

# Support NodeLabelsProvider at Resource Manager side (YARN-3964)

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## Background

YARN-796 provides a node labels feature which allows admins to specify labels for nodes and applications to specify labels on resource-requests. YARN scheduler will schedule applications to nodes which have the required labels.

Currently YARN node labels feature supports centralized configuration and distributed configuration. Regarding distributed configuration, two JIRAs (YARN-2729 and YARN-2923) are created to allow NM to report its labels to RM in configuration way or script way. Regarding centralized configuration, REST API is provided at RM side to allow admins to specify labels for nodes.

This JIRA aims to provide another option to configure node labels: node labels provider similar to YARN-2729 and YARN-2923 at RM side.

### **Why a node labels provider at RM side is necessary:**

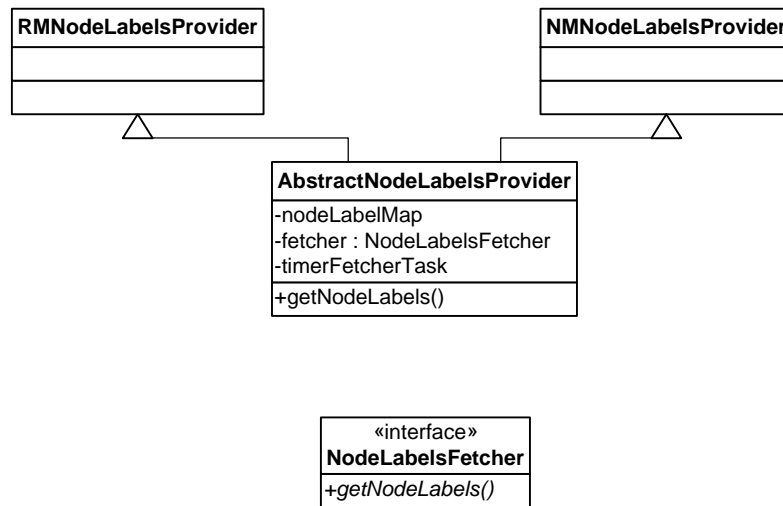
Some node labels are unsuitable to configure at NM side such as platform trust information. The platform trust information indicates whether the underlying platform such as BIOS code, BIOS configuration, OS code, etc has been modified maliciously (Please refer to Intel<sup>®</sup> Trusted Execution Technology for detailed information). RM cannot rely on NM telling if it is trustful as the node on which NM runs may be already compromised and so RM has to fetch this kind of information itself.

### **Why we need another option except REST API at RM side:**

- 1) REST API requires admin privilege. For platform trust label, we have to start up a job to update node trust labels and this job needs to be run in the YARN admin user.
- 2) Supporting a node labels provider at RM side will be more flexible. User can provide their own node labels provider plug-in which can fetch labels from a database, from a remote server, etc.

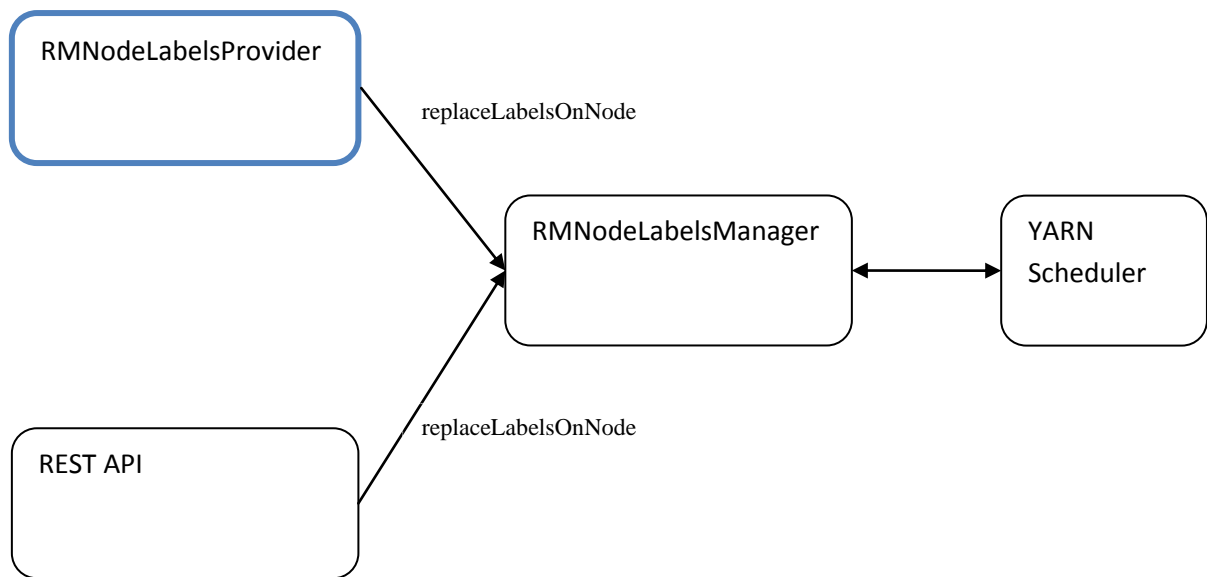
## Basic Design

### Structure about NodeLabelsProvider:



- 1) **AbstractNodeLabelsProvider** has a timer task which is responsible for updating the node labels map periodically by utilizing **NodeLabelsFetcher**
- 2) **NodeLabelsFetcher** provides the function to fetch labels for a node. Different implements provide the function to fetch labels from different sources. This is used in a pluggable way.

### How **RMNodeLabelsProvider** interacts with other RM components:



RMNodeLabelsProvider will call method replaceLabelsOnNode of class RMNodeLabelsManager to update the node labels. All the scheduler logic won't be touched for this JIRA.