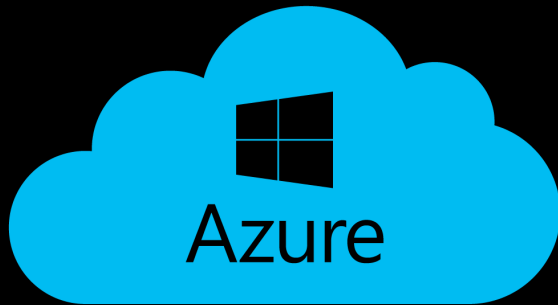




Energy Industry Client Transformation Approach

Energy Industry Azure / On Prem Volumes

Percentage of Systems Going to Azure

Anteil		HJ2.2020	2021	2022	2023	2024	HJ1.2025
100%	Gesamt	0%	30%	40%	50%	60%	60%
60%	virtuelle Systeme	0%	43%	57%	71%	86%	86%
40%	physische Systeme	0%	11%	14%	18%	21%	21%

Percentage of Systems Remaining on Prem

Anteil		HJ2.2020	2021	2022	2023	2024	HJ1.2025
100%	Gesamt	100%	70%	60%	50%	40%	40%
60%	virtuelle Systeme	100%	57%	43%	29%	14%	14%
40%	physische Systeme	100%	89%	86%	82%	79%	79%

- **Key Challenges**

- Private cloud costs go **down by 1.5 Million**, compared to 100% On prem, due to ramp down on refreshed hardware.
- Azure IaaS costs went **up by 6.5 Million**.
- The competition is offering support for **all Azure Services**, while the DXC Offering only supports VMs.

- **Potential Solution using PaaS**

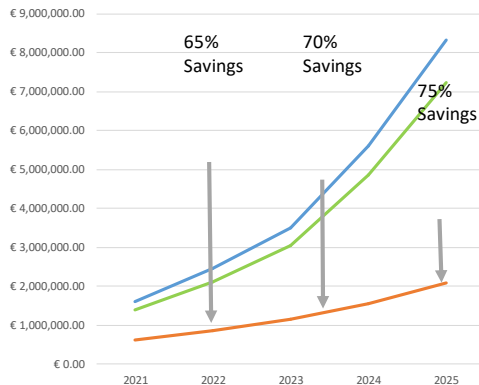
- **Autoscaling** - Business is based in Germany and Compute is mostly used during business hours.
- **DevOps** - Replacement of Old Release Processes with CI/CD pipelines can render a number of systems obsolete.

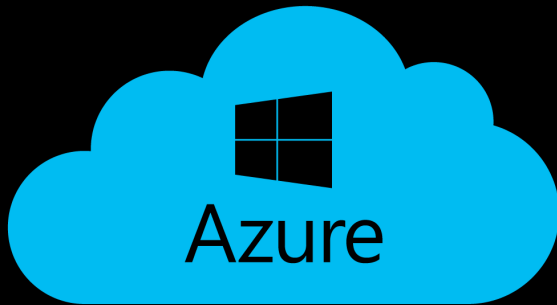
IaaS vs PaaS Cost Comparison Summary

Gas-X Operating Models	Price Monthly	5 Y Total	Cost Savings
On Prem Price	€ 30,233.55	€ 1,814,012.84	-29.70%
Price-to-Win	€ 23,310.67	€ 1,398,639.96	0.00%
Azure IaaS Price	€ 26,842.56	€ 1,610,553.43	-15.15%
Azure PaaS Price	€ 10,208.11	€ 612,486.39	56.21%

All 33 Apps (roughly, assuming all apps are like Gas-X)	Price Monthly	5 Y Total	Cost Savings
On Prem Price	€ 156,425.74	€ 9,385,544.69	-29.70%
Price-to-Win	€ 120,607.36	€ 7,236,441.53	0.00%
Azure IaaS Price	€ 138,881.06	€ 8,332,863.40	-15.15%
Azure PaaS Price	€ 34,720.26	€ 2,083,215.85	71.21%

Azure Costs by Migrated Apps



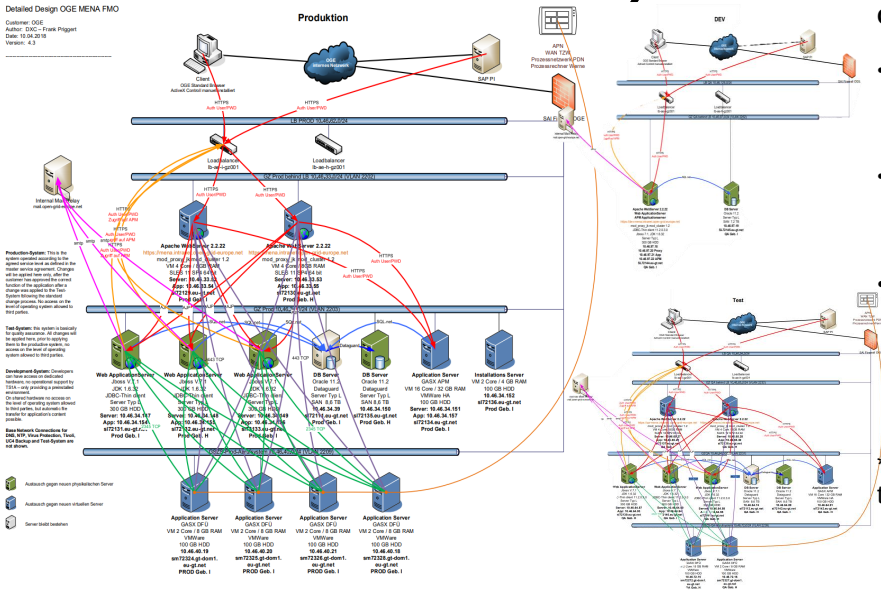


Gas-X Example

Gas-X On Prem (CMO)

Detailed Design OGE MENA FMO

Customer: OGE
Author: DXC - Frank Piggett
Date: 15.04.2019
Version: 4.3



CMO Challenges

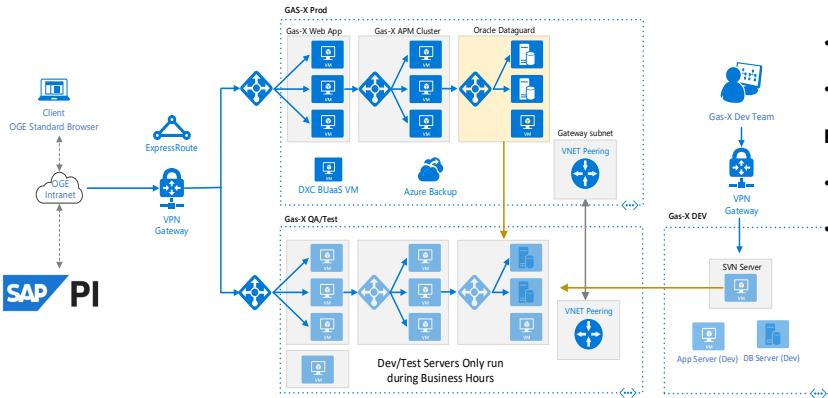
- Servers are idle most of the time**, but the full capacity is required for peak times when data is processed (around 10 s per hour).
- The release process is very slow** as it takes a lot of time to prepare the QA environment for testing.

Infrastructure Costs:

- On Prem Price: € 1,814,012.84**
- Price-to-Win: € 1,398,639.96 ***

* This top down price was submitted to the client in the previous stage.

Gas-X on Azure: Migrate VMs (IaaS)



Advantages

- Quickest migration approach with least amount of transformation efforts.
- Existing processes will work in the same way with as little changes as possible.
- Workloads can be shut down when not in use.

Disadvantages

- **Does not solve the challenges reported by the client**
At least twice more expensive Oracle licensing and a requirement for a duplicate backup service and monitoring system.

- **Azure IaaS (CSP): €1,372,919.25**
- **Managed Services: €237,634.18**
- -----
- **Azure Total: € 1,610,553.43**
- **Price-to-Win: € 1,398,639.96**

- * Price excludes Oracle and BUaaS licenses and Mgmt

Gas-X Option #2. Re-Architect Application

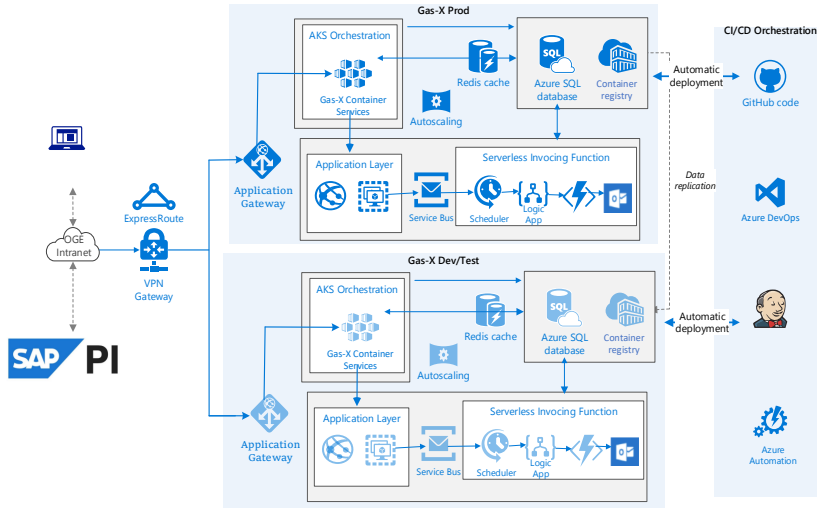
Advantages

- Highest cost savings, compared to all other options.
- Automatic scaling provides optimal resource capacity will be used at any given moment.
- Automatic CI/CD pipelines allows for seamless development and testing.

Disadvantages

- Requires application refactoring to work.
 - **Azure PaaS (CSP): €529,831.02**
 - **Managed Services: €82,655.37**
 - -----
 - **Azure Total: € 612,486.39**
 - **Price-to-Win: € 1,398,639.96**

* We might not need Managed Services for this scenario.



IaaS Cost Drivers

- **The CMO environment is designed for resiliency and high availability.** This means that **all servers are duplicated**, increasing costs and management efforts.
- **Servers are idle most of the time, but the whole compute power is required**, as complex calculations take place when data is processed and invoices are generated.
- **Load spikes occur for about 10 s every hour**, and the infrastructure is largely unused for the rest of the time.
- **The web front end is only used by clients' employees** during business hours.
- **However, the application must be available all the time**, as it's a critical to OGE's revenue and business processes.
- **There are Dev and QA/Test environments**, which increases the **overall hardware capacity requirements**:
 - **Dev resources are only used during business hours**, and the infrastructure is mostly idle for the rest of the time.
 - **QA/Test environment is only used once every few months**, when a new release is about to be pushed to Production.
- **The Release Cycle is very slow:**
 - **OGE have complained about the slowness of the release process** and requested a solution to speed up the Int testing processes
 - The QA/Test environment must have its data synchronized with the PROD and the new code must be downloaded from the SVN server and installed manually on each server for integration testing. **These are all manual processes that require several days to complete.**
 - **Infrastructure and Network Changes** require involvement of multiple teams and manual efforts and **are also very slow.**
 - **Disaster recovery is also mostly manual and takes several days to complete**, in addition to the extra costs for running a dual DC and investment in hardware.

PaaS Advantages

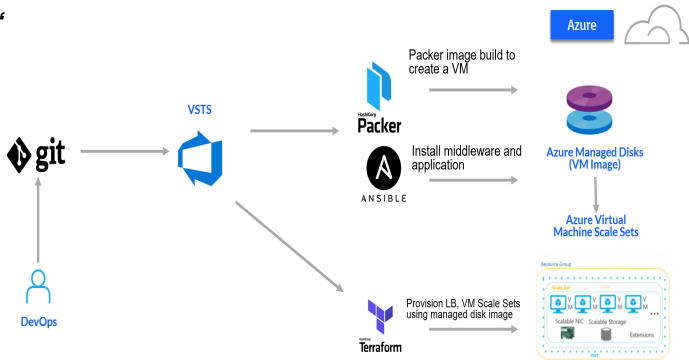
- **High Availability comes out of the box** with Azure services like AKS, App Service Environments, App Gateway, Azure Functions and Logic Apps.
- **There is no need to duplicate anything in the PaaS operation model**, as this is handled by Microsoft in the platform layer.
- **Azure Functions gets billed for execution time**, meaning that they only pay for the time they need the compute.
- **The PaaS solution can deliver identical compute power as the IaaS one**, but you don't pay for it when it's not in use.
- **AKS and App Service Environments can auto-scale the number of pods** based on active HTTP sessions. In addition, **the Kubernetes Cluster Auto-scaler package will scale the number of nodes** based on the number of running pods.
- As a result, **we will have 1 or 2 nodes running most of the time, with the full capacity used only during business hours.**
- Azure's flexible consumption model and fast provisioning **eliminates the need for hardware investment for Dev/Test and operation of servers that aren't in use.**
- **The adoption of DevOps practices and tools** can speed up dramatically the release life cycle and reduce infrastructure costs:
 - **Containerization** encapsulates the Application and all its dependencies, thereby **eliminating the manual efforts for integration testing.**
 - **CI/CD Pipelines automate the testing and release management process**, minimizing the need for manual human intervention and allowing for much shorter release cycles.
 - **Orchestration takes care of the app scaling and availability**, so developers can focus on the business logic, code optimization and feature development and not care about
 - **Infrastructure-as-Code** makes it easy for developers to replicate deployments and make infrastructure changes without waiting on others.
 - **Security and Ops teams can focus on policy and automation scripts**, as opposed to wasting time on repetitive tasks. In fact, there is no need for any IT Ops teams on Azure, as Site Reliability Engineers can automate all operations processes and security policies.

Why Dev Teams will never buy OS patching service on Azure when they do DevOps

When you use CI/CD pipelines you patch VMs like this:

1. Use the tag **"version": "latest"** in the **"imageReference"** section of your **ARM template**.
2. You **deploy a new VM using CI/CD pipelines** and test your app.
3. If it works, you deploy new VMs to Production and destroy the old ones.

When you use CI/CD pipelines, **you do not need anyone to patch your servers**, you need an SRE to code your ARM template and a DevOps engineer to set up your pipelines.

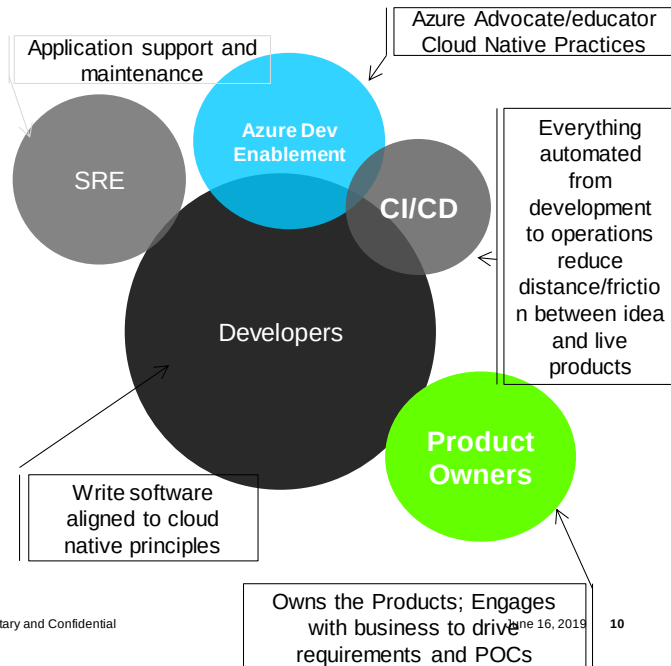


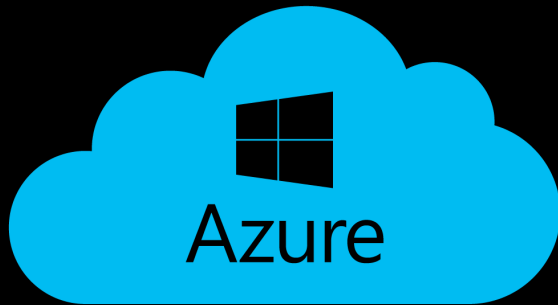
App Services for Azure

- **Rearchitecting the App** is usually required to harness the power PaaS and Server-less Compute
- **DXC can work with Client and Partner Dev teams** for the transformations.
- **DXC is be able to provide resources for any combination of circles to the right**
- **DevOps culture is a pre-requisite**

To facilitate adoption of native PaaS and Server-less resources on Azure:

- **DevOps resources and expertise**
- **App Health Monitoring**





App Cloud Readiness

Energy Industry Client Cloud Readiness Assessment Results and Landing Zones

Reduce Costs	Corporate	SaaS; Public Cloud	Revenue generating	Cloud Native; Public Cloud	IT internal	Private Cloud; SaaS
A - Containerisable	23		5		14	
B - Hybrid	7		5		6	
C - Complex	0		0		0	
D - Do not move, e.g., Planned Decomm	0		0		0	
O - Out of Scope	0		0		0	
L - Learn, more information required	0		0		0	
U - Classification in progress	0		0		0	
Total	30	Re-Arc; Private Cloud	10	Develop; Private Cloud	20	Optimize Legacy
Increase Business Flow	Corporate		Revenue generating		IT internal	
A - Containerisable	10		2		0	
B - Hybrid	2		2		0	
C - Complex	0		1		0	
D - Do not move, e.g., Planned Decomm	0		0		0	
O - Out of Scope	0		0		0	
L - Learn, more information required	0		0		0	
U - Classification in progress	0		0		0	
Total	12		5		0	