

Chaos Engineering Scenario: Leverage Chaos Studio to test an availability zone failure

Introduction

You can use a chaos experiment to verify that your application is resilient to failures by causing those failures in a controlled environment. In this guide, you will cause an availability zone failure on a Linux virtual machine using a chaos experiment and Azure Chaos Studio. Running this experiment can help you defend against service interruption in the event of a zonal outage.

Prerequisites

Before proceeding, you should understand:

- Regions and availability zones (https://dev.azure.com/msazure/AzureWiki/_wiki/wikis/AzureWiki.wiki/59055/Availability-Zones)
- Service level indicators (SLIs) and service level objectives (SLOs) (<https://eng.ms/docs/quality/slos-slis>)
- The Azure Quality Program (<https://eng.ms/docs/quality/program-overview>)

Tools

- An Azure subscription (<https://docs.microsoft.com/azure/guides/developer/azure-developer-guide#understanding-accounts-subscriptions-and-billing>). Create a subscription in AIRS (<https://azuremsregistration.microsoft.com/Default.aspx>) before you begin.
- An application that runs on virtual machines in Azure Canary regions and follows mandatory safe deployment practices (<https://eng.ms/docs/quality/zero-self-inflicted-sev1s/safedeploy>).

Scenario background

Availability zones allow you to digitally access physical locations with data centers and specify geographic regions for compliance boundaries. Deploying an application to multiple availability zones allows it to remain resilient to data center failure, or zonal failure, because each zone has its own isolated network and power. When one availability zone fails, the load balancer should redistribute the deployed application to other availability zones without affecting performance.

Service level indicators (SLIs) are metrics such as availability, latency, throughput, and error rate that are used to analyze service quality and reliability. SLIs are the target values for your service level objectives (SLOs), or what the customer expects from a service's performance. You can use SLIs and SLOs when evaluating the effectiveness of your availability zone failure response.

Scenario goal

In this scenario, you will:

- Understand the relationship between availability zones, data centers, and load balancers, and how they are accessed using Chaos Studio.
 - Identify and use key metrics to formulate an experiment hypothesis.
 - Create an experiment that tests the performance of a deployed application when an availability zone, simulated by virtual machines, shuts down.
 - Interpret experiment results to assess and potentially reformulate your created hypothesis.
-

Establish a hypothesis

Establishing a hypothesis is critical before beginning an experiment. Without a hypothesis, it is difficult to understand what to test or how to interpret any results.

For this scenario, create a hypothesis that addresses both zone down and observability expectations. If an availability zone fails, what do you expect to happen, and how do you expect to receive the results?

To establish a hypothesis, ask questions relevant to the scenario. For example, by running this experiment, what do you expect to happen given your specific application setup, SLI, and SLO? What does a healthy result look like? What is your failure tolerance? What metrics are you assessing?

A hypothesis for this scenario might look like: “If a single availability zone goes down, availability should remain at **% with** % tolerance. I expect to find these results by analyzing ___.” These variables, or the hypothesis altogether, may differ based on your environment.

Using this example, a potential hypothesis may be: “If a single availability zone goes down, availability should remain at 99% with 1% tolerance. I expect to find these results by analyzing my application’s availability monitoring service against my defined SLIs and SLOs.”

Onboard the resources

1. Open **Azure Portal**.
2. Search for **Chaos Studio** in the search bar.
3. In Chaos Studio, select **Targets**, then select the resource group you want the experiment to use from the **All resource groups** menu.

Note: You will only see resources in regions where Chaos Studio is available (<https://azure.microsoft.com/global-infrastructure/services/?products=chaos-studio>).

Microsoft Azure (Preview)

Search resources, services, and docs (G+ /)

Home > Chaos Studio

Chaos Studio | Targets

PREVIEW

Search (Ctrl+ /)

Enable targets

Disable targets

Refresh

Feedback

Overview

Experiment management

Targets

Experiments

Subscriptions - Don't see a subscription?
Open Directory + Subscription settings

Search for any field...

All subscriptions selected

All resource groups

	Name	Subscription	Resource group	Service-direct	Agent-based
<input type="checkbox"/>	dev-d-oqo5vhxfq5rr2	Azure Chaos Studio ...	2021chaosdemo	Enabled	Not Applicab
<input type="checkbox"/>	a2wzqzkmaoty2	Azure Chaos Studio ...	2021chaosdemo	Enabled	Not Applicab
<input type="checkbox"/>	dev-d-oqo5vhxfq5rr2	Azure Chaos Studio ...	2021chaosdemo	Enabled	Not Applicab
<input type="checkbox"/>	dev-ds-oqo5vhxfq5...	Azure Chaos Studio ...	2021chaosdemo	Enabled	Not Applicab
<input type="checkbox"/>	dev-p-oqo5vhxfq5rr2	Azure Chaos Studio ...	2021chaosdemo	Enabled	Not Applicab
<input type="checkbox"/>	Setup-1f1e626ec7fb9	Azure Chaos Studio ...	2021chaosdemo	Enabled	Not Applicab
<input type="checkbox"/>	dev-d-oqo5vhxfq5rr2	Azure Chaos Studio ...	2021chaosdemo	Enabled	Not Applicab
<input type="checkbox"/>	dev-ds-oqo5vhxfq5...	Azure Chaos Studio ...	2021chaosdemo	Enabled	Not Applicab
<input type="checkbox"/>	dev-wf-oqo5vhxfq5...	Azure Chaos Studio ...	2021chaosdemo	Not Enabled	Not Applicab

4. You will see a list of the resource group's contents. Select all your application's virtual machines that you wish to use when running the experiment.

Microsoft Azure (Preview) Search resources, services, and docs (G+)

Home > Chaos Studio

Chaos Studio | Targets

PREVIEW

Search (Ctrl+/) << Enable targets Disable targets Refresh Feedback

Overview

Experiment management

- Targets
- Experiments

Subscriptions - Don't see a subscription? [Open Directory + Subscription settings](#)

Search for any field... All subscriptions selected availabilityzonedemo

<input type="checkbox"/>	Name	Subscription	Resource group	Service-direct	Agent-based
<input type="checkbox"/>	allowRemoting	Azure Chaos Studio ...	availabilityzonedemo	Enabled	Not Applicable
<input checked="" type="checkbox"/>	chaosazdemo0	Azure Chaos Studio ...	availabilityzonedemo	Enabled	Not Enabled
<input checked="" type="checkbox"/>	chaosazdemo1	Azure Chaos Studio ...	availabilityzonedemo	Enabled	Not Enabled
<input checked="" type="checkbox"/>	chaosazdemo2	Azure Chaos Studio ...	availabilityzonedemo	Enabled	Not Enabled

5. Select **Enable targets**, then select **Enable service-direct targets (All resources)** from the dropdown menu.

Microsoft Azure (Preview) Report a bug Search resources, services, and docs (G+)

Home > Chaos Studio

Chaos Studio | Targets

PREVIEW

Search (Ctrl+/) << Enable targets Disable targets Refresh Feedback

Overview

Experiment management

- Targets
- Experiments

Enable service-direct targets (All resources)

Subscriptions - Don't see a subscription? [Open Directory + Subscription settings](#)

2 of 78 subscriptions selected availabilityzonedemo

<input type="checkbox"/>	Name	Subscription	Resource group	Service-direct	Agent-based	
<input checked="" type="checkbox"/>	chaosazdemo0	Azure Chaos Studio Demo	availabilityzonedemo	Not Enabled	Not Enabled	Manage actions
<input type="checkbox"/>	allowRemoting	Azure Chaos Studio Demo	availabilityzonedemo	Enabled	Not Applicable	Manage actions
<input checked="" type="checkbox"/>	chaosazdemo1	Azure Chaos Studio Demo	availabilityzonedemo	Not Enabled	Not Enabled	Manage actions
<input checked="" type="checkbox"/>	chaosazdemo2	Azure Chaos Studio Demo	availabilityzonedemo	Not Enabled	Not Enabled	Manage actions

6. After a few minutes, you will see a **Deployment succeeded** notification indicating the targets were enabled successfully. In the **Targets** window, the virtual machines now display **Enabled** under the **Service-direct** heading and display active **Manage actions** links on the right.

The image consists of two screenshots from the Microsoft Azure portal. The top screenshot shows the 'Overview' page for a deployment named 'enable-targets-94df5f9d-45b5-44de-8983-e160c44dda9e'. It indicates that the deployment is complete and successful. A notification in the top right corner confirms 'Deployment succeeded'. The bottom screenshot shows the 'Chaos Studio | Targets' window. It displays a table of targets with columns for Name, Subscription, Resource group, Service-direct, Agent-based, and Manage actions. The 'Service-direct' column shows 'Enabled' for all targets, and the 'Manage actions' column shows active links for each target.

Deployment Succeeded Notification:

Deployment 'enable-targets-94df5f9d-45b5-44de-8983-e160c44dda9e' to resource group 'availabilityzonedemo' was successful.

Chaos Studio | Targets Table:

Name	Subscription	Resource group	Service-direct	Agent-based	Manage actions
chaosazdemo0	Azure Chaos Studio Demo	availabilityzonedemo	Enabled	Not Enabled	Manage actions
allowRemoting	Azure Chaos Studio Demo	availabilityzonedemo	Enabled	Not Applicable	Manage actions
chaosazdemo1	Azure Chaos Studio Demo	availabilityzonedemo	Not Enabled	Not Enabled	Manage actions ⓘ
chaosazdemo2	Azure Chaos Studio Demo	availabilityzonedemo	Enabled	Not Enabled	Manage actions

Create the experiment

1. Select **Experiments**, then select **Create**.

Microsoft Azure (Preview) [Report a bug](#) Search resources, services, and docs (G+/I)

Home > Chaos Studio

Chaos Studio | Experiments

PREVIEW

Search (Ctrl+/) « **+ Create** Manage view Refresh Export to CSV Open query Assign tags Start experiment(s) Stop experiment(s) Delete experiment(s)

Overview Filter for any field... Subscription == 2 of 78 selected Resource group == all Location == all Add filter

Experiment management

Targets

Experiments

<input type="checkbox"/> Name ↑↓	Status ↑↓	Subscription ↑↓	Resource group ↑↓	Location ↑↓	
<input type="checkbox"/> aksPodKill	Success	Azure Chaos Studio Demo	2021chaosdemo	East US	...
<input type="checkbox"/> AzDownDrill	Failed	Azure Chaos Studio Demo	2021chaosdemo	East US	...
<input type="checkbox"/> complexDemo	Not Started	Azure Chaos Studio Demo	2021chaosdemo	East US	...
<input type="checkbox"/> cpuPressure	Success	Azure Chaos Studio Demo	2021chaosdemo	East US	...
<input type="checkbox"/> latestAgenttest	Failed	Chaos Studio Personal - johnkem	generalTest	East US	...
<input type="checkbox"/> latestAgentTest2	Success	Chaos Studio Personal - johnkem	generalTest	East US	...
<input type="checkbox"/> nsgFailure	Success	Chaos Studio Personal - johnkem	PublicPreviewValidation	East US	...
<input type="checkbox"/> nsgTest2	Success	Chaos Studio Personal - johnkem	PublicPreviewValidation	West Central US	...
<input type="checkbox"/> RedisRebootdemo	Success	Azure Chaos Studio Demo	ChaosTargets	East US	...
<input type="checkbox"/> serviceInterruption	Failed	Azure Chaos Studio Demo	2021chaosdemo	East US	...
<input type="checkbox"/> shmalava_agentCPUPressure	Success	Chaos Studio Personal - johnkem	Shruniga_learning	East US	...

2. You will see the **Create an experiment** screen. In the **Name field**, enter a descriptive name for your experiment.

Microsoft Azure (Preview)Report a bugSearch resources, services, and docs (G+I)

Home > Chaos Studio >

Create an experiment...

Chaos Studio | PREVIEW

BasicsExperiment designerReview + create

A chaos experiment allows you to define one or more faults that you would like to run and the targets against which those faults will be run in order to replicate a failure. Once you create an experiment, you can run it anytime to improve your application's resilience to that failure. [Learn more](#)

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Azure Chaos Studio Demo

Resource group *

2021chaosdemo

Create new

Experiment details

Name *

azDownDrillDemo

Location *

(US) East US

Review + create

< Previous

Next : Experiment designer >

3. Select a region from the **Location** dropdown.

Note: Chaos Studio must be available in the region you select. Refer to the Products available by region documentation (<https://azure.microsoft.com/global-infrastructure/services/?products=chaos-studio>) for a list of applicable regions.

Microsoft Azure (Preview)Report a bugSearch resources, services, and docs (G+/I)

Home > Chaos Studio >

Create an experiment...

Chaos Studio | PREVIEW

BasicsExperiment designerReview + create

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Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Azure Chaos Studio Demo

Resource group *

2021chaosdemo

Create new

Experiment details

Name *

azDownDrillDemo

Location *

(US) East US

Review + create

< Previous

Next : Experiment designer >

4. Select **Next: Experiment designer**.

Microsoft Azure (Preview)

Report a bug

Search resources, services, and docs (G+/I)

[Home](#) > [Chaos Studio](#) >

Create an experiment ...

Chaos Studio | PREVIEW

Basics

Experiment designer

Review + create

A chaos experiment allows you to define one or more faults that you would like to run and the targets against which those faults will be run in order to replicate a failure. Once you create an experiment, you can run it anytime to improve your application's resilience to that failure. [Learn more](#)

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Azure Chaos Studio Demo

Resource group *

2021chaosdemo

[Create new](#)

Experiment details

Name *

azDownDrillDemo

Location *

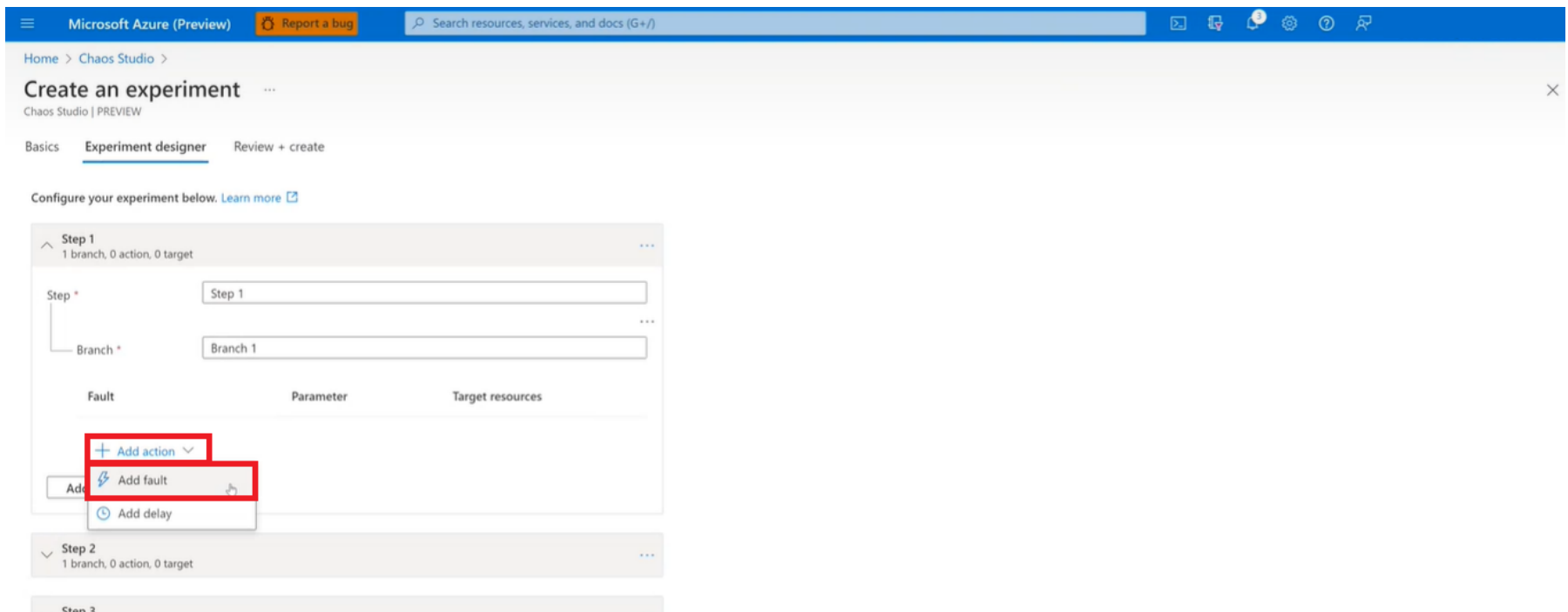
(US) East US

Review + create

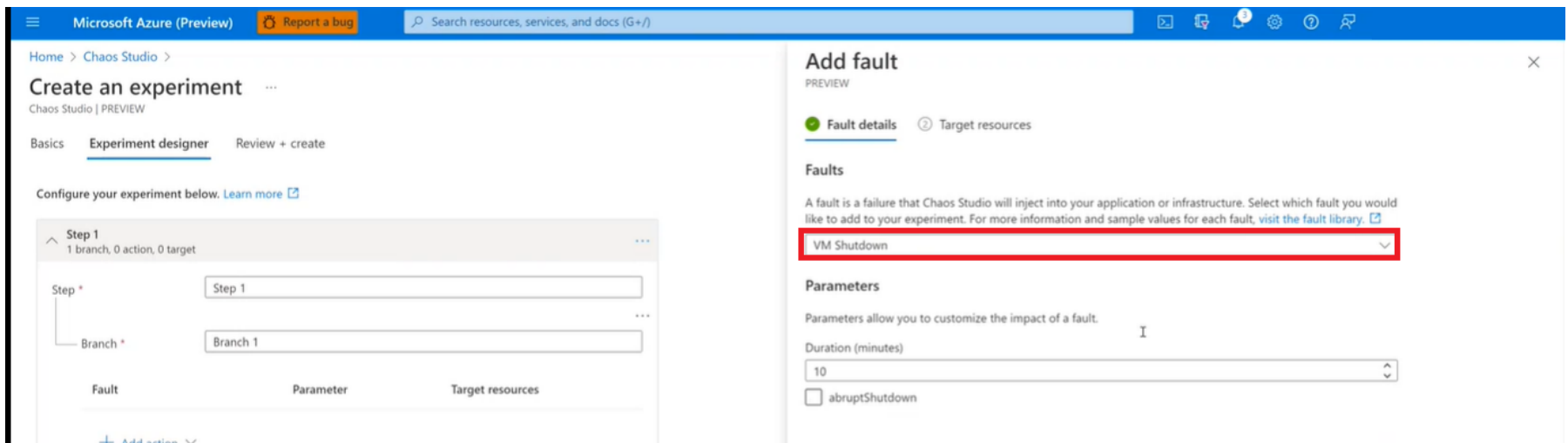
< Previous

Next : Experiment designer >

5. Select **Add action**, then select **Add fault** to add a fault to the step.



6. Select the **Select a fault** dropdown, then select **VM Shutdown** from the fault library.



7. You will see a list of parameters specific to the VM Shutdown fault. Select **abruptShutdown**. The **abruptShutdown** parameter most closely replicates sudden zonal failure.

Microsoft Azure (Preview) [Report a bug](#) Search resources, services, and docs (G+/I)

Home > Chaos Studio >

Create an experiment

Chaos Studio | PREVIEW

Basics **Experiment designer** Review + create

Configure your experiment below. [Learn more](#)

Step 1
1 branch, 0 action, 0 target

Step *

Branch *

Fault	Parameter	Target resources
<div>+ Add action</div>		
<div>Add branch</div>		

Add fault

PREVIEW

Fault details ② Target resources

Faults

A fault is a failure that Chaos Studio will inject into your application or infrastructure. Select which fault you would like to add to your experiment. For more information and sample values for each fault, [visit the fault library](#).

Parameters

Parameters allow you to customize the impact of a fault.

Duration (minutes)

☒ abruptShutdown

Note: The **Duration (minutes)** parameter is set to 10 minutes by default. Although not required, you can change this value to increase or decrease the experiment's runtime. 30 minutes is recommended to allow you to best observe the experiment's impact.

8. Select **Next: Target resources**.

Microsoft Azure (Preview) [Report a bug](#) Search resources, services, and docs (G+/I)

Home > Chaos Studio >

Create an experiment

Chaos Studio | PREVIEW

Basics **Experiment designer** Review + create

Configure your experiment below. [Learn more](#)

Step 1
1 branch, 0 action, 0 target

Step *

Step 1

Branch *

Branch 1

Fault

Parameter

Target resources

+ Add action

Add branch

Step 2
1 branch, 0 action, 0 target

Step 3
1 branch, 0 action, 0 target

Add step

Provide feedback
[Did you find what you needed? Let us know how it went.](#)

[Review + create](#) [< Previous](#) [Next: Review + create >](#)

Add fault

PREVIEW

Fault details [Target resources](#)

Faults

A fault is a failure that Chaos Studio will inject into your application or infrastructure. Select which fault you would like to add to your experiment. For more information and sample values for each fault, [visit the fault library](#).

VM Shutdown

Parameters

Parameters allow you to customize the impact of a fault.

Duration (minutes)

10

☒ abruptShutdown

[Add](#) [< Previous](#) **Next: Target resources >**

Note: This displays a list of virtual machines with service-direct faults enabled. Select the resource group's virtual machines to apply the experiment to. Each virtual machine represents a zone. Selecting only one virtual machine replicates a single zonal failure, but you can select more than one virtual machine if desired to replicate multiple zonal failures.

9. Select **Add**.

Microsoft Azure (Preview)

Report a bug

Search resources, services, and docs (G+/I)

Home > Chaos Studio >

Create an experiment

Chaos Studio | PREVIEW

BasicsExperiment designerReview + create

Configure your experiment below. [Learn more](#)

Step 1
1 branch, 0 action, 0 target

Step *

Step 1

Branch *

Branch 1

Fault

Parameter

Target resources

+ Add action

Add branch

Step 2
1 branch, 0 action, 0 target

Step 3
1 branch, 0 action, 0 target

Add step

Provide feedback
Did you find what you needed? Let us know how it went.

Review + create

< Previous

Next : Review + create >

Add fault

PREVIEW

Fault details

Target resources

A chaos target resource is an Azure resource against which you will run a fault. A resource must first be set up as a chaos target before it can be selected here. [Learn more](#)

Subscriptions - Don't see a subscription? [Open Directory](#) + [Subscription settings](#)

2 of 78 subscriptions selected

<input type="checkbox"/>	Resource name	Subscription	Resource group
<input type="checkbox"/>	ChaosLinuxVM	018bf144-3a6d-4c13-b1d3-d100a03adc...	chaostargets
<input type="checkbox"/>	ChaosWindowsVM	018bf144-3a6d-4c13-b1d3-d100a03adc...	chaostargets
<input type="checkbox"/>	chaosazdemo1	018bf144-3a6d-4c13-b1d3-d100a03adc...	availabilityzonedemo
<input checked="" type="checkbox"/>	chaosazdemo0	018bf144-3a6d-4c13-b1d3-d100a03adc...	availabilityzonedemo
<input type="checkbox"/>	chaosazdemo2	018bf144-3a6d-4c13-b1d3-d100a03adc...	availabilityzonedemo
<input type="checkbox"/>	shmalavaTest	af743041-9b79-46ad-92cb-c298c57b632c	shrunga_learning

Add

< Previous

Next >

10. Enter descriptive names in the **Step** field and the **Branch** field.

Microsoft Azure (Preview)

Report a bug

Search resources, services, and docs (G+I)

Home > Chaos Studio >

Create an experiment

Chaos Studio | PREVIEW

Basics

Experiment designer

Review + create

Configure your experiment below. [Learn more](#)

Availability Zone 1 in East US down
1 branch, 1 action, 1 target

Step *

Availability Zone 1 in East US down

Branch *

Shutdown VMs in Zone 1

Fault	Parameter	Target resources
VM Shutdown	duration: 10 minutes abruptShutdown: true	1 resources

+ Add action

Add branch

Note: If you are attempting to fail multiple availability zones, you can add more steps to the experiment. Each step is run sequentially. Select the **Add step** button and repeat steps 5-11 of this section for each new step.

Microsoft Azure (Preview)

Report a bug

Search resources, services, and docs (G+/I)

Home > Chaos Studio >

Create an experiment ...

Chaos Studio | PREVIEW

Basics Experiment designer Review + create

Configure your experiment below. [Learn more](#)

Availability Zone 1 in East US down
1 branch, 1 action, 1 target

Availability Zone 1 & 2 in East US down
1 branch, 1 action, 2 target

Step *
Availability Zone 1 & 2 in East US down

Branch *
VM shutdown in Zone 1 & 2

Fault	Parameter	Target resources
VM Shutdown	duration: 10 minutes abruptShutdown: true	2 resources

+ Add action

Add branch

Add step

Provide feedback
Did you find what you needed? Let us know how it went.

Review + create

< Previous

Next : Review + create >

11. Once you have added all desired steps, select **Next: Review + create**.

Microsoft Azure (Preview)

Report a bug

Search resources, services, and docs (G+/I)

[Home](#) > [Chaos Studio](#) >

Create an experiment ...

Chaos Studio | PREVIEW

BasicsExperiment designerReview + create

Configure your experiment below. [Learn more](#)

Availability Zone 1 in East US down
1 branch, 1 action, 1 target

Availability Zone 1 & 2 in East US down
1 branch, 1 action, 2 target

Step *Availability Zone 1 & 2 in East US down

Branch *VM shutdown in Zone 1 & 2

Fault	Parameter	Target resources
VM Shutdown	duration: 10 minutes abruptShutdown: true	2 resources

+ Add action

Add branch

Add step

Provide feedback
Did you find what you needed? Let us know how it went.

Review + create

< Previous

Next Review + create >

12. The **Review + create** screen appears. Review the experiment details. Then, when you are ready to proceed, select **Create**.

Microsoft Azure (Preview)

Report a bug

Search resources, services, and docs (G+/I)

[Home](#) > [Chaos Studio](#) >

Create an experiment

Chaos Studio | PREVIEW

[Basics](#) [Experiment designer](#) [Review + create](#)

Before starting your experiment, you need to assign the experiment identity to each resource targeted. [Learn more](#) [\(Link\)](#)

Basics

Subscription	Azure Chaos Studio Demo
Resource group	2021chaosdemo
Name	azDownDrillDemo
Location	(US) East US

Availability Zone 1 in East US down

Shutdown VMs in Zone 1

VM Shutdown

Duration	10 minutes
abruptShutdown	true
Target resources	1 targets

Availability Zone 1 & 2 in East US down

VM shutdown in Zone 1 & 2

VM Shutdown

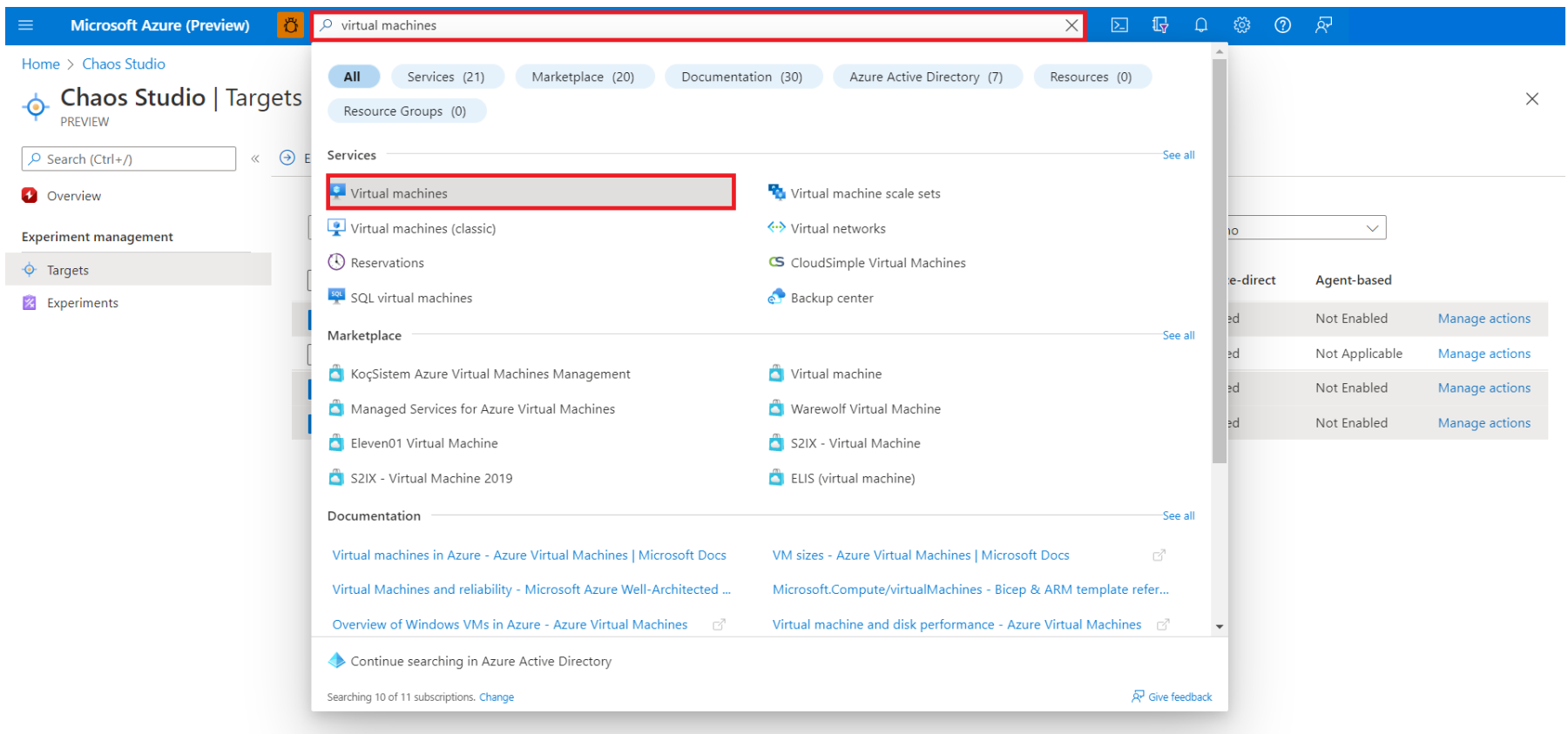
Duration	10 minutes
abruptShutdown	true
Target resources	2 targets

Create < Previous Next >

Assign an experiment identity to each targeted resource

Before starting the experiment, you need to assign an experiment identity to each targeted resource. The experiment will fail if an identity is not assigned.

1. Search for **virtual machines** in the search bar and select **Virtual machines** from the menu.



2. Select one of the resources targeted by any step of the created experiment to open its details panel. In this panel, select **Access control (IAM)**, select **Add**, then select **Add role assignment**.

Microsoft Azure (Preview) Search resources, services, and docs (G+/)

Home > Virtual machines > chaosazdemo0

Virtual machines

Microsoft (microsoft.onmicrosoft.com)

+ Create ▾ ↺ Switch to classic ...

Filter for any field...

Name ↑↓

- chaosazdemo0
- chaosazdemo1
- chaosazdemo2
- ChaosLinuxVM
- ChaosWindowsVM

Page 1 of 1

chaosazdemo0 | Access control (IAM)

Virtual machine

Search (Ctrl+/) <<

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Settings
 - Networking
 - Connect
 - Disks
 - Size
 - Microsoft Defender for Cloud
 - Advisor recommendations
 - Extensions + applications
 - Continuous delivery
 - Availability + scaling
 - Configuration
 - Identity
 - Properties

+ Add Download role assignments Edit columns Refresh Remove Got feedback?

Add role assignment

Add co-administrator

My access

View my level of access to this resource.

View my access

Check access

Review the level of access a user, group, service principal, or managed identity has to this resource. [Learn more](#)

Find ⓘ

☒ User, group, or service principal

☐ Managed identity

Search by name or email address

Grant access to this resource

Grant access to resources by assigning a role.

Add role assignment [Learn more](#)

View access to this resource

View the role assignments that grant access to this and other resources.

View [Learn more](#)







View deny assignments

View the role assignments that have been denied access to specific actions at this scope.

3. Select **Virtual Machine Contributor** from the list, highlighting it. Select **Next**.


Microsoft Azure (Preview)

Search resources, services, and docs (G+/)



[Home](#) > [Virtual machines](#) > [chaosazdemo0](#) >

Add role assignment

 Got feedback?

Managed Application Contributor Role	Allows for creating managed application resources.	BuiltInRole	Management + Gover...	View
Managed Application Operator Role	Lets you read and perform actions on Managed Application resources	BuiltInRole	Management + Gover...	View
Managed Applications Reader	Lets you read resources in a managed app and request JIT access.	BuiltInRole	Management + Gover...	View
masterreader	Lets you view everything, but not make any changes.	CustomRole	None	View
Microsoft OneAsset Reader	This role is for Microsoft OneAsset team (CSEO) to track internal security compliance and resource utilization.	CustomRole	None	View
Monitoring Contributor	Can read all monitoring data and update monitoring settings.	BuiltInRole	Monitor	View
Monitoring Metrics Publisher	Enables publishing metrics against Azure resources	BuiltInRole	Monitor	View
Monitoring Reader	Can read all monitoring data.	BuiltInRole	Monitor	View
Reservation Purchaser	Lets you purchase reservations	BuiltInRole	Management + Gover...	View
Resource Policy Contributor	Users with rights to create/modify resource policy, create support ticket and read resources/hierarchy.	BuiltInRole	Management + Gover...	View
User Access Administrator	Lets you manage user access to Azure resources.	BuiltInRole	General	View
Virtual Machine Administrator Login	View Virtual Machines in the portal and login as administrator	BuiltInRole	Compute	View
Virtual Machine Contributor	Lets you manage virtual machines, but not access to them, and not the virtual network or storage account they're conne...	BuiltInRole	Compute	View
Virtual Machine User Login	View Virtual Machines in the portal and login as a regular user.	BuiltInRole	Compute	View

Review + assign

Previous

Next

4. Select the **Select members** link. In the right sidebar, enter the name of the experiment you created in the **Select** search field. Select the experiment from the list. Once selected, the experiment will move to the **Selected members:** section. Select the **Select** button.

Microsoft Azure (Preview) [Report a bug](#) Search resources, services, and docs (G+/)

Home > chaosazdemo0 >

Add role assignment

[Got feedback?](#)

Role **Members** [Review + assign](#)

Selected role Virtual Machine Contributor

Assign access to ☒ User, group, or service principal ☐ Managed identity

Members [+ Select members](#)

Name	Object ID	Type
No members selected		

Description Optional

[Review + assign](#) [Previous](#) [Next](#)


Select members

Select ⓘ

azDownDrillDemo

No users, groups, or service principals found.

Selected members:

 azDownDrillDemo [Remove](#)


[Select](#) [Close](#)

5. Select **Review + assign**, then select **Review + assign** again to assign the identity to the resource.

Home > chaosazdemo0 >

Add role assignment



 Got feedback?

Role **Members** Review + assign


Selected role Virtual Machine Contributor

Assign access to

☒ User, group, or service principal

☐ Managed identity

Members [+ Select members](#)

Name	Object ID	Type	
azDownDrillDemo	f28565de-21d5-474d-bc4d-3e29b5e94a...	App	

Description

Optional

Review + assign

Previous

Next

Microsoft Azure (Preview)

Search resources, services, and docs (G+)

[Home](#) > [Virtual machines](#) > [chaosazdemo0](#) >

Add role assignment

Got feedback?

Role

Members

Review + assign

Role

Scope

Members

Description

Virtual Machine Contributor

/subscriptions/018bf144-3a6d-4c13-b1d3-d100a03adc6b/resourceGroups/availabilityzonedemo/providers/Microsoft.Compute/virtualMachines/chaosazdemo0

Name	Object ID	Type
azDownDrillDemo	f28565de-21d5-474d-bc4d-3e29b5e94aeb	App

No description

Review + assign

Previous

6. Repeat steps 1-6 of this section for each resource targeted in the experiment. If the experiment only targeted one resource, continue to the next section.

Run the experiment

1. From the main Chaos Studio page, select **Experiments**, then select the name of your experiment. You will see the experiment details panel.

Microsoft Azure (Preview) Search resources, services, and docs (G+)

Home > Chaos Studio >

Chaos Studio | Experiments

PREVIEW

Search (Ctrl+/) Create Manage view

Overview

Experiment management

Targets

Experiments

Filter for any field...

Name ↑↓

- aksPodKill
- AzDownDrill
- azDownDrillDemo**
- complexDemo
- cpuPressure
- RedisRebootdemo
- serviceInterruption
- testAKS
- VMShutdownExp
- websiteFailure

azDownDrillDemo

Chaos Experiment | PREVIEW

Search (Ctrl+/) Start Stop Edit Delete Refresh Feedback

Overview

Activity log

Access control (IAM)

Diagnose and solve problems

Settings

Locks

Monitoring

Alerts

Metrics

Logs

Automation

Tasks (preview)

Export template

Support + troubleshooting

New Support Request

Essentials

Resource group ([move](#))

2021chaosdemo

Subscription ([move](#))

Azure Chaos Studio Demo

Location ([move](#))

East US

Status

Cancelled

Last started

5/5/2022, 2:40:49 PM

Last ended

5/5/2022, 2:50:41 PM

View Cost JSON View

History

Start time ↑	End time	Status	Identifier
5/5/2022, 2:40:49 PM	5/5/2022, 2:50:41 PM	Cancelled	C2F5C6C5-ABE7-4E19-
4/28/2022, 12:54:18 PM	4/28/2022, 1:16:01 PM	Success	DE239B7A-C3DD-4865
4/27/2022, 5:53:17 PM	4/27/2022, 6:14:44 PM	Success	EEE3BF5B-BCF2-42C1-
4/26/2022, 1:45:54 PM	4/26/2022, 2:08:34 PM	Success	0BADE50E-7B13-48D4
4/26/2022, 1:43:04 PM	4/26/2022, 1:43:30 PM	Failed	5221E305-F289-4FAA-

2. Select **Start**, then select **OK**.

Microsoft Azure (Preview) Search resources, services, and docs (G+)

Home > Chaos Studio >

Chaos Studio | Experiments

PREVIEW

Search (Ctrl+/) Create Manage view

Overview

Experiment management

- Targets
- Experiments

Filter for any field...

Name	
aksPodKill	...
AzDownDrill	...
azDownDrillDemo	...
complexDemo	...
cpuPressure	...
RedisRebootdemo	...
serviceInterruption	...
testAKS	...
VMShutdownExp	...
websiteFailure	...

azDownDrillDemo

Chaos Experiment | PREVIEW

Search (Ctrl+/) Start Stop Edit Delete Refresh Feedback

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- New Support Request

Start this experiment

You are about to start a chaos experiment that could impact subscription resources or cause serious outages. Are you sure you want to proceed?

OK Cancel

Azure Chaos Studio Demo 5/5/2022, 2:40:43 PM

Location (move) Last ended
East US 5/5/2022, 2:50:41 PM

History

Start time	End time	Status	Identifier
5/5/2022, 2:40:49 PM	5/5/2022, 2:50:41 PM	Cancelled	C2F5C6C5-ABE7-4E19-
4/28/2022, 12:54:18 PM	4/28/2022, 1:16:01 PM	Success	DE23987A-C3DD-4865
4/27/2022, 5:53:17 PM	4/27/2022, 6:14:44 PM	Success	EEE38F5B-BCF2-42C1-
4/26/2022, 1:45:54 PM	4/26/2022, 2:08:34 PM	Success	0BADE50E-7B13-48D4
4/26/2022, 1:43:04 PM	4/26/2022, 1:43:30 PM	Failed	5221E305-F289-4FAA-

3. Once the status changes to **Running**, the targeted virtual machines are successfully taken offline for the duration of the experiment. Select **Details** for real-time information on each branch and fault in the experiment.

Chaos Studio | Experiments

azDownDrillDemo

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2021chaosdemo

Subscription (move)

Azure Chaos Studio Demo

Location (move)

East US

Status

Running

Last started

5/10/2022, 1:58:42 PM

Last ended

-

History

Start time ↑	End time	Status	Identifier
5/10/2022, 1:58:42 PM	-	Running	809AEF37-6224-46B1-ACD1-Details
5/5/2022, 2:40:49 PM	5/5/2022, 2:50:41 PM	Cancelled	C2F5C6C5-ABE7-4E19-8390-Details
4/28/2022, 12:54:18 PM	4/28/2022, 1:16:01 PM	Success	DE239B7A-C3DD-4865-B16-Details
4/27/2022, 5:53:17 PM	4/27/2022, 6:14:44 PM	Success	EEE3BF5B-BCF2-42C1-8683-Details
4/26/2022, 1:45:54 PM	4/26/2022, 2:08:34 PM	Success	0BADE50E-7B13-48D4-9271-Details
4/26/2022, 1:43:04 PM	4/26/2022, 1:43:30 PM	Failed	5221E305-F289-4FAA-8B16-Details

Assess the hypothesis

Compare the results of the experiment against your hypothesis. Analyze any relevant metrics. Do the results align with your expectations?

For instance, if your hypothesis addresses availability testing, analyze your health model in Geneva for the duration of the Chaos experiment to see if there was any impact on availability. If there was an impact, analyze the returned logs and metrics from the experiment to understand why there was a dip in availability. Similarly, if you are testing to validate SLI alerts or to validate feedback on failures, analyze any feedback against the hypothesis to ensure the alerts are properly responding to failures.

If your results were unexpected, consider any reasons why, create a new hypothesis, implement any necessary changes, and repeat the experiment: "If a single availability zone goes down, availability should remain at % with % tolerance because **resilience improvement has been made. I expect to find these results by analyzing .**"

Overview

You have now learned about availability zones and observability metrics, how to formulate and evaluate an experiment hypothesis, and how to create an experiment in Azure Chaos Studio that tests the resiliency of an application during a zonal failure scenario.

Next steps

- Manage your experiment (<https://docs.microsoft.com/azure/chaos-studio/chaos-studio-tutorial-service-direct-portal#:~:text=Manage%20your%20experiment>)

Additional resources

- Troubleshoot issues with Azure Chaos Studio (<https://docs.microsoft.com/azure/chaos-studio/troubleshooting>)
- Chaos Studio fault and action library (<https://docs.microsoft.com/azure/chaos-studio/chaos-studio-fault-library>)