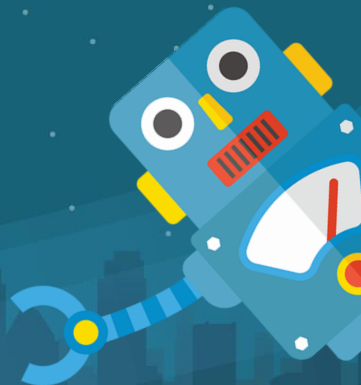


TECHORAMA

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• October 1-3 | 2018

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The banner features a dark teal background with a stylized city skyline at the bottom. Above the skyline, there are several small, colorful dots (white, yellow, red, green) and a small white comet-like object with a tail. The title text is in a clean, white, sans-serif font.

DOCKER ADVENTURES IN AZURE FOR A Hardcore WINDOWS DEVELOPER

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UNDERSTANDING REDUX BY BUILDING YOUR OWN

by LANDER VERHACK

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Microsoft
Most Valuable
Professional



You!



Traditional monolithic application server



Web Server (IIS/Apache)



Data feed service



Message queue



Web API (IIS/Apache)

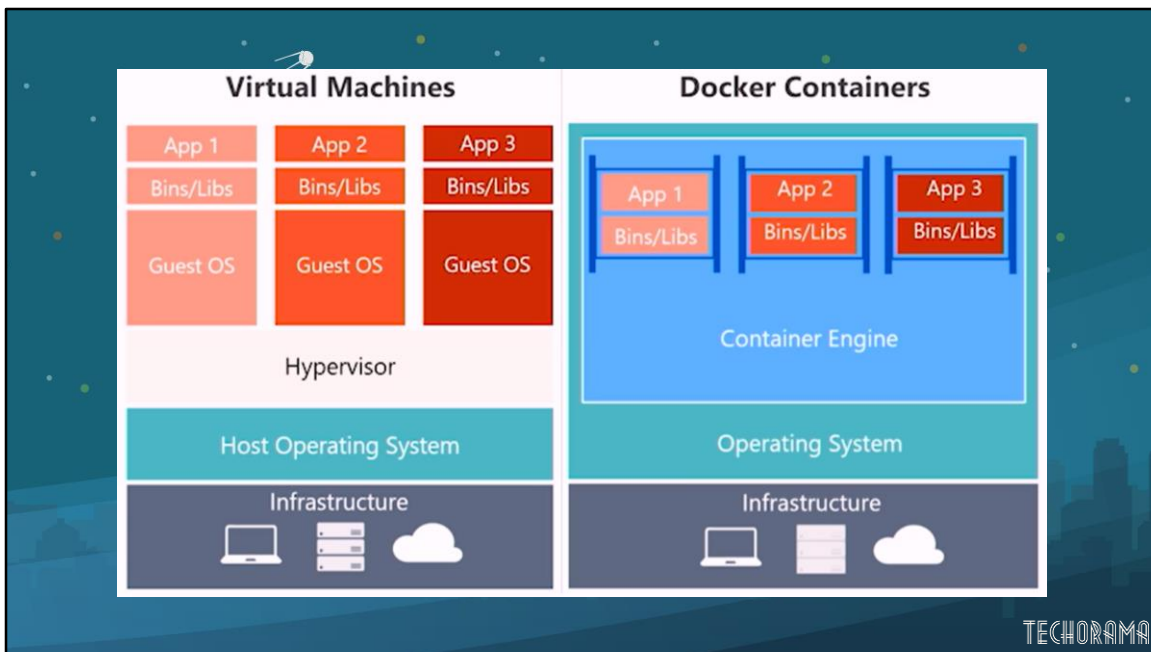
TECHUMMA

Traditional monolithic application server



- Server patching equals application downtime
- Each server has the full application stack
- Hardware utilization is irrelevant
- No way to scale an individual component within the application stack

TECHUMMA



A stylized graphic of a city skyline at night, rendered in various shades of blue. The skyline is composed of several rectangular buildings of different heights. Above the skyline, the sky is a darker blue, filled with numerous small white dots representing stars. A single comet with a white head and three thin, light blue trails is positioned in the upper left quadrant of the sky. The overall composition is clean and modern, with a focus on geometric shapes and a cool color palette.

DEMO
HELLO, DOCKER

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What should I do next?

- The container image is ready and can be tested locally
- We should now **store the image** somewhere. Think of the image as an artifact
- Second, we should test the image outside the dev box
 - *'Works on my machine'* isn't good enough!

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DEMO
RUN A CONTAINER IN THE CLOUD

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Azure Container Registry

- Manage a Docker private registry as a first-class Azure resource
 - Store and manage container images
 - Simplify registry access management with Azure Active Directory
 - Manage a single registry across multiple regions
- One shop-deployment store for Azure Compute services and App Services

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Azure Container Instances

- Run containers without thinking about any underlying engine
- Per-second billing and container-based compute on demand
- Pull container images from Docker Hub or Azure Container Registry
- Start a container in seconds with a single command

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Azure App Services

- Web App for Containers
 - Easily deploy and run containerized applications
 - Same fully-managed compute platform with some infrastructure maintenance capabilities
 - Built-in auto-scaling and load balancing
 - Streamlined CI/CD with Docker Hub, Azure Container Registry, and GitHub
- Run on Linux

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Persisting data with containers

- DO NOT STORE PRODUCTION DATA DIRECTLY INSIDE THE CONTAINER!!!
- Docker allows for the use of volumes
 - ACI can mount Azure Storage Files as volumes

Azure File Volume Arguments

- azure-file-volume-account-key : The storage account access key used to access the Azure File share.
- azure-file-volume-account-name: The name of the storage account that contains the Azure File share.
- azure-file-volume-mount-path : The path within the container where the azure file volume should be mounted. Must not contain colon ':'.
Must not contain colon ':'.
- azure-file-volume-share-name : The name of the Azure File share to be mounted as a volume.

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Azure Container Service

- Solves orchestration requirement
- Container infrastructure build in 2015
- Allows you to choose between orchestrators
 - Docker Swarm
 - DC/OS
 - Kubernetes
- Fully supported but no longer the focus

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Azure Container Service (AKS)

- Microsoft acquired Deis in 2017, a company at the center of Kubernetes innovation
- **Brendan Burns**, co-creator of Kubernetes, now leads Azure's container efforts
- **AKS is free**; you only pay for the VMs that add value to your business
 - '[...] with AKS you will pay nothing for the management of your Kubernetes cluster, ever' (unlike all other cloud providers)

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Service Fabric FTW! But... WHY should I care?!

- Difficult to control application upgrades across clusters
- Load balancing is awesome in container-based apps, but the app is still monolithic
- If breaking the apps apart into microservices is realized, the problem of service discovery arises
- No additional performance benefits (still too many network hops)
- Auto-healing?

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Azure Service Fabric

Any OS, Any Cloud



Dev Box



Azure



On-Premise Data Centers

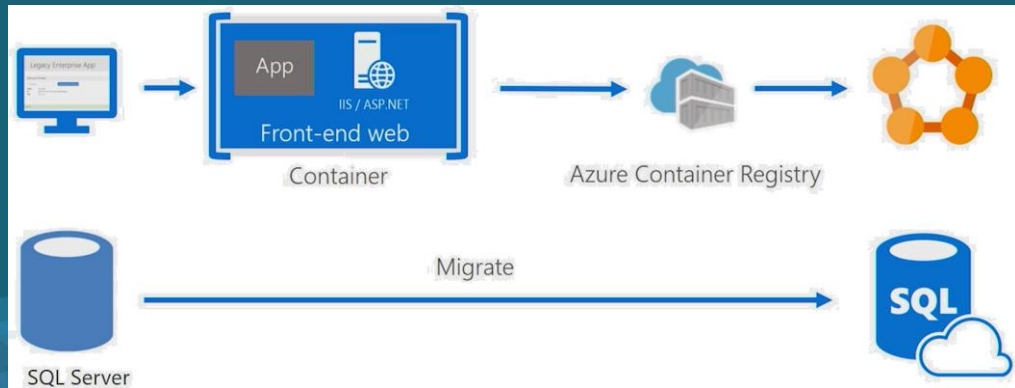


Other Clouds

Azure Stack
Coming 2018

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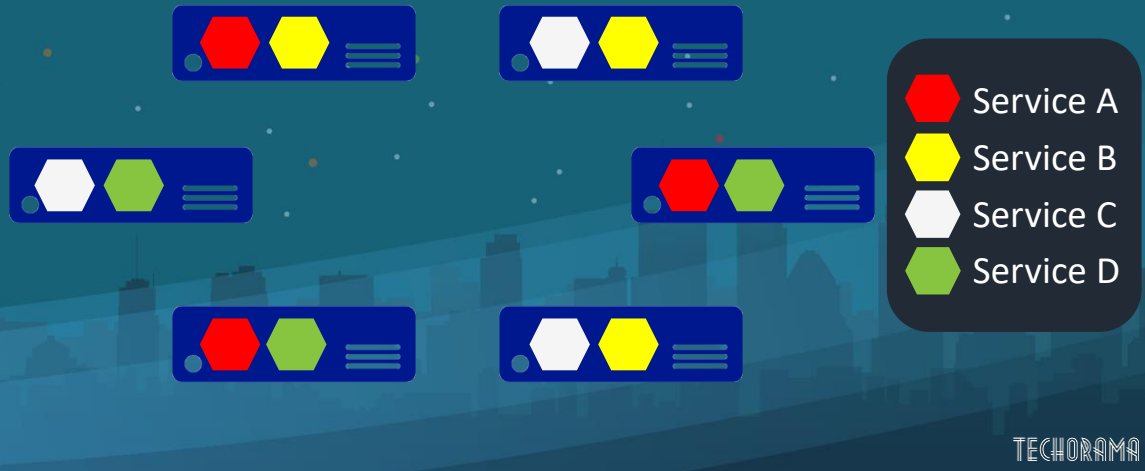
Application Modernization



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Service healing

Services spread across nodes evenly in a cluster



Service healing

Service replicas are distributed for reliability...

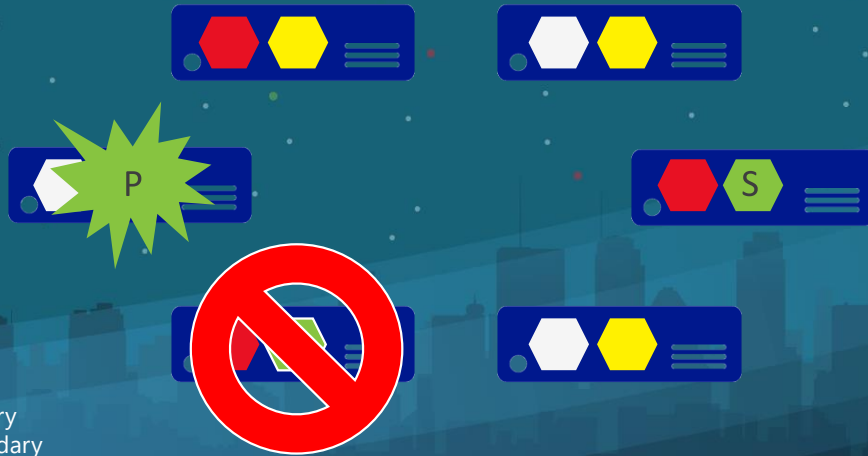


P – primary
S – secondary

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Service healing

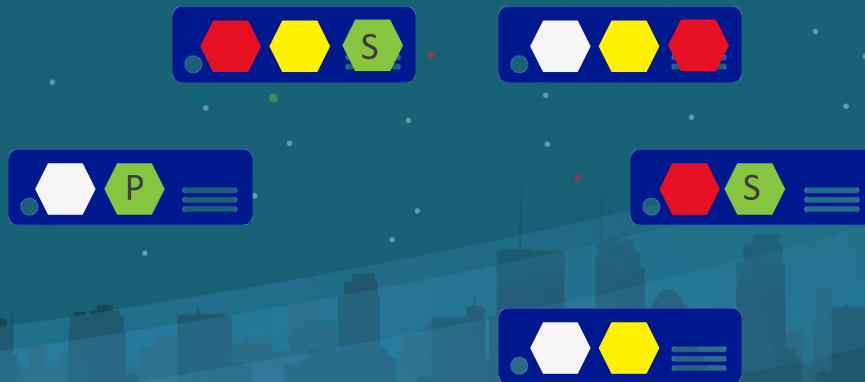
When a primary replica fails, a secondary is promoted.



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Service healing

New replicas are created to meet the quorum.



P – primary
S – secondary

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Service healing

A new node is provisioned in the VM scale set



P – primary
S – secondary

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Service healing

Finally, replicas are rebalanced across the nodes

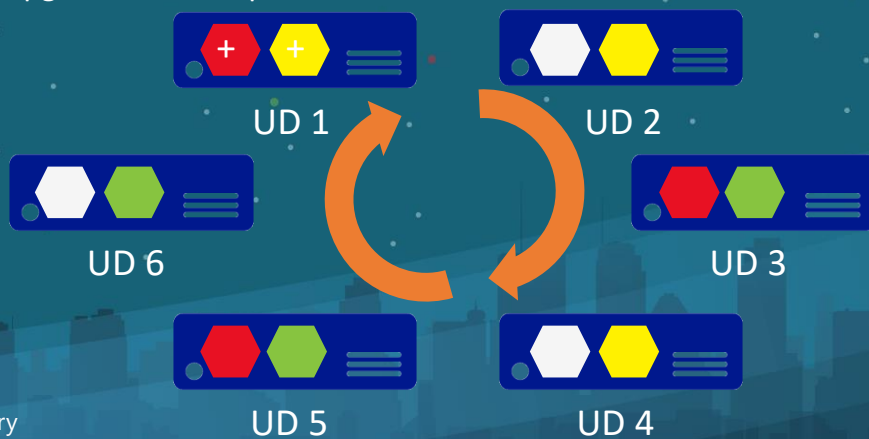


P – primary
S – secondary

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Rolling upgrades

Version upgrades follow update domains, one at a time

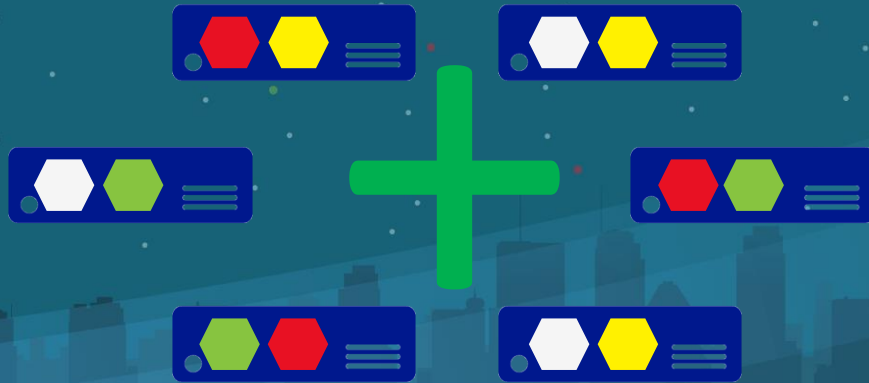


P – primary
S – secondary

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Increasing scale

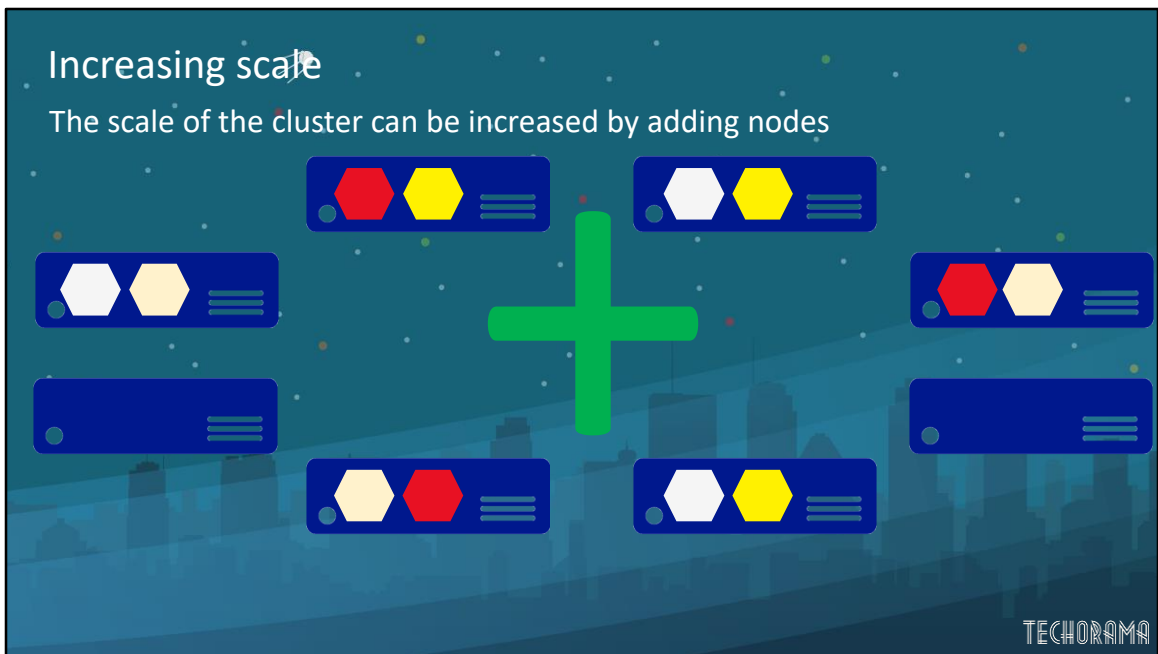
- The scale of the cluster can be increased by adding nodes



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Increasing scale

The scale of the cluster can be increased by adding nodes



Increasing scale

Instances/replicas balance across new nodes automatically



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DEMO

MODERNIZE AND LEGACY ASP.NET WEBFORMS APPLICATION

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Steps to an **actual** modernization

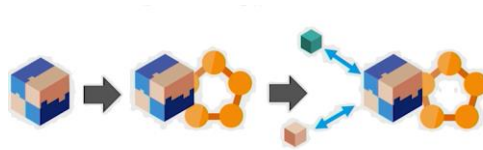
1. Containerize



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Steps to an **actual** modernization

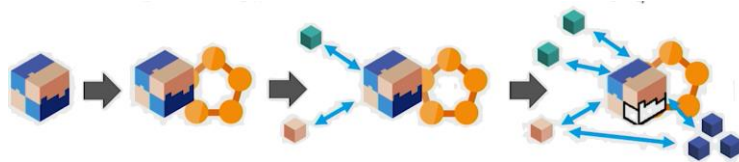
2. Start creating new features as containers



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Steps to an **actual** modernization

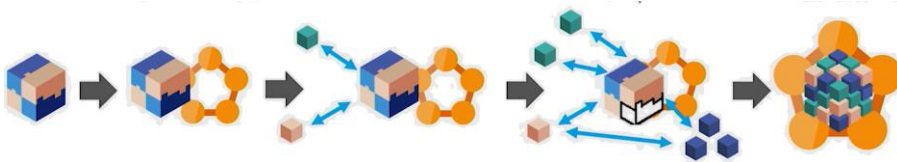
3. Decompose



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Steps to an **actual** modernization

Transformed!



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Q & A

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