



# Study guide reference for Microsoft Exam 70-532

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# Useful links

## **Azure subscription and service limits, quotas, and constraints**

<http://azure.microsoft.com/en-us/documentation/articles/azure-subscription-service-limits/>

## **Azure Documentation Center**

<http://azure.microsoft.com/en-us/documentation/>


## **Azure Free Trial**

<http://azure.microsoft.com/en-us/pricing/free-trial/>

# Reference

The screenshot shows a web browser window with the URL [microsoft.com/en-us/learning/exam-70-532.aspx](https://www.microsoft.com/en-us/learning/exam-70-532.aspx). The page features a dark navigation bar with the Microsoft logo and various menu items like 'Technologies', 'Documentation', and 'Resources'. Below this is a search bar and a user profile for 'Ricardo'. The main content area has a blue banner at the top that says 'Boost your exam-day confidence with an [Exam Replay](#) or an [Exam Replay with Practice Test](#).' The title 'Exam 70-532' is followed by the Visual Studio logo and the course title 'Developing Microsoft Azure Solutions'. Key details include the publication date (September 1, 2014), supported languages (English, Spanish, Chinese, etc.), and the price of \$165.00 USD\*. There is a 'Schedule exam' button and a section for 'Special pricing on Microsoft Azure certification' with a rocket icon. A video thumbnail shows a man speaking, with the caption 'Watch an online prep session'. At the bottom, there is a note about online proctored delivery and social media links for '@MSLearning'.

Exam 70-532

 Visual Studio

Developing Microsoft Azure Solutions

**Published:** September 1, 2014

**Languages:** English, Spanish, Chinese (Simplified), Chinese (Traditional), French, German, Japanese, Portuguese (Brazil), Russian


**Audiences:** [Developers](#)


**Technology:** Microsoft Visual Studio, Microsoft Azure

**Credit toward certification:** MCP, MCSA, MCSE, MCSD

**\$165.00 USD\***

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<https://www.microsoft.com/en-us/learning/exam-70-532.aspx>

# Skills measured

Exam 70-532: Developer

microsoft.com/en-us/learning/exam-70-532.aspx

## Skills measured

This exam measures your ability to accomplish the technical tasks listed below. The percentages indicate the relative weight of each major topic area on the exam. The higher the percentage, the more questions you are likely to see on that content area on the exam. View video tutorials about the [variety of question types](#) on Microsoft exams.

**Please note that the questions may test on, but will not be limited to, the topics described in the bulleted text.**

Do you have feedback about the relevance of the skills measured on this exam? Please [send Microsoft your comments](#). All feedback will be reviewed and incorporated as appropriate while still maintaining the validity and reliability of the certification process. Note that Microsoft will not respond directly to your feedback. We appreciate your input in ensuring the quality of the Microsoft Certification program.

If you have concerns about specific questions on this exam, please submit an [exam challenge](#).

If you have other questions or feedback about Microsoft Certification exams or about the certification program, registration, or promotions, please contact your [Regional Service Center](#).

Since the last exam update, Microsoft Azure has had significant technology changes, and we are updating the exam objectives to include them. As of November 22, 2016, this exam reflects these changes.

**Note** To ensure that they are aware of the latest updates, it is recommended that all individuals registering for this exam review this page several times before their scheduled exam.

[Show all](#)

- + Create and manage Azure Resource Manager Virtual Machines (30–35%)
- + Design and implement a storage and data strategy (25–30%)
- + Manage identity, application, and network services (15–20%)
- + Design and implement Azure PaaS compute and web and mobile services (25–30%)

# Create and manage Azure Resource Manager Virtual Machines (30 - 35%)

## Deploy workloads on Azure Resource Manager (ARM) Virtual Machines (VMs)

- Identify workloads that can and cannot be deployed
- Run workloads, including Microsoft and Linux
- Create VMsIdentificar cargas de trabalho que podem e não podem ser implantadas

<https://support.microsoft.com/en-us/help/2721672/microsoft-server-software-support-for-microsoft-azure-virtual-machines>

<https://docs.microsoft.com/en-us/azure/virtual-machines/>

<https://azure.microsoft.com/en-us/documentation/learning-paths/virtual-machines/>

# Create and manage Azure Resource Manager Virtual Machines (30 - 35%)

## Perform configuration management

- Automate configuration management by using PowerShell Desired State Configuration and VM Agent (custom script extensions)
- Configure VMs using a configuration management tool, such as Puppet or Chef
- Enable remote debugging

<https://azure.microsoft.com/en-us/blog/automating-vm-configuration-using-powershell-dsc-extension/>

<https://blogs.msdn.microsoft.com/powershell/2014/04/03/configuring-an-azure-vm-using-powershell-dsc/>

<https://blogs.msdn.microsoft.com/powershell/2014/08/07/introducing-the-azure-powershell-dsc-desired-state-configuration-extension/>

<https://azure.microsoft.com/en-us/blog/automating-vm-customization-tasks-using-custom-script-extension/>

<https://azure.microsoft.com/en-us/blog/azure-virtual-machines-using-chef-puppet-and-docker-for-managing-linux-vm/>

<https://docs.microsoft.com/en-us/azure/cloud-services/cloud-services-virtual-machines-dotnet-continuous-delivery-remote-debugging#a-nameenabling-remote-debugging-for-virtual-machinesahabilitando-a-depuracao-remota-para-maquinas-virtuais>

# Create and manage Azure Resource Manager Virtual Machines (30 - 35%)

## Configure ARM VM networking

- Configure static IP addresses, Network Security Groups (NSG), DNS, User Defined Routes (UDRs), external and internal load balancing with HTTP and TCP health probes, public IPs, firewall rules, and direct server return
- Design and implement Application Gateway

<https://docs.microsoft.com/en-us/azure/networking/networking-overview>

<https://docs.microsoft.com/en-us/azure/virtual-network/virtual-networks-static-private-ip-arm-pportal>

<https://docs.microsoft.com/en-us/azure/virtual-network/virtual-networks-nsg>

<https://docs.microsoft.com/en-us/azure/virtual-network/virtual-networks-create-nsg-arm-pportal>

<https://docs.microsoft.com/en-us/azure/virtual-network/virtual-networks-udr-overview>

<https://docs.microsoft.com/en-us/azure/load-balancer/load-balancer-overview>

<https://docs.microsoft.com/en-us/azure/application-gateway/>

# Create and manage Azure Resource Manager Virtual Machines (30 - 35%)

## Scale ARM VMs

- Scale up and scale down VM sizes, deploy ARM VM Scale Sets (VMSS), configure ARM VMSS auto-scale

<https://docs.microsoft.com/en-us/azure/virtual-machine-scale-sets/>

<https://docs.microsoft.com/en-us/azure/virtual-machine-scale-sets/virtual-machine-scale-sets-overview>



# Create and manage Azure Resource Manager Virtual Machines (30 - 35%)

## Design and implement ARM VM storage

- Configure disk caching, plan for storage capacity, configure shared storage using Azure File service, configure geo-replication, implement ARM VMs with Standard and Premium Storage

<https://docs.microsoft.com/en-us/azure/storage/storage-premium-storage-performance>

<https://docs.microsoft.com/en-us/azure/storage/storage-dotnet-how-to-use-files>

<https://docs.microsoft.com/en-us/azure/storage/storage-redundancy>

<https://docs.microsoft.com/en-us/azure/storage/storage-about-disks-and-vhds-windows>

<https://docs.microsoft.com/en-us/azure/storage/storage-about-disks-and-vhds-linux>

# Create and manage Azure Resource Manager Virtual Machines (30 - 35%)

## Monitor ARM VMs

- Configure ARM VM monitoring, configure alerts, configure diagnostic and monitoring storage location

<https://docs.microsoft.com/en-us/azure/virtual-machines/windows/tutorial-monitoring>

<https://docs.microsoft.com/en-us/azure/virtual-machines/linux/tutorial-monitoring>

<https://docs.microsoft.com/en-us/azure/storage/storage-monitoring-diagnosing-troubleshooting>

# Create and manage Azure Resource Manager Virtual Machines (30 - 35%)

## Manage ARM VM availability

- Configure multiple ARM VMs in an availability set for redundancy, configure each application tier into separate availability sets, combine the Load Balancer with availability sets
- <https://docs.microsoft.com/en-us/azure/virtual-machines/windows/manage-availability>
- <https://docs.microsoft.com/en-us/azure/virtual-machines/windows/create-availability-set>

# Design and implement a storage and data strategy (25-30%)

## Implement Azure Storage blobs and Azure files

- Read data, change data, set metadata on a container, store data using block and page blobs, stream data using blobs, access blobs securely, implement async blob copy, configure Content Delivery Network (CDN), design blob hierarchies, configure custom domains, scale blob storage

<https://docs.microsoft.com/en-us/azure/storage/>

<https://docs.microsoft.com/en-us/azure/storage/storage-introduction>

<https://docs.microsoft.com/en-us/azure/cdn/cdn-create-a-storage-account-with-cdn>

<https://docs.microsoft.com/en-us/rest/api/storageservices/set-container-metadata>

<https://docs.microsoft.com/en-us/azure/storage/storage-dotnet-how-to-use-blobs>

# Design and implement a storage and data strategy (25-30%)

## Implement Azure storage tables and queues

- Implement CRUD with and without transactions, design and manage partitions, query using OData, scale tables and partitions, add and process messages, retrieve a batch of messages, scale queues

<https://docs.microsoft.com/en-us/azure/storage/storage-table-design-guide>

<https://docs.microsoft.com/en-us/rest/api/storageservices/addressing-queue-service-resources>

<https://docs.microsoft.com/en-us/azure/storage/storage-dotnet-how-to-use-queues>

# Design and implement a storage and data strategy (25-30%)

## Manage access and monitor storage

- Generate shared access signatures, including client renewal and data validation <https://docs.microsoft.com/en-us/azure/storage/storage-dotnet-shared-access-signature-part-1>
- Create stored access policies; regenerate storage account keys <https://docs.microsoft.com/en-us/azure/storage/storage-dotnet-shared-access-signature-part-2>
- Configure and use Cross-Origin Resource Sharing (CORS) <https://docs.microsoft.com/en-us/sql/relational-databases/lesson-1-create-stored-access-policy-and-shared-access-signature>
- Set retention policies and logging levels
- Analyze logs <https://docs.microsoft.com/en-us/rest/api/storageservices/cross-origin-resource-sharing--cors--support-for-the-azure-storage-services>

# Design and implement a storage and data strategy (25-30%)

## Implement Azure SQL Databases

- Choose the appropriate database tier and performance level, configure and perform point-in-time recovery, enable geo-replication, import and export data and schema, scale Azure SQL databases

<https://azure.microsoft.com/en-us/documentation/learning-paths/sql-database-training-learn-sql-database/>

<https://docs.microsoft.com/en-us/azure/sql-database/sql-database-service-tiers>

<https://docs.microsoft.com/en-us/azure/sql-database/sql-database-technical-overview>

# Design and implement a storage and data strategy (25-30%)

## Implement Azure DocumentDB

- Create databases and collections, query documents, run DocumentDB queries

<https://docs.microsoft.com/en-us/azure/cosmos-db/>

<https://docs.microsoft.com/en-us/azure/cosmos-db/tutorial-develop-documentdb-dotnet>

<https://docs.microsoft.com/en-us/azure/cosmos-db/tutorial-query-documentdb>



# Design and implement a storage and data strategy (25-30%)

## Implement Redis caching

- Choose a cache tier, implement data persistence, implement security and network isolation, tune cluster performance

<https://azure.microsoft.com/en-us/documentation/learning-paths/redis-cache/>

<https://docs.microsoft.com/en-us/azure/redis-cache/>

<https://azure.microsoft.com/en-us/services/cache/>

<https://docs.microsoft.com/en-us/azure/redis-cache/cache-premium-tier-intro>

<https://docs.microsoft.com/en-us/azure/redis-cache/cache-faq#what-redis-cache-offering-and-size-should-i-use>

<https://docs.microsoft.com/en-us/azure/redis-cache/cache-configure>

<https://docs.microsoft.com/en-us/azure/redis-cache/cache-how-to-premium-clustering>

# Design and implement a storage and data strategy (25-30%)

## Implement Redis caching

- Choose a cache tier, implement data persistence, implement security and network isolation, tune cluster performance

<https://docs.microsoft.com/en-us/azure/redis-cache/cache-how-to-monitor>

<https://docs.microsoft.com/en-us/azure/app-service-web/web-sites-connect-to-redis-using-memcache-protocol>

# Design and implement a storage and data strategy (25-30%)

## Implement Azure Search

- Create a service index, add data, search an index, handle search results

<https://docs.microsoft.com/en-us/azure/search/>

<https://docs.microsoft.com/en-us/azure/search/search-what-is-azure-search>

<https://docs.microsoft.com/en-us/azure/search/search-sku-tier>

<https://docs.microsoft.com/en-us/azure/search/search-create-service-portal>

<https://docs.microsoft.com/en-us/azure/search/search-what-is-an-index>

<https://docs.microsoft.com/en-us/azure/search/search-what-is-data-import>

<https://docs.microsoft.com/en-us/azure/search/search-query-overview>

# Design and implement a storage and data strategy (25-30%)

## Implement Azure Search

- Create a service index, add data, search an index, handle search results

<https://docs.microsoft.com/en-us/azure/search/search-manage>

<https://docs.microsoft.com/en-us/azure/search/search-lucene-query-architecture>

# Manage identify, application and network services (15-20%)

## Integrate an app with Azure Active Directory (Azure AD)

- Develop apps that use WS-federation, OAuth, and SAML-P endpoints
- Query the directory using Graph API

<https://docs.microsoft.com/en-us/azure/active-directory/develop/active-directory-integrating-applications>

<https://docs.microsoft.com/en-us/azure/active-directory/develop/active-directory-protocols-openid-connect-code>

<https://docs.microsoft.com/en-us/azure/active-directory/develop/active-directory-saml-protocol-reference>

<https://docs.microsoft.com/en-us/azure/active-directory/develop/active-directory-graph-api>

# Manage identify, application and network services (15-20%)

## Design and implement a communication strategy

- Implement hybrid connections to access data sources on-premises, leverage site-to-site (S2S) VPN and ExpressRoute to connect to an on-premises infrastructure

<https://docs.microsoft.com/en-us/azure/app-service-web/web-sites-hybrid-connection-get-started>

<https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-howto-site-to-site-resource-manager-portal>

<https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-howto-point-to-site-resource-manager-portal>

<https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-about-vpngateways>

# Manage identify, application and network services (15-20%)

## Design and implement a messaging strategy

- Develop and scale messaging solutions using service bus queues, topics, relays, and notification hubs; monitor service bus queues, topics, relays, event hubs, and notification hubs

<https://azure.microsoft.com/en-us/documentation/learning-paths/service-bus/>

<https://docs.microsoft.com/en-us/azure/service-bus-messaging/service-bus-messaging-overview>

<https://docs.microsoft.com/en-us/azure/service-bus-messaging/service-bus-fundamentals-hybrid-solutions#queues>

<https://docs.microsoft.com/en-us/azure/service-bus-messaging/service-bus-fundamentals-hybrid-solutions#topics>

<https://docs.microsoft.com/en-us/azure/service-bus-messaging/service-bus-fundamentals-hybrid-solutions#relays>

<https://azure.microsoft.com/en-us/documentation/learning-paths/event-hubs/>

# Manage identify, application and network services (15-20%)

## Design and implement a messaging strategy

- Develop and scale messaging solutions using service bus queues, topics, relays, and notification hubs; monitor service bus queues, topics, relays, event hubs, and notification hubs

<https://docs.microsoft.com/en-us/azure/event-hubs/event-hubs-what-is-event-hubs>

<https://azure.microsoft.com/en-us/services/event-hubs/>

<https://docs.microsoft.com/en-us/azure/notification-hubs/notification-hubs-push-notification-overview>



# Manage identify, application and network services (15-20%)

## Develop apps that use Azure AD B2C and Azure AD B2B

- Design and implement .NET MVC, Web API, and Windows desktop apps that leverage social identity provider authentication, including Microsoft account, Facebook, Google+, Amazon, and LinkedIn  
<https://azure.microsoft.com/en-us/documentation/learning-paths/active-directory-developer/>
- Leverage Azure AD B2B to design and implement applications that support partner-managed identities  
<https://docs.microsoft.com/en-us/azure/active-directory-b2c/active-directory-b2c-overview>  
<https://docs.microsoft.com/en-us/azure/active-directory/active-directory-b2b-what-is-azure-ad-b2b>

# Design and implement Azure PaaS compute and web and mobile services (25-30%)

## Design Azure App Service Web Apps

- Define and manage App Service plans
- Configure Web Apps settings, certificates, and custom domains
- Manage Web Apps by using the API, Azure PowerShell, and Xplat-CLI
- Implement diagnostics, monitoring, and analytics
- Implement web jobs; design and configure Web Apps for scale and resilience

<https://azure.microsoft.com/en-us/documentation/learning-paths/appservice-webapps/>

<https://docs.microsoft.com/en-us/azure/app-service/>

<https://docs.microsoft.com/en-us/azure/app-service/app-service-value-prop-what-is>

<https://azure.microsoft.com/en-us/pricing/details/app-service/>

<https://docs.microsoft.com/en-us/azure/app-service/azure-web-sites-web-hosting-plans-in-depth-overview>

<https://docs.microsoft.com/en-us/azure/app-service-web/web-sites-configure>

<https://docs.microsoft.com/en-us/azure/app-service-web/app-service-web-tutorial-custom-domain>

# Design and implement Azure PaaS compute and web and mobile services (25-30%)

## Design Azure App Service Web Apps

- Define and manage App Service plans <https://docs.microsoft.com/en-us/azure/app-service-web/web-sites-enable-diagnostic-log>
  - Configure Web Apps settings, certificates, and custom domains <https://docs.microsoft.com/en-us/azure/app-service-web/web-sites-scale>
  - Manage Web Apps by using the API, Azure PowerShell, and Xplat-CLI <https://docs.microsoft.com/en-us/azure/app-service-web/websites-dotnet-webjobs-sdk>
  - Implement diagnostics, monitoring, and analytics <https://docs.microsoft.com/en-us/azure/app-service-web/web-sites-security>
  - Implement web jobs; design and configure Web Apps for scale and resilience <https://docs.microsoft.com/en-us/azure/app-service-web/app-service-web-tutorial-custom-ssl>
- <https://docs.microsoft.com/en-us/azure/app-service-web/web-sites-deploy>
- <https://docs.microsoft.com/en-us/cli/azure/appservice>

# Design and implement Azure PaaS compute and web and mobile services (25-30%)

## Implement Azure Functions

- Create Azure Functions, implement a webhook function, create an event processing function, implement an Azure-connected function
  - <https://docs.microsoft.com/en-us/azure/azure-functions/functions-overview>
  - <https://docs.microsoft.com/en-us/azure/azure-functions/functions-create-first-azure-function>
  - <https://docs.microsoft.com/en-us/azure/azure-functions/functions-integrate-storage-queue-output-binding>
  - <https://docs.microsoft.com/en-us/azure/azure-functions/functions-twitter-email>
  - <https://docs.microsoft.com/en-us/azure/azure-functions/functions-create-serverless-api>

# Design and implement Azure PaaS compute and web and mobile services (25-30%)

## Implement API management

- Create managed APIs, configure API management policies, protect APIs with rate limits, add caching to improve performance, monitor APIs, customize the Developer Portal

<https://azure.microsoft.com/en-us/documentation/learning-paths/api-management/>

<https://docs.microsoft.com/en-us/azure/api-management/api-management-key-concepts>

<https://docs.microsoft.com/en-us/azure/api-management/api-management-get-started>

<https://docs.microsoft.com/en-us/azure/api-management/api-management-howto-product-with-rules>

<https://docs.microsoft.com/en-us/azure/api-management/api-management-howto-cache>

# Design and implement Azure PaaS compute and web and mobile services (25-30%)

## Design Azure App Service API Apps

- Create and deploy API Apps, automate API discovery by using Swashbuckle, use Swagger API metadata to generate client code for an API app, monitor API Apps

<https://docs.microsoft.com/en-us/azure/app-service-api/app-service-api-apps-why-best-platform>

<https://docs.microsoft.com/en-us/azure/app-service-api/app-service-api-dotnet-get-started>

<https://docs.microsoft.com/en-us/azure/app-service-api/app-service-api-whats-changed>

<https://docs.microsoft.com/en-us/azure/app-service-web/web-sites-monitor>

# Design and implement Azure PaaS compute and web and mobile services (25-30%)

## Develop Azure App Service Logic Apps

- Create a Logic App connecting SaaS services, create a Logic App with B2B capabilities, create a Logic App with XML capabilities, trigger a Logic App from another app, create custom and long-running actions, monitor Logic Apps

<https://docs.microsoft.com/en-us/azure/logic-apps/logic-apps-what-are-logic-apps>

# Design and implement Azure PaaS compute and web and mobile services (25-30%)

## Develop Azure App Service Mobile Apps

- Create a Mobile App, add offline sync to a Mobile App, add authentication to a Mobile App, add push notifications to a Mobile App

<https://azure.microsoft.com/en-us/documentation/learning-paths/appservice-mobileapps/>

<https://docs.microsoft.com/en-us/azure/app-service-mobile/app-service-mobile-value-prop>



# Design and implement Azure PaaS compute and web and mobile services (25-30%)

## Design and implement Azure Service Fabric apps

- Create a Service Fabric application; build an Actors-based service <https://azure.microsoft.com/en-us/documentation/learning-paths/service-fabric/>
- Add a web front end to a Service Fabric application <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-overview>
- Monitor and diagnose services
- Migrate apps from cloud services <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-overview-microservices>
- Create, secure, upgrade, and scale Service Fabric Cluster in Azure <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-get-started>
- Scale a Service Fabric app <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-create-your-first-application-in-visual-studio>



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