Quick Start Guide

EMC ScaleIO

Version 2.0.1.x

Deploying ScaleIO on XenServer Servers

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Preface

As part of an effort to improve its product lines, EMC periodically releases revisions of its software and hardware. Therefore, some functions described in this document might not be supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information on product features.

Contact your EMC technical support professional if a product does not function properly or does not function as described in this document.

Note

This document was accurate at publication time. Go to EMC Online Support (https://support.emc.com) to ensure that you are using the latest version of this document.

Related documentation

The release notes for your version includes the latest information for your product.

The following EMC publication sets provide information about your ScaleIO or ScaleIO Ready Node product:

- ScaleIO software (downloadable as ScaleIO Software <version> Documentation set)
- ScaleIO Ready Node with AMS (downloadable as ScaleIO Ready Node with AMS Documentation set)
- ScaleIO Ready Node no AMS (downloadable as ScaleIO Ready Node no AMS Documentation set)
- VxRack Node 100 Series (downloadable as VxRack Node 100 Series Documentation set)

You can download the release notes, the document sets, and other related documentation from EMC Online Support.

Typographical conventions

EMC uses the following type style conventions in this document:

Bold	Used for names of interface elements, such as names of windows, dialog boxes, buttons, fields, tab names, key names, and menu paths (what the user specifically selects or clicks)
Italic	Used for full titles of publications referenced in text
`Monospace`	Used for: • System code • System output, such as an error message or script • Pathnames, filenames, prompts, and syntax • Commands and options
Monospace italic	Used for variables
`Monospace bold`	Used for user input
[ ]	Square brackets enclose optional values
|	Vertical bar indicates alternate selections - the bar means “or”

{ }	Braces enclose content that the user must specify, such as x or y or z
...	Ellipses indicate nonessential information omitted from the example

Where to get help

EMC support, product, and licensing information can be obtained as follows:

Product information

For documentation, release notes, software updates, or information about EMC products, go to EMC Online Support at https://support.emc.com.

Technical support

Go to EMC Online Support and click Service Center. You will see several options for contacting EMC Technical Support. Note that to open a service request, you must have a valid support agreement. Contact your EMC sales representative for details about obtaining a valid support agreement or with questions about your account.

Your comments

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Send your opinions of this document to techpubcomments@emc.com.

Before you begin

This document describes prerequisites for deploying ScaleIO.

The procedures in the document apply to ScaleIO deployment in the following scenario:

- all management and data communication are on the same network
- one Protection Domain
- on a fully-converged system

For all other cases and customization options, use the full installation, as described in the *EMC ScaleIO Deployment Guide*. ScaleIO can be deployed in 3-node or 5-node MDM cluster mode. This document supports both modes.

Before Deploying ScaleIO, read this document in its entirety.

Note

ScaleIO installation enables unlimited use of the product, in non-production environments. To obtain a license for production use, and to receive technical support, open a service ticket with EMC Online Support at https://support.emc.com.

Deployment step overview:

1. Prepare the environment.
2. Start the deployment.
3. Monitor the deployment .
4. Enable storage.

System requirements

This section lists the requirements for system components.

This section is specific to ScaleIO software deployments.

For ScaleIO Ready Node or VxRack Node 100 Series systems, refer to your product's Hardware Configuration and Operating System Installation Guide.

ScaleIO cluster components

List of required ScaleIO servers.

- ScaleIO component servers:
  - 3-node cluster
    - One Master MDM
    - One Slave MDM
    - One TieBreaker
    - Minimum of three SDSs (on the same servers as the above components, or on three different servers)
    - SDCs, up to the maximum allowed (on the same servers as the above components, or on different servers)
  - 5-node cluster
    - One Master MDM
    - Two Slave MDMs
    - Two TieBreakers
    - Minimum of three SDSs (on the same servers as the above components, or on three different servers)
    - SDCs, up to the maximum allowed (on the same servers as the above components, or on different servers)
- ScaleIO Gateway server on a separate server, outside of the ScaleIO system.

Physical server requirements

Table 1 Server physical requirements

Component	Requirement
Processor	One of the following: • Intel or AMD x86 64-bit (recommended) • Intel or AMD x86 32-bit (for Xen only)
Physical memory	ScaleIO component requirements: • 500 MB RAM for the Meta Data Manager (MDM) • 500 MB RAM for each ScaleIO Data Server (SDS) • 50 MB RAM for each ScaleIO Data Client (SDC)

Table 1 Server physical requirements (continued)

Component	Requirement
	DAS Cache memory requirements (ScaleIO Ready Node, non-XenServers only). Add to every SVM/node that will be using DAS Cache: • 1U1N servers—500 MB RAM • 2U1N servers—1 GB RAM
Disk space	• 1 GB for each physical node or Xen hypervisor

Connectivity	One of the following:
	• 1 GbE or 10 GbE (recommended) network
	• IP-over-InfiniBand network
	Dual-port network interface cards (recommended)
	Ensure the following:
	• There is network connectivity between all components.
	• Network bandwidth and latency between all nodes is acceptable, according to application demands.
	• Ethernet switch supports the bandwidth between network nodes.
	• MTU settings are consistent across all servers and switches.
	• The following TCP ports are not used by any other application, and are open in the local firewall of the server:
	  ▪ MDM: 6611 and 9011
	  ▪ TieBreaker: 9011
	  ▪ SDS: 7072. Multiple SDS (not supported on Windows): 7073-7076
	  ▪ Light Installation Agent (LIA): 9099
	  ▪ SDBG ports (used by ScaleIO internal debugging tools to extract live information from the system): MDM 25620, SDS 25640. Multiple SDS (not supported on Windows): 25641-25644 (not 25640).
	• The following UDP port is open in the local firewall of the server:
	  ▪ SNMP traps: 162
	Note
	You can change the default ports. For more information, see “Changing default ports” in the user documentation.

Supported operating systems

The list of operating systems supported by this version of ScaleIO.

For the most updated list, see the EMC Simple Support Matrix (ESSM) at https://elabnavigator.emc.com/eln/elnhome.

Table 2 Supported operating systems - ScaleIO components

Operating system	Requirement
Hypervisors	• XenServer 6.5 or 7.0 **Note** OpenSSL 64-bit v1.0.1 is supported on XenServer 6.5 SP1 (or later)

GUI server requirements

Component	Requirement
Supported operating systems	Windows 7, 2008 R2, 10, 2012 or 2012 R2, 2016 (in v2.0.1.1 and later). Server Core editions are not supported.
Other	• Java 1.8 64-bit or later • Screen resolution: 1366 x 768 minimum

ScaleIO Gateway server requirements

Component	Requirement
Supported operating systems	• Windows 2008 R2, 2012 R2, or 2016, including the Visual C++ redistributable 2010 package, 64-bit. Server Core editions are not supported. • Linux: ▪ CentOS 6.x-7.x ▪ Oracle Linux 6.5/7.x ▪ Red Hat 6.x-7.x ▪ SUSE 11.3, 12, 12.1, and 12.2 ▪ Ubuntu 14.04, Ubuntu 16.04 Every server requires 2 cores and a minimum of 3 GB available RAM.
Connectivity	The following TCP ports are not used by any other application, and are open in the local firewall of the server: 80 and 443 (or 8080 and 8443). You can change the default ports. For more information, see “Changing default ports” in the user documentation.
Supported web browsers	• Internet Explorer 10, or later • Firefox, version 42, or later • Chrome, version 45, or later
Java requirements	• 1.8 or later, 64-bit

Component	Requirement
Other	• For a Windows Gateway, the Windows Management Instrumentation service must be enabled on the IM server and on all Windows ScaleIO nodes. • Do not install the Gateway on a server on which RFcache will be enabled or on which SDC will be installed. • The Gateway server must have connectivity to all the nodes that are being installed. If you are using separate networks for management and data, the server must be able to communicate with both networks.

Other requirements

ScaleIO requires that you use a minimum of three SDS servers, with a combined free capacity of at least 300 GB. These minimum values are true per system and per Storage Pool.

NOTICE

ScaleIO installation enables unlimited use of the product, in non-production environments . To obtain a license for production use, and to receive technical support, open a service ticket with Customer Support at https://support.emc.com.

For complete information on licensing, see the *ScaleIO User Guide*.

Prepare the environment

Before deploying ScaleIO, you must prepare the environment.

Before you begin

Ensure that all ScaleIO component and ScaleIO Gateway servers meet the system requirements.

This step prepares the Gateway (GW) server. The Gateway includes the Installation Manager (IM), which is used to deploy the system in the next steps. To install ScaleIO on Linux nodes, the GW server can be a Windows or Linux server. To install ScaleIO on Windows nodes, or to install in a mixed-OS environment, the IM server must be a Windows server.

Procedure

1. Download (and extract) the ScaleIO packages, either from the product ISO or the EMC Support Site:

   a. Management files:

   - Gateway
     - Windows Gateway: `ScaleIO Gateway for Windows Download`
   - GUI - `ScaleIO GUI for Windows Download`

   b. ScaleIO component files:

   - Xen: `ScaleIO <Operating System> Download` (for example ScaleIO 2.0.1.4 XEN 7.0 Download)

2. Create the Gateway server:

Operating system	Steps
Ubuntu	Run the following command (all on one line), where *new_GW_admin_password* is a password that you define to access the IM: `GATEWAY_ADMIN_PASSWORD=<new_GW_admin_password> dpkg -i /tmp/ EMC-ScaleIO-gateway-2.0-14000.X.deb`
Windows	a. From the extracted download file, copy the ScaleIO Gateway MSI to the IM server: `EMC-ScaleIO-gateway-2.0-14000.X-x64.msi` b. Run the file, and enter a new Gateway admin password that will be used to access the IM. c. Prepare disks for storage: a. Ensure that devices to be used are on-line, and initialized as MBR or GPT. b. On each disk, use the Windows Disk Management to create a new, simple volume. Assign a drive letter, and select **Do not format this volume**

The GW server is ready.

3. Log in to the GW server, by pointing your browser to this URL: `https://<GW_Server_IP_Address>`, where *GW_Server_IP_Address* is the IP address of the server where you installed the GW package.

   Use the default username, admin, and the GW admin password you created in the previous step.

4. If prompted, accept the certificate warning (or install your own certificate for the Tomcat server).

   The Installation Manager **Welcome to ScaleIO** window appears. If the Welcome window does not appear, see "Troubleshooting" in the *ScaleIO Deployment Guide*.

Start the deployment

Use the Installation Manager to start the ScaleIO deployment.

Procedure

1. Upload packages:

   a. From the **Welcome** screen, select the **Packages** tab.

      The **Manage Installation Packages** window appears.

   b. Click **Browse**, and select all the extracted ScaleIO component installation packages, for all relevant operating systems.

      Minimally, you must select these packages:

      - LIA

- MDM
- SDC
- SDS (The SDSx packages are not needed.)

c. Click **Open**.

d. Click **Upload**.

The packages are uploaded to the IM, and are displayed in the file table.

2. Click **Proceed to Install**.
3. In the **Provide Installation Topology** screen, click **Installation wizard**.
4. Select the format of the MDM cluster to create:

Option	Description
3-node cluster (default)	Configures a Master MDM, a Slave MDM, and a TieBreaker MDM.
5-node cluster	Configures a Master MDM, two Slave MDMs, and two TieBreaker MDMs.

The **Installation Configuration** window appears.

5. Enter a new MDM password and LIA password.

   Passwords must meet the following criteria:

   - Length is between 6 and 31 (ASCII-printable) characters
   - No white spaces
   - Must include at least 3 of the following groups: [a-z], [A-Z], [0-9], or special chars (!@#$ ...).

6. Review, and accept, the end user license agreement.
7. In the **Topology** section, enter server information:

   The **Topology** section is populated with nodes, according to the MDM cluster chosen in the previous step. Each node is also defined as an SDS and an SDC.

   a. For each node, change the IP address, select the host operating system, and enter the host password (the password of the root user).

   b. To add more hosts, click **Clone host**.

   The assigned IP address is derived from the IP address of the previous host. Each cloned host is enabled to act as an SDS and an SDC.

8. Click **Start Installation**.

   A post-installation notice appears. Its content is described in this document.

Monitor the deployment

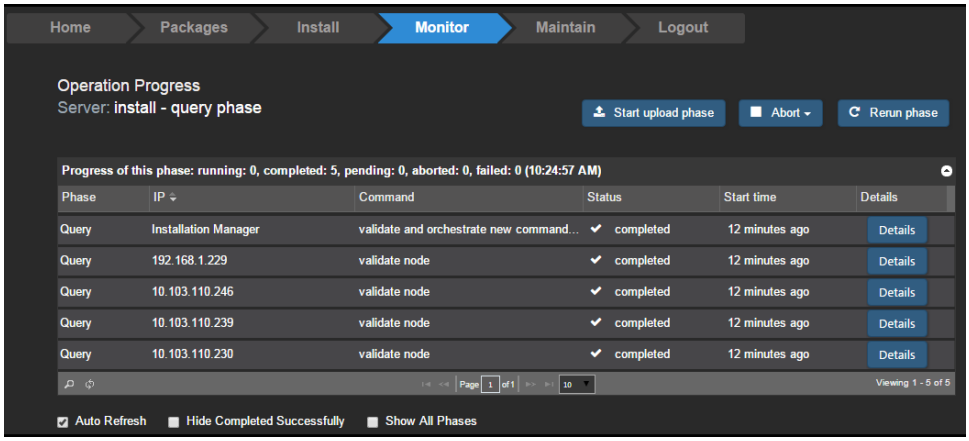
For the ScaleIO deployment to proceed, you must monitor and approve the deployment progress.

The deployment wizard performs the following phases: query, upload, install, and configure.

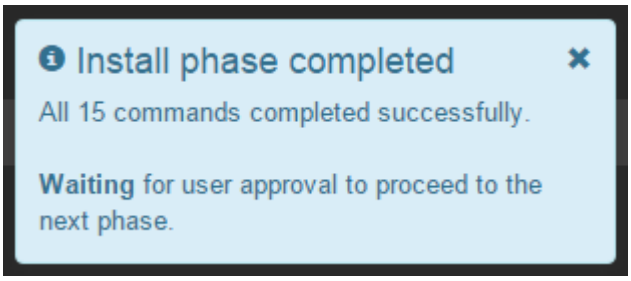
Procedure

1. Click the **Monitor** tab.

   The **Install-query** screen appears:



   When each step completes, a message appears that describes the step progress:



2. When the Query phase is complete, click **Start upload phase**.
3. When the Upload phase is complete, click **Start install phase**.
4. When the Install phase is complete, click **Start configure phase**.
5. When the `Completed Install Operation` message is displayed, click **Mark operation completed**.

Results

The wizard installation creates one Protection Domain and one Storage Pool, both with the name `default`.

After you finish

Best practice is to use the ScaleIO System Analysis tool to analyze the ScaleIO system immediately after deployment, before provisioning volumes, and before using the system in production.

Post-deployment tasks

After ScaleIO has been deployed, there are steps to be done to use the system.

The rest of this document describes steps that may need to be done to use the ScaleIO system in your environment.

Enable the storage

After ScaleIO is deployed, you can enable storage.

Before you begin

You must issue these commands from the Master MDM node, either directly, or via SSH.

Ensure that you have the authentication credentials.
The ScaleIO CLI (SIOCLI) is installed as part of the MDM component and can be found in the following path:

- XenServer — `siocli`

After the ScaleIO system is installed, follow these steps to enable using the storage.

Procedure

1. Add SDS devices:

   You can also add devices with the ScaleIO GUI.

   - You must add at least one device to at least 3 SDSs, with a minimum of 100 GB free storage capacity per device.
   - Balance the total device capacity over all SDSs.

   a. Log in to the ScaleIO cluster:

   ```
   siocli --login ---username <MDM_USERNAME> --password
   <MDM_PASSWORD>
   ```

   Note

   If bash completion isn't enabled, run: `/etc/bash_completion.d/siocli`

   b. Add devices using the following command:

   ```
   siocli --add_sds_device --sds_ip <IP> --
   protection_domain_name <NAME> --storage_pool_name <NAME> --
   device_path <DEVICE_PATH>
   ```

   Examples:

   - XenServer:

   ```
   siocli --add_sds_device --sds_ip 192.168.212.10 --
   protection_domain_name default --storage_pool_name
   default --device_path g
   ```

2. Add and map a volume:

a. Add a volume using the following command:

```
siocli --add_volume --protection_domain_name <NAME>--
storage_pool_name <NAME> --size_gb <SIZE> --volume_name
<NAME>
```

Example:

```
siocli --add_volume --protection_domain_name default --
storage_pool_name default --size_gb 16 --volume_name vol01
```

b. Map a volume to an SDC using the following command:

```
siocli --map_volume_to_sdc --volume_name <NAME> --sdc_ip
<IP>
```

Example:

```
siocli --map_volume_to_sdc --volume_name vol01 --sdc_ip
192.168.212.19
```

You can use the GUI or the CLI `--query_all` command to see the installed nodes and storage.

Results

Now you can start using your storage. For best results, it is recommended to review the *EMC ScaleIO User Guide*.

Installing and opening the ScaleIO GUI

You can open the GUI after it is installed on your workstation.

Perform the instructions in the following topics to install and open the ScaleIO GUI.

Install the ScaleIO GUI

You can install the ScaleIO GUI.

Before you begin

- Ensure that the workstation satisfies the requirements described in the "System Requirements" section of the documentation.
- Get the installation file, `ScaleIO GUI for Windows Software Download`, either from the product ISO or the EMC Support Site.

Procedure

1. Install the GUI:

```
EMC-ScaleIO-gui-2.0-14000.X.msi
```

After you finish

To log in to the GUI, see "Logging in to the ScaleIO GUI."

Log in to the ScaleIO GUI

Open and log in to the ScaleIO GUI.

Before you begin

Ensure that:

- The GUI software is installed on the workstation. To install the GUI, see "Installing the ScaleIO GUI."
- You have these credentials (available from the administrator):
  - MDM management IP address or hostname
  - Username (default: admin)
  - Password (defined during deployment)

Procedure

1. Open the GUI by selecting **Start** > **All Programs** > **ScaleIO GUI**.
   The initial login screen is displayed.
2. Type the IP address or hostname and click **Connect**.
   If a certificate notice is displayed, review and accept the certificate.

   If a login banner is displayed, confirm it to continue.
3. In the login screen, type the username and password, and click **Login**.

Results

The ScaleIO GUI is displayed.

After you finish

Users and passwords are configured with the ScaleIO CLI. For more information, see the "Security" chapter of the *ScaleIO User Guide*.

Associating ScaleIO volumes with physical disks

This section describes how to associate volumes with physical disks.

Contact ScaleIO Customer Support for access to the troubleshooting utility.

To get ScaleIO volume information, run the `scli --query_all_volumes` (or `--query_all` or `--query_volume`) command.

Output similar to the following appears:

```
Query-all-volumes returned 10 volumes
Protection Domain 0728185d00000000 Name: pd1
Storage Pool ad99eaab00000000 Name: default
<No volumes defined>

Storage Pool ad99eaac00000001 Name: sp1
Volume ID: fac22a6300000000 Name: vol0 Size: 152.0 GB (155648 MB) Mapped to 1 SDC Thick-provisioned
Volume ID: fac22a6400000001 Name: vol1 Size: 400.0 GB (409600 MB) Mapped to 1 SDC Thin-provisioned
Volume ID: fac22a6500000002 Name: vol2 Size: 80.0 GB (81920 MB) Mapped to 1 SDC Thick-provisioned
Volume ID: fac22a6600000003 Name: vol3 Size: 392.0 GB (401408 MB) Mapped to 1 SDC Thick-provisioned
Volume ID: fac22a6700000004 Name: vol4 Size: 96.0 GB (98304 MB) Mapped to 1 SDC Thin-provisioned
Volume ID: fac22a6800000005 Name: vol5 Size: 112.0 GB (114688 MB) Mapped to 1 SDC Thick-provisioned
Volume ID: fac22a6900000006 Name: vol6 Size: 96.0 GB (98304 MB) Mapped to 1 SDC Thin-provisioned
Volume ID: fac22a6a00000007 Name: vol7 Size: 176.0 GB (180224 MB) Mapped to 1 SDC Thick-provisioned
Volume ID: fac22a6b00000008 Name: vol8 Size: 272.0 GB (278528 MB) Mapped to 1 SDC Thick-provisioned
Volume ID: fac22a6c00000009 Name: vol9 Size: 360.0 GB (368640 MB) Mapped to 1 SDC Thin-provisioned
```

This output shows the Volume ID and name, as well as other volume information.

Adding a volume in XenServer environment

You enable use of volumes in HA, by enabling the volumes to be recognized as HBA.

This procedure is relevant for XenServer v6.5 and XenServer v7.0.

Procedure

1. Use the ScaleIO CLI to add and map a ScaleIO volume, as described in "Creating volumes" in the *ScaleIO User Guide*.
2. Get the host UUID by running the following command:

```
xe host-list
```

3. For XenServer v6.5 and v7.0, edit the file `/etc/lvm/lvm.conf` by editing the lines that starts with `types`, and adding `"scini", 16` inside the square brackets.

   Example:

```
types = ["nvme", 64, "mtip32xx", 64, "scini", 16]
```

4. For XenServer v7.0 (only), edit `/etc/lvm/master/lvm.conf`, as follows:
   a. Locate the lines that begin with `types`.
   b. In each of these lines, add this string inside the square brackets: `"scini", 16`

```
    types = ["nvme", 64, "mtip32xx", 64, "scini", 16]
```

5. Use the retrieved host UUID while running the `sr-create` command.

Note

ScaleIO provides a unique ID to each volume. It is highly recommended to use the unique ID when running on XenServer. For example, the ScaleIO volume name in the hypervisor is `/dev/disk/by-id/scsi-emc-vol-4a7987a751237ae0-3d467d3900000000`.

Example

```
xe sr-create host-uuid=09fa5d27-aa08-4c71-86bb-71dc73e9f59f
content-type="ScaleIO" name-label="ScaleIO" shared=true
device-config:SCSIid=emc-
vol-4a7987a751237ae0-3d467d3900000000 type=lvmohba
```

Note

To add a shared storage repository, the following conditions must be fulfilled:

- All nodes in the XenServer Center Storage Pool must be installed with SDC.

- The ScaleIO volume to be used as the shared SR must be mapped to all SDCs in the Storage Pool.

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