2-Layer Environment EMC ScaleIO

Version 2.0.x

Quick Start Guide

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EMC²

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CHAPTER 1

Deploying ScaleIO in a 2-Layer Environment

This document describes how to deploy ScaleIO in a 2-Layer environment, when the Backend is on Linux servers. The SDC can be on ESXi, Linux, or Windows servers. Topics include:

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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 topic provides an overview of deploying ScaleIO in a 2-layer configuration.

Deployment begins with preparing the Linux Backend, using the Installation Manager (IM).

For Linux and Windows SDC servers, you can install the SDC using the IM, or you can install the SDC manually. Both methods are described in this document.

For ESXi SDC servers, it is recommended to install the SDC using the VMware plug-in, or you can install it manually. Both methods are described in this document.

For all other cases and customization options, use the procedures described in the *EMC ScaleIO Deployment Guide*.

Note

The EMC-supplied hardware configurations satisfy all of the hardware requirements.

Before deploying ScaleIO on ESX servers:

- The host from which you run the PowerShell (.ps1) script must meet the following prerequisites:
  - Runs on supported Windows OS
  - PowerCLI is installed
  - Java is installed
  - Has incoming and outgoing communication access to the vCenter
- The vSphere web client (Virgo) server must have network connectivity to the host on which the PowerShell script will be used.
- Configure the required network interfaces and IP addresses.

- Configure disks do they are visible to the operating system according to operating system and vendor hardware guidelines. .
- For the most up-to-date information about this release, see *EMC ScaleIO Release Notes* for your version, available from EMC Online Support (https://support.emc.com).

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.

ScaleIO deployment steps:

1. Prepare the Linux environment.
2. Start the Linux deployment. For Linux and Windows SDC servers, this may include installing SDCs.
3. Monitor the deployment.
4. For ESX servers, register the vSphere plug-in and install and configure the SDCs.
5. Manually install and configure SDCs (if you have not done so yet).
6. Run the system analysis.
7. Post-deployment options:
   - Enable storage.
   - Run the GUI.

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, or together with an MDM or SDS. Do not install the Gateway on an SDC server or on an SDS on which RFcache will be enabled.

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) 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 To calculate SVM memory allocation, use the formulas provided in the *ScaleIO Deployment Guide*.
Disk space	• 1 GB for each physical node or Xen hypervisor • 10 GB for VMware topologies
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

Table 1 Server physical requirements (continued)

Component	Requirement
	▪ 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
Linux	Supported versions: • CentOS 6.x-7.x, Oracle Linux 6.5/7.x • Red Hat 6.x-7.x • SUSE 11.3, 11.4, 12, 12.1, 12.2 • Ubuntu 14.04, Ubuntu 16.04 **Note** Before deploying on Ubuntu servers, you must prepare the environment, as described in the *EMC ScaleIO Deployment Guide*. Packages required for all components, all Linux flavors: • numactl • libaio Additional packages required for MDM components: • bash-completion (for SCLI completion) • Latest version of Python 2.X When installing the MDM component on Linux CentOS 6 or RHEL 6 hosts (for software-only systems), set the shared memory parameter in the /etc/sysctl.conf file to at least the

Table 2 Supported operating systems - ScaleIO components (continued)

Operating system	Requirement
	following value: kernel.shmmax=209715200. To use this value, type the `sysctl -p` command. To use the secure authentication mode, ensure that OpenSSL 64-bit v1.0.1 or later (v1.1, however, is not supported) is installed on all servers in the system. To use the secure authentication mode on SUSE 11.3/11.4 servers, ensure that the OpenSSL on the server is v1.0.1 or later (v1.1, however, is not supported), or install these packages (from the ISO in the Complete VMware SW download container) on the server: • `libopenssl1_0_0-1.0.1g-0.40.1.x86_64.rpm` • `openssl1-1.0.1g-0.40.1.x86_64.rpm` To use LDAP, ensure that OpenLDAP 2.4 is installed on all servers.
Hypervisors	• VMware ESXi OS: 5.5 U3, 6.0 U3, or 6.5, managed by vCenter 5.5 or 6.0 • Red Hat KVM

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).

Component	Requirement
	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
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*.

Preparing the Linux environment

Prepare the Linux environment before deploying ScaleIO.

Before you begin

Ensure that all ScaleIO components and the ScaleIO Gateway server 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. The GW server can be a Windows or Linux server.

Procedure

1. Download and extract the following files for this version:
   - ScaleIO Gateway for Linux (or Windows) Download
   - ScaleIO GUI for Windows Download
   - ScaleIO *<Operating System>* Download (for example, ScaleIO 2.0 RHEL7 Download)

2. Create the Gateway server by running 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> rpm -U /tmp/
EMC-ScaleIO-gateway-3.0-<build>.X.x86_64.rpm --nodeps
```

   The GW server is ready.

3. Log in to the GW server by typing the following URL in your browser: 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 password you created in the previous step.

4. Accept the certificate warning; alternatively, install your own certificate for the Tomcat server.

   The Installation Manager **Welcome** screen appears.

   Note

   If the **Welcome** screen does not appear, see the Troubleshooting section in the *EMC ScaleIO Deployment Guide*.

Start the Linux deployment

Use the Installation Manager (IM) to start the Linux deployment.

Procedure

1. From the **Packages** tab, upload the ScaleIO installation packages.
2. Click **Proceed** to install.
3. Enter the ScaleIO Backend nodes' information in a CSV topology file.

   In 2-layer configuration, the Linux servers will form the MDM cluster, and each of those servers will also be SDS.
   The following example shows a sample CSV topology file, only those columns with values in them:

A	B	C	D	E	F	G	H	K	L	M	N
Password	Operating	Is MDM/TB	MDM Mgmt IP	MDM IPs	Is SDS	SDS Name	SDS All IPs	Protection	SDS Device List	SDS Pool List	Is SDC
Scaleio123	Linux	Secondary	10.76.61.177	2.3.4.177,3.4.5.177	Yes	sds_177	2.3.4.177,3.4.5.177	pd1	/dev/sdb,/dev/sdc,/dev/sdd	sp1,sp2,sp3	No
Scaleio123	Linux	TB	10.76.61.178	2.3.4.178,3.4.5.178	Yes	sds_178	2.3.4.178,3.4.5.178	pd1	/dev/sdb,/dev/sdc,/dev/sdd	sp1,sp2,sp3	No
Scaleio123	Linux	Primary	10.76.61.207	2.3.4.207,3.4.5.207	Yes	sds_207	2.3.4.207,3.4.5.207	pd1	/dev/sdb,/dev/sdc,/dev/sdd	sp1,sp2,sp3	No
Scaleio123	Linux				Yes	sds_176	2.3.4.176,3.4.5.176	pd1	/dev/sdb,/dev/sdc,/dev/sdd	sp1,sp2,sp3	No
Scaleio123	Linux				Yes	sds_179	2.3.4.179,3.4.5.179	pd1	/dev/sdb,/dev/sdc,/dev/sdd	sp1,sp2,sp3	No
Scaleio123	Linux				Yes	sds_180	2.3.4.180,3.4.5.180	pd1	/dev/sdb,/dev/sdc,/dev/sdd	sp1,sp2,sp3	No

   Note

   When specifying the Linux SDS devices, use persistent device names. You can find these names by running the command: `# ls -l /dev/disk/by-id/ *`.

4. Add SDCs:

Server OS	Perform one of the following
Linux or Windows	• Use the IM, by adding a row for each SDC, as described in CSV topology file for 2-layer deployment on page 16. • Add manually after deploying the system, as described in Install and configure the SDC manually on page 20.
ESXi	• Use the VMware plug-in, later in the process, as described later in this document. • Add manually after deploying the system, as described in Install and configure the SDC manually on page 20.

The CSV is complete.

5. Upload the installation CSV file.
6. In the **Review Installation Configuration** window, enter the required passwords and other optional information.
7. Click **Start Installation**.

CSV topology file for 2-layer deployment

When deploying SDC nodes on a Linux or Windows server in a 2-layer environment, add SDC rows to the CSV that only contain the values listed in this table.

Table 3 CSV topology spreadsheet-2-layer

Field	Description	Required
Domain	If using a domain user, the name of the domain (not relevant for Linux)	
Username	The name of the user. In Linux, this value is always `root`; in Windows, a user with administrator rights (default: `administrator`).	Yes
Password	Password used to log in to the node. In Linux, the root password. In Windows, the password of a user with administrator rights.	Yes
Operating System	The server's OS: `linux` or `windows`	Yes
SDS-SDC Only IPs	SDS IP addresses to be used for communication among SDS and SDC nodes only. Comma-separated, no spaces. **Note** For SDC-only nodes, enter the IP in this column.	Yes
Is SDC	`Yes`	Yes
perfProfileForSDC	Optional performance profile to set for SDCs. `High` or `Default` (same as leaving this field empty).	
SDC Name	Name for the SDC.	

Monitoring the deployment

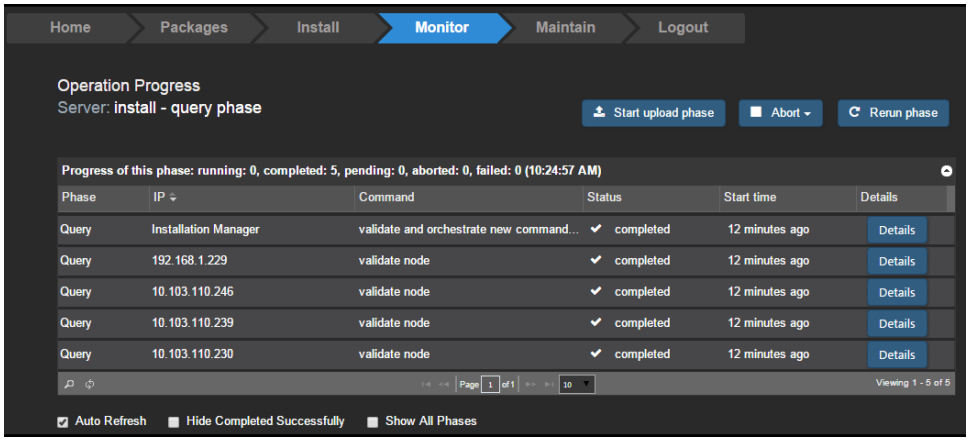
Monitor and advance the ScaleIO deployment.

The deployment wizard performs the following phases: query, upload, install, and configure. You must monitor and approve moving from one phase to the next.

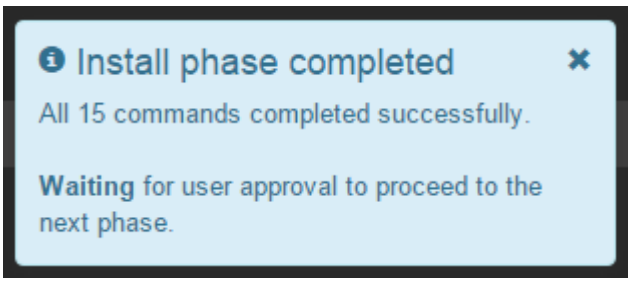
Procedure

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**.

   The **Install - upload** screen appears, displaying which ScaleIO packages are being uploaded to each server, and the status of each command.

3. When the previous phase is complete, click **Start install phase**.

   The **Install - install** screen appears, displaying the status of the installation commands.

4. When the previous phase is complete, click **Start configure phase**.

   The **Install - configure** screen appears, displaying the status of the configuration commands.

5. When the `Completed Install Operation` message appears, click **Mark operation completed**.

Results

The wizard installation creates one **Protection Domain** and one **Storage Pool**, both with default names, and used for creating volumes from devices.

After you finish

It is highly recommended to run the ScaleIO system analysis to analyze the ScaleIO system immediately after deployment, before provisioning volumes, and before using the system in production. For more information, see "System analysis overview."

Registering the VMware plug-in

This topic describes how to register the ScaleIO VMware plug-in.

Procedure

1. Prepare the files:
   a. From the EMC Online Support site (https://support.emc.com), download and extract the `ScaleIOVMware Software Download` for this version.
   b. From the extracted files, copy the following file to your designated host: `EMC-ScaleIO-vSphere-plugin-installer-3.0-<build>.X.zip`
   c. Extract the contents of the zip file.
2. With PowerCLI for VMware, set to Run as administrator, run the following script:

   ```
   ScaleIOPluginSetup-3.0-<build>.X.ps1
   ```

   a. Enter vCenter name or IP address, user name, and password.
   b. For `Choose Mode`, choose option **1, Register ScaleIO plug-in**.
   c. Read the upgrade notice, and enter `y` to continue.
   d. For `Registration`, choose either **Standard** (simplified, using embedded Tomcat), or **Advanced** (to use an external web server or previously installed ScaleIO gateway).

      To use the advanced options, refer to the *ScaleIO Deployment Guide*.
   e. Accept the thumbprint (if required).
3. Load the plug-in by logging out, and then logging back in to the vSphere web client.
4. Return to the PowerCLI window, and press ENTER to return to the script menu and complete the plug-in installation.
5. Go to the **Home** tab and verify that the ScaleIO icon is visible in the **Inventories** section.

   The plug-in is registered. If the ScaleIO icon is missing, the vSphere web client server failed to register the plug-in, due to one of the following reasons:

   - Connectivity problem between the vSphere web client server and the web server storing the plug-in (for example, network / firewall etc.). Resolution: Verify that there is communication between the vSphere web client server and the web server storing the plug-in.

- URL problem when using an external web server. Resolution: Verify that the URL is https:// and is pointing to the correct web server IP address (ScaleIO Gateway).

Installing SDC on ESX with vSphere plug-in

Use the ScaleIO vSphere plug-in to install the SDC on ESX servers and deploy a ScaleIO system.

Procedure

1. Prepare the ESX hosts:
   a. Log in to the vSphere web client.
   b. Open the **ScaleIO** screen by clicking the **EMC SIO** icon.
   c. From the **Basic Tasks** section of the **ScaleIO** screen, click **Pre-Deployment Actions**.

      The **Pre-Deployment Actions** screen appears.
   d. Drill-down on the vCenter to display connected ESX hosts.
   e. For every ESX host that might be part of this ScaleIO system (even if only in the future):
      a. Select **Install SDC**.
      b. To configure DirectPath (optional), select **Configure DirectPath**. (This step selects the Install SDC, too.)
      c. Do not select **Convert ISO**. This feature is in preparation for a future release of ScaleIO Ready Node.
      d. Type **ESX Root Password**.
   f. Click **Run**.

      The status appears in the dialog.
   g. When finished, click **Finish**.
   h. You must restart the ESX hosts before proceeding.
2. Register the system:
   a. From the VMware plug-in **ScaleIO** screen, click **Register ScaleIO system**.
   b. Enter the credentials of the system.
   c. Click **OK**.
3. Deploy ScaleIO:
   a. From the **ScaleIO** screen, click **Deploy ScaleIO environment**.

      The **ScaleIO** deployment wizard is displayed.
   b. In the **Select Installation** screen, select **Add servers to a registered ScaleIO system**, and select the system that you want to extend.
   c. Continue with the deployment steps, adding the new SDC nodes.

      You can skip steps that do not need to be changed. When adding components, the wizard adjusts the displayed screens to options that are relevant to the current ScaleIO system.

4. Complete the deployment.

   For further details, see the *ScaleIO Deployment Guide*.

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.

Install and configure the SDC manually

Install and configure SDC nodes manually.

Perform the OS-specific instructions for your environment.

Installing SDC on an ESX server and connecting it to ScaleIO

Install the SDC with the appropriate parameters to connect it to an existing ScaleIO system.

Before you begin

Ensure that you have:

- The virtual IP address or MDM IP address of the existing system
- Login credentials for the SDC
- The appropriate installation packages for the SDC
- Access to the drv_cfg tool. Contact EMC support for access to this tool on ESX.

The following procedure describes installing an external SDC on an ESX server using the esxcli. Alternatively, you can install the external SDC using the vSphere plug-in. For more information, see "Installing the SDC on ESX hosts" in the *ScaleIO Deployment Guide*.

Procedure

1. On the ESX on which you are installing the SDC, set the acceptance level:

   ```
   esxcli --server=<SERVER_NAME> software acceptance set --
   level=PartnerSupported
   ```

   where *<SERVER_NAME>* is the ESX on which you are installing the SDC.

2. Install the SDC:

   ```
   esxcli software vib update -d “Full Path”
   ```

3. Set the IP address of the MDM:

   ```
   esxcli system module parameters set -m scini -p
   "IoctlIniGuidStr=<XXXXXX> IoctlMdmIPStr=<LIST_VIP_MDM_IPS>"
   ```

   where

   - *<LIST_VIP_MDM_IPS>* is a comma-separated list of the MDM IP addresses or the virtual IP address of the MDM

- *<XXXXXX>* is the version

Results

The SDC is installed on the ESX server and is connected to the ScaleIO system.

Installing SDC on a Linux server and connecting it to ScaleIO

Install the SDC with the appropriate parameters to connect it to an existing ScaleIO system.

Before you begin

Ensure that you have:

- The virtual IP address or MDM IP address of the existing system
- Login credentials for the SDC
- The appropriate installation packages for the SDC

The following procedure describes manually installing an external SDC on a Linux server. Alternatively, you can install the external SDC using the Installation Manager. For more information, see "Extending an existing ScaleIO system" in the *ScaleIO Deployment Guide*.

Procedure

1. Install the SDC:

```
MDM_IP=<LIST_VIP_MDM_IPS> rpm -i <SDC_PATH>.rpm
```

   where

   - *<LIST_VIP_MDM_IPS>* is a comma-separated list of the MDM IP addresses or the virtual IP address of the MDM
   - *<SDC_PATH>* is the path where the SDC installation package is located

Results

The SDC is installed on the Linux server and is connected to the ScaleIO system.

Installing SDC on a Windows server and connecting it to ScaleIO

Install the SDC with the appropriate parameters to connect it to an existing ScaleIO system.

Before you begin

Ensure that you have:

- The virtual IP address or MDM IP address of the existing system
- Login credentials for the SDC
- The appropriate installation packages for the SDC

The following procedure describes manually installing an external SDC on a Windows server. Alternatively, you can install the external SDC using the Installation Manager. For more information, see "Extending an existing ScaleIO system" in the *ScaleIO Deployment Guide*.

Procedure

1. On the Windows server on which you are installing the SDC, run:

```
msiexec /i <SDC_PATH>.msi MDM_IP=<LIST_VIP_MDM_IPS>
```

   where

   - *<SDC_PATH>* is the path where the SDC installation package is located
   - *<LIST_VIP_MDM_IPS>* is a comma-separated list of the MDM IP addresses or the virtual IP address of the MDM

Results

The SDC is installed on the Windows server and is connected to the ScaleIO system.

System analysis overview

This topic describes ScaleIO system analysis and the environment required to use it.

ScaleIO system analysis enables you to identify potential issues with your ScaleIO system which may prevent best performance. It is highly recommended to analyze the ScaleIO system immediately after deployment, before provisioning volumes, and before using the system in production. You can also use it to check the health of a system that is already operational.

The system analysis is invoked from the ScaleIO Installation Manager (IM). The analysis checks the following:

- ScaleIO components are up and running
- Ping between two relevant nodes in the system
- Connectivity within the ScaleIO configuration (for example, connectivity between SDSs within a Protection Domain, connection of SDCs with the cluster virtual IP address)
- Network configuration
- RAID controller and device configuration

Using the system analysis, you can detect any potential issues in the system, then rectify them, before provisioning and using the system in a production environment.

Environment requirements and prerequisites:

- Supports only RHEL 6.x servers, with the following 3rd-party tools:
  - Netcat
  - StorCLI
  - PERCCLI
  - smartctl
- Requires a ScaleIO Gateway server:
  - On a Linux or Windows server. ScaleIO is tested on RHEL 6.x and RHEL 7.x as well as Windows2K12 servers.
  - With at least 1 GB of free disk space per node in the system
- A web browser, that is supported by the IM.
- Supports LSI RAID controller cards.

- Supports IPv4 network configuration.

Best-practice recommendation:

1. Deploy ScaleIO.
2. Analyze system to identify issues that should be fixed.
3. Fix issues.
4. Analyze system to verify that the issues have been fixed.
5. When the system meets your satisfaction, you can move it into production.

Limitations and compatibility:

- On servers with IPv4 and IPv6, the IPv6 (only) analysis is not conclusive; IPv6 is not supported.
- On servers with MegaRAID, the RAID function analysis is not supported; only StorCLI is supported.
- On servers with multiple SDSs, analysis is performed but it is not conclusive.
- RFcache analysis is not performed.
- Due to default Internet Explorer settings, to expand a report, you may need to grant permission for IE to run scripts. For more information, see the version release notes.

Creating the system analysis report

The topic describes how to create and display the ScaleIO system analysis report.

Before you begin

Ensure that you have access to the following:

- A web browser that is supported by the ScaleIO Installation Manager (IM)
- IP address of the ScaleIO Gateway server
- The Gateway admin username (default: admin) and password (defined during deployment)
- Master MDM IP address, username, and password (defined during deployment)
- LIA password

Procedure

1. Log in to the IM server:
   a. Point your browser to **https://*<IM_Server_IP_address>***

      where **<IM_Server_IP_address>** is the IP address of the server on which the Gateway package is installed.

      The **ScaleIO Installer** login screen is displayed.

   b. If a login banner is displayed, accept it to continue.

   c. Type the Gateway username (default is admin) and password.

   d. Click **Login**.

      The **ScaleIO Installer Home** screen is displayed.
2. Generate the system analysis report:
   a. Click the **Maintain** tab.

      The **Maintenance operation** screen is displayed.

If a warning is displayed that indicates that a previous operation is not completed, it means that the last IM operation was not marked as complete. To continue, click the **Monitor** tab, mark the operation complete, then return to the **Maintain** tab.

b. Enter the authentication credentials:

- Master MDM IP address, user name, and password
- LIA password

c. Click **Retrieve system topology**.

The system topology is displayed.

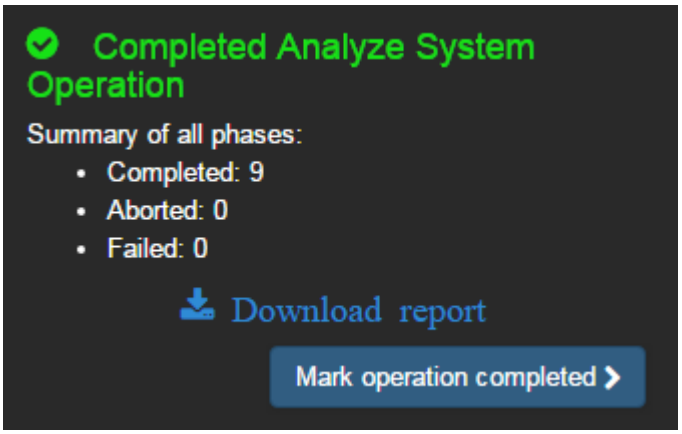
d. Click **Analyze System**.

The system analysis begins.

e. Monitor the progress of the system analysis by clicking the **Monitor** tab.

When the process completes (which could take several minutes), a **Download report** link is displayed.

f. Click the **Download report** link.



The report is saved, in ZIP format, in the default download location of the server on which the report was run.

g. To enable the IM to be available for subsequent operations, click **Mark operation completed**.

3. Display the analysis report:

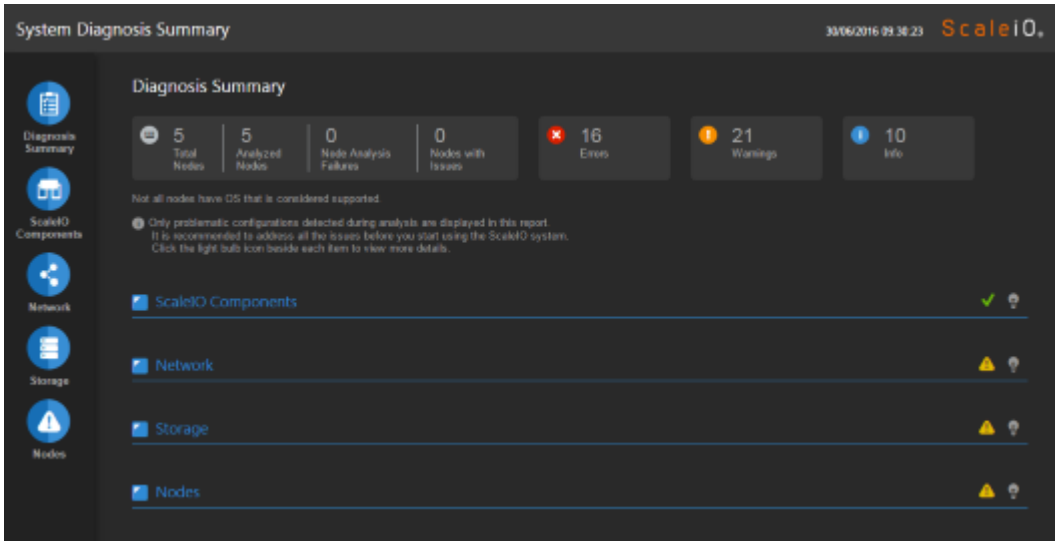
a. Unzip the downloaded file.

The file includes the `ScaleioSystemDiagnosisReport.html` analysis file, and several TGZ files (one for each node, in the `dumps` folder).

b. Double-click `ScaleioSystemDiagnosisReport.html`.

Results

The **System Diagnosis Summary** report is displayed in the default web browser on your computer.

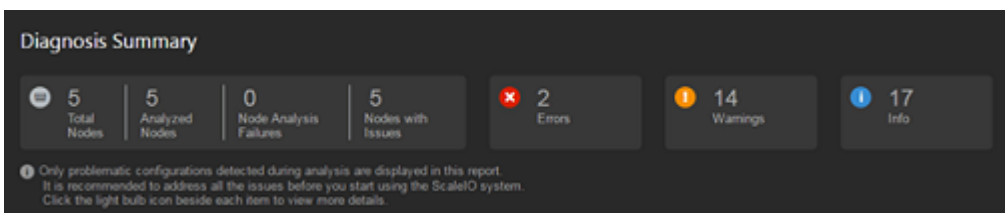


System analysis report description

This topic describes how to get the most benefit from the system analysis report.

At the top of the report, the Diagnosis Summary shows the number of the issues that have been detected system-wide. The summary shows the following categories:

- Node analysis
  - How many nodes are analyzed
  - How many nodes could not be analyzed
  - How many nodes have issues
- Severity analysis
  - How many issues of each severity level were found

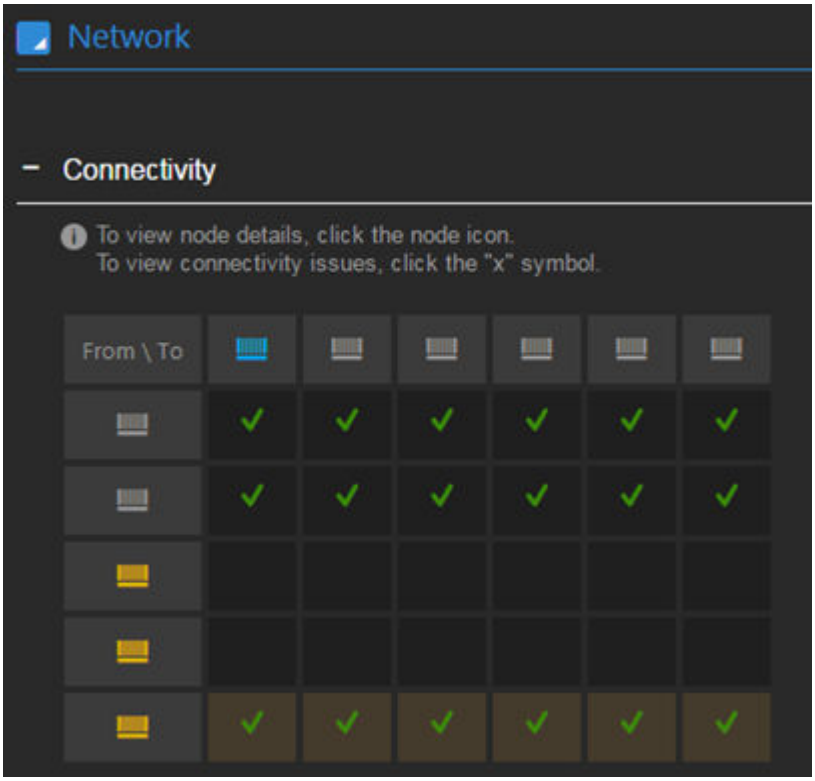


When the analysis first opens, the major sections are shown in summary form. You can expand them to show detailed diagnostic reports, as follows:

- ScaleIO components:
  This section of the report shows the non-running ScaleIO server components, that is, SDS, SDC, and MDM. Failure of these components may affect system performance and data availability. Each of the ScaleIO server components supports the following functionality:
  - SDS server
    The SDS (ScaleIO Data Server) manages the capacity of a single server and acts as the back-end for data access. The SDS is installed on all the servers contributing storage devices to the ScaleIO system. Failure of an SDS may affect the cluster performance and data availability.
  - SDC server
    The SDC (ScaleIO Data Client) server is installed on each server that needs access the ScaleIO storage and it is the gateway to the ScaleIO storage. Failure of an SDC server denies its application access to the ScaleIO storage.

- MDM server
  The MDM (Meta Data Manager) server controls and monitors the ScaleIO system. Failure of an MDM may affect the cluster performance and data availability.

- Network:
  This section of the report checks the connectivity between various ScaleIO components, as well as the NIC configuration and performance. The network issues may impact the system performance and data availability.



  - Connectivity
    Performing pings between ScaleIO components leads to detecting and resolving connectivity-related issues in the system. If the regular pings succeed, then the MTU pings, followed by the Ncat pings are performed to the ports used by the ScaleIO application.

    If virtual IP addresses are assigned to the MDMs in the cluster, a logical host, called *MDM cluster* is displayed (represented by a blue host icon) in the analysis report. The following issues are tested:

    - SDC connectivity with the virtual IP addresses.
    - All virtual IP addresses are configured.
    - Only one physical node is configured to use the virtual IP address.

    To view specific information:

    - To view the node details, click the node icon.
    - To view connectivity issues, click the X symbol

  - NIC Configuration and Performance
    This section of the report displays the configurations that do not meet the best practice recommendations described in the user documentation.

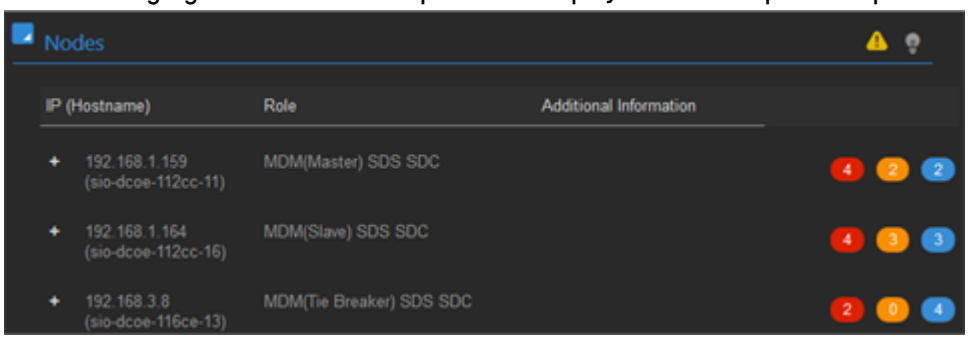
  - MDM cluster
    Shows status of virtual IP addresses assigned to the MDMs in the cluster.

- Storage:
  The Storage section of the report describes the issues associated with the RAID controllers, storage devices, and Storage Pool configurations.
  - RAID Controller
    Describes the issues related to the physical disks
  - Devices
    Describes the list of problematic or potentially problematic storage devices
  - Storage Pool Uniformity
    Indicates Storage Pools with non-homogeneous disk performance
- Nodes (groups all of the reported issues per node): Describes the detected issues, as listed above, grouped by node

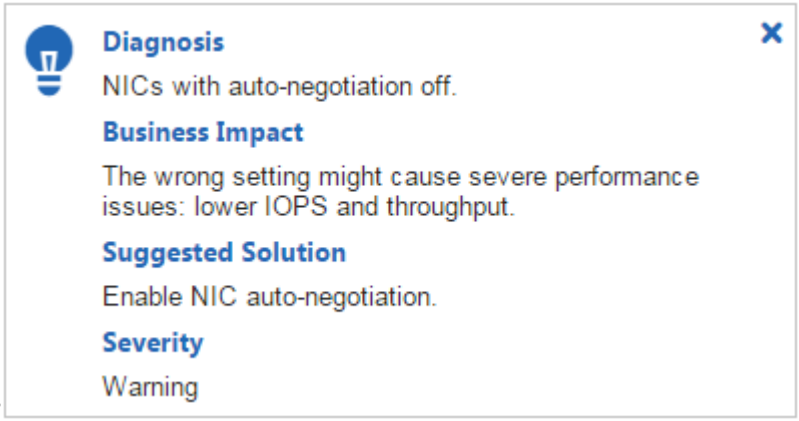
You can show more (or less) information, as follows:

- Use the Expand ( ) button and + symbol to drill down.
- Use the Collapse ( ) button and – symbol to hide information.

The following figure shows an example of the display when the report is expanded.



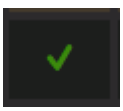
You can show additional details of an error by clicking the ( ) icon. A pop-up window similar to the following is displayed.



The following table describes how to navigate the analysis information:

To display this...	Click this symbol...
Diagnosis Summary	
ScaleIO component issues, sorted according to SDS, SDC, and MDM.	
Network connectivity (including virtual IP address configuration) and NICs	
Storage, including RAID controller, devices, and Storage Pool uniformity	
Nodes, displayed according to IP address and system role	
Collapse a list	
Expand a list	
Open a pop-up containing Diagnosis, Business Impact, and Suggested Solution information.	

The following table describes other symbols and interface elements used in the analysis report display:

Symbol / Interface Elements	Description
	All connectivity tests passed
or	Connectivity issues were detected (for more information, click the symbol)
 (black background)	Connectivity matrix background: all pertinent connectivity tools are available
(brown background)	Connectivity matrix background: connectivity tests could not be performed, due to a missing tool
	Error counters: • Red - Error • Orange - Warning

Symbol / Interface Elements	Description
	• Blue - Info
	All connectivity test tools are available for use on the node
	Some connectivity tests could not be performed on this node, due to missing tools (for more information, click the symbol)
	A logical host, that represents the MDM cluster, when virtual IP addresses are configured

Note

An empty cell in the connectivity matrix indicates that no connectivity check was performed. In such cases, no connectivity is expected.

Enabling storage

This section describes how to use the plug-in to create and map volumes. You can map volumes to SDCs in the same step, or you can map volumes after it has been created.

Volumes are created from devices in a Storage Pool. The steps described here can be performed from the ScaleIO GUI Frontend tab, too.

Procedure

1. From the **Storage Pool** screen, click **Actions** > **Create volume**.

   The **Create Volume** dialog appears.
2. Enter the following information:
   - Volume name
   - Number of volumes to create
   - Volume size
   - Volume provisioning
   - Use RAM Read Cache
3. To map the volumes to ESXs, perform the following:
   a. Select **Map volume to ESXs**.
   b. In the **Select ESXs** area, select the clusters or ESXs to which this volume should be mapped.
4. Click **OK**.
5. Enter the password for the ScaleIO admin user.

Results

The volume creating and mapping results are displayed.

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-3.0-<build>.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*.