The State of Software-Defined Storage (SDS)

2015 MARKET SURVEY

Date conducted: April, 2015

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Executive Summary

For the fifth consecutive year, DataCore Software explored the impact of Software-Defined Storage (SDS) on organizations across the globe.
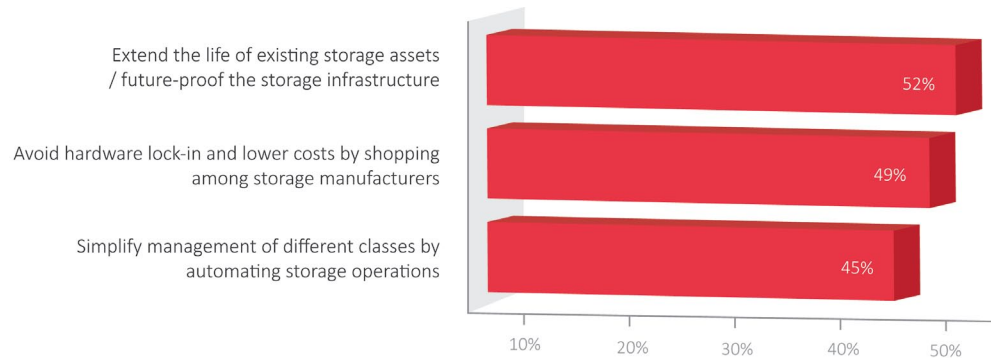
The 2015 survey distills the expectations and experiences of 477 IT professionals that are currently using or evaluating SDS technology to solve critical data storage challenges. The results yield surprising insights from a cross-section of industries over a wide range of workloads.

Please refer to the section on Survey Demographics for details on the size of companies, geographies, and vertical markets represented.

Top Level Drivers for SDS

The top three major business drivers for Software-Defined Storage are charted below.

What are the business drivers for implementing Software-Defined Storage?

Extend the life of existing storage assets / future-proof the storage infrastructure — 52%

Avoid hardware lock-in and lower costs by shopping among storage manufacturers — 49%

Simplify management of different classes by automating storage operations — 45%

Extending the life of existing storage assets and future-proofing the storage infrastructure to absorb new technologies easily topped the list with more than half of respondents naming this as a key factor (52%). Nearly half look to SDS to avoid hardware lock-in from storage manufacturers and lower hardware costs by allowing them to shop among several storage manufacturers. They also see it simplifying management of different classes by automating frequent or complex storage operations.

When compared with earlier surveys, these results portray a sharp increase in the recognition of the economic benefits (reduced CAPEX) generated by SDS, complementing the OPEX savings referenced in prior years.

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Rationale for Virtualizing Storage –

Avoid Business Disruption and Reduce Costs

More than half of this year's survey participants cited the ability to add storage capacity without business disruption (52%) as one of the primary reasons for choosing storage virtualization software. This was also identified as one of the top factors cited in the 2014 report. Supporting synchronous mirroring and metro clusters for high availability to ensure business continuity (49%) and asynchronous data replication for remote site disaster recovery (48%) were also high on the list. The next highest respondents were motivated by general cost reductions (44%) made possible when separating data services from the storage hardware.

What are the primary reasons your organization chose to deploy storage virtualization software?
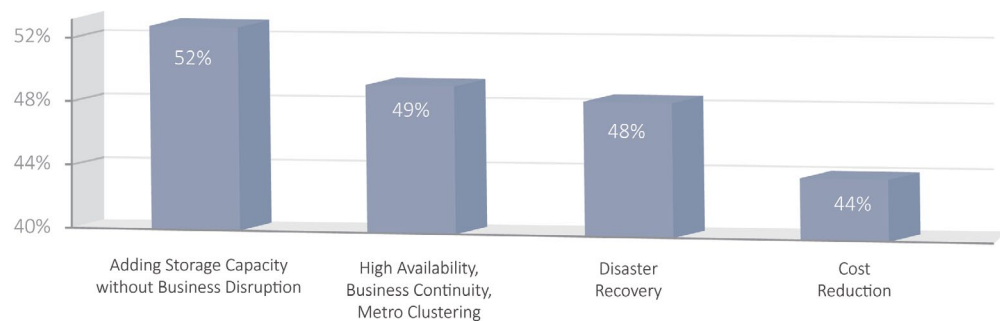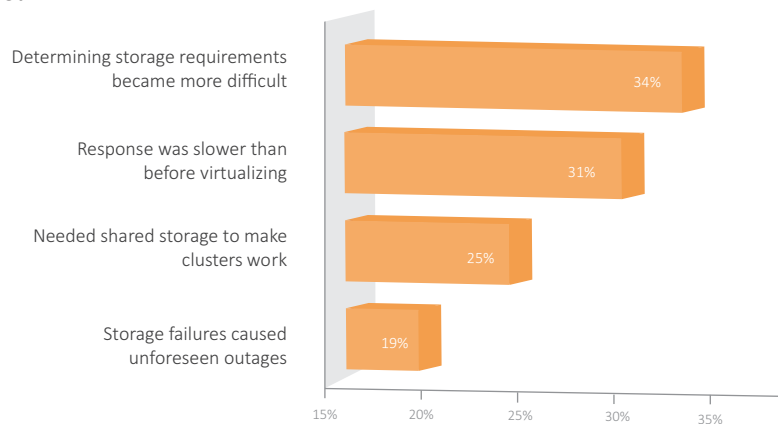

Unexpected Challenges

after Virtualizing Mission-Critical Applications

When it comes to mission-critical applications, more than a third of survey participants reported more difficulties determining storage requirements after virtualizing business applications (34%). Nearly a third also noted that application response was slower than before virtualizing (31%), and 25% encountered complications when trying to share storage among their clustered servers. At the same time, 19% highlighted storage failures caused unforeseen outages. These are all byproducts of consolidating mixed workloads in fewer physical servers.

Which of the following surprises did you encounter after virtualizing mission-critical applications?

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Application Performance Challenges

Digging into the performance concerns uncovered that more than 60% of respondents experienced performance degradation or the inability to meet performance after virtualizing server workloads – with 25% of those considering it a serious obstacle.

When asked what the typical causes of performance problems are, an overwhelming amount of participants (61%) blamed slow applications. 46% of respondents singled out legacy storage devices as the culprit, whereas 22% attributed the slowdowns to incompatible storage equipment.

What are the typical causes of performance problems?
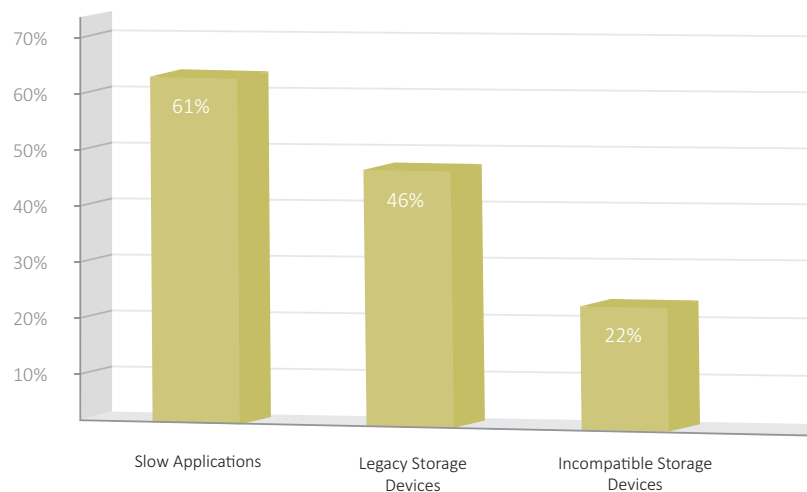
Human Errors

Drive the Need for Greater Automation

In past surveys, the sources of downtime have been relatively constant. However, it has become increasingly clear that the complexity which accompanies data growth and diversity is taking a big toll. An overwhelming number of respondents indicated that human error was behind application and data center outages (61%). In fact, downtime resulting from these errors and accidents were cited with nearly twice the frequency of heating, ventilation and air conditioning failures. Fire, smoke, construction work and vandalism together amounted for roughly 25% of responses.

It's clear from these findings that the automation and workflow orchestration provided by Software-Defined Storage platforms like DataCore's can significantly reduce the occurrence of human errors, and with that, a marked decrease in downtime.

What unexpected incidents have caused application or data center outages?

Flash Storage –
A Key Driver for SDS

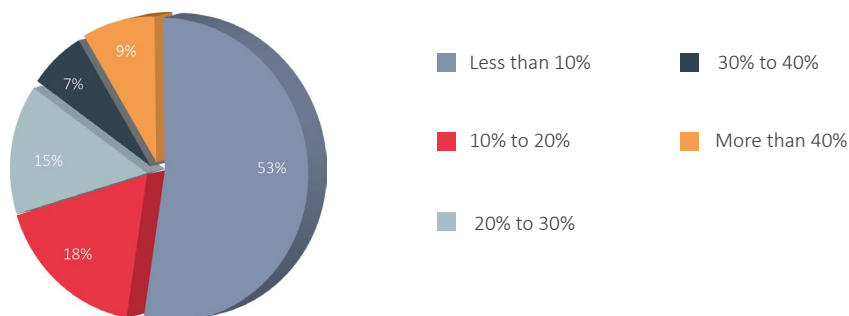As one of the triggers to introduce SDS seems to be a direct result of difficulties en-countered when integrating solid state tiers into the data center, DataCore continues to observe how prevalent flash is becoming in the market. Last year, 63% of respondents had less than 10% of their storage capacity assigned to flash storage. This year the number with less than 10% dropped to 53%, illustrating that Flash devices are beginning to expand from a limited role inside servers to wider use within the storage infrastructure.

The industry hype, however, would have us believe that customers will shift 100% to all flash. Qualitative and quantitative observations from surveys like this one suggest that's unlikely due to the costs involved and the concern over their rapid wear. There are other factors preventing organizations from making that move -- including the realization that not all applications benefit from flash devices (see **"Related Disappointments"** below).

Flash is excellent for specialized 'hot data' workloads that require high-speed reads such as databases. However, it is not a cost-effective solution for all workloads and still accounts for only a very small fraction of the overall storage space. The number of participants who answered that flash makes up higher than 40% of their storage capacity was 9%. Nevertheless, the industry is beginning to realize a smart balance between flash and spin-ning disk technologies already in place. This is where SDS technologies such as auto-tier-ing optimize the cost and performance trade-offs by migrating workloads to the right mix of magnetic and solid state storage.

What storage capacity do you currently have assigned to flash?

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Growth in Hyper-converged and Cloud Storage

Nearly half (45%) of respondents are evaluating the deployment of hyper-converged systems, either to increase performance for specific applications; to increase availability and simplify management for remote sites; or to consolidate compute, networking and storage. While hyper-converged vendors tend to agree that storage services need to be implemented in a server software stack, many cannot take advantage of existing SAN capacity.
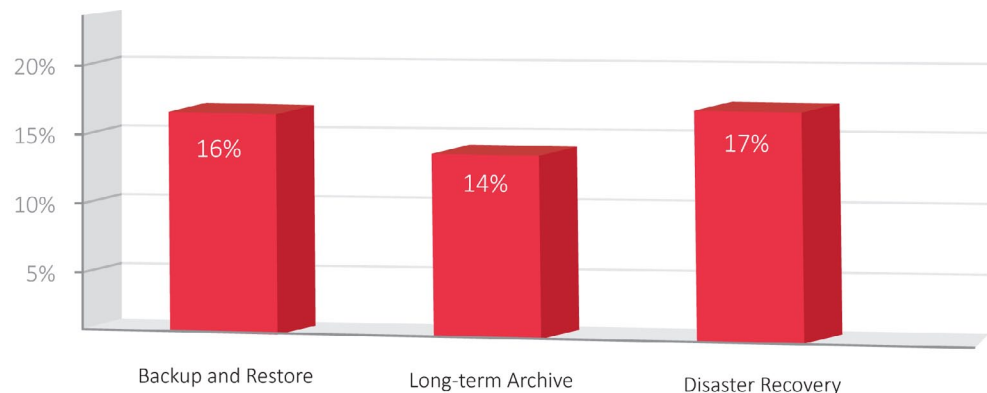
Are you currently evaluating the deployment of hyper-converged systems?
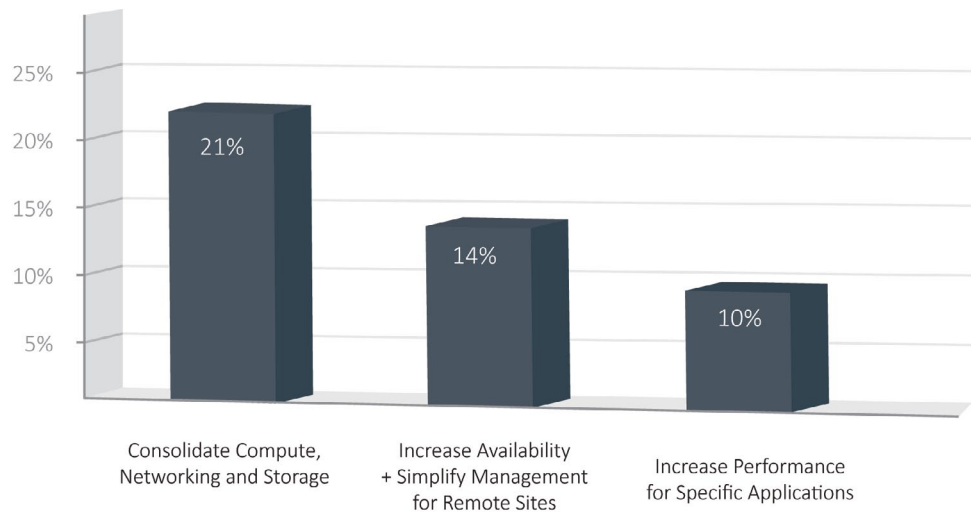
The ideal hyper-converged infrastructure solution is both hardware and hypervisor agnostic, supports DRAM caching and can pool internal as well as external storage, including direct-attached and SAN-attached.

About half (47%) of respondents are currently evaluating public / hybrid cloud storage for backup and restore, long-term archive, or disaster recovery.

Are you currently evaluating the deployment of a public / hybrid cloud for storage?

Furthermore, more than half (57%) of respondents are evaluating the deployment of private cloud storage for self-service IT, to utilize commodity hardware, to automate / orchestrate storage provisioning, and for faster response to business objectives.

Are you currently evaluating the deployment of private cloud storage in your environment?
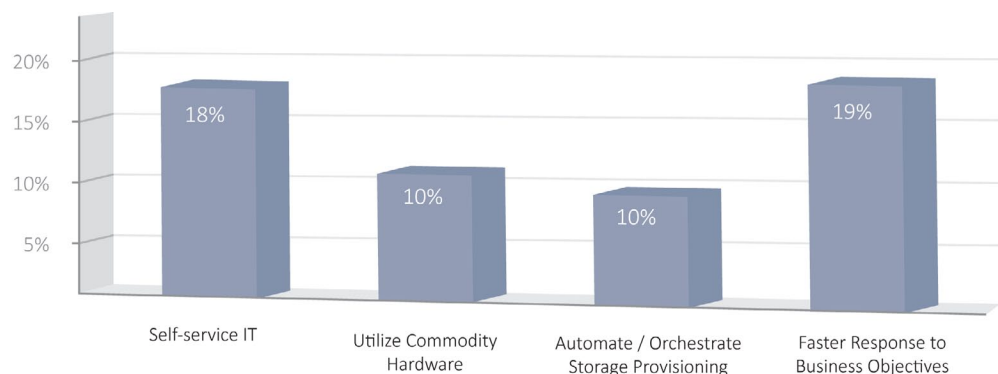
Big Surprises Regarding Big Data

When it comes to data storage technology, there is no shortage of projections about the "next big thing" that will shape the future of the industry -- everything from Big Data, the impact of cloud computing, to the aforementioned "flash everywhere" phenomenon.

DataCore took a look to see where companies will actually spend their 2015 IT budgets.

Most revealing was how many organizations have not budgeted for heavily hyped technologies. For example, from reading recent headlines one would expect to see an overwhelming majority investing in Big Data and Object Storage. On the contrary, half (50%) of the respondents have not earmarked any 2015 funds for either of those initiatives. And more than 70% don't plan any OpenStack activities this year. Even Public Cloud Storage did not make the cut in 55% of the survey participants. Clearly, programs that make news today are often further out in the planning horizon. Even the "ubiquitous" flash technology was absent in 28% of the cases.

Storage Technologies Not Budgeted for in 2015

| Technology	% of Respondents Who Did Not Allocate Budget in 2015
OpenStack Storage	70%
Public Cloud Storage (i.e., Azure, Amazon)	55%
Big Data Storage	50%
Object Storage	50%
VDI Storage	49%
Flash Technology	28%

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Related Disappointments

To better understand the adoption lag, DataCore inquired about disappointments and false starts encountered in storage infrastructure rollouts.

Starting with solid state technologies, 16% of participants felt that flash had failed to accelerate applications. The much-heralded cost reductions anticipated from Cloud storage failed to materialize for 24% of the respondents. Another 21% found that highly touted hyper-converged systems did not perform as required or did not integrate well within their infrastructure. One explanation may simply be that these technologies were applied to the wrong problem or that unreasonably high expectations were used to justify their use.

What technology disappointments or false starts have you encountered in your storage infrastructure?
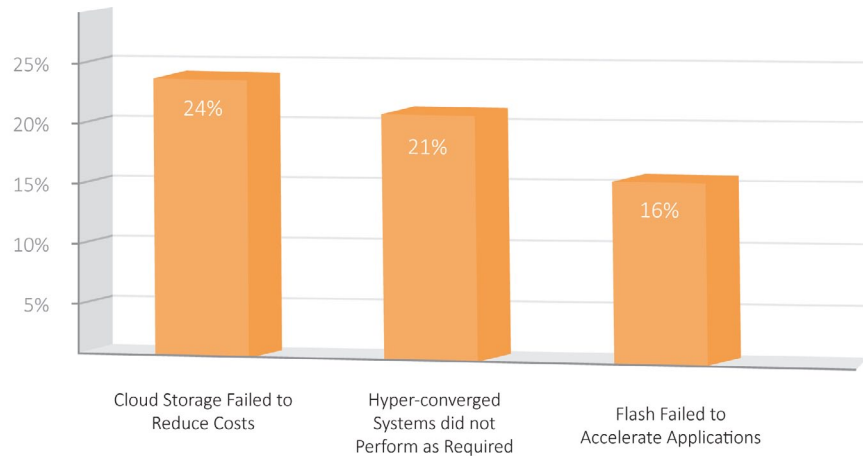
Spending for SDS
in Storage Virtualization and Virtual SANs on the Rise

In sharp contrast to the lack of funding for Object Storage and Big Data, investments in well proven Software-Defined Storage continue to grow. 72% of respondents plan on putting storage virtualization aspects of SDS to use in 2015. Some of that spending likely complements additions to existing centralized SANs. 81% of those polled expect to take advantage of SDS in the form of virtual SANs. They pointed to a couple of use cases. One calls for economical, compact, clustered storage in remote offices / branch offices (ROBO). The other seeks faster performance by moving storage closer to applications, such as latency-sensitive OLTP workloads.

How much of your IT budget was budgeted for Software-Defined Storage in 2015?

SDS Technology	N/A	Less than 5%	5 - 10%	10 - 25%	25% or Greater
Virtual SANs	19%	16%	22%	24%	19%
Storage Virtualization	28%	23%	24%	18%	7%

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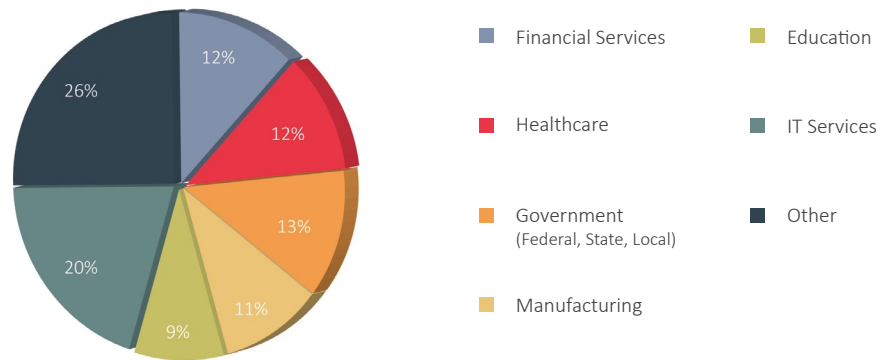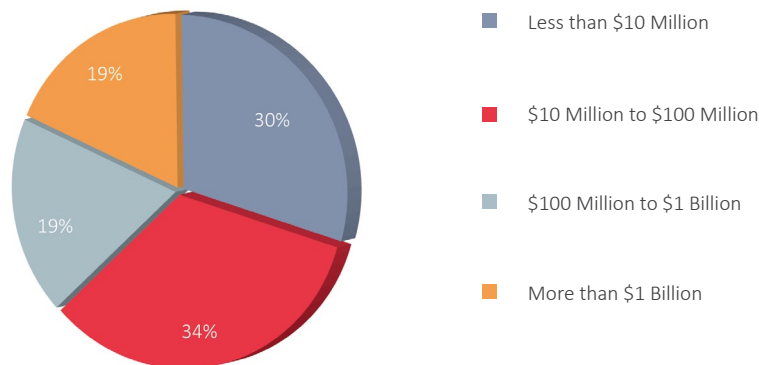
Survey Demographics

The respondents of the 2015 Datacore State of Software-Defined Storage survey represent individuals from a diverse set of organizations, both in size and industries, providing broad insights into the similarity in needs for SDS over a wide range of IT environments.

INDUSTRY

- Financial Services — 12%
- Healthcare — 12%
- Government (Federal, State, Local) — 13%
- Manufacturing — 11%
- Education — 9%
- IT Services — 20%
- Other — 26%

ANNUAL REVENUE

- Less than $10 Million — 30%
- $10 Million to $100 Million — 34%
- $100 Million to $1 Billion — 19%
- More than $1 Billion — 19%

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COMPANY SIZE

- Less than 500 employees
- Between 500 and 5,000 employees
- More than 5,000 employees

46%
32%
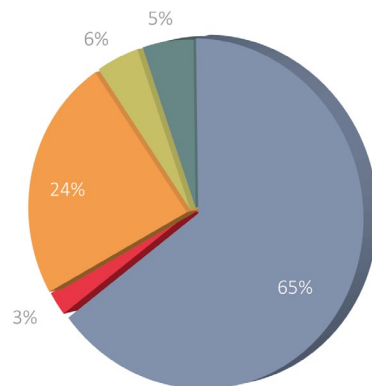24%

GEOGRAPHIC REGION

- North America
- South America
- Europe
- Asia
- Australia & New Zealand

5%
6%
24%
65%
3%

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Conclusions

The fifth annual survey uncovers some major surprises on how IT professionals approach storage-related innovations.

For example, Big Data, object storage, hyper-converged systems and other heavily pro-moted technologies are far from commonplace. They are more often found at the fringes in pilot programs, where IT is hoping to assess their value.

Adoption of these new data organization and management methods occurs at a much slower pace than one would guess from the frequency of news coverage. The responses suggest interest in them is moderated by:

a) Previous hard-learned lessons and disappointments when misapplying much-hyped technologies

b) Inability to quantify return on investment from what appears to be radical structural and organizational changes

At the same time, the poll reveals that many organizations are moving away from storage functions tied to specific hardware. In fact, year-to-year comparisons reveal more pronounced use of Software-Defined Storage and the prerequisite storage virtualization software for purposes of achieving:

· **CONTINUOUS AVAILABILITY:** Safeguarding business information and providing non-stop access to data for critical applications

· **FASTER PERFORMANCE:** Meeting responsiveness and service level agreements necessary to make timely business decisions and assimilate next-generation workloads

· **HIGHER EFFICIENCY:** Getting better utilization from the storage resources already in place, and those planned in the immediate future, whether inside servers, in the SAN or out on the cloud

In DataCore's experience over the past 17 years, across a universe of more than 25,000 global installations, those objectives make perfect sense. As important, they are realizable in a cost-effective manner without disrupting IT operations or increasing business risk.

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