Citrix ADM HA Deployment Guide

Manage Globally Deployed Citrix ADC Instances

November 2018

CITRIX®

Introduction

This deployment guide provides information only for initial deployment scenarios and not for upgrade scenario. For Citrix ADM upgrade information, see upgrade. The HA pair deployment refers to configuring two Citrix ADM servers in active-passive mode. This deployment will suit best if you want to deliver uninterrupted services and is also a recommended mode of deployment for any enterprise. Before you proceed with Citrix ADM HA deployment, it is recommended to go through all the details given in this deployment guide.

Deployment scenario

The following workflow helps you to determine the Citrix ADM deployment for your requirement.
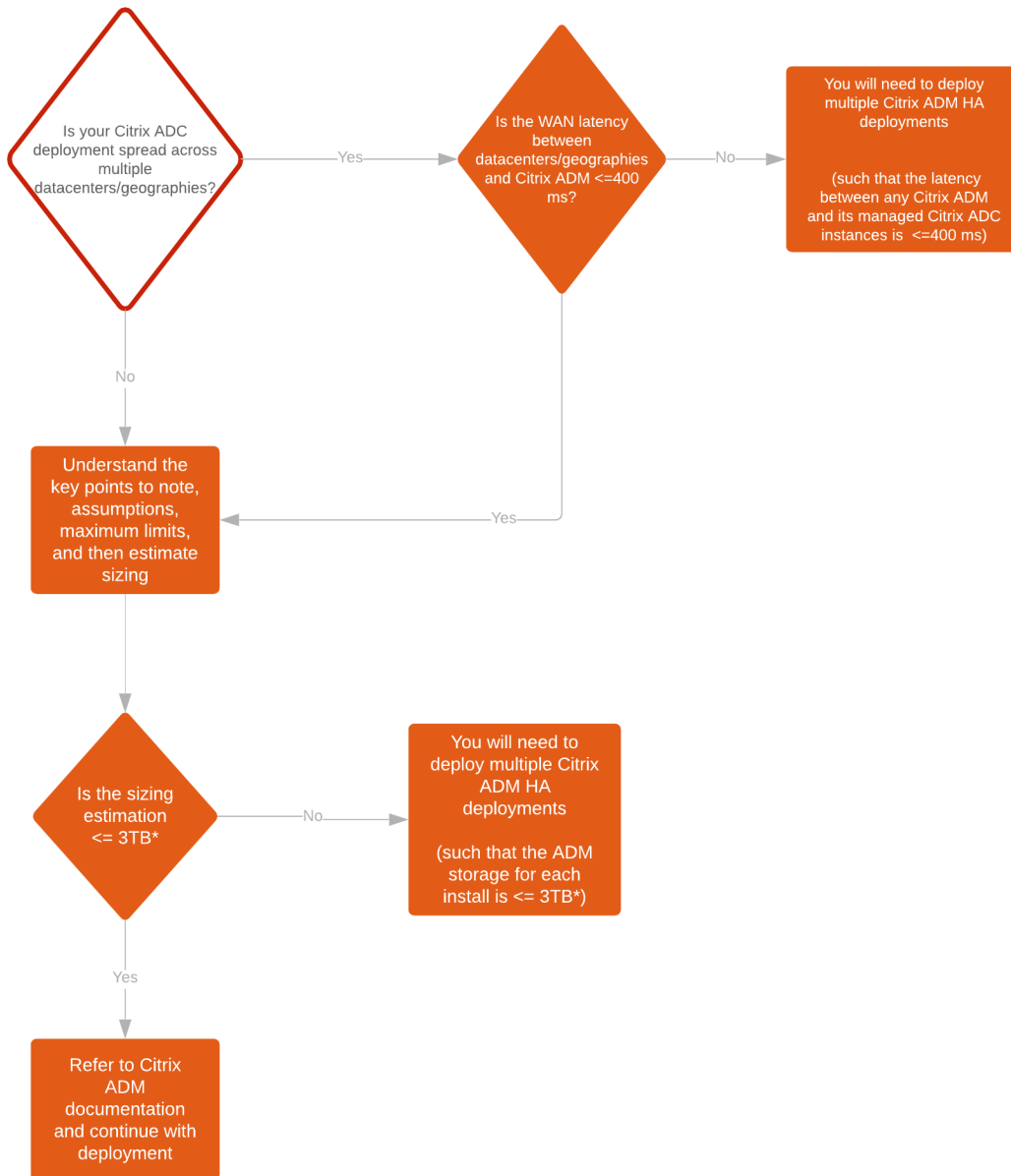
Note: The validated maximum storage limit for a single Citrix ADM HA deployment is 3 TB.

Key points to note

1. Acceptable WAN latency between the Citrix ADM and Citrix ADC instances:
   - If the instances are geographically distributed, then ensure that the maximum WAN latency between the Citrix ADM and Citrix ADC instances is 400 ms.
   - If the latency is greater than 400 ms, then Citrix recommends you to deploy more than one Citrix ADM to ensure the maximum latency between the Citrix ADM and its managed Citrix ADC instances is 400 ms.
2. The maximum validated storage limit for the single MAS HA pair deployment is 3 TB. If the storage is estimated to be more than 3 TB, then Citrix recommends you to deploy more than one Citrix ADM HA pair.
3. The validated latency between Citrix ADM HA nodes is 10 ms.
4. Resource and Storage allocation
   - A new installation of Citrix ADM HA pair allocates 120 GB of storage by default.
   - For more than 120 GB storage allocation based on the sizing guide recommendation, you will need additional disk during the installation.

      Note:

      - You can attach only one additional disk. Adding more disks is not supported.
      - If additional disk is attached, the default 120 GB storage will be used for Citrix ADM HA pair file system related consumption and the additional disk storage will be used for the database.
        For example, if you add 600 GB additional disk to the default install of 120 GB, then the storage will still be 600 GB and does not become 720 GB.
5. The Geo DB files are not calculated as part of storage calculation. Depending upon your Geo DB file estimation, you need to allocate additional storage.
6. Syslog – If you have not configured Citrix ADM as a syslog server, you can ignore this requirement.
7. Data retention settings
   - You will have to change the data retention period based on the features and guidelines.
   - You can change the data retention settings on Citrix ADM from the following navigation:

Feature	Navigation	Default value
Event management	Login to Citrix ADM > System > System Administration > Instance Event Prune Settings	40 days
Syslog management	Login to Citrix ADM > System > System Administration > Instance Syslog Purge Settings	15 days
Network reports	Login to Citrix ADM > System > System Administration > Network Reporting Prune Settings	30 days
Analytics	Login to Citrix ADM > Analytics > Settings > Data Persistence	31 days

8. Maximum API calls/sec supported is 800 API calls/sec
9. Maximum concurrent admin logins – 80

10. Storage type – It is recommended to allocate only SSD as the storage type for Citrix ADM deployments and HDD should not be allocated for any Citrix ADM deployments.

Maximum limits

Important:

You need to use the sizing calculator to do the exact sizing estimation for your Citrix ADM deployment.

The below tables are for maximum limits reference purpose only.

Individual features

Use case	Citrix ADM performance	Data retention duration	Average network bandwidth usage	Comments
Management and Monitoring + App dashboard (Core ADC)	800 ADC Instances, 80000 Virtual Servers, 160000 Services, 40,000 Certificates, 800 SNMP Traps/sec	15 days		If syslog is enabled, the maximum limits will be 800 Syslog/sec
HDX Insight (XD/XA Attach)	25,000 CCU (2 ICA session per user)	15 days	2 Mbits/sec	
GW Insight	50,000 CCUs	15 days	0.75 Mbits/sec	
Security Insight	10,000 violations/sec	15 days	48 Mbits/sec	
Web Insight*	10,000 HTTP request/sec*	15 days	100 Mbits/sec	
Video Insight	5000 video sessions/sec	15 days	60 Mbits/sec	
Secure Web Gateway Insight	10,000 transactions/sec**	15 days	100 Mbits/sec	
WAN Insight	20,000 transactions/sec	15 days	1.4 Mbits/sec	

Note:

- 80000 domain, 300000 Clients, 500 virtual servers, 150 App Servers, 200000 URLs
- ** 2 Citrix ADCs, 2 Virtual servers, 50 domains, 1000 Users

- This table lists the maximum scale limits for each individual use case. All these use cases limits should not be considered together for single Citrix ADM deployment.
- These limits are not additive.
- Storage scale can generally be considered linear up to these limits from the recommended base storage allocation.

Listed features enabled together

Use case	Citrix ADM performance	Data retention duration
Management and Monitoring + App dashboard	300 ADC Instances, 40,000 virtual Servers, 80,000 services, 300 Syslogs/sec, 300 SNMP Traps/sec,	15 days
HDX Insight	40,000 CCUs	15 days
Gateway Insight	40,000 CCUs	15 days
Web Insight	40,000 HTTP Req/sec, 280,000 URLs, 300,000 Clients, 1 Domain, 150 Servers, 1 App	15 days
Security Insight	7500 violations/sec	15 days

System requirements

Before you install Citrix ADM, you must understand the software requirements, browser requirements, port information, license information, and limitations.

Requirements for Citrix ADM 12.1 image

Component	Requirement
RAM	32 GB **Note:** The default value is 8 GB. Citrix recommends that you increase the default value to 32 GB for better performance.
Virtual CPU	8 CPUs **Note:** The default is 2 CPUs. Citrix recommends that you increase the default value to 8 CPUs for better performance. Citrix recommends using solid-state drive (SSD) technology for Citrix ADM deployments. The default value is 120 GB. Actual storage requirement will depend on Citrix ADM sizing estimation.
Storage space	If your Citrix ADM storage requirement exceeds 120 GB, you to have to attach an additional disk. Note that you can add only one additional disk. Citrix recommends you to estimate storage and attach additional disk at the time of initial deployment. Use the sizing calculator to do the exact sizing estimation for your MAS deployment and for more information, see How to Attach an Additional Disk to Citrix ADM.
Virtual network interfaces	1
Throughput	1 Gbps or 100 Mbps

Minimum Citrix versions required for Citrix ADM features

Citrix ADM Feature	Citrix Software Version
StyleBooks	11.1 and later
OpenStack/CloudStack Support	11.1 and later 11.1 and later: If a partition is required 11.1 and later: If partition on shared virtual LAN is required.
NSX Support	11.1 Build 47.14 and later (VPX)
Mesos/Marathon Support	11.1 and later
Backup/Restore	11.1 and later OR for SDX 11.0 and later

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Monitoring/Reporting & Configuration using Jobs	11.1 and later
Analytics Features	
Web Insight	11.1 and later
HDX Insight	11.1 and later
Security Insight	11.1 and later
Gateway Insight	11.1 and later
Cache Insight	11.1 and later*
SSL Insight	11.1.51.21 and later

* Integrated Cache Metrics are not supported in Citrix ADM with Citrix instances running version 11.0 build 66.x.

Requirements for Citrix SD-WAN instance management

Inter-operability matrix of Citrix SD-WAN platform editions/versions and Citrix ADM features

Platform Edition	Discovery	Configuration	Monitoring	Reporting (Network Reports)	Event Management	HDX Insight	WAN Insight	HDX Insight (Multi-hop Deployment)
Citrix SD-WAN WANOP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Citrix SD-WAN SE	Yes	No	No	No	No	No	No	Yes
Citrix SD-WAN EE	Yes	No	No	No	No	No	No	Yes

Citrix SD-WAN versions supported by Citrix ADM

Platform Edition	Citrix SD-WAN Version	Citrix ADM Version
Citrix SD-WAN WANOP	Citrix, CloudBridge, (Citrix, SD-WAN WANOP) 7.4 and later	Citrix ADM 11.1 and later
Citrix SD-WAN SE	Citrix SD-WAN 9.3.0 and later	Citrix ADM 12.0.53.8 and later
Citrix SD-WAN EE	Citrix SD-WAN 9.3.0 and later	Citrix ADM 12.0.53.8 and later

Thin Clients Supported for Citrix SD-WAN Instances

Citrix ADM supports the following thin clients for monitoring Citrix SD-WAN deployments:

- Dell Wyse WTOS Model R10L Rx0L Thin Client
- NComputing N400
- Dell Wyse WTOS Model CX0 C00X Xenith
- Dell Wyse WTOS Model TXO T00X Xenith2
- Dell Wyse WTOS Model CX0 C10LE
- Dell Wyse WTOS Model R00LX Rx0L HDX Thin Client
- Dell Wyse Enhanced Suse Linux Enterprise, Model Dx0D, D50D
- Dell Wyse ZX0 Z90D7 (WES7) Thin Client

Requirements for Citrix ADM Analytics

Minimum Citrix Virtual App and Desktop versions required for Citrix ADM Features

Citrix ADM Feature	Citrix Virtual App and Desktop Version
HDX Insight	Citrix Virtual App 6.5, build 6682 with HRP01
HDX Insight	Citrix Virtual Desktop 7.0, build 3018

Note:

The Citrix Gateway feature (branded as Access Gateway Enterprise for versions 9.3 and 10.x) must be available on the Citrix instance. Citrix ADM does not support standalone Access Gateway Standard appliances.

Citrix ADM can generate reports for applications that are published on Citrix Virtual App and Desktop accessed through Citrix Receiver. However, this capability depends on the operating system on which Receiver is installed. Currently, a Citrix ADC does not parse ICA traffic for applications or desktops that are accessed through Citrix Receiver running on IOS or Android operating systems.

Thin Clients supported for HDX Insight

- WYSE Windows based Thin Clients
- WYSE Linux based Thin Clients
- WYSE ThinOS based Thin Clients
- 10Zig Ubuntu based Thin Clients
- IGEL UD3 W7+ (M340)
- IGEL UD3 W7 (M340C)

Citrix instance license required for HDX Insight

The data collected by Citrix ADM for HDX Insight depends on the version and licenses of the Citrix instances being monitored. HDX Insight reports are displayed only for Citrix Platinum and Enterprise appliances running release 10.5 and later.

Citrix License/Duration	5 minutes	1 Hour	1 Day	1 Week	> 1 Month

Standard	X	X	X	X	X
Enterprise	✓	✓	X	X	X
Platinum	✓	✓	✓	✓	✓

Supported Hypervisors

The following table lists the hypervisors supported by Citrix ADM.

Hypervisor	Versions
Citrix Hypervisor	7.1 and 7.4
VMware ESX	6.0 and 6.5
Microsoft Hyper-V	2012 R2 and 2016
Generic KVM	RHEL 7.4 and Ubuntu 16.04

Supported operating systems and Receiver versions

The following table lists the operating systems supported by Citrix ADM, and the Citrix Receiver versions currently supported with each system:

Operating system	Receiver version
Windows	4.0 Standard Edition
Linux	13.0.265571 and later
Mac	11.8, build 238301 and later
HTML5	1.5*

* Applicable with Citrix CloudBridge (Citrix SD-WAN WANOP) release 7.4 and later.

Supported browsers

The following table lists the web browsers supported by Citrix ADM:

Web browser	Version

Internet Explorer	11.0 and later
Google Chrome	Chrome 19 and later
Safari	Safari 5.1.1 and later
Mozilla Firefox	Firefox 3.6.25 and later

Ports

Citrix ADM uses the NetScaler IP address (NSIP) address to communicate with Citrix ADC. For communication purposes, the following ports must be open between the Citrix ADC and/or SD-WAN instances and Citrix ADM.

Type	Port	Details
TCP	80/443	For NITRO communication from Citrix ADM to Citrix ADC or Citrix SD-WAN instance.443. For NITRO communication between Citrix ADM servers in high availability mode.
TCP	22	For SSH communication from Citrix ADM to Citrix or Citrix SD-WAN instance. For synchronization between Citrix ADM servers deployed in high availability mode.
UDP	4739	For AppFlow communication from Citrix ADC or Citrix SD-WAN instance to Citrix ADM.
ICMP	No reserved port	To detect network reachability between Citrix ADM and Citrix instances, SD WAN instances, or the secondary Citrix ADM server deployed in high availability mode.
SNMP	161, 162	To receive SNMP events from Citrix instance to Citrix ADM.
Syslog	514	To receive syslog messages in Citrix ADM from Citrix or Citrix SD-WAN instance.
TCP	25	To send SMTP notifications from Citrix ADM to users.
TCP	389/636	Default port for authentication protocol. For communication between Citrix ADM and LDAP external authentication server.
UDP	123	Default NTP server port for synchronizing with multiple time sources.

RADIUS	1812	Default port for authentication protocol. For communication between Citrix ADM and RADIUS external authentication server.
TACACS	49	Default port for authentication protocol. For communication between Citrix ADM and TACACS external authentication server.
TCP	5557, 5558	For logstream communication from Citrix to Citrix ADM.
TCP	5454	Default port for communication, and database synchronization in between Citrix ADM nodes in high availability mode.
TCP	27000	License port for communication between Citrix ADM license server and CPX instance.
TCP	7279	Citrix vendor daemon port.

Limitation

Citrix ADM supports IPv6 address for management access only.

Attach an additional disk to Citrix ADM

Citrix Application Delivery Management (ADM) storage requirement is determined based on your Citrix ADM sizing estimation. If your Citrix ADM storage requirement exceeds the default disk space (120 gigabytes), you can attach an additional disk. For Citrix ADM servers in a high availability setup, you need to add an additional disk for each node.

Note:

- You can attach additional disk of capacity <=3TB for a single Citrix ADM HA deployment. Citrix recommends using solid-state drive (SSD) technology for Citrix ADM deployments.
- You must estimate storage requirements and attach an additional disk to the server at the time of initial deployment of Citrix ADM.
- For a Citrix ADM high availability deployment, you must attach an additional disk to each node.

Citrix ADM now provides Citrix ADM Disk Partition Tool, a new command line tool. The functionalities of this tool are described in detail as follows:

1. Using the tool, you can create partitions in the newly added additional disk. The size of the additional disk can be <=3 TB.
2. You can also resize the existing additional disk to a maximum capacity of 3 TB using this tool.

   Note: It is still not possible to resize existing disks beyond 3 TB without losing data due to a known limitation on the platform. To create a storage capacity greater than 3 TB, you must remove the existing partitions and create new partitions using this new tool.

3. Using this new tool, you can perform any partition action on the disk explicitly. The tool provides you with clear visibility and control over the disk and the associated data.

   Note: You can only use this tool on the additional disk that you have attached to the Citrix ADM server. You cannot create partitions in the primary disk using this tool.

   The following are the workflow for attaching a new additional disk, creating partitions, and resizing the additional disks:

   1. Attach a new additional disk
   2. Launch the disk partitioning tool
   3. Create partitions in the new additional disk
   4. Resize the existing additional disk

Attach additional disks to a Citrix ADM in a high availability deployment

Let us consider a scenario where you have configured a pair of Citrix ADM servers in a high availability set up without any secondary disks. Also, let us consider that you have added two or more Citrix ADC instances, checked and ensured that all processes are running. You might want to add secondary disks to the virtual

machines in this setup. In a high availability set up, you must add additional disks to both nodes as detailed in this task:

1. Assume that the Citrix ADM node names are "ADM_Primary" and "ADM_Secondary."
2. Run the partition tool on ADM_Secondary and then add an additional disk. The virtual machine restarts after the disk is added.
3. Shut down the ADM_Secondary after it restarts.
4. Run the partition tool on ADM_Primary and add an additional disk. The virtual machine restarts after the disk is added.

    Ensure that you add disks of similar capacity to both nodes. For example, if you have added a disk of 500 GB capacity to the primary node, add a disk of 500 GB capacity to the secondary node as well.

5. After the ADM_Primary restarts, check that it is the primary node.
6. Start the ADM_Secondary node. Ensure that it has come up as the secondary node and the databases have synchronized.
7. Confirm that all data still exists.

Perform the following steps to increase the capacity of RAM on both the nodes:

1. Shutdown ADM_Secondary and increase the RAM size as required. Do not restart the node.
2. Shutdown ADM_Primary and increase the RAM size as required.

    Ensure that you increase the RAM size equally on both nodes. For example, if you increase the RAM size on the primary node to 16 GB, do the same on the secondary node as well.

3. Restart the ADM_Primary.
4. After the ADM_Primary reboots, check that it is the primary node.
5. Start the ADM_Secondary node. After it restarts, ensure that it has come up as secondary and the DB sync is working.
6. Confirm that all data still exists.

    Note:

    After you add the additional disk, the primary node takes some time to come up and running. Also, note that the entire process of adding the additional disk to both nodes and increasing RAM capacity requires both nodes to be down for some time. Consider this down time while planning this maintenance activity.

Launch the disk partition tool

Perform the following procedure to launch the disk partition tool. For Citrix ADM in high availability deployment, you must launch the tool in both nodes and create or resize partitions after attaching disks to the respective virtual machines.

1. Open an SSH connection by using an SSH client, such as PuTTY.
2. Log on to the Citrix ADM by using the administrator credentials.

3. Switch to the shell prompt and type:

```
/mps/DiskPartitionTool.py
```

```
bash-3.2# /mps/DiskPartitionTool.py

------------------------------------
MAS/SVM Disk Partition Tool (DPT) 1.0
------------------------------------
Welcome to MAS/SVM DPT! Type 'help' or '?' to view a list of commands.

(dpt):
```

Create partitions in the new additional disk

The "**create**" command is used to create new partitions whenever a new additional disk is added. You can also use this command to create new partitions on an existing additional disk after the existing partitions are deleted using the "remove" command.

```
(dpt): ?create
Creates a new partition on the attached disk. A swap partition of size 32GB is also created automatically.

The VM will be automatically rebooted once the operation completes successfully for the changes to take effect.
```

Note:

There is no 2 terabytes size limitation while creating new partitions with the disk partition tool. The tool can create partitions larger than 2 terabytes. While partitioning the disk, a swap partition of size 32 gigabytes is automatically added. The primary partition then uses all the remaining space on the disk.

Once the command is executed, it creates a GUID partition table (GPT) partition scheme and creates the 32 gigabytes swap partition and data partition to use rest of the space. A new file system is then created on the primary partition.

Note:

This process can take a few seconds, and you must not interrupt the process.

```
(dpt): create

The VM will be automatically rebooted once the operation completes successfully for the changes to take effect.

Are you sure you want to continue (Y/N): y
```

```
Creating GPT partition scheme...
da1 created

Creating partition 1 using (456287933) blocks. Leaving aside 32G for swap...
da1p1 added

Creating partition 2 for swap using remaining 32G...
da1p2 added

Formatting the new partition. This may take some time (~20 seconds). Please be patient and don't interrup the process...
```

Once the create command completes, the virtual machine is automatically restarted for the new partition to get mounted.

```
Create Done.
VM has to be rebooted for the new partition to be used.
Rebooting VM now...

*** FINAL System shutdown message from nsroot@ns-mgmt-system ***

System going down IMMEDIATELY
```

After the restart, the new partition is mounted at /var/mps.

```
bash-3.2# df -k
Filesystem    1024-blocks      Used      Avail Capacity  Mounted on
/dev/md0           456046    374346      72580    84%    /
devfs                   1         1          0   100%    /dev
procfs                  4         4          0   100%    /proc
fdescfs                 1         1          0   100%    /dev/fd
/dev/da0s1a       1623950    284466    1209568    19%    /flash
/dev/da0s1e     116073918   2812298  103975708     3%    /var
/dev/da1p1      495168802     43854  455511444     0%    /var/mps
```

The swap partition added shows up as swap space in the output of the "create" command.

```
CPU:  0.0% user,  0.0% nice,  0.0% system,  0.7% interrupt, 99.3% idle
Mem: 89M Active, 21M Inact, 123M Wired, 16M Cache, 74M Buf, 6965M Free
Swap: 37G Total, 37G Free
```

Note:

The tool restarts the virtual machine after you have created the partition. You can also manually restart the virtual machine by using the "**reboot**" command.

Resize the partitions in the existing additional disk

You can use the "**resize**" command to resize the attached (additional) disk. You can resize a disk that has a master boot record (MBR) or GPT scheme and is less than 3 TB in size to a maximum of 3 TB.

Note:

- The "resize" command is designed to function without losing any existing data, but Citrix recommends that you back up critical data in this disk to external storage before attempting the resize. Data backup is helpful in cases where the disk data can get corrupted during the resize operation. For more information on how to take a backup of the data, see Create a backup file of the disk data.
- Ensure to increase the disk space in increments of 100 gigabytes of space while resizing the partitions. Such an incremental increase ensures that you would not have to resize more frequently.

```
(dpt): ?resize
Resizes existing partition on attached disk to utilize all space available. Pre-conditions are:
1. Secondary disk exists and capcity of disk < 2TB
2. A single partition exists on secondary disk and there is atleast 100GB to gain by resizing

********************
***  WARNING !!  ***
********************
Resizing the partition/disk works without affecting the existing data.
However we strongly recommend you to manually backup your data before proceeding with the operation.
The VM will be automatically rebooted once the operation completes successfully for the changes to take effect.
```

The "resize" command checks for all preconditions and proceeds if all preconditions are met and that you have given consent to resizing. It stops all the processes accessing the disk which includes the Citrix ADM subsystems, PostgreSQL DB processes, and Citrix ADM monitor process. Once the processes are stopped, the disk is unmounted to prepare it for resizing. The resizing is done by extending the partition to occupy all available space and then growing the file system. If a swap partition exists on the disk, it is deleted and recreated at the end of the disk after resizing. The swap partition is discussed in the Create command section of the document.

Note:

The "growing file system" process can take some to complete and take care that you do not interrupt the process while it is in progress. The tool restarts the virtual machine after you have resized the partition. You can also manually restart the virtual machine by using the "reboot" command.

```
(dpt): resize

********************
***  WARNING !!  ***
********************
Resizing the partition/disk works without affecting the existing data.
However we strongly recommend you to manually backup your data before proceeding with the operation.
The VM will be automatically rebooted once the operation completes successfully for the changes to take effect.

Are you sure you want to resize (Y/N): y
```

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```
Unmounting partition: /dev/da1p1 from: /var/mps
OK to resize existing partition.
Disabling swap on partition: /dev/da1p2
Deleting swap partition: da1p2
Resizing partition da1p1...
da1p1 resized

Adding a swap partition da1p2...
da1p2 added

Formatting the newly added portions of the partition. This may take some time (~10 seconds). Please be patient and don't
 interrup the process...
```

All the intermediate steps in the resize process (stopping applications, resizing disk, growing filesystem) are shown on the console and once the process completes the following message is seen.

```
Resize Done.
VM has to be rebooted for the resized partition to be used.
Rebooting VM now...

*** FINAL System shutdown message from nsroot@ns-mgmt-system ***

System going down IMMEDIATELY
```

After rebooting, the increase in size can be observed using the "df" command. Here is the before and after details after you increase the size:

```
bash-3.2# df -k                                          bash-3.2# df -k
Filesystem  1024-blocks    Used   Avail Capacity Mounted on  Filesystem  1024-blocks    Used   Avail Capacity Mounted on
/dev/md0        456046  374864   72062    84% /              /dev/md0        456046  374838   72088    84% /
devfs                1       1       0   100% /dev           devfs                1       1       0   100% /dev
procfs               4       4       0   100% /proc          procfs               4       4       0   100% /proc
fdescfs              1       1       0   100% /dev/fd        fdescfs              1       1       0   100% /dev/fd
/dev/da0s1a    1623950  284468 1209566    19% /flash        /dev/da0s1a    1623950  284468 1209566    19% /flash
/dev/da0s1e  116073918 1662048 105125958    2% /var         /dev/da0s1e  116073918 1666800 105121206    2% /var
/dev/da1s1a  152329216 3082226 137060654    2% /var/mps     /dev/da1s1a  304651668 3137954 277141582    1% /var/mps
```

Restart the virtual machine

When a partition is created or resized or when swap file is created, the virtual machine needs to be restarted for the changes to take effect. For this purpose, a "**reboot**" command is provided in the tool.

```
(dpt): ?reboot
Reboot the VM. Note: VM has to be rebooted after new partition is created, existing one is resized or swap file is creat
ed.
The VM is rebooted automatically after these operations. If the automatic reboot does not happen, then this command can
be used to reboot the VM.
```

You are prompted for confirmation and once confirmed, it stops all processes (such as ADM subsystems, PostgreSQL processes, and ADM monitor) and the virtual machine is restarted.

```
(dpt): reboot
Are you sure you want to reboot the VM (Y/N): y

Rebooting VM now...

*** FINAL System shutdown message from nsroot@ns-mgmt-system ***

System going down IMMEDIATELY
```

Create a backup file of the disk data

Here are the steps to follow to backup Citrix ADM data before resizing or removing the partitions.

Note:

Creating a backup file requires disk space, and it is recommended that there is enough free disk space available (50% or more) before backup commands are executed.

1. Stop ADM

   ```
   /mps/masd stop
   ```

2. Stop PostgreSQL

   ```
   su -l mpspostgres /mps/scripts/pgsql/stoppgsql\_smart.sh
   ```

3. Stop MAS Monitor

   ```
   /mps/scripts/stop\_mas\_monit.sh
   ```

4. Create tarball

   ```
   cd /var
   tar cvfz /var/mps/mps\_backup.tgz mps
   ```
   Note: The operation will take time depending on the size of the data to be backed up.

5. Generate checksum

   ```
   md5 mps\_backup.tgz \> mps\_backup\_checksum
   ```

6. Remote copy the tarball and checksum

   ```
   scp
   ```

7. Validate the correctness of the copied tarball. For this generate a checksum of the transferred file and compare with the source checksum
8. Remove the tarball from the MAS VM

```
rm mps\_backup.tgz mps\_backup\_checksum
```

Additional commands

In addition to the commands listed earlier, you can also use the following commands in the tool:

Help command:

To list the supported commands, type **help** or **?** and press enter. To get further help on each of the command press **help** or **?** followed by the command name and press the **Enter** key.

```
(dpt): help

DPT Commands
------------
create  create_swapfile  exit  help  info  reboot  remove  resize

(dpt):
```

Info command:

The "**info**" command provides information about the attached secondary disk if the disk exists. The command provides the device name, the partition scheme, size in human-readable form, and the number of disk blocks. The scheme can be MBR or GPT. An MBR scheme means the disk was partitioned using an earlier version of Citrix ADM version. Note that the MBR/GPT based partition can be resized but not beyond 2 terabytes. GPT partition scheme means that the disk was partitioned using Citrix ADM 12.1 or later.

Note: A GPT partition can be greater than 2 terabytes but when it is created. But you cannot resize the disk to a size greater than 2 terabytes after creating a disk with a smaller size. This is a known limitation of the platform.

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```
(dpt): ?info
Provides information about attached disk (if found).
(dpt): info
-------------
Disk: da1
Scheme: MBR
Size: (150G)
Blocks: 314572737
-------------
(dpt):
```

Create_swapfile command:

The default swap partition on the primary disk of Citrix ADM is 4 gigabytes and therefore, the default swap space is 4 gigabytes. For the default memory configuration of Citrix ADM which is 2 gigabytes, this swap space is sufficient. However, when you run Citrix ADM with a higher memory configuration, you need to have more swap space allocated on the disk.

Note: Swap partition is usually a dedicated partition that is created on a hard disk drive (HDD) during the installation of the operating system. Such a partition is also referred to as a swap space. Swap partition is used for virtual memory that simulates the additional main memory.

Secondary disks that were added in the earlier versions of Citrix ADM don't have a swap partition created by default. The "create_swapfile" command is meant for secondary disks created using older Citrix ADM versions which don't have a swap partition. The command checks for the following:

- Presence of a secondary disk
- Disk being mounted
- Size of the disk (at least 500 gigabytes)
- The existence of the swap file

The "create_swapfile" command is useful only in cases when the memory is greater or equal to 16 gigabytes and should not be used for cases when memory is low. Therefore, this command also checks for memory before proceeding with swap file creation.

```
(dpt): ?create_swapfile
Creates a 32GB swap file on the secondary disk. Pre-conditions are:
1. Secondary disk exists
2. Secondary disk is partitioned and mounted
3. Capacity of disk >= 500GB
4. Swap file is not already found
5. RAM size >= 16GB

Creating swapfile is a time consuming operation and can take ~5 minutes to complete. Once started the operation should n
ot be interrupted.
The VM will be automatically rebooted once the operation completes successfully for the changes to take effect.
```

If all the conditions are met, and the user consents to proceed, a 32 gigabytes swap file is created on the secondary disk. Note that the swap file creation process takes a few minutes to complete and take care that you do not interrupt the process while in progress. After successful completion, a restart is done for the swap file to take effect.

```
Creating swapfile. This may take some time (~5 mins). Please be patient and don't interrupt the process...
32768+0 records in
32768+0 records out
34359738368 bytes transferred in 724.061475 secs (47454173 bytes/sec)

Changing permissions for created swapfile...

Create (swapfile) Done.
VM has to be rebooted for the newly created swapfile to take effect.
```

After reboot, the increase in swap can be observed using the top command.

```
CPU:  1.7% user,  0.0% nice,  0.8% system,  0.2% interrupt, 97.4% idle
Mem: 1847M Active, 506M Inact, 382M Wired, 4684K Cache, 199M Buf, 4473M Free
Swap: 4198M Total, 4198M Free
```
```
CPU: 42.0% user,  0.0% nice,  7.6% system,  5.0% interrupt, 45.3% idle
Mem: 1805M Active, 423M Inact, 393M Wired, 4792K Cache, 199M Buf, 4587M Free
Swap: 36G Total, 36G Free
```

Exit command:

To exit from the tool, type exit and press the Enter key.

```
(dpt): exit
bash-3.2#
```

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Configure Citrix ADM in High Availability (HA) deployment

High Availability (HA) refers to a system that is always available to a user without any interruption to the services. High availability setup is crucial during system downtime, network or application failures, and is a key requirement to any enterprise. A high availability deployment of two Citrix ADM nodes in active-passive mode with same configurations provides uninterrupted operations.

Important:

To access Citrix ADM 12.1 build 48.18 or later versions using HTTPS:

If you have configured a Citrix ADC appliance to load balance Citrix ADM in a high availability mode, first remove the Citrix ADC appliance. Then, configure a floating IP address to access Citrix ADM in high availability mode.

The following are the benefits of high availability deployment in Citrix ADM:

- An improved mechanism to monitor heartbeats between the primary and secondary node.
- Provides physical streaming replication of database instead of a logical bi-directional replication.
- Ability to configure the floating IP address on the primary node to eliminate the need of separate Citrix ADC load balancer.
- Provides easy access to the Citrix ADM user interface using the floating IP address.
- Citrix ADM user interface is provided only on the primary node. By using the primary node, you can eliminate the risk of accessing and making changes to the secondary node.
- Configuring the floating IP address handles the failover situation and reconfiguring the instances is not required.
- Provides built-in ability to detect and handle split-brain situation.

The following table describes the terms used in high availability deployment.

Terms	Description
Primary node	First node registered in the high availability deployment.
Secondary node	Second node registered in the high availability deployment.
Heartbeat	A mechanism used to exchange messages between primary and secondary node in the high availability setup. The messages determine status and health of the application on each individual node.
Floating IP address	A floating IP is an IP address that can be instantly moved from one node to another in the same subnet. Internally it is set up as an alias on the network interface of the primary node. If there is a failover, the floating IP address is seamlessly moved from the old primary to the new one. It is useful in high

	availability setup because it allows clients to communicate with the high availability nodes using a single IP address.

Components of high availability architecture

The following figure displays the architecture of two Citrix ADM nodes deployed in high availability mode.
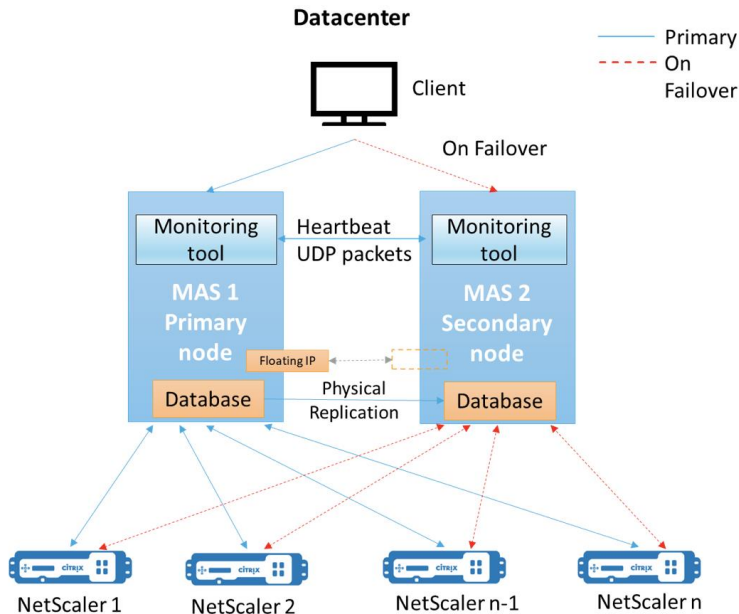
In high availability deployment, one Citrix ADM node is configured as the primary node (MAS 1) and the other as the secondary node (MAS 2). If the primary node goes down due to any reason, the secondary node takes over as the new primary node.

Monitoring tool

Monitoring tool is an internal process used to monitor, alert, and handle failover situations. The tool is active and running on each node in high availability. It is responsible for starting subsystems, initiating database on both the nodes, deciding on the primary, or secondary node if there is a failover, and so on.

Primary node (MAS 1)

The primary node accepts connections and manages the instances. All processes such as AppFlow, SNMP, LogStream, syslog, and so on is managed by the primary node. The Citrix ADM user interface access is available on primary node. The floating IP address is configured on the primary node.

Secondary node (MAS 2)

The secondary node listens to the heartbeat messages sent from the primary node. Database on the secondary node is in read-replica mode only. None of the processes are active in the secondary node and the Citrix ADM user interface is not accessible on the secondary node.

Physical streaming replication

The primary and secondary nodes synchronize through heartbeat mechanism. With the physical streaming replication of database, the secondary node starts in read-replica mode. The secondary node listens to the

heartbeat messages received from the primary node. If the secondary node does not receive any heartbeats for a time period of 180 seconds, the primary node is considered to be down. Then, the secondary node takes over as the primary node.

Heartbeat messages

Heartbeat messages are User Datagram Packets (UDP) that are sent and received between primary and secondary node. It monitors all subsystems of Citrix ADM and database to exchange information about the node state, health, processes, and so on. The information is shared between the high availability nodes every second. Notifications are sent as alerts to the administrator if there is a failover or break up of high availability states.

Floating IP address

The floating IP address is associated with the primary node in the high availability setup. It is an alias given to the primary node IP address, that the client can use to connect to Citrix ADM in the primary node. Since the floating IP address is configured on the primary node, the instance reconfiguration is not required in case of failover. The instances reconnect to the same IP address to reach the new primary.

Key points to note

- In a high availability setup, both the Citrix ADM nodes must be deployed in active-passive mode. The nodes must be on the same subnets using the same software version and build, and have same configurations.
- Floating IP address:
  - After the initial configuration of the secondary node is complete, the floating IP address is configured.
  - Instances need not be reconfigured if there is a failover.
  - You can access a high availability node from the user interface, either by using the primary node IP or floating IP address.

  Note

  Citrix recommends that you use the floating IP address to access the user interface.

- Database:
  - In a high availability setup, all configuration files are synchronized automatically from the primary node to the secondary node at an interval of one minute.
  - Database synchronization happens instantly by physical replication of database.
  - Database on secondary node is in read-replica mode.

Prerequisite

Before you set up high availability for Citrix ADM nodes, download the Citrix ADM image file (.xva) from the Citrix download site: https://www.citrix.com/downloads/

Set up Citrix ADM in high availability mode

1. Register and deploy the first server (primary node).
2. Register and deploy the second server (secondary node).

3. Deploy the primary and secondary node for high availability setup.

# Register and deploy the first server (primary node)

To register the first node:

1. Use the .xva image file downloaded from the Citrix download site and import it in to your hypervisor.

   Note:

    It might take a few minutes for the .xva image file to import and get started. You can see the status on the bottom of the screen.
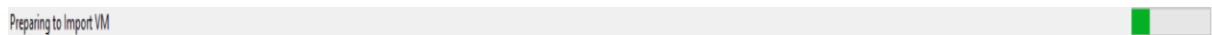
2. After the import is successful, right-click and click **Start**.
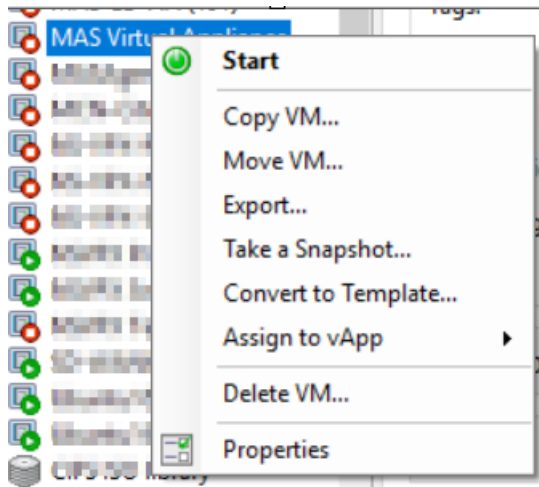
3. From the **Console** tab, configure Citrix ADM with the initial network configurations.

```
---------------------------------------------------------------------------------
Citrix ADM initial network configuration.
This menu allows you to set and modify the initial IPv4 network addresses.
The current value is displayed in brackets ([]).
Selecting the listed number allows the address to be changed.
---------------------------------------------------------------------------------

       1. Citrix ADM Host Name [ADMHA1]:
       2. Citrix ADM IPv4 address [10.102.29.52]:
       3. Netmask [255.255.255.0]:
       4. Gateway IPv4 address [10.102.29.1]:
       5. DNS IPv4 Address [127.0.0.2]:
       6. Cancel and quit.
       7. Save and quit.

Select a menu item from 1 to 7 [7]:
```

4. After the initial network configuration is complete, enter **7** to save and quit. The system now reboots and prompts to login. Log on using the following credentials – *nsrecover/nsroot*.

5. To deploy the primary node, enter **/mps/deployment_type.py**. The Citrix ADM deployment configuration menu is displayed.

```
bash-3.2# /mps/deployment_type.py
--------------------------------------------------------------------------------
--------------
Citrix ADM Deployment Configuration.
The following menu enables you to select the components of your Citrix ADM deplo
yment.
Type the number of the component that you want to deploy, and then press Enter.
For example, type 1 if you want to install as Citrix ADM Server.
--------------------------------------------------------------------------------
--------------

    1. Citrix ADM Server.
    2. Remote Disaster Recovery Node.
    3. Cancel and exit.

Select an option from 1 to 3 [3]: []
```

6. Select **1** to register Citrix ADM server as primary node.

```
--------------------------------------------------------------------------------
--------------
Citrix ADM Deployment Configuration.
The following menu enables you to select the components of your Citrix ADM deplo
yment.
Type the number of the component that you want to deploy, and then press Enter.
For example, type 1 if you want to install as Citrix ADM Server.
--------------------------------------------------------------------------------
--------------

    1. Citrix ADM Server.
    2. Remote Disaster Recovery Node.
    3. Cancel and exit.

Select an option from 1 to 3 [3]: 1
Selected Option      1. Citrix ADM Server.
    Citrix ADM Standalone deployment  [yes/no]:[]
```

The console prompts you to select the Citrix ADM standalone deployment. Enter **No** to confirm the deployment as high availability.

```
--------------------------------------------------------------------------------
--------------
Citrix ADM Deployment Configuration.
The following menu enables you to select the components of your Citrix ADM deplo
yment.
Type the number of the component that you want to deploy, and then press Enter.
For example, type 1 if you want to install as Citrix ADM Server.
--------------------------------------------------------------------------------
--------------

    1. Citrix ADM Server.
    2. Remote Disaster Recovery Node.
    3. Cancel and exit.

Select an option from 1 to 3 [3]: 1
Selected Option      1. Citrix ADM Server.
    Citrix ADM Standalone deployment  [yes/no]:no
```

The console prompts you to select the First Server Node. Enter **Yes** to confirm the node as the first node.

```
--------------------------------------------------------------------------------
--------------
Citrix ADM Deployment Configuration.
The following menu enables you to select the components of your Citrix ADM deplo
yment.
Type the number of the component that you want to deploy, and then press Enter.
For example, type 1 if you want to install as Citrix ADM Server.
--------------------------------------------------------------------------------
--------------

    1. Citrix ADM Server.
    2. Remote Disaster Recovery Node.
    3. Cancel and exit.

Select an option from 1 to 3 [3]: 1
Selected Option      1. Citrix ADM Server.
    Citrix ADM Standalone deployment  [yes/no]:no
    First Server Node for Citrix ADM [yes/no]:yes
```

7. The console prompts you to restart the system. Enter **Yes** to restart.

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After the system reboots, the primary node configuration is complete.

Register and deploy the second server (secondary node)

1. Use the **.xva** image file downloaded from the Citrix download site and import it in to your hypervisor.
2. From the **Console** tab, configure Citrix ADM with the initial network configurations.
3. After the initial network configuration is completed, the system reboots and prompts for login. Log on using the following credentials – *nsrecover/nsroot*.
4. To deploy the secondary node, enter **/mps/deployment_type.py**.
5. Select **1** to register Citrix ADM server as secondary node.
6. The console prompts you to select the Citrix ADM as standalone deployment. Enter **No** to confirm the deployment as high availability.

The console prompts you to select the first server node. Enter **No** to confirm the node as the second server.

The console prompts you to enter the IP address and password of the primary node.

```
   1. Citrix ADM Server.
   2. Remote Disaster Recovery Node.
   3. Cancel and exit.

Select an option from 1 to 3 [3]: 1
Selected Option      1. Citrix ADM Server.
   Citrix ADM Standalone deployment  [yes/no]:no
   First Server Node for Citrix ADM [yes/no]:no


----------------------------------------------------------------------
            Server node Configuration. This menu allows you to specify server ip
 address and password.
            Enter 0 anytime for cancel and quit.
            ------------------------------------------------------------------
--------
   Enter Citrix ADM IP Address:10.102.29.52
   Enter password for Citrix ADM:
```

The console prompts you to enter the floating IP address.

```
   1. Citrix ADM Server.
   2. Remote Disaster Recovery Node.
   3. Cancel and exit.

Select an option from 1 to 3 [3]: 1
Selected Option      1. Citrix ADM Server.
   Citrix ADM Standalone deployment  [yes/no]:no
   First Server Node for Citrix ADM [yes/no]:no


----------------------------------------------------------------------
            Server node Configuration. This menu allows you to specify server ip
 address and password.
            Enter 0 anytime for cancel and quit.
            ------------------------------------------------------------------
--------
   Enter Citrix ADM IP Address:10.102.29.52
   Enter password for Citrix ADM:
   Enter Floating IP address:10.102.29.97
```

The console prompts you to restart the system. Enter **Yes** to restart.

> **Note:**
>
> - Floating IP address is mandatory for high availability deployment of nodes.
> - The system will show error messages if there are any issues in the configuration.
> - The system reboots and takes a few minutes for the configurations to get effect.
> - You may not be able to access the GUI immediately after the configuration is completed. You need to try accessing the GUI after a few minutes.

# Deploy the primary and secondary node as a high availability pair

After the registration, both primary and secondary nodes are displayed on the primary Citrix ADM user interface. Deploy these nodes into a high availability pair.

Note:

- Before deploying the nodes into a high availability pair, ensure that the secondary node is completed with a reboot, after the initial network configuration.
- After the high availability deployment is complete, use the floating IP address to access the Citrix ADM user interface.

To deploy nodes as a high availability pair:

1. Open a web browser and enter the IP address of the primary Citrix ADM server node.
2. In the **user Name** and **password** fields, enter the administrator credentials.
3. Select the deployment type as **Two Servers deployed in High Availability Mode**, and click **Next.**
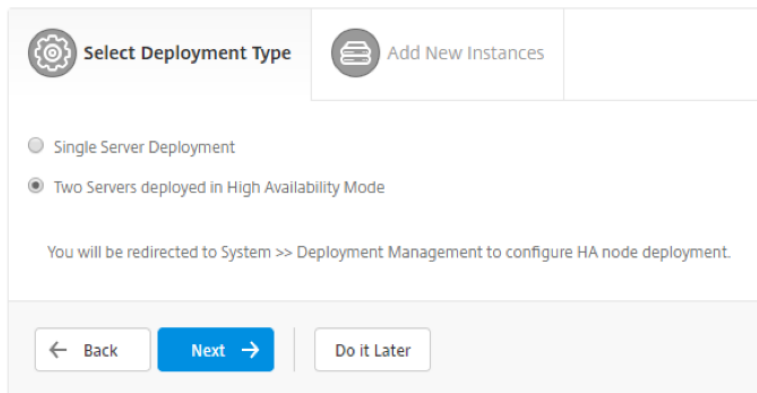
4. On the **System** tab, navigate to **Deployment** and click **Deploy.**
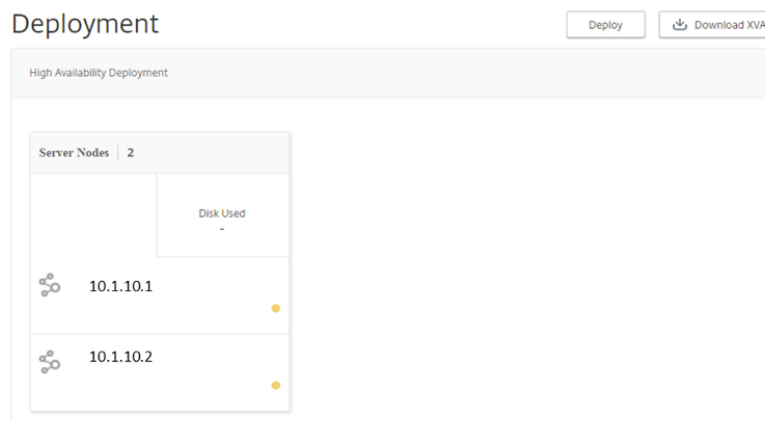
5. A confirmation message is displayed. Click **Yes.**

Confirm ✕

② Deploying will reboot NetScaler Management and Analytics System Server. Do you want to continue?

[Yes] [No]

After you deploy the Citrix ADM in high availability mode, the primary and secondary nodes are displayed.

Deployment [Force Failover] [Break HA] [HA Settings] [⬇ Download XVA]

High Availability Deployment

Server Nodes	2

⚙ 10.1.10.1

Node State	Primary
Memory	4.77 GB of 8.25 GB
CPU	52.06%
Disk Space	27.48 GB of 112.25 GB

⚙ 10.1.10.2

| Node State | Secondary |

Citrix ADC instances in Citrix ADM

Citrix ADC Instances are Citrix appliances or virtual appliances that you want to discover, manage, and monitor from Citrix ADM. You must add instances to the Citrix ADM server if you want to manage and monitor these instances. You can add the following Citrix appliances and virtual appliances to Citrix ADM:

- Citrix ADC
  - o Citrix ADC MPX
  - o Citrix ADC VPX
  - o Citrix ADC SDX
  - o Citrix ADC CPX
- Citrix Gateway
- Citrix SD-WAN

You can add instances either while setting up the Citrix ADM server for the first time or at a later time. You must then specify an instance profile that Citrix ADM can use to access the instance.

Note:

- Citrix ADM uses the Netscaler IP (NSIP) address of the Citrix instances for communication. For information about the ports that must be open between the Citrix ADC instances and Citrix ADM, see Ports.
- For Citrix SD-WAN WO and Citrix SD-WAN EE instances, Citrix ADM uses the management IP address of the instances for communication.
- To learn how Citrix ADM discovers instances, see Discover instances.

Create a Citrix ADC profile

Citrix ADC profile contains the user name, password, communication ports, and authentication types of the instances that you want to add to Citrix ADM. For each instance type, a default profile is available. For example, the nsroot is the default profile for Citrix ADC instances. The default profile is defined by using the default Citrix ADC administrator credentials. If you have changed the default admin credentials of your instances, you can define custom instance profiles for those instances. If you change the credentials of an instance after the instance is discovered, you must edit the instance profile or create a profile, and then rediscover the instance.
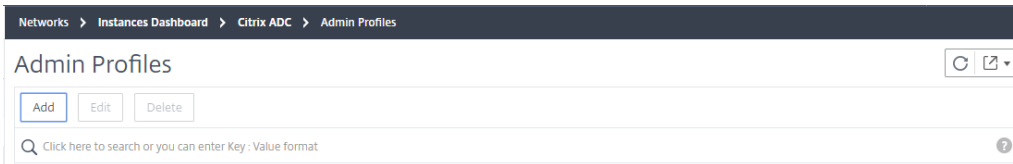
You can create a Citrix ADC profile from the **Instance** page or while adding or changing an instance.

To create a Citrix ADC profile from the Instance page:

1. Navigate to **Networks > Instances**.
2. Select an Instance. For example, Citrix ADC.
3. On the Instance page, select **Profiles**.
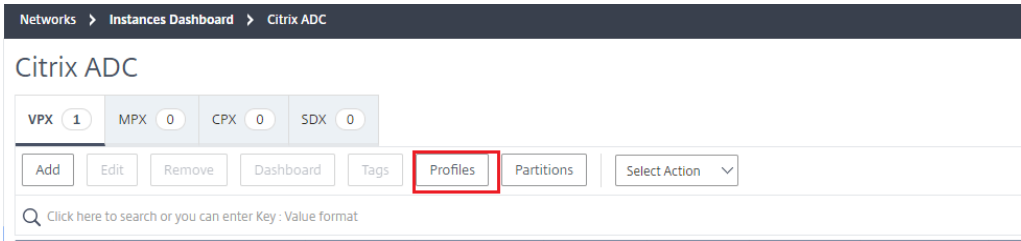
4. On the **Admin Profiles** page, select **Add**.

5. On the **Create Citrix ADC Profile** page, do the following:

1. **Profile Name**: Specify a profile name for the Citrix ADC instance.
2. **User Name**: Specify a user name to log on to the Citrix ADC instance.
3. **Password**: Specify a password to log on to the Citrix ADC instance.
4. **SSH Port**: Specify the port for SSH communication between Citrix ADM and the Citrix ADC instance.
5. **HTTP Port**: Specify the port for HTTP communication between Citrix ADM and the Citrix ADC instance.

Note: The default HTTP port is 80. You can also specify the non-default or customized HTTP port that you might have configured in your Citrix ADC CPX instance. The customized HTTP port can be used for communication only between Citrix ADM and Citrix ADC CPX.

6. **HTTPS Port**: Specify the port for HTTPS communication between Citrix ADM and the Citrix ADC instance.

   Note:

   The default HTTPS port is 443. You can also specify the non-default or customized HTTPS port that you might have configured in your Citrix ADC CPX instance. The customized HTTPS port can be used for communication only between Citrix ADM and Citrix ADC CPX.

7. **Use global settings for Citrix ADC communication**: Select this option if you want to use the system settings for communication between Citrix ADM and Citrix ADC instance, otherwise select either http or https.

8. **SNMP Version**: Select either **SNMPv2** or **SNMPv3** and do the following:
   1. If you select SNMPv2, specify the **Community** name for authentication.
   2. If you select SNMPv3, specify the **Security Name** and **Security Level**. Based on the security level, select the **Authentication Type** and **Privacy Type**.

9. **Timeout Settings**: Specify the time that Citrix ADM must wait before sending a connection request to the Citrix ADC instance after a restart.
10. Select **Create**.

Add instances to Citrix ADM

You can add instances either while setting up the Citrix ADM server for the first time or at a later time.

To add instances, you must specify either the host name or IP address of each Citrix ADC instance, or a range of IP addresses.

For SD-WAN instances, specify the IP address of each instance, or a range of IP addresses. Note that Citrix ADM supports only Citrix SD-WAN WO and Citrix SD-WAN EE editions.

Note:

- To add Citrix ADC instances configured in a cluster, you must specify either the cluster IP address or any one of the individual nodes in the cluster setup. However, on Citrix ADM, the cluster is represented by the cluster IP address only.
- For Citrix ADC instances set up as an HA pair, when you add one instance, the other instance in the pair is automatically added.

To add an instance to Citrix ADM:

1. In a web browser, type the IP address of the **Citrix Management and Analytics System** (for example, http://192.168.100.1).
2. In the **User Name** and **Password** fields, enter the administrator credentials. The default administrator credentials are nsroot/nsroot.
3. Navigate to **Networks** > **Dashboard** and click **Citrix ADC**. On the **Citrix ADC** page, click **Add**. On the **Add Instance** page, from **Instance Type**, select the type of instance you want to add, and then follow the instructions in step 4.

   Alternatively, navigate to **Networks** > **Instances**. Under **Instances**, select the type of instance you want to add (for example, Citrix ADC VPX) and click **Add**.

4. Select one of the following options:
   - **Enter Device IP address** - For Citrix ADC instances, specify either the host name or IP address of each instance, or a range of IP addresses. For SD-WAN instances, specify the IP address of each instance, or a range of IP addresses.
   - **Import from file** - From your local system, upload a text file that contains the IP addresses of all the instances you want to add.
5. From **Profile Name**, select the appropriate instance profile, or create a new profile by clicking the + icon.

   Note:

   For Citrix ADC CPX instances, you must specify the **HTTP, HTTPS, SSH**, and **SNMP** port details of the host. You can also specify the range of ports that were published by the host in the **Start Port** and **Number of ports** field. Also, if your Citrix ADC CPX IP address is reachable from the Citrix ADM server, select the **Routable** checkbox. If your Citrix ADC CPX IP address is reachable through the host, uncheck the **Routable** checkbox and specify the host's IP address.

6. From **Site**, select the location where you want to add the instance, or create a new location by clicking the **+** icon.
7. Click **OK** to initiate the process of adding instances to Citrix ADM.

   Note:

   If you want to rediscover an instance, navigate to **Networks** > **Instances** > **Citrix <Instance Type>**, select the instance you want to rediscover, and then from the **Action** drop-down list, click **Rediscover**.

Frequently Asked Questions

The HA configuration is complete, but the primary node GUI is not accessible. What could be the reason?

It takes a few minutes for the configuration to take effect. You can try accessing again after a few minutes.

The HA configuration is complete, but the floating IP address GUI is not accessible. What could be the reason?

After the HA configuration, you need to first access the primary node GUI and complete the deployment. For more information, see Deploy the primary and secondary node as a high availability pair. After the deployment is complete, the server reboots and gets ready for high availability deployment. You can then access the floating IP address GUI.

What DB is supported in Citrix ADM standalone and Citrix ADM HA?

Both Citrix ADM standalone and Citrix ADM HA support PostgreSQL.

What is the potential data loss to the secondary node?

The secondary node listens to the heartbeat messages that the primary node sends through the Citrix ADM database. If the secondary node does not receive the heartbeats for more than 180 seconds, then the secondary node performs an SSH-based check on the primary node. If the heartbeat and SSH-based check fail, the primary node is considered to be down.
In this scenario, the secondary node takes over as the primary node and the 180 seconds timeframe can be considered as the possible data loss to the secondary node.

What happens if the primary node is down?

The secondary node takes over and becomes the primary node.

How to reinstall the failed node?

It is recommended to install a fresh VM build. To reinstall:

1. Break the HA pair. Navigate to **System > Deployment**.

   The Deployment page is displayed. Click **Break HA**.

2. Delete the failed node from the hypervisor.

3. Import the .xva image file to the hypervisor.

4. From the **Console** tab, configure Citrix ADM with the initial network configurations. For more information, see Register and deploy the first server (primary node) and Register and deploy the second server (secondary node).

5. Redeploy the HA pair.

Does MAS support SAN Storage?

Citrix recommends you to host the Citrix ADM Virtual Hard Disk (VHD) on a local storage. When hosted on a network storage, Citrix ADM might not work as expected.

Does MAS support additional disk?

Yes. A new installation of Citrix ADM HA pair allocates 120 GB of storage by default. For more than 120 GB storage, you can add one additional disk for a maximum of 3 TB storage. Adding more than one additional disk is not supported.

After disabling the HA pair, what happens to the floating IP address configured?

The floating IP address will be no longer accessible and you need to redeploy the high availability pair.

Can I give a different floating IP address while redeploy?

Yes. You can configure a new floating IP address.

Why is secondary node GUI not accessible?

Secondary node is only a read-replica server and acts as a primary node only if the primary node is down for any reason. Citrix recommends to access either the primary node GUI or the floating IP address GUI.

If the primary node is down for a long duration, can the configurations still be done using the floating IP address GUI?

Yes. You can still continue to do configurations and the configurations get saved in the secondary node. After the primary node is back, all the configurations are synchronized.

If there is a necessity to change the primary node IP address or secondary node IP address or floating IP address in the future (for example, changing it to IPv6), what are the recommended solutions to follow?

Changing the IP addresses in HA pair is not supported without breaking the HA pair.

To update the primary node or the secondary node IP address:

Break the HA pair. Navigate to **System > Deployment**.
The Deployment page is displayed. Click **Break HA**.

    a.   Log on to the primary node using an SSH client or from the hypervisor.
    b.   Use **nsrecover** as the user name and enter the password that you have set.
    c.   Enter **networkconfig.** Perform the procedure from **step 3** available at Register and deploy the first server (primary node).
          During the initial network configuration, you can provide a different IP address.
    d.   Perform the same procedure for secondary node and continue with the procedure from **step 3** available at Register and deploy the second server (secondary node).
          During the initial network configuration, you can provide a different IP address.
    e.   Deploy the HA pair.

To update the floating IP address:

1.   Navigate to **System > Deployment**. The Deployment page is displayed
    a.   Click **HA Settings.**
    b.   Click **Configure Floating IP Address for High Availability Mode.**
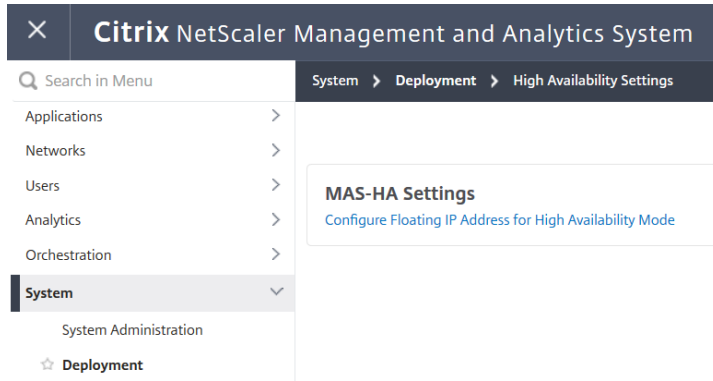
2. Enter the floating IP address and click **OK**.