

# Zerto

## Zerto - Prerequisites & Requirements for Microsoft Azure Environments

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ZVR-REAZ-8.5 U3

# Zerto - Prerequisites & Requirements for Microsoft Azure Environments

This document describes the requirements for Microsoft Azure protected and recovery sites.

Zerto is installed in a site with virtual machines to be protected and in a site to be used for recovery.

For the requirements of VMware, Microsoft Hyper-V or AWS protected sites, go to [myZerto > Technical Documentation](#) portal.

You install a Zerto Cloud Appliance (ZCA) in the Azure site to use for recovery. The ZCA is comprised of the following:

- A **Zerto Virtual Manager (ZVM)**: This is a Windows service that manages the replication between the protected site and Azure.
- A **Virtual Replication Appliance (VRA)**: This is a Windows service that manages the replication of data from protected virtual machines to Azure.
  - For the maximum number of volumes, either being protected or recovered to that site, see [Zerto Scale and Benchmarking Guidelines](#).
- A **Virtual Backup Appliance (VBA)**: A Windows service that manages File Level Recovery operations within Zerto. These repositories can be local or on a shared network.

You can find Zerto Cloud Appliance in the **Azure Marketplace** portal, by entering the url: <https://portal.azure.com>. For further details and instructions, see [Zerto Installation Guide for Microsoft Azure Environments](#).

For the Microsoft Azure recovery site requirements, see the following sections:

- [Requirements for Microsoft Azure Environments on page 4](#)
- [Open Firewall Ports for Microsoft Azure Environments on page 21](#)
- [Access to Azure Cloud Environment on page 22](#)
- [Naming Conventions on page 24](#)

## Requirements for Microsoft Azure Environments

Note:

- For all known issues or limitations, see the [Release Notes](#) > Known Issues section.
- For the maximum number of volumes, either being protected or recovered to that site, see [Zerto Scale and Benchmarking Guidelines](#).

The Zerto Cloud Appliance installation must be on a virtual machine on Azure running a **Windows operating system** that meets the following **requirements**:

- Reserve at least **2 CPUs** and **4GB RAM** for the machine using a subnet accessible by other Zerto Virtual Replication sites. Zerto recommends, as the minimum, using an D3\_V2 instance size.
- Azure ZCA can be installed only on Windows Server 2012 R2 and higher.
- Only virtual machines that are supported by Azure can be protected by Zerto. All Windows operating systems are supported.

**Note:** Microsoft does not support operating systems that are past the **End of Support date**, without a **Custom Support Agreement (CSA)**. For more information about Microsoft operating systems support for Microsoft Azure, see <https://support.microsoft.com/en-us/kb/2721672>.

- To replicate between Azure and your site, you must have a virtual machine in Azure with a Zerto Cloud Appliance installed on it. This ZCA **must be paired with your site**.
- Make sure only one user assigned Managed Identity is assigned to the ZCA VM.
- Make sure user assigned Managed Identities on the VM running the ZCA is enabled and the permission level is set according to permissions needed for Zerto to operate.

Use one of the following methods to obtain the necessary permission level:

- Define a Custom Role using the permissions listed in [Zerto - Prerequisites & Requirements for Microsoft Azure Environments](#), in the section **Minimum Required Azure Permissions**. You can also copy and paste the permissions using the JSON format provided. To learn more about how to create a user-defined managed identity using a custom role, and assigning it to the Zerto Cloud Appliance, see Zerto's Knowledge Base article: [Granular Roles and Permission for Azure](#).
- Alternatively, you can define all of the following pre-defined Azure roles to the ZCA:
  - **Owner** or **Contributor**
  - **Storage Blob Data Contributor**
  - **Storage Queue Data Contributor**

See [Zerto Installation Guide Microsoft Azure Environment](#), in the section **Enabling User Managed Identities and Setting Mandatory Permissions in Azure**.

- Only General-purpose v1 (GPv1) storage accounts are supported. GPv2 is not supported, and as a result [Private Endpoints](#) for Azure Storage are not supported.
- Use a separate storage account for each ZCA.
- For **Linux** distributions, see Azure documentation:
  - Linux on Azure-endorsed distributions: <https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-linux-endorsed-distributions/>
- **Ultra SSD** storage is not supported.

### Requirements for Replication From Azure

Zerto supports replication of VMs with the following types of Managed disks:

- Managed Premium SSD
- Managed Standard SSD
- Managed Standard HDD

### Requirements for Replication To Azure

Zerto uses the cloud native Azure Scale Set service to reduce RTO when failing over to Azure. When ZCA is installed in Azure, and the ZVM is up and running, an Azure scale set with one virtual machine is created in your Azure environment. The new virtual machine, created by the Scale Set, is prefixed with the site ID. When failing over to Azure, multiple VMs in the Scale Set are deployed for the recovery process and created in the ZCA VNet. When recovery is completed, these VMs are terminated.

The following requirements apply when protecting to Azure:

- Protected volumes are recovered in Azure as VHD disks in a page blob. Virtual machines with disks that are less than 1GB are recovered with disks of 1GB.

**Note:** For some instance sizes, the Azure virtual machine is created with a Local SSD disk which is a temporary disk. This disk is in addition to the disks associated with each protected virtual machine.

- The protected virtual machines needs to have at least one NIC.
- Zerto does not require public internet access.

**Note:** Internet access is not required in regions where the new Zerto VM (Ubuntu 18.04 LTS with Python and Docker) exists in the Azure Marketplace. If the VM does not exist then the following URLs are required:

- [azure.archive.ubuntu.com](https://azure.archive.ubuntu.com)
- [security.ubuntu.com](https://security.ubuntu.com)

- ZCA primary NIC subnet requires minimum 50 IP addresses for the Azure Scale Set VMs.
- Increase CPU quota, per Ds1\_v2 SKU family, to at least 50 for the Azure Scale Set service.
- Increase CPU quota, per region, to at least 100 for the Azure Scale Set service and for recovering VMs to Azure.
- When failing over, up to 40 VMs are created of type Ds1\_v2; with Ubuntu server 18.04 LTS.

The following limitations apply when protecting to Azure:

- Reserve at least 2 CPUs and 4GB RAM for the machine using a subnet accessible by other Zerto sites.
- The supported number of data disks and NICs per virtual machine is dependent on the selected instance size. For example, instance size D3\_v2 allows up to eight data disks per virtual machine.

### Requirements for Replication within Azure

- Azure ZCA on both Azure sites need to be version 7.0 and higher.
- The following limitations apply when protecting within Azure:
  - Self replication is not supported.

### Additional Azure Considerations

For additional considerations, see **Azure subscription and service limits, quotas and constraints:** <https://docs.microsoft.com/en-us/azure/azure-subscription-service-limits>

### Azure Limitations Which Affect Installation and Recoverability

Below are the default Azure limitations which affect installation and recovery.

#### Default Azure limitations which Affect Installation

- **Storage Limitations:**
  - Number of storage accounts: **200 per subscription**, where the maximum amount is 250.

## Default Azure Limitations which Affect Recovery

<b>Virtual Machines Limitations</b>	# of VMs per region per subscription:	Default is 20. Increase this default to at least 50.
	# of VMs per series, cores per subscription, per region:	Increase default to at least 50 for Ds1_v2 series.
	Resource groups per subscription:	800
	<b>Networking</b>	
Network interfaces per region:	350	
NICs per instance:	Depends on instance size: <ul style="list-style-type: none"> <li><b>Windows:</b> <a href="https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-windows-sizes">https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-windows-sizes</a></li> <li><b>Linux:</b> <a href="https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-linux-sizes?toc=%2fazure%2fvirtual-machines%2flinux%2ftoc.json">https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-linux-sizes?toc=%2fazure%2fvirtual-machines%2flinux%2ftoc.json</a></li> </ul>	
Private IP Addresses per VNET per subscription per region:	4096	
Cloning of IP addresses during recovery operations:	Azure assigns IP addresses dynamically. Moving or failing over Linux VMs with static IP addresses is coordinated by Zerto. In the VPG configuration, specify the static IP address, and Zerto will configure Azure to assign it upon failover.	

<b>Storage</b>	Storage account total size limitation:	500TB  (# of entities (blobs, containers etc) within a storage account: unlimited)
	Max size of a page blob (vhd):	8TB  For maximum supported disk size considerations, see <a href="#">Release Notes &gt; Known Issues &gt; Azure</a> .
	Min size of a page blob (vhd):	20MB
	Max number of data disks:	Depends on instance size  <ul style="list-style-type: none"> <li>• <b>Windows:</b> <a href="https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-windows-sizes">https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-windows-sizes</a></li> <li>• <b>Linux:</b> <a href="https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-linux-sizes?toc=%2fazure%2fvirtual-machines%2flinux%2ftoc.json">https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-linux-sizes?toc=%2fazure%2fvirtual-machines%2flinux%2ftoc.json</a></li> </ul>

- **Zerto Cloud Appliance:**
  - The **Zerto Cloud Appliance** installation must be installed on an **Azure virtual machine** running a **Windows** operating system with:
    - 64-bit Operating System
    - The Windows operating system must be Server Edition
    - Supported Operating Systems: Windows Server 2012 R2 or higher
  - Microsoft **.NET Framework 4.7.2. or higher**
    - The 4.7.2 installation executable is **included** as part of the Zerto installation and it needs an additional **4.5GB of free disk space**.
    - If you install .NET Framework 4.7.2 as part of the Zerto installation, you will be prompted to restart.
- Make sure that you have the latest .NET and Windows updates, unless Zerto support warns against a specific update.
  - Reserve at least **2 CPUs** and **4GB RAM** for the machine using a subnet accessible by other Zerto Virtual Replication sites. Zerto recommends, as the minimum, using a **D3\_v2 instance size**.
- The machine on which the **Zerto:** software is installed:

- At least **4GB** of **free disk space**.
- The following must be **excluded** from **antivirus scanning**:

Zerto
%ProgramData%\Zerto\Data\zvm_db.mdf
C:\Program Files\Zerto\Zerto Virtual Replication\Zerto.Zvm.Service.exe
C:\Program Files\Zerto\Zerto Virtual Replication\Zerto.Vba.VbaService.exe
C:\Program Files\Zerto\Zerto Virtual Replication\Zerto Online Services Connector\Zerto.Online.Services.Connector.exe
C:\Program Files\Zerto\Zerto Virtual Replication\Embedded DB Manager Service\Zerto.LocalDbInstanceManagerService.exe

Failure to do so may lead to the Zerto folder being incorrectly identified as a threat and in some circumstances corrupt the Zerto Virtual Replication folder.

- The **clocks** on the machines where Zerto is installed must be **synchronized with UTC** and with each other (the timezones can be different). Zerto recommends synchronizing the clocks using NTP.
- A **connection** between the instance on Azure and the protected site is required.

## Minimum required Azure permissions

For the Azure account used by the ZCA, Zerto requires only a subset of Azure permissions. This gives the Zerto customer more security and control over their Azure environment.

**Tip:** To create a custom role for Managed Identity, you can use the JSON in the following section:  
[Minimum required Azure permissions - in JSON format on page 16.](#)

Permissions are required for:

- Installing Zerto on Azure
- Failover to Azure
- Failover from Azure
- Basic functionality
- Collection of environment data

The following table lists the minimum required permissions, and for which task or action each permission is required:

Permission	Permission Type	Required for
Microsoft.Compute/register/action	Action	Basic Functionality
Microsoft.Storage/register/action	Action	Basic Functionality
Microsoft.Storage/storageAccounts/listkeys/action	Action	Basic Functionality
Microsoft.Compute/disks/read	Action	Collection of environment data
Microsoft.Compute/locations/operations/read	Action	Collection of environment data
Microsoft.Compute/virtualMachines/read	Action	Collection of environment data
microsoft.insights/eventtypes/values/read	Action	Collection of environment data

Permission	Permission Type	Required for
Microsoft.Network/networkInterfaces/read	Action	Collection of environment data
Microsoft.Network/networkSecurityGroups/read	Action	Collection of environment data
Microsoft.Network/virtualNetworks/read	Action	Collection of environment data
Microsoft.Resources/subscriptions/read	Action	Collection of environment data
Microsoft.Resources/subscriptions/resourceGroups/read	Action	Collection of environment data
Microsoft.Storage/storageAccounts/read	Action	Collection of environment data
Microsoft.Storage/storageAccounts/dataSharePolicies/*	Not Action	Disallow dataSharePolicies actions
Microsoft.Storage/storageAccounts/services/diagnosticSettings/*	Not Action	Disallow diagnosticSettings actions
Microsoft.Storage/storageAccounts/encryptionScopes/*	Not Action	Disallow encryptionScopes actions
Microsoft.Storage/storageAccounts/fileServices/*	Not Action	Disallow fileServices actions
Microsoft.Storage/storageAccounts/localUsers/*	Not Action	Disallow localUsers actions
Microsoft.Storage/storageAccounts/managementPolicies/*	Not Action	Disallow managementPoliciesPolicies actions
Microsoft.Storage/storageAccounts/objectReplicationPolicies/*	Not Action	Disallow objectReplicationPolicies actions

Permission	Permission Type	Required for
Microsoft.Storage/storageAccounts/privateEndpointConnectionsProxies/*	Not Action	Disallow privateEndpointConnectionsProxies actions
Microsoft.Storage/storageAccounts/privateEndpointConnections/*	Not Action	Disallow privateEndpointConnections actions
Microsoft.Storage/storageAccounts/privateLinkResources/*	Not Action	Disallow privateLinkResources actions
Microsoft.Storage/storageAccounts/tableServices/*	Not Action	Disallow tableServices actions
Microsoft.Compute/disks/beginGetAccess/action	Action	Failover From Azure
Microsoft.Compute/disks/delete	Action	Failover From Azure
Microsoft.Compute/disks/endGetAccess/action	Action	Failover From Azure
Microsoft.Compute/snapshots/beginGetAccess/action	Action	Failover From Azure
Microsoft.Compute/snapshots/delete	Action	Failover From Azure
Microsoft.Compute/snapshots/endGetAccess/action	Action	Failover From Azure
Microsoft.Compute/snapshots/read	Action	Failover From Azure
Microsoft.Compute/snapshots/write	Action	Failover From Azure
Microsoft.Compute/virtualMachines/deallocate/action	Action	Failover From Azure
Microsoft.Compute/virtualMachines/delete	Action	Failover From Azure
Microsoft.Compute/virtualMachines/powerOff/action	Action	Failover From Azure
Microsoft.Compute/virtualMachines/write	Action	Failover to Azure
Microsoft.Compute/disks/write	Action	Failover To Azure
Microsoft.Compute/galleries/images/read	Action	Failover To Azure

Permission	Permission Type	Required for
Microsoft.Compute/galleries/images/versions/read	Action	Failover To Azure
Microsoft.Compute/virtualMachineScaleSets/deallocate/action	Action	Failover To Azure
Microsoft.Compute/virtualMachineScaleSets/delete	Action	Failover To Azure
Microsoft.Compute/virtualMachineScaleSets/delete/action	Action	Failover To Azure
Microsoft.Compute/virtualMachineScaleSets/extensions/delete	Action	Failover To Azure
Microsoft.Compute/virtualMachineScaleSets/extensions/read	Action	Failover To Azure
Microsoft.Compute/virtualMachineScaleSets/extensions/roles/read	Action	Failover To Azure
Microsoft.Compute/virtualMachineScaleSets/extensions/roles/write	Action	Failover To Azure
Microsoft.Compute/virtualMachineScaleSets/extensions/write	Action	Failover To Azure
Microsoft.Compute/virtualMachineScaleSets/read	Action	Failover To Azure
Microsoft.Compute/virtualMachineScaleSets/start/action	Action	Failover To Azure
Microsoft.Compute/virtualMachineScaleSets/write	Action	Failover To Azure
Microsoft.Insights/AutoscaleSettings/Delete	Action	Failover To Azure
Microsoft.Insights/AutoscaleSettings/Read	Action	Failover To Azure
Microsoft.Insights/AutoscaleSettings/Write	Action	Failover To Azure
Microsoft.MarketplaceOrdering/offertypes/publishers/offers/plans/agreements/read	Action	Failover To Azure
Microsoft.MarketplaceOrdering/offertypes/publishers/offers/plans/agreements/write	Action	Failover To Azure
Microsoft.Network/networkInterfaces/delete	Action	Failover To Azure
Microsoft.Network/networkInterfaces/join/action	Action	Failover To Azure
Microsoft.Network/networkInterfaces/write	Action	Failover To Azure

Permission	Permission Type	Required for
Microsoft.Network/networkSecurityGroups/join/action	Action	Failover To Azure
Microsoft.Network/virtualNetworks/join/action	Action	Failover To Azure
Microsoft.Network/virtualNetworks/subnets/join/action	Action	Failover To Azure
Microsoft.Resources/subscriptions/resourceGroups/delete	Action	Failover To Azure
Microsoft.Resources/subscriptions/resourceGroups/write	Action	Failover To Azure
Microsoft.Storage/storageAccounts/*/read	Action	Failover To Azure
Microsoft.Storage/storageAccounts/blobServices/containers/blob/delete	Data Actions	Failover To Azure
Microsoft.Storage/storageAccounts/blobServices/containers/blob/read	Data Actions	Failover To Azure
Microsoft.Storage/storageAccounts/blobServices/containers/blob/tags/read	Data Actions	Failover To Azure
Microsoft.Storage/storageAccounts/blobServices/containers/blob/tags/write	Data Actions	Failover To Azure
Microsoft.Storage/storageAccounts/blobServices/containers/blob/write	Data Actions	Failover To Azure
Microsoft.Storage/storageAccounts/blobServices/containers/delete	Action	Failover To Azure
Microsoft.Storage/storageAccounts/blobServices/containers/read	Action	Failover To Azure
Microsoft.Storage/storageAccounts/blobServices/containers/write	Action	Failover To Azure
Microsoft.Storage/storageAccounts/blobServices/read	Action	Failover To Azure
Microsoft.Storage/storageAccounts/blobServices/write	Action	Failover To Azure
Microsoft.Storage/storageAccounts/queueServices/queues/delete	Action	Failover To Azure

Permission	Permission Type	Required for
Microsoft.Storage/storageAccounts/queueServices/queues/messages/delete	Data Actions	Failover To Azure
Microsoft.Storage/storageAccounts/queueServices/queues/messages/read	Data Actions	Failover To Azure
Microsoft.Storage/storageAccounts/queueServices/queues/messages/write	Data Actions	Failover To Azure
Microsoft.Storage/storageAccounts/queueServices/queues/read	Action	Failover To Azure
Microsoft.Storage/storageAccounts/queueServices/queues/write	Action	Failover To Azure
Microsoft.Storage/storageAccounts/queueServices/read	Action	Failover To Azure
Microsoft.Storage/storageAccounts/queueServices/write	Action	Failover To Azure
Microsoft.Compute/virtualMachines/start/action	Action	Failover To/From Azure
Microsoft.Authorization/permissions/read	Action	Installing Zerto on Azure
Microsoft.Authorization/roleAssignments/read	Action	Installing Zerto on Azure
Microsoft.Authorization/roleDefinitions/read	Action	Installing Zerto on Azure
Microsoft.ManagedIdentity/userAssignedIdentities/assign/action	Action	Installing Zerto on Azure
Microsoft.ManagedIdentity/userAssignedIdentities/read	Action	Installing Zerto on Azure
Microsoft.Storage/storageAccounts/write	Action	Installing Zerto on Azure

### Minimum required Azure permissions - in JSON format

To create the required custom role for Zerto , use the JSON below. See Azure documentation [here](#) for more details.

For your convenience, click [here](#) to access a .txt file, from which you can copy and paste.

```

{
  "properties": {
    "roleName": "Zerto Admin Role",
    "description": "Zerto Admin Role",
    "assignableScopes": [
      "/subscriptions/e832942b-a1dc-48d2-8fa8-a4adb5e437a1",
      "/subscriptions/21bf52fb-47e6-4678-b34f-94290c53e599",
      "/subscriptions/702fe1ff-a6d4-494c-b0b9-a93c680f5e68",
      "/subscriptions/cb23ec28-fb01-4612-8096-73db727fe861",
      "/subscriptions/b48e3dce-5d4c-4e05-86f0-8cb395c70735",
      "/subscriptions/1cca699f-b518-41e8-8707-3c744dc3346c",
      "/subscriptions/2a2cf1d6-7835-41b4-9bce-6c254b106505",
      "/subscriptions/33eb1d36-e4d1-46c8-9e67-4053730b033c",
      "/subscriptions/b1177388-bdfe-4606-a33a-cb450f504f0f",
      "/subscriptions/3707b980-9260-4efb-a089-337e6f6ce71c"
    ],
    "permissions": [
      {
        "actions": [
          "Microsoft.Compute/register/action",
          "Microsoft.Compute/virtualMachines/read",
          "Microsoft.Compute/virtualMachines/write",
          "Microsoft.Compute/virtualMachines/delete",
          "Microsoft.Compute/locations/operations/read",
          "Microsoft.Compute/virtualMachines/start/action",
          "Microsoft.Compute/virtualMachines/powerOff/action",
          "Microsoft.Compute/virtualMachines/deallocate/action",
          "Microsoft.Compute/virtualMachineScaleSets/read",
          "Microsoft.Compute/virtualMachineScaleSets/write",
          "Microsoft.Compute/virtualMachineScaleSets/delete",
          "Microsoft.Compute/virtualMachineScaleSets/delete/action",
          "Microsoft.Compute/virtualMachineScaleSets/start/action",
          "Microsoft.Compute/virtualMachineScaleSets/deallocate/action",
          "Microsoft.Compute/virtualMachineScaleSets/extensions/read",
          "Microsoft.Compute/virtualMachineScaleSets/extensions/write",
          "Microsoft.Compute/virtualMachineScaleSets/extensions/delete",
          "Microsoft.Compute/virtualMachineScaleSets/extensions/roles/read",
          "Microsoft.Compute/virtualMachineScaleSets/extensions/roles/write",
          "Microsoft.Compute/disks/read",
          "Microsoft.Compute/disks/write",
          "Microsoft.Compute/disks/delete",
          "Microsoft.Compute/disks/beginGetAccess/action",
          "Microsoft.Compute/disks/endGetAccess/action",
          "Microsoft.Compute/snapshots/read",
          "Microsoft.Compute/snapshots/write",
          "Microsoft.Compute/snapshots/delete",
          "Microsoft.Compute/snapshots/beginGetAccess/action",
          "Microsoft.Compute/snapshots/endGetAccess/action",

```

```

"Microsoft.Compute/galleries/images/read",
"Microsoft.Compute/galleries/images/versions/read",
"Microsoft.Insights/AutoscaleSettings/Write",
"Microsoft.Insights/AutoscaleSettings/Delete",
"Microsoft.Insights/AutoscaleSettings/Read",
"Microsoft.MarketplaceOrdering/offertypes/publishers/offers/plans/agreements/read",
"Microsoft.MarketplaceOrdering/offertypes/publishers/offers/plans/agreements/write",
"Microsoft.Network/networkInterfaces/read",
"Microsoft.Network/networkInterfaces/write",
"Microsoft.Network/networkInterfaces/delete",
"Microsoft.Network/networkInterfaces/join/action",
"Microsoft.Network/networkSecurityGroups/read",
"Microsoft.Network/networkSecurityGroups/join/action",
"Microsoft.Network/virtualNetworks/read",
"Microsoft.Network/virtualNetworks/join/action",
"Microsoft.Network/virtualNetworks/subnets/join/action",
"Microsoft.Resources/subscriptions/resourceGroups/read",
"Microsoft.Resources/subscriptions/resourceGroups/write",
"Microsoft.Resources/subscriptions/resourceGroups/delete",
"Microsoft.Resources/subscriptions/read",
"microsoft.insights/eventtypes/values/read",
"Microsoft.ManagedIdentity/userAssignedIdentities/read",
"Microsoft.ManagedIdentity/userAssignedIdentities/assign/action",
"Microsoft.Authorization/permissions/read",
"Microsoft.Authorization/roleAssignments/read",
"Microsoft.Authorization/roleDefinitions/read",
"Microsoft.Storage/register/action",
"Microsoft.Storage/storageAccounts/listkeys/action",
"Microsoft.Storage/storageAccounts/read",
"Microsoft.Storage/storageAccounts/write",
"Microsoft.Storage/storageAccounts/blobServices/read",
"Microsoft.Storage/storageAccounts/blobServices/write",
"Microsoft.Storage/storageAccounts/blobServices/containers/read",
"Microsoft.Storage/storageAccounts/blobServices/containers/write",
"Microsoft.Storage/storageAccounts/blobServices/containers/delete",
"Microsoft.Storage/storageAccounts/queueServices/read",
"Microsoft.Storage/storageAccounts/queueServices/write",
"Microsoft.Storage/storageAccounts/queueServices/queues/read",
"Microsoft.Storage/storageAccounts/queueServices/queues/write",
"Microsoft.Storage/storageAccounts/queueServices/queues/delete",
"Microsoft.Storage/storageAccounts/*/read"
],
"notActions": [
"Microsoft.Storage/storageAccounts/dataSharePolicies/*",
"Microsoft.Storage/storageAccounts/encryptionScopes/*",
"Microsoft.Storage/storageAccounts/fileServices/*",

```

```

"Microsoft.Storage/storageAccounts/localUsers/*",
"Microsoft.Storage/storageAccounts/managementPolicies/*",
"Microsoft.Storage/storageAccounts/objectReplicationPolicies/*",
"Microsoft.Storage/storageAccounts/privateEndpointConnectionProxies/*",

"Microsoft.Storage/storageAccounts/privateEndpointConnections/*",
"Microsoft.Storage/storageAccounts/privateLinkResources/*",
"Microsoft.Storage/storageAccounts/services/diagnosticSettings/*",
"Microsoft.Storage/storageAccounts/tableServices/*"
],
"dataActions": [
"Microsoft.Storage/storageAccounts/blobServices/containers/blobs/delete",
"Microsoft.Storage/storageAccounts/blobServices/containers/blobs/read",

"Microsoft.Storage/storageAccounts/blobServices/containers/blobs/write",
"Microsoft.Storage/storageAccounts/blobServices/containers/blobs/tags/read",
"Microsoft.Storage/storageAccounts/blobServices/containers/blobs/tags/write",
"Microsoft.Storage/storageAccounts/queueServices/queues/messages/delete",
"Microsoft.Storage/storageAccounts/queueServices/queues/messages/read",

"Microsoft.Storage/storageAccounts/queueServices/queues/messages/write"

],
"notDataActions": []
}
]
}
}

```

## Routable Networks

- The virtual machine on which the Zerto Cloud Appliance is installed must use a subnet that is accessible from all Zerto Virtual Managers that may be connected to this instance.
- Zerto Virtual Manager does not support NAT (Network Address Translation) firewalls.

## Minimum Bandwidth

- The connectivity between sites must have the bandwidth capacity to handle the data to be replicated between the sites. The **minimum** dedicated bandwidth must be at least **5 Mb/sec**.

## The Zerto User Interface

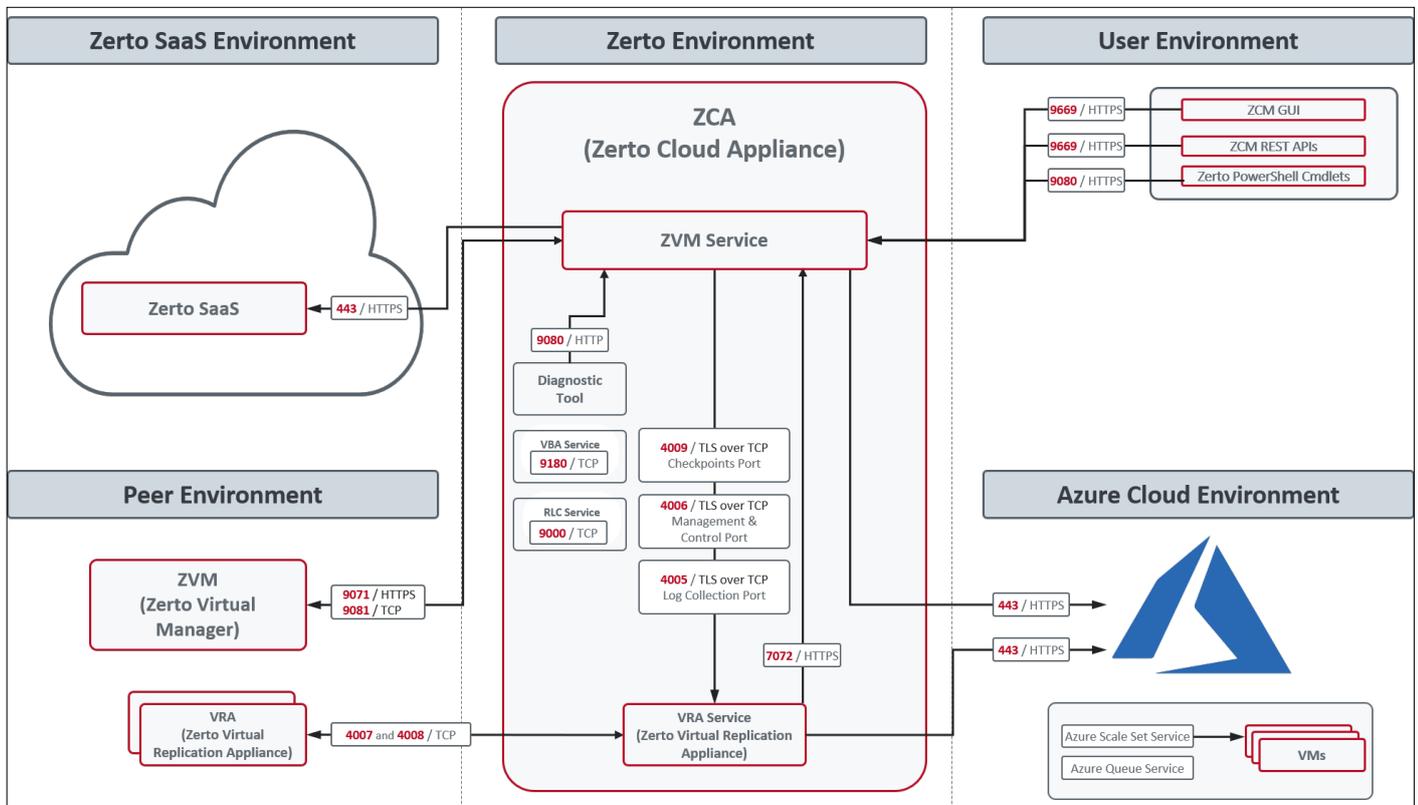
**Log in** using the username and password for the machine where the **Zerto Cloud Appliance** was installed.

For supported browsers, see [Interoperability Matrix for All Zerto Versions](#), in the section **Zerto Virtual Manager - Supported Browsers**.

The lowest supported screen resolution is **1366x768**.

## Open Firewall Ports for Microsoft Azure Environments

The following architecture diagram shows the **ports** that must be opened in the firewalls on all sites.



The following table provides basic information about the ports shown in the above diagram by Zerto.

Zerto Cloud Appliance (ZCA) requires the following **ports** to be open in the **Azure site firewall**, set in the **Azure network security group**:

Port	Description
443	<ul style="list-style-type: none"> <li>Required between the ZVM and the Azure Cloud environment.</li> <li>Required between the Azure REST Service and the ZVM during installation of a VRA.</li> <li>Required for communication between the ZVM and Azure Scale Set and Queues services.</li> </ul>
4005	Log collection between the ZVM and site VRAs, using TLS over TCP communication.
4006	TLS over TCP communication between the ZVM and local site VRAs and the site VBA.
4007	Control communication between protecting and peer VRAs.

Port	Description
4008	Communication between VRAs to pass data from protected virtual machines to a VRA on a recovery site.
4009	TLS over TCP communication between the ZVM and local site VRAs to handle checkpoints.
7072	Communication between the VRA and ZVM. Required for metadata promotion.
7073	Internal port, used only on the ZVM VM. Used for communication with the service in charge of collecting data for the Zerto Resource Planner.  <b>Note:</b> Unless you select the checkbox 'Enable Support notification and product improvement feedback', data is <b>not</b> transmitted to Zerto Analytics.
9071*	HTTPS communication between paired ZVMs, when both Zerto versions are 8.0 and above.
9080*	Communication between the ZVM, Zerto Powershell Cmdlets, and Zerto Diagnostic tool.
9081*	Communication between paired ZVMs, maintained for backward compatibility purposes**.
9180*	Communication between the ZVM and the VBA.
9669*	Communication between ZVM and ZVM GUI and ZVM REST APIs, and the ZCM.
9779	Communication between ZVM and ZSSP (Zerto Self Service Portal).
9989	Communication between ZCM, and ZCM GUI and ZCM REST APIs.

\*The **default** port provided during the ZVR installation which can be changed during the installation.

## Access to Azure Cloud Environment

The followings list contains the endpoints required to set up replication to and from Azure:

- management.azure.com
- 168.63.129.16:32526
- 169.254.169.254
- \*.blob.core.windows.net
- \*.management.azure-api.net
- login.microsoftonline.com

- secure\*.microsoftonline-p.com
- \*.store.core.windows.net
- portal.azure.com
- graph.windows.net
- For **Azure global** and **Azure China** regions, set as follows:

Service category	Azure global URI	Azure URI (in China)
Azure service management	https://management.core.windows.net	https://management.core.chinacloudapi.cn
Azure Resource Manager	https://management.azure.com	https://management.chinacloudapi.cn

For further details see: <https://docs.microsoft.com/en-us/azure/china/resources-developer-guide>

- For **Azure Government** regions, set as follows:

Name	Azure Government endpoint
Azure API	https://management.usgovcloudapi.net/
Classic Deployment Model Url	https://management.core.usgovcloudapi.net/

For further details see: <https://docs.microsoft.com/en-us/azure/azure-government/documentation-government-developer-guide#endpoint-mapping>

- For **Azure Germany** regions, set as follows:

Name	Azure Germany endpoint
ServiceManagementUrl	https://management.core.cloudapi.de/
ResourceManagerUrl	https://management.microsoftazure.de/

For further details see: <https://docs.microsoft.com/en-us/azure/germany/germany-developer-guide#endpoint-mapping>

## Naming Conventions

When creating a new resource in Azure, it is necessary to adhere to certain naming conventions. These naming conventions apply to the following resources: virtual machines, resource groups, storage accounts, page blobs and blob containers.

To view **Microsoft Azure's recommended naming conventions**, see the following links:

<https://azure.microsoft.com/en-us/documentation/articles/guidance-naming-conventions>

<https://msdn.microsoft.com/library/azure/dd135715.aspx>

<https://blogs.msdn.microsoft.com/jmstall/2014/06/12/azure-storage-naming-rules>

Note:

- The name of **virtual machines** can include up to **64 characters**
- The name of **disks** can include up to **80 characters**

Zerto helps customers accelerate IT transformation through a single, scalable platform for cloud data management and protection. Built for enterprise scale, Zerto's simple, software-only platform uses continuous data protection to converge disaster recovery, backup, and data mobility and eliminate the risks and complexity of modernization and cloud adoption

Learn more at [Zerto.com](https://Zerto.com).

For assistance using Zerto's Solution, contact: [@Zerto Support](https://twitter.com/ZertoSupport).

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