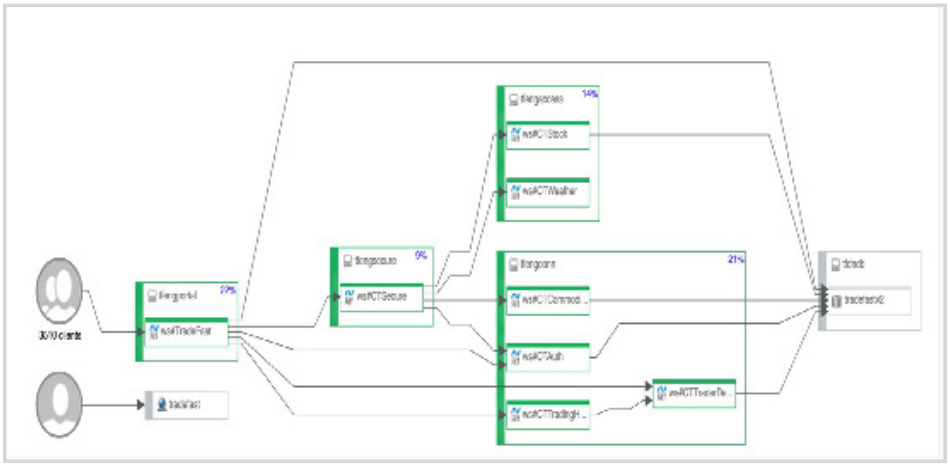
Riverbed **NetIM** (ITIM) provides deep details of an organization's systems via SNMP, CLI or WMI. With additional modules, this platform can provide configuration management, security compliance and network modeling capabilities that are critical to verifying and maintaining a zero trust compliant enterprise.





The above diagrams show the model of a network with application flows being simulated to complete a survivability analysis before an application upgrade. The top diagram includes the JRSS stack. This capability is critical before any changes or migrations are performed and assures there will be no impact once changes are implemented.

Riverbed **AppInternals** allows an organization to monitor applications down to lines of code and transactions. It can show unusual behavior to help identify potential problems with applications or potential security breaches. Organizations can receive useful information to help understand application behavior when implementing a micro-segmentation solution for zero trust.



Transaction path through the classes and methods of the actual application code for Java and .NET applications.

Where To Go From Here

By utilizing these technology solutions from RavenTek and Riverbed, branches of the DoD can access critical metrics and deep visibility into the Network Modernization project. Riverbed provides the superior tools, RavenTek provides superior integration and a framework for success through RavenVISION.

Monitoring and collecting data is just the beginning. Organizations must be able to understand what it means and to be able to turn it into a resource that yields results in all theaters of operation.

The RavenVISION solution allows for the technology behind Riverbed's suite of tools, as well as all other existing tools, to be integrated in a way that breaks down data silos and enables data-driven decision making for enterprise technology and teams to adapt, overcome and modernize organically—from top down policy and governance to the bottom up data.

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Riverbed understands that every agency is on a digital journey and that every journey is unique. With a proud heritage of technology leadership and proven expertise maximizing performance and visibility for the world's largest organizations, we can help agencies reach the full potential of their network and application investments today and in the future.

Learn more at riverbed.com

RavenTek provides digital transformation and cybersecurity solutions and services to mission critical organizations worldwide. As a Veteran and Native-American-owned business, we combine small-company agility with big-company stability—applying our team's industry expertise to understanding client business needs and delivering the right solutions, at the right time.

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