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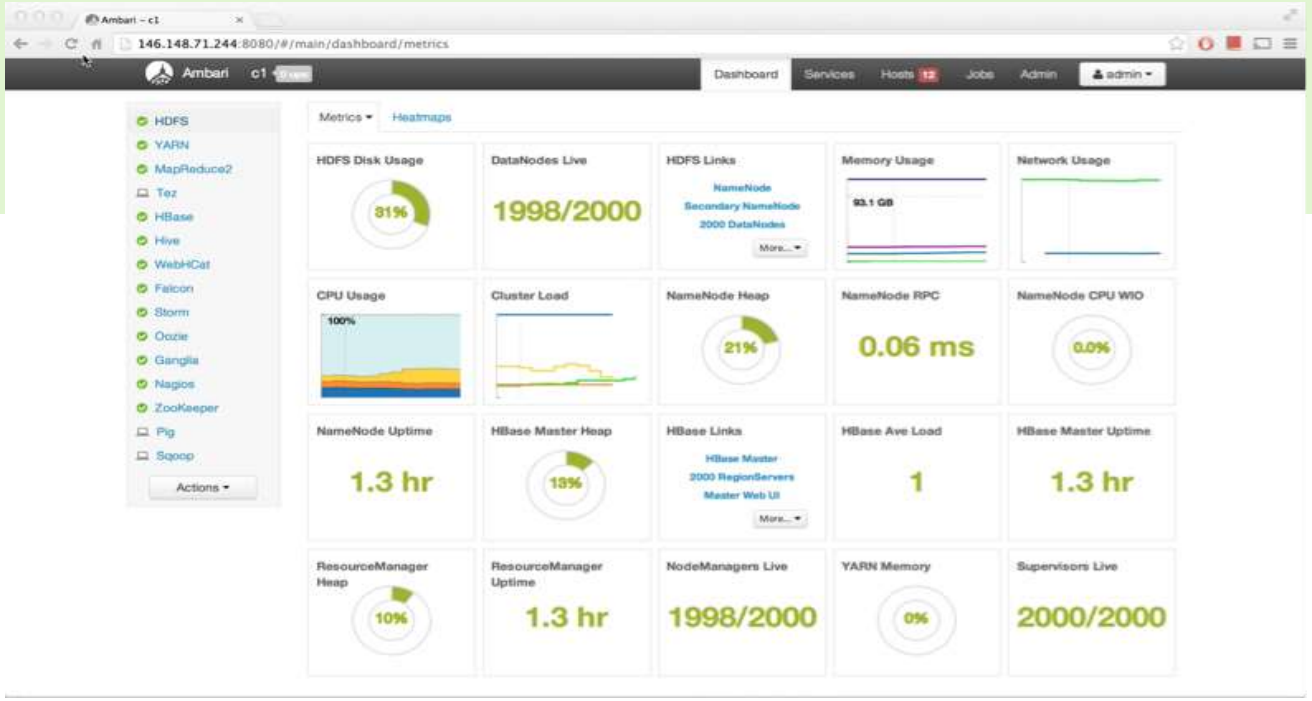
Apache Ambari 2.1

What's New

July 2015

What is Ambari?

Apache Ambari is the open source operational platform to provision, manage and monitor Hadoop clusters



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What's New in Ambari 2.1

Core Platform

Guided Configs (AMBARI-9794)

Customizable Dashboards (AMBARI-9792)

Manual Kerberos Setup (AMBARI-9783)

Rack Awareness (AMBARI-6646)

HDP Stack Support

Storm Nimbus HA (AMBARI-10457)

Ranger HA (AMBARI-10281, AMBARI-10863)

Ambari Platform

New OS: RHEL/CentOS 7 (AMBARI-9791)

New JDKs: Oracle 1.8 (AMBARI-9784)

Blueprints API

Host Discovery (AMBARI-10750)

Views Framework

Auto-Cluster Configuration (AMBARI-10306)

Auto-Create Instance (AMBARI-10424)

For a complete list of changes:
https://issues.apache.org/jira/browse/AMBARI/fixforversion/12328677

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Kerberos Improvements

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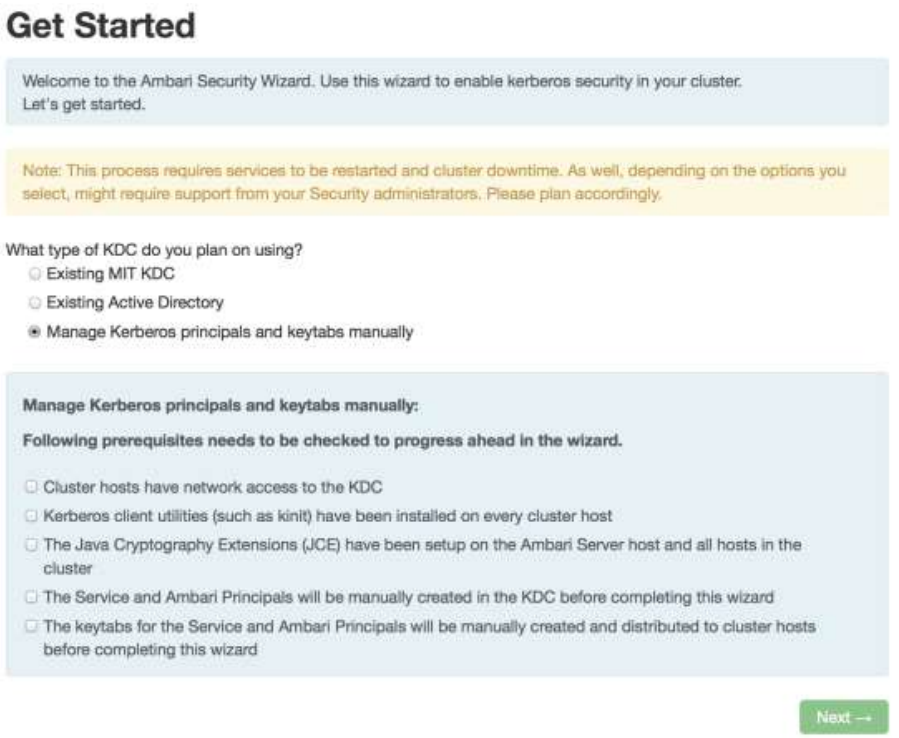
Ambari 2.1 Kerberos Improvements

New Manual Kerberos (AMBARI-9783)

- **Enable and manage Kerberos manually**



Automated Kerberos

- **Option to "not" install Kerberos clients**
- **Customizable Password rules**

General Improvements

- **Specify Kerberos client utilities path**

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Automated vs. Manual Kerberos

	Automated	Manual
KDC Infrastructure	MIT, Active Directory	MIT, Active Directory, FreeIPA
Requires KDC administrative credentials	Yes	No
Installation of Kerberos clients	Yes, optional	No
Management of Kerberos client krb5.conf	Yes, optional	No
Creation of principals	Yes	No
Creation of keytabs	Yes	No
Distribution of keytabs	Yes	No
Cluster configuration	Yes	Yes

So…why Manual Kerberos?

- **FreeIPA**
- **Corporate security policy does not allow admin access to KDC infra**

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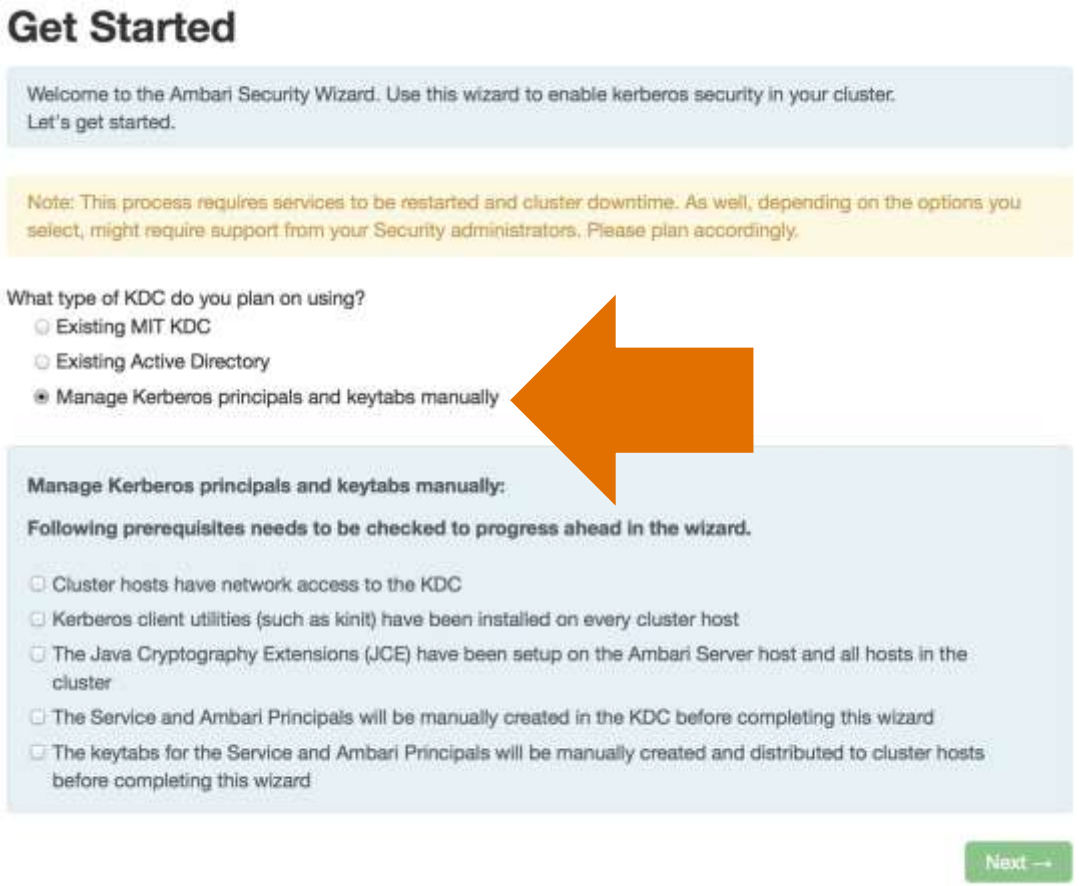
New Manual Kerberos Option



Manage Kerberos manually

No automatic creation of principals or keytabs

No automatic distribution of keytabs

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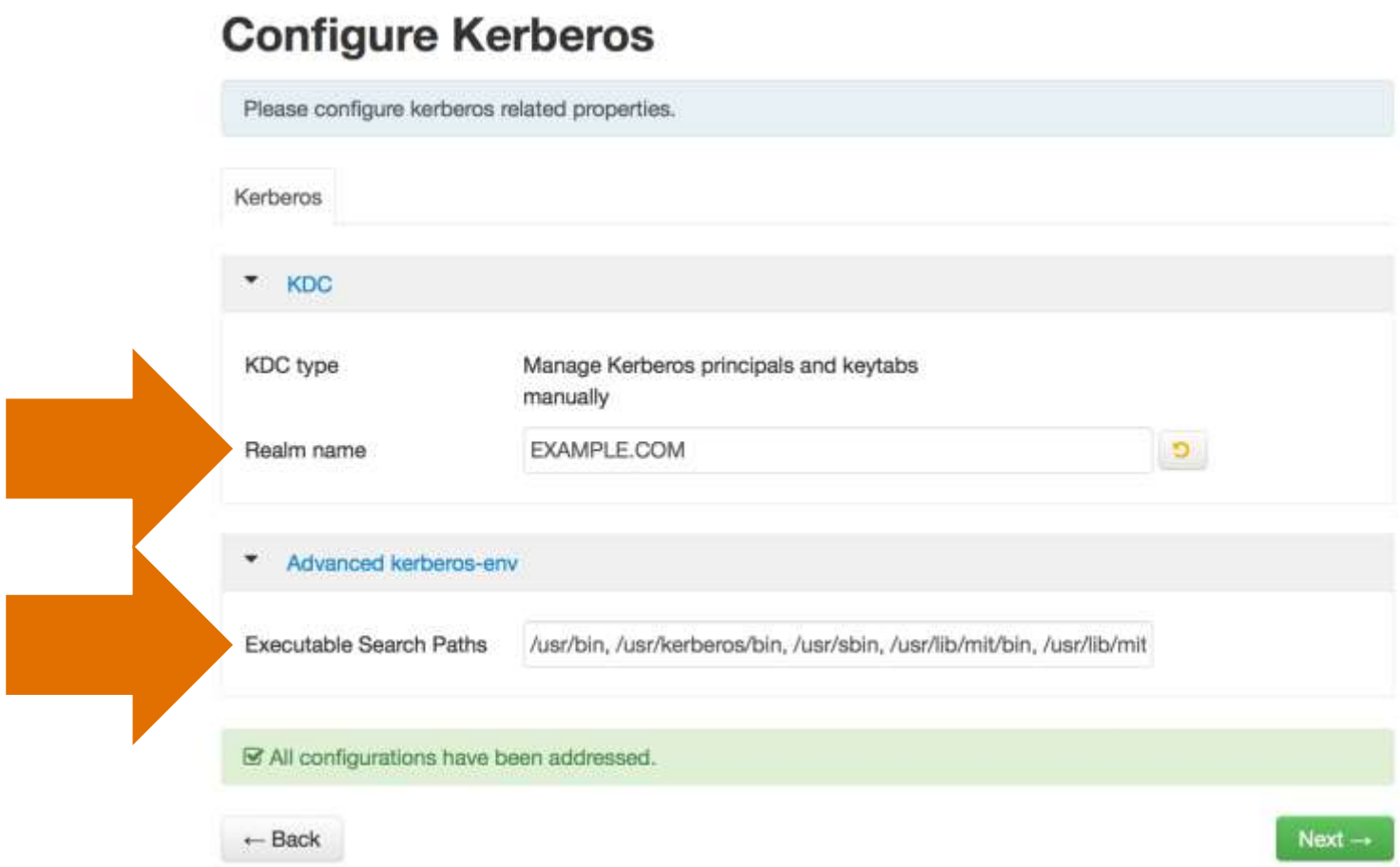
Manual Kerberos: Specify Realm, Client Utilities Path



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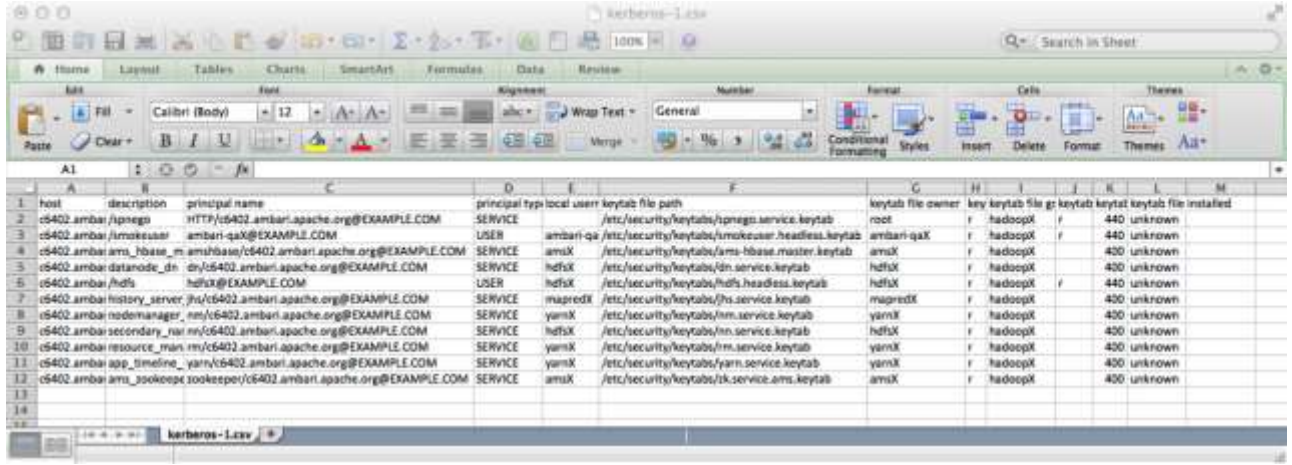
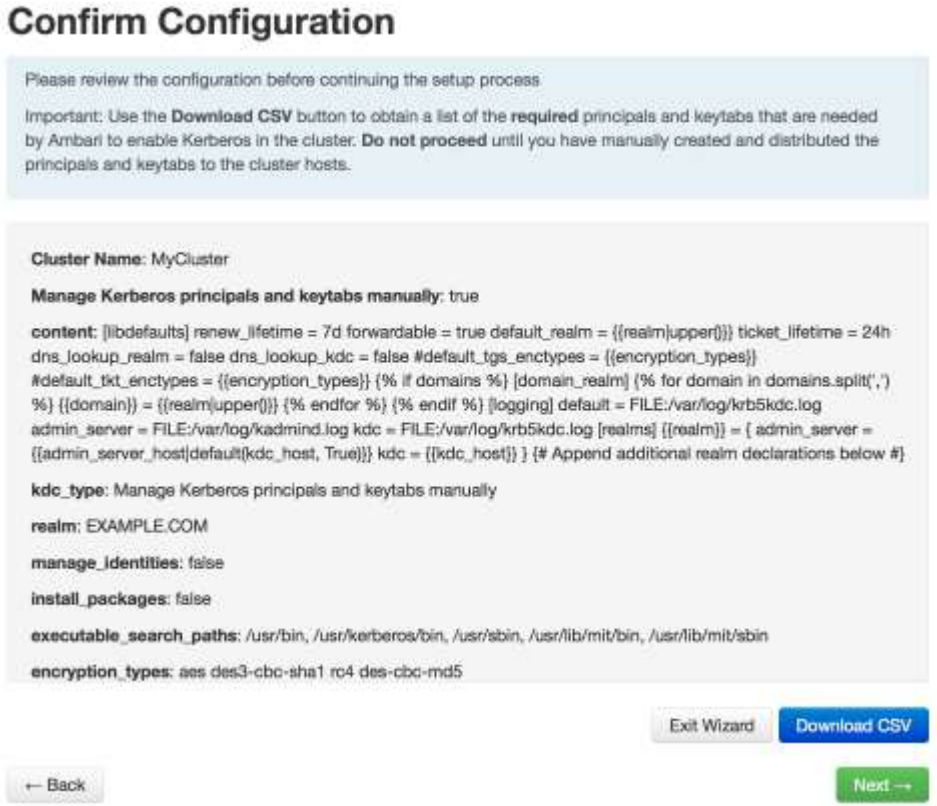
Manual Kerberos: Principal and Keytab CSV

Configure Identities

Download CSV





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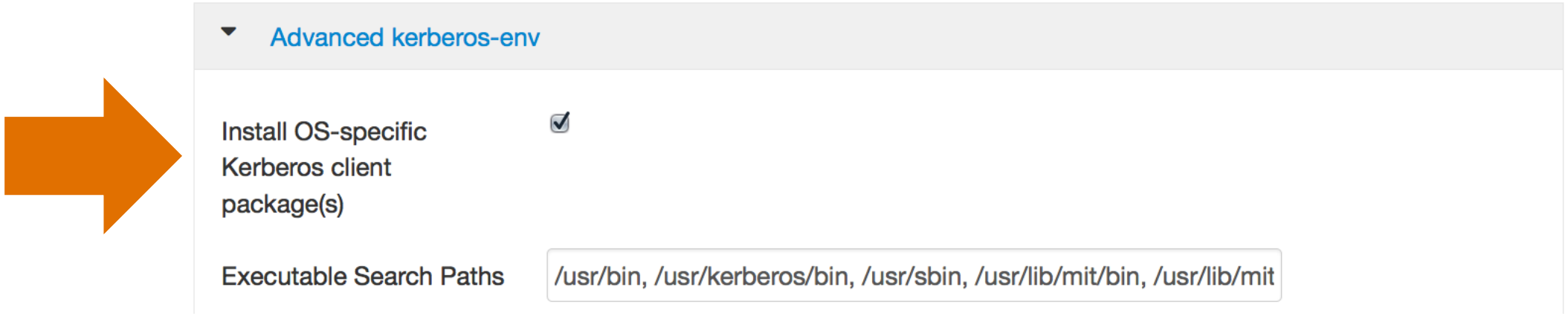
Automated Kerberos: Optional Client Install

Option to not install client packages

Specify client utilities path



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Automated Kerberos: Optional Password Rules

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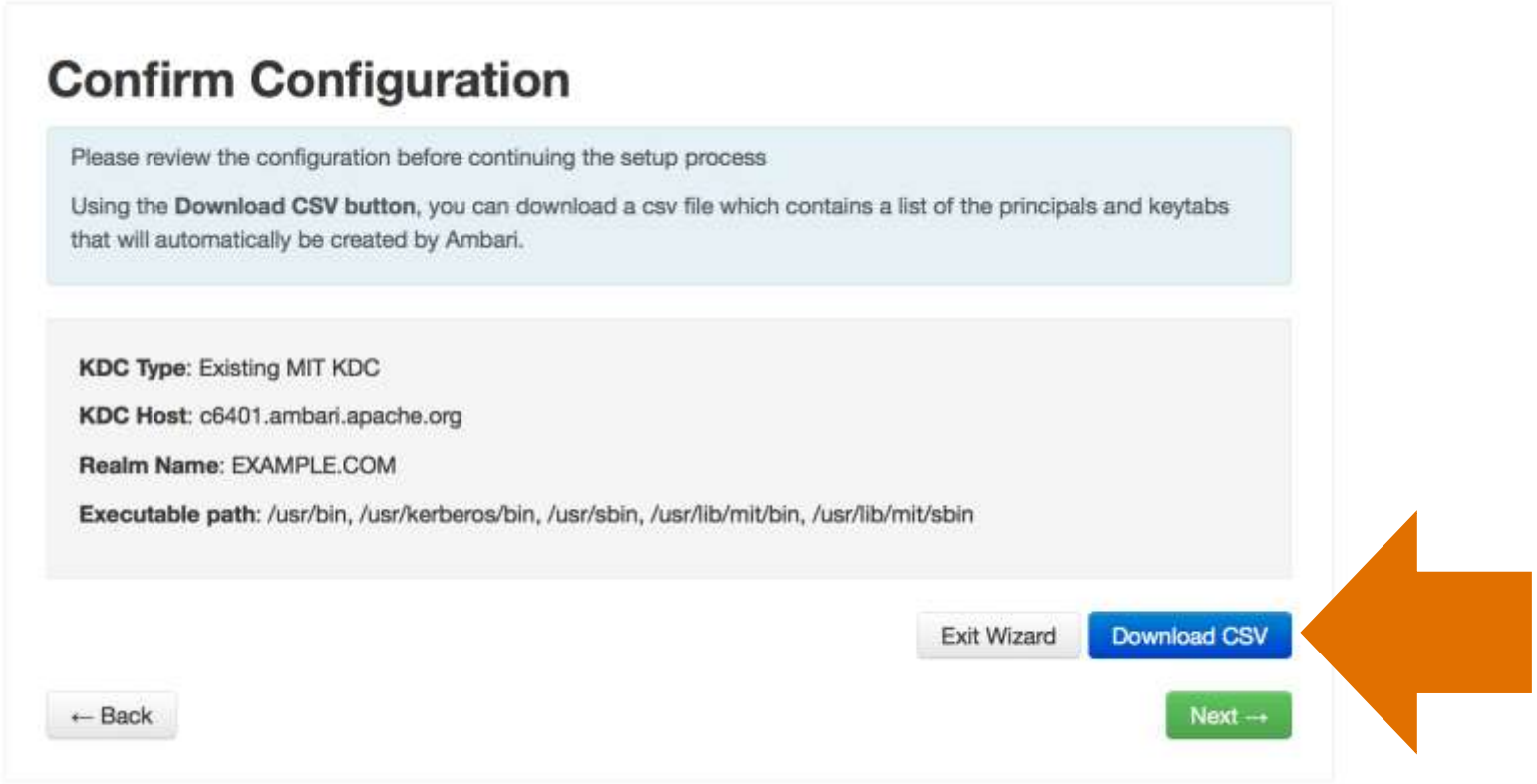
Automated: Download CSV

Even if using Automated option, CSV is available for download

Useful for record of Ambari KDC changes (principals created, etc)



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Blueprint Improvements

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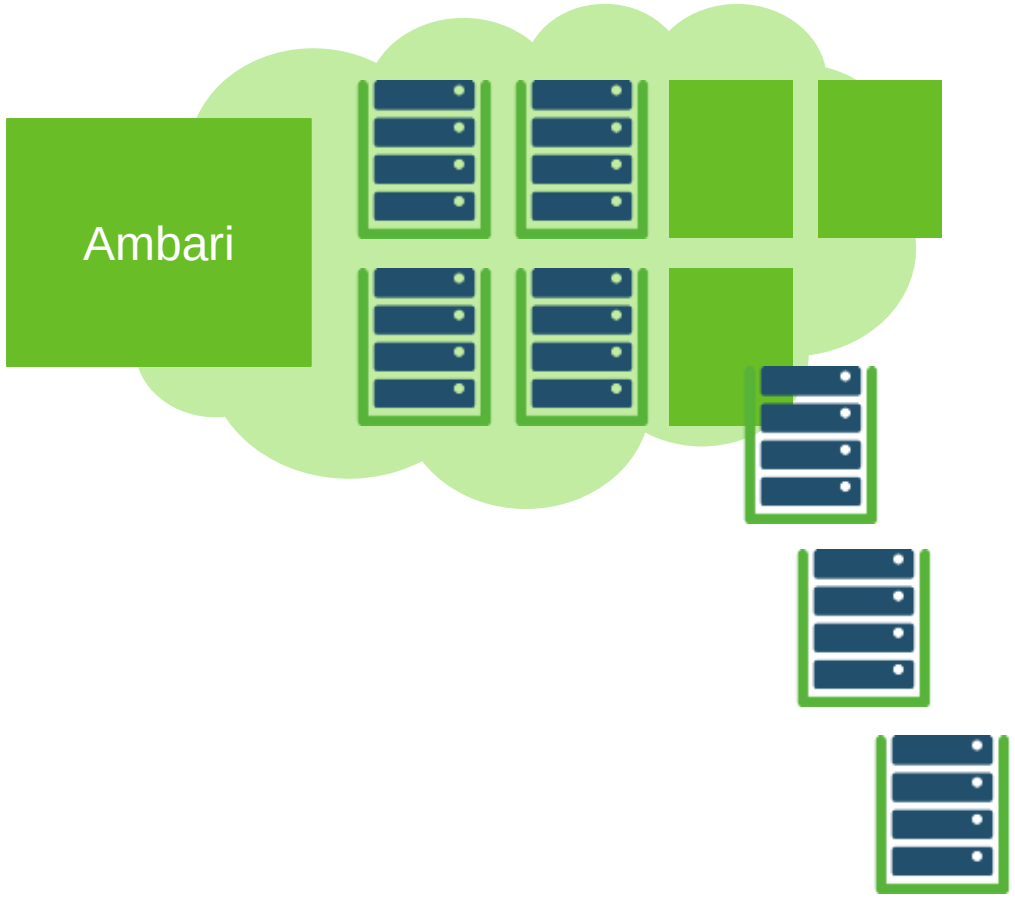
Blueprints Host Discovery (AMBARI-10750)



- **Provision cluster with all, some or no hosts. When Hosts come online and Agents register with Ambari, Blueprints will automatically put the hosts into the cluster**

```
POST /api/v1/clusters/MyCluster/hosts

[
  {
    "blueprint" : "single-node-hdfs-test2",
    "host_groups" :[
      {
      "host_group" : "slave",
      "host_count" : 3,
      "host_predicate" : "Hosts/cpu_count>1”
      }
    ]
  }
]
```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Guided Configs

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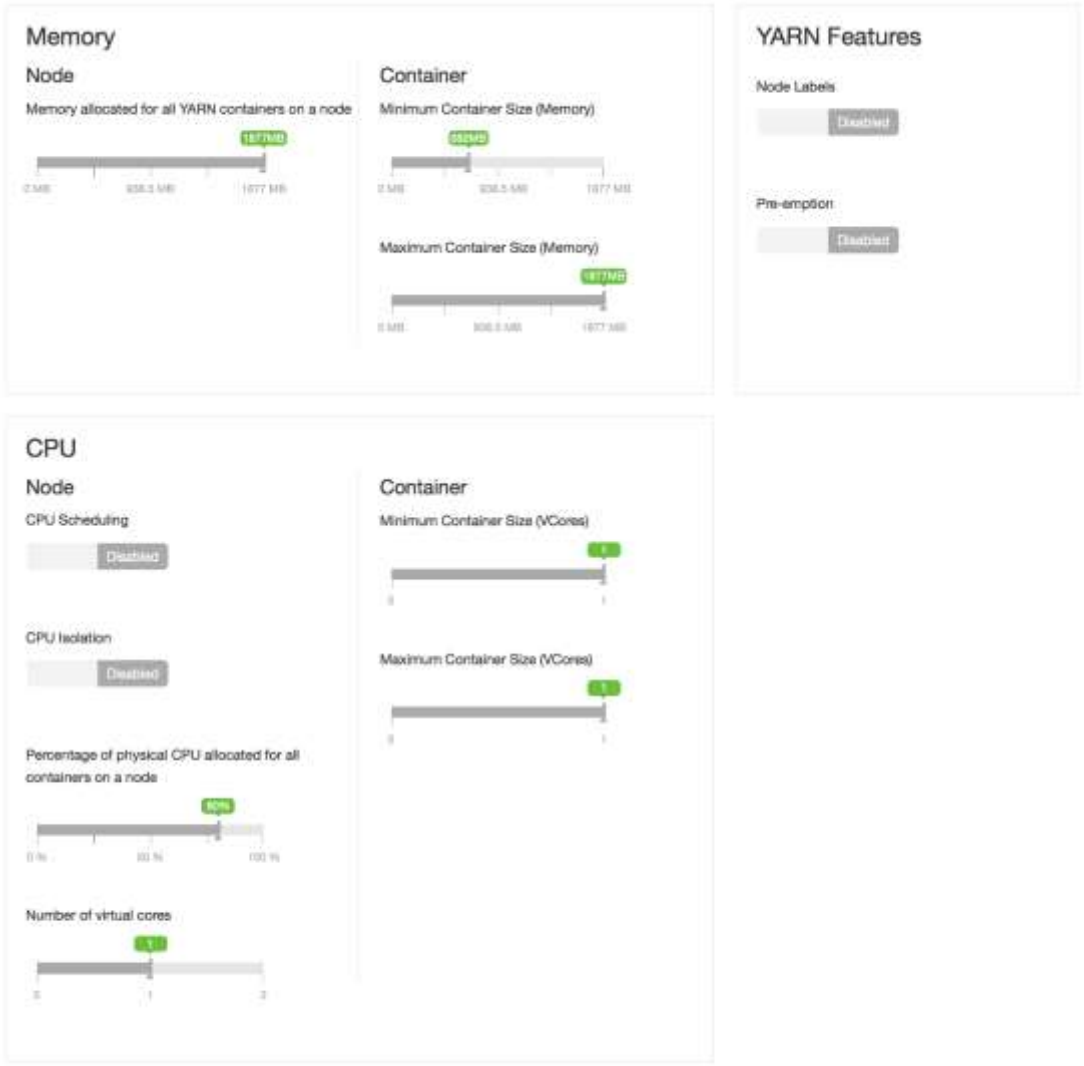
Guided Configurations



- **Improved layout and grouping of configurations**
- **New UI controls to make it easier to set values**
- **Better recommendations and cross-service dependency checks**
- **Implemented for HDFS, YARN, HBase and Hive**
- **Driven by Stack definition**

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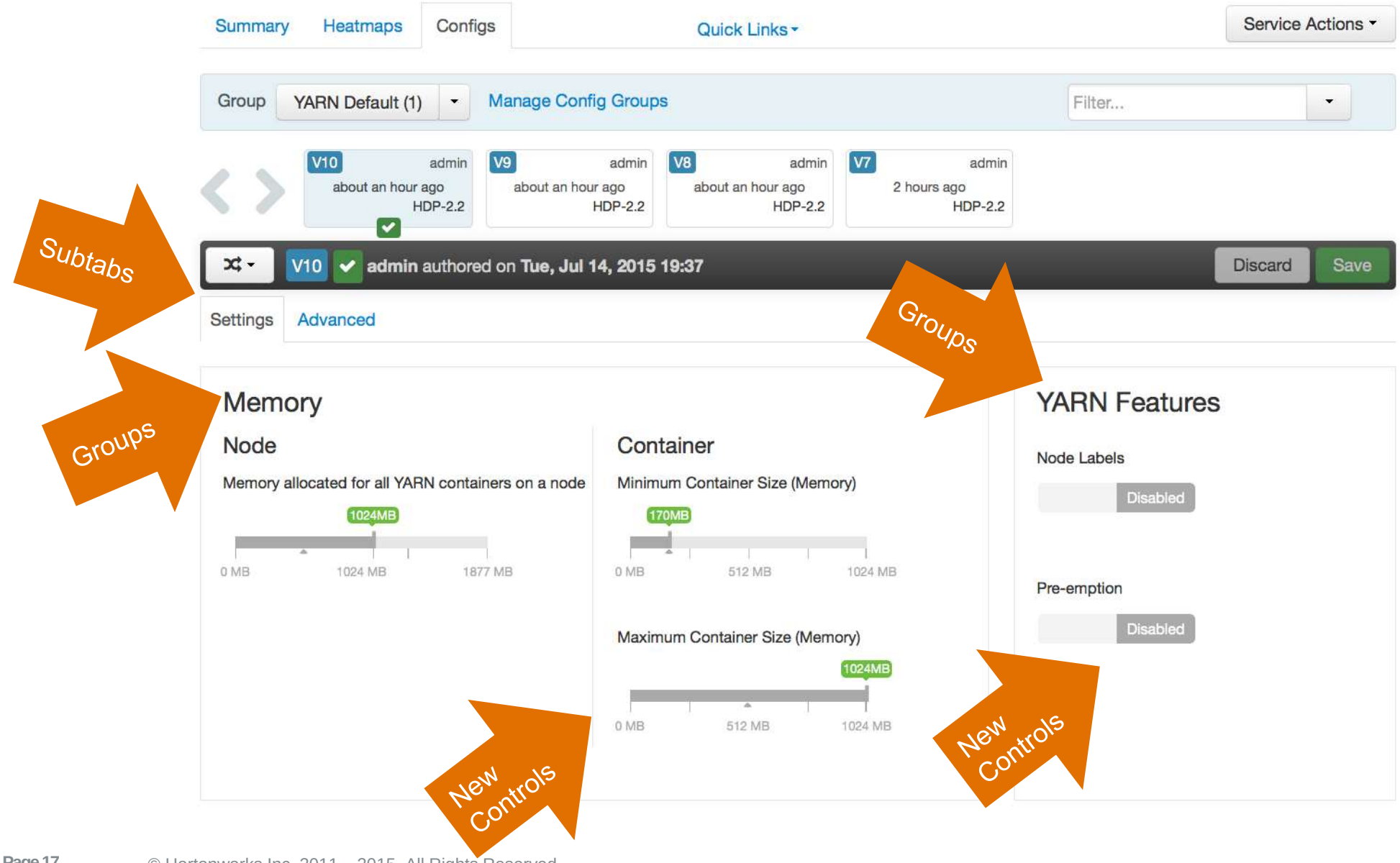
New Layout and Grouping



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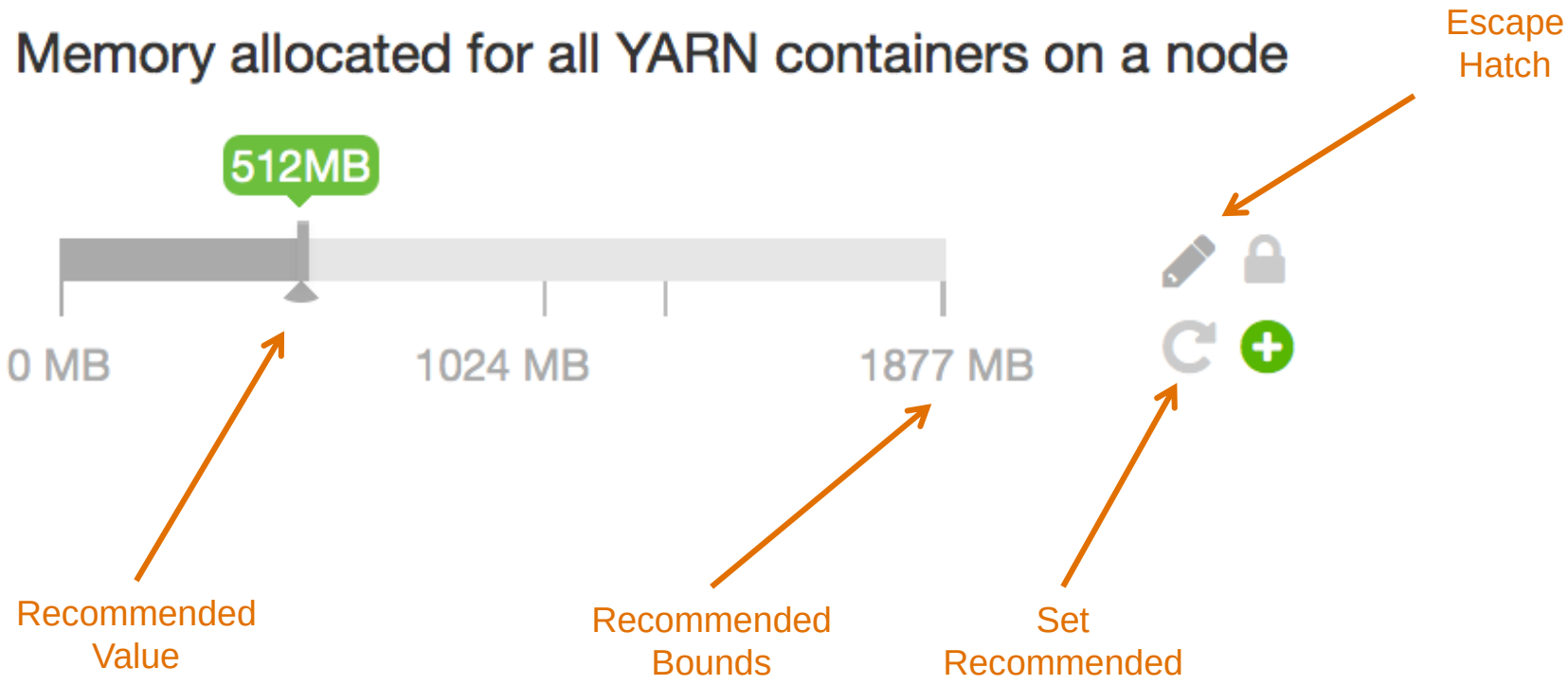
New UI Controls



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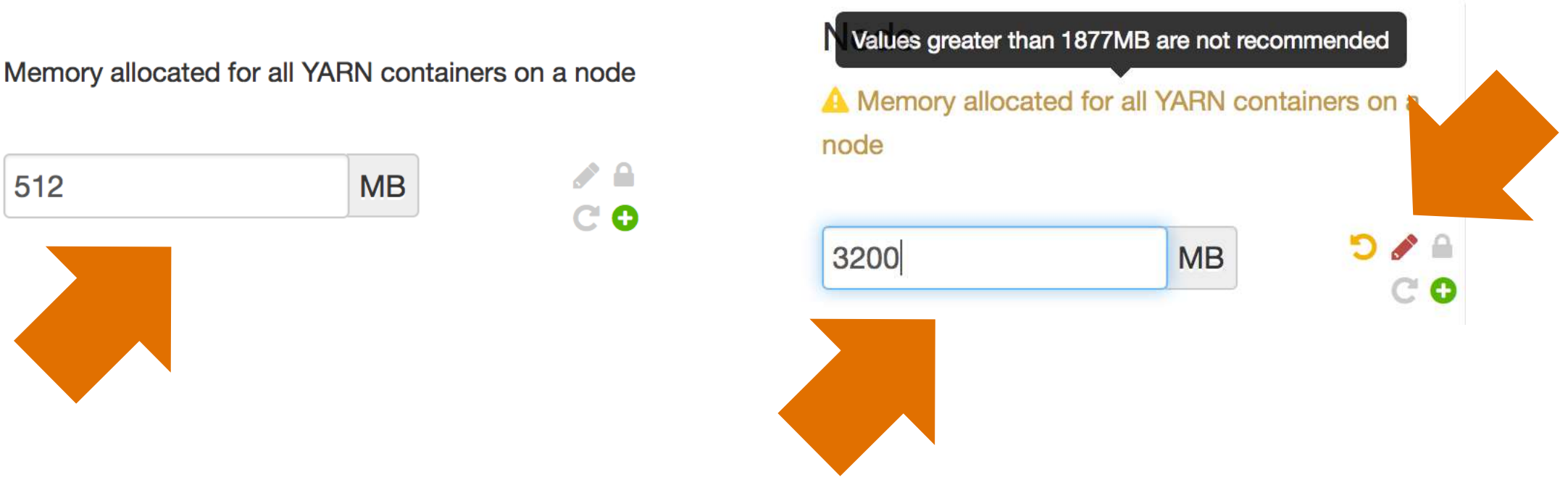
Control “Escape Hatch”



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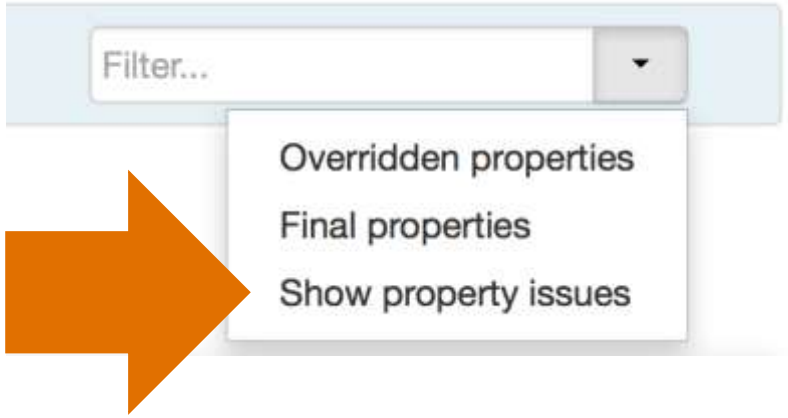
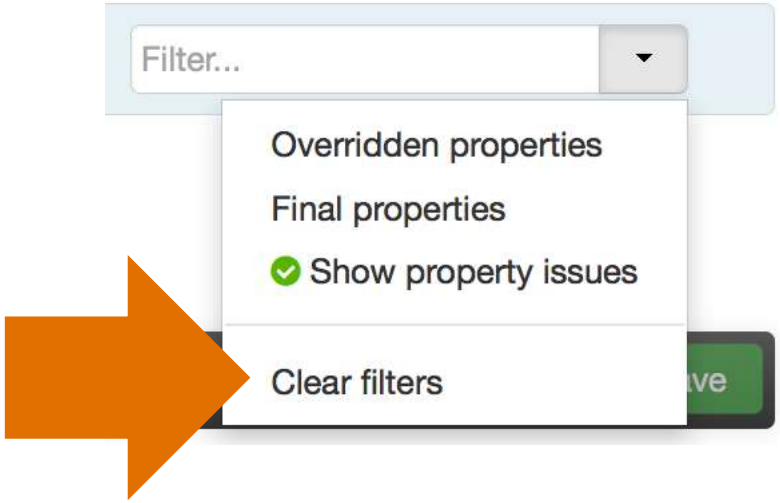
New Filtering





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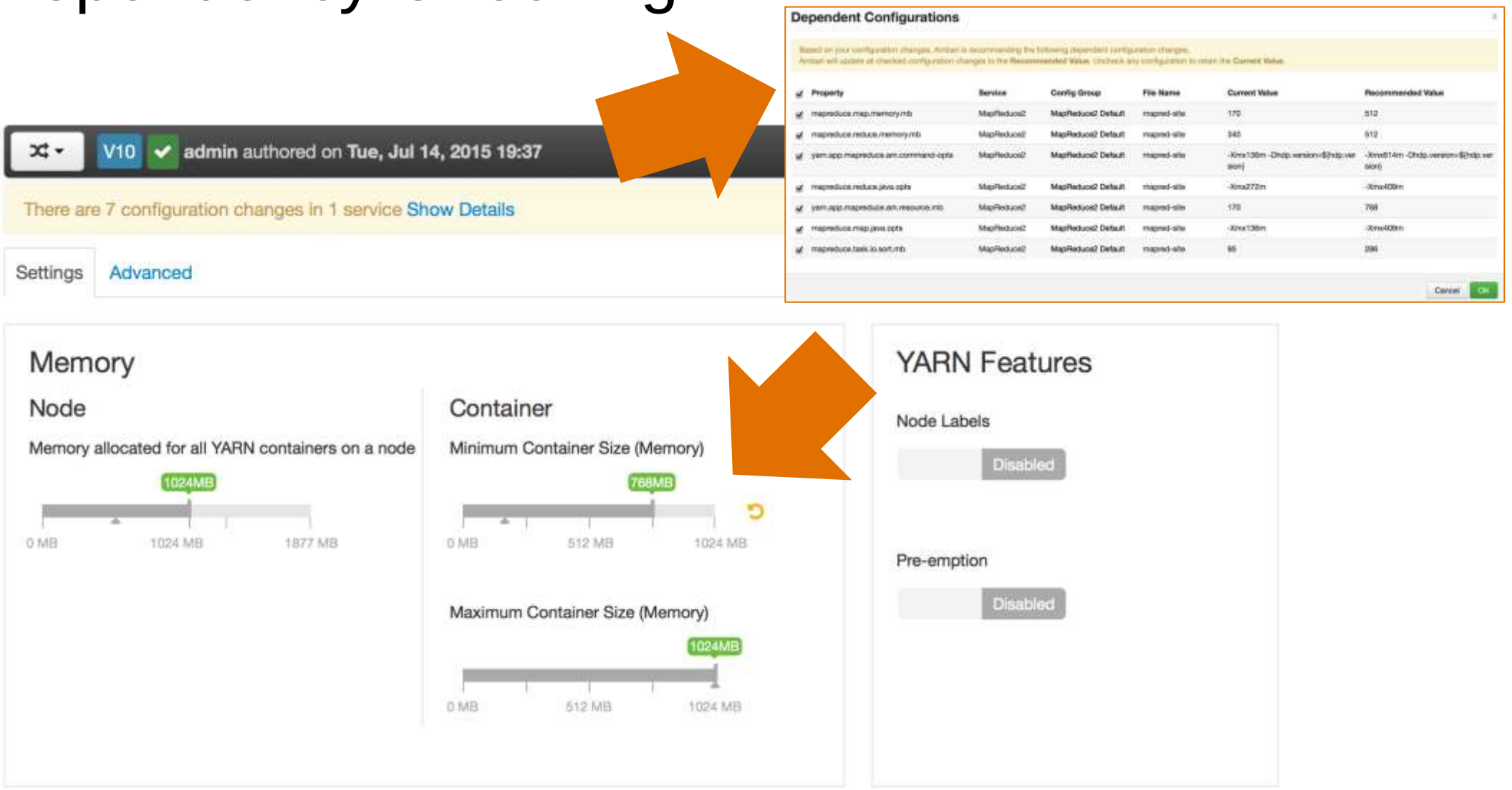
More Dependency Checking



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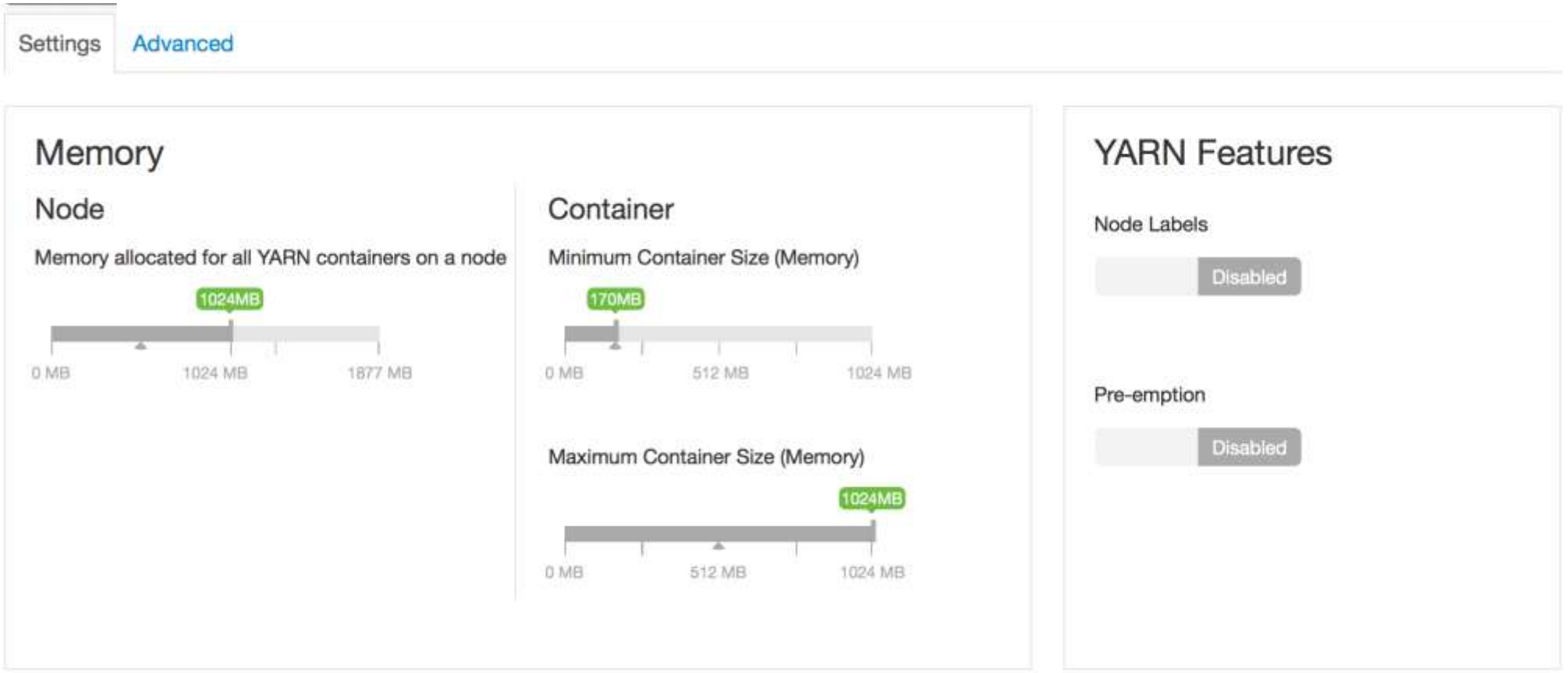
Driven By Stack Definition: Themes

/ resources / stacks / HDP / 2.2 / services / YARN / themes / **theme.json**



Note: Since this is a new Stack capability. Framework and API likely to evolve over upcoming releases.

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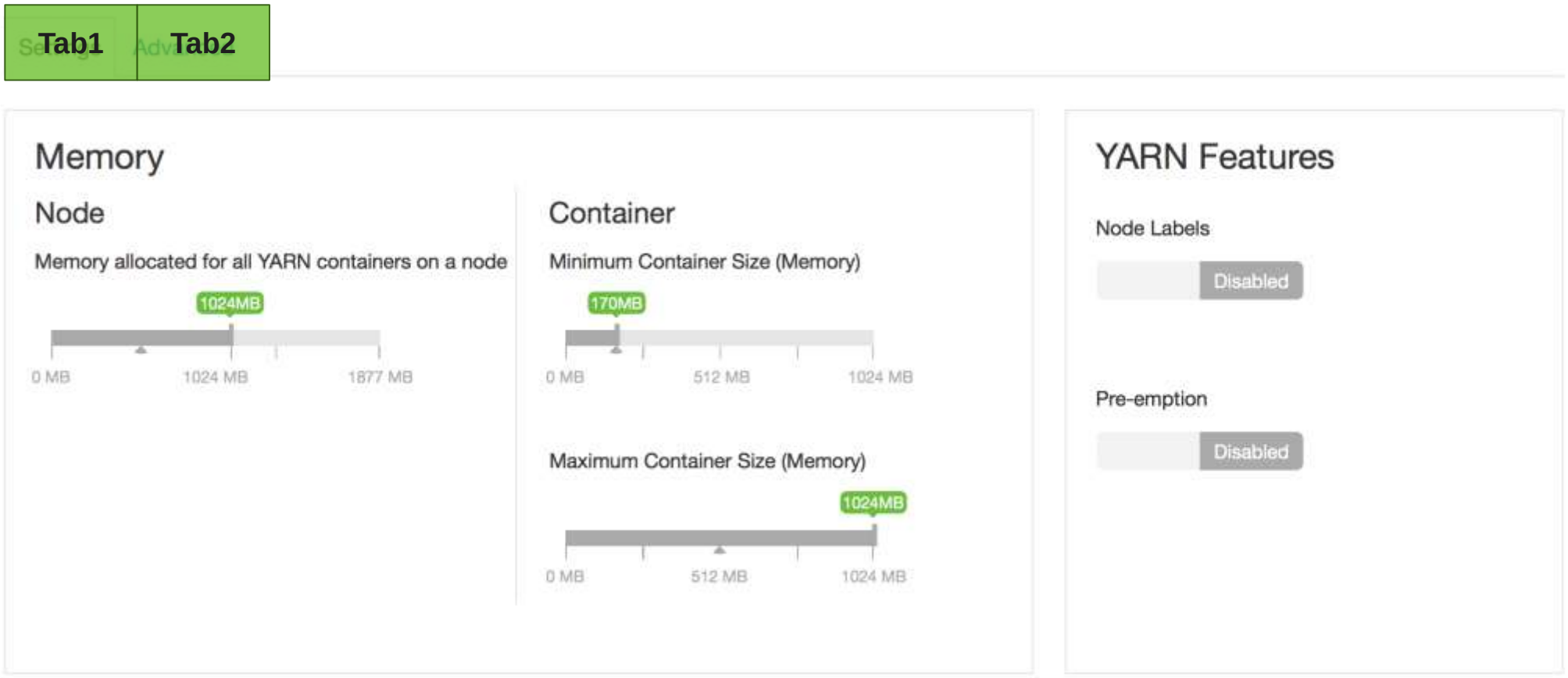
Tabs



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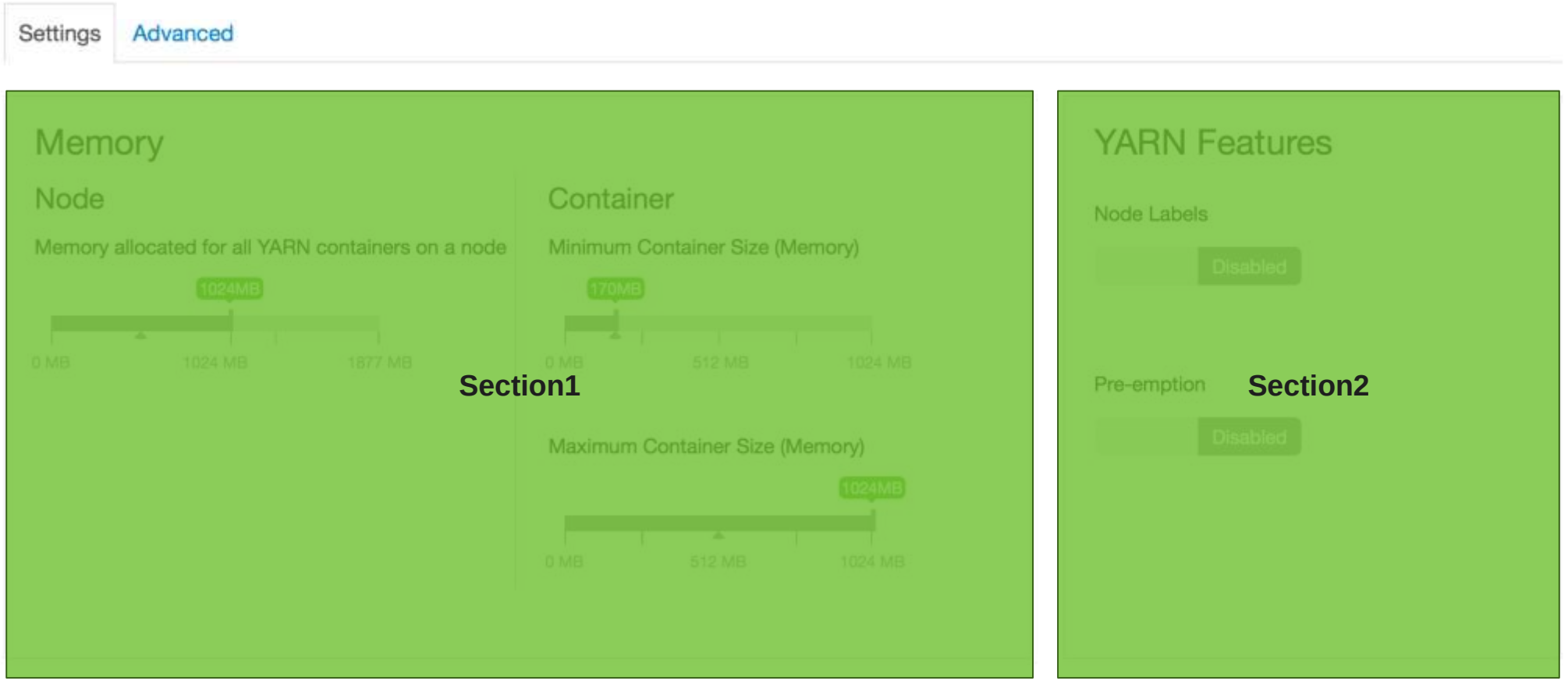
Sections



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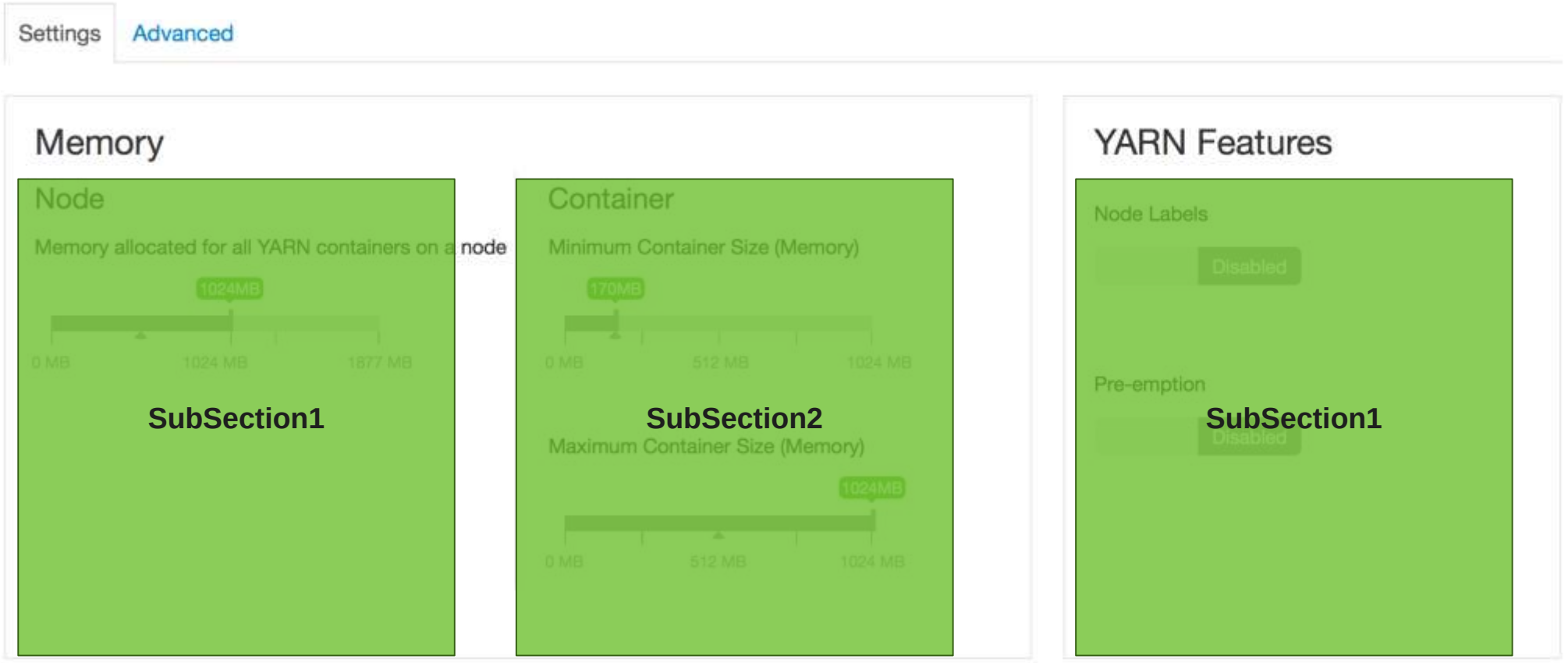
SubSections



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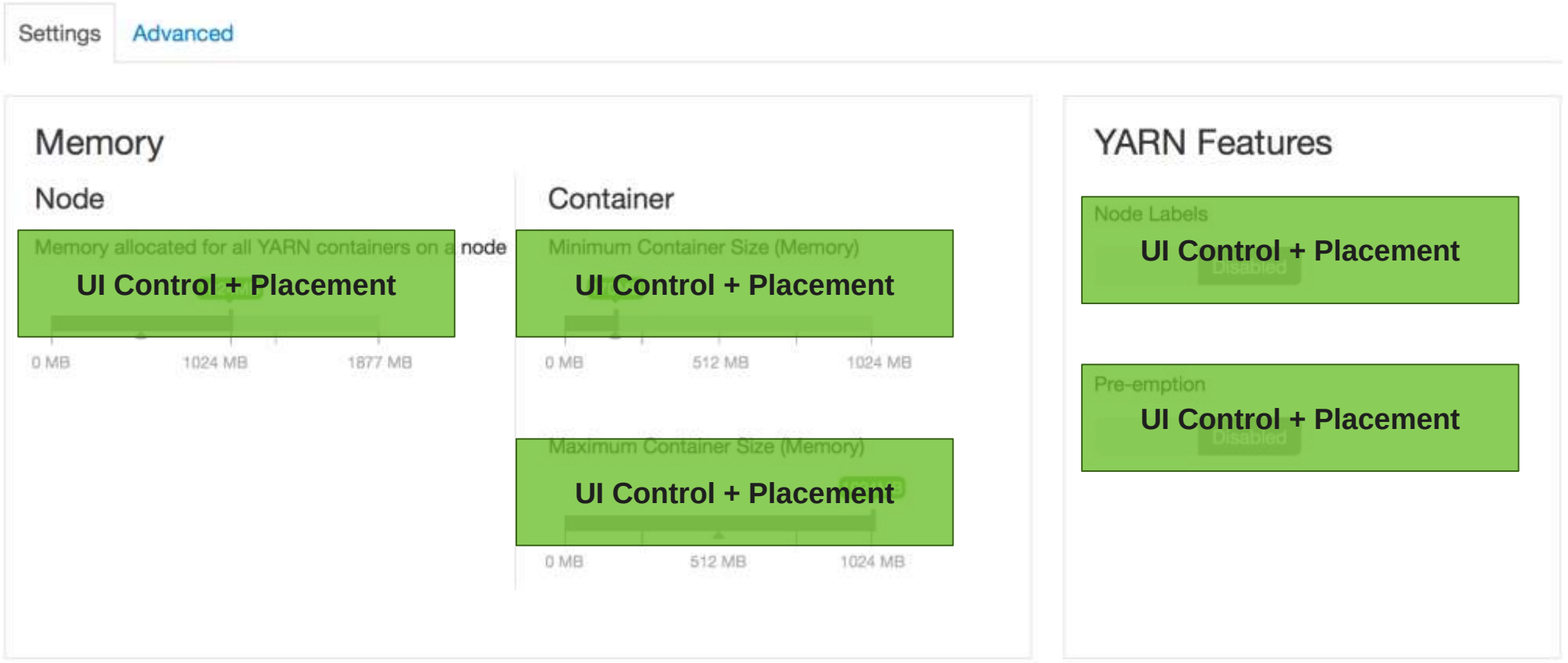
UI Controls and Placement



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Customizable Dashboards

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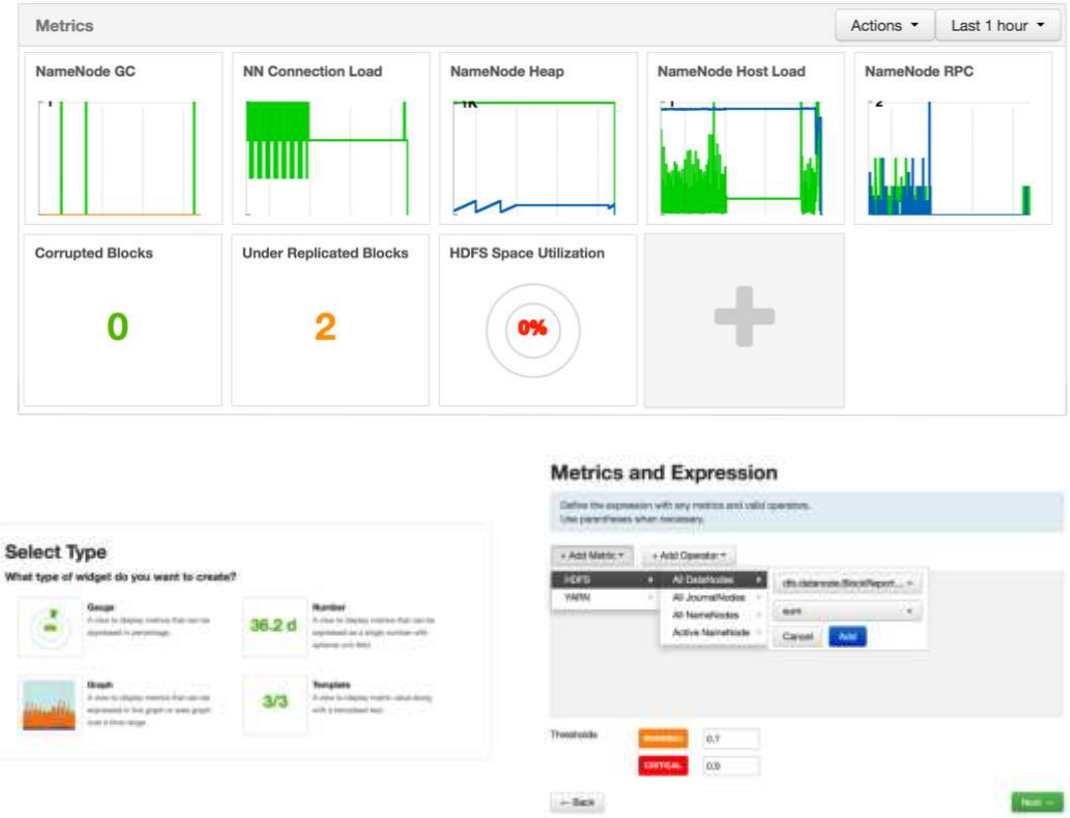
Customizable Operations Dashboards



- **Ability to customize the metrics displayed on the Service Dashboards**
- **Add and remove widgets**
- **Create and Share new widgets**
- **Implemented for HDFS, YARN, HBase and Hive**
- **Driven by Stack definition**

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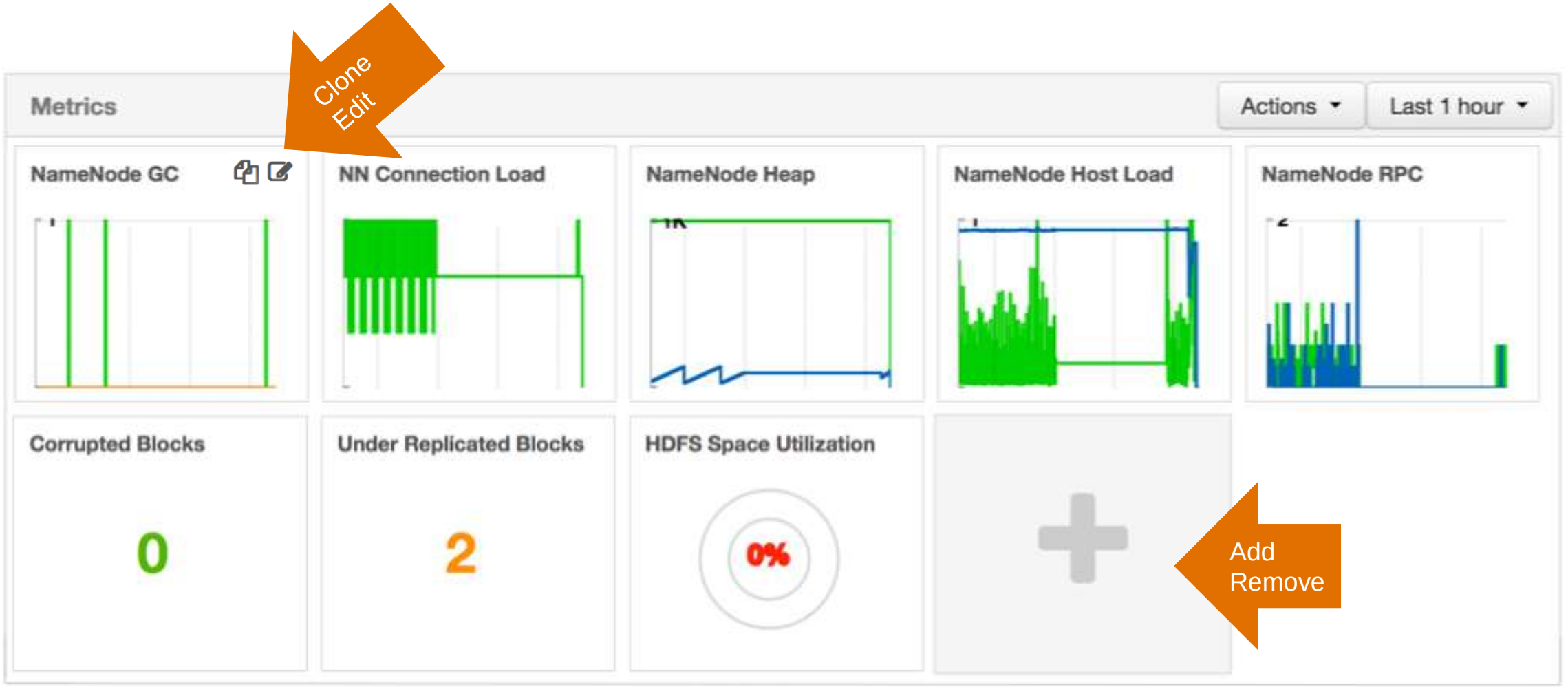
Customizable Dashboards (AMBARI-9792)



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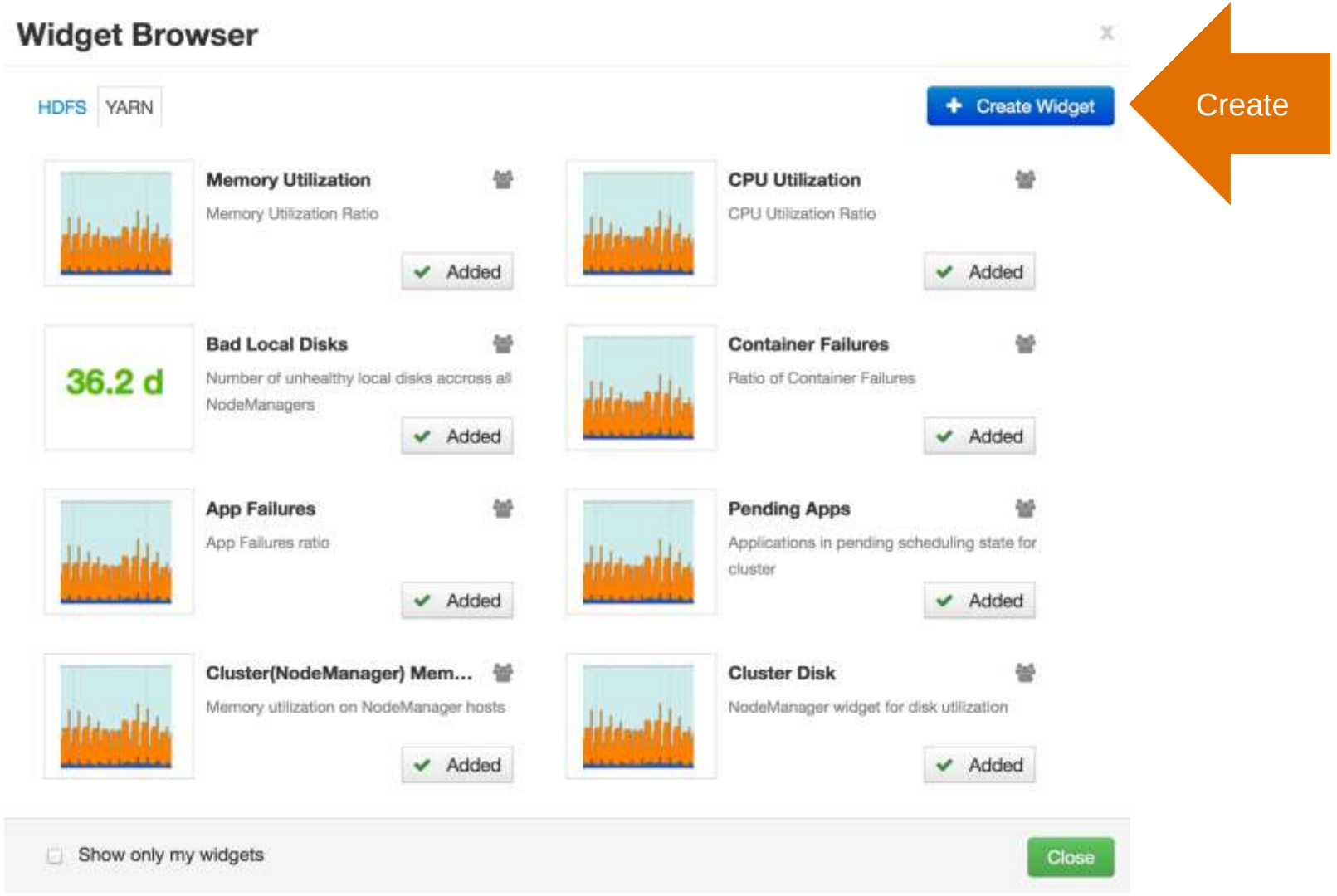
Widget Library



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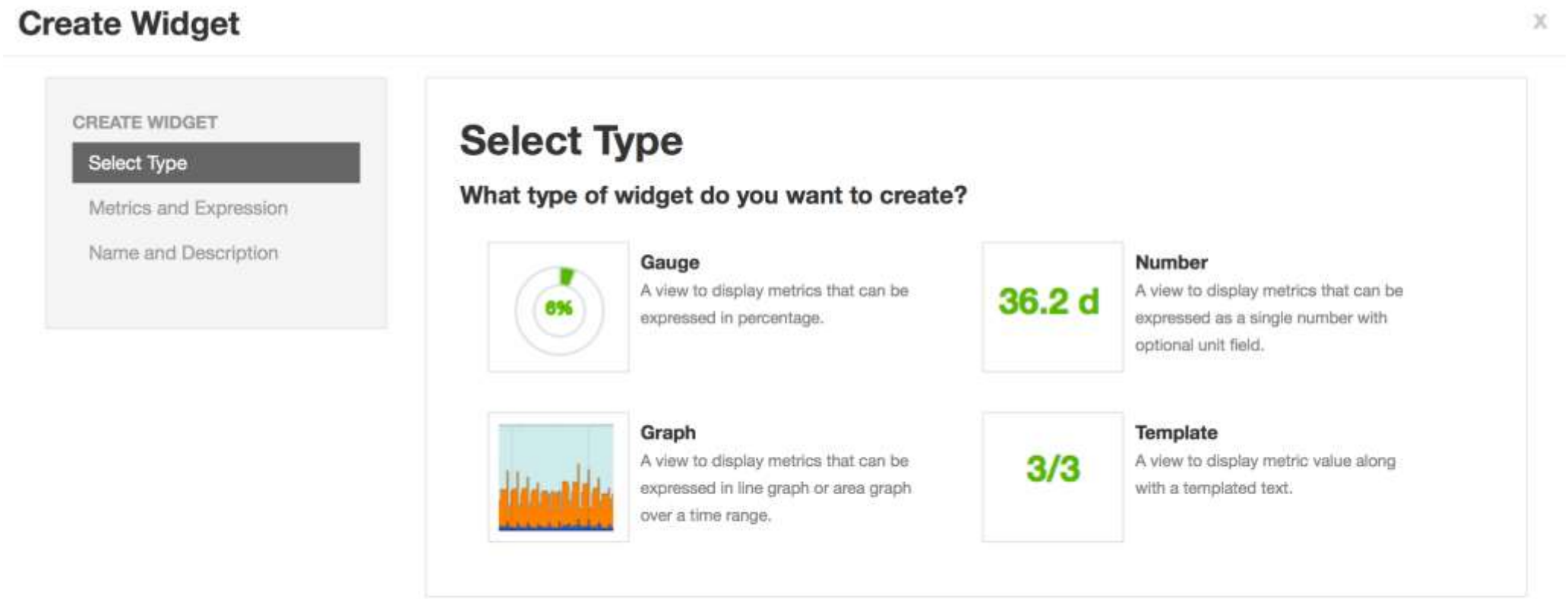
Create Custom Widgets



Note: Only Ambari Admins or Operators can create widgets

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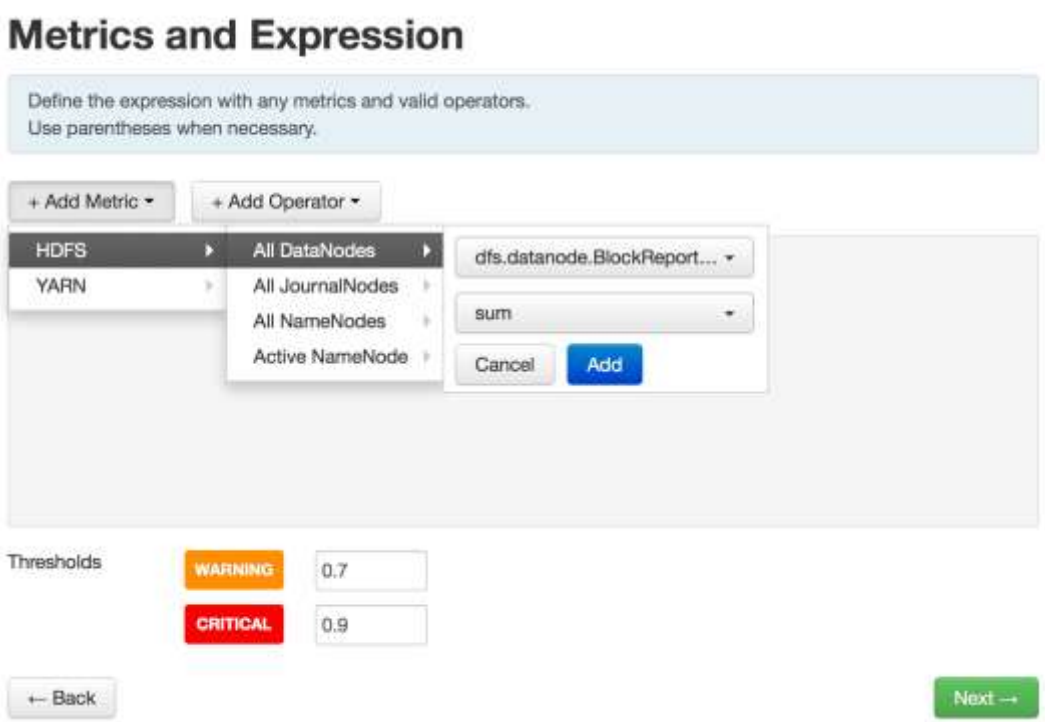
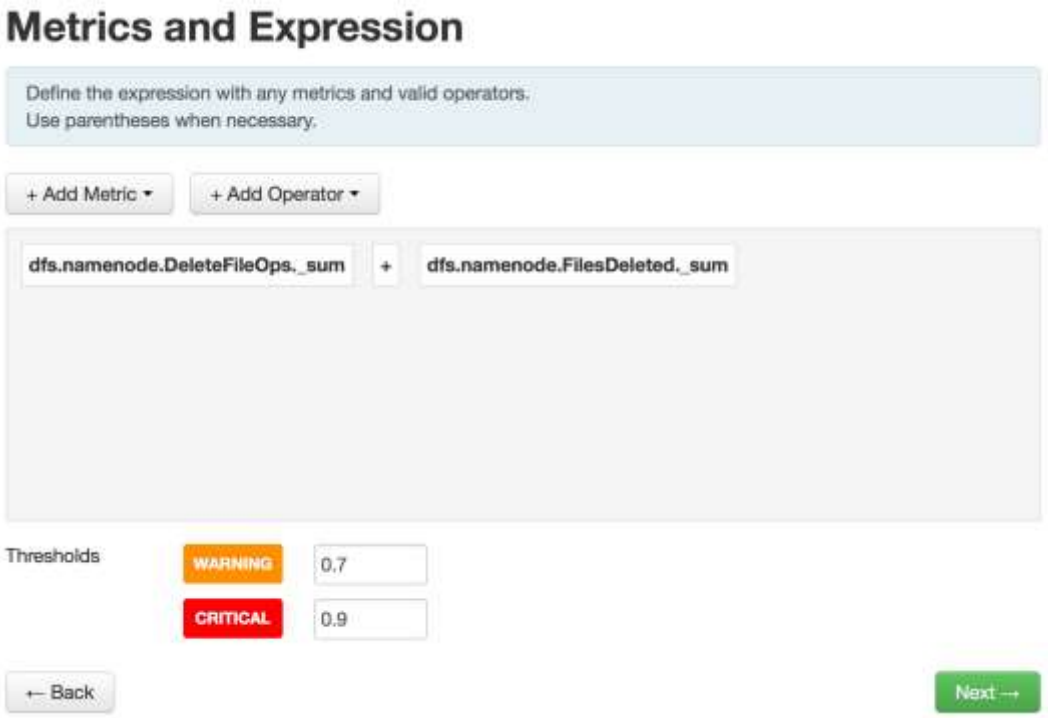
Select Metrics, Build Expressions





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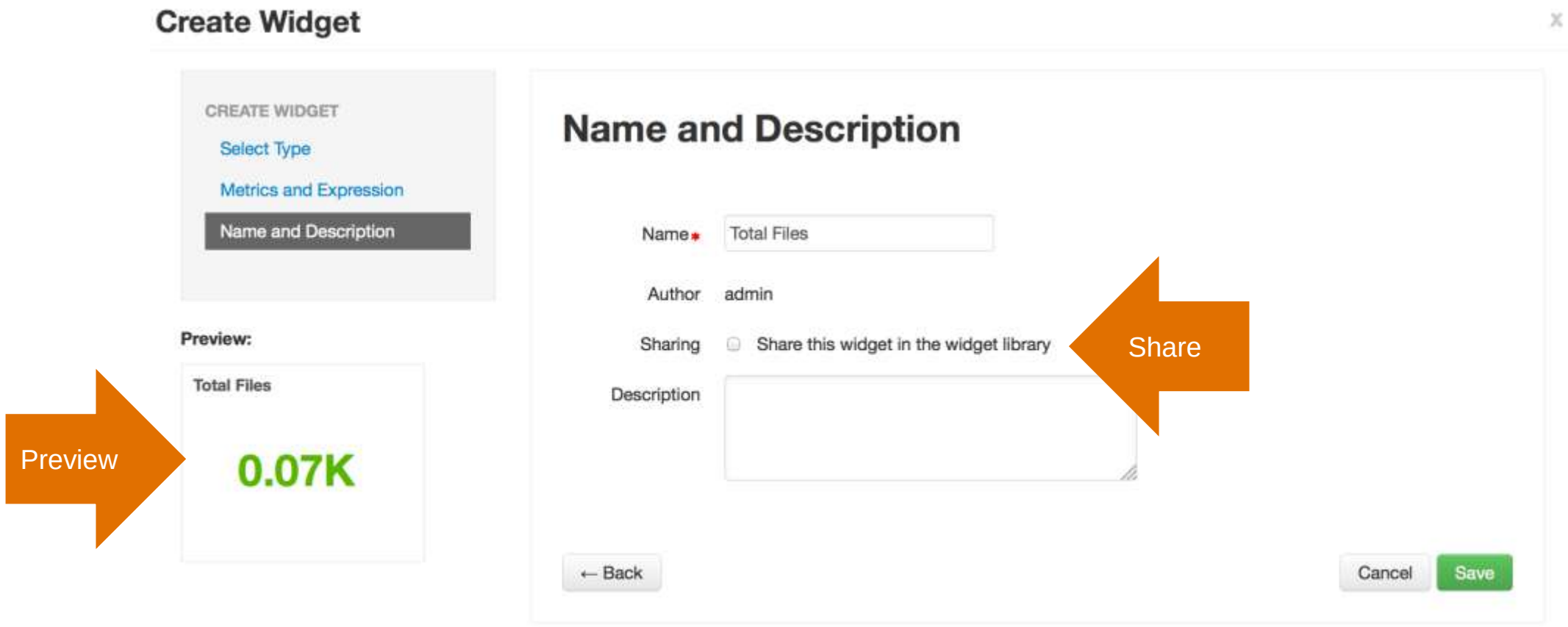
Save and Share (Optional)



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Shared Widgets

Widgets can be shared or not shared

When shared, widget goes into Widget Library for ALL users (Operator and Read-only)

ALL Operators can edit or delete shared widgets (even if NOT the author)

Once shared, cannot be un-shared

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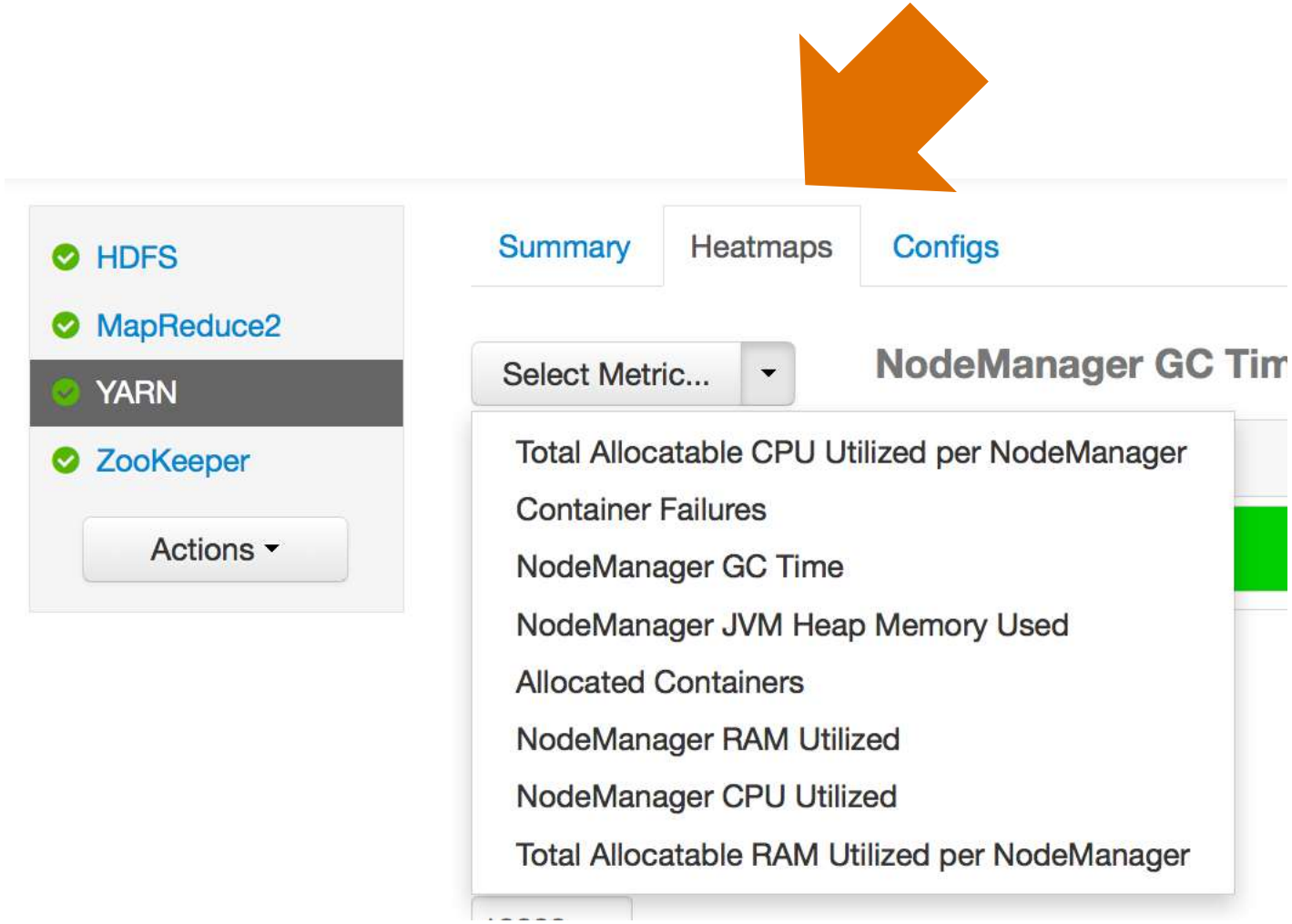
New Service Heatmaps



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Alerts

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Alert Changes

Alerts Log (AMBARI-10249)

- **Alert state changes are written to `/var/log/ambari-server/ambari-alerts.log`**

```
2015-07-13 14:58:03,744 [OK] [ZOOKEEPER] [zookeeper_server_process] (ZooKeeper Server
Process) TCP OK - 0.000s response on port 2181
2015-07-13 14:58:03,768 [OK] [HDFS] [datanode_process_percent] (Percent DataNodes Available)
affected: [0], total: [1]
```

Script-based Alert Notifications (AMBARI-9919)

- **Define a custom script-based notification dispatcher**
- **Executed on alert state changes**
- **Only available via API**

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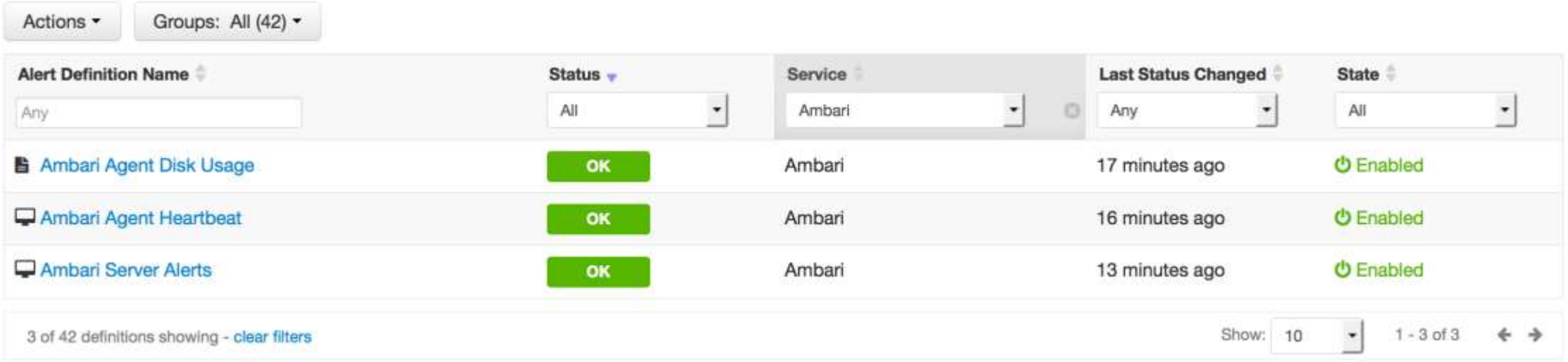
New Ambari Alerts

Ambari Agent Heartbeat (if Server has lost contact with Agent)

Ambari Server Alerts (if Server detects alert checks have not run)



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Rack Awareness

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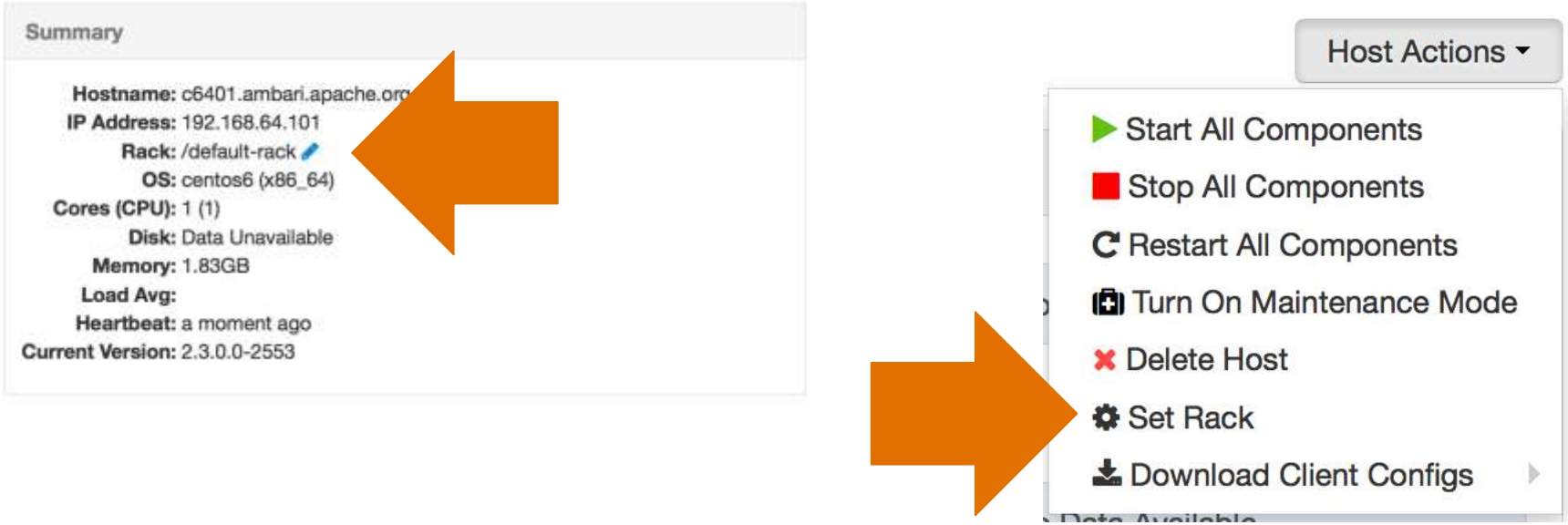
HDFS Topology Script + Host Mappings

Set Rack ID from Ambari

Ambari generates + distributes topology script with mappings file

```
/etc/hadoop/conf/topology_script.py
/etc/hadoop/conf/topology_mappings.data
```

Sets core-site “net.topology.script.file.name” property



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Views

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Views Framework Improvements

Auto configure (AMBARI-10306)

- **Ability to associate view configuration with existing cluster**
- **Automatically derive configuration parameters via <cluster-config>**

Auto create (AMBARI-10424)

- **Ability to specify <auto-instance> create if cluster meets minimal Stack and Service requirements**

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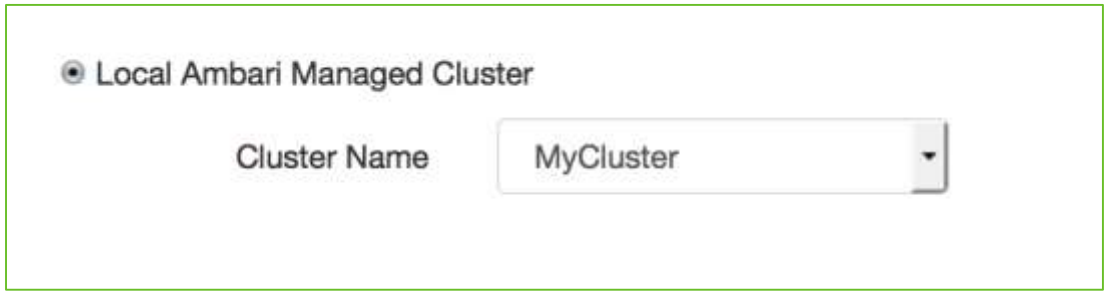
Auto-Configure by Specifying the Cluster



Previously, Ambari Admins had to specify a (potentially) large number of configuration parameters manually.

Now, Ambari Admins can select the cluster for the view to automatically derive the configurations.

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Identifying Cluster Configuration Property

- **View Developer can identify the cluster configuration property to use for the view configuration parameter.**
- **Syntax is `config-type/property-name`**

```
<parameter>
  <name>yarn.timeline-server.url</name>
  <description>The URL to the YARN Application Timeline Server, used to provide Te
  <label>YARN Timeline Server URL</label>
  <placeholder>yarn.timeline-service.hostname:8188</placeholder>
  <cluster-config>yarn-site/yarn.timeline-service.webapp.address</cluster-config>
</parameter>
<parameter>
  <name>yarn.resourcemanager.url</name>
  <description>The URL to the YARN ResourceManager, used to provide YARN Applicati
  <label>YARN ResourceManager URL</label>
  <placeholder>yarn.resourcemanager.hostname:8088</placeholder>
  <cluster-config>yarn-site/yarn.resourcemanager.webapp.address</cluster-config>
</parameter>
```


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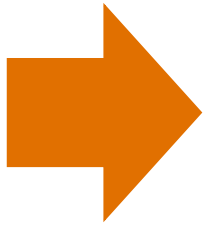
Auto-Create View Instance

- **View Developer can specify that a view instance can be auto-created if the cluster meets HDP and Service requirements**
- **View configuration must also be satisfied (meaning: view can be auto-configured and/or all configurations have default values)**



```
<auto-instance>
  <name>TEZ_CLUSTER_INSTANCE</name>
  <label>Tez View</label>
  <description>Monitor and debug all Tez jobs, submitte
  <stack-id>HDP-2.*</stack-id>
  <services>
    <service>TEZ</service>
  </services>
</auto-instance>
</view>
```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New User Views

New set of Views included by default:

- **Tez**
- **Capacity Scheduler**
- **Hive**
- **Pig**
- **Files**

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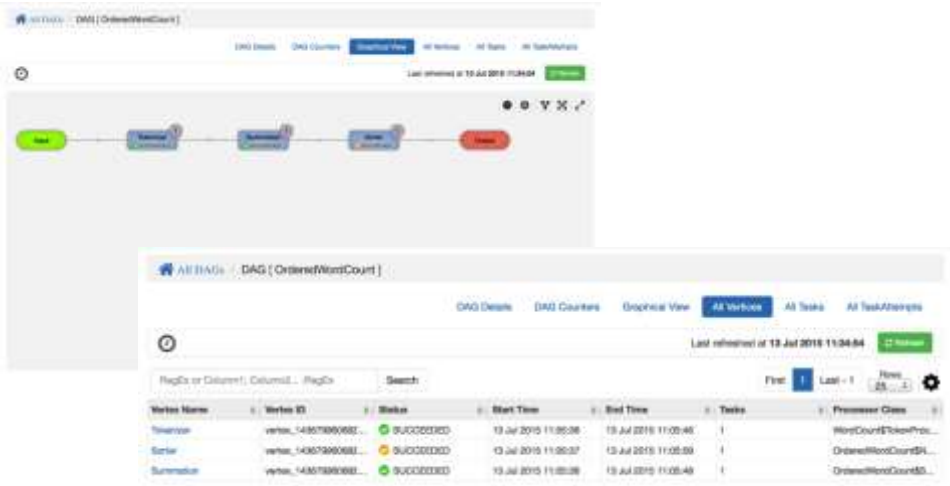
New User Views

Capacity Scheduler View
Browse + manage YARN queues



Tez View
View information related to Tez jobs that are executing on the cluster.

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New User Views

Pig View
Author and execute Pig Scripts.

Files View
Browse HDFS file system.

Hive View
Author, execute and debug Hive queries.

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Ambari Server “Standalone”

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Separate Ambari Servers

- **For Hadoop Operators:**

  Deploy Views in an Ambari Server that is managing a Hadoop cluster

- **For Data Workers:**

  Run Views in a “standalone” Ambari Server

Operators manage the cluster, **may have Views** deployed

Data Workers use the cluster and use a “standalone” Ambari Server **for Views**

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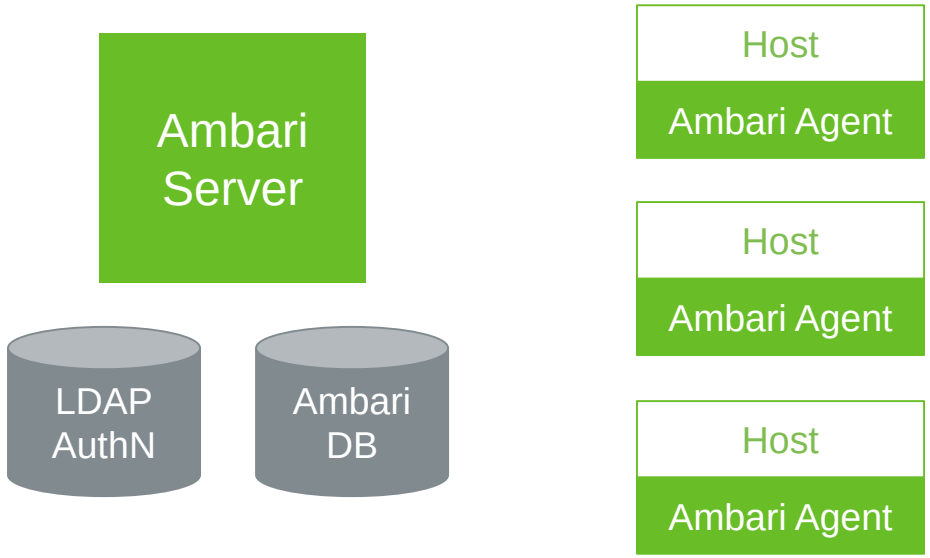
Comparison

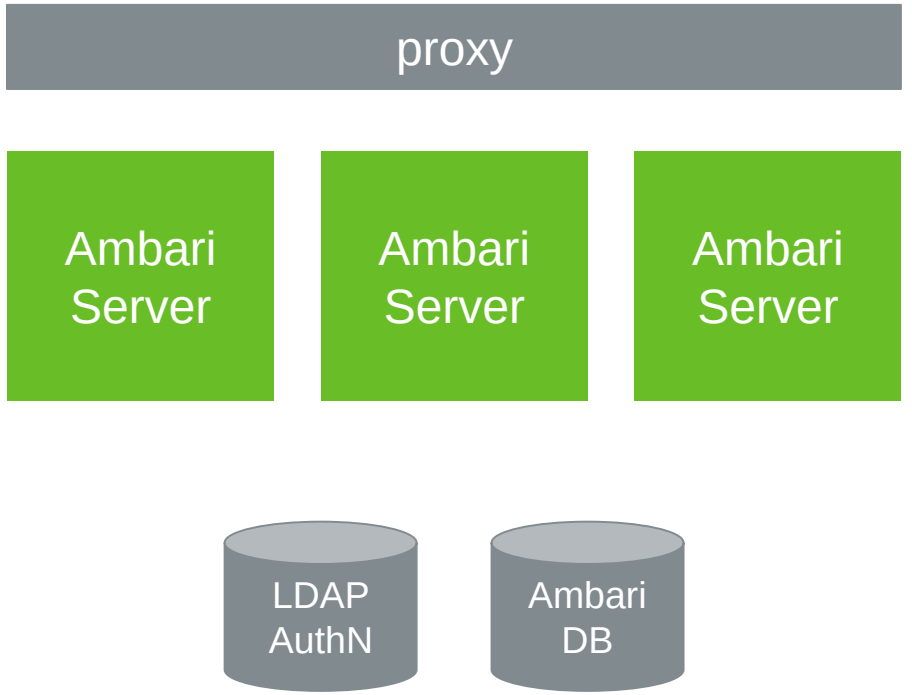
Operational Ambari

One Ambari Server Instance
Talking with Agents, Managing the cluster



Standalone Ambari Server

One or More Ambari Server Instances
No Agents, no requirement to operate the cluster



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Setup Comparison

	Operational Ambari Server	Standalone Ambari Server(s)
1	Install ambari-server package	Install ambari-server package
2	Run ambari-server setup (DB, JDK)	Run ambari-server setup (DB, JDK)
3	Configure external LDAP authentication	Configure external LDAP authentication
4	Install Cluster	
5	Deploy views	Deploy views
6	Create + configure view instances	Create + configure view instances
7		(Optional) Repeat for each Ambari Server instance
8		(Optional) Setup proxy for Ambari Server instances

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Multiple Standalone Ambari Server Requirements

- **Ambari Server instances should be the same version.**
- **Ambari Server instances should point to the same Ambari DB.**
- **Ambari DB should be scaled and made highly-available independent of Ambari Server.**
- **In the case of a Kerberos-enabled cluster, Kerberos client utilities must be installed on the Ambari Server hosts and each Ambari Server instance should be setup for Kerberos.**
- **If using reverse proxy for multiple Ambari Server instances, setup proxy to honor session affinity.**

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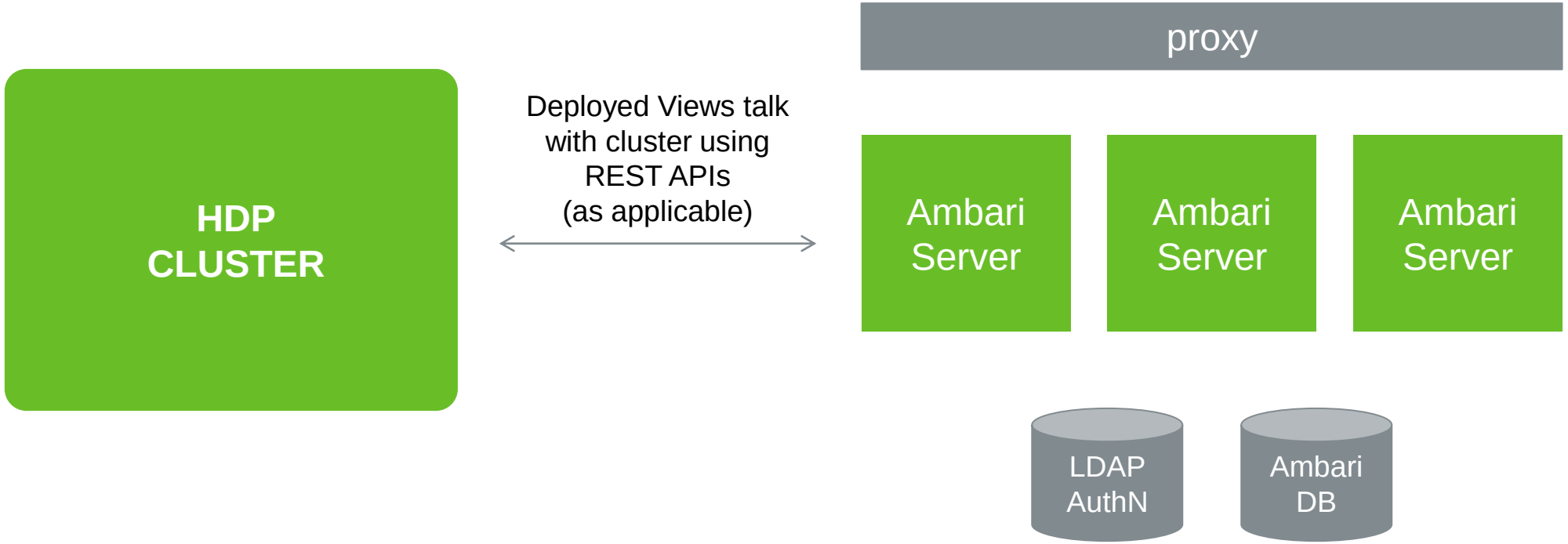
Views <-> Cluster Communications

Important: It is NOT a requirement to operate your cluster with Ambari to use Views with your cluster. Run Ambari "standalone".



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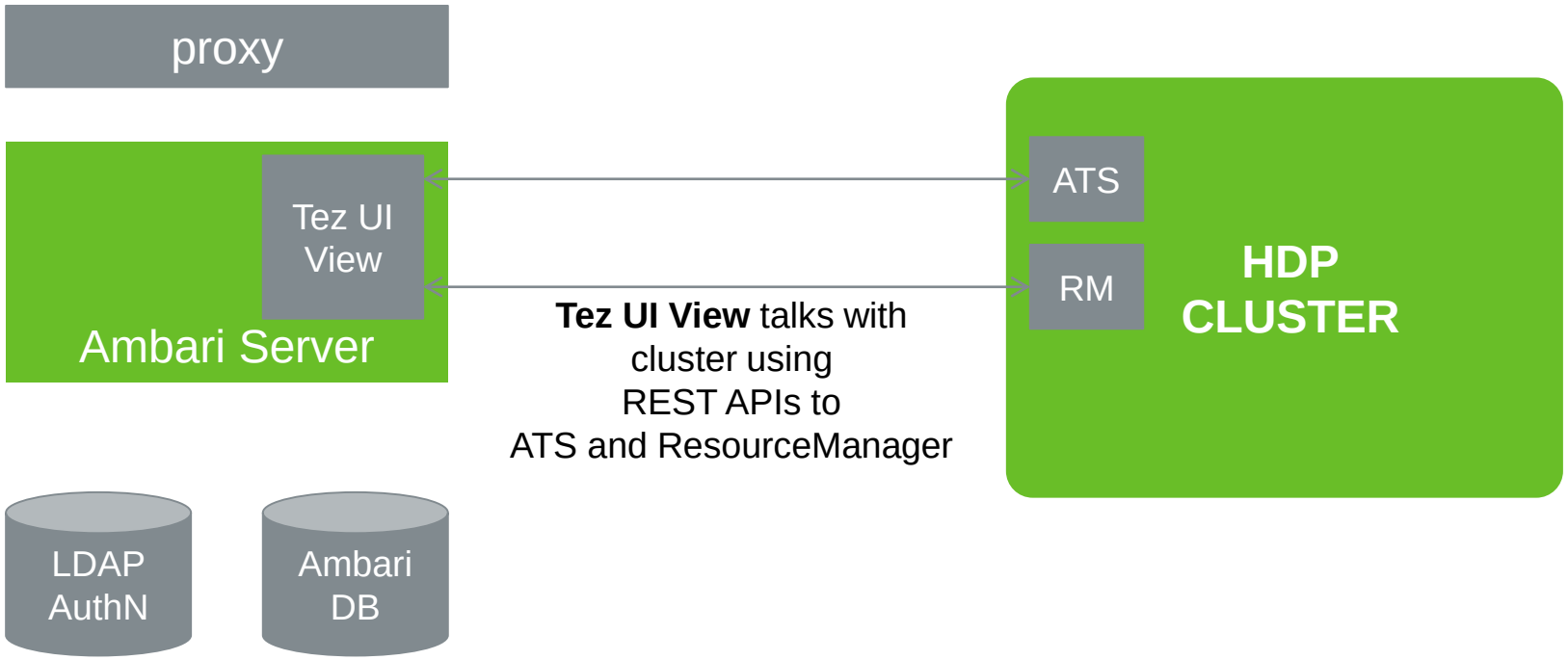
Tez UI View <-> Cluster Communication



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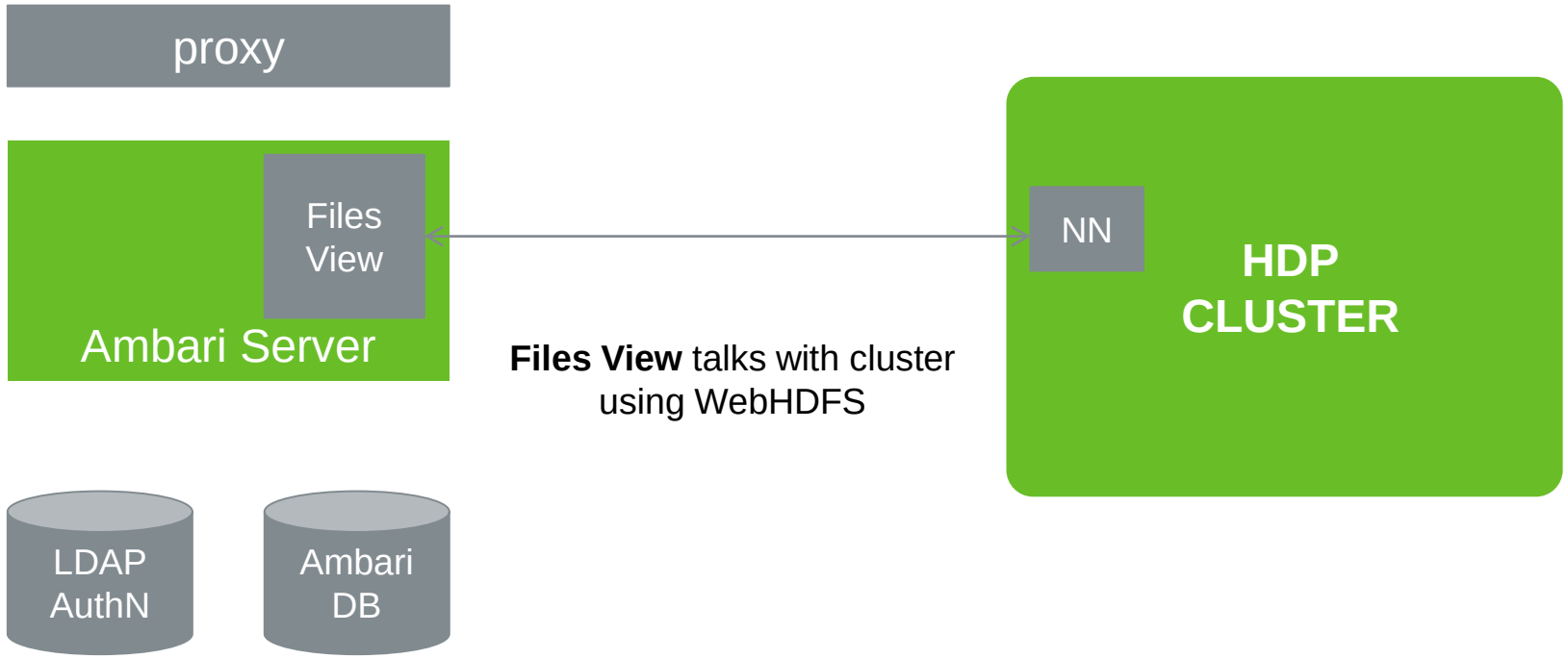
Files View <-> Cluster Communication



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Learn More

Resource	Location
Apache Ambari Project Page	http://ambari.apache.org
Ambari Project Wiki	https://cwiki.apache.org/confluence/display/AMBARI
Ambari Project JIRA	https://issues.apache.org/jira/browse/AMBARI
Stacks	https://cwiki.apache.org/confluence/pages/viewpage.action?pageId=38571133
Blueprints	https://cwiki.apache.org/confluence/display/AMBARI/Blueprints
Views	https://cwiki.apache.org/confluence/display/AMBARI/Views

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