Best Practices for Production Deployments HCI

NetApp July 31, 2020

This PDF was generated from https://docs.netapp.com/us-en/hci-solutions/redhat_virtualization_updating_rhv_manager_and_rhv-h_hosts.html on July 31, 2020. Always check docs.netapp.com for the latest.



Table of Contents

В	est Practices for Production Deployments	. 1
	Updating RHV Manager and RHV-H Hosts: NetApp HCI with RHV	. 1
	Enabling Fencing for RHV-H Hosts: NetApp HCI with RHV	. 1
	Optimizing Memory for Red Hat Virtualization: NetApp HCI with RHV	. 3

Best Practices for Production Deployments

Updating RHV Manager and RHV-H Hosts: NetApp HCI with RHV

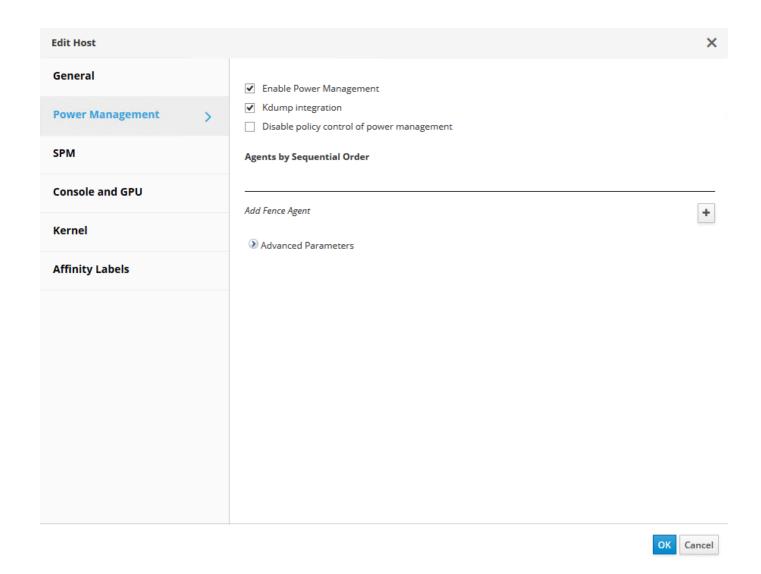
It is a recommended best practice to make sure that both the RHV Manager and the RHV-H hosts have the latest security and stability updates applied to make sure that the environment is protected and continues to run as expected. To apply the updates to the hosts in the deployment, they must first be subscribed to either the Red Hat Content Delivery Network or a local Red Hat Satellite repository. The tasks involved in updating the platform include updating the manager VM and afterward updating each physical host non-disruptively after ensuring virtual guests are migrated to another node in the cluster.

Official documentation to support the upgrade of RHV 4.3 between minor releases can be found here.

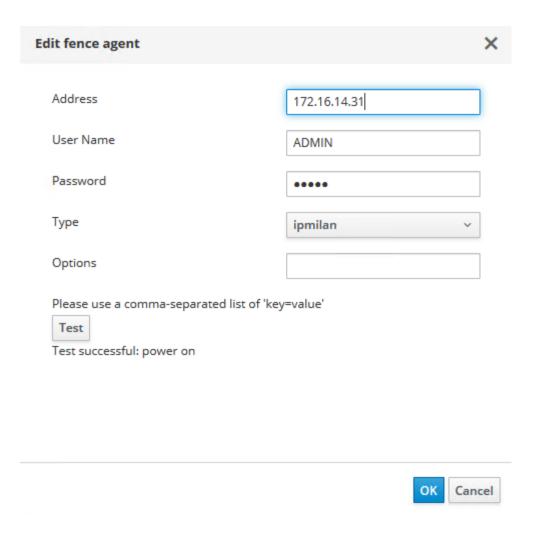
Enabling Fencing for RHV-H Hosts: NetApp HCI with RHV

Fencing is a process by which the RHV Manager can provide high availability of the VMs in the environment by automatically shutting down a non-responsive hypervisor host. It does this by sending commands to a fencing agent, which in the case of NetApp HCI is available through the IPMI out-of-band management interface on the compute nodes and rebooting the host. This action releases the locks that the non-responsive hypervisor node has on VM disks and allows for those virtual guests to be restarted on another node in the cluster without risking data corruption. After the host completes its boot process, it automatically attempts to rejoin the cluster it was a part of prior to the shutdown. If it is successful, it is once again allowed to host VMs.

To enable fencing, each host must have power management enabled; this can be found by highlighting the host and clicking the Edit button in the upper right-hand corner or by right-clicking on the host and selecting Edit.



After power management is enabled, the next step involves configuring a fencing agent. Click on the plus sign (+) near the Add Fence Agent, and a new window pops up that must be filled out with the information for the IPMI connection on the NetApp HCI compute nodes. The type of connection is IPMILAN, and the agent needs the IP address, username, and password for the console login. After you have provided this information, you can click test to validate the configuration. If properly configured, it should report the current power status of the node.



With fencing enabled, the RHV environment is configured to support a highly available deployment should one of the hypervisor nodes become nonresponsive.

Optimizing Memory for Red Hat Virtualization: NetApp HCI with RHV

One of the primary benefits for deploying a virtual infrastructure is to enable the more efficient use of physical resources in the environment. In a case in which the guest VMs underutilize the memory allotted, you can use memory overcommitment to optimize memory usage. With this feature, the sum of the memory allocated to guest VMs on a host is allowed to exceed the amount of physical memory on that host.

The concept behind memory overcommitment is similar to thin provisioning of storage resources. At any given moment, every VM on the host does not use the total amount of memory allocated to it. When one VM has excess memory, its unused memory is available for other VMs to use. Therefore, an end user can deploy more VMs that the physical infrastructure would not normally allow. Memory overcommitment on the hosts in the cluster is handled by Memory Overcommit Manager (MoM).

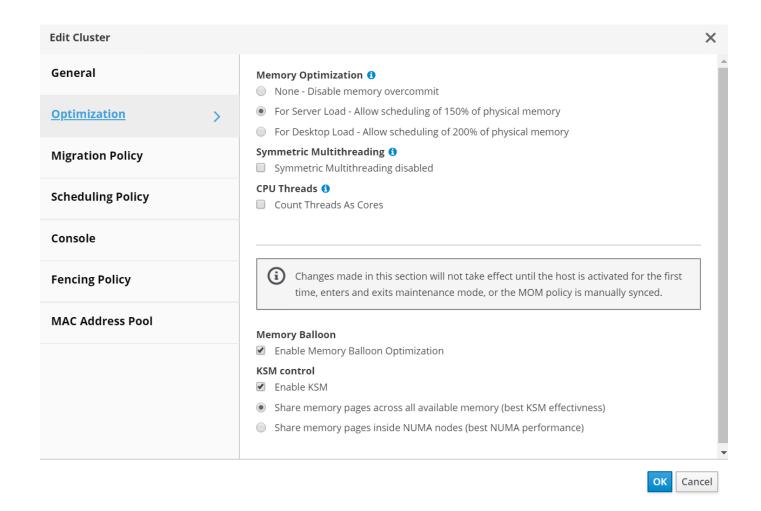
Techniques like memory ballooning and Kernel Same-page Merging (KSM) can improve memory overcommitment depending on the kind of workload.

Memory ballooning is a memory management technique which allows a host to artificially expand its memory by reclaiming unused memory that was previously allocated to various VMs, with a limitation of the guaranteed memory size of every VM. For memory ballooning to work, each VM by default has a balloon device with the necessary drivers. Ballooning essentially is a cooperative operation between the VM driver and the host. Depending on the memory needs of the host, it instructs the guest OS to inflate (provide memory to host) or deflate (regain the memory) the balloon which is controlled by the balloon device.

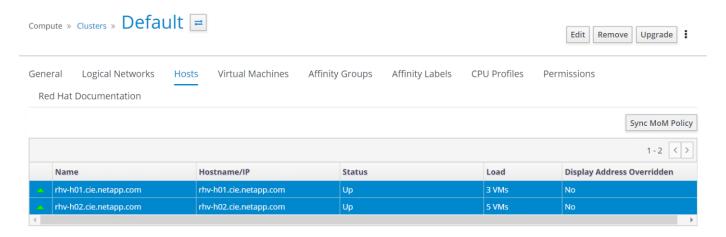
Kernel Same-page Merging (KSM) allows the host kernel to examine two or more running VMs and compare their image and memory. If any memory regions or pages are identical, KSM reduces multiple identical memory pages to a single page. This page is then marked 'copy on write' and a new page is created for that guest VM if the contents of the page are modified by a guest VM.

Both features can be enabled at a cluster level to apply to all hosts in that cluster. To enable these features, navigate to Compute > Clusters, select the desired cluster and click Edit. Then click the Optimization sub-tab and perform the following steps based on your requirements:

- 1. Depending on the use-case and workload, enable Memory Optimization to allow overcommitment of memory to either 150% or 200% of the available physical memory.
- 2. To enable memory ballooning, check the Enable Memory Balloon Optimization checkbox.
- 3. To enable KSM, check the Enable KSM checkbox.
- 4. Click Ok to confirm the changes.



Be aware that after these changes have been applied, they do not take effect until you manually sync the MoM policy. To sync the MoM policy, navigate to Compute > Clusters and click the cluster for which you made the optimization changes. Navigate to the Hosts sub-tab, select all the hosts, and then click Sync MoM Policy.



KSM and ballooning can free up some memory on the host and facilitate overcommitment, but, if the amount of shareable memory decreases and the use of physical memory increases, it might cause an out-of-memory condition. Therefore, the administrator should be sure to reserve enough memory to

avoid out-of-memory conditions if the shareable memory decreases.

In some scenarios, memory ballooning may collide with KSM. In such situations, MoM tries to adjust the balloon size to minimize collisions. Also, there can be scenarios for which ballooning might cause sub-optimal performance. Therefore, depending on the workload requirements, you can consider enabling either or both the techniques.

Copyright Information

Copyright © 2020 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 systemwithout 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.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

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.