

Apache Hadoop YARN Overview

Date published: 2020-02-11

Date modified: 2020-11-24

CLOUdera

Legal Notice

© Cloudera Inc. 2025. All rights reserved.

The documentation is and contains Cloudera proprietary information protected by copyright and other intellectual property rights. No license under copyright or any other intellectual property right is granted herein.

Unless otherwise noted, scripts and sample code are licensed under the Apache License, Version 2.0.

Copyright information for Cloudera software may be found within the documentation accompanying each component in a particular release.

Cloudera software includes software from various open source or other third party projects, and may be released under the Apache Software License 2.0 (“ASLv2”), the Affero General Public License version 3 (AGPLv3), or other license terms. Other software included may be released under the terms of alternative open source licenses. Please review the license and notice files accompanying the software for additional licensing information.

Please visit the Cloudera software product page for more information on Cloudera software. For more information on Cloudera support services, please visit either the Support or Sales page. Feel free to contact us directly to discuss your specific needs.

Cloudera reserves the right to change any products at any time, and without notice. Cloudera assumes no responsibility nor liability arising from the use of products, except as expressly agreed to in writing by Cloudera.

Cloudera, Cloudera Altus, HUE, Impala, Cloudera Impala, and other Cloudera marks are registered or unregistered trademarks in the United States and other countries. All other trademarks are the property of their respective owners.

Disclaimer: EXCEPT AS EXPRESSLY PROVIDED IN A WRITTEN AGREEMENT WITH CLOUDERA, CLOUDERA DOES NOT MAKE NOR GIVE ANY REPRESENTATION, WARRANTY, NOR COVENANT OF ANY KIND, WHETHER EXPRESS OR IMPLIED, IN CONNECTION WITH CLOUDERA TECHNOLOGY OR RELATED SUPPORT PROVIDED IN CONNECTION THEREWITH. CLOUDERA DOES NOT WARRANT THAT CLOUDERA PRODUCTS NOR SOFTWARE WILL OPERATE UNINTERRUPTED NOR THAT IT WILL BE FREE FROM DEFECTS NOR ERRORS, THAT IT WILL PROTECT YOUR DATA FROM LOSS, CORRUPTION NOR UNAVAILABILITY, NOR THAT IT WILL MEET ALL OF CUSTOMER’S BUSINESS REQUIREMENTS. WITHOUT LIMITING THE FOREGOING, AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, CLOUDERA EXPRESSLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, QUALITY, NON-INFRINGEMENT, TITLE, AND FITNESS FOR A PARTICULAR PURPOSE AND ANY REPRESENTATION, WARRANTY, OR COVENANT BASED ON COURSE OF DEALING OR USAGE IN TRADE.

Contents

Introduction.....	4
YARN Features.....	4
Understanding YARN architecture.....	4

Introduction

Apache Hadoop YARN is the processing layer for managing distributed applications that run on multiple machines in a network.

YARN Features

YARN enables you to manage resources and schedule jobs in Hadoop.

YARN provides the following features:

Multi-tenancy

You can use multiple open-source and proprietary data access engines for batch, interactive, and real-time access to the same dataset. Multi-tenant data processing improves an enterprise's return on its Hadoop investments.

Cluster utilization

You can dynamically allocate cluster resources to improve resource utilization.

Multiple resource types

You can use multiple resource types such as memory, CPU, and GPU.

Scalability

Significantly improved data center processing power. YARN's ResourceManager focuses exclusively on scheduling and keeps pace as clusters expand to thousands of nodes managing petabytes of data.

Compatibility

MapReduce applications developed for Hadoop 1 runs on YARN without any disruption to existing processes. YARN maintains API compatibility with the previous stable release of Hadoop.

Understanding YARN architecture

YARN allows you to use various data processing engines for batch, interactive, and real-time stream processing of data stored in HDFS or cloud storage like S3 and ADLS. You can use different processing frameworks for different use-cases, for example, you can run Hive for SQL applications, Spark for in-memory applications, and Storm for streaming applications, all on the same Hadoop cluster.

YARN extends the power of Hadoop to new technologies found within the data center so that you can take advantage of cost-effective linear-scale storage and processing. It provides independent software vendors and developers a consistent framework for writing data access applications that run in Hadoop.

YARN architecture and workflow

YARN has three main components:

- **ResourceManager:** Allocates cluster resources using a Scheduler and ApplicationManager.
- **ApplicationMaster:** Manages the life-cycle of a job by directing the NodeManager to create or destroy a container for a job. There is only one ApplicationMaster for a job.
- **NodeManager:** Manages jobs or workflow in a specific node by creating and destroying containers in a cluster node.

