

SOLUZIONI
FUTURA

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**[https://github.com/soluzionifutura/
unimore-ecs](https://github.com/soluzionifutura/unimore-ecs)**



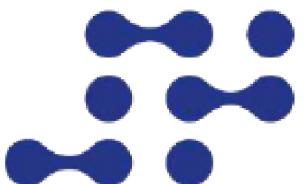
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Case study: Cassandra





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Same Marketing Budget More Revenue

Is your Marketing Mix too complex to Optimize it?

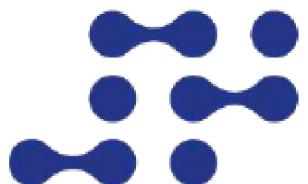
Cassandra analyzes your marketing data, detects where you're wasting your budget, and provides media plans that maximize your ROI

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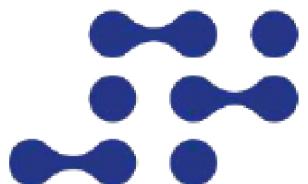
Cassandra: starting point

- Applicativo containerizzato (Docker)
- Stack basato su Python
- Compute su EC2 (Virtual Machine)
- Version control, deployment via Git pull
- Database su istanza EC2



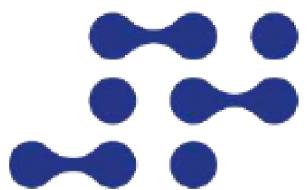
Cassandra: obiettivi

- Alta affidabilità
- Scalabilità
- Rollback su deployment falliti
- Offload e parallelizzazione di task asincroni



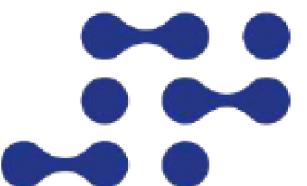
Cassandra: today

- Container orchestrator: ECS
- Compute: Fargate (serverless containers)
- Configurations: AWS Secrets Manager
- Deployment: CodePipeline + CodeBuild
- Load balancing
- Database: Amazon Aurora
- Storage: S3 + EFS
- Parallel processing: Celery + SQS



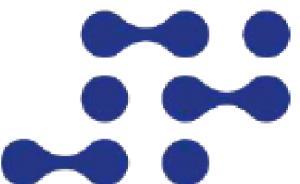
Compute a confronto

- Bare metal
- VM
- Container orchestration (**Kubernetes/ECS/Swarm**)
- Serverless



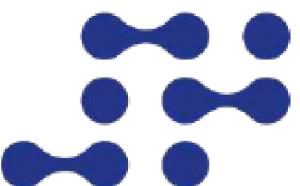
Load Balancing: AWS ALB

- Perché?
- Listener
- Target Group
- Relazione con il container orchestrator (ECS)
- Relazione con la CI/CD (CodePipeline)



ECS: Deep dive

- Perché?
- ECR (Container Registry)
- Task Definition
- Task
- Service



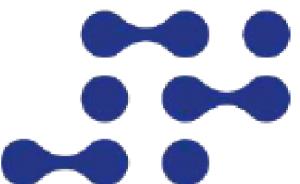
Calcolo parallelo: Celery

- Perché?
- Modalità di autoscaling
- Message passing: SQS / RabbitMQ / Redis / Kafka



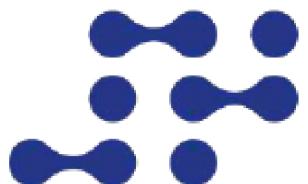
Pipeline di CI/CD

- Perché?
- CodePipeline
- CodeBuild
- “E GitHub actions?” (GitLab runner, etc etc)



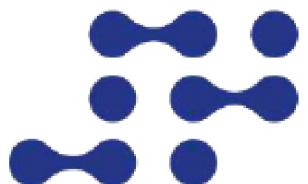
Storage

- S3
- EFS
- Differenti tipologie di storage distribuito
(Shared vs. replicated)



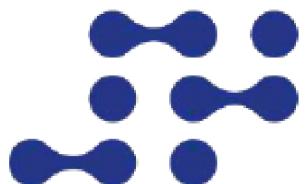
Database

- MySQL vs. NoSQL
- Active / Passive vs. Multi-Master
- Sistemi di consenso (Raft), consistency model
- Case study: Turso



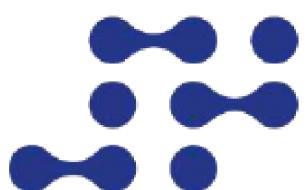
Credentials Management

- Secrets Manager
- Parameter Store
- (Consul / Vault)



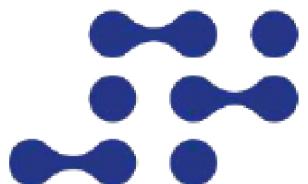
Observability

- Iniziativa OpenTelemetry
- CloudWatch
- DataDog e altri SaaS
- Trace (req id) vs. Metric (float) vs. Log (text)
- Storage e visualizzazione
(Timeseries, compressione, downsampling)



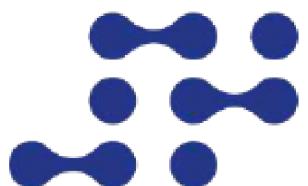
Infra-as-Code

- CloudFormation
- CDK
- Terraform
- Branch deploy



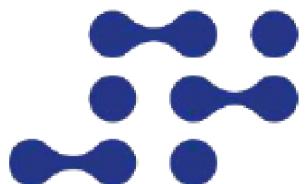
Infra-as-Code: CloudFormation

- Templates vs. Stacks
- Sintassi (JSON vs. YAML)
- Parametri
- Risorse
- Update



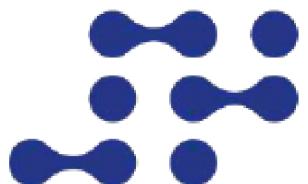
Infra-as-Code: CDK

- Applications vs. Stacks
- JavaScript, TypeScript, Python, Java, C#, Go
- Environment, Context, CfnParameters
- Resources
- Update



Infra-as-Code: Terraform

- State management
- Configurazione: HCL
- Providers
- Modules
- Update



Configuration Management

- Ansible
- Puppet
- Chef
- cloud-init
- Relazione con sistemi di infra-as-code
- Ruolo nell'epoca del cloud



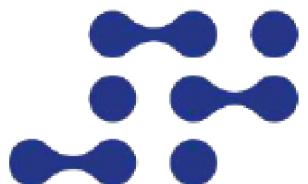
Letture

- **High-Performance Browser Networking**

<https://hpbn.co/>

- **Designing Data-Intensive Applications**

<https://www.oreilly.com/library/view/designing-data-intensive-applications/9781491903063/>



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