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Resilient Software Design

Pt 1: Introduction

Bugsquashing Seminar
Dominique Cheray, Janek Gröhl

dkfz.

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50 Years – Research for
A Life Without Cancer



Welcome to the DKFZ!

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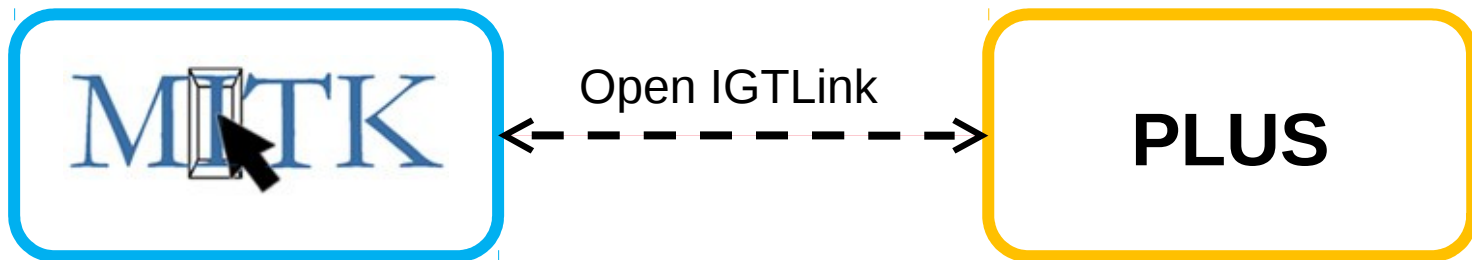
50 Years – Research for
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Context

- Distributed Systems
- Service Oriented Architectures
- Microservices
- Resilient Software Design

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- Distributed Systems
- Service Oriented Architectures
- Microservices
- Resilient Software Design



Introduction Quote

*“We will prepare for the armies of
illogical users who do crazy,
unpredictable things”*

- Michael Nygard

Definition

- 1. the power or ability to return to the original form, position, etc., after being bent, compressed, or stretched; elasticity.

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- 2. ability to recover readily from illness, depression, adversity, or the like; buoyancy.

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Main Concept

-

$$\text{Availability} = \frac{\text{MTTF}}{\text{MTTF} + \text{MTTR}}$$

- MTTF = Mean Time To Failure
- MTTR = Mean Time To Recover
- MTTF = Mean Time To Failure
- MTTR = Mean Time To Recover

- Resilience:
 - Ability of a system to handle unexpected situations
 - Best case: without the user noticing it
 - Worst case: with a graceful degradation of service

Example

The Netflix logo is displayed in a bold, white, sans-serif font with a 3D effect, set against a solid red rectangular background.

<https://help.netflix.com/en/node/14164>

Example

NETFLIX



- Simian Army
- Fault Injection Testing

Example



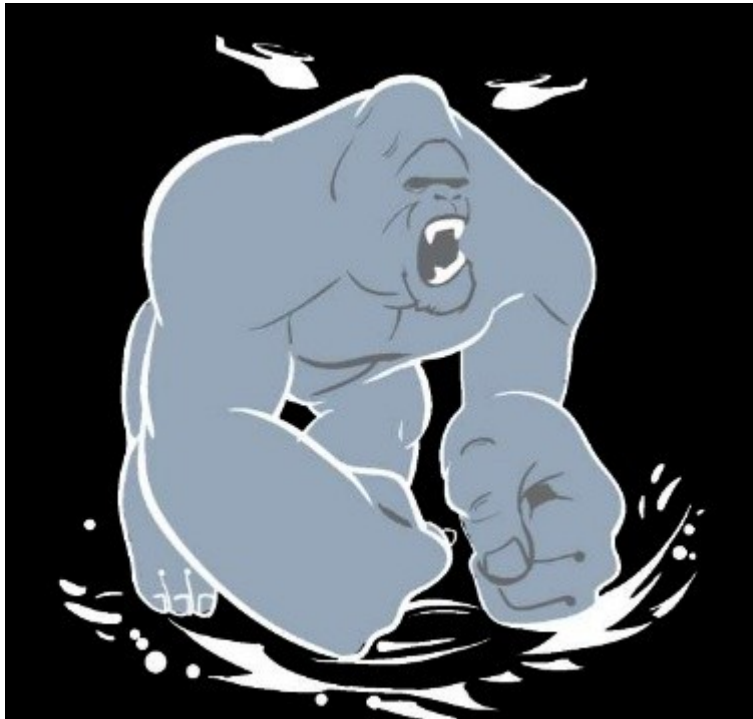
- Chaos Monkey
- Arbitrarily shuts down
 - Services
- At peak usage times
- System needs to handle this

Example



- Chaos Gorilla
- Arbitrarily shuts down
 - Servers

Example



- Chaos Kong
- Arbitrarily shuts down
 - Server Cluster Regions

Thank you for
your attention!

Questions?

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