

A decorative graphic on the left side of the page, featuring a complex network of thin, light blue lines connecting various points, resembling a mesh or a web structure. It is partially overlaid by a light blue diagonal band that runs from the top left towards the bottom right.

# **EPAM Cloud Infrastructure Orchestrator ver.2.1.111**

## **What's New**

December 2017

[CI2WN-S108-111](#)

Version 1.0

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## 1 OVERVIEW

EPAM Orchestrator v.2.1.111 was released on December 16, 2017. The new version does not bring dramatic changes in functionality, but it contains a big number of improvements, stabilization updates, and finalized processes.

We go on with **introducing infrastructure updates**, which include final wrapping up of the per-second billing in OpenStack regions and the complete decommission of the EPAM-MSQ3 region.

As to the **integration with AWS**, we **reviewed the AMIs** used by Orchestrator to launch instances on AWS, and replaced Linux public images with Marketplace ones, in order to improve their reliability. Additionally, we finalized the switch to the new MFA control policy.

Traditionally, the new release comes with a set of changes in **platform services** management. Now, you can see each active service details via the respective option of the Manage Services wizard. The Relational Database Service now includes a new configuration which allows to get a larger system volume. The guest OS were reviewed for all services, with Ubuntu 12.04 being replaced by Ubuntu 14.04 and Ubuntu 16.04.

One of our main services, **Auto Configuration Service**, now allows to see each chef client's info with a single call of a Maestro CLI command, performed inside the target VM.

We are also glad to announce, that due to the cooperation between EPAM Cloud team and Cloud Community, the new EPAM Orchestration application for Android and iOS platforms is created.



The functionality changes, of course, are reflected in Maestro CLI, where necessary, and in EPAM Cloud documentation. Refer to the [EPAM Cloud](#) website for detailed information on the improvements and features introduced in Orchestrator version 2.1.111.



We are also glad to announce that [EPAM's Advanced AWS Partner Membership](#) has been renewed, and it enables numerous benefits by APN. These include free trainings, additional education materials, documentation, and other facilities.

In the nearest future, we will deliver a detailed article covering the benefits of the Amazon Partner Network membership, and describe how it affects the company in general, as well as each EPAMer. Keep track of the announcements!

## 2 INFRASTRUCTURE UPDATES

With the current EPAM Orchestrator, we would like to announce the completed decommissioning of the EPAM-MSQ3 region and the migration of personal projects to the EPAM-BY2 region. We also finalized the introduction of the per-second billing in OpenStack regions.

### 2.1 PER-SECOND BILLING

Amongst the main principles supported by Cloud providers the “Pay as you go” rule allows provision of necessary resources in the shortest terms without overpaying for them.

Along with AWS, Google and Azure supporting such billing model, EPAM Orchestrator stays on top and provides its users with per-second billing!



The new billing policy is applied starting from **December 1**, in the OpenStack-based regions:

- EPAM-BY2
- EPAM-IN1
- EPAM-US2

In case you terminate an instance or stop it, you don't have to pay for the whole active hour, only for the seconds when the VM was RUNNING.

On the next second, the PASSIVE billing activates for the stopped and suspended VMs. In this case you pay the base price for the storage. CPU and memory are not billed. If a VM is terminated, its billing is stopped.

You can get the actual prices for virtual infrastructure in EPAM regions by calling the **or2price** command:

```
or2price -r <EPAM-REGION>
```



The prices in each region remain the same. However, the per-second billing makes them more accurate, and your standard monthly bills may change. This especially will influence the projects that use EPAM Cloud for CI/CD processes, testing, and other tasks, that need creating VMs with short (from minutes to several hours) lifetime.

### 2.2 EPAM-MSQ3 REGION DECOMMISSIONED

EPAM-MSQ3 region was decommissioned on December 1, within the scope of the global process of EPAM Cloud migration to OpenStack.

The change has foremost affected the personal projects, as EPAM-MSQ3 was the basic region for cloud-based and cloud-related self-education.



From now on, all personal projects are activated in EPAM-BY2, and all UPSA projects that were active in EPAM-MSQ3, have already migrated to the new region.

The OpenStack-based EPAM-BY2 region has a number of useful benefits over its ESX predecessor:

- Billing coefficient: 0.8
- Shapes up to 5XL (8CPU, 15GB RAM)
- SSD available and is provided by the same price as HDD.
- Recycle bin feature is supported (you can restore a terminated virtual machine within 7 days after termination)

We can already see the solid growth of the new region usage by both individual users and projects, and expect it continues in the coming year.

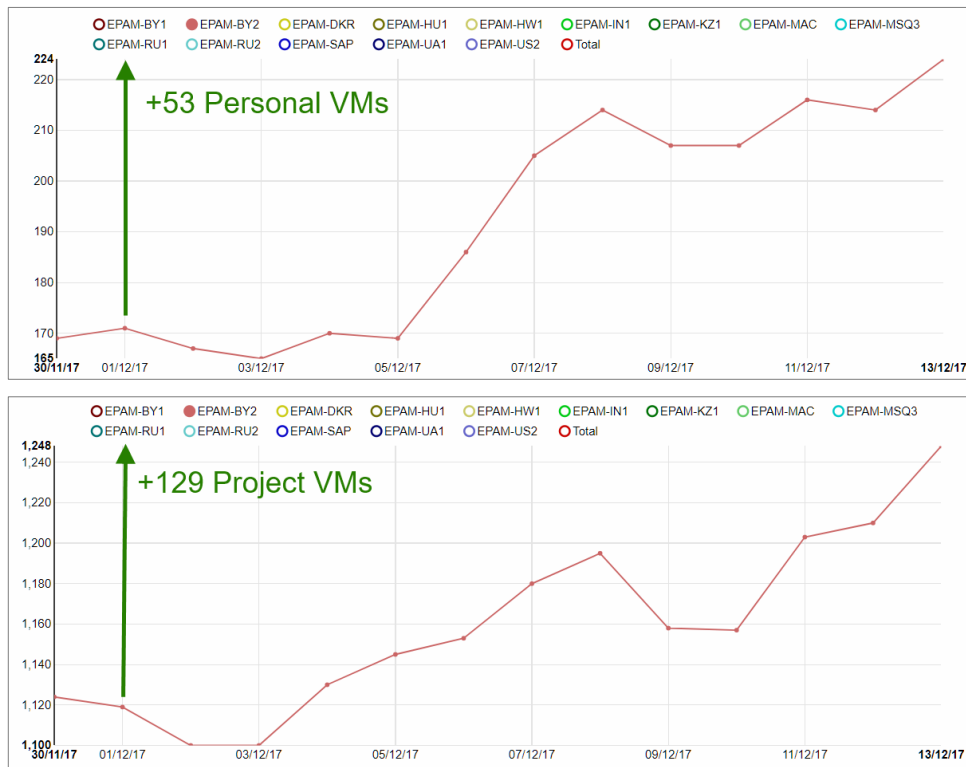


Figure 1 - Virtual resources growth in EPAM-BY2 region after EPAM-MSG3 decommissioning

As it was announced before, the EPAM-BY1 region is also in process of decommissioning. If you have any resources there, we highly recommend moving them to the EPAM-BY2 region as well. It will allow you using all the benefits of an OpenStack region and solving a number of complex tasks, both technical and financial.

### 3 UNIFIED APPROACH TO THE PERMISSIONS MANAGEMENT

The approach to the roles and permissions management in Cloud has been simplified, starting from **December 3**. From now on, specific user's permissions are no longer managed through zCloud roles on the Staffing Portal. The detailed by-operation permissions mapping was removed and replaced with the enhanced generalized role settings.



To set specific permissions for a person, project key staff can use the Manage Cloud wizard available on [Cloud Dashboard](#). You can choose one of three existing permission sets for a particular user with the help of the respective wizard option:



Figure 2 - Changing individual user's permissions

There are three sets of permissions available for each user:

- **Project role-based.** The user will get the set of permissions, guaranteed to them according to their project role.
- **Admin.** The user will get the max project permissions level.
- **Deny access.** The user will have no access to perform project manipulations in Cloud.

To set up permissions for a specified user, you can use the Manage permissions option on the first step of Manage Cloud wizard. You change permissions for a group of people with the same project role.

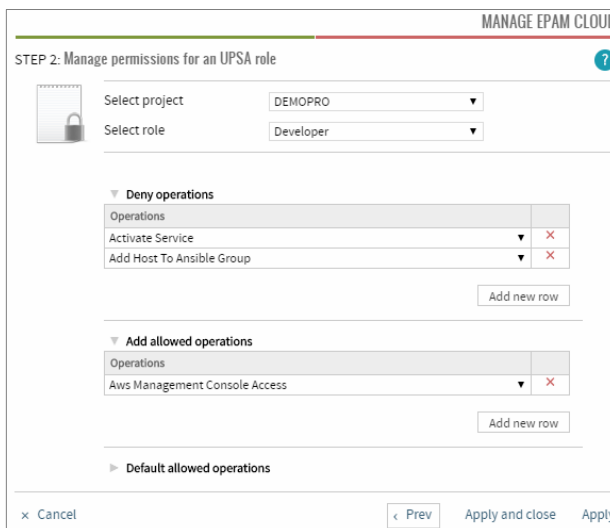


Figure 3 - Permissions management for a UPSA role

You can find more information about the permissions management in the [Account Management Guide](#).

## 4 SERVICES UPDATES

EPAM Orchestrator 2.1.111 includes a number of changes related to services configuration and information review.

Now, you can get the details on each active service via the Manage Services wizard, and easily collect information about the Auto Configuration Service to monitor its activity via Maestro CLI.

You can also request a large system disk (up to 500GB) for the Relational Database Service instead of 3 additional storages.

The PaaS services moved from Ubuntu 12.04 to Ubuntu 14.04/16.04.

### 4.1 THE MANAGE SERVICES WIZARD UPDATE

In the previous release, we updated the Manage Services wizard, so that you can review the services that are currently active on your project with the “Browse activated services” button. This time, we have added a Show details button on this step. It will help you to receive the more detailed information about the selected service.

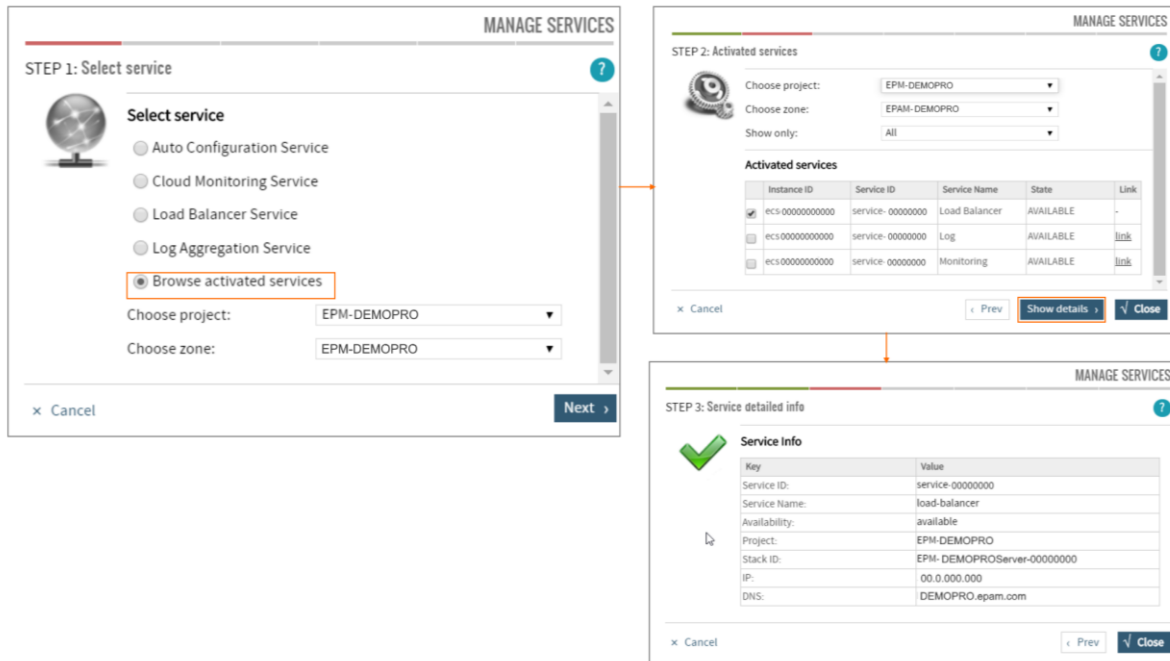


Figure 4 - Detailed information about services

### 4.2 AUTO CONFIGURATION SERVICE UPDATES

Auto Configuration Service is one of the core services delivered by EPAM Orchestrator. With this update, we enabled precise user control on the service disabling for project, and implemented the tool for collecting the data on Chef Clients.

## 4.2.1 Collecting Info on Chef Clients

The new Maestro CLI command, **or2-validate-chef (or2vchef)**, allows the user to control and monitor the work of the service indicating any errors occurred.

The command should be run in Maestro CLI on the target VM and does not need any parameters:

```
or2-validate-chef
```

The command output includes the following information:

```

=====
Status: Chef-client is installed!
Chef client version: 11.1.1
Chef server url: https://aaa01-ddd0.aaaaa.aaa.com
Chef-client log path: /.../.../client.log
Last run time: [2017-12-13T16:15:14+03:00]
ERROR: Client log has errors. Please check it.
ERROR log path: /.../.../chef-stacktrace.out
=====

```

Figure 5 - The or2-validate-chef command output



Please see the [Maestro CLI Quick Start Guide](#) for more information about Maestro CLI installation.

## 4.2.2 Disabling Auto Configuration for Specific OS

EPAM orchestrator now allows to disable auto configuration for VMs with specific OS types, rather than for the whole project.

This is done by adding the **--customize** parameter to the **or2-manage-service (or2ms)** command with the **--activate** flag:

```
or2ms -a -s chef -p project -r region --customize
```

When run, the command will prompt you for the ACS disable mode. As a response, specify the OS family for which the auto configuration should be disabled (ALL, WINDOWS, LINUX):

```

or2ms -a -s chef -p demopro -r epam-by2 --customize
Select preferable ACS disable mode (ALL, WINDOWS, LINUX, NONE): LINUX
Response: Service activated

```

Figure 6 - Disabling auto configuration for a specific OS

The information on the auto configuration disabling on the project can be found in the **or2-describe-chef (or2dchef)** command:



```

or2dchef -p demopro -r epam-by2
Response:
=====
chefMode | chefServer | chefVersion | active | disableType |
=====
DEFAULT | acs01-a1.cloud.epam.com | 11 | true | WINDOWS |
=====

```

Figure 7 - Reviewing information on the current status of the ACS

To enable auto configuration back, run the same **or2ms** command with the **--customize** parameter, and select the NONE mode.



The new auto configuration disabling mode is applied only to the virtual instances that are launched after the mode is changed. The virtual instances created earlier, will stick to the mode in which they were created.

### 4.3 THE RDB SERVICE: A 500GB SYSTEM DISK AVAILABLE

The Relational Database (RDB) service automatically creates a database entity for your project.

With EPAM Orchestrator 2.1.111, we added a new option to the RDB Service configuration. An extended system disk can be used instead of attaching three additional 100GB storages. The allowed system disk sizes are 100, 200, 300, and 500 GB. To use this option, add the **--use-sys-disk-size** parameter to the **or2-manage-rdb (or2rdb)** command at the service start.

All you have to do to start the service is run the command with the following parameters:

```

or2rdb -p project -r region -a install -t type [-n db_name] -u db_username
[-pwd db_password] [-d description] [-f file_path] --use-sys-disk-size 200

```

Where:

- **-a install** – obligatory parameter; the action parameter specifying that a new database instance should be created
- **-t type** – obligatory parameter; the type of the database to be installed (mysql, postgresql, mmsql, oracle, mariadb)
- **-u db\_username** – obligatory parameter; the username that will be used to login to the created database
- **-n db\_name** – optional parameter; the name of the database to be created; if not specified, will be generated automatically
- **-pwd db\_password** – optional parameter; the password to be used to login to the created database. If not specified, a random password will be generated.
- **-d description** – optional parameter; the description of the new database.
- **-f file\_path** – the parameter specifying the path to the initialization script used for database configuration.
- **--use-sys-disk-size** – the parameter specifying the extended system disk size



The extended system disk is available only for the OpenStack regions.

```

or2rdb -p epm-csup -r epam-openstack -t mysql -a install -u dbUser --use-sys-disk-size 500
Response:
=====
stackName      | stackId              | status          |
=====
EPM-CSUPMySQLServer | EPM-CSUPMySQLServer-00000000 | PENDING_TO_CREATE |
=====
    
```

Figure 8 - The command output

#### 4.4 SERVICES GUEST OS CHANGES TO UBUNTU14/16

EPAM Cloud keeps up with the time and tends to use to up-to-date technologies and Operating systems for its solutions and services. One of the most popular images for EO PaaS services is Ubuntu. With EPAM Orchestrator 2.1.111 release, we decommissioned Ubuntu 12.04 and moved the services from it to Ubuntu 14.04 and Ubuntu 16.04 versions.

You can find the updated mapping table of the required images in [Appendix 1](#).

Please also note that the Linux-based AMIs for AWS were changed in this release. You can find more information in [this section](#).



## 5 AWS INTEGRATION UPDATES

Integration with external clouds, especially AWS, is an important part of EPAM Orchestrator functionality. Thus, we pay special attention to usability of our approaches and to security of EPAM accounts in Amazon.

With the current update, we start using AWS Marketplace for retrieving AMIs used by Orchestrator. In addition, we finalized the introduction of the new MFA control policy.

### 5.1 AWS MARKETPLACE AMIS FOR LINUX INSTANCES

Starting with v.2.1.111, EPAM Orchestrator uses AWS Marketplace AMIs for running new Linux-family instances. This brings a number of benefits for Cloud users:

- Marketplace AMIs are officially maintained by their owners.
- Unlike public AMIs, Marketplace ones cannot be unexpectedly deleted and cause the respective inconveniences.

In addition, the collection of the supported operating system is updated to reflect the latest trends in AWS usage.



Please note: the default login for the Linux-family instances will change. This may influence your automation flows, so we would recommend to review them.

However, the default login change won't influence the VMs, launched in the scope of [EPAM Cloud Platform Services](#).

The set of the supported images also changed. You can see all the details on the AMIs supported by EPAM Orchestrator in the table below:

Operating System (EPAM Alias)	Marketplace Link	AMI Owner	Login User	Comment
CentOS6_64-bit	<a href="#">CentOS 6</a>	<a href="#">Centos.org</a>	centos	Updated
CentOS7_64-bit	<a href="#">CentOS 7</a>	<a href="#">Centos.org</a>	centos	Updated
Debian_7_64-bit		-		Removed
Debian_8_64-bit		-		Removed
Debian8_64-bit	<a href="#">Debian 8</a>	<a href="#">Debian</a>	admin	Updated
Debian9_64-bit	<a href="#">Debian 9</a>	<a href="#">Debian</a>	admin	Added
Ubuntu10.04_64-bit		-		Removed
Ubuntu12.04_64-bit		-		Removed
Ubuntu14.04_64-bit	<a href="#">Ubuntu 14.04</a>	<a href="#">Canonical Group Limited</a>	ubuntu	Updated
Ubuntu16.04_64-bit	<a href="#">Ubuntu 16.04</a>	<a href="#">Canonical Group Limited</a>	ubuntu	Updated

To connect to a Linux VM, run the following Linux command:

```
ssh user@<hostname> -i<path>
```

Where <hostname> stands for your VM DNS Name and <path> stands for the full path to your key file. For example, if CentOS is used, the command will look as follows:

```
ssh centos@<hostname> -i<path>
```

## 5.2 MFA SECURITY POLICY CHANGES

Security is one of the core points for the work in Cloud. To ensure the necessary conditions for users accessing AWS management Console via IAM user accounts, we request that they set up the Multi-Factor Authentication.



A set of tools in EPAM Orchestrator is dedicated to monitor MFA settings on each account. Monitoring is followed by a proper reaction, up to blocking the users who do not have this security measure enabled.

The default permissions of any newly created IAM user prohibit any actions except those necessary for MFA setup. As soon as the setup is performed, the user automatically gains all the permissions specified for them.

Our new approach is aimed at the simplification of the MFA policies setup. It also decreases the chances for illicit access within the period between the IAM user is created and the MFA is set up.

## 6 MAESTRO CLI CHANGES

### 6.1 CLI CHANGES AND IMPROVEMENTS

The current Orchestration update includes a number of Maestro CLI updates that reflect the changes in EPAM Orchestrator functionality and improve the usability of the tool:

- **or2-manage-rdb (or2rdb)** – the **--use-sys-disk-size** parameter is added to allow expanding the system disk of the database server VM.
- **or2-validate-chef (or2vchef)** – the command is added to enable Chef validation on instances in Cloud.
- **or2-manage-servcies (or2ms)** – the **--customize** flag used with the command now allows to disable auto configuration for a specific OS on Chef service activation.

### 6.2 MAESTRO CLI ADMIN UTILITY

EPAM Cloud is a complex service which contains a big amount of user tools for managing virtual infrastructures.

It also includes quite a big layer that enables deep-dive admin control over EPAM Orchestrator. This layer is implemented as the command line interface - Maestro CLI Admin Utility.



Maestro CLI Admin Utility represents the Admin Portal implemented as a command-line interface. Together with other cloud management components, the Admin Portal forms the comprehensive Hybrid Cloud Management Solution.

Currently, there are 36 command groups, that can be logically split into 10 categories according to their application and purpose.

The tool is under constant development and faces regular updates. It is widely used by EPAM Cloud Support teams, and we would like to say **special thanks to EPAM Cloud Support Level 1.5 team**. Our colleagues constantly share their ideas, suggest user scenarios and provide feedback based on their user experience. This allows us to identify the areas for improvements, and to set up new roadmaps for the Admin Utility development.

## 7 EPAM CLOUD CONTRIBUTORS: CLOUD TO BE MOBILE

For a year already, EPAM Cloud team and contributors from the Cloud community work on an EPAM Orchestrator Open-Source solution, Maestro3. It utilizes Amazon resources in all its components which are designed as standalone units and can be used separately, also for purposes outside the EPAM Cloud. Open-source means that the product code is publicly shared and that anyone can contribute to it. The same approach will be applied in Maestro 3. Code contributors can choose to integrate their code with the existing Maestro 3 functionality only for their purposes or to make it generally available.



Resulting the effective partnership with the EPAM contributors based on Maestro3, a prototype of the Cloud mobile application was developed. The application is planned for release next year.

The application idea evolved as the EPAM Orchestrator team pays a lot of attention to the usability of the service and to the ways to make it more accessible. We understand what the response time matters for any business solutions. Thus, with the current EPAM Orchestration release, we are glad to announce the EPAM Cloud mobile application for iOS and Android platforms which can be easily installed on your gadget.



Figure 9 - Cloud mobile application icon

This brand-new feature was implemented as a result of the fruitful cooperation between our UI Team and a contributor from the EPAM Cloud community – the Android Developer who made his valuable input to the application development.

The new application has the following essential properties:

- It is based on the same framework as the desktop version. Due to the intuitively clear and habitual interface and functionality, the application is simple to use.
- It ensures an easy access to the Cloud services. You can reach the necessary service in a snap of a finger from everywhere
- A push notification system allows to receive valuable and relevant updates even when the app is closed, and react properly. If anything important requires your attention and reaction, you will be notified at once and will be able to response on the spot.
- A new customization level of the notifications is allowed. You can choose what notifications should always be sent, what can be notified via email and what notifications can be off.

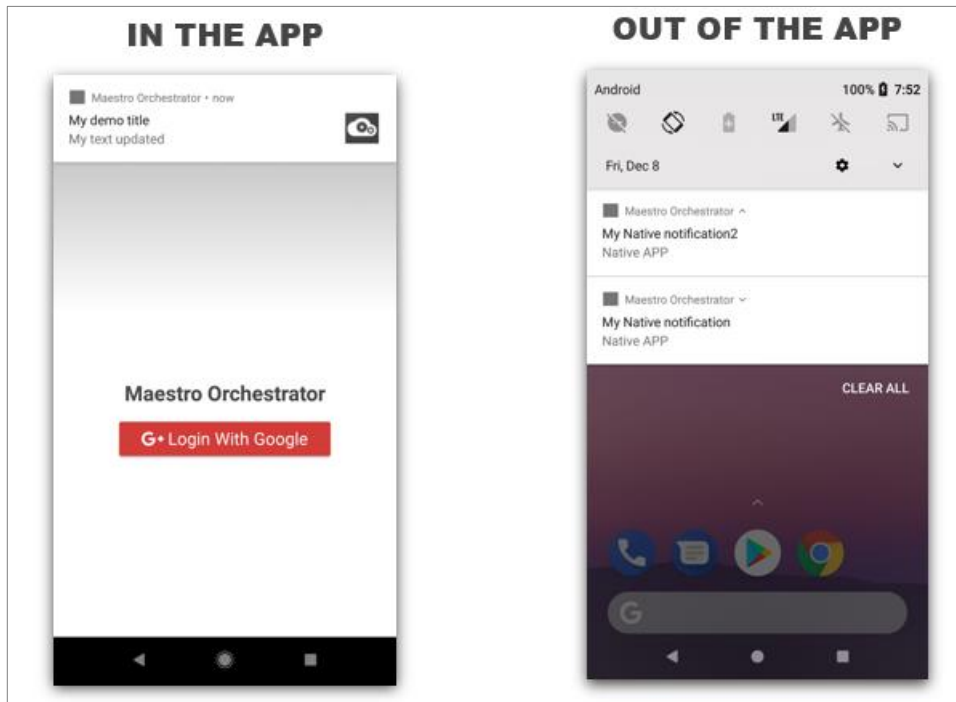


Figure 10 - Push notifications

So, be in with us for the Cloud application release next year! Meanwhile, if you have interesting ideas, we are happy to see you amongst the [EPAM contributors](#) and join our efforts to make great things together!

## 8 CLOUD HEROES

A month ago, we proudly announced the introduction of the two advanced AWS badges introduced to recognize those who have passed official **AWS Associate and Professional Certifications**. We are glad to say that 39 of these badges were already granted to Amazon Web Services experts, and the new requests are submitted regularly.

We are also glad to announce, that two new Google Badges were introduced:

- **Google Cloud Track** – for those who passed official Google trainings.
- **Google Cloud Professional** – for those who passed official Google certifications.



Feel free to submit your certificates- for these courses and any other, supported by EPAM Cloud Appreciation program!

We are looking forward to finding new heroes!

## 9 DOCUMENTATION UPDATES

All changes and updates to the EPAM Orchestrator functionality are reflected in the documentation and other EPAM Cloud resources. With the release of EPAM Orchestrator 2.1.111, the following documents were updated according to the changes:

- [EPAM Cloud Services Guide](#) was updated with the news on the Chef and auto configuration, as well as the guest OS changes for Ubuntu 14.04/16.04 where applicable.
- [Maestro CLI User Guide](#) was changed according to Maestro CLI updates, Auto configuration Service updates and the guest OS changes..
- The [EPAM Cloud website](#) was updated to reflect the current functionality.

All the knowledge base was updated due to EPAM-MSQ3 region decommissioning.



**APPENDIX 1. PAAS GUEST OPERATING SYSTEMS**

Service name	Used Image
Adobe AEM as a Service (AEM)	CentOS6_64-bit
Ambari Service (AAS)	CentOS6_64-bit
Artifactory as a Service (AFS)	CentOS7_64-bit
ATG as a Service (ATG)	CentOS6_64-bit
Auto Configuration Service (ACS): Chef server (epc/user modes)	Ubuntu14.04_64-bit
Cloud Monitoring Service (CMS): Zabbix	Ubuntu16.04_64-bit
Docker/Docker registry (DOS) (with volumes)	CoreOS_899.13_64-bit
Docker/Docker registry Service (DOS)	Ubuntu16.04_64-bit/Ubuntu14.04_64
Gerrit as a Service (GAS)	Ubuntu 14.04_64-bit
Hybris as a Service (HAS)	CentOS7_64-bit
Jenkins as a Service (JAS)	Ubuntu16.04_64-bit
Kubernetes as a Service (KUB)	CoreOS_899.13_64-bit
Load Balancer Service (LBS)	Ubuntu16.04_64-bit
Log Aggregation Service (LAS)	Ubuntu14.04_64-bit
Magento as a Service (MAS)	CentOS7_64-bit
Messaging Service (MES)	Ubuntu14.04_64-bit
Relational Data Base Service (RDB) Mariadb	Ubuntu14.04_64-bit
Relational Data Base Service (RDB) MSSQL (2012)	W2012R2Std
Relational Data Base Service (RDB) MSSQL (2014) hardware	W2012R2Std
Relational Data Base Service (RDB) MySQL	Ubuntu14.04_64-bit
Relational Data Base Service (RDB) Oracle	OracleLinux7_64-bit
Relational Data Base Service (RDB) PostgreSQL	Ubuntu14.04_64-bit
Sitecore as a Service (SAS)	W2012R2Std
Sonar as a Service (SQS)	Ubuntu 14.04_64-bit
Splunk as a Service (SPS)	Ubuntu 14.04_64-bit
Telemetry as a Service (TMS)	Ubuntu16.04_64-bit

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## VERSION HISTORY

Version	Date	Summary
1.0	December 16, 2017	First published