#Coding
VentiVentiquattro

Test di scalabilità e resilienza in Azure

Francesco Belacca


development innovation


Microsoft


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Navigare la Trasformazione Digitale:
Un Viaggio attraverso Dev, DevOps e il Cloud

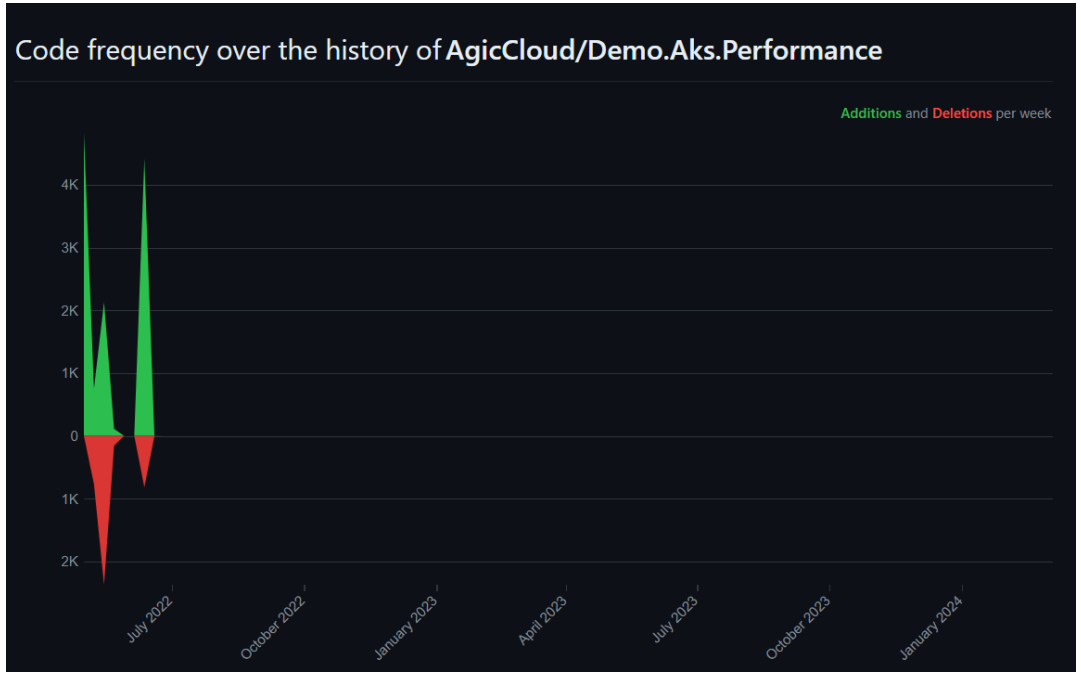
Come si comporta la mia applicazione in circostanze altamente specifiche?

CPU al 90%
Under Load

Quali sono gli strumenti da usare per scoprirlo con un test?

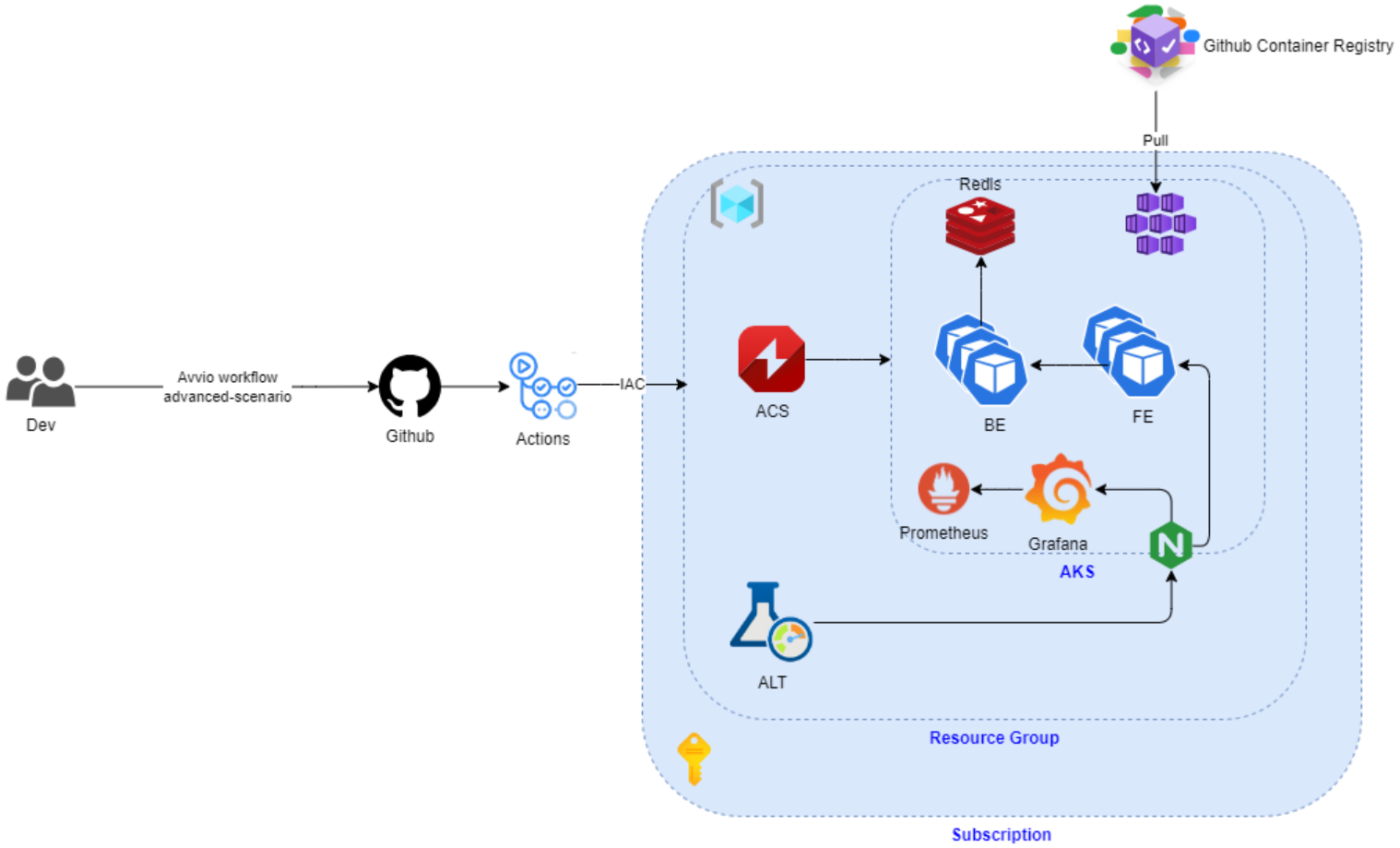
Demo V0 - creata ed evoluta internamente per validare alcune nostre applicazioni

Siamo partiti sperimentando quasi 2 anni fa



Prima versione (old) - [AgicCloud/Demo.Aks.Performance (github.com)]

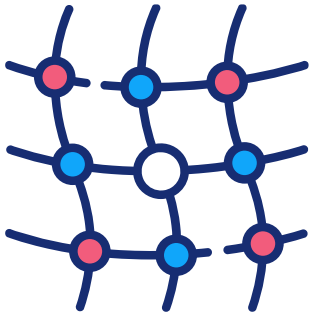
Architettura Demo



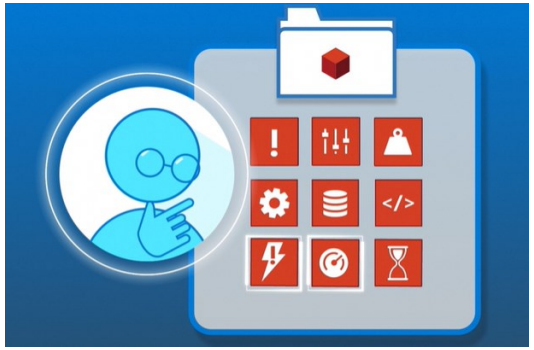
Azure Chaos Studio

- Fault Injection Controllata
- Integrato con AKS, VM, Entra ID, CosmosDB, …
- Per AKS sfrutta Chaos Mesh(CNCF)

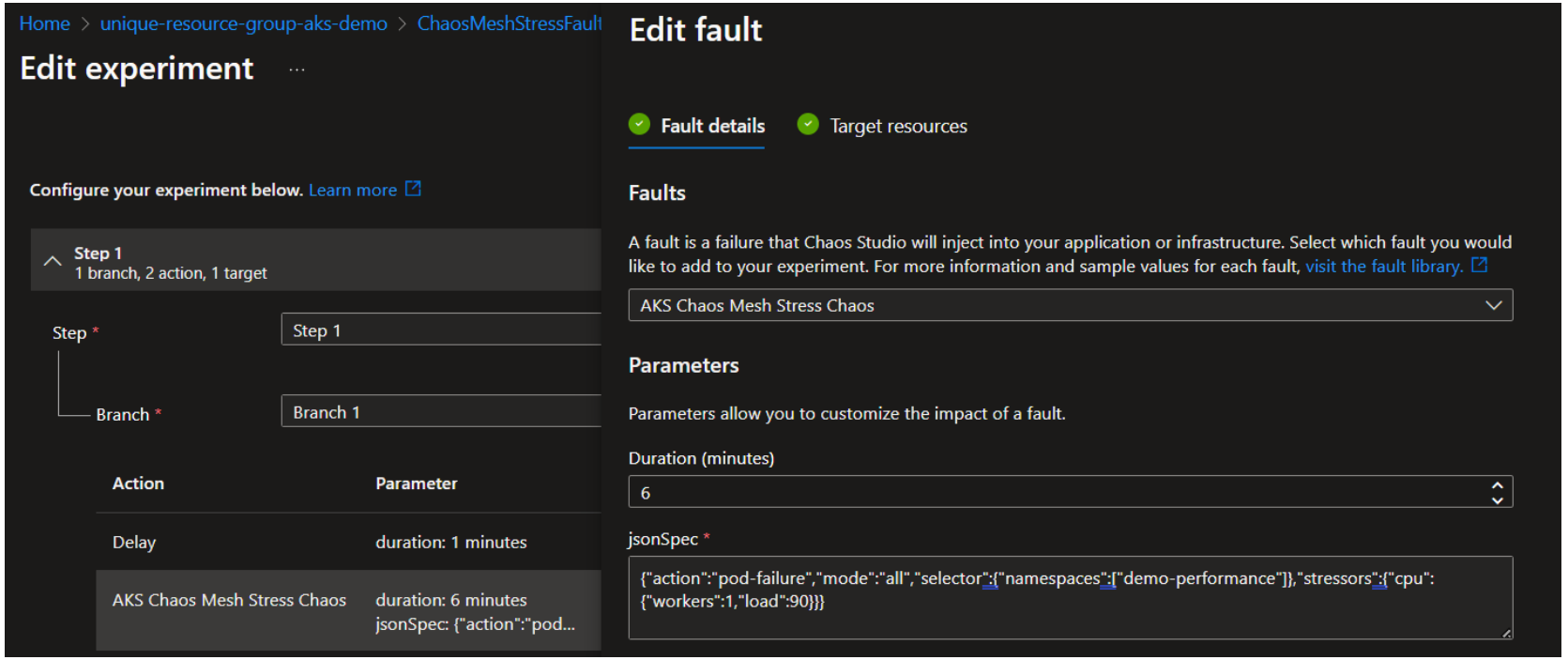
- I fault sono reali



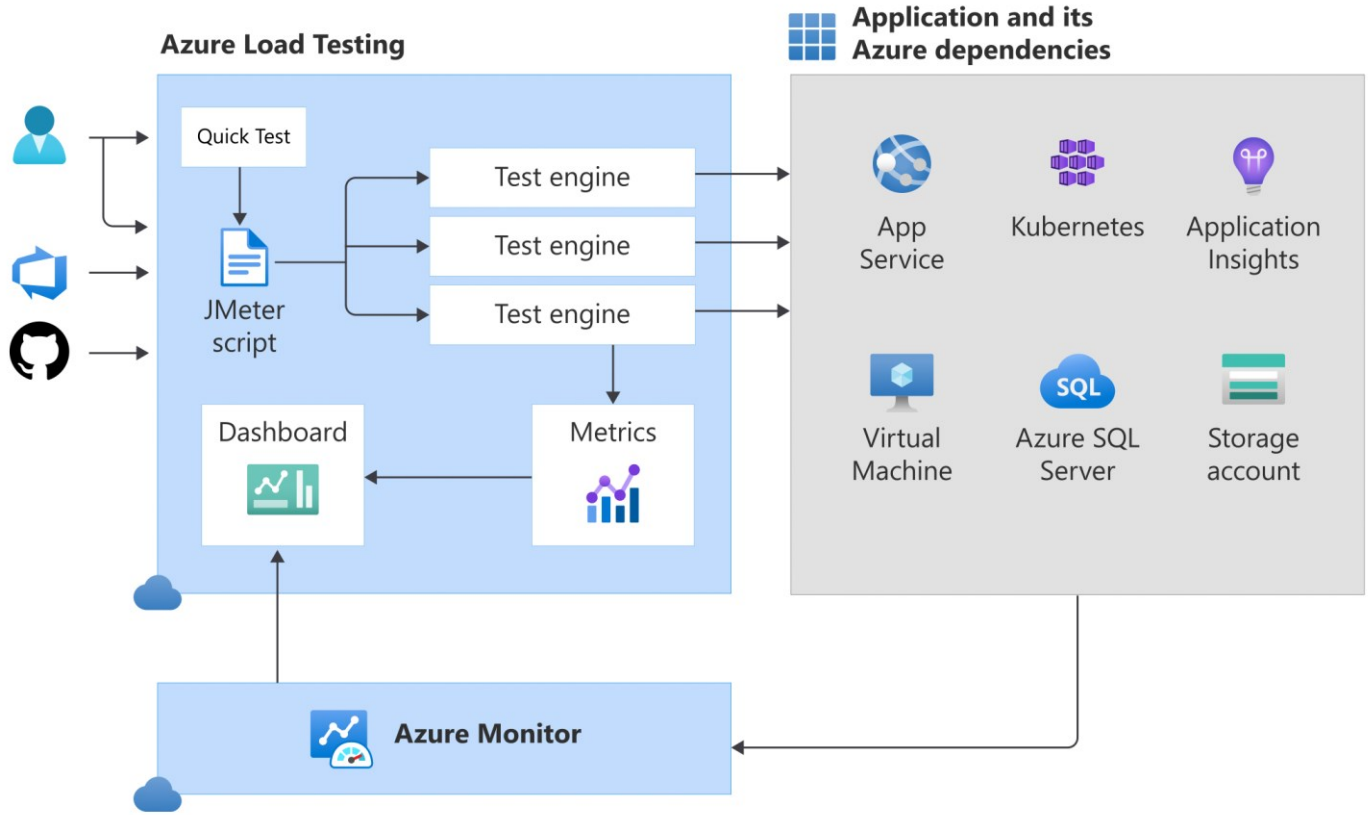
Azure Chaos Studio



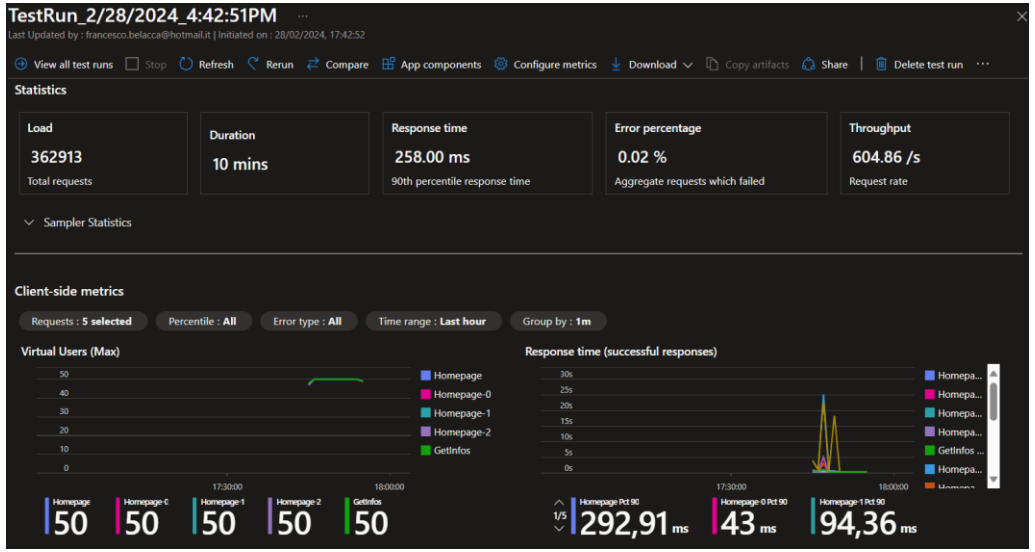
Shift right
vs
Shift left



Azure Load Testing

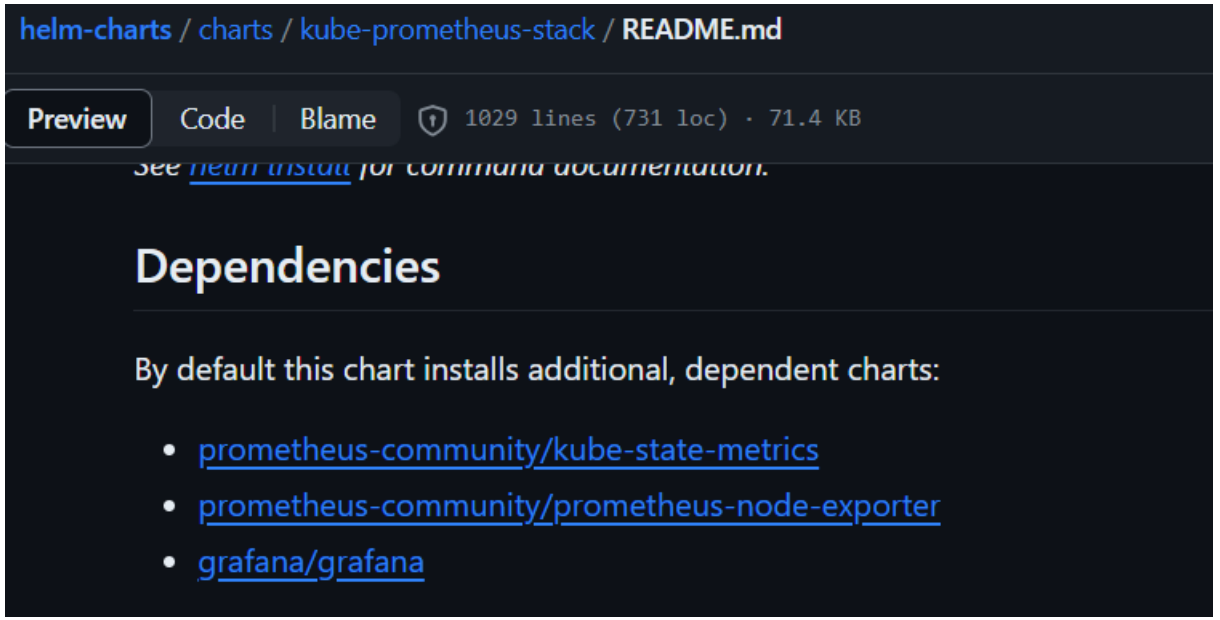


Azure Load Testing



- Il JMX simula 50 utenti per 10 minuti
- Simula perché fa 2 GET sequenziali
- No Auth
- Integrato anche con Azure Monitor

Honorable mentions



App

FE Infos

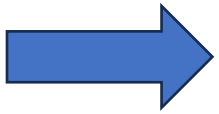
.NET version	.NET 8.0.1
Operating system	Ubuntu 22.04.3 LTS
Processor architecture	X64
CPU cores	1
Containerized	true
Memory, total available GC memory	192.00 MiB
Host name	three-tier-app-front-8569bd5c86-rt4sk
Server IP address	10.244.0.14 fe80::d054:85ff:fefc:4c81%2

BE Infos

.NET version	.NET 8.0.1
Operating system	Ubuntu 22.04.3 LTS
Processor architecture	X64
CPU cores	1
Containerized	true
Memory, total available GC memory	192.00 MiB
Host name	three-tier-app-api-86b67f66fd-kp4wh
Server IP address	10.244.0.13 fe80::2815:f3ff:fe0f:840f%2

Database Infos: Latest 10 hosts that connected to db

HostName	three-tier-app-api-86b67f66fd-kp4wh
UTC Date	2024-02-29T08:25:34.1329734+00:00



FE Infos

.NET version	.NET 8.0.1
Operating system	Ubuntu 22.04.3 LTS
Processor architecture	X64
CPU cores	1
Containerized	true
Memory, total available GC memory	192.00 MiB
Host name	three-tier-app-front-8569bd5c86-ltzvl
Server IP address	10.244.0.16 fe80::5445:a4ff:fe2b:8154%2

BE Infos

.NET version	.NET 8.0.1
Operating system	Ubuntu 22.04.3 LTS
Processor architecture	X64
CPU cores	1
Containerized	true
Memory, total available GC memory	192.00 MiB
Host name	three-tier-app-api-86b67f66fd-5pfzd
Server IP address	10.244.0.15 fe80::f489:d2ff:fe05:1564%2

Database Infos: Latest 10 hosts that connected to db

HostName	three-tier-app-api-86b67f66fd-5pfzd
UTC Date	2024-02-29T08:26:30.6286847+00:00
HostName	three-tier-app-api-86b67f66fd-kp4wh
UTC Date	2024-02-29T08:25:34.1329734+00:00

[macel94/AKS-3-Tier-App: AKS-3-Tier-App for demo purposes. (github.com)](https://github.com/macel94/AKS-3-Tier-App)

GitHub Actions

Virtual Machine	Processor (CPU)	Memory (RAM)	Storage (SSD)	OS (YAML workflow label)	Notes
Linux	4	16 GB	150 GB	`ubuntu-latest`, `ubuntu-22.04`, `ubuntu-20.04`	The `ubuntu-latest` label currently uses the Ubuntu 22.04 runner image.
Windows	4	16 GB	150 GB	`windows-latest`, `windows-2022`, `windows-2019`	The `windows-latest` label currently uses the Windows 2022 runner image.
macOS	3	14 GB	14 GB	`macos-latest`, `macos-12`, `macos-11`	The `macos-latest` workflow label currently uses the macOS 12 runner image.
macOS	4	14 GB	14 GB	`macos-13` [Beta]	N/A

[GitHub-hosted runners: Double the power for open source]

Standard GitHub-hosted runners

GitHub plan	Total concurrent jobs	Maximum concurrent macOS jobs
Free	20	5

Azure Kubernetes Service

- Control plane automaticamente creato e gestito
- Facilita distribuzione ed il management di app
- SLO(99.5%)
- Integrato nativamente con Azure Monitor

Scalabilità Orizzontale e Verticale

```yaml
#Autoscaler
apiVersion: autoscaling/v1
kind: HorizontalPodAutoscaler
metadata:
  name: three-tier-app-api-hpa
  namespace: {{ .Values.Namespace }}
spec:
  maxReplicas: 30 # define max replica count
  minReplicas: 3  # define min replica count
  scaleTargetRef:
    apiVersion: apps/v1
    kind: Deployment
    name: three-tier-app-api
  targetCPUUtilizationPercentage: 50 # target CPU utilization
```

```
{
  name: 'apppool'
  osDiskSizeGB: osDiskSizeGB
  enableAutoScaling: true
  minCount: 1
  maxCount: agentCount
  count: 1
  vmSize: agentVMSize
  osType: 'Linux'
  mode: 'User'
  type: 'VirtualMachineScaleSets'
  maxPods: 30
  nodeLabels: {
    type: 'user-node'
  }
```

Fino a 30 POD di FE e 30 di BE…

…con 30 POD al massimo per user-node

Demo Time

[Advanced-Scenario-Manual-Deploy · Workflow runs]

Descrizione step logici di come funziona la demo
0 – installazione prerequisiti(o se possibile vorrei scriptare questa parte usando gh codespaces), oauth credentials, …
TODO

0.5 – check durante la pipeline che i resource providers siano correttamente registrati per la subscription usata

1 – creazione AKS, installazione ingress-nginx

2 – deploy applicazione con helm

3 – deploy prometheus e grafana

4 – setup chaos mesh

5 – enable aks as chaos studio target and enable the stress capability

6 – deploy ALT e ACS

7 – run di entrambi

GH Packages

Introduction to GitHub Packages - GitHub Docs – free for public repo

Supporta

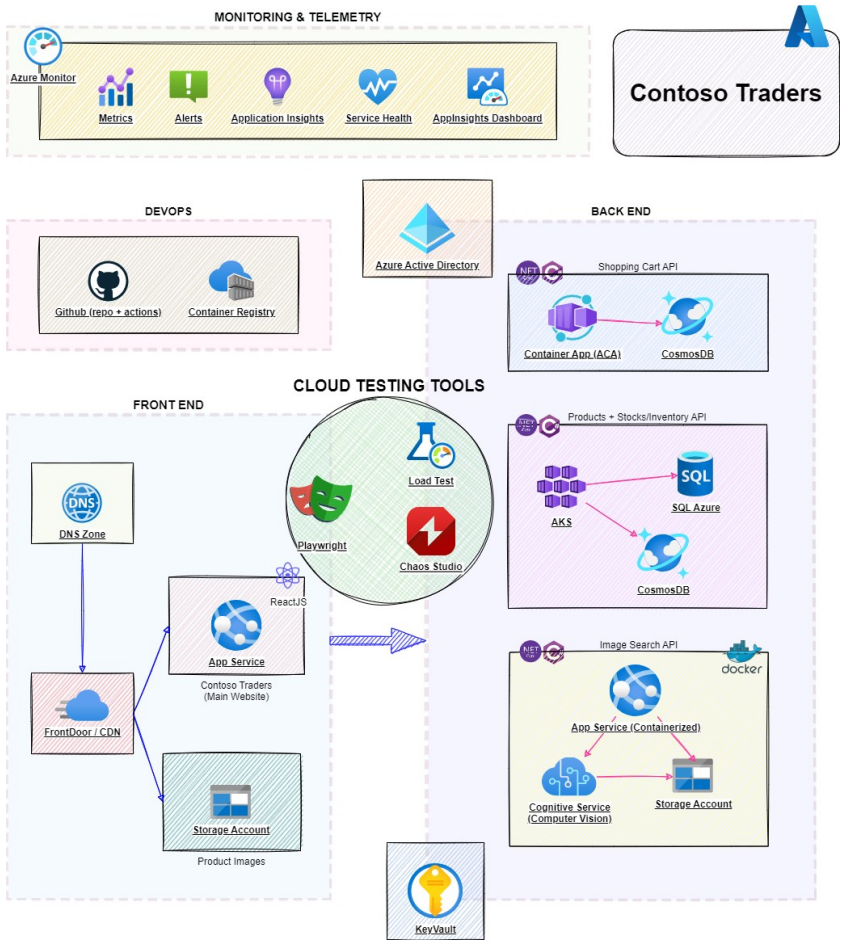
Support for package registries

Language	Description	Package format	Package client
JavaScript	Node package manager	`package.json`	`npm`
Ruby	RubyGems package manager	`Gemfile`	`gem`
Java	Apache Maven project management and comprehension tool	`pom.xml`	`mvn`
Java	Gradle build automation tool for Java	`build.gradle` or `build.gradle.kts`	`gradle`
.NET	NuGet package management for .NET	`nupkg`	`dotnet` CLI
N/A	Docker container management	`Dockerfile`	`Docker`

Conclusioni

[microsoft/contosotraders-cloudtesting: The Contoso Traders app is a sample application showcasing Playwright, Azure Load Testing, Azure Chaos Studio. (github.com)]

Per scenari avanzati e molto più completi, controllare questo nuovo repo di Microsoft



Grazie mille per l'attenzione!

Q&A

https://www.linkedin.com/in/francesco-belacca-dev

https://github.com/macel94/Agic.Infra.Environment.LoadChaosTest

AGIC Technology

https://agicgroup.it/