WHITE PAPER

Agentless, On-Premises Data Validation for Archival and Application Data

Serpentua Data Validation Platform (DVP) · 2026

Deploy a single Docker container, connect your NFS, SMB, or iSCSI storage, and validate your files entirely on-premises — with no cloud dependency, no agents, and no internet required.

Executive Summary

For organizations that operate in air-gapped environments, handle classified or compliance-sensitive data, or simply require complete control over their data validation infrastructure, cloud-connected solutions are often not an option.

The Serpentua Data Validation Platform (DVP) is purpose-built for these environments. It is a fully self-contained, Docker-based data validation solution that runs entirely on-premises. There is no cloud dependency, no internet requirement, and no agents to deploy on individual hosts. Connect your existing network-attached storage, run the container, and begin validating your files in minutes.

This white paper describes the DVP architecture, storage protocol support, key features, technical specifications, and the environments and use cases it is designed to serve.

The Challenge: Validation Without Compromise

Many organizations face a fundamental tension when evaluating data integrity and validation solutions: the most capable platforms typically require cloud connectivity, persistent agents on managed hosts, or both. For security-sensitive, regulated, or isolated environments, these requirements are either impractical or prohibited.

Common constraints include:

- Air-gapped or isolated networks with no internet access

- Regulatory or policy requirements that prohibit data from leaving the organization's physical infrastructure
- Environments where deploying and maintaining agents on individual systems is operationally prohibitive
- Facilities requiring fully reproducible, auditable, and self-contained tooling

Existing solutions force a tradeoff between capability and control. The Serpentua DVP eliminates that tradeoff.

Platform Architecture

The DVP is architected around simplicity, portability, and complete on-premises operation. Its core design principle is that a single Docker container should be sufficient to deliver enterprise-grade file validation across an organization's entire storage infrastructure.

Single-Container Design

The entire DVP stack — validation engine, local web dashboard, reporting module, and storage connectors — runs within a single Docker container. This design ensures consistent behavior across any infrastructure that supports Docker or OCI-compatible runtimes, eliminates dependency conflicts, and simplifies deployment to a single command.

There are no external services, no sidecar containers required for basic operation, and no cloud endpoints to configure. The container is self-sufficient.

Agentless Operation

Unlike agent-based validation platforms, the DVP does not require software to be installed on the systems hosting the data being validated. Instead, storage is mounted directly to the Docker host via NFS, SMB, or iSCSI — protocols that are already standard in virtually every enterprise storage environment. The DVP container accesses mounted storage through the host, performing all validation locally without touching the originating systems.

This agentless approach eliminates the operational burden of agent lifecycle management, reduces the attack surface on production systems, and makes the DVP viable in environments where installing software on storage hosts is not permitted.

Local-Only Processing

All data processing — file reading, integrity checking, hash computation, and result storage — occurs within the container on the local host. No data is transmitted externally. The DVP is fully functional in completely offline environments, including those with no network path to the internet whatsoever.

How It Works

The DVP workflow is intentionally straightforward. From a Docker pull to validated data typically takes under ten minutes.

Step	Description
1. Deploy Container	Pull the DVP Docker image and run it on any Docker or OCI-compatible host.
2. Configure Storage	Mount NFS shares, SMB shares, or iSCSI targets to the host system.
3. Validation Scans	Automated integrity checks run across all mounted storage on a configurable schedule.
4. Local Processing	All file analysis and hash verification happens on-premises — no data leaves the network.
5. Dashboard	Review real-time validation status and trends via the built-in local web UI.
6. Reports	Generate detailed per-file integrity reports for compliance, audit, or operational review.

Storage Protocol Support

The DVP is designed to integrate with existing enterprise storage infrastructure without requiring changes to how that storage is provisioned or managed. Three major storage protocols are supported natively.

NFS (Network File System)

The DVP supports NFSv3 and NFSv4, enabling validation of files on NFS shares across the network. NFS is the dominant protocol for Unix and Linux file sharing in enterprise environments, and full support ensures compatibility with the widest possible range of NAS devices, file servers, and storage appliances.

SMB (Server Message Block)

SMB 2.0 and 3.0 are supported with authenticated access, enabling the DVP to connect to Windows file shares, Samba servers, and SMB-capable NAS devices. This makes the platform equally viable in Windows-centric environments and in mixed infrastructure where both Unix and Windows file shares coexist.

iSCSI (Internet Small Computer Systems Interface)

For organizations using block-level storage — SAN volumes, dedicated storage arrays, or iSCSI targets — the DVP supports direct iSCSI connections to the host. This extends validation coverage beyond file-level NAS storage to block storage infrastructure that would otherwise require more complex tooling to validate.

Multi-share support allows the DVP to validate files across multiple storage targets simultaneously from a single container deployment.

Platform Features

Agentless Architecture

No software installation is required on the systems hosting the data being validated. Connect storage to the Docker host and the DVP handles the rest. This eliminates agent deployment overhead, reduces the risk profile of production hosts, and makes the platform viable in environments with strict change control requirements.

Docker-Based Deployment

The DVP ships as a single Docker image compatible with any OCI runtime. Deployment is a single command. Updates are delivered as new container images, ensuring reproducible builds and easy rollback. The container encapsulates all dependencies, making behavior consistent regardless of the underlying host OS.

On-Premises Processing

All validation and analysis happens locally. Your data never leaves your network. The DVP is designed from the ground up for air-gapped and compliance-sensitive environments, with no external calls, no telemetry, and no cloud dependencies of any kind.

Built-In Local Dashboard

A web-based dashboard is served directly from the container, providing real-time validation status, trend tracking, and results browsing without requiring any external tooling or cloud-based reporting infrastructure. Access it from any browser on the local network.

Offline Operation

The DVP is fully functional with no internet connectivity. It is suitable for secure government facilities, classified networks, industrial control environments, and any other setting where internet access is restricted or prohibited. Offline updates are supported.

OS-Agnostic Deployment

Because the DVP runs as a Docker container, it is agnostic to the underlying host operating system. Deploy on Linux, Windows Server with Docker, or any other platform that supports Docker or OCI-compatible container runtimes.

Technical Specifications

Specification	Value
Deployment Model	Single Docker container (OCI-compatible)
Host OS Requirement	Any OS supporting Docker or OCI runtime
Storage Protocols	NFS (v3/v4), SMB (2.0/3.0), iSCSI
Internet Required	No
Cloud Dependency	None
Agent Installation	Not required
Supported File Types	All formats

Dashboard	Built-in local web UI
Air-Gap Capable	Yes
Offline Updates	Supported

Key Use Cases

Air-Gapped & Classified Environments

Government agencies, defense contractors, and organizations operating classified or sensitive networks require validation tooling that functions without any internet connectivity. The DVP's fully offline design makes it one of the few enterprise-grade validation platforms suitable for these environments.

Archival & Long-Term Preservation

Libraries, archives, museums, research institutions, and enterprises with long-horizon data retention mandates can use the DVP to continuously verify the integrity of stored files — detecting silent corruption, storage medium degradation, and bit rot before data is permanently lost.

Compliance-Sensitive Industries

Healthcare, financial services, legal, and other regulated industries often face strict requirements about where data can be processed and whether it can leave organizational control. The DVP's entirely on-premises design satisfies these requirements while still delivering structured, auditable validation reports.

NAS & SAN Infrastructure Validation

IT and storage teams managing large NAS or SAN environments can use the DVP to run scheduled integrity scans across all connected storage, providing continuous assurance that files stored on network-attached or block-level storage remain uncorrupted and unmodified.

Secure Facilities & Industrial Environments

Operational technology environments, industrial control systems, and secure facilities often have strict network segregation requirements. The DVP deploys into these environments without requiring firewall exceptions, VPN tunnels, or outbound internet access.

Open Source

The Serpentua Data Validation Platform is available as an open-source project. Organizations can review the source code, contribute improvements, and adapt the platform to their specific requirements.

The DVP source code is available on GitHub at github.com/Serpentua/DVP

Getting Started

The DVP is available for deployment today. Pull the Docker image, mount your storage, and begin validating your data in minutes — with no cloud account, no agent rollout, and no internet connection required.

Learn more and access the documentation at serpentua.com/products/dvp, or contact the Serpentua team at serpentua.com to discuss your deployment requirements.

About Serpentua

Serpentua is an enterprise data validation and digital preservation company. Its product portfolio spans cloud-connected and fully air-gapped deployment models, enabling organizations of all types to protect the integrity of their digital assets at scale.

For more information, visit serpentua.com.