



QUICKFABRIC - A SELF-SERVE TOOL TO SET UP AWS EMR IN MULTIPLE ACCOUNTS WITH ONE BUTTON CLICK

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ABSTRACT

QuickFabric, a self-service web-based automation can be used to streamline the management and monitoring of Amazon EMR (Elastic MapReduce) clusters across various AWS accounts. Designed as a unified interface, it simplifies complex cluster operations such as creation, termination, restacking, and cloning, while also offering observability features like cost tracking, resource usage, and application performance history. It supports secure user access, integrates with enterprise tools like Jira and ServiceNow for change management, and provides job performance advice through intelligent recommendations.

Beyond its operational features, QuickFabric enhances team collaboration with role-based access control, automated email reporting, and subscription-based insights that reduce the need to manually monitor systems. Although currently limited to one AWS region per account, it sets the foundation for scalable, production-ready EMR management with user-friendly deployment supported by Terraform and Docker.

QuickFabric reflects the commitment to building one click automation that drive efficiency, governance, and intelligent automation in cloud operations, ensuring teams can focus on delivering business value while the platform handles infrastructure complexity behind the scenes.

Keywords: QuickFabric, Automation, Amazon EMR, AWS Management, Cluster Operations, Observability, Cost Tracking, Performance Monitoring, User Access, Jira, ServiceNow, Recommendations, Reporting, Terraform, Docker, Cloud Operations, Scalability, Governance.

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I. Introduction

Managing big data processing infrastructure at scale presents significant challenges, particularly in environments that span multiple cloud accounts, teams, and business segments. Amazon Elastic MapReduce (EMR) is a widely adopted service for running large-scale data processing tasks, but its management—especially across a complex enterprise landscape—can be cumbersome and error-prone without proper orchestration and observability tools.

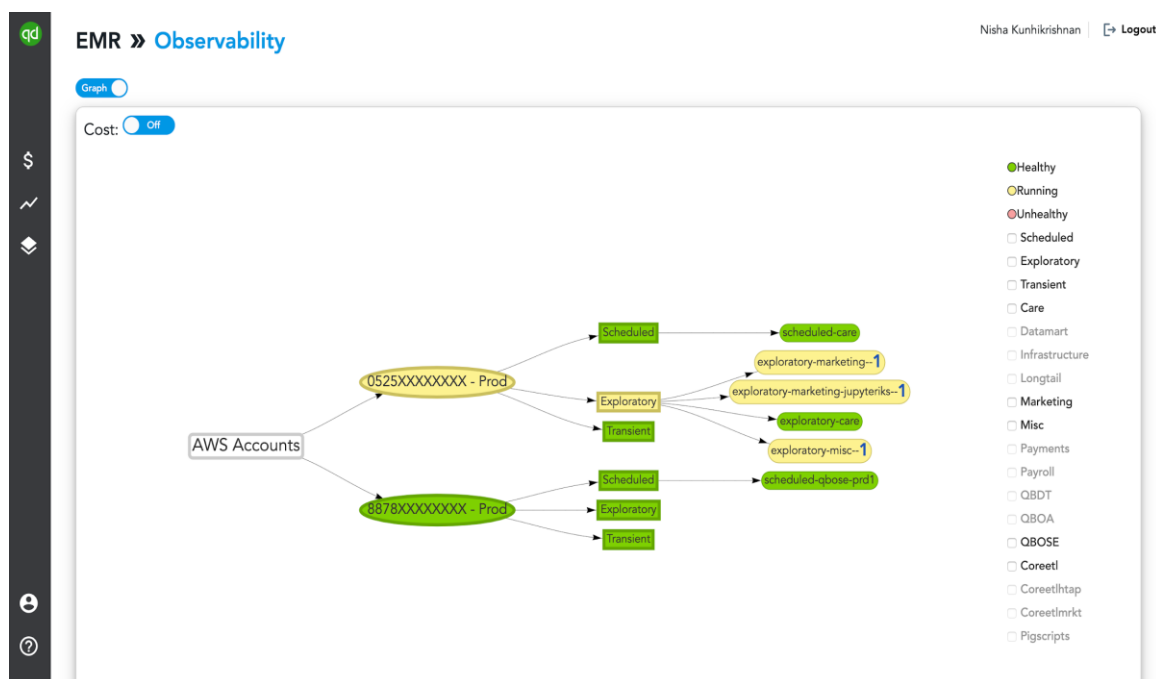
To address these challenges, **QuickFabric**, an one button click solution designed as a one-stop platform for managing and monitoring Amazon EMR clusters. QuickFabric automates routine operational tasks such as provisioning, termination, configuration management, and cost tracking, while also offering advanced features like application observability, usage-based recommendations, access control, and seamless integration with enterprise ticketing systems like Jira and ServiceNow.

This paper introduces QuickFabric’s capabilities and highlights how it improves operational agility, governance, and performance optimization in EMR environments. By enabling streamlined cluster lifecycle management and actionable insights, QuickFabric empowers engineering teams to focus on data innovation rather than infrastructure maintenance.

II. Details

This one-button web-based tool provides interactive and self explanatory UI as shown in below diagram

Quickfabric - A Self-Serve Tool to Set up AWS EMR in Multiple Accounts with one Button Click



EMR » Orchestration » View All Clusters

View Workflows

Create Cluster

Terminate Cluster

Add Step

Rotate AMI

Flip To Production

All Clusters | Exploratory Clusters | Schedule Clusters | Transient Clusters | Select an Account

[Export to Excel](#) [Refresh Table](#)

Drag a column header and drop it here to group by that column

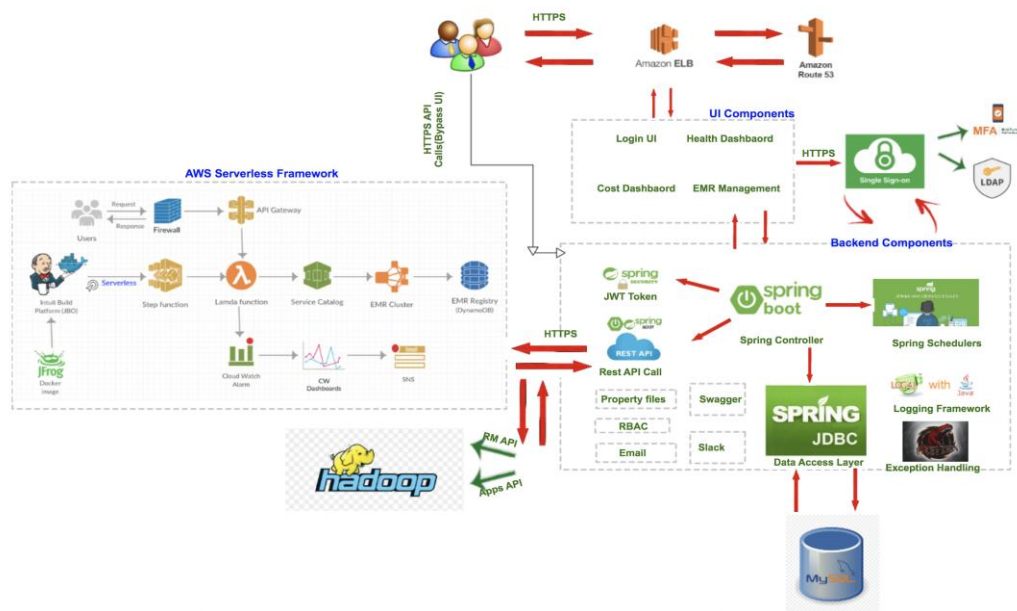
	EMR ID	EMR Name	Cluster Status	Account ID	Created By	Creation Timestamp	Workflows
+	j-16UW4UWRT8QO5	exploratory-testing-addstepstest	● HEALTHY	0525XXXXXXX	Dan Russotto	2019-12-17 10:44:14.0	
+	j-10BZXF494RRIV	exploratory-care	● HEALTHY	0525XXXXXXX	Jenkins	2019-12-16 16:41:59.0	
+	j-9YR8IYDCLZJK	scheduled-testing-prd1	● TERMINATED	8878XXXXXXX	Dan Russotto	2019-12-16 15:56:08.0	
+	j-1LNQT7PYXRDOV	scheduled-testing-emailforaction2	● TERMINATED	8878XXXXXXX	Dan Russotto	2019-12-16 15:15:46.0	
+	j-1HEAPWLU3JJKW	scheduled-testing-emailforaction1	● TERMINATED	8878XXXXXXX	Dan Russotto	2019-12-16 14:25:41.0	

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IV. Benefits

1. EMR Orchestration across AWS accounts
 - Cluster creation (provisioning) with bootstrap actions
 - Cluster termination
 - AMI rotation/restacking (one-click, or automatically on a schedule)
 - Add custom steps to execute on the cluster
 - DNS flip to move clusters in and out of production
 - Cluster Clone: Create a cluster using another as a starting point
 - Optionally receive email notifications about all cluster actions performed
2. EMR Observability
 - Cost history of individual clusters or grouped by cluster type, AWS account, and business segment
 - Running application details, including progress and resource utilization
 - Resource utilization history, including memory, CPU cores, and active nodes
 - Completed applications history, both succeeded and failed
3. Expert Advice
 - Job tuning advice produced using integration with Dr. Elephant tool from LinkedIn
 - Scheduling advice produced based on the current usage to improve load balancing
4. Access Control
 - Grant users privileges for only clusters belonging to the AWS account and business segments relevant to them
 - Manage privileges to perform only read access or only certain actions
5. JIRA/ServiceNow Integration
 - Require approval for all production changes to EMRs enforced by QuickFabric application
 - Document ticket information for production changes
6. Subscription-Based Email Reporting
 - View key metrics without having to navigate to QuickFabric application
 - Subscribe only to reports that contain information relevant to you

V. QuickFabric Architecture diagram



VI. To start using QuickFabric

I. In Local Environment (UAT)

NOTE: Local setup is just to see the look and feel and to understand how the product works. In order to have full functionality with orchestration and observability of real EMR clusters, see the section below for setup on AWS.

II. Requirements

- Terraform 0.12+
- Docker 19.08+
- Java 1.8+
- mvn 3.6+
- npm 6.11+

III. Pre-requisites

- Clone GitHub repo
git clone <https://github.com/intuit/QuickFabric.git>
- Follow the readme for step-by-step setup.

IV. Caution

Quickfabric will save all the terraform state files inside QuickFabric/terraform/terraform.tfstate.d/ directory. Make sure that you save all the terraform state files in a safe place (in git or S3 location) as it will be needed next time when you want to deploy/update QuickFabric again in some accounts.

VII. Troubleshooting Tips

- Unable to access quickfabric_url after terraform setup is done.
 - You need to wait few minutes as docker is running in the background to finish setting up the containers
- Project is not up, is my docker setup complete?
 - You can check docker setup logs here to see if the setup is still going on or if there are any errors during the setup

VIII. Limitation

Quickfabric supports one region per account (Multiple region support is coming soon...).

IX. Conclusion

QuickFabric represents a significant advancement in enterprise-scale data infrastructure management by offering a unified platform for orchestrating and observing Amazon EMR clusters across multiple AWS accounts. Through automation of complex cluster operations, integration with governance tools, and enhanced visibility into resource usage and costs, QuickFabric simplifies the operational overhead associated with big data processing.

By aligning with organizational needs such as cost optimization, security, and compliance, the platform supports faster decision-making and more reliable execution of data workloads. Its modular architecture and extensibility ensure that it can evolve with emerging business requirements, including future support for multi-region deployments.

In essence, QuickFabric not only enhances the efficiency of managing EMR environments but also contributes to better business outcomes by enabling teams to deliver data-driven insights at scale with greater agility and control.

IX. References

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