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CISAC Azure Infrastructure Update

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Agenda

- Background & Introduction
- ISWC Architecture
- Matching Engine Architecture
- Consumption & Cost Optimisation
- Effort Required
- Q&A

Background

Since the system was established, there have been numerous changes to the services in Azure.

- Enhance overall security by incorporating additional layers into the network architecture.
- Benefit from improved scalability and cost-effectiveness by utilizing the new hyperscale service tier of Azure SQL Database.

Introduction

What are we trying to achieve

- Swich component to component communication from public networking to private networking.
- Add HTTP layer 7 web application firewall to protect all web traffic.
  - Public portal
  - Agency portal
  - APIs and API developer portal
- Upgrade Sql database edition to Hyperscale sku.

How are we planning to do it

- Focus on infrastructure changes only, avoid application change.
- Minimise downtime where possible.
- Dual network path and co-existence if necessary, during transition period.

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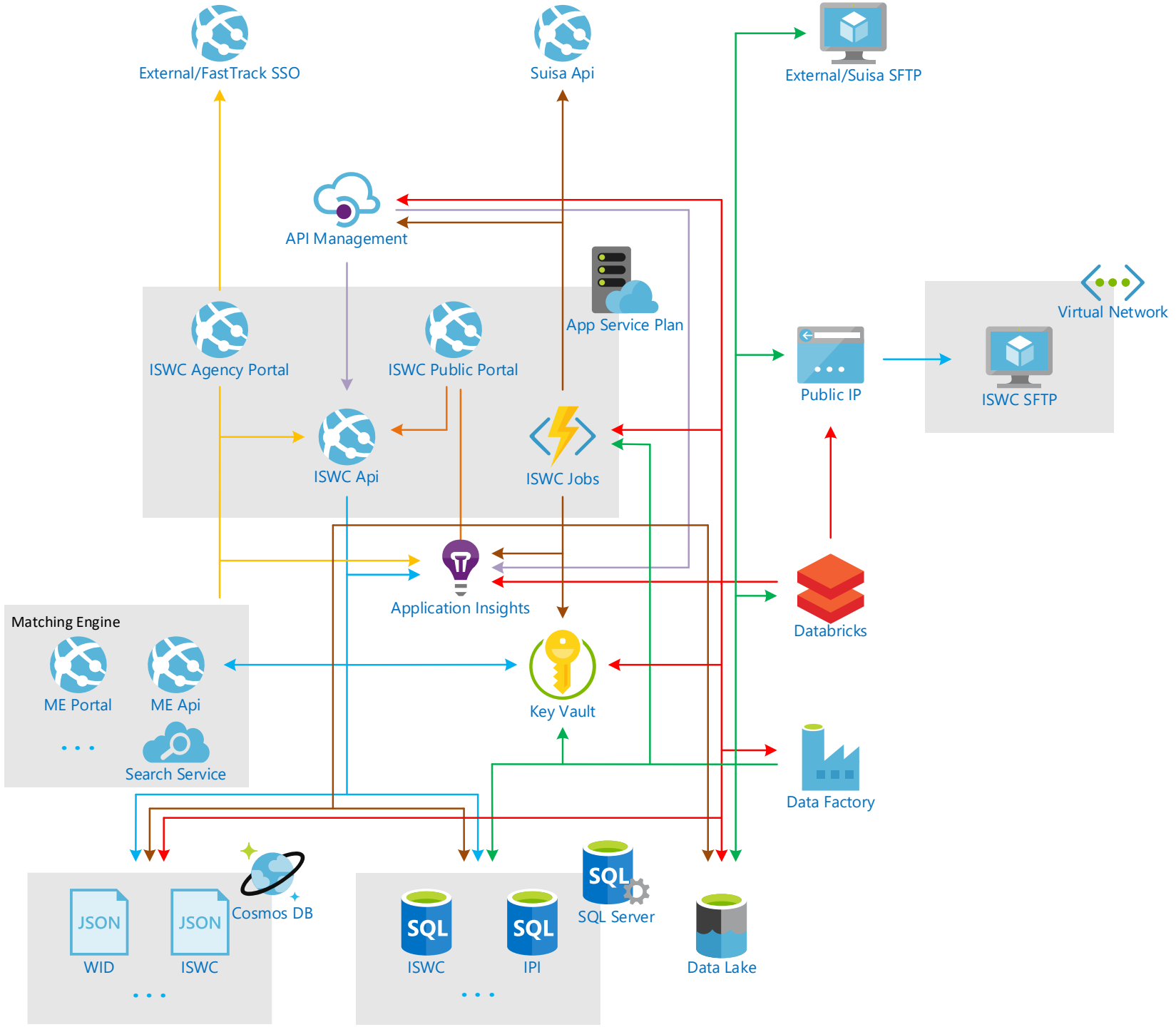
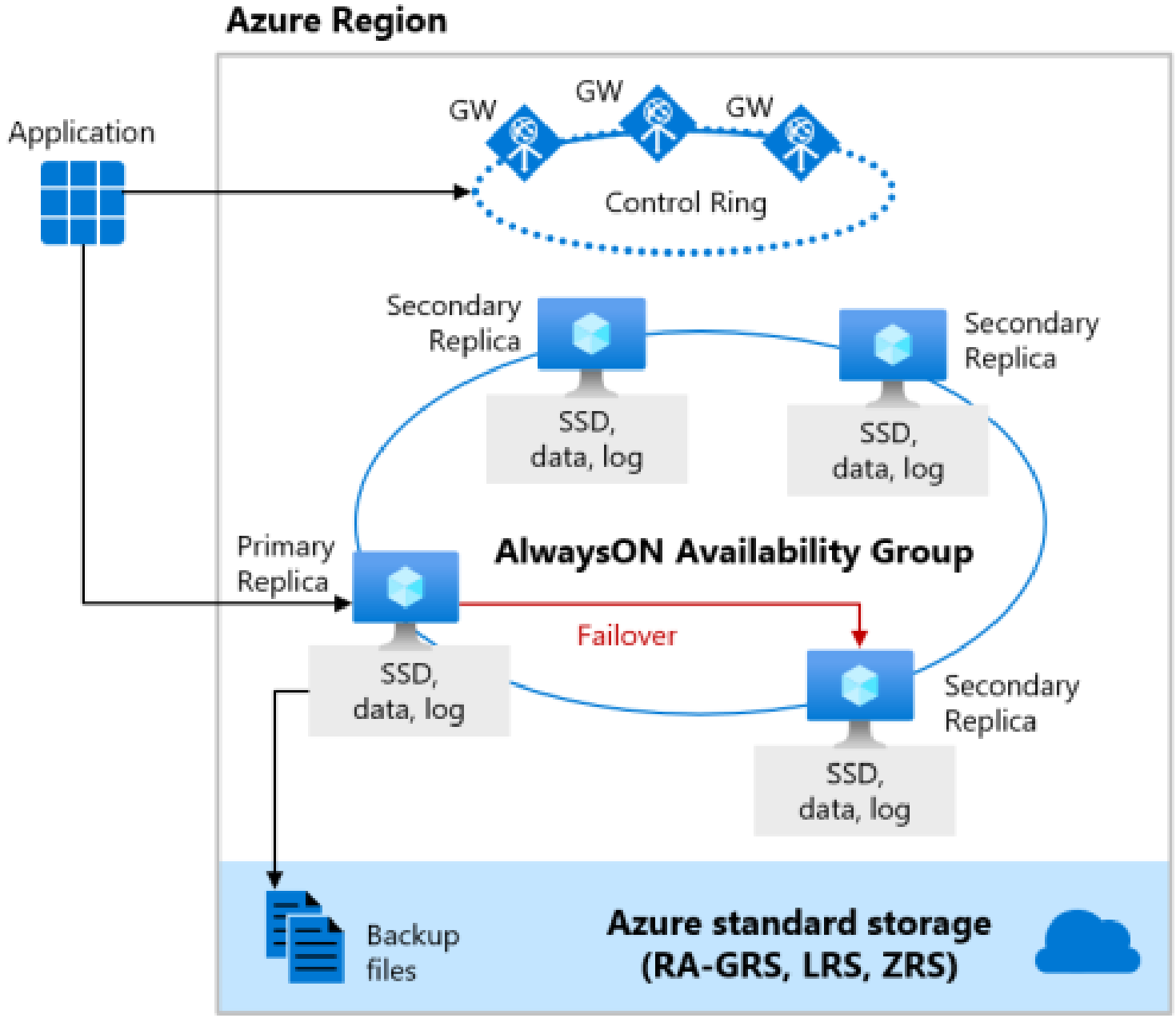
ISWC Architecture

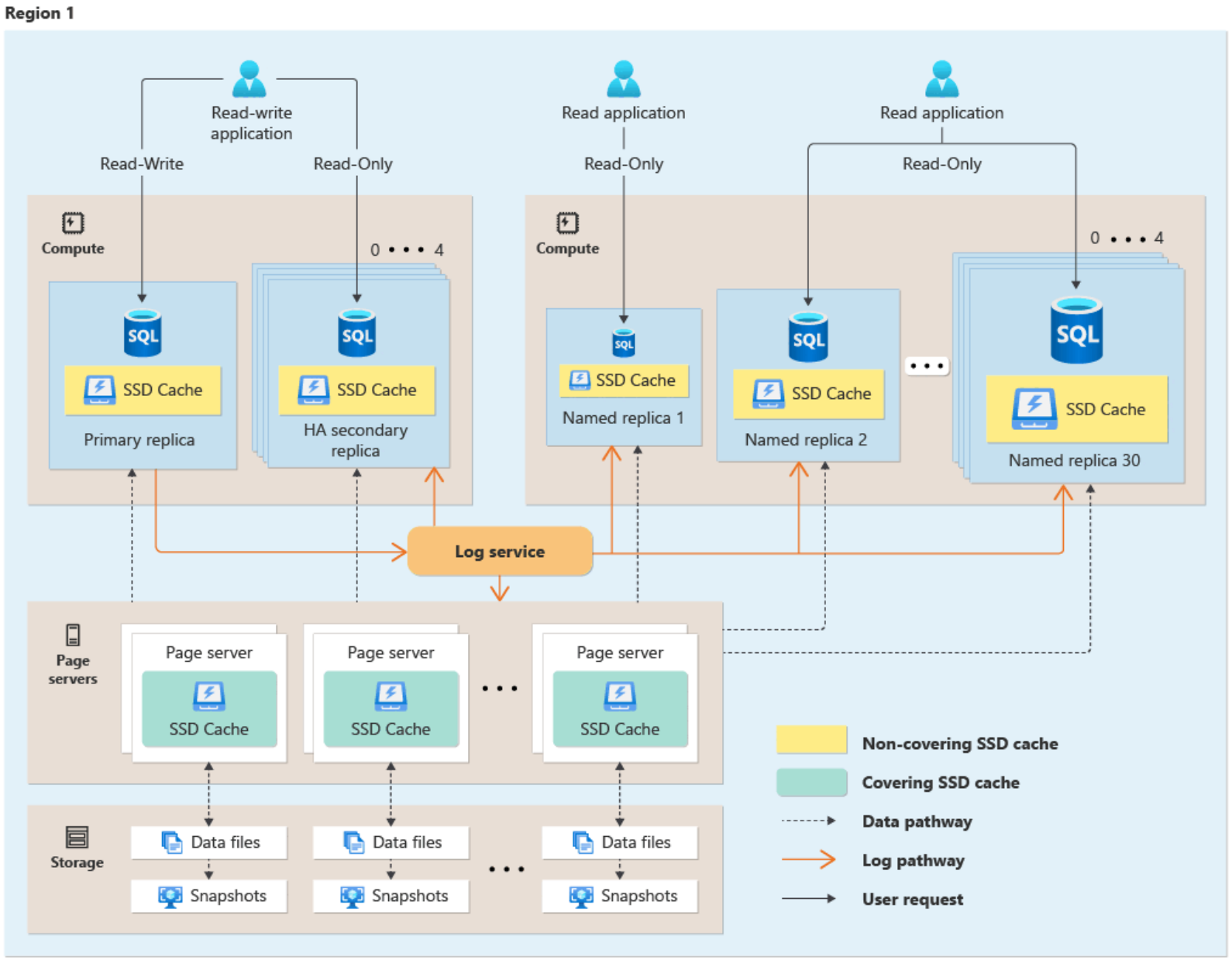
Current


External/FastTrack SSO
Suisa Api
External/Suisa SFTP
API Management
App Service Plan
Virtual Network
ISWC Agency Portal
ISWC Public Portal
Public IP
ISWC SFTP
ISWC Api
ISWC Jobs
Application Insights
Databricks
Matching Engine
ME Portal
ME Api
Key Vault
Search Service
Data Factory
JSON
WID
JSON
ISWC
Cosmos DB
SQL
ISWC
SQL
IPI
SQL Server
Data Lake

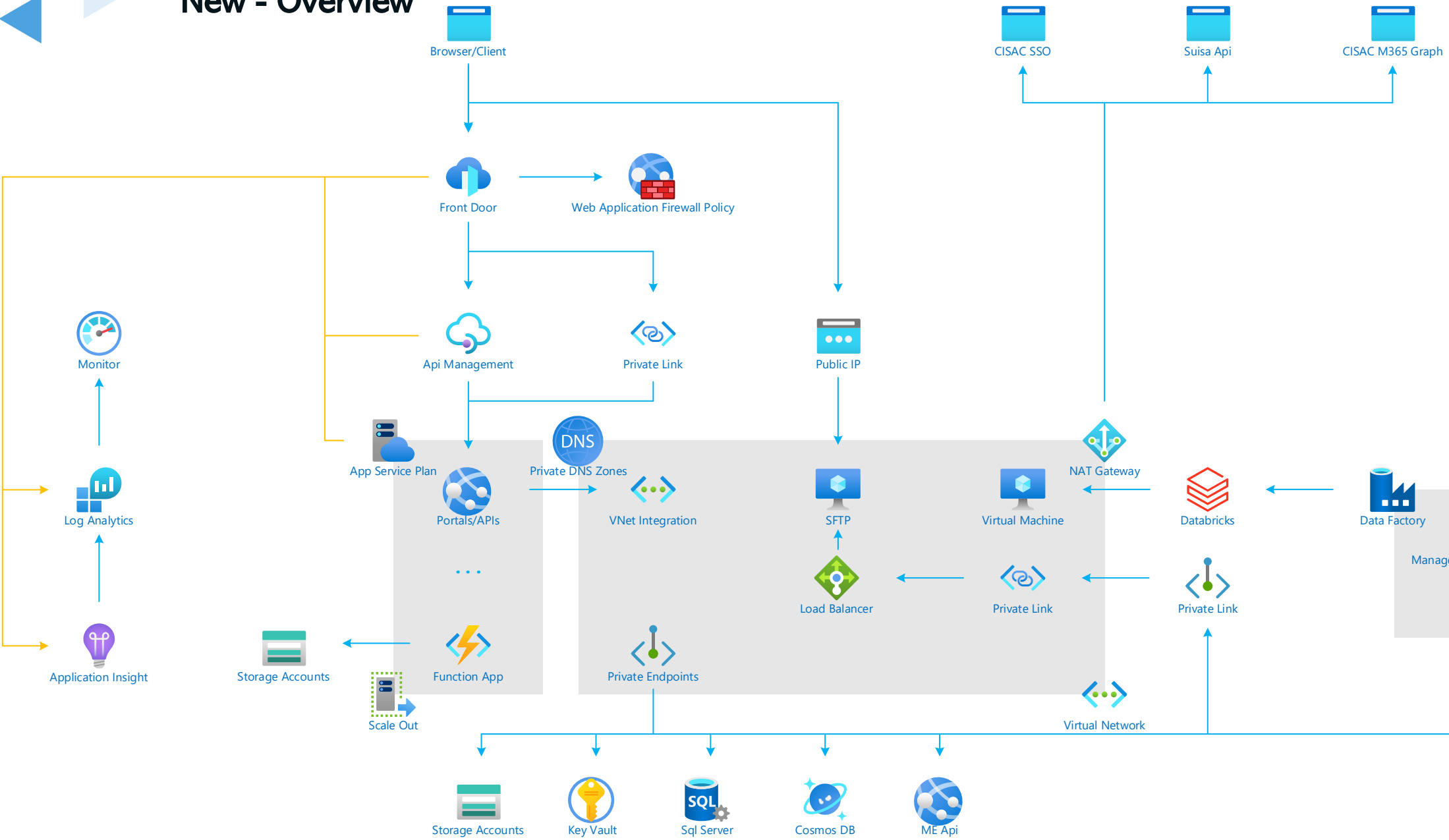
Current - Azure Sql Database - Business Critical



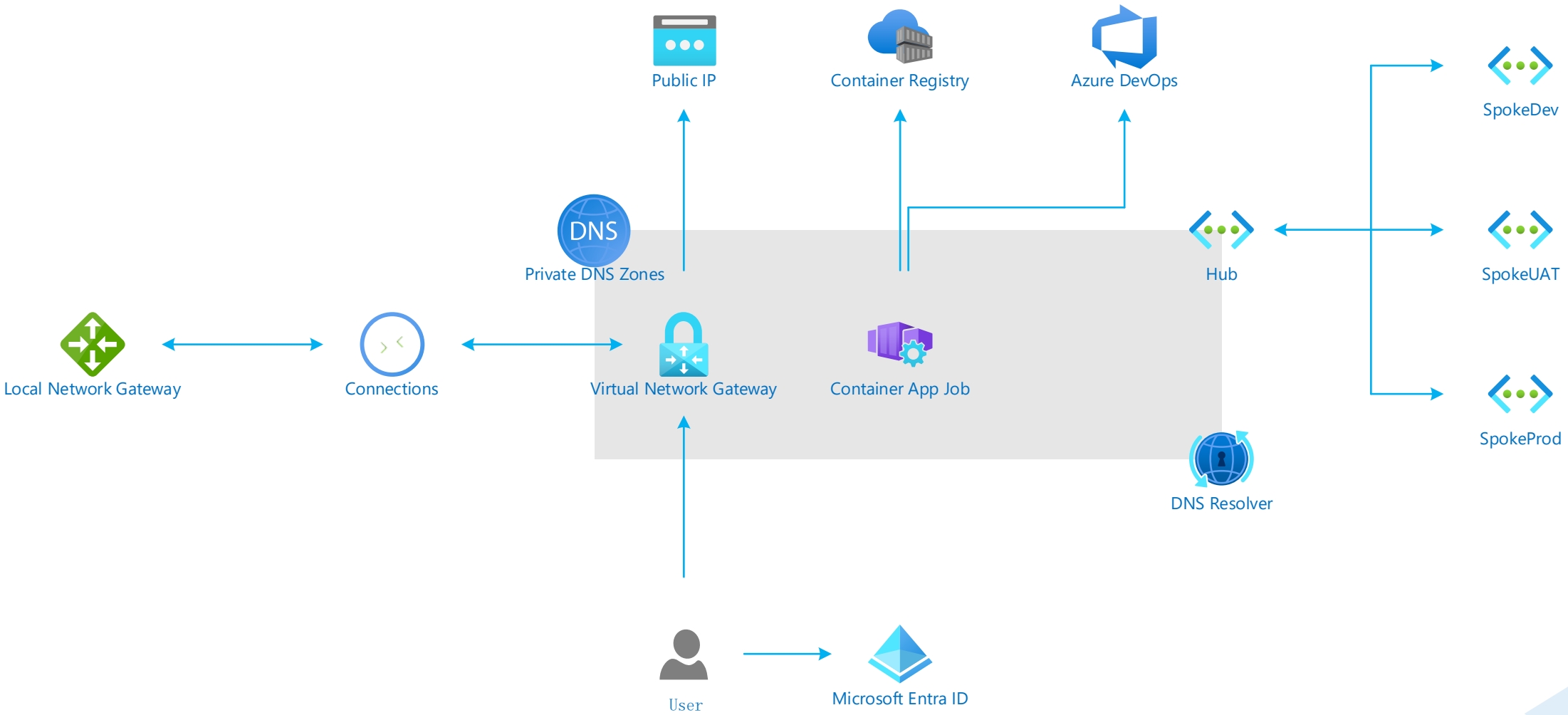
New – Azure Sql Database - Hyperscale



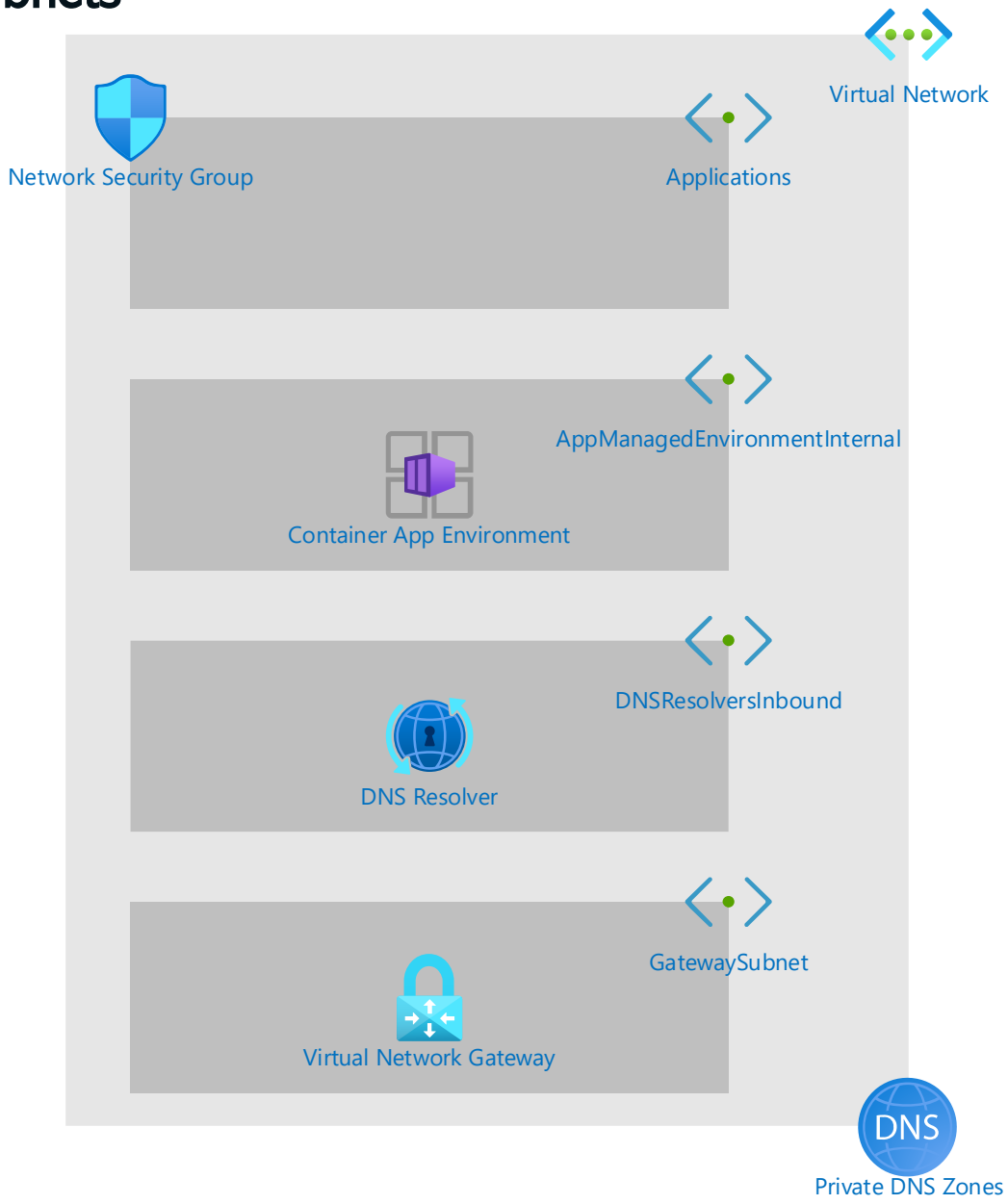
New - Overview



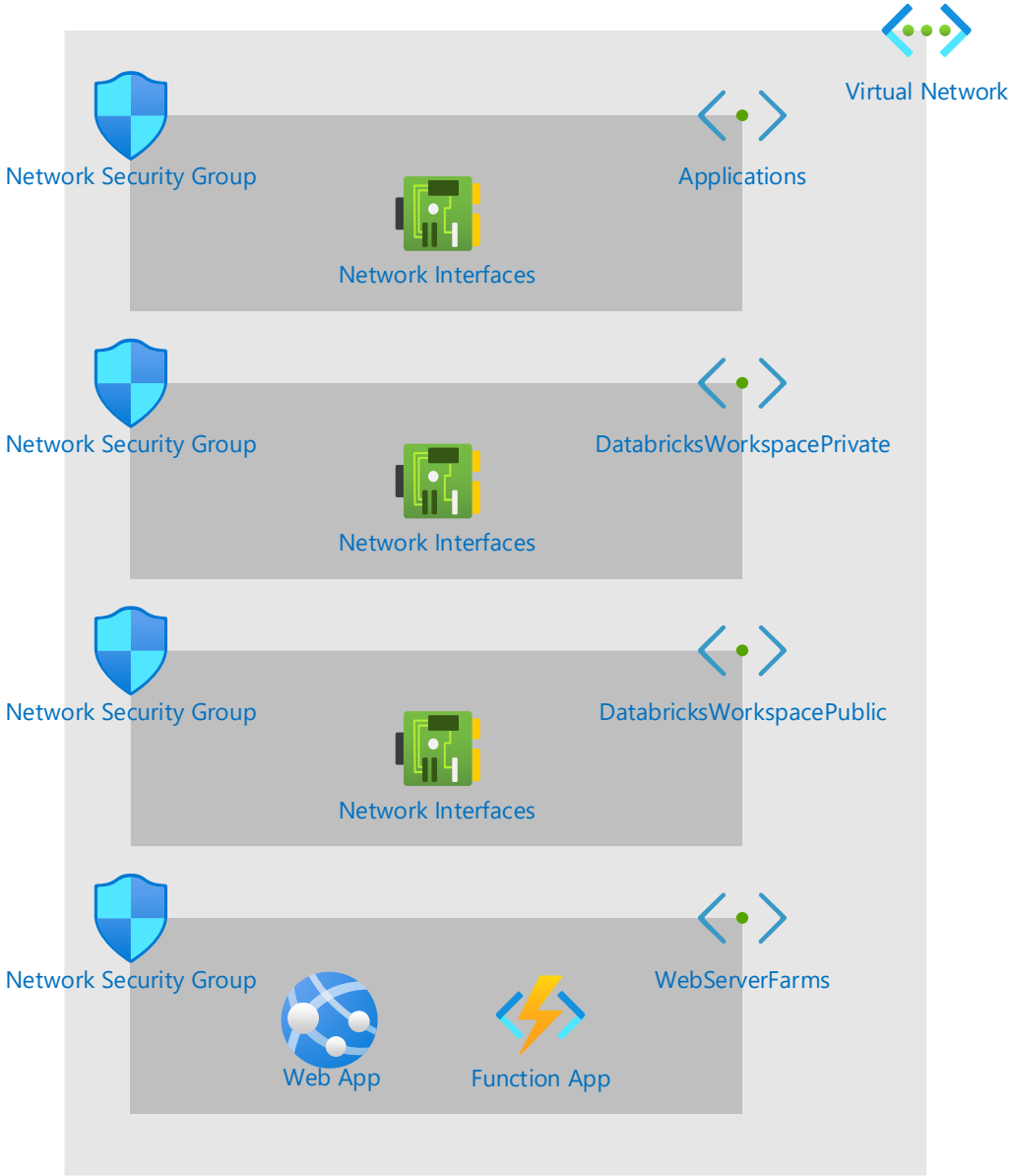
New - Hub/Shared



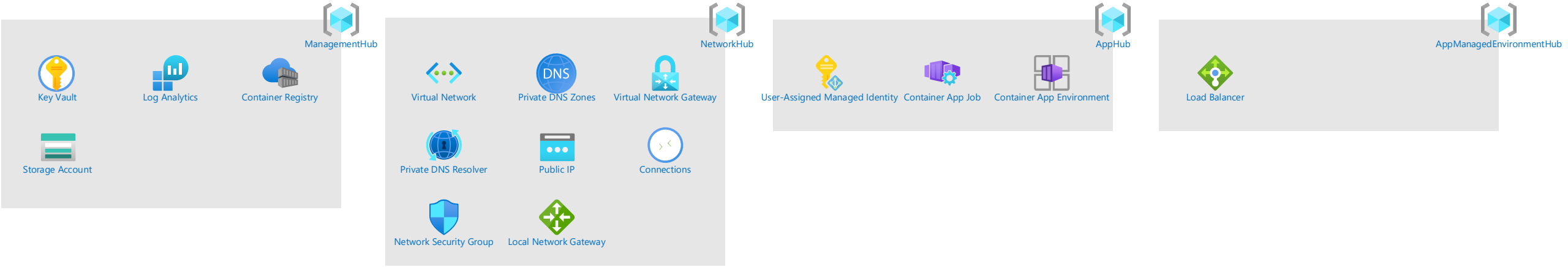
New - Hub/Shared Subnets



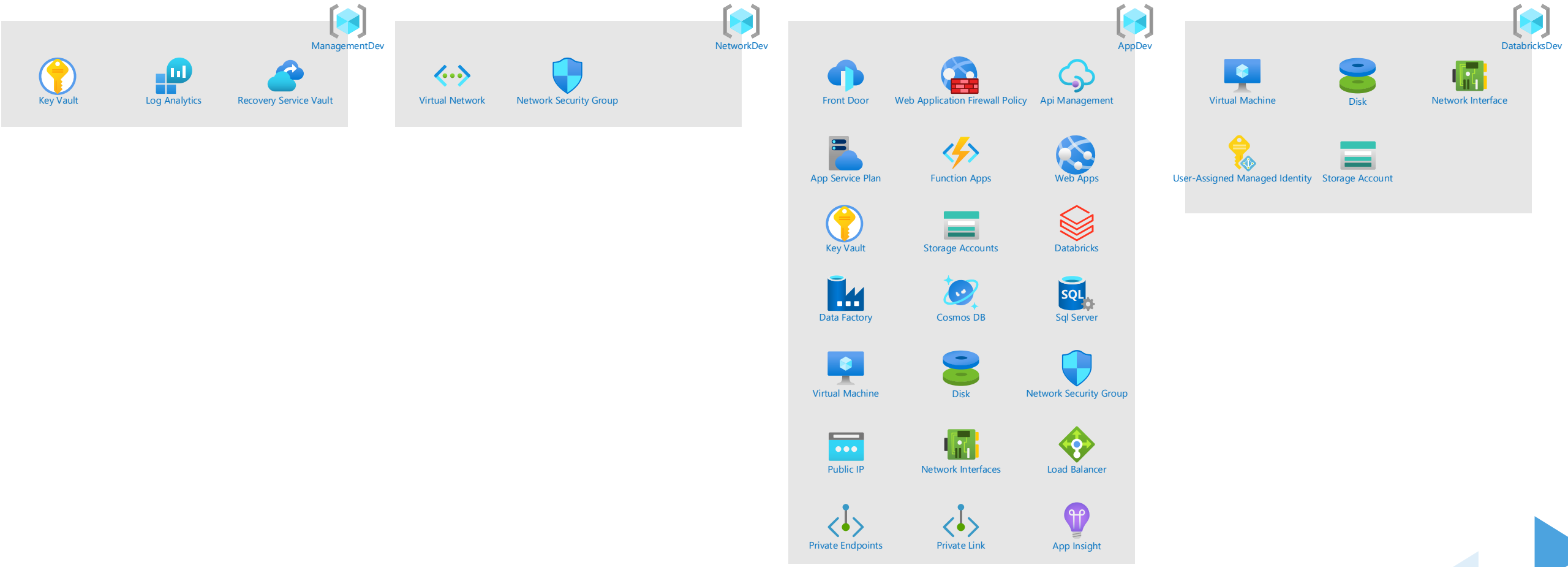
New - Spoke Subnets



New - Hub/Shared Resources



New - Spoke/Dev environment Resources



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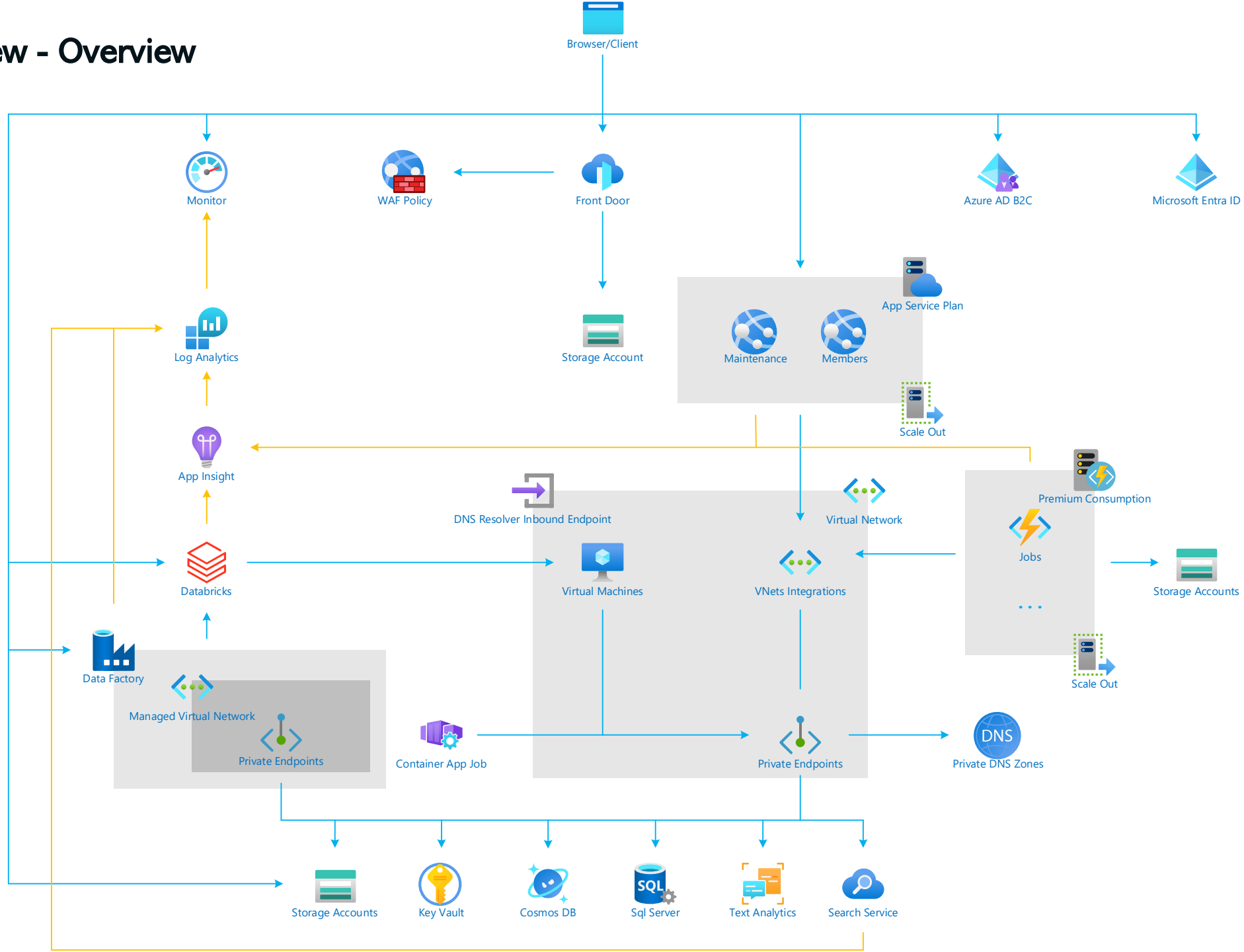
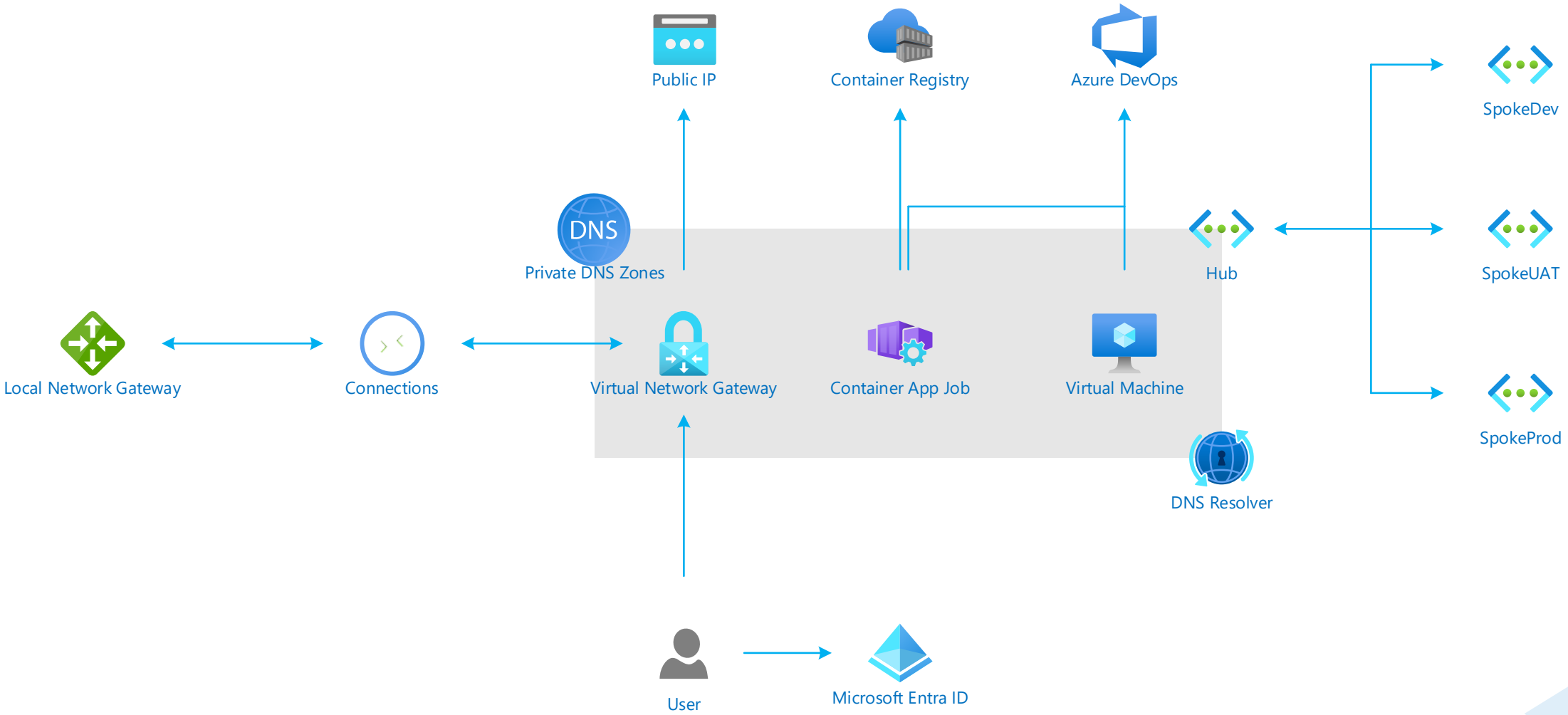
Matching Engine

New - Overview



New - Hub/Shared



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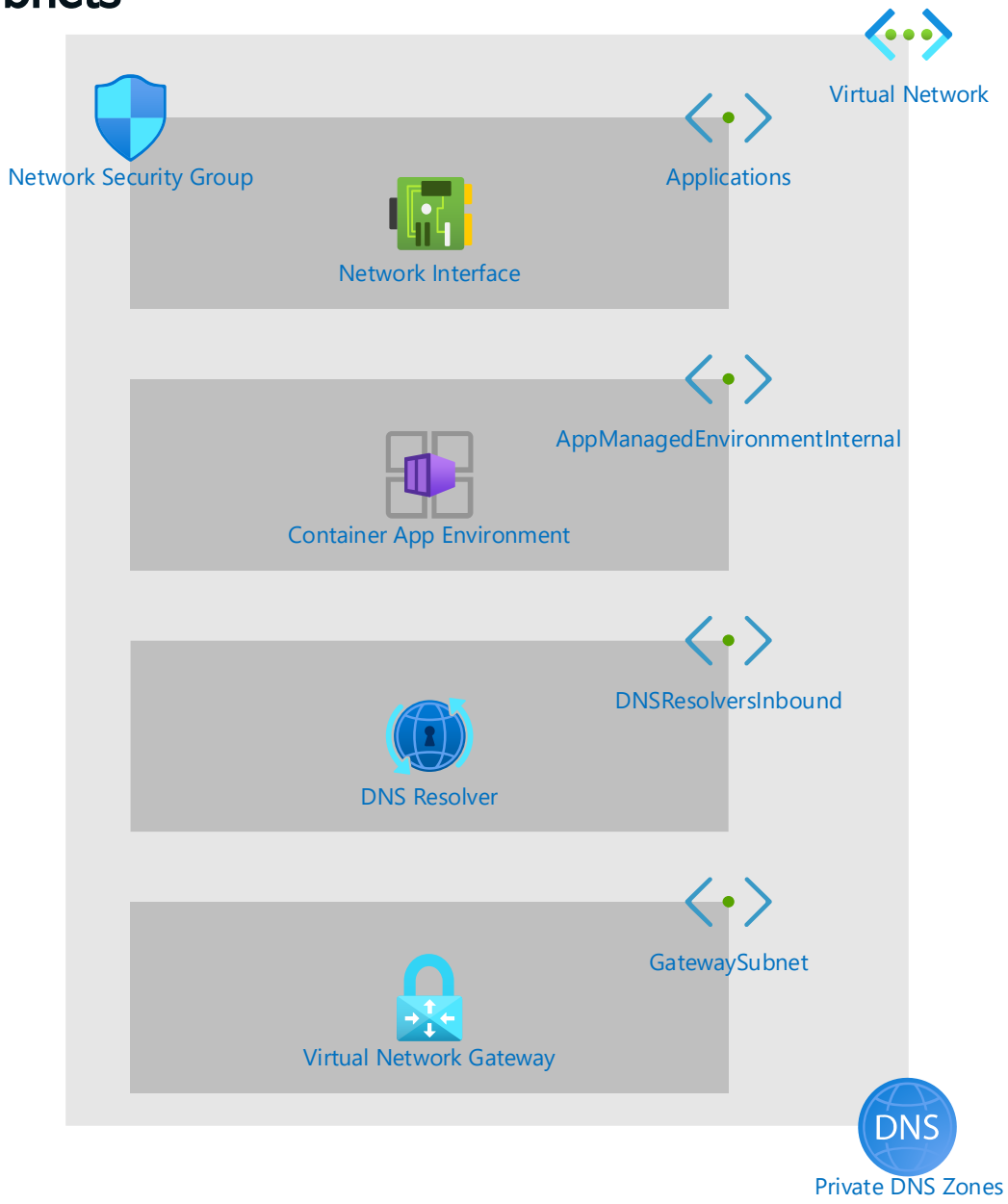
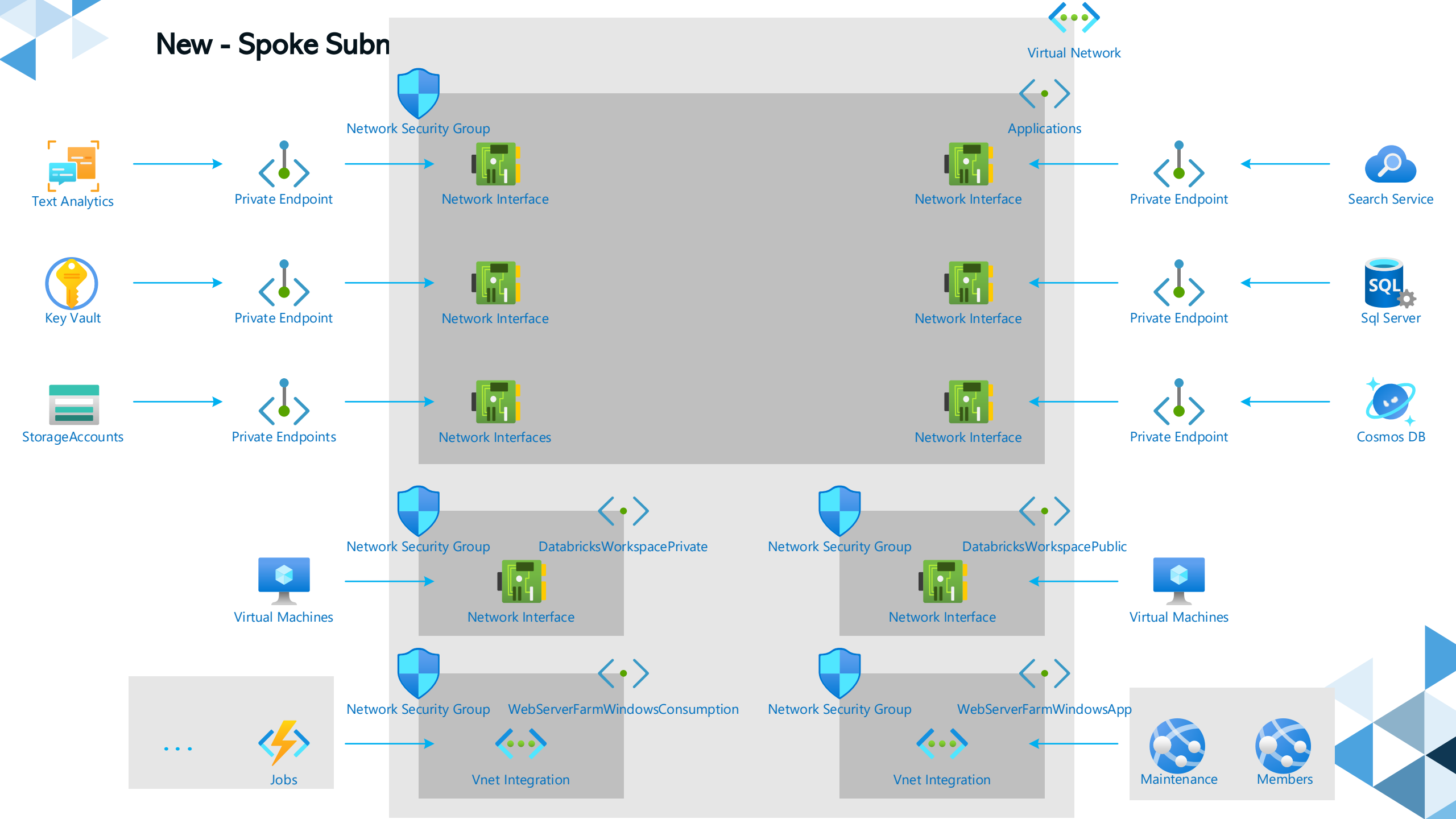
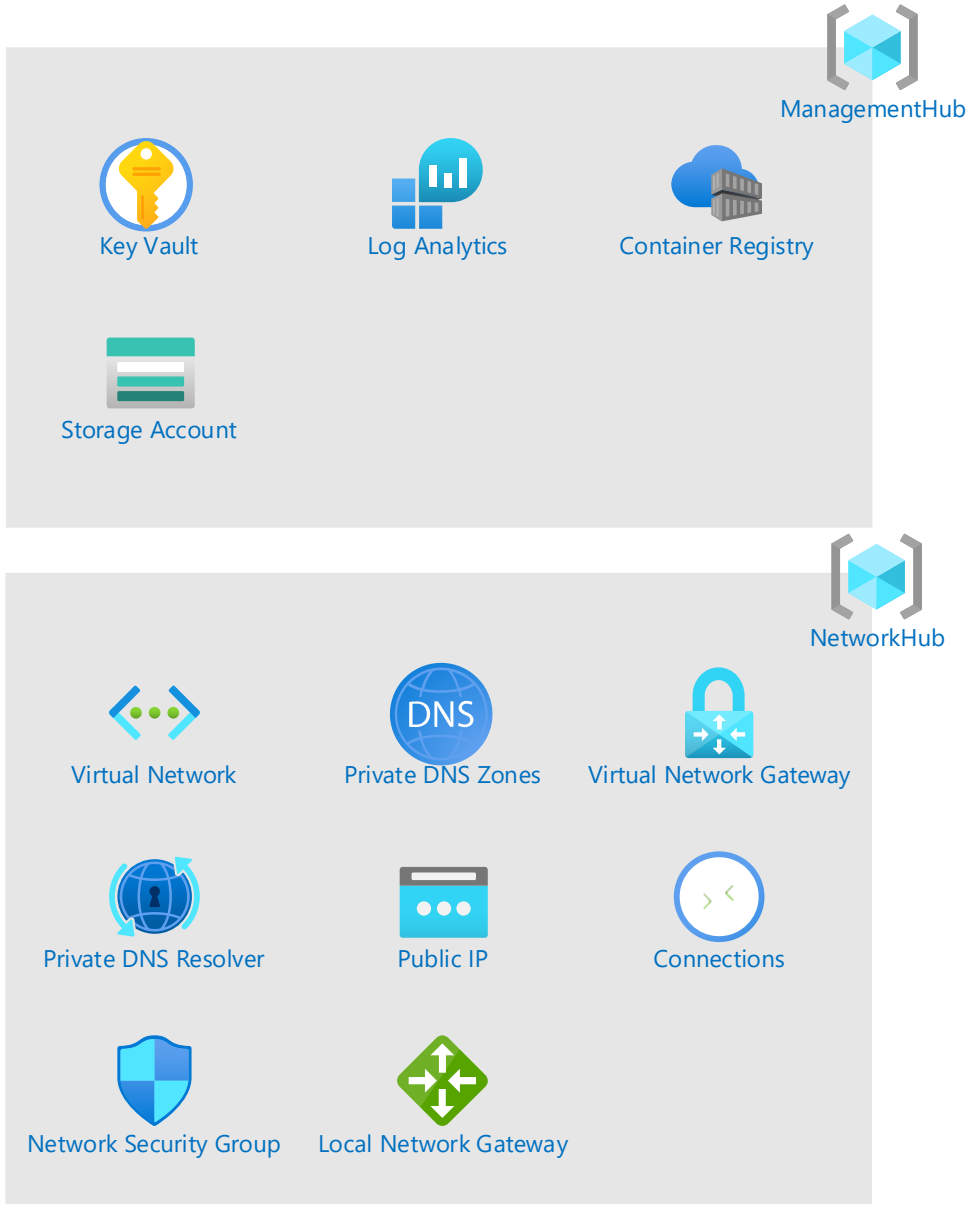


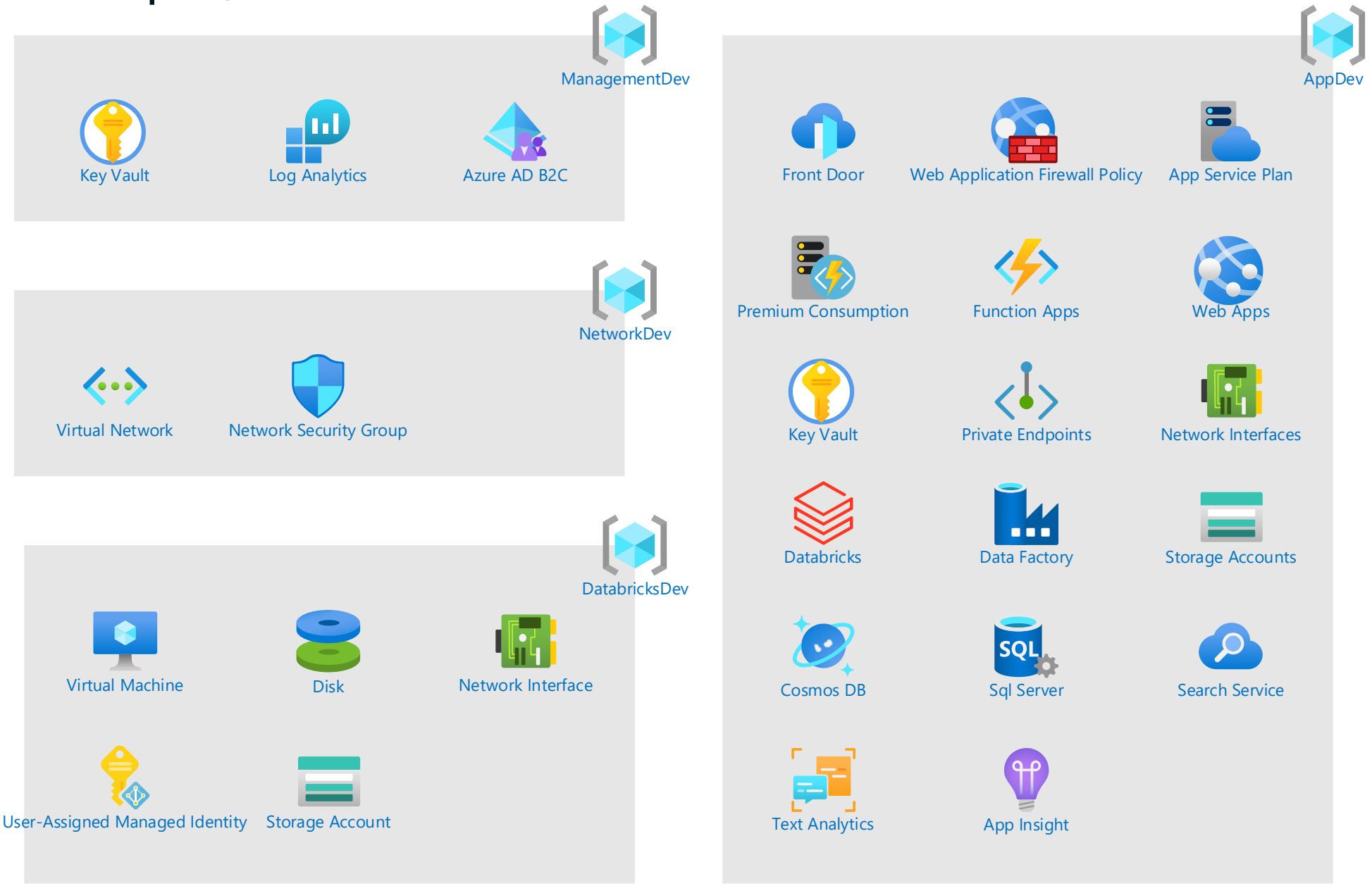
New - Spoke Subn



New - Hub/Shared Resources



New - Spoke/Dev environment Resources



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Consumption & Cost Optimisation

Impact

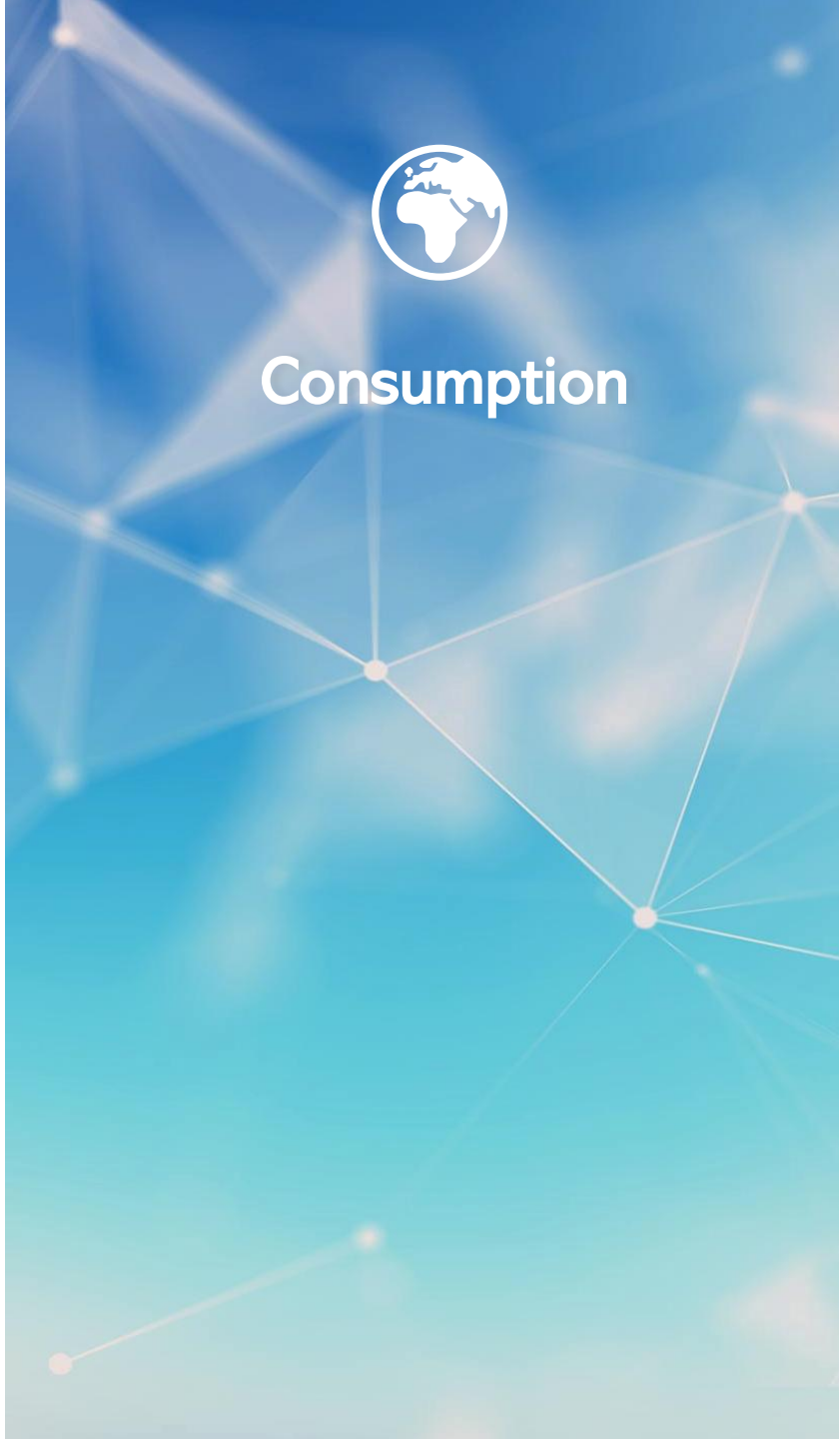
Top items with increasing cost

- €500, Data Factory Azure Hosted IR to to Azure Hosted Managed VNet IR
- €600, Front Door/WAF
- €200, VPN gateway
- €200, Databricks standard to premium

Top items with decreasing cost

- €3300, Database Business Critical to Hyperscale
  - Based on current reserved instance core count
  - Reserved instance will be returned and re-purchased on the new sku

We expect the decreased cost can cover the increased cost, with additional room for Sql performance upgrade.



Azure Sql Database

Business Critical

- Compute (includes 4 replicas) + Sql License + Storage + Backup

Hyperscale

- Compute (includes 1 primary replica) + Secondary replicas (LRS: 0…N, ZRS: 1…N) + Storage + Backup
- Sql License is bundled together with Compute, with reduced price, up to 35%.

  Azure SQL Database Hyperscale FAQ - Azure SQL | Microsoft Learn

Optimisation

Azure Sql Database

Recommendation:

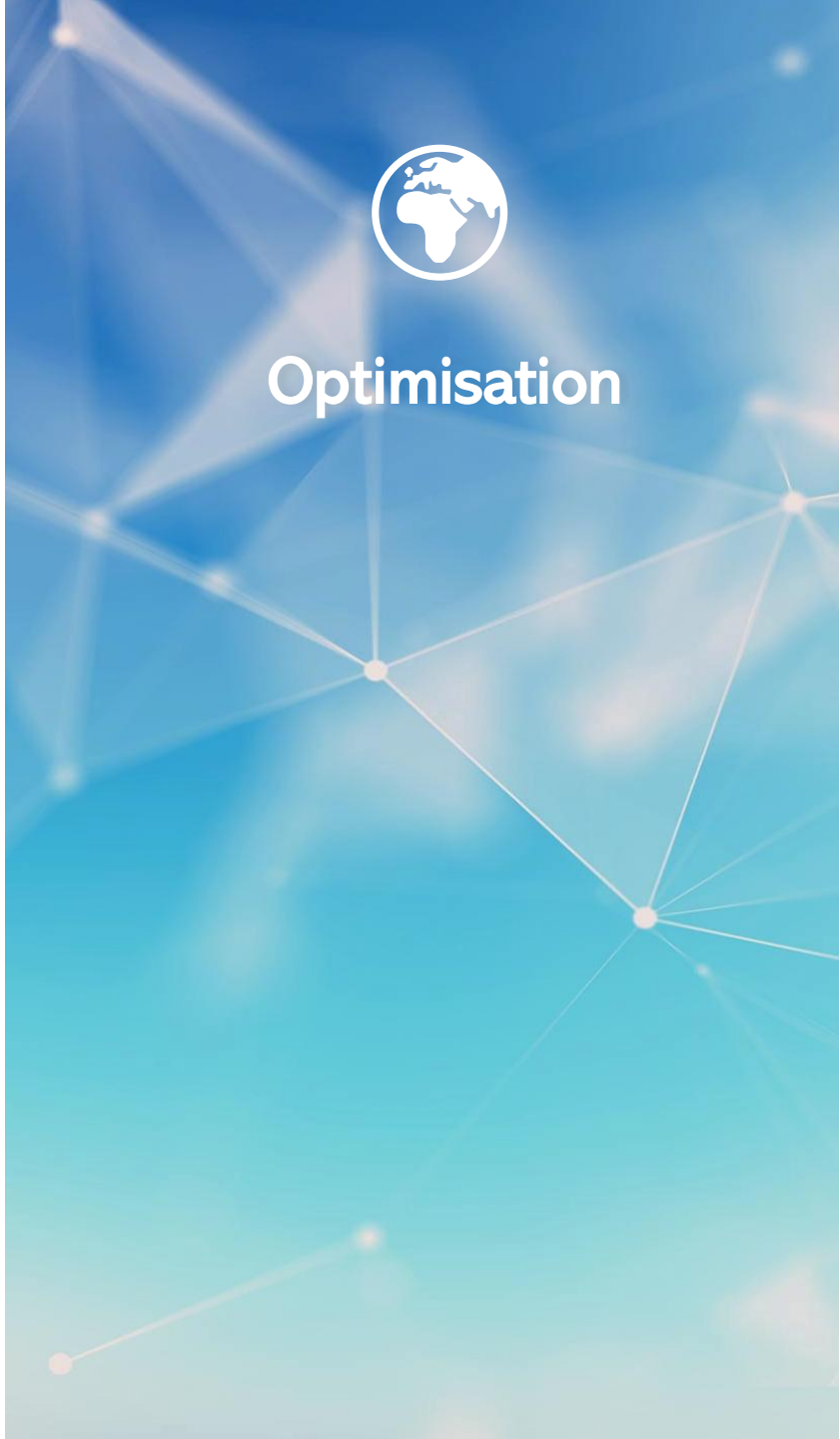
- Reserved Instance: will review later this year
- Hyperscale: 1 Primary + 1 Secondary
- Performance: More cores, higher performance with the same amount of money

Pay-as-You-Go

Core	BC Compute	BC License	BC C+L	HS Per Replica	HS 1P+1S
4	865.04	1044.65	1909.69	519.02	1038.04
8	1730.07	2089.3	3819.37	1038.03	2076.06
12	2595.11	3133.94	5729.05	1557.05	3114.1
16	3460.14	4178.59	7638.73	2076.07	4152.14
20	4325.18	5223.24	9548.42	2595.09	5190.18

1 Year Reserved

Core	HS Per Replica	HS 1P+1S
4	365.95	731.9
8	731.91	1463.82
12	1097.86	2195.72
16	1463.81	2927.62
20	1829.76	3659.52



Additional Options - Cosmos DB

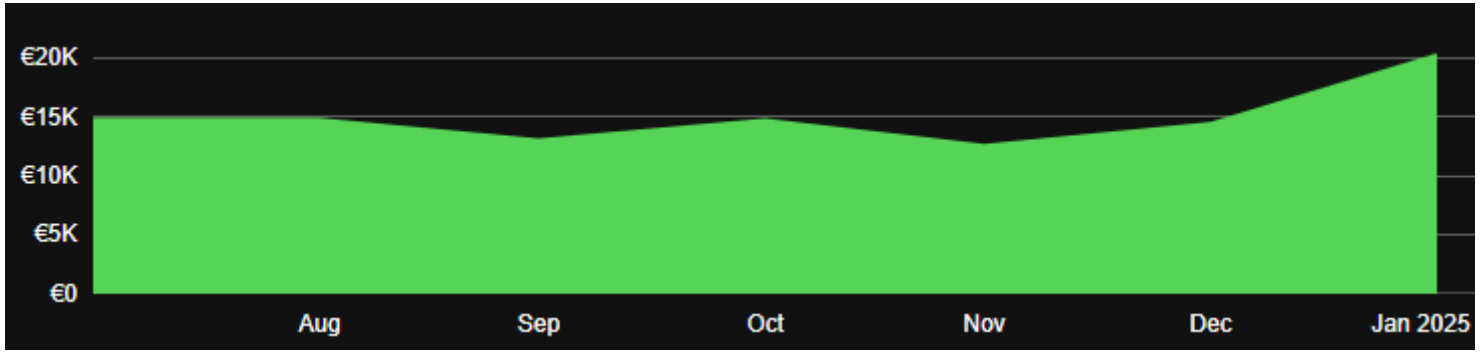
Recommendation:

- Reserved Instance: 1 Year with monthly payment
- 1 Year term discount: 20%

1 Year Reserved

Requet Units per Second	Pay-As-You-Go	1 Year Reserved
100,000	8406.91	6717.85
120,000	10088.29	8061.42
140,000	11769.67	9404.99
160,000	13451.06	10748.56
180,000	15132.44	12092.13
200,000	16813.82	13435.7
220,000	18495.2	14779.27

Historical Usage, under PAYG



Optimisation

Additional Options - Azure Databricks - Unit

Optimisation

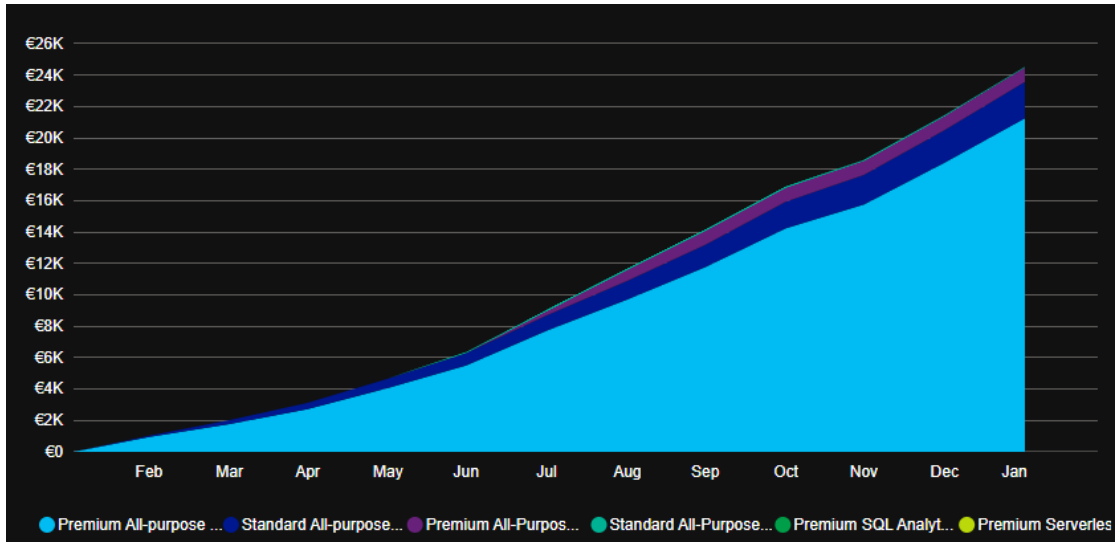
Recommendation:

- If workload or application logic changes, then do not purchase.

1-year pre-purchase plan

Databricks commit unit (DBCU)	Price (with discount)	Discount
12,500	€11,516.32	4%
25,000	€22,552.78	6%

Historical Usage, under PAYG



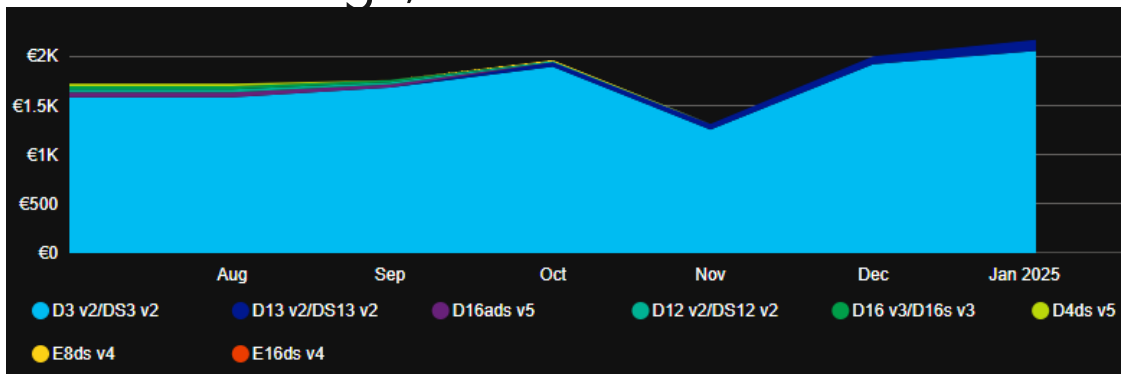
Additional Options - Azure Databricks - Cluster VM

Optimisation

Recommendation:

- Reserved Instance: 1 Year with monthly payment
- Cluster VM, 1 Year term discount: 40% to 41%
- Cluster VM Sku: Upgrade to the latest hardware
- If Databricks workload or application logic changes, then do not purchase.

Historical Usage, under PAYG



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Effort Required

ISWC

2000	**ISWC IaC and CI/CD**	
	Update Hub/Shared IaC	3
	Update Spoke/Environment IaC	5
	Create private deployment agents	1
	Update CI/CD	3
3000	**ISWC Conversion (Dev&UAT&Prod prep)**	
	private network conversion	1
	Databricks recreation	4
	Sql database sku conversion (dev&UAT&Prod)	1.25
	CISAC/FastTrack SSO, public IP allowed list	0.5
	private connectivity to ME Api (Dev&UAT&Prod)	0.75
	prep custom domain migration to front door	1
	prep Portal sites maintenance notification via front door	2
4000	**ISWC Prod Cutover**	
	custom domain migration to front door	0.25
	Portal sites maintenance notification via front door	0.25
	private network conversion	0.25
	Databricks recreation	0.5

Matching Engine

5000	**Matching Engine IaC and CI/CD**	
	Update Hub/Shared IaC parameter	1
	Update Spoke/Environment IaC parameter	1.5
	Create private deployment agents	1
	Update CI/CD	0.75
6000	**Matching Engine Non-Prod Conversion**	
	private network conversion	1
	Databricks recreation	2
	Sql database sku conversion	1
7000	**Matching Engine Prod Cutover**	
	private network conversion	0.25
	Sql database sku conversion	0.25
	Databricks recreation	0.5
	search outbound shared privatelink to ISWC database	0.25

Continue…

1000	Project Management	
	PM	6
	Architecture design	3

8000	Post Deployment Drawdown	
	Handover	1
	Issue fixing	5
	CISAC/FastTrack SSO, remove old public IP allowed list	0.25

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PM Cost:

9 days x €918.60 = €8267.4

Developer Cost:

39.5 days x €794.7 = €31390.65

Total Cost:

€8267.4 + €31390.65 = €39658.05

WBS	Description	Days
1000	**Project Management**	
	PM	6
	Architecture design	3
2000	**ISWC IaC and CI/CD**	
	Update Hub/Shared IaC	3
	Update Spoke/Environment IaC	5
	Create private deployment agents	1
	Update CI/CD	3
3000	**ISWC Conversion (Dev&UAT&Prod prep)**	
	private network conversion	1
	Databricks recreation	4
	Sql database sku conversion (dev&UAT&Prod)	1.25
	CISAC/FastTrack SSO, public IP allowed list	0.5
	private connectivity to ME Api (Dev&UAT&Prod)	0.75
	prep custom domain migration to front door	1
	prep Portal sites maintenance notification via front door	2
4000	**ISWC Prod Cutover**	
	custom domain migration to front door	0.25
	Portal sites maintenance notification via front door	0.25
	private network conversion	0.25
	Databricks recreation	0.5
5000	**Matching Engine IaC and CI/CD**	
	Update Hub/Shared IaC parameter	1
	Update Spoke/Environment IaC parameter	1.5
	Create private deployment agents	1
	Update CI/CD	0.75
6000	**Matching Engine Non-Prod Conversion**	
	private network conversion	1
	Databricks recreation	2
	Sql database sku conversion	1
7000	**Matching Engine Prod Cutover**	
	private network conversion	0.25
	Sql database sku conversion	0.25
	Databricks recreation	0.5
	search outbound shared privatelink to ISWC database	0.25
8000	**Post Deployment Drawdown**	
	Handover	1
	Issue fixing	5
	CISAC/FastTrack SSO, remove old public IP allowed list	0.25
Total		**48.5**

ISWC - Web Application Firewall - Optional

PM Cost:
3 days x €918.60 = €2755.8

Developer Cost:
40 days x €794.7 = €31788

Total Cost:
€2755.8 + €31788 = €34543.8

WBS	Description	Days
1000	**Project Management**	
	PM	3
2000	**ISWC WAF OWASP rules fine-tuning**	
	public portal	10
	agency portal	15
	APIs via APIM	15
Total		**43**

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Thank You