Some tips and tricks

Data Engineer
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THANK YOU

Data Community Austria Day 2025

Awesome Partner

Microsoft

Platinum

redgate

ACP IT for innovators.

Gold

b.telligent
smart data. smart decisions.

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Agenda

01 An expensive Python

02 Azure Databricks Pricing

03 Monitoring & Alerts

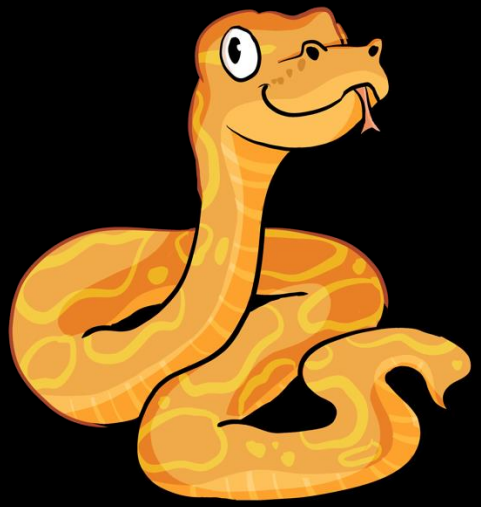
04 Solutions (1-6)

05 Conclusion

Household announcements

- A lot in preview!
  - Needs Unity Catalog
- An overview of options
- Based on my own experiences

1. An expensive python



An expensive python

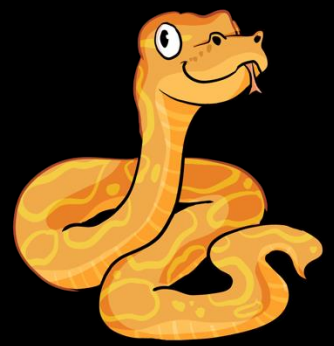
Azure spend

Microsoft Azure Sponsorship

Subscription Cost: $920.35

SERVICE NAME	SERVICE RESOURCE	SPEND
Storage	Hot GRS Iterative Read Operations	$387.44
Azure Databricks	Premium All-Purpose Photon DBU	$374.16
Virtual Machines	D4ds v5	$102.32
Storage	P15 LRS Disk	$22.65
Storage	Hot GRS Write Operations	$19.56
IoT Hub	S1 Unit	$4.84

(14-06-2024 to 16-06-2024)



2. Azure Databricks Pricing

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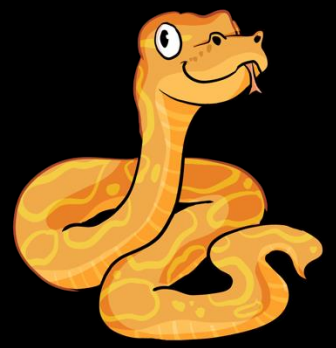
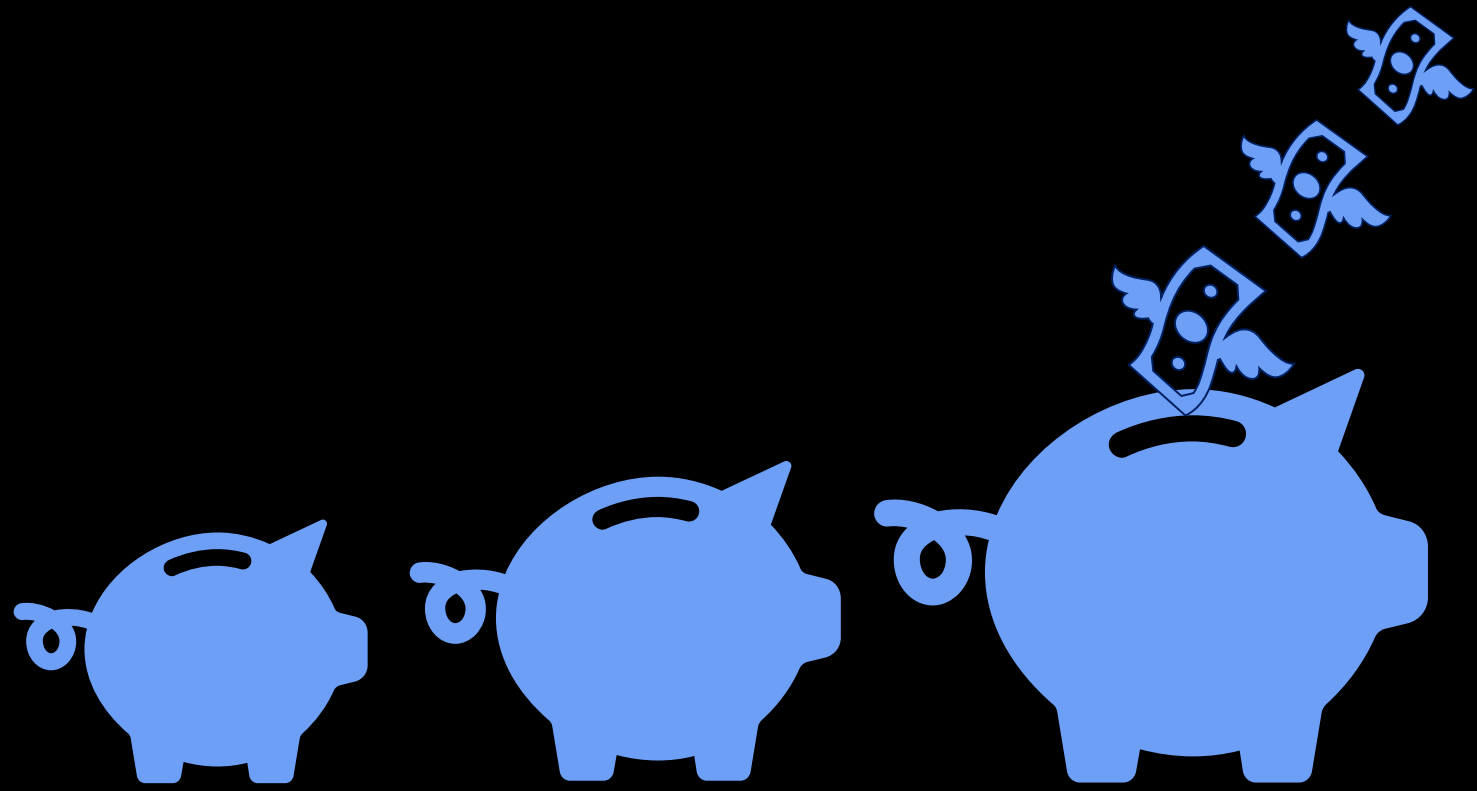


2. Azure Databricks Pricing

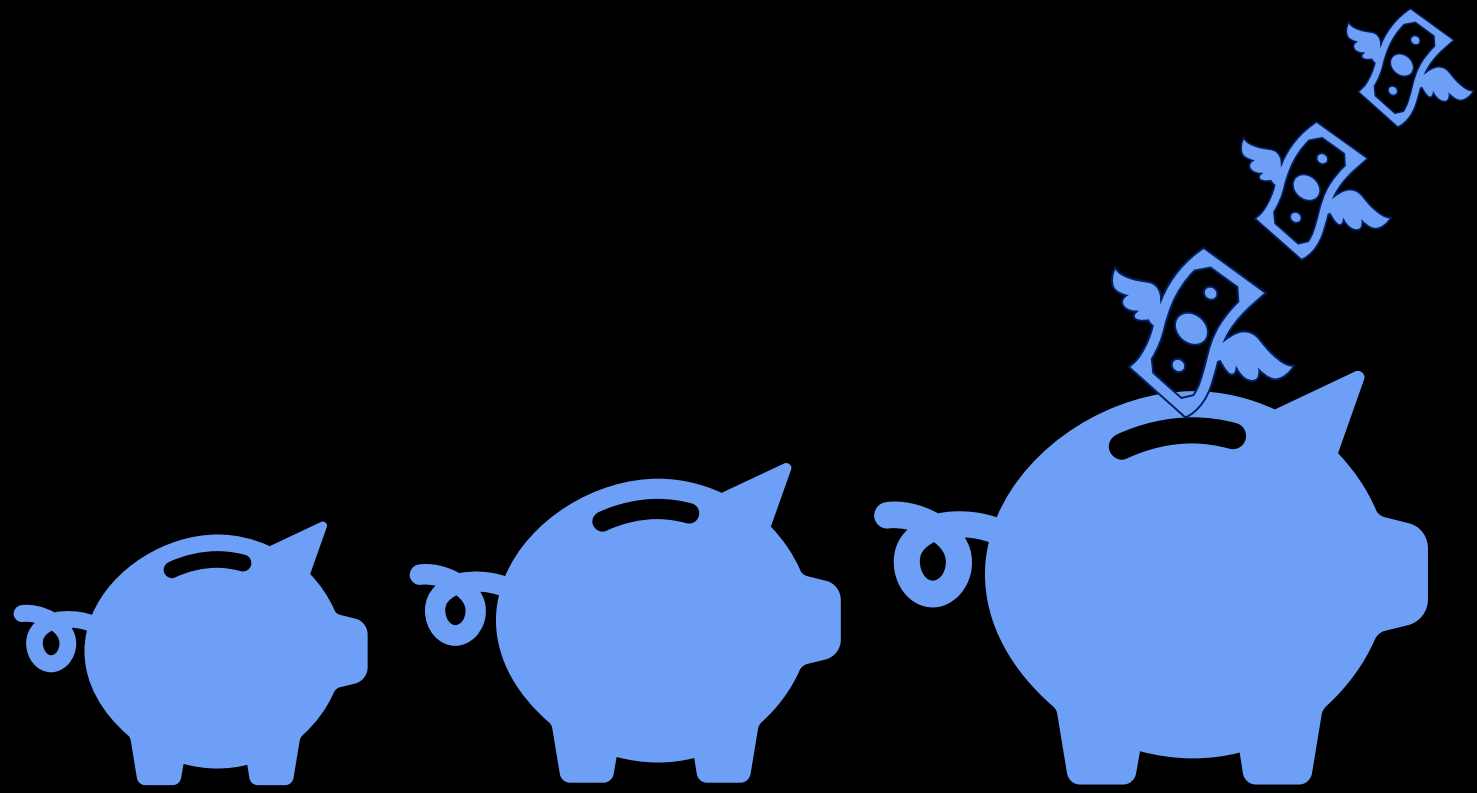
- DBU
- Virtual Machines
- Data Sources
- Other Resources



2. Azure Databricks Pricing

Databricks Unit (DBU)

- Normalized unit of processing power
  - Per hour



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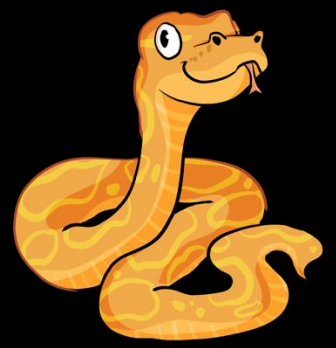

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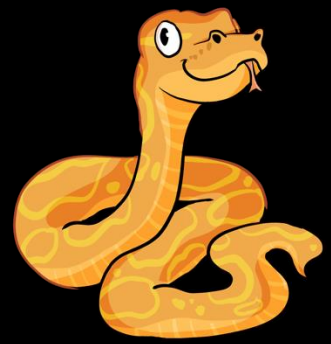
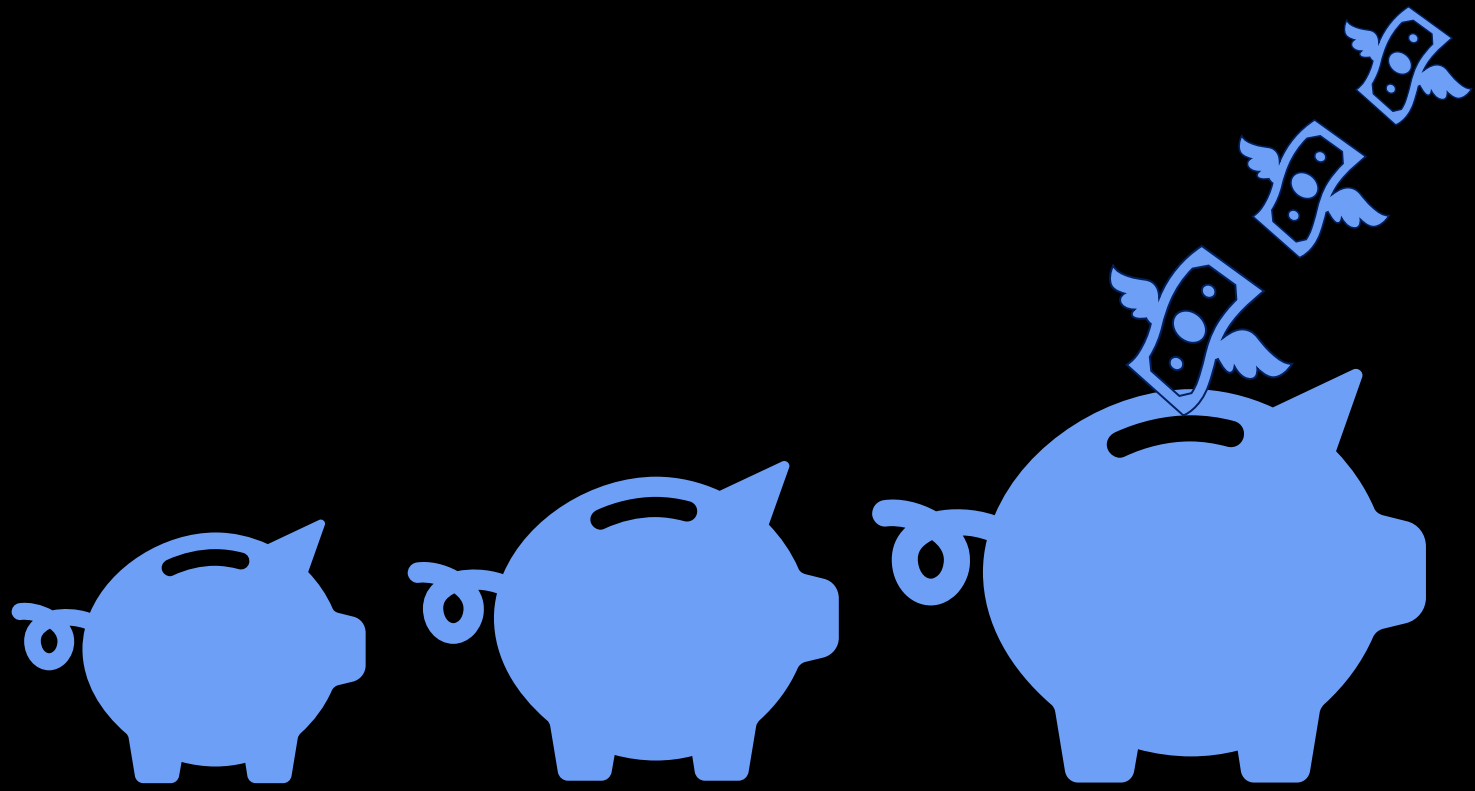


2. Azure Databricks Pricing

- DBU
- Virtual Machines
  - Disks
  - IP Address
- Other resources
  - Storage Account
  - Key Vault
  - Log Analytics
  - Data sources



This is why you should monitor!

3. Monitoring & Alerts

3. Monitoring & Alerts

3 options

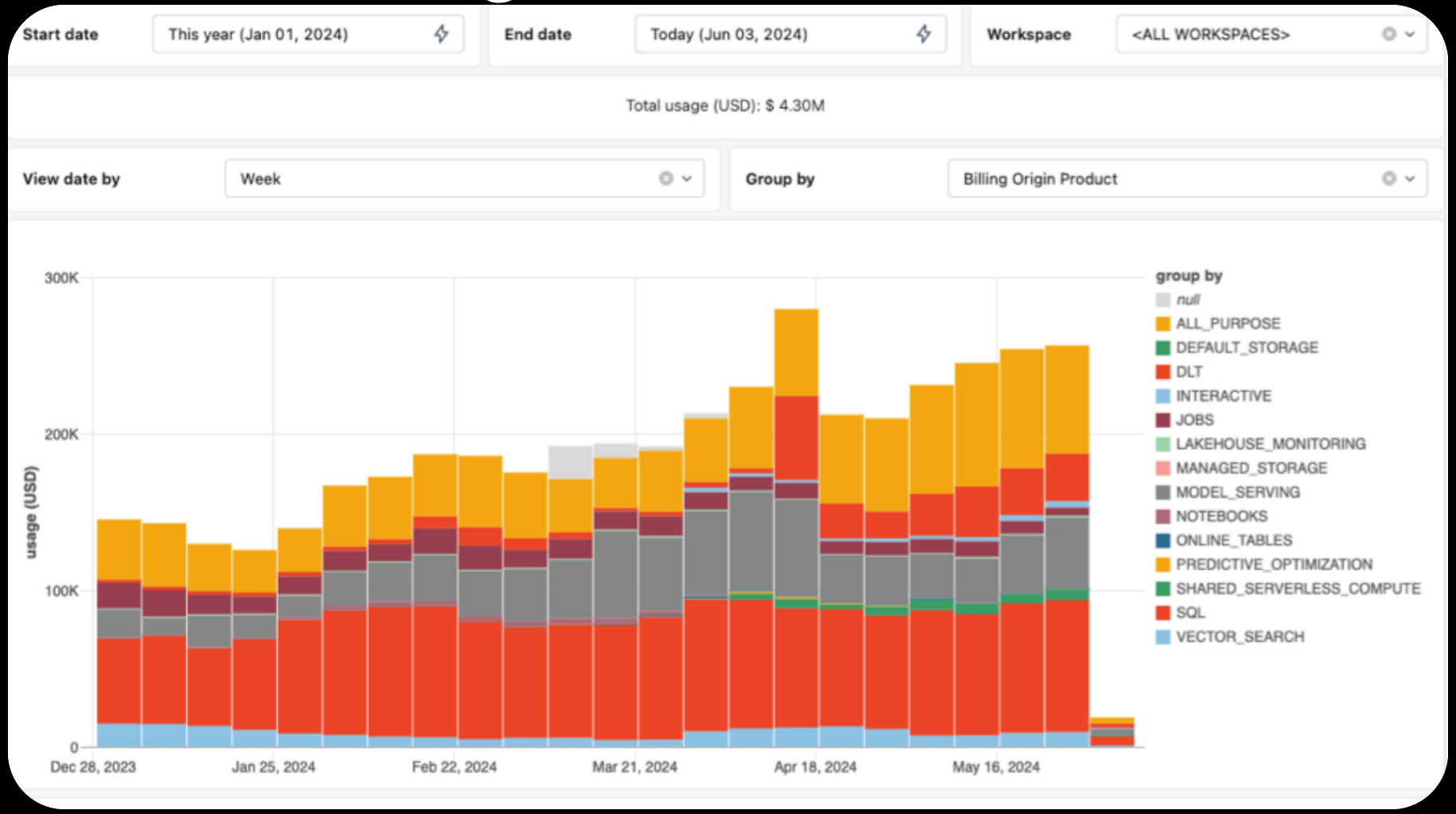
- Azure Portal
  - Budgets
  - Alerts
- Azure Databricks (Unity Catalog)
  - Budgets
  - Alerts
  - Serverless

Serverless

Workspace

3. Monitoring & Alerts

Databricks Usage Dashboard



4. Solutions

Solutions

01 Optimize Data Source

02 Optimize Code

03 Cluster Settings

04 Make it a Job!

05 Stream or Micro Batch?

06 Prepay

4. Solutions

(1) Optimize Data Source

4. Solutions

Optimize Data Source

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(14-06-2024 to 16-06-2024)

4. Solutions

Optimize Data Source

- What do your queries cost?
- What techniques are used?
- Can they be more efficient?

Azure cost calculator

West Europe VM: D4ds_v5	0.27 VM/hour
West Europe All purpose compute (Photon) Premium Workspace	0.55 DBU/hour
DBU	2/VM
Number of VM's (workers + driver)	7
Hours	48

Total Cost

VM	$90.72
DBU	$369.60
Data Source	$407.00
Total	**$867.32**

Azure cost calculator

West Europe VM: D4ds_v5	0.27 VM/hour
West Europe All purpose compute (Photon) Premium Workspace	0.55 DBU/hour
DBU	2/VM
Number of VM's (workers + driver)	7
Hours	48

47%

Total Cost

VM	$90.72
DBU	$369.60
Data Source	$3.11
Total	**$463.43**

4. Solutions

(2) Code Optimization

4. Solutions

Code Optimization

- The most expensive resource? It’s-a me!
  - *At some point, you should stop*

4. Solutions

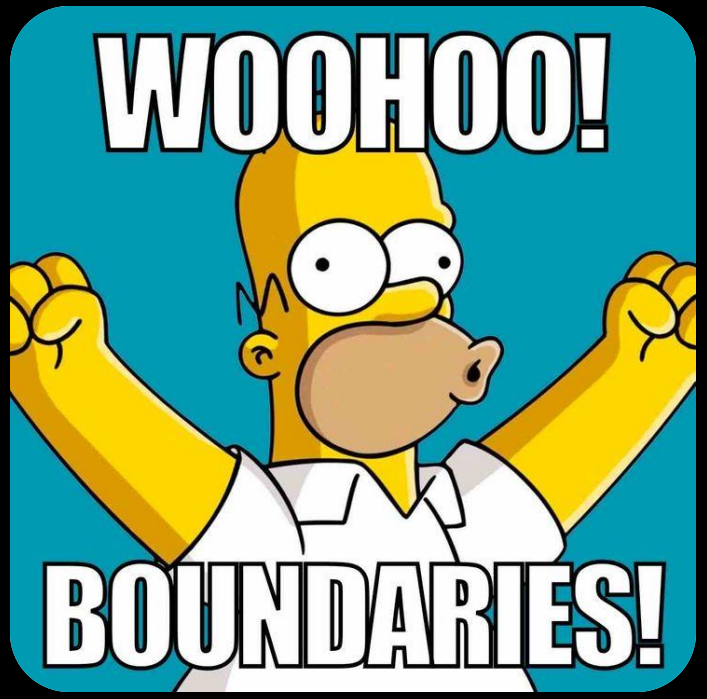
Code Optimization

When?

- Upgrade Apache Spark
- File format != Parquet or Delta Lake
- Change UDF to Apache Spark native
- Data is inefficiently partitioned
    - High shuffle
    - Disk spill

4. Solutions

(3) Cluster Settings



4. Solutions

Cluster Settings

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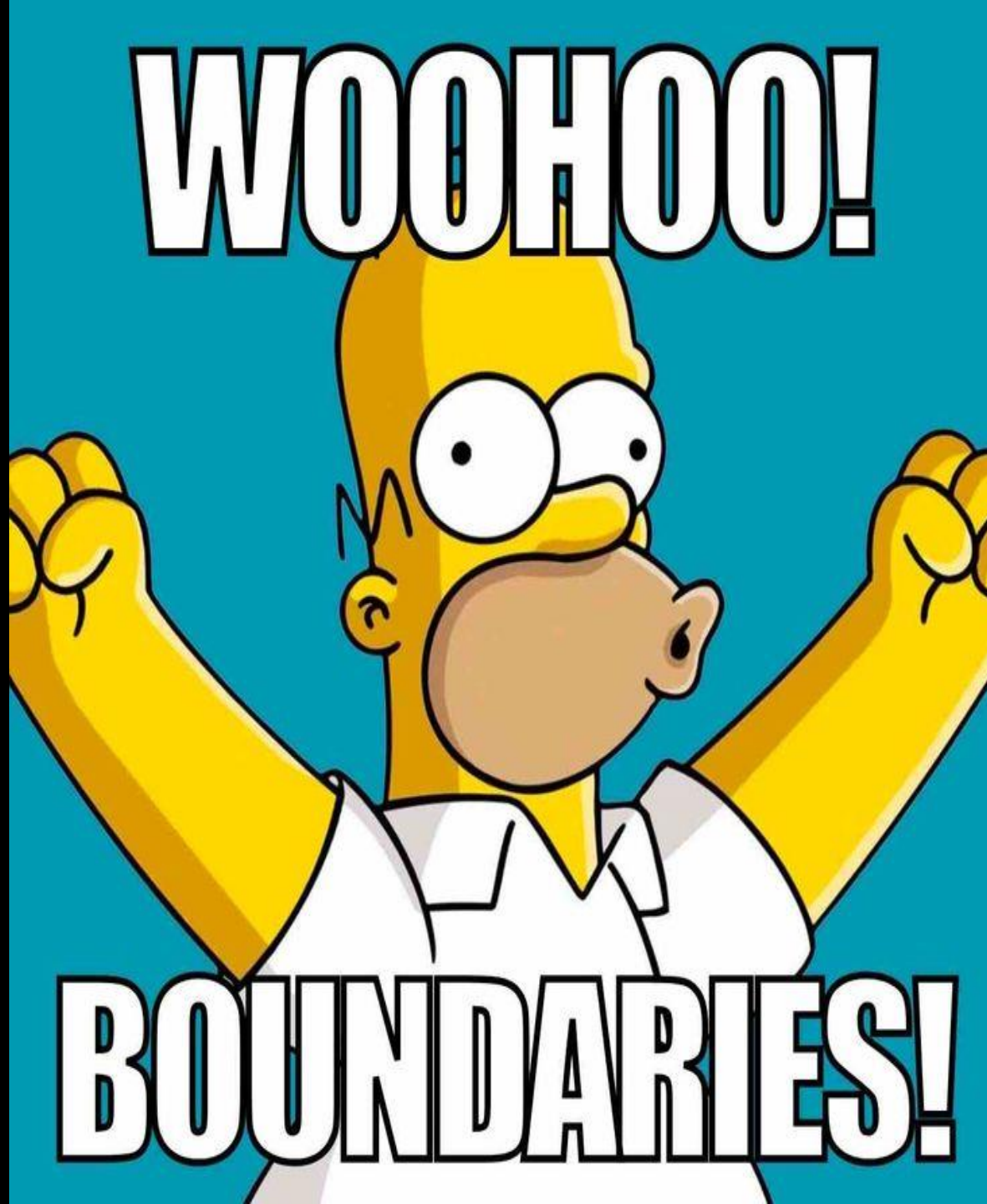
(14-06-2024 to 16-06-2024)

4. Solutions

Cluster Settings

Change DBU

- Photon
- Number of workers (VM’s)
- Worker/driver Type

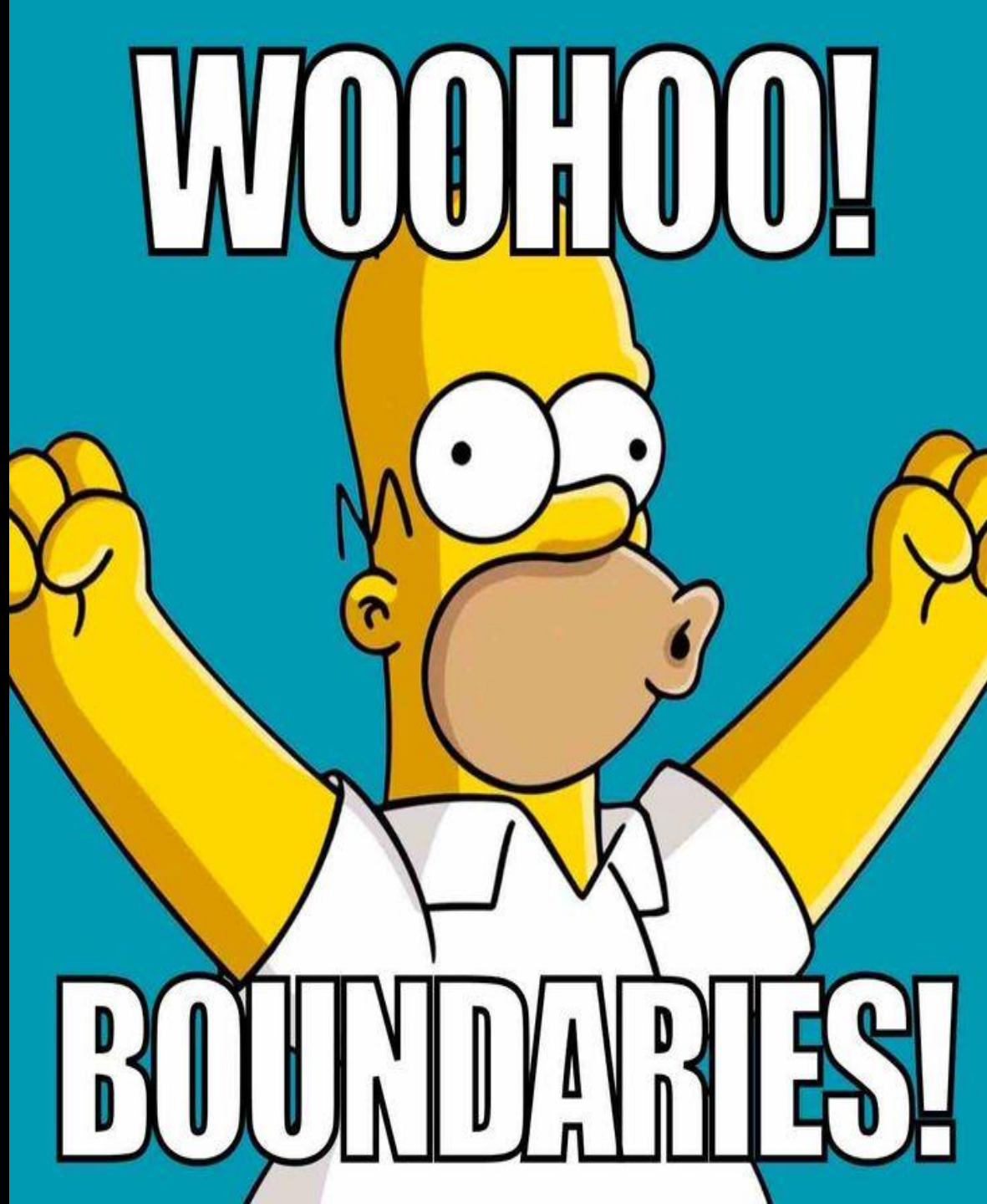


4. Solutions

Cluster Settings

Decrease cluster time

- Auto Terminate
- Spark version



4. Solutions

Cluster Settings

Spot instances

- Might decrease price
- Not for driver nodes

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Hours	48

Total Cost

VM	$90.72
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Data Source	$3.11
Total	**$463.43**

Azure cost calculator

West Europe VM: D4ds_v5	0.27 VM/hour
West Europe All purpose compute (no photon) Premium Workspace	0.55 DBU/hour
DBU	1/VM
Number of VM's (workers + driver)	2 - 4
Hours	48

65%

Total Cost

VM	$25.92 - $51.84
DBU	$52.80 – $105.60
Data Source	$3.11
Total	**$81.83 – $160.55**

4. Solutions

(4) Make it a job!

4. Solutions

Make it a job!

- DBU price differs per workload type
- Jobs compute < All-purpose compute
    - *$0.30 < $0.55 per DBU/hour*

Azure cost calculator

West Europe VM: D4ds_v5	0.27 VM/hour
West Europe All purpose compute (no photon) Premium Workspace	0.55 DBU/hour
DBU	1/VM
Number of VM's (workers + driver)	2 - 4
Hours	48

Total Cost

VM	$25.92 - $51.84
DBU	$52.80 – $105.60
Data Source	$3.11
Total	**$81.83 – $160.55**

Azure cost calculator

West Europe VM: D4ds_v5	0.27 VM/hour
West Europe Job Compute Premium Workspace	0.30 DBU/hour
DBU	1/VM
Number of VM's (workers + driver)	2 - 4
Hours	48

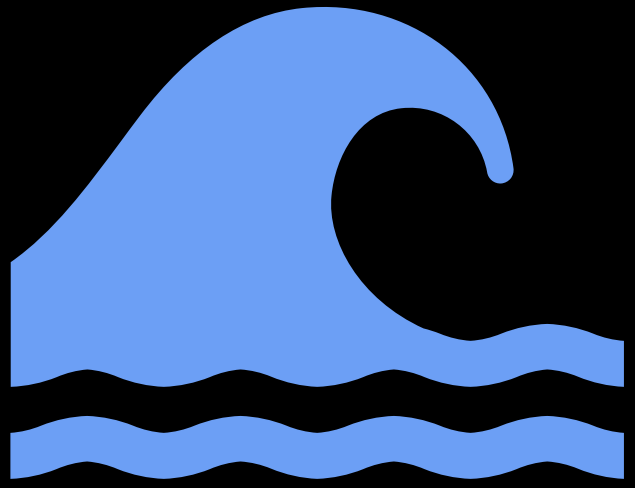
30%

Total Cost

VM	$25.92 - $51.84
DBU	$28.80 – $57.60
Data Source	$3.11
Total	**$57.83 – $112.55**

4. Solutions

(5) Stream or Micro Batch?



4. Solutions

Stream or Micro Batch?

How real time do you need it to be?

Azure cost calculator

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West Europe Job Compute Premium Workspace	0.30 DBU/hour
DBU	1/VM
Number of VM's (workers + driver)	2 - 4
Hours	48

Total Cost

VM	$25.92 - $51.84
DBU	$28.80 – $57.60
Data Source	$3.11
Total	**$57.83 – $112.55**

Azure cost calculator

West Europe VM: D4ds_v5	0.27 VM/hour
West Europe Job Compute Premium Workspace	0.30 DBU/hour
DBU	1/VM
Number of VM's (workers + driver)	2 - 4
Hours	21

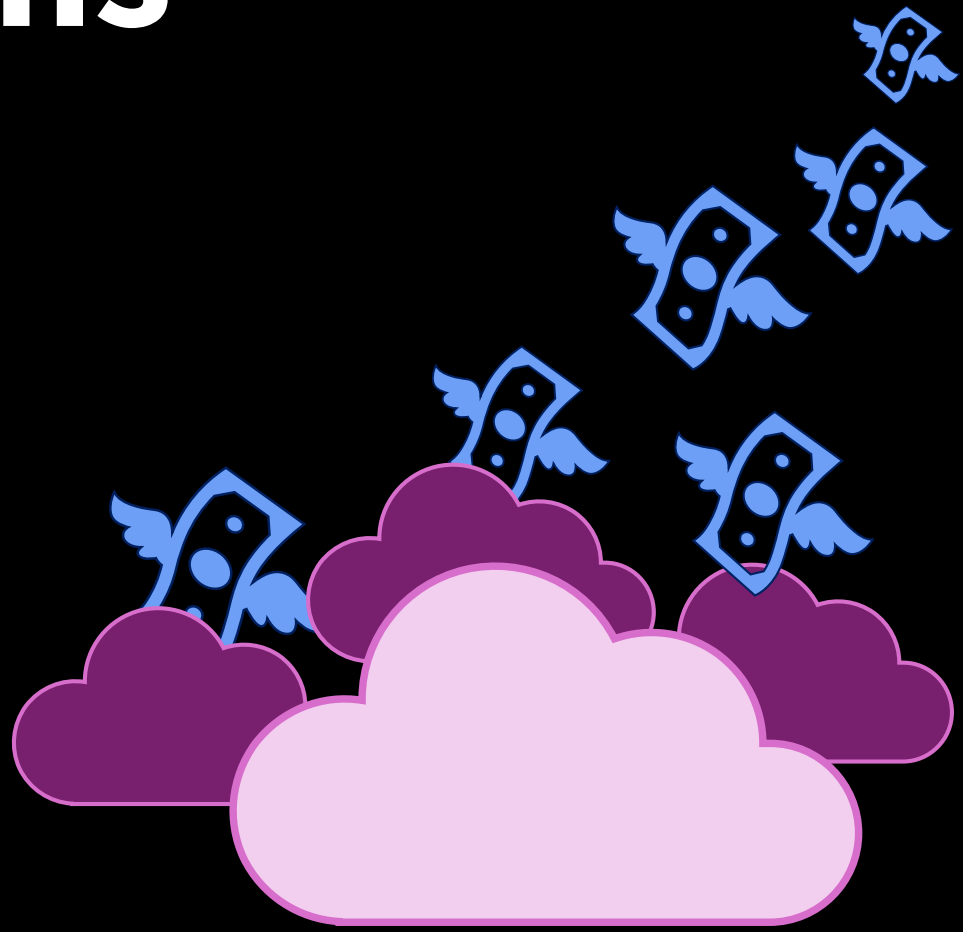
55%

Total Cost

VM	$11.34 - $22.68
DBU	$12.60 – $25.20
Data Source	$3.11
Total	**$27.05 – $50.99**

4. Solutions

(6) Prepay



4. Solutions

Prepay

VM’s

- Reserved instances
- Savings plan

I don’t have clusters running 24/7

4. Solutions

Prepay

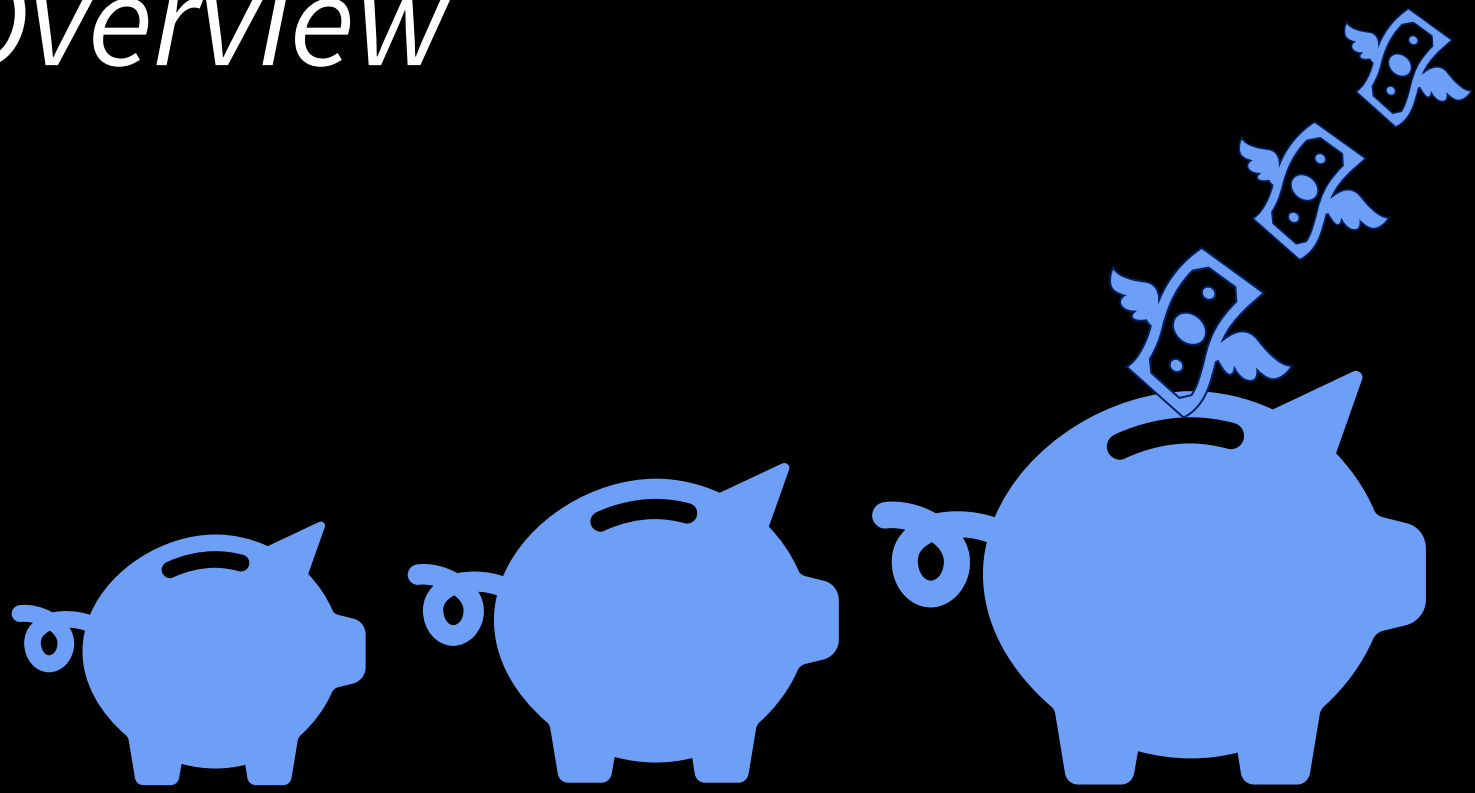
DBCU

- Savings depends DBCU
  - Starts at 12,500 DCBU
  - 1 Year: 4 - 33 %
  - 3 Years: 6 - 37%

I don’t have enough DBU usage

4. Solutions

Overview

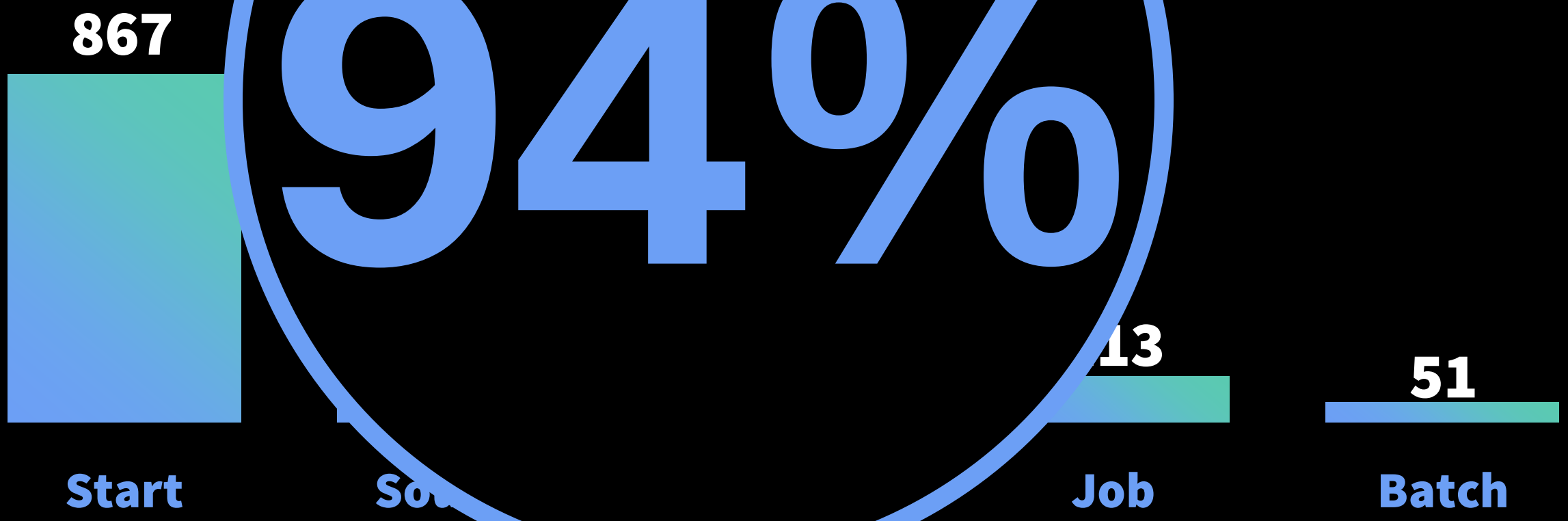


4. Solutions

Overview of cost savings

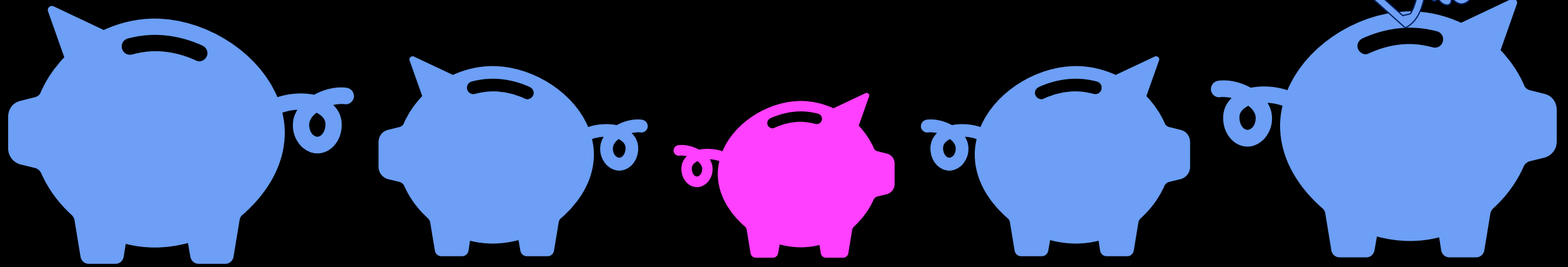
4. Solutio

Overview of c



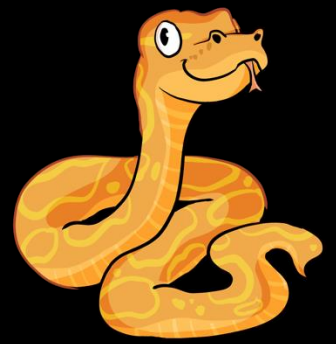
94%

I could have saved >$800



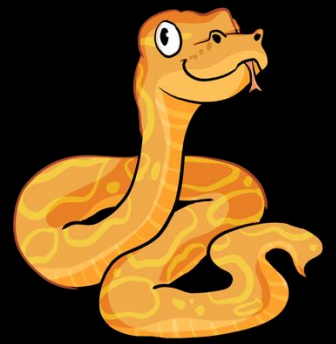
5. Conclusion

- Total Azure spend
  - DBU
  - VM
  - Data Sources
  - Other resources
- Monitoring
  - Alerts: At least in Azure Portal
  - Usage Dashboard: for optimizing workloads



5. Conclusion

- Don’t forget your Data Sources
- Optimize your cluster settings
- Avoid unnecessary gold-plating of code
- Job clusters are cheaper than General Purpose
- Prepay if you have a higher usage
- Streaming is expensive



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Review

Documentation
&
Slides