

**70 – 534 : Exam prep by  
- Vijay Mohire**

**Architecting Microsoft Azure Solutions -  
New syllabus**

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## Official exam details

<https://www.microsoft.com/en-in/learning/exam-70-534.aspx>

## Download new exam syllabus

[http://download.microsoft.com/download/E/5/0/E50E05D4-DBBD-4811-A21A-85B78DCF4333/70-534\\_OD.pdf](http://download.microsoft.com/download/E/5/0/E50E05D4-DBBD-4811-A21A-85B78DCF4333/70-534_OD.pdf)

## Objective Domain: Design Azure Resource Manager (ARM) networking (5-10%)

### Design Azure virtual networks

Leverage Azure networking services: implement load balancing using Azure Load Balancer and Azure Traffic Manager; define DNS, DHCP, and IP addressing configuration; define static IP reservations; apply Network Security Groups (NSGs) and User Defined Routes (UDRs); deploy Azure Application Gateway

<https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-vnet-plan-design-arm>

<https://channel9.msdn.com/Series/Windows-Azure-Virtual-Machines-and-Networking-Tutorials/Step-by-step-click-by-click-video-of-creating-Internet-facing-Load-Balancer-and-2-VMs-in-the-portal->

<http://techgenix.com/load-balancers-microsoft-azure/>

<https://docs.microsoft.com/en-us/azure/load-balancer/load-balancer-get-started-internet-arm-ps> - IMP

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

<https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-ip-addresses-overview-arm>

<https://books.google.co.in/books?id=gjR-BAAAQBAJ&pg=PA200&lpg=PA200&dq=DNS,+DHCP,+and+IP+addressing+configuration+using+resource+manager&source=bl&ots=mnnMUXCX3q&sig=ljldQADizzjdhzOGryR1bTyFPAC&hl=en&sa=X&ved=0ahUKEwisoNWP4LvRAhVHrY8KHYxbBj4Q6AEIOzAG#v=onepage&q=DNS%2C%20DHCP%2C%20and%20IP%20addressing%20configuration%20using%20resource%20manager&f=false>

<https://www.microsoftpressstore.com/articles/article.aspx?p=2358300&seqNum=2> - IMP

[https://technet.microsoft.com/en-us/library/hh831353\(v=ws.11\).aspx](https://technet.microsoft.com/en-us/library/hh831353(v=ws.11).aspx) - IPAM

<http://www.techrepublic.com/blog/data-center/how-to-use-ip-address-management-in-windows-server-2012/> - IPAM-IMP

<https://github.com/Microsoft/azure-docs/blob/master/articles/virtual-network/virtual-networks-static-private-ip-arm-portal.md>

<https://blog.kloud.com.au/2014/07/18/static-dip-request-vip-reservation-on-microsoft-azure/>

<https://www.opsgility.com/blog/windows-azure-powershell-reference-guide/setting-static-ip-addresses-in-a-virtual-network/>

<https://www.petri.com/network-security-groups-azure-resource-manager>

<https://docs.microsoft.com/en-us/azure/azure-resource-manager/best-practices-resource-manager-security>

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

<https://blogs.technet.microsoft.com/keithmayer/2015/10/22/step-by-step-user-defined-routing-in-the-cloud-with-azure-resource-manager-and-azure-powershell-1-0-preview/> - IMP New

<https://campus.barracuda.com/product/nextgenfirewallf/article/NGF70/AzureARMUDRWebPortal/>

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

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

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

<https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-linux-infrastructure-networking-guidelines>

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

<https://docs.microsoft.com/en-us/azure/traffic-manager/traffic-manager-load-balancing-azure>

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

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

<https://docs.microsoft.com/en-us/azure/traffic-manager/traffic-manager-powershell-arm>

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

<https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-create-udr-arm-template>

## **Describe Azure VPN and ExpressRoute architecture and design**

Describe Azure P2S and S2S VPN; leverage Azure VPN and ExpressRoute in network architecture

<https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-point-to-site-create>

<https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-howto-point-to-site-rm-ps>

<https://channel9.msdn.com/Blogs/Azure-Documentation-Shorts/AzureP2SStep1of3>

<https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-plan-design>

<https://github.com/Microsoft/azure-docs/blob/master/articles/vpn-gateway/vpn-gateway-howto-site-to-site-resource-manager-portal.md>

<https://scomandoothergeekystuff.com/2016/09/19/creating-a-site-to-site-vpn-with-azure-resource-manager-arm-and-windows-2012r2/> - IMP

<https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-point-to-site-create>

<https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-howto-point-to-site-rm-ps>

<https://github.com/Microsoft/azure-docs/blob/master/articles/vpn-gateway/vpn-gateway-howto-site-to-site-resource-manager-portal.md>

<https://docs.microsoft.com/en-us/azure/vpn-gateway/vpn-gateway-create-site-to-site-rm-powershell>

<https://docs.microsoft.com/en-us/azure/guidance/guidance-hybrid-network-expressroute>

<https://www.microsoftpressstore.com/articles/article.aspx?p=2358300&seqNum=4>

<https://nirajrules.wordpress.com/2015/11/19/azure-expressroute-primer/>

<https://docs.microsoft.com/en-us/azure/guidance/guidance-hybrid-network-expressroute>

## **Objective Domain: Secure resources (20-25%)**

### **Secure resources by using managed identities**

Describe the differences between Active Directory on-premises and Azure Active Directory (AAD); programmatically access AAD using Graph API; secure access to resources from AAD applications using OAuth and OpenID Connect

<http://windowsitpro.com/azure/azure-active-directory-vs-premises-active-directory>

<https://jumpcloud.com/blog/active-directory-azure-active-directory/>

<https://github.com/Microsoft/azure-docs/blob/master/articles/active-directory-b2c/active-directory-b2c-devquickstarts-graph-dotnet.md>

<https://github.com/Microsoft/azure-docs/blob/master/articles/active-directory/active-directory-graph-api.md>

<https://dzimchuk.net/accessing-azure-ad-protected-resources-using-openid-connect/>

<http://nordicapis.com/api-security-oauth-openid-connect-depth/>

<https://docs.microsoft.com/en-us/azure/active-directory/active-directory-authentication-scenarios> - IMP

<https://docs.microsoft.com/en-us/azure/active-directory/active-directory-v2-protocols-oidc>

### **Secure resources by using hybrid identities**

Use SAML claims to authenticate to on-premises resources; describe AD Connect synchronization; implement federated identities using Active Directory Federation Services (AD FS)

<https://technet.microsoft.com/en-us/library/hh305235.aspx>

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

<https://technet.microsoft.com/en-us/library/hh305235.aspx>

<https://msdn.microsoft.com/en-us/library/gg334502.aspx>

<http://techgenix.com/claims-based-identity-what-does-mean-you-part3/>

<https://blog.kloud.com.au/2014/06/06/claims-based-federation-service-using-microsoft-azure/>

<https://docs.microsoft.com/en-us/azure/active-directory/connect/active-directory-aadconnectsync-what-is>

<https://docs.microsoft.com/en-us/azure/active-directory/connect/active-directory-aadconnectsync-configure-filtering>

<https://msdn.microsoft.com/en-us/library/bb897402.aspx>

<https://msdn.microsoft.com/en-us/library/ff359110.aspx>

<https://msdn.microsoft.com/en-us/library/dn589790.aspx>

<https://msdn.microsoft.com/en-us/library/aa479079.aspx>

### **Secure resources by using identity providers**

Provide access to resources using identity providers such as Microsoft account, Facebook, Google, and Yahoo; manage identity and access by using AAD B2C; implement AAD B2B

<https://docs.microsoft.com/en-us/azure/active-directory/fundamentals-identity>

<https://msdn.microsoft.com/en-us/library/hh446534.aspx>

[https://msdn.microsoft.com/en-us/library/jj863497\(v=nav.90\).aspx](https://msdn.microsoft.com/en-us/library/jj863497(v=nav.90).aspx)

<https://azure.microsoft.com/en-in/services/active-directory-b2c/>

<https://azure.microsoft.com/en-in/resources/videos/azureadb2c/>

<https://docs.microsoft.com/en-us/azure/active-directory-b2c/> IMP

<https://channel9.msdn.com/Series/Azure-Active-Directory-Videos-Demos/Consumer-Identity-and-access-management-in-the-cloud-Azure-AD-B2C>

<https://docs.microsoft.com/en-us/azure/active-directory-b2c/active-directory-b2c-overview> IMP

<https://docs.microsoft.com/en-us/azure/active-directory/active-directory-b2b-detailed-walkthrough>

<https://docs.microsoft.com/en-us/azure/active-directory/active-directory-b2b-collaboration-overview>

### **Identify an appropriate data security solution**

Identify security requirements for data in transit and data at rest; implement data security requirements using Azure services, including Azure Storage encryption, Azure Disk Encryption, and Azure SQL Database TDE

<https://docs.microsoft.com/en-us/azure/security/azure-security-data-encryption-best-practices>

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

<https://www.microsoft.com/en-us/trustcenter/Security/default.aspx>

<https://github.com/Microsoft/azure-docs.pl-pl/blob/master/articles/active-directory/active-directory-hybrid-identity-design-considerations-dataprotection-requirements.md>

<https://github.com/Microsoft/azure-docs.pl-pl/blob/master/articles/active-directory/active-directory-hybrid-identity-design-considerations-overview.md> - IMP

<https://github.com/Microsoft/azure-docs.pl-pl/blob/master/articles/active-directory/active-directory-hybrid-identity-design-considerations-contentmgt-requirements.md>

<https://blogs.microsoft.com/microsoftsecure/2015/09/10/cloud-security-controls-series-encrypting-data-at-rest/>

<https://gallery.technet.microsoft.com/Azure-Hybrid-Identity-b06c8288> - Download Hybrid Identity AD book

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

<https://azure.microsoft.com/en-us/blog/announcing-the-general-availability-of-storage-service-encryption-for-data-at-rest/>

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

<https://docs.microsoft.com/en-us/azure/security/azure-security-disk-encryption>

<http://www.eweek.com/cloud/microsoft-enhances-cloud-security-with-azure-storage-encryption.html>

<https://blogs.msdn.microsoft.com/azuresecurity/2016/09/26/azure-disk-encryption-for-linux-vms-and-vms-with-premium-storage-reaches-general-availability/>

<https://azure.microsoft.com/en-us/updates/generally-available-azure-disk-encryption-for-windows-and-linux-for-standard-and-premium-iaas-virtual-machines/>

<https://github.com/Azure/azure-quickstart-templates/tree/master/201-encrypt-running-windows-vm>

<https://msdn.microsoft.com/en-us/library/dn948096.aspx?f=255&MSPPError=-2147217396>

<https://msdn.microsoft.com/en-us/library/bb934049.aspx>

### **Design a role-based access control (RBAC) strategy**

Secure resource scopes such as the ability to create VMs and Azure Web Apps; implement Azure RBAC standard roles; design Azure RBAC custom roles

<https://docs.microsoft.com/en-us/azure/active-directory/role-based-access-control-configure>

<https://docs.microsoft.com/en-us/azure/active-directory/active-directory-v2-scopes>

<https://books.google.co.in/books?id=cNICQAAQBAJ&pg=PT190&lpg=PT190&dq=Secure+resource+scopes+using+Azure&source=bl&ots=VBITBMXDmc&sig=z1YbRKNrupLMVDt3GDQeUNn0-8&hl=en&sa=X&ved=0ahUKEwiM8JL-47zRAhXJtY8KHacLDVkJQ6AEINzAF#v=onepage&q=Secure%20resource%20scopes%20using%20Azure&f=false>

<http://www.azurefieldnotes.com/2016/11/30/azure-role-based-access-control-part-1/>

<https://krajewski.online/2016/05/18/design-a-role-based-access-control-strategy/>

<https://github.com/Microsoft/azure-docs/blob/master/articles/active-directory/active-directory-hybrid-identity-design-considerations-lifecycle-adoption-strategy.md>

<https://docs.microsoft.com/en-us/azure/active-directory/role-based-access-control-what-is>

<https://blog.puneusergroup.org/manage-and-secure-resources-using-azure-resource-groups-and-role-based-access-control-for-management-of-azure/>

<https://cloudpuzzles.net/2015/11/taking-control-of-your-azure-resources-with-rbac-policies-tags-and-locks/>

<https://docs.microsoft.com/en-us/azure/active-directory/role-based-access-built-in-roles>

### **Manage security risks by using an appropriate security solution**

Identify, assess, and mitigate security risks by using Azure Security Center, Operations Management Suite, and other services

<https://docs.microsoft.com/en-us/azure/security-center/security-center-policies>

<https://docs.microsoft.com/en-us/azure/security-center/security-center-incident-response>

<https://docs.microsoft.com/en-us/azure/operations-management-suite/operations-management-suite-overview>

<https://channel9.msdn.com/Shows/TechNet+Radio/TNR1649>

## **Objective Domain: Design an application storage and data access strategy (5-10%)**

### **Design data storage**

Design storage options for data including Table Storage, SQL Database, DocumentDB, Blob Storage, MongoDB, and MySQL; design security options for SQL Database or Azure Storage

<https://channel9.msdn.com/Series/Architecting-Microsoft-Azure-Solutions/03>

<https://www.pluralsight.com/courses/azure-solutions-70-534-storage-data-access> - Course

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

<https://github.com/Microsoft/azure-docs/blob/master/articles/storage/storage-dotnet-how-to-use-tables.md>

<https://github.com/Microsoft/azure-docs/blob/master/articles/sql-database/sql-database-design-patterns-multi-tenancy-saas-applications.md>

<https://docs.microsoft.com/en-us/azure/best-practices-data-partitioning>

<http://www.sqlshack.com/azure-blob-storage-literally-a-hybrid-database-deployment/>

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

<https://docs.microsoft.com/en-us/azure/documentdb/documentdb-sql-query>

<http://www.drdoobs.com/cloud/azure-documentdb-working-with-microsofts/240168992>

<https://alexandrebrisebois.wordpress.com/2013/02/20/windows-azure-blob-storage-polling-task/>

<http://www.jeff.wilcox.name/2013/09/mongodb-azure-linux/>

<https://www.asp.net/aspnet/overview/developing-apps-with-windows-azure/building-real-world-cloud-apps-with-windows-azure/data-storage-options>

<http://serverfault.com/questions/721390/what-type-of-azure-configuration-should-i-use-for-a-mongodb-deployment>



<https://www.asp.net/aspnet/overview/developing-apps-with-windows-azure/building-real-world-cloud-apps-with-windows-azure/data-storage-options>

<https://azure.microsoft.com/en-in/blog/mysql-in-app-preview-app-service/>

<https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-linux-classic-optimize-mysql>

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

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

<https://docs.microsoft.com/en-us/azure/sql-database/sql-database-control-access>

### **Select the appropriate storage option**

Select the appropriate storage for performance; identify storage options for cloud services and hybrid scenarios with compute on-premises and storage on Azure

<https://www.asp.net/aspnet/overview/developing-apps-with-windows-azure/building-real-world-cloud-apps-with-windows-azure/data-storage-options>

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

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

<https://azure.microsoft.com/en-in/services/storage/>

<https://docs.microsoft.com/en-us/azure/cloud-services/cloud-services-sizes-specs>

<http://blog.nwcadence.com/which-azure-storage-option-is-right-for-you/>

<http://blog.nwcadence.com/which-azure-storage-option-is-right-for-you/>

<https://azure.microsoft.com/en-in/blog/deploy-hybrid-scenarios-in-microsoft-cloud/>

<http://searchcloudstorage.techtarget.com/tip/Cloud-storage-options-Public-vs-private-vs-hybrid-cloud-storage>

<https://azure.microsoft.com/en-in/blog/deploy-hybrid-scenarios-in-microsoft-cloud/>

<https://blogs.msdn.microsoft.com/nikosan/2011/12/20/on-premise-storage-sync-with-windows-azure-storage-options/>

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

<https://azure.microsoft.com/en-us/solutions/architecture/backup-archive-on-premises-applications/>

## Objective Domain: Design advanced applications (20-25%)

### Create compute-intensive applications

Design high-performance computing (HPC) and other compute-intensive applications using Azure Services

<https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-windows-a8-a9-a10-a11-specs>

<https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-windows-classic-java-run-compute-intensive-task>

<https://azure.microsoft.com/en-in/solutions/big-compute/>

<https://github.com/Microsoft/azure-docs/blob/master/articles/batch/batch-hpc-solutions.md>

<https://channel9.msdn.com/Events/windowsazure/learn/Building-and-Running-HPC-Applications-in-Windows-Azure>

<https://github.com/Microsoft/azure-docs/blob/master/articles/batch/batch-hpc-solutions.md> - IMP

<https://blog.appliedis.com/2014/03/04/applied-windows-azure-compute-intensive-apps-with-azure-worker-roles/>

<https://trello.com/c/YO42lbpy/18-4-1-create-compute-intensive-applications>

### Create long-running applications

Implement Azure Batch for scalable processing; design stateless components to accommodate scale; use Azure Scheduler

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

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

<https://docs.microsoft.com/en-us/azure/data-factory/data-factory-data-processing-using-batch>

<https://github.com/mszcool/AzureBatchTesseractSample>

[https://blogs.msdn.microsoft.com/microsoft\\_press/2015/05/04/from-the-mvps-application-design-going-stateless-on-azure/](https://blogs.msdn.microsoft.com/microsoft_press/2015/05/04/from-the-mvps-application-design-going-stateless-on-azure/)

<https://books.google.co.in/books?id=aum9BAAAQBAJ&pg=PA256&lpg=PA256&dq=design+long+running+stateless+components+azure&source=bl&ots=RYjIUAYln2&sig=TIzgyY3SNubHupd4xKYdZOKfOLY&hl=en&sa=X&ved=0ahUKEwjHp934177RAhUGNY8KHUw8AZY4ChDoAQhFMak#v=onepage&q=design%20long%20running%20stateless%20components%20azure&f=false>

<http://www.techrepublic.com/article/azures-new-autoscale-feature-makes-vm-deploys-much-easier/>

<https://azure.microsoft.com/en-in/services/scheduler/>

<http://stackoverflow.com/questions/11235787/long-running-or-forever-task-on-windows-azure>

### **Integrate Azure services in a solution**

Design Azure architecture using Azure services such as Azure Active Directory (AAD), Azure AppService, API Management, Azure Cache, Azure Search, Service Bus, Event Hubs, Stream Analytics, and IoT Hub; identify the appropriate use of services such as Azure Machine Learning, Big Data, Azure Media Services, and Azure Search services

<https://msdn.microsoft.com/en-us/library/dn568099.aspx>

<https://azure.microsoft.com/en-us/solutions/architecture/>

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

<https://docs.microsoft.com/en-us/azure/guidance/guidance-web-apps-basic>

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

<https://azure.microsoft.com/en-in/services/api-management/>

<https://www.codit.eu/blog/2016/12/01/bff-pattern-azure-api-management/>

<https://blog.kloud.com.au/2016/09/09/azure-api-management-step-by-step/>

<https://msdn.microsoft.com/en-us/magazine/gg983488.aspx>

<https://docs.microsoft.com/en-us/azure/search/search-modeling-multitenant-saas-applications>

<https://blogs.technet.microsoft.com/privatecloud/2014/12/02/modern-datacenter-architectural-patterns-azure-search-tier/>

<https://alexandrebrisebois.wordpress.com/2014/07/18/getting-acquainted-with-azure-service-bus-event-hubs/> IMP

<https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-real-time-event-processing-reference-architecture>

<https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-build-an-iot-solution-using-stream-analytics>

<https://rahulrai.in/post/building-the-azure-iot-analytics-architecture-prototype/>

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

<https://blogs.msdn.microsoft.com/shishirs/2016/01/25/examples-of-machine-learning-use-cases-of-relevance-to-retail/>

<https://docs.microsoft.com/en-us/azure/machine-learning/machine-learning-algorithm-choice>

<https://msdn.microsoft.com/en-us/library/dn749816.aspx>

<https://msdn.microsoft.com/en-us/library/dn749874.aspx>

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

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

## **Implement messaging applications**

Use a queue-centric pattern for development; select appropriate technology such as Azure Storage Queues, Azure Service Bus queues, topics, subscriptions, and Azure Event Hubs

<https://www.asp.net/aspnet/overview/developing-apps-with-windows-azure/building-real-world-cloud-apps-with-windows-azure/queue-centric-work-pattern> - IMP

[https://blogs.msdn.microsoft.com/jason\\_short/2013/06/02/thoughts-on-queue-centric-workflow-design/](https://blogs.msdn.microsoft.com/jason_short/2013/06/02/thoughts-on-queue-centric-workflow-design/)

<https://buildazure.com/2015/12/19/using-azure-storage-queues-from-net/> - IMP

<https://blog.kloud.com.au/2016/03/01/cloud-cushioning-using-azure-queues/>

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

<https://docs.microsoft.com/en-us/azure/service-bus-messaging/service-bus-dotnet-multi-tier-app-using-service-bus-queues>

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

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

<https://www.codeproject.com/Articles/276400/Using-Windows-Azure-Service-Bus-Messaging>

<https://lockmedown.com/everything-you-need-to-know-about-azure-service-bus-brokered-messaging-part-2/>

<http://microsoftintegration.guru/2015/03/03/azure-event-hubs-vs-azure-messaging/>

<https://docs.microsoft.com/en-us/azure/event-hubs/event-hubs-programming-guide>

## **Implement applications for background processing**

Implement Azure Batch for compute-intensive tasks; use Azure Web Jobs to implement background tasks; use Azure Functions to implement event-driven actions; leverage Azure Scheduler to run processes at preset/recurring timeslots

<https://docs.microsoft.com/en-us/azure/best-practices-background-jobs>

<http://lixiar.com/lixiar-blog/tech/introduction-batch-processing-azure-batch-services/>

<http://azureblogger.com/2016/02/azure-batch/>

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<http://stackoverflow.com/questions/29403815/are-scheduled-azure-webjobs-per-instance-or-per-site>

## **Design connectivity for hybrid applications**

Connect to on-premises data from Azure applications using Service Bus Relay, Hybrid Connections, or Azure Web App's virtual private network (VPN) capability; identify constraints for connectivity with VPN; identify options for joining VMs to domains or cloud services

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<https://pleasereleaseme.net/continuous-delivery-tfs-vsts-join-vm-domain-azure-resource-manager-templates/>

<https://docs.microsoft.com/en-us/azure/cloud-services/cloud-services-connect-to-custom-domain>

<https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-linux-classic-connect-vms>

## **Objective Domain: Design Azure Web and Mobile Apps (5-10%)**

### **Design web applications**

Design Azure App Service Web Apps; design custom web API; offload long-running applications using WebJobs; secure Web API using AAD; design Web Apps for scalability and performance; deploy Azure Web Apps to multiple regions for high availability; deploy Web Apps; create App service plans; design Web Apps for business continuity; configure data replication patterns; update Azure Web Apps with minimal downtime; back up and restore data; design for disaster recovery

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

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

<https://powerapps.microsoft.com/en-us/tutorials/customapi-web-api-tutorial/>

<http://www.hanselman.com/blog/HowToRunBackgroundTasksInASPNET.aspx>

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<https://github.com/Azure/azure-quickstart-templates/tree/master/app-service-environment-serviceplan-logicapp>

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<http://stackoverflow.com/questions/40773941/how-to-achieve-zero-downtime-deployment-to-azure-web-app-with-database-updates>

<https://docs.microsoft.com/en-us/azure/app-service-web/web-sites-staged-publishing#configuration-for-deployment-slots>

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

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<https://docs.microsoft.com/en-us/azure/best-practices-availability-paired-regions>

<https://azure.microsoft.com/en-us/blog/updated-high-availability-and-disaster-recovery-app-design-guidance/>

## **Design Mobile Applications**

Design Azure Mobile Services; consume Mobile Apps from cross-platform clients; integrate offline sync capabilities into an application; extend Mobile Apps using custom code; implement Mobile Apps using Microsoft .NET or Node.js; secure Mobile Apps using AAD; implement push notification services in Mobile Apps; send push notifications to all subscribers, specific subscribers, or a segment of subscribers

<http://www.dotnetcurry.com/windows-azure/1091/azure-mobile-services-aspnet-mvc>

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<https://docs.microsoft.com/en-us/azure/notification-hubs/notification-hubs-aspnet-cross-platform-notification>

<https://docs.microsoft.com/en-us/azure/mobile-engagement/mobile-engagement-send-personalized-notifications>

<https://azure.microsoft.com/en-in/services/notification-hubs/>

## Objective Domain: Design a management, monitoring, and business continuity strategy (20-25%)

### Design a monitoring strategy

Identify the Microsoft products and services for monitoring Azure solutions; leverage the capabilities of Azure Operations Management Suite and Azure Application Insights for monitoring Azure solutions; leverage built-in Azure capabilities; identify third-party monitoring tools including open source; describe the Azure architecture constructs such as availability sets and update domains and how they impact a patching strategy; analyze logs by using the Azure Operations Management Suite

<https://azure.microsoft.com/en-in/services/?sort=popular&filter=monitoring-management>

<https://docs.microsoft.com/en-us/azure/app-service-logic/app-service-logic-monitor-your-logic-apps>

<https://www.microsoft.com/en-in/cloud-platform/operations-management-suite>

<https://github.com/Microsoft/azure-docs/blob/master/articles/operations-management-suite/operations-management-suite-monitoring-product-comparison.md>

<https://argonsys.com/learn-microsoft-cloud/library/use-operations-management-suite-to-monitor-containers-on-azure-container-service-with-mesosphere-dcos/>

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<https://docs.microsoft.com/en-us/azure/security/azure-security-best-practices-software-updates-iaas>

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<http://hanussoftware.com/sccm-patch-management-for-azure-virtual-machines/>

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

<https://azure.microsoft.com/en-in/services/log-analytics/>

### **Describe business continuity/disaster recovery (BC/DR) by using Azure**

Leverage the architectural capabilities of BC/DR; describe Hyper-V Replica and Azure Site Recovery (ASR); describe use cases for Hyper-V Replica and ASR

[https://technet.microsoft.com/en-us/library/jj134172\(v=ws.11\).aspx](https://technet.microsoft.com/en-us/library/jj134172(v=ws.11).aspx)

<https://azure.microsoft.com/en-in/services/site-recovery/>

<http://www.brainscale.com/azure-site-recovery-addressing-common-issues/>

<http://www.brainscale.com/azure-site-recovery-supported-scenarios/>

<https://virtualizationreview.com/articles/2016/06/13/hyperv-replica-part-1-use-cases-and-configuration.aspx>

<http://searchservervirtualization.techtarget.com/tip/When-to-host-applications-in-Microsoft-Hyper-V-Replica>

<https://vmontalbanojr.wordpress.com/2015/04/24/microsoft-azure-site-recovery-part-1-asr-overview/>

<http://www.itpromentor.com/tag/azure-site-recovery/>

[https://blogs.msdn.microsoft.com/azuregov/2016/11/01/\\_use-case-azure-site-recovery/](https://blogs.msdn.microsoft.com/azuregov/2016/11/01/_use-case-azure-site-recovery/)

### **Design a disaster recovery strategy**

Design and deploy Azure Backup and other Microsoft backup solutions for Azure; leverage use cases when StorSimple and System Center Data Protection Manager would be appropriate; design and deploy Azure Site recovery

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

<https://azure.microsoft.com/en-in/resources/videos/getting-started-with-azure-backup-1-of-3-set-up-a-backup-vault-on-azure/>

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

<http://www.softtechww.com/datacenter-use-cases/>

<https://blog.kloud.com.au/tag/storsimple/>

<https://blogs.technet.microsoft.com/dpm/>

<https://github.com/Microsoft/azure-docs/blob/master/articles/backup/backup-azure-dpm-introduction.md>

<https://docs.microsoft.com/en-us/azure/site-recovery/site-recovery-best-practices>

## **Design Azure Automation and PowerShell workflows**

Create a PowerShell script specific to Azure; automate tasks by using the Azure Operations Management Suite

<https://docs.microsoft.com/en-us/azure/automation/automation-first-runbook-textual>

<https://docs.microsoft.com/en-us/azure/automation/automation-powershell-workflow>

<http://www.prosum.com/insights/top-five-things-to-automate-using-oms-in-the-azure-cloud/>

<https://www.microsoft.com/en-in/cloud-platform/automation-and-control>

## **Describe the use cases for Azure Automation configuration**

Evaluate when to use Azure Automation, Chef, Puppet, PowerShell, or Desired State Configuration (DSC)

<http://www.sqlchick.com/entries/2016/9/18/overview-of-azure-automation>

<http://searchcloudcomputing.techtarget.com/tip/Explore-Microsoft-Azure-automation-options-and-tools>

<https://www.chef.io/partners/azure/>

<https://msopentech.com/blog/2014/03/31/using-chef-to-manage-azure-resources/>

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<https://puppet.com/product/managed-technology/microsoft-windows-azure>

<https://puppet.com/blog/managing-azure-virtual-machines-puppet>

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<https://azure.microsoft.com/en-in/blog/what-why-how-azure-automation-desired-state-configuration/>

<https://blog.kloud.com.au/tag/desired-state-configuration/>

## Objective Domain: Architect an Azure compute infrastructure (10-15%)

### Design ARM virtual machines (VMs)

Design VM deployments leveraging availability sets, fault domains, and update domains in Azure; select appropriate VM SKUs

<https://azure.microsoft.com/en-in/solutions/architecture/>

<https://blogs.msdn.microsoft.com/hanuk/2013/12/03/which-windows-azure-cloud-architecture-paas-or-iaas/>

<https://www.microsoftpressstore.com/articles/article.aspx?p=2358300>

<http://www.learningsharepoint.com/2016/01/08/understanding-azure-fault-domain-update-domain-availability-set-affinity-group/>

<https://github.com/Microsoft/azure-docs.hu-hu/blob/master/includes/virtual-machines-common-compare-deployment-models.md>

<https://docs.microsoft.com/en-us/azure/virtual-machines/virtual-machines-windows-cli-ps-findimage>

<https://blogs.msdn.microsoft.com/igorpag/2015/11/04/azure-vm-resizing-and-sku-change-in-asm-and-arm/>

<https://github.com/Microsoft/azure-docs/blob/master/articles/marketplace-publishing/marketplace-publishing-vm-image-creation.md>

### Design ARM template deployment

Author ARM templates; deploy ARM templates via the portal, PowerShell, and CL

<https://docs.microsoft.com/en-us/azure/azure-resource-manager/best-practices-resource-manager-design-templates>

<https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-authoring-templates>

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

<https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-template-deploy>

<https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-template-deploy-cli>

<https://docs.microsoft.com/en-us/azure/azure-stack/azure-stack-deploy-template-powershell>

<https://github.com/Microsoft/azure-docs/blob/master/articles/azure-stack/azure-stack-deploy-template-command-line.md>

<https://github.com/Microsoft/azure-docs/blob/master/articles/documentdb/documentdb-automation-resource-manager-cli.md>

## **Design for availability**

Implement regional availability and high availability for Azure deployments

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

<http://www.mscloud.be/azure-locations-regions-datacenters-fault-domains-update-domains-clusters-availability-sets/>

<https://docs.microsoft.com/en-us/azure/resiliency/resiliency-high-availability-azure-applications>

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

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<http://windowsitpro.com/azure/azure-active-directory-vs-premises-active-directory>

<https://technet.microsoft.com/en-gb/windowsserver/dd448613.aspx?f=255&MSPPError=-2147217396>

<https://docs.microsoft.com/en-gb/azure/storage/storage-import-export-service>

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

<https://gallery.technet.microsoft.com/scriptcenter/How-to-use-workflow-cd57324f>

<https://docs.microsoft.com/en-us/azure/active-directory/role-based-access-control-manage-access-powershell>

## **ACS / AD**

<https://msdn.microsoft.com/en-us/library/azure/hh147631.aspx>

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<https://docs.microsoft.com/en-us/azure/active-directory/connect/active-directory-aadconnect> - IMP

<https://blogs.office.com/2014/04/15/synchronizing-your-directory-with-office-365-is-easy/>

<https://blogs.office.com/2014/05/13/choosing-a-sign-in-model-for-office-365/> - IMP

<https://azure.microsoft.com/en-gb/documentation/articles/cloud-services-configure-sslcertificate/>

<https://azure.microsoft.com/en-us/pricing/details/virtual-machines/linux/>

<https://www.simple-talk.com/cloud/cloud-development/using-the-windows-azure-content-delivery-network/> - IMP

## **RBAC using PS**

<https://docs.microsoft.com/en-us/azure/active-directory/role-based-access-control-manage-access-powershell>

## **Mobile synch iOS**

<https://docs.microsoft.com/en-us/azure/app-service-mobile/app-service-mobile-ios-get-started-offline-data>

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<https://pwrshell.net/deploy-a-custom-windows-vhd-in-azure-with-powershell-and-validate-with-pester/>

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<https://azure.microsoft.com/en-us/suites/cortana-intelligence-suite/>

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