



Understanding Infinite Volumes

OnCommand Unified Manager 9.5

NetApp
October 23, 2024

This PDF was generated from <https://docs.netapp.com/us-en/oncommand-unified-manager-95/online-help/concept-what-an-infinite-volume-is.html> on October 23, 2024. Always check docs.netapp.com for the latest.

Table of Contents

Understanding Infinite Volumes	1
What an Infinite Volume is	1
Maximum number of files an Infinite Volume can store	1
What a storage class is	1
What a namespace constituent is	2
What data constituents are	2
What a namespace mirror constituent is	3

Understanding Infinite Volumes

An Infinite Volume is a logical storage unit that you can use to provide a large, scalable data container with a single namespace and a single mount point. Understanding some of the basic concepts of Infinite Volumes helps you to monitor and manage your SVMs with Infinite Volume.

What an Infinite Volume is

An Infinite Volume is a single, scalable volume that can store up to 2 billion files and tens of petabytes of data.

With an Infinite Volume, you can manage multiple petabytes of data in one large logical entity and clients can retrieve multiple petabytes of data from a single junction path for the entire volume.

An Infinite Volume uses storage from multiple aggregates on multiple nodes. You can start with a small Infinite Volume and expand it nondisruptively by adding more disks to its aggregates or by providing it with more aggregates to use.

Maximum number of files an Infinite Volume can store

In most cases, an Infinite Volume can hold up to 2 billion files. If an Infinite Volume is relatively small, its maximum number of files might be less than 2 billion.

The maximum number of files that an Infinite Volume can hold is determined by the size of its namespace constituent. If the namespace constituent is 10 TB, the Infinite Volume can hold 2 billion files. If the namespace constituent is less than 10 TB, the Infinite Volume can hold proportionally fewer files.

The size of the namespace constituent is roughly proportional to the size of the Infinite Volume, depending on several factors, such as the namespace constituent's 10 TB maximum size, the available space in the aggregate that holds the namespace constituent, and the SnapDiff setting.

For a two-node Infinite Volume or a multi-node Infinite Volume without SnapDiff enabled, setting the Infinite Volume to a size of 80 TB or greater typically creates a namespace constituent of 10 TB.

The file count not only includes regular files, but also other file system structures, such as directories and symbolic links.

What a storage class is

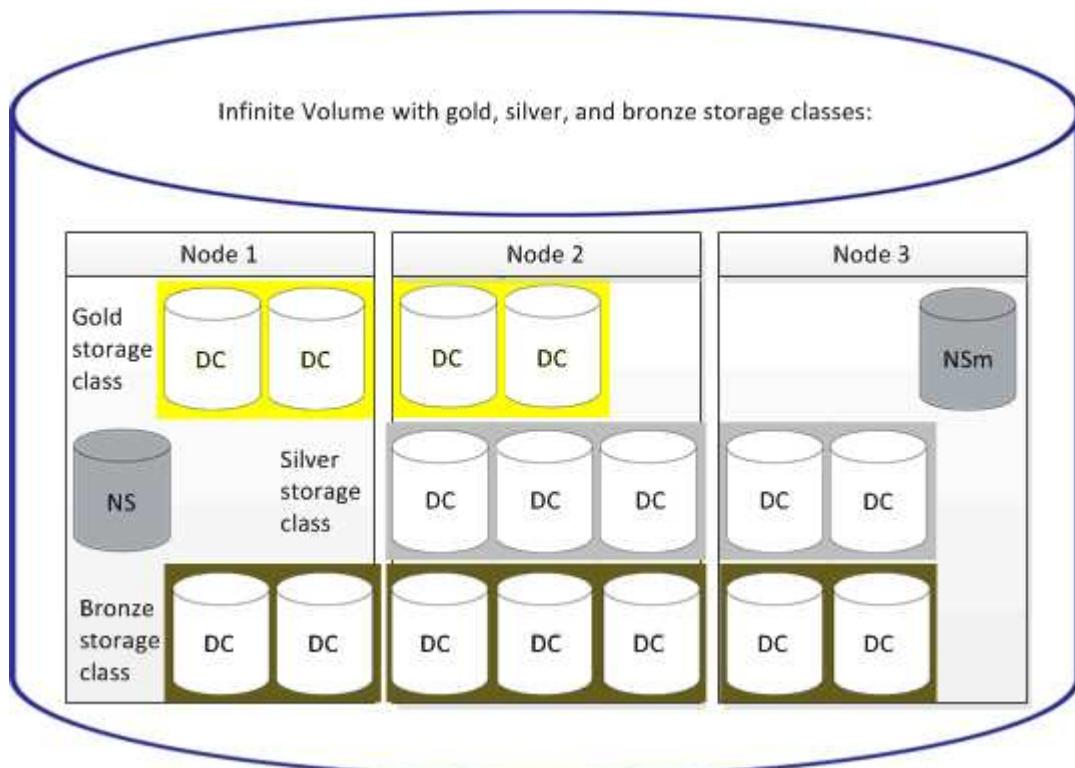
A storage class is a definition of aggregate characteristics and volume settings. You can define different storage classes and associate one or more storage classes with an Infinite Volume. You must use OnCommand Workflow Automation to define workflows for your storage class requirements and to assign storage classes to Infinite Volumes.

You can define the following characteristics for a storage class:

- Aggregate characteristics, such as the type of disks to use
- Volume settings, such as compression, deduplication, and volume guarantee

For example, you can define a storage class that uses only aggregates with SAS disks and the following volume settings: thin provisioning with compression and deduplication enabled.

The following diagram illustrates an Infinite Volume that spans multiple nodes and uses the following storage classes: gold, silver, and bronze. Each storage class can span two or more nodes within an Infinite Volume. The diagram also illustrates the placement of data constituents in each storage class.



What a namespace constituent is

Each Infinite Volume has a single namespace constituent that maps directory information and file names to the file's physical data location within the Infinite Volume.

Clients are not aware of the namespace constituent and do not interact directly with it. The namespace constituent is an internal component of the Infinite Volume.

What data constituents are

In an Infinite Volume, data is stored in multiple separate data constituents. Data constituents store only the data from a file, not the file's name.

Clients are not aware of data constituents. When a client requests a file from an Infinite Volume, the node retrieves the file's data from a data constituent and returns the file to the client.

Each Infinite Volume typically has dozens of data constituents. For example, a 6 PB Infinite Volume that contains 1 billion files might have 60 data constituents located on aggregates from 6 nodes.

What a namespace mirror constituent is

A namespace mirror constituent is an intracluster data protection mirror copy of the namespace constituent in an Infinite Volume. The namespace mirror constituent performs two roles: It provides data protection of the namespace constituent, and it supports SnapDiff for incremental tape backup of Infinite Volumes.

Copyright information

Copyright © 2024 NetApp, Inc. All Rights Reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—with prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

Trademark information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.