

# Using notifications

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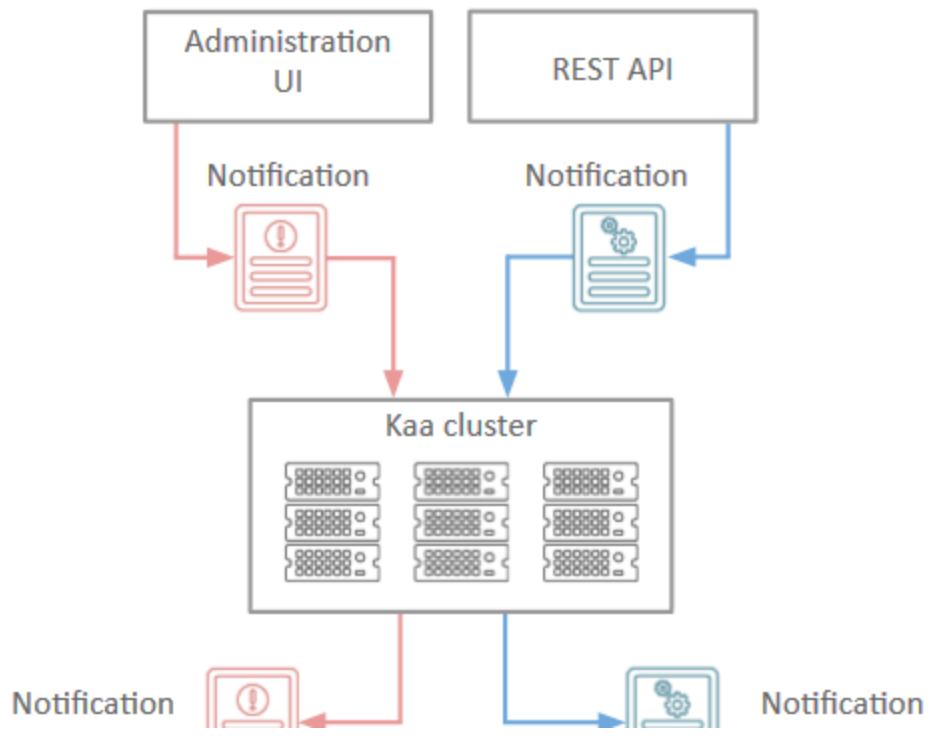
The Kaa notification subsystem enables delivery of messages from the Kaa server to endpoints. The structure of the data that is carried by notifications is defined by the notification schema, which is configured on the Kaa server and built into Kaa endpoints. Please review the [Kaa notifications design reference](#) for more details.

This guide will familiarize you with the basic concepts of Kaa notifications and programming of the Kaa notification subsystem. It is assumed that you have already set up either a [Kaa Sandbox](#) or a [full-blown Kaa cluster](#) and that you have created at least one [tenant](#) and one [application](#) in Kaa. We also recommend that you review [collecting endpoint profiles guide](#) and [using endpoint groups](#) before you proceed with this guide.

## Basic architecture

The following diagram illustrates basic entities and data flows in scope of the notification management:

- Notifications are generated based on the [notification schema](#) created by the developer for the application
- The user or admin sends a notification using either [Admin UI](#) or [REST API](#)





## Configuring Kaa

This section provides guidance on how to configure notifications in Kaa.

### Notification schema

The default notification schema installed for Kaa applications is empty. You can configure your own notification schema using the [Admin UI](#) or [REST API](#). For the purpose of this guide, we will use a simple notification schema shown in the following code block.

```
{
  "type": "record",
  "name": "Notification",
  "namespace": "org.kaaproject.kaa.schema.sample.notification",
  "fields": [
    {
      "name": "message",
      "type": "string"
    }
  ]
}
```

### Notification topics

Notifications in Kaa are organized into topics. Each topic may be associated with one or more endpoint groups. To subscribe to a specific notification, endpoints must belong to one or more endpoint groups that are associated with the corresponding notification topic.

Topics can be mandatory or optional. Mandatory topic notifications are delivered in an enforced manner. Optional topics require subscription. It is responsibility of the client code to add notification listeners and subscribe to optional topics.

You can manage notification topics via [Admin UI](#) or [REST API](#).

Once created, a notification topic does not impact any endpoints. To deliver notifications to some endpoint, at first you need to assign the topic to an endpoint group containing this endpoint via [Admin UI](#) or [REST API](#).

Assuming that you have created custom endpoint groups from the [Using endpoint groups guide](#), it would be logical to create and assign the following topics:

Topic id	Endpoint Group Name				
	All	Android Froyo endpoints	Android endpoints	iOS 8 endpoints	3.0 RC1 QA group endpoints
Android notifications	false	true	true	false	false
iOS 8 notifications	false	false	false	true	false

All devices notifications	true	false	false	false	false
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## Sending notifications

To send a notification, you can issue the [REST API](#) request or use [Admin UI](#).

## Coding

This section provides code samples which illustrate practical usage of notifications in Kaa.

### Get available topics

To get a list of available topics, do the following:

### Subscribe to updates on available topics

To receive updates for the available topics list, add at least one listener as shown in the following code block (the number of listeners is not limited):

When subscription changes simultaneously for several topics, the following approach is recommended for performance reasons:

### Default notification listener

There are two types of topic notification listeners: the default and topic specific. To receive notifications, add at least one default listener (the number of default listeners is not limited) as shown in the following code block. As a result, the listener will receive notifications from all topics (mandatory topics, as well as optional topics having been subscribed to).

### Topic specific notification listener

To receive notifications on some specific topic (either mandatory or optional), you can use topic specific listeners (the number of listeners per topic is not limited) instead of the default listener. To create a topic specific listener, do the following:

### Subscribe to optional topics

To receive notifications on some optional topic, at first subscribe to that topic as shown in the following code block:

You can work with a list of optional topics in a similar way as with a list of available topics.

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