FIDEP - A Fault Injection Framework for Dependability Analysis on Cloud — Computing Systems —

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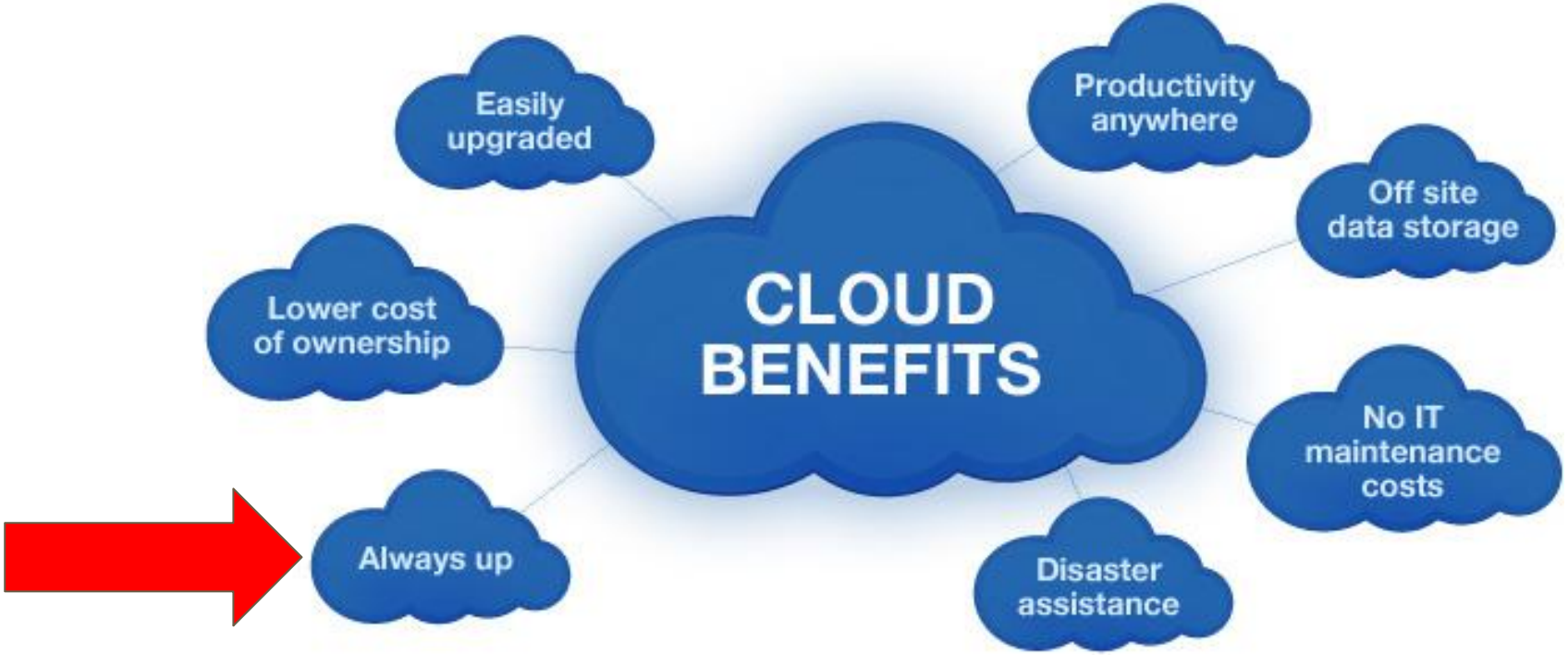
Agenda

- Motivation
- Objective and Contributions
- Fault Injection
- Eucalyptus
- Fidep
- Conclusion

Motivation

Cloud Computing



SLA versus Availability

Objective

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To develop an unified fault injection framework (for dependability analysis)

- To be applied on Linux Based-Cloud Computing Systems (IaaS Providers)
  - OpenStack, OpenNebula, CloudStack, AppScale, OpenShift, Nimbus, Eucalyptus, OpenQRM, oVirt, Cloud Foundry, ...

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- Capable of injecting, repairing and monitoring faults
- To provide a scalable and easy to use framework to support dependability studies

Fault Injection

Fault Injection

- Hardware Implemented techniques

- Software Implemented techniques

Software Implemented Fault Injection

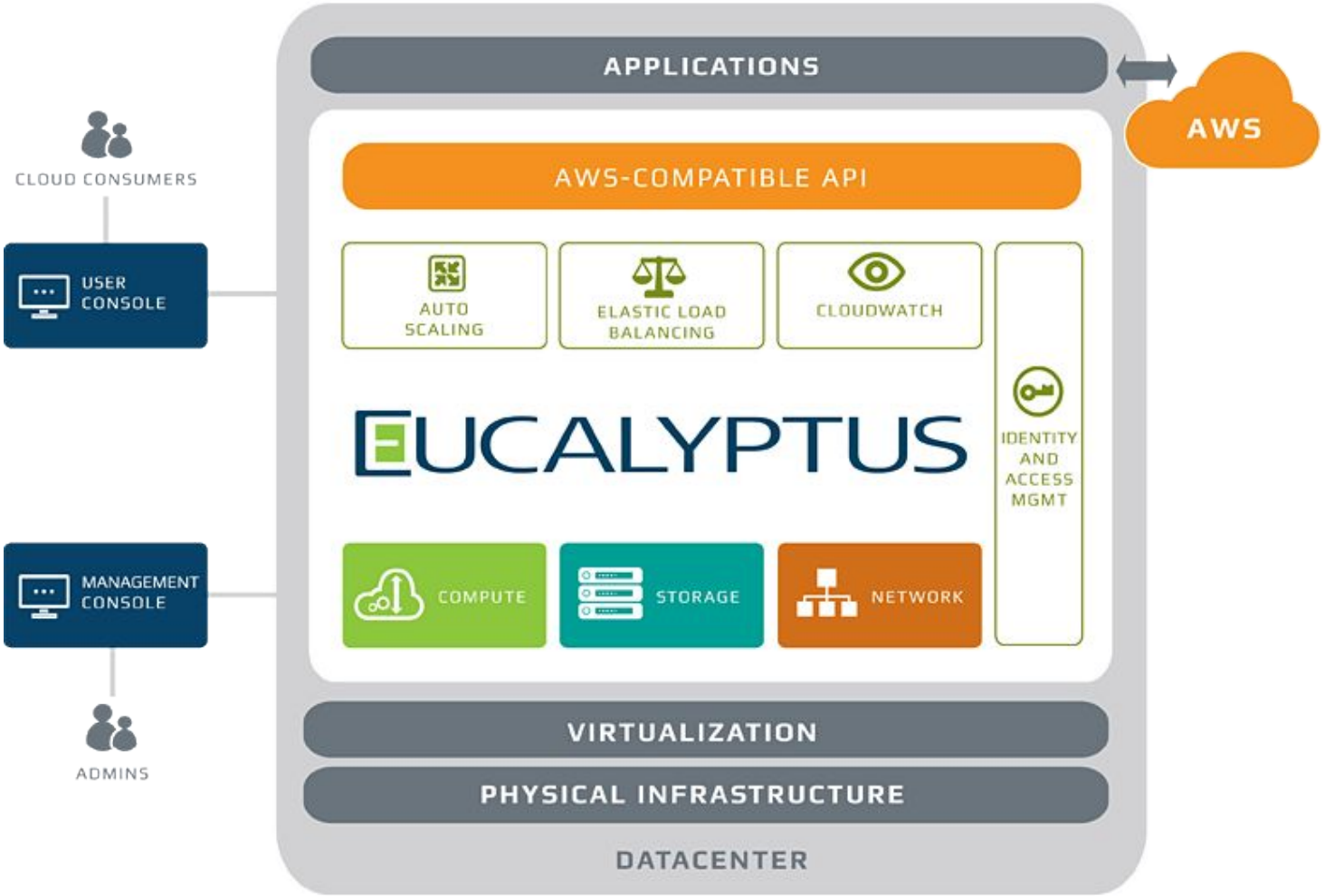
SWIFI techniques can be categorized into two types:

- Compile-time injection
- Runtime Injection 

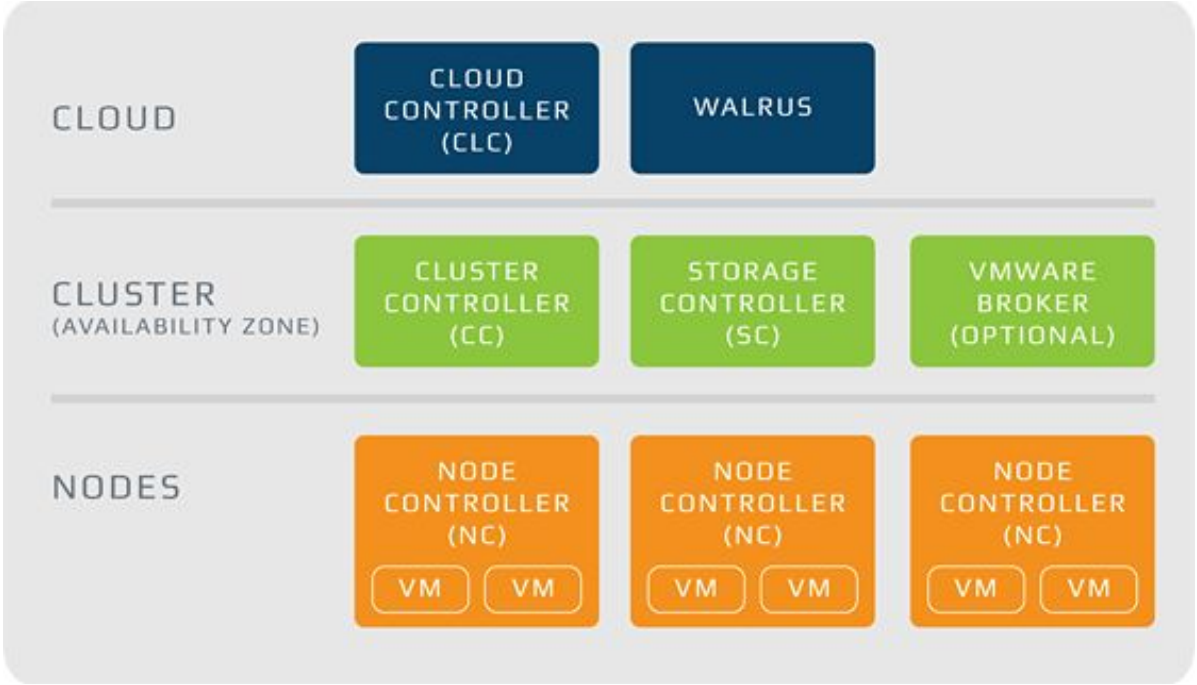
Cloud Computing Platforms

There are different platforms to *instantiate* the proposed framework.

Eucalyptus


APPLICATIONS
AWS
CLOUD CONSUMERS
AWS-COMPATIBLE API
USER CONSOLE
AUTO SCALING
ELASTIC LOAD BALANCING
CLOUDWATCH
EUCALYPTUS
IDENTITY AND ACCESS MGMT
MANAGEMENT CONSOLE
COMPUTE
STORAGE
NETWORK
ADMINS
VIRTUALIZATION
PHYSICAL INFRASTRUCTURE
DATACENTER

Eucalyptus Components



Framework

FIDEP - A **F**ault **I**njection Framework for **Dep**endability Analysis on Cloud Computing Systems

Fidep

- JAVA

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- Design patterns (GoF)
  - Singleton ; Observer; Abstract Factory

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- *SYSSTAT*

Fidep

- Developers using FIDEP do **not** to worry with *Threads**

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- Components { start(), stop(), isAlive() }

Fidep

- Developers using FIDEP do **not** to worry with *Threads**
- Components { start(), stop(), isAlive() }
- *Random* Time generation (EXPONENTIAL, ERLANG, NORMAL, PARETO, GEOMETRIC, LOGNORMAL, POISSON, TRIANGULAR, WEIBULL, UNIFORM)

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