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What is Azure CLI

3/19/2020 • 2 minutes to read • [Edit Online](#)

The Azure command-line interface (Azure CLI) is a set of commands used to create and manage Azure resources. The Azure CLI is available across Azure services and is designed to get you working quickly with Azure, with an emphasis on automation.

Key Characteristics

Azure CLI capabilities make it easy to work with different programming languages and software environments. For example, Azure CLI:

- Is available to install in Windows, macOS, and Linux environments.
- Can also be run in Docker and Azure Cloud Shell.
- Offers command-line flexibility when managing an Azure solution.
- Supports long-running operations.
- Has the ability to use one subscription for all commands, or vary subscriptions per command.
- Allows for querying of command-line results with query output returned in your format of choice.
- Has the flexibility to work with multiple clouds.
- Provides configurable settings for logging, data collection, and default argument values.
- Is deployed with Resource Manager deployment templates.

Current Version

The current version of the Azure CLI is 2.7.0. For information about the latest release, see the [release notes](#). To find your installed version and see if you need to update, run `az --version`.

See Also

- [Get started with the Azure CLI](#)
- [Full command reference list for the Azure CLI](#)
- [Services the Azure CLI can manage](#)

Azure services the Azure CLI can manage

3/31/2020 • 2 minutes to read • [Edit Online](#)

The Azure CLI is available across many Azure services, and is a flexible yet powerful tool to create and manage Azure resources. This article provides the list of Azure services the Azure CLI can manage.

Azure CLI references are available for the following:

CATEGORY WITH LINK TO POPULAR ARTICLES	SERVICE FULL DOCUMENTATION
AI + Machine Learning	Azure Machine Learning
	Cognitive Services
Analytics	Azure Data Lake Storage
	Data Lake Analytics
	Event Hubs
	HDInsight
Blockchain	Azure Cosmos DB
Compute	App Service
	Azure Functions
	Azure Kubernetes Service (AKS)
	Azure Spring Cloud
	Batch
	Container Instances
	Service Fabric
	Virtual Machine Scale Sets
Containers	Azure Functions
	Azure Kubernetes Service (AKS)
	Container Instances
	Container Registry
	Service Fabric

CATEGORY WITH LINK TO POPULAR ARTICLES	SERVICE FULL DOCUMENTATION
Databases	Azure Cosmos DB
	Azure Database for MariaDB
	Azure Database for MySQL
	Azure Database for PostgreSQL
	Azure SQL Database
Developer Tools	App Configuration
	Azure DevOps
	Azure DevTest Labs
	Azure Lab Services
DevOps	Azure DevOps
	Azure DevTest Labs
Hybrid	Azure Active Directory (AD)
	Azure Database for PostgreSQL
	Azure DevOps
	Azure IoT Edge
	Azure SQL Database
Identity	Azure Active Directory (AD)
Integration	Event Grid
	Service Bus
Internet of Things	Azure Cosmos DB
	Azure Functions
	Azure IoT Central
	Azure IoT Edge
	Azure IoT Hub
	Azure Machine Learning

CATEGORY WITH LINK TO POPULAR ARTICLES	SERVICE FULL DOCUMENTATION
	Event Grid
Management and Governance	Azure Backup
	Azure Managed Applications
	Azure Resource Manager
	Traffic Manager
Media	Media Services
Mobile	App Service
Networking	Azure DNS
	Azure Private Link
	Load Balancer
	Traffic Manager
	Virtual Network
Security	Azure Active Directory (AD)
	Key Vault
Storage	Azure Backup
	Azure Data Lake Storage
	Managed Disks
	Storage Accounts
Web	App Service
	Azure Cognitive Search
	Azure Spring Cloud
	Notification Hubs

See also

- [Get started with the Azure CLI](#)
- [Full command reference list for the Azure CLI](#)
- [Popular articles on using the Azure CLI](#)

Get started with Azure CLI

3/19/2020 • 4 minutes to read • [Edit Online](#)

Welcome to the Azure CLI! This article introduces the CLI and helps you complete common tasks.

NOTE

In scripts and on the Microsoft documentation site, Azure CLI examples are written for the `bash` shell. One-line examples will run on any platform. Longer examples which include line continuations (`\`) or variable assignment need to be modified to work on other shells, including PowerShell.

Install or run in Azure Cloud Shell

The easiest way to get started with the Azure CLI is by running it in an Azure Cloud Shell environment through your browser. To learn about Cloud Shell, see [Quickstart for Bash in Azure Cloud Shell](#).

When you're ready to install the CLI, see the [installation instructions](#).

After installing the CLI for the first time, check that it's installed and you've got the correct version by running

```
az --version
```

NOTE

If you're using the Azure classic deployment model, [install the Azure classic CLI](#).

Sign in

Before using any CLI commands with a local install, you need to sign in with [az login](#).

1. Run the `login` command.

```
az login
```

If the CLI can open your default browser, it will do so and load an Azure sign-in page.

Otherwise, open a browser page at <https://aka.ms/devicelogin> and enter the authorization code displayed in your terminal.

2. Sign in with your account credentials in the browser.

After logging in, you see a list of subscriptions associated with your Azure account. The subscription information with `isDefault: true` is the currently activated subscription after logging in. To select another subscription, use the [az account set](#) command with the subscription ID to switch to. For more information about subscription selection, see [Use multiple Azure subscriptions](#).

There are ways to sign in non-interactively, which are covered in detail in [Sign in with Azure CLI](#).

Common commands

This table lists some common commands used in the CLI and links to their reference documentation.

RESOURCE TYPE	AZURE CLI COMMAND GROUP
Resource group	az group
Virtual machines	az vm
Storage accounts	az storage account
Key Vault	az keyvault
Web applications	az webapp
SQL databases	az sql server
CosmosDB	az cosmosdb

Finding commands

Commands in the CLI are organized as *commands* of *groups*. Each group represents an Azure service, and commands operate on that service.

To search for commands, use [az find](#). For example, to search for command names containing `secret`, use the following command:

```
az find secret
```

Use the `--help` argument to get a complete list of commands and subgroups of a group. For example, to find the CLI commands for working with Network Security Groups (NSGs):

```
az network nsg --help
```

The CLI has full tab completion for commands under the bash shell.

Globally available arguments

There are some arguments that are available for every command.

- `--help` prints CLI reference information about commands and their arguments and lists available subgroups and commands.
- `--output` changes the output format. The available output formats are `json`, `jsonc` (colorized JSON), `tsv` (Tab-Separated Values), `table` (human-readable ASCII tables), and `yaml`. By default the CLI outputs `json`. To learn more about the available output formats, see [Output formats for Azure CLI](#).
- `--query` uses the [JMESPath query language](#) to filter the output returned from Azure services. To learn more about queries, see [Query command results with Azure CLI](#) and the [JMESPath tutorial](#).
- `--verbose` prints information about resources created in Azure during an operation, and other useful information.
- `--debug` prints even more information about CLI operations, used for debugging purposes. If you find a bug, provide output generated with the `--debug` flag on when submitting a bug report.

Interactive mode

The CLI offers an interactive mode that automatically displays help information and makes it easier to select subcommands. You enter interactive mode with the [az interactive](#) command.

```
az interactive
```

For more information on interactive mode, see [Azure CLI Interactive Mode](#).

There's also a [Visual Studio Code plugin](#) that offers an interactive experience, including autocomplete and mouse-over documentation.

Learn CLI basics with quickstarts and tutorials

To get you started with the Azure CLI, try an in-depth tutorial for setting up virtual machines and using the power of the CLI to query Azure resources.

[Create virtual machines with the Azure CLI tutorial](#)

There are also quickstarts for other popular services.

- [Create a storage account using the Azure CLI](#)
- [Transfer objects to/from Azure Blob storage using the CLI](#)
- [Create a single Azure SQL database using the Azure CLI](#)
- [Create an Azure Database for MySQL server using the Azure CLI](#)
- [Create an Azure Database for PostgreSQL using the Azure CLI](#)
- [Create a Python web app in Azure](#)
- [Run a custom Docker Hub image in Azure Web Apps for Containers](#)

Give feedback

We welcome your feedback for the CLI to help us make improvements and resolve bugs. You can [file an issue on GitHub](#) or use the built-in features of the CLI to leave general feedback with the [az feedback](#) command.

```
az feedback
```

See also

- [Services the Azure CLI can manage](#)
- [Full command reference list for the Azure CLI](#)
- [Popular articles on using the Azure CLI](#)

Popular articles using the Azure CLI

3/19/2020 • 7 minutes to read • [Edit Online](#)

The Azure CLI is used in many Azure services resulting in articles being spread across document repositories. This page provides links to select popular articles.

Compute

Virtual Machines	Tutorial: Linux	Create a Linux virtual machine with the Azure CLI	Create a virtual machine. Learn about output queries and setting environment variables.
Virtual Machines	Quickstart: Linux	Create a Linux virtual machine using the Azure CLI	Create and deploy a Linux virtual machine. Open a port for web traffic, and install a web server.
Virtual Machines	How-to guide: Linux	Create a Linux image of a virtual machine or VHD	Deprovision an existing virtual machine, create an image, and create a new virtual machine from the captured image.
Virtual Machines	How-to guide: Linux	Upload a VHD to Azure using the Azure CLI	Create an empty managed disk, upload your local VHD file, and copy a managed disk.
Virtual Machines	How-to guide: Linux	Create a shared image gallery using the Azure CLI	Create a Shared Image Gallery of custom VM images with others in your organization, within or across regions, or within an Azure Active Directory tenant.
Virtual Machines	How-to guide: Linux	Deploy Spot VMs using the Azure CLI (preview)	Deploy a Linux Spot virtual machine that will not be evicted based on price.
Virtual Machines	Quickstart: Windows	Create a Windows virtual machine using the Azure CLI	Deploy a virtual machine in Azure that runs Windows Server 2016.
Virtual Machines	Learn Module	Manage virtual machines using the Azure CLI	Create, start, stop, and perform additional management tasks related to virtual machines.

Azure Kubernetes Service (AKS)	Quickstart	Deploy an Azure Kubernetes Service (AKS) cluster using the Azure CLI	Deploy and manage AKS clusters. See how to monitor the health of the cluster and pods that run your application.
Azure Batch	Sample	Run a job and tasks with Azure Batch using the Azure CLI	Create a Batch job and add a series of tasks to the job. Monitor a job and its tasks.
Azure Batch	Sample	Create and manage a Windows pool in Azure Batch using the Azure CLI	Create and manage a pool of Windows compute nodes with a Cloud Services configuration.
Azure Container Instance	Quickstart	Deploy a container instance using the Azure CLI	Deploy an isolated Docker container and make its application available with a fully qualified domain name (FQDN). Execute a single deployment command, then browse to the application running in the container.
Azure Function	Quickstart	Create a function in Azure that responds to HTTP requests using the Azure CLI	Use command-line tools to create a function that responds to HTTP requests. After testing the code locally, deploy the function to the serverless environment of Azure Functions.

Networking

Virtual Network	Quickstart	Create a virtual network using the Azure CLI	Create a virtual network, deploy two virtual machines into the virtual network, and connected to the virtual machines from the internet.
Virtual Network	How-to guide	Enable Accelerated Networking on a Linux virtual machine using the Azure CLI	Create a Linux virtual machine, handle dynamic binding and revocation of virtual function, and enable Accelerated Networking.

Internet of Things

IoT Hub	Tutorial	Configure IoT Hub message routing using the Azure CLI	Set up and use custom routing queries with IoT Hub.

Developer Tools

Azure App Configuration	Samples	Azure CLI samples for Azure App Configuration	Get links to bash scripts that use the Azure CLI for Azure App Configuration.
Azure DevOps	Get Started: DevOps Pipeline	Create your first Azure Pipeline using the Azure CLI	Create a new pipeline in a cloned GitHub directory, manage and run your pipelines.
Azure DevOps	How-to guide: DevOps Pipeline	Azure Pipeline deployment tasks using the Azure CLI	In a build or release pipeline, run a shell or batch script containing the Azure CLI. Commands run on cross-platform agents running on Linux, macOS, or Windows operating systems.
Azure DevOps	Tutorial: Jenkins Pipeline	Deploy to Azure App Service with Jenkins using the Azure CLI	Create and configure a Jenkins virtual machine, create a web app in Azure, and prepare a GitHub repository. Create and run the Jenkins pipeline.

Databases

SQL Database	Sample	Configure Azure SQL Database using the Azure CLI	Azure CLI samples for Azure SQL Database.
MySQL	Quickstart	Create an Azure Database for MySQL server using the Azure CLI	Create an Azure Database for MySQL server. Configure a firewall rule and SSL settings. Get and use connection information.
Cosmos DB	How-to guide	Manage Azure Cosmos resources using the Azure CLI	Use common commands to automate management of your Azure Cosmos DB accounts, databases, and containers.
Cosmos DB	Sample	Azure CLI samples for Azure Cosmos DB SQL (Core) API	Get links to sample Azure CLI scripts for Azure Cosmos DB SQL (Core) API.

Analytics

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Azure Event Hub	Quickstart	Create an event hub using the Azure CLI	Create an Event Hubs namespace, and an event hub.
HDInsight	How-to-guide	Create HDInsight clusters using the Azure CLI	Create a HDInsight 3.6 cluster.
HDInsight	Tutorial	Manage Azure HDInsight clusters using the Azure CLI	List, show, delete, and scale HDInsight clusters.

Management and Governance

Resource Manager Templates	How-to guide	Deploy resources with Azure Resource Manager templates and the Azure CLI	Deploy your resources to Azure using templates.
Resource Manager groups	How-to guide	Manage Azure Resource Manager resource groups by using the Azure CLI	Use Azure Resource Manager to manage your Azure resource groups.
Resource Graph	Quickstart	Run your first Resource Graph query using the Azure CLI	Add Azure Resource Graph to your Azure CLI installation and run your first Resource Graph query.
Policy assignment	Quickstart	Create a policy assignment to identify non-compliant resources using the Azure CLI	Create a policy assignment to identify virtual machines that aren't using managed disks.

Hybrid

Azure Stack Hub	Quickstart: Linux VM	Create a Linux server virtual machine in Azure Stack Hub using the Azure CLI	Create an Ubuntu Server 16.04 LTS virtual machine, connect to the virtual machine with a remote client, and install an NGINX web server.
Azure Stack Hub	Quickstart: Windows VM	Create a Windows Server virtual machine in Azure Stack Hub using the Azure CLI	Create a Windows Server 2016 virtual machine, connect the virtual machine with a remote client, and install the IIS web server.
Azure Stack Hub	How-to guide: ASDK resources	Manage and deploy resources to Azure Stack Hub using the Azure CLI	Set up the Azure CLI to manage Azure Stack Development Kit (ASDK) resources from Linux, Mac, and Windows client platforms.

Storage

Blob storage	Quickstart	Create, download, and list blobs using the Azure CLI	Upload and download data to and from Azure Blob storage.
Blob storage	How-to guide	Authorize access to blob or queue data using the Azure CLI	Specify how data operations are authorized, and set environment variables for parameters.
Blob storage	How-to guide	Use the Azure CLI to manage directories, files, and ACLs in Azure Data Lake Storage Gen2 (preview)	Create and manage directories, files, and permissions in storage accounts that have a hierarchical namespace.
File storage	Quickstart	Create and manage Azure file shares using the Azure CLI	Create and use Azure file shares. Create and manage share snapshots.

Security

Service principal	How-to guide	Create an Azure service principal with the Azure CLI	Create, get information about, and reset a service principal with the Azure CLI.
RBAC	How-to guide	Add or remove role assignments using Azure RBAC and the Azure CLI	Assign roles to Azure role-based access control.
Key Vault	How-to guide	Manage Key Vault using the Azure CLI	Create and manage Azure Key Vault. Register and authorize an application, set advanced access policies, and learn cross-platform command-line interface commands.
Key Vault	Tutorial	Manage storage account keys with Key Vault and the Azure CLI	Manage storage account keys, and generate shared access signature tokens.

AI + Machine Learning

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Machine Learning	Reference	Use the Azure CLI extension for Azure Machine Learning	Run experiments to create machine learning models and register machine learning models for customer usage. Package, deploy and track the lifecycle of your machine learning models.
Cognitive Services	How-to-guide	Create a Cognitive Services resource using the Azure CLI	Sign up for Azure Cognitive Services and create an account that has a single-service or multi-service subscription. Use the keys and endpoint generated for you to authenticate your applications.
Azure Monitor	How-to guide	Create a Log Analytics workspace using the Azure CLI	Create and deploy a Log Analytics workspace.

Geographies

Azure Germany	Get Started	Connect to Azure Germany by using the Azure CLI	Using Azure Germany, manage a large subscription through scripts and access features that are not currently available in the global Azure portal.
Azure Government	Get Started	Connect to Azure Government with Azure CLI	Access and start managing resources in Azure Government.

See also

- [Get started with the Azure CLI](#)
- [Full command reference list for the Azure CLI](#)
- [Services the Azure CLI can manage](#)

Azure CLI release notes

6/2/2020 • 132 minutes to read • [Edit Online](#)

June 02, 2020

Version 2.7.0

ACR

- Fix a typo in an error message of token creation

AKS

- Change default vm sku to Standard_D2s_v3
- Fix creating role assignment for MSI cluster plus custom subnet

AppService

- Fix #12739 az appservice list-locations returns some invalid locations

ARM

- `az deployment`: Fix issue #13159 of incorrect message of JSON after removing comments and compressing
- `az resource tag`: Fix issue #13255 of tagging resources with resource type `Microsoft.ContainerRegistry/registries/webhooks`
- Improve the examples for the resource module

ARO

- Change CLIErrror to correct flag for `--worker-vm-disk-size-gb`

EventHub

- Fix for issue #12406 Argument `--capture-interval` does not update the "intervalInSeconds"

HDInsight

- Change `get_json_object` to `shell_safe_json_parse`

Monitor

- `az monitor metrics alert`: refine several help messages
- `az monitor diagnostic-settings create`: support `--export-to-resource-specific` argument
- Support LA workspace recover

Network

- `az network dns zone`: support - character
- `az network vpn-connection ipsec-policy`: change the `--sa-lifetime` and `--sa-max-size` to larger values in example
- Bump network to 2020-04-01
- `az network private-endpoint-connection`: support event grid
- `az network express-route list-route-tables`: fix bug that cannot list routes as table

Packaging

- Add Ubuntu Focal Package

RBAC

- `az ad sp credential reset`: modify credential generation to avoid troublesome special characters

Redis

- Fix #13529: Change documentation of parameter enable_non_ssl_port

Storage

- `az storage copy`: Add parameter `--follow-symlinks` to support symlinks
- Enable local context for storage account
- `az storage logging`: Fix issue #11969 to refine error message

May 19, 2020

Version 2.6.0

ACR

- Add default timeout of 5 minutes for any requests to ACR
- Support disable public network access
- `az acr token create`: expose `--days` argument
- `az acr import`: accept `--source` argument values which contain login in server name through client end correction

ACS

- Bug fix: remove fields cleanup for fields that no longer exist

AKS

- Update uptime-sla command help context
- Remove range check for updating min count for autoscaler
- Fix that cli do not fail when user only specifies Windows password

AMS

- `az ams transform create`: Add ability to create a transform with a FaceDetector preset
- `az ams content-key-policy create`: Add ability to create a FairPlay content key policy with an offline rental configuration

AppConfig

- Bug fix for list key values with fields

AppService

- `az functionapp create`: AzureWebJobsDashboard will only be set if AppInsights is disabled
- Fix #10664- VNet Integration - Location Check Issue & fix #13257- az webapp up failing when RG needs to be created
- `az webapp|functionapp config ssl import`: Lookup key vault across resources groups in subscription and improve help and examples.
- Onboard local context for app service

ARM

- `az deployment`: Fix the problem that the templateLink will not be returned when deploying or validating template-uri
- `az deployment`: Fix the problem that deployment/validate does not support specially encoded character
- `az deployment sub/group what-if`: Fix array alignment and error handling
- `az deployment operation`: Modify the deprecate information

ARO

- Add examples to az aro create, list, list-credentials, show, delete

- Add generate_random_id function

Backup

- Allow FriendlyName in enable protection for AzureFileShare command
- Fix in laasVM restore-disks Command
- Add "MAB" BackupManagementType to item list command
- Add support for retrying policy update for failed items.
- Add Resume Protection functionality for Azure Virtual Machine
- Add support to specify ResourceGroup for storing instantRP during Create or Modify Policy

CI

- Support flake8 3.8.0

Compute

- New command az vm auto-shutdown
- `az vm list-skus`: Update --zone behavior, return all type skus now

Core

- Update local context on/off status to global user level

Extension

- `az extension add`: Add --system to enable installing extensions in a system path
- Support .egg-info to store wheel type extension metadata

IoT

- `az iot`: Update the IoT command module first run extension awareness message to the accurate, non-deprecated modern Id `azure-iot`.

IoT Hub

- Support for 2020-03-01 API and Network Isolation commands

NetAppFiles

- `az volume create`: Adds snapshot-id as a parameter to create volume this will allow users to create a volume from existing snapshot.

Network

- Fix ttl value changed unintended for dns add-record
- `az network public-ip create`: Inform customers of a coming breaking change
- Support generic commands for private link scenario
- `az network private-endpoint-connection`: Support mysql, postgre and mariadb types
- `az network private-endpoint-connection`: Support cosmosdb types
- `az network private-endpoint`: deprecate --group-ids and redirect to --group-id

Output

- Show update instruction in find, feedback and --help

Packaging

- Build MSI/Homebrew packages with dependencies resolved from requirements.txt

RBAC

- `az ad sp credential reset`: fix weak credential generation

Storage

- `az storage account file-service-properties update/show` : Add File Properties Support for Storage Account
- `az storage container create` : Fix #13373 by adding validator for public access
- Add ADLS Gen2 track2 support
- `az storage blob sync` : Support `--connection-string`
- `az storage blob sync` : Fix the incorrect error message when azcopy cannot find the installation location

April 30, 2020

Version 2.5.1

ACR

- `az acr check-health` : Fix "DOCKER_PULL_ERROR" on Windows

Compute

- `az vm list-ip-addresses` : Error handling
- Fix a bug of vm create if endpoint_vm_image_alias_doc is not set in cloud profile
- `az vmss create` : Add `--os-disk-size-gb`

Cosmos DB

- `az cosmosdb create/update` : add `--enable-public-network` support

Extension

- Fix loading wrong metadata for wheel type extension

Packaging

- Add az script for Git Bash/Cygwin on Windows

SQL

- `az sql instance-pool` : Add instance pools command group

Storage

- Upgrade package azure-multiapi-storage to 0.3.0
- Support GZRS for storage account creation and update
- `az storage account failover` : Add support for grs/gzrs storage account failover
- `az storage blob upload` : Add `--encryption-scope` parameter to support specifying encryption scope information

April 28, 2020

Version 2.5.0

ACS

- [BREAKING CHANGE] `az openshift create`: remove `--vnet-peer` parameter.
- `az openshift create` : add flags to support private cluster.
- `az openshift` : upgrade to `2019-10-27-preview` API version.
- `az openshift` : add `update` command.

AKS

- `az aks create` : Add support for Windows

AppService

- `az webapp deployment source config-zip` : remove sleep after request.get()

ARM

- Add template deployment What-If commands

ARO

- `az aro` : Fix table output

CI

- Onboard pytest and deprecate nose for Automation Test

Compute

- `az vmss disk detach` : fix data disk NoneType issue
- `az vm availability-set list` : Support showing VM list
- `az vm list-skus` : Fix display problem of table format

KeyVault

- Add new parameter `--enable-rbac-authorization` during creating or updating

Monitor

- Support LA cluster CMK features
- `az monitor log-analytics workspace linked-storage` : supports BYOS features

Network

- `az network security-partner` : support security partner provider

Privatedns

- Add feature in private DNS zone to import export zone file

April 21, 2020

Version 2.4.0

ACR

- `az acr run --cmd` : disable working directory override
- Support dedicated data endpoint

AKS

- `az aks list -o table` should show privateFqdn as fqdn for private clusters
- Add `--uptime-sla`
- Update containerservice package
- Add node public IP support
- Fix typo in the help command

AppConfig

- Resolve key vault reference for kv list and export commands
- Bug fix for list key values

AppService

- `az functionapp create` : Changed the way linuxFxVersion was being set for dotnet linux function apps. This should fix a bug that was preventing dotnet linux consumption apps from being created
- [BREAKING CHANGE] `az webapp create` : fix to keep existing AppSettings with az webapp create
- [BREAKING CHANGE] `az webapp up` : fix to create RG for az webapp up command when using -g flag
- [BREAKING CHANGE] `az webapp config` : fix to show values for non-JSON output with az webapp config connection-string list

ARM

- `az deployment create/validate` : Add parameter `--no-prompt` to support skipping the prompt of missing parameters for ARM template
- `az deployment group/mg/sub/tenant validate` : Support comments in deployment parameter file
- `az deployment` : Remove `is_preview` for parameter `--handle-extended-json-format`
- `az deployment group/mg/sub/tenant cancel` : Support cancel deployment for ARM template
- `az deployment group/mg/sub/tenant validate` : Improve the error message when deployment verification fails
- `az deployment-scripts` : Add new commands for DeploymentScripts
- `az resource tag` : Add parameter `--is-incremental` to support adding tags to resource incrementally

ARO

- `az aro` : Add Azure RedHat OpenShift V4 aro command module

Batch

- Update Batch API

Compute

- `az sig image-version create` : Add storage account type Premium_LRS
- `az vmss update` : Fix terminate notification update issue
- `az vm/vmss create` : Add support for specialized image version
- SIG API Version 2019-12-01
- `az sig image-version create` : Add `--target-region-encryption`
- Fix tests fail when running in serial due to keyvault name is duplicated in global in-memory cache

CosmosDB

- Support `az cosmosdb private-link-resource/private-endpoint-connection`

IoT Central

- Deprecate `az iotcentral`
- Add `az iot central` command module

Monitor

- Support private link scenario for monitor
- Fix wrong mocking way in `test_monitor_general_operations.py`

Network

- Deprecate sku for public ip update command
- `az network private-endpoint` : Support private dns zone group
- Enable local context feature for vnet/subnet parameter
- Fix wrong usage example in `test_nw_flow_log_delete`

Packaging

- Drop support for Ubuntu/Disco package

RBAC

- `az ad app create/update` : support `--optional-claims` as a parameter

RDBMS

- Add Azure active directory administrator commands for PostgreSQL and MySQL

Service Fabric

- Fix #12891: `az sf application update --application-parameters` removes old parameters that are not in the

request

- Fix #12470 az sf create cluster, fix bugs in update durability and reliability and find vmss correctly through the code given a node type name

SQL

- Add `az sql mi op list`, `az sql mi op get`, `az sql mi op cancel`
- `az sql midb`: update/show long term retention policy, show/delete long term retention backups, restore long term retention backup

Storage

- Upgrade azure-mgmt-storage to 9.0.0
- `az storage logging off`: Support turning off logging for a storage account
- `az storage account update`: Enable key auto-rotated for CMK
- `az storage account encryption-scope create/update/list/show`: Add support to customize encryption scope
- `az storage container create`: Add `--default-encryption-scope` and `--deny-encryption-scope-override` to set encryption scope for container level

Survey

- Add switch to turn off survey link

April 01, 2020

Version 2.3.1

ACR

- Fix wrong version of azure-mgmt-containerregistry for Linux

Profile

- az login: Fix login failure with cloud profiles other than `latest`

March 31, 2020

Version 2.3.0

ACR

- 'az acr task update': null pointer exception
- `az acr import`: Modify help and error message to clarify the usage of `--source` and `--registry`
- Add a validator for argument 'registry_name'
- `az acr login`: Remove the preview flag on '`--expose-token`'
- [BREAKING CHANGE] 'az acr task create/update' Branch parameter is removed
- 'az acr task update' Customer now can update context, git-token, and or triggers individually
- 'az acr agentpool': new feature

AKS

- Fix apiServerAccessProfile when updating `--api-server-authorized-ip-ranges`
- aks update: Override outbound IPs with input values when update
- Do not create SPN for MSI clusters and support attach acr to MSI clusters

AMS

- Fix #12469: adding Fairplay content-key-policy fails due to problems with 'ask' parameter

AppConfig

- Add `--skip-keyvault` for kv export

AppService

- Fix #12509: Remove the tag to az webapp up by default
- az functionapp create: Updated --runtime-version help menu and added warning when user specifies --runtime-version for dotnet
- az functionapp create: Updated the way javaVersion was being set for Windows function apps

ARM

- az deployment create/validate: Use --handle-extended-json-format by default
- az lock create: Add examples of creating subresource in the help documentation
- az deployment {group/mg/sub/tenant} list: Support provisioningState filtering
- az deployment: Fix the parse bug for comment under the last argument

Backup

- Added multiple files restore capabilities
- Added support for Backing up OS Disks only
- Added restore-as-unmanaged-disk parameter to specify unmanaged restore

Compute

- az vm create: Add NONE option of --nsg-rule
- az vmss create/update: remove vmss automatic repairs preview tag
- az vm update: Support --workspace
- Fix a bug in VirtualMachineScaleSetExtension initialization code
- Upgrade VMAccessAgent version to 2.4
- az vmss set-orchestration-service-state: support vmss set orchestration service state
- Upgrade disk API version to 2019-11-01
- az disk create: add --disk-iops-read-only, --disk-mbps-read-only, --max-shares, --image-reference, --image-reference-lun, --gallery-image-reference, --gallery-image-reference-lun

Cosmos DB

- Fix missing --type option for deprecation redirections

Docker

- Update to Alpine 3.11 and Python 3.6.10

Extension

- Allow to load extensions in the system path via packages

HDInsight

- (az hdinsight create:) Support customers specify minimal supported tls version by using parameter `--minimal-tls-version`. The allowed value is 1.0,1.1,1.2

IoT

- Add codeowner
- az iot hub create : Change default sku to S1 from F1
- iot hub: Support IoT Hub in the profile of 2019-03-01-hybrid

IoTCentral

- Update error details, update default application template and prompt message

KeyVault

- Support certificate backup/restore

- keyvault create/update: Support --retention-days
- No longer display managed keys/secrets while listing
- az keyvault create: support `--network-acls`, `--network-acls-ips` and `--network-acls-vnets` for specifying network rules while creating vault

Lock

- az lock delete fix bug: az lock delete does not work on Microsoft.DocumentDB

Monitor

- az monitor clone: support clone metric rules from one resource to another
- Fix lcM179210086: unable to create custom metric alert for their Application Insights metric

NetAppFiles

- az volume create: Allow data protection volumes adding replication operations: approve, suspend, resume, status, remove

Network

- az network application-gateway waf-policy managed-rule rule-set add: support Microsoft_BotManagerRuleSet
- network watcher flow-log show: fix wrong deprecating info
- support host names in application gateway listener
- az network nat gateway: support create empty resource without public ip or public ip prefix
- Support vpn gateway generation
- Support `--if-none-match` in `az network dns record-set {} add-record`

Packaging

- Drop support for python 3.5

Profile

- az login: Show warning for MFA error

RDBMS

- Add server data encryption key management commands for PostgreSQL and MySQL

March 10, 2020

Version 2.2.0

ACR

- Fix: `az acr login` wrongly raise error
- Add new command `az acr helm install-cli`
- Add private link and CMK support
- add 'private-link-resource list' command

AKS

- fix the aks browse in cloud shell
- az aks: Fix monitoring addon and agentpool NoneType errors
- Add --nodepool-tags to node pool when creating azure kubernetes cluster
- Add --tags when adding or updating a nodepool to cluster
- aks create: add `--enable-private-cluster`
- add --nodepool-labels when creating azure kubernetes cluster
- add --labels when adding a new nodepool to azure kubernetes cluster
- add missing / in the dashboard url

- Support create aks clusters enabling managed identity
- az aks: Validate network plugin to be either "azure" or "kubenet"
- az aks: Add aad session key support
- [BREAKING CHANGE] az aks: support msi changes for GF and BF for omsagent (Container monitoring)(#1)
- az aks use-dev-spaces: Adding endpoint type option to the use-dev-spaces command to customize the endpoint created on an Azure Dev Spaces controller

AppConfig

- Unblock using "kv set" to add keyvault reference and feature ...

AppService

- az webapp create : Fix issue when running the command with --runtime
- az functionapp deployment source config-zip: Add an error message if resource group or function name are invalid/don't exist
- functionapp create: Fix the warning message that appears with `functionapp create` today which cites a `--functions_version` flag but erroneously uses a `_` instead of a `-` in the flag name
- az functionapp create: Updated the way linuxFxVersion and container image name were being set for linux function apps
- az functionapp deployment source config-zip: Fix an issue caused by app settings change racing condition during zip deploy, giving 5xx errors during deployment
- Fix #5720946: az webapp backup fails to set name

ARM

- az resource: Improve the examples of the resource module
- az policy assignment list: Support listing policy assignments at Management Group scope
- Add `az deployment group` and `az deployment operation group` for template deployment at resource groups. This is a duplicate of `az group deployment` and `az group deployment operation`
- Add `az deployment sub` and `az deployment operation sub` for template deployment at subscription scope. This is a duplicate of `az deployment` and `az deployment operation`
- Add `az deployment mg` and `az deployment operation mg` for template deployment at management groups
- Add `az deployment tenant` and `az deployment operation tenant` for template deployment at tenant scope
- az policy assignment create: Add a description to the `--location` parameter
- az group deployment create: Add parameter `--aux-tenants` to support cross tenants

CDN

- Add CDN WAF commands

Compute

- az sig image-version: add --data-snapshot-luns
- az ppg show: add --colocation-status to enable fetching the colocation status of all the resources in the proximity placement group
- az vmss create/update: support automatic repairs
- [BREAKING CHANGE] az image template: rename template to builder
- az image builder create: add --image-template

Cosmos DB

- Add Sql stored procedure, udf and trigger cmdlets
- az cosmosdb create: add --key-uri to support adding key vault encryption information

KeyVault

- keyvault create: enable soft-delete by default

Monitor

- az monitor metrics alert create: support `~` in `--condition`

Network

- az network application-gateway rewrite-rule create: support url configuration
- az network dns zone import: `--zone-name` will be case insensitive in the future
- az network private-endpoint/private-link-service: remove preview label
- az network bastion: support bastion
- az network vnet list-available-ips: support list available ips in a vnet
- az network watcher flow-log create/list/delete/update: add new commands to manage watcher flow log and exposing `--location` to identify watcher explicitly
- az network watcher flow-log configure: deprecated
- az network watcher flow-log show: support `--location` and `--name` to get ARM-formatted result, deprecated old formatted output

Policy

- az policy assignment create: Fix the bug that automatically generated name of policy assignment exceeds the limit

RBAC

- az ad group show: fix `--group` value treated as regex problem

RDBMS

- Bump the azure-mgmt-rdbms SDK version to 2.0.0
- az postgres private-endpoint-connection: manage postgres private endpoint connections
- az postgres private-link-resource: manage postgres private link resources
- az mysql private-endpoint-connection: manage mysql private endpoint connections
- az mysql private-link-resource: manage mysql private link resources
- az mariadb private-endpoint-connection: manage mariadb private endpoint connections
- az mariadb private-link-resource: manage mariadb private link resources
- Updating RDBMS Private Endpoint Tests

SQL

- Sql midb Add: list-deleted, show-deleted, update-retention, show-retention
- (sql server create:) Add optional public-network-access 'Enable'/'Disable' flag to sql server create
- (sql server update:) make some customer-facing change
- Add minimal_tls_version property for MI and SQL DB

Storage

- az storage blob delete-batch: Misbehaving `--dryrun` flag
- az storage account network-rule add (bug fix): add operation should be idempotent
- az storage account create/update: Add Routing Preference support
- Upgrade azure-mgmt-storage version to 8.0.0
- az storage container immutability create: add `--allow-protected-append-write` parameter
- az storage account private-link-resource list: Add support to list private link resources for storage account
- az storage account private-endpoint-connection approve/reject/show/delete: Support to manage private endpoint connections
- az storage account blob-service-properties update: add `--enable-restore-policy` and `--restore-days`
- az storage blob restore: Add support to restore blob ranges

February 18, 2020

Version 2.1.0

ACR

- Add a new argument `--expose-token` for `az acr login`
- Fix the incorrect output of `az acr task identity show -n Name -r Registry -o table`
- `az acr login`: Throw a `CLLError` if there are errors returned by docker command

ACS

- `aks create/update`: add `--vnet-subnet-id` validation

Aladdin

- Parse generated examples into commands' `_help.py`

AMS

- `az ams` is GA now

AppConfig

- Revise help message to exclude unsupported key/label filter
- Remove preview tag for most commands excluding managed identity and feature flags
- Add customer managed key when updating stores

AppService

- `az webapp list-runtimes`: Fix the bug for list-runtimes
- Add `az webapp|functionapp config ssl create`
- Add support for v3 function apps and node 12

ARM

- `az policy assignment create`: Fix the error message when the `--policy` parameter is invalid
- `az group deployment create`: Fix "stat: path too long for Windows" error when using large parameters.json file

Backup

- Fix for item level recovery flow in OLR
- Add restore as files support for SQL and SAP Databases

Compute

- `vm/vmss/availability-set update`: add `--ppg` to allowing updating ProximityPlacementGroup
- `vmss create`: add `--data-disk-iops` and `--data-disk-mbps`
- `az vm host`: remove preview tag for `vm host` and `vm host group`
- [BREAKING CHANGE] Fix #10728: `az vm create`: create subnet automatically if vnet is specified and subnet not exists
- Increase robustness of vm image list

Eventhub

- Azure Stack support for 2019-03-01-hybrid profile

KeyVault

- `az keyvault key create`: add a new value `import` for parameter `--ops`
- `az keyvault key list-versions`: support parameter `--id` for specifying keys
- Support private endpoint connections

Network

- Bump to azure-mgmt-network 9.0.0
- az network private-link-service update/create: support --enable-proxy-protocol
- Add connection Monitor V2 feature

Packaging

- [BREAKING CHANGE] Drop support for Python 2.7

Profile

- Preview: Add new attributes `homeTenantId` and `managedByTenants` to subscription accounts. Please re-run `az login` for the changes to take effect
- az login: Show a warning when a subscription is listed from more than one tenants and default to the first one. To select a specific tenant when accessing this subscription, please include `--tenant` in `az login`

Role

- az role assignment create: Fix the error that assigning a role to a service principal by display name yields a HTTP 400

SQL

- Update SQL Managed Instance cmdlet `az sql mi update` with two new parameters: tier and family

Storage

- [BREAKING CHANGE] `az storage account create`: Change default storage account kind to StorageV2

February 04, 2020

Version 2.0.81

ACS

- Add support to set outbound allocated ports and idle timeouts on standard load balancer
- Update to API Version 2019-11-01

ACR

- [BREAKING CHANGE] `az acr delete` will prompt
- [BREAKING CHANGE] 'az acr task delete' will prompt
- Add a new command group 'az acr taskrun show/list/delete' for taskrun management

AKS

- Each cluster gets a separate service principal to improve isolation

AppConfig

- Support import/export of keyvault references from/to appservice
- Support import/export of all labels from appconfig to appconfig
- Validate key and feature names before setting and importing
- Expose sku modification for configuration store.
- Add command group for managed identity.

AppService

- Azure Stack: surface commands under the profile of 2019-03-01-hybrid
- functionapp: Add ability to create Java function apps in Linux

ARM

- Fix issue #10246: `az resource tag` crashes when the parameter `--ids` passed in is resource group ID
- Fix issue #11658: `az group export` command does not support `--query` and `--output` parameters

- Fix issue #10279: The exit code of `az group deployment validate` is 0 when the verification fails
- Fix issue #9916: Improve the error message of the conflict between tag and other filter conditions for `az resource list` command
- Add new parameter `--managed-by` to support adding managedBy information for command `az group create`

Azure Red Hat OpenShift

- Add `monitor` subgroup to manage Log Analytics monitoring in Azure Red Hat OpenShift cluster

BotService

- Fix issue #11697: `az bot create` is not idempotent
- Change name-correcting tests to run in Live-mode only

CDN

- Add support for rulesEngine feature
- Add new commands group 'cdn endpoint rule' to manage rules
- Update azure-mgmt-cdn version to 4.0.0 to use api version 2019-04-15

Deployment Manager

- Add list operation for all resources.
- Enhance step resource for new step type.
- Update azure-mgmt-deploymentmanager package to use version 0.2.0.

IoT

- Deprecate 'IoT hub Job' commands.

IoT Central

- Support app creation/update with the new sku name ST0, ST1, ST2.

Key Vault

- Add a new command `az keyvault key download` for downloading keys.

Misc

- Fix #6371: Support filename and environment variable completion in Bash

Network

- Fix #2092: `az network dns record-set add/remove`: add warning when record-set is not found. In the future, an extra argument will be supported to confirm this auto creation.

Policy

- Add new command `az policy metadata` to retrieve rich policy metadata resources
- `az policy remediation create`: Specify whether compliance should be re-evaluated prior to remediation with the `--resource-discovery-mode` parameter

Profile

- `az account get-access-token`: Add `--tenant` parameter to acquire token for the tenant directly, needless to specify a subscription

RBAC

- [BREAKING CHANGE] Fix #11883: `az role assignment create`: empty scope will prompt error

Security

- Add new commands `az atp show` and `az atp update` to view and manage advanced threat protection settings for storage accounts.

SQL

- `sql dw create`: deprecate `--zone-redundant` and `--read-replica-count` parameters. These parameters do not apply to DataWarehouse.
- [BREAKING CHANGE] `az sql db create`: Remove "WideWorldImportersStd" and "WideWorldImportersFull" as documented allowed values for "az sql db create --sample-name". These sample databases would always cause creation to fail.
- Add New commands `sql db classification show/list/update/delete` and `sql db classification recommendation list/enable/disable` to manage sensitivity classifications for SQL databases.
- `az sql db audit-policy`: Fix for empty audit actions and groups

Storage

- Add a new command group `az storage share-rm` to use the Microsoft.Storage resource provider for Azure file share management operations.
- Fix issue #11415: permission error for `az storage blob update`
- Integrate Azcopy 10.3.3 and support Win32.
- `az storage copy`: Add `--include-path`, `--include-pattern`, `--exclude-path` and `--exclude-pattern` parameters
- `az storage remove`: Change `--include` and `--exclude` parameters to `--include-path`, `--include-pattern`, `--exclude-path` and `--exclude-pattern` parameters
- `az storage sync`: Add `--include-pattern`, `--exclude-path` and `--exclude-pattern` parameters

ServiceFabric

- Add new commands to manage application and services.

January 13, 2020

Version 2.0.80

Compute

- disk update: Add `--disk-encryption-set` and `--encryption-type`
- snapshot create/update: Add `--disk-encryption-set` and `--encryption-type`

Storage

- Upgrade azure-mgmt-storage version to 7.1.0
- `az storage account create`: Add `--encryption-key-type-for-table` and `--encryption-key-type-for-queue` to support Table and Queue Encryption Service

January 07, 2020

Version 2.0.79

ACR

- [BREAKING CHANGE] Remove '--os' parameter for 'acr build', 'acr task create/update', 'acr run', and 'acr pack'. Use '--platform' instead.

AppConfig

- Add support for importing/exporting feature flags
- Add new command 'az appconfig kv set-keyvault' for creating keyvault reference
- Support various naming conventions when exporting feature flags to file

AppService

- Fix issue #7154: Updating documentation for command `<>` to use back ticks instead of single quotes

- Fix issue #11287: webapp up: By default make the app created using up 'should be 'SSL enabled'
- Fix issue #11592: Add az webapp up flag for html static sites

ARM

- Fix `az resource tag`: Recovery Services Vault tags cannot be updated

Backup

- Added new command 'backup protection undelete' to enable soft-delete feature for laasVM workload
- Added new parameter '--soft-delete-feature-state' to set backup-properties command
- Added disk exclusion support for laasVM workload

Compute

- Fix `vm create` failure in Azure Stack profile.
- vm monitor metrics tail/list-definitions: support query metric and list definitions for a vm.
- Add new reapply command action for az vm

HDInsight

- Support for creating a Kafka cluster with Kafka Rest Proxy
- Upgrade azure-mgmt-hdinsight to 1.3.0

Misc.

- Add preview command `az version show` to show the versions of Azure CLI modules and extensions in JSON format by default or format configured by --output

Event Hubs

- [BREAKING CHANGE] Remove 'ReceiveDisabled' status option from command 'az eventhubs eventhub update' and 'az eventhubs eventhub create'. This option is not valid for Event Hub entities.

Service Bus

- [BREAKING CHANGE] Remove 'ReceiveDisabled' status option from command 'az servicebus topic create', 'az servicebus topic update', 'az servicebus queue create', and 'az servicebus queue update'. This option is not valid for Service Bus topics and queues.

RBAC

- Fix #11712: `az ad app/sp show` does not return exit code 3 when the application or service principal does not exist

Storage

- `az storage account create`: Remove preview flag for --enable-hierarchical-namespace parameter
- Update azure-mgmt-storage version to 7.0.0 to use api version 2019-06-01
- Add new parameters `--enable-delete-retention` and `--delete-retention-days` to support managing delete retention policy for storage account blob-service-properties.

December 17, 2019

2.0.78

ACR

- Added support Local context in acr task run

ACS

- [BREAKING CHANGE]az openshift create: rename `--workspace-resource-id` to `--workspace-id`.

AMS

- Updated show commands to return 3 when resource not found

AppConfig

- Fixed bug when appending api-version to request url. The existing solution doesn't work with pagination.
- Added support for showing languages besides English as our backend service support unicode for globalization.

AppService

- Fixed issue #11217: webapp: az webapp config ssl upload should support slot parameter
- Fixed issue #10965: Error: Name cannot be empty. Allow remove by ip_address and subnet
- Added support for importing certificates from Key Vault `az webapp config ssl import`

ARM

- Updated azure-mgmt-resource package to use 6.0.0
- Cross Tenant Support for `az group deployment create` command by adding new parameter `--aux-sub`
- Added new parameter `--metadata` to support adding metadata information for policy set definitions.

Backup

- Added Backup support for SQL and SAP Hana workload.

BotService

- [Breaking change] Remove '--version' flag from preview command 'az bot create'. Only v4 SDK bots are supported.
- Added name availability check for 'az bot create'.
- Added support for updating the icon URL for a bot via 'az bot update'.
- Added support for updating a Direct Line channel via 'az bot directline update'.
- Added '--enable-enhanced-auth' flag support to 'az bot directline create'.
- The following command groups are GA and not in preview: 'az bot authsetting'.
- The following commands in 'az bot' are GA and not in preview: 'create', 'prepare-deploy', 'show', 'delete', 'update'.
- Fixed 'az bot prepare-deploy' changing '--proj-file-path' value to lower case (e.g. "Test.csproj" to "test.csproj").

Compute

- vmss create/update: Added --scale-in-policy, which decides which virtual machines are chosen for removal when a VMSS is scaled-in.
- vm/vmss update: Added --priority.
- vm/vmss update: Added --max-price.
- Added disk-encryption-set command group (create, show, update, delete, list).
- disk create: Added --encryption-type and --disk-encryption-set.
- vm/vmss create: Added --os-disk-encryption-set and --data-disk-encryption-sets.

Core

- Removed support for Python 3.4
- Plug in HaTS survey in multiple commands

DLS

- Updated ADLS sdk version (0.0.48).

Install

- Install script support python 3.8

IOT

- [BREAKING CHANGE] Removed `--failover-region` parameter from `manual-failover`. Now it will failover to assigned geo-paired secondary region.

Key Vault

- Fixed #8095: `az keyvault storage remove` : improve the help message
- Fixed #8921: `az keyvault key/secret/certificate list/list-deleted/list-versions` : fix the validation bug on parameter `--maxresults`
- Fixed #10512: `az keyvault set-policy` : improve the error message when none of `--object-id` , `--spn` or `--upn` is specified
- Fixed #10846: `az keyvault secret show-deleted` : when `--id` is specified, `--name/-n` is not required
- Fixed #11084: `az keyvault secret download` : improve the help message of parameter `--encoding`

Network

- `az network application-gateway probe`: Added support `--port` option to specify a port for probing backend servers when create and update
- `az network application-gateway url-path-map create/update`: bug fix for `--waf-policy`
- `az network application-gateway`: Added support `--rewrite-rule-set`
- `az network list-service-aliases`: Added support list service aliases which can be used for Service Endpoint Policies
- `az network dns zone import`: Added support `.@` in record name

Packaging

- Added back edge builds for pip install
- Added Ubuntu eoan package

Policy

- Added support for Policy API version 2019-09-01.
- `az policy set-definition`: Added support grouping within policy set definitions with `--definition-groups` parameter

Redis

- Added preview param `--replicas-per-master` to `az redis create` command
- Updated `azure-mgmt-redis` from 6.0.0 to 7.0.0rc1

ServiceFabric

- Fixed in `node-type` add logic including #10963: Adding new node type with durability level Gold will always throw CLI error
- Updated `ServiceFabricNodeVmExt` version to 1.1 in creation template

SQL

- Added `"--read-scale"` and `"--read-replicas"` parameters to `sql db create` and `update` commands, to support read scale management.

Storage

- GA Release Large File Shares property for storage account create and update command
- GA Release User Delegation SAS token Support
- Added new commands `az storage account blob-service-properties show` and `az storage account blob-service-properties update --enable-change-feed` to manage blob service properties for storage account.
- [COMING BREAKING CHANGE] `az storage copy` : `*` character is no longer supported as a wildcard in URL, but new parameters `--include-pattern` and `--exclude-pattern` will be added with `*` wildcard support.

- Fixed issue #11043: Added support to remove whole container/share in `az storage remove` command

November 26, 2019

Version 2.0.77

ACR

- Deprecated parameter `--branch` from acr task create/update

Azure Red Hat OpenShift

- Added `--workspace-resource-id` flag to allow creation of Azure Red Hat Openshift cluster with monitoring
- Added `monitor_profile` to create Azure Red Hat OpenShift cluster with monitoring

AKS

- Added support cluster certificate rotation operation using "az aks rotate-certs".

AppConfig

- Added support for using ":" for `as az appconfig kv import` separator
- Fixed issue for listing key values with multiple labels including null label.
- Updated management plane sdk, azure-mgmt-appconfiguration, to version 0.3.0.

AppService

- Fixed issue #11100: AttributeError for az webapp up when create service plan
- az webapp up: Forcing the creation or deployment to a site for supported languages, no defaults used.
- Added support for App Service Environment: az appservice ase show | list | list-addresses | list-plans | create | update | delete

Backup

- Fixed issue in az backup policy list-associated-items. Added optional BackupManagementType parameter.

Compute

- Upgraded API version of compute, disks, snapshots to 2019-07-01
- vmss create: Improvement for --orchestration-mode
- sig image-definition create: Added --os-state to allow specifying whether the virtual machines created under this image are 'Generalized' or 'Specialized'
- sig image-definition create: Added --hyper-v-generation to allow specifying the hypervisor generation
- sig image-version create: Added support --os-snapshot and --data-snapshots
- image create: Added --data-disk-caching to allow specifying caching setting of data disks
- Upgraded Python Compute SDK to 10.0.0
- vm/vmss create: Added 'Spot' to 'Priority' enum property
- [Breaking change] Renamed '--max-billing' parameter to '--max-price', for both VM and VMSS, to be consistent with Swagger and Powershell cmdlets
- vm monitor log show: Added support for querying log over linked log analytics workspace.

IOT

- Fix #2531: Added convenience arguments for hub update.
- Fix #8323: Added missing parameters to create storage custom endpoint.
- Fix regression bug: Reverted the changes which overrides the default storage endpoint.

Key Vault

- Fixed #11121: When using `az keyvault certificate list`, passing `--include-pending` now doesn't require a value of `true` or `false`

NetAppFiles

- Upgraded azure-mgmt-netapp to 0.7.0 which includes some additional volume properties associated with upcoming replication operations

Network

- application-gateway waf-config: deprecated
- application-gateway waf-policy: Added subgroup managed-rules to manage managed rule sets and exclusion rules
- application-gateway waf-policy: Added subgroup policy-setting to manage global configuration of a waf-policy
- [BREAKING CHANGE] application-gateway waf-policy: Renamed subgroup rule to custom-rule
- application-gateway http-listener: Added --firewall-policy when create
- application-gateway url-path-map rule: Added --firewall-policy when create

Packaging

- Rewrote the az wrapper in Python
- Added support for Python 3.8
- Changed to Python 3 for RPM package

Profile

- Polished error when running `az login -u {} -p {}` with Microsoft account
- Polished `SSLError` when running `az login` behind a proxy with self-signed root certificate
- Fixed #10578: `az login` hangs when more than one instances are launched at the same time on Windows or WSL
- Fixed #11059: `az login --allow-no-subscriptions` fails if there are subscriptions in the tenant
- Fixed #11238: After renaming a subscription, logging in with MSI will result in the same subscription appearing twice

RBAC

- Fixed #10996: Polish error for `--force-change-password-next-login` in `az ad user update` when `--password` is not specified

Redis

- Fixed #2902: Avoid setting memory configs while updating Basic SKU cache

Reservations

- Upgraded SDK Version to 0.6.0
- Added billingplan details info after calling Get-Gatalogs
- Added new command `az reservations reservation-order calculate` to calculate the price for a reservation
- Added new command `az reservations reservation-order purchase` to purchase a new reservation

Rest

- Changed `az rest` to GA

SQL

- Updated azure-mgmt-sql to version 0.15.0.

Storage

- storage account create: Added --enable-hierarchical-namespace to support filesystem semantics in blob service.
- Removed unrelated exception from error message
- Fixed issues with incorrect error message "You do not have the required permissions needed to perform this operation." when blocked by network rules or AuthenticationFailed.

November 4, 2019

Version 2.0.76

ACR

- Added a preview parameter `--pack-image-tag` to command `az acr pack build`.
- Added support for enabling auditing on creating a registry
- Added support for Repository-scoped RBAC

AKS

- Added `--enable-cluster-autoscaler`, `--min-count` and `--max-count` to the `az aks create` command, which enables cluster autoscaler for the node pool.
- Added the above flags as well as `--update-cluster-autoscaler` and `--disable-cluster-autoscaler` to the `az aks update` command, allowing updates to cluster autoscaler.

AppConfig

- Added appconfig feature command group to manage feature flags stored in an App Configuration.
- Fixed minor bug for appconfig kv export to file command. Stop reading dest file contents during export.

AppService

- `az appservice plan create`: Added support to set 'persitescaling' on appservice plan create.
- Fixed an issue where webapp config ssl bind operation was removing existing tags from the resource
- Added `--build-remote` flag for `az functionapp deployment source config-zip` to support remote build action during function app deployment.
- Changed default node version on function apps to ~10 for Windows
- Added `--runtime-version` property to `az functionapp create`

ARM

- `az deployment/group deployment validate`: Added `--handle-extended-json-format` parameter to support multiline and comments in json template when deployment.
- Bumped azure-mgmt-resource to 2019-07-01

Backup

- Added AzureFiles backup support

Compute

- `az vm create`: Added warning when specifying accelerated networking and an existing NIC together.
- `az vm create`: Added `--vmss` to specify an existing virtual machine scale set that the virtual machine should be assigned to.
- `az vm/vmss create`: Added a local copy of image alias file so that it can be accessed in a restricted network environment.
- `az vmss create`: Added `--orchestration-mode` to specify how virtual machines are managed by the scale set.
- `az vm/vmss update`: Added `--ultra-ssd-enabled` to allow updating ultra SSD setting.
- [BREAKING CHANGE] `az vm extension set`: Fixed bug where users could not set an extension on a VM with `--ids`.
- Added new commands `az vm image terms accept/cancel/show` to manage Azure Marketplace image terms.
- Updated VMAccessForLinux to version 1.5

CosmosDB

- [BREAKING CHANGE] `az sql container create`: Changed `--partition-key-path` to required parameter
- [BREAKING CHANGE] `az gremlin graph create`: Changed `--partition-key-path` to required parameter

- `az sql container create`: Added `--unique-key-policy` and `--conflict-resolution-policy`
- `az sql container create/update`: Updated the `--idx` default schema
- `gremlin graph create`: Added `--conflict-resolution-policy`
- `gremlin graph create/update`: Updated the `--idx` default schema
- Fixed typo in help message
- database: Added deprecation information
- collection: Added deprecation information

IoT

- Added new routing source type: DigitalTwinChangeEvents
- Fixed missing features in `az iot hub create`

Key Vault

- Fixed an unexpected error when certificate file does not exist
- Fixed `az keyvault recover/purge` not working

NetAppFiles

- Upgraded azure-mgmt-netapp to 0.6.0 to use API version 2019-07-01. This new API version includes:
 - Volume creation `--protocol-types` accepts now "NFSv4.1" not "NFSv4"
 - Volume export policy property now named 'nfsv41' not 'nfsv4'
 - Volume `--creation-token` renamed to `--file-path`
 - Snapshot creation date now named just 'created'

Network

- `az network private-dns link vnet create/update`: Support cross-tenant virtual network linking.
- [BREAKING CHANGE] `az network vnet subnet list`: Changed `--resource-group` and `--vnet-name` to be required now.
- `az network public-ip prefix create`: Added support to specify IP address version (IPv4, IPv6) when creation
- Bumped azure-mgmt-network to 7.0.0 and api-version to 2019-09-01
- `az network vrouter`: Added support for new service virtual router and virtual router peering
- `az network express-route gateway connection`: Added support for `--internet-security`

Profile

- Fixed `az account get-access-token --resource-type ms-graph` not working
- Removed warning from `az login`

RBAC

- Fixed `az ad app update --id {} --display-name {}` doesn't work

ServiceFabric

- `az sf cluster create`: Fixed an issue by modifying service fabric linux and windows template.json compute vmss from standard to managed disks

SQL

- Added `--compute-model`, `--auto-pause-delay`, and `--min-capacity` parameters to support CRUD operations for new SQL Database offering: Serverless compute model.

Storage

- `az storage account create/update`: Added `--enable-files-adds` parameter and Azure Active Directory Properties Argument group to support Azure Files Active Directory Domain Service Authentication

- Expanded `az storage account keys list/renew` to support listing or regenerating Kerberos keys of storage account.

October 15, 2019

Version 2.0.75

AKS

- Changed `--load-balancer-sku` default value to `standard` if supported by the kubernetes version
- Changed `--vm-set-type` default value to `virtualmachinescalesets` if supported by the kubernetes version

AMS

- [BREAKING CHANGE] Changed the name of `job start` to `job create`
- [BREAKING CHANGE] Changed the `--ask` parameter of `content-key-policy create` to use a 32-character hex string instead of UTF8

AppService

- Added commands `webapp config access-restriction show|set|add|remove`
- Added better error handling to `webapp up`
- Added support for `Isolated` SKU to `appservice plan update`

ARM

- Added `--handle-extended-json-format` parameter `deployment create` to support multiline and comments in json template

Compute

- Added `--enable-agent` parameter to `vm create`
- Changed `vm create` to use standard public IP SKU automatically when using zones
- Changed `vm create` to automatically create a valid computer name for a VM if none is provided
- Added `--computer-name-prefix` parameter to `vmss create` to support custom computer name prefix of virtual machines in the VMSS
- Add `--workspace` parameter to `vm create` to enable log analytics workspace automatically
- Updated galleries API version to 2019-07-01

Core

- Added syntax check for `--set` parameter in generic update command

IoT

- Fixed an issue where `iot hub show` would incorrectly error with "resource not found"

Monitor

- Added support for CRUD to `monitor log-analytics workspace`

Network

- Added support for cross-tenant virtual linking to `network private-dns link vnet [create|update]`
- [BREAKING CHANGE] Changed `network vnet subnet list` to require `--resource-group` and `--vnet-name` parameters

SQL

- Added commands to `sql mi ad-admin` that support setting an AAD administrator on managed instances

Storage

- Added `--preserve-s2s-access-tier` parameter `storage copy` to preserve access tier during service to service

copy

- Added `--enable-large-file-share` parameter to `storage account [create|update]` to support large file shares for storage account

September 24, 2019

Version 2.0.74

ACR

- Added a required `--type` parameter to `acr config retention update`
- [BREAKING CHANGE] Renamed parameter `--name -n` changed to `--registry -r` for `acr config` command group

AKS

- Added `--load-balancer-sku` parameter to `aks create` command, which allows for creating AKS cluster with SLB
- Added `--load-balancer-managed-outbound-ip-count`, `--load-balancer-outbound-ips` and `--load-balancer-outbound-ip-prefixes` parameters to `aks [create|update]` commands, which allow for updating load balancer profile of an AKS cluster with SLB
- Added `--vm-set-type` parameter to `aks create` command, which allows to specify vm types of an AKS Cluster (vmas or vmss)

ARM

- Added `--handle-extended-json-format` parameter to `group deployment create` command to support multiline and comments in json template

Compute

- Added `--terminate-notification-time` parameter to `vmss [create|update]` commands to support terminate scheduled event configurability
- Added `--enable-terminate-notification` parameter to `vmss update` command to support terminate scheduled event configurability
- Added `--priority`, `--eviction-policy`, `--max-billing` parameters to `[vm|vmss] create` commands
- Changed `disk create` to allow specifying the exact size of the disk upload
- Added support for incremental snapshots for managed disks to `snapshot create`

Cosmos DB

- Added `--type <key-type>` parameter to `cosmosdb keys list` command to show key, read only keys or connection strings
- Added `cosmosdb keys regenerate` command
- [DEPRECATED] Deprecated `cosmosdb list-connection-strings`, `cosmosdb regenerate-key` and `cosmosdb list-read-only-keys` commands

EventGrid

- Fixed the endpoint help text to refer to the right parameter

Key Vault

- Fixed issue where logging in with a tenant (`login -t`) could cause `keyvault create` to fail

Monitor

- Fixed issue where `:` character was not allowed in `--condition` argument to `monitor metrics alert create`

Policy

- Added support for Policy API version 2019-06-01
- Added `--enforcement-mode` parameter to `policy assignment create` command

Storage

- Added `--blob-type` parameter to `az storage copy` command

September 10, 2019

ACR

- Added command group `acr config retention` to configure retention policy

AKS

- Added support for ACR integration with the following commands:
 - Added `--attach-acr` parameter to `aks [create|update]` to attach an ACR to an AKS cluster
 - Added `--detach-acr` parameter to `aks update` to detach the ACR from an AKS cluster

ARM

- Updated to use API version 2019-05-10

Batch

- Added new JSON configuration settings to `--json-file` for `batch pool create`:
 - Added `MountConfigurations` for file system mounts (see <https://docs.microsoft.com/rest/api/batchservice/pool/add#request-body> for details)
 - Added optional property `publicIPs` on `NetworkConfiguration` for public IPs on pools (see <https://docs.microsoft.com/rest/api/batchservice/pool/add#request-body> for details)
- Added support for shared image galleries to `--image`
- [BREAKING CHANGE] Changed default value of `--start-task-wait-for-success` on `batch pool create` to be `true`
- [BREAKING CHANGE] Changed default value for `Scope` on `AutoUserSpecification` to always be Pool (was `Task` on Windows nodes, `Pool` on Linux nodes)
 - This argument can only be set from a JSON configuration with `--json-file`

HDInsight

- GA release
- [BREAKING CHANGE] Changed parameter `--workernode-count/-c` of `az hdinsight resize` to be required.

Key Vault

- Fixed issue where subnets couldn't be deleted from network rules
- Fixed issue where duplicated subnets and IP addresses could be added to network rules

Network

- Added `--interval` parameter to `network watcher flow-log` to set traffic analysis interval value
- Added `network application-gateway identity` to manage gateway identity
- Added support for setting Key Vault ID to `network application-gateway ssl-cert`
- Added `network express-route peering peer-connection [show|list]`

Policy

- Updated to use API version 2019-01-01

August 27, 2019

ACR

- [BREAKING CHANGE] Removed support for the `classic` SKU

API Management

- [PREVIEW] Added `apim` command group

AppService

- Fixed issue with `webapp webjob continuous start` command when specifying a slot
- Changed `webapp up` to detect `env` folder and remove it from the file used for deployment

Keyvault

- Fixed a bug in `keyvault secret set` that ignored the `--expires` argument

Network

- Added support for IPv6 addresses to `--private-ip-address-version` arguments
- Added new commands `network private-endpoint [create|update|list-types]` for private endpoint management
- Added command group `network private-link-service`
- Added `--private-endpoint-network-policies` and `--private-link-service-network-policies` arguments to `network vnet subnet update`

RBAC

- Fixed issue with `ad app update --homepage` where homepage would not be updated

ServiceFabric

- Added support for mixed-case Key Vault names
- Fixed issue when using certificates in Key Vault
- Fixed issue with using PFX certificate files
- Fixed issue with `sf cluster certificate add` when Key Vault resource group wasn't specified
- Fixed issue with `sf cluster set` not working

SignalR

- Added new commands:
 - `signalr cors` : Manage SignalR CORS
 - `signalr restart` : Restart a SignalR service
 - `signalr update` : Update a SignalR service
- Added `--service-mode` argument to `signalr create`

Storage

- Added `storage account revoke-delegation-keys` command

August 13, 2019

Version 2.0.71

AppService

- Fixed issue where `webapp webjob continuous` commands were failing for slots

BotService

- [BREAKING CHANGE] Removed support for creating v3 SDK bots

CognitiveServices

- Added `cognitiveservices account network-rule` commands

Cosmos DB

- Removed warning when updating multiple write locations
- Added CRUD commands for CosmosDB SQL, MongoDB, Cassandra, Gremlin and Table resources and resource's throughput

HDInsight

This release contains a large number of breaking changes.

- [BREAKING CHANGE] Renamed parameters for `hdinsight create` :
 - Renamed `--storage-default-container` to `--storage-container`
 - Renamed `--storage-default-filesystem` to `--storage-filesystem`
- [BREAKING CHANGE] Changed the `--name` argument of `application create` to represent the application name instead of the cluster name
- Added `--cluster-name` argument to `application create` to replace old `--name` functionality
- [BREAKING CHANGE] Renamed parameters for `application create` :
 - Renamed `--application-type` to `--type`
 - Renamed `--marketplace-identifier` to `--marketplace-id`
 - Renamed `--https-endpoint-access-mode` to `--access-mode`
 - Renamed `--https-endpoint-destination-port` to `--destination-port`
- [BREAKING CHANGE] Removed parameters for `application create` :
 - `--https-endpoint-location`
 - `--https-endpoint-public-port`
 - `--ssh-endpoint-destination-port`
 - `--ssh-endpoint-location`
 - `--ssh-endpoint-public-port`
- [BREAKING CHNAGE] Renamed `--target-instance-count` to `--workernode-count` for `hdinsight resize`
- [BREAKING CHANGE] Changed all commands in the `hdinsight script-action` group to use the `--name` parameter as the name of the script action.
- Added `--cluster-name` argument to all `hdinsight script-action` commands to replace old `--name` functionality
- [BREAKING CHANGE] Renamed `--script-execution-id` to `--execution-id` for all `hdinsight script-action` commands
- [BREAKING CHANGE] Renamed `hdinsight script-action show` to `hdinsight script-action show-execution-details`
- [BREAKING CHNAGE] Changed parameters to `hdinsight script-action execute --roles` to be space-separated instead of comma-separated
- [BREAKING CHANGE] Removed the `--persisted` parameter of `hdinsight script-action list`
- Changed the `hdinsight create --cluster-configurations` parameter to accept a path to a local JSON file or a JSON string
- Added command `hdinsight script-action list-execution-history`
- Changed `hdinsight monitor enable --workspace` to accept a Log Analytics workspace ID or workspace name
- Added the `hdinsight monitor enable --primary-key` argument, which is needed if a workspace ID is provided as the parameter
- Added more examples and updated descriptions for help messages

Interactive

- Fixed a loading error

Kubernetes

- Changed to use `https` if dashboard container port is using `https`

Network

- Added `--yes` argument `network dns record-set cname delete`

Profile

- Added `--resource-type` argument to `account get-access-token` to get resource access tokens

ServiceFabric

- Added all supported os version for sf cluster create
- Fixed primary certificate validation bug

Storage

- Added command `storage copy`

July 30, 2019

Version 2.0.70

ACR

- Fixed issue #9952 (a regression in the `acr pack build` command)
- Removed the default builder image name in `acr pack build`

Appservice

- Changed `webapp config ssl` to show a message if a resource is not found
- Fixed issue where `functionapp create` does not accept `Standard_RAGRS` storage account type
- Fixed an issue where `webapp up` would fail if run using older versions of python

Network

- Removed invalid parameter `--ids` from `network nic ip-config add` (fixes #9861)
- Fixes #9604. Added `--root-certs` parameter to `network application-gateway http-settings [create|update]` to support user associate trusted root certificates.
- Fixed argument `--subscription` for `network dns record-set ns create` (#9965)

RBAC

- Added `user update` command
- [DEPRECATED] Deprecated `--upn-or-object-id` from user-related commands
 - Use replacement argument `--id`
- Added `--id` argument to user-related commands

SQL

- Added management commands for managed instance keys and TDE protector

Storage

- Added `storage remove` command
- Fixed an issue with `storage blob update`

VM

- Changed `list-skus` to use newer api-version to output zone details
- Changed default of `--single-placement-group` to `false` for `vmss create`
- Added ability to select ZRS storage SKUs for `[snapshot|disk] create`

- Added new command group `vm host` to support dedicated hosts
- Added parameters `--host` and `--host-group` on `vm create` to set VM dedicated host

July 16, 2019

Version 2.0.69

Appservice

- Changed `webapp identity` commands to return a proper error message if ResourceGroupName or App name are invalid
- Fixed `webapp list` to return the correct value for numberOfSites if no ResourceGroup was provided
- Fixed side-effects of `appservice plan create` and `webapp create`

Core

- Fixed issue where `--subscription` would appear despite being not applicable

Batch

- [BREAKING CHANGE] Replaced `batch pool node-agent-skus list` with `batch pool supported-images list`
- Added support for security rules blocking network access to a pool based on the source port of the traffic when using the `--json-file` option of `batch pool create network`
- Added support for executing the task in the container working directory or in the Batch task working directory when using the `--json-file` option of `batch task create`
- Fixed error in `--application-package-references` option of `batch pool create` where it would only work with defaults

Eventhubs

- Added validation for parameter `--rights` of `authorizationrule` commands

RDBMS

- Added optional parameter to specify replica SKU for create replica command
- Fixed the issue with CI test failure with creating MySQL replica

Relay

- Fixed issue with hybrid connection when client authroization disabled [#8775](#)
- Added parameter `--requires-transport-security` to `relay wcfrelay create`

Servicebus

- Added validation for parameter `--rights` of `authorizationrule` commands

Storage

- Enable Files AADDs for storage account update
- Fixed issue `storage blob service-properties update --set`

July 2, 2019

Version 2.0.68

Core

- Command modules are now consolidated into a single Python distributable. This deprecates direct use of many `azure-cli-` packages on PyPI. This should reduce install size and only affect users who have directly installed via `pip`.

ACR

- Added support for Timer Triggers to Task

Appservice

- Changed `functionapp create` to enable application insights by default
- [BREAKING CHANGE] Removed deprecated `functionapp devops-build` command.
 - Use the new command `az functionapp devops-pipeline` instead
- Added Linux Consumption function app plan support to `functionapp deployment config-zip`

Cosmos DB

- Added support for disabling TTL

DLS

- Updated ADLS version (0.0.45)

Feedback

- When reporting a failed extension command, `az feedback` now attempts to open the browser to the project/repo url of the extension from the index

HDInsight

- [BREAKING CHANGE] Changed `oms` command group name to `monitor`
- [BREAKING CHANGE] Made `--http-password/-p` a required parameter
- Added completers for `--cluster-admin-account` and `cluster-users-group-dns` parameters completer
- Changed `cluster-users-group-dns` parameter to be required when `-esp` is present
- Added a timeout for all existing argument auto-completers
- Added a timeout for transforming resource name to resource id
- Changed Auto-completers to select resources from any resource group. It can be a different resource group than the one specified with `-g`
- Added support for `--sub-domain-suffix` and `--disable_gateway_auth` parameters in the `hdinsight application create` command

Managed Services

- Introducing managed service command module in preview

Profile

- Suppress `--subscription` argument for logout command

RBAC

- [BREAKING CHANGE] Removed `--password` argument for `create-for-rbac`
- Added `--assignee-principal-type` parameter to `create` command to avoid intermittent failures caused by AAD graph server replication latency
- Fixed a crash in `ad signed-in-user` when listing owned objects
- Fixed issue where `ad sp` would not find the right application from a service principal

RDBMS

- Added support for replication for MariaDB

SQL

- Documented allowed values for `sql db create --sample-name`

Storage

- Added user delegation SAS token support with `--as-user` to `storage blob generate-sas`
- Added user delegation SAS token support with `--as-user` to `storage container generate-sas`

VM

- Fixed bug where `vmss create` returns an error message when run with `--no-wait`
- Removed client-side validation for `vmss create --single-placement-group`. Does not fail if `--single-placement-group` is set to `true` and `--instance-count` is greater than 100 or availability zones are specified, but leaves this validation to the compute service
- Fixed bug where `[vm|vmss] extension image list` fails when used with `--latest`

June 18, 2019

Version 2.0.67

Core

This release introduces a new [Preview] tag to more clearly communicate to customers when a command group, command or argument is in preview status. This was previously called out in help text or communicated implicitly by the command module version number. The CLI will be removing version numbers for individual packages in the future. If a command is in preview, all of its arguments are as well. If a command group is labeled as being in preview, then all commands and arguments are considered to be in preview as well.

As a result of this change, several command groups may seem to "suddenly" appear to be in a preview status with this release. What actually happened is that most packages were in a preview status, but are being deemed GA with this release

ACR

- Added 'acr check-health' command
- Improved error handling for AAD tokens and for retrieving external commands

ACS

- Deprecated ACS commands are now hidden from help view

AMS

- [BREAKING CHANGE] Changed to return ISO 8601 time strings for archive-window-length and key-frame-interval-duration

AppService

- Added location based routing for `webapp deleted list` and `webapp deleted restore`
- Fixed issue where webapp up logged target URL ("You can launch the app at...") was not clickable in Azure Cloud Shell
- Fixed an issue where creating apps with the some SKUs was failing with an AlwaysOn error
- Added pre-validation to `[appservice|webapp] create`
- Fixed `[webapp|functionapp] traffic-routing` to use the correct actionHostName
- Added slot support to `functionapp` commands

Batch

- Fixed AAD auth regression caused by over-aggressive error reporting for Shared Key Auth

BatchAI

- BatchAI commands are now deprecated and hidden

BotService

- Added "discontinued support"/"maintenance mode" warning messages for commands that support the v3 SDK

CosmosDB

- [DEPRECATED] Deprecated the `cosmosdb list-keys` command

- Added the `cosmosdb keys list` command - replaces `cosmosdb list-keys`
- `cosmosdb create/update`: Added new format for `--location` to allow setting "isZoneRedundant" property. Deprecating old format

EventGrid

- Added `eventgrid domain` commands for domain CRUD operations
- Added `eventgrid domain topic` commands for domain topics CRUD operations
- Added `--odata-query` argument to `eventgrid [topic|event-subscription] list` for filtering results using OData syntax
- `event-subscription create/update`: Added servicebusqueue as new values for the `--endpoint-type` parameter
- [BREAKING CHANGE] Removed support for `--included-event-types All` with `eventgrid event-subscription [create|update]`

HDInsight

- Added support for `--ssh-public-key` parameter in `hdinsight create` command

IoT

- Added support to regenerate authorization policy keys
- Added SDK and support for DigitalTwin Repository Provisioning Service

Network

- Added Zone support for Nat Gateway
- Added command `network list-service-tags`
- Fixed issue with `dns zone import` where users could not import wildcard A records
- Fixed issue with `watcher flow-log configure` where flow logging could not be enabled in certain regions

Resource

- Added `az rest` command for making REST calls
- Fixed error when using `policy assignment list` with a resource group or subscription level `--scope`

ServiceBus

- Fixed issue with `servicebus topic create --max-size` [#9319](#)

SQL

- Changed `--location` to be optional for `sql [server|mi] create` - uses resource group location if not specified
- Fixed "'NoneType' object is not iterable" error for `sql db list-editions --available`

SQLVm

- [BREAKING CHANGE] Changed `sql vm create` to require `--license-type` parameter
- Changed to allow setting SQL image SKU when creating or updating a sql vm

Storage

- Fixed issue with missing account key for `storage container generate-sas`
- Fixed issue with `storage blob sync` on Linux

VM

- [PREVIEW] Added `vm image template` commands to build VM images

June 4, 2019

Version 2.0.66

Core

- Fixed bug where commands fail if `--output yaml` is used with `--query`

ACR

- Added 'acr pack' command group for creating quick build Tasks using Buildpacks.

ACS

- Allow enabling/disabling AKS kube-dashboard addon
- Print a friendly message when the subscription is not whitelisted to use Azure Red Hat OpenShift

Batch

- Improved error handling when not logged in to an account [[#9165](#)][[#8978](#)]

IoT

- Added support for manual failover

Network

- Added `network application-gateway waf-policy` commands to support custom WAF rules.
- Added `--waf-policy` and `--max-capacity` arguments to `network application-gateway [create|update]`

Resource

- Improved error message from `deployment create` when there is no TTY available

Role

- Updated help text.

Compute

- Added support to `vm create` for VMs from a managed image with data-disk luns that do not start from 0 or that skip numbers

May 21, 2019

Version 2.0.65

Core

- Added better feedback for authentication errors
- Fixed issue where the CLI would load extensions that were not compatible with its core version
- Fixed issue with launching when `clouds.config` is corrupted

ACR

- Added support for Managed Identities to Tasks

ACS

- Fixed `openshift create` command when used with customer AAD client

AppService

- [DEPRECATED] Deprecated `functionapp devops-build` command - will be removed in next release
- Changed `functionapp devops-pipeline` to fetch build log from Azure DevOps in verbose mode
- [BREAKING CHANGE] Removed `--use_local_settings` flag from `functionapp devops-pipeline` command - was a no-op
- Changed `webapp up` to return JSON output if `--logs` is not used
- Added support for writing default resources to local config for `webapp up`
- Added support to `webapp up` for redeploying an app without using the `--location` argument
- Fixed an issue where for Linux Free SKU ASP creation use Free as SKU value was not working

BotService

- Changed to allow all casing for `--lang` parameters for commands
- Updated description for command module

Consumption

- Added missing required parameter when running `consumption usage list --billing-period-name`

IoT

- Added support to list all keys

Network

- [BREAKING CHANGE]: Removed `network interface-endpoints` command group - use `network private-endpoints`
- Added `--nat-gateway` argument to `network vnet subnet [create|update]` for attaching to a NAT gateway
- Fixed issue with `dns zone import` where record names could not match a record type

RDBMS

- Added postgres and mysql support for geo replication

RBAC

- Added support for management group scope to `role assignment`

Storage

- `storage blob sync`: add sync command for storage blob

Compute

- Added `--computer-name` to `vm create` for setting a VM's computer name
- Renamed `--ssh-key-value` renamed to `--ssh-key-values` for `[vm|vmss] create` - can now accept multiple ssh public key values or paths
 - **Note:** This is **not** a breaking change - `--ssh-key-value` will be parsed correctly as it matches only `--ssh-key-values`
- Changed the `--type` argument of `ppg create` to be optional

May 6, 2019

Version 2.0.64

ACS

- [BREAKING CHANGE] Removed `--fqdn` flag on `openshift` commands
- Changed to use Azure Red Hat Openshift GA API Version
- Added `customer-admin-group-id` flag to `openshift create`
- [GA] Removed `(PREVIEW)` from `aks create` option `--network-policy`

Appservice

- [DEPRECATED] Deprecated `functionapp devops-build` command
 - Renamed to `functionapp devops-pipeline`
- Fixed getting the correct username for cloudshell which was causing `webapp up` to fail
- Updated `appservice plan --sku` documentation updated to reflect the supported appserviceplans
- Added optional arguments for resource group and plan to `webapp up`
- Added support to `webapp ssh` to respect `AZURE_CLI_DISABLE_CONNECTION_VERIFICATION` environment variable
- Added `appserviceplan create` support for Linux Free SKU

- Changed `webapp up` to have a 30s sleep after setting `SCM_DO_BUILD_DURING_DEPLOYMENT=true` appsetting to handle kudu cold start
- Added support for `powershell` runtime to `functionapp create` on Windows
- Added `create-remote-connection` command

Batch

- Fixed bug in validator for `--application-package-references` options

Bot service

- [BREAKING CHANGE] Changed `bot create -v v4 -k webapp` to create an empty Web App Bot by default (i.e. no bot is deployed to the App Service)
- Added `--echo` flag to `bot create` to use the old behavior with `-v v4`
- [BREAKING CHANGE] Changed the default value of `--version` to `v4`
 - **NOTE:** `bot prepare-publish` still uses the its old default
- [BREAKING CHANGE] Changed `--lang` to no longer default to `Csharp`. If the command requires `--lang` and it is not provided, the command will now error out
- [BREAKING CHANGE] Changed the `--appid` and `--password` args for `bot create` to be required and can now be created via `ad app create`
- Added `--appid` and `--password` validation
- [BREAKING CHANGE] Changed `bot create -v v4` to not create or use a Storage Account or Application Insights
- [BREAKING CHANGE] Changed `bot create -v v3` to require a region where Application Insights is available
- [BREAKING CHANGE] Changed `bot update` to now affect only specific properties of a bot
- [BREAKING CHANGE] Changed `--lang` flags to accept `Javascript` instead of `Node`
- [BREAKING CHANGE] Removed `Node` as an allowed `--lang` value
- [BREAKING CHANGE] Changed `bot create -v v4 -k webapp` to no longer set `SCM_DO_BUILD_DURING_DEPLOYMENT` to true. All deployments through Kudu will act according to their default behavior
- Changed `bot download` for bots without `.bot` files to create the language-specific configuration file with values from the Application Settings for the bot
- Added `Typescript` support to `bot prepare-deploy`
- Added warning message to `bot prepare-deploy` for `Javascript` and `Typescript` bots for when `--code-dir` does not contain `package.json`
- Changed `bot prepare-deploy` to return `true` if successful
- Added verbose logging to `bot prepare-deploy`
- Added more available Application Insights regions to `az bot create -v v3`

Configure

- Added support for folder based argument default value configurations

Eventhubs

- Added `namespace network-rule` commands
- Added `--default-action` argument for network rules to `namespace [create|update]`

Network

- [BREAKING CHANGE] Replaced `--cache` argument with `--defer` for `vnet [create|update]`

Policy Insights

- Added support for `--expand PolicyEvaluationDetails` to query policy evaluation details on the resource

Role

- [DEPRECATED] Changed `create-for-rbac` hide '--password' argument - support will be removed in May 2019

Service Bus

- Added `namespace network-rule` commands
- Added `--default-action` argument for network rules to `namespace [create|update]`
- Fixed `topic [create|update]` to allow `--max-size` support for 10, 20, 40 and 80GB values with premium SKU

SQL

- Added `sql virtual-cluster [list|show|delete]` commands

VM

- Added `--protect-from-scale-in` and `--protect-from-scale-set-actions` to `vmss update` to enable updates to the protection policy of VMSS VM instances
- Added `--instance-id` to `vmss update` to enable generic update of VMSS VM instances
- Added `--instance-id` to `vmss wait`
- Added new `ppg` command group for managing Proximity Placement Groups
- Added `--ppg` to `[vm|vmss] create` and `vm availability-set create` for managing PPGs
- Added `--hyper-v-generation` parameter to `image create`

April 23, 2019

Version 2.0.63

ACS

- Changed `aks get-credentials` to prompt to overwrite duplicated values
- Removed `(PREVIEW)` from Dev Spaces commands "aks use-dev-spaces" and "aks remove-dev-spaces"

AMS

- Fixed bug with asset and account filters update

AppService

- Added support for ASE and timeout to `webapp ssh`
- Added support for establishing CI CD to an Azure DevOps pipeline from a Github repository to Function apps
- Added `--github-pat` argument to `functionapp devops-build create` to accept Github personal access token
- Added `--github-repository` argument to `functionapp devops-build create` to accept Github repository that contains a functionapp source code
- Fixed issue where `az webapp up --logs` was failing with a error and updating default .NETCORE version to 2.1
- Removed unnecessary functionapp settings when creating a function app with consumption plan
- Changed `webapp up` so the default asp string now appends number at the end to create a new ASP based on SKU options
- Added `-b` as an option to `webapp up` to launch the app in the browser
- Changed `webapp deployment source config zip` to handle `AZURE_CLI_DISABLE_CONNECTION_VERIFICATION` environment variable

Deployment Manager

- [PREVIEW] Create and manage artifacts that support rollouts

Lab

- Fixed bug which would cause an early exit

Network

- Added auto name server delegation to `dns zone create` in parent during child zone creation

Resource

- [DEPRECATED] Deprecated `--link-id`, `--target-id` and `--filter-string` arguments of `resource link`
 - Use the arguments `--link`, `--target`, and `--filter` instead
- Fixed issue where `resource link [create|update]` commands would not work
- Fixed an issue where deleting using a resource ID could crash on error

SQL

- Added support for custom time zone on managed instances
- Changed to allow elastic pool name to be used with `sql db update`
- Added `--no-wait` support to `sql server [create|update]`
- Added command `sql server wait`

Storage

- Fixed issue with double-encoded SAS tokens in `storage blob generate-sas`

VM

- Added `--skip-shutdown` flag to `vm|vmss stop` to power-off VMs without shutdown
- Added `--storage-account-type` argument to `sig image-version create` to set the publishing profile's account type
- Added `--target-regions` argument to `sig image-version create` to allow setting region-specific storage account types

April 9, 2019

Core

- Fixed issue where some extensions showed a version of `Unknown` and could not be updated

ACR

- Added support running an image contextlessly

AMS

- [DEPRECATED]: Deprecated the `--bitrate` parameter of `account-filter` and `asset-filter`
- [BREAKING CHANGE]: Renamed the `--bitrate` parameter to `--first-quality`
- Added new encryption parameters support in `ams streaming-policy create`
- Added new paramter `--filters` to `ams streaming-locator create`

AppService

- Added `--logs` support to `webapp up`
- Fixed `functionapp devops-build create` command `azure-pipelines.yml` generation issues
- Improved `unctionapp devops-build create` error handling and indicators
- [BREAKING CHANGE] Removed the `--local-git` flag for `devops-build` command, local git detection and handling are compulsory for creating Azure DevOps pipelines
- Added support for Linux functions plan creation
- Added ability to switch a plan underneath a function app using `functionapp update --plan`
- Added support for Azure Functions premium plan scale out settings

CDN

- Added support for `Microsoft_Standard` and `Standard_ChinaCdn`

Feedback

- Changed `feedback` to show metadata on recently run commands
- Changed `feedback` to prompt user to assist in issue creation process by opening a browser and using an issue template
- Changed `feedback` to print out issue body when run with '--verbose'

Monitor

- Fixed issue where "count" was not a permitted value with `metrics alert [create|update]`

Network

- Fixed table format not displaying with `vnet-gateway list-bgp-peer-status`
- Added `list-request-headers` and `list-response-headers` commands to `application-gateway rewrite-rule`
- Added `list-server-variables` command to `application-gateway rewrite-rule condition`
- Fixed an issue where updating link state on an express-route port would throw an unknown attribute exception `express-route port update`

PrivateDNS

- Added `network private-dns` for Private DNS zones

Resource

- Fixed issue with `deployment create` and `group deployment create` where a parameters file with an empty set of parameters would not work

Role

- Fixed `create-for-rbac` to handle `--years` correctly
- [BREAKING CHANGE] Changed `role assignment delete` to prompt when deleting all assignments under the subscription unconditionally

SQL

- Updated `sql mi [create|update]` with the properties `proxyOverride` and `publicDataEndpointEnabled`

Storage

- [BREAKING CHANGE] Removed result of `storage blob delete`
- Added `--full-uri` to `storage blob generate-sas` to create the full uri for the blob with sas
- Added `--file-snapshot` to `storage file copy start` to copy file from snapshot
- Changed `storage blob copy cancel` to only show the error instead of exception for `NoPendingCopyOperation`

March 26, 2019

Core

- Fixed issues with dev extension incompatibility
- Error handling now points customers to issues page

Cloud

- Fixed a 'subscription not found' error in `cloud set`

ACR

- Fixed redundant sources in image import
- Added `--auth-mode` to `acr build`, `acr run`, `acr task create`, and `acr task update` commands
- Added 'acr task credential' command group for managing credentials for a Task
- Added '--no-wait' to `acr build` command

AppService

- Fixed bug where `webapp up` was not handling running from empty directory or unknown code scenario correctly
- Fixed bug where slots didn't work for `[webapp|functionapp] config ssl bind`

BOT Service

- Added `bot prepare-deploy` to prepare for deploying bots via `webapp`
- Changed `bot create --kind registration` to show password if the password is not provided
- [BREAKING CHANGE] Changed `--endpoint` in `bot create --kind registration` to default to an empty string instead of being required
- Added `SCM_DO_BUILD_DURING_DEPLOYMENT` to ARM template's Application Settings for v4 Web App Bots

CDN

- Added support for `--no-wait` to `cdn endpoint [create|update|start|stop|delete|load|purge]`
- [BREAKING CHANGE]: Changed `cdn endpoint create` default query string caching behaviour. No longer defaults to "IgnoreQueryString". It is now set by the service

Cosmosdb

- Added support for `--enable-multiple-write-locations` on account update
- Added `network-rule` subgroup with commands `add`, `remove`, and `list` for managing VNET rules of a Cosmos DB account

Interactive

- Fixed incompatibility with Interactive extension installed through azdev

Monitor

- Changed to allow dimension value `*` for `monitor metrics alert [create|update]`

Network

- Added `rewrite-rule` command group to `application-gateway`

Profile

- Added tenant level account support for managed service identity to `login`

Postgres

- Added postgresql `replica` commands and `restart server` command
- Changed to get default location from resource group when not provided for creating servers and add validation for retention days

Resource

- Improved table output for `deployment [create|list|show]`
- Fixed issue with `deployment [create|validate]` where type `secureObject` was not recognized

Graph

- Added support for `--end-date` to `ad [app|sp] credential reset`
- Added support to add permissions with `ad app permission add`
- Fixed a bug with `ad app permission list` when there were no permissions
- Changed `ad sp delete` to skip role assignment delete if the current account has no subscription
- Changed `ad app create` to have `--identifier-uris` default to empty list if not provided

storage

- Added `--snapshot` to `storage file download-batch` to download from a share snapshot

- Changed `storage blob [download-batch|upload-batch]` progress bar to be less verbose and indicate current blob
- Fixed issue with `storage account update` when updating encryption parameters
- Fixed issue where `storage blob show` would fail when using oauth (`--auth-mode=login`)

VM

- Added `image update` command

March 12, 2019

Version 2.0.60

Core

- Fixed an incorrect error in `cloud set` about subscription not found

ACR

- Fixed redundant sources in image import

ACS

- Changed to ignore the `--listen-address` parameter for `aks browse` if it is not supported by kubectl

AppService

- Added `[webapp|functionapp] deployment list-publishing-credentials` to get the Kudu publishing url and its credentials
- Removed erroneous print statement for `webapp auth update`
- Fixed `functionapp` to set the correct image for runtime in Linux App Service plans
- Removed preview tag for `webapp up` and added improvements to the command

BotService

- Added `SCM_DO_BUILD_DURING_DEPLOYMENT` to ARM template's Application Settings for v4 Web App Bots
- Added `Microsoft-BotFramework-AppId` and `Microsoft-BotFramework-AppPassword` to ARM template's Application Settings for v4 Web App Bots
- Removed single quotes from `bot publish` command output at end of `bot create`
- Changed `bot publish` to be asynchronous

Container

- Added `--no-wait` argument to `container [start|restart]`

EventHub

- Added `--skip-empty-archives` flag to `eventhub create|update` to support empty archives in capture

Find

- Major functionality update

HDInsight

- Added the `--storage-account-managed-identity` parameter to `hdinsight create` to support ADLS Gen2 MSI

Network

- Fixed issue with `vpn-connection update` where updating a VPN connection between gateways in different subscriptions would fail

Rdbms

- Minor fixes to get default location from resource group when not provided for creating servers and add

validation for retention days

Role

- Fixed `role definition update` to use ID to resolve definition correctly
- Changed `ad app credential reset` to remove the assumption that app's service principal always exists

Service Fabric

- Fixed issue with `sf cluster list` was not iterable

February 26, 2019

Version 2.0.59

Core

- Fixed issue where in some instances using `--subscription NAME` would throw an exception

ACR

- Added `--target` parameter for `acr build`, `acr task create` and `acr task update` commands
- Improved error handling for runtime commands when not logged into Azure

ACS

- Added `--listen-address` option to `aks port-forward`

AppService

- Added `functionapp devops-build` command

Batch

- [BREAKING CHANGE] Removed the `batch pool upgrade os` command
- [BREAKING CHANGE] Removed the `Packages` property from `Application` responses
- Added the `batch application package list` command to list packages of an application
- [BREAKING CHANGE] Changed `--application-id` to `--application-name` in all `batch application` commands,
- Added the `--json-file` argument to commands for requesting the raw API response
- Updated validation to automatically include `https://` in all endpoints if missing

CosmosDB

- Added `network-rule` subgroup with commands `add`, `remove`, and `list` for managing VNET rules of a Cosmos DB account

Kusto

- [BREAKING CHANGE] Changed `hot_cache_period` and `soft_delete_period` types for database to ISO8601 duration format

Network

- Added `--express-route-gateway-bypass` argument to `vpn-connection [create|update]`
- Added command groups from `express-route` extensions
- Added `express-route gateway` and `express-route port` command groups
- Added argument `--legacy-mode` to `express-route peering [create|update]`
- Added arguments `--allow-classic-operations` and `--express-route-port` to `express-route [create|update]`
- Added `--gateway-default-site` argument to `vnet-gateway [create|update]`
- Added `ipsec-policy` commands to `vnet-gateway`

Resource

- Fixed issue with `deployment create` where type field was case-sensitive
- Added support for URI-based parameters file to `policy assignment create`
- Added support for URI-based parameters and definitions to `policy set-definition update`
- Fixed handling of parameters and rules for `policy definition update`
- Fixed issue with `resource show/update/delete/tag/invoke-action` where cross-subscription IDs did not properly honor the subscription ID

Role

- Added support for app roles to `ad app [create|update]`

VM

- Fixed issue with `vm create where --accelerated-networking`` was not enabled by default for Ubuntu 18.0

February 12, 2019

Version 2.0.58

Core

- `az --version` now displays a notification if you have packages that can be updated
- Fixed regression where `--ids` could no longer be used with JSON output

ACR

- [BREAKING CHANGE] Removed `acr build-task` command group
- [BREAKING CHANGE] Removed `--tag` and `--manifest` options from `acr repository delete`

ACS

- Added support for case-insensitive names to `aks [enable-addons|disable-addons]`
- Added support for Azure Active Directory updating operation using `aks update-credentials --reset-aad`
- Added clarification that `--output` is ignored for `aks get-credentials`

AMS

- Added `ams streaming-endpoint [start | stop | create | update] wait` commands
- Added `ams live-event [create | start | stop | reset] wait` commands

Appservice

- Added ability to create and configure functions using ACR containers
- Added support for updating webapp configurations through json
- Improved help for `appservice-plan-update`
- Added support for app insights on functionapp create
- Fixed issues with webapp SSH

Botservice

- Improved UX for `bot publish`
- Added warning for timeouts when running `npm install` during `az bot publish`
- Removed invalid char `.` from `--name` in `az bot create`
- Changed to stop randomizing resource names when creating Azure Storage, App Service Plan, Function/Web App and Application Insights
- [DEPRECATED] Deprecated `--proj-name` argument in favor of `--proj-file-path`
- Changed `az bot publish` to remove fetched IIS Node.js deployment files if they did not already exist
- Added `--keep-node-modules` argument to `az bot publish` to not delete `node_modules` folder on App Service
- Added `"publishCommand"` key-value pair to output from `az bot create` when creating an Azure Function or

Web App bot

- The value of "publishCommand" is an az bot publish command prepopulated with the required parameters to publish the newly created bot
- Updated "WEBSITE_NODE_DEFAULT_VERSION" in ARM template for v4 SDK bots to use 10.14.1 instead of 8.9.4

Key Vault

- Fixed issue with keyvault secret backup where some users received an unexpected_keyword error when using --id

Monitor

- Changed monitor metrics alert [create|update] to allow dimension value *

Network

- Changed dns zone export to ensure exported CNAMEs are FQDNs
- Added --gateway-name parameter to nic ip-config address-pool [add|remove] to support application gateway backend address pools
- Added --traffic-analytics and --workspace arguments to network watcher flow-log configure to support traffic analytics through a Log Analytics workspace
- Added --idle-timeout and --floating-ip to lb inbound-nat-pool [create|update]

Policy Insights

- Added policy remediation commands to support resource policy remediation features

RDBMS

- Improved help message and command parameters

Redis

- Added commands for managing firewall-rules (create, update, delete, show, list)
- Added commands for managing server-link (create, delete, show, list)
- Added commands for managing patch-schedule (create, update, delete, show)
- Added support for Availability Zones and Minimum TLS Version to redis create
- [BREAKING CHANGE] Removed redis update-settings and redis list-all commands
- [BREAKING CHANGE] Parameter for redis create : 'tenant settings' is not accepted in key[=value] format
- [DEPRECATED] Added warning message for deprecating redis import-method command

Role

- [BREAKING CHANGE] Moved az identity command here from vm commands

SQL VM

- [DEPRECATED] Deprecated --bootstrap-acc-pwd argument due to typo

VM

- Changed vm list-skus to allow use of --all in place of --all true
- Added vmss run-command [invoke | list | show]
- Fixed bug where vmss encryption enable would fail if run previously
- [BREAKING CHANGE] Moved az identity command to role commands

January 31, 2019

Version 2.0.57

Core

- Hot Fix for [issue 8399](#).

January 28, 2019

Version 2.0.56

ACR

- Added support for VNet/IP rules

ACS

- Added Virtual Nodes Preview
- Added Managed OpenShift commands
- Added support for service principal updates operation with `aks update-credentials -reset-service-principal`

AMS

- [BREAKING CHANGE] Renamed `ams asset get-streaming-locators` to `ams asset list-streaming-locators`
- [BREAKING CHANGE] Renamed `ams streaming-locator get-content-keys` to `ams streaming-locator list-content-keys`

Appservice

- Added support for app insights on `functionapp create`
- Added support for app service plan creation (including Elastic Premium) to Function Apps
- Fixed app setting issues with Elastic Premium plans

Container

- Added `container start` command
- Changed to allow using decimal values for CPU during container creation

EventGrid

- Added `--deadletter-endpoint` parameter to `event-subscription [create|update]`
- Added storagequeue and hybridconnection as new values for 'event-subscription [create|update] --endpoint-type'
- Added `--max-delivery-attempts` and `--event-ttl` parameters to `event-subscription create` to specify the retry policy for events
- Added a warning message to `event-subscription [create|update]` when webhook as destination is used for an event subscription
- Added source-resource-id parameter for all event subscription related commands and mark all other source resource related parameters as deprecated

HDInsight

- [BREAKING CHANGE] Removed the `--virtual-network` and `--subnet-name` parameters from `hdinsight [application] create`
- [BREAKING CHANGE] Changed `hdinsight create --storage-account` to accept name or id of storage account instead of blob endpoints
- Added `--vnet-name` and `--subnet-name` parameters to `hdinsight create`
- Added support for Enterprise Security Package and disk encryption to `hdinsight create`
- Added `hdinsight rotate-disk-encryption-key` command
- Added `hdinsight update` command

IoT

- Added encoding format to routing-endpoint command

Kusto

- Preview release

Monitor

- Changed ID comparison to be case insensitive

Profile

- Enable tenant level account for managed service identity for `login`

Network

- Fixed issue with `express-route update` : where `--bandwidth` argument was ignored
- Fixed issue with `ddos-protection update` where set comprehension caused stack trace

Resource

- Added support for URI parameters file to `group deployment create`
- Added support for managed identity to `policy assignment [create|list|show]`

SQL Virtual Machine

- Preview release

Storage

- Changed fix to update only properties that are changed on the same object
- Fixed #8021, binary data is encoded in base 64 when returned

VM

- Changed `vm encryption enable` to validate disk encryption keyvault and that key encryption keyvault exists
- Added `--force` flag to `vm encryption enable`

January 15, 2019

Version 2.0.55

ACR

- Changed to allow force push a helm chart that doesn't exist
- changed to allow runtime operations without ARM requests
- [DEPRECATED] Deprecated `--resource-group` parameter in the commands:
 - `acr login`
 - `acr repository`
 - `acr helm`

ACS

- Added support for new ACI regions

Appservice

- Fixed issue with uploading certificates for apps that are hosted on an ASE, where the ASE RG & App RG are different
- Changed `webapp up` to use SKU P1V1 as default for Linux
- Fixed `[webapp|functionapp] deployment source config-zip` to show the right error message when a deployment fails
- Added `webapp ssh` command

Botservice

- Added deployment status updates to `bot create`

Configure

- Added `none` as a configurable output format

CosmosDB

- Added support for creating database with shared throughput

HDInsight

- Added commands for managing applications
- Added commands for managing script actions
- Added commands for managing Operations Management Suite (OMS)
- Added support to list regional usage to `hdinsight list-usage`
- [BREAKING CHANGE] Removed default cluster type from `hdinsight create`

Network

- Added `--custom-headers` and `--status-code-ranges` arguments to `traffic-manager profile [create|update]`
- Added new routing types: Subnet and Multivalued
- Added `--custom-headers` and `--subnets` arguments to `traffic-manager endpoint [create|update]`
- Fixed issue where supplying `--vnets ""` to `ddos-protection update` caused an error

Role

- [DEPRECATED] Deprecate `--password` argument for `create-for-rbac`. Use secure passwords generated by the CLI instead

Security

- Initial Release

Storage

- [BREAKING CHANGE] Changed `storage [blob|file|container|share] list` default number of results to be 5,000. Use `--num-results *` for original behavior of returning all results
- Added `--marker` parameter to `storage [blob|file|container|share] list`
- Added log marker for next page to STDERR for `storage [blob|file|container|share] list`
- Added `storage blob service-properties update` command with support for static websites

VM

- Changed `vm [disk|unmanaged-disk]` and `vmss disk` to have more consistent parameters
- Added support for cross tenant image referencing to `[vm|vmss] create`
- Fixed bug with default configuration in `vm diagnostics get-default-config --windows-os`
- Added argument `--provision-after-extensions` to `vmss extension set` to define what extensions must be provisioned before the extension being set
- Added argument `--replica-count` to `sig image-version update` for setting the default replication count
- Fixed bug with `image create --source` where source os disk is mistaken for a VM with the same name, even if the full resource ID is provided

December 20, 2018

Version 2.0.54

Appservice

- Fixed issue where `webapp up` would fail to redeploy
- Added support for listing and restoring webapp snapshots
- Added support for `--runtime` flag to Windows function apps

IoTCentral

- Fixed update command API call

Role

- [BREAKING CHANGE] Changed `ad [app|sp] list` to only list the first 100 objects by default

SQL

- Added support for custom collation on managed instances

VM

- Added `---os-type` parameter to `disk create`

December 18, 2018

Version 2.0.53

ACR

- Added support for image import from external Container Registries
- Condensed the table layout for task list
- Added support for Azure DevOps URLs

ACS

- Added Virtual Nodes Preview
- Removed "(PREVIEW)" from AAD arguments to `aks create`
- [DEPRECATED] Depreciated `az acs` commands. The ACS service will retire on January 31, 2020
- Added support of Network Policy when creating new AKS clusters
- Removed requirement of `--nodepool-name` argument for `aks scale` if there's only one nodepool

Appservice

- Fixed issue where `webapp config container` did not honor `--slot` parameter

Botservice

- Added support for `.bot` file parsing when calling `bot show`
- Fixed AppInsights provisioning bug
- Fixed whitespace bug when dealing with file paths
- Reduced Kudu network calls
- General command UX improvements

Consumption

- Fixed bugs for budget API to show notifications

CosmosDB

- Added support for updating account from multi-master to single-master

Maps

- Added support for the S1 SKU to `maps account [create|update]`

Network

- Added support for `--format` and `--log-version` to `watcher flow-log configure`
- Fixed issue with `dns zone update` where using "" to clear resolution and registration VNets didn't work

Resource

- Fixed handling of scope parameter for management groups in

`policy assignment [create|list|delete|show|update]`

- Added new command `resource wait`

Storage

- Added ability to update log schema version for storage services in `storage logging update`

VM

- Fixed crash in `vm identity remove` when the specified vm has no assigned managed service identities

December 4, 2018

Version 2.0.52

Core

- Added support for cross tenant resource provisioning for multi-tenant service principal
- Fixed bug where ids piped from a command with tsv output was improperly parsed

Appservice

- [PREVIEW] Added `webapp up` command that helps in creating & deploying contents to app
- Fixed a bug on container based windows app due to backend change

Network

- Added `--exclusion` argument to `application-gateway waf-config set` to support WAF exclusions

Role

- Added support for custom identifiers for password credential

VM

- [DEPRECATED] Deprecated `vm extension [show|wait] --expand` parameter
- Added `--force` parameter to `vm restart` to redeploy unresponsive VMs
- Changed `[vm|vmss] create --authentication-type` to accept "all" to create a VM with both password and ssh authentication
- Added `image create --os-disk-caching` parameter to set os disk caching for an image

November 20, 2018

Version 2.0.51

Core

- Changed MSI login to not reuse subscription name in identity

ACR

- Added context token to task step
- Added support for setting secrets in acr run to mirror acr task
- Improved support for `--top` and `--orderby` for `show-tags` and `show-manifests` commands

Appservice

- Changed zip deployment default timeout to poll for the status increased to 5 mins, also adding a timeout property to customize this value
- Updated the default `node_version`. Resetting slot swap action, during a two phase swap preserves all the appsettings & connection strings
- Removed client-side SKU check for Linux app service plan create
- Fixed error when trying to get zipdeploy status

IoT Central

- Added subdomain availability check when creating an IoT Central application

KeyVault

- Fixed bug where errors may have been ignored

Network

- Added `root-cert` subcommands to `application-gateway` to handle trusted root certificates
- Added `--min-capacity` and `--custom-error-pages` options to `application-gateway [create|update]` :
- Added `--zones` for availability zone support to `application-gateway create`
- Added arguments `--file-upload-limit`, `--max-request-body-size` and `--request-body-check` to `application-gateway waf-config set`

Rdbms

- Added mariadb vnet commands

Rbac

- Fixed an issue with attempting to update immutable credentials in `ad app update`
- Added output warnings to communicate breaking changes in the near future for `ad [app|sp] list`

Storage

- Improved handling of corner cases for storage copy commands
- Fixed issue with `storage blob copy start-batch` not using login credentials when the destination and source accounts are the same
- Fixed bug with `storage [blob|file] url` where `sas_token` wasn't incorporated into URL
- Added breaking change warning to `[blob|container] list` : will soon output only first 5000 results by default

VM

- Added support to `[vm|vmss] create --storage-sku` to specify the storage account SKU for managed OS and data disks separately
- Changed version name parameters to `sig image-version` to be `--image-version -e`
- Deprecated `sig image-version` argument `--image-version-name`, replaced by `--image-version`
- Added support to use local OS disk to `[vm|vmss] create --ephemeral-os-disk`
- Added support for `--no-wait` to `snapshot create/update`
- Added `snapshot wait` command
- Added support for using instance name with `[vm|vmss] extension set --extension-instance-name`

November 6, 2018

Version 2.0.50

Core

- Added support for service principal sn+issuer auth

ACR

- Added support for commit and pull request git events for Task source trigger
- Changed to use default Dockerfile if it's not specified in build command

ACS

- [BREAKING CHANGE] Removed `enable_cloud_console_aks_browse` to enable 'az aks browse' by default

Advisor

- GA release

AMS

- Added new command groups:
 - `ams account-filter`
 - `ams asset-filter`
 - `ams content-key-policy`
 - `ams live-event`
 - `ams live-output`
 - `ams streaming-endpoint`
 - `ams mru`
- Added new commands:
 - `ams account check-name`
 - `ams job update`
 - `ams asset get-encryption-key`
 - `ams asset get-streaming-locators`
 - `ams streaming-locator get-content-keys`
- Added encryption parameters support to `ams streaming-policy create`
- Added support to `ams transform output remove` now can be performed by passing the output index to remove
- Added `--correlation-data` and `--label` arguments to `ams job` command group
- Added `--storage-account` and `--container` arguments to `ams asset` command group
- Added default values for expiry time (Now+23h) and permissions (Read) in `ams asset get-sas-url` command
- [BREAKING CHANGE] Replaced `ams streaming locator` command with `ams streaming-locator`
- [BREAKING CHANGE] Updated `--content-keys` argument of `ams streaming locator`
- [BREAKING CHANGE] Renamed `--content-policy-name` to `--content-key-policy-name` in `ams streaming locator` command
- [BREAKING CHANGE] Replaced `ams streaming policy` command with `ams streaming-policy`
- [BREAKING CHANGE] Replaced `--preset-names` argument with `--preset` in `ams transform` command group. Now you can only set 1 output/preset at a time (to add more you have to run `ams transform output add`). Also, you can set custom StandardEncoderPreset by passing the path to your custom JSON
- [BREAKING CHANGE] Renamed `--output-asset-names` to `--output-assets` in `ams job start` command. Now it accepts a space-separated list of assets in 'assetName=label' format. An asset without label can be sent like this: 'assetName='

AppService

- Fixed a bug in `az webapp config backup update` that prevents setting a backup schedule if one is not already set

Configure

- Added YAML to output format options

Container

- Changed to show identity when exporting a container group to yaml

EventHub

- Added `--enable-kafka` flag to support Kafka in `eventhub namespace [create|update]`

Interactive

- Interactive now installs the `interactive` extension, which will allow for faster updates and support

Monitor

- Added support for metric names which include characters forward-slash (/) and period (.) to `--condition` in `monitor metrics alert [create|update]`

Network

- Deprecated `network interface-endpoint` command names in favor of `network private-endpoint`
- Fixed issue with where `--peer-circuit` argument in `express-route peering connection create` would not accept an ID
- Fixed issue where `--ip-tags` did not work correctly with `public-ip create`

Profile

- Added `--use-cert-sn-issuer` to `az login` for service principal login with cert auto-rolls

RDBMS

- Added mysql replica commands

Resource

- Added support for management groups and subscriptions to `policy definition|set-definition` commands

Role

- Added support for API permission management, signed-in-user, and application password & certificate credential management
- Changed `ad sp create-for-rbac` to clarify the confusion between displayName and service principal name
- Added support to grant permissions to AAD apps

Storage

- Added support to connect to storage services only with SAS and endpoints (without an account name or a key) as described in

Configure Azure Storage connection strings <<https://docs.microsoft.com/azure/storage/common/storage-configure-connection-string>>

VM

- Added `storage-sku` argument to `image create` for setting the image's default storage account type
- Fixed bug with `vm resize` where `--no-wait` option causes command to crash
- Changed `vm encryption show` table output format to show status
- Changed `vm secret format` to require json/jsonc output. Warns user and defaults to json output if an undesired output format is selected
- Improved argument validation for `vm create --image`

October 23, 2018

Version 2.0.49

Core

- Fixed issue with `--ids` where `--subscription` would take precedence over the subscription in `--ids`
- Added explicit warnings when parameters would be ignored by use of `--ids`

ACR

- Fixed an ACR Build encoding issue in Python2

CDN

- [BREAKING CHANGE] Changed `cdn endpoint create`'s default query string caching behaviour to no longer defaults to "IgnoreQueryString". It is now set by the service

Container

- Added `Private` as a valid type to pass to `--ip-address`
- Changed to allow using only subnet ID to setup a virtual network for the container group
- Changed to allow using vnet name or resource id to enable using vnets from different resource groups
- Added `--assign-identity` for adding a MSI identity to a container group
- Added `--scope` to create a role assignment for the system assigned MSI identity
- Added a warning when creating a container group with an image without a long running process
- Fixed table output issues for `list` and `show` commands

CosmosDB

- Added `--enable-multiple-write-locations` support to `cosmosdb create`

Interactive

- Changed to ensure global subscription parameter appears in parameters

IoT Central

- Added template and display name options for IoT Central Application creation
- [BREAKING CHANGE] Removed support for the F1 SKU; Use S1 SKU instead

Monitor

- Changes to `monitor activity-log list`:
 - Added support for listing all events at the subscription level
 - Added `--offset` parameter to more easily create time queries
 - Improved validation for `--start-time` and `--end-time` to use wider range of ISO8601 formats and more user-friendly datetime formats
 - Added `--namespace` as alias for deprecated option `--resource-provider`
 - Deprecated `--filters` because no values other than those with strongly-typed options are supported by the service
- Changes to `monitor metrics list`:
 - Added `--offset` parameter to more easily create time queries
 - Improved validation for `--start-time` and `--end-time` to use wider range of ISO8601 formats and more user-friendly datetime formats
- Improved validation for `--event-hub` and `--event-hub-rule` arguments to `monitor diagnostic-settings create`

Network

- Added `--app-gateway-address-pools` and `--gateway-name` arguments to `nic create`, to support adding application gateway backend address pools to a NIC
- Added `--app-gateway-address-pools` and `--gateway-name` arguments to `nic ip-config create/update`, to support adding application gateway backend address pools to a NIC

ServiceBus

- Added Read-Only `migration_state` to `MigrationConfigProperties` to show current Service Bus Standard to Premium namespace migration state

SQL

- Fixed `sql failover-group create` and `sql failover-group update` to work with Manual failover policy

Storage

- Fixed `az storage cors list` output formatting, all items show correct "Service" key
- Added `--bypass-immutability-policy` parameter for immutability-policy blocked container deletion

VM

- Enforce disk caching mode be `None` for Lv/Lv2 series of machines in `[vm|vmss] create`
- Updated supported size list supporting networking accelerator for `vm create`
- Added strong typed arguments for ultrasssd iops and mbps configs for `disk create`

October 16, 2018

Version 2.0.48

VM

- Fixed SDK issue that caused Homebrew installation to fail

October 9, 2018

Version 2.0.47

Core

- Improved error handling for "Bad Request" errors

ACR

- Added support for similar table format as helm client

ACS

- Added `aks [create|scale] --nodepool-name` to configure nodepool name, truncated to 12 characters, default - nodepool1
- Fixed to fall back to 'scp' when Parimiko fails
- Changed `aks create` to no longer require `--aad-tenant-id`
- Improved merging of Kubernetes credentials when duplicate entries are present

Container

- Changed `functionapp create` to support creating a Linux consumption plan type with a specific runtime
- [PREVIEW] Added support for hosting webapps on Windows containers

Event Hub

- Fixed `eventhub update` command
- [BREAKING CHANGE] Changed `list` commands to handle errors for resource(s) NotFound(404) in the typical way instead of showing empty list

Extensions

- Fixed issue with attempting to add an extension that is already installed

HDInsight

- Initial release

IoT

- Added extension installation command to first-run banner

KeyVault

- Changed to restrict keyvault storage commands to the latest API profile

Network

- Fixed `network dns zone create`: Command succeeds even if the user has configured a default location. See #6052
- Deprecated `--remote-vnet-id` for `network vnet peering create`

- Added `--remote-vnet` to `network vnet peering create` which accepts a name or ID
- Added support for multiple subnet prefixes to `network vnet create` with `--subnet-prefixes`
- Added support for multiple subnet prefixes to `network vnet subnet [create|update]` with `--address-prefixes`
- Fixed issue with `network application-gateway create` that prevented creating gateways with `WAF_v2` or `Standard_v2` SKU
- Added `--service-endpoint-policy` convenience argument to `network vnet subnet update`

Role

- Added support for listing Azure AD app owners to `ad app owner`
- Added support for listing Azure AD service principal owners to `ad sp owner`
- Changed to ensure role definition create & update commands accept multiple permission configurations
- Changed `ad sp create-for-rbac` to ensure home page URI is always "https"

Service Bus

- [BREAKING CHANGE] Changed `list` commands to handle errors for resource(s) NotFound(404) in the typical way instead of showing empty list

VM

- Fixed empty `accessSas` field in `disk grant-access`
- Changed `vmss create` to reserve large enough frontend port range to handle overprovisioning
- Fixed update commands for `sig`
- Added `--no-wait` support for managing image versions in `sig`
- Changed `vm list-ip-addresses` to show availability zone of public IP addresses
- Changed `[vm|vmss] disk attach` to set disk's default lun to the first available spot

September 21, 2018

Version 2.0.46

ACR

- Added ACR Task commands
- Added quick run command
- Deprecated `build-task` command group
- Added `helm` command group to support managing helm charts with ACR
- Added support for idempotent create for managed registry
- Added a no-format flag for displaying build logs

ACS

- Changed the `install-connector` command to set the AKS Master FQDN
- Fixed creating role assignment for vnet-subnet-id when not specifying service principal and skip-role-assignment

AppService

- Added support for webjobs (continuous and triggered) operations management
- `az webapp config set` supports `--fts-state` property Also added support for `az functionapp config set` & show
- Added support for bring your own storage for webapps
- Added support for listing and restoring deleted webapps

Batch

- Changed adding tasks through `--json-file` to support `AddTaskCollectionParameter` syntax

- Updated documentation of accepted `--json-file` formats
- Added `--max-tasks-per-node-option` to `batch pool create`
- Changed behavior of `batch account` to show currently logged in account if no options are specified

Batch AI

- Fixed auto storage account creation failure in `batchai cluster create` command

Cognitive Services

- Added completer for `--sku`, `--kind`, `--location` arguments
- Added command `cognitiveservices account list-usage`
- Added command `cognitiveservices account list-kinds`
- Added command `cognitiveservices account list`
- Deprecated `cognitiveservices list`
- Changed `--name` to be optional for `cognitiveservices account list-skus`

Container

- Added ability to restart and stop a running container group
- Added `--network-profile` for passing in a network profile
- Added `--subnet`, `--vnet_name`, to allow creating container groups in a VNET
- Changed table output to show the status of the container group

Datalake

- Added commands for virtual network rules

Interactive Shell

- Fixed error on Windows where commands fail to run properly
- Fixed command loading problem in interactive that was caused by deprecated objects

IoT

- Added support for routing IoT Hubs

Key Vault

- Fixed Key Vault key import for RSA keys

Network

- Add `network public-ip prefix` commands to support public IP prefixes features
- Add `network service-endpoint` commands to support service endpoint policy features
- Add `network lb outbound-rule` commands to support creation of Standard Load Balancer outbound rules
- Add `--public-ip-prefix` to `network lb frontend-ip create/update` to support frontend IP configurations using public IP prefixes
- Add `--enable-tcp-reset` to `network lb rule/inbound-nat-rule/inbound-nat-pool create/update`
- Add `--disable-outbound-snat` to `network lb rule create/update`
- Allow `network watcher flow-log show/configure` to be used with classic NSGs
- Add `network watcher run-configuration-diagnostic` command
- Fix `network watcher test-connectivity` command and add `--method`, `--valid-status-codes` and `--headers` properties
- `network express-route create/update`: Add `--allow-global-reach` flag
- `network vnet subnet create/update`: Add support for `--delegation`
- Added `network vnet subnet list-available-delegations` command
- `network traffic-manager profile create/update`: Added support for `--interval`, `--timeout` and

`--max-failures` for Monitor configuration Deprecated options `--monitor-path`, `--monitor-port` and `--monitor-protocol` in favor of `--path`, `--port`, `--protocol`

- `network lb frontend-ip create/update`: Fixed the logic for setting private IP allocation methodIf a private IP address is provided, the allocation will be staticIf no private IP address is provided, or empty string is provided for private IP address, allocation is dynamic.
- `dns record-set * create/update`: Add support for `--target-resource`
- Add `network interface-endpoint` commands to query interface endpoint objects
- Add `network profile show/list/delete` for partial management of network profiles
- Add `network express-route peering connection` commands to manage peering connections between ExpressRoutes

RDBMS

- Added support for MariaDB service

Reservation

- Added CosmosDb in the reserved resource enum type
- Added name property in Patch model

Manage App

- Fixed bug in `managedapp create --kind Marketplace` causing instance creation of a Marketplace managed app to crash
- Changed `feature` commands to be restricted to supported profiles

Role

- Added support for listing user's group memberships

SignalR

- First release

Storage

- Added `--auth-mode login` parameter for use of user's login credentials for blob and queue authorization
- Added `storage container immutability-policy/legal-hold` to manage immutable storage

VM

- Fixed issue where `vm create --generate-ssh-keys` overwrites private key file if public key file is missing (#4725, #6780)
- Added support for shared image gallery through `az sig`

August 28, 2018

Version 2.0.45

Core

- Fixed issue of loading empty configuration file
- Added support for profile `2018-03-01-hybrid` for Azure Stack

ACR

- Added a workaround for runtime operations without ARM requests
- Changed to exclude version control files (eg, `.git`, `.gitignore`) from uploaded tar by default in `build` command

ACS

- Changed `aks create` to defaults to `Standard_DS2_v2` VMs

- Changed `aks get-credentials` to now call new apis to get cluster credential

AppService

- Added support for CORS on functionapp & webapp
- Added ARM tag support on create commands
- Changed `[webapp|functionapp] identity show` to exit with code 3 upon a missing resource

Backup

- Changed `backup vault backup-properties show` to exit with code 3 upon a missing resource

Bot Service

- Initial Bot Service CLI Release

Cognitive Services

- Added new parameter `--api-properties,` which is required for creating some of the services

IoT

- Fixed issue with associating linked hubs

Monitor

- Added `monitor metrics alert` commands for near-realtime metric alerts
- Deprecated `monitor alert` commands

Network

- Changed `network application-gateway ssl-policy predefined show` to exit with code 3 upon a missing resource

Resource

- Changed `provider operation show` to exit with code 3 upon a missing resource

Storage

- Changed `storage share policy show` to exit with code 3 upon a missing resource

VM

- Changed `vm/vmss identity show` to exit with code 3 upon a missing resource
- Deprecated `--storage-caching` for `vm create`

August 14, 2018

Version 2.0.44

Core

- Fixed numeric display in `table` output
- Added YAML output format

Telemetry

- Improved telemetry reporting

ACR

- Added `content-trust policy` commands
- Fixed issue where `.dockerignore` was not handled properly

ACS

- Changed `az acs/aks install-cli` to install under `%USERPROFILE%\azure-kubectl` on Windows
- Changed `az aks install-connector` to detect if the cluster has RBAC and configure ACI Connector

appropriately

- Changed to role assignment to the subnet when it's provided
- Added new option to "skip role assignment" for subnet when it's provided
- Changed to skip role assignment to subnet when assignment already exists

AppService

- Fixed a bug that prevent from creating a function-app using storage accounts in external resource groups
- Fixed a crash on zip deployment

BatchAI

- Changed logger output for auto-storage account creation to specifies "resource *group*".

Container

- Added `--secure-environment-variables` for passing secure environment variables to a container

IoT

- [BREAKING CHANGE] Removed deprecated commands which have moved to the iot extension
- Updated elements to not assume `azure-devices.net` domain

IoT Central

- Initial release of IoT Central module

KeyVault

- Added commands for managing storage accounts and sas-definitions
- Added commands for network-rules
- Added `--id` parameter to secret, key, and certificate operations
- Added support for KV mgmt multi-api version
- Added support for KV data plane multi-api version

Relay

- Initial release

Sql

- Added `sql failover-group` commands

Storage

- [BREAKING CHANGE] Changed `storage account show-usage` to require `--location` parameter and will list by region
- Changed `--resource-group` parameter to be optional for `storage account` commands
- Removed 'Failed precondition' warnings for individual failures in batch commands for single aggregated message
- Changed `[blob|file] delete-batch` commands to no longer output array of nulls
- Changed `blob [download|upload|delete-batch]` commands to read sas-token from container url

VM

- Added common filters to `vm list-skus` for ease of use

July 31, 2018

Version 2.0.43

ACR

- Added `--with-secure-properties` flag to `acr build-task show` command

- Added `acr build-task update-build` command

ACS

- Changed to return 0 (success) when ending `az aks browse` by pressing [Ctrl+C]

Batch

- Fixed bug when showing AAD token in cloudshell

Container

- Removed requirement for `--log-analytics-workspace-key` for name or ID when in set subscription

Network

- Added dns support to 2017-03-09-profile for Azure Stack

Resource

- Added `--rollback-on-error` to `group deployment create` to execute a known-good deployment on error
- Fixed issue where `--parameters {}` with `group deployment create` resulted in an error

Role

- Added support for stack profile 2017-03-09-profile
- Fixed issue where generic update parameters to `app update` would not work correctly

Search

- Added commands for Azure Search service

Service Bus

- Added migration command group to migrate a namespace from Service Bus Standard to Premium
- Added new optional properties to Service Bus queue and Subscription
 - `--enable-batched-operations` and `--enable-dead-lettering-on-message-expiration` in `queue`
 - `--dead-letter-on-filter-exceptions` in `subscriptions`

Storage

- Added support for download of large files using a single connection
- Converted `show` commands that were missed from failing with exit code 3 upon a missing resource

VM

- Added support to list availability sets by subscription
- Added support for `StandardSSD_LRS`
- Added support for application security group on creating VM scale set
- [BREAKING CHANGE] Changed `[vm|vmss] create`, `[vm|vmss] identity assign`, and `[vm|vmss] identity remove` to output user assigned identities in dictionary format

July 18, 2018

Version 2.0.42

Core

- Added support for browser-based login in WSL bash window
- Added `--force-string` flag to all generic update commands
- [BREAKING CHANGE] Changed 'show' commands to log error message and fail with exit code of 3 upon a missing resource

ACR

- [BREAKING CHANGE] Updated '--no-push' to a pure flag in 'acr build' command
- Added `show` and `update` commands under `acr repository` group
- Added `--detail` flag for `show-manifests` and `show-tags` to show more detailed information
- Added `--image` parameter to support get build details or logs by an image

ACS

- Changed `az aks create` to error out if `--max-pods` is less than 5

AppService

- Added support for PremiumV2 skus

Batch

- Fixed bug on using token credential on cloud shell mode
- Changed JSON input to be case-insensitive

Batch AI

- Fixed `az batchai job exec` command

Container

- Removed the requirement for username and password for non dockerhub registries
- Fixed error when creating container groups from yaml file

Network

- Added `--no-wait` support to `network nic [create|update|delete]`
- Added `network nic wait`
- Deprecated `--ids` argument for `network vnet [subnet|peering] list`
- Added `--include-default` flag to include default security rules in the output of `network nsg rule list`

Resource

- Added `--no-wait` support to `group deployment delete`
- Added `--no-wait` support to `deployment delete`
- Added `deployment wait` command
- Fixed issue where the subscription-level `az deployment` commands erroneously appeared for profile 2017-03-09-profile

SQL

- Fixed 'The provided resource group name ... did not match the name in the Url' error when specifying elastic pool name for `sql db copy` and `sql db replica create` commands
- Allow configuring default sql server by executing `az configure --defaults sql-server=<name>`
- Implemented table formatters for `sql server`, `sql server firewall-rule`, `sql list-usages`, and `sql show-usage` commands

Storage

- Added `pageRanges` property to `storage blob show` output that will be populated for page blobs

VM

- [BREAKING CHANGE] Changed `vmss create` to use `Standard_DS1_v2` as the default instance size
- Added `--no-wait` support to `vm extension [set|delete]` and `vmss extension [set|delete]`
- Added `vm extension wait`

July 3, 2018

Version 2.0.41

AKS

- Changed monitoring to use subscription ID

July 3, 2018

Version 2.0.40

Core

- Added a new authorization code flow for interactive login

ACR

- Added polling build status
- Added support for case-insensitive enum values
- Added `--top` and `--orderby` parameters for `show-manifests`

ACS

- [BREAKING CHANGE] Enable Kubernetes role-based access control by default
- Added `--disable-rbac` argument and deprecated `--enable-rbac` since it's the default now
- Updated options for `aks browse` command. Added `--listen-port` support
- Updated the default helm chart package for `aks install-connector` command. Use virtual-kubelet-for-aks-latest.tgz
- Added `aks enable-addons` and `aks disable-addons` commands to update an existing cluster

AppService

- Added support for disabling identity via `webapp identity remove`
- Removed `preview` tag for Identity feature

Backup

- Updated module definition

BatchAI

- Fixed table output for `batchai cluster node list` and `batchai job node list` commands

Cloud

- Added `acr login` server suffix to cloud config

Container

- Changed `container create` to default to long running operation
- Added Log Analytics parameters `--log-analytics-workspace` and `--log-analytics-workspace-key`
- Added `--protocol` parameter to specify which network protocol to use

Extension

- Changed `extension list-available` to only show extensions compatible with CLI version

Network

- Fixed issue where record types were case-sensitive ([#6602](#))

Rdbms

- Added `[postgres|mysql] server vnet-rule` commands

Resource

- Added new operation group `deployment`

VM

- Added support for removing system assigned identity

June 25, 2018

Version 2.0.39

CLI

- Updated file trimming in MSI installer to fix extension installation issue

June 19, 2018

Version 2.0.38

Core

- Added global support for `--subscription` to most commands

ACR

- Added `azure-storage-blob` as dependency
- Changed default CPU configuration with `acr build-task create` to use 2 cores

ACS

- Updated options of `aks use-dev-spaces` command. Added `--update` support
- Changed `aks get-credentials --admin` to not replace the user context in `$HOME/.kube/config`
- Exposed read-only `nodeResourceGroup` property on managed clusters
- Fixed `acs browse` command error
- Made `--connector-name` optional for `aks install-connector`, `aks upgrade-connector` and `aks remove-connector`
- Added new Azure Container Instance regions for `aks install-connector`
- Added the normalized location into the helm release name and node name to `aks install-connector`

AppService

- Added support for newer versions of urllib
- Added support to `functionapp create` to use appservice plan from external resource groups

Batch

- Removed `azure-batch-extensions` dependency

Batch AI

- Added support for workspaces. Workspaces allow to group clusters, file-servers and experiments in groups removing limitation on number of resources can be created
- Added support for experiments. Experiments allow to group jobs in collections removing limitation on number of created jobs
- Added support to configure `/dev/shm` for jobs running in a docker container
- Added `batchai cluster node exec` and `batchai job node exec` commands. These commands allow to execute any commands directly on nodes and provide functionality for port forwarding.
- Added support for `--ids` to `batchai` commands
- [BREAKING CHANGE] All clusters and fileservers must be created under workspaces
- [BREAKING CHANGE] Jobs must be created under experiments
- [BREAKING CHANGE] Removed `--nfs-resource-group` from `cluster create` and `job create` commands. To mount an NFS belonging to a different workspace/resource group provide file server's ARM ID via `--nfs`

option

- [BREAKING CHANGE] Removed `--cluster-resource-group` from `job create` command. To submit a job on a cluster belonging to a different workspace/resource group provide cluster's ARM ID via `--cluster` option
- [BREAKING CHANGE] Removed `location` attribute from jobs, cluster and file servers. Location now is an attribute of a workspace.
- [BREAKING CHANGE] Removed `--location` from `job create`, `cluster create` and `file-server create` commands
- [BREAKING CHANGE] Changed names of short options to make interface more consistent:
 - Renamed `[--config, -c]` to `[--config-file, -f]`
 - Renamed `[--cluster, -r]` to `[--cluster, -c]`
 - Renamed `[--cluster, -n]` to `[--cluster, -c]`
 - Renamed `[--job, -n]` to `[--job, -j]`

Maps

- [BREAKING CHANGE] Changed `maps account create` to require accepting Terms of Service either by interactive prompt or `--accept-tos` flag

Network

- Added support for `https` to `network lb probe create` [#6571](#)
- Fixed issue where `--endpoint-status` was case sensitive. [#6502](#)

Reservations

- [BREAKING CHANGE] Added required parameter `ReservedResourceType` to `reservations catalog show`
- Added parameter `Location` to `reservations catalog show`
- [BREAKING CHANGE] Removed `kind` from `ReservationProperties`
- [BREAKING CHANGE] Renamed `capabilities` to `sku_properties` in `Catalog`
- [BREAKING CHANGE] Removed `size` and `tier` properties from `Catalog`
- Added parameter `InstanceFlexibility` to `reservations reservation update`

Role

- Improved error handling

SQL

- Fixed confusing error when running `az sql db list-editions` for a location that is not available to your subscription

Storage

- Changed table output for `storage blob download` to be more readable

VM

- Improved refine vm size check for accelerated networking support in `vm create`
- Added warning for `vmss create` that the default vm size will be switched from `Standard_D1_v2` to `Standard_DS1_v2`
- Added `--force-update` to `[vm|vmss] extension set` to update the extension even when the configuration has not changed

June 13, 2018

Version 2.0.37

Core

- Improved interactive telemetry

June 13, 2018

Version 2.0.36

AKS

- Added advanced networking options to `aks create`
- Added arguments to `aks create` to enable monitoring and HTTP routing
- Added `--no-ssh-key` argument to `aks create`
- Added `--enable-rbac` argument to `aks create`
- [PREVIEW] Added support for Azure Active Directory authentication to `aks create`

AppService

- Fixed an issue with incompatible urllib versions

June 5, 2018

Version 2.0.35

Interactive

- Added limits to the dependencies of interactive mode

June 5, 2018

Version 2.0.34

Core

- Added support for cross tenant resource referencing
- Improved telemetry upload reliability

ACR

- Added support for VSTS as a remote source location
- Added `acr import` command

AKS

- Changed `aks get-credentials` to create the kube config file with more secure filesystem permissions

Batch

- Fixed bug in Pool list table formatting [[Issue #4378](#)]

IOT

- Added support for creating Basic Tier IoT Hubs

Network

- Improved `network vnet peering`

Policy Insights

- Initial Release

ARM

- Added `account management-group` commands.

SQL

- Added new managed instance commands:

- `sql mi create`
- `sql mi show`
- `sql mi list`
- `sql mi update`
- `sql mi delete`

- Added new managed database commands:

- `sql midb create`
- `sql midb show`
- `sql midb list`
- `sql midb restore`
- `sql midb delete`

Storage

- Added extra mimetypes for json and javascript to be inferred from file extensions

VM

- Changed `vm list-skus` to use fixed columns and add warning that `Tier` and `Size` will be removed
- Added `--accelerated-networking` option to `vm create`
- Added `--tags` to `identity create`

May 22, 2018

Version 2.0.33

Core

- Added support for expanding `@` in file names

ACS

- Added new Dev-Spaces commands `aks use-dev-spaces` and `aks remove-dev-spaces`
- Fixed typo in help message

AppService

- Improved generic update commands
- Added async support for `webapp deployment source config-zip`

Container

- Added support for exporting a container group in yaml format
- Added support for using a yaml file to create / update a container group

Extension

- Improved removal of extensions

Interactive

- Changed logging to mute parser for completions
- Improved handling of bad help caches

KeyVault

- Fixed keyvault commands to work in cloud shell or VMs with identity

Network

- Fix issue where `network watcher show-topology` would not work with vnet and/or subnet name [#6326](#)

- Fix issue where some `network watcher` commands would claim Network Watcher is not enabled for regions when it actually is [#6264](#)

SQL

- [BREAKING CHANGE] Changed response objects returned from `db` and `dw` commands:
 - Renamed `serviceLevelObjective` property to `currentServiceObjectiveName`
 - Removed `currentServiceObjectiveId` and `requestedServiceObjectiveId` properties
 - Changed `maxSizeBytes` property to be an integer value instead of a string
- [BREAKING CHANGE] Changed the following `db` and `dw` properties to be read-only:
 - `requestedServiceObjectiveName`. To update, use the `--service-objective` parameter or set the `sku.name` property
 - `edition`. To update, use the `--edition` parameter or set the `sku.tier` property
 - `elasticPoolName`. To update, use the `--elastic-pool` parameter or set the `elasticPoolId` property
- [BREAKING CHANGE] Changed the following `elastic-pool` properties to be read-only:
 - `edition`. To update, use the `--edition` parameter
 - `dtu`. To update, use the `--capacity` parameter
 - `databaseDtuMin`. To update, use the `--db-min-capacity` parameter
 - `databaseDtuMax`. To update, use the `--db-max-capacity` parameter
- Added `--family` and `--capacity` parameters to `db`, `dw`, and `elastic-pool` commands.
- Added table formatters to `db`, `dw`, and `elastic-pool` commands.

Storage

- Added completer for `--account-name` argument
- Fixed problem with `storage entity query`

VM

- [BREAKING CHANGE] Removed `--write-accelerator` from `vm create`. The same support can be accessed through `vm update` or `vm disk attach`
- Fixed extension image matching in `[vm|vmss] extension`
- Added `--boot-diagnostics-storage` to `vm create` to capture boot log
- Added `--license-type` to `[vm|vmss] update`

May 7, 2018

Version 2.0.32

Core

- Fixed an unhandled exception when retrieving secrets from a service principal account with cert
- Added limited support for positional arguments
- Fix issue where `--query` could not be used with `--ids`. [#5591](#)
- Improved piping scenarios from commands when using `--ids`. Supports `-o tsv` with a query specified or `-o json` without specifying a query
- Added command suggestions on error if users have typo in their commands
- Improved error when users type `az ''`
- Added support custom resource types for command modules and extensions

ACR

- Added ACR Build commands
- Improved resource not found error messages

- Improved resource creation performance and error handling
- Improved acr login in non-standard consoles and WSL
- Improved repository commands error messages
- Updated table columns and ordering

ACS

- Added warning that `az aks` is a preview service
- Fixed the permission issue in `aks install-connector` when `--aci-resource-group` is not specified

AMS

- Initial release - Manage Azure Media Services resources

Appservice

- Fixed a bug in `webapp delete` when `--slot` is provided
- Removed `--runtime-version` from `webapp auth update`
- Added support for `min_tls_version` & `https2.0`
- Added support for multicontainers

Batch AI

- Changed `batchai create cluster` to respect vm priority configured in the cluster's configuration file

Cognitive Services

- Fixed typo in example for `cognitiveservices account create` [#5603](#)

Consumption

- Added new commands for budget API

Container

- Removed requirement for `--registry-server` for `container create` when a registry server is included in the image name

Cosmos DB

- Introducing VNET support for Azure CLI - Cosmos DB

DMS

- Initial release - Adds support for the SQL to Azure SQL migration scenario

Extension

- Fixed bug where extension metadata stopped being shown

Interactive

- Allow interactive completers to function with positional arguments
- More user-friendly output when users type "
- Fixed completions for parameters with no help
- Fixed descriptions for command-groups

Lab

- Fixed regressions from knack conversion

Network

- [BREAKING CHANGE] Removed the `--ids` parameter for:
 - `express-route auth list`
 - `express-route peering list`

- `nic ip-config list`
- `nsg rule list`
- `route-filter rule list`
- `route-table route list`
- `traffic-manager endpoint list`

Profile

- Fixed `disk create` source detection
- [BREAKING CHANGE] Removed `--msi-port` and `--identity-port` as they are no longer used
- Fixed typo in `account get-access-token` short summary

Redis

- Deprecated `redis patch-schedule patch-schedule show` in favor of `redis patch-schedule show`
- Deprecated `redis list-all`. This functionality has been folded into `redis list`
- Deprecated `redis import-method` in favor of `redis import`
- Added support for `--ids` to various commands

Role

- [BREAKING CHANGE] Removed deprecated `ad sp reset-credentials`

Storage

- Allow destination sas-token to apply to source for blob copy if source sas and account key are unspecified
- Exposed `--socket-timeout` for blob uploads and downloads
- Treat blob names that start with path separators as relative paths
- Allow `storage blob copy --source-sas` with starting query char, '?'
- Fixed `storage entity query --marker` to accept list of key=values

VM

- Fixed an invalid detection logic on unmanaged blob uri
- Added support disk encryption w/o user provided service principals
- [BREAKING CHANGE] Do not use VM 'ManagedIdentityExtension' for MSI support
- Added support for eviction policy to `vmss`
- [BREAKING CHANGE] Removed `--ids` from:
 - `vm extension list`
 - `vm secret list`
 - `vm unmanaged-disk list`
 - `vmss nic list`
- Added write accelerator support
- Added `vmss perform-maintenance`
- Fixed `vm diagnostics set` to detect VM's OS type reliably
- Changed `vm resize` to check if the requested size is different than currently set and update only on change

April 10, 2018

Version 2.0.31

ACR

- Improved error handling of wincred fallback

ACS

- Changed aks created SPNs to be valid for 5 years

Appservice

- [BREAKING CHANGE]: Removed `assign-identity`
- Fixed uncaught exception for nonexistant webapp plans

BatchAI

- Added support for 2018-03-01 API
 - Job level mounting
 - Environment variables with secret values
 - Performance counters settings
 - Reporting of job specific path segment
 - Support for subfolders in list files api
 - Usage and limits reporting
 - Allow to specify caching type for NFS servers
 - Support for custom images
 - Added pyTorch toolkit support
- Added `job wait` command which allows to wait for the job completion and reports job exit code
- Added `usage show` command to list current Batch AI resources usage and limits for different regions
- National clouds are supported
- Added job command line arguments to mount filesystems on the job level in addition to config files
- Added more options to customize clusters - vm priority, subnet, initial nodes count for auto-scale clusters, specifying custom image
- Added command line option to specify caching type for Batch AI managed NFS
- Simplified specifying mount filesystem in config files. Now you can omit credentials for Azure File Share and Azure Blob Containers - CLI will populate missing credentials using storage account key provided via command line parameters or specified via environment variable or will query the key from Azure Storage (if the storage account belongs to the current subscription)
- Job file stream command now auto-completes when the job is completed (succeeded, failed, terminated or deleted)
- Improved `table` output for `show` operations
- Added `--use-auto-storage` option for cluster creation. This option make it simpler to manage storage accounts and mount Azure File Share and Azure Blob Containers to clusters
- Added `--generate-ssh-keys` option to `cluster create` and `file-server create`
- Added ability to provide node setup task via command line
- [BREAKING CHANGE] Moved `job stream-file` and `job list-files` commands under `job file` group
- [BREAKING CHANGE] Renamed `--admin-user-name` to `--user-name` in `file-server create` command to be consistent with `cluster create` command

Billing

- Added enrollment account commands

Consumption

- Added `marketplace` commands
- [BREAKING CHANGE] Renamed `reservations summaries` to `reservation summary`
- [BREAKING CHANGE] Renamed `reservations details` to `reservation detail`
- [BREAKING CHANGE] Removed `--reservation-order-id` and `--reservation-id` short options for `reservation` commands
- [BREAKING CHANGE] Removed `--grain` short options for `reservation summary` commands
- [BREAKING CHANGE] Removed `--include-meter-details` short options for `pricesheet` commands

Container

- Added git repo volume mount parameters `--gitrepo-url` `--gitrepo-dir` `--gitrepo-revision` and `--gitrepo-mount-path`
- Fixed [#5926](#): `az container exec` failing when `--container-name` specified

Extension

- Changed distribution check message to be debug-level

Interactive

- Changed to stop completions upon unrecognized commands
- Added event hooks before and after command subtree is created
- Added completion for `--ids` parameters

Network

- Fixed [#5936](#): `application-gateway create` tags could not be set
- Added argument `--auth-certs` to attach authentication certificates for `application-gateway http-settings [create|update]`. [#4910](#)
- Added `ddos-protection` commands to create DDoS protection plans
- Added support for `--ddos-protection-plan` to `vnet [create|update]` to associate a VNet to a DDoS protection plan
- Fixed issue with `--disable-bgp-route-propagation` flag in `network route-table [create|update]`
- Removed dummy arguments `--public-ip-address-type` and `--subnet-type` for `network lb [create|update]`
- Added support for TXT records with RFC 1035 escape sequences to `network dns zone [import|export]` and `network dns record-set txt add-record`

Profile

- Added support for Azure Classic accounts in `account list`
- [BREAKING CHANGE] Removed `--msi` & `--msi-port` arguments

RDBMS

- Added `georestore` command
- Removed storage size restriction from `create` command

Resource

- Added support for `--metadata` to `policy definition create`
- Added support for `--metadata`, `--set`, `--add`, `--remove` to `policy definition update`

SQL

- Added `sql elastic-pool op list` and `sql elastic-pool op cancel`

Storage

- Improved error messages for malformed connection strings

VM

- Added support to configure platform fault domain count to `vmss create`
- Changed `vmss create` to default to Standard LB for zonal, large or single-placement-group disabled scale-set
- [BREAKING CHANGE]: Removed `vm assign-identity`, `vm remove-identity` and `vm format-secret``
- Added support for Public-IP SKU to `vm create`
- Added `--keyvault` and `--resource-group` arguments to `vm secret format` to support scenarios where the command is unable to resolve the vault ID. [#5718](#)
- Better errors for `[vm|vmss create]` when a resource group's location has no zone support

March 27, 2018

Version 2.0.30

Core

- Show message for extensions marked as preview in help

ACS

- Fix SSL certificate verification error for `aks install-cli` in Cloud Shell

Appservice

- Added HTTPS-only support to `webapp update`
- Added support for slots to `az webapp identity [assign|show]` and `az functionapp identity [assign|show]`

Backup

- Added new command `az backup protection isenabled-for-vm`. This command can be used to check if a VM is backed up by any vault in the subscription
- Enabled Azure object IDs for `--resource-group` and `--vault-name` parameters for the following commands:
 - `backup container show`
 - `backup item set-policy`
 - `backup item show`
 - `backup job show`
 - `backup job stop`
 - `backup job wait`
 - `backup policy delete`
 - `backup policy get-default-for-vm`
 - `backup policy list-associated-items`
 - `backup policy set`
 - `backup policy show`
 - `backup protection backup-now`
 - `backup protection disable`
 - `backup protection enable-for-vm`
 - `backup recoverypoint show`
 - `backup restore files mount-rp`
 - `backup restore files unmount-rp`
 - `backup restore restore-disks`
 - `backup vault delete`
 - `backup vault show`
- Changed `--name` parameters to accept the output format from `backup ... show` commands

Container

- Added `container exec` command. Executes commands in a container for a running container group
- Allow table output for creating and updating a container group

Extension

- Added message for `extension add` if extension is in preview
- Changed `extension list-available` to show full extension data with `--show-details`
- [BREAKING CHANGE] Changed `extension list-available` to show simplified extension data by default

Interactive

- Changed completions to activate as soon as command table loading is done
- Fixed bug with using `--style` parameter
- Interactive lexer instantiated after command table dump if missing
- Improved completer support

Lab

- Fixed bugs with `create environment` command

Monitor

- Added support for `--top`, `--orderby` and `--namespace` to `metrics list` [#5785](#)
- Fixed [#4529](#): `metrics list` Accepts a space-separated list of metrics to retrieve
- Added support for `--namespace` to `metrics list-definitions` [#5785](#)

Network

- Added support for Private DNS zones

Profile

- Added warning for `--identity-port` and `--msi-port` to `login`

RDBMS

- Added business model GA API version 2017-12-01

Resource

- [BREAKING CHANGE]: Changed `provider operation [list|show]` to not require `--api-version`

Role

- Added support for required access configurations and native clients to `az ad app create`
- Changed `rbac` commands to return less than 1000 IDs on object resolution
- Added credential management commands `ad sp credential [reset|list|delete]`
- [BREAKING CHANGE] Removed 'properties' from `az role assignment [list|show]` output
- Added support for `dataActions` and `notDataActions` permissions to `role definition`

Storage

- Fixed issue when uploading file with size between 195GB and 200GB
- Fixed [#4049](#): Problems with append blob uploads ignoring condition parameters

VM

- Added warning to `vmss create` for upcoming breaking changes for sets with 100+ instances
- Added zone resilient support to `vm [snapshot|image]`
- Changed disk instance view to report better encryption status
- [BREAKING CHANGE] Changed `vm extension delete` to no longer return output

March 13, 2018

Version 2.0.29

ACR

- Added support for `--image` parameter to `repository delete`
- Deprecated `--manifest` and `--tag` parameters of the `repository delete` command
- Added `repository untag` command to remove a tag without deleting data

ACS

- Added `aks upgrade-connector` command to upgrade an existing connector
- Changed `kubect1` config files to use a more readable block-style YAML

Advisor

- [BREAKING CHANGE] Renamed `advisor configuration get` to `advisor configuration list`
- [BREAKING CHANGE] Renamed `advisor configuration set` to `advisor configuration update`
- [BREAKING CHANGE] Removed `advisor recommendation generate`
- Added `--refresh` parameter to `advisor recommendation list`
- Added `advisor recommendation show` command

Appservice

- Deprecated `[webapp|functionapp] assign-identity`
- Added managed identity commands `webapp identity [assign|show]` and `functionapp identity [assign|show]`

Eventhubs

- Initial release

Extension

- Added check to warn user if used distro is different then the one stored in package source file, as this may lead into errors

Interactive

- Fixed [#5625](#): Persist history across different sessions
- Fixed [#3016](#): History not recorded while in scope
- Fixed [#5688](#): Completions did not appear if command table loading encountered an exception
- Fixed progress meter for long running operations

Monitor

- Deprecated the `monitor autoscale-settings` commands
- Added `monitor autoscale` commands
- Added `monitor autoscale profile` commands
- Added `monitor autoscale rule` commands

Network

- [BREAKING CHANGE] Removed `--tags` parameter from `route-filter rule create`
- Removed some erroneous default values for the following commands:
 - `network express-route update`
 - `network nsg rule update`
 - `network public-ip update`
 - `traffic-manager profile update`
 - `network vnet-gateway update`

- Added `network watcher connection-monitor` commands`
- Added `--vnet` and `--subnet` parameters to `network watcher show-topology`

Profile

- Deprecated `--msi` parameter for `az login`
- Added `--identity` parameter for `az login` to replace `--msi`

RDBMS

- [PREVIEW] Changed to use the API 2017-12-01-preview

Service Bus

- Initial release

Storage

- Fixed [#4971](#): `storage blob copy` now supports other Azure clouds
- Fixed [#5286](#): Batch commands `storage blob [delete-batch|download-batch|upload-batch]` no longer throw an error upon precondition failures

VM

- Added support to `[vm|vmss] create` to attach unmanaged data disks and configure caching
- Deprecated `[vm|vmss] assign-identity` and `[vm|vmss] remove-identity`
- Added `vm identity [assign|remove|show]` and `vmss identity [assign|remove|show]` commands to replace deprecated commands
- Changed default priority in `vmss create` to None

February 27, 2018

Version 2.0.28

Core

- Fixed [#5184](#): Homebrew install issue
- Added support for extension telemetry with custom keys
- Added HTTP logging to `--debug`

ACS

- Changed to use the the `virtual-kubelet-for-aks` Helm chart for `aks install-connector` by default
- Fixed issue: Insufficient permission for service principals to create ACI container group issue
- Added `--aci-container-group`, `--location`, and `--image-tag` parameters to `aks install-connector`
- Removed deprecation notice from `aks get-versions`

Appservice

- Updates for new SDK version (azure-mgmt-web 0.35.0)
- Fixed [#5538](#): `Free` reported as invalid SKU

Cognitive Services

- Updated the 'notice' when creating a new Cognitive Services account

Consumption

- Added new commands for pricesheet API
- Updated the existing Usage Details and Reservation Details formats

Container

- Added `--secrets` and `--secrets-mount-path` arguments to `container create` to use secrets in ACI

Network

- Fixed [#5559](#): Missing client in `network vnet-gateway vpn-client generate`

Resource

- Changed `group deployment export` to display a partial template and errors on failure

Role

- Added `role assignment list-changelogs` to allow auditing of service principal roles

SQL

- Added zone redundancy support for databases and elastic pools on creation and update

Storage

- Enabled specifying destination-path/prefix for `storage blob [upload-batch|download-batch]`

VM

- Added support for attaching/detaching disks on a single VMSS instance

February 13, 2018

Version 2.0.27

Core

- Changed authentication to key on both subscription ID and name on MSI login

ACS

- [BREAKING CHANGE] Renamed `aks get-versions` to `aks get-upgrades` in the interest of accuracy
- Changed `aks get-versions` to show Kubernetes versions available for `aks create`
- Changed `aks create` defaults to letting the server choose the version of Kubernetes
- Updated help messages referring to the service principal generated by AKS
- Changed default node sizes for `aks create` from "Standard_D1_v2" to "Standard_DS1_v2"
- Improved reliability when locating the dashboard pod for `az aks browse`
- Fixed `aks get-credentials` to handle Unicode errors when loading Kubernetes configuration files
- Added a message to `az aks install-cli` to help get `kubect1` in `$PATH`

Appservice

- Fixed issue where `webapp [backup|restore]` failed because of a null reference
- Added support for default app service plans through `az configure --defaults appserviceplan=my-asp`

CDN

- Added `cdn custom-domain [enable-https|disable-https]` commands

Container

- Added `--follow` option to `az container logs` for streaming logs
- Added `container attach` command that attaches local standard output and error streams to a container in a container group

CosmosDB

- Added support for setting capabilities

Extension

- Added support for `--pip-proxy` parameter to `az extension [add|update]` commands
- Added support for `--pip-extra-index-urls` argument to `az extension [add|update]` commands

Feedback

- Added extension information to telemetry data

Interactive

- Fixed issue where user is prompted to login when using interactive mode in Cloud Shell
- Fixed regression with missing parameter completions

IoT

- Fixed issue where `iot dps access policy [create|update]` would return a 'not found' error on success
- Fixed issue where `iot dps linked-hub [create|update]` would return a 'not found' error on success
- Added `--no-wait` support to `iot dps access policy [create|update]` and `iot dps linked-hub [create|update]`
- Changed `iot hub create` to allow specifying the number of partitions

Monitor

- Fixed `az monitor log-profiles create` command

Network

- Fixed the `--tags` option for the following commands:
 - `network public-ip create`
 - `network lb create`
 - `network local-gateway create`
 - `network nic create`
 - `network vnet-gateway create`
 - `network vpn-connection create`

Profile

- Enabled `az login` in from interactive mode

Resource

- Added back `feature show`

Role

- Added `--available-to-other-tenants` argument to `ad app update`

SQL

- Added `sql server dns-alias` commands
- Added `sql db rename`
- Added support for the `--ids` argument to all sql commands

Storage

- Added `storage blob service-properties delete-policy` and `storage blob undelete` commands to enable soft-delete

VM

- Fixed a crash when VM encryption may not be fully initialized
- Added principal ID output on enabling MSI
- Fixed `vm boot-diagnostics get-boot-log`

January 31, 2018

Version 2.0.26

Core

- Added support raw token retrieval in MSI context
- Removed polling indicator string after finishing LRO on Windows cmd.exe
- Added a warning that appears when using a configured default has been changed to an INFO level entry. Use `--verbose` to see
- Add a progress indicator for wait commands

ACS

- Clarified `--disable-browser` argument
- Improved tab completion for `--vm-size` arguments

Appservice

- Fixed `webapp log [tail|download]`
- Removed the `kind` check on webapps and functions

CDN

- Fixed missing client issue with `cdn custom-domain create`

CosmosDB

- Fixed parameter description for failover policies

Interactive

- Fixed issue where command option completions no longer appeared

Network

- Added protection for `--cert-password` to `application-gateway create`
- Fixed issue with `application-gateway update` where `--sku` erroneously applied a default value
- Added protection for `--shared-key` and `--authorization-key` to `vpn-connection create`
- Fixed missing client issue with `asg create`
- Added `--file-name / -f` parameter for exported names to `dns zone export`
- Fixed the following issues with `dns zone export`:
 - Fixed issue where long TXT records were incorrectly exported
 - Fixed issue where quoted TXT records were incorrectly exported without escaped quotes
- Fixed issue where certain records were imported twice with `dns zone import`
- Restored `vnet-gateway root-cert` and `vnet-gateway revoked-cert` commands

Profile

- Fixed `get-access-token` to work inside a VM with identity

Resource

- Fixed bug with `deployment [create|validate]` where warning was incorrectly displayed when a template 'type' field contained uppercase values

Storage

- Fixed issue with migrating Storage V1 accounts to Storage V2
- Added progress reporting for all upload/download commands
- Fixed bug preventing "-n" arg option with `storage account check-name`
- Added 'snapshot' column to table output for `blob [list|show]`

- Fixed bugs with various parameters that needed to be parsed as ints

VM

- Added `vm image accept-terms` command to allow creating VMs from images with additional charges
- Fixed `[vm|vmss create]` to ensure commands can run under proxy with unsigned certificates
- [PREVIEW] Added support for "low" priority to VMSS
- Added protection for `--admin-password` to `[vm|vmss] create`

January 17, 2018

Version 2.0.25

ACR

- Added acr login fallback on Windows credential errors
- Enabled registry logs

ACS

- Fixed `get-credentials` command
- Removed SPN role requirement

Appservice

- Fixed bug with `config ssl upload` where `hosting_environment_profile` was null
- Added support for custom URLs to `browse`
- Fixed slot support for `log tail`

Backup

- Changed `--container-name` option of `backup item list` to be optional
- Added storage account options to `backup restore restore-disks`
- Fixed location check in `backup protection enable-for-vm` to be case insensitive
- Fixed issue where commands failed with an invalid container name
- Changed `backup item list` to include 'Health Status' by default

Batch

- Changed `batch login` to return authentication details

Cloud

- Changed to not require endpoints when setting `--profile` on a cloud

Consumption

- Added new commands for reservations: `consumption reservations summaries` and `consumption reservations details`

Event Grid

- [BREAKING CHANGE] Moved the `az eventgrid topic event-subscription` commands to `eventgrid event-subscription`
- [BREAKING CHANGE] Moved the `az eventgrid resource event-subscription` commands to `eventgrid event-subscription`
- [BREAKING CHANGE] Removed the `eventgrid event-subscription show-endpoint-url` command. Use `eventgrid event-subscription show --include-full-endpoint-url` instead
- Added command `eventgrid topic update`
- Added command `eventgrid event-subscription update`

- Added `--ids` parameter for `eventgrid topic` commands
- Added tab completion support for topic names

Interactive

- Fixed issue where interactive mode did not work with Python 2.x
- Fixed errors on startup
- Fixed issue with some commands not running in interactive mode

IoT

- Added support for device provisioning service
- Added deprecation messages in commands and command help
- Added IoT check to inform users of the IoT Extension

Monitor

- Added multi-diagnostic setting support. The `--name` parameter is now required for `az monitor diagnostic-settings create`
- Added command `monitor diagnostic-settings categories` to get diagnostic settings category

Network

- Fixed issue when trying to change to/from active-standby mode with `vnet-gateway update`
- Added support for HTTP2 to `application-gateway [create|update]`

Profile

- Added support for login with user assigned identities

Role

- Added `--assignee-object-id` argument to `role assignment create` to bypass graph query

Service Fabric

- Added detailed errors to validation response when creating cluster
- Fixed missing client issue with several commands

VM

- [PREVIEW] Cross-zone support for `vmss`
- [BREAKING CHANGE] Changed single-zone `vmss` default to "Standard" load balancer
- [BREAKING CHANGE] Changed `externalIdentities` to `userAssignedIdentities` for EMSI
- [PREVIEW] Added support for OS disk swap
- Added support for using VM images from other subscriptions
- Added `--plan-name`, `--plan-product`, `--plan-promotion-code` and `--plan-publisher` arguments to `[vm|vmss] create`
- Fixed error issues with `[vm|vmss] create`
- Fixed excessive resource usage caused by `vm image list --all`

December 19, 2017

Version 2.0.23

- Added support for login with user assigned identities

Container

- Fixed incorrect order of parameters for container logs

Network

- Added `--disable-bgp-route-propagation` argument to `route-table [create|update]`
- Added `--ip-tags` argument to `public-ip [create|update]`

Storage

- Added support for storage V2

VM

- [PREVIEW] Added support for user-assigned identities for VMs and VMSSes

December 5, 2017

Version 2.0.22

- Removed `az component` commands. Use `az extension` instead

Core

- Modified the `AZURE_US_GOV_CLOUD` AAD authority endpoint from `login.microsoftonline.com` to `login.microsoftonline.us`
- Fixed issue where telemetry would continuously resend

ACS

- Added `aks install-connector` and `aks remove-connector` commands
- Improved error reporting for `acs create`
- Fixed usage of `aks get-credentials -f` without fully-qualified path

Advisor

- Initial release

Appservice

- Fixed cert name generation with `webapp config ssl upload`
- Fixed `webapp [list|show]` and `functionapp [list|show]` to display correct apps
- Added default value for `WEBSITE_NODE_DEFAULT_VERSION`

Consumption

- Added support for API version 2017-11-30

Container

- Fixed default ports regression

Monitor

- Added multi-dimension support to metrics command

Resource

- Added `--include-response-body` argument to `resource show`

Role

- Added display of default assignments for "classic" administrators to `role assignment list`
- Added support to `ad sp reset-credentials` for adding credentials instead of overwriting
- Improved error reporting for `ad sp create-for-rbac`

SQL

- Added `sql db list-usages` and `sql db show-usage` commands
- Added `sql server conn-policy show` and `sql server conn-policy update` commands

VM

- Added zone information to `az vm list-skus`

November 14, 2017

Version 2.0.21

ACR

- Added support for creating webhooks in replication regions

ACS

- Changed all wording of "agent" to "node" in AKS
- Deprecated `--orchestrator-release` option for `acs create`
- Changed default VM size for AKS to `Standard_D1_v2`
- Fixed `az aks browse` on Windows
- Fixed `az aks get-credentials` on Windows

Appservice

- Added deployment source `config-zip` for webapps and function apps
- Added `--docker-container-logging` option to `az webapp log config`
- Removed the `storage` option from the parameter `--web-server-logging` of `az webapp log config`
- Improved error messages for `deployment user set`
- Added support for creating Linux function apps
- Fixed `list-locations`

Batch

- Fixed bug in pool create command when a resource ID was used with the `--image` flag

Batchai

- Added short option, `-s`, for `--vm-size` when providing VM size in `file-server create` command
- Added storage account name and key arguments to `cluster create` parameters
- Fixed documentation for `job list-files` and `job stream-file`
- Added short option, `-r`, for `--cluster-name` when providing cluster name in `job create` command

Cloud

- Changed `cloud [register|update]` to prevent registering clouds that have missing required endpoints

Container

- Added support to open multiple ports
- Added container group restart policy
- Added support to mount Azure File share as a volume
- Updated helper docs

Data Lake Analytics

- Changed `[job|account] list` to return more concise information

Data Lake Store

- Changed `account list` to return more concise information

Extension

- Added `extension list-available` to allow listing official Microsoft extensions
- Added `--name` to `extension [add|update]` to allow installing extensions by name

IoT

- Added support for certificate authorities (CA) and certificate chains

Monitor

- Added `activity-log alert` commands

Network

- Added support for CAA DNS records
- Fixed issue where endpoints could not be updated with `traffic-manager profile update`
- Fixed issue where `vnet update --dns-servers` didn't work depending on how the VNET was created
- Fixed issue where relative DNS names were incorrectly imported by `dns zone import`

Reservations

- Initial preview release

Resource

- Added support for resource IDs to `--resource` parameter and resource-level locks

SQL

- Added `--ignore-missing-vnet-service-endpoint` parameter to `sql server vnet-rule [create|update]`

Storage

- Changed `storage account create` to use SKU `Standard_RAGRS` as default
- Fixed bugs when dealing with file/blob names that include non-ascii chars
- Fixed bug that prevented using `--source-uri` with `storage [blob|file] copy start-batch`
- Added commands to glob and delete multiple objects with `storage [blob|file] delete-batch`
- Fixed issue when enabling metrics with `storage metrics update`
- Fixed issue with files over 200GB when using `storage blob upload-batch`
- Fixed issue where `--bypass` and `--default-action` were ignored by `storage account [create|update]`

VM

- Fixed a bug with `vmss create` that prevented using the `Basic` size tier
- Added `--plan` arguments to `[vm|vmss] create` for custom images with billing information
- Added `vm secret [add|remove|list]` commands
- Renamed `vm format-secret` to `vm secret format`
- Added `--encrypt format` argument to `vm encryption enable`

October 24, 2017

Version 2.0.20

Core

- Updated `2017-03-09-profile` to consume `MGMT_STORAGE` API version `2016-01-01`

ACR

- Updated resource management to point to `2017-10-01` API version
- Changed 'bring your own storage' SKU to Classic
- Renamed registry SKUs to Basic, Standard, and Premium

ACS

- [PREVIEW] Added `az aks` commands
- Fixed kubernetes `get-credentials`

Appservice

- Fixed issue where downloaded `webapp` logs may be invalid

Component

- Added clearer deprecation message for all installers and confirmation prompt

Monitor

- Added `action-group` commands

Resource

- Fixed incompatibility with most recent version of msrest dependency in `group export`
- Fixed `policy assignment create` to work with built in policy definitions and policy set definitions

VM

- Added `--accelerated-networking` argument to `vmss create`

October 9, 2017

Version 2.0.19

Core

- Added handling of ADFS authority URLs with a trailing slash to Azure Stack

Appservice

- Added generic update with new command `webapp update`

Batch

- Updated to Batch SDK 4.0.0
- Updated `--image` option of `VirtualMachineConfiguration` to support ARM image references in addition to `publish:offer:sku:version`
- Added support for the new CLI extension model for Batch Extensions commands
- Removed Batch support from the component model

Batchai

- Initial release of Batch AI module

Keyvault

- Fixed Key Vault authentication issue when using ADFS on Azure Stack. ([#4448](#))

Network

- Changed `--server` argument of `application-gateway address-pool create` to be optional, allowing for empty address pools
- Updated `traffic-manager` to support latest features

Resource

- Added support for `--resource-group/-g` options for resource group name to `group`
- Added commands for `account lock` to work with subscription-level locks
- Added commands for `group lock` to work with group-level locks
- Added commands for `resource lock` to work with resource-level locks

Sql

- Added support for SQL Transparent Data Encryption (TDE) and TDE with Bring Your Own Key
- Added `db list-deleted` command and `db restore --deleted-time` parameter, allowing the ability to find and

restore deleted databases

- Added `db op list` and `db op cancel`, allowing the ability to list and cancel in-progress operations on database

Storage

- Added support for file share snapshot

Vm

- Fixed a bug in `vm show` where using `-d` caused a crash on missing private ip addresses
- [PREVIEW] Added support for rolling upgrade to `vmss create`
- Added support for updating encryption settings with `vm encryption enable`
- Added `--os-disk-size-gb` parameter to `vm create`
- Added `--license-type` parameter for Windows to `vmss create`

September 22, 2017

Version 2.0.18

Resource

- Added support for showing built-in policy definitions
- Added support mode parameter for creating policy definitions
- Added support for UI definitions and templates to `managedapp definition create`
- [BREAKING CHANGE] Changed `managedapp` resource type from `appliances` to `applications` and `applianceDefinitions` to `applicationDefinitions`

Network

- Added support for availability zone to `network lb` and `network public-ip` subcommands
- Added support for IPv6 Microsoft Peering to `express-route`
- Added `asg` application security group commands
- Added `--application-security-groups` argument to `nic [create|ip-config create|ip-config update]`
- Added `--source-asgs` and `--destination-asgs` arguments to `nsg rule [create|update]`
- Added `--ddos-protection` and `--vm-protection` arguments to `vnet [create|update]`
- Added `network [vnet-gateway|vpn-client|show-url]` commands

Storage

- Fixed issue where `storage account network-rule` commands may fail after updating the SDK

Eventgrid

- Updated Azure Event Grid Python SDK to use newer API version "2017-09-15-preview"

SQL

- Changed `sql server list` argument `--resource-group` to be optional. If not specified, all sql servers in the subscription will be returned
- Added `--no-wait` param to `db [create|copy|restore|update|replica create|create|update]` and `dw [create|update]`

Keyvault

- Added support for Keyvault commands from behind a proxy

VM

- Added support to availability zone to `[vm|vmss|disk] create`

- Fixed issue where using `--app-gateway ID` with `vmss create` would cause a failure
- Added `--asgs` argument to `vm create`
- Added support for running commands on VMs with `vm run-command`
- [PREVIEW] Added support for VMSS disk encryption with `vmss encryption`
- Added support for performing maintenance on VMs with `vm perform-maintenance`

ACS

- [PREVIEW] Added `--orchestrator-release` argument to `acs create` for ACS preview regions

Appservice

- Added ability to update and show authentication settings with `webapp auth [update|show]`

Backup

- Preview release

September 11, 2017

Version 2.0.17

Core

- Enabled command module to set its own correlation ID in telemetry
- Fixed JSON dump issue when telemetry is set to diagnostics mode

Acs

- Added `acs list-locations` command
- Made `ssh-key-file` come with expected default value

Appservice

- Added ability to create a webapp in a resource group other than the active service plan's

CDN

- Fixed 'CustomDomain is not interable' bug for `cdn custom-domain create`

Extension

- Initial Release

Keyvault

- Fixed issue where permissions were case sensitive for `keyvault set-policy`

Network

- Renamed `vnet list-private-access-services` to `vnet list-endpoint-services`
- Renamed `--private-access-services` argument to `--service-endpoints` for `vnet subnet create/update`
- Added support for multiple IP ranges and port ranges to `nsg rule create/update`
- Added support for SKU to `lb create`
- Added support for SKU to `public-ip create`

Resource

- Allow passing in resource policy parameter definitions in `policy definition create`, and `policy definition update`
- Allow passing in parameter values for `policy assignment create`
- Allow for passing JSON or file for all params
- Incremented API version

SQL

- Added `sql server vnet-rule` commands

VM

- Fixed: Don't assign access unless `--scope` is provided
- Fixed: Use the same extension naming as portal does
- Removed `subscription` from the `[vm|vmss] create` output
- Fixed: `[vm|vmss] create` storage SKU is not applied on data disks with an image
- Fixed: `vm format-secret --secrets` would not accept newline separated IDs

August 31, 2017

Version 2.0.16

Keyvault

- Fixed bug when trying to automatically resolve secret encoding with `secret download`

Sf

- Deprecating all commands in favor of Service Fabric CLI (sfctl)

Storage

- Fixed issue where storage accounts could not be created in regions that don't support the NetworkACLs feature
- Determine content type and content encoding during blob and file upload if neither content type and content encoding are specified

August 28, 2017

Version 2.0.15

CLI

- Added legal note to `--version`

ACS

- Corrected preview regions
- Formatted default `dns_name_prefix` properly
- Optimized acs command output

Appservice

- [BREAKING CHANGE] Fixed inconsistencies in the output of `az webapp config appsettings [delete|set]`
- Added a new alias of `-i` for `az webapp config container set --docker-custom-image-name`
- Exposed `az webapp log show`
- Exposed new arguments from `az webapp delete` to retain app service plan, metrics or dns registration
- Fixed: Detect slot settings correctly

IoT

- Fixed #3934: Policy creation no longer clears existing policies

Network

- [BREAKING CHANGE] Renamed `vnet list-private-access-services` to `vnet list-endpoint-services`
- [BREAKING CHANGE] Renamed option `--private-access-services` to `--service-endpoints` for `vnet subnet [create|update]`

- Added support for multiple IP and port ranges to `nsg rule [create|update]`
- Added support for SKU to `lb create`
- Added support for SKU to `public-ip create`

Profile

- Exposed `--msi` and `--msi-port` to login using a virtual machine's identity

Service Fabric

- Preview release
- Simplified registry user/password rules for command
- Fixed password prompt for user even after passing in the param
- Added support for empty `registry_cred`

Storage

- Enabled setting blob tier
- Added `--bypass` and `--default-action` arguments to `storage account [create|update]` to support service tunneling
- Added commands to add VNET rules and IP based rules to `storage account network-rule`
- Enabled service encryption by customer managed key
- [BREAKING CHANGE] Renamed `--encryption` option to `--encryption-services` for `az storage account create` and `az storage account update` command
- Fixed #4220: `az storage account update encryption` - syntax mismatch

VM

- Fixed issue where extra, erroneous information was displayed for `vmss get-instance-view` when using `--instance-id *`
- Added support for `--lb-sku` to `vmss create`:
- Removed human names from the admin name blacklist for `[vm|vmss] create`
- Fixed issue where `[vm|vmss] create` would throw an error if unable to extract plan information from an image
- Fixed a crash when creating a vmms scaleset with an internal LB
- Fixed issue where `--no-wait` argument did not work with `vm availability-set create`

August 15, 2017

Version 2.0.14

ACS

- Corrected sshMaster0 port number for kubernetes

Appservice

- Fixed an exception when creatng a new git based Linux webapp

Event Grid

- Added SDK dependencies

August 11, 2017

Version 2.0.13

ACS

- Added more preview regions

Batch

- Updated to Batch SDK 3.1.0 and Batch Management SDK 4.1.0
- Added a new command show the task counts of a job
- Fixed bug in resource file SAS URL processing
- Batch account endpoint now supports optional 'https://' prefix
- Support for adding lists of more than 100 tasks to a job
- Added debug logging for loading Extensions command module

Component

- Added deprecation warning to 'az component' commands

Container

- `create`: Fixed issue where equals sign was not allowed inside an environment variable

Data Lake Store

- Enabled progress control

Event Grid

- Initial release

Network

- `lb`: Fixed issue where the certain child resource names did not resolve correctly when omitted
- `application-gateway {subresource} delete`: Fixed issue where `--no-wait` was not honored
- `application-gateway http-settings update`: Fixed issue where `--connection-draining-timeout` could not be turned off
- Fixed error unexpected keyword argument `sa_data_size_kilobytes` with `az network vpn-connection ipsec-policy add`

Profile

- `account list`: Added `--refresh` to sync up the latest subscriptions from server

Storage

- Enable update storage account with system assigned identity

VM

- `availability-set`: Exposed fault domain count on convert
- Exposed `list-skus` command
- Support to assign identity w/o creating role assignments
- Apply storage sku on attaching data disks
- Removed default os-disk name and storage SKU when using managed disks

July 28, 2017

Version 2.0.12

- Added container commands
- Added billing and consumption modules

```
azure-cli (2.0.12)

acr (2.0.9)
acs (2.0.11)
appservice (0.1.11)
batch (3.0.3)
billing (0.1.3)
cdn (0.0.6)
cloud (2.0.7)
cognitiveservices (0.1.6)
command-modules-nspkg (2.0.1)
component (2.0.6)
configure (2.0.10)
consumption (0.1.3)
container (0.1.7)
core (2.0.12)
cosmosdb (0.1.11)
dla (0.0.10)
dls (0.0.11)
feedback (2.0.6)
find (0.2.6)
interactive (0.3.7)
iot (0.1.10)
keyvault (2.0.8)
lab (0.0.9)
monitor (0.0.8)
network (2.0.11)
nspkg (3.0.1)
profile (2.0.9)
rdbms (0.0.5)
redis (0.2.7)
resource (2.0.11)
role (2.0.9)
sf (1.0.5)
sql (2.0.8)
storage (2.0.11)
vm (2.0.11)
```

Core

- Output sdk auth info for service principals with certificates
- Fixed deployment progress exceptions
- Use arm endpoint from the current cloud to create subscription client
- Improved concurrent handling of clouds.config file (#3636)
- Refresh client request id for each command execution
- Create subscription clients with right SDK profile (#3635)
- Progress Reporting for template deployments (#3510)
- Added support for picking table output fields through jmespath query (#3581)
- Improved the muting of parse args and append history with gestures (#3434)
- Create subscription clients with right SDK profile
- Move all existing recording files to latest folder
- Fixed idempotency for VM/VMSS create (#3586)
- Command paths are no longer case sensitive
- Certain boolean-type parameters are no longer case sensitive
- Support login to ADFS on prem server like Azure Stack
- Fixed concurrent writes to clouds.config (#3255)

ACR

- Added `show-usage` command for managed registries

- Support SKU update for managed registries
- Added managed registries with managed SKU
- Added webhooks for managed registries with acr webhook command module
- Added AAD authentication with acr login command
- Added delete command for docker repositories, manifests, and tags

ACS

- Support for API version 2017-07-01

Appservice

- Fixed bug where listing Linux webapp would return nothing
- Support to retrieve creds from acr
- Remove all commands under `appservice web`
- Mask docker registry passwords from command output (#3656)
- Ensure default browser is used on macOS without errors (#3623)
- Improve the help of `webapp log tail` and `webapp log download` (#3624)
- Exposed `traffic-routing` command to configure static routing (#3566)
- Added reliability fixes in configuring source control (#3245)
- Removed unsupported `--node-version` argument from `webapp config update` for Windows webapps. Instead use `webapp config appsettings set --settings WEBSITE_NODE_DEFAULT_VERSION=...`

Batch

- Updated to Batch SDK 3.0.0 with support for low-priority VMs in pools
- Renamed `pool create` option `--target-dedicated` to `--target-dedicated-nodes`
- Added `pool create` options `--target-low-priority-nodes` and `--application-licenses`

CDN

- Provided a better error message for `cdn endpoint list` when the profile specified by `--profile-name` does not exist

Cloud

- Changed API version of cloud metadata endpoint to YYYY-MM-DD format
- Gallery endpoint isn't required
- Support for registering cloud just with ARM resource manager endpoint
- Provided an option for `cloud set` to choose the profile while selecting current cloud
- Exposed `endpoint_vm_image_alias_doc`

CosmosDB

- Fixed allowing creation of collection with custom partition key
- Added support for collection default TTL

Data Lake Analytics

- Added commands for compute policy management under the `dla account compute-policy` heading
- Added `dla job pipeline show`
- Added `dla job recurrence list`

Data Lake Store

- Added support for user managed key vault key rotation in `dls account update`
- Updated underlying Data Lake Store filesystem SDK version, addressing a performance issue
- Added command `dls enable-key-vault`. This command attempts to enable a user provided Key Vault for use

encrypting the data in a Data Lake Store account

Interactive

- Improved the start up time by using cached commands
- Increased test coverage
- Enhanced the '?' gesture to also inject into the next command
- Fixed interactive errors with the profile 2017-03-09-profile-preview (#3587)
- Allowed `--version` as a parameter for interactive mode (#3645)
- Stop interactive mode throwing errors from validation completions (#3570)
- Progress reporting for template deployments (#3510)
- Added `--progress` flag
- Removed `--debug` and `--verbose` from completions
- Removed `interactive` from completions (#3324)

IoT

- Fixed policy creation no longer clears existing policies. (#3934)

Key vault

- Added commands for key vault recovery features:
 - `keyvault` subcommands `purge`, `recover`, `keyvault list-deleted`
 - `keyvault secret` subcommands `backup`, `restore`, `purge`, `recover`, `list-deleted`
 - `keyvault certificate` subcommands `purge`, `recover`, `list-deleted`
 - `keyvault key` subcommands `purge`, `recover`, `list-deleted`
- Added service principal key vault integration (#3133)
- Updated key vault dataplane to 0.3.2. (#3307)

Lab

- Added support for claiming any vm in the lab through `az lab vm claim`
- Added table output formatter for `az lab vm list` and `az lab vm show`

Monitor

- Fix for template file with `monitor autoscale-settings get-parameters-template` command (#3349)
- Renamed `monitor alert-rule-incidents list` to `monitor alert list-incidents`
- Renamed `monitor alert-rule-incidents show` to `monitor alert show-incident`
- Renamed `monitor metric-definitions list` to `monitor metrics list-definitions`
- Renamed `monitor alert-rules` to `monitor alert`
- Changed `monitor alert create`:
 - `condition` and `action` subcommands no longer accept JSON
 - Add numerous parameters to simplify the rule creation process
 - `location` no longer required
 - Add name and ID support for target
 - Remove `--alert-rule-resource-name`
 - Rename `is-enabled` to `enabled`, no longer required
 - `description` defaults now based on the supplied condition
 - Add examples to help clarify the new format
- Support names or IDs for `monitor metric` commands
- Added convenience arguments and examples to `monitor alert rule update`

Network

- Added `list-private-access-services` command
- Added `--private-access-services` argument to `vnet subnet create` and `vnet subnet update`
- Fixed issue where `application-gateway redirect-config create` would fail
- Fixed issue where `application-gateway redirect-config update` with `--no-wait` would not work
- Fixed bug when using `--servers` argument with `application-gateway address-pool create` and `application-gateway address-pool update`
- Added `application-gateway redirect-config` commands
- Added commands to `application-gateway ssl-policy`: `list-options`, `predefined list`, `predefined show`
- Added arguments to `application-gateway ssl-policy set`: `--name`, `--cipher-suites`, `--min-protocol-version`
- Added arguments to `application-gateway http-settings create` and `application-gateway http-settings update`: `--host-name-from-backend-pool`, `--affinity-cookie-name`, `--enable-probe`, `--path`
- Added arguments to `application-gateway url-path-map create` and `application-gateway url-path-map update`: `--default-redirect-config`, `--redirect-config`
- Added argument `--redirect-config` to `application-gateway url-path-map rule create`
- Added support for `--no-wait` to `application-gateway url-path-map rule delete`
- Added arguments to `application-gateway probe create` and `application-gateway probe update`: `--host-name-from-http-settings`, `--min-servers`, `--match-body`, `--match-status-codes`
- Added argument `--redirect-config` to `application-gateway rule create` and `application-gateway rule update`
- Added support for `--accelerated-networking` to `nic create` and `nic update`
- Removed `--internal-dns-name-suffix` argument from `nic create`
- Added support for `--dns-servers` to `nic update` and `nic create`: Add support for `--dns-servers`
- Fixed bug where `local-gateway create` ignored `--local-address-prefixes`
- Added support for `--dns-servers` to `vnet update`
- Fixed bug when creating a peering without route filtering with `express-route peering create`
- Fixed bug where `--provider` and `--bandwidth` arguments did not work with `express-route update`
- Fixed bug with `network watcher show-topology` defaulting logic
- Improved output formatting for `network list-usages`
- Use default frontend IP for `application-gateway http-listener create` if only one exists
- Use default address pool, HTTP settings, and HTTP listener for `application-gateway rule create` if only one exists
- Use default frontend IP and backend pool for `lb rule create` if only one exists
- Use default frontend IP for `lb inbound-nat-rule create` if only one exists

Profile

- Support login inside a VM with a managed identity
- Support output for `account show` in SDK auth file format
- Show deprecation warnings when using `--expanded-view`
- Added `get-access-token` command to provide raw AAD token
- Support login with a user account with no associated subscriptions

RDBMS

- Support listing servers across a subscription (#3417)
- Fixed `%s` not processed because of missing `% server_type` (#3393)
- Fixed doc source map and added CI task to verify (#3361)
- Fixed MySQL and PostgreSQL help (#3369)

Resource

- Improved prompts for missing parameters for `group deployment create`
- Improved parsing of `--parameters KEY=VALUE` syntax
- Fixed issues where `group deployment create` parameter files were no longer recognized using `@<file>` syntax
- Support `--ids` argument for `resource` and `managedapp` commands
- Fixed up some parsing and error messages (#3584)
- Fixed `--resource-type` parsing for the `lock` command to accept `<resource-namespace>` and `<resource-type>`
- Added parameter checking for template link templates (#3629)
- Added support for specifying deployment parameters using `KEY=VALUE` syntax

Role

- Support output in SDK auth file format for `create-for-rbac`
- Cleaned up role assignments and related AAD application when deleting a service principal (#3610)
- Include time format in `app create` args `--start-date` and `--end-date` descriptions
- Show deprecation warnings when using `--expanded-view`
- Added key vault integration to the `create-for-rbac` and `reset-credentials` commands

Service Fabric

- Fixed an issue with large files in applications being truncated on upload (#3666)
- Added tests for Service Fabric commands (#3424)
- Fixed numerous Service Fabric commands (#3234)

SQL

- Removed broken `sql server create --identity` parameter
- Removed password values from `sql server create` and `sql server update` command output
- Added commands `sql db list-editions` and `sql elastic-pool list-editions`

Storage

- Removed `--marker` option from `storage blob list`, `storage container list`, and `storage share list` commands (#3745)
- Enabled creating an https-only storage account
- Updated storage metrics, logging and cors commands (#3495)
- Rephrased exception message from CORS add (#3638) (#3362)
- Converted generator to a list in download batch command dry run mode (#3592)
- Fixed blob download batch dryrun issue (#3640) (#3592)

VM

- Support configuring nsg
- Fixed a bug where the DNS server would not be configured correctly
- Support managed service identities
- Fixed issue where `cmss create` with an existing load balancer required `--backend-pool-name`
- Make datadisks created with `vm image create` lun start with 0

May 10, 2017

Version 2.0.6

- documentdb renamed to cosmosdb
- Add rdbms (mysql, postgres)
- Include Data Lake Analytics and Data Lake Store modules
- Include Cognitive Services module

- Include Service Fabric module
- Include Interactive module (rename of az-shell)
- Add support for CDN commands
- Remove Container module
- Add 'az -v' as shortcut for 'az --version' ([#2926](#))
- Improve performance of package load and command execution ([#2819](#))

```

azure-cli (2.0.6)

acr (2.0.4)
acs (2.0.6)
appservice (0.1.6)
batch (2.0.4)
cdn (0.0.2)
cloud (2.0.2)
cognitiveservices (0.1.2)
command-modules-nspkg (2.0.0)
component (2.0.4)
configure (2.0.6)
core (2.0.6)
cosmosdb (0.1.6)
dla (0.0.6)
dls (0.0.6)
feedback (2.0.2)
find (0.2.2)
interactive (0.3.1)
iot (0.1.5)
keyvault (2.0.4)
lab (0.0.4)
monitor (0.0.4)
network (2.0.6)
nspkg (3.0.0)
profile (2.0.4)
rdbms (0.0.1)
redis (0.2.3)
resource (2.0.6)
role (2.0.4)
sf (1.0.1)
sql (2.0.3)
storage (2.0.6)
vm (2.0.6)

```

Core

- core: capture exceptions caused by unregistered provider and auto-register it
- perf: persist adal token cache in memory till process exits ([#2603](#))
- Fix bytes returned from hex fingerprint -o tsv ([#3053](#))
- Enhanced Key Vault Certificate Download and AAD SP Integration ([#3003](#))
- Add Python location to 'az --version' ([#2986](#))
- login: support login when there are no subscriptions ([#2929](#))
- core: fix a failure when login using a service principal twice ([#2800](#))
- core: Allow file path of accessToken.json to be configurable through an env var ([#2605](#))
- core: Allow configured defaults to apply on optional args ([#2703](#))
- core: Improved performance
- core: Custom CA Certs - Support setting REQUESTS_CA_BUNDLE environment variable
- core: Cloud configuration - use 'resource manager' endpoint if 'management' endpoint not set

ACS

- fix the master and agent count to be integer instead of string
- expose 'az acs create --no-wait' and 'az acs wait' for async creation
- expose 'az acs create --validate' for dry-run validations
- remove windows profile before PUT call for scale command ([#2755](#))

AppService

- functionapp: add full functionapp supports, including create, show, list, delete, hostname, ssl, etc
- Adding Team Services (vsts) as a continuous delivery option to "appservice web source-control config"
- Create "az webapp" to replace "az appservice web" (for backward compat, "az appservice web" will stay for 2 releases)
- Expose arguments to configure deployment and "runtime stacks" on webapp create
- Expose "webapp list-runtimes"
- support configure connection strings ([#2647](#))
- support slot swap with preview
- Polish errors from appservice commands ([#2948](#))
- Use the app service plan's resource group for cert operations ([#2750](#))

CosmosDB

- Rename documentdb module to cosmosdb
- Added support for documentdb data-plane APIs: database and collection management
- Added support for enabling automatic failover on database accounts
- Added support for new consistency policy ConsistentPrefix

Data Lake Analytics

- Fix a bug where filtering on result and state for job lists would throw an error
- Add support for new catalog item type: package. accessed through: `az dla catalog package`
- Made it possible to list the following catalog items from within a database (no schema specification required):
 - Table
 - Table valued function
 - View
 - Table Statistics. This can also be listed with a schema, but without specifying a table name

Data Lake Store

- Update the version of the underlying filesystem SDK, which gives better support for handling server side throttling scenarios
- Improve performance of package load and command execution ([#2819](#))
- missed help for access show. adding it. ([#2743](#))

Find

- improve search results and allow for versioning of the search index

KeyVault

- BC: `az keyvault certificate download` change -e from string or binary to PEM or DER to better represent the options
- BC: Remove --expires and --not-before from `keyvault certificate create` as these parameters are not supported by the service
- Adds the --validity parameter to `keyvault certificate create` to selectively override the value in --policy
- Fixes issue in `keyvault certificate get-default-policy` where 'expires' and 'not_before' were exposed but

'validity_in_months' was not

- keyvault fix for import of pem and pfx ([#2754](#))

Lab

- Adding create, show, delete & list commands for environment in the lab
- Adding show & list commands to view ARM templates in the lab
- Adding --environment flag in `az lab vm list` to filter VMs by environment in the lab
- Add convenience command `az lab formula export-artifacts` to export artifact scaffold within a Lab's formula
- Add commands to manage secrets within a Lab

Monitor

- Bug Fix: Modeling `--actions` of `az alert-rules create` to consume JSON string ([#3009](#))
- Bug fix - diagnostic settings create does not accept logs/metrics from show commands ([#2913](#))

Network

- Add `network watcher test-connectivity` command
- Add support for `--filters` parameter for `network watcher packet-capture create`
- Add support for Application Gateway connection draining
- Add support for Application Gateway WAF rule set configuration
- Add support for ExpressRoute route filters and rules
- Add support for TrafficManager geographic routing
- Add support for VPN connection policy-based traffic selectors
- Add support for VPN connection IPSec policies
- Fix bug with `vpn-connection create` when using the `--no-wait` or `--validate` parameters
- Add support for active-active VNet gateways
- Remove nulls values from output of `network vpn-connection list/show` commands
- BC: Fix bug in the output of `vpn-connection create`
- Fix bug where '--key-length' argument of 'vpn-connection create' was not parsed correctly
- Fix bug in `dns zone import` where records were not imported correctly
- Fix bug where `traffic-manager endpoint update` did not work
- Add 'network watcher' preview commands

Profile

- Support login when there are no subscriptions found ([#2560](#))
- Support short param name in az account set --subscription ([#2980](#))

Redis

- Adding update command which also adds the ability to scale for redis cache
- Deprecates the 'update-settings' command

Resource

- Add managedapp and managedapp definition commands ([#2985](#))
- Support 'provider operation' commands ([#2908](#))
- Support generic resource create ([#2606](#))
- Fix resource parsing and api version lookup. ([#2781](#))
- Add docs for az lock update. ([#2702](#))
- Error out if you try to list resources for a group that doesn't exist. ([#2769](#))
- [Compute] Fix issues with VMSS and VM availability set update. ([#2773](#))
- Fix lock create and delete if parent-resource-path is None ([#2742](#))

Role

- create-for-rbac: ensure SP's end date will not exceed certificate's expiration date ([#2989](#))
- RBAC: add full support for 'ad group' ([#2016](#))
- role: fix issues on role definition update ([#2745](#))
- create-for-rbac: ensure user provided password is picked up

SQL

- Added az sql server list-usages and az sql db list-usages commands
- SQL - ability to connect directly to resource provider ([#2832](#))

Storage

- Default location to resource group location for `storage account create`
- Add support for incremental blob copy
- Add support for large block blob upload
- Change block size to 100MB when file to upload is larger than 200GB

VM

- avail-set: make UD&FD domain counts optional

note: VM commands in sovereign clouds Please avoid managed disk related features, including the following:

1. az disk/snapshot/image
 2. az vm/vmss disk
 3. Inside "az vm/vmss create", use "--use-unmanaged-disk" to avoid managed disk Other commands should work
- vm/vmss: improve the warning text when generates ssh key pairs
 - vm/vmss: support create from a market place image which requires plan info ([#1209](#))

April 3, 2017

Version 2.0.2

We released the ACR, Batch, KeyVault, and SQL components in this release


```
azure-cli (2.0.2)

acr (2.0.0)
acs (2.0.2)
appservice (0.1.2)
batch (2.0.0)
cloud (2.0.0)
component (2.0.0)
configure (2.0.2)
container (0.1.2)
core (2.0.2)
documentdb (0.1.2)
feedback (2.0.0)
find (0.0.1b1)
iot (0.1.2)
keyvault (2.0.0)
lab (0.0.1)
monitor (0.0.1)
network (2.0.2)
nspkg (2.0.0)
profile (2.0.2)
redis (0.1.1b3)
resource (2.0.2)
role (2.0.1)
sql (2.0.0)
storage (2.0.2)
vm (2.0.2)
```

Core

- Add acr, lab, monitor, and find modules to default list
- Login: skip erroneous tenant ([#2634](#))
- login: set default subscription to one with the state of "Enabled" ([#2575](#))
- Add wait commands and --no-wait support to more commands ([#2524](#))
- core: support login using service principal with a cert ([#2457](#))
- Add prompting for missing template parameters. ([#2364](#))
- Support setting default values for common arguments like default resource group, default web, default vm
- Support login to specific tenant

ACS

- [ACS] Adding support for configuring a default ACS cluster ([#2554](#))
- Add support for ssh key password prompting. ([#2044](#))
- Add support for windows clusters. ([#2211](#))
- Switch from Owner to Contributor role. ([#2321](#))

AppService

- appservice: support to get external ip address used for DNS A records ([#2627](#))
- appservice: support binding wildcard certificates ([#2625](#))
- appservice: support list publishing profiles ([#2504](#))
- AppService - Trigger source control sync after config ([#2326](#))

DataLake

- Initial release of Data Lake Analytics module
- Initial release of Data Lake Store module

DocuemntDB

- DocumentDB: Adding support for listing connection strings ([#2580](#))

VM

- [Compute] Add AppGateway support to virtual machine scale set create (#2570)
- [VM/VMSS] Improved disk caching support (#2522)
- VM/VMSS: incorporate credentials validation logic used by portal (#2537)
- Add wait commands and --no-wait support (#2524)
- Virtual machine scale set: support * to list instance view across vms (#2467)
- Add --secrets for VM and virtual machine scale set ([#2212](https://github.com/Azure/azure-cli/pull/2212))
- Allow VM creation with specialized VHD (#2256)

February 27, 2017

Version 2.0.0

This release of Azure CLI 2.0 is the first "Generally Available" release. General availability applies to these command modules:

- Container Service (acs)
- Compute (including Resource Manager, VM, virtual machine scale sets, Managed Disks)
- Networking
- Storage

These command modules can be used in production and are supported by standard Microsoft SLA. You can open issues directly with Microsoft support or on our [github issues list](#). You can ask questions on [StackOverflow using the azure-cli tag](#), or contact the product team at azfeedback@microsoft.com. You can provide feedback from the command line with the `az feedback` command.

The commands in these modules are stable and the syntax is not expected to change in upcoming releases of this version of Azure CLI.

To verify the version of the CLI, use `az --version`. The output lists the version of the CLI itself (2.0.0 in this release), the individual command modules, and the versions of Python and GCC that you're using.

```
azure-cli (2.0.0)

acs (2.0.0)
appservice (0.1.1b5)
batch (0.1.1b4)
cloud (2.0.0)
component (2.0.0)
configure (2.0.0)
container (0.1.1b4)
core (2.0.0)
documentdb (0.1.1b2)
feedback (2.0.0)
iot (0.1.1b3)
keyvault (0.1.1b5)
network (2.0.0)
nspkg (2.0.0)
profile (2.0.0)
redis (0.1.1b3)
resource (2.0.0)
role (2.0.0)
sql (0.1.1b5)
storage (2.0.0)
vm (2.0.0)

Python (Darwin) 2.7.10 (default, Jul 30 2016, 19:40:32)
[GCC 4.2.1 Compatible Apple LLVM 8.0.0 (clang-800.0.34)]
```

NOTE

Some of the command modules have a "b n " or "rc n " postfix. These command modules are still in preview and will become generally available in the future.

We also have nightly preview builds of the CLI. For information, see these instructions on [getting the nightly builds](#), and these instructions on [developer setup and contributing code](#).

You can report issues with nightly preview builds in the following ways:

- Report issues in our [github issues list](#)
- Contact the product team at azfeedback@microsoft.com
- Provide feedback from the command line with the `az feedback` command

Differences between Azure CLI products

2/28/2020 • 2 minutes to read • [Edit Online](#)

As of the end of June 2018, explicit version numbers have been removed from Azure CLI product names. This change helps eliminate confusion that sometimes showed up in documentation where users were told to use "the Azure CLI" but it was unclear what version of the product was being referenced. If you're familiar with the old product names, here is how they have changed:

- Azure CLI versions 2.0 and later are now referred to only as "Azure CLI."
- Earlier Azure CLI versions (1.x and lower) are now referred to as "Azure classic CLI."

The name change to Azure classic CLI makes it clear that this tool is meant to be used only with the classic deployment model. The classic CLI is also no longer updated or maintained. For this reason, and many more, it's recommended that you move any classic deployments to use the Azure Resource Manager model and migrate to the latest available version of the Azure CLI.

If you are still using the classic CLI, you can learn about the process of migrating in the following articles:

- [Migrate from Classic to Azure Resource Manager](#)
- [Install the Azure CLI](#)
- [Migrating from Azure classic CLI to Azure CLI](#)

Install the Azure CLI

3/17/2020 • 2 minutes to read • [Edit Online](#)

The Azure CLI is available to install in Windows, macOS and Linux environments. It can also be run in a Docker container and Azure Cloud Shell.

Install

The current version of the Azure CLI is **2.7.0**. For information about the latest release, see the [release notes](#). To find your installed version and see if you need to update, run `az --version`.

- [Install on Windows](#)
- [Install on macOS](#)
- Install on Linux or [Windows Subsystem for Linux \(WSL\)](#)
 - [Install with apt on Debian or Ubuntu](#)
 - [Install with yum on RHEL, Fedora, or CentOS](#)
 - [Install with zypper on openSUSE or SLE](#)
 - [Install from script](#)
- [Run in Docker container](#)
- [Run in Azure Cloud Shell](#)

NOTE

If you're using the Azure classic deployment model, [install the Azure classic CLI](#).

Next Steps

See [What is Azure CLI?](#) for key characteristics.

Install Azure CLI on Windows

3/31/2020 • 3 minutes to read • [Edit Online](#)

For Windows the Azure CLI is installed via an MSI, which gives you access to the CLI through the Windows Command Prompt (CMD) or PowerShell. When installing for Windows Subsystem for Linux (WSL), packages are available for your Linux distribution. See the [main install page](#) for the list of supported package managers or how to install manually under WSL.

The current version of the Azure CLI is **2.7.0**. For information about the latest release, see the [release notes](#). To find your installed version and see if you need to update, run `az --version`.

Install or update

The MSI distributable is used for installing or updating the Azure CLI on Windows. You don't need to uninstall any current versions before using the MSI installer.

[Download the MSI installer](#)

When the installer asks if it can make changes to your computer, click the "Yes" box.

You can also install the Azure CLI using PowerShell. Start PowerShell as administrator and run the following command:

```
Invoke-WebRequest -Uri https://aka.ms/installazurecliwindows -OutFile .\AzureCLI.msi; Start-Process  
msiexec.exe -Wait -ArgumentList '/I AzureCLI.msi /quiet'; rm .\AzureCLI.msi
```

This will download and install the latest version of the Azure CLI for Windows. If you already have a version installed, it will update the existing version. After the installation is complete, you will need to reopen PowerShell to use the Azure CLI.

You can now run the Azure CLI with the `az` command from either Windows Command Prompt or PowerShell. PowerShell offers some tab completion features not available from Windows Command Prompt. To sign in, run the `az login` command.

1. Run the `login` command.

```
az login
```

If the CLI can open your default browser, it will do so and load an Azure sign-in page.

Otherwise, open a browser page at <https://aka.ms/devicelogin> and enter the authorization code displayed in your terminal.

2. Sign in with your account credentials in the browser.

To learn more about different authentication methods, see [Sign in with Azure CLI](#).

Troubleshooting

Here are some common problems seen when installing on Windows. If you experience a problem not covered here, [file an issue on GitHub](#).

Proxy blocks connection

If you can't download the MSI installer because your proxy is blocking the connection, make sure that you have your proxy properly configured. For Windows 10, these settings are managed in the `Settings > Network & Internet > Proxy` pane. Contact your system administrator for the required settings, or for situations where your machine may be configuration-managed or require advanced setup.

IMPORTANT

These settings are also required to be able to access Azure services with the CLI, from both PowerShell or the Command Prompt. In PowerShell, you do this with the following command:

```
(New-Object System.Net.WebClient).Proxy.Credentials = `
[System.Net.CredentialCache]::DefaultNetworkCredentials
```

In order to get the MSI, your proxy needs to allow HTTPS connections to the following addresses:

- `https://aka.ms/`
- `https://azurecliprod.blob.core.windows.net/`

Uninstall

If you decide to uninstall the Azure CLI, we're sorry to see you go. Before you uninstall, use the `az feedback` command to let us know what could be improved or fixed. Our goal is to make the Azure CLI bug-free and user-friendly. If you found a bug, we'd appreciate it if you [file a GitHub issue](#).

You uninstall the Azure CLI from the Windows "Apps and Features" list. To uninstall:

PLATFORM	INSTRUCTIONS
Windows 10	Start > Settings > Apps
Windows 8 Windows 7	Start > Control Panel > Programs > Uninstall a program

Once on this screen type **Azure CLI** into the program search bar. The program to uninstall is listed as **Microsoft CLI 2.0 for Azure**. Select this application, then click the `Uninstall` button.

Next Steps

Now that you've installed the Azure CLI, take a short tour of its features and common commands.

[Get started with the Azure CLI](#)

Install Azure CLI on macOS

2/28/2020 • 3 minutes to read • [Edit Online](#)

For the macOS platform, you can install the Azure CLI with [homebrew package manager](#). Homebrew makes it easy to keep your installation of the CLI update to date. The CLI package has been tested on macOS versions 10.9 and later.

The current version of the Azure CLI is 2.7.0. For information about the latest release, see the [release notes](#). To find your installed version and see if you need to update, run `az --version`.

Install with Homebrew

Homebrew is the easiest way to manage your CLI install. It provides convenient ways to install, update, and uninstall. If you don't have homebrew available on your system, [install homebrew](#) before continuing.

You can install the CLI by updating your brew repository information, and then running the `install` command:

```
brew update && brew install azure-cli
```

IMPORTANT

The Azure CLI has a dependency on the Homebrew `python3` package, and will install it. The Azure CLI is guaranteed to be compatible with the latest version of `python3` published on Homebrew.

You can then run the Azure CLI with the `az` command. To sign in, use `az login` command.

1. Run the `login` command.

```
az login
```

If the CLI can open your default browser, it will do so and load an Azure sign-in page.

Otherwise, open a browser page at <https://aka.ms/devicelogin> and enter the authorization code displayed in your terminal.

2. Sign in with your account credentials in the browser.

To learn more about different authentication methods, see [Sign in with Azure CLI](#).

Troubleshooting

If you encounter a problem when installing the CLI through Homebrew, here are some common errors. If you experience a problem not covered here, [file an issue on github](#).

Completion is not working

The Homebrew formula of Azure CLI installs a completion file named `az` in the Homebrew-managed completions directory (default location is `/usr/local/etc/bash_completion.d/`). To enable completion, please follow Homebrew's instructions [here](#).

Unable to find Python or installed packages

There may be a minor version mismatch or other issue during homebrew installation. The CLI doesn't use a Python virtual environment, so it relies on finding the installed Python version. A possible fix is to install and relink the `python3` dependency from Homebrew.

```
brew update && brew install python3 && brew upgrade python3  
brew link --overwrite python3
```

CLI version 1.x is installed

If an out-of-date version was installed, it could be because of a stale homebrew cache. Follow the [update](#) instructions.

Proxy blocks connection

You may be unable to get resources from Homebrew unless you have correctly configured it to use your proxy. Follow the [Homebrew proxy configuration instructions](#).

IMPORTANT

If you are behind a proxy, `HTTP_PROXY` and `HTTPS_PROXY` must be set to connect to Azure services with the CLI. If you are not using basic auth, it's recommended to export these variables in your `.bashrc` file. Always follow your business' security policies and the requirements of your system administrator.

In order to get the bottle resources from Homebrew, your proxy needs to allow HTTPS connections to the following addresses:

- `https://formulae.brew.sh`
- `https://homebrew.bintray.com`

Update

The CLI is regularly updated with bug fixes, improvements, new features, and preview functionality. A new release is available roughly every two weeks. Update your local repository information and then upgrade the `azure-cli` package.

```
brew update && brew upgrade azure-cli
```

Uninstall

If you decide to uninstall the Azure CLI, we're sorry to see you go. Before you uninstall, use the `az feedback` command to let us know what could be improved or fixed. Our goal is to make the Azure CLI bug-free and user-friendly. If you found a bug, we'd appreciate it if you [file a GitHub issue](#).

Use homebrew to uninstall the `azure-cli` package.

```
brew uninstall azure-cli
```

Other installation methods

If you can't use homebrew to install the Azure CLI in your environment, it's possible to use the manual instructions for Linux. Note that this process is not officially maintained to be compatible with macOS. Using a package manager such as Homebrew is always recommended. Only use the manual installation method if you have no other option available.

For the manual installation instructions, see [Install Azure CLI on Linux manually](#).

Next Steps

Now that you've installed the Azure CLI, take a short tour of its features and common commands.

[Get started with the Azure CLI](#)

Install Azure CLI with apt

3/31/2020 • 6 minutes to read • [Edit Online](#)

If you are running a distribution that comes with `apt`, such as Ubuntu or Debian, there's an `x86_64` package available for the Azure CLI. This package has been tested with and is supported for:

- Ubuntu trusty, xenial, artful, bionic, and disco
- Debian wheezy, jessie, stretch, and buster

The current version of the Azure CLI is **2.7.0**. For information about the latest release, see the [release notes](#). To find your installed version and see if you need to update, run `az --version`.

NOTE

The package for Azure CLI installs its own Python interpreter, and does not use the system Python.

Install

We offer two ways to install the Azure CLI with distributions that support `apt`: As an all-in-one script that runs the install commands for you, and instructions that you can run as a step-by-step process on your own.

Install with one command

We offer and maintain a script which runs all of the installation commands in one step. Run it by using `curl` and pipe directly to `bash`, or download the script to a file and inspect it before running.

IMPORTANT

This script is only verified for Ubuntu 16.04+ and Debian 8+. It may not work on other distributions. If you're using a derived distribution such as Linux Mint, follow the manual install instructions and perform any necessary troubleshooting.

```
curl -sL https://aka.ms/InstallAzureCLIDeb | sudo bash
```

Manual install instructions

If you don't want to run a script as superuser or the all-in-one script fails, follow these steps to install the Azure CLI.

1. Get packages needed for the install process:

```
sudo apt-get update
sudo apt-get install ca-certificates curl apt-transport-https lsb-release gnupg
```

2. Download and install the Microsoft signing key:

```
curl -sL https://packages.microsoft.com/keys/microsoft.asc |
gpg --dearmor |
sudo tee /etc/apt/trusted.gpg.d/microsoft.asc.gpg > /dev/null
```

3. Add the Azure CLI software repository:

```
AZ_REPO=$(lsb_release -cs)
echo "deb [arch=amd64] https://packages.microsoft.com/repos/azure-cli/ $AZ_REPO main" |
sudo tee /etc/apt/sources.list.d/azure-cli.list
```

4. Update repository information and install the `azure-cli` package:

```
sudo apt-get update
sudo apt-get install azure-cli
```

Run the Azure CLI with the `az` command. To sign in, use the `az login` command.

1. Run the `login` command.

```
az login
```

If the CLI can open your default browser, it will do so and load an Azure sign-in page.

Otherwise, open a browser page at <https://aka.ms/devicelogin> and enter the authorization code displayed in your terminal.

2. Sign in with your account credentials in the browser.

To learn more about different authentication methods, see [Sign in with Azure CLI](#).

Troubleshooting

Here are some common problems seen when installing with `apt`. If you experience a problem not covered here, [file an issue on github](#).

lsb_release does not return the correct base distribution version

Some Ubuntu- or Debian-derived distributions such as Linux Mint may not return the correct version name from `lsb_release`. This value is used in the install process to determine the package to install. If you know the code name of the Ubuntu or Debian version your distribution is derived from, you can set the `AZ_REPO` value manually when [adding the repository](#). Otherwise, look up information for your distribution on how to determine the base distribution code name and set `AZ_REPO` to the correct value.

No package for your distribution

Sometimes it may be a while after a distribution is released before there's an Azure CLI package available for it. The Azure CLI designed to be resilient with regards to future versions of dependencies and rely on as few of them as possible. If there's no package available for your base distribution, try a package for an earlier distribution.

To do this, set the value of `AZ_REPO` manually when [adding the repository](#). For Ubuntu distributions use the `bionic` repository, and for Debian distributions use `stretch`. Distributions released before Ubuntu Trusty and Debian Wheezy are not supported.

Elementary OS (EOS) fails to install the Azure CLI

EOS fails to install the Azure cli because `lsb_release` returns `HERA`, which is the EOS release name. The solution is to fix the file `/etc/apt/sources.list.d/azure-cli.list` and change `hera main` to `bionic main`.

Original file contents:

```
deb [arch=amd64] https://packages.microsoft.com/repos/azure-cli/ hera main
```

Modified file contents

```
deb [arch=amd64] https://packages.microsoft.com/repos/azure-cli/ bionic main
```

Proxy blocks connection

If you're unable to connect to an external resource due to a proxy, make sure that you've correctly set the `HTTP_PROXY` and `HTTPS_PROXY` variables in your shell. You will need to contact your system administrator to know what host(s) and port(s) to use for these proxies.

These values are respected by many Linux programs, including those which are used in the install process. To set these values:

```
# No auth
export HTTP_PROXY=http://[proxy]:[port]
export HTTPS_PROXY=https://[proxy]:[port]

# Basic auth
export HTTP_PROXY=http://[username]:[password]@[proxy]:[port]
export HTTPS_PROXY=https://[username]:[password]@[proxy]:[port]
```

IMPORTANT

If you are behind a proxy, these shell variables must be set to connect to Azure services with the CLI. If you are not using basic auth, it's recommended to export these variables in your `.bashrc` file. Always follow your business' security policies and the requirements of your system administrator.

You may also want to explicitly configure `apt` to use this proxy at all times. Make sure that the following lines appear in an `apt` configuration file in `/etc/apt/apt.conf.d/`. We recommend using either your existing global configuration file, an existing proxy configuration file, `40proxies`, or `99local`, but follow your system administration requirements.

```
Acquire {
    http::proxy "http://[username]:[password]@[proxy]:[port]";
    https::proxy "https://[username]:[password]@[proxy]:[port]";
}
```

If your proxy does not use basic auth, **remove** the `[username]:[password]@` portion of the proxy URI. If you require more information for proxy configuration, see the official Ubuntu documentation:

- [apt.conf manpage](#)
- [Ubuntu wiki - apt-get howto](#)

In order to get the Microsoft signing key and get the package from our repository, your proxy needs to allow HTTPS connections to the following address:

- `https://packages.microsoft.com`

CLI fails to install or run on Windows Subsystem for Linux

Since [Windows Subsystem for Linux \(WSL\)](#) is a system call translation layer on top of the Windows platform, you might experience an error when trying to install or run the Azure CLI. The CLI relies on some features that may have a bug in WSL. If you experience an error no matter how you install the CLI, there's a good chance it's an issue with WSL and not with the CLI install process.

To troubleshoot your WSL installation and possibly resolve issues:

- If you can, run an identical install process on a Linux machine or VM to see if it succeeds. If it does, your issue is almost certainly related to WSL. To start a Linux VM in Azure, see the [create a Linux VM in the Azure Portal](#) documentation.
- Make sure that you're running the latest version of WSL. To get the latest version, [update your Windows 10 installation](#).
- Check for any [open issues](#) with WSL which might address your problem. Often there will be suggestions on how to work around the problem, or information about a release where the issue will be fixed.
- If there are no existing issues for your problem, [file a new issue with WSL](#) and make sure that you include as much information as possible.

If you continue to have issues installing or running on WSL, consider [installing the CLI for Windows](#).

Update

Use `apt-get upgrade` to update the CLI package.

```
sudo apt-get update && sudo apt-get upgrade
```

NOTE

This command upgrades all of the installed packages on your system that have not had a dependency change. To upgrade the CLI only, use `apt-get install`.

```
sudo apt-get update && sudo apt-get install --only-upgrade -y azure-cli
```

Uninstall

If you decide to uninstall the Azure CLI, we're sorry to see you go. Before you uninstall, use the `az feedback` command to let us know what could be improved or fixed. Our goal is to make the Azure CLI bug-free and user-friendly. If you found a bug, we'd appreciate it if you [file a GitHub issue](#).

1. Uninstall with `apt-get remove`:

```
sudo apt-get remove -y azure-cli
```

2. If you don't plan to reinstall the CLI, remove the Azure CLI repository information:

```
sudo rm /etc/apt/sources.list.d/azure-cli.list
```

3. If you use no other packages from Microsoft, remove the signing key:

```
sudo rm /etc/apt/trusted.gpg.d/microsoft.asc.gpg
```

4. Remove any unneeded packages:

```
sudo apt autoremove
```

Next Steps

Now that you've installed the Azure CLI, take a short tour of its features and common commands.

[Get started with the Azure CLI](#)

Install Azure CLI with yum

3/5/2020 • 5 minutes to read • [Edit Online](#)

For Linux distributions with `yum` such as RHEL, Fedora, or CentOS, there's a package for the Azure CLI. This package has been tested with RHEL 7.7, RHEL 8, Fedora 24 and higher, CentOS 7 and CentOS 8.

The current version of the Azure CLI is **2.7.0**. For information about the latest release, see the [release notes](#). To find your installed version and see if you need to update, run `az --version`.

IMPORTANT

The RPM package of the Azure CLI depends on the `python3` package. On your system, this may be a Python version which predates the requirement of Python 3.6.x. If this affects you, find a replacement `python3` package.

Be aware that Python 2 has reached the end of life on January 1, 2020, and will no longer receive updates. Azure CLI has dropped support for Python 2.7 since version `2.1.0`. New versions no longer guarantee to run with Python 2.7 correctly.

Install

1. Import the Microsoft repository key.

```
sudo rpm --import https://packages.microsoft.com/keys/microsoft.asc
```

2. Create local `azure-cli` repository information.

```
sudo sh -c 'echo -e "[azure-cli]
name=Azure CLI
baseurl=https://packages.microsoft.com/yumrepos/azure-cli
enabled=1
gpgcheck=1
gpgkey=https://packages.microsoft.com/keys/microsoft.asc" > /etc/yum.repos.d/azure-cli.repo'
```

3. Install with the `yum install` command.

```
sudo yum install azure-cli
```

Run the Azure CLI with the `az` command. To sign in, use `az login` command.

1. Run the `login` command.

```
az login
```

If the CLI can open your default browser, it will do so and load an Azure sign-in page.

Otherwise, open a browser page at <https://aka.ms/devicelogin> and enter the authorization code displayed in your terminal.

2. Sign in with your account credentials in the browser.

To learn more about different authentication methods, see [Sign in with Azure CLI](#).

Troubleshooting

Here are some common problems seen when installing with `yum`. If you experience a problem not covered here, [file an issue on github](#).

Install on RHEL 7.6 or other systems without Python 3

If you can, please upgrade your system to a version with official support for `python3` package. Otherwise, you need to first install a `python3` package, either [build from source](#) or install through some [additional repo](#). Then you can download the package and install it without dependency.

```
$ sudo yum install yum-utils
$ sudo yumdownloader azure-cli
$ sudo rpm -ivh --nodeps azure-cli-*.rpm
```

If you have setup python3 but are still getting an error `python3: command not found` when trying to run the cli, you need to add it to your path.

```
$ scl enable rh-python36 bash
```

Proxy blocks connection

If you're unable to connect to an external resource due to a proxy, make sure that you've correctly set the `HTTP_PROXY` and `HTTPS_PROXY` variables in your shell. You will need to contact your system administrator to know what host(s) and port(s) to use for these proxies.

These values are respected by many Linux programs, including those which are used in the install process. To set these values:

```
# No auth
export HTTP_PROXY=http://[proxy]:[port]
export HTTPS_PROXY=https://[proxy]:[port]

# Basic auth
export HTTP_PROXY=http://[username]:[password]@[proxy]:[port]
export HTTPS_PROXY=https://[username]:[password]@[proxy]:[port]
```

IMPORTANT

If you are behind a proxy, these shell variables must be set to connect to Azure services with the CLI. If you are not using basic auth, it's recommended to export these variables in your `.bashrc` file. Always follow your business' security policies and the requirements of your system administrator.

You may also want to explicitly configure `yum` to use this proxy at all times. Make sure that the following lines appear under the `[main]` section of `/etc/yum.conf`:

```
[main]
# ...
proxy=http://[proxy]:[port] # If your proxy requires https, change http->https
proxy_username=[username] # Only required for basic auth
proxy_password=[password] # Only required for basic auth
```

In order to get the Microsoft signing key and get the package from our repository, your proxy needs to allow HTTPS connections to the following address:

- `https://packages.microsoft.com`

CLI fails to install or run on Windows Subsystem for Linux

Since [Windows Subsystem for Linux \(WSL\)](#) is a system call translation layer on top of the Windows platform, you might experience an error when trying to install or run the Azure CLI. The CLI relies on some features that may have a bug in WSL. If you experience an error no matter how you install the CLI, there's a good chance it's an issue with WSL and not with the CLI install process.

To troubleshoot your WSL installation and possibly resolve issues:

- If you can, run an identical install process on a Linux machine or VM to see if it succeeds. If it does, your issue is almost certainly related to WSL. To start a Linux VM in Azure, see the [create a Linux VM in the Azure Portal](#) documentation.
- Make sure that you're running the latest version of WSL. To get the latest version, [update your Windows 10 installation](#).
- Check for any [open issues](#) with WSL which might address your problem. Often there will be suggestions on how to work around the problem, or information about a release where the issue will be fixed.
- If there are no existing issues for your problem, [file a new issue with WSL](#) and make sure that you include as much information as possible.

If you continue to have issues installing or running on WSL, consider [installing the CLI for Windows](#).

Update

Update the Azure CLI with the `yum update` command.

```
sudo yum update azure-cli
```

Uninstall

If you decide to uninstall the Azure CLI, we're sorry to see you go. Before you uninstall, use the `az feedback` command to let us know what could be improved or fixed. Our goal is to make the Azure CLI bug-free and user-friendly. If you found a bug, we'd appreciate it if you [file a GitHub issue](#).

1. Remove the package from your system.

```
sudo yum remove azure-cli
```

2. If you don't plan to reinstall the CLI, remove the repository information.

```
sudo rm /etc/yum.repos.d/azure-cli.repo
```

3. If you don't use any other Microsoft packages, remove the signing key.

```
MSFT_KEY=`rpm -qa gpg-pubkey /* --qf "%{version}-%{release} %{summary}\n" | grep Microsoft | awk '{print $1}'`  
sudo rpm -e --allmatches gpg-pubkey-$MSFT_KEY
```

Next Steps

Now that you've installed the Azure CLI, take a short tour of its features and common commands.

[Get started with the Azure CLI](#)

Install Azure CLI with zypper

3/10/2020 • 5 minutes to read • [Edit Online](#)

For Linux distributions with `zypper`, such as openSUSE or SLES, there's a package available for the Azure CLI. This package has been tested with openSUSE Leap 15.1, and SLES 15.

The current version of the Azure CLI is **2.7.0**. For information about the latest release, see the [release notes](#). To find your installed version and see if you need to update, run `az --version`.

IMPORTANT

The RPM package of the Azure CLI depends on the `python3` package. On your system, this may be a Python version which predates the requirement of Python 3.6.x. If this affects you, find a replacement `python3` package.

Be aware that Python 2 has reached the end of life on January 1, 2020, and will no longer receive updates. Azure CLI has dropped support for Python 2.7 since version `2.1.0`. New versions no longer guarantee to run with Python 2.7 correctly.

Install

1. Install `curl`:

```
sudo zypper install -y curl
```

2. Import the Microsoft repository key:

```
sudo rpm --import https://packages.microsoft.com/keys/microsoft.asc
```

3. Create local `azure-cli` repository information:

```
sudo zypper addrepo --name 'Azure CLI' --check https://packages.microsoft.com/yumrepos/azure-cli azure-cli
```

4. Update the `zypper` package index and install:

```
sudo zypper install --from azure-cli azure-cli
```

Input 2 to continue install by ignoring some of its dependencies.

You can then run the Azure CLI with the `az` command. To sign in, use `az login` command.

1. Run the `login` command.

```
az login
```

If the CLI can open your default browser, it will do so and load an Azure sign-in page.

Otherwise, open a browser page at <https://aka.ms/devicelogin> and enter the authorization code displayed in your terminal.

2. Sign in with your account credentials in the browser.

To learn more about different authentication methods, see [Sign in with Azure CLI](#).

Troubleshooting

Here are some common problems seen when installing with `zypper`. If you experience a problem not covered here, [file an issue on github](#).

Install on SLES 12 or other systems without Python 3.6

On SLES 12, the default python3 package is 3.4 and not supported by Azure CLI. You can first build a higher version python3 from source. Then you can download the Azure CLI package and install it without dependency.

```
$ sudo zypper install -y gcc gcc-c++ make ncurses patch wget tar zlib-devel zlib openssl-devel
# Download Python source code
$ PYTHON_VERSION="3.6.9"
$ PYTHON_SRC_DIR=$(mktemp -d)
$ wget -qO- https://www.python.org/ftp/python/$PYTHON_VERSION/Python-$PYTHON_VERSION.tgz | tar -xz -C
"$PYTHON_SRC_DIR"
# Build Python
$ $PYTHON_SRC_DIR/*/configure
$ make
$ sudo make install
#Download azure-cli package
$ AZ_VERSION=$(zypper --no-refresh info azure-cli |grep Version | awk -F': ' '{print $2}' | awk
'{$1=$1;print}')
$ wget https://packages.microsoft.com/yumrepos/azure-cli/azure-cli-$AZ_VERSION.x86_64.rpm
#Install without dependency
$ sudo rpm -ivh --nodeps azure-cli-$AZ_VERSION.x86_64.rpm
```

Proxy blocks connection

If you're unable to connect to an external resource due to a proxy, make sure that you've correctly set the `HTTP_PROXY` and `HTTPS_PROXY` variables in your shell. You will need to contact your system administrator to know what host(s) and port(s) to use for these proxies.

These values are respected by many Linux programs, including those which are used in the install process. To set these values:

```
# No auth
export HTTP_PROXY=http://[proxy]:[port]
export HTTPS_PROXY=https://[proxy]:[port]

# Basic auth
export HTTP_PROXY=http://[username]:[password]@[proxy]:[port]
export HTTPS_PROXY=https://[username]:[password]@[proxy]:[port]
```

IMPORTANT

If you are behind a proxy, these shell variables must be set to connect to Azure services with the CLI. If you are not using basic auth, it's recommended to export these variables in your `.bashrc` file. Always follow your business' security policies and the requirements of your system administrator.

You may also want to explicitly configure `zypper` (via `yast2`) to use this proxy at all times. To do so, run the `yast2 proxy` command as superuser, and fill in the information presented in the form. If you have a window manager available on your system, you can also use the `Network Services > Proxy` pane in the `YaST Control Center`.

For advanced configuration or more information, see the [OpenSUSE Proxy configuration documentation](#)

In order to get the Microsoft signing key and get the package from our repository, your proxy needs to allow HTTPS connections to the following addresses:

- `https://packages.microsoft.com`
- `https://download.opensuse.org`

CLI fails to install or run on Windows Subsystem for Linux

Since [Windows Subsystem for Linux \(WSL\)](#) is a system call translation layer on top of the Windows platform, you might experience an error when trying to install or run the Azure CLI. The CLI relies on some features that may have a bug in WSL. If you experience an error no matter how you install the CLI, there's a good chance it's an issue with WSL and not with the CLI install process.

To troubleshoot your WSL installation and possibly resolve issues:

- If you can, run an identical install process on a Linux machine or VM to see if it succeeds. If it does, your issue is almost certainly related to WSL. To start a Linux VM in Azure, see the [create a Linux VM in the Azure Portal](#) documentation.
- Make sure that you're running the latest version of WSL. To get the latest version, [update your Windows 10 installation](#).
- Check for any [open issues](#) with WSL which might address your problem. Often there will be suggestions on how to work around the problem, or information about a release where the issue will be fixed.
- If there are no existing issues for your problem, [file a new issue with WSL](#) and make sure that you include as much information as possible.

If you continue to have issues installing or running on WSL, consider [installing the CLI for Windows](#).

Update

You can update the package with the `zypper update` command.

```
sudo zypper refresh
sudo zypper update azure-cli
```

Uninstall

If you decide to uninstall the Azure CLI, we're sorry to see you go. Before you uninstall, use the `az feedback` command to let us know what could be improved or fixed. Our goal is to make the Azure CLI bug-free and user-friendly. If you found a bug, we'd appreciate it if you [file a GitHub issue](#).

1. Remove the package from your system.

```
sudo zypper remove -y azure-cli
```

2. If you don't plan to reinstall the CLI, remove the repository information.

```
sudo zypper removerepo azure-cli
```

3. If you don't use other Microsoft packages, remove the Microsoft signing key.

```
MSFT_KEY=`rpm -qa gpg-pubkey /* --qf "%{version}-%{release} %{summary}\n" | grep Microsoft | awk '{print $1}'`  
sudo rpm -e --allmatches gpg-pubkey-$MSFT_KEY
```

Next Steps

Now that you've installed the Azure CLI, take a short tour of its features and common commands.

[Get started with the Azure CLI](#)

Install Azure CLI on Linux manually

2/28/2020 • 4 minutes to read • [Edit Online](#)

If there's no package for the Azure CLI for your distribution, install the CLI manually by running a script.

The current version of the Azure CLI is **2.7.0**. For information about the latest release, see the [release notes](#). To find your installed version and see if you need to update, run `az --version`.

NOTE

It's strongly recommend to install the CLI with a package manager. A package manager makes sure you always get the latest updates, and guarantees the stability of CLI components. Check and see if there is a package for your distribution before installing manually.

Prerequisites

The CLI requires the following software:

- [Python 3.6.x, 3.7.x or 3.8.x](#).
- [libffi](#)
- [OpenSSL 1.0.2](#)

IMPORTANT

The CLI has dropped support for Python 2.7 since version `2.1.0`. New versions no longer guarantee to run with Python 2.7 correctly.

Install or update

Both installing and updating the CLI requires re-running the install script. Install the CLI by running `curl`.

```
curl -L https://aka.ms/InstallAzureCli | bash
```

The script can also be downloaded and run locally. You may have to restart your shell in order for changes to take effect.

You can then run the Azure CLI with the `az` command. To sign in, use `az login` command.

1. Run the `login` command.

```
az login
```

If the CLI can open your default browser, it will do so and load an Azure sign-in page.

Otherwise, open a browser page at <https://aka.ms/devicelogin> and enter the authorization code displayed in your terminal.

2. Sign in with your account credentials in the browser.

To learn more about different authentication methods, see [Sign in with Azure CLI](#).

Troubleshooting

Here are some common problems seen during a manual installation. If you experience a problem not covered here, [file an issue on GitHub](#).

curl "Object Moved" error

If you get an error from `curl` related to the `-L` parameter, or an error message including the text "Object Moved", try using the full URL instead of the `aka.ms` redirect:

```
curl https://azurecliprod.blob.core.windows.net/install | bash
```

az command not found

If you can't run the command after installation and using `bash` or `zsh`, clear your shell's command hash cache. Run

```
hash -r
```

and check if the problem is resolved.

The issue can also occur if you didn't restart your shell after installation. Make sure that the location of the `az` command is in your `$PATH`. The location of the `az` command is

```
<install path>/bin
```

Proxy blocks connection

If you're unable to connect to an external resource due to a proxy, make sure that you've correctly set the `HTTP_PROXY` and `HTTPS_PROXY` variables in your shell. You will need to contact your system administrator to know what host(s) and port(s) to use for these proxies.

These values are respected by many Linux programs, including those which are used in the install process. To set these values:

```
# No auth
export HTTP_PROXY=http://[proxy]:[port]
export HTTPS_PROXY=https://[proxy]:[port]

# Basic auth
export HTTP_PROXY=http://[username]:[password]@[proxy]:[port]
export HTTPS_PROXY=https://[username]:[password]@[proxy]:[port]
```

IMPORTANT

If you are behind a proxy, these shell variables must be set to connect to Azure services with the CLI. If you are not using basic auth, it's recommended to export these variables in your `.bashrc` file. Always follow your business' security policies and the requirements of your system administrator.

In order to get the installation scripts, your proxy needs to allow HTTPS connections to the following addresses:

- `https://aka.ms/`
- `https://azurecliprod.blob.core.windows.net/`
- `https://pypi.python.org`
- Endpoints used by your distribution's package manager (if any) for core packages

CLI fails to install or run on Windows Subsystem for Linux

Since [Windows Subsystem for Linux \(WSL\)](#) is a system call translation layer on top of the Windows platform, you might experience an error when trying to install or run the Azure CLI. The CLI relies on some features that may have a bug in WSL. If you experience an error no matter how you install the CLI, there's a good chance it's an issue with WSL and not with the CLI install process.

To troubleshoot your WSL installation and possibly resolve issues:

- If you can, run an identical install process on a Linux machine or VM to see if it succeeds. If it does, your issue is almost certainly related to WSL. To start a Linux VM in Azure, see the [create a Linux VM in the Azure Portal](#) documentation.
- Make sure that you're running the latest version of WSL. To get the latest version, [update your Windows 10 installation](#).
- Check for any [open issues](#) with WSL which might address your problem. Often there will be suggestions on how to work around the problem, or information about a release where the issue will be fixed.
- If there are no existing issues for your problem, [file a new issue with WSL](#) and make sure that you include as much information as possible.

If you continue to have issues installing or running on WSL, consider [installing the CLI for Windows](#).

Uninstall

If you decide to uninstall the Azure CLI, we're sorry to see you go. Before you uninstall, use the `az feedback` command to let us know what could be improved or fixed. Our goal is to make the Azure CLI bug-free and user-friendly. If you found a bug, we'd appreciate it if you [file a GitHub issue](#).

Uninstall the CLI by directly deleting the files from the location chosen at the time of installation. The default install location is `$HOME`.

1. Remove the installed CLI files.

```
rm -r <install location>/lib/azure-cli
rm <install location>/bin/az
```

2. Modify your `$HOME/.bash_profile` file to remove the following line:

```
<install location>/lib/azure-cli/az.completion
```

3. If using `bash` or `zsh`, reload your shell's command cache.

```
hash -r
```

Next Steps

Now that you've installed the Azure CLI, take a short tour of its features and common commands.

[Get started with the Azure CLI](#)

Run Azure CLI in a Docker container

2/28/2020 • 2 minutes to read • [Edit Online](#)

You can use Docker to run a standalone Linux container with the Azure CLI pre-installed. Docker gets you started quickly with an isolated environment to run the CLI in. The image can also be used as a base for your own deployments.

Run in a Docker container

NOTE

The Azure CLI has migrated to [Microsoft Container Registry](#). Existing tags on Docker Hub are still supported, but new releases will only be available as `mcr.microsoft.com/azure-cli`.

Install the CLI using `docker run`.

```
docker run -it mcr.microsoft.com/azure-cli
```

NOTE

If you want to pick up the SSH keys from your user environment, use `-v ${HOME}/.ssh:/root/.ssh` to mount your SSH keys in the environment.

```
docker run -it -v ${HOME}/.ssh:/root/.ssh mcr.microsoft.com/azure-cli
```

The CLI is installed on the image as the `az` command in `/usr/local/bin`. To sign in, run the `az login` command.

1. Run the `login` command.

```
az login
```

If the CLI can open your default browser, it will do so and load an Azure sign-in page.

Otherwise, open a browser page at <https://aka.ms/devicelogin> and enter the authorization code displayed in your terminal.

2. Sign in with your account credentials in the browser.

To learn more about different authentication methods, see [Sign in with the Azure CLI](#).

Update Docker image

Updating with Docker requires both pulling the new image and re-creating any existing containers. For this reason, you should try to avoid using a container that hosts the CLI as a data store.

Update your local image with `docker pull`.

```
docker pull mcr.microsoft.com/azure-cli
```

Uninstall Docker image

If you decide to uninstall the Azure CLI, we're sorry to see you go. Before you uninstall, use the `az feedback` command to let us know what could be improved or fixed. Our goal is to make the Azure CLI bug-free and user-friendly. If you found a bug, we'd appreciate it if you [file a GitHub issue](#).

After halting any containers running the CLI image, remove it.

```
docker rmi mcr.microsoft.com/azure-cli
```

Next Steps

Now that you're ready to use the Azure CLI, take a short tour of its features and common commands.

[Get started with the Azure CLI](#)

Sign in with Azure CLI

4/9/2020 • 3 minutes to read • [Edit Online](#)

There are several authentication types for the Azure CLI. The easiest way to get started is with [Azure Cloud Shell](#), which automatically logs you in. Locally, you can sign in interactively through your browser with the [az login](#) command. When writing scripts, the recommended approach is to use service principals. By granting just the appropriate permissions needed to a service principal, you can keep your automation secure.

None of your sign-in information is stored by the CLI. Instead, an [authentication refresh token](#) is generated by Azure and stored. As of August 2018 this token is revoked after 90 days of inactivity, but this value can be changed by Microsoft or your tenant administrator. Once the token is revoked you get a message from the CLI saying you need to sign in again.

After signing in, CLI commands are run against your default subscription. If you have multiple subscriptions, you can [change your default subscription](#).

Sign in interactively

The Azure CLI's default authentication method uses a web browser and access token to sign in.

1. Run the `login` command.

```
az login
```

If the CLI can open your default browser, it will do so and load an Azure sign-in page.

Otherwise, open a browser page at <https://aka.ms/devicelogin> and enter the authorization code displayed in your terminal.

2. Sign in with your account credentials in the browser.

Sign in with credentials on the command line

Provide your Azure user credentials on the command line.

NOTE

This approach doesn't work with Microsoft accounts or accounts that have two-factor authentication enabled.

```
az login -u <username> -p <password>
```

IMPORTANT

If you want to avoid displaying your password on console and are using `az login` interactively, use the `read -s` command under `bash`.

```
read -sp "Azure password: " AZ_PASS && echo && az login -u <username> -p $AZ_PASS
```

Under PowerShell, use the `Get-Credential` cmdlet.

```
$AzCred = Get-Credential -UserName <username>  
az login -u $AzCred.UserName -p $AzCred.GetNetworkCredential().Password
```

Sign in with a service principal

Service principals are accounts not tied to any particular user, which can have permissions on them assigned through pre-defined roles. Authenticating with a service principal is the best way to write secure scripts or programs, allowing you to apply both permissions restrictions and locally stored static credential information. To learn more about service principals, see [Create an Azure service principal with the Azure CLI](#).

To sign in with a service principal, you need:

- The URL or name associated with the service principal
- The service principal password, or the X509 certificate used to create the service principal in PEM format
- The tenant associated with the service principal, as either an `.onmicrosoft.com` domain or Azure object ID

NOTE

A **CERTIFICATE** must be appended to the **PRIVATE KEY** within a PEM file. For an example of a PEM file format, see [Create an Azure service principal with the Azure CLI](#).

IMPORTANT

If your service principal uses a certificate that is stored in Key Vault, that certificate's private key must be available without signing in to Azure. To retrieve a private key for use offline, use [az keyvault secret show](#).

```
az login --service-principal -u <app-url> -p <password-or-cert> --tenant <tenant>
```

IMPORTANT

If you want to avoid displaying your password on console and are using `az login` interactively, use the `read -s` command under `bash`.

```
read -sp "Azure password: " AZ_PASS && echo && az login --service-principal -u <app-url> -p $AZ_PASS --  
tenant <tenant>
```

Under PowerShell, use the `Get-Credential` cmdlet.

```
$AzCred = Get-Credential -UserName <app-url>  
az login --service-principal -u $AzCred.UserName -p $AzCred.GetNetworkCredential().Password --tenant  
<tenant>
```

Sign in with a different tenant

You can select a tenant to sign in under with the `--tenant` argument. The value of this argument can either be an `.onmicrosoft.com` domain or the Azure object ID for the tenant. Both interactive and command-line sign in methods work with `--tenant`.

```
az login --tenant <tenant>
```

Sign in with a managed identity

On resources configured for managed identities for Azure resources, you can sign in using the managed identity. Signing in with the resource's identity is done through the `--identity` flag.

```
az login --identity
```

To learn more about managed identities for Azure resources, see [Configure managed identities for Azure resources](#) and [Use managed identities for Azure resources for sign in](#).

Create an Azure service principal with the Azure CLI

3/31/2020 • 6 minutes to read • [Edit Online](#)

Automated tools that use Azure services should always have restricted permissions. Instead of having applications sign in as a fully privileged user, Azure offers service principals.

An Azure service principal is an identity created for use with applications, hosted services, and automated tools to access Azure resources. This access is restricted by the roles assigned to the service principal, giving you control over which resources can be accessed and at which level. For security reasons, it's always recommended to use service principals with automated tools rather than allowing them to log in with a user identity.

This article shows you the steps for creating, getting information about, and resetting a service principal with the Azure CLI.

Create a service principal

Create a service principal with the `az ad sp create-for-rbac` command. When creating a service principal, you choose the type of sign-in authentication it uses.

NOTE

If your account doesn't have permission to create a service principal, `az ad sp create-for-rbac` will return an error message containing "Insufficient privileges to complete the operation." Contact your Azure Active Directory admin to create a service principal.

There are two types of authentication available for service principals: Password-based authentication, and certificate-based authentication.

Password-based authentication

Without any authentication parameters, password-based authentication is used with a random password created for you.

```
az ad sp create-for-rbac --name ServicePrincipalName
```

IMPORTANT

As of Azure CLI 2.0.68, the `--password` parameter to create a service principal with a user-defined password is **no longer supported** to prevent the accidental use of weak passwords.

The output for a service principal with password authentication includes the `password` key. **Make sure** you copy this value - it can't be retrieved. If you forget the password, [reset the service principal credentials](#).

The `appId` and `tenant` keys appear in the output of `az ad sp create-for-rbac` and are used in service principal authentication. Record their values, but they can be retrieved at any point with [az ad sp list](#).

Certificate-based authentication

For certificate-based authentication, use the `--cert` argument. This argument requires that you hold an existing certificate. Make sure any tool that uses this service principal has access to the certificate's private key. Certificates should be in an ASCII format such as PEM, CER, or DER. Pass the certificate as a string, or use the `@path` format to

load the certificate from a file.

NOTE

When using a PEM file, the **CERTIFICATE** must be appended to the **PRIVATE KEY** within the file.

```
az ad sp create-for-rbac --name ServicePrincipalName --cert "-----BEGIN CERTIFICATE-----  
...  
-----END CERTIFICATE-----"
```

```
az ad sp create-for-rbac --name ServicePrincipalName --cert @/path/to/cert.pem
```

The `--keyvault` argument can be added to use a certificate in Azure Key Vault. In this case, the `--cert` value is the name of the certificate.

```
az ad sp create-for-rbac --name ServicePrincipalName --cert CertName --keyvault VaultName
```

To create a *self-signed* certificate for authentication, use the `--create-cert` argument:

```
az ad sp create-for-rbac --name ServicePrincipalName --create-cert
```

Console output:

```
Creating a role assignment under the scope of "/subscriptions/myId"  
Please copy C:\myPath\myNewFile.pem to a safe place.  
When you run 'az login', provide the file path in the --password argument  
{  
  "appId": "myAppId",  
  "displayName": "myDisplayName",  
  "fileWithCertAndPrivateKey": "C:\\myPath\\myNewFile.pem",  
  "name": "http://myName",  
  "password": null,  
  "tenant": "myTenantId"  
}
```

Contents of the new PEM file:

```
-----BEGIN PRIVATE KEY-----  
myPrivateKeyValue  
-----END PRIVATE KEY-----  
-----BEGIN CERTIFICATE-----  
myCertificateValue  
-----END CERTIFICATE-----
```

NOTE

The `az ad sp create-for-rbac --create-cert` command creates the service principal and a PEM file. The PEM file contains a correctly formatted **PRIVATE KEY** and **CERTIFICATE**.

The `--keyvault` argument can be added to store the certificate in Azure Key Vault. When using `--keyvault`, the `--cert` argument is **required**.

```
az ad sp create-for-rbac --name ServicePrincipalName --create-cert --cert CertName --keyvault VaultName
```

Unless you store the certificate in Key Vault, the output includes the `fileWithCertAndPrivateKey` key. This key's value tells you where the generated certificate is stored. **Make sure** that you copy the certificate to a secure location, or you can't sign in with this service principal.

For certificates stored in Key Vault, retrieve the certificate's private key with [az keyvault secret show](#). In Key Vault, the name of the certificate's secret is the same as the certificate name. If you lose access to a certificate's private key, [reset the service principal credentials](#).

The `appId` and `tenant` keys appear in the output of `az ad sp create-for-rbac` and are used in service principal authentication. Record their values, but they can be retrieved at any point with [az ad sp list](#).

Get an existing service principal

A list of the service principals in a tenant can be retrieved with [az ad sp list](#). By default this command returns the first 100 service principals for your tenant. To get all of a tenant's service principals, use the `--all` argument. Getting this list can take a long time, so it's recommended that you filter the list with one of the following arguments:

- `--display-name` requests service principals that have a *prefix* that match the provided name. The display name of a service principal is the value set with the `--name` parameter during creation. If you didn't set `--name` during service principal creation, the name prefix is `azure-cli-`.
- `--spn` filters on exact service principal name matching. The service principal name always starts with `https://`. If the value you used for `--name` wasn't a URI, this value is `https://` followed by the display name.
- `--show-mine` requests only service principals created by the signed-in user.
- `--filter` takes an OData filter, and performs *server-side* filtering. This method is recommended over filtering client-side with the CLI's `--query` argument. To learn about OData filters, see [OData expression syntax for filters](#).

The information returned for service principal objects is verbose. To get only the information necessary for sign-in, use the query string `[].{id:appId, tenant:appOwnerTenantId}`. For example, to get the sign-in information for all service principals created by the currently logged in user:

```
az ad sp list --show-mine --query "[].{id:appId, tenant:appOwnerTenantId}"
```

IMPORTANT

`az ad sp list` or [az ad sp show](#) get the user and tenant, but not any authentication secrets *or* the authentication method. Secrets for certificates in Key Vault can be retrieved with [az keyvault secret show](#), but no other secrets are stored by default. If you forget an authentication method or secret, [reset the service principal credentials](#).

Manage service principal roles

The Azure CLI has the following commands to manage role assignments:

- [az role assignment list](#)
- [az role assignment create](#)
- [az role assignment delete](#)

The default role for a service principal is **Contributor**. This role has full permissions to read and write to an Azure account. The **Reader** role is more restrictive, with read-only access. For more information on Role-Based Access Control (RBAC) and roles, see [RBAC: Built-in roles](#).

This example adds the **Reader** role and removes the **Contributor** one:

```
az role assignment create --assignee APP_ID --role Reader
az role assignment delete --assignee APP_ID --role Contributor
```

NOTE

If your account doesn't have permission to assign a role, you see an error message that your account "does not have authorization to perform action 'Microsoft.Authorization/roleAssignments/write'." Contact your Azure Active Directory admin to manage roles.

Adding a role *doesn't* restrict previously assigned permissions. When restricting a service principal's permissions, the **Contributor** role should be removed.

The changes can be verified by listing the assigned roles:

```
az role assignment list --assignee APP_ID
```

Sign in using a service principal

Test the new service principal's credentials and permissions by signing in. To sign in with a service principal, you need the `appId`, `tenant`, and credentials.

To sign in with a service principal using a password:

```
az login --service-principal --username APP_ID --password PASSWORD --tenant TENANT_ID
```

To sign in with a certificate, it must be available locally as a PEM or DER file, in ASCII format. When using a PEM file, the **PRIVATE KEY** and **CERTIFICATE** must be appended together within the file.

```
az login --service-principal --username APP_ID --tenant TENANT_ID --password /path/to/cert
```

To learn more about signing in with a service principal, see [Sign in with the Azure CLI](#).

Reset credentials

If you forget the credentials for a service principal, use [az ad sp credential reset](#). The reset command takes the same arguments as `az ad sp create-for-rbac`.

```
az ad sp credential reset --name APP_ID
```

Query Azure CLI command output

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The Azure CLI uses the `--query` argument to execute a [JMESPath query](#) on the results of commands. JMESPath is a query language for JSON, giving you the ability to select and modify data from CLI output. Queries are executed on the JSON output before any display formatting.

The `--query` argument is supported by all commands in the Azure CLI. This article covers how to use the features of JMESPath with a series of small, simple examples.

Dictionary and list CLI results

Even when using an output format other than JSON, CLI command results are first treated as JSON for queries. CLI results are either a JSON array or dictionary. Arrays are sequences of objects that can be indexed, and dictionaries are unordered objects accessed with keys. Commands that *could* return more than one object return an array, and commands that *always* return *only* a single object return a dictionary.

Get properties in a dictionary

Working with dictionary results, you can access properties from the top level with just the key. The `.` (**subexpression**) character is used to access properties of nested dictionaries. Before introducing queries, take a look at the unmodified output of the `az vm show` command:

```
az vm show -g QueryDemo -n TestVM -o json
```

The command will output a dictionary. Some content has been omitted.

```
{
  "additionalCapabilities": null,
  "availabilitySet": null,
  "diagnosticsProfile": {
    "bootDiagnostics": {
      "enabled": true,
      "storageUri": "https://xxxxxx.blob.core.windows.net/"
    }
  },
  ...
  "osProfile": {
    "adminPassword": null,
    "adminUsername": "azureuser",
    "allowExtensionOperations": true,
    "computerName": "TestVM",
    "customData": null,
    "linuxConfiguration": {
      "disablePasswordAuthentication": true,
      "provisionVmAgent": true,
      "ssh": {
        "publicKeys": [
          {
            "keyData": "ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQDMobZnJTqgjWn/IB5xl1lvE4Y+BMYPqkDnGRUcA0g9BYPgrGSQquCES37v2e3JmpfDPHFsaR+CPK1Vr2
GoVJMMHeRcMJhj50ZWq0hAnkJBhlZVWy8S7dwdGAqPyPmWM2iJDCVMVrLITAJCno4704Ees7RCH6ku7kU86b1NOanvrNwqThr14wtNLhgZ0gQ5
GV1oLWvMEVg1YFMIgPRkTsSQKWCG5lLqQ45aU/4NMJoUxGyJTL9i8YxMavaB1Z2npfTQDQo9+womZ7SXzHaIWC858gWN19e5UFyHDnTEDc14hK
kf1CqnGJVcCJkmSfmrHk/CkmF0ZT3whTH01DhJTtV stramer@contoso",
            "path": "/home/azureuser/.ssh/authorized_keys"
          }
        ]
      }
    },
    "secrets": [],
    "windowsConfiguration": null
  },
  ....
}
```

The following command gets the SSH public keys authorized to connect to the VM by adding a query:

```
az vm show -g QueryDemo -n TestVM --query osProfile.linuxConfiguration.ssh.publicKeys -o json
```

```
[
  {
    "keyData": "ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQDMobZnJTqgjWn/IB5xl1lvE4Y+BMYPqkDnGRUcA0g9BYPgrGSQquCES37v2e3JmpfDPHFsaR+CPK1Vr2
GoVJMMHeRcMJhj50ZWq0hAnkJBhlZVWy8S7dwdGAqPyPmWM2iJDCVMVrLITAJCno4704Ees7RCH6ku7kU86b1NOanvrNwqThr14wtNLhgZ0gQ5
GV1oLWvMEVg1YFMIgPRkTsSQKWCG5lLqQ45aU/4NMJoUxGyJTL9i8YxMavaB1Z2npfTQDQo9+womZ7SXzHaIWC858gWN19e5UFyHDnTEDc14hK
kf1CqnGJVcCJkmSfmrHk/CkmF0ZT3whTH01DhJTtV stramer@contoso",
    "path": "/home/azureuser/.ssh/authorized_keys"
  }
]
```

Get a single value

A common case is that you need to only get *one* value out of a CLI command, such as an Azure resource ID, a resource name, a username, or a password. In that case, you also often want to store the value in a local environment variable. To get a single property, first make sure that you're only getting one property out of the query. Modifying the last example to get only the admin username:

```
az vm show -g QueryDemo -n TestVM --query 'osProfile.adminUsername' -o json
```

```
"azureuser"
```

This looks like a valid single value, but note that the `"` characters are returned as part of the output. This indicates that the object is a JSON string. It's important to note that when you assign this value directly as output from the command to an environment variable, the quotes may **not** be interpreted by the shell:

```
USER=$(az vm show -g QueryDemo -n TestVM --query 'osProfile.adminUsername' -o json)
echo $USER
```

```
"azureuser"
```

This is almost certainly not what you want. In this case, you want to use an output format which doesn't enclose returned values with type information. The best output option that the CLI offers for this purpose is `tsv`, tab-separated values. In particular, when retrieving a value that's only a single value (not a dictionary or list), `tsv` output is guaranteed to be unquoted.

```
az vm show -g QueryDemo -n TestVM --query 'osProfile.adminUsername' -o tsv
```

```
azureuser
```

For more information about the `tsv` output format, see [Output formats - TSV output format](#)

Get multiple values

To get more than one property, put expressions in square brackets `[]` (a **multiselect list**) as a comma-separated list. To get the VM name, admin user, and SSH key all at once use the command:

```
az vm show -g QueryDemo -n TestVM --query '[name, osProfile.adminUsername,
osProfile.linuxConfiguration.ssh.publicKeys[0].keyData]' -o json
```

```
[
  "TestVM",
  "azureuser",
  "ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQDMobZnJTqgjWn/IB5x1i1vE4Y+BMYPqkDnGRUcA0g9BYPgrGSQquCES37v2e3JmpfDPHFsaR+CPK1Vr2
GoVJMMHeRcMJhj50ZWq0hAnkJBh1ZVWy8S7dwdGAqPyPmWM2iJDCVMVrLITAJCno4704Ees7RCH6ku7kU86b1NOanvrNwqTHr14wtnLhgZ0gQ5
GV1oLwvMEVg1YFMIgPRkTsSQKWCG51LqQ45aU/4NMJoUxGyJTL9i8YxMavaB1Z2npfTQDQo9+womZ7SXzHaIWC858gWN19e5UFyHDnTEDc14hK
kf1CqnGJVcCJkmSfmrrHk/CkmF0ZT3whTH01DhJTtV stramer@contoso"
]
```

These values are listed in the result array in the order they were given in the query. Since the result is an array, there are no keys associated with the results.

Rename properties in a query

To get a dictionary instead of an array when querying for multiple values, use the `{ }` (**multiselect hash**) operator. The format for a multiselect hash is `{displayName: JMESPathExpression, ...}`. `displayName` will be the

string shown in output, and `JMESPathExpression` is the JMESPath expression to evaluate. Modifying the example from the last section by changing the multiselect list to a hash:

```
az vm show -g QueryDemo -n TestVM --query '{VMName:name, admin:osProfile.adminUsername, sshKey:osProfile.linuxConfiguration.ssh.publicKeys[0].keyData }' -o json
```

```
{
  "VMName": "TestVM",
  "admin": "azureuser",
  "ssh-key": "ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQDMobZnJTqgjWn/IB5x1ilvE4Y+BMYPqkDnGRUcA0g9BYPgrGSQquCES37v2e3JmpfDPHFsaR+CPK1Vr2
GoVJMMHeRcMJhj50ZWq0hAnkJBh1ZVWy8S7dwdGAqPyPmWM2iJDCVMVrLITAJCno4704Ees7RCH6ku7kU86b1NOanvrNwqThr14wtnLhgZ0gQ5
GV1oLWvMEVg1YFMIgPRkTsSQKWCG51LqQ45aU/4NMJoUxGyJTL9i8YxMavaB1Z2npfTQDQo9+womZ7SXzHaIWC858gWNl9e5UFyHDnTEDc14hK
kf1CqnGJVcCJkmSfmrHk/CkmF0ZT3whTH01DhJTtV stramer@contoso"
}
```

Get properties in an array

An array has no properties of its own, but it can be indexed. This feature is shown in the last example with the expression `publicKeys[0]`, which gets the first element of the `publicKeys` array. There's no guarantee CLI output is ordered, so avoid using indexing unless you're sure of the order or don't care what element you get. To access the properties of elements in an array, you do one of two operations: *flattening* and *filtering*. This section covers how to flatten an array.

Flattening an array is done with the `[]` JMESPath operator. All expressions after the `[]` operator are applied to each element in the current array. If `[]` appears at the start of the query, it flattens the CLI command result. The results of `az vm list` can be inspected with this feature. To get the name, OS, and administrator name for each VM in a resource group:

```
az vm list -g QueryDemo --query '[].{Name:name, OS:storageProfile.osDisk.osType, admin:osProfile.adminUsername}' -o json
```

```
[
  {
    "Name": "Test-2",
    "OS": "Linux",
    "admin": "sttramer"
  },
  {
    "Name": "TestVM",
    "OS": "Linux",
    "admin": "azureuser"
  },
  {
    "Name": "WinTest",
    "OS": "Windows",
    "admin": "winadmin"
  }
]
```

When combined with the `--output table` output format, the column names match up with the `displayKey` value of the multiselect hash:

```
az vm list -g QueryDemo --query '[].{Name:name, OS:storageProfile.osDisk.osType, Admin:osProfile.adminUsername}' --output table
```

Name	OS	Admin
Test-2	Linux	sttramer
TestVM	Linux	azureuser
WinTest	Windows	winadmin

NOTE

Certain keys are filtered out and not printed in the table view. These keys are `id`, `type`, and `etag`. To see these values, you can change the key name in a multiselect hash.

```
az vm show -g QueryDemo -n TestVM --query "{objectID:id}" -o table
```

Any array can be flattened, not just the top-level result returned by the command. In the last section, the expression `osProfile.linuxConfiguration.ssh.publicKeys[0].keyData` was used to get the SSH public key for sign-in. To get *every* SSH public key, the expression could instead be written as

`osProfile.linuxConfiguration.ssh.publicKeys[].keyData`. This query expression flattens the `osProfile.linuxConfiguration.ssh.publicKeys` array, and then runs the `keyData` expression on each element:

```
az vm show -g QueryDemo -n TestVM --query '{VMName:name, admin:osProfile.adminUsername, sshKeys:osProfile.linuxConfiguration.ssh.publicKeys[].keyData }' -o json
```

```
{
  "VMName": "TestVM",
  "admin": "azureuser",
  "sshKeys": [
    "ssh-rsa
    AAAAB3NzaC1yc2EAAAADAQABAAQDMobZNTJtqgjWn/IB5x1l1vE4Y+BMYPqkDnGRUcA0g9BYPgrGSQquCES37v2e3JmpfDPHFsaR+CPK1Vr2
    GoVJMMHeRcMJhj50ZWq0hAnkJBh1ZVWy8S7dwdGAqPyPmWM2iJDCVMVrLITAJCno4704Ees7RCH6ku7kU86b1NOanvrNwqThr14wtnLhgZ0gQ5
    GV1oLwvMEVg1YFMIgPRkTsSQKwCG51LqQ45aU/4NMJoUxGyJTL9i8YxMavaB1Z2npfTQDQo9+womZ7SXzHaIWC858gWn19e5UFyHDnTEDc14hK
    kf1CqnGJVccJkmSfmrrHk/CkmF0ZT3whTH01DhJTtV stramer@contoso\n"
  ]
}
```

Filter arrays

The other operation used to get data from an array is *filtering*. Filtering is done with the `[?...]` JMESPath operator. This operator takes a predicate as its contents. A predicate is any statement that can be evaluated to either `true` or `false`. Expressions where the predicate evaluates to `true` are included in the output.

JMESPath offers the standard comparison and logical operators. These include `<`, `<=`, `>`, `>=`, `==`, and `!=`.

JMESPath also supports logical and (`&&`), or (`||`), and not (`!`). Expressions can be grouped within parenthesis, allowing for more complex predicate expressions. For the full details on predicates and logical operations, see the [JMESPath specification](#).

In the last section, we flattened an array to get the complete list of all VMs in a resource group. Using filters, this output can be restricted to only Linux VMs:

```
az vm list -g QueryDemo --query "[?storageProfile.osDisk.osType=='Linux'].{Name:name, admin:osProfile.adminUsername}" --output table
```


Name	Admin
Test-2	sttramer
TestVM	azureuser

IMPORTANT

In JMESPath, strings are always surrounded by single quotes (`'`). If you use double quotes as part of a string in a filter predicate, you'll get empty output.

JMESPath also has built-in functions that can help with filtering. One such function is `contains(string, substring)`, which checks to see if a string contains a substring. Expressions are evaluated before calling the function, so the first argument can be a full JMESPath expression. The next example finds all VMs using SSD storage for their OS disk:

```
az vm list -g QueryDemo --query "[?contains(storageProfile.osDisk.managedDisk.storageAccountType,'SSD')].{Name:name, Storage:storageProfile.osDisk.managedDisk.storageAccountType}" -o json
```

```
[
  {
    "Name": "TestVM",
    "Storage": "StandardSSD_LRS"
  },
  {
    "Name": "WinTest",
    "Storage": "StandardSSD_LRS"
  }
]
```

This query is a little long. The `storageProfile.osDisk.managedDisk.storageAccountType` key is mentioned twice, and rekeyed in the output. One way to shorten it is to apply the filter after flattening and selecting data.

```
az vm list -g QueryDemo --query "[].{Name:name, Storage:storageProfile.osDisk.managedDisk.storageAccountType}[?contains(Storage,'SSD')]" -o json
```

```
[
  {
    "Name": "TestVM",
    "Storage": "StandardSSD_LRS"
  },
  {
    "Name": "WinTest",
    "Storage": "StandardSSD_LRS"
  }
]
```

For large arrays, it may be faster to apply the filter before selecting data.

See the [JMESPath specification - Built-in Functions](#) for the full list of functions.

Change output

JMESPath functions also have another purpose, which is to operate on the results of a query. Any function that returns a non-boolean value changes the result of an expression. For example, you can sort data by a property

value with `sort_by(array, &sort_expression)`. JMESPath uses a special operator, `&`, for expressions that should be evaluated later as part of a function. The next example shows how to sort a VM list by OS disk size:

```
az vm list -g QueryDemo --query "sort_by([].{Name:name, Size:storageProfile.osDisk.diskSizeGb}, &Size)" --output table
```

Name	Size
TestVM	30
Test-2	32
WinTest	127

See the [JMESPath specification - Built-in Functions](#) for the full list of functions.

Experiment with queries interactively

To start experimenting with JMESPath, the [JMESPath-terminal](#) Python package offers an interactive environment to work with queries. Data is piped as input, and then queries are written and run in the editor.

```
pip install jmespath-terminal
az vm list --output json | jpترم
```

Output formats for Azure CLI commands

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The Azure CLI uses JSON as its default output format, but offers other formats. Use the `--output` (`--out` or `-o`) parameter to format CLI output. The argument values and types of output are:

--OUTPUT	DESCRIPTION
<code>json</code>	JSON string. This setting is the default
<code>jsonc</code>	Colorized JSON
<code>yaml</code>	YAML, a machine-readable alternative to JSON
<code>table</code>	ASCII table with keys as column headings
<code>tsv</code>	Tab-separated values, with no keys
<code>none</code>	No output other than errors and warnings

JSON output format

The following example displays the list of virtual machines in your subscriptions in the default JSON format.

```
az vm list --output json
```

The following output has some fields omitted for brevity, and identifying information replaced.

```
[
  {
    "availabilitySet": null,
    "diagnosticsProfile": null,
    "hardwareProfile": {
      "vmSize": "Standard_DS1"
    },
    "id": "/subscriptions/.../resourceGroups/DEMORG1/providers/Microsoft.Compute/virtualMachines/DemoVM010",
    "instanceView": null,
    "licenseType": null,
    "location": "westus",
    "name": "DemoVM010",
    "networkProfile": {
      "networkInterfaces": [
        {
          "id":
"/subscriptions/.../resourceGroups/demorg1/providers/Microsoft.Network/networkInterfaces/DemoVM010VMNic",
          "primary": null,
          "resourceGroup": "demorg1"
        }
      ]
    },
    ...
    ...
    ...
  ]
]
```

YAML output format

The `yaml` format prints output as [YAML](#), a plain-text data serialization format. YAML tends to be easier to read than JSON, and easily maps to that format. Some applications and CLI commands take YAML as configuration input, instead of JSON.

```
az vm list --out yaml
```

The following output has some fields omitted for brevity, and identifying information replaced.

```
- availabilitySet: null
  diagnosticsProfile: null
  hardwareProfile:
    vmSize: Standard_DS1_v2
  id: /subscriptions/.../resourceGroups/DEMORG1/providers/Microsoft.Compute/virtualMachines/DemoVM010
  identity: null
  instanceView: null
  licenseType: null
  location: westus
  name: ExampleVM1
  networkProfile:
    networkInterfaces:
      - id: /subscriptions/.../resourceGroups/DemoRG1/providers/Microsoft.Network/networkInterfaces/DemoVM010Nic
        primary: null
        resourceGroup: DemoRG1
    ...
  ...
```

Table output format

The `table` format prints output as an ASCII table, making it easy to read and scan. Nested objects aren't included in table output, but can still be filtered as part of a query. Some fields aren't included in the table, so this format is

best when you want a quick, human-searchable overview of data.

```
az vm list --out table
```

Name	ResourceGroup	Location
DemoVM010	DEMORG1	westus
demovm212	DEMORG1	westus
demovm213	DEMORG1	westus
KBDemo001VM	RGDEMO001	westus
KBDemo020	RGDEMO001	westus

You can use the `--query` parameter to customize the properties and columns you want to show in the list output. The following example shows how to select just the VM Name and the Resource Group Name in the `list` command.

```
az vm list --query "[].{resource:resourceGroup, name:name}" -o table
```

Resource	Name
DEMORG1	DemoVM010
DEMORG1	demovm212
DEMORG1	demovm213
RGDEMO001	KBDemo001VM
RGDEMO001	KBDemo020

NOTE

Some keys are not printed in the table view by default. These are `id`, `type`, and `etag`. If you need to see these in your output, you can use the JMESPath re-keying feature to change the key name and avoid filtering.

```
az vm list --query "[].{objectID:id}" -o table
```

For more about using queries to filter data, see [Use JMESPath queries with Azure CLI](#).

TSV output format

The `tsv` output format returns tab- and newline-separated values without additional formatting, keys, or other symbols. This format makes it easy to consume the output into other commands and tools that need to process the text in some form. Like the `table` format, `tsv` doesn't print nested objects.

Using the preceding example with the `tsv` option outputs the tab-separated result.

```
az vm list --out tsv
```

```

None      None
/subscriptions/.../resourceGroups/DEMORG1/providers/Microsoft.Compute/virtualMachines/DemoVM010      None
None      westus      DemoVM010      None      Succeeded      DEMORG1      None
Microsoft.Compute/virtualMachines      cbd56d9b-9340-44bc-a722-25f15b578444
None      None
/subscriptions/.../resourceGroups/DEMORG1/providers/Microsoft.Compute/virtualMachines/demovm212      None
None      westus      demovm212      None      Succeeded      DEMORG1      None
Microsoft.Compute/virtualMachines      4bdac85d-c2f7-410f-9907-ca7921d930b4
None      None
/subscriptions/.../resourceGroups/DEMORG1/providers/Microsoft.Compute/virtualMachines/demovm213      None
None      westus      demovm213      None      Succeeded      DEMORG1      None
Microsoft.Compute/virtualMachines      2131c664-221a-4b7f-9653-f6d542fbfa34
None      None
/subscriptions/.../resourceGroups/RGDEMO001/providers/Microsoft.Compute/virtualMachines/KBDemo001VM      None
None      westus      KBDemo001VM      None      Succeeded      RGDEMO001      None
Microsoft.Compute/virtualMachines      14e74761-c17e-4530-a7be-9e4ff06ea74b
None      None
/subscriptions/.../resourceGroups/RGDEMO001/providers/Microsoft.Compute/virtualMachines/KBDemo020      None
None      westus      KBDemo020      None      Succeeded      RGDEMO001      None
Microsoft.Compute/virtualMachines      36baa9-9b80-48a8-b4a9-854c7a858ece

```

One restriction of the TSV output format is that there isn't a guarantee on output ordering. The CLI makes a best effort to preserve ordering by sorting keys in the response JSON alphabetically, and then printing their values in order for TSV output. This isn't a guarantee that the order is always identical though, since the Azure service response format may change.

In order to enforce consistent ordering, you'll need to use the `--query` parameter and the [multiselect list](#) format. When a CLI command returns a single JSON dictionary, use the general format `[key1, key2, ..., keyN]` to force a key order. For CLI commands which return an array, use the general format `[].[key1, key2, ..., keyN]` to order column values.

For example, to order the information displayed above by ID, location, resource group, and VM name:

```
az vm list --out tsv --query '[][id, location, resourceGroup, name]'
```

```

/subscriptions/.../resourceGroups/DEMORG1/providers/Microsoft.Compute/virtualMachines/DemoVM010      westus
DEMORG1      DemoVM010
/subscriptions/.../resourceGroups/DEMORG1/providers/Microsoft.Compute/virtualMachines/demovm212      westus
DEMORG1      demovm212
/subscriptions/.../resourceGroups/DEMORG1/providers/Microsoft.Compute/virtualMachines/demovm213      westus
DEMORG1      demovm213
/subscriptions/.../resourceGroups/RGDEMO001/providers/Microsoft.Compute/virtualMachines/KBDemo001VM      westus
RGDEMO001      KBDemo001VM
/subscriptions/.../resourceGroups/RGDEMO001/providers/Microsoft.Compute/virtualMachines/KBDemo020      westus
RGDEMO001      KBDemo020

```

The next example shows how `tsv` output can be piped to other commands in bash. The query is used to filter output and force ordering, `grep` selects items that have text "RGD" in them, then the `cut` command selects the fourth field to show the name of the VM in output.

```
az vm list --out tsv --query '[][id, location, resourceGroup, name]' | grep RGD | cut -f4
```

```

KBDemo001VM
KBDemo020

```

Set the default output format

Use the interactive `az configure` command to set up your environment and establish default settings for output formats. The default output format is `json`.

```
az configure
```

```
Welcome to the Azure CLI! This command will guide you through logging in and setting some default values.
```

```
Your settings can be found at /home/defaultuser/.azure/config
```

```
Your current configuration is as follows:
```

```
...
```

```
Do you wish to change your settings? (y/N): y
```

```
What default output format would you like?
```

```
[1] json - JSON formatted output that most closely matches API responses.
```

```
[2] jsonc - Colored JSON formatted output that most closely matches API responses.
```

```
[3] table - Human-readable output format.
```

```
[4] tsv - Tab- and Newline-delimited. Great for GREP, AWK, etc.
```

```
[5] yaml - YAML formatted output. An alternative to JSON. Great for configuration files.
```

```
[6] none - No output, except for errors and warnings.
```

```
Please enter a choice [1]:
```

To learn more about configuring your environment, see [Azure CLI configuration](#).

Azure CLI configuration

5/19/2020 • 4 minutes to read • [Edit Online](#)

The Azure CLI allows for user configuration for settings such as logging, data collection, and default argument values. The CLI offers a convenience command for managing some defaults, `az configure`. Other values can be set in a configuration file or with environment variables.

Configuration values used by the CLI are evaluated in the following precedence, with items higher on the list taking priority.

1. Command-line parameters
2. Environment variables
3. Values in the configuration file or set with `az configure`

CLI configuration with az configure

You set defaults for the CLI with the `az configure` command. This command takes one argument, `--defaults`, which is a space-separated list of `key=value` pairs. The provided values are used by the CLI in place of required arguments.

The following table contains a list of available configuration keys.

NAME	DESCRIPTION
group	The default resource group to use for all commands.
location	The default location to use for all commands.
web	The default app name to use for <code>az webapp</code> commands.
vm	The default VM name to use for <code>az vm</code> commands.
vmss	The default virtual machine scale set (VMSS) name to use for <code>az vmss</code> commands.
acr	The default container registry name to use for <code>az acr</code> commands.

As an example, here's how you would set the default resource group and location for all commands.

```
az configure --defaults location=westus2 group=MyResourceGroup
```

CLI configuration file

The CLI configuration file contains other settings that are used for managing CLI behavior. The configuration file itself is located at `$AZURE_CONFIG_DIR/config`. The default value of `AZURE_CONFIG_DIR` is `$HOME/.azure` on Linux and macOS, and `%USERPROFILE%\azure` on Windows.

Configuration files are written in the INI file format. This file format is defined by section headers, followed by a list of key-value entries.

- Section headers are written as `[section-name]`. Section names are case-sensitive.
- Entries are written as `key=value`. Key names are not case-sensitive.
- Comments are any line that begins with a `#` or `;`. Inline comments are not allowed.

Booleans are case-insensitive, and are represented by the following values.

- **True:** 1, yes, true, on
- **False:** 0, no, false, off

Here's an example of a CLI configuration file that disables any confirmation prompts and sets up logging to the `/var/log/azure` directory.

```
[core]
disable_confirm_prompt=Yes

[logging]
enable_log_file=yes
log_dir=/var/log/azure
```

See the next section for details on all of the available configuration values and what they mean. For the full details on the INI file format, see the [Python documentation on INI](#).

CLI configuration values and environment variables

The following table contains all of the sections and option names that can be placed in a configuration file. Their corresponding environment variables are set as `AZURE_{section}_{name}`, in all caps. For example, `output` default for `core` is set in the `AZURE_CORE_OUTPUT` variable, and the `storage_account` default for `batchai` is set in the `AZURE_BATCHAI_STORAGE_ACCOUNT` variable.

When you provide a default value, that argument is no longer required by any command. Instead, the default value is used.

SECTION	NAME	TYPE	DESCRIPTION
core	output	string	The default output format. Can be one of <code>json</code> , <code>jsonc</code> , <code>tsv</code> , or <code>table</code> .
	disable_confirm_prompt	boolean	Turn confirmation prompts on/off.
	collect_telemetry	boolean	Allow Microsoft to collect anonymous data on the usage of the CLI. For privacy information, see the Azure CLI MIT license .

SECTION	NAME	TYPE	DESCRIPTION
	only_show_errors	boolean	Only show errors during command invocation. In other words, only errors will be written to <code>stderr</code> . It suppresses warnings from preview, deprecated and experimental commands. It is also available for individual commands with the <code>--only-show-errors</code> parameter.
	no_color	boolean	Disable color. Originally colored messages will be prefixed with <code>DEBUG</code> , <code>INFO</code> , <code>WARNING</code> and <code>ERROR</code> . This bypasses the issue of a third-party library where the terminal's color cannot revert back after a <code>stdout</code> redirection.
logging	enable_log_file	boolean	Turn logging on/off.
	log_dir	string	The directory to write logs to. By default this value is <code>\${AZURE_CONFIG_DIR}/logs</code> .
storage	connection_string	string	The default connection string to use for <code>az storage</code> commands.
	account	string	The default account name to use for <code>az storage</code> commands.
	key	string	The default account key to use for <code>az storage</code> commands.
	sas_token	string	The default SAS token to use for <code>az storage</code> commands.
batchai	storage_account	string	The default storage account to use for <code>az batchai</code> commands.
	storage_key	string	The default storage key to use for <code>az batchai</code> commands.
batch	account	string	The default Azure Batch account name to use for <code>az batch</code> commands.

SECTION	NAME	TYPE	DESCRIPTION
	access_key	string	The default access key to use for <code>az batch</code> commands. Only used with <code>aad</code> authorization.
	endpoint	string	The default endpoint to connect to for <code>az batch</code> commands.
	auth_mode	string	The authorization mode to use for <code>az batch</code> commands. Can be <code>shared_key</code> or <code>aad</code> .
cloud	name	string	The default cloud for all <code>az</code> commands. The possible values are <code>AzureCloud</code> (default), <code>AzureChinaCloud</code> , <code>AzureUSGovernment</code> , <code>AzureGermanCloud</code> . To change clouds, you can use the <code>az cloud set -name</code> command. For an example, see Manage Clouds with the Azure CLI .

NOTE

You may see other values in your configuration file, but these are managed directly through CLI commands, including `az configure`. The ones listed in the table above are the only values you should change yourself.

Use multiple Azure subscriptions

2/28/2020 • 2 minutes to read • [Edit Online](#)

Most Azure users will only ever have a single subscription. However, if you are part of more than one organization or your organization has divided up access to certain resources across groupings, you may have multiple subscriptions within Azure. The CLI supports selecting a subscription both globally and per command.

For detailed information on subscriptions, billing, and cost management, see the [billing and cost management documentation](#).

Tenants, users, and subscriptions

You might have some confusion over the difference between tenants, users, and subscriptions within Azure. A *tenant* is the Azure Active Directory entity that encompasses a whole organization. This tenant has at least one *subscription* and *user*. A user is an individual and is associated with only one tenant, the organization that they belong to. Users are those accounts that sign in to Azure to create, manage, and use resources. A user may have access to multiple *subscriptions*, which are the agreements with Microsoft to use cloud services, including Azure. Every resource is associated with a subscription.

To learn more about the differences between tenants, users, and subscriptions, see the [Azure cloud terminology dictionary](#). To learn how to add a new subscription to your Azure Active Directory tenant, see [How to add an Azure subscription to Azure Active Directory](#). To learn how to sign in to a specific tenant, see [Sign in with Azure CLI](#).

Change the active subscription

To access the resources for a subscription, switch your active subscription or use the `--subscription` argument. Switching your subscription for all commands is done with [az account set](#).

To switch your active subscription:

1. Get a list of your subscriptions with the [az account list](#) command:

```
az account list --output table
```

2. Use `az account set` with the subscription ID or name you want to switch to.

```
az account set --subscription "My Demos"
```

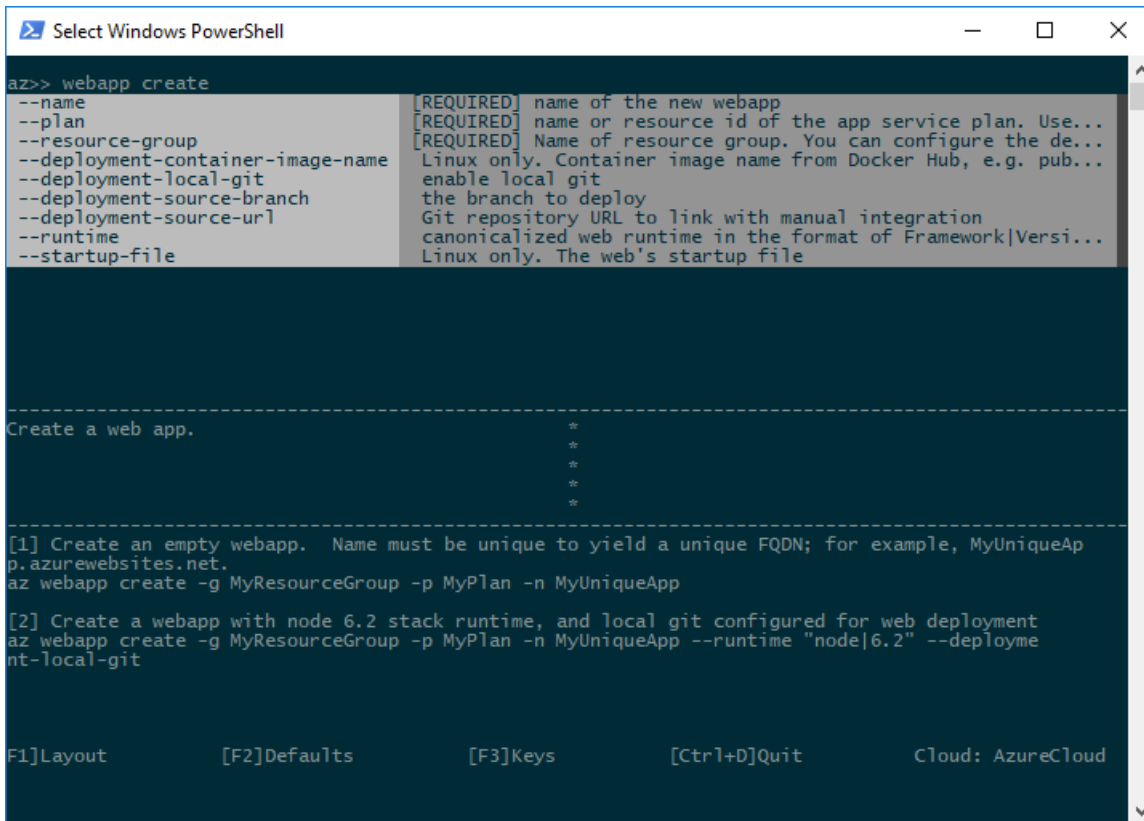
To run only a single command with a different subscription, use the `--subscription` argument. This argument takes either a subscription ID or subscription name:

```
az vm create --subscription "My Demos" --resource-group MyGroup --name NewVM --image Ubuntu
```

Azure CLI interactive mode

2/28/2020 • 2 minutes to read • [Edit Online](#)

You can use Azure CLI in interactive mode by running the `az interactive` command. This mode places you in an interactive shell with auto-completion, command descriptions, and examples.

A screenshot of a Windows PowerShell window titled "Select Windows PowerShell". The terminal shows the Azure CLI interactive mode. At the top, it says "az>> webapp create". Below this, there's a list of command-line options for 'az webapp create' with their descriptions. For example, '--name' is described as "[REQUIRED] name of the new webapp", and '--runtime' is described as "[REQUIRED] Name of resource group. You can configure the de...". The terminal also shows a prompt "Create a web app." followed by a list of examples. Example [1] shows "az webapp create -g MyResourceGroup -p MyPlan -n MyUniqueApp". Example [2] shows "az webapp create -g MyResourceGroup -p MyPlan -n MyUniqueApp --runtime 'node|6.2' --deployment-local-git". At the bottom, there are keyboard shortcuts: [F1]Layout, [F2]Defaults, [F3]Keys, [Ctrl+D]Quit, and Cloud: AzureCloud.

NOTE

We're not using the default style here, which doesn't read as well on a black background.

If you're not already signed in to your account, use the `login` command.

Configure

Interactive mode optionally displays command descriptions, parameter descriptions, and command examples. Turn descriptions and examples on or off using `F1`.

```
Windows PowerShell
bash-4.3# az interactive --style none
Do you want examples (y/n): y
Do you want parameter descriptions (y/n): y
Do you want command descriptions (y/n): y
Please restart the interactive mode for changes to take effect.

az>>
az>>

-----
*
*
*
*
-----

[F1]Layout      [F2]Defaults    [F3]Keys        [Ctrl+D]Quit    Cloud: AzureCloud
```

You can turn the display of parameter defaults on or off using `F2`.

```
Windows PowerShell
bash-4.3# az interactive --style none
az>>

-----
*
*
*
*
-----

No Default Values

[F1]Layout      [F2]Defaults    [F3]Keys        [Ctrl+D]Quit    Cloud: AzureCloud
```

`F3` toggles the display of some key gestures.

```
Windows PowerShell
bash-4.3# az interactive --style none
az>>

-----
*
*
*
-----

Ctrl+Y      : Scroll up the documentation
"?[query]"  : Jmespath query of the previous command
#[cmd]      : use commands outside the application
%% ..       : go back a scope
%%[cmd]     : set a scope, and scopes can be chained with spaces
Ctrl+N      : Scroll down the documentation
[cmd] + [param] + "?[query]" : Inject jmespath query from previous command
$           : get the exit code of the previous command
[cmd] :: [num] : do a step by step tutorial of example

[F1]Layout      [F2]Defaults      [F3]Keys      [Ctrl+D]Quit      Cloud: AzureCloud
```

Scope

You can scope your interactive mode to a specific command group like `vm` or `vm image`. When you do, all commands are interpreted in that scope. It's a great shorthand if you're doing all your work in that command group.

Instead of typing these commands:

```
az>> vm create -n myVM -g myRG --image UbuntuLTS
az>> vm list -o table
```

You can scope to the `vm` command group and type these commands:

```
az>> %%vm
az vm>> create -n myVM -g myRG --image UbuntuLTS
az vm>>list -o table
```

You can scope to lower-level command groups as well. You could scope to `vm image` using `%%vm image`. In this case, since we're already scoped to `vm`, we would use `%%image`.

```
az vm>> %%image
az vm image>>
```

At that point, we can pop the scope back up to `vm` using `%%..`, or we can scope to the root with just `%%`.

```
az vm image>> %%
az>>
```

Query

You can execute a JMESPath query on the results of the last command that you executed by using `??` followed by a JMESPath query. For example, after you created a group, you can retrieve the id of the new group.

```
az>> group create -n myRG -l westEurope
az>> "?? id"
```

You can also use this syntax to use the result of the previous command as an argument for your next command.* For instance after having listed all groups, list all the resources of type `virtualMachine` on the first group whose location is westeurope.

```
az>> vm create --name myVM --resource-group myRG --image UbuntuLTS --no-wait -o json
az>> group list -o json
az>> resource list -g "?? [?location=='westeurope'].name | [0]" --query "[?
type=='Microsoft.Compute/virtualMachines'].name"
```

To learn more about querying the results of your commands, see [Query command results with the Azure CLI](#).

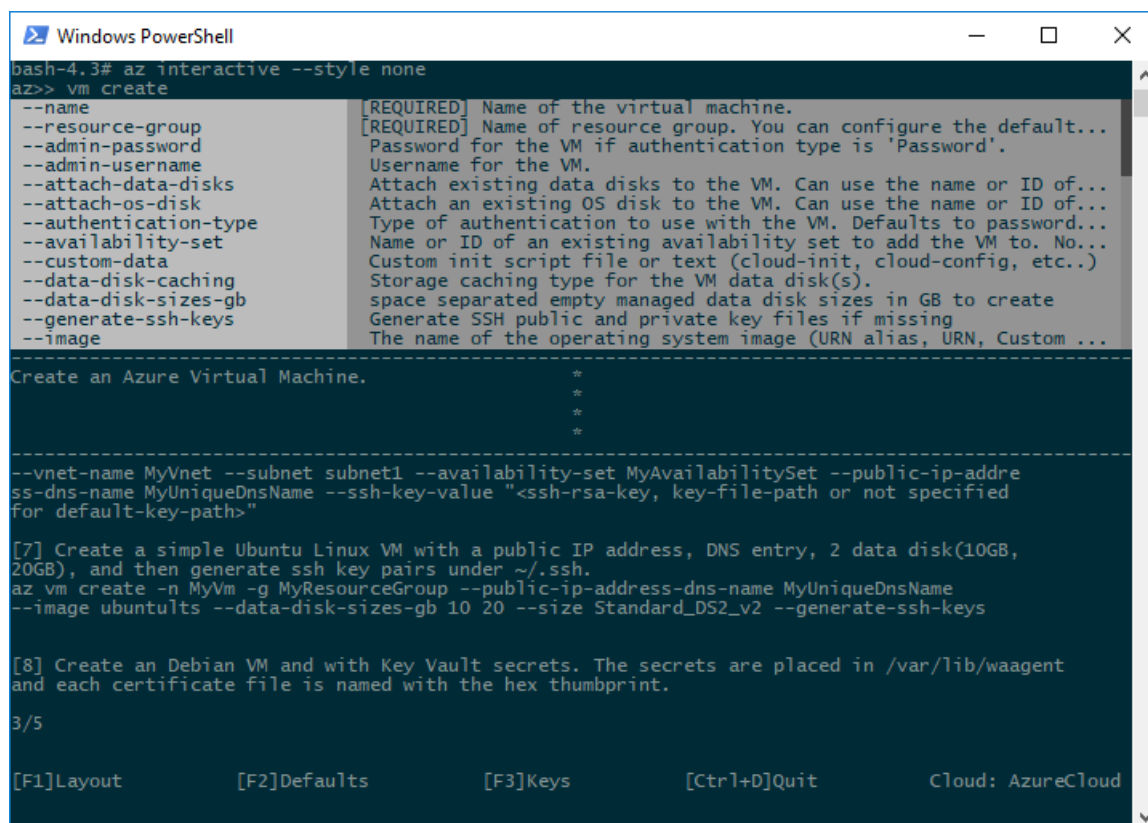
Bash commands

You can run shell commands without leaving interactive mode using `#[cmd]`.

```
az>> #dir
```

Examples

Some commands have lots of examples. You can scroll to the next page of examples using `CTRL-N` and the previous page using `CTRL-Y`.



```
Windows PowerShell
bash-4.3# az interactive --style none
az>> vm create
--name [REQUIRED] Name of the virtual machine.
--resource-group [REQUIRED] Name of resource group. You can configure the default...
--admin-password Password for the VM if authentication type is 'Password'.
--admin-username Username for the VM.
--attach-data-disks Attach existing data disks to the VM. Can use the name or ID of...
--attach-os-disk Attach an existing OS disk to the VM. Can use the name or ID of...
--authentication-type Type of authentication to use with the VM. Defaults to password...
--availability-set Name or ID of an existing availability set to add the VM to. No...
--custom-data Custom init script file or text (cloud-init, cloud-config, etc..)
--data-disk-caching Storage caching type for the VM data disk(s).
--data-disk-sizes-gb space separated empty managed data disk sizes in GB to create
--generate-ssh-keys Generate SSH public and private key files if missing
--image The name of the operating system image (URN alias, URN, Custom ...

Create an Azure Virtual Machine.
*
*
*
*

--vnet-name MyVnet --subnet subnet1 --availability-set MyAvailabilitySet --public-ip-addre
ss-dns-name MyUniqueDnsName --ssh-key-value "<ssh-rsa-key, key-file-path or not specified
for default-key-path>"

[7] Create a simple Ubuntu Linux VM with a public IP address, DNS entry, 2 data disk(10GB,
20GB), and then generate ssh key pairs under ~/.ssh.
az vm create -n MyVm -g MyResourceGroup --public-ip-address-dns-name MyUniqueDnsName
--image ubuntu1604 --data-disk-sizes-gb 10 20 --size Standard_DS2_v2 --generate-ssh-keys

[8] Create an Debian VM and with Key Vault secrets. The secrets are placed in /var/lib/waagent
and each certificate file is named with the hex thumbprint.

3/5

[F1]Layout [F2]Defaults [F3]Keys [Ctrl+D]Quit Cloud: AzureCloud
```

You can also look at a specific example using `::#`.


```
az>> vm create ::8
```

Select clouds with the Azure CLI

2/28/2020 • 2 minutes to read • [Edit Online](#)

If you work across different regions or use [Azure Stack](#), you may need to use more than one cloud. Microsoft provides clouds for compliance with regional laws, which are available for your use. This article shows you how to get information on clouds, change the current cloud, and register or unregister new clouds.

List available clouds

You can list available clouds with the [az cloud list](#) command. This command shows which cloud is currently active, what its current profile is, and information on regional suffixes and host names.

To get the active cloud and a list of all the available clouds:

```
az cloud list --output table
```

IsActive	Name	Profile
True	AzureCloud	latest
	AzureChinaCloud	latest
	AzureUSGovernment	latest
	AzureGermanCloud	latest

The currently active cloud has `True` in the `IsActive` column. Only one cloud can be active at any time. To get more detailed information on a cloud, including the endpoints that it uses for Azure services, use the `cloud show` command:

```
az cloud show --name AzureChinaCloud --output json
```

```
{
  "endpoints": {
    "activeDirectory": "https://login.chinacloudapi.cn",
    "activeDirectoryDataLakeResourceId": null,
    "activeDirectoryGraphResourceId": "https://graph.chinacloudapi.cn/",
    "activeDirectoryResourceId": "https://management.core.chinacloudapi.cn/",
    "batchResourceId": "https://batch.chinacloudapi.cn/",
    "gallery": "https://gallery.chinacloudapi.cn/",
    "management": "https://management.core.chinacloudapi.cn/",
    "resourceManager": "https://management.chinacloudapi.cn",
    "sqlManagement": "https://management.core.chinacloudapi.cn:8443/",
    "vmImageAliasDoc": "https://raw.githubusercontent.com/Azure/azure-rest-api-specs/master/arm-compute/quickstart-templates/aliases.json"
  },
  "isActive": false,
  "name": "AzureChinaCloud",
  "profile": "latest",
  "suffixes": {
    "azureDataLakeAnalyticsCatalogAndJobEndpoint": null,
    "azureDataLakeStoreFileSystemEndpoint": null,
    "keyvaultDns": ".vault.azure.cn",
    "sqlServerHostname": ".database.chinacloudapi.cn",
    "storageEndpoint": "core.chinacloudapi.cn"
  }
}
```

Switch the active cloud

To set the default cloud using a configuration file, see [CLI configuration values and environment variables](#). To switch the active cloud, run the `az cloud set` command. This command takes one required argument, the name of the cloud.

```
az cloud set --name AzureChinaCloud
```

IMPORTANT

If your authentication for the activated cloud has expired, you need to re-authenticate before performing any other CLI tasks. If this is your first time switching to the new cloud, you also need to set the active subscription. For instructions on authenticating, see [Sign in with Azure CLI](#). For information on subscription management, see [Manage Azure subscriptions with Azure CLI](#).

Register a new cloud

Register a new cloud if you have your own endpoints for Azure Stack. Creating a cloud is done with the `az cloud register` command. This command requires a name and a set of service endpoints. To learn how to register a cloud for use with Azure Stack, see [Use API version profiles with Azure CLI in Azure Stack](#).

You don't need to register information for the China, US Government, or German regions. These clouds are managed by Microsoft and available by default. For more information on all of the available endpoint settings, see the [documentation for `az cloud register`](#).

Registering a cloud doesn't automatically switch to it. Use the `az cloud set` command to select the newly created cloud.

Update an existing cloud

If you have permissions, you can also update an existing cloud. Updating a cloud switches to a different Azure

services profile or modifies the connection endpoints. Update a cloud with the [az cloud update](#) command, which takes the same arguments as `az cloud register`.

Unregister a cloud

If you no longer need a created cloud, it can be unregistered with the [az cloud unregister](#) command:

```
az cloud unregister --name MyCloud
```

Use extensions with Azure CLI

2/28/2020 • 2 minutes to read • [Edit Online](#)

The Azure CLI offers the capability to load extensions. Extensions are Python wheels that aren't shipped as part of the CLI but run as CLI commands. With extensions, you gain access to experimental and pre-release commands along with the ability to write your own CLI interfaces. This article covers how to manage extensions and answers common questions about their use.

Find extensions

To see the extensions provided and maintained by Microsoft, use the [az extension list-available](#) command.

```
az extension list-available --output table
```

We also host a [list of extensions](#) on the documentation site.

Install extensions

Once you have found an extension to install, use [az extension add](#) to get it. If the extension is listed in

`az extension list-available`, you can install the extension by name.

```
az extension add --name <extension-name>
```

If the extension is from an external resource or you have a direct link to it, provide the source URL or local path. The extension *must* be a compiled Python wheel file.

```
az extension add --source <URL-or-path>
```

Once an extension is installed, it's found under the value of the `$AZURE_EXTENSION_DIR` shell variable. If this variable is unset, by default the value is `$HOME/.azure/cliextensions` on Linux and macOS, and `%USERPROFILE%.azure\cliextensions` on Windows.

Update extensions

If an extension was installed by name, update it using [az extension update](#).

```
az extension update --name <extension-name>
```

Otherwise, an extension can be updated from source by following the [Install extensions](#) instructions.

If an extension name can't be resolved by the CLI, uninstall it and attempt to reinstall. The extension could also have become part of the base CLI. Try updating the CLI as described in [Install the Azure CLI](#) and see if the extension's commands were added.

Uninstall extensions

If you no longer need an extension, remove it with [az extension remove](#).

```
az extension remove --name <extension-name>
```

You can also remove an extension manually by deleting it from the location where it was installed. The `$AZURE_EXTENSION_DIR` shell variable defines where modules are installed. If this variable is unset, by default the value is `$HOME/.azure/cliextensions` on Linux and macOS, and `%USERPROFILE%.azure\cliextensions` on Windows.

```
rm -rf $AZURE_EXTENSION_DIR/<extension-name>
```

FAQ

Here are some answers to other common questions about CLI extensions.

What file formats are allowed for installation?

Currently, only compiled Python wheels can be installed as extensions.

Can extensions replace existing commands?

Yes. Extensions may replace existing commands, but before running a command that has been replaced the CLI will issue a warning.

How can I tell if an extension is in pre-release?

An extension's documentation and versioning will show if it's in pre-release. Microsoft often releases preview commands as CLI extensions, with the option of moving them into the main CLI product later. When commands are moved out of extensions, the old extension should be uninstalled.

Can extensions depend upon each other?

No. Since the CLI doesn't guarantee a load order, dependencies might not be satisfied. Removing an extension won't affect any others.

Are extensions updated along with the CLI?

No. Extensions must be updated separately, as described in [Update extensions](#).

How to develop our own extension?

Please refer to the official repository for more help. [Azure/azure-cli-extensions](#)

Available extensions for the Azure CLI

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This article is a complete list of the available extensions for the Azure CLI which are supported by Microsoft.

The list of extensions is also available from the CLI. To get it, run `az extension list-available`:

```
az extension list-available --output table
```

NAME	VERSION	SUMMARY	PREVIEW
account	0.1.0	Microsoft Azure Command-Line Tools SubscriptionClient Extension	
aem	0.1.1	Manage Azure Enhanced Monitoring Extensions for SAP	
ai-did-you-mean-this	0.1.1	Recommend recovery options on failure.	
ai-examples	0.2.0	Add AI powered examples to help content.	Yes
aks-preview	0.4.49	Provides a preview for upcoming AKS features	Yes
alertsmanagement	0.1.0	Microsoft Azure Command-Line Tools Alerts Extension	
alias	0.5.2	Support for command aliases	Yes
application-insights	0.1.7	Support for managing Application Insights components and querying metrics, events, and logs from such components.	Yes
azure-batch-cli-extensions	5.0.1	Additional commands for working with Azure Batch service	
azure-cli-iot-ext	0.8.9	The Azure IoT extension for Azure CLI.	
azure-cli-ml	1.6.0	Microsoft Azure Command-Line Tools AzureML Command Module	

NAME	VERSION	SUMMARY	PREVIEW
azure-devops	0.18.0	Tools for managing Azure DevOps.	
azure-firewall	0.3.1	Manage Azure Firewall resources.	Yes
azure-iot	0.9.2	The Azure IoT extension for Azure CLI.	
blueprint	0.1.0	Microsoft Azure Command-Line Tools Blueprint Extension	
connectedk8s	0.2.1	Microsoft Azure Command-Line Tools Connectedk8s Extension	Yes
connectedmachine	0.1.1	Microsoft Azure Command-Line Tools Connectedmachine Extension	Yes
connection-monitor-preview	0.1.0	Microsoft Azure Command-Line Connection Monitor V2 Extension	Yes
csvmware	0.3.0	Manage Azure VMware Solution by CloudSimple.	Yes
custom-providers	0.1.0	Microsoft Azure Command-Line Tools Custom Providers Extension	
databox	0.1.0	Microsoft Azure Command-Line Tools DataBox Extension	
databricks	0.2.0	Microsoft Azure Command-Line Tools DatabricksClient Extension	
datashare	0.1.0	Microsoft Azure Command-Line Tools DataShareManagementClient Extension	
db-up	0.1.14	Additional commands to simplify Azure Database workflows.	Yes
deploy-to-azure	0.2.0	Deploy to Azure using Github Actions.	Yes

NAME	VERSION	SUMMARY	PREVIEW
dev-spaces	1.0.5	Dev Spaces provides a rapid, iterative Kubernetes development experience for teams.	
dev-spaces-preview	0.1.6	Dev Spaces provides a rapid, iterative Kubernetes development experience for teams.	Yes
dms-preview	0.11.0	Support for new Database Migration Service scenarios.	Yes
eventgrid	0.4.9	Microsoft Azure Command-Line Tools EventGrid Command Module.	Yes
express-route	0.1.3	Manage ExpressRoutes with preview features.	Yes
express-route-cross-connection	0.1.1	Manage customer ExpressRoute circuits using an ExpressRoute cross-connection.	
front-door	1.0.7	Manage networking Front Doors.	
hack	0.4.2	Microsoft Azure Command-Line Tools Hack Extension	Yes
healthcareapis	0.1.3	Microsoft Azure Command-Line Tools HealthCareApis Extension	
hpc-cache	0.1.0	Microsoft Azure Command-Line Tools StorageCache Extension	Yes
image-copy-extension	0.2.4	Support for copying managed vm images between regions	
import-export	0.1.1	Microsoft Azure Command-Line Tools StorageImportExport Extension	
interactive	0.4.4	Microsoft Azure Command-Line Interactive Shell	Yes
internet-analyzer	0.1.0rc5	Microsoft Azure Command-Line Tools Internet Analyzer Extension	Yes

NAME	VERSION	SUMMARY	PREVIEW
ip-group	0.1.1	Microsoft Azure Command-Line Tools IpGroup Extension	
k8sconfiguration	0.1.8	Microsoft Azure Command-Line Tools K8sconfiguration Extension	Yes
keyvault-preview	0.1.3	Preview Azure Key Vault commands.	Yes
kusto	0.1.0	Microsoft Azure Command-Line Tools KustoManagementClient Extension	
log-analytics	0.1.4	Support for Azure Log Analytics query capabilities.	Yes
log-analytics-solution	0.1.0	Microsoft Azure Command-Line Tools Operations Extension	
logic	0.1.0	Microsoft Azure Command-Line Tools LogicManagementClient Extension	
maintenance	1.0.1	Support for Azure maintenance management.	
managementpartner	0.1.2	Support for Management Partner preview	
mesh	0.10.6	Support for Microsoft Azure Service Fabric Mesh - Public Preview	Yes
mixed-reality	0.0.1	Mixed Reality Azure CLI Extension.	
netappfiles-preview	0.3.2	Provides a preview for upcoming Azure NetApp Files (ANF) features.	Yes
notification-hub	0.2.0	Microsoft Azure Command-Line Tools Notification Hub Extension	
peering	0.1.0rc2	Microsoft Azure Command-Line Tools Peering Extension	Yes
portal	0.1.1	Microsoft Azure Command-Line Tools Portal Extension	

NAME	VERSION	SUMMARY	PREVIEW
powerbidedicated	0.1.1	Microsoft Azure Command-Line Tools PowerBIDedicated Extension	Yes
privatedns	0.1.1	Commands to manage Private DNS Zones	Yes
resource-graph	1.1.0	Support for querying Azure resources with Resource Graph.	Yes
sap-hana	0.6.2	Additional commands for working with SAP HanaOnAzure instances.	
spring-cloud	0.2.4	Microsoft Azure Command-Line Tools spring-cloud Extension	Yes
storage-or-preview	0.4.0	Microsoft Azure Command-Line Tools Storage-ors-preview Extension	Yes
storage-preview	0.2.10	Provides a preview for upcoming storage features.	Yes
storagesync	0.1.0	Microsoft Azure Command-Line Tools MicrosoftStorageSync Extension	
stream-analytics	0.1.0	Microsoft Azure Command-Line Tools stream-analytics Extension	
subscription	0.1.3	Support for subscription management preview.	
support	1.0.2	Microsoft Azure Command-Line Tools Support Extension	
synapse	0.2.0	Microsoft Azure Command-Line Tools Synapse Extension	Yes
timeseriesinsights	0.1.2	Microsoft Azure Command-Line Tools TimeSeriesInsightsClient Extension	
virtual-network-tap	0.1.0	Manage virtual network taps (VTAP).	Yes
virtual-wan	0.1.3	Manage virtual WAN, hubs, VPN gateways and VPN sites.	Yes

NAME	VERSION	SUMMARY	PREVIEW
vm-repair	0.2.7	Auto repair commands to fix VMs.	
vmware	0.6.0	Preview Azure VMware Solution commands.	Yes
webapp	0.2.24	Additional commands for Azure AppService.	Yes

The Azure CLI alias extension

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The alias extension allows users to define custom commands for the Azure CLI by using existing commands. Aliases help keep your workflow simple by allowing shortcuts. Since aliases are powered by the Jinja2 template engine, they even offer advanced argument processing.

NOTE

The Alias Extension is in public preview. The features and configuration file format may change.

Install the alias extension

The minimum required Azure CLI version to use the alias extension is **2.0.28**. To check your CLI version, run `az --version`. If you need to update your installation, follow the instructions in [Install the Azure CLI](#).

Install the extension with the [az extension add](#) command.

```
az extension add --name alias
```

Verify the installation of the extension with [az extension list](#). If the alias extension was installed properly, it's listed in the command output.

```
az extension list --output table --query '[].{Name:name}'
```

```
Name
-----
alias
```

Keep the extension up-to-date

The alias extension is under active development and new versions are released regularly. New versions aren't installed when you update the CLI. Install the updates for the extension with [az extension update](#).

```
az extension update --name alias
```

Manage aliases for the Azure CLI

The alias extension lets you create and manage aliases for other CLI commands. To view all the available commands and parameter details, run the alias command with `--help`.

```
az alias --help
```

Create simple alias commands

One use of aliases is for shortening existing command groups or command names. For example, you can shorten

the `group` command group to `rg` and the `list` command to `ls`.

```
az alias create --name rg --command group
az alias create --name ls --command list
```

These newly defined aliases can now be used anywhere that their definition would be.

```
az rg list
az rg ls
az vm ls
```

Do not include `az` as part of the command.

Aliases can also be shortcuts for complete commands. The next example lists available resource groups and their locations in table output:

```
az alias create --name ls-groups --command "group list --query '[].{Name:name, Location:location}' --output table"
```

Now `ls-groups` can be run like any other CLI command.

```
az ls-groups
```

Create an alias command with arguments

You can also add positional arguments to an alias command by including them as `{{ arg_name }}` in the alias name. The whitespace inside the braces is required.

```
az alias create --name "alias_name {{ arg1 }} {{ arg2 }} ..." --command "invoke_including_args"
```

The next example alias shows how to use positional arguments to get the public IP address for a VM.

```
az alias create \
  --name "get-vm-ip {{ resourceGroup }} {{ vmName }}" \
  --command "vm list-ip-addresses --resource-group {{ resourceGroup }} --name {{ vmName }} \
    --query [0].virtualMachine.network.publicIpAddresses[0].ipAddress"
```

When running this command, you give values to the positional arguments.

```
az get-vm-ip MyResourceGroup MyVM
```

You can also use environment variables in aliased commands, which are evaluated at runtime. The next example adds the `create-rg` alias, which creates a resource group in `eastus` and adds an `owner` tag. This tag is assigned the value of the local environment variable `USER`.

```
az alias create \
  --name "create-rg {{ groupName }}" \
  --command "group create --name {{ groupName }} --location eastus --tags owner=\$USER"
```

To register the environment variables inside the command of the alias, the dollar sign `$` must be escaped.

Process arguments using Jinja2 templates

Argument substitution in the alias extension is performed by [Jinja2](#). Jinja2 templates allow for manipulating the arguments.

With Jinja2 templates, you can write aliases that take different types of arguments than the underlying command. For example, you can make an alias that takes a storage URL. Then this URL is parsed to pass the account and container names to the storage command.

```
az alias create \  
  --name 'storage-ls {{ url }}' \  
  --command "storage blob list  
    --account-name {{ url.replace('https://', '').split('.')[0] }}  
    --container-name {{ url.replace('https://', '').split('/')[1] }}"
```

To learn about the Jinja2 template engine, see [the Jinja2 documentation](#).

Alias configuration file

Another way to create and modify aliases is to alter the alias configuration file. Alias command definitions are written into a configuration file, located at `$AZURE_USER_CONFIG/alias`. The default value of `AZURE_USER_CONFIG` is `$HOME/.azure` on macOS and Linux, and `%USERPROFILE%\azure` on Windows. The alias configuration file is written in the INI configuration file format. The format for alias commands is:

```
[alias_name]  
command = invoked_commands
```

For aliases that have positional arguments, the format for alias commands is:

```
[alias_name {{ arg1 }} {{ arg2 }} ...]  
command = invoked_commands_including_args
```

Create an alias command with arguments via the alias configuration file

The next example shows an alias for a command with arguments. This command gets the public IP address for a VM. Aliased commands must all be on a single line, and use all of the arguments in the alias name.

```
[get-vm-ip {{ resourceGroup }} {{ vmName }}]  
command = vm list-ip-addresses --resource-group {{ resourceGroup }} --name {{ vmName }} --query  
[0].virtualMachine.network.publicIpAddresses[0].ipAddress
```

Uninstall the alias extension

To uninstall the extension, use the [az extension remove](#) command.

```
az extension remove --name alias
```

If you uninstalled because a bug or other problem with the extension, [file a GitHub issue](#) so that we can provide a fix.