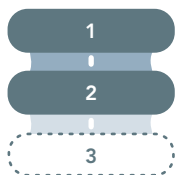**PT**

Easily back up and restore private cloud local volumes

Easily back up and restore private cloud local VMs to a cloud storage tier

Simplify cloud failover and disaster recovery of VMs
29% fewer steps to execute

Improve backup and recovery outcomes by combining Dell APEX Data Storage Services with Amazon Web Services

Using the Dell APEX solution in conjunction with AWS Elastic Disaster Recovery let us complete multicloud backup, restore, and disaster recovery scenarios faster while offering greater flexibility and functionality

Because no one cloud solution will be appropriate for all business use cases, companies are increasingly embracing the use of multiple cloud solutions. In one 2023 survey of IT professionals and executive leaders, 87 percent of respondents have adopted a multicloud strategy, and 72 percent are using both public and private clouds in a hybrid approach.[1] In this multicloud landscape, backup and disaster recovery become extremely important considerations. Fires, power outages, and weather events are among the many potential causes of a data center disaster.[2] If your cloud provider experienced such a disaster, your data would be vulnerable. That's why it's essential to have a strong backup and disaster recovery strategy in place.

We conducted testing to explore the flexibility and ease of use of a solution that combines Dell APEX Data Storage Services Backup Target with Dell PowerProtect Data Manager with Amazon Web Services (AWS™) Elastic Disaster Recovery. We carried out three backup and disaster recovery scenarios in this multicloud environment and found that using the Dell APEX solution in conjunction with AWS offered ease-of-use advantages, simplifying and speeding the process of conducting cloud failover disaster recovery.
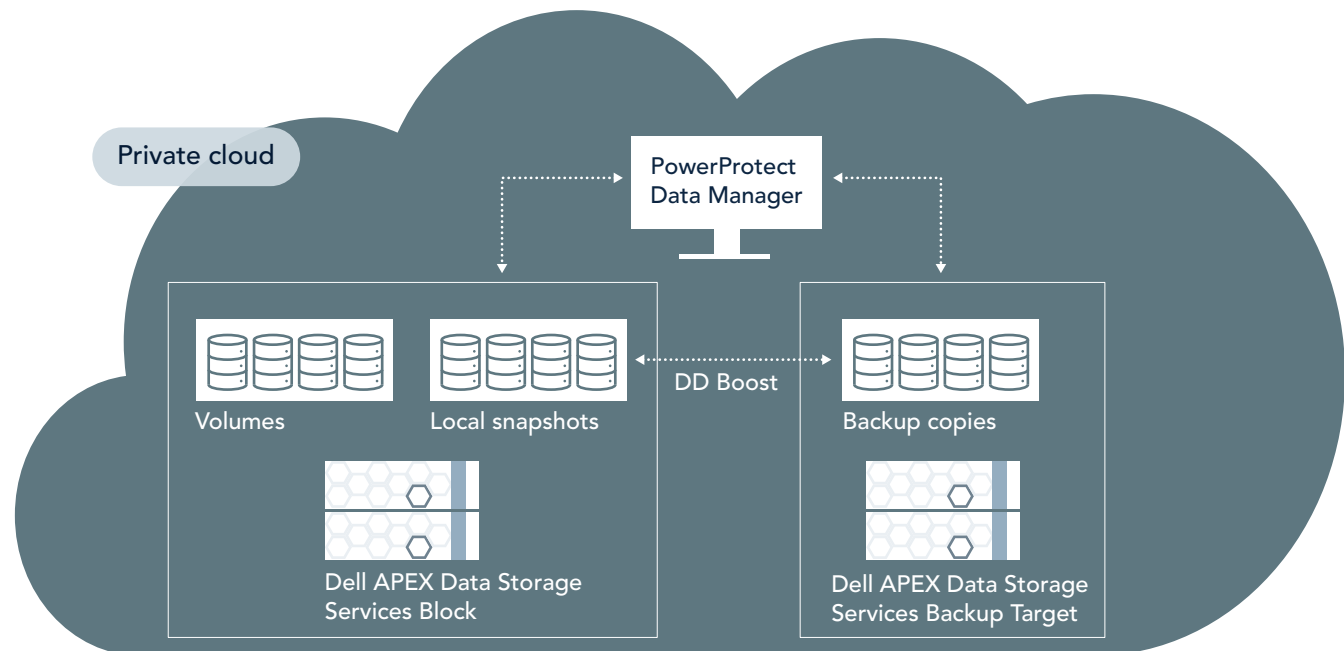
Our testing

PT engineers tested a Dell APEX-based backup and disaster recovery solution and an AWS solution in one private cloud scenario and two multicloud scenarios: private cloud local volume backup and restore, VM backup and restore to cloud storage tier, and disaster recovery orchestration.

Our test setup included the following components:

- Dell APEX Data Storage Services Backup Target
- Dell PowerProtect Data Manager
  - Dell Cloud Disaster Recovery server

- Dell APEX Data Storage Services Block
- AWS Elastic Disaster Recovery

Scenario 1: Private cloud local volume backup and restore

In this scenario, we tested local volume backup and restore using Dell APEX Data Storage Services Block based on the PowerStore™ 5000T for our source volumes and Dell APEX Data Storage Services Backup Target based on the PowerProtect™ DD6900 appliance as our backup target. We used a local PowerProtect Data Manager instance running on VMware® vSphere®. We set up four volumes to perform local backups. We conducted the backup and restore both manually and automatically by setting up a regular backup schedule using Data

Manager. Figure 1 shows our test setup.

Figure 1: Our testing setup for the private cloud local volume backup and restore scenario. Source: Principled Technologies.

We found the Dell solution, with its streamlined interface, was easy to set up and required minimal effort on the part of our engineers to back up local volumes. Setting up the backup policy was a straightforward process that took us less than 10 minutes. (See the science behind the report for detailed steps.) We also found that Dell APEX Data Storage Services Backup Target based on the PowerProtect DD6900 is directly integrated with Dell APEX Data Storage Services Block based on PowerStore 5000T. PowerStore can back up to and restore from PowerProtect DD two ways: (1) directly to DD via PowerStore Manager and (2) indirectly via PowerProtect Data Manager for centralized orchestration.[3]

Figure 2 shows the PowerProtect Data Manager Storage screen during this scenario, which indicates that we had configured Dell APEX Data Storage Services Backup Target based on PowerProtect DD6900 as a local backup target.
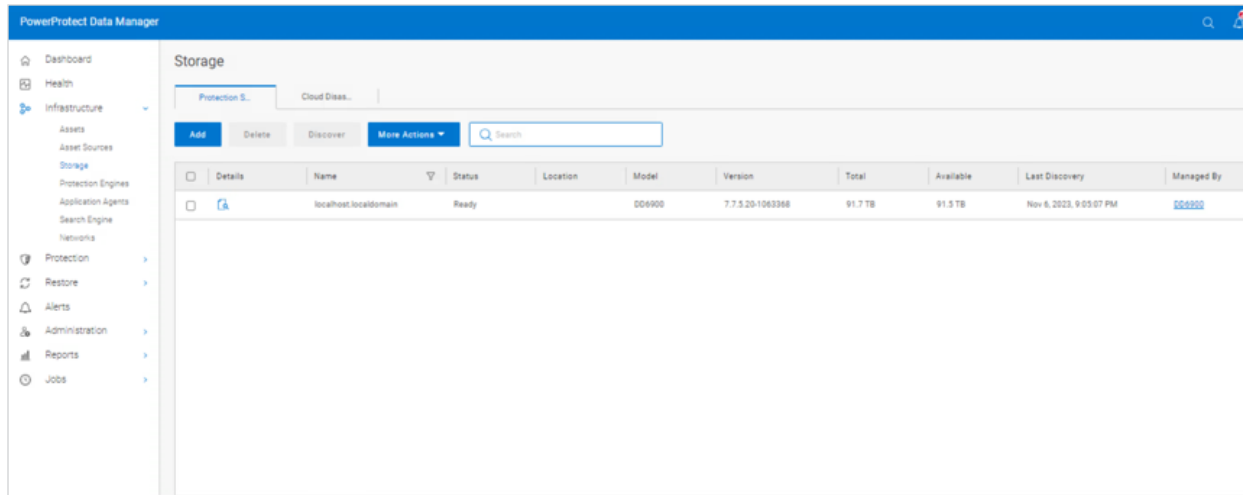

Figure 2: Screenshot of the PowerProtect Data Manager Storage screen during the private cloud local volume backup and restore scenario. Source: Principled Technologies.

AWS Elastic Disaster Recovery service is limited to backup and restore to the AWS public cloud environment only, so it was not possible to perform this scenario using only AWS services.[4]

About the Dell APEX offerings we used in our study

Dell APEX delivers cloud resources wherever an organization needs them. We chose customer-managed Dell APEX Data Storage Services for this study. Organizations can deploy Dell APEX offerings in their data center, a co-location facility, or an edge location.[5]

We used the following: Dell APEX Private Cloud (as the compute platform running our workload whose data we backed up), Dell APEX Data Storage Services Block, Dell APEX Data Storage Services Backup Target, Dell PowerProtect Data Manager, and Dell DD Boost.

According to Dell, PowerProtect Data Manager is "a next-generation software platform for proven and modern cloud data protection."[6] It offers local backup, cloud tiering, and cloud disaster recovery. DD Boost is software that Dell developed for use with PowerProtect DD appliances. We provide more information about these offerings later in this report.

Dell APEX Data Storage Services

Dell describes APEX Data Storage Services as an as-a-service portfolio of scalable and elastic storage resources that converts storage to an operating expense to let organizations "respond dynamically to changing business needs, eliminate the risks associated with under-provisioning and wasted cost from over-provisioning, and save IT staff time and resources."[7] Dell APEX Data Storage Services comprises three storage services— File, Block, and Backup Target—from which you can choose to meet the requirements of your workloads. You can also select different performance tiers aligned with different underlying hardware.

Companies can dynamically meet fluctuating customer and workload requirements, pay for what they use at one rate with no overage penalties, and get access to a dedicated Customer Success Manager."[8]

Scenario 2: VM backup and restore to cloud storage tier

In this scenario, we used the PowerProtect Data Manager integration to easily back up and restore a VM to an AWS storage tier. To demonstrate how the components function as a tiered backup storage environment, we used four VMs and backed them up locally. We then enabled the DD Cloud Tier feature, configured the AWS account, and copied the backups to AWS using the Data Manager Cloud Tier feature. Dell APEX Data Storage Services can complement the AWS offering, allowing customers to adopt a flexible cloud tiering model by adding local backup capability to the existing AWS offering, which is limited to backing up and restoring volumes hosted on AWS. Note that Dell APEX Data Storage Services Backup Target along with Data Manager supports tiering backup to other public cloud platforms as well. Figure 3 shows our test setup.
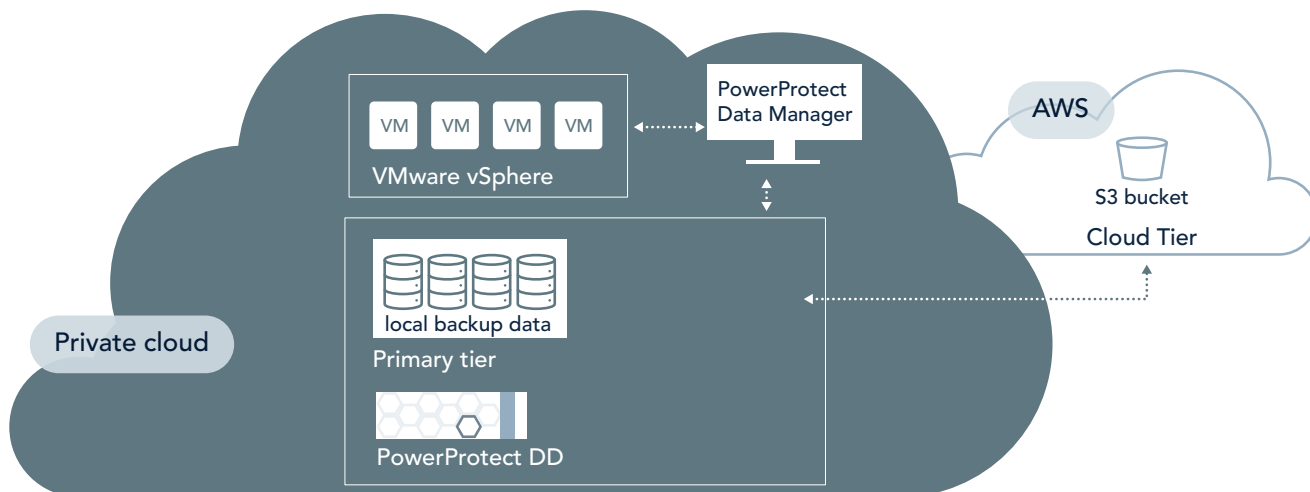
Figure 3: Our testing setup for the VM backup and restore to cloud storage tier scenario. Source: Principled Technologies.

Figure 4 shows the Data Manager Protection Policies screen during this scenario. We could clearly see that we had created a VM protection policy in Data Manager with Dell APEX Data Storage Services Backup Target (PowerProtect DD6900 appliance) as the primary tier and AWS as the cloud tier.
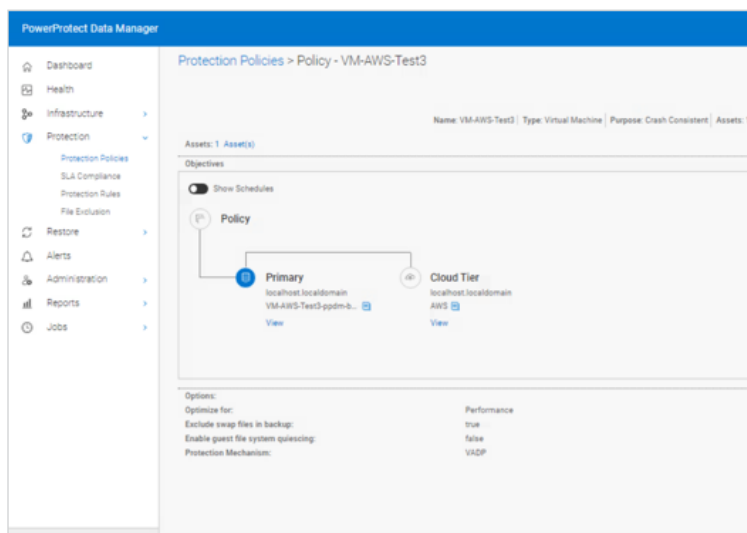
Figure 4: Screenshot of the PowerProtect Data Manager Protection Policies screen during the VM backup and restore to cloud storage tier scenario. Source: Principled Technologies.

The Cloud Tier feature of Dell PowerProtect Data Manager

According to Dell, "Cloud Tier is a native feature of DDOS 6.0 (or later) for moving data from the active tier to low-cost, high-capacity object storage in the public, private, or hybrid cloud for long-term retention. Cloud Tier is best suited for long-term storage of infrequently accessed data that is being held for compliance, regulatory, and governance reasons. The ideal data for Cloud Tier is data that is past its normal recovery window."[9]

We found that the process of creating a cloud-tier protection policy, backing up a VM to the cloud using the PowerProtect Data Manager user interface, and recalling and restoring a VM from the cloud tier using the Data Manager user interface was easy and straightforward. Configuring a primary tier and cloud tier in the Data Manager user interface took us less than 10 minutes. (See the science behind the report for details.). The Dell solution can provide long-term storage of on-prem backups by seamlessly and securely tiering data to AWS cloud.[10]

With AWS Elastic Disaster Recovery, there is only one tier—the cloud tier—so there is no option to have a primary on-premises tier.[11] The Dell solution allows for tiering to different clouds.

Dell APEX Data Storage Services

Dell APEX Data Storage Services is an as-a-Service portfolio of scalable and elastic storage resources. According to Dell, this service offers simplicity, agility, and control, and can reduce planning and provisioning costs by "eliminating complex procurement and migration cycles."[12]

Dell PowerProtect Data Manager

We managed the Dell APEX Data Storage Services Backup Target (PowerProtect DD appliance) with PowerProtect Data Manager. In addition to the VM backup capabilities that we tested, Dell claims that Data Manager "provides software defined data protection, automated discovery, deduplication, operational agility, self-service and IT governance for physical, virtual and cloud environments."[13]

Dell APEX Data Storage Services Block

Dell APEX Data Storage Services Block is based on Dell PowerStore technology, which lets users "[a]ccelerate block, file and vVols workloads with a single unified platform that scales both up and out, keeping pace with rapidly changing business requirements."[14]

The appliance uses Intel® Xeon® Scalable processors, and has an all-NVMe® design featuring dual-ported Intel Optane™ SSDs and NVMe-over-fabric networking (both FC and TCP).[15]

Scenario 3: Disaster recovery orchestration

In this scenario, we used the Cloud Disaster Recovery capability in Data Manager to back up and execute intentional failover to AWS to enhance disaster recovery resiliency and business continuity. We created and configured an AWS account and Amazon S3 storage bucket. We deployed Cloud Disaster Recovery Server in AWS. We simulated a disaster recovery scenario by moving on-prem backups to AWS using the Cloud DR feature in PowerProtect Data Manager. We then recovered the backup copies from the Data Manager interface and failed them back to on-prem vCenter from the Data Manager interface.

We also performed the scenario in AWS and compared the effort involved—in terms of time and steps—using AWS alone and AWS with Data Manager. Figure 5 shows our test setup.
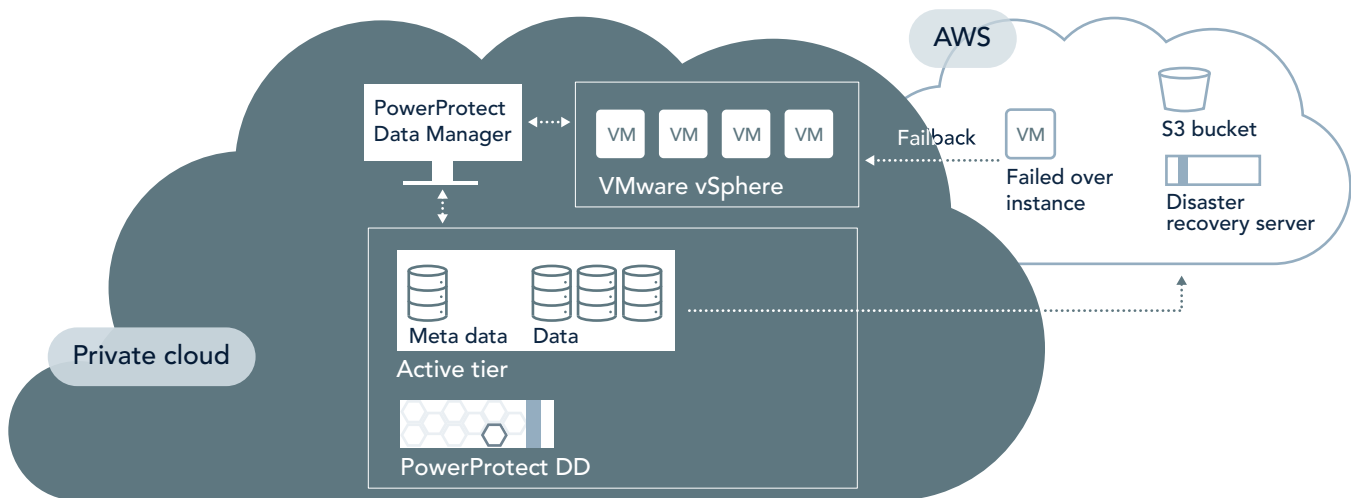

Figure 5: Our testing setup for the disaster recovery orchestration scenario. Source: Principled Technologies.

Dell APEX Data Storage Services Backup Target

Dell APEX Data Storage Services Backup Target is based on the PowerProtect DD6900, part of the PowerProtect DD series, which Dell calls the next generation of data domain appliances. They let organizations "protect, manage and recover data at scale across their diverse environments."[16] They offer "the ecosystem support, efficiency, powerful data protection and cloud-enabled capabilities that customers have come to expect and appreciate from Data Domain and takes it to the next level."[17]

The PowerProtect Data Manager screen during this scenario shows that we had deployed Cloud Disaster Recovery on AWS from the PowerProtect Data Manager user interface (see Figure 6).
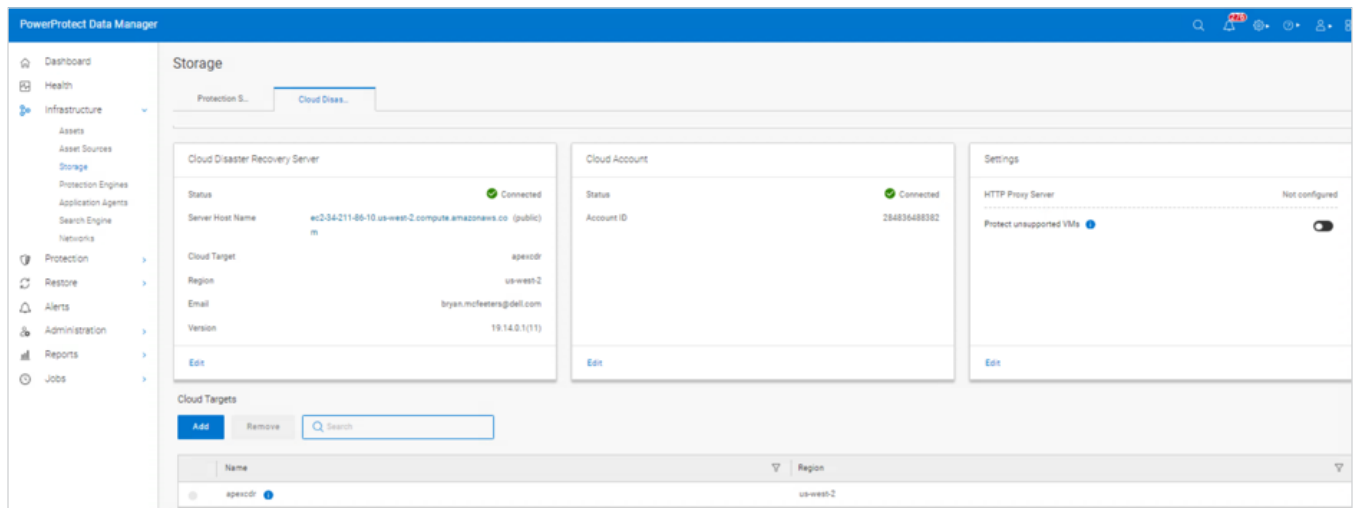

Figure 6: Screenshot of the PowerProtect Data Manager Protection Storage screen during the disaster recovery orchestration scenario. Source: Principled Technologies.

As Figure 7 shows, executing the disaster recovery scenario in the Dell APEX Data Storage Services environment took only 17 steps, 29 percent fewer steps than it took to complete the same scenario in the AWS-only environment. Note that AWS Elastic Disaster Recovery is limited to restoring exclusively to AWS.[18] In contrast, PowerProtect Data Manager supports the following public clouds: AWS, AWS GovCloud, Azure, and Azure Government.

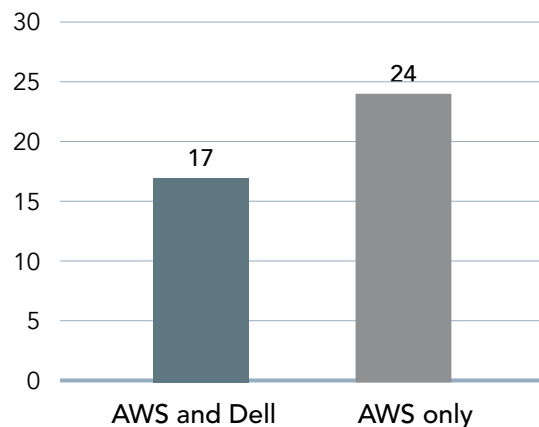**Steps to execute**
Lower is better

Figure 7: Number of steps required to execute disaster recovery scenario. Lower is better to save time. Source:

DD Boost

As we mentioned earlier, Dell developed DD Boost software for use with PowerProtect DD protection storage systems. It offloads part of deduplication process to a backup server or application client, reducing the amount of data to be transferred over the network and improving overall backup and restore performance. By integrating with various backup applications and providing a more efficient data transfer mechanism, DD Boost helps organizations optimize their data protection workflows and minimize the impact on network resources. It is particularly beneficial in environments with large-scale data backup requirements, as it accelerates the backup and recovery processes while reducing storage costs through deduplication.[19,20]

Conclusion

In our testing, we found that the Dell APEX Data Storage Services PowerProtect Data Manager solution made it easy to back up and restore private cloud local volumes and that its Cloud Tiering feature made it easy to back up and restore private cloud local VMs to a cloud storage tier. We also found that adding Data Manager to AWS simplified cloud failover and disaster recovery of virtual machines, thanks to its Cloud Disaster Recovery feature, requiring 29 percent fewer steps.

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Read the science behind this report ▶

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