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VM Manager User Guide

Activity 4: Basic Service Operation

WP 4.2: Cloud Runtime Optimization

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PP	Restricted to other programme participants (including the Commission)	
RE	Restricted to a group specified by the consortium (including the Commission)	
CO	Confidential, only for members of the consortium (including the Commission)	



Version History

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1 Introduction

This document includes the user guide for the software component VM Manager.

Section 2 details the component's release information, its functionality and provided API. It also details its limitations, as well as its code information and directory structure. Its usage and testing procedures are also provided.

1.1 Glossary of Acronyms

Acronym	Definition
API	Application Programming Interface
BLO	Business Level Objective
EMOTIVE	Elastic Management Of Tasks In Virtualized Environments
IP	Infrastructure Provider
OCCI	Open Cloud Computing Interface
OVF	Open Virtualization Format
REC	Risk, Eco and Cost
REST	Representational State Transfer
VM	Virtual Machine

2 VM Manager User Guide

2.1 Release information

Component Name	Release Number	Release Date
VM Manager	3.0	2013-03-31

2.2 Introduction

The VM Manager is part of the OPTIMIS toolkit for Infrastructure Providers (IPs). Mainly, it is the virtualization-level manager, i.e. operates at the level of virtual machines.

It is responsible for providing an efficient placement of VMs running in a Cloud infrastructure, and during their whole lifecycle (deployment and operation).

In particular, given a number of VMs and the IP physical infrastructure, the VM Manager's main task is to optimize how these VMs are placed on the physical resources so that the IP's internal goals are maximized.

At any given moment the VM Manager is capable of re-organizing the mapping of VMs to physical resources according to these IP's internal goals.

Besides, it offers interfaces which follow the OCCI specification (which allows adding, removing, getting VMs through OVF's).

2.3 Functionalities

The new functionalities included in this release are the following:

- TREC-based optimization of VMs placement in private Cloud runtime
- Behaviour configurable through policies

2.3.1 TREC-based optimization of VMs placement in private Cloud runtime

There is no interface provided by the component related to this functionality. It is part of internal decision-making processes.

2.3.2 Behaviour configurable through policies

Operation	Input	Output	Description
setBLO	Parameter: rules	-	This method is aimed to allow the Cloud Optimizer to set the current management policy and rules used in this VM-level management tool.

In addition, Cloud Optimizer can forward to Virtual Machine Manager some of the TREC notifications for taking reactive measures:

This release includes the next methods which are offered to TREC tools in order to let them to pull TREC assessments when thresholds are reached:

- /hm/risk/vm/{vmlId}
- /hm/eco/vm/{vmlId}
- /hm/cost/vm/{vmlId}
- /hm/trust/vm/{vmlId}
 - Notifies when VM Trust/Risk/Eco/Cost goes beyond the given threshold (as specified by see method setBLO)
 - Parameters
 - vmlId: identifier of the virtual machine
 - Actual value of the TREC
- /hm/trust/service/{servicId}
- /hm/risk/service/{servicId}
- /hm/eco/service/{servicId}
- /hm/cost/service/{servicId}
 - Notifies when Service Trust/Risk/Eco/Cost goes beyond the given threshold (as specified by see method setBLO)
 - Parameters
 - servicId: identifier of the service
 - Actual value of the TREC
- /hm/trust/node/{nodId}
- /hm/risk/node/{nodId}
- /hm/eco/node/{nodId}
- /hm/cost/node/{nodId}
 - Notifies when Node Trust/Risk/Eco/Cost goes beyond the given threshold (as specified by see method setBLO)
 - Parameters
 - nodId: identifier of the node
 - Actual value of the TREC
- /hm/trust/ip
- /hm/risk/ip
- /hm/eco/ip
- /hm/cost/ip

- Notifies when the Trust/Risk/Eco/Cost of the whole IP goes beyond the given threshold (as specified by see method setBLO)
- Parameters
 - Actual value of the TREC

2.4 Known limitations

N/A

2.5 Getting Started

2.5.1 Using the Software

There is a client to interact with this component, which is packaged as a JAR file and can be used by any user. The only thing that one needs to do is importing such file, which can be found into the project's repository: <http://optimis-artifactory.atosorigin.es/artifactory/repo/eu/optimis/VMManagerRESTClient/1.0-SNAPSHOT/VMManagerRESTClient-1.0-SNAPSHOT.jar>

2.5.2 Testing the Software

In a Maven environment, the test cases provided can be invoked by means of the following command: `mvn test`.

2.5.3 Configuration

VM Manager must be configured by editing the configuration file at `$(OPTIMIS_HOME)/etc/VMManager/config.properties`. Next are listed the properties that can be manually tuned for configuration:

- `config.ipvm_host`, `config.ipvm_port`
 - Hostname and port of the host where other IP components are. Usually is 'localhost:8080'
- `config.drp_host`, `config.drp_port`
 - Hostname and port of the host where EMOTIVE Cloud REST interface is
- `migration.enabled`
 - 'true' if the EMOTIVE layer should allow migration of VMs. 'false' otherwise.

2.6 FAQ

N/A

2.7 Other information

2.7.1 Source Code Information

This component has been developed in Java. Its main classes are the following:

- VMManagerRESTClient: Java interfaces that act as a client of the RESTful interfaces provided
- VMManagerREST: contains the RESTful interfaces, which contact with the EMOTIVE OCCI API
- PlacementOptimizer: encapsulates the functionality of optimizing the placement of several VMs in a given Cloud infrastructure during their deployment and operation

2.7.2 Directory Structure

The VM Manager is divided in three directories:

- VMManagerRESTClient: this software part is intended to be used by clients of this component. It is composed by several Java interfaces that act as clients of REST methods offered by a server.
- VMManagerService: it contains the server's core functionality and RESTful interfaces that provide the OCCI interfaces.

2.7.3 Contributors

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