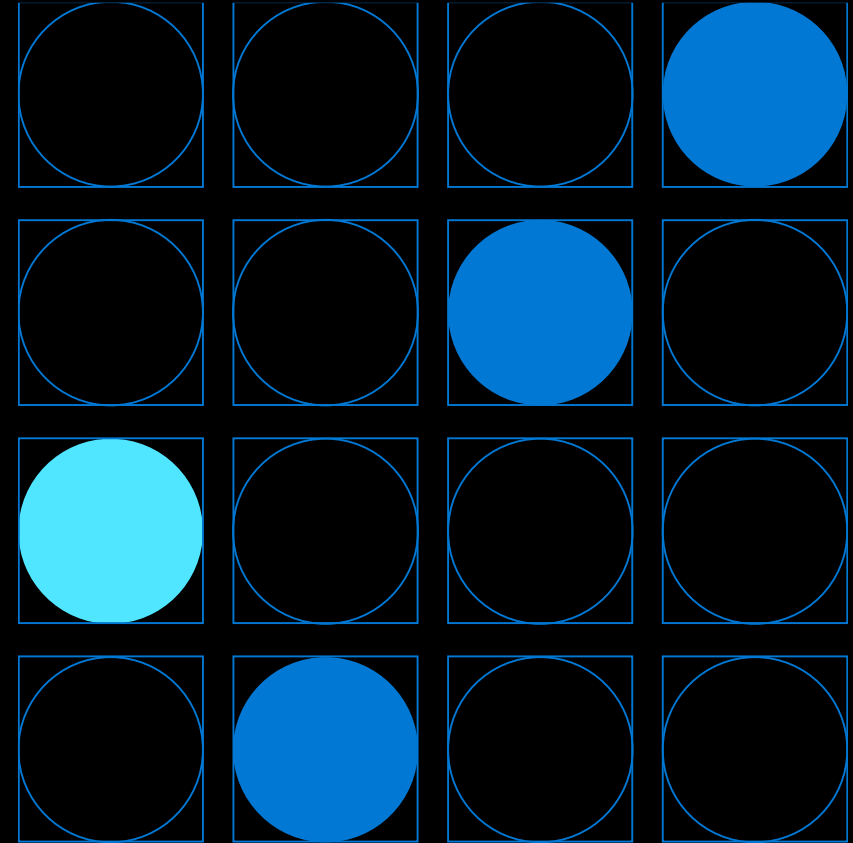


Migrating Applications to the Cloud



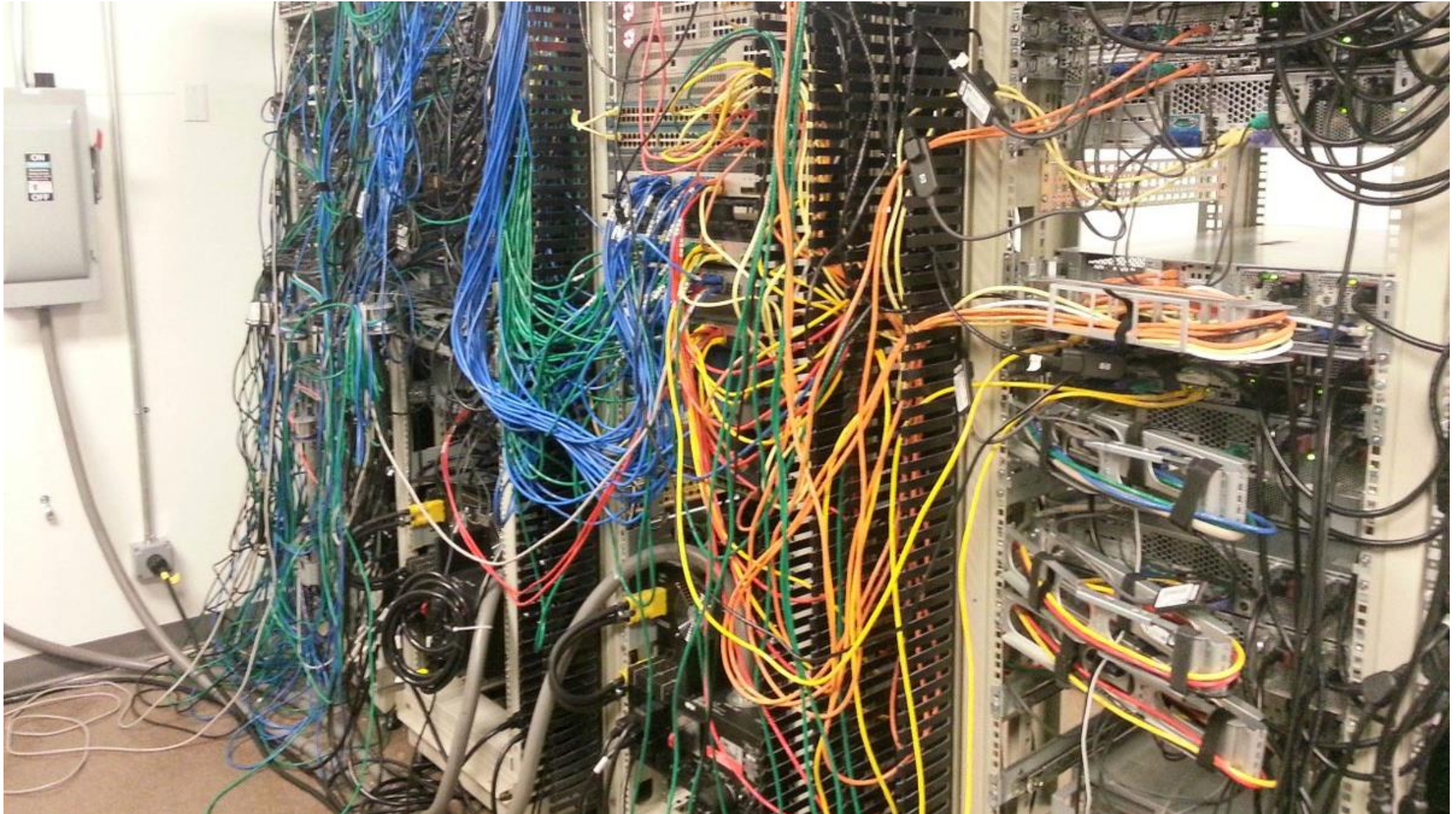
Migrating Web Applications to Azure

- Abishek Narayan
Cloud Solution Architect
[@cyberabishek](https://twitter.com/cyberabishek) 

Goals for this session

- Migrate a Datacenter hosted app to Azure.
- Review available endpoints for migration.
- Modernize operational tasks with Azure.
- Demo!

Where are your applications?





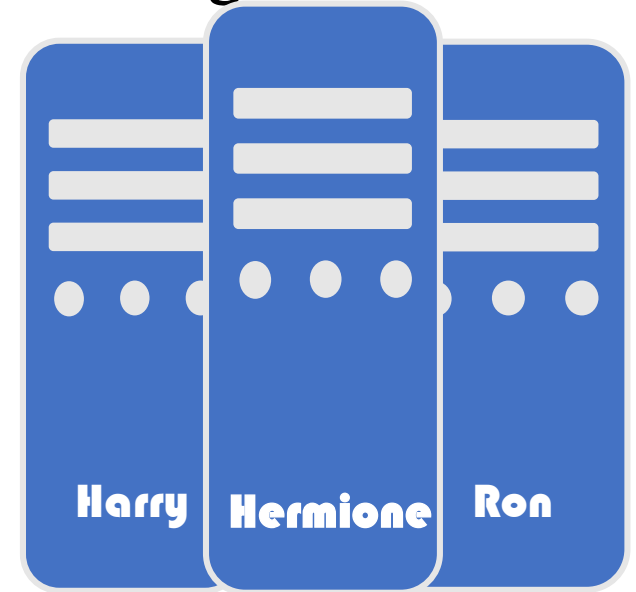
Drawbacks to your datacenter hosted application.

- Physical infrastructure requires large Capital Expenditure.
- You are essentially assuming scale with static hardware.
- Expensive compliance requirements.

There are countless reasons to move to “the cloud” but scale and cashflow tend to be leaders.

Benefits hosting in Azure

- No more hardware to manage
- Always up to date
- Flexible costs
- Faster deployment
- You can keep your cute server names

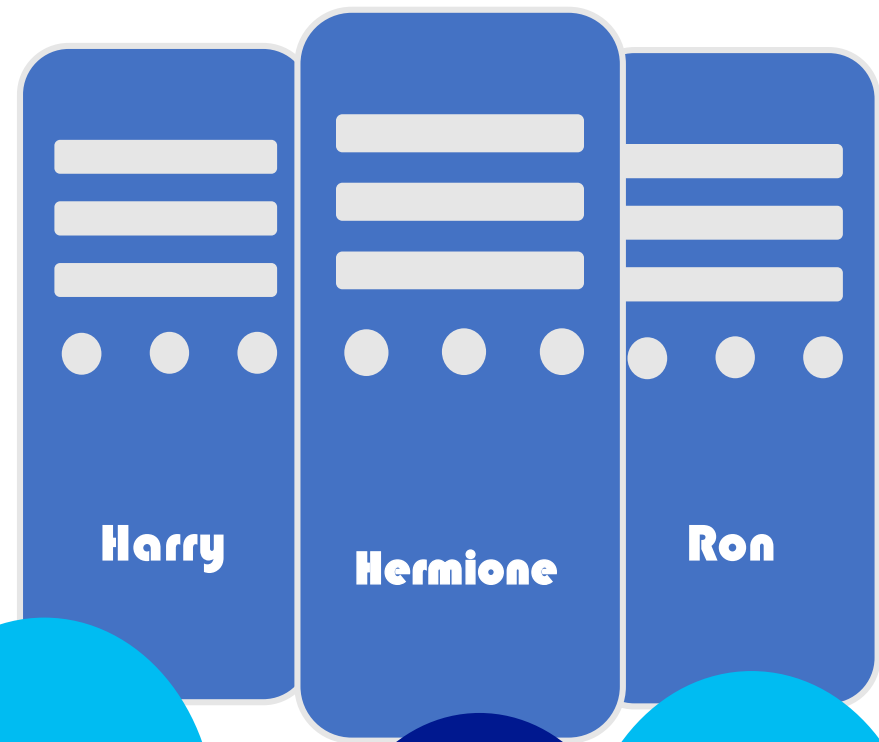


To the cloud!

Get out of the business of herding hardware and operating systems so you can focus on applications.

That's what you're really after in the end, isn't it?

ON to the business case.....



THE DAILY NEWS

theuselessweb.com

THE WORLD'S MOST MEH NEWSPAPER

- Since 5 seconds ago

Tailwind Traders Acquires Northwind



REDMOND, WA - **Tailwind Traders, Inc** announced that it has agreed to acquire Northwind **Traders**, the venerable "old guard" international foods company, in an effort to bolster its virtual hardware offerings with some international culinary flare. Tailwind agreed to acquire Northwind for an undisclosed sum and **is** assuming control of all of Northwind's virtual assets, **not** excluding the company's flagship product: Aniseed Syrup/

"This is a profoundly wonderful development for

for all involved, and will help to bring our food products to **a** whole new sector of the market" stated Nancy Daviolo, Executive Vice President of Operations. "We **really** couldn't be happier with the arrangement". The recently-promoted Daviolo will join the Tailwind executive team along with two of her close associates, Margaret Peacock and Michael Suyama. Daviolo took over Northwind's **company** sales operations in 2012 after Andrew Fuller was

Continued on page 8

Tailwind Traders Application – Inventory System

TAILWIND TRADERS					
ID	NAME	SKU	PRICE	SUPPLIER	INVENTORY
1	Licensed Steel Gloves	OSKMJHLCVUFWPEPQBQNL	206.00	Schoen LLC	13
2	Intelligent Concrete Bike	GLFBHSMCBIQTXBYSKIGQ	226.00	Lang Group	48
3	Tasty Cotton Pizza	PFRZBDBMQLMFBZKWUWKB	892.00	Kiehn - Lemke	98
4	Rustic Frozen Tuna	RTEUGYTBXWQJJRSOZJST	382.00	Lesch - Wolf	83
5	Intelligent Steel Hat	MRPIRZDQSOWUHPGDKVNT	709.00	Terry Group	2
6	Handcrafted Steel Car	UVOASLOEMXJRSEDXDGSE	893.00	Russel - Zemlak	38
7	Practical Fresh Salad	CIGHOHGDMZWWUYBBXTLN	389.00	Bauch Inc	79

TAILWIND TRADERS

NAME	SKU	PRICE	SUPPLIER	INVENT
------	-----	-------	----------	--------

Tasty Wooden Mouse

Zboncak, Schultz and Dooley

65



- **SKU:** CUUTEDXXLXHDTSIJSBVA
- **Price:** 879.00
- **Digital:** True
- **Dimensions:** 5ft x 31ft x 31ft
- **Weight:** 74 lbs
- **Reorder Amount:**
- **Status:** in-stock
- **Location:** Row E, Level 2, Shelf 81, Position 38
- **Product Type:** Automotive
- **Unit Description:** Rerum et labore dolores rerum.
- **Short Description:** numquam expedita rerum
- **Long Description:** Dicta molestiae nihil. Quia sit sed nesciunt est soluta sit possimus ut. Ea tempora nesciunt. Laborum reprehenderit sed est molestias vel accusantium aut et expedita.

Close

Rustic Fresh Bike	KLLQKZKXGHCZHBHYJKSV	234.00	Anderson, Kohler and B...	75
-------------------	----------------------	--------	---------------------------	----

Licensed Plastic Chips	EFVHBMKQYNRUWFOFDSUA	741.00	Dickinson - Rolfson	85
------------------------	----------------------	--------	---------------------	----

Status quo @ Tailwind



- App layer – 4 servers (NodeJS + React, .NET)
- Data layer – 5 servers (MongoDB/SQL)
- Backups, monitoring – min 2 servers (Nagios/Bacula)
- Network gear

Migration path

- Move to elastic solution.
- Reduce responsibility for team, offload to services.
- Modernize for a more rapid deployment.

Platform Services

Security & Management



Compute



Web and Mobile



Developer Services



Hybrid Operations



Integration



Analytics & IoT



Data



Media & CDN



Infrastructure Services

Compute



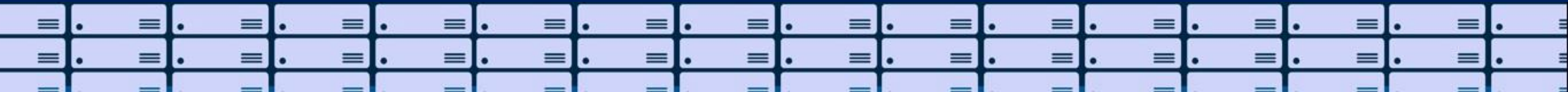
Storage



Networking



Datacenter Infrastructure (54 regions, 140 countries)







Virtual Machines






Microsoft Azure provides VMs with popular OS images ready for you to deploy immediately.





- No gear? Works for me!
- Add and remove resources as you need.
- Easy to manage networks.
- Run what you need, Operating System, processes, etc.
- Security, RBAC, Monitoring ready to be configured all out of the box



Lift and shift : IaaS (quick migration)

Name ↑↓	Type ↑↓
 inventory	Virtual machine
 inventory-ip	Public IP address
 inventory_dis...	Disk
 inventoryic	Network interface

Name ↑↓	Type ↑↓
 sql	Virtual machine
 sql	Network interface
 sql-ip	Public IP address
 sql_disk2_dcf566d36...	Disk
 sql_OsDisk_1_a7acb1...	Disk

Name ↑↓	Type ↑↓
 mongo	Virtual machine
 mongo-ip	Public IP address
 mongo_disk1_cce46...	Disk
 mongonic	Network interface

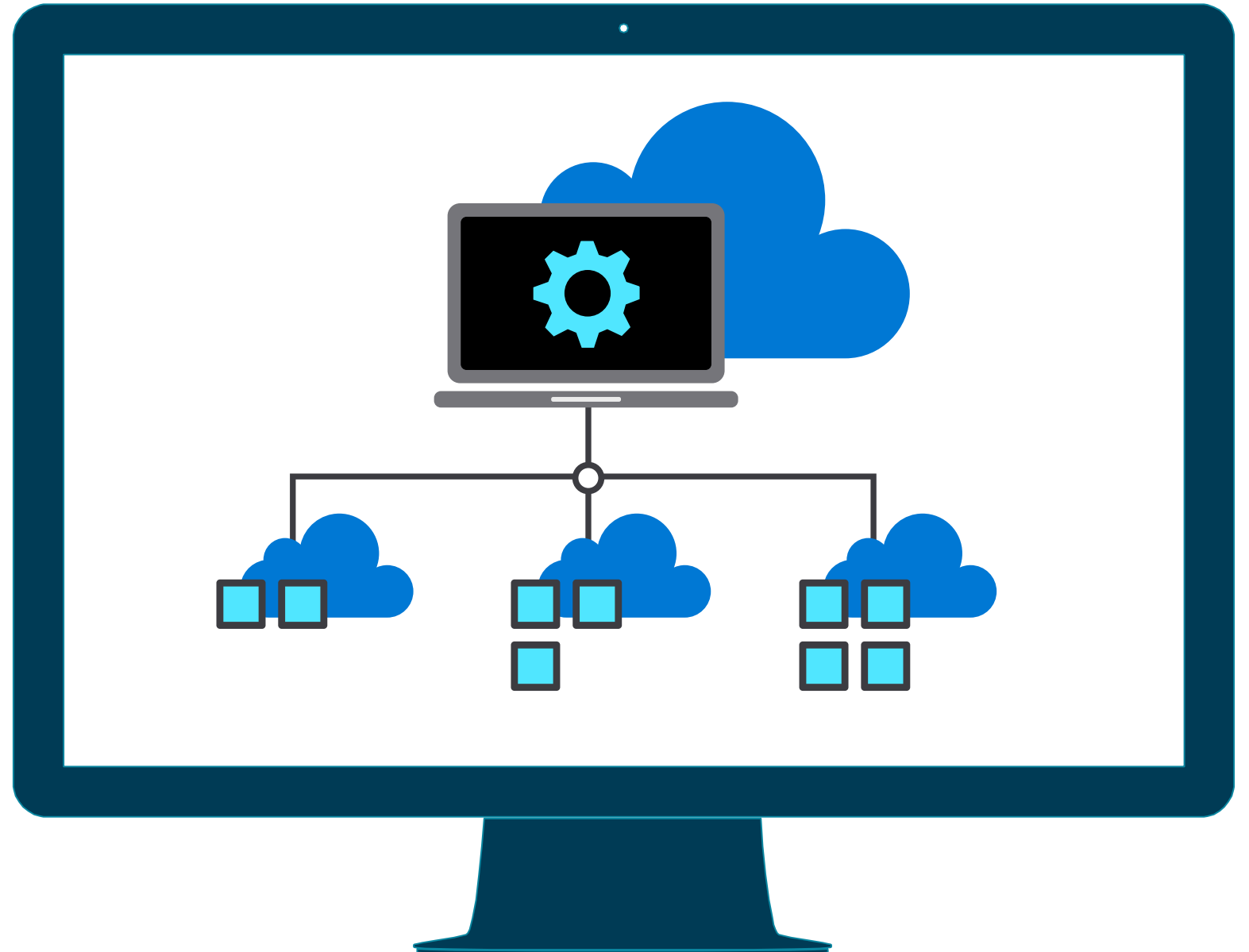


fully managed PaaS offering

Web App

Use these fully managed platforms for apps. Runtimes for .NET, Node.js, PHP, Java, Python and more.

- Less maintenance. No OS, no patching.
- Deploy containers for applications.
- Improved scale and integration with CI/CD tools.
- Defaults that help improve reliability and security.
- Manage CORS, SSL, DNS and more.



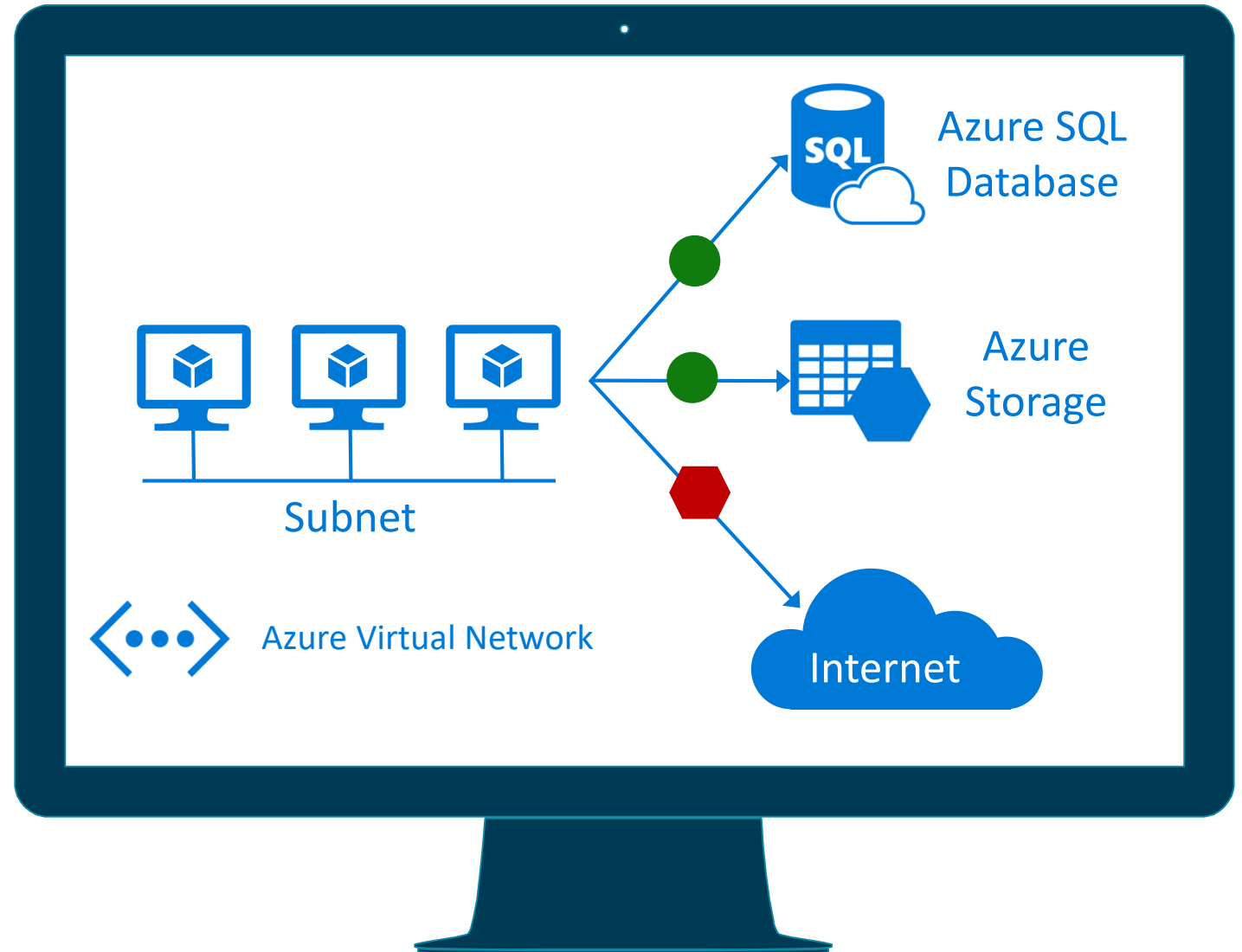
Database Services

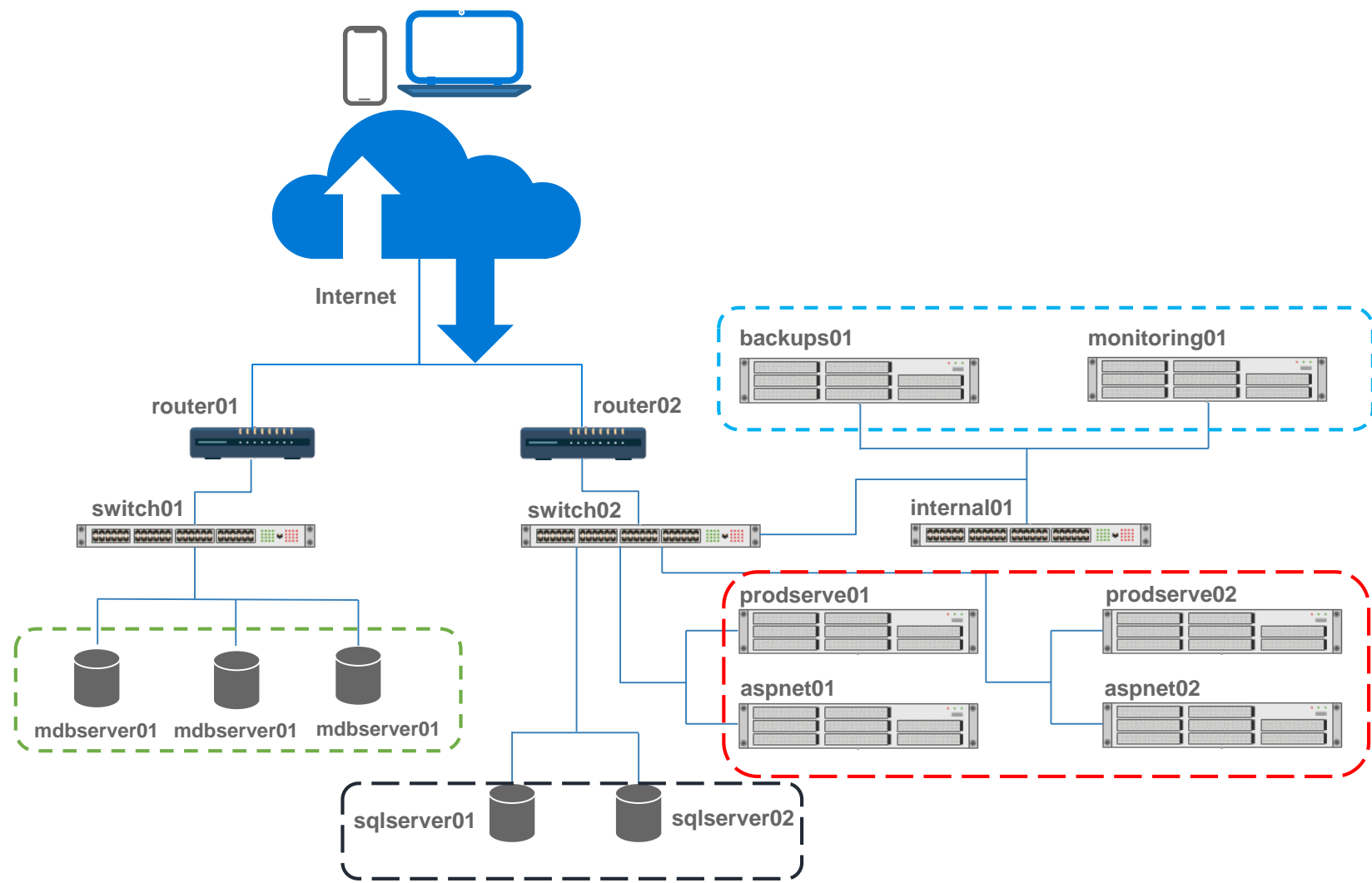
- Less maintenance. No OS, no patching.
- Multiple options for different workloads (SQL, NoSQL, Document, Graph)
- Multiple APIs based on your app requirements.
- Ops tasks are managed. (Backups, Monitoring, Scale)

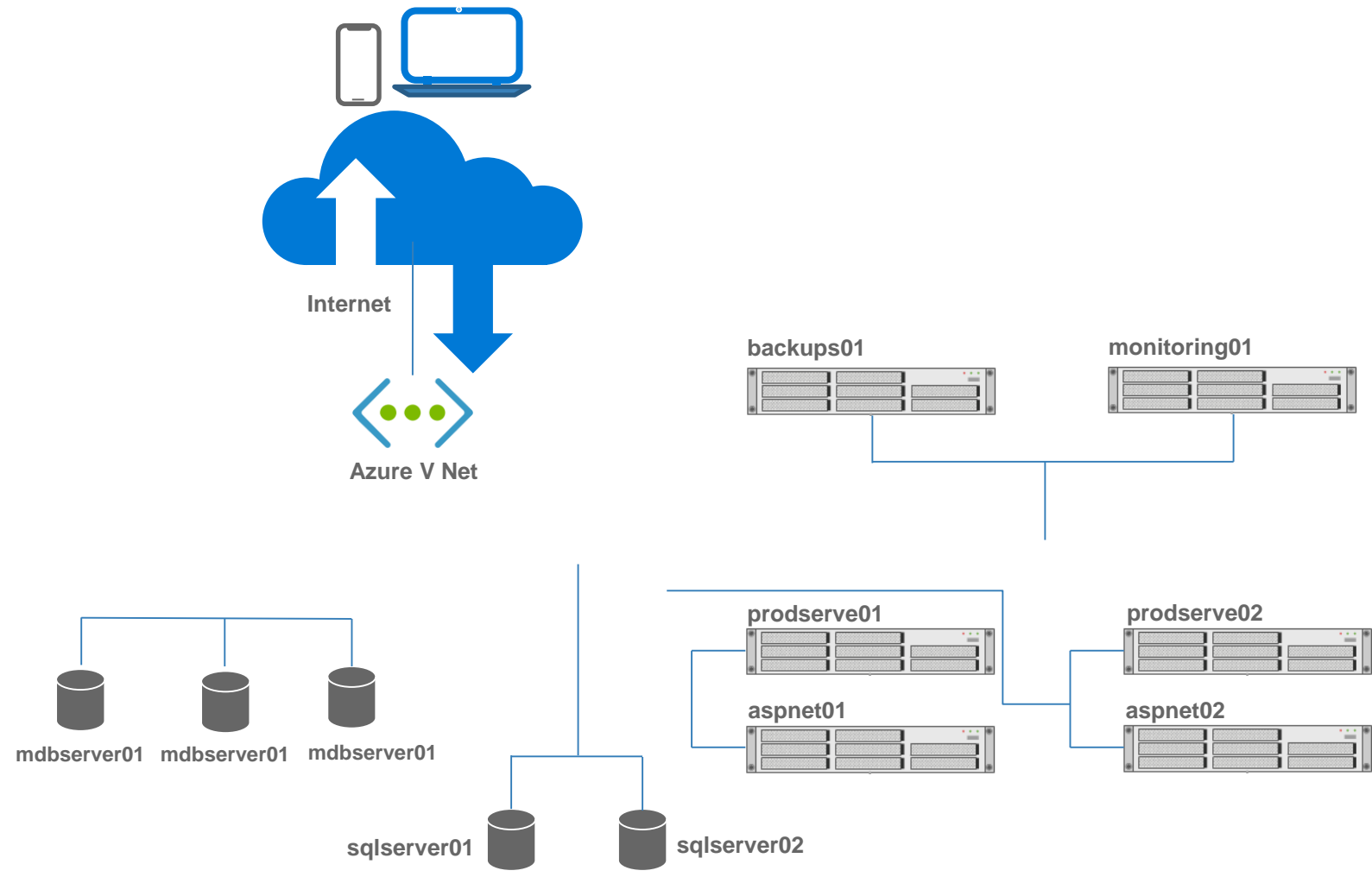


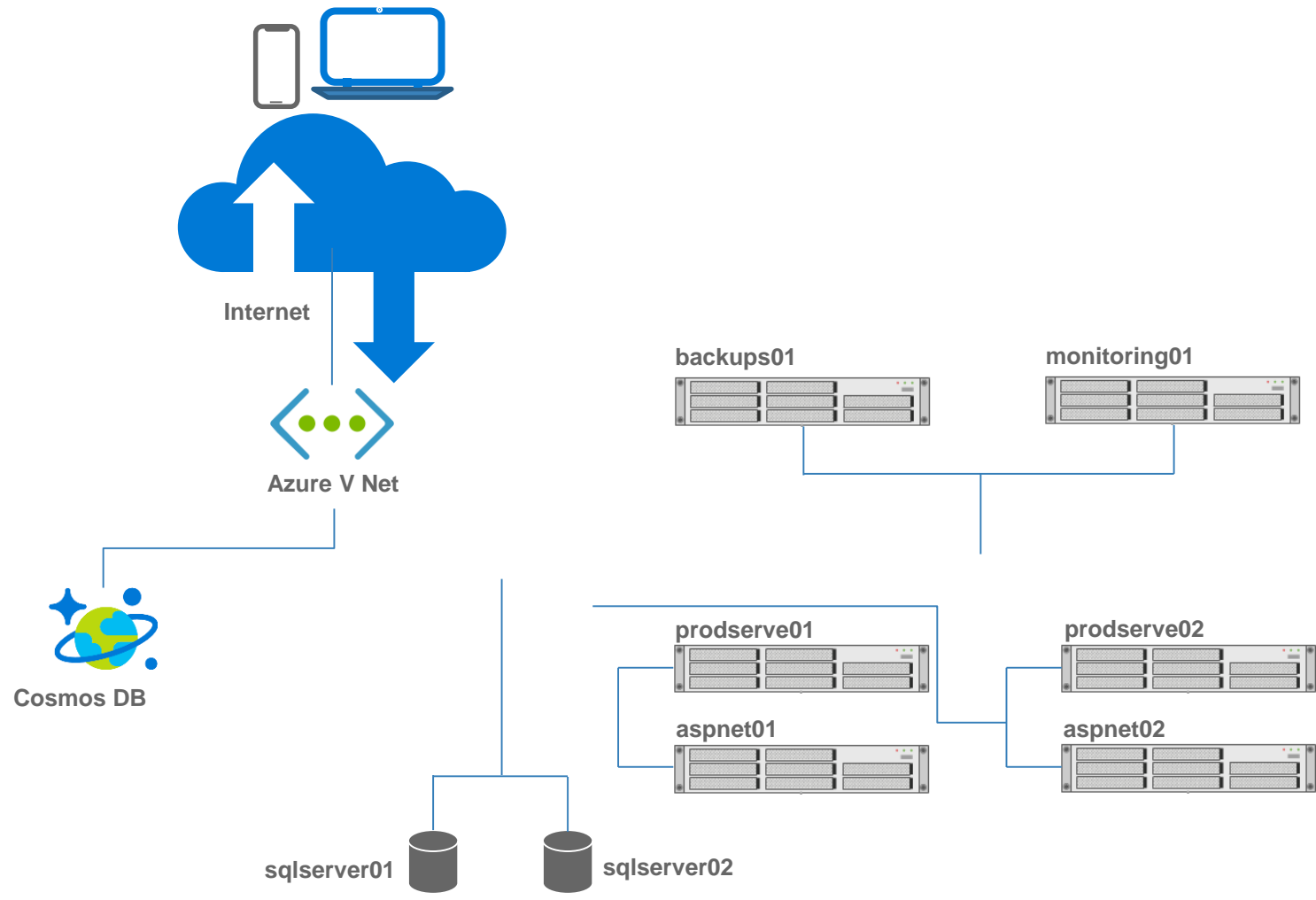
Network & Storage

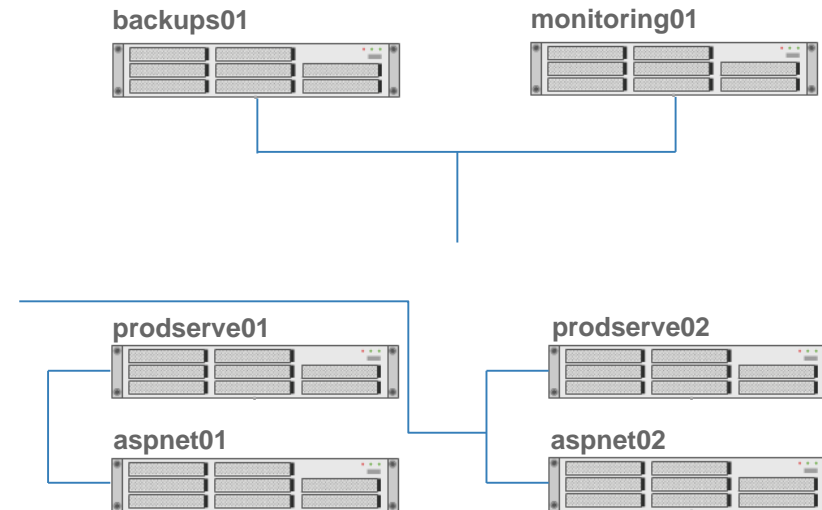
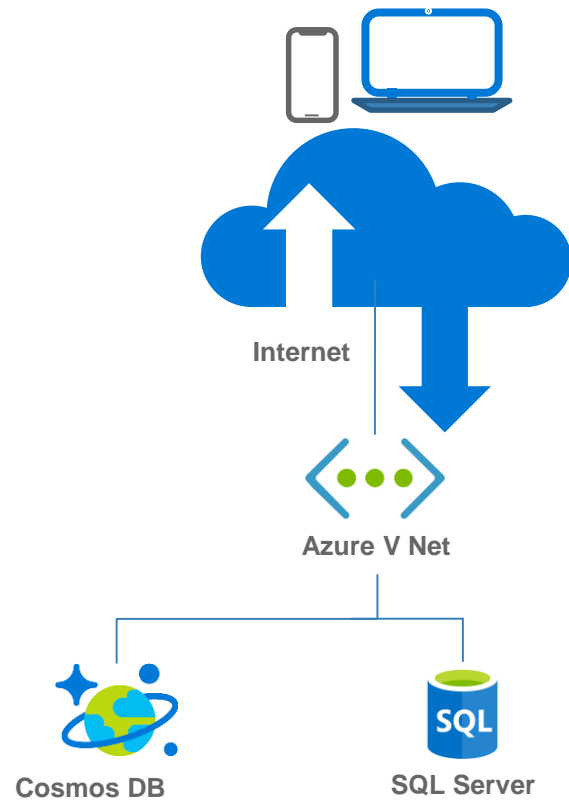
- Globally available Domain Name System (DNS).
- Virtual networks with subnetting.
- Content Delivery Network (CDN), Caching, Load Balancing, Firewalls.
- Hybrid solutions to integrate with on-prem.

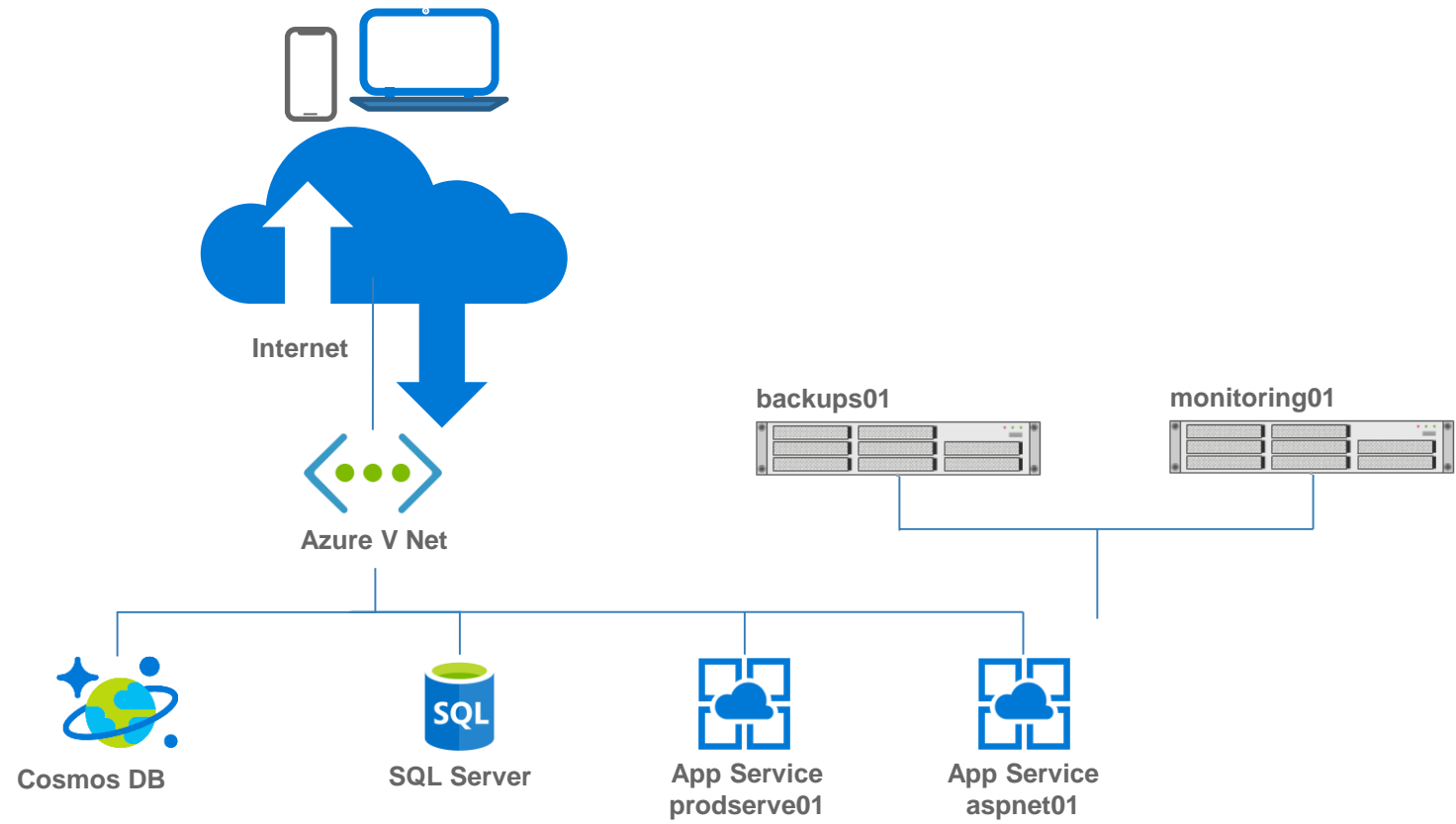


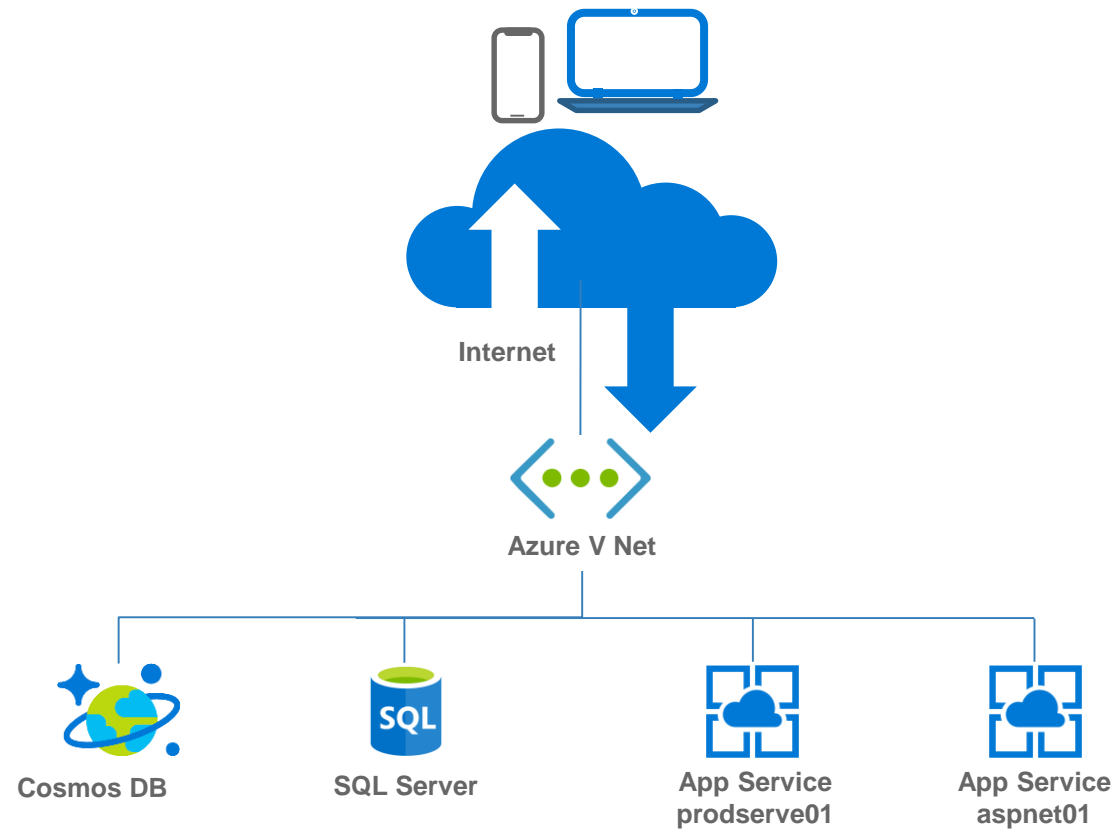














Pre-requisites

- An Azure Subscription
- Docker engine
(Linux/Windows/Mac/cloud)
- Bash/powershell (local /Azure)
- An image registry

Azure Container Registry .. POINTS TO CONSIDER

SKU features and limits

The following table details the features and limits of the Basic, Standard, and Premium service tiers.

Resource	Basic	Standard	Premium
Storage ¹	10 GiB	100 GiB	500 GiB
Maximum image layer size	200 GiB	200 GiB	200 GiB
ReadOps per minute ^{2, 3}	1,000	3,000	10,000
WriteOps per minute ^{2, 4}	100	500	2,000
Download bandwidth MBps ²	30	60	100
Upload bandwidth MBps ²	10	20	50
Webhooks	2	10	100
Geo-replication	N/A	N/A	Supported
Content trust	N/A	N/A	Supported
Virtual network access	N/A	N/A	Preview
Repository-scoped permissions	N/A	N/A	Preview
• Tokens	N/A	N/A	20,000
• Scope maps	N/A	N/A	20,000
• Repositories per scope map	N/A	N/A	500

Why Dockers?



Why Dockers?

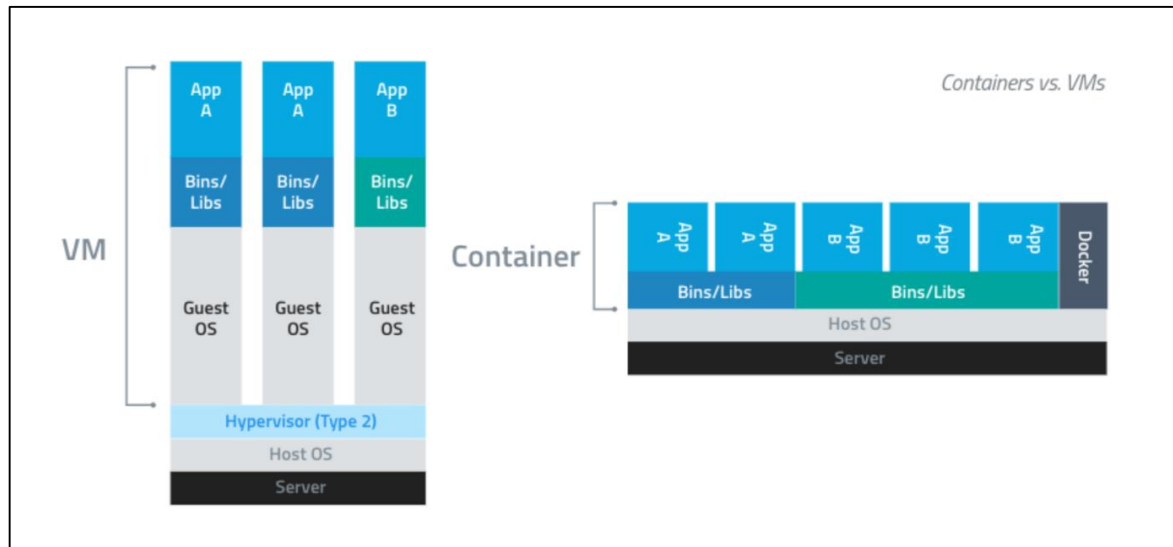


Image from: <https://www.upguard.com/articles/docker-vs.-vmware-how-do-they-stack-up>

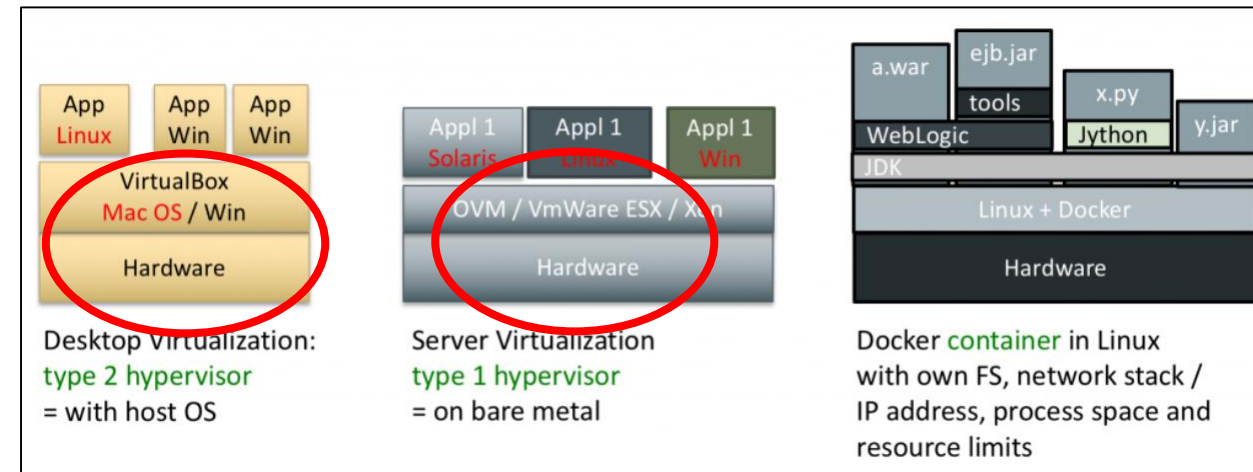


Image from: <http://www.munzandmore.com/2015/cc/docker-container-vs-virtualization>

Getting started demo

Create our required resources for the migration.



Tailwind Traders Product Service

This project requires Node.js 8+ as well CosmosDB or MongoDB running somewhere.

1. Create a file called `.env` in `<project>/src/frontend/`
2. Put these variables in it:
 - `DB_CONNECTION_STRING` — CosmosDB or MongoDB URL – make sure it has the db name in it. If you're pulling from CosmosDB, make sure to add a `/tailwind` (or whatever you called it in `DB_NAME`) after the port but before the query string
 - `DB_NAME` — Name of DB in CosmosDB or MongoDB. default `tailwind`
 - `COLLECTION_NAME` — Name of collection in db. default `inventory`
 - `ITEMS_AMOUNT` — If running the `populate:mongodb` script, how many total items to fill the DB with. default `10000`
 - `IMAGE_SIZE` — If running the `populate:mongodb` script, what size of images to use. default: `250`
 - `PG_CONNECTION_STRING` — If running the `populate:mongodb` script, an optional param to draw data from a Postgres database first before filling the rest of the MongoDB/CosmosDB instance with random data. optional
 - `PORT` — What port to start the service on. default `8000` – don't add this to your `.env` unless you *definitely* need it
 - `HOSTNAME` — What hostname the server is hosted on. default: `localhost` – don't add this to your `.env` unless you *definitely* need it
 - `CORS` - Which URL would you like to restrict CORS to? By default it is set to `'*'`.
 - `APPINSIGHTS_INSTRUMENTATIONKEY` - Applications Insights key (enables Application Insights)

Inventory Service

This project needs an instance of SQL Server, SQL Database, or PostgreSQL. Create a user secret in InventoryService.Api project and run the app:

```
dotnet user-secrets set 'ConnectionStrings:InventoryContext' '<sqlldb-connection-string>'
dotnet run
```

Example Connection String

```
Server=tailwind32671.postgres.database.azure.com;Database=Tailwind;Port=5432;User Id=admin_1136@tailwind32671;Password
```

- REST API docs can be accessed using Swagger UI: `/swagger`
- Get real-time inventory updates, see SignalR test page: `/www`

Optional: Use Azure SignalR Service by adding another secret:

```
dotnet user-secrets set 'SignalRServiceConnectionString' '<azure-signalr-connection-string>'
```

Tailwind Traders Inventory Frontend

This project requires Node.js 8+ to build. It won't work well without the product-service and inventory-service running.

To Setup

1. Create a file called `.env` in `<project>/src/frontend/`
2. Put two variables in it, `PRODUCT_SERVICE_BASE_URL` and `INVENTORY_SERVICE_BASE_URL` with the correct URLs to your service.
 - If running locally, copy the snippet below.
 - If running in production, make sure the URLs match where the services are
 - Make sure CORS headers are set correctly in other services

```
PRODUCT_SERVICE_BASE_URL=http://localhost:8000
INVENTORY_SERVICE_BASE_URL=http://localhost:5000
```

1. (Optional) Set `APPINSIGHTS_INSTRUMENTATIONKEY` with Applications Insights key (enables Application Insights)
2. (Optional) Set `DISPLAY_SQL_INFO` = `true` to display SQL Server information from Inventory Service. **Leave empty if you don't want to show this.**

Is someone taking us for a ride ?

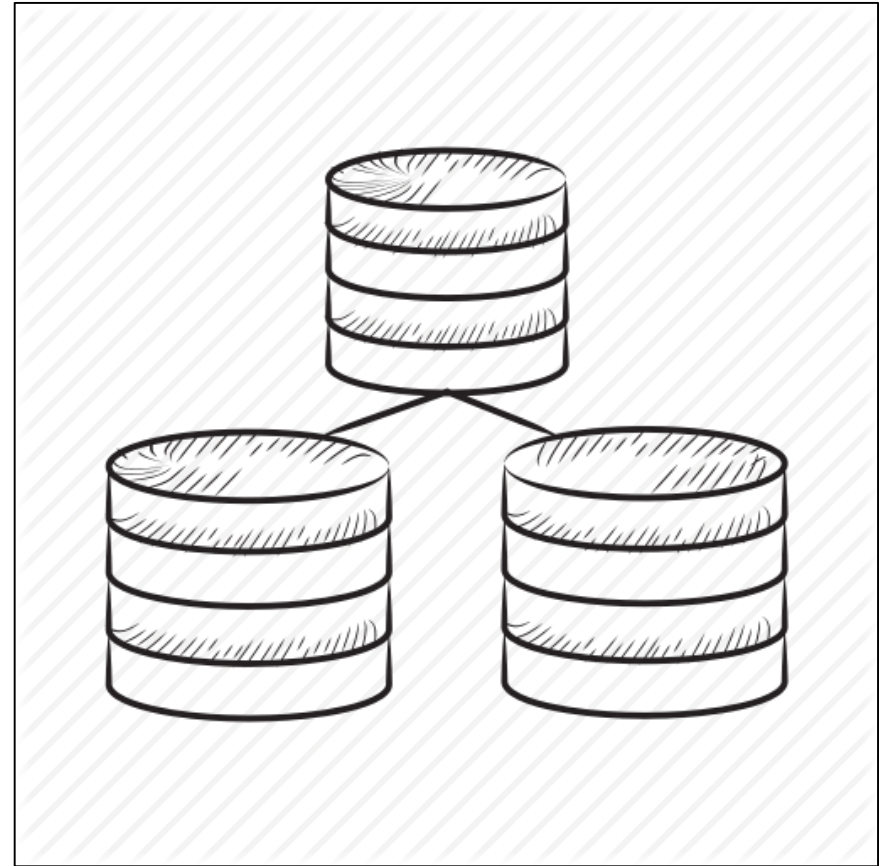
What happened to the database ?

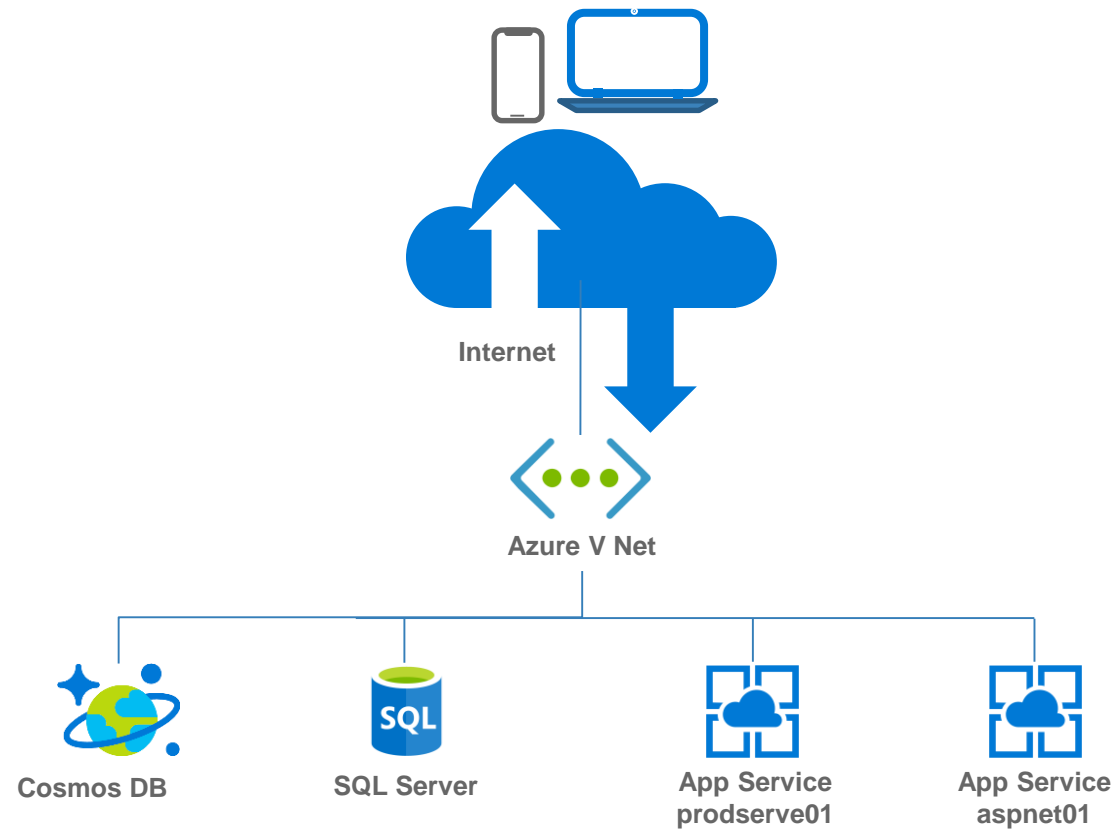
HOW and WHEN do we see that
part of the migration ?

IN SESSION 2!!!

with

Thomas Skytte





Best practices for Azure container registry

Network-close deployment

Geo-replicate multi-region deployments

Dedicated resource group

Repository namespaces

- `contoso.azurecr.io/products/widget/web:1`
- `contoso.azurecr.io/products/bettermousetrap/refundapi:12.3`
- `contoso.azurecr.io/marketing/2017-fall/concertpromotions/campaign:218.42`

Authentication

- Users (individual identity)
- Headless

Wrap up

- Migrated Tailwind Traders Datacenter hosted app to Azure!
- Used service-based endpoints and containers.
- Modernized operational tasks with Azure.
- Reduced overhead and ready for further expansion!

Github resource to run the demo's-

<https://aka.ms/AzAppMigrate>

