

COS80029-Technology Application Project

Group User Manual Team 1

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1. Introduction

Resource level breakdown of services is a new and exciting addition to XC3 designed to further breakdown of each individual services on region basis. With this feature enhancement of XC3, it empowers you to effortlessly monitor spending trends, optimize resource distribution, and make informed choices for enhanced cost control. This user manual provides comprehensive guidance on installing, configuring, and using this feature effectively. Whether you are a developer, system administrator, or end user, this manual is your go-to resource for harnessing the full potential of Resource level breakdown.

2. System Requirements

To use the "Resource Level Breakdown" feature effectively, ensure that your system meets the following requirements:

- Terraform 1.0+
- Python 3.9
- AWScli
- Cloud Custodian
- Prometheus/Grafana/Pushgateway
- Pandas 2.1.3 or later
- Numpy 1.26.2 or later
- Pytz 2023.3 or later
- checkov 2.0.574 or later
- shellcheck 0.7.1 or later

3. Installation Instructions

The "Resource level Breakdown" feature is integrated into XC3 by default. There's no separate installation required for this specific feature. You can follow the installation guide provided by the XC3 community for deployment. However, there is addition of the **Pandas** library for the new lambda. So, we have to package the **Pandas** and its supporting library **Numpy** and **Pytz** for creating the lambda layer. In the installation guide for the heading "Packaging the Prometheus" follow the following instructions:

Download Pandas library from this link [pandas](#)

Download Numpy library from this link [numpy](#)

Download Pytz library from this link [pytz](#)

Extract all above three .whl library

```
cd xc3/infrastructure/  
mkdir python  
pip3 install -t python/ prometheus-client  
copy the above extracted files in to the "python" folder  
zip -r python.zip ./python
```

4. Architecture Diagram

This new feature is based on the Cost and Usage Report (CUR) generated by the AWS. For the generation of the CUR user doesn't need to manually create the report from the AWS console. The report is generated automatically and placed into the S3 bucket using the terraform.

The architecture diagram for the **Resource level cost breakdown** feature using Cost and Usage Report is:

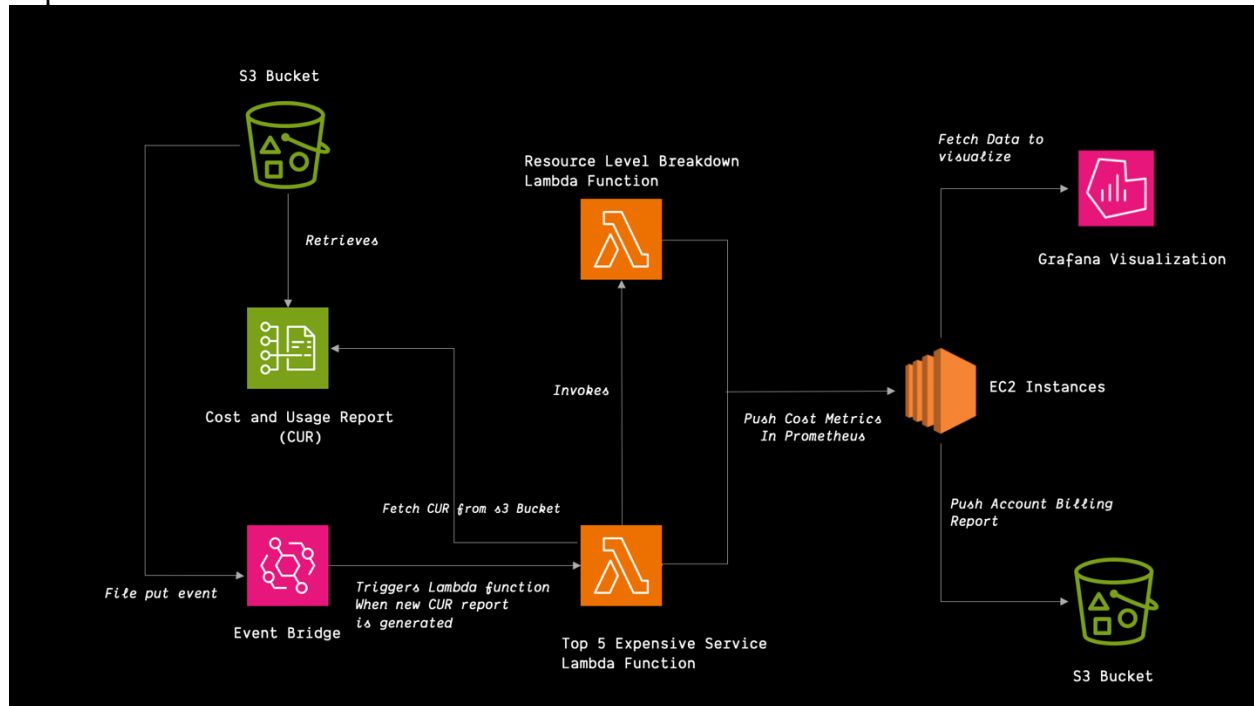


Fig 1: Architecture diagram resource level breakdown

5. Testing Lambda Function

Once the XC3 is deployed, the CUR generation part takes 24 hours by AWS to create the report. So, user have to wait that period.

User can see the report generation in progress by visiting the AWS Billing Dashboard service in AWS console and under it go to Cost and Usage Report option.

Enabling the s3 bucket notification :

- Login to your aws s3 account
- Go to the S3 services
- From the list of bucket select the **{namespace}-metadata-storage** bucket and go to its properties
- Scroll down below and enable the Amazon Eventbridge

The two-lambda function for Top 5 expensive service and Resource level breakdown can be found in the functions list of AWS lambda dashboard. Those lambda functions are:

Top_5_Expensive_Service

Function Name: {namespace}-expensive-services-cost

Resource_Level_Breakdown

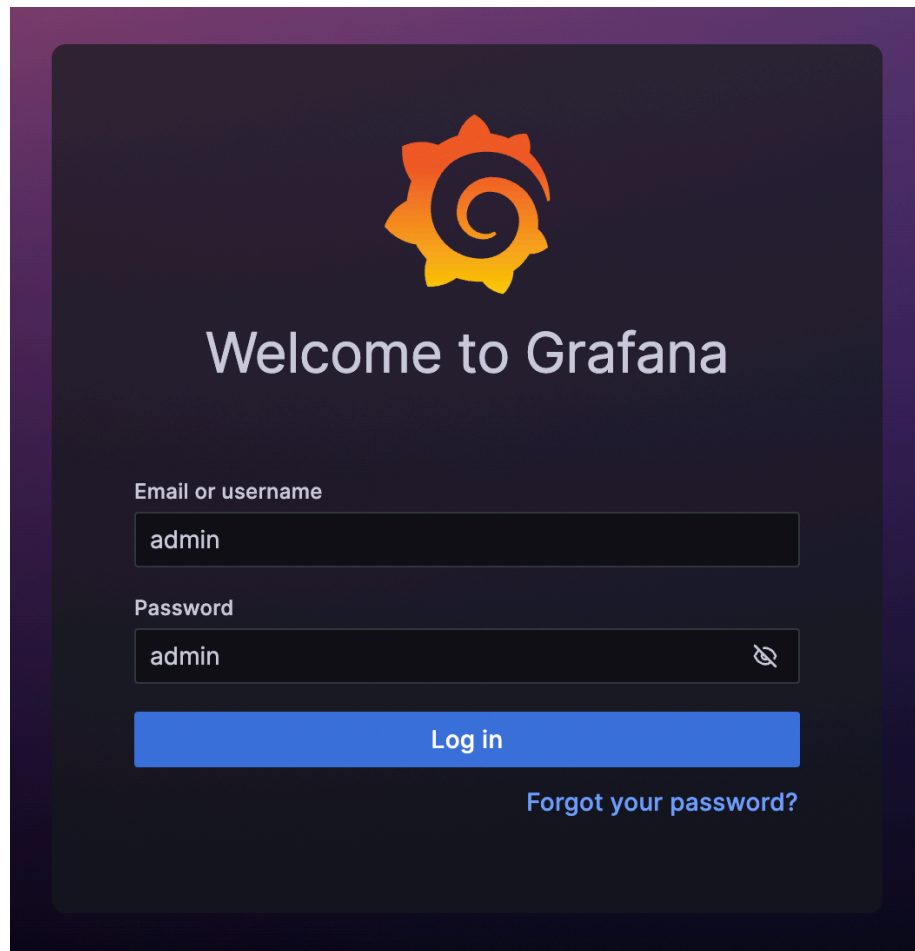
Function Name: {namespace}-resources-cost-breakdown

As the CUR generation takes 24-hour, user need not need to manually invoke these 2 lambdas. Once the report is generated **Top_5_Expensive_Service lambda** will invoke automatically by the event bridge and in turn this lambda will invoke the **Resource_Level_Breakdown** lambda programmatically and data is pushed into the Prometheus.

6. User Interface

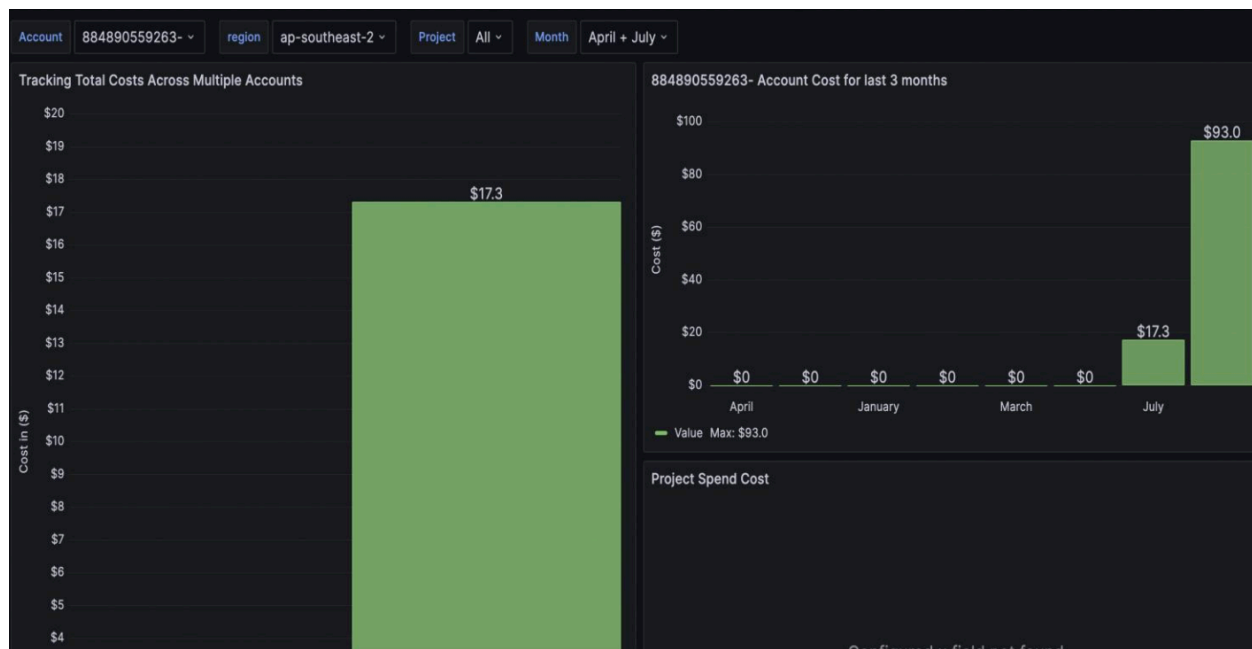
Login Panel

- Go to the ec2 Public-ip:3000
- Use the HTTP Protocol
- Login to the dashboard with Grafana Default Credentials
- Enter Username: admin
- Enter Password: admin



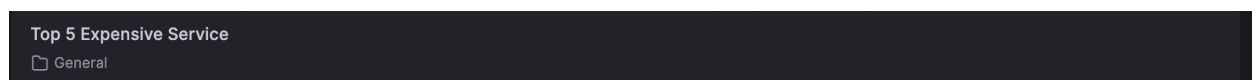
Home Dashboard

After logging in you can see home dashboard for different data as shown in below:

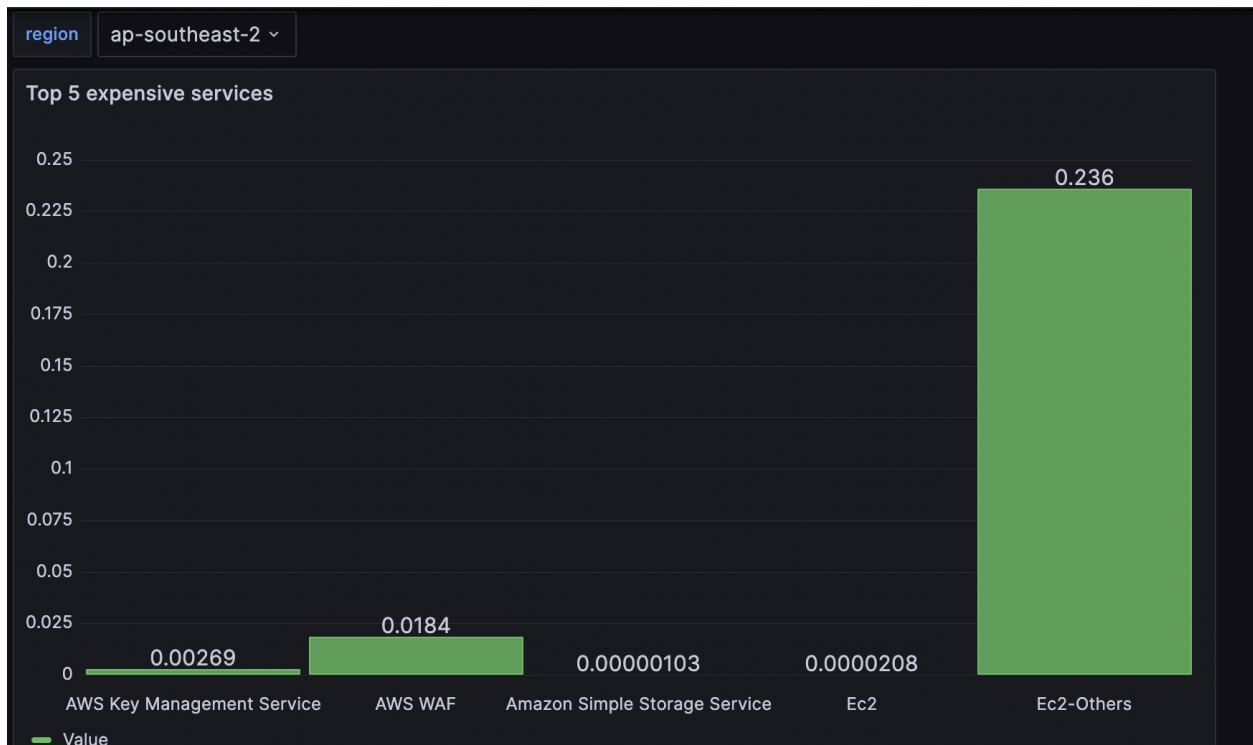


Top 5 Expensive Service Dashboard

- Go the Dashboard pages in the Grafana and select the Top 5 Expensive Service Dashboard.



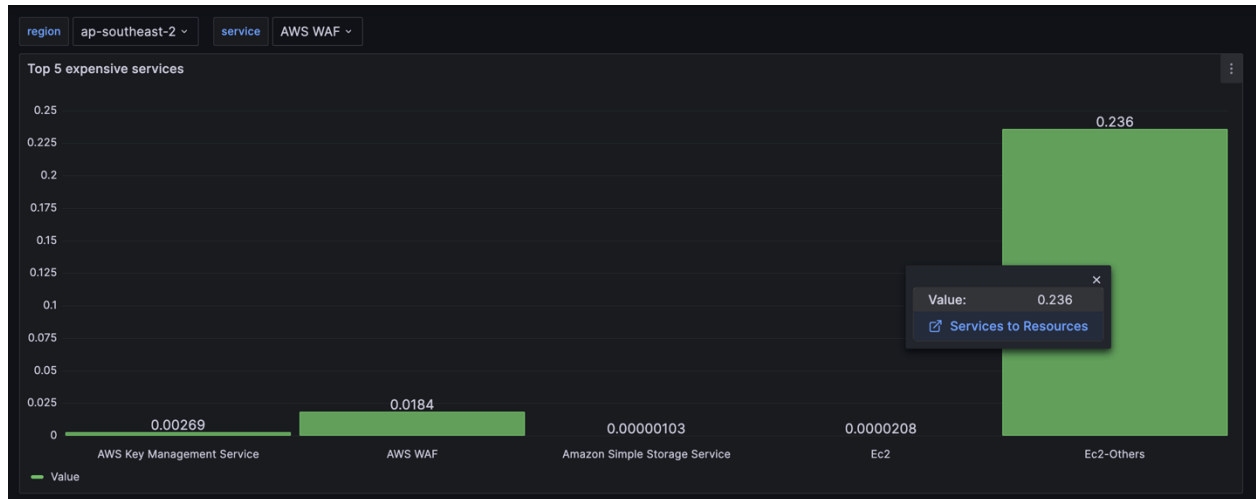
Once it is clicked a dashboard showing the top 5 expensive service will show as below:



- From the region variable dropdown, you can select the region of which you want to see the top 5 expensive service.



- Click on the service bar. You can see the link to go to the next dashboard. This link is to open the associated resources panel which shows cost data of resource level breakdown of the selected services



Resource Level Breakdown Dashboard:

The resource level breakdown dashboard consists of two panels bar chart and table.

Bar chart:

The bar chart shows the top 5 resources of the selected service and region. You can select the service and region from the dropdown.



Table:

The tabular view shows all the resources of the selected region and service and its associated cost.

All Resources of Amazon Simple Storage Service		
resource	service	Cost(\$) ↓
sujanpersonal-metadata-storage	Amazon Simple Storage ...	1.67e-7
sujanpersonal-cloudtrail-logs-storage	Amazon Simple Storage ...	7.52e-8
sujantap5-cloudtrail-logs-storage	Amazon Simple Storage ...	5.46e-8
terraform-state-sujanxc3tap9	Amazon Simple Storage ...	0
Total		2.96e-7

7. Using Feature

The “Resource level Breakdown” feature allows you to:

- Select the region and the used services.
- See detail view of the resources and its associated cost of selected service.

8. Troubleshooting

If you encounter any issues while using the "Resource Level Breakdown" feature, consider the following steps:

- After the XC3 is deployed, wait for the CUR to generate for 24 hours, then, you can see the resource level breakdown on Grafana.
- Make sure your XC3 installation is up to date.
- Make sure there were no errors while installing XC3.
- Ensure that your AWS credentials have sufficient permissions to access the necessary resources.
- Verify that the environment variables (Prometheus Ip, bucket name, resource_cost_breakdown_prefix) are correctly configured.
- Ensure that your Prometheus push gateway is reachable from the Lambda function's execution environment.

9. Contacting Support

For additional help or if you continue to experience problems, please email our support staff at 103851447@student.swin.edu.au. We have a committed team available to assist you with any queries or worries you may have.