



Azure Governance and Compliance Crash Course

Use Azure Policy to Enforce Organization Standards and **Azure Best Practices**

October/2022



Reza Salehi

Cloud Consultant and Trainer



@zaalion

Microsoft®
CERTIFIED
Trainer



Course Overview



Course Repository

<https://github.com/zaalion/oreilly-policy-governance>





Azure Governance and Compliance

- Importance of Governance and Compliance
- Azure Policy
- Azure Built-in Policies
- Creating Custom Policy Definitions
- Azure Policy Initiatives



Azure Governance

“Governance provides mechanisms and processes to maintain control over your applications and resources in Azure. It involves planning your initiatives and setting strategic priorities. ”

Microsoft



Azure Governance

Making sure your Azure resources are created and maintained according to company standards, Azure cloud best practices, or comply with government regulations such as EU GDPR.










Azure compliance documentation


If your organization needs to comply with legal or regulatory standards, start here to learn about compliance in Azure.

Compliance offerings












Global

-  CIS benchmark
-  CSA STAR Attestation
-  CSA STAR Certification
-  CSA STAR self-assessment
-  SOC 1
-  SOC 2
-  SOC 3

Global

-  ISO 20000-1
-  ISO 22301
-  ISO 27001
-  ISO 27017
-  ISO 27018
-  ISO 27701
-  ISO 9001
-  WCAG

US government

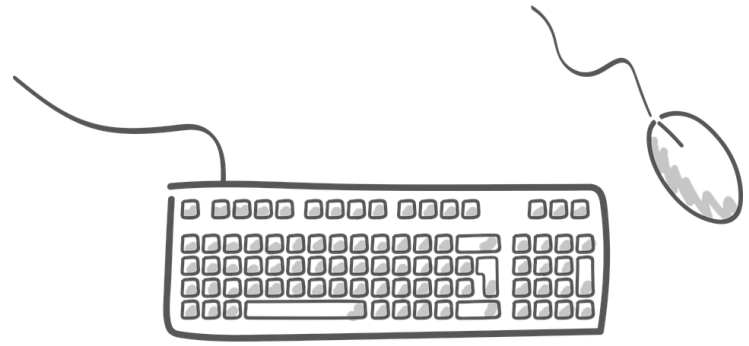
-  CJIS
-  CMMC
-  CNSSI 1253
-  DFARS
-  DoD IL2
-  DoD IL4
-  DoD IL5
-  DoD IL6
-  DoE 10 CFR Part 810
-  EAR
-  FedRAMP
-  FIPS 140

US government

-  ICD 503
-  IRS 1075
-  ITAR
-  JSIG
-  NDAA
-  NIST 800-161
-  NIST 800-171
-  NIST 800-53
-  NIST 800-63
-  NIST CSF
-  Section 508 VPATs
-  StateRAMP



Demo



- Exploring Azure Compliance portal (PCI DSS, EU GDPR)



Azure Governance

- Function Apps are accessed only via HTTPS
- Azure Storage Accounts only allow AAD authentication
- API Management to disallow public network access
- Azure Cosmos DB accounts should have firewall rules
- Azure Cosmos DB should use CMKs to encrypt data at rest



Azure Governance

- User data should not be stored outside North America
- Developers are not allowed to create VMs in the DEV subscription
- Make sure the resource location matches its resource group location
- Specify a set of VM sizes that your team can deploy





Azure Policy

“Azure Policy helps to enforce organizational standards and to assess compliance at-scale.”

Microsoft



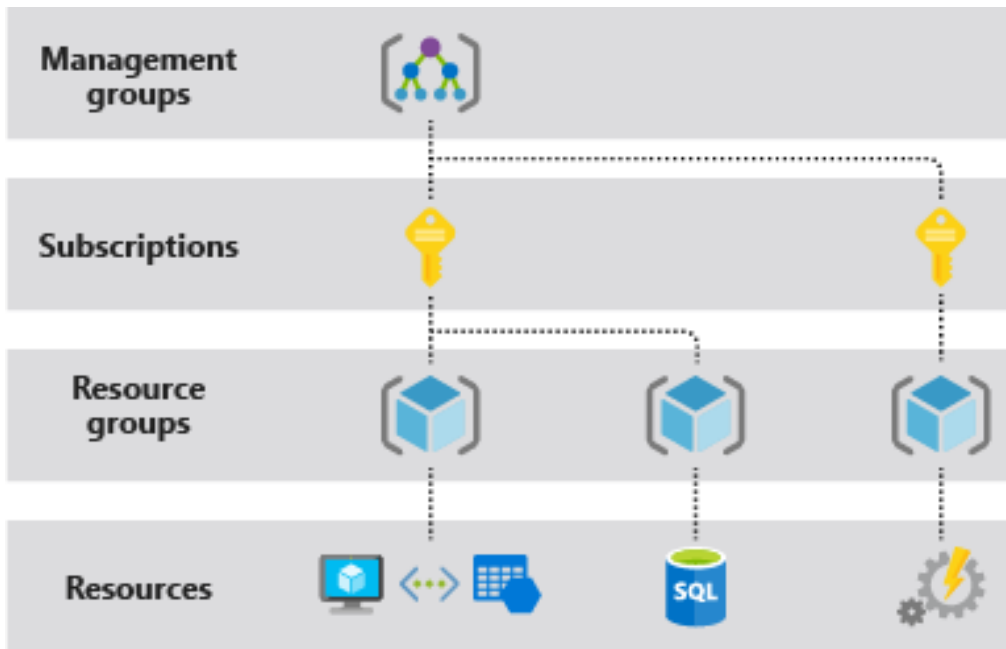
Azure Policy Assignment Steps

- Choose the right built-in **policy definition** for your task.
- If no built-in definition, **create a custom policy**
- Determine the **scope** for the policy
- **Assign** the policy definition to the desired scope



Azure Policy Scope

- Azure Subscription
- Azure Resource Group



[See reference](#)



Azure Policy Definition Structure

- Type
- Display name, description
- Mode
- Metadata
- Parameters
- Policy rule (logical evaluation, effect)



Audit virtual machines without disaster recovery configured ...

Policy definition

[Assign](#) [Edit definition](#) [Duplicate definition](#) [Delete definition](#) [Export definition](#)

^ Essentials

Name : Audit virtual machines without disaster recovery configured

Definition location : --

Description : Audit virtual machines which do not have disaster recovery configured. To learn...

Definition ID : /providers/Microsoft.Authorization/policyDefinitions/0015ea4d-51ff-4ce3-8d...

Available Effects : AuditIfNotExists

Type : Built-in

Category : Compute

Mode : All

Definition Assignments (0)

```
1  {
2    "properties": {
3      "displayName": "Audit virtual machines without disaster recovery configured",
4      "policyType": "BuiltIn",
5      "mode": "All",
6      "description": "Audit virtual machines which do not have disaster recovery configured. To learn more about disaster recovery, visit https://aka.ms/a",
7      "metadata": {
8        "version": "1.0.0",
9        "category": "Compute"
10     },
11     "parameters": {},
12     "policyRule": {
13       "if": {
14         "field": "type",
15         "in": [
16           "Microsoft.Compute/virtualMachines",
17           "Microsoft.ClassicCompute/virtualMachines"
18         ]
19       },
20       "then": {
```

Azure Policy Effect

- Each policy definition in Azure Policy has a single effect.
- Determines what happens when the policy rule is evaluated
- The effects behave differently if they are for a *new resource*, an *updated resource*, or an *existing resource*



Azure Policy Effect

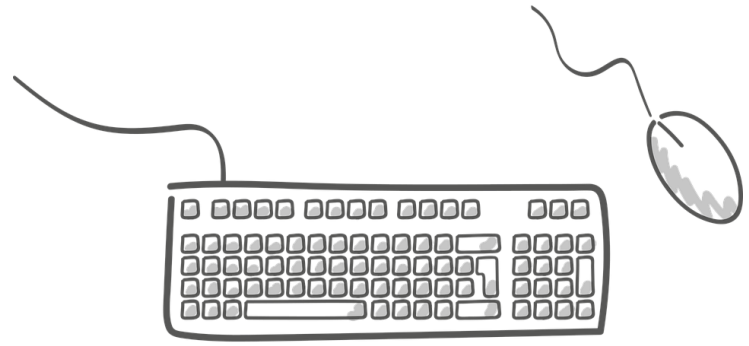
- Append
- Audit
- AuditIfNotExists
- Deny
- DeployIfNotExists
- Disabled
- Modify

See reference



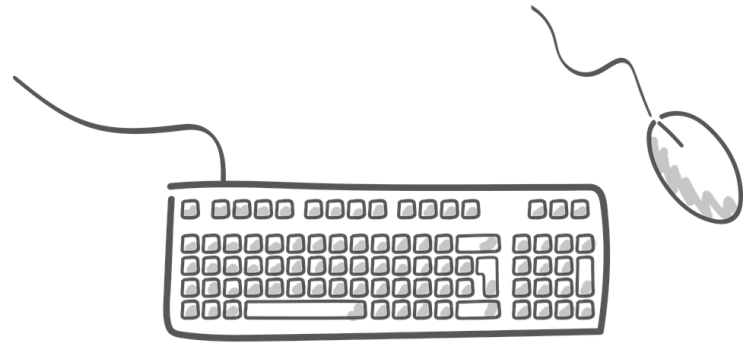
Demo

- Exploring the [Azure Policy overview page](#)

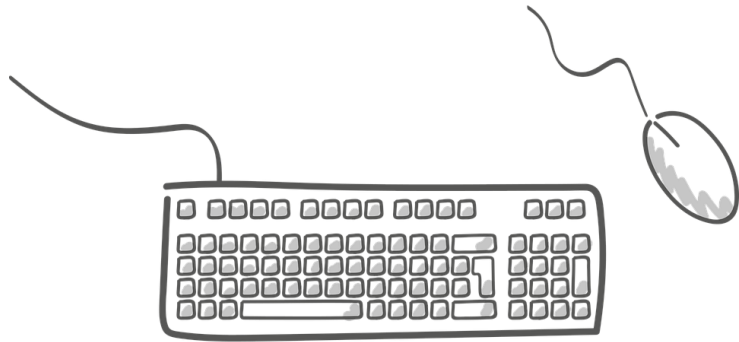


Demo

- Built-in general Policy definitions



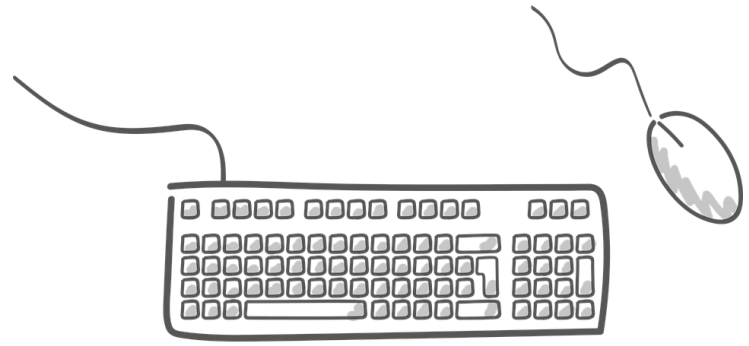
Demo



- Policy definitions for specific resource types



Demo



- Identifying the right built-in policy for your scenario



Azure Policy Assignment Structure

- Display name, description
- Metadata
- Enforcement mode
- Excluded scopes
- Policy definition
- Non-compliance messages
- Parameters
- Identity

See reference



Policy | Assignments

×

Search (Ctrl+/)



Assign policy

Assign initiative

Refresh

- Overview
- Getting started
- Compliance
- Remediation
- Events

Authoring

- Definitions
- Assignments
- Exemptions

Scope

Pay-As-You-Go



Definition type

All definition types



Search

Filter by name or ID...

Now create custom non-compliance messages for policy assignments. Learn more <https://aka.ms/policyassignmentnoncompliancessage>

Total Assignments ⓘ

1

Initiative Assignments ⓘ

1

Policy Assignments ⓘ

0

Assignment name ↑↓

Scope ↑↓


Type ↑↓

ASC Default (subscription: 19969c81-e8ff-4585-8c2f-3f196b588227)






Pay-As-You-Go

Initiative






 Search (Ctrl+/)



-  Overview
-  Getting started
-  Compliance
-  Remediation
-  Events


Authoring

-  Definitions
-  Assignments
-  Exemptions

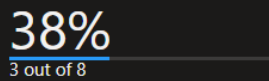
Scope

Pay-As-You-Go

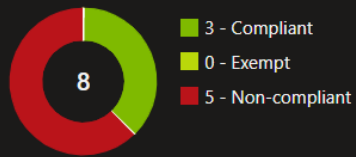


 Get notified of compliance state changes! Use event-based architecture to react to notifications with an Azure Function, Logic App, or any other supported event handler. [Learn more https://aka.ms/policyPlusEventGrid](https://aka.ms/policyPlusEventGrid)

Overall resource compliance ⓘ




Resources by compliance state ⓘ



Non-compliant initiatives ⓘ





LEARN MORE

[Learn about Policy](#) 
[Onboarding tutorial](#)

Non-compliant policies ⓘ



Name	↑↓	Scope	↑↓	Compliance state	↑↓	Resource compli...↑↓	Non-Compliant Reso...↑↓	Non-compliant polici...↑↓
 ASC Default (subscription...		Pay-As-You-Go		 Non-compliant		38% (3 out of 8)	5	38

[View all](#)

Built-in Azure Policy Definitions

[API Management](#)

[App Service](#)

[Azure Databricks](#)

[Bot Service](#)

[Cognitive Services](#)

[Compute](#)

[Cosmos DB](#)

[General](#)

[Key Vault](#)

[Network](#)

[Service Bus](#)

[SQL](#)

[Storage](#)

[Tags](#)

[See reference](#)



Policy | Definitions

Search (Ctrl+ /)

- Overview
- Getting started
- Compliance
- Remediation
- Events

Authoring

- Definitions
- Assignments
- Exemptions

+ Policy definition + Initiative definition ↺ Export definitions ↻ Refresh

Scope

Pay-As-You-Go

Definition type

All definition types












Category

All categories

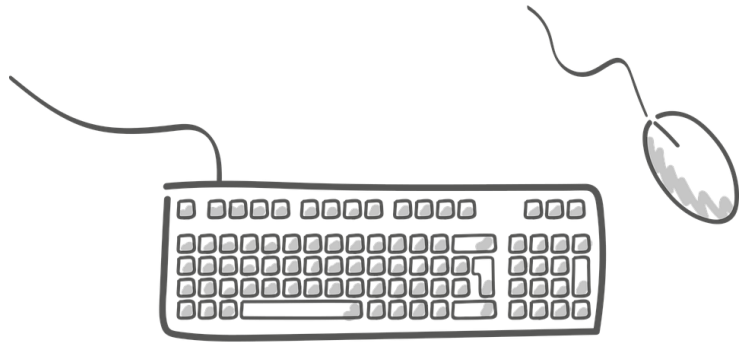
Search

Filter by name or ID...

Now export your definitions and assignments to GitHub and manage them using actions! Click on 'Export definition' menu option. [Learn more](#)

Name ↑↓	Definition location ↑↓	Policies ↑↓	Type ↑↓	Definition type ↑↓
 Audit virtual machines without disaster recovery confi...			BuiltIn	Policy
 Vulnerability assessment should be enabled on your S...			BuiltIn	Policy
 SQL Server Integration Services integration runtimes ...			BuiltIn	Policy
 [Preview]: Configure VMSS created with Shared Image...			BuiltIn	Policy
 Private endpoint connections on Batch accounts shou...			BuiltIn	Policy
 Azure Backup should be enabled for Virtual Machines			BuiltIn	Policy
 Configure a private DNS Zone ID for table groupID			BuiltIn	Policy
 [Preview]: Azure Security agent should be installed on...			BuiltIn	Policy
 Cognitive Services accounts should restrict network a...			BuiltIn	Policy
 Azure Kubernetes Service Private Clusters should be e...			BuiltIn	Policy
 Audit Linux machines that have the specified applicati...			BuiltIn	Policy

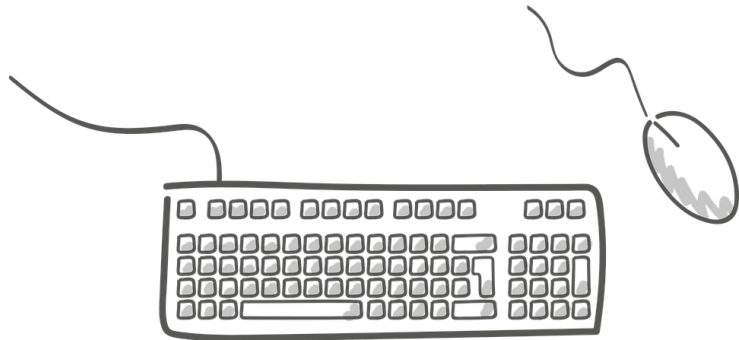
Demo



- Using policies to limit deployment locations (regions)
- Using policies to limit allowed resource types
- Using policies to enforce resource tagging
- Using policies to enforce proper resource logging (resource log)



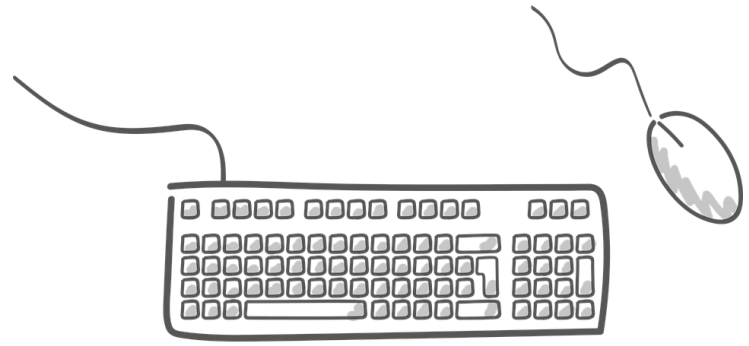
Demo



- Storage accounts should restrict network access using virtual network rules
- Secure transfer to storage accounts should be enabled
- Storage accounts should be limited by allowed SKUs
- Storage accounts should prevent shared key access
- Storage accounts should disable public network access
- Storage accounts should have the specified minimum TLS version



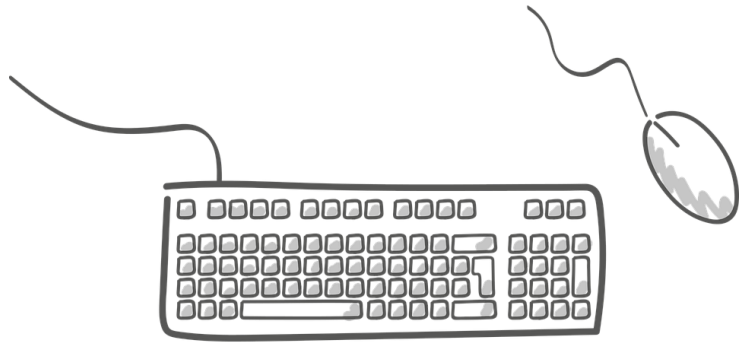
Demo



- Azure Cosmos DB should disable public network access
- Azure Cosmos DB accounts should have firewall rules
- Configure CosmosDB accounts with private endpoints
- Enable Azure Cosmos DB throughput policy



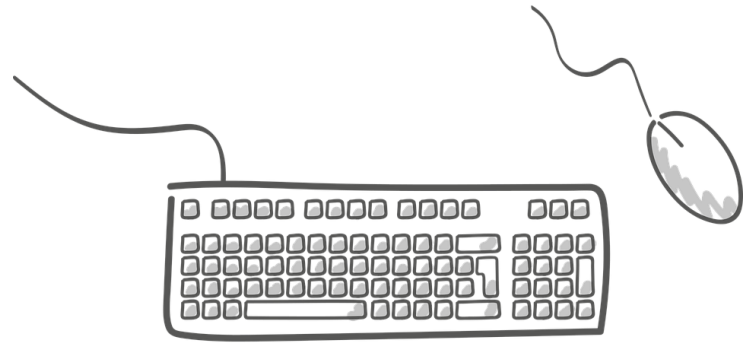
Demo



- Function apps should use managed identity
- Configure Function apps to turn off remote debugging
- Function apps should only be accessible over HTTPS
- Function apps should use latest 'HTTP Version'



Demo



- Azure Service Bus namespaces should use private link
- Service Bus Namespaces should disable public network access
- Resource logs in Service Bus should be enabled



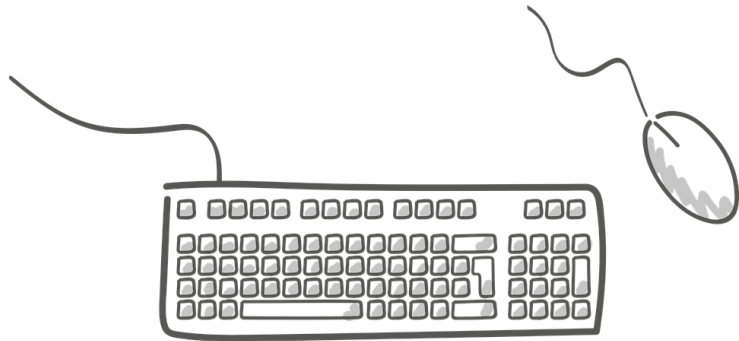
Creating Custom Policy Definitions

- When there is **no built-in policy** matching your needs
- Create a new policy definition
- **Assign** the policy to desired scopes.
- **Store the policy definition** JSON in source control

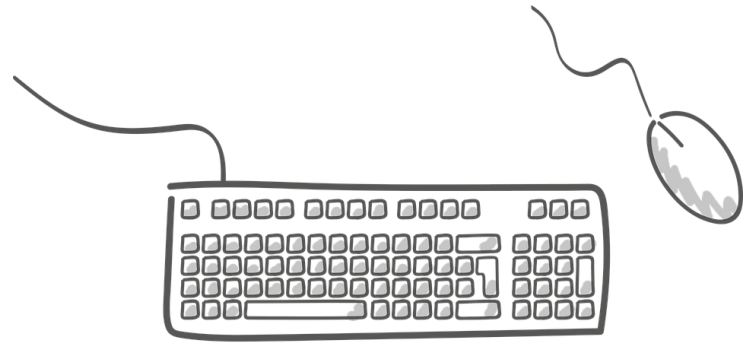


Demo

- Creating a new custom policy definition



Demo



- Assigning our new custom policy definition



Azure Policy Exemptions

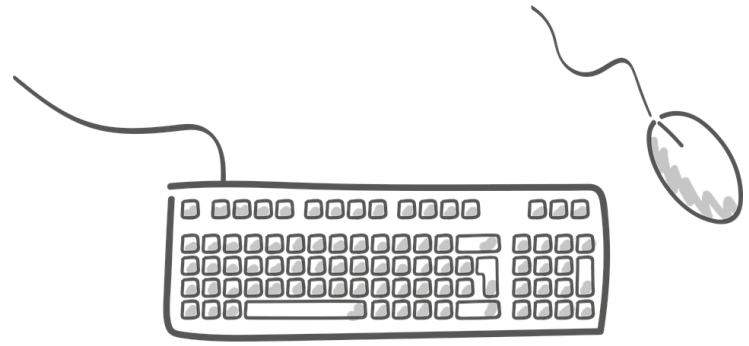
“The Azure Policy exemptions feature is used to exempt a resource hierarchy or an individual resource from evaluation of initiatives or definitions.”

Microsoft



Demo

- Azure Policy Exemptions



Azure Policy Initiative

“An Azure Policy initiative is a collection of Azure Policy definitions, or rules, that are grouped together towards a specific goal or purpose. “

Microsoft



Policy | Definitions

Search (Ctrl+ /)

- Overview
- Getting started
- Compliance
- Remediation
- Events

Authoring

- Definitions
- Assignments
- Exemptions

+ Policy definition + Initiative definition Export definitions Refresh

Scope

Pay-As-You-Go

Definition type

Initiative












Category

All categories

Search

Filter by name or ID...

Now export your definitions and assignments to GitHub and manage them using actions! Click on 'Export definition' menu option. Learn more








Name ↑↓	Definition location ↑↓	Policies ↑↓	Type ↑↓	Definition type 1
 NIST SP 800-171 Rev. 2		247	BuiltIn	Initiative
 Audit machines with insecure password security settings		9	BuiltIn	Initiative
 Deploy Windows Azure Monitor Agent with user-assigne...		5	BuiltIn	Initiative
 IRS1075 September 2016		60	BuiltIn	Initiative
 Configure Linux machines to run Azure Monitor Agent an...		4	BuiltIn	Initiative
 Deploy prerequisites to enable Guest Configuration polici...		4	BuiltIn	Initiative
 NIST SP 800-53 Rev. 5		955	BuiltIn	Initiative
 CIS Microsoft Azure Foundations Benchmark v1.1.0		86	BuiltIn	Initiative
 Azure Security Benchmark		203	BuiltIn	Initiative
 Enable Azure Monitor for VMSS with Azure Monitoring A...		6	BuiltIn	Initiative
 [Preview]: Australian Government ISM PROTECTED		55	BuiltIn	Initiative

Azure compliance documentation



If your organization needs to comply with legal or regulatory standards, start here to learn about compliance in Azure.

Compliance offerings



Global

-  CIS benchmark
-  CSA STAR Attestation
-  CSA STAR Certification
-  CSA STAR self-assessment
-  SOC 1
-  SOC 2
-  SOC 3

Global

-  ISO 20000-1
-  ISO 22301
-  ISO 27001
-  ISO 27017
-  ISO 27018
-  ISO 27701
-  ISO 9001
-  WCAG

US government

-  CJIS
-  CMMC
-  CNSSI 1253
-  DFARS
-  DoD IL2
-  DoD IL4
-  DoD IL5
-  DoD IL6
-  DoE 10 CFR Part 810
-  EAR
-  FedRAMP
-  FIPS 140

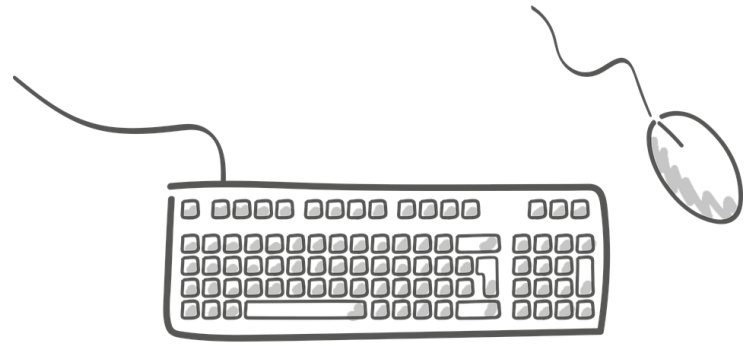
US government

-  ICD 503
-  IRS 1075
-  ITAR
-  JSIG
-  NDAA
-  NIST 800-161
-  NIST 800-171
-  NIST 800-53
-  NIST 800-63
-  NIST CSF
-  Section 508 VPATs
-  StateRAMP



Demo

- Exploring built-in policy initiatives



Course Repository

<https://github.com/zaalion/oreilly-policy-governance>





Q&A



O'REILLY[®]

Thank you!

Reza Salehi

@zaalion

