Azure

Azure Kubernetes Service & Service Fabric on Azure Stack

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Agenda

- Azure Stack Overview

- AKS on Azure Stack
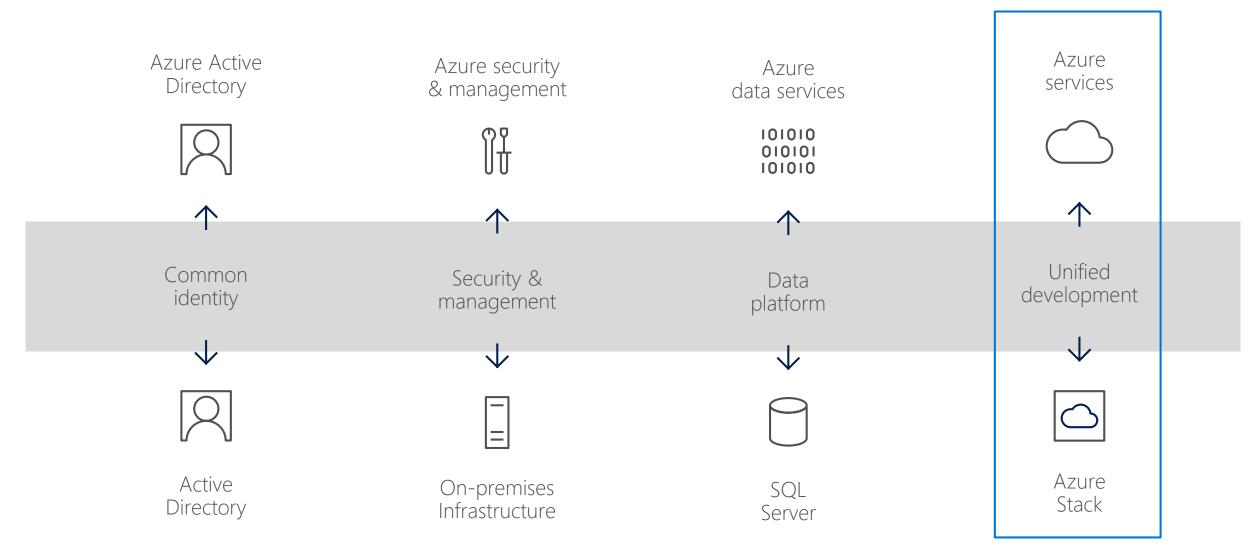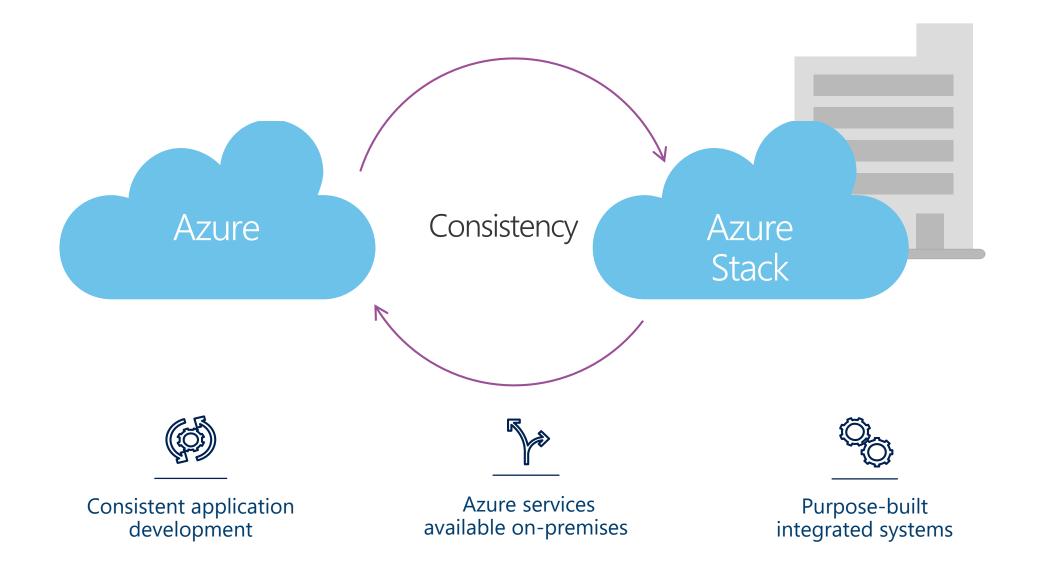
- Service Fabric on Azure Stack

- Hybrid Scenarios

- Microsoft TSP Azure (hybrid) Infra

- Fromer MVP Cloud & Datacenter Management

- 20 yrs. Experience as Architect & Senior Consultant

- Microsoft Champ: Azure Stack, Connectivity & CDN

- IT Community Freak

- Book Editor (Azure Stack, Azure & MultiCloud)

- www.DrAzureStack.com

Consistent hybrid environment

Azure Active Directory	Azure security & management	Azure data services	Azure services
Common identity	Security & management	Data platform	Unified development
Active Directory	On-premises Infrastructure	SQL Server	Azure Stack

Azure Stack: an extension of Azure

Azure

Consistency

Azure Stack

Consistent application development

Azure services available on-premises

Purpose-built integrated systems

Consistent Cloud Platform

App development and operations

- Tools
- Experiences
- Deployments
- Application Patterns
- Automations
- Operations

Azure services

- Serverless
- App Service
- Containers
- Marketplace
- Virtual machines
- Networking
- Storage
- Key Vault

Azure ⟷ Consistency ⟷ Azure Stack

Azure and Azure Stack
Truly consistent hybrid cloud platform

Portal | PowerShell | DevOps tools

Azure Resource Manager

Azure IaaS | Azure PaaS
Compute | Network | Storage | App Service | Service Fabric*

Cloud-inspired infrastructure

Microsoft Azure Stack
Private | Hosted

Sealed hosts
Integrated Systems Hardware

Developers

CONSISTENCY

IT

Portal | PowerShell | DevOps tools

Azure Resource Manager

IaaS | PaaS

Cloud infrastructure

Microsoft Azure
Public

Sealed hosts
Azure-designed Hardware

Integrated delivery experience

Integrated systems
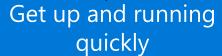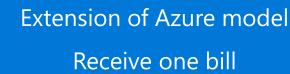
DELL EMC   Hewlett Packard Enterprise

Lenovo   CISCO

HUAWEI   WORTMANN AG

Fast to deploy

Get up and running quickly

Deliver 100s of VMs initially (and grow over time)

Pay-as-you-use

Extension of Azure model

Receive one bill

Option: Capacity Model

Integrated support, broadly available

Consistent support experience, no matter who you call

Available in 92 geos

Roadmap: Fujitsu integrated systems will be available in CY19.

Azure managed Kubernetes

AKS: Simplify the deployment, management, and operations of Kubernetes

Deploy and manage
Kubernetes with ease

Accelerate containerized
application development

Set up CI/CD in a
few clicks

Secure your Kubernetes
environment

Scale and run applications
with confidence

Work how you want with
open-source tools & APIs

… in Azure …

Azure Kubernetes Service (AKS)

Kubernetes made easy – get the most complete and simple end-to-end experience for seamless Kubernetes lifecycle management on Azure

Deploy and manage Kubernetes with ease	Scale and run applications with confidence	Secure your Kubernetes environment
• Free managed control plane for auto upgrades, patching and self healing • Provision with portal, CLI, ARM, or Terraform • Full visibility with integrated monitoring and logging	• Built-in auto scaling • Global data center to boost performance and reach • Elastically burst from AKS cluster using ACI	• Control access through AAD and RBAC • Safeguard keys and secrets with Key Vault • Secure network communication with VNET and CNI
Accelerate containerized application development	**Work how you want with open-source tools & APIs**	**Set up CI/CD in a few clicks**
• Define, install and upgrade apps easily with Helm • Automatically scaffold, containerize and deploy with CLI or Visual Studio • Rapidly iterate, test and debug microservices using Dev Spaces	• 100% open source Kubernetes • Take full advantage of services and tools in the ecosystem • Easily integrate with SLA-backed Azure services with OSBA	• Three steps away from a CI/CD pipeline with DevOps Project • Work with existing tools such as Jenkins • Geo-replicated container registry

Azure makes Kubernetes easy

Deploy and manage Kubernetes with ease

Task	The Old Way	With Azure
Create a cluster	Provision network and VMs Install dozens of system components including etcd Create and install certificates Register agent nodes with control plane	`az aks create`
Upgrade a cluster	Upgrade your master nodes Cordon/drain and upgrade worker nodes individually	`az aks upgrade`
Scale a cluster	Provision new VMs Install system components Register nodes with API server	`az aks scale`

Azure makes Kubernetes easy

Accelerate containerized application development

Task	← The Old Way	→ With Azure
Build a containerized app and deploy to Kubernetes	Build the app Write a Dockerfile Build the container image Push the container to a registry Write Kubernetes manifests/Helm chart Deploy to Kubernetes	`draft init` to configure your environment `draft create` to auto-create Dockerfile/Helm chart `draft up` to deploy to Kubernetes
Build a containerized app and deploy to Kubernetes	Set up a local dev environment using Minikube Determine the transitive closure of your dependencies Identify behavior of dependencies for key test cases Stub out dependent services with expected behavior Make local changes, check-in, and hope things work Validate with application logs	Use DevSpaces Do breakpoint debugging in your IDE
Expose web apps to the internet with a DNS entry	Deploy an ingress controller Create a load-balanced IP for it Add an ingress resource to your deployment Acquire a custom domain Create a DNS A-record for your service	Turn HTTP application routing on in your cluster Add an ingress resource to your deployment

Azure makes Kubernetes easy

Set up CI/CD in a few clicks

▤ Task	⬅ The Old Way	➡ With Azure
Set up a CI/CD pipeline and deploy to Kubernetes	Create git repo Create a build pipeline Create a container registry Create a Kubernetes cluster Configure build pipeline to push to container registry Configure build pipeline to deploy to Kubernetes	Create an Azure DevOps project with AKS as a target
Make container images available for deployment worldwide	Create a container registry in every region Configure build pipeline with multiple endpoints Loop through all regions and push following build	Create an Azure Container Registry with geo-replication Push your image to a single endpoint
Track health with consolidated cluster and application logs	Choose a logging solution Deploy log stack in your cluster or provision a service Configure and deploy a logging agent onto all nodes	Checkbox "container monitoring" in the Azure portal

… on Azure Stack …

Is there a difference?

- Azure Stack AKS is (today) a set of ARM templates that deploy virtual machines

- Deploys Kubernetes in the VM scale set

- Provides the same API & UI

- Is not integrated in the Portal (so far)

AKS is ...

- In the basis for all modern PaaS Solutions on public Azure
- Makes it quite simple ... Just deploy a container and be fine
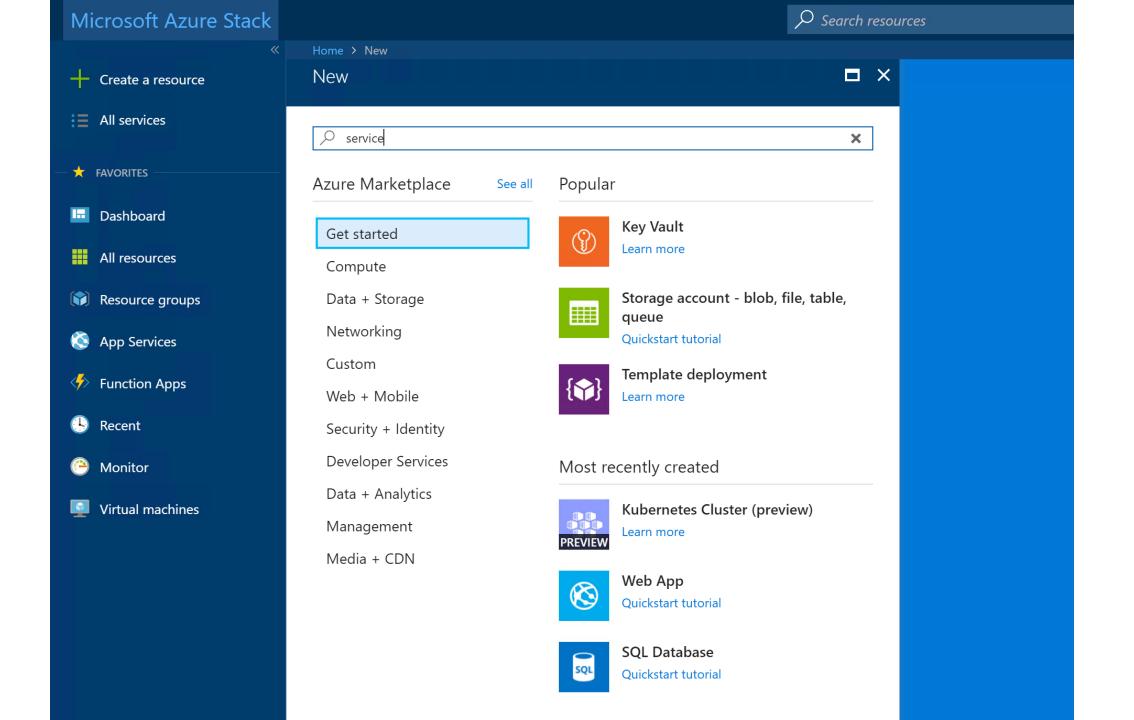
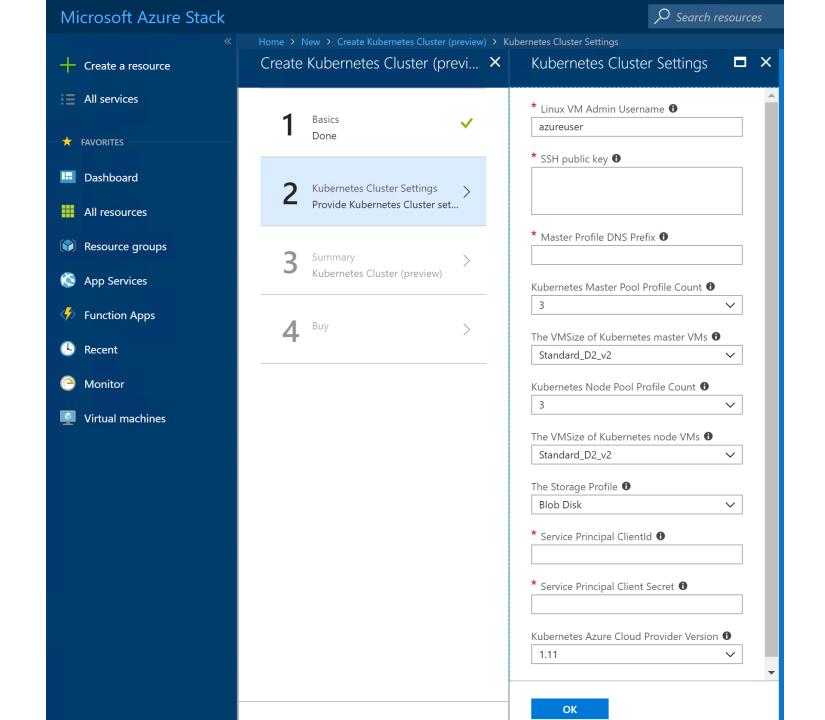## Containers in Azure Cognitive Services

Azure Cognitive Services containers provide the following set of Docker containers, each of which contains a subset of functionality from services in Azure Cognitive Services:

Service	Container	Description
Computer Vision	Recognize Text	Extracts printed text from images of various objects with different surfaces and backgrounds, such as receipts, posters, and business cards. **Important:** The Recognize Text container currently works only with English. Request access
Face	Face	Detects human faces in images, and identifies attributes, including face landmarks (such as noses and eyes), gender, age, and other machine-predicted facial features. In addition to detection, Face can check if two faces in the same image or different images are the same by using a confidence score, or compare faces against a database to see if a similar-looking or identical face already exists. It can also organize similar faces into groups, using shared visual traits. Request access
Text Analytics	Key Phrase Extraction (image)	Extracts key phrases to identify the main points. For example, for the input text "The food was delicious and there were wonderful staff", the API returns the main talking points: "food" and "wonderful staff".
Text Analytics	Language Detection (image)	For up to 120 languages, detects which language the input text is written in and report a single language code for every document submitted on the request. The language code is paired with a score indicating the strength of the score.
Text Analytics	Sentiment Analysis (image)	Analyzes raw text for clues about positive or negative sentiment. This API returns a sentiment score between 0 and 1 for each document, where 1 is the most positive. The analysis models are pre-trained using an extensive body of text and natural language technologies from Microsoft. For selected languages, the API can analyze and score any raw text that you provide, directly returning results to the calling application.

https://docs.microsoft.com/en-us/azure/cognitive-services/cognitive-services-container-support

Microsoft Azure Stack

Search resources

Create a resource

All services

FAVORITES

Dashboard

All resources

Resource groups

App Services

Function Apps

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Monitor

Virtual machines

Home > New

New

New

service

Azure Marketplace   See all

Get started

Compute

Data + Storage

Networking

Custom

Web + Mobile

Security + Identity

Developer Services

Data + Analytics

Management

Media + CDN

Popular

Key Vault
Learn more

Storage account - blob, file, table, queue
Quickstart tutorial

Template deployment
Learn more

Most recently created

Kubernetes Cluster (preview)
Learn more
PREVIEW

Web App
Quickstart tutorial

SQL Database
Quickstart tutorial

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Create Kubernetes Cluster (previ... ✕

Kubernetes Cluster Settings

1	Basics Done	✓

2	Kubernetes Cluster Settings Provide Kubernetes Cluster set...	›

3	Summary Kubernetes Cluster (preview)	›

4	Buy	›

* Linux VM Admin Username ⓘ

azureuser

* SSH public key ⓘ

* Master Profile DNS Prefix ⓘ

Kubernetes Master Pool Profile Count ⓘ

3

The VMSize of Kubernetes master VMs ⓘ

Standard_D2_v2

Kubernetes Node Pool Profile Count ⓘ

3

The VMSize of Kubernetes node VMs ⓘ

Standard_D2_v2

The Storage Profile ⓘ

Blob Disk

* Service Principal ClientId ⓘ

* Service Principal Client Secret ⓘ

Kubernetes Azure Cloud Provider Version ⓘ

1.11

OK

Top scenarios for Kubernetes on Azure

Lift and shift to containers

Cost saving

without refactoring your app

Microservices

Agility

Faster application development

Machine learning

Performance

Low latency processing

IoT

Portability

Build once, run anywhere

AKS resources

- [Azure Kubernetes Service (AKS)](#)

- [Containers on Azure pitch deck](#)

- [Smart Hotel 360 Demo](#)

- [Documentation resources](#)

- [Ebook for distributed systems](#)

- [Distributed system HoL](#)

- [AKS HoL](#)

Sign up for a free Azure account

Check out the Azure container videos page

Hone your skills with Azure training

Get the code from GitHub

Azure Service Fabric

Azure Service Fabric

Build, deploy, and operate applications, using any OS, at any scale, on any cloud

Build

Build new or transform existing applications

Deploy

Deploy any code at any scale using tools you know

Operate

Run and secure services reliably at any scale

… on Azure …

Proven platform powering core Azure and Microsoft services

Microsoft has **deep expertise** in running global services such as Cortana, Skype & Cosmos DB

Service Fabric is the **foundational technology** powering these services & core Azure infrastructure

Sample scale of one of these services**: 60 billion events per day** with millions of databases

About **30%** of Azure's cores run Service Fabric directly.

Service Fabric Manages **Millions of Service upgrades** weekly within Microsoft alone

SQL Database

SQL

Cosmos DB

Power BI

IoT Hub

Dynamics

Event Hub

Intune

Skype/Teams

Cortana

Service Fabric Architecture

Your Scalable, Reliable, Managed Applications

Application Programming Models
Declarative application description, .NET, Java, and C++ APIs

Management Subsystem

Application and microservice lifecycle

Deployment, upgrade and monitoring

Communication Subsystem

Microservice discovery
Reverse proxy

Reliability Subsystem

Orchestration, reliability, availability, replication

Hosting & Activation

Process & container activation

Testability Subsystem

Fault injection, test in production

Federation Subsystem
Federates a set of nodes to form a consistent scalable cluster of machines

Transport Subsystem
Secure point-to-point communication

Service Fabric Programming Models

Guest Executables/Containers

- Bring any exe
- Any language
- Any programming model
- Packaged as Application
- Gets versioning, upgrade, monitoring, health, resource governance

Reliable Services

- Stateless & stateful services
- Independent lifecycles
- High density
- Access to Reliable Collections
- Transactions across collections
- Full platform integration

Reliable Actors

- Simplified programming model
- Single Threaded model
- Requires totally disconnected compute & state
- Removes access to some advanced features
- Be careful

Service Fabric Products

Service Fabric Standalone

Any cloud

On-premises

App, Cluster and Hardware Control

Customer manages hardware, OS patching, runtime upgrades, cluster capacity & application deployment

Service Fabric Hosted (SFRP) **"SeaBreeze"**

Azure   Azure

App & Cluster Control **App Control**

Azure manages VMs, OS patching, runtime upgrades

Azure manages VMs, OS patching, runtime upgrades, capacity planning, provides micro-billing

Customer manages application deployment and cluster capacity

Customer manages application deployment (serverless)

More ← Control and Responsibility → Less

Resources

Try it now: in under 5 minutes!

Create a new .NET Service Fabric application in Azure

- https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-quickstart-dotnet

Deploy a Service Fabric Windows container application on Azure

- https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-quickstart-containers

Deploy a Linux container application on Azure

- https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-quickstart-containers-linux

More resources

Service Fabric developer SDK

- http://aka.ms/ServiceFabricSDK

Service Fabric course and lab

- https://mva.microsoft.com/en-US/training-courses/building-microservices-applications-on-azure-service-fabric-16747

Learn from samples, free clusters, and labs

- http://aka.ms/ServiceFabricSamples
- http://aka.ms/tryservicefabric
- https://blogs.msdn.microsoft.com/azureservicefabric/2016/07/06/introduction-to-service-fabric-lab-part-1/

Questions? Comments? Issues?

- https://stackoverflow.com/questions/tagged/azure-service-fabric
- http://aka.ms/ServiceFabricForum
- https://github.com/azure/service-fabric-issues
- http://aka.ms/ServiceFabricSlack

Service Fabric in under 4 minutes (video)

... on Azure Stack ...

Is there a difference?

- Service Fabric Cluster is (today) a set of ARM templates that deploy virtual machines

- Deploys Service Fabric in the VM scale set

- Provides the same API & UI

- Is not integrated in the Portal (so far)

Create a resource

All services

FAVORITES

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Create Service Fabric Cluster ✕

1	Basics Configure basic settings	>
2	Network Settings Configure the network settings	>
3	Node Configuration Configure the Node settings	>
4	Security Configure the security settings	>
5	Summary Service Fabric Cluster	>
6	Buy	>

Basics

* Service Fabric Cluster Name ⓘ

[   ]

* Node Type Prefix ⓘ

[SFNode   ]

* Primary Node Type Size ⓘ

[5   ]

Additional Node Type Sizes ⓘ

[   ]

* Admin Username ⓘ

[   ]

* Password ⓘ

[   ]

* Confirm Password ⓘ

[   ]

DNS Service (Optional) ⓘ

[Yes] [**No**]

Repair Manager (Optional) ⓘ

[Yes] [**No**]

Service Fabric deployment package URL ⓘ

[http://go.microsoft.com/fwlink/?LinkId=7...]

Subscription

[Base Subscription   ▾]

* Resource group ⓘ

(●) Create new   (○) Use existing

OK

Create a resource

All services

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Create Service Fabric Cluster

Network Settings

1	Basics Done	✓
2	Network Settings Configure the network settings	>
3	Node Configuration Configure the Node settings	>
4	Security Configure the security settings	>
5	Summary Service Fabric Cluster	>
6	Buy	>

* Service Fabric TCP Port ⓘ

19000

* Service Fabric HTTP Port ⓘ

19080

* Service Fabric Reverse Proxy Port ⓘ

19081

Custom Application Endpoints ⓘ

Custom ports to open in the Network Security Group ⓘ

OK

Create a resource

All services

★ FAVORITES

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Create Service Fabric Cluster ✕

Node Configuration ▭ ✕

1 Basics
Done ✓

2 Network Settings
Done ✓

3 Node Configuration
Configure the Node settings ›

4 Security
Configure the security settings ›

5 Summary
Service Fabric Cluster ›

6 Buy ›

Image SKU

Windows Server 2016 Datacenter ▼

* VM Size
1x Standard D1 v2 ›

Microsoft Azure Stack

Search resources

+ Create a resource

All services

★ FAVORITES

Dashboard

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Virtual machines

Create Service Fabric Cluster ✕

1 Basics
Done ✓

2 Network Settings
Done ✓

3 Node Configuration
Done ✓

4 Security
Configure the security settings ⟩

5 Summary
Service Fabric Cluster ⟩

6 Buy ⟩

Security ✕

* Source Key Vault. ⓘ

[   ]

* Cluster Certificate URL ⓘ

[   ]

* Cluster Certificate thumbprint ⓘ

[   ]

* Server Certificate URL ⓘ

[   ]

* Server Certificate thumbprint ⓘ

[   ]

Use Reverse Proxy Certificate ⓘ

| Yes | No |

* Admin Client Certificate Thumbprints ⓘ

[   ]

Non-Admin Client Certificate Thumbprints ⓘ
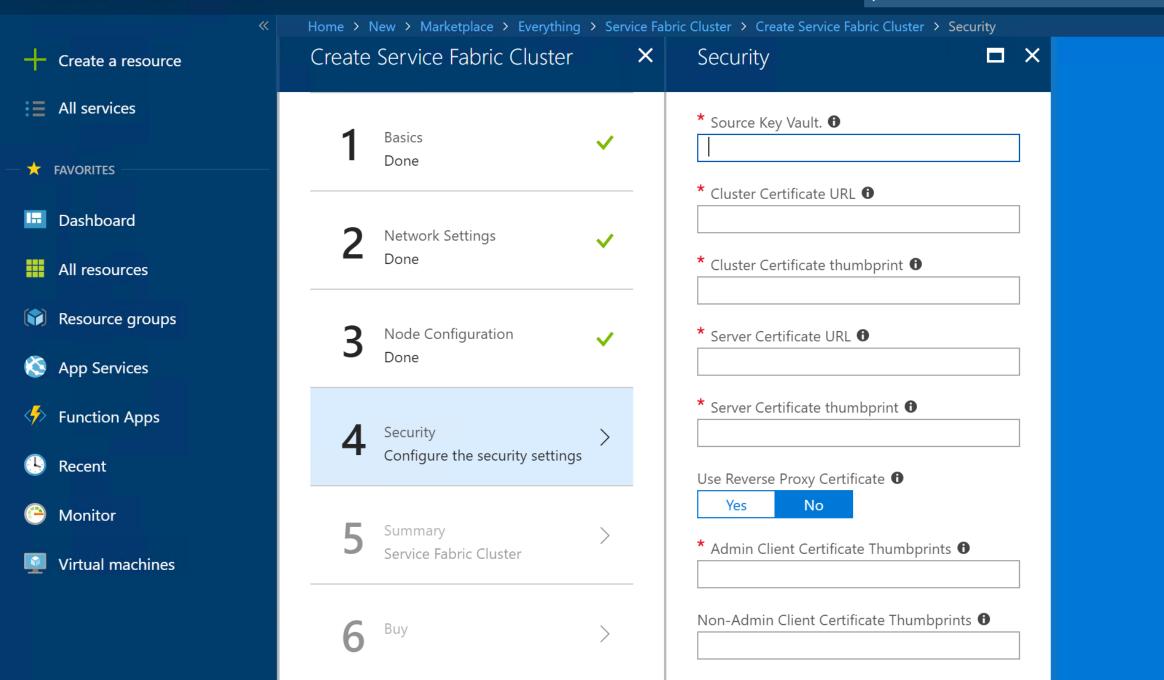
[   ]

Hybrid Scenarios

Requirements to be „really" hybrid

- Use the same technology basis on-prem and in the cloud
- Provide performant & reliable connectivity (Express Route)
- Deploy services near to the customer (into public Azure) where you need it
- Deploy services near to the vendor (into Azure Stack) where you require it
- Provide High Availability (how many Azure STacks???)
- Provide Business Continoutiy (ASR from Azure Stack to Azure???)
- Have a good monitoring (Azure Log Analytics with On-Prem Integration???)
- BE HAPPY :D

Demo time …

(If the „demo god" is with us)