Arenadata™ Grid

Версия - v2.7

Installing ADG cluster with ADCM

2020 Arenadata™

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The simplest way to install **ADG** cluster is to use **Arenadata Cluster Manager** – ADCM.

Глава 1

Benefits

The advantages of installing the **ADG** cluster through the **ADCM** are:

1. All installation and configuration logic is encapsulated in ADG bundle:
   - User doesn't have to prepare and enter tons of xml-configs;
   - All important OS, cache and DataStorage settings are configured.
2. Either cloud or bare metal host infrastructure can be used.
3. All ADG rpm packages are taken from Arenadata repository:
   - All rpms have been tested;
   - Since certain packets are used, it is easier to help users to report their bugs.

Глава 2

Preliminary steps

To install the **ADG** cluster using **ADCM** you must complete the following preliminary steps:

1. Install ADCM;
2. Create hosts for ADG cluster:
   - Load required host bundle. The current example uses the *Datafort* bundle;
   - Initialize four hosts: two for Grid servers (*df-mdw*), and two for *Grid* clients;
3. (Optional) Create monitoring cluster:
   - Load monitoring bundle.
   - Instantiate and install monitoring cluster.

Глава 3

Installation steps

3.1 Upload ADG bundle

The goal of **ADG** bundle uploading is to create a cluster prototype for **ADG**. From this prototype cluster it is possible to generate the cluster instances later.

To load the bundle:

1. Open "BUNDLES" tab in ADCM (Pic.3.1).

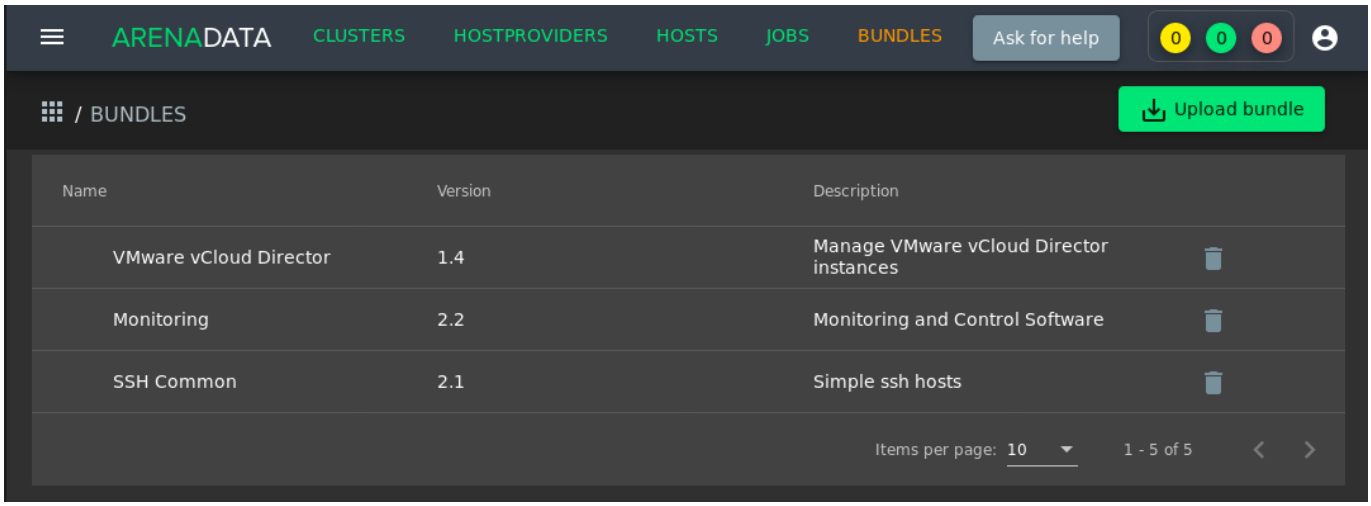


Рис.3.1.: "BUNDLES" tab

2. Press the "Upload bundle" button and select the ADG bundle file in the opened form (Pic.3.2).
3. Now ADG bundle is uploaded to ADCM (Pic.3.3).

3.2 Create ADG cluster

After you complete *preliminary steps* and *upload ADG bundle*, the **ADCM** cluster Manager contains bundle's objects and some artifacts (Pic.3.4):

- A monitoring cluster prototype and instantiated cluster (a real monitoring program running on a host);
- An *ADG* cluster prototype for instantiation;

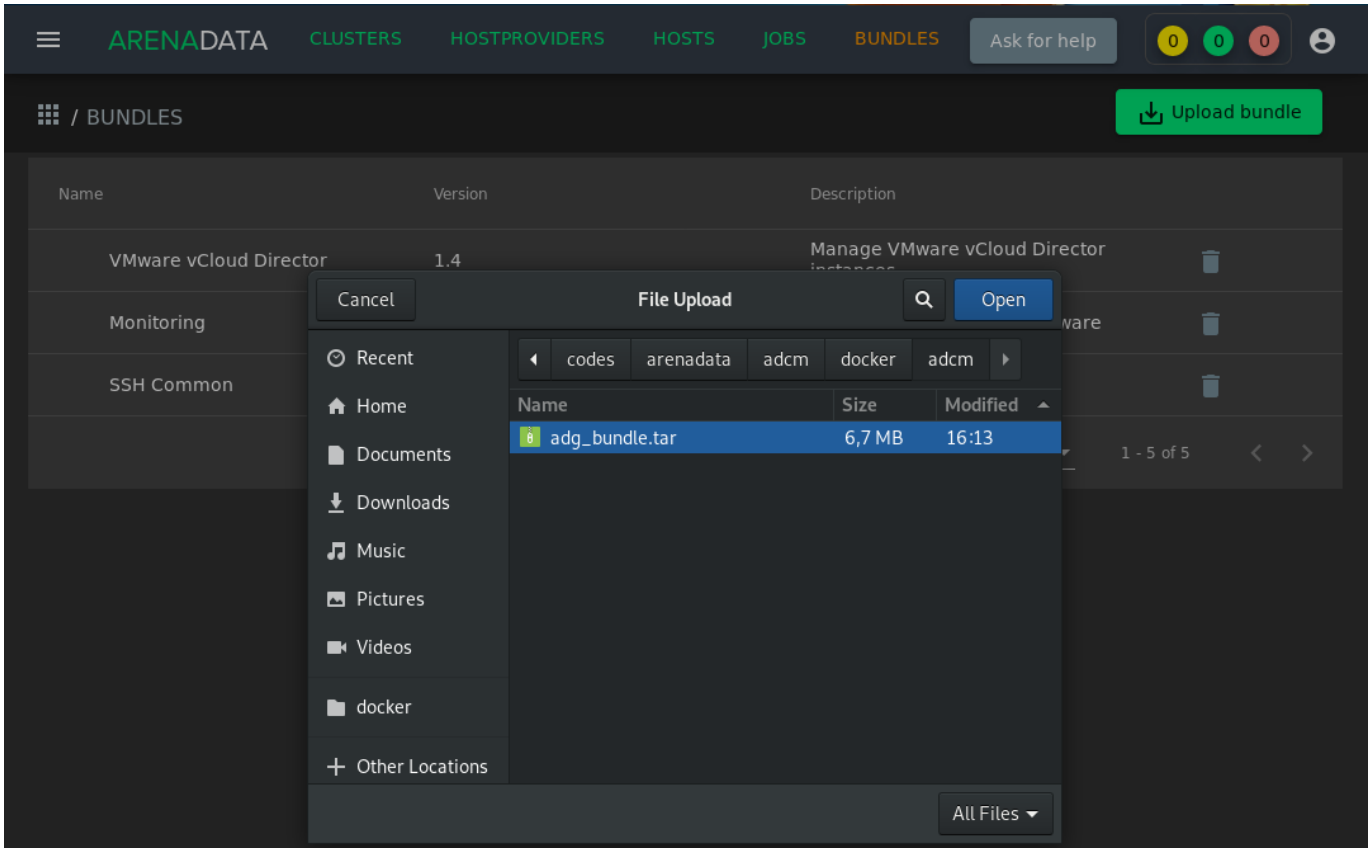


Рис.3.2.: Choice of bundle

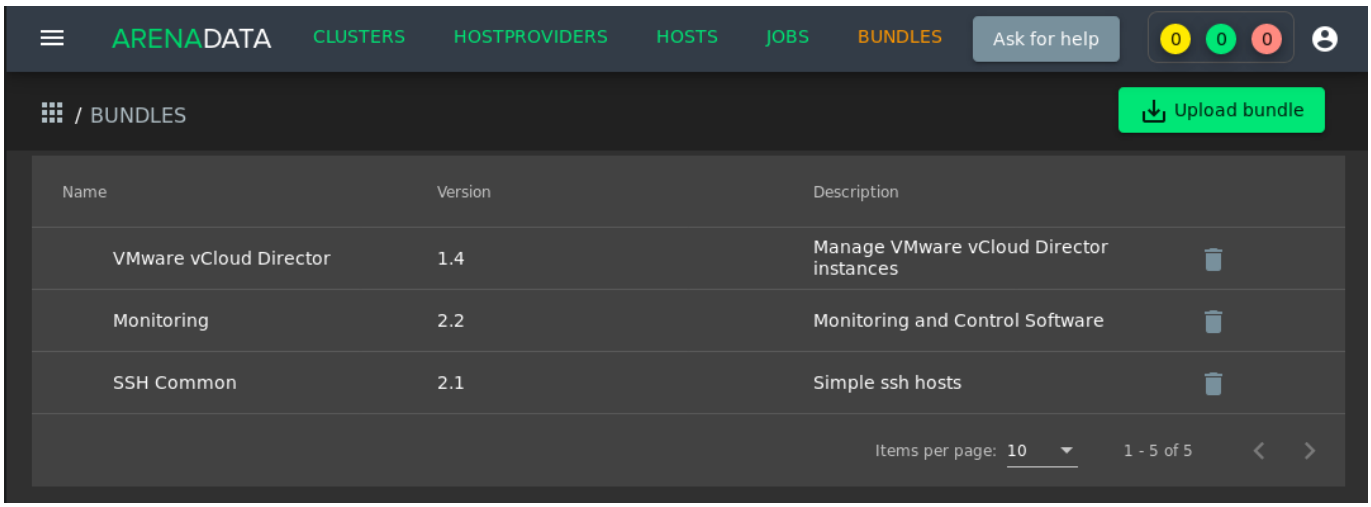


Рис.3.3.: ADG bundle is uploaded

- Pre-generated four from *Datafort* bundle. It means that the hosts physically exist in the *Datafort* cloud, and records about them and their credentials — ssh keys or passwords — are stored in the ADCM database.

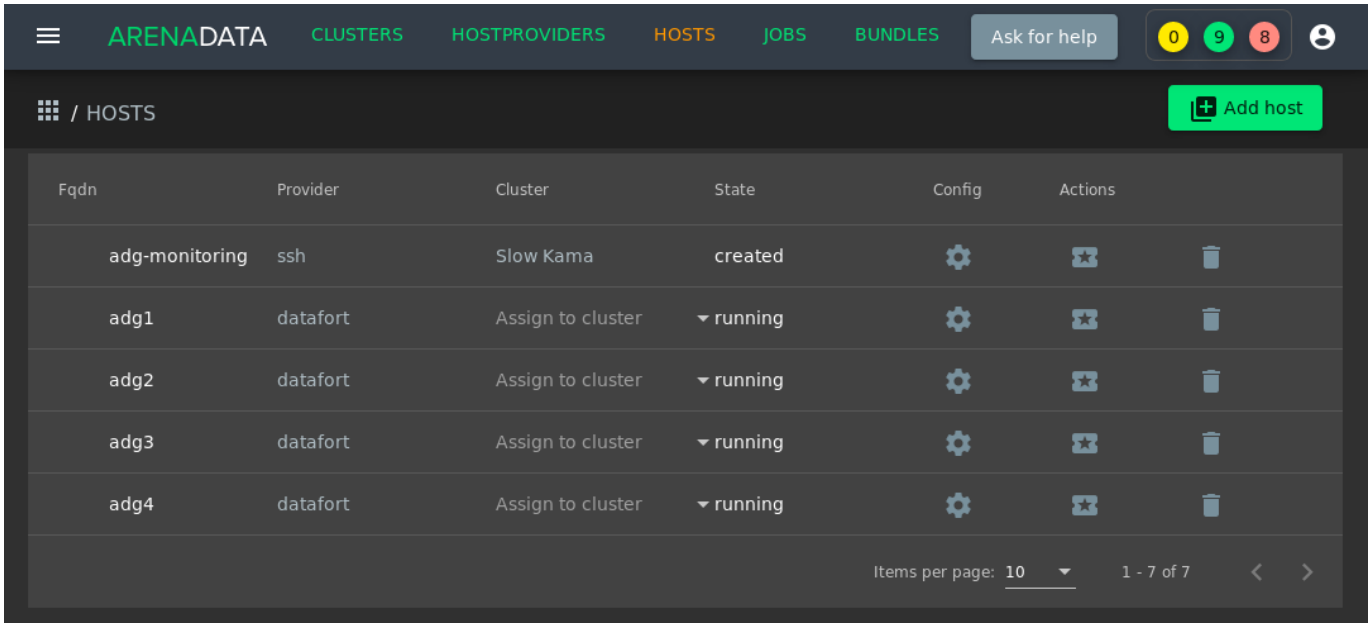


Рис.3.4.: List of objects of ADCM

The following functionality is available:

- *Instantiate cluster*;
- *Configure cluster*;
- *Add services*;
- *Add hosts*;
- *Map service components to hosts*;
- *Install adg services*;
- *Install monitoring clients service*.

3.2.1 Instantiate cluster

When *ADG* cluster instance is created in web interface of **ADCM**, it is not actually installed at physical hosts yet. It will be actually installed on physical (or virtual) hosts when the following steps are done:

1. Open the "CLUSTERS" tab in ADCM (Pic.3.5).
2. Press the "Add cluster" button and in the opened form create a bundle instance from *ADG* bundle prototype (Pic.3.6).
3. As a result of the actions performed, the creation of the cluster instance is displayed in the ADCM database on the "CLUSTERS" tab (Pic.3.7).

3.2.2 Configure cluster

To go to the settings of the cluster instance *adg*, press the button with the gear icon in the necessary row of the "CLUSTERS" tab (Pic.3.7) and go to the "Configuration" menu section. This opens the configuration window for the selected instance (Pic.3.8).

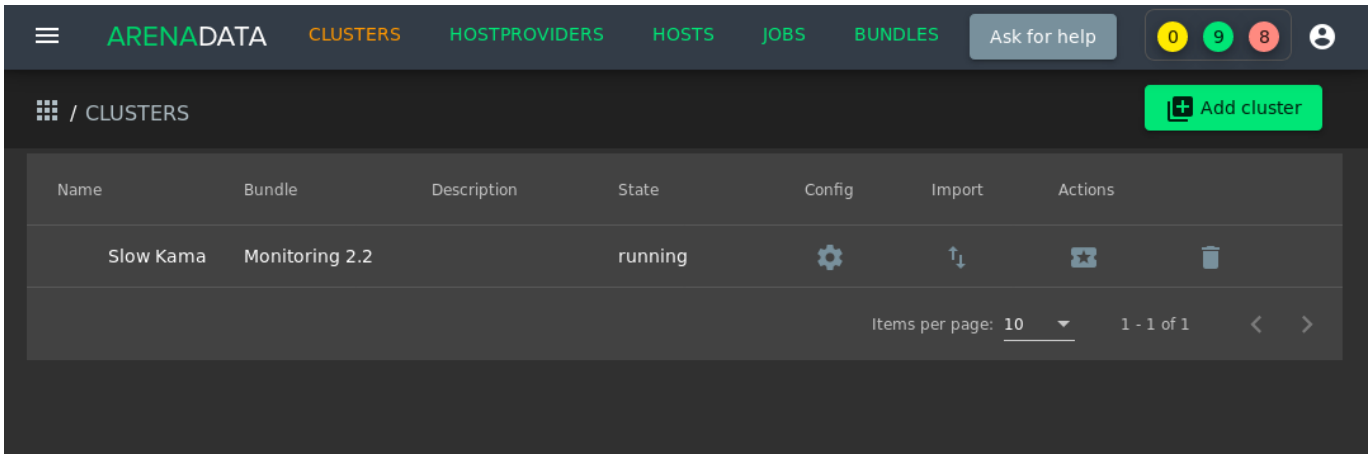


Рис.3.5.: “CLUSTERS” tab

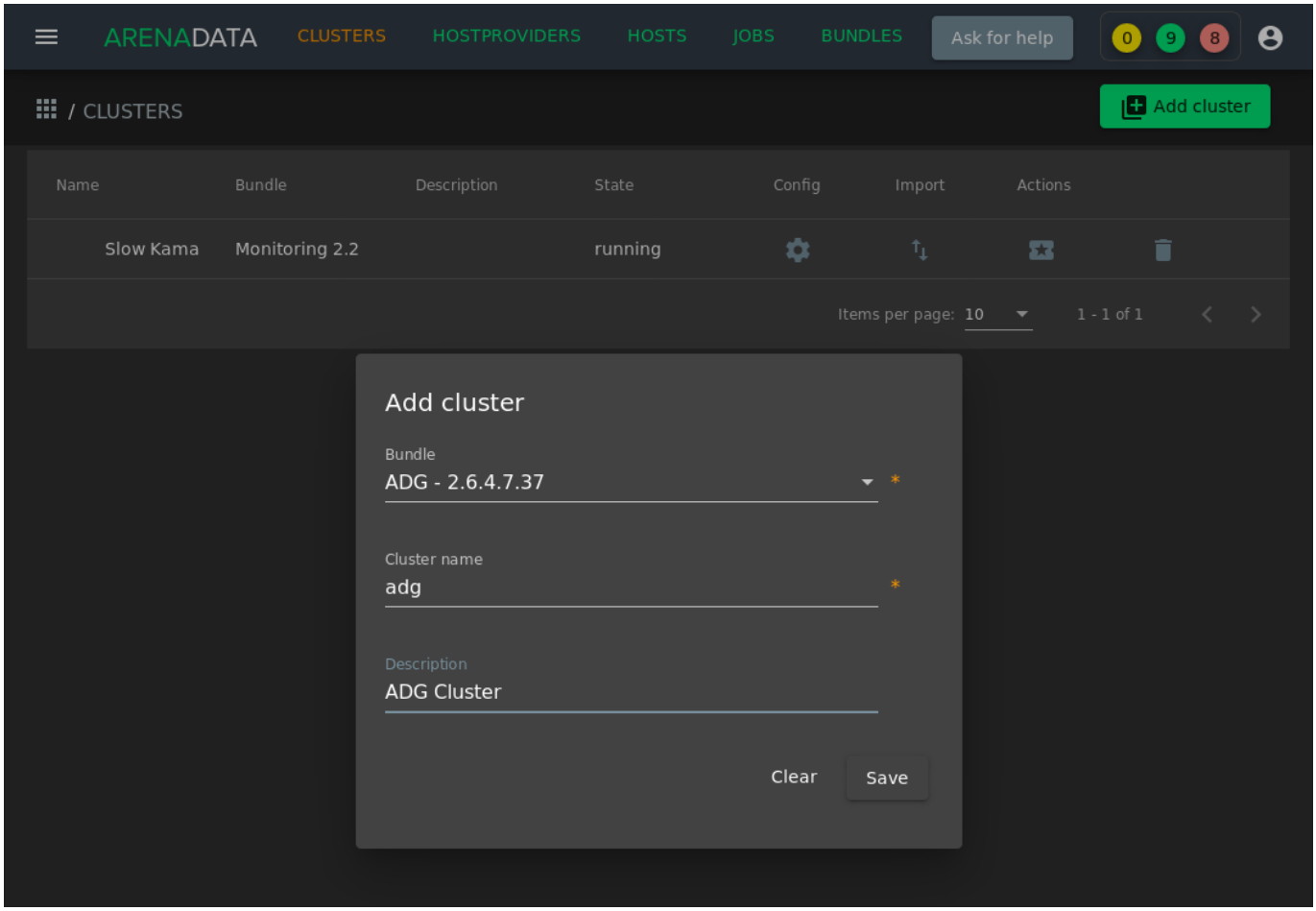


Рис.3.6.: Creating a bundle instance

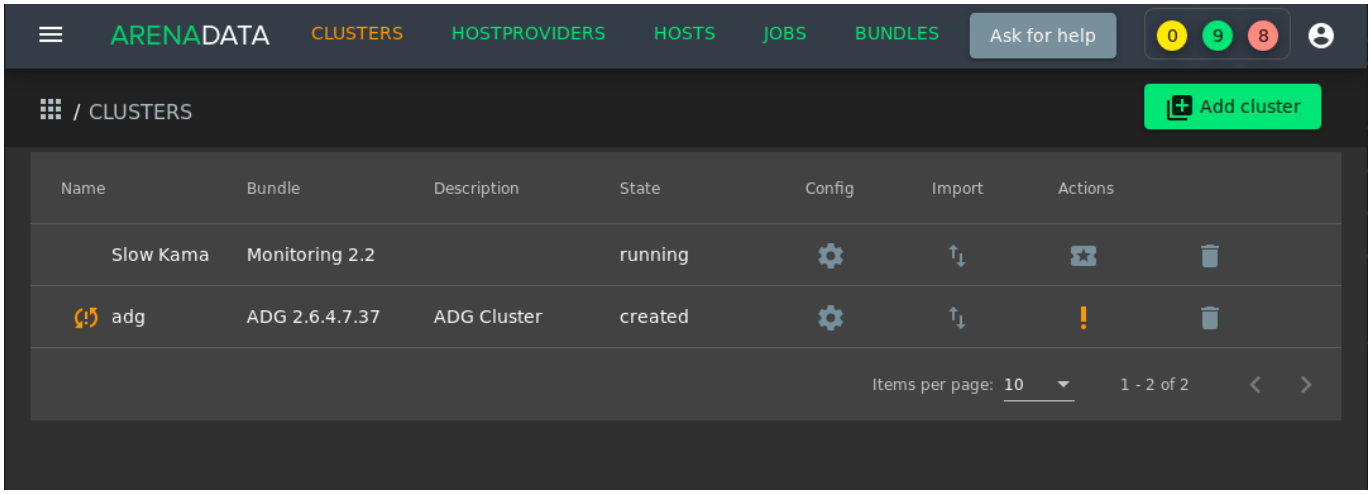


Рис.3.7.: Cluster instance creation

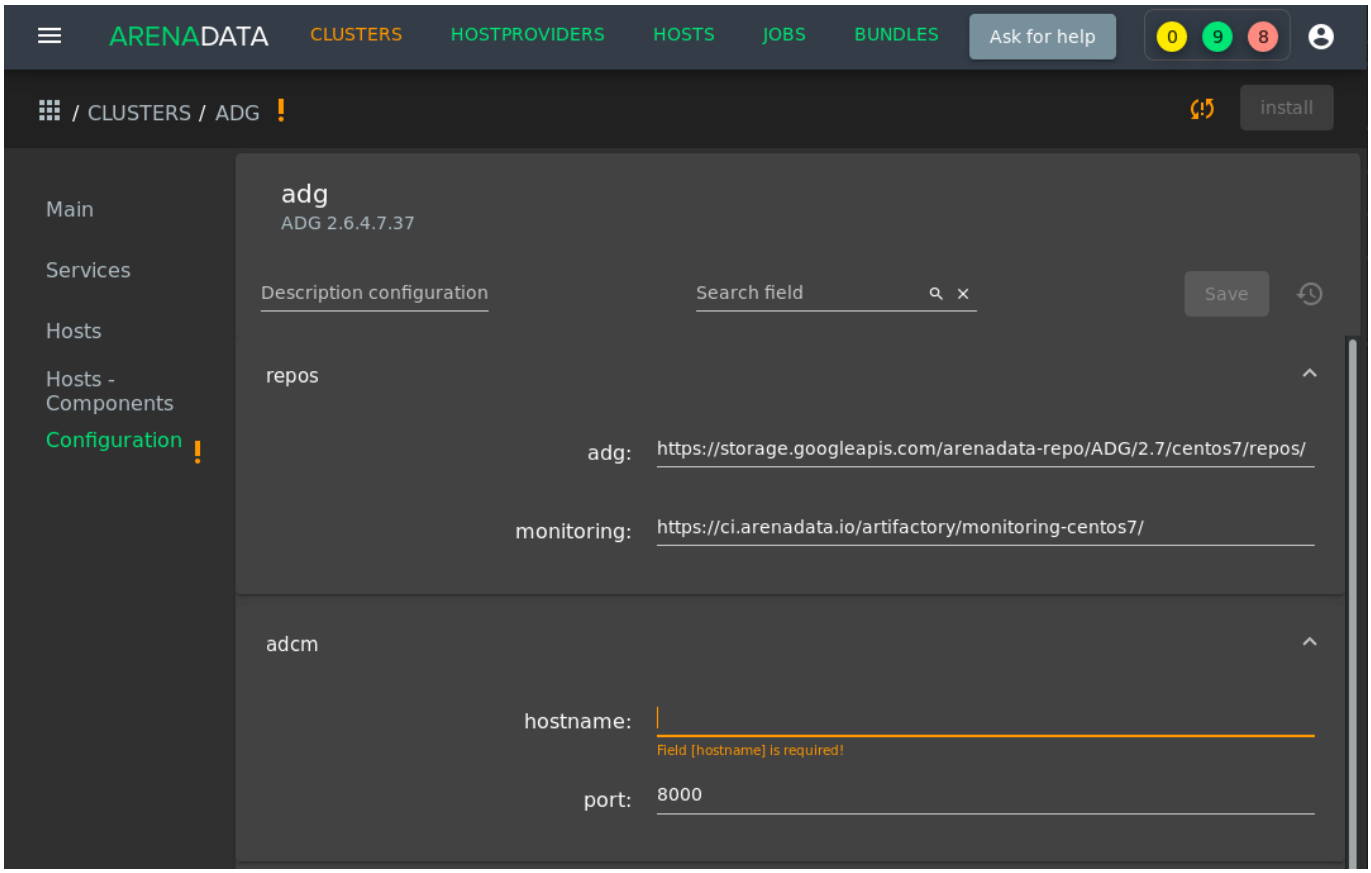


Рис.3.8.: Cluster configuration window

In the "repos" settings block, you specify the packages required for *adg* installation from various yum repositories, and in each of the parameters you can change the default url to the required one (for example, when there is installing without access to the Internet):

- Arenadata ADG repo;
- Arenadata Monitoring repo.

In the block "adcm" it is possible to configure addresses:

- *hostname* (or IP address);
- *port*.

Here you have to set hostname property. It is a hostname of the host where **ADCM** is deployed and where status infromation will be sent to. Any cluster's service component is able to send keep alive status information to the **ADCM** process in the docker container. Sometimes **ADCM** can be behind NAT and there is no evident way to automatically tell the address of **ADCM** to the service components located on cluster's hosts. That is why it should be configured manually. During the **ADG** installation the **ADCM** address would be used to fill component's keep alive status configuration. That is why an address field must be filled to perform further steps (a warning is displayed on the interface if the address field is empty).

3.2.3 Add services

Cluster **ADG** contains the following services:

- *server* – Grid Compute and Storage node;
- *client* – Grid Client node;
- *monitoring* – agents sending host and ADG statistics to monitoring instance.

Not all services are required to be installed. For example, if you are monitoring by third-party tools there is no need to install *monitoring clients*. But if you plan to create a full-featured cluster instance the presence of the **ADG** service is mandatory.

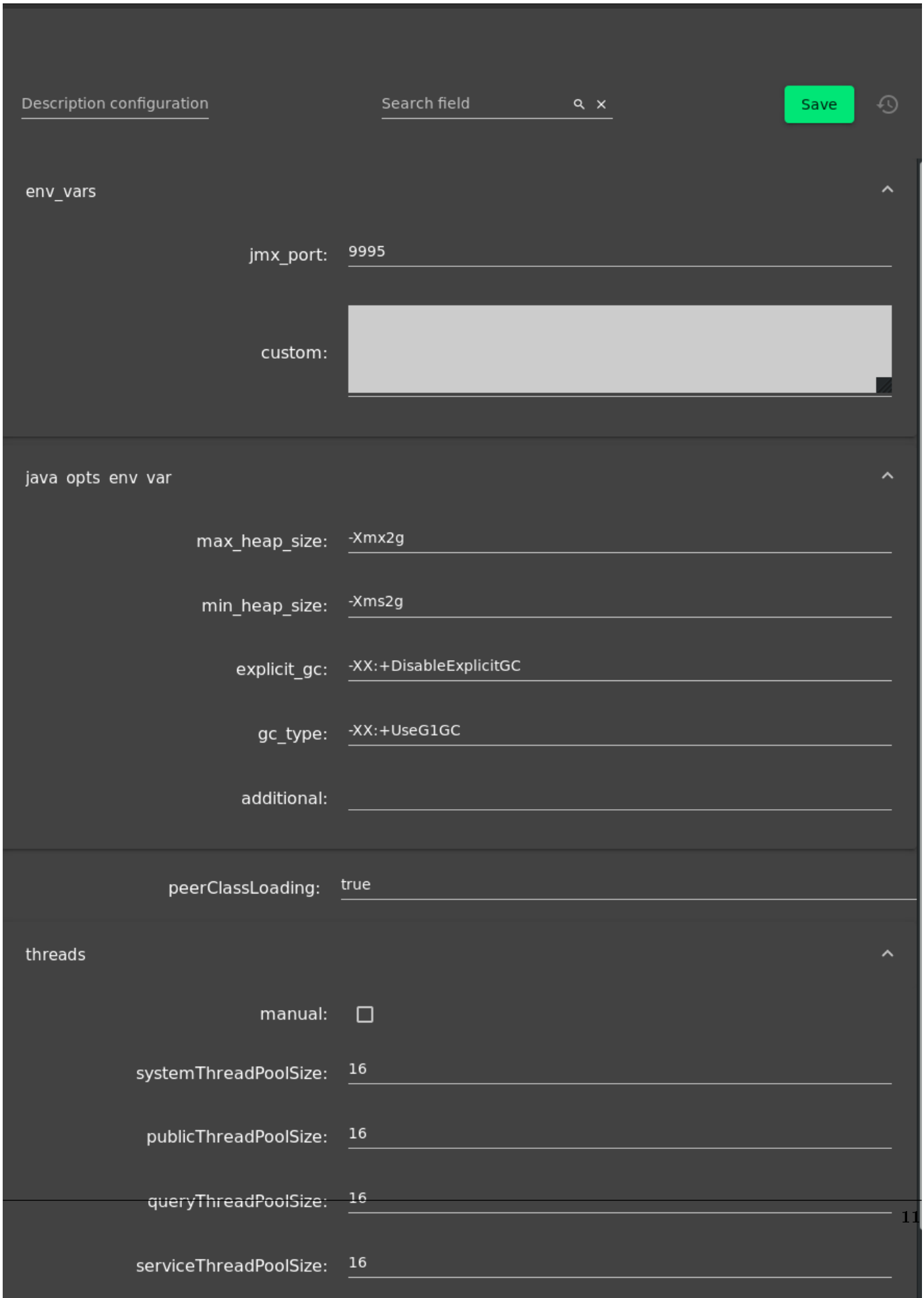
In a current example all available services would be added to cluster.

Important: Currently it is not possible to remove already added service from the cluster

Configure ADG server and client service

To go to the settings of the *adg* server or client service, press the button with the gear icon in the necessary row of the "SERVICES" tab and go to the "Configuration" menu section. This opens the configuration window for the service *adg* (Pic.3.9).

- Settings block "env_vars" – you can change existent or add new environment variables:
  - *jmx_port* – port where metrics will be fetched from;
- Settings block "java_opts_evn_var" – you can tune JAVA_OPTS default values or add new ones;
- Field "peerClassLoading" allows you to enable Grid *peerClassLoading* feature;
- Settings block "threads" – you can tune number of threads. Enable the field "manual" for the tuning to take effect;
- Settings block "caches" – you can define caches. Paste your xml-configuration here. Enable the field "manual" for caches config to take effect;
- Settings block "default storage" and "storage" – you can configure default storage and it's configuraion: size in GBs, persistance status and storage name. Enable the field "manual" for storage configuration to take effect.


Description configuration
Search field
Save
env_vars
jmx_port:
9995
custom:
java opts env var
max_heap_size:
-Xmx2g
min_heap_size:
-Xms2g
explicit_gc:
-XX:+DisableExplicitGC
gc_type:
-XX:+UseG1GC
additional:
peerClassLoading:
true
threads
manual:
systemThreadPoolSize:
16
publicThreadPoolSize:
16
queryThreadPoolSize:
16
serviceThreadPoolSize:
16

Configure monitoring clients service

In this section you can fix the *json* that describes the grafana dashboard as well as a list of metrics in *yaml* format that describes the metrics collected from the virtual machines.

3.2.4 Add hosts

Based on the results of *preliminary steps* there are four hosts in the *Datafort* cloud in **ADCM** (their addresses and credentials are stored in their configurations). The corresponding machine ip-addresses and access parameters are set in the "Hosts → Configuration" section via the gear icon. Now this hosts can be used in previously configured *adg* cluster:

1. Open the "Hosts" tab in the *adg* cluster menu (Pic.3.10).

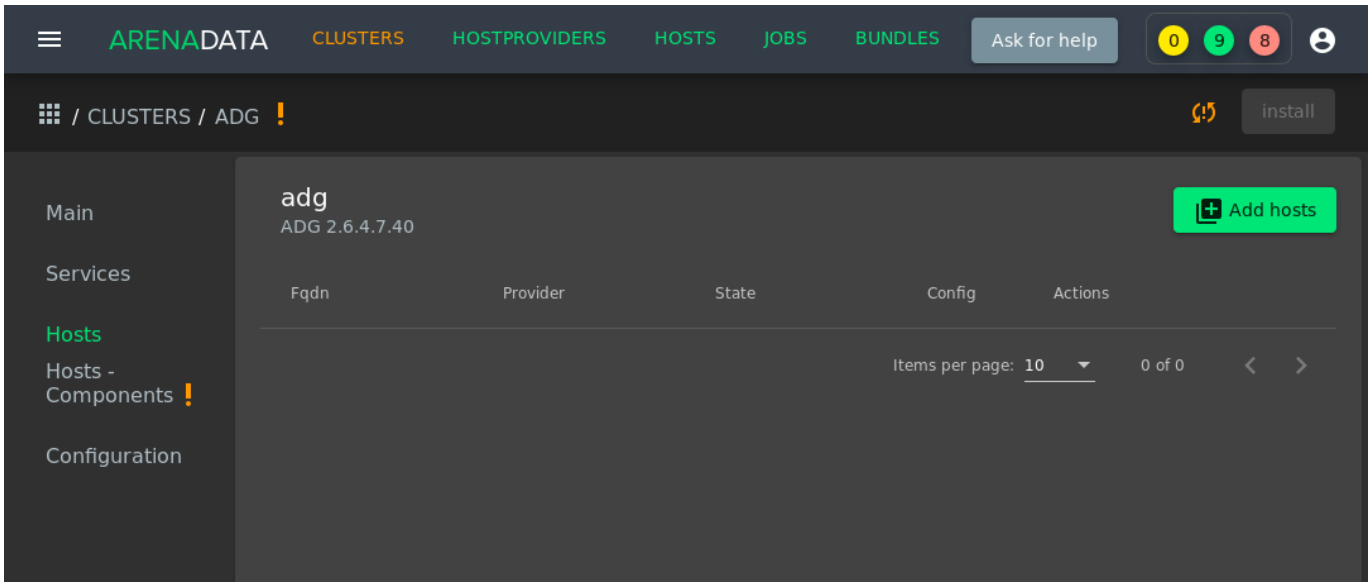


Рис.3.10.: "Hosts" tab of the adg cluster

2. Press the "Add hosts" button and in the opened form select the required hosts (Pic.3.11).
3. As a result, the fact of adding hosts is displayed in the *adb* cluster in the list of the "Hosts" tab (Pic.3.12).

3.2.5 Map service components to hosts

Each service consists of components that should be mapped to some hosts in the cluster. To do this, a component should be selected on the "Hosts - Components" tab by clicking on it in the "Components" column and mapped with a click to the required host in the "Hosts" column (Pic.3.13).

Because the server client and monitoring services added to the *ADG* cluster, but are not mapped yet, initially there are no components on any of the hosts:

1. Server and Client components mapping

ADG cluster can include from one to three services – client, server, monitoring. At the same time components of any service can be installed on several machines. Since the only component of the server service is the server itself, the component is fully named as *server.server*. The same is for the client component.

Now you can map this component as only you wish. For instance, we mapped server component to *adg1* and *adg2* virtual hosts, and client component to *adg3* and *adg4* virtual hosts (Pic.3.14).

2. Mapping for monitoring service components (optional):

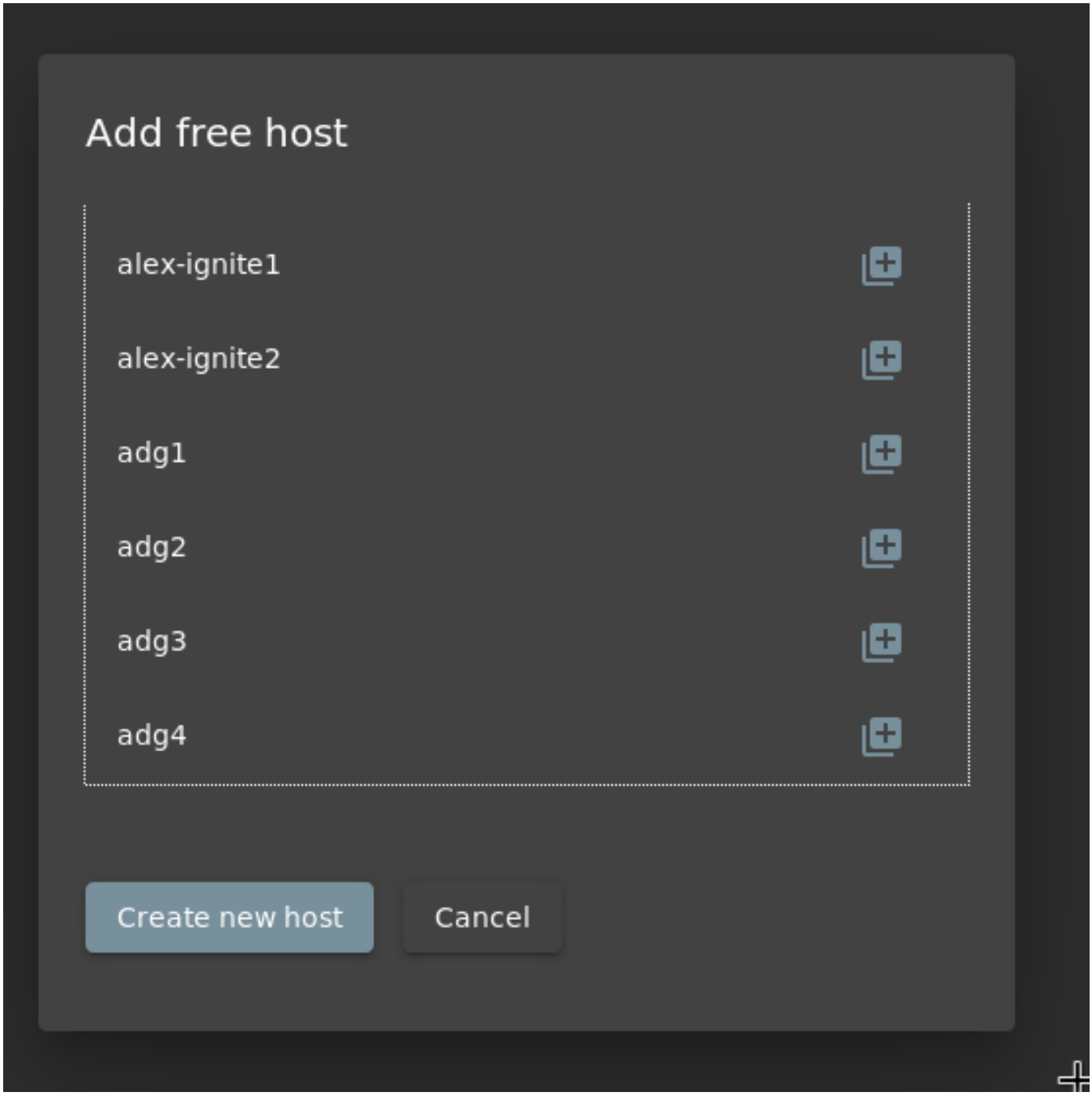


Рис.3.11.: Choice of hosts

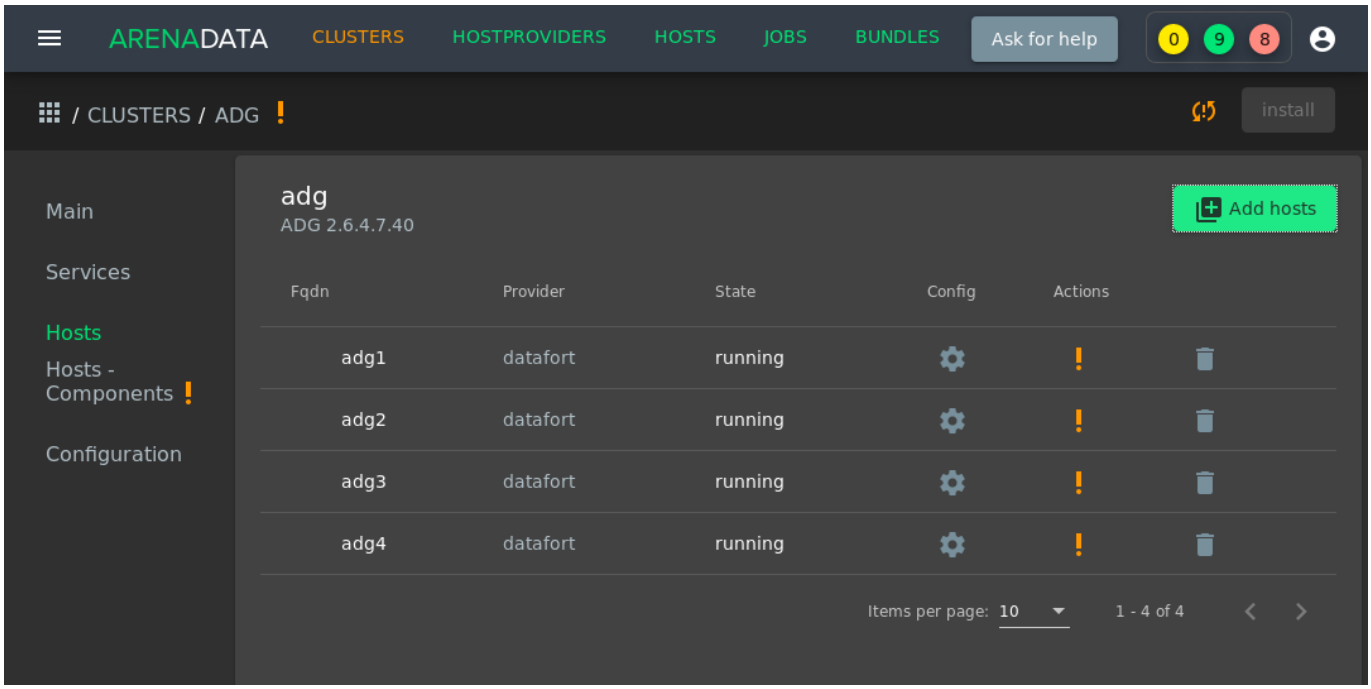


Рис.3.12.: Result of successfully adding hosts

- *monitoring.diamond* – should be mapped to all hosts (*adg1*, *adg2*, ...). It's collect metrics from hosts, and therefore must be installed to all hosts in a cluster;
- *monitoring.jmxtrans* – requests metrics from JVMs and send them to Graphite. One instance for cluster is required.

3.2.6 Install adg services

Now that all is ready to begin installation. In the "Actions" field click on the icon in the *server* service row and select the action *Install*. After successful installation, repeat install action for client service.

3.2.7 Install monitoring clients service

Istallation of monitoring clients service is optional and requires import of Monitoring cluster configuration parameters to *ADG* cluster therefore this cluster must be pre-deployed. Monitoring cluster provides ip-addresses and ports as well as login/password.

1. To import the monitoring configuration to the *adg* cluster, open the "CLUSTERS" tab in ADCM, select the *Import* option and mark the imported service settings using the checkboxes in the opened form (Pic.3.15).
2. Install monitoring clients in *ADG* cluster:

- Return to the cluster tab "Services". Press in the "Actions" field on the icon in the *monitoring* service row and select the action *Install* (Pic.3.16).
- Confirm the action in the dialog box.
- As a result of the installation, the service *monitoring* changes state from *created* to *installed* (Pic.3.17).

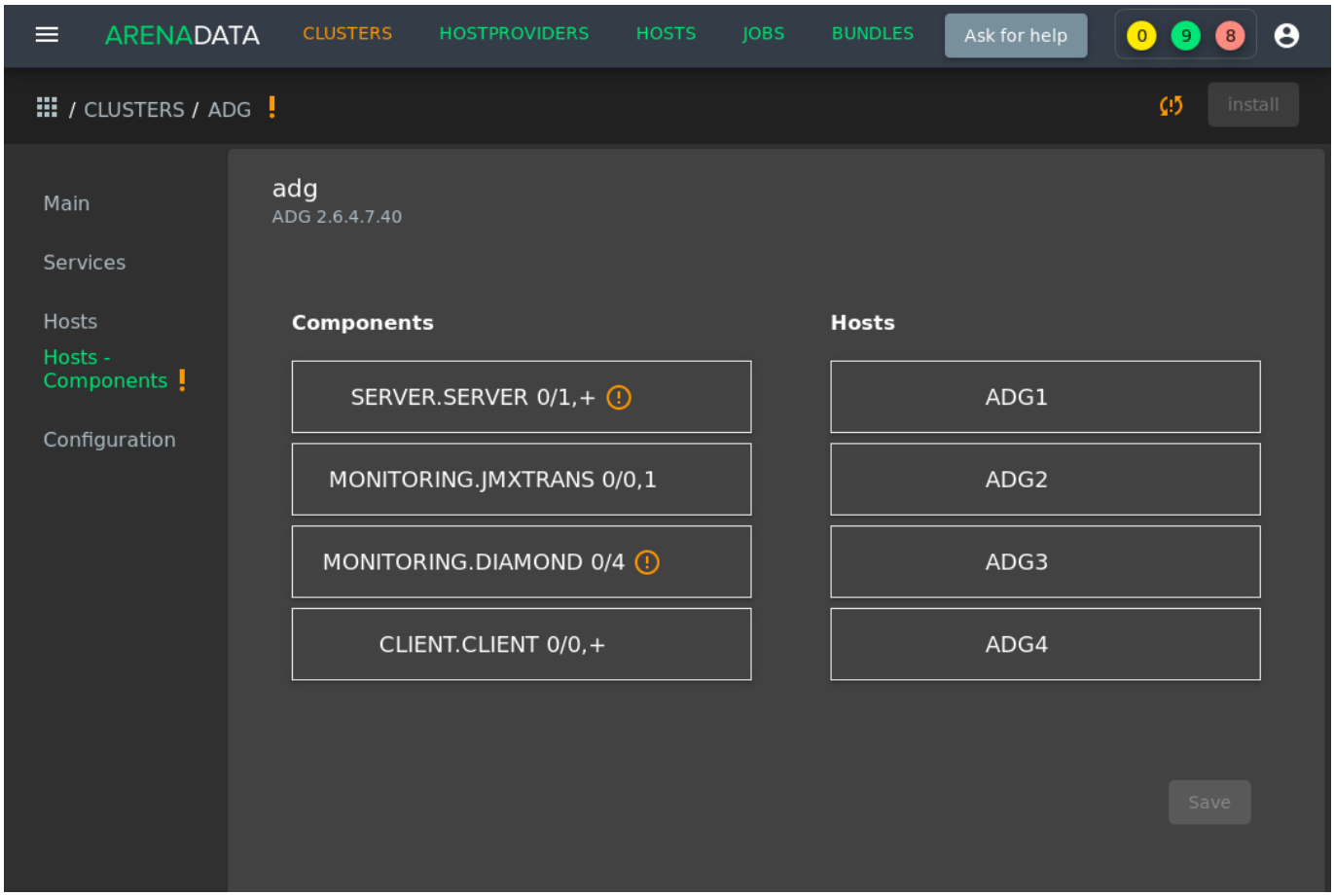


Рис.3.13.: Map service components to hosts

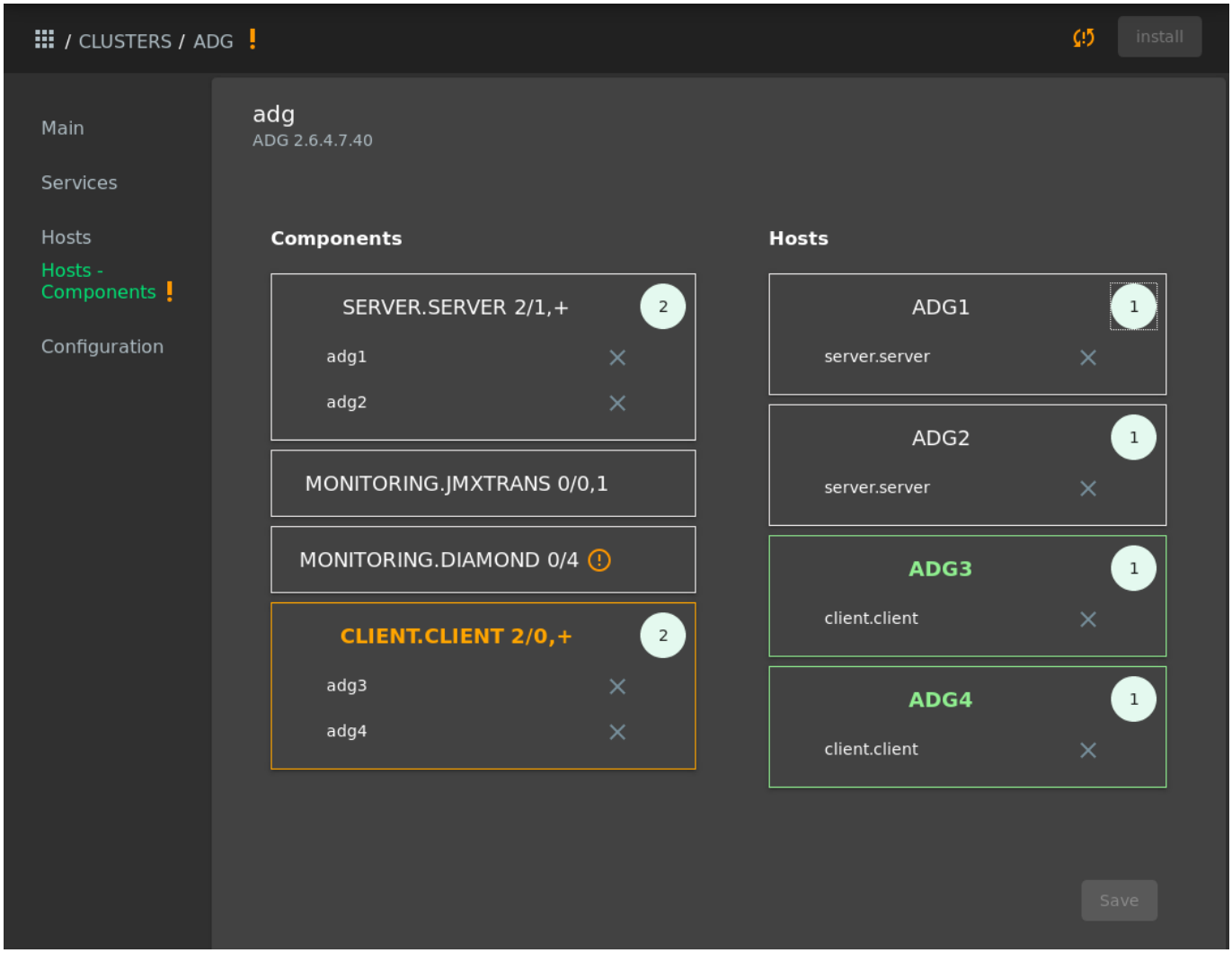


Рис.3.14.: Server and Client components mapping

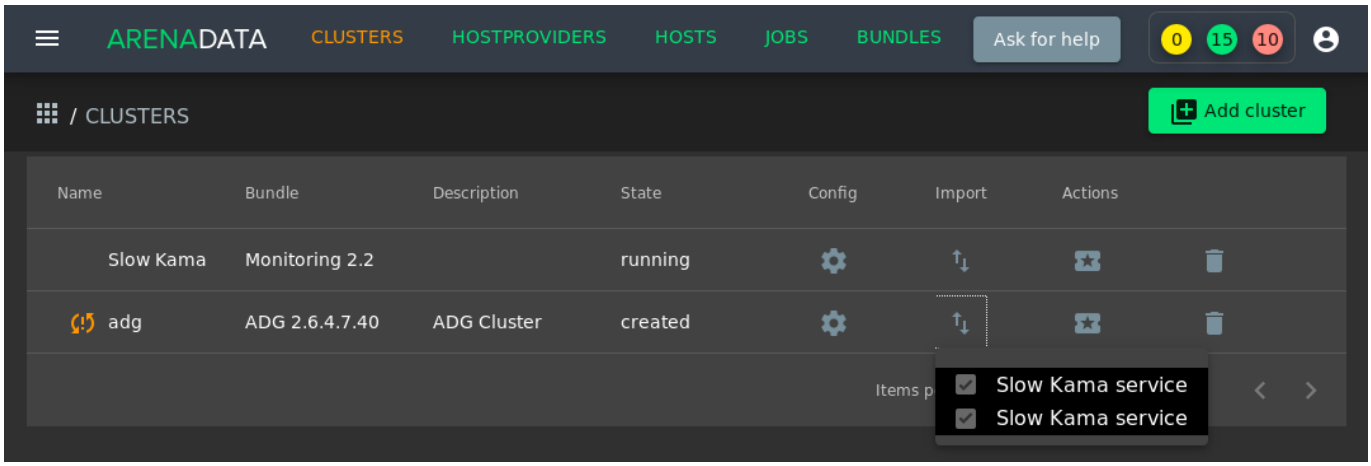


Рис.3.15.: Import cluster configuration Monitoring

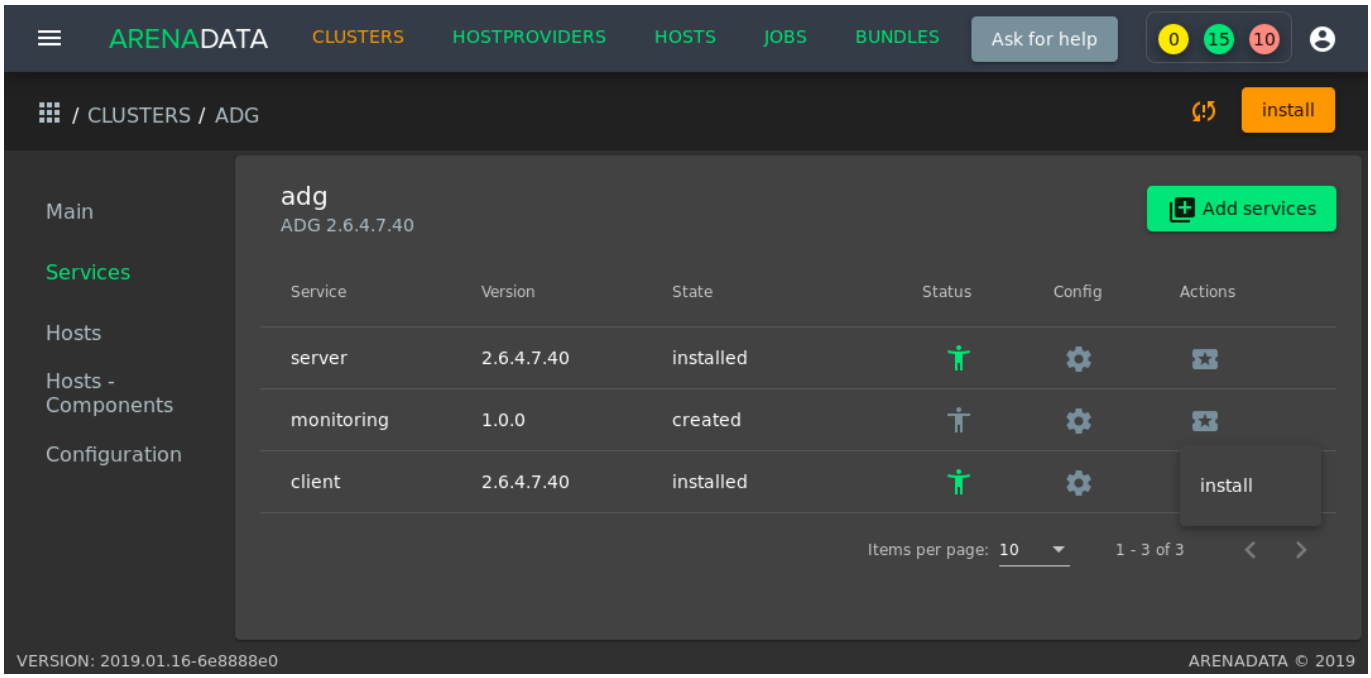


Рис.3.16.: Install monitoring clients

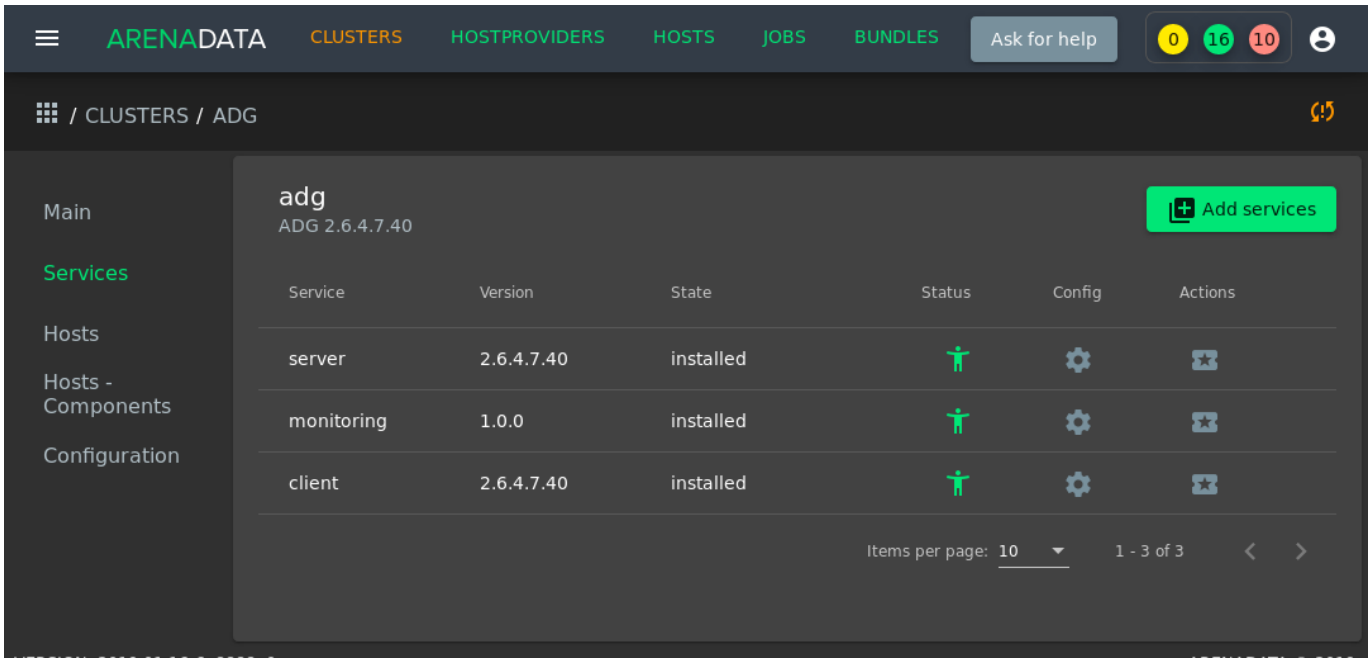


Рис.3.17.: Service state

3.3 Manage tools

3.3.1 Start and stop ADG

ADCM allows you to stop and start **ADG** cluster services:

1. Open the *adg* cluster in ADCM and select "Services" tab. In the "Actions" field for the adg service or client service select *Start* to start or *Stop* to stop the cluster.
2. As a result of this or that action, the status of the cluster doesn't change to *started* or *stopped* because systemd under the hood doesn't actually change service state. Use the "status" field to check actual service status.