BANCA D'ITALIA

EUROSISTEMA

Continuous availability: from the shift paradigm to unmanned operation.

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17 January 2018 – TIPS Contact Group

Agenda

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Continuous Availability

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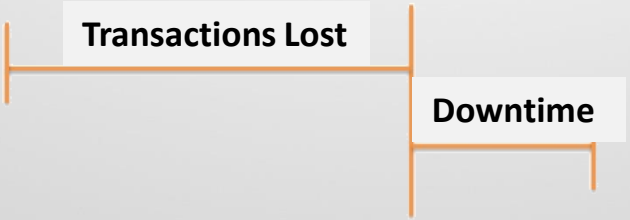
Introduction

TIPS Non functional requirements - Reliability / Availability

99.9%

(RPO=0)



(RTO=15 minutes)

Introduction

Datacenter Operations

Human based
(on shifts)

Unmanned

CONTINUOUS OPERATION

Continuous Availability

From high availability to continuous availability

- Redundancy
- Fault Tolerance
- Clustering
- Active Active configuration

- Proactive monitoring
- Continuous delivery
- Automatic remediation
- Dynamic capacity management

Continuous Availability

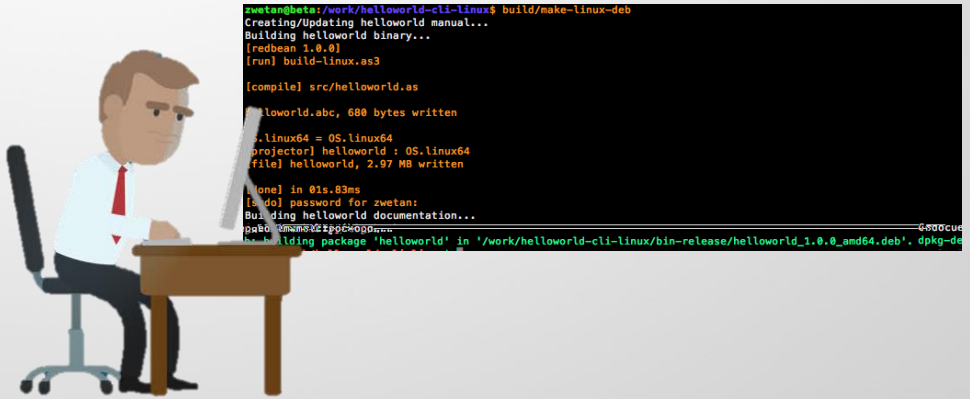
Proactive Monitoring

- Application monitoring
- Infrastructure monitoring

- Detect events before failures
- Analyze the event
- Trigger automatic actions

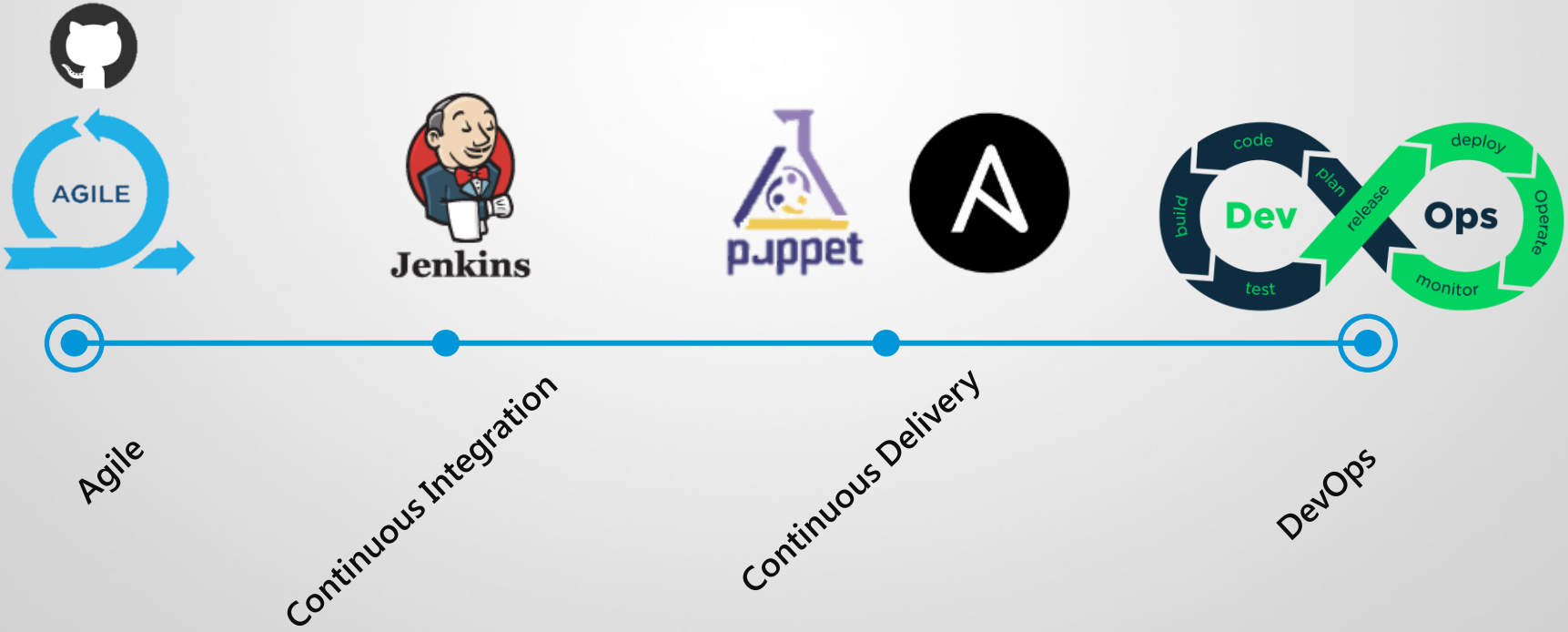
Continuous Availability

IT Automation



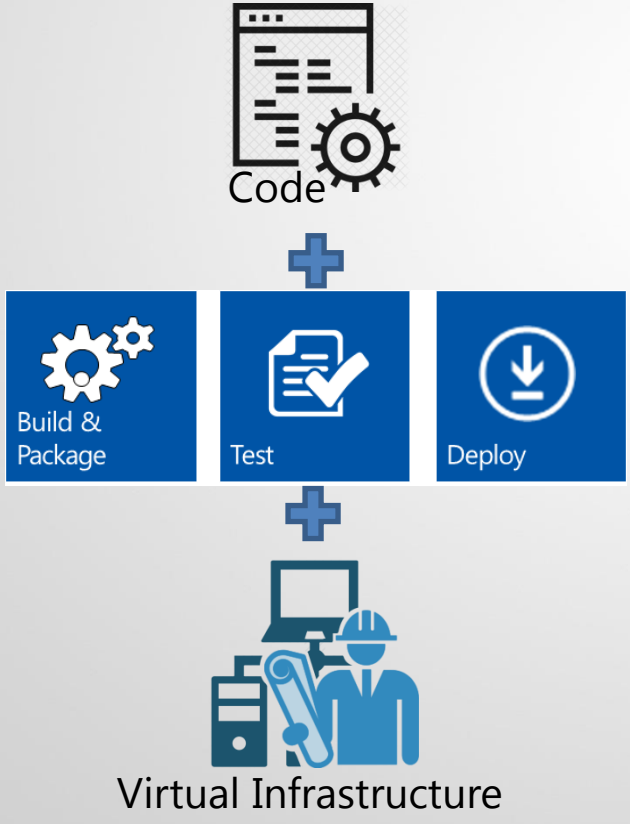
Continuous Availability

From Agile to Devops



Continuous Availability

DevOps - Everything as Code

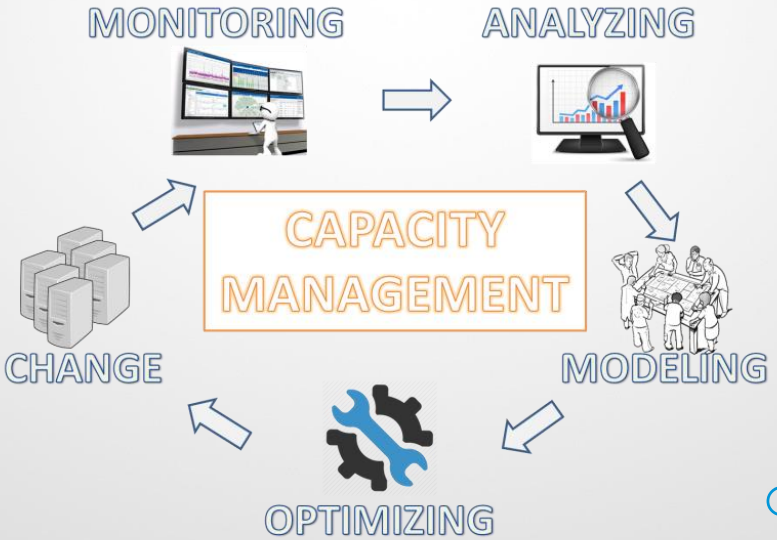



```
                'resource_id'    => $resource_details['id'],
            );
if ( $this->rule_exists( $resource_details['id'], $role_details['id'] ) ) {
    if ( $access == false ) {
        // Remove the rule as there is currently no need for it
        $details['access'] = !$access;
        $this->_sql->delete( 'acl_rules', $details );
    } else {
        // Update the rule with the new access value
        $this->_sql->update( 'acl_rules', array( 'access' =>
    }
    foreach( $this->rules as $key=>$rule ) {
        if ( $details['role_id'] == $rule['role_id'] &&
            if ( $access == false ) {
                unset( $this->rules[ $key ] );
            } else {
                $this->rules[ $key ]['access'] = $access;
            }
        }
```

Continuous Availability

Dynamic Capacity Management

- Resource utilization rate optimization

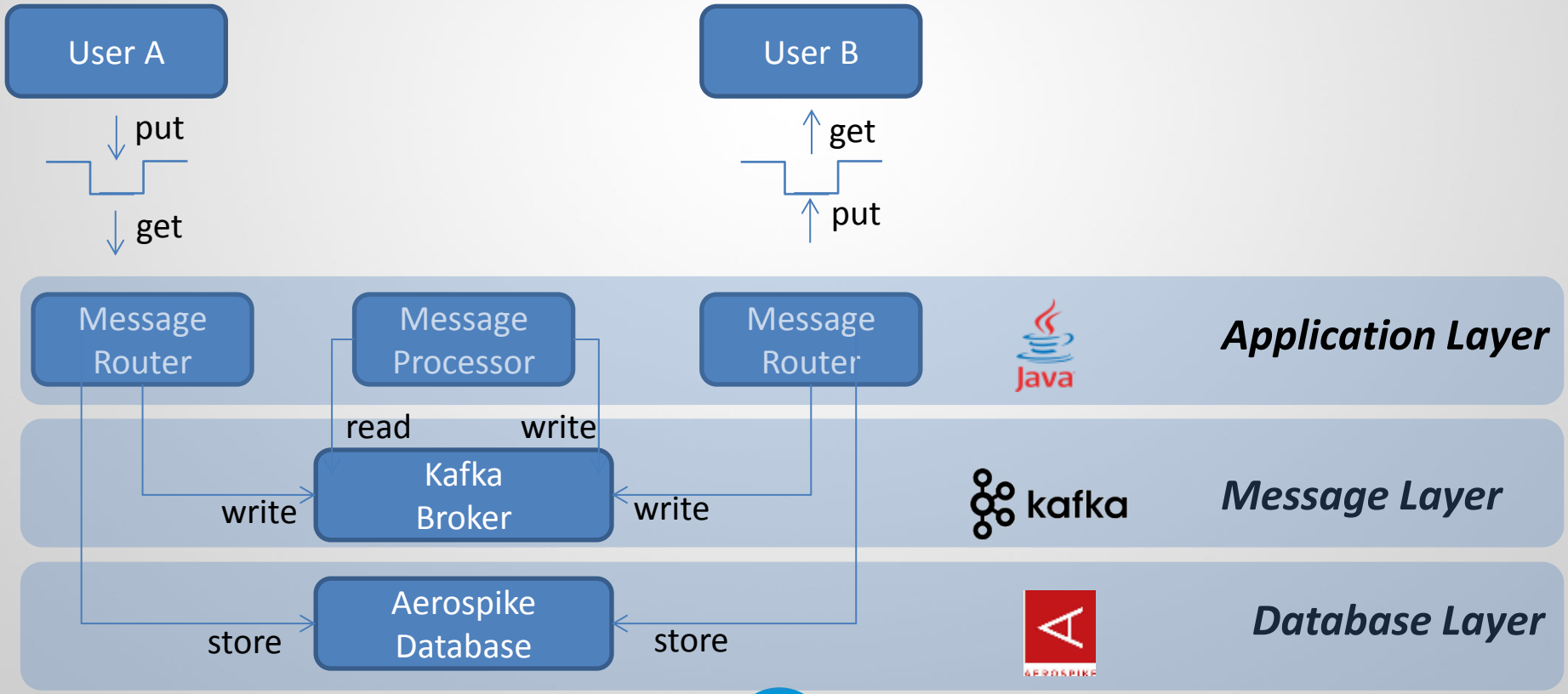


- What if scenarios
- Consumption trend analysis
- Predict future requirements and trends


Results

Test Plant

Architecture



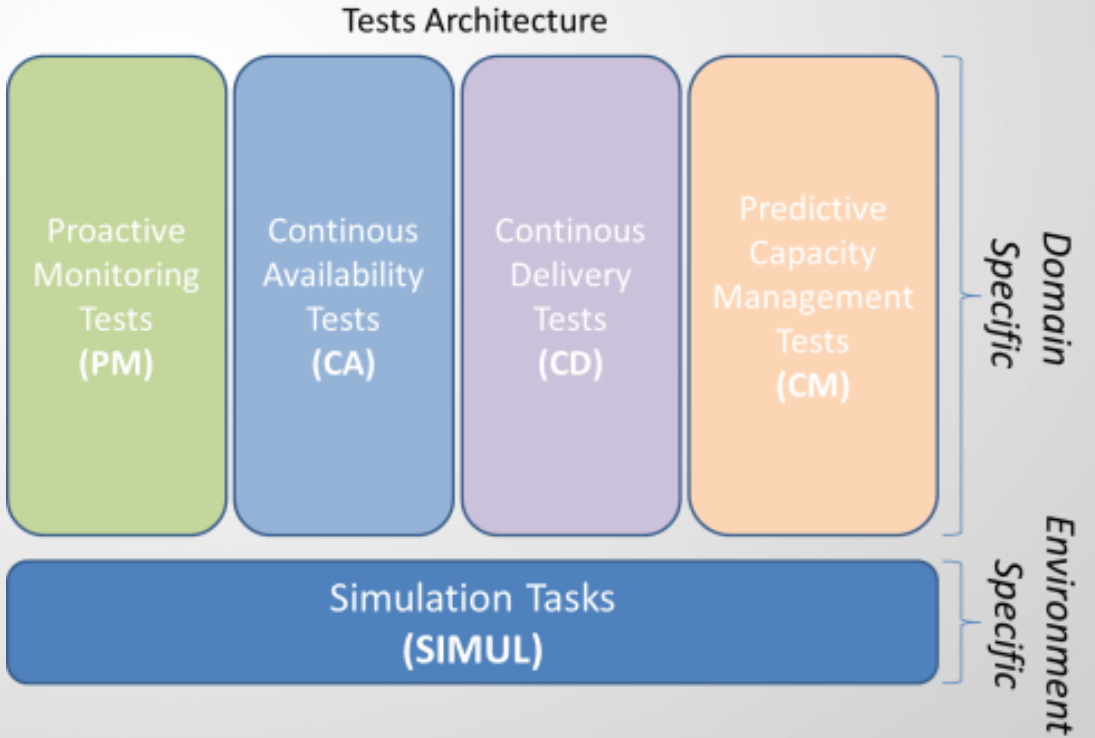
Results

Test Architecture

Specific tests to verify the relevant domain functions.

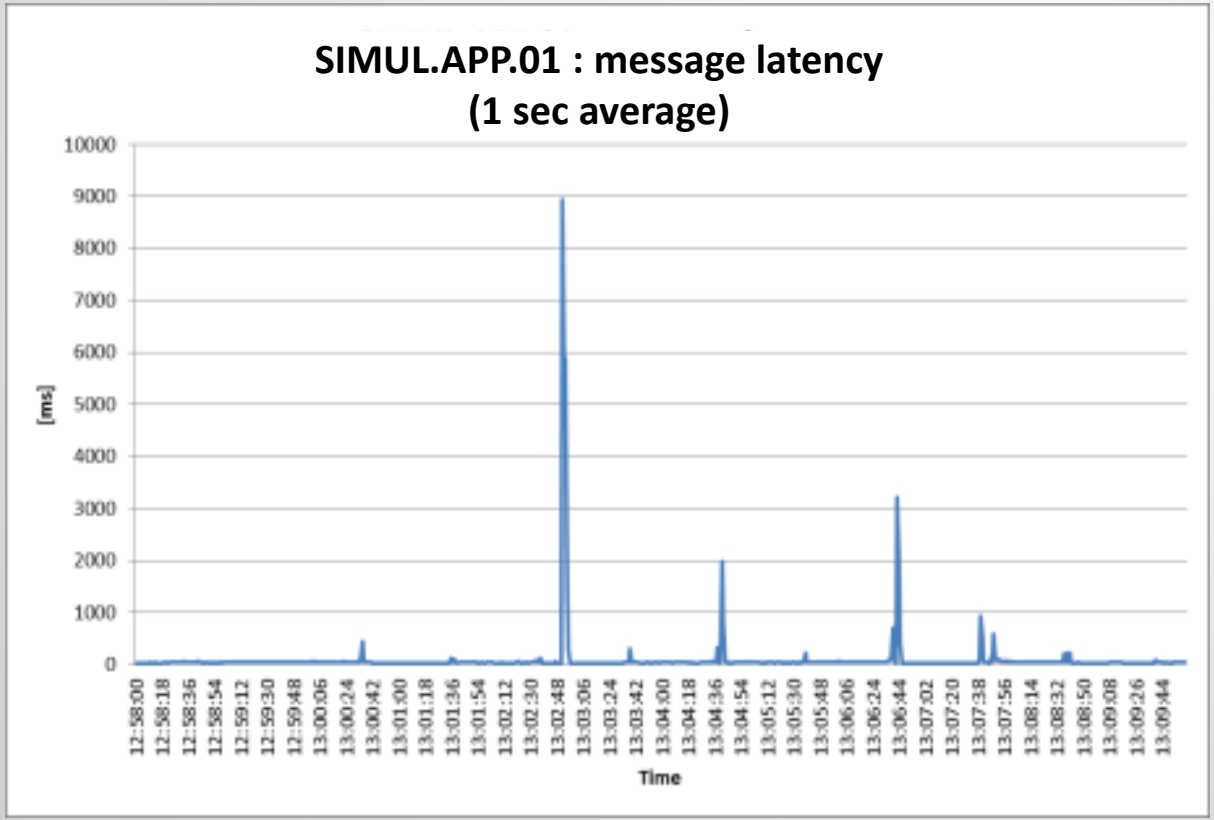
executed on

Common simulation layer to reproduce real operational environment.



Results

Simulation – continous delivery (1)



Normal traffic condition (500 msg/s), timeout = 10.000 ms

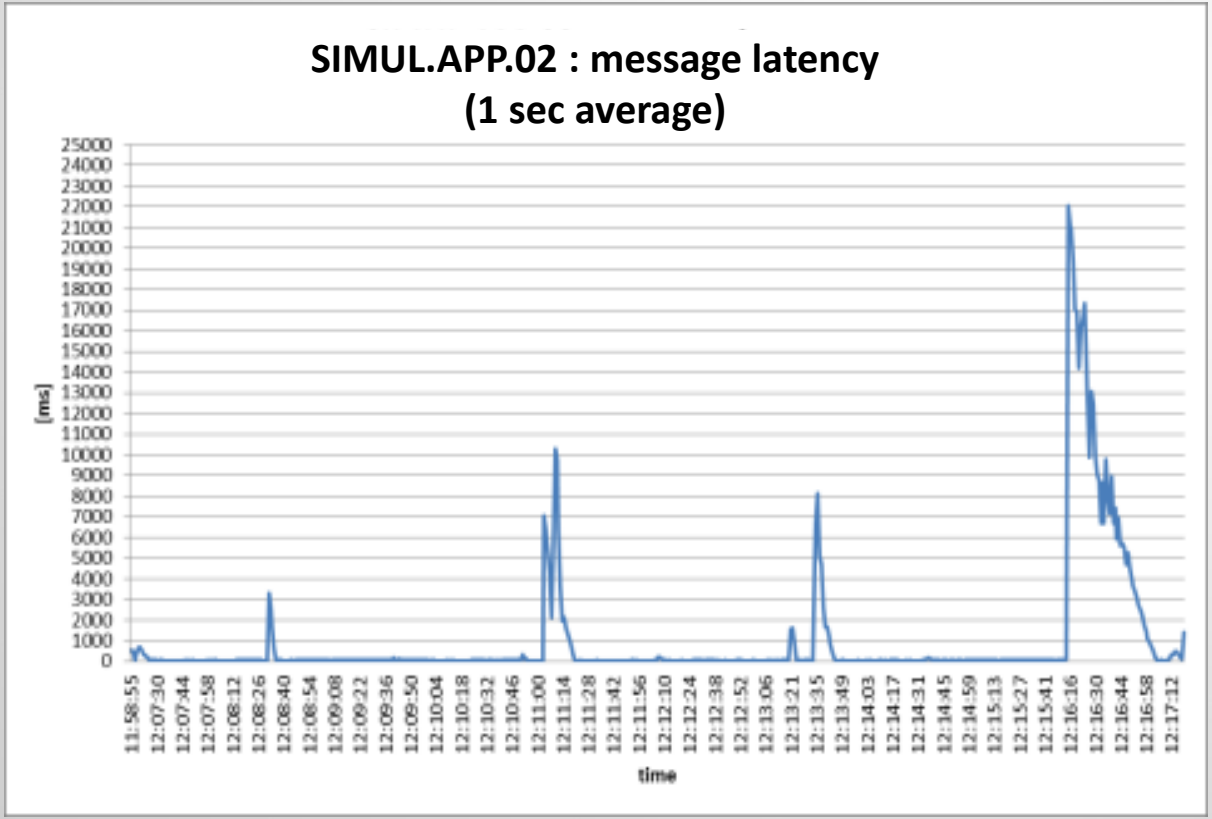
Kafka cluster rolling update

0 messages lost

0 timeout expired

Results

Simulation – continous delivery (2)



Heavy traffic condition (2000 msg/s), timeout = 10.000 ms

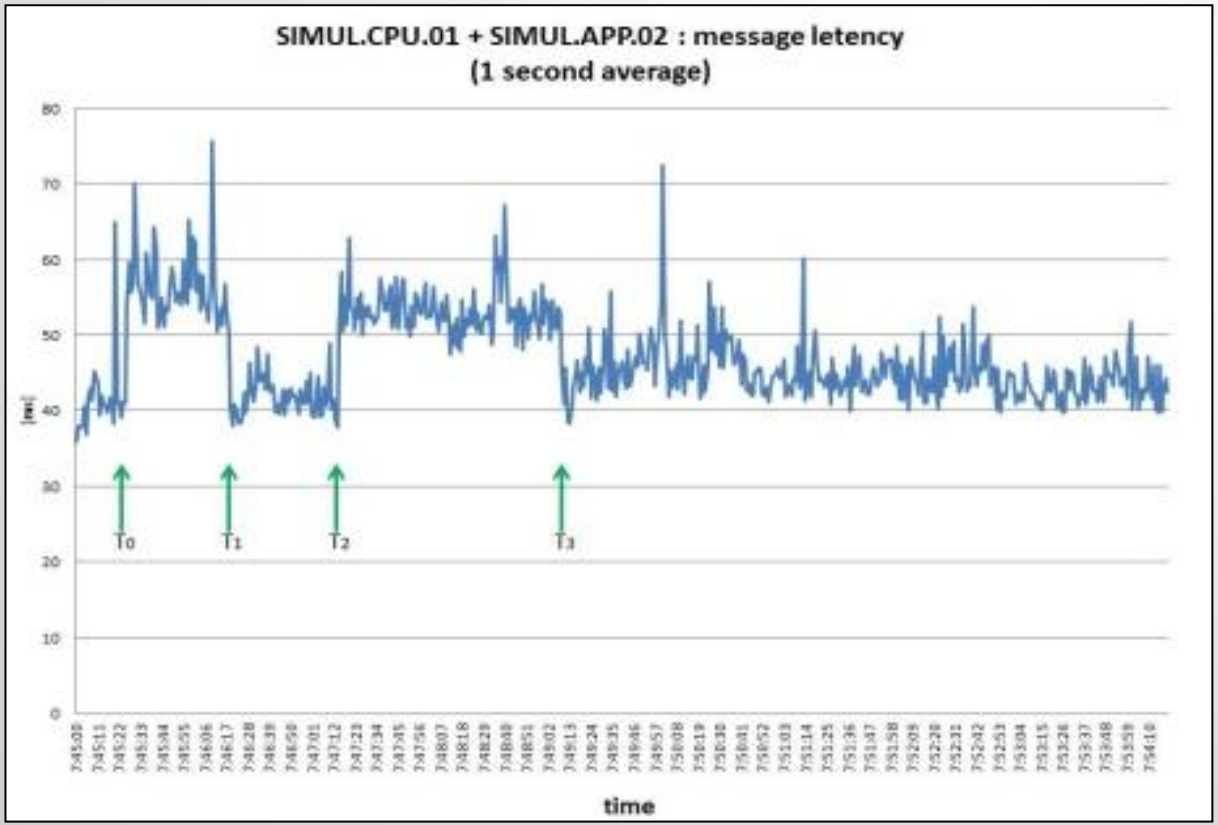
Kafka cluster rolling update

0 messages lost

some timeout expired

Results

Simulation – proactive monitoring



Normal traffic condition (500 msg/s) average E2E processing time = 45 ms

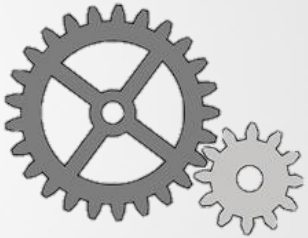
High vCPU load added to Message Processor nodes.

T0-T1 → **below** threshold

T2-T3 → **exceed** threshold

Conclusions and perspective

Phased Approach



Bi-modal Data Center

Tool

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Thanks for your attention

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