

VAST Amplify:

The Capacity Amplification Program



VAST Amplify Assessment Overview

The VAST Amplify Assessment is designed to determine whether an environment is a good candidate for the **VAST Amplify: Capacity Amplification Program** and to estimate the potential increase in effective capacity that can be achieved through architectural optimization.

The assessment focuses on understanding how storage is currently deployed, protected, and consumed, with the goal of identifying flash capacity that is underutilized due to architectural inefficiencies rather than physical limitations.

What the Assessment Evaluates

Infrastructure and Deployment Model

The assessment identifies the platforms and architectures in scope, including:

- Direct-attached storage (DAS) environments (such as data lakes and analytics platforms)
- Software-defined storage platforms
- Enterprise storage systems

Environments built on x86 servers with DAS or software-defined storage are often strong candidates due to replication overhead, fragmented capacity, and limited sharing across workloads. Enterprise storage systems are also eligible and can yield significant savings.

SSD Eligibility and Health

Only NVMe-interface SSDs are eligible for the VAST Amplify program. SAS- and SATA-based SSDs are not supported. The assessment reviews:

- SSD models and capacities
- Remaining endurance
- Accessibility of NVMe health and telemetry data

This information is used to determine supportability and long-term viability once the capacity is re-architected.

Data Protection and Utilization

The assessment examines how data is protected and replicated today, including:

- Application-level replication
- Software-defined replication or erasure coding
- Controller-based RAID or protection schemes

Replication and protection overhead are key drivers of effective capacity loss and often represent a significant opportunity for amplification..

Data Characteristics and Reduction Potential

The assessment captures the types of data stored and how it is used, including:

- Structured, semi-structured, and unstructured data
- Backup and secondary copies
- Analytics and AI data pipelines
- Compression methodologies
- Data security and encryption strategies

VAST uses this information to estimate expected data reduction based on compression methods, data patterns, and workflow behavior.

Growth and Future Workloads

The assessment considers expected data growth and planned workloads, such as analytics, AI training, inference, or streaming. This helps determine how amplified capacity can be consumed over time and whether the platform will remain aligned with future needs.

How Estimates Are Produced

In most cases, VAST provides highly accurate estimates using its experience across data types, workflows, and compression behavior. This expert-driven approach avoids unnecessary disruption to production environments.

For environments where additional precision is required, VAST may recommend using the VAST Probe, a container-based tool that empirically measures data reduction potential.

Assessment Outcomes

At the conclusion of the assessment, customers receive:

- An eligibility determination for the VAST Amplify program
- A recommended architectural path (for example, software deployment on existing servers or redeployment into NVMe-based infrastructure)
- An estimated range of effective capacity amplification
- Guidance on next steps for qualification and implementation

Important Notes

- Participation in VAST Amplify requires NVMe-based SSDs
- Final results depend on data characteristics, architecture, and deployment design
- Capacity amplification is achieved through architectural efficiency, not hardware over-provisioning

Quantifying the Impact of VAST Amplify

VAST Amplify is grounded in measurable, production-validated efficiency gains enabled by the Disaggregated Shared Everything (DASE) architecture. Using fleet-wide telemetry covering **all data in production**, we can quantify the savings customers can reasonably expect across three dimensions: **data protection overhead**, **data reduction**, and **total effective capacity uplift**.

Savings from Reduced Data Protection Overhead

Traditional shared-nothing storage systems consume a significant portion of raw flash capacity to achieve durability:

Erasure coding (typical)

15–25% overhead

Replication

50–66% overhead

In contrast, VAST's locally decodable erasure codes operate at scale with:

~3% parity overhead

~12% total system overhead

(including formatting and management)

Measured Result (Production Data)

93% of data stored on VAST operates below 21% total overhead

96% operates below 28% overhead

The majority of deployed capacity clusters tightly around ~12% overhead

What This Means in Practice

Compared to a typical erasure-coded system at ~25% overhead, VAST returns:

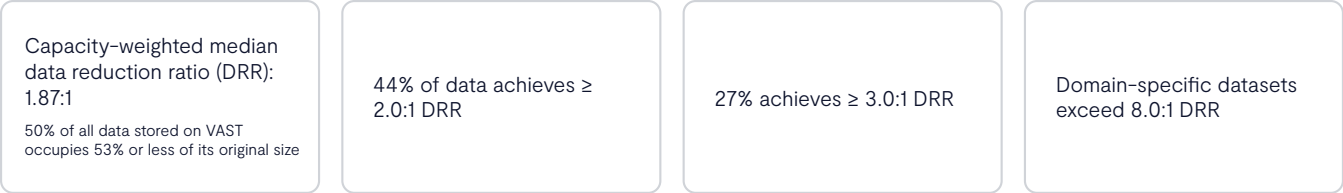
~13% of raw flash capacity immediately, before any data reduction is applied

Compared to replicated systems, the recovered capacity is substantially higher.

Savings from Global Data Reduction

Because of VAST’s DASE architecture, VAST applies compression, deduplication, and similarity-based reduction across entire clusters, not within isolated silos.

Fleet-Wide Measured Data Reduction



Typical Reduction by Data Type (Observed)

Data Type	Typical DRR
Precompressed video	~ 1.1
Precompressed financial data	1.1–1.5
Scientific & simulation data	1.5–3.0
Raw LLM training datasets	3.0–8.0
Log stores & enterprise backups	> 3.0

Combined Effect: Total Effective Capacity Uplift

The true impact of VAST Amplify comes from combining low protection overhead with global data reduction.

Conservative, Fleet-Validated Scenario

Using median fleet values:

This results in approximately:



Higher-Efficiency Scenarios (Common in DAS / SDS Environments)

In environments with:

- High replication factors (e.g., HDFS, log analytics)
- Redundant copies
- Compressible or similar datasets

It is common to see:

- Protection overhead reduced from 33–66% → ~12%
- DRR in the **3.0–4.0×** range

That yields:

- **4×–6× effective capacity improvement**, without adding flash

These outcomes are not theoretical; they are consistent with production telemetry and observed customer deployments.

Implementation, Migration, and Support Considerations

VAST Amplify is designed to be implemented in a controlled, low-risk manner that aligns with the customer's existing assets, operational model, and long-term strategy. Each deployment is planned based on the specific combination of **SSD models, server platforms, and architectural goals**, rather than a one-size-fits-all approach.

Implementation Planning

As part of the program, VAST works closely with customers to design an implementation plan that addresses:

- Existing NVMe SSD models and quantities
- Current server platforms and their suitability for reuse
- Required additional components, such as VAST enclosures, CNodes and NVMe fabric, and cables.
- Whether SSDs remain in place (EBox model) or are redeployed into JBOFs
- Formatting and onboarding of SSDs into a VAST cluster

This planning phase determines the most efficient path to amplification while minimizing disruption and avoiding unnecessary hardware replacement.

Migration Strategy

VAST Amplify does not require a disruptive “rip and replace” migration. Instead, VAST helps customers plan a **phased transition** that may include:

- Incremental onboarding of reclaimed SSD capacity
- Gradual data movement while legacy systems remain online
- Reuse or redeployment of hardware as capacity is consolidated

VAST supports these transitions using native capabilities such as the **VAST SyncEngine**, as well as through close integration with established data mobility tools. The goal is to allow data and infrastructure to shift without service interruption or forced cutovers.

Support Models

Support for VAST Amplify environments is structured to reflect the level of hardware reuse and the customer's strategic objectives. Depending on the configuration, one of the following models may apply:

- **Software-only support**, where VAST supports the VAST software and system behavior while the customer or a third party supports the underlying hardware
- **Full hardware and software support**, where VAST provides end-to-end support for qualified platforms
- **Partial hardware support**, where VAST supports specific components (such as CNodes) while SSDs or servers are supported elsewhere

In some cases, VAST already has joint support models in place with OEM partners, enabling coordinated support across hardware and software layers. Third-party hardware support may also be used where appropriate, depending on the environment.

Support options are determined during planning and clearly documented before deployment, ensuring there is no ambiguity once the system is in production.



VAST Amplify: Efficiency at Scale & Executed in the Real World

Across industries, customers running data lakes, AI pipelines, and analytics platforms consistently unlock dramatic capacity efficiency gains on the VAST AI Operating System, driven by a combination of advanced data reduction and modern erasure coding that replaces legacy triplication. In production environments today, customers are seeing outcomes such as:

- An electric vehicle manufacturer achieving 2.8:1 data reduction, combined with VAST's 2.91x efficiency versus triplicated architectures, **delivering nearly 8x more** usable capacity for data lake and AI workloads.
- An autonomous vehicle company realizing **5.5:1 data reduction on AI training data**.
- A leading online travel company running Hadoop ML workloads achieving ~1.35:1 data reduction, translating to a **3.9x overall capacity advantage**.
- An insurance provider reaching 4.4:1 data reduction, yielding a **12.8x capacity advantage** over its legacy HDFS environment.
- A wireless telco storing pre-compressed ORC data still achieving a **4.28x net capacity** improvement by eliminating triplication alone for data analytics.
- A credit card provider delivering 2.7:1 data reduction and an **8.1x overall capacity** boost versus its prior data lake.
- A neo-cloud service provider, hosting AI training environments for model builders, consistently seeing **greater than 2:1 data reduction**.
- A chip design company currently operating at an exceptional **29:1 overall data reduction ratio**.

These examples highlight the massive efficiency headroom available when data characteristics are favorable—but they are only one part of the Amplify story.

VAST Amplify is not only dependent on the efficiency that VAST's technology brings. Equally important is VAST's proven ability to **plan and execute** complex hardware repurposing projects and deliver production-ready systems. Through Amplify, VAST has successfully qualified and repurposed **thousands of existing servers** and SSDs into supported VAST EBox and JBOF-based deployments, reclaiming **hundreds of petabytes of usable capacity**. Here are two examples of large-scale projects:

Cybersecurity Provider – Multi-Tenant Repurposing

Through the VAST Amplify program, VAST Data qualified and repurposed multiple generations of a cybersecurity provider's existing 2000 servers (and SSDs) into a supported VAST E-Box deployment. By consolidating siloed tenants into a single cluster with native multi-tenancy and QoS, VAST is helping the customer reclaim 250PB of usable capacity and improve raw-to-usable efficiency by 50%.

AI Lab – Large-Scale Flash Reclaim

In a separate engagement, VAST Amplify enabled an AI lab to repurpose 2,880 existing 60TB NVMe SSDs into a shared VAST JBOF-based architecture, transforming server-local storage into a production-grade VAST cluster. The system delivered 154PB of usable capacity, recovered 38PB through architectural efficiency alone, and reached stable production in just six weeks.

The result

Amplify is both a force multiplier for efficiency and a repeatable execution model, unlocking maximum value from existing hardware while delivering the operational stability and scale required for modern AI and data platforms.

To learn more about how to maximize your capacity, contact us at vastdata.com

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