OnApp Cloud 6.0
Upgrade Guide

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The guides in this section apply to upgrading to the OnApp Cloud 6.0 version. For the release notes, please refer to the Release Notes space. For information on how to install OnApp 6.0, refer to the Installation guide.

You can upgrade to OnApp 6.0 from OnApp 5.0 and OnApp 5.5. Depending on the version that you have, refer to one of the following documentation sets.

1 Upgrade from OnApp 5.0

- Upgrade Guide for Control Panel Server
- Upgrade Guide for Cloud with CloudBoot Servers
- Upgrade Guide for Cloud with Static Servers
- Upgrade Guide for Cloud with Mixed CloudBoot and Static Servers
- Upgrade to Custom Control Panel Version
- OS Components Upgrade
- OnApp IS Upgrade Paths

2 Upgrade from OnApp 5.5

- Upgrade Guide for Control Panel Server
- Upgrade Guide for Cloud with CloudBoot Servers
- Upgrade Guide for Cloud with Static Servers
- Upgrade Guide for Cloud with Mixed CloudBoot and Static Servers
- Upgrade to Custom Control Panel Version
- OS Components Upgrade
- OnApp IS Upgrade Paths

3 Upgrade from OnApp 5.0

The guides in this section apply to upgrading to OnApp 6.0 from the 5.0 version.

3.1 Upgrade Notes (5.0 to 6.0)

OnApp 6.0 is a new long-term support (LTS) version that introduces a lot of new features, improvements, and fixes. Before upgrading to OnApp 6.0, read these upgrade notes to get ready for the upgrade.

On this page:

Before You Upgrade
Important Notes
Check Cloud Configuration
Billing Changes
Troubleshooting

3.1.1 Before You Upgrade

Before you upgrade, we strongly recommend you to do the following:

1. Check the *character_set_database* and *collation_database* variables on your database server. If you have non-Latin values applied for character set and collation, edit the following parameters in the *my.cnf* file before the upgrade.

```
character-set-server=utf8
collation-server=utf8_general_ci
```

   After you save the changes, restart your SQL server.

2. Archive your billing statistics to speed up the upgrade process. This step is important if you have a lot of billing statistics records on your system. You can apply the following procedure to archive your statistics:

- Edit the *Time of hourly statistics storage (months)* parameter at **Settings** > **Configuration** > **System Configuration** on your Control Panel. For example, if you set the parameter to 10, the hourly statistics is stored for the current month and the ten previous months, while everything older than ten months is archived.
- Run the following commands to archive statistics for the period you specified in the previous step.

```
su -l onapp
cd /onapp/interface/
RAILS_ENV=production rake billing:archive_hourly_stats
```

  When the *rake billing:archive_hourly_stats* task is run, your Control Panel cannot be accessed. The longer the period to archive statistics is, the more time it takes to complete the rake task. If you want to archive statistics for a long period of time, please consider repeating the procedure and set a short period for the *Time of hourly statistics storage (months)* parameter. In such a way, you could gradually archive statistics and the rake task would run faster for each short period of time.

3.1.2 Important Notes

Take into consideration the important note related to the upgrade to OnApp 6.0:

3.1.2.1 Billing

- After the upgrade, your billing plans will be migrated into buckets. The Master Bucket and Master Template were removed. Buckets consist of Access Control where you can give users access to cloud resources and Rate Card where you can set prices for the usage of these resources. The Access Control and Rate Card are arranged according to the types of resources available in your cloud, such as virtual, smart, baremetal, and others.
- If your buckets are empty after the upgrade, users have no access to resources available in your cloud. Add resources to Access Control to make them available to users. For more information about the logic of migration from billing plans to buckets, see Billing Changes.

3.1.2.2 API

- If you have an API integration, please test your upgrade in a non-production environment before upgrading your production environment.
- The API requests related to billing plans can be applied to plans that were created before the upgrade. If you create new buckets after the upgrade, please use new API requests.

3.1.2.3 Control Panel Server

- You need to run the latest patch of OnApp 5.0 to upgrade to the 6.0 version. If you are using an earlier version, please upgrade to 5.0 first.
- Check the Activity Log in your OnApp CP if there are no transactions running in your cloud. If so, wait until all transactions are complete.
- Make sure no Control Panel files are open for editing under the root user account.
- Be aware that OnApp Licensing has a standalone client. Use only 443 port to connect from Control Panel to the licensing server.
- If you use custom languages on your CP, after the update please check the **i18n Customization** menu to submit translations for new UI labels, texts, and messages that will be available in the *Missing translations* tab.
- We strongly recommend that you test all your custom scripts before upgrading your production environment.

3.1.2.4 CloudBoot Servers

- If you use Integrated Storage, refer to the OnApp IS Upgrade Paths for more information about the upgrade details.
- When upgrading Xen-based compute resources from 4.4 to 4.8, only the cold migration option is available.
- Drives assigned for use by Integrated Storage are identified using a disk signature that is generated by the SCSI page query mechanism to the device. Please note that disk signatures may change across different kernel versions following an upgrade and reboot. If this occurs, go to the compute resource edit page to re-identify and select the correct drives. Please contact support if you have any concerns regarding this operation.

3.1.2.5 Static Servers

- When upgrading Xen-based compute resources from 4.4 to 4.8, only the cold migration option is available.
- OnApp does not support UEFI on static compute resources. You should disable UEFI on your compute resources before upgrading.

3.1.3 Check Your Cloud Configuration

When you upgrade your cloud from 5.0 to 6.0, a rake task will check whether your system is compatible with the changes introduced within the 5.1-6.0 versions. Your cloud must comply with both the new resource zone and networking requirements.

3.1.3.1 Zone Types

Starting with OnApp 5.3, there's a strict system requirement that all compute resources, data stores, networks, and backup servers should be attached to zones. All compute, data store, network and backup server zones after the upgrade will have an assigned zone type. This type will be inherited by the compute resources, data stores, networks and backup servers in the zones. During the update to OnApp 6.0, the updater will check the cloud configuration. If at least one conflict is found in the configuration, the cloud will not be updated. If your cloud configuration is correct, the CP updater will be run and new types will be set for your zones and resources automatically. Resources can be later moved only between zones of the same type.

- *Compute zones* can have the Virtual, Baremetal, Smart and VPC (Virtual Private Cloud) types.
- *Data store zones* can have the Virtual, Smart and VPC types.
- *Network zones* can have the Virtual, Baremetal, Smart and VPC types.
- *Backup server zones* can have the Virtual and Smart types.

For more information refer to Zone Types document.

Prior to the update procedure, it is required to check your cloud configuration. The cloud should comply with the following requirements for a successful upgrade:

- All compute resources are assigned to compute zones
- All data stores are assigned to data store zones
- All networks are assigned to network zones
- All backup servers are assigned to backup server zones
- Compute zones should not be mixed. Xen/KVM and vCloud Director compute resource cannot reside in one compute zone.
- Network zones should not be mixed. All networks in a zone should be assigned to compute resources or compute zones of the same type.
- Data store zones should not be mixed. All data stores in a zone should be assigned to compute resources or compute zones of the same type.
- Backup server zones should not be mixed. All backup servers in a zone should be assigned to compute resources or compute zones of the same type.

If any inconsistencies are detected on your system, the update procedure will stop and no types will be assigned to your zones and resources. In such a case, you need to address the issues that have been found and run the CP updater again. If it is not possible to fix the cloud configuration, please, contact our support team.

If the configuration of the cloud meets the requirements listed above, the update to OnApp 6.0 will go smoothly, and all zones will acquire the corresponding zone type.

When you run the Control Panel updater, the system will check your configuration. You can view the log at log/production_upgrade.log. If any inconsistencies are found, the log might contain any of the following warning messages:

- The compute resource that is not assigned to a compute zone has been detected. The ID and the label of the compute resource will be provided.
- The data store that is not assigned to a data store zone has been detected. The ID and the label of the data store will be provided.
- The network that is not assigned to a network zone has been detected. The ID and the label of the network will be provided.
- The backup server that is not assigned to a backup server zone has been detected. The ID and the label of the backup server will be provided.
- The mixed compute zone with vCloud Director compute resource(s) and compute resources of other type has been detected. The ID and the label of the compute zone which has mixed resources will be provided.
- The mixed network zone with networks which are assigned to compute zones or compute resources of different types has been detected. The ID and the label of the network zone will be provided.
- The mixed data store zone with data stores which are assigned to compute zones or compute resources of different types has been detected. The ID and the label of the data store zone will be provided.
- The mixed backup server zone with backup servers which are assigned to compute zones or compute resources of different types has been detected. The ID and the label of the backup server zone will be provided.

3.1.3.2 Networking

Starting with OnApp 5.4, networks are made up of sub-networks called IP nets which contain ranges of IP addresses. To make your system compatible with the new networking scheme, a rake task will run with the updater. The rake task will modify your networks to contain IP ranges and IP nets. If a network contains two or more consecutive IP addresses of the same range of addresses, they will be united into one IP range. Individual IPs will each constitute an IP range. For each of the IP ranges an IP net will be added to the network. If at least one conflict is found in the configuration, the cloud will not be updated. If your cloud configuration is correct, the CP updater will be run and your networks will be modified to include IP nets and IP ranges.

Prior to the update procedure, it is required to check your cloud configuration. The cloud should comply with the following requirements for a successful upgrade:

- All VLANs indicated for the networks in the cloud should have a relevant value. The value for VLAN should not exceed 4095.
- All networks which have one or several IP addresses assigned to user(s) should be within a network zone
- All IP addresses added to the cloud should be represented with feasible values
- All network masks should have relevant lengths
- There should be no overlapping IP addresses in a single network

If one or several of the IP address you've added to the cloud do not correspond with their prefix, the system will offer to switch on the *force* option. When the *force* option is enabled, the system will automatically change the IP address to correspond with their prefix. For example, if you've had a 198.168.0.1/255.255.0.0 IP address with 8 as its prefix, the system will change the address to 198.168.0.1/255.0.0.0.

If any inconsistencies are detected in your system, the update procedure will stop and the networks will undergo no changes. In such a case, you need to address the issues that have been found and run the CP updater again. If it is not possible to fix the cloud configuration, please, contact our support team.

If the configuration of the cloud meets the requirements listed above, the update to OnApp 6.0 will go smoothly, and all networks will be modified to include IP nets and IP ranges.

When you run the Control Panel updater the system will check your configuration. You can view the log at log/ip_consistency_check.log. If any inconsistencies are found, the log might contain any of the following warning messages:

- The incorrect VLAN for a network has been detected. The ID and label of the network will be provided.
- The network that has an IP address assigned to a user and which is not in a network zone has been detected. The ID of the network, the ID of the assigned IP address and the ID of the user to whom the IP is assigned will be provided.
- The IP address which is represented incorrectly has been detected. The ID of the IP address will be provided.
- The IP address which does not correspond with its prefix has been detected. The ID of the network, the ID of the IP address and the existing and expected prefixes will be provided.
- The overlapping IP addresses have been detected in one network. The IP addresses and the network ID will be provided.

3.1.4 Billing Changes

In OnApp 5.6, billing plans were substituted by buckets. Buckets enable you to set up resources allocation and pricing separately; the master bucket and master template have been removed. Buckets are subdivided into two tabs:

- *Access Control* - in this section you configure the resources allocation for the users under this bucket. If you assign a bucket to a user, that user will have access only to those resources which you have added to the bucket. If no resources are added to a section of the Access Control, e.g. compute zones, the user under the bucket will not have access to any of the compute zones in the cloud.
- *Rate Card* - in this section you set up prices for the resources and the amount of resources users can request for free. Users under the bucket will be billed according to the prices you configure in the Rate Card.

These tabs are further subdivided into sections that depend on the server types of resources you have in the cloud:

- *Virtual* - the server type under which Xen, KVM, or CloudBoot compute, data store, network and backup server zones of the virtual server type can be created.
- *Smart* - the server type under which KVM compute, data store, network and backup server zones of the smart type can be added.
- *Baremetal* - the server type under which XEN compute and network zones of the baremetal type can be added.
- *VPC* - the server type that *includes* vCloud Director compute, data store and network zones.
- *Other* - the resources that relate to the system and do not have a server type. This section includes template stores, edge groups, recipes, and service add-on groups.

For detailed information, refer to Billing Plans.

Your billing plans from OnApp 5.0 have been merged into buckets, following the logic described in the table below.

Server	Case	Migration behavior

type		
Virtual	Empty billing plan	Access Control: • all resources in the *Miscellaneous* section (these were previously the *User VS Limits*) will be added and their limits will be set to *unlimited* • all template stores, recipe groups and service add-on groups in the cloud will be added to the corresponding sections in the *Other* tab of the Access Control • none of the edge groups in the system will be added to the Access Control • all data store zones which have SolidFire will be added to the *Guaranteed minIOPS* section with all limits set to *unlimited* • all resources of the *virtual* type will be added to the Access Control with all limits set to *unlimited.* These resources include XEN/KVM/vCenter compute zones, data store, network, and backup server zones of the *virtual* type Rate Card: • the prices for individual templates will be set according to the prices you have previously configured for these templates in the template store • the prices for individual service add-ons will be set according to the prices you have previously configured for these service add-ons in the service add-on groups • for all other resources (IPs, CPU, RAM, etc.) prices and free limits will be set to '0', meaning that the resource usage is free
	Filled-in billing plan	Access Control: • Only the resources you have previously added will be added to the Access Control. The same limits that were configured prior to the upgrade to 6.0 will be set in the bucket. Rate Card: • Only the resources for which the prices were previously configured will be added to the Rate Card. The same prices and free limits that were configured prior to the upgrade to 6.0 will be set in the bucket.
	Master Bucket	If there was only the master bucket and no other compute zones added to the billing plan: • all compute zones of the *virtual* type will be added to the bucket with the same prices and limits as those that were set in the master bucket If there were some compute zones that used the master bucket and other which had custom limits and prices: • the compute zones that used the master bucket will be added with the same prices and limits as those that were set in the master bucket

		• the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master bucket was not used and there were only compute zones with custom limits and prices: • all the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
	Master template	If there was only the master template and no other data store/network zones added to the billing plan: • all data store/network zones of the *virtual* type will be added to the bucket with the same prices and limits as those that were set in the master template If there were some network/data store zones that used the master template and other which had custom limits and prices: • the network/data store zones that used the master bucket will be added with the same prices and limits as those that were set in the master template • the network/data store zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master template was not used and there were only network/data store zones with custom limits and prices: • all the network/data store zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
Smart	Empty billing plan	Access Control: • all resources in the *Miscellaneous* section (smart servers, templates, ISO's & backups storage and backups) will be added and their limits will be set to *unlimited* • all template stores, recipe groups and service add-on groups in the cloud will be added to the corresponding sections in the *Other* tab of the Access Control • none of the edge groups in the system will be added to the Access Control • all resources of the *smart* type will be added to the Access Control with all limits set to *unlimited.* These resources include KVM compute zones, data store, network, and backup server zones of the *smart* type Rate Card: • the prices for individual templates will be set according to the prices you have previously configured for these templates in the template store • the prices for individual service add-ons will be set according to the prices you have previously configured for these service add-ons in the service add-on groups

		• for all other resources (IPs, CPU, RAM, etc.) prices and free limits will be set to '0', meaning that the resource usage is free
	Filled-in billing plan	Access Control: • Only the resources you have previously added will be added to the Access Control. • All resources in the *Miscellaneous* section (smart servers, templates, ISO's & backups storage and backups) will be set to *unlimited.* All the other resources of the *smart* type that were configured prior to the upgrade to 6.0 will be set in the bucket as they were set in the billing plan. Rate Card: • Only the resources for which the prices were previously configured will be added to the Rate Card. • All resources in the *Miscellaneous* section (templates, ISO's & backups storage and backups) will be migrated without prices. Prices for other resources of the *smart* type that were configured prior to the upgrade to 6.0 will be set in the bucket as they were set in the billing plan. After the upgrade, you can configure limits and prices for resources in the *Miscellaneous* section of the bucket by following instructions from the Set User Billing Plan Prices And Resource Limits section of the Administration Guide.
	Master Bucket	If there was only the master bucket and no other compute zones added to the billing plan: • all compute zones of the *smart* type will be added to the bucket with the same prices and limits as those that were set in the master bucket If there were some compute zones that used the master bucket and other which had custom limits and prices: • the compute zones that used the master bucket will be added with the same prices and limits as those that were set in the master bucket • the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master bucket was not used and there were only compute zones with custom limits and prices: • all the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
	Master template	If there was only the master template and no other data store/network zones added to the billing plan: • all data store/network zones of the *smart* type will be added to the bucket with the same prices and limits as those that were set in the master template If there were some network/data store zones that used the master

		template and other which had custom limits and prices: • the network/data store zones that used the master bucket will be added with the same prices and limits as those that were set in the master template • the network/data store zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master template was not used and there were only network/data store zones with custom limits and prices: • all the network/data store zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
Baremetal	Empty billing plan	Access Control: • all resources in the *Miscellaneous* section (baremetal servers) will be added and their limits will be set to *unlimited* • all template stores, recipe groups and service add-on groups in the cloud will be added to the corresponding sections in the *Other* tab of the Access Control • none of the edge groups in the system will be added to the Access Control • all resources of the *baremetal* type will be added to the Access Control with all limits set to *unlimited.* These resources include XEN compute and network zones of the *baremetal* type. Rate Card: • the prices for individual templates will be set according to the prices you have previously configured for these templates in the template store • the prices for individual service add-ons will be set according to the prices you have previously configured for these service add-ons in the service add-on groups • for all other resources (IPs) prices and free limits will be set to '0', meaning that the resource usage is free
	Filled-in billing plan	Access Control: • Only the resources you have previously added will be added to the Access Control. The same limits that were configured prior to the upgrade to 6.0 will be set in the bucket. Rate Card: • Only the resources for which the prices were previously configured will be added to the Rate Card. The same prices per IP for powered-on baremetal servers and free limits that were configured prior to the upgrade to 6.0 will be set in the bucket. Prices per IP for powered-off baremetal servers are not migrated and not configured in the bucket.

			After the upgrade, you can configure limits in the *Miscellaneous* section of the bucket by following instructions from the Set User Billing Plan Prices And Resource Limits section of the Administration Guide.
	Master Bucket		If there was only the master bucket and no other compute zones added to the billing plan: • all compute zones of the *baremetal* type will be added to the bucket with the same prices and limits as those that were set in the master bucket If there were some compute zones that used the master bucket and other which had custom limits and prices: • the compute zones that used the master bucket will be added with the same prices and limits as those that were set in the master bucket • the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master bucket was not used and there were only compute zones with custom limits and prices: • all the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
	Master template		If there was only the master template and no other network zones added to the billing plan: • all network zones of the *baremetal* type will be added to the bucket with the same prices and limits as those that were set in the master template If there were some network zones that used the master template and other which had custom limits and prices: • the network zones that used the master bucket will be added with the same prices and limits as those that were set in the master template • the network zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master template was not used and there were only network zones with custom limits and prices: • all the network zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
VPC	User billing plan	Empty billing plan	Access Control: • the *Virtual Server* limit in the *Miscellaneous* section of the Access Control will be set to unlimited • the *Application Server* limit in the *Miscellaneous* section of the Access Control will be set to unlimited • all the compute zones of the *vpc* type will be added to the

			Access Control and the *VS CPU Cores* and *VS RAM* parameters in these zones will be set to unlimited • all the data store zones of the *vpc* type will be added to the Access Control and the *VS Disk Size* parameter in these zones will be set to unlimited • all the network zones of the *vpc* type will be added to the Access Control and the *VS IP Addresses* parameter in these zones will be set to unlimited Rate Card: • no prices and free limits will be set for vCloud Director resources in the Rate Card meaning that resource usage is free
		Filled-in billing plan	Access Control: • The *Virtual Server* limit in the *Miscellaneous* section of the Access Control will be set to the value configured prior to the upgrade to 6.0. If this value was not configured previously, it will be set to *unlimited.* • The *Application Server* limit in the *Miscellaneous* section of the Access Control will be set to the value configured prior to the upgrade to 6.0. If this value was not configured previously, it will be set to *unlimited.* • The compute zones that were previously in the user billing plan will be added to the Access Control and the *VS CPU Cores* and *VS RAM* parameters in these zones will be set to the value configured prior to the upgrade to 6.0. • All the data store zones that were previously in the user billing plan will be added to the Access Control and the *VS Disk Size* parameter in these zones will be set to the value configured prior to the upgrade to 6.0. • All the network zones that were previously in the user billing plan will be added to the Access Control and the *VS IP Addresses* in these zones will be set to the value configured prior to the upgrade to 6.0. Rate Card: • Only the resources for which the prices were previously configured will be added to the Rate Card. The same prices and free limits that were configured prior to the upgrade to 6.0 will be set in the bucket.
		Master bucket	If there was only the master bucket and no other compute zones added to the billing plan: • all compute zones of the *virtual* type will be added to the bucket with the same prices and limits as those that were set in the master bucket If there were some compute zones that used the master bucket and other which had custom limits and prices: • the compute zones that used the master bucket will be added

			with the same prices and limits as those that were set in the master bucket • the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master bucket was not used and there were only compute zones with custom limits and prices: • all the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
		Master Template	Iftherewasonlythe master template and no other data store/network zones added to the billing plan: • all data store/network zones of the *virtual* type will be added to the bucket with the same prices and limits as those that were set in the master template If there were some network/data store zones that used the master template and other which had custom limits and prices: • the network/data store zones that used the master bucket will be added with the same prices and limits as those that were set in the master template • the network/data store zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master template was not used and there were only network/data store zones with custom limits and prices: • all the network/data store zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
	Company Billing Plan	Empty billing plan	If no resources were added to the company billing plan, no resource will be added to the bucket's Access Control and Rate Card. This means that a user under this bucket will have no access to any of the resources in the cloud.
		Filled-in billing plan	Access Control: • the *Virtual Server* limit in the *Miscellaneous* section of the Access Control will be set to unlimited • the *Application Server* limit in the *Miscellaneous* section of the Access Control will be set to unlimited • only the compute zones which were previously added will be present in the Access Control with the limits that were set in the billing plan • only the network zones which were previously added will be present in the Access Control with their previously set limits • only the network zones which were previously added will be present in the Access Control with their previously set limits

			Rate Card: • the prices and free limits will be set according to the prices and free limits configured prior to the upgrade to OnApp 6.0

3.1.5 Troubleshooting

You may face an error during the upgrade to OnApp 6.0 if the following issues are detected on your system. Please apply the workflow from the Resolution section and continue with the upgrade. If you can't fix your cloud configuration, contact our support team.

Issue	Resolution
Inconsistencies within the OnApp database, for example, a template or another entity is assigned to a non-existing user.	Remove an entity or assign it to a valid user and run the CP updater again.
Inconsistencies within resources and zones, for example, compute resources are not assigned to compute zones.	Check your cloud configuration to address the zone-related issues that have been found and run the CP updater again.
Configuration that is not compatible with a new networking scheme.	Check your cloud configuration to address the networking issues that have been found and run the CP updater again.

3.2 Upgrade Guide for Control Panel Server (5.0 to 6.0)

This guide presents the complete walk-through on how to upgrade you Control Panel server from OnApp Cloud 5.0 to 6.0. Please follow the complete procedure of the upgrade process. All packages must belong to the same major version to ensure the best performance of your cloud.

3.2.1 Upgrade Control Panel Server

- Installer output is redirected to ./onapp-cp-install.log
- All installer critical errors are in /var/log/messages

See also:

Installation Guide
Upgrade Guide for Cloud with CloudBooted Servers
Upgrade Guide for Cloud with Static Servers
Upgrade Guide for Cloud with CloudBooted and Static Servers

To upgrade your Control Panel server under CentOS 6.x from OnApp 5.0 to 6.0:

1. Download and install the OnApp Control Panel update package:

```
bash# rpm -Uvh http://rpm.repo.onapp.com/repo/centos/6/x86_64/RPMS-
6.0/onapp-cp-update-6.0-2.noarch.rpm
```

Before running the OnApp Control Panel update script, apply the following changes to the */onapp/onapp-cp.conf* file to avoid the RC4 Cipher Suite (CVE-2015-2808) vulnerability.

```
SSLCIPHERSUITE="EECDH+ECDSA+AESGCM:EECDH+aRSA+AESGCM:EECDH+ECD
SA+SHA384:EECDH+ECDSA+SHA256:EECDH+aRSA+SHA384:EECDH+aRSA+SHA2
56:EECDH+aRSA+RC4:EECDH:EDH+aRSA:RC4:!aNULL:!eNULL:!LOW:!
3DES:!MD5:!EXP:!PSK:!SRP:!DSS:!RC4:!3DES"
SSLPROTOCOL="all -SSLv2 -SSLv3 -TLSv1"
```

2. Run the update script:

```
bash# /onapp/onapp-cp-update/onapp-cp-update.sh
```

The update script is interrupted if any inconsistencies are detected on your system. See Upgrade Notes for more details.

If the update script has failed, you can:

- Manually solve the reason of the failure.
- Continue updating to a certain version with the Control Panel installer by running the following command:

```
bash# /onapp/onapp-cp-install/onapp-cp-install.sh
```

If the CP installer command is run successfully, you can continue with the update script.

3. Check that the cloud has been successfully updated through the OnApp versions 5.1-6.0:

```
bash# ls -1 /onapp/onapp-cp-update/.installed.*
    /onapp/onapp-cp-update/.installed.5.1
    /onapp/onapp-cp-update/.installed.5.2
    /onapp/onapp-cp-update/.installed.5.3
    /onapp/onapp-cp-update/.installed.5.4
    /onapp/onapp-cp-update/.installed.5.5
    /onapp/onapp-cp-update/.installed.5.7
    /onapp/onapp-cp-update/.installed.5.8
    /onapp/onapp-cp-update/.installed.5.9
    /onapp/onapp-cp-update/.installed.5.10
    /onapp/onapp-cp-update/.installed.6.0
```

The update to 5.6 is skipped on purpose since the code from 5.6 was ported to 5.7 that is a cumulative update.

4. If the update has been completed successfully, run the following command:

```
bash# service onapp start &&  service  httpd start
```

5. Ensure that all services are working:

```
bash# service onapp status &&  service  httpd status
```

3.3 Upgrade Guide for Cloud with CloudBoot Servers (5.0 to 6.0)

This guide presents the complete walk-through on how to upgrade OnApp Cloud 5.0 to 6.0 for the cloud configuration with all CloudBoot servers except for the Control Panel server. Please follow the complete procedure of the upgrade process. All the packages (Control Panel, CloudBoot, and compute resources) must belong to the same major version to ensure the best performance of your cloud.

3.3.1 Upgrade Control Panel Server

Follow the procedure at **Upgrade Guide (5.0 to 6.0)** to upgrade your Control Panel server.

On this page:

Upgrade Control Panel Server
Upgrade CloudBoot Packages
Local Read Policy

See also:

Installation Guide
Upgrade Guide for Control Panel Server
Upgrade Guide for Cloud with Static Servers
Upgrade Guide for Cloud with CloudBoot and Static Servers

3.3.2 Upgrade CloudBoot Packages

- Create a backup of the /tftpboot directory in case the storage packages rollback is needed.
- Power off Windows virtual servers before proceeding to the following procedures.

To upgrade the OnApp Storage packages:

1. Upgrade the repo:

```
CP_host# rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-
6.0.noarch.rpm
```

2. Uninstall the OnApp store:

```
bash# yum remove onapp-store-install
```

3. Install the following packages:

```
bash# yum install onapp-ramdisk-centos7-default
bash# yum install onapp-ramdisk-tools
bash# yum install onapp-ramdisk-centos6-kvm
bash# yum install onapp-ramdisk-centos6-xen
```

After the packages installation, go to the Control Panel's **Settings** menu > **Configuration** and click the **Save Configuration** button.

THE FOLLOWING STEPS (4-5) APPLY ONLY TO XEN-BASED COMPUTE RESOURCES:

4. Increase the Dom0 value for a Xen CloudBoot compute resource up to 3072 Mb. To increase the Dom0 memory for all Xen compute resources, edit the Dom0 value in the /tftpboot/pxelinux.cfg/template-xen file on the CP server.

   To increase dom0 memory for a single Xen compute resource, edit the /tftpboot/pxelinux.cfg/xx-xx-xx-xx-xx-xx file, where you have to replace the x's with your compute resource's management NIC MAC address.
5. Power off all the virtual servers that run on a Xen compute resource.
6. Run the script:

   ```
   CP_host# /onapp/onapp-store-install/onapp-store-install.sh
   ```

   Be aware that the disk-less nodes password is the root password for the CloudBoot compute resources. By default it is blank.

   When run in the interactive mode, enter the required information.

3.3.3 Upgrade CloudBoot Backup Servers

Make sure to update CloudBoot packages on your Control Panel server before proceeding to the upgrade of CloudBoot backup servers.

CloudBoot backup servers are CloudBoot KVM compute resources that can be used as backup servers. The CloudBoot backup server upgrade procedure is almost the same as the CloudBoot compute resource upgrade. Follow the instructions provided in this section to upgrade CloudBoot backup servers in your cloud.

Once you have upgraded the CloudBoot dependencies, you have to reboot your CloudBoot compute resource to update the Cloud Boot RPM. You do not need to perform any backup server upgrade operations using console.

To do so:

1. Go to your Control Panel **Settings > Compute Resources** menu.
2. Click the label of the CloudBoot compute resource the backup server is based on.
3. On the compute resource details screen, click the **Actions** button, then click **Reboot Compute resource.**
4. A new screen will open asking for confirmation before reboot:
   - **Are you sure you want to reboot this compute resource?** Confirm that you want the compute resource to reboot.
5. When you're certain you want to proceed with the reboot, click the **Reboot** button.
6. Repeat these steps for all CloudBoot backup servers in your cloud.
7. Once all are rebooted, proceed to CloudBoot compute resources upgrade.

3.3.4 Upgrade CloudBoot Compute Resources

Depending on the infrastructure, scale and needs of your cloud we suggest the following methods of upgrading CloudBoot compute resources:

Simple Reboot	This method is the simplest method technically. It also ensures all tools are updated. However, it will result in some limited downtime (its duration depends on how many virtual servers are running on each compute resource).
Migrate and Reboot **For Xen only the *cold* migrate option is available.**	This method involves migrating all virtual servers off each CloudBoot compute resource in turn. The compute resource can then be safely rebooted, picking up the upgraded Integrated Storage and CloudBoot packages. Virtual servers that do not support hot migrate will have to be stopped.

In case you have applied any custom configuration to your CloudBoot servers, it is recommended to recheck that this customization does not break new cloud boot image version. For this, reboot a compute resource and run Storage Health Check and Network Health Check. Make sure that Vdisks hosted on a compute resource are redundant and healthy before rebooting a CloudBoot compute resource.

> For more information about upgrade scenarios, refer to the OnApp IS Upgrade Paths **5.0 to 6.0** or **5.5 to 6.0**.
>
> If you are using the auto healing functionality for Integrated Storage, make sure to disable it before an upgrade.

3.3.4.1 Simple Reboot

Follow the below procedure to upgrade the CloudBoot compute resources with reboot:

1. Upgrade CloudBoot Packages.

2. When the CloudBoot packages upgrade is complete, stop all virtual servers which reside on the CloudBoot compute resources.

3. Reboot all CloudBoot compute resources.

Once the compute resources are booted, the upgrade is complete. Before starting all Virtual Servers please ensure that the diagnostics page does not report any issue. In case of any issue, please clik repair button to resolve it, then continue with starting Virtual Servers.

> Note that virtual servers cannot be stopped simultaneously, but must be stopped in sequence. This can result in considerable downtime if there are a large number of virtual servers.

3.3.4.2 Migrate and Reboot

Use this procedure if you prefer migrating all virtual servers to another compute resource and conducting overall upgrade of your CloudBoot and Integrated Storage. Virtual servers that do not support hot migrate will have to be stopped.

Once you have upgraded the CloudBoot packages, you have to reboot your CloudBoot compute resources to update them.

To do so:

1. Run the following command from the Control Panel server terminal to display the list of compute resources with their IP addresses. Make a note of the list of IPs:

```
CP_host# liveUpdate listHVs
```

If the command *liveUpdate* is not available, then it may be located in the sbin directory instead (cd /usr/local/sbin).

2. Migrate all the virtual servers from the CloudBoot compute resource to another compute resource. Follow the instructions described in the Migrate Virtual Server section of the Admin guide to migrate virtual servers.
3. After that, go to your Control Panel **Settings** menu.
4. Click the **Compute Resources** icon.
5. Click the label of the CloudBoot compute resource you have migrated all VSs from.
6. On the compute resource details screen, click the **Actions** button, then click **Reboot Compute resource.**

Rebooting a compute resource assigned to a data store with a single replica (single-replica compute resource) or degraded virtual disks may result in data loss.

7. A new screen will open asking for confirmation (via two check boxes) before reboot:
    - **Stop all virtual servers that cannot be migrated to another compute resource?** Check this box if you want VSs that cannot be migrated to be powered off. When a compute resource is scheduled for a reboot, OnApp will first attempt to hot migrate all VSs it hosts. If hot migration is not possible for a VS, OnApp will attempt to cold migrate that VS. With this box checked, if cold migration fails, the VS will be stopped so the reboot may proceed. If you don't check this box, OnApp will attempt to hot and then cold migrate all VSs hosted by the compute resource being rebooted – but will stop the migration process if any VS cannot be migrated.
    - **Are you sure you want to reboot this compute resource?** A simple confirmation to confirm that you want the compute resource to reboot.

Before the reboot, please ensure that all vdisks are fully synced and redundant. If some of them are not fully synced, the virtual server, that is owner of a degraded (or non-redundant) vdisk, can loose access to the vdisk. It can be manifested as IO errors during writes or reads to/from the vdisk inside the virtual server.

8. When you're certain you want to proceed with the reboot, click the **Reboot** button.
9. Repeat these steps for all CloudBoot compute resources in your cloud.

3.3.5 Local Read Policy

Enabling Local Read on a compute zone ensures that the locally stored copy of the data will always be used for reads. This significantly reduces read latency and improves overall storage performance by reducing load on the SAN network. However, in order to use this policy every compute resource must have sufficient physical drives to be able to store the number of stripes specified in the data store. For example, in a 2R4S data store there must be at least 4 physical disks on the compute resource to use local read.

Changes to Local Read Policy Enforcement

Originally, when this policy was introduced OnApp did not enforce the requirement for the minimum number of drives. Consequently, some users who set the policy having insufficient drives may see the following error message:

```
Fatal: OnApp::Actions::Fatal Storage API Call failed:
{"result"=>"FAILURE", "error"=>"Local reads have been enabled on the
zone - members required per host: 4, required hosts: 2, available hosts:
0"}
```

The solution is to either add additional drives to that compute resource and then add them to the data store or to disable read local.

3.4 Upgrade Guide for Cloud with CloudBoot and Static (5.0 to 6.0)

This guide explains how to upgrade OnApp Cloud 5.0 to 6.0 for the cloud with the mixed CloudBoot and static servers configuration. Follow the procedure below in the correct order to upgrade your cloud. Please follow the complete procedure of the upgrade process. All the packages (Control Panel, CloudBoot, and compute resources) must belong to the same major version to ensure the best performance of your cloud.

3.4.1 Upgrade Control Panel Server

Follow the procedure at **Upgrade Guide (5.0 to 6.0)** to upgrade your Control Panel server.

On this page:

Upgrade Control Panel Server
Upgrade Static Compute Resources
Upgrade CloudBoot Compute Resources
Local Read Policy

See also:

Installation Guide
Upgrade Guide for Control Panel Server
Upgrade Guide for Cloud with CloudBoot Servers
Upgrade Guide for Cloud with Static Servers

3.4.2 Upgrade Static Compute Resources

At first upgrade your static compute resources.

1. Make sure your compute resource is visible and online in the Control Panel.
2. Download and install the latest OnApp YUM repository file:

   ```
   bash# rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-
   6.0.noarch.rpm
   ```

3. Upgrade OnApp compute resource installer package:

   ```
   bash# yum update onapp-hv-install
   ```

4. If required, update your server OS components using the corresponding installer (Xen or KVM) with the '-y' parameter given:

   Xen installer example

```
bash# /onapp/onapp-hv-install/onapp-hv-xen-install.sh -y
```

KVM installer example

```
bash# /onapp/onapp-hv-install/onapp-hv-kvm-install.sh -y
```

5. Run the OnApp compute resource installer script, depending on the compute resource:
   - **Run the OnApp compute resource installer script for Xen compute resources:**

     ```
     bash# /onapp/onapp-hv-install/onapp-hv-xen-install.sh
     ```

     The full list of Xen installer options:

     Usage:

     ```
     /onapp/onapp-hv-install/onapp-hv-xen-install.sh [-c
     CONFIG_FILE] [-a] [-y] [-t] [-s] [-v HV_VERSION] [-p
     API_VERSION] [-h]
     ```

     Where:

-c CONFIG_FILE	Custom installer configuration file. Otherwise, the pre-installed one is used.
-v HV_VERSION	Custom compute resource Tools version
-p API_VERSION	Custom StorageAPI version
-a	Do NOT be interactive. Process with automatic installation.
-y	Update OS packages (except for OnApp provided) with 'yum update'.
-t	Initiate Recovery templates and ISO(s), which are used to provision FreeBSD guests, download. The download is initiated if the '-a' option is used.
-s	Skip packages management: install, remove, upgrade.
- x	Skip xen, kernel, and libvirt (compute resource related RPM) packages management.
-h	Print this info

   - **Run the OnApp compute resource installer script for KVM compute resources:**

     ```
     bash# /onapp/onapp-hv-install/onapp-hv-kvm-install.sh
     ```

     The full list of KVM installer options:

     Usage:

     ```
     /onapp/onapp-hv-install/onapp-hv-kvm-install.sh [-c
     ```

```
  CONFIG_FILE] [-a] [-y] [-t] [-s] [-x] [-v HV_VERSION] [-p
  API_VERSION] [-h]
```

Where:

-c CONFIG_FILE	Custom installer configuration file. Otherwise, the pre-installed one is used.
-a	Do NOT be interactive. Process with automatic installation.
-v HV_VERSION	Custom compute resource Tools version
-p API_VERSION	Custom StorageAPI version
-t	Initiate Recovery templates and ISO(s), which are used to provision FreeBSD guests, download. The download is initiated if the '-a' option is used.
-y	Update OS packages (except those provided by OnApp for a compute resource) with 'yum update'. Useful for update (not for fresh install).
-s	Skip packages management: install, remove, upgrade. Useful for update (not for fresh install).
- x	Skip kvm, kernel, and libvirt (compute resource related RPM) packages management. Useful for update (not for fresh install).
-h	Print this info

6. Gracefully reboot static compute resources from UI. To do so, log in to Control Panel and go to **Settings** > **Compute Resources**. Click the specific compute resource. When the page loads, click **Tools** > **Reboot Compute resource**. For KVM compute resources only: the kernel package update is a part of the "Upgrade Static Compute Resources" default procedure. If the kernel package was upgraded, reboot KVM compute resources to use the new kernel package.

If you do not have the /home/mq/onapp/messaging/credentials.yml file on your compute resources and you plan to deploy an Accelerator, run the following command on the CP server:

- For all compute resources:

```
rake hypervisor:messaging:configure
```

- For certain compute resources only:

```
rake hypervisor:messaging:configure['11.0.50.111 11.0.50.112']
```

To perform the configuration for a number of compute resources, separate their IPs with a space.

For information on manual configuration for Accelerator, refer to RabbitMQ Configuration for Accelerator.

3.4.3 Upgrade Static Backup Servers

After you upgraded static compute resources, proceed to static backup servers upgrade.

1. Download the OnApp repository:

```
bash# rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-
6.0.noarch.rpm
```

2. Update the package:

```
bash# yum update onapp-bk-install
```

3. If required, update your server OS components using installer with the '-y' parameter given:

```
bash# /onapp/onapp-bk-install/onapp-bk-install.sh -y
```

4. Run the installer. It is recommended to download Base, Load Balancer, and CDN templates while running the installer. You may rerun the installer later with the -t option.

```
bash# sh /onapp/onapp-bk-install/onapp-bk-install.sh
```

The full list of installer options:

Usage:

```
/onapp/onapp-bk-install/onapp-bk-install.sh [-c CONFIG_FILE] [-a] [-
y] [-t] [-b] [-v BK_VERSION] [-p API_VERSION] [-h]
```

Where:

-c CONFIG_FILE	Custom installer configuration file. Otherwise, the pre-installed one is used.
-a	Do NOT be interactive. Process with automatic installation.
- v BK_VERSION	Custom backup tools version
- p API_VERSION	Custom StorageAPI version
-y	Update OS packages (except for the ones provided by OnApp) with 'yum update'.
- t	Initiate the Load Balancer Virtual Appliance, OnApp CDN Appliance, and Application Server Appliance templates download. The download is initiated if the '-a' option is used.
- b	Initiate the Base templates download
-h	Print this info

3.4.4 Upgrade CloudBoot Packages

- Create a backup of the /tftpboot directory in case the storage packages

rollback is needed.

- Power off Windows virtual servers before proceeding to the following procedures.

To upgrade the OnApp Storage packages:

1. Upgrade the repo:

```
CP_host# rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-
6.0.noarch.rpm
```

2. Uninstall the OnApp store:

```
bash# yum remove onapp-store-install
```

3. Install the following packages:

```
bash# yum install onapp-ramdisk-centos7-default
bash# yum install onapp-ramdisk-tools
bash# yum install onapp-ramdisk-centos6-kvm
bash# yum install onapp-ramdisk-centos6-xen
```

After the packages installation, go to the Control Panel's **Settings** menu > **Configuration** and click the **Save Configuration** button.

THE FOLLOWING STEPS (4-5) APPLY ONLY TO XEN-BASED COMPUTE RESOURCES:

4. Increase the Dom0 value for a Xen CloudBoot compute resource up to 3072 Mb. To increase the Dom0 memory for all Xen compute resources, edit the Dom0 value in the /tftpboot/pxelinux.cfg/template-xen file on the CP server.

   To increase dom0 memory for a single Xen compute resource, edit the /tftpboot/pxelinux.cfg/xx-xx-xx-xx-xx-xx file, where you have to replace the x's with your compute resource's management NIC MAC address.

5. Power off all the virtual servers that run on a Xen compute resource.
6. Run the script:

```
CP_host# /onapp/onapp-store-install/onapp-store-install.sh
```

Be aware that the disk-less nodes password is the root password for the CloudBoot compute resources. By default it is blank.

When run in the interactive mode, enter the required information.

3.4.5 Upgrade CloudBoot Backup Servers

Make sure to update CloudBoot packages on your Control Panel server before proceeding to the upgrade of CloudBoot backup servers.

CloudBoot backup servers are CloudBoot KVM compute resources that can be used as backup servers. The CloudBoot backup server upgrade procedure is almost the same as the CloudBoot compute resource upgrade. Follow the instructions provided in this section to upgrade CloudBoot backup servers in your cloud.

Once you have upgraded the CloudBoot dependencies, you have to reboot your CloudBoot compute resource to update the Cloud Boot RPM. You do not need to perform any backup server upgrade operations using console.

To do so:

1. Go to your Control Panel **Settings > Compute Resources** menu.
2. Click the label of the CloudBoot compute resource the backup server is based on.
3. On the compute resource details screen, click the **Actions** button, then click **Reboot Compute resource.**
4. A new screen will open asking for confirmation before reboot:
    - **Are you sure you want to reboot this compute resource?** Confirm that you want the compute resource to reboot.
5. When you're certain you want to proceed with the reboot, click the **Reboot** button.
6. Repeat these steps for all CloudBoot backup servers in your cloud.
7. Once all are rebooted, proceed to CloudBoot compute resources upgrade.

3.4.6 Upgrade CloudBoot Compute Resources

Depending on the infrastructure, scale and needs of your cloud we suggest the following methods of upgrading CloudBoot compute resources:

Simple Reboot	This method is the simplest method technically. It also ensures all tools are updated. However, it will result in some limited downtime (its duration depends on how many virtual servers are running on each compute resource).
Migrate and Reboot **For Xen only the *cold* migrate option is available.**	This method involves migrating all virtual servers off each CloudBoot compute resource in turn. The compute resource can then be safely rebooted, picking up the upgraded Integrated Storage and CloudBoot packages. Virtual servers that do not support hot migrate will have to be stopped.

In case you have applied any custom configuration to your CloudBoot servers, it is recommended to recheck that this customization does not break new cloud boot image version. For this, reboot a compute resource and run Storage Health Check and Network Health Check. Make sure that Vdisks hosted on a compute resource are redundant and healthy before rebooting a CloudBoot compute resource.

For more information about upgrade scenarios, refer to the OnApp IS Upgrade Paths **5.0 to 6.0** or **5.5 to 6.0**.

If you are using the auto healing functionality for Integrated Storage, make sure to disable it before an upgrade.

3.4.6.1 Simple Reboot

Follow the below procedure to upgrade the CloudBoot compute resources with reboot:

1. Upgrade CloudBoot Packages.

2. When the CloudBoot packages upgrade is complete, stop all virtual servers which reside on the CloudBoot compute resources.

3. Reboot all CloudBoot compute resources.

Once the compute resources are booted, the upgrade is complete. Before starting all Virtual Servers please ensure that the diagnostics page does not report any issue. In case of any issue, please clik repair button to resolve it, then continue with starting Virtual Servers.

> Note that virtual servers cannot be stopped simultaneously, but must be stopped in sequence. This can result in considerable downtime if there are a large number of virtual servers.

3.4.6.2 Migrate and Reboot

Use this procedure if you prefer migrating all virtual servers to another compute resource and conducting overall upgrade of your CloudBoot and Integrated Storage. Virtual servers that do not support hot migrate will have to be stopped.

Once you have upgraded the CloudBoot packages, you have to reboot your CloudBoot compute resources to update them.

To do so:

1. Run the following command from the Control Panel server terminal to display the list of compute resources with their IP addresses. Make a note of the list of IPs:

```
CP_host# liveUpdate listHVs
```

> If the command *liveUpdate* is not available, then it may be located in the sbin directory instead (cd /usr/local/sbin).

2. Migrate all the virtual servers from the CloudBoot compute resource to another compute resource. Follow the instructions described in the Migrate Virtual Server section of the Admin guide to migrate virtual servers.
3. After that, go to your Control Panel **Settings** menu.
4. Click the **Compute Resources** icon.
5. Click the label of the CloudBoot compute resource you have migrated all VSs from.
6. On the compute resource details screen, click the **Actions** button, then click **Reboot Compute resource.**

> Rebooting a compute resource assigned to a data store with a single replica (single-replica compute resource) or degraded virtual disks may result in data loss.

7. A new screen will open asking for confirmation (via two check boxes) before reboot:
    - **Stop all virtual servers that cannot be migrated to another compute resource?** Check this box if you want VSs that cannot be migrated to be powered off. When a compute resource is scheduled for a reboot, OnApp will first attempt to hot migrate all VSs it hosts. If hot migration is not possible for a VS, OnApp will attempt to cold migrate that VS. With this box checked, if cold migration fails, the VS will be stopped so the reboot may proceed. If you don't check this box, OnApp will attempt to hot and then cold migrate all VSs hosted by the compute resource being rebooted – but will stop the migration process if any VS cannot be migrated.

- **Are you sure you want to reboot this compute resource?** A simple confirmation to confirm that you want the compute resource to reboot.

> Before the reboot, please ensure that all vdisks are fully synced and redundant. If some of them are not fully synced, the virtual server, that is owner of a degraded (or non-redundant) vdisk, can loose access to the vdisk. It can be manifested as IO errors during writes or reads to/from the vdisk inside the virtual server.

8. When you're certain you want to proceed with the reboot, click the **Reboot** button.
9. Repeat these steps for all CloudBoot compute resources in your cloud.

3.4.7 Local Read Policy

Enabling Local Read on a compute zone ensures that the locally stored copy of the data will always be used for reads. This significantly reduces read latency and improves overall storage performance by reducing load on the SAN network. However, in order to use this policy every compute resource must have sufficient physical drives to be able to store the number of stripes specified in the data store. For example, in a 2R4S data store there must be at least 4 physical disks on the compute resource to use local read.

Changes to Local Read Policy Enforcement

Originally, when this policy was introduced OnApp did not enforce the requirement for the minimum number of drives. Consequently, some users who set the policy having insufficient drives may see the following error message:

```
Fatal: OnApp::Actions::Fatal Storage API Call failed:
{"result"=>"FAILURE", "error"=>"Local reads have been enabled on the
zone - members required per host: 4, required hosts: 2, available hosts:
0"}
```

The solution is to either add additional drives to that compute resource and then add them to the data store or to disable read local.

3.5 Upgrade Guide for Cloud with Static Servers (5.0 to 6.0)

This guide explains how to upgrade OnApp Cloud 5.0 to 6.0 for the cloud where all servers are static. Follow the procedure listed below in the correct order to upgrade your cloud. All the packages (Control Panel and compute resources) must belong to the same major version to ensure the best performance of your cloud.

3.5.1 Upgrade Control Panel Server

Follow the procedure at **Upgrade Guide (5.0 to 6.0)** to upgrade your Control Panel server.

On this page:

Upgrade Control Panel Server
Upgrade Static Compute Resources

See also:

Installation Guide
Upgrade Guide for Cloud with CloudBoot Servers
Upgrade Guide for Cloud with CloudBoot and Static Servers

3.5.2 Upgrade Static Compute Resources

At first upgrade your static compute resources.

1. Make sure your compute resource is visible and online in the Control Panel.
2. Download and install the latest OnApp YUM repository file:

```
bash# rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-
6.0.noarch.rpm
```

3. Upgrade OnApp compute resource installer package:

```
bash# yum update onapp-hv-install
```

4. If required, update your server OS components using the corresponding installer (Xen or KVM) with the '-y' parameter given:

   Xen installer example

```
bash# /onapp/onapp-hv-install/onapp-hv-xen-install.sh -y
```

   KVM installer example

```
bash# /onapp/onapp-hv-install/onapp-hv-kvm-install.sh -y
```

5. Run the OnApp compute resource installer script, depending on the compute resource:
   - **Run the OnApp compute resource installer script for Xen compute resources:**

```
bash# /onapp/onapp-hv-install/onapp-hv-xen-install.sh
```

     The full list of Xen installer options:

     Usage:

```
/onapp/onapp-hv-install/onapp-hv-xen-install.sh [-c
CONFIG_FILE] [-a] [-y] [-t] [-s] [-v HV_VERSION] [-p
API_VERSION] [-h]
```

     Where:

-c CONFIG_FILE	Custom installer configuration file. Otherwise, the pre-installed one is used.
-v HV_VERSION	Custom compute resource Tools version
-p API_VERSION	Custom StorageAPI version
-a	Do NOT be interactive. Process with automatic installation.
-y	Update OS packages (except for OnApp provided) with 'yum update'.

-t	Initiate Recovery templates and ISO(s), which are used to provision FreeBSD guests, download. The download is initiated if the '-a' option is used.
-s	Skip packages management: install, remove, upgrade.
- x	Skip xen, kernel, and libvirt (compute resource related RPM) packages management.
-h	Print this info

- **Run the OnApp compute resource installer script for KVM compute resources:**

```
bash# /onapp/onapp-hv-install/onapp-hv-kvm-install.sh
```

The full list of KVM installer options:

Usage:

```
/onapp/onapp-hv-install/onapp-hv-kvm-install.sh [-c
CONFIG_FILE] [-a] [-y] [-t] [-s] [-x] [-v HV_VERSION] [-p
API_VERSION] [-h]
```

Where:

-c CONFIG_FILE	Custom installer configuration file. Otherwise, the pre-installed one is used.
-a	Do NOT be interactive. Process with automatic installation.
-v HV_VERSION	Custom compute resource Tools version
-p API_VERSION	Custom StorageAPI version
-t	Initiate Recovery templates and ISO(s), which are used to provision FreeBSD guests, download. The download is initiated if the '-a' option is used.
-y	Update OS packages (except those provided by OnApp for a compute resource) with 'yum update'. Useful for update (not for fresh install).
-s	Skip packages management: install, remove, upgrade. Useful for update (not for fresh install).
- x	Skip kvm, kernel, and libvirt (compute resource related RPM) packages management. Useful for update (not for fresh install).

-h	Print this info

6. Reboot static compute resources.

   For KVM compute resources only: the kernel package update is a part of the "Upgrade Static Compute Resources" default procedure. If the kernel package was upgraded, reboot KVM compute resources to use the new kernel package.

If you do not have the /home/mq/onapp/messaging/credentials.yml file on your compute resources and you plan to deploy an Accelerator, run the following command on the CP server:

- For all compute resources:

```
rake hypervisor:messaging:configure
```

- For certain compute resources only:

```
rake hypervisor:messaging:configure['11.0.50.111 11.0.50.112']
```

For information on manual configuration for Accelerator, refer to RabbitMQ Configuration for Accelerator.To perform the configuration for a number of compute resources, separate their IPs with a space.

3.5.3 Upgrade Static Backup Servers

1. To upgrade your static backups servers, download and install the latest OnApp YUM repository file:

```
bash# rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-
6.0.noarch.rpm
```

2. Update the package:

```
bash# yum update onapp-bk-install
```

3. If required, update your server OS components using installer with the '-y' parameter given:

```
bash# /onapp/onapp-bk-install/onapp-bk-install.sh -y
```

4. Run the installer. It is recommended to download Base, Load Balancer, and CDN templates while running the installer. You may rerun the installer later with the -t option.

```
bash# sh /onapp/onapp-bk-install/onapp-bk-install.sh
```

The full list of installer options:

Usage:

```
/onapp/onapp-bk-install/onapp-bk-install.sh [-c CONFIG_FILE] [-a] [-
y] [-t] [-b] [-v BK_VERSION] [-p API_VERSION] [-h]
```

Where:

-c CONFIG_FILE	Custom installer configuration file. Otherwise, the pre-installed one is used.

-a	Do NOT be interactive. Process with automatic installation.
- v BK_VERSION	Custom backup tools version
- p API_VERSION	Custom StorageAPI version
-y	Update OS packages (except for the ones provided by OnApp) with 'yum update'.
- t	Initiate the Load Balancer Virtual Appliance, OnApp CDN Appliance, and Application Server Appliance templates download. The download is initiated if the '-a' option is used.
- b	Initiate the Base templates download
-h	Print this info

3.6 OnApp IS Upgrade Paths (5.0 to 6.0)

IS Version Upgrading to	5.0.0-21	5.1.0-5	5.2.0-5	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10	6.0
Upgrade by "Simple Reboot"	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Upgrade by "Migrate and Reboot"	Yes	Yes	Yes	Yes	Yes *	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Upgrade by "Live Upgrade"	N/A	N/A	Yes	N/A	Yes *	Yes	No	No	No	No	No	No

* Applicable only to CentOS 6 KVM/XEN

Yes - recommended by OnApp
N/A - not recommended by OnApp, will not update properly the CloudBoot OS or Integrated Storage
No - not available in the corresponding release

- For versions < 5.0 please use only the "Simple Reboot" method. Use "Migrate and Reboot" only if you are running 4.2.1-8.
- For information about the upgrade of versions previous to 5.0.0-21, refer to the OnApp IS Upgrade Paths (4.0.0-3 - 4.2.1-11 versions) section.

3.6.1 General information and recommendations about CloudBoot OS and Integrated Storage upgrades

Starting with OnApp 5.0 LTS, we have made some changes to updates for CloudBoot OS and Integrated Storage.
CloudBoot OS upgrades that include security patches, kernel upgrades and updated drivers will be released on a regular basis. If a security patch was released by CentOS it will be included in the next released RPM.
These releases may not include updates for Integrated Storage, a component of the CloudBoot OS, as this platform is very stable and does not require changes with every release.

For the best experience, stability and security OnApp recommends that the CloudBoot compute resources should be upgraded by reboot at a convenient time if a new CloudBoot RPM is released. This is required to completely apply the security patches, kernel upgrades and updated drivers.

Integrated Storage as a platform does not strictly require the CloudBoot compute resource to be rebooted after upgrade. However, in case of critical updates and fixes it can be required to reboot the CloudBoot compute resource for them to take full effect. Currently, only version 4.1 requires to be rebooted after Integrated Storage update. OnApp will notify in future release notes if the Simple Reboot method is the recommended way to upgrade.

3.6.1.1 Each upgrade procedure explanation:

Simple Reboot

This upgrade method requires to reboot the CloudBoot compute resources with all VSs (Virtual Servers) powered off to apply security patches, kernel upgrades and updated drivers to the CloudBoot OS. Simple reboot is the fastest and the safest way to upgrade, but does result in some downtime for the Virtual Servers. Integrated Storage virtual disks do not become degraded. This upgrade method also upgrades the Integrated Storage platform as a component of the CloudBoot OS.

Migrate and Reboot

This upgrade method requires to reboot the CloudBoot compute resources to apply security patches, kernel upgrades and updated drivers to the CloudBoot OS and Integrated Storage platform. Your VSs will remain online, you only need to migrate them from the CloudBoot compute resources that will be rebooted. Keep in mind that it is required to repair any degraded virtual disks before proceeding with reboot.

Live Upgrade

This upgrade method upgrades the Integrated Storage platform only. Your VSs will remain online. There is almost no risk of data loss and zero downtime. However this method does not update the CloudBoot OS, you will not get the security patches, kernel upgrades and updated drivers if they are included in the release.

- Live Upgrade is not available for an upgrade from OnApp 5.0 to 6.0.
- Starting from OnApp 5.3, each CloudBoot OS image is divided into a separate package for better experience and support. For example, if the CentOS 6 Xen CloudBoot OS image receives a security patch, it will be updated and released by OnApp. Only this image will be downloaded during the upgrade procedure, saving internet traffic and time.

Please contact our Support team if you are unsure regarding the right upgrade path for you to ensure you choose the right path for you and your clients.

3.7 Getting Support for Upgrade (5.0 to 6.0)

You can use the information in this space to perform your own upgrade to the 6.0 version of the OnApp Cloud. However, if you have a full OnApp Cloud license, you are entitled to free upgrade support from the OnApp Support team.

If you would prefer to have the Support team perform the upgrade for you, just raise a ticket in a usual way. Please be aware, however, that there may be a queue!

4 Upgrade from OnApp 5.5

The guides in this section apply to upgrading to the OnApp 6.0 from the 5.5 version.

4.1 Upgrade Notes (5.5 to 6.0)

OnApp 6.0 is a new long-term support (LTS) version that introduces a lot of new features, improvements, and fixes. Before upgrading to OnApp 6.0, read these upgrade notes to get ready for the upgrade.

On this page:

Before You Upgrade
Important Notes
Billing Changes
Troubleshooting

4.1.1 Before You Upgrade

Before you upgrade, we strongly recommend you to do the following:

1. Check the *character_set_database* and *collation_database* variables on your database server. If you have non-Latin values applied for character set and collation, edit the following parameters in the *my.cnf* file before the upgrade.

```
character-set-server=utf8
collation-server=utf8_general_ci
```

   After you save the changes, restart your SQL server.

2. Archive your billing statistics to speed up the upgrade process. This step is important if you have a lot of billing statistics records on your system. You can apply the following procedure to archive your statistics:

- Edit the *Time of hourly statistics storage (months)* parameter at **Settings** > **Configuration** > **System Configuration** on your Control Panel. For example, if you set the parameter to 10, the hourly statistics is stored for the current month and the ten previous months, while everything older than ten months is archived.
- Run the following commands to archive statistics for the period you specified in the previous step.

```
su -l onapp
cd /onapp/interface/
RAILS_ENV=production rake billing:archive_hourly_stats
```

  When the *rake billing:archive_hourly_stats* task is run, your Control Panel cannot be accessed. The longer the period to archive statistics is, the more time it takes to complete the rake task. If you want to archive statistics for a long period of time, please consider repeating the procedure and set a short period for the *Time of hourly statistics storage (months)* parameter. In such a way, you could gradually archive statistics and the rake task would run faster for each short period of time.

4.1.2 Important Notes

Before you upgrade to OnApp 6.0, take into consideration the following points:

4.1.2.1 Billing

- After the upgrade, your billing plans will be migrated into buckets. The Master Bucket and Master Template were removed. Buckets consist of Access Control where you can give users access to cloud resources and Rate Card where you can set prices for the usage of these resources. The Access Control and Rate Card are arranged according to the types of resources available in your cloud, such as virtual, smart, baremetal, and others.
- If your buckets are empty after the upgrade, users have no access to resources available in your cloud. Add resources to Access Control to make them available to users. For more information about the logic of migration from billing plans to buckets, see Billing Changes.

4.1.2.2 API

- If you have an API integration, please test your upgrade in a non-production environment before upgrading your production environment.
- The API requests related to billing plans can be applied to plans that were created before the upgrade. If you create new buckets after the upgrade, please use new API requests.

4.1.2.3 Control Panel Server

- You need to run the latest patch of OnApp 5.5 to upgrade to the 6.0 version. If you are using an earlier version, please upgrade to 5.5 first.
- Check the Activity Log in your OnApp CP if there are no transactions running in your cloud. If so, wait until all transactions are complete.
- Make sure no Control Panel files are open for editing under the root user account.
- If you use custom languages on your CP, after the update please check the **i18n Customization** menu to submit translations for new UI labels, texts, and messages that will be available in the *Missing translations* tab.
- We strongly recommend that you test all your custom scripts before upgrading your production environment.
- If you have a non-Latin database characters set in the *character_set_database* and *collation_database*, edit the following parameters in the *my.cnf* file before the upgrade. After you apply the settings, restart your SQL server.

```
character-set-server=utf8
collation-server=utf8_general_ci
```

4.1.2.4 CloudBoot Servers

- If you use Integrated Storage, refer to the OnApp IS Upgrade Paths for more information about the upgrade details.
- When upgrading CloudBoot CentOS 7 KVM compute resources, you may face dangling device mappers. This is a known issue that doesn't affect the upgrade and that will be fixed in the future OnApp releases.
- When upgrading Xen-based compute resources from 4.4 to 4.8, only the cold migration option is available.
- If you use the auto-healing functionality for Integrated Storage, make sure to disable it before the upgrade.
- Drives assigned for use by Integrated Storage are identified using a disk signature that is generated by the SCSI page query mechanism to the device. Please note that disk signatures may change across different kernel versions following an upgrade and reboot. If

this occurs, go to the compute resource edit page to re-identify and select the correct drives. Please contact support if you have any concerns regarding this operation.

4.1.2.5 Static Servers

- When upgrading Xen-based compute resources from 4.4 to 4.8, only the cold migration option is available.
- OnApp does not support UEFI on static compute resources. You should disable UEFI on your compute resources before upgrading.

4.1.3 Billing Changes

In OnApp 5.6, billing plans were substituted by buckets. Buckets enable you to set up resources allocation and pricing separately; the master bucket and master template have been removed. Buckets are subdivided into two tabs:

- *Access Control* - in this section you configure the resources allocation for the users under this bucket. If you assign a bucket to a user, that user will have access only to those resources which you have added to the bucket. If no resources are added to a section of the Access Control, e.g. compute zones, the user under the bucket will not have access to any of the compute zones in the cloud.
- *Rate Card* - in this section you set up prices for the resources and the amount of resources users can request for free. Users under the bucket will be billed according to the prices you configure in the Rate Card.

These tabs are further subdivided into sections that depend on the server types of resources you have in the cloud:

- *Virtual* - the server type under which Xen, KVM, or CloudBoot compute, data store, network and backup server zones of the virtual server type can be created.
- *Smart* - the server type under which KVM compute, data store, network and backup server zones of the smart type can be added.
- *Baremetal* - the server type under which Xen compute and network zones of the baremetal type can be added.
- *VPC* - the server type that *includes* vCloud Director compute, data store and network zones.
- *Other* - the resources that relate to the system and do not have a server type. This section includes template stores, edge groups, recipes, and service add-on groups.

For detailed information, refer to Billing Plans.

Your billing plans from OnApp 5.5 are merged into buckets, following the logic described in the table below.

Server type	Case	Migration behavior
Virtual	Empty billing plan	Access Control: • all resources in the *Miscellaneous* section (these were previously the *User VS Limits*) will be added and their limits will be set to *unlimited* • all template stores, recipe groups and service add-on groups in the cloud will be added to the corresponding sections in the *Other* tab of the Access Control • none of the edge groups in the system will be added to the

		Access Control • all data store zones which have SolidFire will be added to the *Guaranteed minIOPS* section with all limits set to *unlimited* • all resources of the *virtual* type will be added to the Access Control with all limits set to *unlimited.* These resources include XEN/KVM/vCenter compute zones, data store, network, and backup server zones of the *virtual* type Rate Card: • the prices for individual templates will be set according to the prices you have previously configured for these templates in the template store • the prices for individual service add-ons will be set according to the prices you have previously configured for these service add-ons in the service add-on groups • for all other resources (IPs, CPU, RAM, etc.) prices and free limits will be set to '0', meaning that the resource usage is free
	Filled-in billing plan	Access Control: • Only the resources you have previously added will be added to the Access Control. The same limits that were configured prior to the upgrade to 6.0 will be set in the bucket. Rate Card: • Only the resources for which the prices were previously configured will be added to the Rate Card. The same prices and free limits that were configured prior to the upgrade to 6.0 will be set in the bucket.
	Master Bucket	If there was only the master bucket and no other compute zones added to the billing plan: • all compute zones of the *virtual* type will be added to the bucket with the same prices and limits as those that were set in the master bucket If there were some compute zones that used the master bucket and other which had custom limits and prices: • the compute zones that used the master bucket will be added with the same prices and limits as those that were set in the master bucket • the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master bucket was not used and there were only compute zones with custom limits and prices: • all the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0

	Master template	If there was only the master template and no other data store/network zones added to the billing plan: • all data store/network zones of the *virtual* type will be added to the bucket with the same prices and limits as those that were set in the master template If there were some network/data store zones that used the master template and other which had custom limits and prices: • the network/data store zones that used the master bucket will be added with the same prices and limits as those that were set in the master template • the network/data store zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master template was not used and there were only network/data store zones with custom limits and prices: • all the network/data store zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
Smart	Empty billing plan	Access Control: • all resources in the *Miscellaneous* section (smart servers, templates, ISO's & backups storage and backups) will be added and their limits will be set to *unlimited* • all template stores, recipe groups and service add-on groups in the cloud will be added to the corresponding sections in the *Other* tab of the Access Control • none of the edge groups in the system will be added to the Access Control • all resources of the *smart* type will be added to the Access Control with all limits set to *unlimited.* These resources include KVM compute zones, data store, network, and backup server zones of the *smart* type Rate Card: • the prices for individual templates will be set according to the prices you have previously configured for these templates in the template store • the prices for individual service add-ons will be set according to the prices you have previously configured for these service add-ons in the service add-on groups • for all other resources (IPs, CPU, RAM, etc.) prices and free limits will be set to '0', meaning that the resource usage is free
	Filled-in billing plan	Access Control: • Only the resources you have previously added will be added to the Access Control. • All resources in the *Miscellaneous* section (smart servers, templates, ISO's & backups storage and backups) will be set to *unlimited.* All the other resources of the *smart* type that

		were configured prior to the upgrade to 6.0 will be set in the bucket as they were set in the billing plan. Rate Card: • Only the resources for which the prices were previously configured will be added to the Rate Card. • All resources in the *Miscellaneous* section (templates, ISO's & backups storage and backups) will be migrated without prices. Prices for other resources of the *smart* type that were configured prior to the upgrade to 6.0 will be set in the bucket as they were set in the billing plan. After the upgrade, you can configure limits and prices for resources in the *Miscellaneous* section of the bucket by following instructions from the Set User Billing Plan Prices And Resource Limits section of the Administration Guide.
	Master Bucket	If there was only the master bucket and no other compute zones added to the billing plan: • all compute zones of the *smart* type will be added to the bucket with the same prices and limits as those that were set in the master bucket If there were some compute zones that used the master bucket and other which had custom limits and prices: • the compute zones that used the master bucket will be added with the same prices and limits as those that were set in the master bucket • the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master bucket was not used and there were only compute zones with custom limits and prices: • all the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
	Master template	If there was only the master template and no other data store/network zones added to the billing plan: • all data store/network zones of the *smart* type will be added to the bucket with the same prices and limits as those that were set in the master template If there were some network/data store zones that used the master template and other which had custom limits and prices: • the network/data store zones that used the master bucket will be added with the same prices and limits as those that were set in the master template • the network/data store zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master template was not used and there were only network/data store zones with custom limits and prices: • all the network/data store zones which had custom limits and

		pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
Baremetal	Empty billing plan	Access Control: • all resources in the *Miscellaneous* section (baremetal servers) will be added and their limits will be set to *unlimited* • all template stores, recipe groups and service add-on groups in the cloud will be added to the corresponding sections in the *Other* tab of the Access Control • none of the edge groups in the system will be added to the Access Control • all resources of the *baremetal* type will be added to the Access Control with all limits set to *unlimited.* These resources include XEN compute and network zones of the *baremetal* type. Rate Card: • the prices for individual templates will be set according to the prices you have previously configured for these templates in the template store • the prices for individual service add-ons will be set according to the prices you have previously configured for these service add-ons in the service add-on groups • for all other resources (IPs) prices and free limits will be set to '0', meaning that the resource usage is free
	Filled-in billing plan	Access Control: • Only the resources you have previously added will be added to the Access Control. The same limits that were configured prior to the upgrade to 6.0 will be set in the bucket. Rate Card: • Only the resources for which the prices were previously configured will be added to the Rate Card. The same prices per IP for powered-on baremetal servers and free limits that were configured prior to the upgrade to 6.0 will be set in the bucket. Prices per IP for powered-off baremetal servers are not migrated and not configured in the bucket. After the upgrade, you can configure limits in the *Miscellaneous* section of the bucket by following instructions from the Set User Billing Plan Prices And Resource Limits section of the Administration Guide.
	Master Bucket	If there was only the master bucket and no other compute zones added to the billing plan: • all compute zones of the *baremetal* type will be added to the bucket with the same prices and limits as those that were set in the master bucket If there were some compute zones that used the master bucket and other which had custom limits and prices:

			• the compute zones that used the master bucket will be added with the same prices and limits as those that were set in the master bucket • the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master bucket was not used and there were only compute zones with custom limits and prices: • all the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
	Master template		If there was only the master template and no other network zones added to the billing plan: • all network zones of the *baremetal* type will be added to the bucket with the same prices and limits as those that were set in the master template If there were some network zones that used the master template and other which had custom limits and prices: • the network zones that used the master bucket will be added with the same prices and limits as those that were set in the master template • the network zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master template was not used and there were only network zones with custom limits and prices: • all the network zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
VPC	User billing plan	Empty billing plan	Access Control: • the *Virtual Server* limit in the *Miscellaneous* section of the Access Control will be set to unlimited • the *Application Server* limit in the *Miscellaneous* section of the Access Control will be set to unlimited • all the compute zones of the *vpc* type will be added to the Access Control and the *VS CPU Cores* and *VS RAM* parameters in these zones will be set to unlimited • all the data store zones of the *vpc* type will be added to the Access Control and the *VS Disk Size* parameter in these zones will be set to unlimited • all the network zones of the *vpc* type will be added to the Access Control and the *VS IP Addresses* parameter in these zones will be set to unlimited Rate Card: • no prices and free limits will be set for vCloud Director

			resources in the Rate Card meaning that resource usage is free
		Filled-in billing plan	Access Control: • The *Virtual Server* limit in the *Miscellaneous* section of the Access Control will be set to the value configured prior to the upgrade to 6.0. If this value was not configured previously, it will be set to *unlimited.* • The *Application Server* limit in the *Miscellaneous* section of the Access Control will be set to the value configured prior to the upgrade to 6.0. If this value was not configured previously, it will be set to *unlimited.* • The compute zones that were previously in the user billing plan will be added to the Access Control and the *VS CPU Cores* and *VS RAM* parameters in these zones will be set to the value configured prior to the upgrade to 6.0. • All the data store zones that were previously in the user billing plan will be added to the Access Control and the *VS Disk Size* parameter in these zones will be set to the value configured prior to the upgrade to 6.0. • All the network zones that were previously in the user billing plan will be added to the Access Control and the *VS IP Addresses* in these zones will be set to the value configured prior to the upgrade to 6.0. Rate Card: • Only the resources for which the prices were previously configured will be added to the Rate Card. The same prices and free limits that were configured prior to the upgrade to 6.0 will be set in the bucket.
		Master bucket	If there was only the master bucket and no other compute zones added to the billing plan: • all compute zones of the *virtual* type will be added to the bucket with the same prices and limits as those that were set in the master bucket If there were some compute zones that used the master bucket and other which had custom limits and prices: • the compute zones that used the master bucket will be added with the same prices and limits as those that were set in the master bucket • the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master bucket was not used and there were only compute zones with custom limits and prices: • all the compute zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0

		Master Template	Iftherewasonlythe master template and no other data store/network zones added to the billing plan: • all data store/network zones of the *virtual* type will be added to the bucket with the same prices and limits as those that were set in the master template If there were some network/data store zones that used the master template and other which had custom limits and prices: • the network/data store zones that used the master bucket will be added with the same prices and limits as those that were set in the master template • the network/data store zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0 If the master template was not used and there were only network/data store zones with custom limits and prices: • all the network/data store zones which had custom limits and pricing will be added to the bucket with the same limits and prices as those that were set prior to the upgrade to 6.0
	Company Billing Plan	Empty billing plan	If no resources were added to the company billing plan, no resource will be added to the bucket's Access Control and Rate Card. This means that a user under this bucket will have no access to any of the resources in the cloud.
		Filled-in billing plan	Access Control: • the *Virtual Server* limit in the *Miscellaneous* section of the Access Control will be set to unlimited • the *Application Server* limit in the *Miscellaneous* section of the Access Control will be set to unlimited • only the compute zones which were previously added will be present in the Access Control with the limits that were set in the billing plan • only the network zones which were previously added will be present in the Access Control with their previously set limits • only the network zones which were previously added will be present in the Access Control with their previously set limits Rate Card: • the prices and free limits will be set according to the prices and free limits configured prior to the upgrade to OnApp 6.0

4.1.4 Troubleshooting

You may face an error during the upgrade to OnApp 6.0 if there are inconsistencies within the OnApp database. For example, there can be a template or another entity that is assigned to a

non-existing user. Please remove an entity or assign it to a valid user and run the CP updater again. If you can't fix the errors you face, please contact our support team.

4.2 Upgrade Guide for Control Panel Server (5.5 to 6.0)

This guide presents the complete walk-through on how to upgrade you Control Panel server from OnApp Cloud 5.5 to 6.0. Please follow the complete procedure of the upgrade process. All packages must belong to the same major version to ensure the best performance of your cloud.

4.2.1 Upgrade Control Panel Server

- Installer output is redirected to ./onapp-cp-install.log
- All installer critical errors are in /var/log/messages

See also:

Installation Guide
Upgrade Guide for Cloud with CloudBoot Servers
Upgrade Guide for Cloud with Static Servers
Upgrade Guide for Cloud with CloudBoot and Static Servers

To upgrade your Control Panel server under CentOS 6.x from OnApp 5.5 to 6.0:

1. Download and install the OnApp Control Panel update package:

```
bash# rpm -Uvh http://rpm.repo.onapp.com/repo/centos/6/x86_64/RPMS-
6.0/onapp-cp-update-6.0-2.noarch.rpm
```

Before running the OnApp Control Panel update script, apply the following changes to the */onapp/onapp-cp.conf* file to avoid the RC4 Cipher Suite (CVE-2015-2808) vulnerability.

```
SSLCIPHERSUITE="EECDH+ECDSA+AESGCM:EECDH+aRSA+AESGCM:EECDH+ECD
SA+SHA384:EECDH+ECDSA+SHA256:EECDH+aRSA+SHA384:EECDH+aRSA+SHA2
56:EECDH+aRSA+RC4:EECDH:EDH+aRSA:RC4:!aNULL:!eNULL:!LOW:!
3DES:!MD5:!EXP:!PSK:!SRP:!DSS:!RC4:!3DES"
SSLPROTOCOL="all -SSLv2 -SSLv3 -TLSv1"
```

2. Run the update script:

```
bash# /onapp/onapp-cp-update/onapp-cp-update.sh
```

The update script is interrupted if any inconsistencies are detected on your system. See Upgrade Notes for more details.

If the update script has failed, you can:

- Manually solve the reason of the failure.
- Continue updating to a certain version with the Control Panel installer by running the following command:

```
bash# /onapp/onapp-cp-install/onapp-cp-install.sh
```

If the CP installer command is run successfully, you can continue with the update script.

3. Check that the cloud has been successfully updated through the OnApp versions 5.7-6.0:

```
bash# ls -1 /onapp/onapp-cp-update/.installed.*
    /onapp/onapp-cp-update/.installed.5.7
    /onapp/onapp-cp-update/.installed.5.8
    /onapp/onapp-cp-update/.installed.5.9
    /onapp/onapp-cp-update/.installed.5.10
    /onapp/onapp-cp-update/.installed.6.0
```

The update to 5.6 is skipped on purpose since the code from 5.6 was ported to 5.7 that is a cumulative update.

4. If the update has been completed successfully, run the following command:

```
bash# service onapp start &&  service  httpd start
```

5. Ensure that all services are working:

```
bash# service onapp status &&  service  httpd status
```

4.3 Upgrade Guide for Cloud with CloudBoot Servers (5.5 to 6.0)

This guide presents the complete walk-through on how to upgrade OnApp Cloud 5.5 to 6.0 for the cloud configuration where all servers are CloudBoot except for the Control Panel server. Please follow the complete procedure of the upgrade process. All the packages (Control Panel, CloudBoot, and compute resources) must belong to the same major version to ensure the best performance of your cloud.

4.3.1 Upgrade Control Panel Server

Follow the procedure at **Upgrade Guide (5.5 to 6.0)** to upgrade your Control Panel server.

On this page:

Upgrade Control Panel Server
Upgrade CloudBoot Packages
Local Read Policy

See also:

Installation Guide
Upgrade Guide for Control Panel Server
Upgrade Guide for Cloud with Static Servers
Upgrade Guide for Cloud with CloudBoot and Static Servers

4.3.2 Upgrade CloudBoot Packages

- Create a backup of the /tftpboot directory in case the storage packages

rollback is needed.

- Power off Windows virtual servers before proceeding to the following procedures.

To upgrade the OnApp Storage packages:

1. Upgrade the repo:

```
CP_host# rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-
6.0.noarch.rpm
```

2. Install the following packages:

```
bash# yum install onapp-ramdisk-centos7-default
bash# yum install onapp-ramdisk-tools
bash# yum install onapp-ramdisk-centos6-kvm
bash# yum install onapp-ramdisk-centos7-kvm
bash# yum install onapp-ramdisk-centos6-xen
```

After the packages installation, go to the Control Panel's **Settings** menu > **Configuration** and click the **Save Configuration** button.

THE FOLLOWING STEPS (3-4) APPLY ONLY TO XEN-BASED COMPUTE RESOURCES:

3. Increase the Dom0 value for a Xen CloudBoot compute resource up to 3072 Mb. To increase the Dom0 memory for all Xen compute resources, edit the Dom0 value in the /tftpboot/pxelinux.cfg/template-xen file on the CP server.

   To increase dom0 memory for a single Xen compute resource, edit the /tftpboot/pxelinux.cfg/xx-xx-xx-xx-xx-xx file, where you have to replace the x's with your compute resource's management NIC MAC address.

4. Power off all the virtual servers that run on a Xen compute resource.
5. Run the script:

```
CP_host# /onapp/onapp-store-install/onapp-store-install.sh
```

Be aware that the disk-less nodes password is the root password for the CloudBoot compute resources. By default it is blank.

When run in the interactive mode, enter the required information.

4.3.3 Upgrade CloudBoot Backup Servers

Make sure to update CloudBoot packages on your Control Panel server before proceeding to the upgrade of CloudBoot backup servers.

CloudBoot backup servers are CloudBoot KVM compute resources that can be used as backup servers. The CloudBoot backup server upgrade procedure is almost the same as the CloudBoot compute resource upgrade. Follow the instructions provided in this section to upgrade CloudBoot backup servers in your cloud.

Once you have upgraded the CloudBoot dependencies, you have to reboot your CloudBoot compute resource to update the Cloud Boot RPM. You do not need to perform any backup server upgrade operations using console.

To do so:

1. Go to your Control Panel **Settings > Compute Resources** menu.
2. Click the label of the CloudBoot compute resource the backup server is based on.
3. On the compute resource details screen, click the **Actions** button, then click **Reboot Compute resource.**
4. A new screen will open asking for confirmation before reboot:
    - **Are you sure you want to reboot this compute resource?** Confirm that you want the compute resource to reboot.
5. When you're certain you want to proceed with the reboot, click the **Reboot** button.
6. Repeat these steps for all CloudBoot backup servers in your cloud.
7. Once all are rebooted, proceed to CloudBoot compute resources upgrade.

4.3.4 Upgrade CloudBoot Compute Resources

Depending on the infrastructure, scale and needs of your cloud we suggest the following methods of upgrading CloudBoot compute resources:

Simple Reboot	This method is the simplest method technically. It also ensures all tools are updated. However, it will result in some limited downtime (its duration depends on how many virtual servers are running on each compute resource).
Migrate and Reboot **For Xen only the *cold* migrate option is available.**	This method involves migrating all virtual servers off each CloudBoot compute resource in turn. The compute resource can then be safely rebooted, picking up the upgraded Integrated Storage and CloudBoot packages. Virtual servers that do not support hot migrate will have to be stopped.

In case you have applied any custom configuration to your CloudBoot servers, it is recommended to recheck that this customization does not break new cloud boot image version. For this, reboot a compute resource and run Storage Health Check and Network Health Check. Make sure that Vdisks hosted on a compute resource are redundant and healthy before rebooting a CloudBoot compute resource.

For more information about upgrade scenarios, refer to the OnApp IS Upgrade Paths **5.0 to 6.0** or **5.5 to 6.0**.

If you are using the auto healing functionality for Integrated Storage, make sure to disable it before an upgrade.

4.3.4.1 Simple Reboot

Follow the below procedure to upgrade the CloudBoot compute resources with reboot:

1. Upgrade CloudBoot Packages.

2. When the CloudBoot packages upgrade is complete, stop all virtual servers which reside on the CloudBoot compute resources.

3. Reboot all CloudBoot compute resources.

Once the compute resources are booted, the upgrade is complete. Before starting all Virtual Servers please ensure that the diagnostics page does not report any issue. In case of any issue, please clik repair button to resolve it, then continue with starting Virtual Servers.

> Note that virtual servers cannot be stopped simultaneously, but must be stopped in sequence. This can result in considerable downtime if there are a large number of virtual servers.

4.3.4.2 Migrate and Reboot

Use this procedure if you prefer migrating all virtual servers to another compute resource and conducting overall upgrade of your CloudBoot and Integrated Storage. Virtual servers that do not support hot migrate will have to be stopped.

Once you have upgraded the CloudBoot packages, you have to reboot your CloudBoot compute resources to update them.

To do so:

1. Run the following command from the Control Panel server terminal to display the list of compute resources with their IP addresses. Make a note of the list of IPs:

```
CP_host# liveUpdate listHVs
```

> If the command *liveUpdate* is not available, then it may be located in the sbin directory instead (cd /usr/local/sbin).

2. Migrate all the virtual servers from the CloudBoot compute resource to another compute resource. Follow the instructions described in the Migrate Virtual Server section of the Admin guide to migrate virtual servers.
3. After that, go to your Control Panel **Settings** menu.
4. Click the **Compute Resources** icon.
5. Click the label of the CloudBoot compute resource you have migrated all VSs from.
6. On the compute resource details screen, click the **Actions** button, then click **Reboot Compute resource.**

> Rebooting a compute resource assigned to a data store with a single replica (single-replica compute resource) or degraded virtual disks may result in data loss.

7. A new screen will open asking for confirmation (via two check boxes) before reboot:
    - **Stop all virtual servers that cannot be migrated to another compute resource?** Check this box if you want VSs that cannot be migrated to be powered off. When a compute resource is scheduled for a reboot, OnApp will first attempt to hot migrate all VSs it hosts. If hot migration is not possible for a VS, OnApp will attempt to cold migrate that VS. With this box checked, if cold migration fails, the VS will be stopped so the reboot may proceed. If you don't check this box, OnApp will attempt to hot and then cold migrate all VSs hosted by the compute resource being rebooted – but will stop the migration process if any VS cannot be migrated.

- **Are you sure you want to reboot this compute resource?** A simple confirmation to confirm that you want the compute resource to reboot.

> Before the reboot, please ensure that all vdisks are fully synced and redundant. If some of them are not fully synced, the virtual server, that is owner of a degraded (or non-redundant) vdisk, can loose access to the vdisk. It can be manifested as IO errors during writes or reads to/from the vdisk inside the virtual server.

8. When you're certain you want to proceed with the reboot, click the **Reboot** button.
9. Repeat these steps for all CloudBoot compute resources in your cloud.

4.3.5 Local Read Policy

Enabling Local Read on a compute zone ensures that the locally stored copy of the data will always be used for reads. This significantly reduces read latency and improves overall storage performance by reducing load on the SAN network. However, in order to use this policy every compute resource must have sufficient physical drives to be able to store the number of stripes specified in the data store. For example, in a 2R4S data store there must be at least 4 physical disks on the compute resource to use local read.

Changes to Local Read Policy Enforcement

Originally, when this policy was introduced OnApp did not enforce the requirement for the minimum number of drives. Consequently, some users who set the policy having insufficient drives may see the following error message:

```
Fatal: OnApp::Actions::Fatal Storage API Call failed:
{"result"=>"FAILURE", "error"=>"Local reads have been enabled on the
zone - members required per host: 4, required hosts: 2, available hosts:
0"}
```

The solution is to either add additional drives to that compute resource and then add them to the data store or to disable read local.

4.4 Upgrade Guide for Cloud with CloudBoot and Static (5.5 to 6.0)

This guide explains how to upgrade OnApp Cloud 5.5 to 6.0 for the cloud with the mixed CloudBoot and static servers configuration. Follow the procedure listed below in the correct order to upgrade your cloud. Please follow the complete procedure of the upgrade process. All the packages (Control Panel, CloudBoot, and compute resources) must belong to the same major version to ensure the best performance of your cloud.

4.4.1 Upgrade Control Panel Server

Follow the procedure at **Upgrade Guide (5.5 to 6.0)** to upgrade your Control Panel server.

On this page:

Upgrade Control Panel Server
Upgrade Static Compute Resources
Upgrade CloudBoot Compute Resources
Local Read Policy

See also:

Installation Guide
Upgrade Guide for Control Panel Server
Upgrade Guide for Cloud with CloudBoot Servers
Upgrade Guide for Cloud with Static Servers

4.4.2 Upgrade Static Compute Resources

At first upgrade your static compute resources.

1. Make sure your compute resource is visible and online in the Control Panel.
2. Download and install the latest OnApp YUM repository file:

```
bash# rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-
6.0.noarch.rpm
```

3. Upgrade OnApp compute resource installer package:

```
bash# yum update onapp-hv-install
```

4. If required, update your server OS components using the corresponding installer (Xen or KVM) with the '-y' parameter given:

   Xen installer example

```
bash# /onapp/onapp-hv-install/onapp-hv-xen-install.sh -y
```

   KVM installer example

```
bash# /onapp/onapp-hv-install/onapp-hv-kvm-install.sh -y
```

5. Run the OnApp compute resource installer script, depending on the compute resource:
   - **Run the OnApp compute resource installer script for Xen compute resources:**

```
bash# /onapp/onapp-hv-install/onapp-hv-xen-install.sh
```

     The full list of Xen installer options:

     Usage:

```
/onapp/onapp-hv-install/onapp-hv-xen-install.sh [-c
CONFIG_FILE] [-a] [-y] [-t] [-s] [-v HV_VERSION] [-p
API_VERSION] [-h]
```

     Where:

-c CONFIG_FILE	Custom installer configuration file. Otherwise, the pre-installed one is used.
-v HV_VERSION	Custom compute resource Tools version
-p API_VERSION	Custom StorageAPI version
-a	Do NOT be interactive. Process with automatic installation.

-y	Update OS packages (except for OnApp provided) with 'yum update'.
-t	Initiate Recovery templates and ISO(s), which are used to provision FreeBSD guests, download. The download is initiated if the '-a' option is used.
-s	Skip packages management: install, remove, upgrade.
- x	Skip xen, kernel, and libvirt (compute resource related RPM) packages management.
-h	Print this info

- **Run the OnApp compute resource installer script for KVM compute resources:**

```
bash# /onapp/onapp-hv-install/onapp-hv-kvm-install.sh
```

The full list of KVM installer options:

Usage:

```
/onapp/onapp-hv-install/onapp-hv-kvm-install.sh [-c
CONFIG_FILE] [-a] [-y] [-t] [-s] [-x] [-v HV_VERSION] [-p
API_VERSION] [-h]
```

Where:

-c CONFIG_FILE	Custom installer configuration file. Otherwise, the pre-installed one is used.
-a	Do NOT be interactive. Process with automatic installation.
-v HV_VERSION	Custom compute resource Tools version
-p API_VERSION	Custom StorageAPI version
-t	Initiate Recovery templates and ISO(s), which are used to provision FreeBSD guests, download. The download is initiated if the '-a' option is used.
-y	Update OS packages (except those provided by OnApp for a compute resource) with 'yum update'. Useful for update (not for fresh install).
-s	Skip packages management: install, remove, upgrade. Useful for update (not for fresh install).
- x	Skip kvm, kernel, and libvirt (compute resource related RPM) packages

	management. Useful for update (not for fresh install).
-h	Print this info

6. Gracefully reboot static compute resources from UI. To do so, log in to Control Panel and go to **Settings** > **Compute Resources**. Click the specific compute resource. When the page loads, click **Tools** > **Reboot Compute resource**. For KVM compute resources only: the kernel package update is a part of the "Upgrade Static Compute Resources" default procedure. If the kernel package was upgraded, reboot KVM compute resources to use the new kernel package.

If you do not have the /home/mq/onapp/messaging/credentials.yml file on your compute resources and you plan to deploy an Accelerator, run the following command on the CP server:

- For all compute resources:

```
rake hypervisor:messaging:configure
```

- For certain compute resources only:

```
rake hypervisor:messaging:configure['11.0.50.111 11.0.50.112']
```

To perform the configuration for a number of compute resources, separate their IPs with a space.

For information on manual configuration for Accelerator, refer to RabbitMQ Configuration for Accelerator.

4.4.3 Upgrade Static Backup Servers

After you upgraded static compute resources, proceed to static backup servers upgrade.

1. Download the OnApp repository:

```
bash# rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-
6.0.noarch.rpm
```

2. Update the package:

```
bash# yum update onapp-bk-install
```

3. If required, update your server OS components using installer with the '-y' parameter given:

```
bash# /onapp/onapp-bk-install/onapp-bk-install.sh -y
```

4. Run the installer. It is recommended to download Base, Load Balancer, and CDN templates while running the installer. You may rerun the installer later with the -t option.

```
bash# sh /onapp/onapp-bk-install/onapp-bk-install.sh
```

The full list of installer options:

Usage:

```
/onapp/onapp-bk-install/onapp-bk-install.sh [-c CONFIG_FILE] [-a] [-
y] [-t] [-b] [-v BK_VERSION] [-p API_VERSION] [-h]
```

```
```

Where:

-c CONFIG_FILE	Custom installer configuration file. Otherwise, the pre-installed one is used.
-a	Do NOT be interactive. Process with automatic installation.
- v BK_VERSION	Custom backup tools version
- p API_VERSION	Custom StorageAPI version
-y	Update OS packages (except for the ones provided by OnApp) with 'yum update'.
- t	Initiate the Load Balancer Virtual Appliance, OnApp CDN Appliance, and Application Server Appliance templates download. The download is initiated if the '-a' option is used.
- b	Initiate the Base templates download
-h	Print this info

4.4.4 Upgrade CloudBoot Packages

- Create a backup of the /tftpboot directory in case the storage packages rollback is needed.
- Power off Windows virtual servers before proceeding to the following procedures.

To upgrade the OnApp Storage packages:

1. Upgrade the repo:

```
CP_host# rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-
6.0.noarch.rpm
```

2. Install the following packages:

```
bash# yum install onapp-ramdisk-centos7-default
bash# yum install onapp-ramdisk-tools
bash# yum install onapp-ramdisk-centos6-kvm
bash# yum install onapp-ramdisk-centos7-kvm
bash# yum install onapp-ramdisk-centos6-xen
```

After the packages installation, go to the Control Panel's **Settings** menu > **Configuration** and click the **Save Configuration** button.

THE FOLLOWING STEPS (3-4) APPLY ONLY TO XEN-BASED COMPUTE RESOURCES:

3. Increase the Dom0 value for a Xen CloudBoot compute resource up to 3072 Mb. To increase the Dom0 memory for all Xen compute resources, edit the Dom0 value in the /tftpboot/pxelinux.cfg/template-xen file on the CP server.

   To increase dom0 memory for a single Xen compute resource, edit the /tftpboot/pxelinux.cfg/xx-xx-xx-xx-xx-xx file, where you have to replace the x's with your compute resource's management NIC MAC address.

4. Power off all the virtual servers that run on a Xen compute resource.
5. Run the script:

```
CP_host# /onapp/onapp-store-install/onapp-store-install.sh
```

   Be aware that the disk-less nodes password is the root password for the CloudBoot compute resources. By default it is blank.

   When run in the interactive mode, enter the required information.

4.4.5 Upgrade CloudBoot Backup Servers

Make sure to update CloudBoot packages on your Control Panel server before proceeding to the upgrade of CloudBoot backup servers.

CloudBoot backup servers are CloudBoot KVM compute resources that can be used as backup servers. The CloudBoot backup server upgrade procedure is almost the same as the CloudBoot compute resource upgrade. Follow the instructions provided in this section to upgrade CloudBoot backup servers in your cloud.

Once you have upgraded the CloudBoot dependencies, you have to reboot your CloudBoot compute resource to update the Cloud Boot RPM. You do not need to perform any backup server upgrade operations using console.

To do so:

1. Go to your Control Panel **Settings > Compute Resources** menu.
2. Click the label of the CloudBoot compute resource the backup server is based on.
3. On the compute resource details screen, click the **Actions** button, then click **Reboot Compute resource.**

4. A new screen will open asking for confirmation before reboot:
   - **Are you sure you want to reboot this compute resource?** Confirm that you want the compute resource to reboot.
5. When you're certain you want to proceed with the reboot, click the **Reboot** button.
6. Repeat these steps for all CloudBoot backup servers in your cloud.
7. Once all are rebooted, proceed to CloudBoot compute resources upgrade.

4.4.6 Upgrade CloudBoot Compute Resources

Depending on the infrastructure, scale and needs of your cloud we suggest the following methods of upgrading CloudBoot compute resources:

Simple Reboot	This method is the simplest method technically. It also ensures all tools are updated. However, it will result in some limited downtime (its duration depends on how many virtual servers are running on each compute

	resource).
Migrate and Reboot **For Xen only the *cold* migrate option is available.**	This method involves migrating all virtual servers off each CloudBoot compute resource in turn. The compute resource can then be safely rebooted, picking up the upgraded Integrated Storage and CloudBoot packages. Virtual servers that do not support hot migrate will have to be stopped.

In case you have applied any custom configuration to your CloudBoot servers, it is recommended to recheck that this customization does not break new cloud boot image version. For this, reboot a compute resource and run Storage Health Check and Network Health Check. Make sure that Vdisks hosted on a compute resource are redundant and healthy before rebooting a CloudBoot compute resource.

For more information about upgrade scenarios, refer to the OnApp IS Upgrade Paths **5.0 to 6.0** or **5.5 to 6.0**.

If you are using the auto healing functionality for Integrated Storage, make sure to disable it before an upgrade.

4.4.6.1 Simple Reboot

Follow the below procedure to upgrade the CloudBoot compute resources with reboot:

1. Upgrade CloudBoot Packages.

2. When the CloudBoot packages upgrade is complete, stop all virtual servers which reside on the CloudBoot compute resources.

3. Reboot all CloudBoot compute resources.

Once the compute resources are booted, the upgrade is complete. Before starting all Virtual Servers please ensure that the diagnostics page does not report any issue. In case of any issue, please clik repair button to resolve it, then continue with starting Virtual Servers.

Note that virtual servers cannot be stopped simultaneously, but must be stopped in sequence. This can result in considerable downtime if there are a large number of virtual servers.

4.4.6.2 Migrate and Reboot

Use this procedure if you prefer migrating all virtual servers to another compute resource and conducting overall upgrade of your CloudBoot and Integrated Storage. Virtual servers that do not support hot migrate will have to be stopped.

Once you have upgraded the CloudBoot packages, you have to reboot your CloudBoot compute resources to update them.

To do so:

1. Run the following command from the Control Panel server terminal to display the list of compute resources with their IP addresses. Make a note of the list of IPs:

```
CP_host# liveUpdate listHVs
```

If the command *liveUpdate* is not available, then it may be located in the sbin directory instead (cd /usr/local/sbin).

2. Migrate all the virtual servers from the CloudBoot compute resource to another compute resource. Follow the instructions described in the Migrate Virtual Server section of the Admin guide to migrate virtual servers.
3. After that, go to your Control Panel **Settings** menu.
4. Click the **Compute Resources** icon.
5. Click the label of the CloudBoot compute resource you have migrated all VSs from.
6. On the compute resource details screen, click the **Actions** button, then click **Reboot Compute resource.**

> Rebooting a compute resource assigned to a data store with a single replica (single-replica compute resource) or degraded virtual disks may result in data loss.

7. A new screen will open asking for confirmation (via two check boxes) before reboot:
    - **Stop all virtual servers that cannot be migrated to another compute resource?** Check this box if you want VSs that cannot be migrated to be powered off. When a compute resource is scheduled for a reboot, OnApp will first attempt to hot migrate all VSs it hosts. If hot migration is not possible for a VS, OnApp will attempt to cold migrate that VS. With this box checked, if cold migration fails, the VS will be stopped so the reboot may proceed. If you don't check this box, OnApp will attempt to hot and then cold migrate all VSs hosted by the compute resource being rebooted – but will stop the migration process if any VS cannot be migrated.
    - **Are you sure you want to reboot this compute resource?** A simple confirmation to confirm that you want the compute resource to reboot.

> Before the reboot, please ensure that all vdisks are fully synced and redundant. If some of them are not fully synced, the virtual server, that is owner of a degraded (or non-redundant) vdisk, can loose access to the vdisk. It can be manifested as IO errors during writes or reads to/from the vdisk inside the virtual server.

8. When you're certain you want to proceed with the reboot, click the **Reboot** button.
9. Repeat these steps for all CloudBoot compute resources in your cloud.

4.4.7 Local Read Policy

Enabling Local Read on a compute zone ensures that the locally stored copy of the data will always be used for reads. This significantly reduces read latency and improves overall storage performance by reducing load on the SAN network. However, in order to use this policy every compute resource must have sufficient physical drives to be able to store the number of stripes specified in the data store. E.g. in a 2R4S data store there must be at least 4 physical disks on the compute resource to use local read.

Changes to Local Read Policy Enforcement

Originally, when this policy was introduced OnApp did not enforce the requirement for the minimum number of drives. Consequently, some users who set the policy having insufficient drives may see the following error message:

```
Fatal: OnApp::Actions::Fatal Storage API Call failed:
{"result"=>"FAILURE", "error"=>"Local reads have been enabled on the
zone - members required per host: 4, required hosts: 2, available hosts:
0"}
```

The solution is to either add additional drives to that compute resource and then add them to the data store or to disable read local.

4.5 Upgrade Guide for Cloud with Static Servers (5.5 to 6.0)

This guide explains how to upgrade OnApp Cloud 5.5 to 6.0 for the cloud where all servers are static. Follow the procedure listed below in the correct order to upgrade your cloud. All the packages (Control Panel and Compute resources) must belong to the same major version to ensure the best performance of your cloud.

4.5.1 Upgrade Control Panel Server

Follow the procedure at **Upgrade Guide (5.5 to 6.0)** to upgrade your Control Panel server.

On this page:

Upgrade Control Panel Server
Upgrade Static Compute Resources

See also:

Installation Guide
Upgrade Guide for Control Panel Server
Upgrade Guide for Cloud with CloudBoot Servers
Upgrade Guide for Cloud with CloudBoot and Static Servers

4.5.2 Upgrade Static Compute Resources

At first upgrade your static compute resources.

1. Make sure your compute resource is visible and online in the Control Panel.
2. Download and install the latest OnApp YUM repository file:

```
bash# rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-
6.0.noarch.rpm
```

3. Upgrade OnApp compute resource installer package:

```
bash# yum update onapp-hv-install
```

4. If required, update your server OS components using the corresponding installer (Xen or KVM) with the '-y' parameter given:

   Xen installer example

```
bash# /onapp/onapp-hv-install/onapp-hv-xen-install.sh -y
```

   KVM installer example

```
bash# /onapp/onapp-hv-install/onapp-hv-kvm-install.sh -y
```

5. Run the OnApp compute resource installer script, depending on the compute resource:
   - **Run the OnApp compute resource installer script for Xen compute resources:**

```
bash# /onapp/onapp-hv-install/onapp-hv-xen-install.sh
```

The full list of Xen installer options:

Usage:

```
/onapp/onapp-hv-install/onapp-hv-xen-install.sh [-c
CONFIG_FILE] [-a] [-y] [-t] [-s] [-v HV_VERSION] [-p
API_VERSION] [-h]
```

Where:

-c CONFIG_FILE	Custom installer configuration file. Otherwise, the pre-installed one is used.
-v HV_VERSION	Custom compute resource Tools version
-p API_VERSION	Custom StorageAPI version
-a	Do NOT be interactive. Process with automatic installation.
-y	Update OS packages (except for OnApp provided) with 'yum update'.
-t	Initiate Recovery templates and ISO(s), which are used to provision FreeBSD guests, download. The download is initiated if the '-a' option is used.
-s	Skip packages management: install, remove, upgrade.
- x	Skip xen, kernel, and libvirt (compute resource related RPM) packages management.
-h	Print this info

- **Run the OnApp compute resource installer script for KVM compute resources:**

```
bash# /onapp/onapp-hv-install/onapp-hv-kvm-install.sh
```

The full list of KVM installer options:

Usage:

```
/onapp/onapp-hv-install/onapp-hv-kvm-install.sh [-c
CONFIG_FILE] [-a] [-y] [-t] [-s] [-x] [-v HV_VERSION] [-p
API_VERSION] [-h]
```

Where:

-c CONFIG_FILE	Custom installer configuration file. Otherwise, the pre-installed one is used.
-a	Do NOT be interactive. Process with

	automatic installation.
-v HV_VERSION	Custom compute resource Tools version
-p API_VERSION	Custom StorageAPI version
-t	Initiate Recovery templates and ISO(s), which are used to provision FreeBSD guests, download. The download is initiated if the '-a' option is used.
-y	Update OS packages (except those provided by OnApp for a compute resource) with 'yum update'. Useful for update (not for fresh install).
-s	Skip packages management: install, remove, upgrade. Useful for update (not for fresh install).
- x	Skip kvm, kernel, and libvirt (compute resource related RPM) packages management. Useful for update (not for fresh install).
-h	Print this info

6. Reboot static compute resources.

   For KVM compute resources only: the kernel package update is a part of the "Upgrade Static Compute Resources" default procedure. If the kernel package was upgraded, reboot KVM compute resources to use the new kernel package.

If you do not have the /home/mq/onapp/messaging/credentials.yml file on your compute resources and you plan to deploy an Accelerator, run the following command on the CP server:

- For all compute resources:

```
rake hypervisor:messaging:configure
```

- For certain compute resources only:

```
rake hypervisor:messaging:configure['11.0.50.111 11.0.50.112']
```

For information on manual configuration for Accelerator, refer to RabbitMQ Configuration for Accelerator.To perform the configuration for a number of compute resources, separate their IPs with a space.

4.5.3 Upgrade Static Backup Servers

1. To upgrade your static backups servers, download and install the latest OnApp YUM repository file:

```
bash# rpm -Uvh http://rpm.repo.onapp.com/repo/onapp-repo-
6.0.noarch.rpm
```

2. Update the package:

```
bash# yum update onapp-bk-install
```

3. If required, update your server OS components using installer with the '-y' parameter given:

```
bash# /onapp/onapp-bk-install/onapp-bk-install.sh -y
```

4. Run the installer. It is recommended to download Base, Load Balancer, and CDN templates while running the installer. You may rerun the installer later with the -t option.

```
bash# sh /onapp/onapp-bk-install/onapp-bk-install.sh
```

The full list of installer options:

Usage:

```
/onapp/onapp-bk-install/onapp-bk-install.sh [-c CONFIG_FILE] [-a] [-
y] [-t] [-b] [-v BK_VERSION] [-p API_VERSION] [-h]
```

Where:

-c CONFIG_FILE	Custom installer configuration file. Otherwise, the pre-installed one is used.
-a	Do NOT be interactive. Process with automatic installation.
- v BK_VERSION	Custom backup tools version
- p API_VERSION	Custom StorageAPI version
-y	Update OS packages (except for the ones provided by OnApp) with 'yum update'.
- t	Initiate the Load Balancer Virtual Appliance, OnApp CDN Appliance, and Application Server Appliance templates download. The download is initiated if the '-a' option is used.
- b	Initiate the Base templates download
-h	Print this info

4.6 OnApp IS Upgrade Paths (5.5 to 6.0)

IS Version upgrading to	5.0.0-21	5.1.0-5	5.2.0-5	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10	6.0
Upgrade by "Simple Reboot"	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Upgrade by "Migrate and Reboot"	Yes	Yes	Yes	Yes	Yes *	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Upgrade by "Live Upgrade"	N/A	N/A	Yes	N/A	Yes *	Yes	No	No	No	No	No	No

* Applicable only for CentOS 6 KVM/XEN

Yes - recommended by OnApp
N/A - not recommended by OnApp, will not update properly the CloudBoot OS or Integrated

Storage
No - not available in the corresponding release

- For versions < 5.0 please use only "Simple Reboot" upgrade method. Use "Migrate and Reboot" only if you are running 4.2.1-8.
- For information about the upgrade of versions previous to 5.0.0-21, refer to the OnApp IS Upgrade Paths (4.0.0-3 - 4.2.1-11 versions) section.

4.6.1 General information and recommendations about CloudBoot OS and Integrated Storage upgrades

Starting with OnApp 5.0 LTS, we have made some changes to updates for CloudBoot OS and Integrated Storage.
CloudBoot OS upgrades that include security patches, kernel upgrades and updated drivers will be released on a regular basis. If a security patch was released by CentOS it will be included in the next released RPM.
These releases may not include updates for Integrated Storage, a component of the CloudBoot OS, as this platform is very stable and does not require changes with every release.

For the best experience, stability and security OnApp recommends that the CloudBoot compute resources should be upgraded by reboot at a convenient time if a new CloudBoot RPM is released. This is required to completely apply the security patches, kernel upgrades and updated drivers.

Integrated Storage as a platform does not strictly require the CloudBoot compute resource to be rebooted after upgrade. However, in case of critical updates and fixes it can be required to reboot the CloudBoot compute resource for them to take full effect. Currently, only version 4.1 requires to be rebooted after Integrated Storage update. OnApp will notify in future release notes if the Simple Reboot method is the recommended way to upgrade.

4.6.1.1 Each upgrade procedure explanation:

Simple Reboot

This upgrade method requires to reboot the CloudBoot compute resources with all VSs (Virtual Servers) powered off to apply security patches, kernel upgrades and updated drivers to the CloudBoot OS. Simple reboot is the fastest and the safest way to upgrade, but does result in some downtime for the Virtual Servers. Integrated Storage virtual disks do not become degraded. This upgrade method also upgrades the Integrated Storage platform as a component of the CloudBoot OS.

Migrate and Reboot

This upgrade method requires to reboot the CloudBoot compute resources to apply security patches, kernel upgrades and updated drivers to the CloudBoot OS and Integrated Storage platform. Your VSs will remain online, you only need to migrate them from the CloudBoot compute resources that will be rebooted. Keep in mind that it is required to repair any degraded virtual disks before proceeding with reboot.

Live Upgrade

This upgrade method upgrades the Integrated Storage platform only. Your VSs will remain online. There is almost no risk of data loss and zero downtime. However this method does not update the CloudBoot OS, you will not get the security patches, kernel upgrades and updated drivers if they are included in the release.

Starting from OnApp 5.3, each CloudBoot OS image is divided into a separate package for better a experience and support. For example, if the

CentOS 6 Xen CloudBoot OS image receives a security patch it will be updated and released by OnApp. Only this image will be downloaded during the upgrade procedure, saving internet traffic and time.

Please contact our Support team if you are unsure regarding the right upgrade path for you to ensure you choose the right path for you and your clients.

4.7 Getting Support for Upgrade (5.5 to 6.0)

You can use the information in this space to perform your own upgrade to the 6.0 version of the OnApp Cloud. However, if you have a full OnApp Cloud license, you are entitled to free upgrade support from the OnApp Support team.

If you would prefer to have the Support team perform the upgrade for you, just raise a ticket in a usual way. Please be aware, however, that there may be a queue!